MCKENZIE DRAIN
MCRAE BRANCH & BRABANT BRANCH
PROPOSED PARTIAL REALIGNMENT
& PARTIAL ENCLOSURE
S. 78 ENGINEER'S REPORT

TOWNSHIP OF NORTH STORMONT

PREPARED BY

SHADE GROUP INC
4625 MARCH ROAD
ALMONTE, ON
K0A 1A0

PREPARED FOR

THE TOWNSHIP OF NORTH STORMONT
15 UNION STREET
BERWICK, ON
K0C 1G0

FEBRUARY 6, 2025

EXECUTIVE SUMMARY

This Engineer's Report has been prepared under Section 78 of the *Drainage Act, R.S.O. 1990, c. D. 17* (henceforth referred to as *the Act*). Section 78 refer to 'major improvements', which refers in this case to the intention to relocate a portion of the existing adopted municipal drain.

This Section 78 process was initiated at the request of the United Counties of Stormont, Dundas and Glengarry to accommodate partial realignments of the Brabant Branch and McRae Branch of the McKenzie Drain. The partial realignments of the Brabant Branch and McRae Branch are required to accommodate a widening of the County Road 22 road surface. In addition to accommodating partial realignments of the Brabant Branch and McRae Branch, this Section 78 report also seeks to adopt a partial enclosure of the McRae Branch, within lands described as Lot 9, Concession 7, Geographic Township of Roxborough. An approximately 327m enclosure had previously been completed by the landowner, and the landowner would like to enclose an additional approximately 1250m of open channel to facilitate more efficient farming practices.

Shade Group Inc. (SGI) was appointed by resolution on July 26, 2022 (Resolution No. 219-2022) to "*update the necessary engineer's reports to legitimize all drainage works required to be completed as part of the SDG County Road 22 project*". Due to delays in the design of the road work (by others), a renewal resolution was completed July 18, 2023 (Resolution No. 219-2023). Copies of the resolutions have been enclosed in **Appendix G**.

This report includes:

- A watershed map of the drain and its contributing area (**Appendix D**);
- Plan and Profile Drawings for the proposed realignment and enclosure (**Appendix D**);
- Updated Assessment Schedules (**Appendix B**);
- Hydrology and hydraulic analysis for the enclosure (**Appendix E**);

Available under separate cover, the following information has also been referenced in the preparation of this report

- Hydrology and hydraulic assessments (by others) of the municipal drainage system, including the driveway culverts;
    - Municipal Drain Assessment – Technical Memorandum – July 30, 2024 (BTE)
    - Culvert Replacement Recommendations – Technical Memorandum – July 30, 2024 (Sanchez Engineering Inc.)
- Construction specifications, which will be used for the initial construction and should be referenced (as applicable) for future maintenance.
    - Special Provisions – Tender Document

A map showing the location of the McRae Drain and Brabant Branch has been enclosed in **Appendix A**.

Design of the realignments of the Brabant Branch and McRae Branch along County Road 22 were undertaken by the County's engineering consultants – BTE – as part of the design of the County Road 22 reconstruction project while the design of the enclosure has been undertaken by Shade Group in consultation with the initiating landowner and in reference to the hydrologic and hydraulic analysis completed by Headway Engineering.

Future maintenance works for the McRae and Brabant branches shall be assessed in accordance with the assessment schedules enclosed within **Appendix B.** The assessment schedule for the McRae Branch is comprised of Schedules A through D while Schedule E is for future maintenance of the Brabant Branch. Construction cost estimates used for the associated assessment schedules can be found in **Appendix F**.

CONTENTS

APPENDICES

REVISIONS & SUBMISSIONS

Revision #	Comments	Date
00	Draft Submission to Township	January 22, 2025
01	Formal Submission to Township	February 6, 2025

1.0 INTRODUCTION

This Engineer's Report has been prepared under Section 78 of the *Drainage Act, R.S.O. 1990, c. D. 17* (henceforth referred to as *the Act*). Section 78 refers to 'major improvements' to existing adopting drainage systems.

This Section 78 process was initiated at the request of the United Counties of Stormont, Dundas and Glengarry to accommodate partial realignments of the Brabant Branch and McRae Branch of the McKenzie Drain. The partial realignments of the Brabant Branch and McRae Branch are required to accommodate a widening of the County Road 22 road surface. The existing right-of-way for County Road 22 is understood to be as narrow as ~12m in many areas along the project area, and the proposed County Road 22 project will see the right-of-way increased to 35m along the areas in the vicinity of the McRae Branch and Brabant Branch. The County has undertaken land acquisition as part of the road widening project, and therefore the realigned Brabant and McRae Branches will continue to be within the County owned right-of-way. As the land has been acquired through other means, no allowances under the Drainage Act have been applied to this project.

In addition to accommodating partial realignments of the Brabant Branch and McRae Branch, this Section 78 report also seeks to adopt a partial enclosure of the McRae Branch, within lands described as Lot 9, Concession 7, Geographic Township of Roxborough. An approximately 327m enclosure had previously been completed by the landowner, and the landowner would like to enclose an additional approximately 1250m of open channel. The reasoning for the previous and proposed enclosure is to facilitate more efficient farming practices across Lot 9, Concession 7, as the current meandering channel makes for inefficient work of the land in its current configuration.

This report includes updated Plan and Profile Drawings for the realignment and the enclosures. This report also includes an updated Schedule of Assessment for future maintenance of the system, which accounts for updates required to the assessment due to variances in the parcel fabric compared to the previous adopted report, and to appropriately distribute future maintenance costs associated with the changes to County Road 22, and the change in assessment for the enclosures.

All proceedings associated with the preparation of this report have been completed in accordance with the specifications of *the Act*.

2.0 DRAIN HISTORY

The Township of North Stormont was consulted about the history of the McRae Branch and Brabant Branch of the McKenzie Drain as part of the preparation of this report. Per supplied information, it is our understanding that the governing report (relevant to this project) for the

McRae Branch and Brabant Branch is the *Engineer's Report McRae Branch of the McKenzie Drain – Stidwill & Associates Limited, September 16, 1975*. This report includes for improvements to the McRae Branch as described as having originally been constructed around 1909, with intermittent maintenance having been carried out prior to 1935, and a major improvement (deepening) having been performed in 1951. The lower 1000 feet of the McRae Branch was then further deepened and improved in 1973, at the time of improvements to the McKenzie Drain. The 1975 report also included for the construction of a new branch – the Brabant Branch.

It's worth noting that various current available digital maps (including AgMaps and SDG GIS) refer to the "Howes Branch" rather than the Brabant Branch, however no records can be found for the "Howes Branch" – and it has been assumed that this is an error in the digital mapping – and should instead refer to the Brabant Branch.

3.0 EXISTING CONDITIONS

3.1 DESCRIPTION OF THE ALIGNMENT + AREA REQUIRING DRAINAGE

The 1975 Engineer's Report described the McRae Drain and Brabant Branch as follows:

The point of commencement of the McRae Drain is at the north limit of the given road through Concession 7, and at the line between Lots 8 and 9. The Brabant Branch starts at the south limit of Lot 10, Concession 7 and runs east into the McRae Drain at a point opposite the southwest corner of Lot 8, Concession 7.

The outlet for the McRae Drain is the McKenzie Drain, intersecting at the North ½ of Lot 6, Concession 6.

The McRae Drain starts at the north limits of the road allowance for the road through Concession 7, at the line between Lots 8 and 9. At the time of this report, the road is known as McLean Road. The alignment as adopted in 1975 then zig-zags south and west through Lot 9, Concession 7 before turning southeasterly until it reaches the limits between Lot 8 and 9, Concession 7, where it continues south until it intersects with the road between Concession 6 and 7. The McRae Drain continues parallel to this road (known as County Road 22 at the time of this report) for approximately 180m before passing under the road, and continuing south, then ultimately east, out to the McKenzie Drain. The McRae Drain as described in the 1975 Engineer's Report was adopted with a total length of approximately 11,715 ft.

The area requiring drainage for this report shall be considered those lands upstream of any improvements. This area requiring drainage shall be described as Lots 7 – 12, Concession 7, Geographic Township of Roxborough. The lands within Concession 6 would not be expected to be impacted by any of the improvements made upstream; however the assessment schedule for the entire watershed has been updated to reflect current conditions.

The total contributing area for the Brabant Branch is estimated to be approximately 157 ha, while the McRae Branch is estimated to be approximately 401 ha.

A plan view illustrating the watershed boundary of the McRae Branch, including the subcatchment of the Brabant Branch, is enclosed in **Appendix D**.

3.2 PREVIOUS ENCLOSURE

An enclosure was conducted on the McRae Drain prior to the appointment of Shade Group. The enclosure has a point of commencement approximately 200m from the point of commencement of the McRae Drain. The first 200m of the McRae Drain remain as open channel, along the line between Lot 8 and 9, Concession 7, up until the point where the previous alignment began to zig-zag to the west. The approximate alignment of the enclosure has been shown on the attached Plan View, per information supplied by the landowner that completed the enclosure works.

As the works were completed prior to the appointment of this engineer, the alignment and profile as shown has been approximated based on information supplied by the owner. Per discussions with the Township's Drainage Superintendent, no measurable concerns have been observed as a result of the enclosure, even after significant rainfall events.

The enclosure was assumed to have been generally installed at the same slope as the previous drain profile, and hydrology and hydraulic calculations for the previous enclosure have been conducted as part of the preparation of this report to confirm the installed enclosure has adequate capacity to meet current design standards for service levels. For more on the hydrology and hydraulics, refer to **Section 6.0** of this report. A copy of the Hydrologic & Hydraulic Analysis Brief as prepared by Headway Engineering (July 12, 2024) can be found in **Appendix E**.

A profile drawing for the previous enclosure has been provided in **Appendix D**.

3.3 DOWNSTREAM CONDITIONS

The improvements being made under this report are limited to works upstream of County Road 22 (up to ~Station 74+84 per the 1975 Engineer's Report). The McRae Branch continues to exist further downstream of this point, from Stations 74+84 to 117+15 – in accordance with the design specifications as adopted under the 1975 Engineer's Report by Stidwill & Associates Limited. Future maintenance of the McRae Branch between 74+84 and 117+15 shall be conducted in accordance with the 1975 Engineer's Report's Plan, Profiles and Specifications. Maintenance works performed on the McRae Branch shall be assessed to those within the watershed in accordance with the updated assessment schedule enclosed within *this* Engineer's Report – both for works conducted upstream and downstream of County Road 22. Where only partial maintenance works are performed (i.e. not a full cleanout), the costs for such maintenance shall be assessed to those *upstream* of where the works were completed, in fitting with the directives of the Drainage Act.

4.0 PROPOSED IMPROVEMENTS

Proposed improvements that are part of this Section 78 undertaking include the following:

- Realignments of part of the Brabant Branch parallel County Road 22;
- Realignments of part of the McRae Branch parallel County Road 22;
- Enclosure of parts of the McRae Branch through Lot 9, Concession 7.

Design of the realignments of the Brabant Branch and McRae Branch along County Road 22 were undertaken by the County's engineering consultants – BTE – as part of the design of the County Road 22 reconstruction project. The relevant Plan and Profile have been included in **Appendix C**, and the associated technical reports discussing the hydrology and hydraulics associated with the channel cross-section and the applicable culverts, can be found under separate cover. The hydrologic and hydraulic analysis design works can be found in the following two documents, prepared by others:

1) Municipal Drain Assessment – Technical Memorandum – July 30, 2024 (BTE)
2) Culvert Replacement Recommendations – Technical Memorandum – July 30, 2024 (Sanchez Engineering Inc.)

Design of the enclosure has been undertaken by Shade Group, in consultation with the initiating landowner, an experienced tile drainage contractor and long-term farmer – and in reference to the hydrologic and hydraulic analysis completed by Headway Engineering. Profile drawings for the proposed enclosure can be found in **Appendix D**, while a copy of the Hydrologic & Hydraulic Analysis Brief as prepared by Headway Engineering (July 12, 2024) can be found in **Appendix E**.

5.0 DRAINAGE ACT, 1990, PROCESS

5.1 TO DATE

Shade Group Inc. (SGI) was appointed by resolution on July 26, 2022 (Resolution No. 219-2022) to "*update the necessary engineer's reports to legitimize all drainage works required to be completed as part of the SDG County Road 22 project*". Due to delays in the design of the road work (by others), a renewal resolution was completed July 18, 2023 (Resolution No. 219-2023). Copies of the resolutions have been enclosed in **Appendix G**.

Shade Group was appointed early in the design stage of the road reconstruction project, and as the road design work took multiple years, there were certain delays in the preparation of the Engineer's Report pending completion and permitting for the proposed drainage works associated with the road reconstruction.

An on-site meeting was held at the Moose Creek Community Centre on July 12, 2023. Approximately 12 property owners attended the meeting as well as representatives from the

Township (CAO and Drainage Superintendent), representatives from BTE and representatives from the County.

Discussions at the on-site meeting were generally related to concerns with the improvements being proposed pertaining to the County Road 22 project, including concerns over land acquisition, and further requests for enclosures in areas alongside the road. The land acquisition component of the project was completed as part of the road widening project and was undertaken separate from the Drainage Act component. The land acquisition was overseen by the County – not the Township or Drainage Engineer. As the land has been acquired through other means, allowances under the Drainage Act were not applied. No concerns were brought forth regarding the current performance of the drainage system, nor any concerns noted with respect to flooding or erosion of the system as it currently exists.

Throughout the time leading up to, and following the on-site meeting, Shade Group undertook on-going consultation with the Township's Drainage Superintendent and the County's project lead. Shade Group conducted high level peer review of the drainage design documents prepared by BTE as it pertains to the design of the realigned channel and associated culverts. Multiple iterations were provided however the final governing design documents are understood to be:

1) Drawings - "County Road 22 – Reconstruction and Drainage Improvements from Highway-138 to 0.6km east of the Roxborough Kenyon Boundary Road" Issued for Tender package (07/24) (BTE)
2) Municipal Drain Assessment – Technical Memorandum – July 30, 2024 (BTE)
3) Culvert Replacement Recommendations – Technical Memorandum – July 30, 2024 (Sanchez Engineering Inc.)

Ultimately the final design drawings associated with the realignment works will remain the liability of the design engineers (BTE/Sanchez Engineering Inc.)

5.2 NEXT STEPS

Following the formal submission of this report to the Township, the report will be brought to a Meeting to Consider (Section 42).

The clerk of the municipality shall send a copy of the report and a notice stating the date on which the report was filed, the name or designation of the drainage works; and the date of the council meeting at which the report will be considered, to the prescribed people (Section 41).

The Meeting to Consider is held by council, and council may adopt the report by provisional by-law by giving two readings (Section 45(1)).

Following the Meeting to Consider, and assuming a provisional by-law is adopted by two readings, a notice is sent, including a copy of the provisional by-law (exclusive of the Engineer's

Report) of the time and place for the first sitting of the Court of Revision. This notice is sent to each body or person as entitled under Section 41 of the Drainage Act.

Following the completion of addressing all appeals; or the time for appealing has expired, Council may pass the provisional by-law by a third reading, thereby authorizing construction of the drainage works. Work may then be commenced as early as ten days after the by-law is passed, if no notice of intention to make an application to quash the by-law has been filed with the clerk of the council (Section 58(1)), assuming the limitations for construction can be met at such a time (e.g. compliance with any permitting restrictions with respect to timing windows).

Through discussions with Township staff, it is understood that the Township's Drainage Superintendent will oversee any hiring of a contractor for the proposed enclosure works. The Township's Drainage Superintendent is also understood to be undertaking any contract administration, construction supervision, and final walkthrough, as required, for the enclosure works. Should additional Shade Group involvement be required, any such additional would be assessed back to the initiating landowner.

It is understood that the County will be overseeing the tendering of the drainage realignment works as part of the road reconstruction tender. It is anticipated that a combination of Township staff and Shade Group resources may be drawn upon during the construction to oversee the construction and the final walkthrough, on an as needed basis. All such involvement from Shade Group to oversee the drain realignment works would be billed back to the County.

5.3 RESOLUTION AND BY-LAW

Appendix G has been included in this report as a place to attach the applicable resolution and by-law associated with this Section 78(1) undertaking. The resolutions for Shade Group's appointment have been enclosed with this submission; and it is recommended that the Drainage Superintendent (or applicable Township Staff) attach a copy of the report adoption by-law following its third reading for ease of future reference.

5.4 LIMITATIONS

The process overview provided in **Section 5.2** is provided as a general summary of the next steps to completion. Should the process described conflict with the specifications of the Drainage Act, the Drainage Act shall govern. The process described is provided as a summary only, the Township clerk shall be responsible for ensuring that the applicable administrative works are completed in accordance with the specifications of the Drainage Act.

6.0 DESIGN CONSIDERATIONS

6.1 ENCLOSURE ALIGNMENT CONSIDERATION

Minor changes are proposed to the previous adopted alignment to accommodate the proposed enclosure. The previous adopted alignment included a number of 90-degree bends throughout

the alignment, with the open channel zig-zagging across the lands. The proposed enclosure includes changing the 90-degree bends to 45-degree bends – which will reduce the overall length of travel and offer improved flow through the pipe compared to 90 degree elbows.

6.2 HYDROLOGIC + HYDRAULIC ANALYSIS – ENCLOSURE

A hydrologic and hydraulic analysis was conducted by Headway Engineering for both the existing enclosure and the proposed enclosure. Based on the design analysis, the existing 24" (600mm) smooth wall pipe is of appropriate size to meet current standard design practice, while the additional enclosure also meets current design standards as a smooth wall 24" (600mm) diameter HDPE pipe.

For a breakdown of the calculations, refer to the *Hydrologic & Hydraulic Analysis Brief* as prepared by Headway Engineering (July 12, 2024) found in **Appendix E**.

6.3 HYDROLOGIC + HYDRAULIC ANALYSIS – REALIGNMENTS

A hydrologic and hydraulic analysis was conducted by BTE and Sanchez Engineering Inc. as part of the County Road 22 reconstruction project.

The *Technical Memorandum* prepared by Sanchez Engineering Inc. (June 11, 2024) analyzes road crossing culverts within the County Road 22 project area – where "Culvert 2" within the report refers to the road crossing culvert on the McRae Branch, under County Road 22.

The *Technical Memorandum – Municipal Drain Assessment* prepared by BTE analyzes the entrance culverts and drain channel cross-section.

As both reports are quite lengthy, they have not been included with this report, however both of the Technical Memoranda can be found under separate cover.

6.4 EROSION CONSIDERATIONS

Erosion control measures have been proposed by the County's design engineer (BTE) as part of the road reconstruction project, including measures within the Brabant Branch and McRae Branch. Measures include recommendations such as the placement of rip-rap per OPSD 810.010. Slope flattening measures have also been proposed throughout the realignments – with the foreslope proposed at 4:1 and backslope at max 3:1, which is a considerable improvement over the 1975 design criteria that specified side slopes of 1-1/4 horizontal to 1 vertical for the entirety of the Brabant Branch and McRae Branch. Changes to side slopes are limited to areas along County Road 22 – in those areas specified on the enclosed plans. The specified erosion control measures can be found on the Plan and Profile drawings prepared by BTE, enclosed in **Appendix C**.

Erosion measures have also been proposed as part of the proposed enclosure project. Erosion measures are proposed at the inlet in the form of a sediment trap; and the outlet is proposed to be protected with rock protection.

Permanent erosion and sediment control measures have been shown on the enclosed engineering plans.

Temporary erosion and sediment control measures may be required to accommodate site conditions at the time of the work. Additional erosion and sediment control measures may be required at the direction of the engineer, municipality (upper and/or lower tier), SNCA or DFO, as needed to address site conditions at the time of the work, referring both to the new construction and future maintenance activities. The review and implementation of erosion and sediment control measures is intended to be a living practice, where additional measures may be required depending on the conditions at the time of the work.

7.0 PLAN, PROFILE & SPECIFICATIONS

It is intended that the accompanying Plan, Profile and Specifications form part of this report, and that they together govern the performance of the work.

The enclosed Watershed Map - Plan View (**Appendix D**) shows:

- The watershed boundary and subcatchment;
- The general course of proposed works (existing alignment to be abandoned + new alignment, enclosures);
- Turns and intersections have been referenced;
- Property ID numbers have been assigned to each property for ease of reference to the assessment schedule. The use of Property IDs rather than names offers protection of private information and affords continuity of use as property ownership can change over time.

The enclosed Profile Drawings (C-004 – C-006) (**Appendix C**) show:

- The realigned alignment of the Brabant and McRae Branches relative to the centerline of the road;
- Slopes and elevations associated with the open channel and applicable driveway culverts;
- Applicable road crossing culverts.

Specifications for the channel cross-section can be found in the Municipal Drain Assessment – Technical Memorandum (available under separate cover). The specifications note that the realigned Brabant and McRae Branches are to have a trapezoidal geometry with a bottom width of 0.5m; and side slopes of 3:1 or 4:1. Side slopes of 3:1 are proposed on the backslope of the municipal drain, while the 4:1 side slope is proposed on the foreslope (road-side). An extract from the aforementioned Technical Memorandum is provided in the figure below.

Subject: Municipal Drain Assessment
Project: BTE File 22-019, Stormont, Dundas and Glengarry Counties, County Road 22 Rehabilitation
Date: July 30, 2024

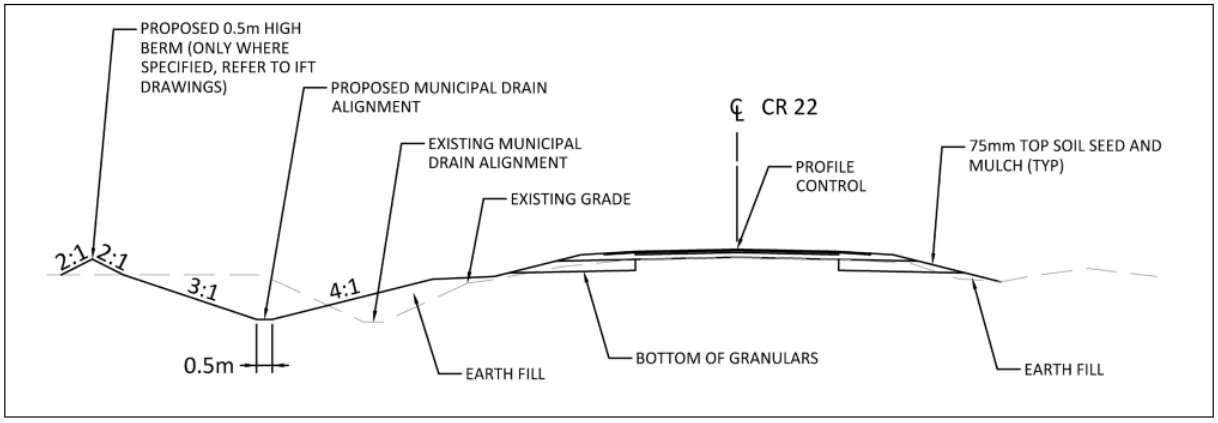


Figure 1: Typical Cross-Section - Per Municipal Drain Assessment - Technical Memorandum - Page 5

Appendix D also includes profile and plan view details for the proposed enclosure, including details associated with temporary and permanent erosion control measures and other such applicable details needed for construction and future maintenance.

8.0 EXISTING ALIGNMENT – ABANDONMENT

The alignment as adopted in 1975 shall be considered abandoned within the following stations:

- Station 7+55 to ~60+22 – the open channel is to be considered abandoned. This stretch of drain is to be replaced with a pipe which is to be adopted under this Section 78 report.
- The alignment of the Brabant Branch as adopted in 1975 shall be considered abandoned and replaced instead with the alignment shown within the enclosed plans. The new alignment of the Brabant Branch as reflected on the enclosed plans is to be adopted as the new governing alignment.
- The alignment of the McRae Branch between ~67+65 and 74+18 as adopted in 1975 is to be abandoned and shall be replaced with the alignment as reflected on the enclosed plans. The new alignment of the McRae Branch as reflected on the enclosed plans – between former station 67+65 and 74+18 – is to be adopted as the new governing alignment.

9.0 CULVERTS + FUTURE MAINTENANCE

Table 1 and 2 provides a summary of the culverts on the McRae Branch and Brabant Branch, and includes culverts within the improvement area and an updated summary of culverts downstream of the improvement area for completeness. No changes are proposed to culverts downstream of the improvement area.

Table 1: McRae Branch – Culvert Inventory

				Column A	Column B	Column C
Culvert ID # (BTE)	Culvert ID # (Shade Group)	Property ID Reference	Station (2025 - Measured)	Inventory Details [A]	Length at 2:1 Side Slopes [B]	Difference assigned to Special Benefit [C]
DC22	4	25	1+958	1400mm Ø C.S.P. 76.0m	N/A – See Note 1	
DC23	5	27	2+105	1400mm Ø C.S.P. 18.5m	17.0	1.5
CC2	6	-	2+123	1600mm Ø C.S.P. 37.2m	N/A – Road Crossing Assessed to County per Section 26	
-	7	38	2+816	1500mm Ø C.S.P. 9m	N/A – See Note 2	
-	8	39	3+006	1500mm Ø C.S.P. 9m		
-	9	-	3+325	1500mm Ø C.S.P. 9m	N/A – See Note 2 and 3	

Table 2: Brabant Branch – Culvert Inventory

				Column A	Column B	Column C
Culvert ID #	Culvert ID # (Shade Group)	Property ID Reference	Station (BTE)	Inventory Details [A]	Length at 2:1 Side Slopes [B]	Difference assigned to Special Benefit [C]
DC14	1	20	0+051	900mm Ø C.S.P. 34.0m	29.0	5.0
DC16	2	21,22	0+260	1100mm Ø C.S.P. 117.3m	N/A – See Note 1	
DC21	3	23	0+436	1100mm Ø C.S.P. 27.9m	22.4	5.5

[A] *Culvert lengths are as per BTE drawings.*
[B] *Length of culvert required if side slopes were specified at the minimum standard of 2:1.*
[C] *Difference between length specified by the County at 3:1 or greater side slopes versus the minimum standard of 2:1. Additional length is to be assessed as a special benefit to the United Counties of Stormont, Dundas and Glengarry when undertaking future replacement.*

Note 1: Two culverts – DC22 and DC16 – are proposed to be enclosures along the McRae and Brabant Branches respectively. These enclosures are required to accommodate the widening of the road. It is not possible to have the ditch remain as an open channel in these areas as the impacted properties are relatively small residential properties that do not have space to move an open channel further into their property. With that, the installation and future replacement of these enclosures is to be assessed to the road authority, as the enclosure requirement is a

direct result of impacts caused by the widening of the road. This assessment to the road authority is in fitting with Section 26 of the Drainage Act.

Furthermore, per discussions with the County, we understand that the County standard for end treatment of culverts is 2:1. In a number of cases, BTE has designed to a greater standard, with many driveways specified with 3:1 (+\- 33%) end treatments. With that, the proposed extra length of pipe is considered above the minimum standard and therefore considered a special benefit.

When undertaking future replacement of the driveway culverts, the replacement culverts shall be like-for-like replacement of the diameter and material specified in Column A; with the cost of the length of Column B assessed back to the drain; and the cost of the additional length (Column C) assessed solely to the County.

Note 2: The inventory of these culverts is as per information provided by the Drainage Superintendent. The lengths are based on continued reinstatement of headwalls on culverts 7, 8, 9. Headwalls are understood to be comprised of field stone. Reinstatement may be of hand laid field stone or approved equivalent.

Note 3: According to the available GIS information from the County, Culvert 9 is located within an unopened or unmaintained road allowance that is understood to be owned by the Township. As this is not an active road, and as this culvert primarily serves as passage for the adjacent private agricultural fields - I do not feel that Section 26 applies here, and instead future replacement of this culvert would be assessed to the landowners upstream.

9.1 FUTURE MAINTENANCE AND REPLACEMENT – ENTRANCE CULVERTS

Future maintenance of entrance culverts is to be completed by the Township, as per the Section 74 of *the Act*. Per *the Act:*

"Maintenance of drainage works and cost

74. *Any drainage works constructed under a by-law passed under this Act or any predecessor of this Act, relating to the construction or improvement of a drainage works by local assessment, shall be maintained and repaired by each local municipality through which it passes, to the extent that such drainage works lies within the limits of such municipality, at the expense of all the upstream lands and roads in any way assessed for the construction or improvement of the drainage works and in the proportion determined by the then current by-law pertaining thereto until, in the case of each municipality, such provision for maintenance or repair is varied or otherwise determined by an engineer in a report or on appeal therefrom. R.S.O. 1990, c. D.17, s. 74."*

The maintenance and replacement of standard entrance culverts (DC14, DC21 & DC23) are to be at the expense of the upstream landowners, in the same apportionments as distributed in the enclosed assessment schedule (**Appendix B**).

Costs associated with routine maintenance (flushing, etc.) and future replacement of the enclosures along County Road 22 (DC16, D22) shall be assessed solely to the County (or applicable road authority at the time of the work) in fitting with Section 26 of *the Act*.

Costs associated with the maintenance and/or replacement of the enclosure through Lot 9, Concession 7 shall be per the assessment schedules enclosed for the applicable works (**Appendix B**).

9.2 FUTURE MAINTENANCE AND REPLACEMENT – ROAD CROSSING CULVERTS

The maintenance and replacement of the road crossing (CC2) is to be at the expense of the road authority with ownership of the road, in fitting with Section 26 of *the Act*.

9.3 FUTURE MAINTENANCE – DRAINAGE CHANNEL

Similar to the culverts, future maintenance of the drainage system is to be completed in accordance with Section 74 of the Drainage Act. Future maintenance works of the drainage channel would be expected to include such works as a bottom cleanout, reinstatement of side slopes, and other such general works required to restore the system to the original design. Where only a partial cleanout is completed, only those upstream of the works would be assessed. Where the entire drain is maintained, the entire watershed would be assessed. Whether partial or full maintenance, assessed costs would be in accordance with the assessment schedule enclosed in **Appendix B**.

10.0 ASSESSMENTS

Updates to the assessment schedules for the McRae Branch and Brabant Branch have been undertaken to account for the lands acquired by the County from the properties adjacent to County Road 22 to accommodate the road widening project.

As per Section 21 of *the Act*, "*The engineer in the report shall assess for benefit, outlet liability and injuring liability, and shall insert in an assessment schedule, in separate columns, the sums assessed for each opposite each parcel of land and road liable therefor."* As this is an existing drain and the scope of works does not include any works that would be considered injuring to lands or roads, injuring liability is not considered applicable for this project. And as the land acquisition was part of the County Road project (i.e. not the Drainage Act component), no allowances for land acquisition have been included.

As the overall changes to the land use have been minimal *for lands directly abutting the drain*, and as it can reasonably be assumed that the overall benefit-to-outlet ratio of the drain can be considered to be relatively proportional today to that of the governing Engineer's Report from 1975 (i.e. the benefit area has not measurably changed in size); the total benefit apportionment has not been changed from that of the previous governing reports, and has instead been reapportioned amongst the lands who meet the definition of such an assessment. Under *the Act*, lands eligible for benefits assessment are defined as those "*lands, roads, buildings, utilities, or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance or repair of a drainage works may be assessed for benefit. R.S.O. 1990, c. D.17, s. 22."*

Finally, all lands within the watershed are assessed outlet liability, which is defined as "*lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek or watercourse, may be assessed for outlet liability. R.S.O. 1990, c. D.17, s. 23 (1)."*

The method for determining the appropriate apportionment of benefit and outlet liability assessment is the responsibility of the appointed Drainage Engineer. The Drainage Engineer shall use their best judgement to determine an apportionment that is considered fair to all those assessed.

For the purposes of assessing outlet and benefit across the lands within the watershed, the Drainage Engineer has generally followed the Factored Areas Method. Under this method, the areas of land within the watershed are assigned factors based on land use, proximity to the drain and general location in the watershed (sub-section factor). Calculations were initially completed using the distance factor as well (offset from the drain) but the results appeared to skew assessments in a manner that the engineer deemed to be unfair to certain landowners. With that, distance factor has not been considered in the calculations. The summation of these factors provides a factored area that allows lands within the watershed to be compared on what has been considered a fair basis. The appropriate factors are assigned by the engineer, on a case-by-case basis, as deemed appropriate and fair by the engineer.

As the cost for maintenance on an enclosed drain is generally considered lower compared to maintenance of an open channel (on a life-cycle analysis), separate assessment schedules have been prepared for maintenance versus replacement. Specifically, the following assessment schedules have been enclosed:

Schedule 'A' – McRae Branch Enclosure – New Construction (One-Time Use) – Stations 0+568 – 1+712

Schedule 'B' – McRae Branch – Maintenance of Open Channel – Stations 1+712 – 3+438

Schedule 'C' – McRae Branch – Maintenance of Enclosure + Open Channel Upstream – Station 0+000 – 1+712

Schedule 'D' – McRae Branch – Replacement of Enclosure – Station 0+200 – 1+712

Schedule 'E' – Brabant Branch – Future maintenance

10.1 LAND USE FACTORS

Each property was assigned a land use factor based on current aerial mapping. The assigned values for the respective land use have been summarized in Table 2.

Table 3: Land-use factors

Land Use Description	Factor
Agricultural	1.0
Commercial/Industrial	4.0
Roads	2.0

10.2 LENGTH FACTORS

Each property was assigned a factor between 0 and 1 based on their relative location in the watershed. Properties farthest upstream (top of the watershed) make use of the entire length of the drain and were assigned a factor of 1.0, while properties at the outlet of the drain only make use of a small relative apportionment of the total system; and were assigned a smaller factor. Properties throughout the watershed were then assigned factors between 1.0 and 0.18 based on their relative location within the watershed. Factors were determined based on the approximate outlet station of where water from the property would be expected to enter the drain, and pro-rated accordingly.

For example, when calculating the assessments for a property draining halfway along the length of a given drain at 500m in length, the property would be assigned a factor of 0.5.

This would be calculated as follows:

$$(500\text{-}250) / 500 = 0.5$$

This calculation equates the total linear length of the drain used (500 – 250; where 500 is the total length of the drain in meters, and 250 is the approximate point at which the property's water enters the drain) and assigns that value as a factor.

Each of these factors (land use, offset, and length) was used to determine an equivalent area, which was used to determine the apportionment of the associated outlet liability for each property.

11.0 ESTIMATED FEES

11.1 REALIGNMENT ESTIMATED FEES

As the realignments of the municipal drains is being undertaken as part of the County Road 22 reconstruction contract, with all costs to be borne by the County as part of their capital project; no separate construction cost estimate has been prepared for the realignments. As the realignments are needed to accommodate the proposed road widening, it is generally understood that the *construction cost* associated with the realignments is not a concern to the County and the works would be expected to proceed at any cost.

11.2 ENCLOSURE ESTIMATED FEES

The estimated fees for the enclosure are anticipated to be $505,960, plus any applicable taxes. This includes estimated construction costs, engineering fees, and associated permitting fees. A breakdown of the estimate fees has been enclosed in **Appendix F**. All costs associated with the enclosure, including applicable permitting fees, labour, equipment, material and engineering fees are to be assessed to the requesting landowner. Schedule 'A' shows the proposed assessment associated with this work. Although it is understood to be a single property owner, the impacted lands are two roll numbers – so the proposed costs have been assessed to both those roll numbers.

11.3 FUTURE MAINTENANCE FEES

Additional construction cost estimates have been prepared for future maintenance works. Note these are estimates only and are based on 2024/2025 pricing. Future pricing may be higher/lower depending on inflation at the time of the works. Shade Group is not aware of any intentions to undertake maintenance at this time, however these costs have been prepared to allow for the update to the associated assessment schedules. Future maintenance works would be assessed to the associated lands in the same apportionments as reflected in the enclosed assessment schedules.

Assessment Schedule 'B' breaks down the assessment for if works are done between the outlet of the new enclosure of the McRae Branch (Station 1+712) to the outlet of the McRae Branch (Station 3+438).

Assessment Schedule 'C' is the assessment schedule to be used for any *maintenance* works done between Station 0+000 to 0+200 (open channel) and 0+200 to 1+712 (enclosure). As maintenance costs are generally less on enclosed systems compared to open channels, these maintenance costs are to be assessed across all those upstream of the enclosure.

Assessment Schedule 'D' is for the replacement of the enclosure. For the replacement of the enclosure, the author has calculated what the equivalent maintenance costs would have been had the channel remained as open ditch, factoring in anticipated maintenance already performed. The author has assumed that two rounds of maintenance would have occurred

during the equivalent life cycle of the enclosure. The difference between these two values is what has then been assessed to the initiating landowner. This equates to 7% of the estimated future replacement costs being assessed to the drain (upstream of the enclosure); and the remaining 93% assessed solely to the original petitioning landowner as a Special Benefit.

It should be noted that the proposed enclosure would be expected to provide an overall improvement to the drainage system and reduced maintenance needs as the soils are known to be relatively sandy, and prone to erosion.

12.0 PERMITTING & SPECIAL CONSIDERATIONS

As part of the preparation of this report, the author conducted a review of AgMaps, the Geographic Information System managed by the Ministry of Agriculture, Food and Rural Affairs. AgMaps identifies the Brabant Branch (incorrectly labeled the Howes Branch) and the McRae Branch both as 'Class F' drains. Class F drains are defined as intermittent watercourses that are dry for at least 3 months of the year.

No fisheries studies were conducted as part of Shade Group's scope.

12.1 SOUTH NATION CONSERVATION AUTHORITY

The design of the enclosure (Lot 9, Concession 7) was circulated to the South Nation Conservation Authority (SNCA) for review and permit for the enclosure works. A separate application to SNCA was circulated for the realignments – as filed by the County. SNCA provides permits under the Conservation Authorities Act, R.S.O. 1990, c. C 27 for the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

The applicable permitting documents have been enclosed in **Appendix H**.

12.2 DEPARTMENT OF FISHERIES AND OCEANS

Consultation with Fisheries and Oceans Canada (DFO) was completed by both Shade Group and the County. Shade Group submitted a "Request for Review" for the proposed enclosure works; while the County submitted a "Request for Review" for the realignment works adjacent County Road 22. Both projects were issued a "Letter of Advice". Both letters can be found enclosed in **Appendix H**.

12.3 OTHER CONSIDERATIONS

BLIND INLETS

Blind inlets have been proposed at eleven locations along the enclosure through Lot 9, Concession 7. The location of the proposed blind inlets was provided by the initiating landowner (Lot 9, Con 7). These inlets are comprised of clear stone areas overtop of privately owned perforated pipe which will allow surface water to enter the enclosure along various points of the property. As the primary intention of these blind inlets is to ensure that surface water from the

adjacent lands is able to enter the drain, and as the blind inlets include perforated pipe that is assumed to be connected to the privately owned tile drainage system, these blind inlets will be considered private infrastructure – and the initial construction and continued maintenance of these blind inlets would be the responsibility of landowner on which the inlet is located. When required, the Township's Drainage Superintendent shall have the authority to repair, maintain and reinstate as required, at the sole expense of the landowner on which the blind inlet is located.

UTILITIES

The contractor shall acquire applicable utility clearance prior to excavation as per the Ontario Underground Infrastructure Notification System Act. Should utility conflicts be identified, BTE is to be notified to address any redesign considerations. Any changes to the design would need to be incorporated into the Engineer's Report. Changes needed during construction may be eligible to be incorporated through 84.1 (1) of the Drainage Act, as outlined in O. Reg 500/21, Part III, Process for Amendments to an Engineer's Report.

WORKING SPACE

The Drainage Act specifies that works (both maintenance and initial construction) are to be completed within the working space designated in the Engineer's Report (Section 63(1)).

For the initial construction, the working space shall be considered to be 30m from the top of bank on both sides of the drain. For residential properties, this working space shall be reduced to 8m for the initial construction. For future maintenance, the working space is specified as 20m from the top of bank on either side of the drain. Where the working space impacts a residential property, the working space shall be reduced to 6m from the top of bank on the side impacting the residential property for future maintenance.

This working space will allow the Drainage Superintendent to complete works either from the south or north side of the drain. This working space is required to ensure that maintenance works can be performed and allows excavated materials to be spread within the working space (as applicable).

Permanent obstructions should not be installed within the working space, including (but not limited to) trees, fences, structures, etc. Obstructions that impact future maintenance works maybe removed by the Drainage Superintendent or the property owner – at the expense of the property owner. Where fences are installed – reinstatement costs would be the responsibility of the property owner.

SPREADING OF MATERIAL – FUTURE MAINTENANCE

When undertaking future maintenance, it is anticipated the sediment from the ditch bottom will need to be excavated out of the channel to restore the original drain design. The bottom of the ditch shall be excavated to an even grade so that no water may lay stagnant therein.

The excavated earth/silt from the drain cleanout shall be spread on the north side of the drain. In cultivated lands, the depth of spread materials shall not exceed 150mm (6 inches) above grade and relief channels shall be cut at a maximum spacing of 50m to allow surface water to continue to sheet flow into the drain – so as not to berm the adjacent lands by the excavated materials. Materials shall be taken a minimum of 3m back from the top of slope.

OFF-SITE DISPOSAL – OWNER'S EXPENSE

Where offsite disposal is requested by a property owner, the property owner may make arrangements with the Contractor to have the material hauled away. Costs would be borne solely by the requesting property owner – and a signed agreement between the Contractor and property owner would need to be presented to the Drainage Superintendent. The property owner would pay the Contractor directly for these additional works. Note that off-site removal may be subject to other legislative requirements, including the "Excess Soil Regulations".

ADDITIONAL CONSTRUCTION SPECIFICATIONS

Additional construction specifications can be found in the **Special Provisions** as taken from the County Road 22 Tender Document – available under separate cover. The entirety of the Special Provisions are available for completeness, however some provisions may be irrelevant to the specific drainage works and may not be relevant to future maintenance works. Applicability of the special provisions shall be at the discretion of the Drainage Superintendent, who shall be responsible for administering the maintenance works.

13.0 ADIP GRANTS

Properties that are registered with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) for the Farm Property Class Tax Rate Program may be eligible for a 1/3 grant from the Province. As no current maintenance is planned, and as grant eligibility may vary year to year based on the property's registered status with the Farm Property Class Tax Rate Program, grant eligibility has not been reflected on the assessment schedules at this time.

Based on current ADIP policy:

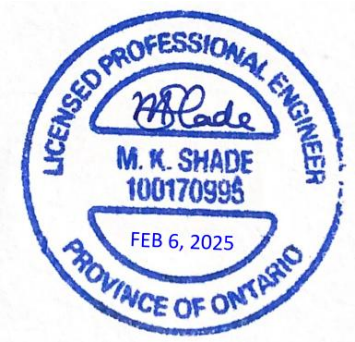
"The cost of enclosing or replacing an existing open ditch municipal drain with a buried pipe is not eligible for grant if, using normal design standards, more pipe flow capacity is required than can be provided by a single 300 millimeter (mm) diameter corrugated plastic pipe (or equivalent capacity)."

As the current realignment works are being undertaken by the County as part of their capital roads project; and as the proposed enclosure through Lot 9, Concession 7 is greater than 300mm in diameter, it is not expected that any of the immediate planned improvement works would be eligible for grant. Future maintenance works however may be eligible for grant, depending on ADIP policy at the time of the maintenance works.

14.0 CLOSING

This submission is respectfully submitted to the Council of the Township of North Stormont this February 6, 2025.

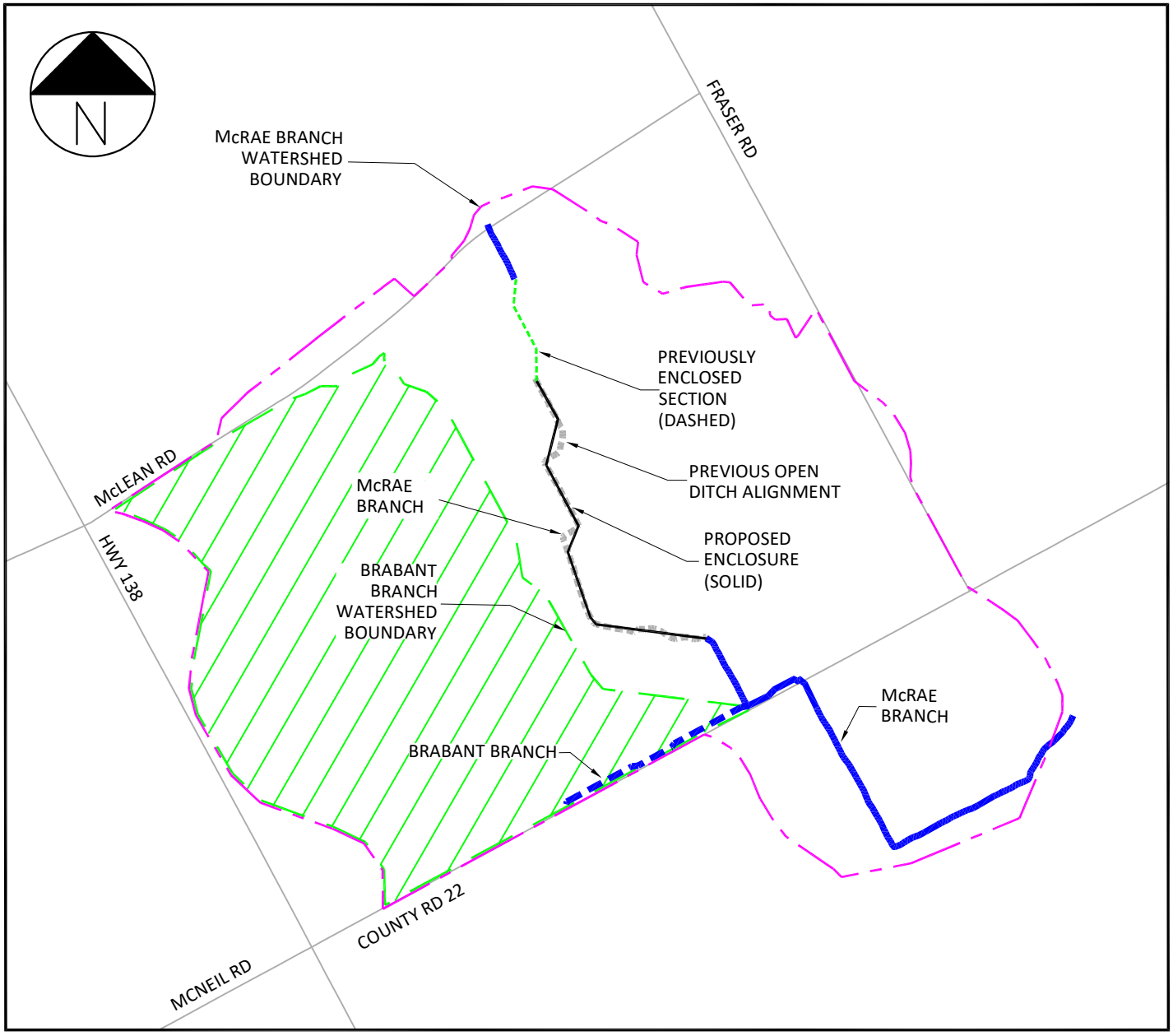
Should you have any questions or concerns, please do not hesitate to contact the undersigned.



Monica Shade, P. Eng.
Drainage Engineer
Shade Group Inc.

APPENDIX A

LOCATION PLAN



LOCATION PLAN
N.T.S.

MCRAE & BRABANT BRANCH
OF THE MCKENZIE DRAIN
TOWNSHIP NORTH STORMONT
2025

SHADE GROUP INC

APPENDIX B

ASSESSMENT SCHEDULES

Assessment Schedule - Updated 2025

Schedule 'A'

Station 0+568 - 1+712

Proposed Enclosure - Initial Construction - McRae Branch (One-Time Use)

Property ID No.	Roll No.	Con	Lot	Area drained (Acres)	% Length of Enclosure	Special Benefit ($)*
23	41101600949001	7	9	73.3	49%	$ 249,655.00
24	41101600948800	7	9	78.8	51%	$ 259,845.00
					Sub-Total	**$ 509,500.00**

SHADE GROUP INC

Assessment Schedule - Updated 2025

Schedule 'B'

Station 1+712 - 3+438

Future Maintenance of Open Channel - McRae Branch

Property ID No.	Roll No.	Con	Lot	Area drained (Acres)	Outlet ($)	Benefit ($)	Est Assess. ($)*
1	41101600954000	7	11	0.6	$ 27.50	$ -	$ 27.50
2	41101600952210	7	11	0.5	$ 21.70	$ -	$ 21.70
3	41101600952205	7	11	0.6	$ 24.35	$ -	$ 24.35
4	41101600952200	7	11	0.9	$ 37.04	$ -	$ 37.04
5	41101600952005	7	11	1.4	$ 60.24	$ -	$ 60.24
6	41101600951100	7	10	1.6	$ 68.29	$ -	$ 68.29
7	41101600951000	7	10	6.2	$ 134.70	$ -	$ 134.70
8	41101600950000	7	9	1.1	$ 45.47	$ -	$ 45.47
9	41101600948000	7	9	0.8	$ 35.02	$ -	$ 35.02
10	41101600947000	7	8	1.6	$ 34.93	$ -	$ 34.93
11	41101600947002	7	8	0.6	$ 24.24	$ -	$ 24.24
12	41101600957000	7	12	25.7	$ 486.43	$ -	$ 486.43
13	41101600955002	7	12	2.6	$ 111.93	$ -	$ 111.93
14	41101600955000	7	12	57.5	$ 1,089.20	$ -	$ 1,089.20
15	41101600955010	7	12	1.8	$ 69.72	$ -	$ 69.72
16	41101600953050	7	11	1.6	$ 60.64	$ -	$ 60.64
17	41101600953400	7	11	0.8	$ 30.26	$ -	$ 30.26
18	41101600953000	7	11	119.8	$ 2,270.78	$ -	$ 2,270.78
19	41101600951200	7	10	2.0	$ 74.39	$ -	$ 74.39
20	41101600951010	7	10	169.4	$ 3,208.88	$ -	$ 3,208.88
21	41101600949200	7	9	1.0	$ 37.39	$ -	$ 37.39
22	41101600949000	7	9	1.0	$ 37.43	$ -	$ 37.43
23	41101600949001	7	9	73.3	$ 1,580.24	$ -	$ 1,580.24
24	41101600948800	7	9	78.8	$ 1,699.22	$ 594.33	$ 2,293.55
25	41101600944500	7	8	1.7	$ 72.94	$ 130.73	$ 203.67
26	41101600946000	7	8	2.7	$ 45.19	$ -	$ 45.19

Assessment Schedule - Updated 2025

Schedule 'B'

Station 1+712 - 3+438

Future Maintenance of Open Channel - McRae Branch

Property ID No.	Roll No.	Con	Lot	Area drained (Acres)	Outlet ($)	Benefit ($)	Est Assess. ($)*
27	41101600946200	7	8	140.7	$ 3,032.68	$ 718.61	$ 3,751.29
28	41101600947003	7	8	12.4	$ 267.84	$ -	$ 267.84
29	41101600945400	7	7	55.8	$ 1,203.92	$ -	$ 1,203.92
30	41101600945200	7	7	0.6	$ 20.05	$ -	$ 20.05
31	41101600945000	7	7	1.2	$ 39.69	$ -	$ 39.69
32	41101600944000	7	7	44.2	$ 735.60	$ -	$ 735.60
33	41101600944007	7	7	2.6	$ 55.29	$ -	$ 55.29
34	41101600943004	7	6	2.4	$ 39.86	$ -	$ 39.86
35	41101600856000	6	8,9	0.6	$ 23.75	$ -	$ 23.75
36	41101600857000	6	8,9	34.7	$ 650.63	$ 858.51	$ 1,509.14
37	41101600855000	6	8	5.6	$ 421.94	$ 356.10	$ 778.04
38	41101600854000	6	8	32.0	$ 368.09	$ 1,475.74	$ 1,843.83
39	41101600853000	6	7	32.0	$ 291.64	$ 652.88	$ 944.52
40	41101600852300	6	7	28.2	$ 190.23	$ 514.54	$ 704.77
41	41101600852000	6	7	0.9	$ 7.21	$ -	$ 7.21
42	41101600848000	6	6	9.5	$ 37.24	$ 130.75	$ 167.99
				Sub-Total	**$ 18,773.78**	**$ 5,432.19**	**$ 24,205.97**

Assessment Schedule - Updated 2025

Schedule 'B'

Station 1+712 - 3+438

Future Maintenance of Open Channel - McRae Branch

Roads

ID/Name	Owner	Outlet ($)	Benefit ($)	Net Assessment ($)
County Road 22	United Counties of Stormont, Dundas and Glengarry	$ 401.39	$ 97.51	**$ 498.90**
McLean Road	North Stormont	$ 312.19	$ -	**$ 312.19**
Fraser Road		$ 117.94	$ -	**$ 117.94**
	Sub-Total	**$ 831.52**	**$ 97.51**	**$ 929.03**

Summary

Real Properties	$ 18,773.78	$ 5,432.19	**$ 24,205.97**
North Stormont - Roads	$ 430.13	$ -	**$ 430.13**
United Counties of Stormont, Dundas, and Glengarry - Roads	$ 401.39	$ 97.51	**$ 498.90**
Sub-Total (Pre-Tax/Grant)	**$ 19,605.30**	**$ 5,529.70**	**$ 25,135.00**

SHADE GROUP INC

Assessment Schedule - Updated 2025

Schedule 'C'

Station 0+000 - 1+712

Future Maintenance of Open Channel + Enclosure - McRae Branch

Property ID No.	Roll No.	Con	Lot	Area drained (Acres)	Outlet ($)	Benefit ($)	Est Assess. ($)*
1	41101600954000	7	11	0.6	$ 25.25	$ -	$ 25.25
2	41101600952210	7	11	0.5	$ 19.81	$ -	$ 19.81
3	41101600952205	7	11	0.6	$ 22.24	$ -	$ 22.24
4	41101600952200	7	11	0.9	$ 33.82	$ -	$ 33.82
5	41101600952005	7	11	1.4	$ 55.00	$ -	$ 55.00
6	41101600951100	7	10	1.6	$ 62.35	$ -	$ 62.35
7	41101600951000	7	10	6.2	$ 122.98	$ -	$ 122.98
8	41101600950000	7	9	1.1	$ 41.52	$ -	$ 41.52
9	41101600948000	7	9	0.8	$ 63.95	$ 23.60	$ 87.55
10	41101600947000	7	8	1.6	$ 63.79	$ 38.83	$ 102.62
11	41101600947002	7	8	0.6	$ 44.26	$ -	$ 44.26
19	41101600951200	7	10	1.5	$ 49.29	$ -	$ 49.29
20	41101600951010	7	10	8.1	$ 134.23	$ -	$ 134.23
23	41101600949001	7	9	60.9	$ 2,369.89	$ 803.38	$ 3,173.27
24	41101600948800	7	9	64.0	$ 2,489.84	$ 1,313.26	$ 3,803.10
27	41101600946200	7	8	74.4	$ 1,859.64	$ -	$ 1,859.64
28	41101600947003	7	8	8.5	$ 247.77	$ 89.59	$ 337.36
29	41101600945400	7	7	16.4	$ 202.99	$ -	$ 202.99
32	41101600944000	7	7	0.8	$ 6.27	$ -	$ 6.27
33	41101600944007	7	7	2.6	$ 20.94	$ -	$ 20.94
				Sub-Total	**$ 7,935.83**	**$ 2,268.66**	**$ 10,204.49**

Assessment Schedule - Updated 2025

Schedule 'C'

Station 0+000 - 1+712

Future Maintenance of Open Channel + Enclosure - McRae Branch

Roads

ID/Name	Owner	Outlet ($)	Benefit ($)	Net Assessment ($)
McLean Road	North Stormont	$ 215.17	$ 30.34	$ 245.51
	Sub-Total	**$ 215.17**	**$ 30.34**	**$ 245.51**

Summary

Real Properties	$ 7,935.83	$ 2,268.66	**$ 10,204.49**
North Stormont - Roads	$ 215.17	$ 30.34	**$ 245.51**
Sub-Total (Pre-Tax/Grant)	**$ 8,151.00**	**$ 2,299.00**	**$ 10,450.00**

Assessment Schedule - Updated 2025

Schedule 'D'

Station 0+200 - 1+712

Future Enclosure Replacement - McRae Branch

Property ID No.	Roll No.	Con	Lot	Area drained (Acres)	Outlet ($)	Benefit ($)	Special Benefit ($)	Est Assess. ($)*
1	41101600954000	7	11	0.6	$ 64.43	$ -	$ -	$ 64.43
2	41101600952210	7	11	0.5	$ 50.56	$ -	$ -	$ 50.56
3	41101600952205	7	11	0.6	$ 56.74	$ -	$ -	$ 56.74
4	41101600952200	7	11	0.9	$ 86.30	$ -	$ -	$ 86.30
5	41101600952005	7	11	1.4	$ 140.33	$ -	$ -	$ 140.33
6	41101600951100	7	10	1.6	$ 159.09	$ -	$ -	$ 159.09
7	41101600951000	7	10	6.2	$ 313.80	$ -	$ -	$ 313.80
8	41101600950000	7	9	1.1	$ 105.93	$ -	$ -	$ 105.93
9	41101600948000	7	9	0.8	$ 163.16	$ 60.22	$ -	$ 223.38
10	41101600947000	7	8	1.6	$ 162.77	$ 99.08	$ -	$ 261.85
11	41101600947002	7	8	0.6	$ 112.93	$ -	$ -	$ 112.93
19	41101600951200	7	10	1.5	$ 125.77	$ -	$ -	$ 125.77
20	41101600951010	7	10	8.1	$ 342.51	$ -	$ -	$ 342.51
23	41101600949001	7	9	60.9	$ 6,046.95	$ 2,049.90	$ 173,374.74	$ 181,471.59
24	41101600948800	7	9	64.0	$ 6,353.03	$ 3,350.90	$ 180,451.26	$ 190,155.19
27	41101600946200	7	8	74.4	$ 4,745.01	$ -	$ -	$ 4,745.01
28	41101600947003	7	8	8.5	$ 632.20	$ 228.59	$ -	$ 860.79
29	41101600945400	7	7	16.4	$ 517.95	$ -	$ -	$ 517.95
32	41101600944000	7	7	0.8	$ 15.99	$ -	$ -	$ 15.99
33	41101600944007	7	7	2.6	$ 53.43	$ -	$ -	$ 53.43
				Sub-Total	**$ 20,248.88**	**$ 5,788.69**	**$ 353,826.00**	**$ 379,863.57**

Assessment Schedule - Updated 2025

Schedule 'D'

Station 0+200 - 1+712

Construction - For Future Replacement of Enclosure

Roads

ID/Name	Owner	Outlet ($)	Benefit ($)	Special Benefit ($)	Net Assessment ($)
McLean Road	North Stormont	$ 549.04	$ 77.39	$ -	**$ 626.43**
	Sub-Total	**$ 549.04**	**$ 77.39**	**$ -**	**$ 626.43**

Summary

Real Properties	$ 20,248.88	$ 5,788.69	$ 353,826.00	**$ 379,863.57**
North Stormont - Roads	$ 549.04	$ 77.39	$ -	**$ 626.43**
Sub-Total (Pre-Tax/Grant)	**$ 20,797.92**	**$ 5,866.08**	**$ 353,826.00**	**$ 380,490.00**

Assessment Schedule - Updated 2025

Schedule 'E'

Brabant Branch

Future Maintenance

Property ID No.	Roll No.	Con	Lot	Area Drained Acres	Outlet ($)	Benefit ($)	Special Benefit ($)	Est Assess. ($)*
12	41101600957000	7	12	24.5	$ 162.20	$ -	$ -	$ 162.20
13	41101600955002	7	12	2.6	$ 34.41	$ -	$ -	$ 34.41
14	41101600955000	7	12	56.8	$ 376.13	$ -	$ -	$ 376.13
15	41101600955010	7	12	1.8	$ 24.38	$ -	$ -	$ 24.38
16	41101600953050	7	11	1.6	$ 21.21	$ -	$ -	$ 21.21
17	41101600953400	7	11	0.8	$ 10.58	$ -	$ -	$ 10.58
18	41101600953000	7	11	119.8	$ 794.16	$ -	$ -	$ 794.16
19	41101600951200	7	10	0.5	$ 3.21	$ -	$ -	$ 3.21
20	41101600951010	7	10	161.3	$ 1,068.60	$ 1,599.52	$ -	$ 2,668.12
21	41101600949200	7	9	1.0	$ 7.86	$ 180.51	$ -	$ 188.37
22	41101600949000	7	9	1.0	$ 6.73	$ 167.33	$ -	$ 174.06
23	41101600949001	7	9	8.0	$ 32.01	$ 563.86	$ -	$ 595.87
24	41101600948800	7	9	2.9	$ 5.77	$ 282.74	$ -	$ 288.51
				Sub-Total	**$ 2,547.25**	**$ 2,793.96**	**$ -**	**$ 5,341.21**

*Estimated Assessment does not include Farm Tax Credit (FTC). Farm Tax Credit eligibility to be confirmed at time of maintenance.

Assessment Schedule - Updated 2025

Schedule 'E'

Brabant Branch

Future Maintenance

Roads

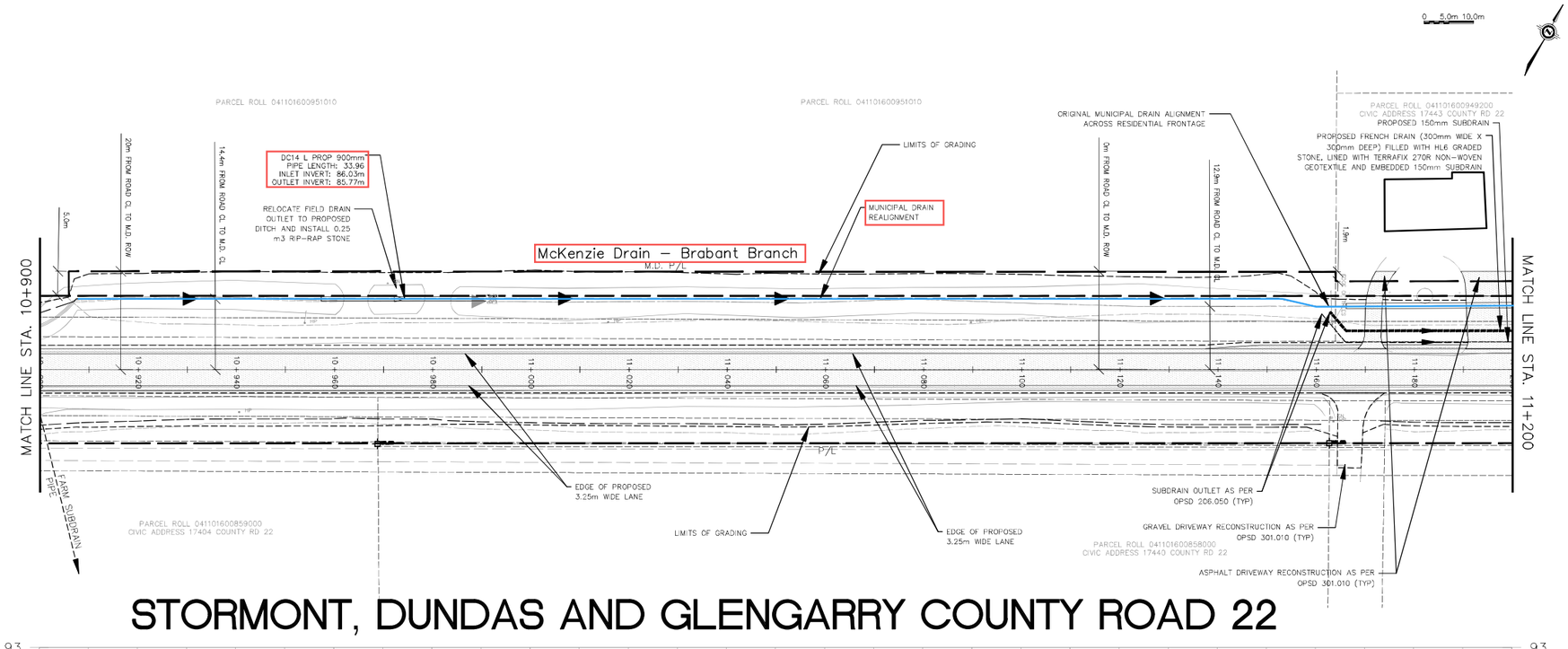
ID/Name	Owner	Outlet ($)	Benefit ($)	Special Benefit ($)	Net Assessment ($)
County Road 22	United Counties of Stormont, Dundas, and Glengarry	$ 76.69	$ 436.74	**$ -**	$ 513.43
McLean Road	North Stormont	$ 19.36	$ -	$ -	$ 19.36
	Sub-Total	**$ 96.05**	**$ 436.74**	**$ -**	**$ 532.79**

Summary

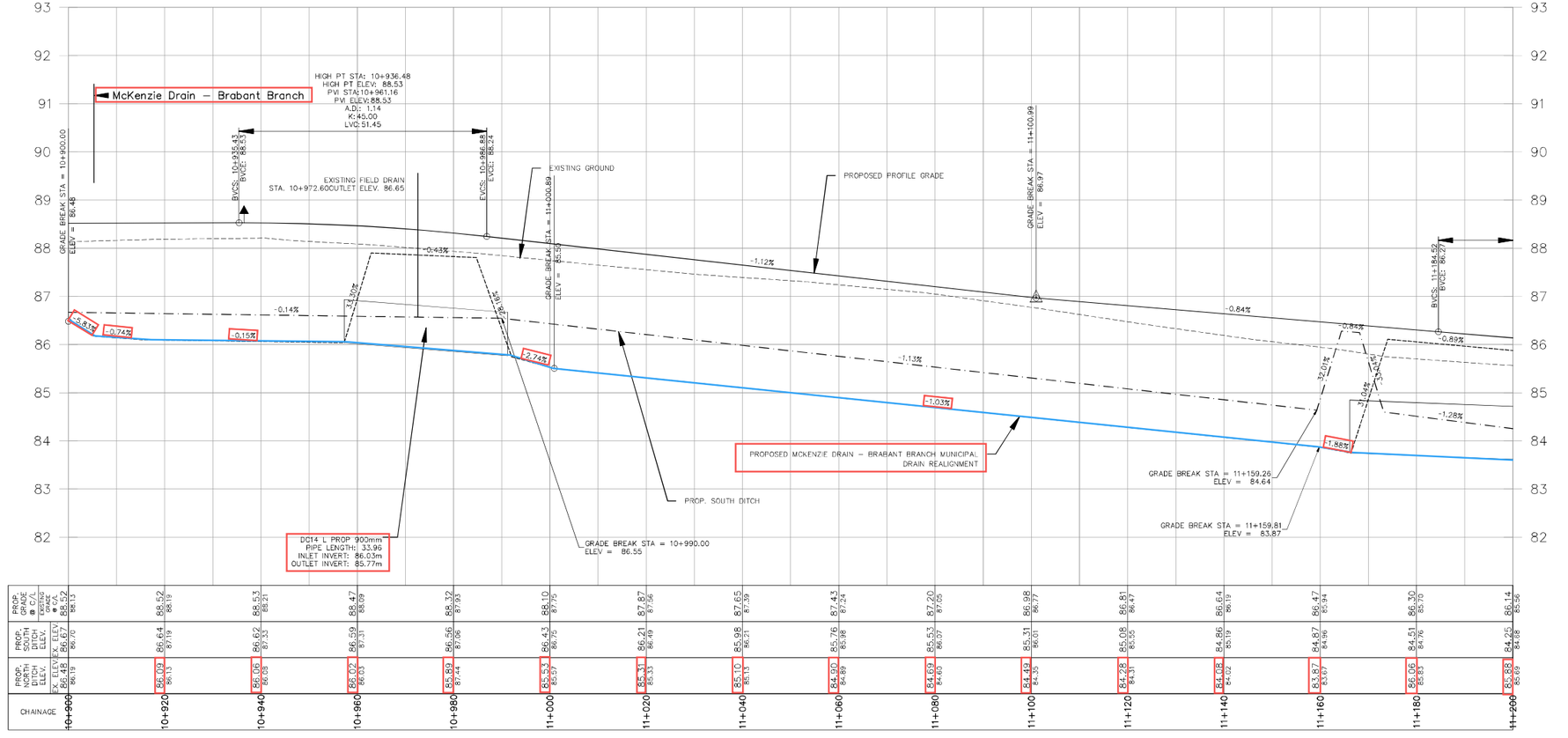
Real Properties	$ 2,547.25	$ 2,793.96	$ -	**$ 5,341.21**
North Stormont - Roads	$ 19.36	$ -	$ -	**$ 19.36**
United Counties of Stormont, Dundas, and Glengarry - Roads	$ 76.69	$ 436.74	$ -	**$ 513.43**
Sub-Total (Pre-Tax/Grant)	**$ 2,643.30**	**$ 3,230.70**	**$ -**	**$ 5,874.00**

APPENDIX C

ENGINEERING PLANS – REALIGNMENTS (BTE)

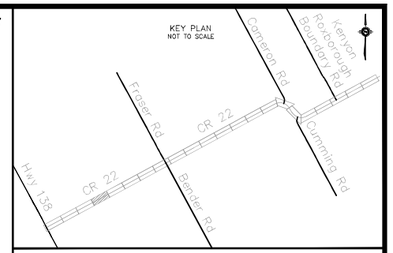


STORMONT, DUNDAS AND GLENGARRY COUNTY ROAD 22



CHAINAGE	10+900	10+920	10+940	10+960	10+980	11+000	11+020	11+040	11+060	11+080	11+100	11+120	11+140	11+160	11+180	11+200
PROP. GRADE @ C/L ROAD ELEV.	88.13	88.52 / 88.19	88.53 / 88.21	88.47 / 88.09	88.32 / 87.93	88.10 / 87.75	87.87 / 87.56	87.65 / 87.39	87.43 / 87.24	87.20 / 87.05	86.98 / 86.77	86.81 / 86.47	86.64 / 86.19	86.47 / 85.94	86.30 / 85.76	86.14 / 85.58
PROP. SOUTH DITCH ELEV.	86.70	86.64 / 87.19	86.62 / 87.33	86.59 / 87.31	86.56 / 87.06	86.43 / 86.75	86.21 / 86.49	85.98 / 86.21	85.76 / 85.96	85.53 / 86.07	85.31 / 86.01	85.08 / 85.55	84.86 / 85.19	84.87 / 84.96	84.51 / 84.76	84.05 / 84.68
PROP. NORTH DITCH ELEV.	EVCE: 86.48 / 86.19	86.09 / 86.13	86.06 / 86.08	86.02 / 86.03	85.89 / 85.44	85.53 / 85.57	85.31 / 85.33	85.10 / 85.13	84.90 / 84.89	84.69 / 84.69	84.49 / 84.35	84.28 / 84.31	84.08 / 84.02	83.87 / 83.67	84.06 / 83.83	83.88 / 83.99

KEY PLAN
NOT TO SCALE



GENERAL NOTES

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY. THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.
2. DRAWINGS PLOTTED HALF SIZE (11X17) ARE NOT TO SCALE.
3. ALL DISTURBED AREAS WHERE GRADING IS REQUIRED UNLESS OTHERWISE NOTED IN PLAN SHALL BE RESTORED WITH 100mm TOPSOIL SEED & MULCH.
4. WHERE PAVED DRIVEWAY RECONSTRUCTION INDICATED IN PLAN PAVEMENT STRUCTURE SHALL BE 50mm HL3 AND PAD WITH GRANULAR 'A' AS REQUIRED. WHERE GRANULAR DRIVEWAY RECONSTRUCTION INDICATED IN PLAN RECONSTRUCT WITH GRANULAR 'A' AS REQUIRED.
5. ALL DRIVEWAY RECONSTRUCTIONS ARE TO MATCH EXISTING WIDTH AND OPSD 301.010.
6. 1.5m SHOULDER (1.0m PARTIALLY PAVED SHOULDER).
7. PAVEMENT REHABILITATION
   - IN PLACE PROCESS TO 200mm DEPTH (SEE NOTE ON TYPICAL SECTIONS).
   - PLACE AND GRADE GRANULAR B IF NECESSARY (DEPTH VARIES).
   - ADD GRANULAR A AND COMPACT AS REQUIRED TO ACHIEVE THE TOP OF ASPHALT DESIGN ELEVATION (150mm MAX GRANULAR A DEPTH).
   - PLACE NEW ASPHALT COURSES.

LEGEND

DRAIN BOTTOM

NOTES RELEVANT TO MCRAE AND BRABANT BRANCH

BENCH MARKS

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCPs): XTM ZONE XX, NAD83 (ORIGINAL).

COORDINATES TO A ***URBAN RURAL REMOTE*** ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
SCP 00820170142	505 079.67	5 011 904.17
SCP 01019920466	511 131.14	5 013 326.41

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

BENCHMARK DATA (SIB, IB AND RIB)

EASTING	NORTHING	ELEVATION
505860.69	5012529.306	86.914
506031.115	5012621.782	84.648

NO.	REVISIONS	DATE	APPROVED
1.	ISSUED FOR 90% REVIEW	MMM/YY	S.J.T.
2.	ISSUED FOR TENDER	07/24	S.J.T.

LICENSED PROFESSIONAL ENGINEER
S.J. TAYLOR
07/26/2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A. ALLARD-DUFOUR
100513904
07/26/2024
PROVINCE OF ONTARIO

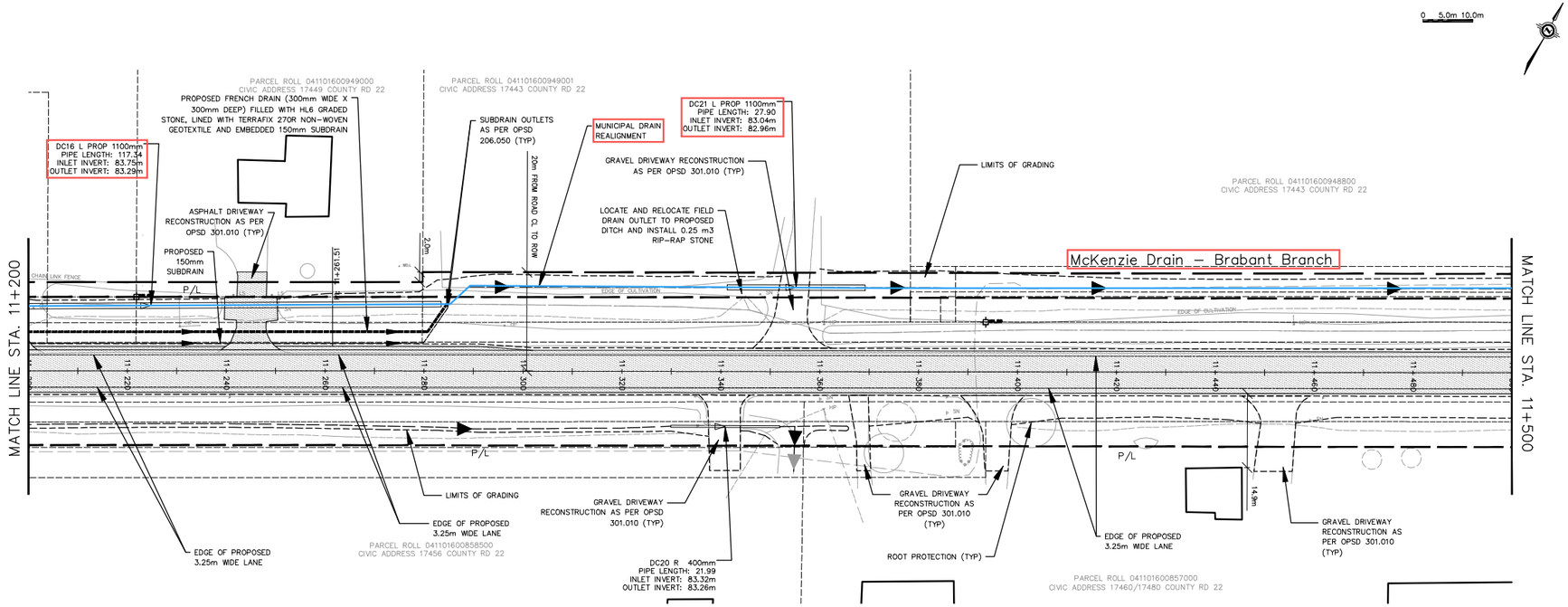
COUNTY ROAD 22

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

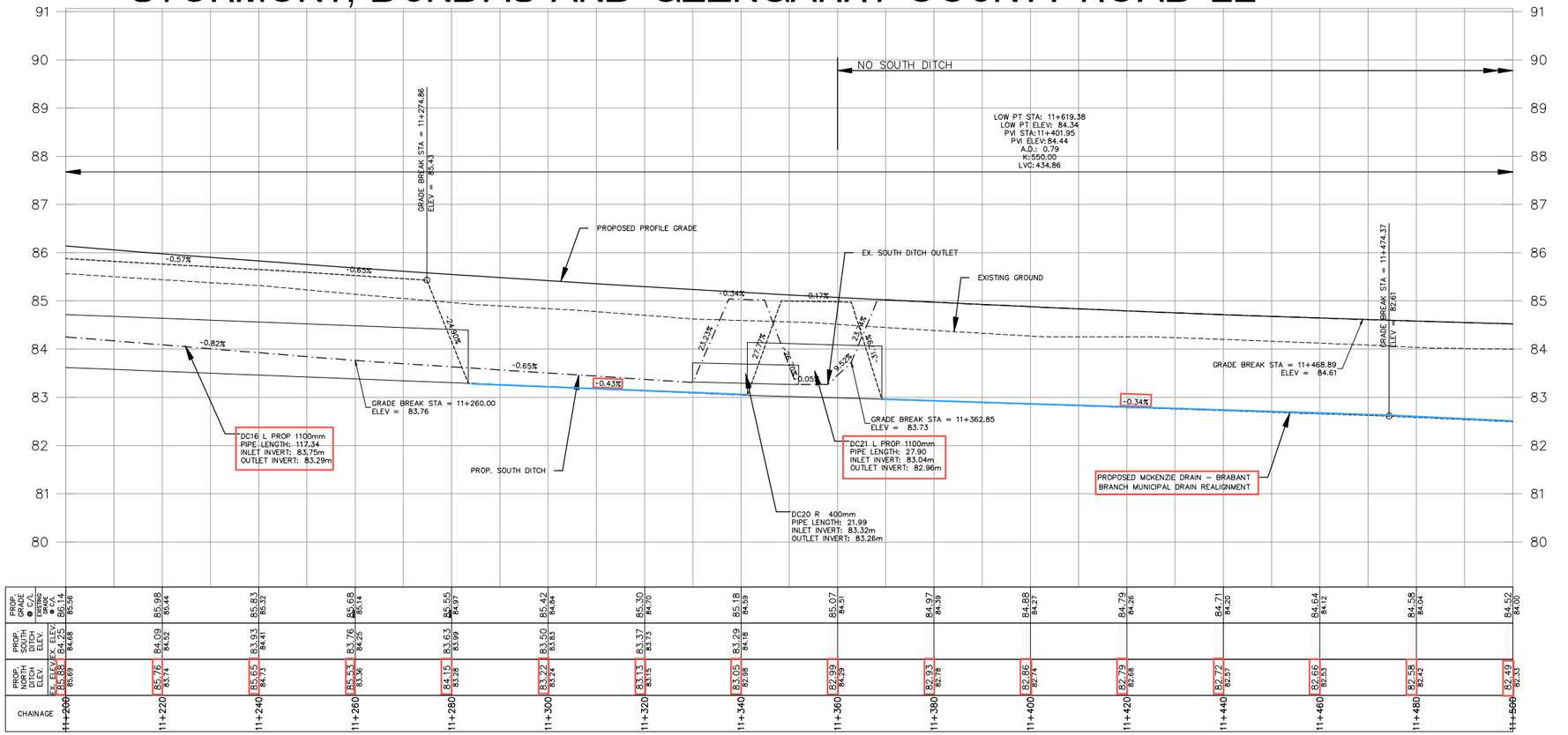
NEW CONSTRUCTION
STA. 10+900 TO STA. 11+200

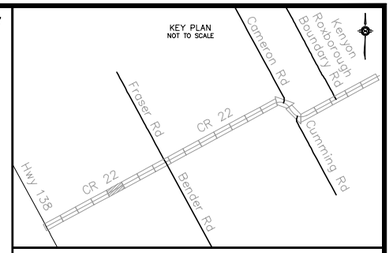
BT ENGINEERING

SCALE HOR.	1:500	VERT.	1:50	CONTRACT NO.	2024-22-00000
DESIGN	A.D.	DRAWN	A.D.	SHEET NO.	C-004
REVIEWED	S.J.T.	DATE	2024.07		



STORMONT, DUNDAS AND GLENGARRY COUNTY ROAD 22





GENERAL NOTES

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.
2. DRAWINGS PLOTTED HALF SIZE (11X17) ARE NOT TO SCALE.
3. ALL DISTURBED AREAS WHERE GRADING IS REQUIRED UNLESS OTHERWISE NOTED IN PLAN SHALL BE RESTORED WITH 100mm TOPSOIL SEED & MULCH.
4. WHERE PAVED DRIVEWAY RECONSTRUCTION INDICATED IN PLAN PAVEMENT STRUCTURE SHALL BE 50mm HL3 AND PAD WITH GRANULAR 'A' AS REQUIRED. WHERE GRANULAR DRIVEWAY RECONSTRUCTION INDICATED IN PLAN RECONSTRUCT WITH GRANULAR 'A' AS REQUIRED.
5. ALL DRIVEWAY RECONSTRUCTIONS ARE TO MATCH EXISTING WIDTH AND OPSD 301.010.
6. 1.5m SHOULDER (1.0m PARTIALLY PAVED SHOULDER).
7. PAVEMENT REHABILITATION
   - IN PLACE PROCESS TO 200mm DEPTH (SEE NOTE ON TYPICAL SECTIONS).
   - PLACE AND GRADE GRANULAR B IF NECESSARY (DEPTH VARIES).
   - ADD GRANULAR A AND COMPACT AS REQUIRED TO ACHIEVE THE TOP OF ASPHALT DESIGN ELEVATION (150mm MAX GRANULAR A DEPTH).
   - PLACE NEW ASPHALT COURSES.

LEGEND

DRAIN BOTTOM

NOTES RELEVANT TO MCRAE AND BRABANT BRANCH

BENCH MARKS

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCPs): XTM ZONE XX, NAD83 (ORIGINAL).

COORDINATES TO A ***URBAN RURAL REMOTE*** ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
SCP 00820170142	505 079.67	5 011 904.17
SCP 01019920466	511 131.14	5 013 326.41

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

BENCHMARK DATA (SIB, IB AND RIB)

EASTING	NORTHING	ELEVATION
506068.854	5012676.308	84.456
506222.355	5012753.631	83.184

NO.	REVISIONS	DATE	APPROVED
1.	ISSUED FOR 90% REVIEW	MMM/YY	S.J.T.
2.	ISSUED FOR TENDER	07/24	S.J.T.

LICENSED PROFESSIONAL ENGINEER S.J.TAYLOR PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A. ALLARD-DUFOUR 100513904 PROVINCE OF ONTARIO

COUNTY ROAD 22

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

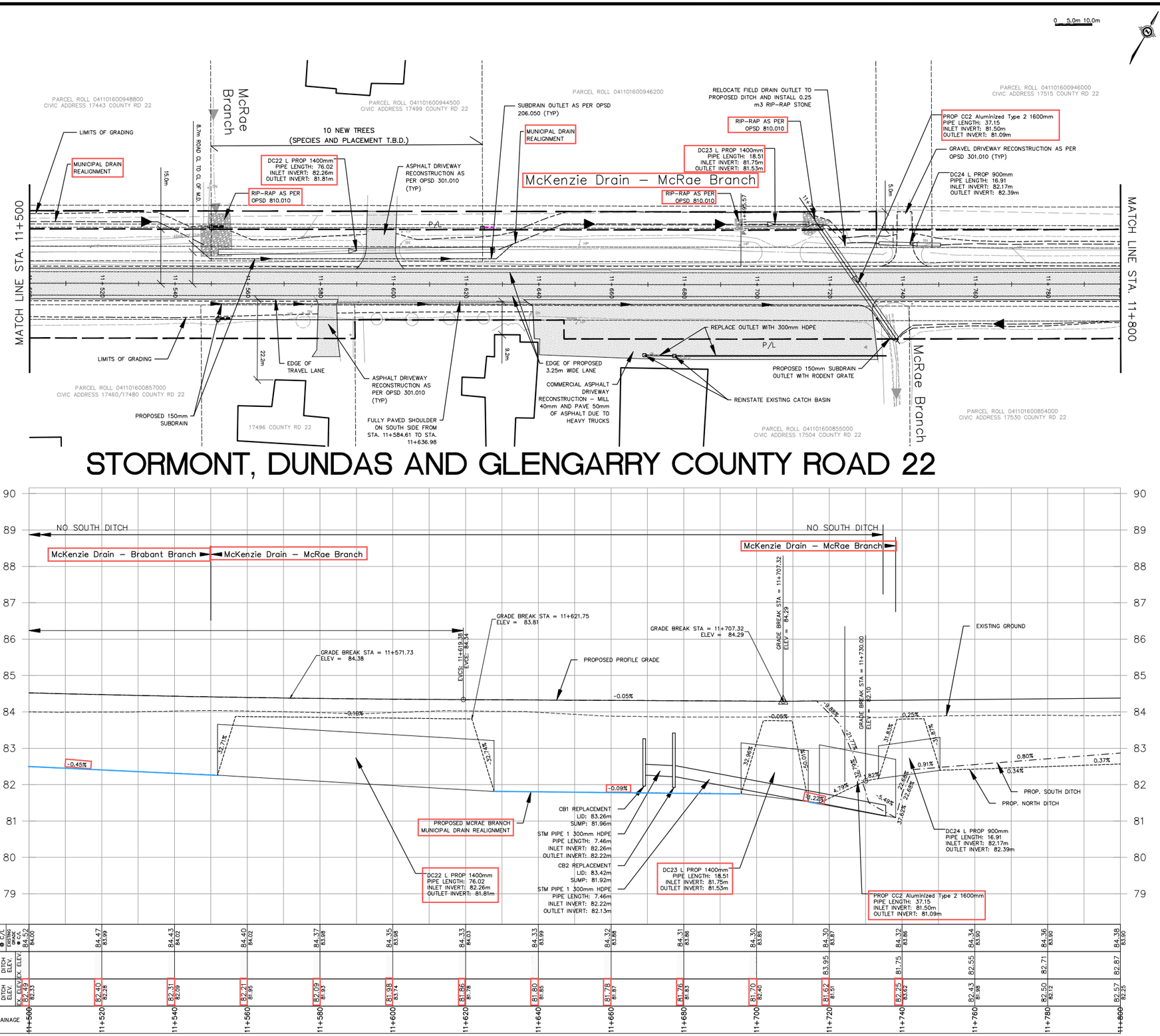
NEW CONSTRUCTION
STA. 11+200 TO STA. 11+500

BT ENGINEERING

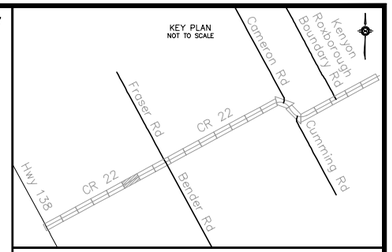
SCALE HOR.	1:500	VERT.	1:50
DESIGN	A.D.	DRAWN	A.D.
REVIEWED	S.J.T.	DATE	2024.07

CONTRACT NO. 2024-22-00000

SHEET NO. C-005



STORMONT, DUNDAS AND GLENGARRY COUNTY ROAD 22



GENERAL NOTES

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.
2. DRAWINGS PLOTTED HALF SIZE (11X17) ARE NOT TO SCALE.
3. ALL DISTURBED AREAS WHERE GRADING IS REQUIRED UNLESS OTHERWISE NOTED IN PLAN SHALL BE RESTORED WITH 100mm TOPSOIL SEED & MULCH.
4. WHERE PAVED DRIVEWAY RECONSTRUCTION INDICATED IN PLAN PAVEMENT STRUCTURE SHALL BE 50mm HL3 AND PAD WITH GRANULAR 'A' AS REQUIRED. WHERE GRANULAR DRIVEWAY RECONSTRUCTION INDICATED IN PLAN RECONSTRUCT WITH GRANULAR 'A' AS REQUIRED.
5. ALL DRIVEWAY RECONSTRUCTIONS ARE TO MATCH EXISTING WIDTH AND OPSD 301.010.
6. 1.5m SHOULDER (1.0m PARTIALLY PAVED SHOULDER).
7. PAVEMENT REHABILITATION
   - IN PLACE PROCESS TO 200mm DEPTH (SEE NOTE ON TYPICAL SECTIONS).
   - PLACE AND GRADE GRANULAR B IF NECESSARY (DEPTH VARIES).
   - ADD GRANULAR A AND COMPACT AS REQUIRED TO ACHIEVE THE TOP OF ASPHALT DESIGN ELEVATION (150mm MAX GRANULAR A DEPTH).
   - PLACE NEW ASPHALT COURSES.

LEGEND

DRAIN BOTTOM

NOTES RELEVANT TO MCRAE AND BRABANT BRANCH

BENCH MARKS

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCPs): XTM ZONE XX, NAD83 (ORIGINAL).

COORDINATES TO A ***URBAN RURAL REMOTE*** ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
SCP 00820170142	505 079.67	5 011 904.17
SCP 01019920466	511 131.14	5 013 326.41

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

BENCHMARK DATA (SIB, IB AND RIB)

EASTING	NORTHING	ELEVATION
506357.422	5012832.636	82.73
506371.056	5012811.294	83.188
506423.051	5012867.988	82.926

NO.	REVISIONS	DATE	APPROVED
1.	ISSUED FOR 90% REVIEW	MMM/YY	S.J.T.
2.	ISSUED FOR TENDER	07/24	S.J.T.

LICENSED PROFESSIONAL ENGINEER S.J.TAYLOR PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A. ALLARD-DUFOUR 100513904 PROVINCE OF ONTARIO

COUNTY ROAD 22

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

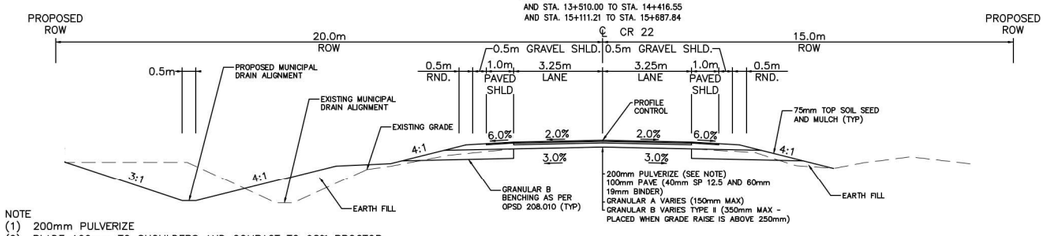
NEW CONSTRUCTION
STA. 11+500 TO STA. 11+800

BT ENGINEERING

SCALE HOR.	1:500	VERT.	1:50	CONTRACT NO.	2024-22-00000
DESIGN	A.D.	DRAWN	A.D.	SHEET NO.	C-006
REVIEWED	S.J.T.	DATE	2024.07		

PROPOSED CR 22 TYPICAL SECTION

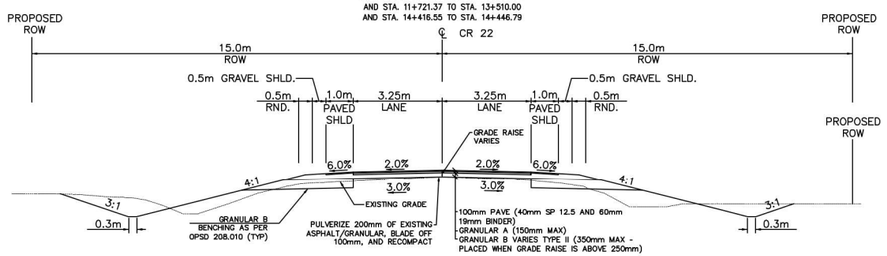
PULVERIZE AND PAVE WITH NORTH SIDE MUNICIPAL DRAIN (GRADE RAISE VARIES)
FROM STA. 10+907.54 TO STA. 11+721.37
AND STA. 13+510.00 TO STA. 14+416.55
AND STA. 15+111.21 TO STA. 15+687.84



NOTE
(1) 200mm PULVERIZE
(2) BLADE 100mm TO SHOULDERS AND COMPACT TO 98% PROCTOR STANDARD DENSITY
(3) SWEETEN WITH GRANULAR A TO 150mm BELOW FINISHED CENTRELINE GRADE LINE AND COMPACT TO 98% PROCTOR STANDARD DENSITY

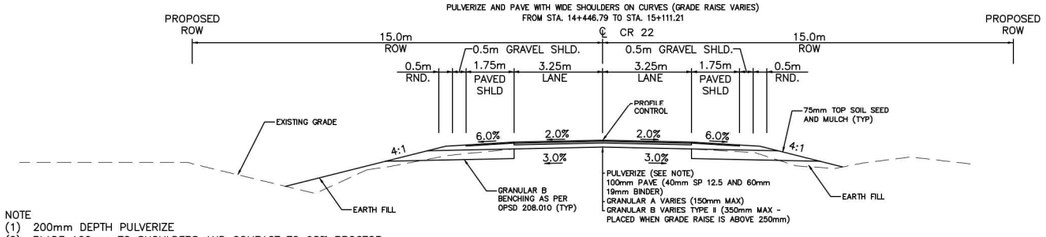
PROPOSED CR 22 TYPICAL SECTION

PULVERIZE AND PAVE (GRADE RAISE VARIES)
FROM STA. 10+022.39 TO STA. 10+907.54
AND STA. 11+721.37 TO STA. 13+510.00
AND STA. 14+416.55 TO STA. 14+446.79



PROPOSED CR 22 TYPICAL SECTION

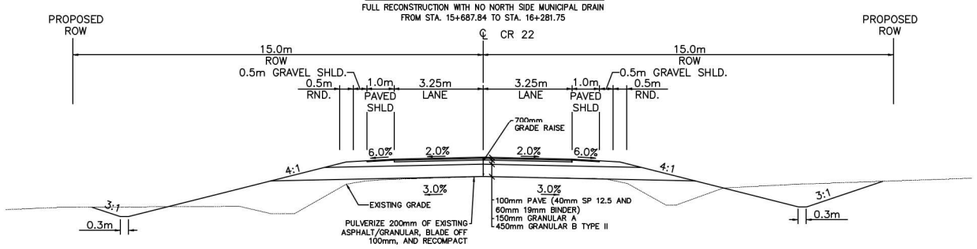
PULVERIZE AND PAVE WITH WIDE SHOULDERS ON CURVES (GRADE RAISE VARIES)
FROM STA. 14+446.79 TO STA. 15+111.21



NOTE
(1) 200mm DEPTH PULVERIZE
(2) BLADE 100mm TO SHOULDERS AND COMPACT TO 98% PROCTOR STANDARD DENSITY
(3) SWEETEN WITH GRANULAR A TO 150mm BELOW FINISHED CENTRELINE GRADE LINE AND COMPACT TO 98% PROCTOR STANDARD DENSITY

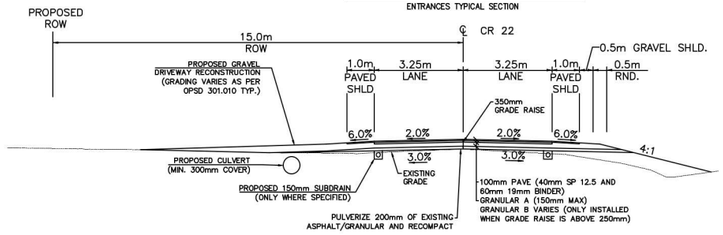
PROPOSED CR 22 TYPICAL SECTION

FULL RECONSTRUCTION WITH NO NORTH SIDE MUNICIPAL DRAIN
FROM STA. 15+687.84 TO STA. 16+281.75



PROPOSED CR 22 TYPICAL SECTION

ENTRANCES TYPICAL SECTION



GENERAL NOTES

BENCH MARKS

NO.	REVISIONS	DATE	APPROVED
1.	ISSUED FOR 90% REVIEW	MMM/YY	S.J.T.
2.	ISSUED FOR TENDER	07/24	S.J.T.

LICENSED PROFESSIONAL ENGINEER
S.J.TAYLOR
07/26/2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A. ALLARD-DUFOUR
100513904
07/26/2024
PROVINCE OF ONTARIO

COUNTY ROAD 22

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

TYPICAL SECTIONS

BT ENGINEERING

SCALE HOR.	N.T.S.	VERT.	N.T.S.	CONTRACT NO.
DESIGN	A.D.	DRAWN	A.D.	SHEET NO. CX-001
REVIEWED	S.J.T.	DATE	2024.07	

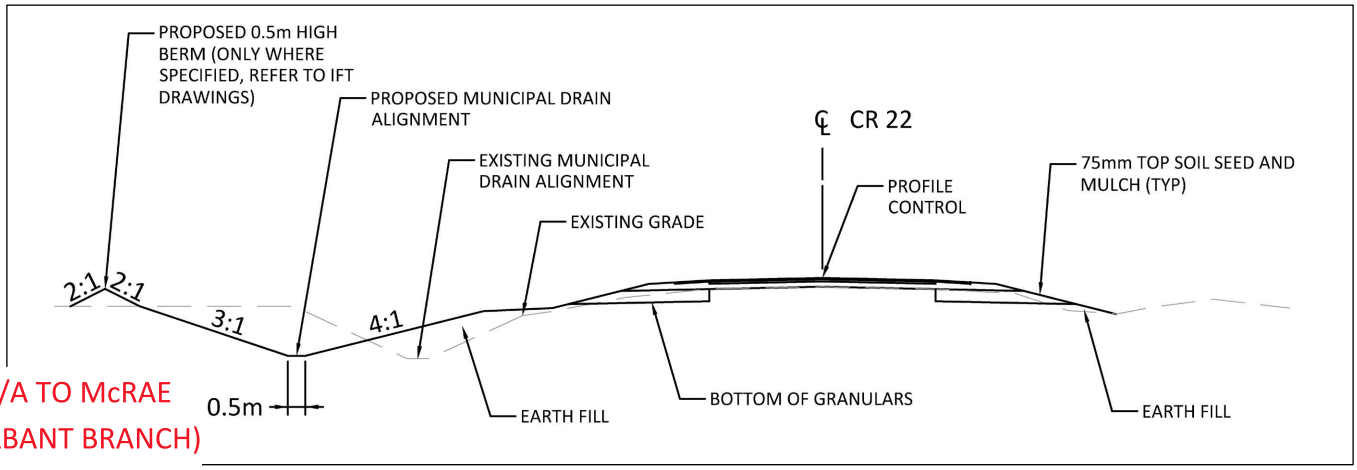


Figure 3: Municipal Drain Typical Section

7.0 RESULTS AND COMMENTS

7.1 Design Flows

Peak flows for the driveway culverts along the realigned drain sections are summarized in **Table 4**.

Table 4: Proposed Municipal Drain Realignment Peak Flow Results

Municipal Drain Branch	Design Flow (m^3/s)
Brabant Branch	0.58
McRae Branch	1.66
Morrow-Brabec Branch	0.49
County Road Branch	1.21

7.2 Culvert Sizing

Table 5 shows the recommended sizes for the driveway culverts to convey the minimum 10-year design flow. HEC-RAS Analysis Report and Results are presented in **Appendix A**.

Table 5: Proposed Culvert Configuration

Culvert ID	Branch	Start Station	Type	Size (mm)	Length (m)	Slope (m/m)
DC6	Roadside Ditch	10+464.578	Circular CSP	500	45.45	0.011
DC9	Roadside Ditch	10+654.500	Circular CSP	600	16.74	0.004
DC11	Roadside Ditch	10+759.487	Circular CSP	600	16.50	0.003
DC14	Brabant Branch	10+957.300	Circular CSP	900	33.96	0.008
DC16	Brabant Branch	11+166.137	Circular CSP	1100	117.34	0.004
DC21	Brabant Branch	11+341.302	Circular CSP	1100	27.90	0.003
DC22	McRae Branch	11+551.830	Circular CSP	1400	76.02	0.006
DC23	McRae Branch	11+695.744	Circular CSP	1400	18.51	0.012
DC42	Morrow-Brabec Branch	13+664.102	Circular CSP	1000	26.14	0.004

APPENDIX D

ENGINEERING PLANS – ENCLOSURE (LOT 9, CON 7)

MCRAE & BRABANT BRANCH
TO THE MCKENZIE DRAIN

LOT 12 CONCESSION 7 ROXBOROUGH
LOT 11 CONCESSION 7 ROXBOROUGH
LOT 10 CONCESSION 7 ROXBOROUGH
LOT 9 CONCESSION 7 ROXBOROUGH
LOT 8 CONCESSION 7 ROXBOROUGH
LOT 7 CONCESSION 7 ROXBOROUGH
LOT 6 CONCESSION 7 ROXBOROUGH
LOT 5 CONCESSION 7 ROXBOROUGH
LOT 10 CONCESSION 6 ROXBOROUGH
LOT 9 CONCESSION 6 ROXBOROUGH
LOT 8 CONCESSION 6 ROXBOROUGH
LOT 7 CONCESSION 6 ROXBOROUGH
LOT 6 CONCESSION 6 ROXBOROUGH

McLEAN RD
MCNEIL ROAD
COUNTY ROAD 22
HIGHWAY 138
FRASER ROAD
McKENZIE DRAIN

0+000 (0+50 (1975); 0+63 (1975))
0+200 (7+55 (1975); 8+50 (1975))
0+267
0+418 (15+78 (1975))
0+520 (17+28 (1975))
0+568 (±20+15 (1975))
0+653 (24+51 (1975))
0+803 (28+23 (1975))
1+020 (36+17 (1975); 37+91 (1975))
1+120
1+346 (47+62 (1975); 51+95 (1975))
1+708
1+712 (±60+35 (1975); 60+22 (1975))
2+142 (74+60 (1975); ±11+738 (BTE))
2+723
3+191 (106+40 (1975); 99+99 (1975))
3+438 (±13+70 (1975); ±17+15 (1975))
0+00 (±10+905 (BTE))
6+51 (BRABANT)

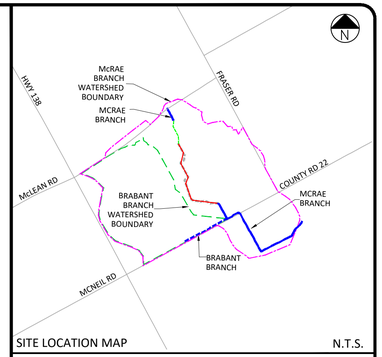
PREVIOUS OPEN DITCH ALIGNMENT
PREVIOUS COMPLETED ENCLOSURE ALIGNMENT 600mm Ø SMOOTHWALL PIPE (ALIGNMENT IS APPROXIMATE)
PROPOSED ADDITIONAL ENCLOSURE (START) 600mm Ø SMOOTHWALL PIPE
VILLENEUVE BRANCH (ABANDONED)
CURRIER BRANCH (ABANDONED)
INTERMITTENT REALIGNMENTS PROPOSED. REFER TO PLANS PREPARED BY BTE.
PROPOSED ENCLOSURE TERMINATION AT ±1+712 PIPE TO EXTEND 0.91m (3FT) AFTER BEND TO ALLOW OUTFLOW INLINE WITH EXISTING CHANNEL ALIGNMENT
BRABANT BRANCH

LIST OF CULVERTS BRABANT BRANCH

CULVERT I.D.	CULVERT I.D. (BTE)	PROPERTY I.D. REFERENCE	APPROX. MEASURED STATION (m)	DIAMETER (mm)	MATERIAL	LENGTH (m)
1	DC14	20	0+051	900	CSP	34.0
2	DC16	21,22	0+260	1100	CSP	117.3
3	DC21	23	0+436	1100	CSP	27.9

LIST OF CULVERTS MCRAE BRANCH

CULVERT I.D.	CULVERT I.D. (BTE)	PROPERTY I.D. REFERENCE	APPROX MEASURED STATION (m)	DIAMETER (mm)	MATERIAL	LENGTH (m)
4	DC22	25	1+958	1400	CSP	76.0
5	DC23	27	2+102	1400	CSP	18.5
6	CC2	-	2+123	1600	CSP	37.2
7	-	38	2+816	1500	CSP	9.0
8	-	39	3+006	1500	CSP	9.0
9	-	-	3+325	1500	CSP	9.0



SITE LOCATION MAP N.T.S.

SCALE BAR DO NOT SCALE DRAWING

0 50 125 250 500m

ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE MARKED.

PAGE SIZE 24" x 36" | SCALE 1 : 5000

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ON
K0A 1A0

SHADE GROUP INC

LEGEND

- 2024 PROPERTY LINES (GIS DATA)
- MUNICIPAL DRAIN ALIGNMENT
- McRAE BRANCH OPEN DITCH ALIGNMENT
- McRAE BRANCH PREVIOUS OPEN DITCH ALIGNMENT
- McRAE BRANCH PROPOSED ENCLOSURE ALIGNMENT
- McRAE BRANCH PREVIOUS COMPLETED ENCLOSURE ALIGNMENT
- MCRAE BRANCH WATERSHED BOUNDARY
- ENCLOSURE SUBWATERSHED BOUNDARY
- BRABANT BRANCH WATERSHED BOUNDARY
- 00+00 (1975) STATIONS (FT) - PER 1975 ENGINEER'S REPORT
- 0+100 STATIONS (m) - MEASURED STATIONS
- ±13+488 (BTE) STATIONS (m) - PER BTE PROFILE DRAWINGS
- WATERCOURSES
- LOT & CONCESSION LINES
- 10 PROPERTY ID REFERENCE REFER TO ASSESSMENT SCHEDULES
- DIRECTION OF FLOW
- APPROX. BLIND INLET TILE DRAINAGE CONNECTION POINT FOR VENTING (SEE BLIND INLET TILE DRAINAGE CONNECTION DETAIL IN ESC PLAN)
- (1) APPROX. LOCATION OF CULVERT

NOTES

1. ALL STATION LABELS ARE APPROXIMATE. THIS MAP IS FOR INFORMATION PURPOSES ONLY AND IMPLIES NO GUARANTEE OF ACCURACY. DO NOT SCALE DRAWING.
2. ALL PROPERTY LINES ARE AS SUPPLIED BY THE COUNTIES OF STORMONT, DUNDAS & GLENGARRY, AS ACQUIRED FROM THEIR GEOGRAPHIC INFORMATION SYSTEM (GIS) AUGUST 2022. THIS IS NOT A LEGAL SURVEY.
3. THIS MAP AND THE WATERSHED BOUNDARY SHOWN HERE HAS BEEN PREPARED IN REFERENCE TO THE 1975 ENGINEER'S REPORT AS PREPARED BY STIDWELL & ASSOCIATES LTD.

REV. #	REVISION DESCRIPTION	DATE
02	ISSUED WITH ENGINEER'S REPORT	FEB 6, 2025
01	ISSUED WITH DRAFT REPORT	JAN 22, 2025
00	ISSUED TO SNCA	JULY 16,2024

STAMP

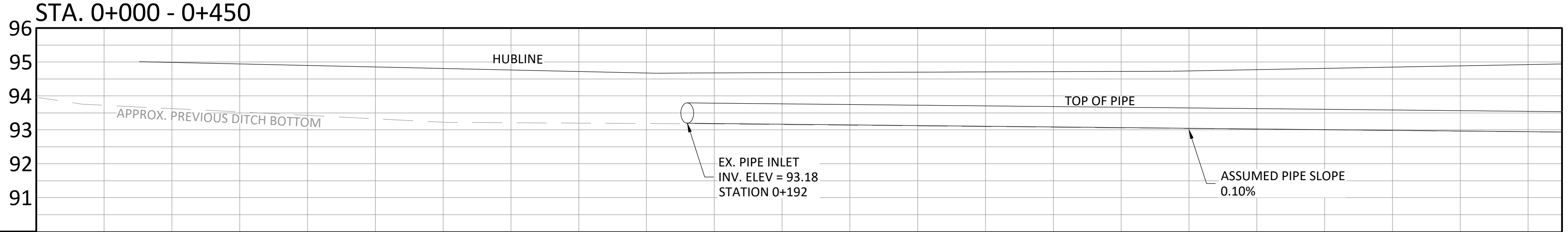
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
FEB 6, 2025
PROVINCE OF ONTARIO

PROJECT TITLE **McRAE & BRABANT BRANCH TO THE McKENZIE DRAIN**

DRAWING TITLE **WATERSHED MAP PLAN VIEW**

DRAWING NO. **1 OF 1**

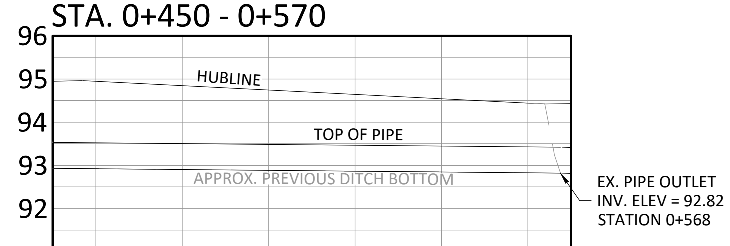
MCRAE BRANCH
PREVIOUSLY COMPLETED ENCLOSURE PROFILE
STA. 0+000 - 0+450



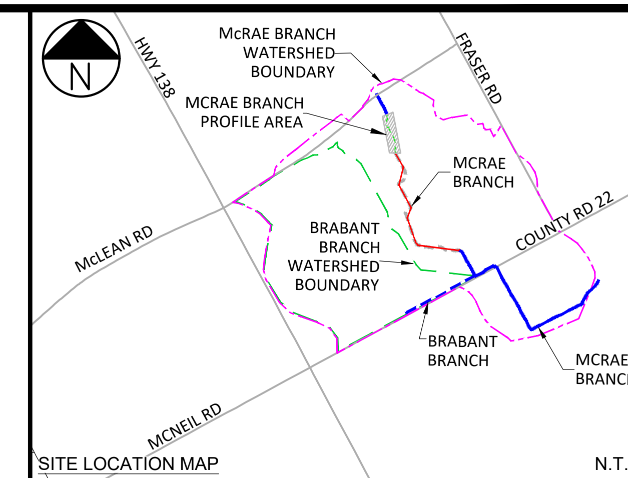
STATIONS	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220
ELEVATIONS – HUBLINE (TOS)		94.99	94.94	94.90	94.86	94.81	94.77	94.72	94.68	94.68	94.68
ELEVATIONS – EX. DITCH INV.	93.73	93.63	93.53	93.43	93.33	93.23	93.21	93.20	93.19	93.17	93.15

STATIONS	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440
ELEVATIONS – HUBLINE (TOS)	94.69	94.70	94.71	94.72	94.72	94.74	94.78	94.81	94.85	94.89	94.93
ELEVATIONS – EX. DITCH INV.	93.13	93.12	93.10	93.08	93.06	93.04	93.02	93.00	92.98	92.96	92.94

MCRAE BRANCH
PREVIOUSLY COMPLETED ENCLOSURE PROFILE
STA. 0+450 - 0+570



STATIONS	0+460	0+480	0+500	0+520	0+540	0+560
ELEVATIONS – HUBLINE (TOS)	94.94	94.84	94.74	94.64	94.54	94.44
ELEVATIONS – EX. DITCH INV.	92.92	92.90	92.89	92.87	92.85	92.83



SITE LOCATION MAP N.T.S.

PAGE SIZE	11" x 17"	SCALE	H: 1:1750 V: 1:175

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

SHADE GROUP INC

NOTE

PLAN TO BE READ IN CONJUNCTION WITH DRAWING TITLED "MISC. CROSS-SECTIONS AND EROSION AND SEDIMENT CONTROL MEASURES"

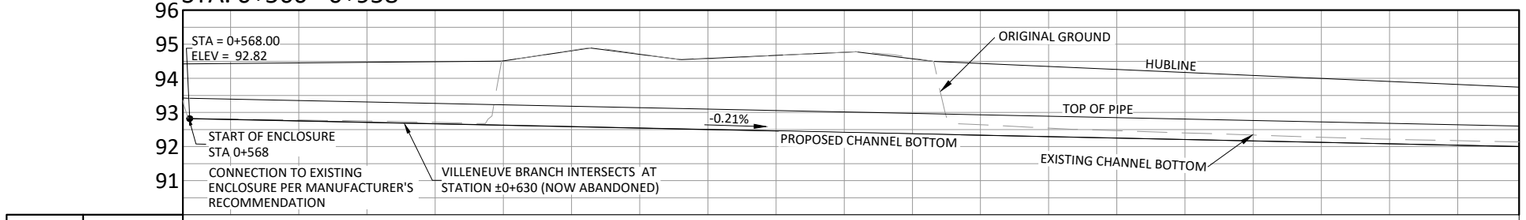
TOS: TOP OF SLOPE

REV.	DESCRIPTION	DATE
02	ISSUED WITH ENGINEER'S REPORT	FEB 6, 2025
01	REVISED PER SNCA COMMENTS	SEPT 13, 2024
00	ISSUED TO SNCA	JULY 16, 2024

STAMP

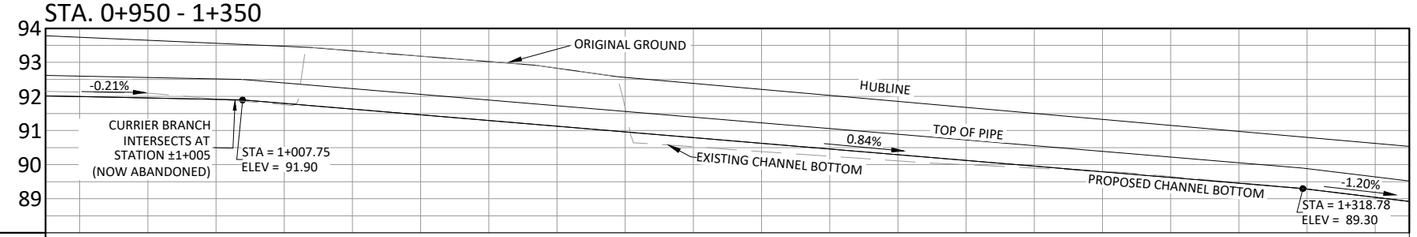
PROJECT TITLE	McCRAE BRANCH PARTIAL ENCLOSURE
DRAWING TITLE	PROFILE VIEW - PREVIOUSLY COMPLETED ENCLOSURE
DRAWING NO.	1 OF 2

MCRAE BRANCH
PROPOSED ENCLOSURE PROFILE
STA. 0+566 - 0+958



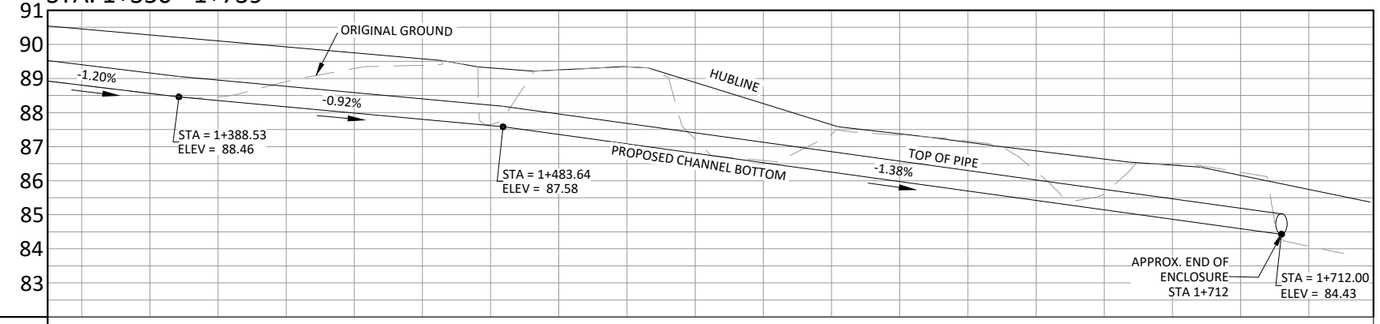
ELEVATIONS	HUBLINE (TOS)	PR. PIPE INV.	94.44	92.80	94.45	92.75	94.47	92.71	94.49	92.67	94.51	92.63	94.81	92.59	94.70	92.54	94.58	92.50	94.68	92.46	94.77	92.42	94.58	92.38	94.44	92.33	94.35	92.29	94.26	92.25	94.17	92.21	94.09	92.17	94.00	92.12	93.91	92.08	93.82	92.04
STATIONS	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940																					

MCRAE BRANCH
PROPOSED ENCLOSURE PROFILE
STA. 0+950 - 1+350

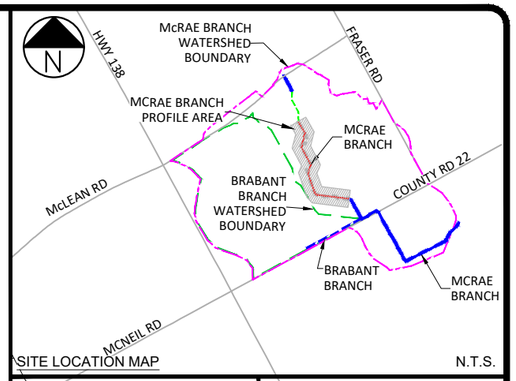


ELEVATIONS	HUBLINE (TOS)	PR. PIPE INV.	93.73	92.00	93.65	91.96	93.56	91.91	93.47	91.79	93.34	91.63	93.18	91.46	93.03	91.29	92.83	91.13	92.56	90.96	92.39	90.79	92.21	90.62	92.04	90.46	91.86	90.29	91.68	90.12	91.51	89.96	91.33	89.79	91.16	89.62	90.98	89.45	90.80	89.28	90.63	89.04
STATIONS	0+960	0+980	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340																					

MCRAE BRANCH
PROPOSED ENCLOSURE PROFILE
STA. 1+350 - 1+739



ELEVATIONS	HUBLINE (TOS)	PR. PIPE INV.	90.45	88.80	90.28	88.56	90.10	88.35	89.92	88.17	89.75	87.98	89.57	87.80	89.31	87.61	89.25	87.35	89.34	87.08	88.88	86.80	88.26	86.53	87.64	86.25	87.37	85.97	87.13	85.70	86.88	85.42	86.63	85.15	86.46	84.87	86.16	84.59	85.74	
STATIONS	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720																					



SITE LOCATION MAP N.T.S.

PAGE SIZE 11" x 17" | SCALE H: 1:1750 V: 1:175

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

SHADE GROUP INC

NOTE

PLAN TO BE READ IN CONJUNCTION WITH DRAWING TITLED "MISC. CROSS-SECTIONS AND EROSION AND SEDIMENT CONTROL MEASURES"

TOS: TOP OF SLOPE

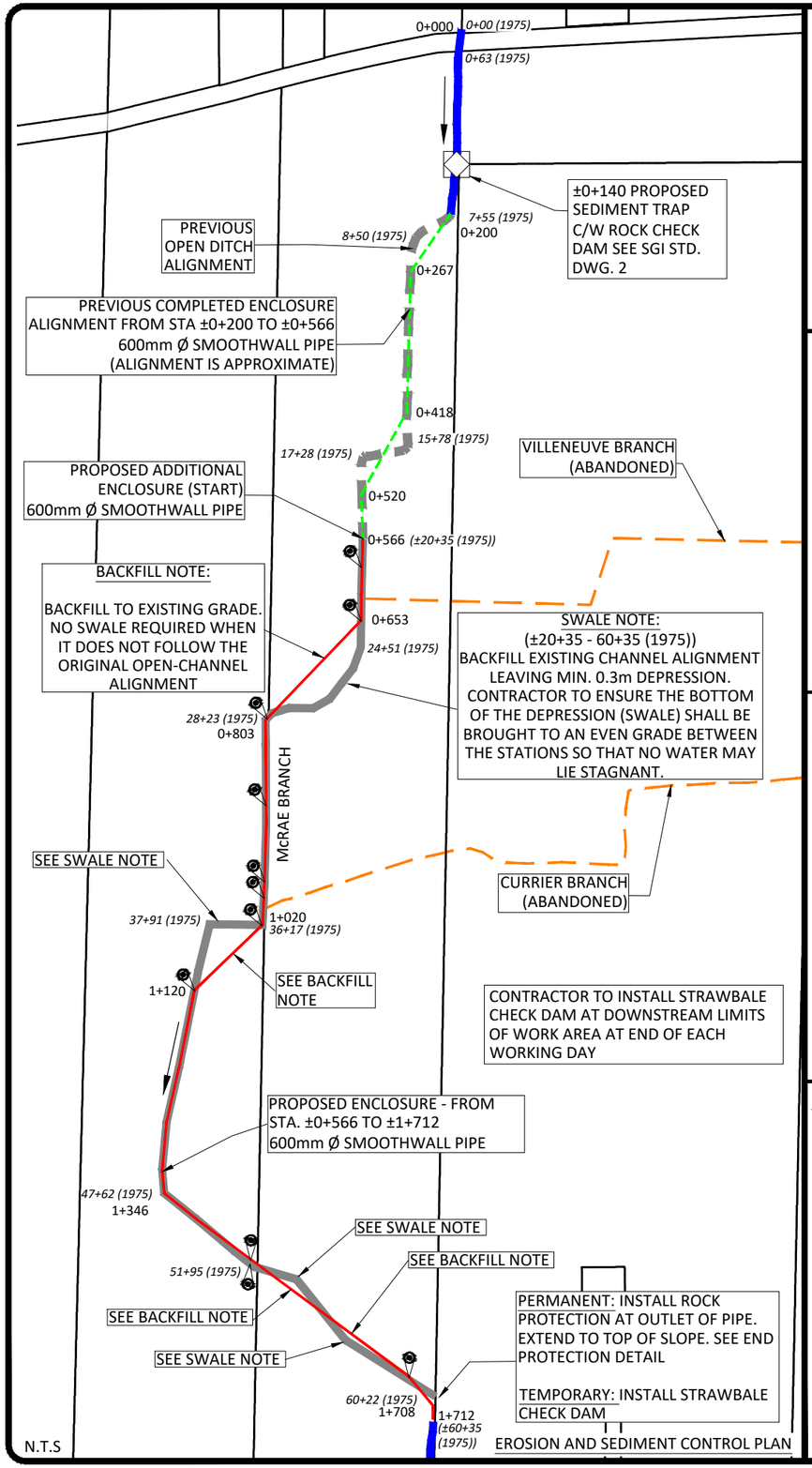
REV.	DESCRIPTION	DATE
02	ISSUED WITH ENGINEER'S REPORT	FEB 6, 2025
01	REVISED PER SNCA COMMENTS	SEPT 13, 2024
00	ISSUED TO SNCA	JULY 16, 2024

STAMP

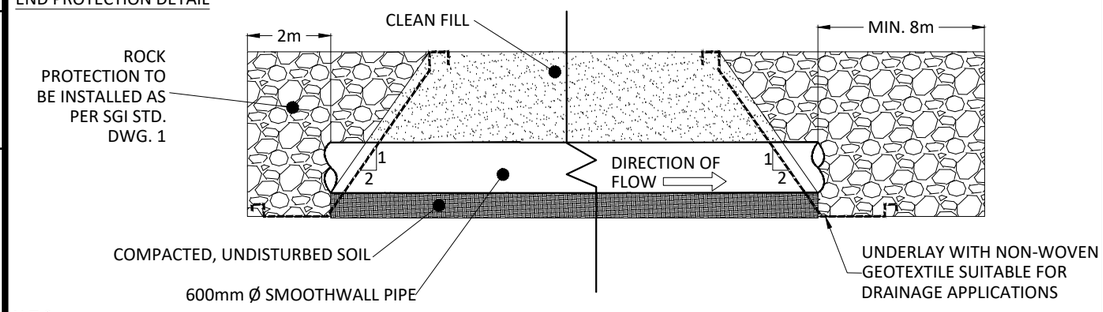
PROJECT TITLE: McCRAE BRANCH PARTIAL ENCLOSURE

DRAWING TITLE: PROFILE VIEW - PROPOSED ENCLOSURE

DRAWING NO.: 2 OF 2

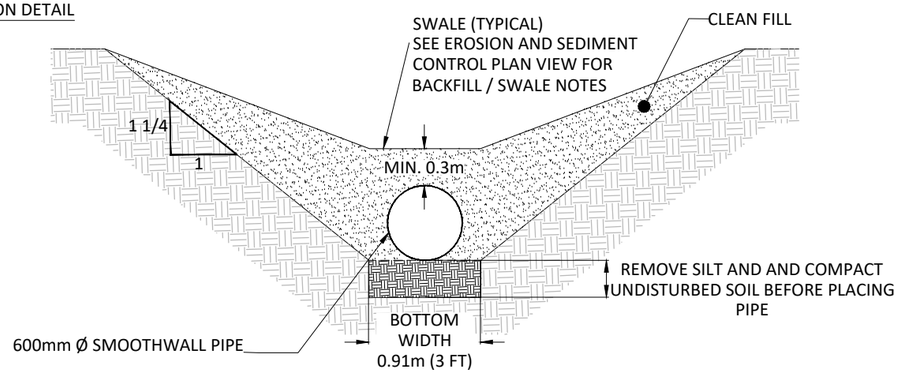


END PROTECTION DETAIL



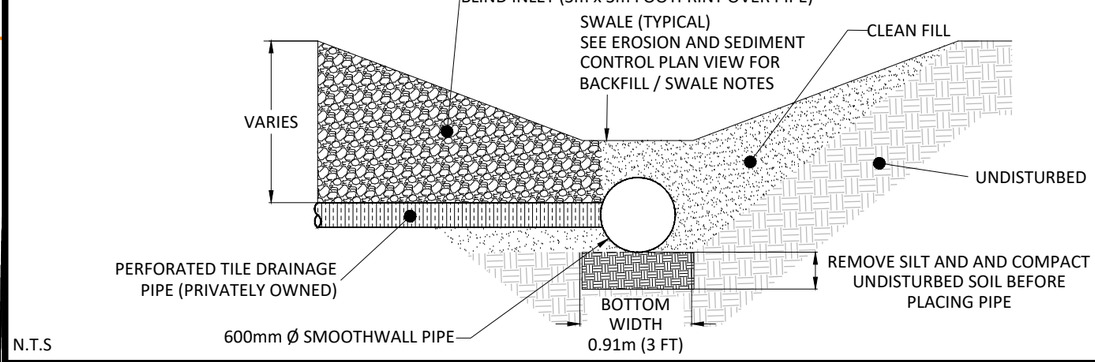
N.T.S

TYPICAL CROSS SECTION DETAIL



N.T.S

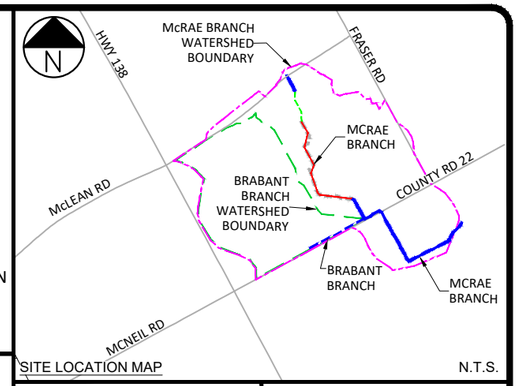
TYPICAL BLIND INLET TILE DRAIN CONNECTION DETAIL



N.T.S

EROSION AND SEDIMENT CONTROL NOTES

1. THIS PLAN INCLUDES PERMANENT AND TEMPORARY EROSION CONTROL MEASURES WHICH ARE TO BE APPLIED DURING THE INITIAL CONSTRUCTION AND DURING FUTURE MAINTENANCE WORKS.
2. IN ADDITION TO THOSE SPECIFICATIONS PROVIDED ON THE PLAN VIEW, THE CONTRACTOR SHALL ALSO INCLUDE FOR THE ERECTION OF SILT FENCE AROUND THE BASE OF ANY EXCAVATED STOCKPILES DURING THE INITIAL CONSTRUCTION; PRIOR TO THE FILLING IN OF THE PREVIOUS ALIGNMENT.
3. EROSION AND SEDIMENT CONTROL PLANS ARE CONSIDERED TO BE LIVING DOCUMENTS, AND ADDITIONAL MEASURES MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER, MUNICIPALITY, SNCA OR DFO, AS NEEDED TO ADDRESS SITE CONDITIONS AT THE TIME OF CONSTRUCTION (BOTH DURING THE INITIAL CONSTRUCTION AND FUTURE MAINTENANCE).
4. MAINTENANCE OF THE TEMPORARY EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR DURING AND IMMEDIATELY FOLLOWING CONSTRUCTION. THE CONTRACTOR SHOULD REVIEW AND DOCUMENT THE CONDITION OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION, AT THE START OF EACH DAY OF ON-SITE WORKS AND AFTER EVERY RAINFALL EVENT (>10mm). CORRECTIVE MEASURES TO REMOVE SEDIMENT BUILD UP, RESTORE EROSION CONTROL MEASURES, ETC. SHALL BE PERFORMED WITHIN NO MORE THAN 24 HOURS FOLLOWING THE RAINFALL EVENT, FOLLOWING OBSERVATION OF THE FAILED MEASURE, OR FOLLOWING NOTIFICATION FROM THE DRAINAGE SUPERINTENDENT, ENGINEER OR CONSERVATION AUTHORITY OVER A MEASURE REQUIRING MAINTENANCE. CONTINUED MAINTENANCE OF TEMPORARY MEASURES MAY STILL BE REQUIRED IMMEDIATELY FOLLOWING FUTURE MAINTENANCE AND/OR THE INITIAL CONSTRUCTION, UP UNTIL SUCH A TIME AS THE SITE CONDITIONS ARE DEEMED TO BE ADEQUATELY STABILIZED AS PER THE ENGINEER, SNCA, DFO OR MUNICIPALITY.
5. THE ON-GOING MONITORING AND CORRECTIVE ACTION ASSOCIATED WITH THE PERMANENT EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE LANDOWNERS ADJACENT THE DRAIN, AND THE MUNICIPALITY (DRAINAGE SUPERINTENDENT). IT IS EXPECTED THAT LANDOWNERS WOULD PROVIDE NOTIFICATION TO THE MUNICIPALITY WHEN CORRECTIVE ACTION IS REQUIRED, WHILE THE MUNICIPALITY WOULD LOOK AFTER HIRING A CONTRACTOR TO COMPLETE MAINTENANCE WORKS AS REQUIRED, IN FITTING WITH THE DIRECTIVES OF THE DRAINAGE ACT.
6. CONSTRUCTION WORKS (INITIAL + FUTURE MAINTENANCE) ARE TO BE COMPLETED IN LOW OR NO FLOW CONDITIONS, OUTSIDE OF ANY TIMING WINDOW RESTRICTIONS.
7. SCHEDULING OF CONSTRUCTION WORKS SHOULD AVOID WET, WINDY OR RAINY PERIODS (AND HEED WEATHER ADVISORIES) AS THESE MAY RESULT IN HIGH FLOW VOLUMES AND/OR INCREASED EROSION AND SEDIMENTATION.
8. THE CONTRACTOR SHALL OPERATE MACHINERY ON LAND IN STABLE, DRY AREAS.
9. THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT A RESPONSE PLAN TO AVOID A SPILL OF DELETERIOUS SUBSTANCES.



SITE LOCATION MAP N.T.S.

PAGE SIZE	11" x 17"	SCALE	N.T.S

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

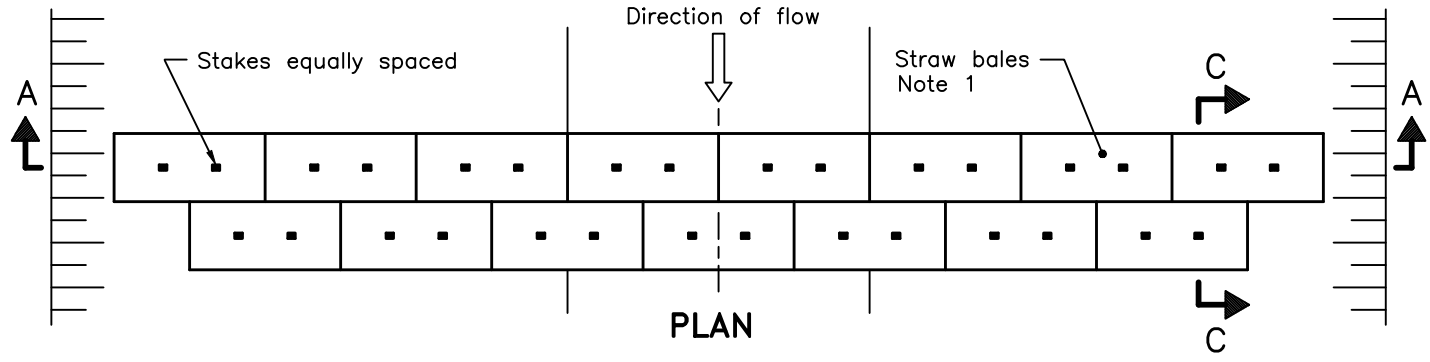
SHADE GROUP INC

- 2023 PROPERTY LINES (GIS DATA)
- MUNICIPAL DRAIN ALIGNMENT
- McRAE BRANCH OPEN DITCH ALIGNMENT
- McRAE BRANCH PREVIOUS OPEN DITCH ALIGNMENT
- McRAE BRANCH PROPOSED ENCLOSURE ALIGNMENT
- McRAE BRANCH PREVIOUS COMPLETED ENCLOSURE ALIGNMENT
- *00+00 (1975)* STATIONS (FT) - PER 1975 ENGINEER'S REPORT
- **0+100** STATIONS (m) - NEW ALIGNMENT
- WATERCOURSES
- PR. SEDIMENT TRAP - SEE SGI STD. DWG 2
- APPROX. BLIND INLET TILE DRAINAGE CONNECTION POINT FOR VENTING

02	ISSUED WITH ENGINEER'S REPORT	FEB 6, 2025
01	REVISED PER SNCA COMMENTS	SEPT 13, 2024
00	ISSUED TO SNCA	JULY 16, 2024
REV.	DESCRIPTION	DATE

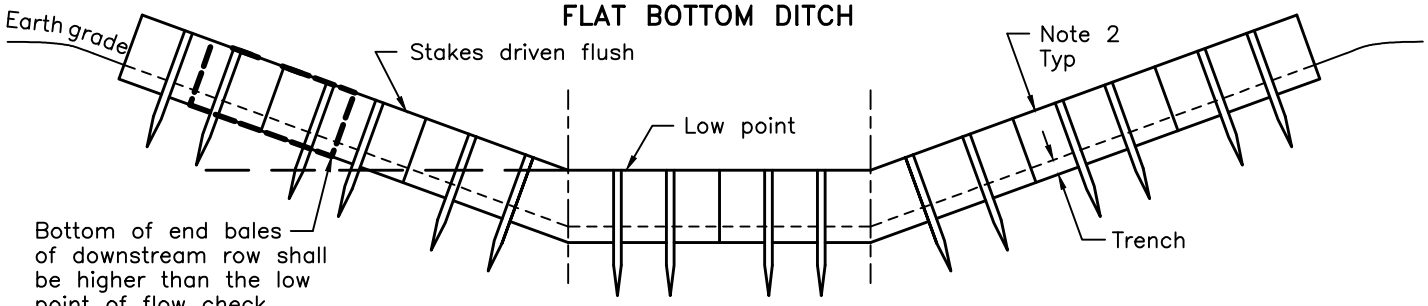
STAMP

PROJECT TITLE	McCRAE BRANCH PARTIAL ENCLOSURE
DRAWING TITLE	MISC. CROSS-SECTIONS AND EROSION AND SEDIMENT CONTROL MEASURES
DRAWING NO.	1 OF 1



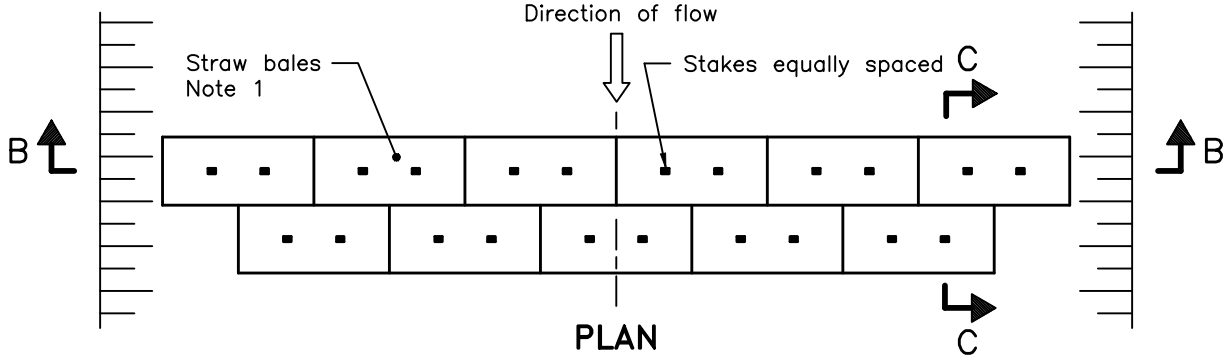
PLAN

FLAT BOTTOM DITCH



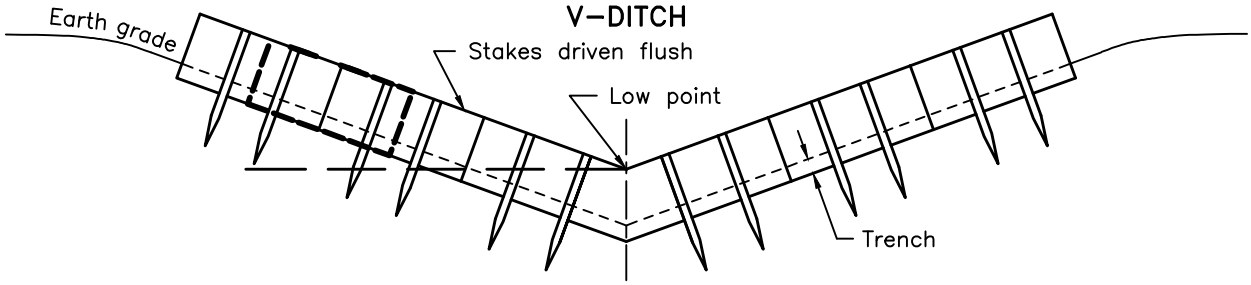
Bottom of end bales of downstream row shall be higher than the low point of flow check. Downstream bale position outlined. Typ

SECTION A–A

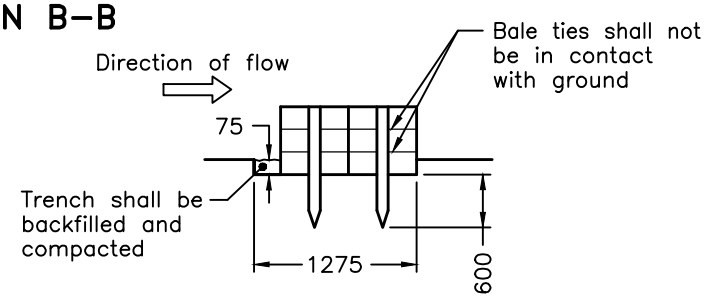


PLAN

V–DITCH



SECTION B–B



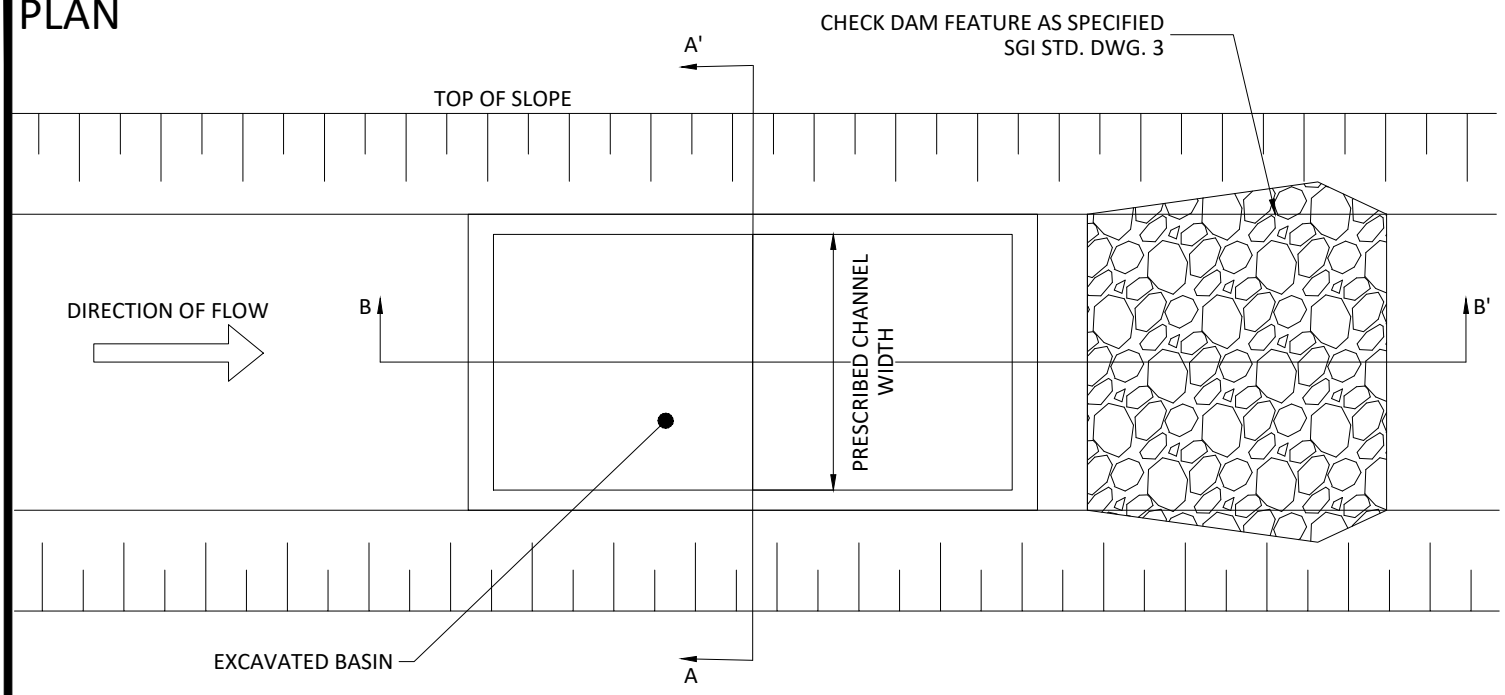
SECTION C–C

NOTES:

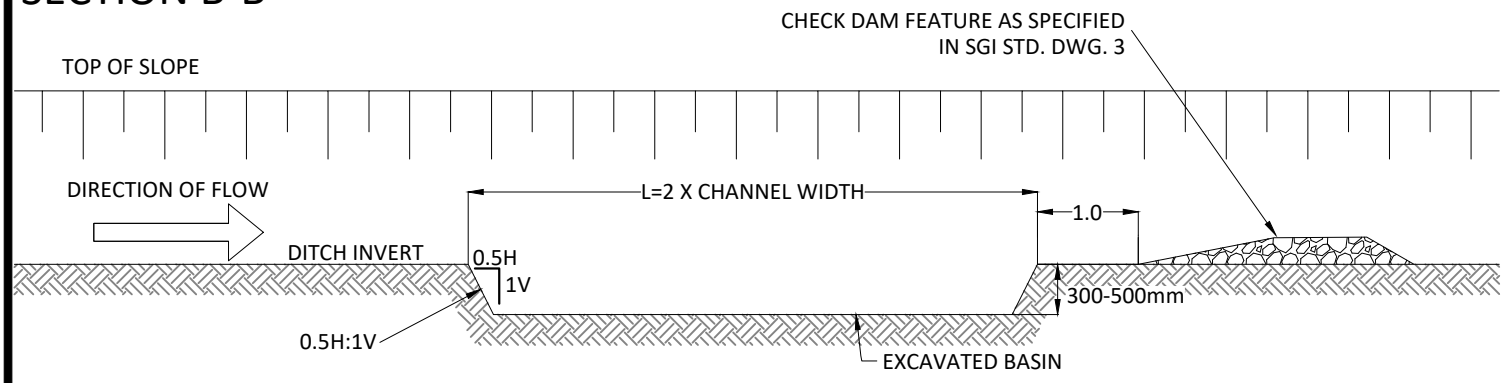
1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A Fill and compact gaps with loose straw.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	3
STRAW BALE FLOW CHECK DAM			
	OPSD 219.180		

PLAN



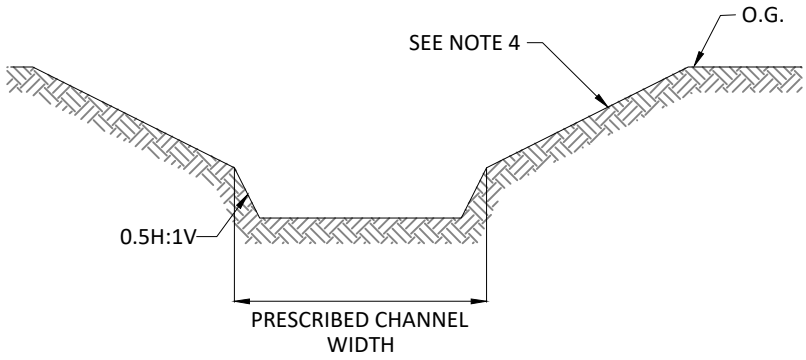
SECTION B-B'



NOTES:

1. THIS DRAWING MODIFIES OPSD 219.220
2. DITCH CROSS-SECTION UPSTREAM OR DOWNSTREAM OF SEDIMENT TRAP MAY BE FLAT BOTTOM OR V-SHAPED, FLAT BOTTOM SHOWN.
3. THIS STANDARD DRAWING SHALL BE READ IN CONJUNCTION WITH OPSD 219.180 OR 219.191 OR 219.211 FOR THE SPECIFIED CHECK DAM FEATURE.
4. MIN. SIDE SLOPES AS SPECIFIED IN ENGINEER'S REPORT OR CONTRACT DRAWINGS
5. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SECTION A-A'



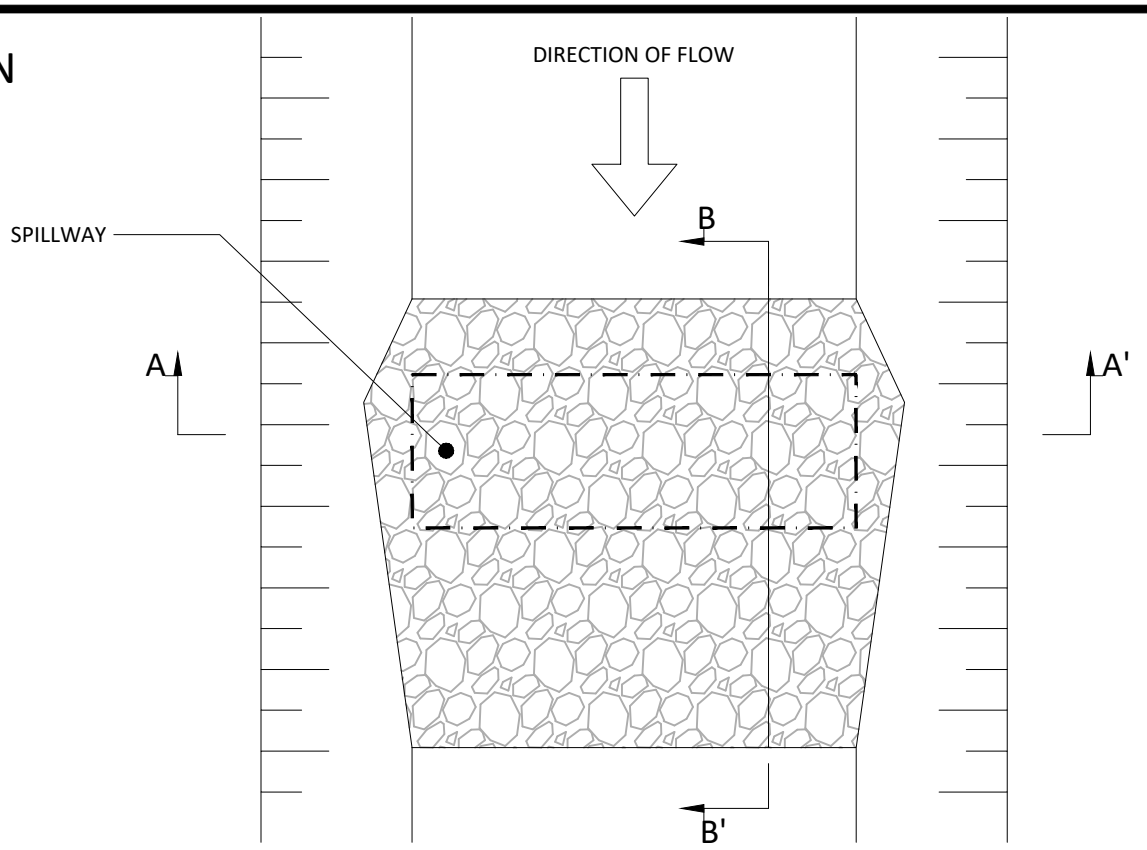
PETITION DRAIN STANDARD DRAWING

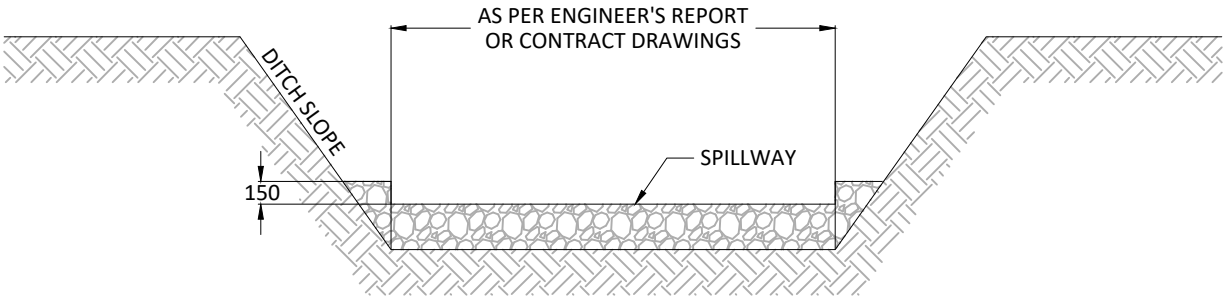
EXCAVATED SEDIMENT TRAP

DETAIL DWG.NO.	
SGI STD. DWG. 2	
REVISION	DATE
1.0	Jan/24
SCALE	
N.T.S	

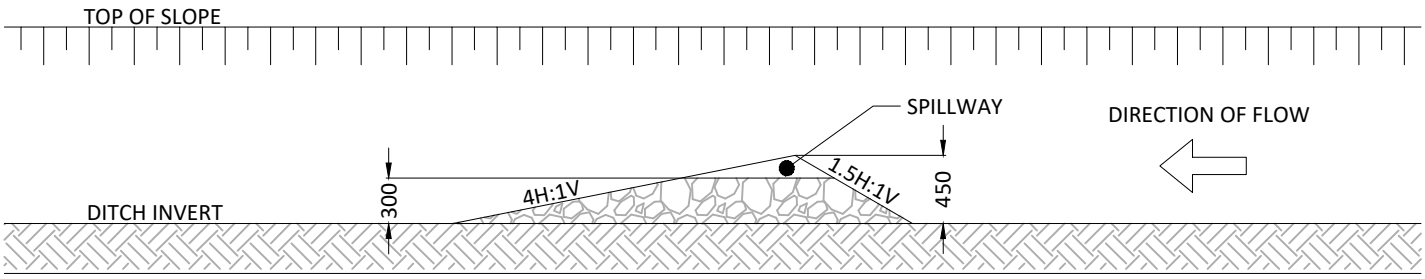
SHADE GROUP INC

PLAN





SECTION A-A'



SECTION B-B'

NOTE:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING IS A MODIFICATION OF OPSD 219.211

PETITION DRAIN STANDARD DRAWING

DETAIL DWG.NO.
SGI STD. DWG. 3

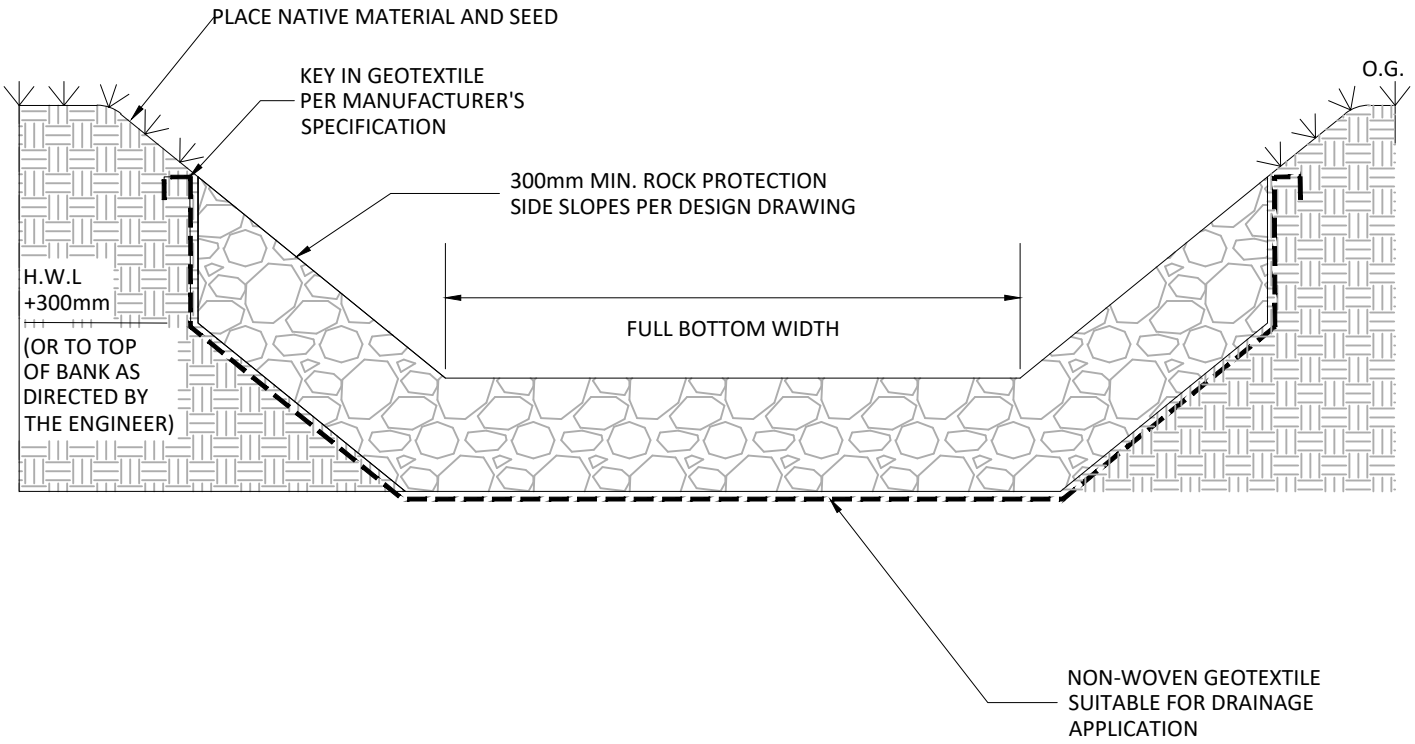
SHADE GROUP INC

REVISION
1.0

DATE
Jan/24

ROCK FLOW CHECK DAM

SCALE
N.T.S



NOTE:

1. SURFACE OF ROCK PROTECTION TO BE FLUSH WITH THE FINISHED SURFACE OF DRAIN UPSTREAM AND DOWNSTREAM OF THE EROSION CONTROL. MIN. SIDE SLOPE AS SPECIFIED IN THE ENGINEER'S REPORT OR THE CONTRACT DRAWINGS.

2. ROCK TO BE R-50 PER OPSS 1004.05.05.02 OR OPSS 1004.05.05.03. BLAST ROCK MAY BE SUBSTITUTED SUBJECT TO ENGINEER APPROVAL.

PETITION DRAIN STANDARD DRAWING

DETAIL DWG.NO.
SGI STD. DWG. 1

SHADE GROUP INC

TYPICAL ROCK PROTECTION EROSION CONTROL

REVISION	DATE
1.0	Jan/24

SCALE
N.T.S

APPENDIX E

HYDROLOGY / HYDRAULICS - ENCLOSURE

McRae Municipal Drain Hydrologic & Hydraulic Analysis Brief

Revised July 12, 2024

Prepared for:

SHADE GROUP INC

Headway Engineering
23-500 Fairway Road South
Suite 308
Kitchener, Ontario N2C 1X3
226 243 6614
www.headwayeng.ca

23-500 Fairway Road South
Suite 308
Kitchener, Ontario N2C 1X3
226 243 6614
www.headwayeng.ca

Kitchener, Ontario
Revised July 12, 2024

To Shade Group Inc.

Re: McRae Municipal Drain
Hydrologic & Hydraulic Analysis Brief
Our Reference No. SG-001

1.0 INTRODUCTION

Headway Engineering has been asked by Shade Group Inc. to conduct a hydrologic and hydraulic analysis of recent changes, and proposed changes to the McRae Municipal Drain. This analysis is required for the possible incorporation of a recently installed pipe system, previously constructed outside the bounds of the Drainage Act. Section 78 of the Drainage Act authorizes the possible incorporation of the recent construction, as well as the downstream extension of the enclosure to further manage the watershed's drainage needs.

This analysis synthesizes the hydrologic and hydraulic data for the existing and proposed McRae Drain enclosures. Utilizing the watershed plan, existing pipe data (size, material, elevations), and a previous drainage report prepared by Stidwill & Associates, dated September 16, 1975, all of which was provided by Shade Group Inc., and without conducting additional fieldwork, the analysis aims to evaluate the existing enclosure's adequacy, and to provide design details for a downstream enclosure that conforms to rural Ontario design standards.

Information provided by Monica Shade, P.Eng., V.P. of Engineering and Sales at Shade Group Inc., served as the basis for this evaluation, which focused on verifying the current and proposed drainage systems against hydrological demands and hydraulic capacities.

2.0 METHODOLOGY

2.1 Data Analysis:

Utilization of GIS tools facilitated an examination of the watershed area using current provincial data. This included defining sub-catchment and comprehensive watershed boundaries.

The GIS delineated watershed boundaries were compared to the previously determined watershed boundaries contained in the previous engineer's report.

2.2 Hydrologic Assessment:

Flow requirements for the existing and proposed enclosures were calculated based on commonly accepted design standards for rural settings in Ontario. More specifically, the proposed drainage system is sized using the Drainage Coefficient method contained in the OMAFRA Publication 29 – 'Drainage Guide for Ontario'. The Drainage Coefficient describes a depth of water to be conveyed by the drainage works per a 24-hour period and is expressed in millimeters per 24 hours. The

drainage coefficient design standard used for the works proposed in this report is 38mm per 24-hour period.

2.3 Hydraulic Design:

The analysis included the assessment of pipe sizes, materials, and required grades to ensure adequate drainage and compliance with established design standards. The Pipe Size Design Calculations are attached to this report for detailed review of each station range.

3.0 FINDINGS AND RECOMMENDATIONS

Headway Engineering's analysis, informed by the collected data and documentary review, yields the following insights and guidance:

1. The GIS analysis of the most current provincially available topographic data largely validates the watershed determined by Stidwill & Associates noted in the report dated September 16, 1975, albeit with some exceptions.

2. The existing enclosure was recently constructed and includes the installation of approximately 360m of 600mm diameter, smooth wall HDPE pipe.

3. **The capacity of the existing enclosure complies with or exceeds the prevalent rural design standards of Ontario, based on the information available.**

4. Inspection and confirmation of the existing enclosure's pipe condition are advised.

5. As much as 1,200m of additional downstream enclosure is contemplated.

6. **The continuance of the 600mm diameter smooth wall HDPE pipe is appropriate, with a recommended gradient increase at the confluence of the Villeneuve Branch to about 0.20% to retain adequate capacity. Aside from this specified minimum grade near the Villeneuve Branch, grades similar to that of the previous report will provide adequate capacity.**

7. Detailed design and drafting responsibilities, including the finalization of construction plans, catch basin placements, and other structural elements are to be undertaken by Shade Group Inc.

4.0 CONCLUSION

The assessments affirm that the existing drain enclosure satisfies or surpasses current hydrologic and hydraulic criteria for today's standards of drainage in rural settings. The proposed drainage enclosure with the installation of a 600mm diameter smooth wall HDPE pipe on grades similar to the previous report dated 1975 will provide adequate capacity at today's standards of drainage, with the exception of a length of drain located downstream of the Villeneuve Branch, where the gradient should be increased to a minimum of 0.20%. Detailed design, conforming to the specifications herein, should be pursued by Shade Group Inc.

Yours truly,

Stephen Brickman, P.Eng.
Project Engineer and Manager
HEADWAY ENGINEERING
SB/

McRae Drain

Ex. Main Drain (Closed)

Drainage Coefficient 1.5

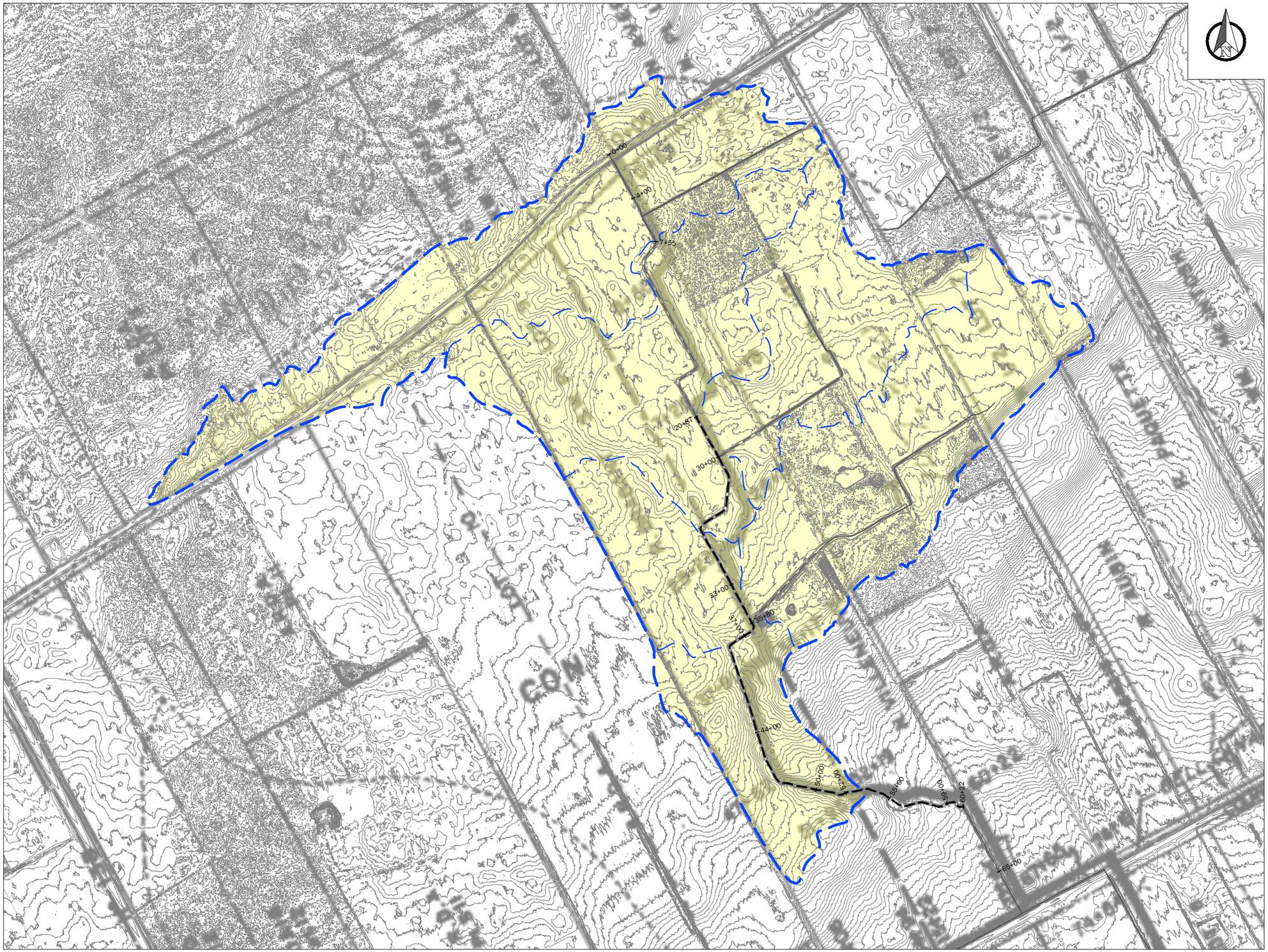
Station Range (Upper to Lower)	Drainage Area (Hectares)	Required Flow (C.F.S.)	Grade	Pipe Diameter (Inches)	Manning's 'n'	Flow Velocity (ft/s)	Calculated Flow (C.F.S.)	Required Diameter (Inches)	Required Percent Grade	Comments
0+192 - 0+567.6	26.38	4.11	0.10%	24	0.012	2.47	**7.77**	18.9	0.03%	ex enclosure

Pr. Main Drain (Closed)

Drainage Coefficient 1.5

Station Range (Upper to Lower)	Drainage Area (Hectares)	Required Flow (C.F.S.)	Grade	Pipe Diameter (Inches)	Manning's 'n'	Flow Velocity (ft/s)	Calculated Flow (C.F.S.)	Required Diameter (Inches)	Required Percent Grade	Comments
0+567.6 - 0+630	46.38	7.22	0.21%	24	0.012	3.58	**11.26**	20.3	0.09%	
0+630 - 1+007.75	61.92	9.64	0.21%	24	0.012	3.58	**11.26**	22.6	0.15%	0+630 Villenueve Br enters
1+007.75 - 1+200	91.75	14.29	0.84%	24	0.012	7.17	**22.52**	20.2	0.34%	1+005 Currier Br enters
1+200 - 1+318.78	101.43	15.80	0.84%	24	0.012	7.17	**22.52**	21.0	0.41%	
1+318.78 - 1+388.53	101.43	15.80	1.20%	24	0.012	8.57	**26.92**	19.7	0.41%	
1+388.53 - 1+483.64	101.43	15.80	0.92%	24	0.012	7.50	**23.57**	20.7	0.41%	
1+483.64 - 1+712	101.43	15.80	1.38%	24	0.012	9.19	**28.87**	19.1	0.41%	

McRAE DRAIN



PLAN SCALE

0 150 300 450

LICENSED PROFESSIONAL ENGINEER
July 12,2024
S.G.R. BRICKMAN
100150920
PROVINCE OF ONTARIO

NOTES:

1. THE BASE PLAN DEPICTED HEREIN IS DERIVED FROM THE 1975 REPORT BY SIDWELL AND ASSOCIATES. IT HAS BEEN ALIGNED TO BEST FIT, AND IS USED FOR REFERENCE PURPOSES ONLY.
2. THE CONTOURS WERE CREATED USING LIDAR DERIVED DIGITAL DATA (2022) FROM LAND INFORMATION ONTARIO.

LEGEND

MAJOR WATERSHED BOUNDARY
MINOR WATERSHED BOUNDARY

EXISTING FEATURES:

DRAIN NAME — OPEN DRAIN WITH CROSSING AND FLOW DIRECTION

DRAIN NAME — CB MH — CLOSED DRAIN WITH CATCH BASIN, MANHOLE AND FLOW DIRECTION

PROPOSED FEATURES:

DRAIN NAME — OPEN DRAIN WITH CROSSING AND FLOW DIRECTION

DRAIN NAME — CB MH — CLOSED DRAIN WITH CATCH BASIN, MANHOLE AND FLOW DIRECTION

Headway Engineering

APPENDIX F

CONSTRUCTION COST ESTIMATE

Project Cost Estimate
(Schedule 'A')
Station 0+568 - 1+712
Proposed Enclosure - McRae Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
600mm HDPE - Smoothwall Pipe (Supply + Install)	m	1146	$ 275.00	$ 315,150.00
Backfill (Supply + Install)	m^3(P)	10500	$ 12.50	$ 131,250.00
Strawbale Check Dam (Supply + Install)	ea	3	$ 200.00	$ 600.00
Rip Rap End Treatment (Supply + Install)	m	10	$ 150.00	$ 1,500.00
Sediment Trap with Rock Check Dam (Supply + Install)	ea	1	$ 1,000.00	$ 1,000.00
Sub-Total - Construction Costs				$ 449,500.00
Contingency Allowance - Construction	10%			$ 44,950.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 494,450.00**

Administration/Engineering Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
Permitting				
SNCA	Lump Sum	100%	$ 2,050.00	$ 2,050.00
Engineering				
Engineer's Report	Lump Sum	1	$ 13,000.00	$ 13,000.00
Sub-Total - Administration/Engineering Costs (Pre-Tax)				**$ 15,050.00**

Summary	
Sub-Total - Construction Costs (Pre-Tax)	$ 494,450.00
Sub-Total - Administration/Engineering Costs (Pre-Tax)	$ 15,050.00
Estimated Project Total	**$ 509,500.00**

SHADE GROUP INC

Project Cost Estimate
(Schedule 'B')
Station 1+712 - 3+438
Future Maintenance of Open Channel - McRae Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
Mobilization	Lump Sum	1	$ 1,500.00	$ 1,500.00
Maintenance	m	1735	$ 10.00	$ 17,350.00
Strawbale Check Dam	ea	4	$ 125.00	$ 500.00
Misc. Bank Stabilization	Lump Sum	2	$ 750.00	$ 1,500.00
Sediment Trap with Rock Check Dam	ea	2	$ 1,000.00	$ 2,000.00
Sub-Total - Construction Costs				$ 22,850.00
Contingency Allowance - Construction	10%			$ 2,285.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 25,135.00**

SHADE GROUP INC

Project Cost Estimate

(Schedule 'C')

Station 0+000 - 1+712

Future Maintenance of Open Channel + Enclosure - McRae Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
Mobilization	Lump Sum	1	$ 1,500.00	$ 1,500.00
Flushing of Enclosure	Lump Sum	1	$ 5,000.00	$ 5,000.00
Open Channel Maintenance	m	200	$ 10.00	$ 2,000.00
Sediment Trap with Rock Check Dam (Reinstatement)	ea	1	$ 1,000.00	$ 1,000.00
Sub-Total - Construction Costs				$ 9,500.00
Contingency Allowance - Construction	10%			$ 950.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 10,450.00**

SHADE GROUP INC

Station 0+200 - 1+712
Equivalent Open Channel Maintenance Costs - McRae Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
Mobilization	Lump Sum	1	$ 1,500.00	$ 1,500.00
Maintenance	m	1512	$ 10.00	$ 15,120.00
Strawbale Check Dam	ea	4	$ 125.00	$ 500.00
Misc. Bank Stabilization	Lump Sum	6	$ 750.00	$ 4,500.00
Sub-Total - Construction Costs				$ 21,620.00
Contingency Allowance - Construction	10%			$ 2,162.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 23,782.00**

Project Cost Estimate
(Schedule 'D')
Station 0+200 - 1+712
Future Enclosure Replacement - McRae Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
600mm HDPE - Smoothwall Pipe Replacement, including removal & disposal of old pipe	m	1146	$ 300.00	$ 343,800.00
Strawbale Check Dam	ea	3	$ 200.00	$ 600.00
Rip Rap End Treatment	m	10	$ 150.00	$ 1,500.00
Sediment Trap with Rock Check Dam	ea	1	$ 1,000.00	$ 1,000.00
Sub-Total - Construction Costs				$ 345,900.00
Contingency Allowance - Construction	10%			$ 34,590.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 380,490.00**

Construction Cost Assessed to Landowners (2 cleanouts)*	$ 26,664.00	7%
Remainder Assessed to Initiating Landowner (Lot 9, Con 7)	$ 353,826.00	93%

2 cleanouts of an open ditch	$ 47,564.00
2 x 10k maintenance	$ 20,900.00
Remainder	**$ 26,664.00**

SHADE GROUP INC

Project Cost Estimate
(Schedule 'E')
Future Maintenance - Brabant Branch

Construction Estimate				
Item	**Unit**	**Quantity**	**Cost/Unit**	**Total**
Mobilization	Lump Sum	1	$ 1,500.00	$ 1,500.00
Open Channel Maintenance	m	534	$ 10.00	$ 5,340.00
Sub-Total - Construction Costs				$ 5,340.00
Contingency Allowance - Construction	10%			$ 534.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 5,874.00**

SHADE GROUP INC

APPENDIX G

RESOLUTION + BY-LAW

The Corporation of the Township of

NORTH STORMONT RESOLUTION

Date: July 26, 2022

Resolution No. 219-2022

MOVED BY:		**SECONDED BY:**	
Deputy Mayor F. Landry		Deputy Mayor F. Landry	
Councillor S. Densham		Councillor S. Densham	✓
Councillor R. Douglas	✓	Councillor R. Douglas	
Councillor R. Villeneuve		Councillor R. Villeneuve	

THAT Council approves of the SDG Counties request, and appoint Shade Group Inc. under Section 78(1) of the Drainage Act, R.S.O 1990 Chapter D. 17 to update the necessary engineer's report to legitimize all drainage works required to be completed as part of the SDG County Road 22 project.

☑ **CARRIED** ☐ **DEFEATED** ☐ **DEFERRED**

Jim Wert

Mayor

Declaration of Conflict of Interest: _____

☐ **Disclosed His/Her/Their Interest**

☐ **Vacated His/Her/Their Seat**

RECORDED VOTE	
Councillor S. Densham	
Councillor R. Douglas	
Councillor R. Villeneuve	
Deputy Mayor F. Landry	
Mayor J. Wert	

The Corporation of the Township of
NORTH STORMONT
RESOLUTION

Date: July 18, 2023

Resolution No. 219-2023

MOVED BY:		**SECONDED BY:**	
Mayor F. Landry		Mayor F. Landry	
Deputy Mayor S. Densham		Deputy Mayor S. Densham	
Councillor A. Bugelli	✓	Councillor A. Bugelli	
Councillor A. McDonald		Councillor A. McDonald	
Councillor C. Shane		Councillor C. Shane	✓

THAT Council receive this information report and extend the appointment of Shade Group Inc under Section 39(1) of the Drainage Act, as the Drainage Engineer appointed under Section 78 of the Drainage Act for the drains affected by the County Road 22 improvements.

☑ **CARRIED** ☐ **DEFEATED** ☐ **DEFERRED**

Mayor

Declaration of Conflict of Interest: _____

☐ **Disclosed His/Her/Their Interest**

☐ **Vacated His/Her/Their Seat**

RECORDED VOTE	
Councillor C. Shane	
Councillor A. McDonald	
Councillor A. Bugelli	
Deputy Mayor S. Densham	
Mayor F. Landry	

APPENDIX H

AGENCY CONSULTATION & PERMITS

SOUTH NATION CONSERVATION
DE LA NATION SUD

Permit No. 2024-NST-R107

PERMIT FOR DEVELOPMENT ACTIVITY WITHIN A REGULATED AREA
Section 28.1 of the *Conservation Authorities Act*, R.S.O. 1990, c. C.27
& Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits

Permit Holder:	Alain Leduc 16999 MacKillican Road Moose Creek, ON K0C 1W0
Decision:	**Approved With Conditions**
Issued:	October 3, 2024
Expires:	October 3, 2026
Work Description:	Enclosure of the McRae Branch of the McKenzie Drain
Location:	Lot 9, Concession 7, Former Township of Roxborough County Road 22, North Stormont Township Roll No. 041101600948800 & 041101600949001

The attached Schedules form part of this permit for the approved work and must be implemented in accordance with the stated conditions. A copy of this permit must be kept at the worksite.

The Permit Holder, by acceptance and in consideration of the issuance of this permit, agrees to the permit conditions.

Dated at Finch, Ontario, this 3rd day of October 2024.

Jennifer Boyer

Jennifer Boyer, M.Sc., MCIP RPP

Managing Director, Approvals
South Nation Conservation
jboyer@nation.on.ca

SCHEDULE A: WORK DESCRIPTION

SNC understands the following work will be completed (the "Work"):

1. The applicant proposes to enclose a portion of the McRae Branch of the McKenzie Municipal Drain.

2. A 600mm diameter smooth wall HDPE pipe will be used to enclose 1,200m of the McRae Branch of the McKenzie Municipal Drain.

The details of the Work are outlined in the following documents forwarded to SNC:

1. South Nation Conservation Section 28.1 Permit Application Form – Signed by Alain Leduc, dated May 10, 2024, signed by Monica Shade, dated May 22, 2024.

2. Drawing: "Misc. Cross Sections and Erosion and Sediment Control Measures", prepared by Shade Group, dated Sept 13, 2024.

3. Drawing: "Profile View – Previously Completed Enclosure", prepared by Shade Group, dated Sept 13, 2024.

4. Drawing: "Profile View – Proposed Enclosure", prepared by Shade Group, dated Sept 13, 2024.

5. Drawing: "Watershed Map Plan View", prepared by Shade Group, dated July 16, 2024.

6. Report: "McRae Municipal Drain, Hydrologic and Hydraulic Analysis Brief", prepared by Headway Engineering, revised July 12, 2024, stamped by S.G.R. Brickman.

7. Comment response letter, dated July 16, 2024, signed by Monica Shade.

SCHEDULE B: CONDITIONS

The Permit Holder must adhere to the following conditions for permit compliance:

1. Erosion Control

    a) 8 metres of rock is proposed at the outlet of the pipe to prevent erosion. A strawbale check dam is proposed as a temporary erosion control measure.

    b) The Permit Holder must ensure no erosion occurs in or near a watercourse or waterbody that is in proximity to the Work.

    c) In the event of unexpected rainfall, any fill that is removed from the site and placed on the shore (above the high-water mark) is to be properly stabilized as required through the implementing of appropriate erosion control measures.

    d) SNC may visit the Work location anytime from application submittal through to the expiration of the permit to inspect the implementation of erosion control measures on site. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

    e) Disturbed areas must be stabilized and revegetated as required upon completion of Work and restored to a pre-disturbed state or better.

SCHEDULE C: ADDITIONAL COMMENTS

SNC makes the following additional comments:

1. This permit does not review, certify, or provide permission for any works that may be located outside the above noted property boundary.

2. Nothing in this permit relieves the Permit Holder(s) from obtaining, where necessary, regulatory approval from any other agency, government including the Majesty the King in Right of Ontario, municipality, landowner, or authority having legal jurisdiction regarding development at the above noted location or any adjacent lands that may be impacted by the Work. SNC makes no representation and has made no representation as to whether the Permit Holder(s) must obtain any other approval(s) regarding the Work. SNC hereby confirms that it is the Permit Holder(s)' sole and complete responsibility to ensure that it applies for and obtains all necessary regulatory approvals prior to undertaking the Work.

3. Permit review completed by L. Crites. Technical review completed by M. Rajaie and S. Zand.

SCHEDULE D: GENERAL CONDITIONS

1. Term

This permit is valid for 24 months from the date of issuance. No notice will be issued on expiration. It is the responsibility of the Permit Holder to ensure a valid permit is in effect at the time the Work is occurring. The Permit Holder may, at least 60 days before the expiry of the permit, apply to SNC and pay a fee for an extension of the permit.

2. Other Permits and Permissions

This permit does not relieve the Permit Holder of the responsibility to obtain any other documents or permits that the Work may require from the Government of Canada, the Government of Ontario, or the local municipality. It is the responsibility of third-party agents to secure property owner permission to undertake the Work.

3. Right to Hearing

A Permit Holder who disagrees with the conditions attached to their permit has the right to request a hearing before the SNC Board of Directors. Please contact our office for further details.

4. Property Entry

SNC may enter the subject property where the Work is taking place during the permit's period of validity to ensure compliance with the conditions of the permit. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

5. Cancellation of Permit

SNC may cancel a permit or change the permit conditions if:

a) false information was submitted as part of the permit application; or
b) the Work deviates from the conditions of the permit without SNC's prior written approval.

6. Offences

It is an offence to undertake work in a regulated area without a permit or to contravene the conditions of a permit. A person who commits an offence under the *Conservation Authorities Act* is liable on conviction:

a) in the case of an individual,
(i) to a fine of not more than $50,000 or to a term of imprisonment of not more than three months, or to both, and

(ii) to an additional fine of not more than $10,000 for each day or part of a day on which the offence occurs or continues; and

b) in the case of a corporation,

(i) to a fine of not more than $1,000,000, and

(ii) to an additional fine of not more than $200,000 for each day or part of a day on which the offence occurs or continues.

Despite the maximum fines, a court that convicts a person of an offence may increase the fine it imposes on the person by an amount equal to the amount of the monetary benefit that was acquired by the person, or that accrued to the person, as a result of the commission of the offence.

In addition to any other remedy or penalty provided by law, the court, upon convicting a person of an offence, may order the convicted person to,

a) remove, at the convicted person's expense, any development within such reasonable time as the court orders; and
b) take such actions as the court directs, within the time the court may specify, to repair or rehabilitate the damage that results from or is in any way connected to the commission of the offence.

7. Liability

The Permit Holder acknowledges that the sole function of this permit is to confirm the Work is consistent with Part VI of the *Conservation Authorities Act*, O. Reg. 41/24, and SNC policies. SNC makes no representations or warranties regarding any other aspect of the Work.

By accepting this permit, the Permit Holder agrees:

a) to indemnity and save harmless, SNC and its officers, employees, and agents, from and against all damage, injury, loss, costs, claims, demands, actions, and proceedings, arising out of or resulting from any act or omission of the Permit Holder or of any of their agents, employees, or contractors relating to any of the particular terms or conditions of this permit; and
b) that this permit shall not release the Permit Holder from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law.

SNC assumes no responsibility or liability for flood, erosion, or slope failure damage that may occur to the subject property, nor any activity undertaken by the Permit Holder affecting the property interests of adjacent landowners.

Fisheries and Oceans Canada
Pêches et Océans Canada

Ontario and Prairies Region
Fish and Fish Habitat
Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Région de l'Ontario et des Prairies
Programme de la protection
du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

Your file *Votre référence*
24-HCAA-01176

September 6, 2024

Alain & Susan Leduc
16999 Mackillican Rd RR 1
Moose Creek, ON K0C 1W0

Subject: Drain Enclosure, McRae Branch of the McKenzie Drain, North Stormont – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Alain & Susan Leduc:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on May 23rd, 2024. We understand that you propose to:

- Enclose approximately 1,200 linear m of the McRae Branch of the McKenzie municipal class F drain running through agricultural land.

We understand that you propose to formally abandon both the Currier and Villeneuve Drains. These drains have been partially enclosed already. In addition, these drains enclosures are linked to an occurrence file 24-HCAA-01926 which concluded with a letter outlining implications under the *Fisheries Act*.

Our review considered the following information:

- Request for Review and supporting documents received on May 23rd, 2024.
- Call with Monica Shade (Shade Group Inc.) and Sean MacDonald (Township Drainage consultant) on July 30th, 2024.
- Additional information provided by Monica Shade and Sean MacDonald following up the call from July 30th, 2024.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*. ; and

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures outlined in your plan, in addition to the following listed below:

- Plan in-water work, undertaking or activity to respect timing windows (i.e. NO in-water work between March 15 – July 15).
- Develop and implement an Erosion and Sediment Control Plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity.
- Restore the banks and riparian vegetation to their natural state, with native species suitable for the site.
- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.
- Aquatic invasive species are introduced and spread through transporting sands and sediments and using contaminated construction equipment. To prevent the spread of aquatic invasive species during construction in aquatic environments:
    - Clean, drain and dry any equipment used in the water; and,
    - Never move organisms or water from one body of water to another.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries* Act or permit under the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations.*

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html).

Notify this office at least 10 days before starting any in-water works. Send your notification to Kirsten Luck (kirsten.luck@dfo-mpo.gc.ca) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Kirsten Luck at our Burlington office at (506) 269-5694 or by email at kirsten.luck@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Elyjah Schimmens
A/Senior Biologist
Fish and Fish Habitat Protection Program
Fisheries and Oceans Canada

COPY: Kirsten Luck – Fisheries and Oceans Canada
Sean MacDonald – Township of North Stormont Drainage Superintendent consultant

SOUTH NATION CONSERVATION
DE LA NATION SUD

Permit No. 2024-NST-R150

PERMIT FOR DEVELOPMENT ACTIVITY WITHIN A REGULATED AREA
Section 28.1 of the *Conservation Authorities Act*, R.S.O. 1990, c. C.27
& Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits

Permit Holder:	United Counties of SDG Care of: Dana Grant 26 Pitt Street Cornwall, ON K6J 3P2
Decision:	**Approved With Conditions**
Issued:	December 3, 2024
Expires:	December 3, 2026
Work Description:	Relocate Municipal Drains as part of the County Road 22 Reconstruction Project
Location:	County Road 22, from Highway 138 to the Urban Limit of Maxville Township of North Stormont Geographic Township of Roxborough

The attached Schedules form part of this permit for the approved work and must be implemented in accordance with the stated conditions. A copy of this permit must be kept at the worksite.

The Permit Holder, by acceptance and in consideration of the issuance of this permit, agrees to the permit conditions.

Dated at Finch, Ontario, this 3rd day of December 2024.

Jennifer Boyer, M.Sc., MCIP RPP
Managing Director, Approvals

South Nation Conservation
jboyer@nation.on.ca

SCHEDULE A: WORK DESCRIPTION

SNC understands the following work will be completed (the "Work"):

1. County Road 22 will be reconstructed from Highway 138 to Roxborough Kenyon Boundary Road. The reconstruction design includes the relocation of several Municipal drain segments where the road will be widened.

2. The Permit Holder identified 8 locations where the road reconstruction will interfere with a watercourse:

    I. **Howes Branch of the McKenzie Municipal Drain**: located across the road from 17404 County Road 22 and flows east to the southwest corner of 17499 County Road 22.

    - Approximately 650m of the drain will be relocated further away from the road. The proposed drain alignment does not differ substantially from the existing alignment. Along the front of residential properties, the municipal drain will follow the existing alignment and be enclosed.

    II. **McRae Branch of the McKenzie Municipal Drain:** located on the southeast corner of 17499 County Road to and flows east for 180m.

    - 180m of the drain will be relocated further away from the road. The municipal drain will follow the existing alignment and be enclosed.

    III. **McRae Branch of the McKenzie Municipal Drain:** located east of 17504 County Road 22.

    - The existing culvert on County Road 22 is a 1300mm diameter corrugated steel pipe (CSP) and is proposed to be replaced with a 1600mm diameter CSP.

    IV. **Morrow Brabec Municipal Drain:** located across the road from 17750 County Road 22 and flows east for 925m.

    - Approximately 925m of the drain will be relocated further away from the road. The relocated drain will differ from the existing

alignment by approximately 1m, north or south, varying by location along the length of the drain.

V. **Cumming Drain:** located approximately 400m east of the entrance to 17810 County Road 22.

- The existing culvert on County Road 22 is a 1500mm diameter CSP, and is proposed to be replaced with a 1600mm diameter CSP.

VI. **County Road Branch of the Cumming Municipal Drain:** officially located on the south side of the Road from 18032 County Road 22 and flows west for approximately 850m.

- A 900mm CSP cross culvert was installed near the western entrance at 17996 County Road 22, and the flows were directed along the north side of County Road 22. There is another cross culvert near the residential entrance at 17946, returning flows to the south side of County Road 22.

- The existing 900mm CSP cross culvert will be removed. A new 1000mm CSP cross culvert will be installed closer to Kenyon-Roxborough Boundary Road. The municipal drain will be located on the north side of County Road 22 and flow into the Morrow Branch of the Cumming Municipal Drain.

VII. **Morrow Branch of the Cumming Municipal Drain:** the cross culvert is located approximately 135m west of the entrance to 17946 County Road 22.

- The existing twin 1600mm CSP will be replaced with a 1200mm x 1200mm concrete box culvert.

VIII. **Morrow Spur Branch of the Cumming Municipal Drain:** the cross culvert is located approximately 200m west of the entrance to 17946 County Road 22.

- The existing 500m CSP will be replaced with a 600mm CSP.

The details of the Work are outlined in the following documents forwarded to SNC:

1. South Nation Conservation Section 28.1 Permit Application Form – signed by Mike Jans on June 27, 2024.

2. Letter: “RE: County Road 22 Reconstruction – Project Context and Permit Application”, signed by Mike Jans, dated May 13, 2024.

3. Technical Memorandum: “Stormont, Dundas & Glengarry Counties Road 22 Rehabilitation, Culvert Replacement Recommendations”, signed, stamped, and dated by L. Sanchez, P. Eng, on June 11, 2024.

4. Drawing Package: “County Road 22 – Reconstruction and Drainage Improvements from Highway 138 to 0.6km East of the Roxborough Kenyon Boundary Road”, signed, stamped and dated by S.J. Taylor, P.Eng, and A. Allard-Dufour, P.Eng on 6/18/2024.

5. Memorandum: “Municipal Drain Assessment”, prepared by BT Engineering, signed, stamped, and dated by L. Sanchez, P. Eng, on June 7, 2024.

6. “SNCA Comments and Response Table – 2024”, not signed, or stamped, dated 2024, received via email from Mike Jans on September 3, 2024.

7. “CR 22 – Proposed Transverse Culverts”, not signed, stamped or dated, received via email from Mike Jans on September 3, 2024.

8. “SNCA Comment and Response Table – 2024”, prepared by BT Engineering, dated 2024, not signed, or stamped, received via email from Mike Jans on October 21, 2024.

9. Email Correspondence: “Follow-up: SDG Answers to SNCA Comments- County Road 22 Reconstruction”, sent by Steve Taylor on November 15, 2024.

10. Email Correspondence: “Re: County Road 22”, sent by Michael Jans on July 26, 2024.

SCHEDULE B: CONDITIONS

The Permit Holder must adhere to the following conditions for permit compliance:

1. Erosion Control

    a) The Permit Holder must ensure no erosion occurs in or near a watercourse or waterbody that is in proximity to the Work.

    b) Any fill that is removed from the site and placed on land above the high-water mark is to be properly stabilized as required through the implementing of appropriate erosion control measures.

    c) SNC may visit the Work location anytime from application submittal through to the expiration of the permit to inspect the implementation of erosion control measures on site. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

    d) Disturbed areas must be stabilized and revegetated as required upon completion of Work and restored to a pre-disturbed state or better.

SCHEDULE C: ADDITIONAL COMMENTS

SNC makes the following additional comments:

1. According to the construction drawings, the existing twin box culverts on the McKenzie Municipal Drain will be maintained and no watercourse interference is anticipated. However, the contractor should ensure there is sufficient erosion protection at this location prior to commencing road work.

2. This permit does not review, certify, or provide permission for any works that may be located outside the above noted property boundary.

3. Nothing in this permit relieves the Permit Holder(s) from obtaining, where necessary, regulatory approval from any other agency, government including the Majesty the King in Right of Ontario, municipality, landowner, or authority having legal jurisdiction regarding development at the above noted location or any adjacent lands that may be impacted by the Work. SNC makes no representation and has made no representation as to whether the Permit Holder(s) must obtain any other approval(s) regarding the Work. SNC hereby confirms that it is the Permit Holder(s)' sole and complete responsibility to ensure that it applies for and obtains all necessary regulatory approvals prior to undertaking the Work.

4. Permit review completed by L. Crites. Technical review completed by F. Forough.

SCHEDULE D: GENERAL CONDITIONS

1. Term

This permit is valid for 24 months from the date of issuance. No notice will be issued on expiration. It is the responsibility of the Permit Holder to ensure a valid permit is in effect at the time the Work is occurring. The Permit Holder may, at least 60 days before the expiry of the permit, apply to SNC and pay a fee for an extension of the permit.

2. Other Permits and Permissions

This permit does not relieve the Permit Holder of the responsibility to obtain any other documents or permits that the Work may require from the Government of Canada, the Government of Ontario, or the local municipality. It is the responsibility of third-party agents to secure property owner permission to undertake the Work.

3. Right to Hearing

A Permit Holder who disagrees with the conditions attached to their permit has the right to request a hearing before the SNC Board of Directors. Please contact our office for further details.

4. Property Entry

SNC may enter the subject property where the Work is taking place during the permit's period of validity to ensure compliance with the conditions of the permit. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

5. Cancellation of Permit

SNC may cancel a permit or change the permit conditions if:

a) false information was submitted as part of the permit application; or
b) the Work deviates from the conditions of the permit without SNC's prior written approval.

6. Offences

It is an offence to undertake work in a regulated area without a permit or to contravene the conditions of a permit. A person who commits an offence under the *Conservation Authorities Act* is liable on conviction:

a) in the case of an individual,
(i) to a fine of not more than $50,000 or to a term of imprisonment of not more than three months, or to both, and

(ii) to an additional fine of not more than $10,000 for each day or part of a day on which the offence occurs or continues; and

b) in the case of a corporation,

(i) to a fine of not more than $1,000,000, and

(ii) to an additional fine of not more than $200,000 for each day or part of a day on which the offence occurs or continues.

Despite the maximum fines, a court that convicts a person of an offence may increase the fine it imposes on the person by an amount equal to the amount of the monetary benefit that was acquired by the person, or that accrued to the person, as a result of the commission of the offence.

In addition to any other remedy or penalty provided by law, the court, upon convicting a person of an offence, may order the convicted person to,

a) remove, at the convicted person's expense, any development within such reasonable time as the court orders; and
b) take such actions as the court directs, within the time the court may specify, to repair or rehabilitate the damage that results from or is in any way connected to the commission of the offence.

7. Liability

The Permit Holder acknowledges that the sole function of this permit is to confirm the Work is consistent with Part VI of the *Conservation Authorities Act*, O. Reg. 41/24, and SNC policies. SNC makes no representations or warranties regarding any other aspect of the Work.

By accepting this permit, the Permit Holder agrees:

a) to indemnity and save harmless, SNC and its officers, employees, and agents, from and against all damage, injury, loss, costs, claims, demands, actions, and proceedings, arising out of or resulting from any act or omission of the Permit Holder or of any of their agents, employees, or contractors relating to any of the particular terms or conditions of this permit; and
b) that this permit shall not release the Permit Holder from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law.

SNC assumes no responsibility or liability for flood, erosion, or slope failure damage that may occur to the subject property, nor any activity undertaken by the Permit Holder affecting the property interests of adjacent landowners.

Fisheries and Oceans Canada
Pêches et Océans Canada

Ontario and Prairies Region
Fish and Fish Habitat
Protection Program
867 Lakeshore Road
Burlington, ON L7S 1A1

Région de l'Ontario et des Prairies
Programme de la protection
du poisson et de son habitat
867 Lakeshore Road
Burlington, ON L7S 1A1

October 22, 2024

Our file *Notre référence*

24-HCAA-01679

United Counties of SD&G
ATTENTION: Michael Jans
Manager of Infrastructure
26 Pitt St
Cornwall, ON
K6J 3P2

Subject: Drain Realignment, Road Reconstruction, County Road 22, North Stormont – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Michael Jans:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on July 8th, 2024. We understand that you propose to:

- Realign approximately 1,840 m of class C, E and F municipal drains to accommodate road reconstruction activities on County Road 22.
- Enclose approximately 700 m of class F municipal drains in segments running through landowner driveways.
- Replace existing culvert crossings and driveway culverts of class C, E and F municipal drains to accommodate road reconstruction activities.

Our review considered the following information:

- Request for Review and supporting documents received on July 8th, 2024.
- Call with Michael Jans (The Counties), Derek McMillan (The Counties), Andrea Doherty (DFO) and Kirsten Luck (DFO) on August 21st, 2024.
- Additional information provided by Michael Jans following up the call from August 21st, 2024.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and

- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.; and
- The introduction of aquatic species into regions or bodies of water frequented by fish where they are not indigenous, which is prohibited under section 10 of the *Aquatic Invasive Species Regulations*.]

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures outlined in your plan, in addition to the following listed below:

- Plan in-water work, undertaking or activity to respect timing windows (i.e. NO in-water work between March 15 – July 15).
- Develop and implement an Erosion and Sediment Control Plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity.
- Restore the banks and riparian vegetation to their natural state, with native species suitable for the site.
- Aquatic invasive species are introduced and spread through transporting sands and sediments and using contaminated construction equipment. To prevent the spread of aquatic invasive species during construction in aquatic environments:
    - Clean, drain and dry any equipment used in the water; and,
    - Never move organisms or water from one body of water to another.
- Replace removed trees at a 1:1 replacement ratio onto the back-slopes of the channel.
- In areas where proposed realignment overlaps with existing realignment AND takes place in a class C or E drain, conduct work in the dry. If working in the dry is not possible, work in isolation of flow with pump bypass, fish salvage and silt fencing used in workable segments.
- Replace the Cumming Main Branch culvert (CC6) in isolation of flow with pump bypass, fish salvage, silt fencing, and riprap armouring along the eroded bank.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries* Act or permit under the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations.*

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html).

Notify this office at least 10 days before starting any in-water works. Send your notification to Kirsten Luck (kirsten.luck@dfo-mpo.gc.ca) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Kirsten Luck at our Burlington office at (506) 269-5694 or by email at kirsten.luck@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Elyjah Schimmens
A/Senior Biologist
Fish and Fish Habitat Protection Program
Fisheries and Oceans Canada

COPY: Kirsten Luck – Fisheries and Oceans Canada