Robinson Consultants

Engineer's Report for the McKinnons Creek Municipal Drain

Prepared For:

Ottawa

Prepared By:

Robinson Consultants Inc.
Consulting Engineers

Our Project No. 16070
May 2025

Robinson Consultants

May 30th, 2025

Mayor and Members of Council
City of Ottawa
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: **Ms. Caitlin Salter MacDonald**
City Clerk

Reference: **Engineer's Report for**
McKinnons Creek Municipal Drain
Cumberland Ward
Our Project No. 16070

Dear Ms. Salter MacDonald:

This Engineer's Report for the McKinnons Creek Municipal Drain, which is respectfully submitted for Council's consideration, was initiated by petition to the City of Ottawa under Section 4 of the Drainage Act, R.S.O. 1990, c. D.17.

All costs associated with the project, including the Engineer's Report, allowances, and initial construction will be assessed to the properties (owners/developers) of the lands identified as Blocks F1, F2 and F3 on Dwg. No. 16070-A3 (A-3.1 through A-3.3 in detail). All costs associated with future maintenance and repair will be assessed against the properties as indicated on Dwg. No. 16070-A3 (A-3.1 through A-3.3 in detail), and on the Schedules of Assessment.

If you have any questions, please feel free to contact Andy Robinson by e-mail at ajrobinson@rcii.com or Lorne Franklin at lfranklin@rcii.com .

Yours very truly,

ROBINSON CONSULTANTS INC.

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Licensed Engineering Technologist
Drainage Services

c.c. David Ryan, P. Geo., Municipal Drainage Manager/Drainage Superintendent, City of Ottawa

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1.0 INTRODUCTION

1.1 Appointment

Robinson Consultants Inc. (RCI) was appointed by the City of Ottawa on December 14, 2016, to complete an Engineer's Report for the proposed McKinnons Creek Municipal Drain including the incorporation of the former Richard Clark Municipal Drain. The new Engineer's Report was initiated by the City of Ottawa in response to a petition under Section 4 of the Drainage Act, R.S.O. 1990, c. D.17, by the developers/property owners of the lands within the proposed development area.

1.2 On-Site Meeting

An On-site meeting of the affected property owners and concerned parties was held on February 9, 2017. Comments, concerns, and questions from the on-site meeting include the following:

- Noted that there is a 1990s report for Bear Brook and the engineer should review the Bear Brook report to see if it requires maintenance or improvements and provides sufficient outlet. Also noted that there is a lot of rock on Bear Brook near the Village of Bear Brook.
- Concern that no matter how much McKinnons Creek is improved; Bear Brook cannot accept the flow unless improved.
- Concern about cost associated with environmental features that may be required.
- Several suggestions that storm water from proposed developments should be taken to the Ottawa River.
- Richard Clark Municipal Drain runs very slowly—floods fields multiple weeks in the spring and sometimes in the summer.
- Will there be funding to replace existing bridges.
- Maybe Bear Brook should be included in any improvements.
- Golf course property has erosion control issues on steep banks near house.

1.3 History

At present, McKinnons Creek is a natural water course without status under the Drainage Act, R.S.O. 1990, c. D.17. McKinnons Creek is tributary to the Richard Clark Municipal Drain which was the subject of an "Engineer's Report Richard Clark Municipal Drain," July 1966 and Supplementary Report, July 1967 both by Stidwill & Associates Limited. The Richard Clark Municipal Drain in turn is tributary to the Bear River Municipal Drain which was last improved by an "Engineer's Report Bear River Municipal Drain Maintenance and Improvements," August 1990 by McNeely Engineering Limited.

2.0 PURPOSE OF THE NEW ENGINEER'S REPORT

The City of Ottawa initiated the Engineer's Report under Section 4 of the Drainage Act, R.S.O. 1990, c. D.17, in response to a petition from property owners in conjunction with the proposed urban development of lands within the drainage area. The purpose of the report is to create a new drain, from the limit of the storm water management pond serving the existing and proposed development, to accommodate the change in land use from rural/agricultural to urban development for the lands identified as proposed Blocks F1, F2, and F3 on Dwg. No. 16070-A3 (A-3.1 through A-3.3 in detail).

To accommodate these changes, amendments are required to the profile of the existing water course and to modify the existing Engineer's Report. The entirety of the Richard Clark Municipal Drain will be modified and incorporated by this report. Therefore, the previous reports will no longer have status following the enactment of this Engineer's Report.

For the purpose of clarity, the drain will be referred to as the McKinnons Creek Municipal Drain. Modifications are as detailed in the following sections.

2.1 Modifications – Main Drain

Modifications to the existing McKinnons Creek include establishing a new profile and cross sections for the existing watercourse to its connection to the existing Richard Clark Municipal Drain. Modifications to the existing Richard Clark Municipal Drain include establishing new profiles and cross sections to accommodate drainage from the upstream lands including the area proposed for urban development. Where required to accommodate the design flow, existing culvert crossings or bridges will be replaced, and extensive slope stabilization and erosion control works will be implemented.

The design of the proposed municipal drain between Sta. 0+000.00 and Sta. 4+053.00 has been completed by Arcadis (formerly IBI) Group in conjunction with engineering design on behalf of the property owners that will form part of the urban development. The design of the proposed municipal drain between Sta. 10+000.00 and Sta. 16+741.50 has been completed by RCI.

3.0 EXISTING CONDITIONS

3.1 Location of the Drain

The main drain as identified by this report commences at Sta. 0+000.00 at the headwall of the existing stormwater management pond upstream of Tenth Line Road. The drain follows the course of the existing McKinnons Creek in a southernly direction to the location of the existing Hydro corridor upstream of Navan Road at Sta. 4+053.0.

At this location, The Arcadis engineer's profile transitions into the RCI engineer's profile (chainage equation Sta. 4+053.0 upstream = Sta. 10+000.00 downstream). From this point, the McKinnons Creek continues in a southernly direction until it transitions into the existing Richard Clark Municipal Drain at Sta. 12+670.00. From this location, the drain continues in a southernly direction to its outlet at the East Savage Municipal Drain at Sta. 16+741.50, immediately upstream of the confluence with the Bear River (Bear Brook) Municipal Drain. **Figure 3.1** shows a Location Plan, including the drainage boundary and drain, as well as the surrounding area.

3.2 Drainage Basin and Limits

The drainage basin for the McKinnons Creek Municipal Drain has been adjusted to conform to the drainage scheme for the proposed development and existing urban development and to reflect the current drainage area, including adjustments that have been made to divert areas from the original drainage basin to adjacent drainage basins.

The drainage basin includes parts of the following Lots and Concessions:

- Lots 10 through 14, Concession 8, geographic Township of Cumberland.
- Lots 3 through 17, Concession 9, geographic Township of Cumberland.
- Lots 3 through 9, Concession 10, geographic Township of Cumberland.
- Lots 1 through 7, Concession 11, geographic Township of Cumberland.

The drainage area of the proposed McKinnons Creek Municipal Drain is approximately 2043ha (5048 acres). The limits of the drainage boundary (drainage basin) are shown on Dwg. No. 16070-A1. These limits have been determined by the drainage design of the proposed development, the drainage area boundaries of adjacent drains, 2014 City of Ottawa LiDAR mapping of the area, field reconnaissance and the area defined in the South Nation Conservation Authority flood plain mapping draft report.

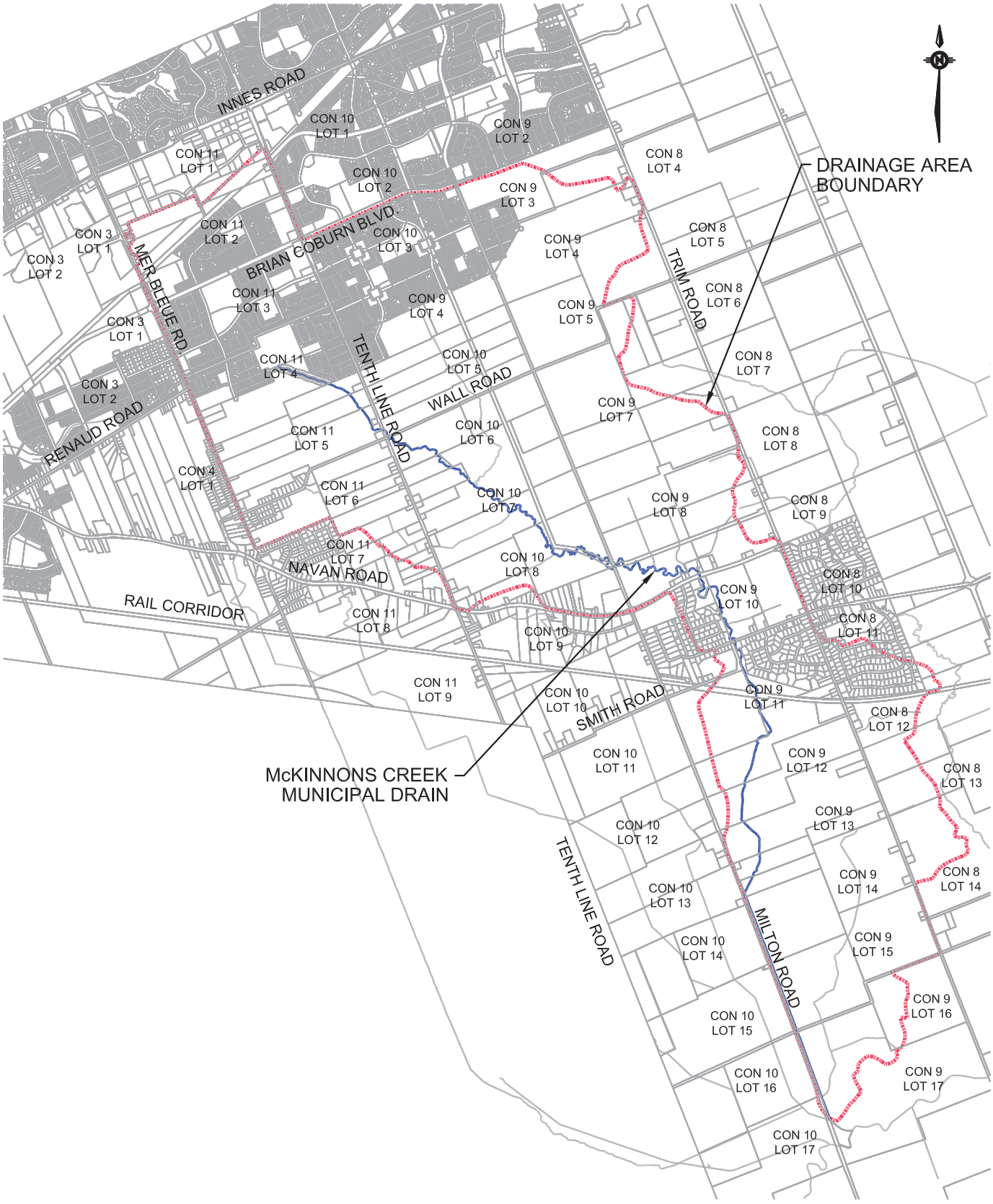
Should the final approval for the development area result in changes or modifications to the drainage area, an additional Engineer's Report amending the drainage area to match the final drainage area will be required.

3.3 Drawings Forming Part of the Engineer's Report

3.3.1 RCI Drawings

The design for the proposed municipal drain between Sta. 10+000.00 and Sta.16+741.50 has been completed by RCI.

Dwg. No. 16070-A1 - "Drainage Area Plan" has been prepared showing the drainage area boundary as a bold heavy dash-dot-dot line (red were provided in colour), and the existing (incorporated) drain as heavy solid line (blue were provided in colour).



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Title: LOCATION PLAN		Fig. No. 3.1
Project: McKINNONS CREEK MUNICIPAL DRAIN		Job No. 16070
	Scale: NTS	Date: MAY 2025

Dwg. No. 16070-A2 (A2.1 through A2.8 – in detail) - "Culvert and Sediment and Erosion Control Plans" have been prepared showing the location of any existing and proposed (where applicable) culvert crossings as well as minimum measures required for construction phase sediment and erosion control including straw bale check dams, rock check dams and permanent erosion control (rock protection).

Dwg. No. 16070-A3 (A3.1 through A3.3 – in detail) "Property Ownership Information Plans" have been prepared showing property information including a property ID No. (for reference to schedules) and property lines.

Profiles of the proposed drain are shown on Dwg. Nos. 16070-P1 through 16070-P10 inclusive. The profile shows the existing bottom of the ditch, the original ground for channel sections, existing/known tile outlets (as surveyed), and the proposed profile.

Cross-Sections of the proposed Municipal Drain are shown on Dwg. Nos. 16070-C1, 16070-C2, and 16070-X1 through 16070-X3 to indicate the existing and proposed sections through typical portions of the proposed drain. Two-Stage channel design is also indicated (where applicable).

All plans, profiles and cross-sections are provided in **Appendix A** of this report. Applicable Ontario Provincial Standard Drawings and/or RCI Standard Detail Drawings are also provided in **Appendix A**.

3.3.2 Arcadis Group Drawings

The design of the proposed municipal drain between Sta. 0+000.00 and Sta. 4+053.00 has been completed by Arcadis (formerly IBI) Group in conjunction with engineering design on behalf of the property owners that will form part of the urban development. The drawings are entitled "Mer Bleue Urban Expansion Area McKinnons Creek Enhancement, Project 117618." The applicable drawings are listed below:

Dwg. No. 700 General Plan.

Dwg. Nos. 710 through 721 - Plan and Proposed profile for the new drain and the modification and improvement of the existing Creek.

Dwg. Nos. 730 through 736 - Design Cross Sections for the main drain

Dwg. Nos. 740 and 741 - Extra Details.

Dwg. Nos. 750 and 751 - Culvert crossings on Tenth Line Road and Wall Road.

Dwg. No. 900 Sediment and Erosion Control Plan

The drawings noted above are attached to this report in **Appendix A-1**.

Note: the design drawings of the Arcadis Group portion of the project are being approved by review agencies separately through a submission by Arcadis. Approved plans will be incorporated in the final engineer's report once all review agency approvals have been received. Refer to DFO file no. 21-HCAA-02525 and SNCA reference no. 2025-CUM-R023.

3.4 Special Provisions

Special provisions for future maintenance and the construction and modification of this municipal drain are included in **Appendix B**.

4.0 AREA REQUIRING DRAINAGE

The areas requiring drainage under this report for the McKinnons Creek Municipal Drain are Blocks F1, F2, and F3 as shown on Dwg. No. 16070-A3 (A-3.1 through A-3.3 in detail).

5.0 DESIGN CONSIDERATIONS

5.1 Proposed Development Areas

The drainage design for the proposed urban development area was completed by Arcadis Group the engineer retained to complete the drainage and stormwater management engineering for the development of the lands and was approved by the City of Ottawa, the South Nation River Conservation Authority (SNCA), Ministry of Natural Resources and Forestry (MNRF), Ministry of Environment, Conservation and Parks (MECP) and Department of Fisheries and Oceans (DFO). Hydrology, hydraulics, and stormwater management criteria and analysis associated with the development area is included in the report entitled Mer Bleue Urban Expansion Area McKinnons Creek Enhancement, Arcadis (formerly IBI) Group, August 16, 2024. A copy of a summary of the report is included in **Appendix J.**

5.2 Hydrologic and Hydraulic Modeling

The South Nation Conservation Authority undertook flood risk mapping for the McKinnons Creek sub-watershed which includes the McFadden Municipal Drain, McKinnons Creek and the East Savage Municipal Drain. As part of the flood risk mapping study detailed hydrologic and hydraulic modeling was completed to determine the limits of the flooding impacts. The models are contained in the report "McKinnons Creek Subwatershed (East Savage, McFadden and McKinnons Creeks) Flood Risk Mapping Report," dated March 27, 2018, prepared by SNCA.

The SWMHYMO hydrologic model was completed in 2018 by Water's Edge on behalf of SNCA. The hydrologic model was developed to generate runoff rates from rainfall events for existing conditions. The rainfall events used for the generation of these hydrographs are the 2, 5, 10, 25, 50, and 100 years return period design storms.

A 1D GeoHECRAS model was developed by J.F. Sabourin and Associates (JFSA) on behalf of SNCA. Due to the flat topography of the downstream portion of the water course and the spill areas that were generated a 2D HECRAS hydraulic model was developed by JFSA. The peak flows from the 2D HECRAS model were utilized for the updated 1D HECRAS model.

5.3 Modeling Results

5.3.1 Hydrologic Model

The rainfall-runoff relationship of the McKinnons Creek Municipal Drain was evaluated for existing land use conditions and modifications within the watershed. This provided flow estimates for the watershed under existing and proposed conditions. The total instantaneous peak flow for various return period design flows at key locations along the Drain is presented in **Table 5.1**. Table 5.1 should be reviewed in conjunction with Dwg. No. 16070-A1, which shows a plan view of the watershed. The flows are calculated at the various locations along the main drain. The flows in Table 5.1 have been taken from "Table 9: Riparian Peak Flows – McKinnons Creek Sub-watershed 2D Hydraulic Model Development", page 28, JFSA, February 2018.

Table 5.1
Peak Flow Estimates

Locations	Peak Flow m^3/s					
	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Main Drain						
Sta. 10+000.0 to Sta. 11+060.0	3.52	5.97	7.76	10.26	12.25	14.42
Sta. 11+060.0 to Sta. 12+660.0	4.49	7.66	10.01	13.24	15.78	18.50
Sta. 12+660.0 to Sta. 16+550.0	4.59	7.89	10.34	13.64	16.17	18.82
Sta. 16+550.0 to Sta. 16+741.5	4.82	7.92	9.81	12.84	14.36	17.32

5.3.2 Hydraulic Model

As part of the McKinnons Creek Municipal Drain project, an analysis of the existing and proposed conditions was completed utilizing the existing SNCA HEC-RAS model. This analysis was completed to determine the impact of the proposed improvements on the100 year flood plain water surface elevations.

A technical memorandum entitled "McKinnons Creek Municipal Drain SNC HEC-RAS Model Revisions" is included in **Appendix J** of this report.

The analysis demonstrated that there is no impact on the existing flood plain mapping water surface elevations as a result of the modifications to the channel, including spreading of excavated material on the adjacent land, with the exception of a slight increase in elevation for an isolated short length of the drain.

The velocities in the channel are comparable between the existing and proposed conditions with the exception of a few locations at the inlet and outlet of structures.

5.4 Side Slopes (Typical Cross Section)

The side slopes on the various sections of the main drain are as shown on RCI Dwg. Nos. 16070-C1, 16070-C2, and 16070-X1 through 16070-X3, and Arcadis Group Dwg. Nos. 730 through 736.

5.4.1 Slope Stability and Toe Protection

In response to a request by the SNCA, Arcadis Group retained GEO Morphix Ltd. to conduct a geomorphological assessment study entitled, "McKinnon's Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements, Project No. PN22106". GEO Morphix identified several areas along McKinnons Creek to be at risk of erosion or continued erosion. The report prepared by GEO Morphix is included in **Appendix J.**

Paterson Group was retained by Arcadis Group to conduct a geotechnical slope stability study to address the areas of concern in conjunction with the GEO Morphix Report. The report prepared by Paterson Group is entitled "Slope Stability Assessment – Proposed Drainage Act Improvements - McKinnon's Creek Municipal Drain, Project PG5072-LET.01", is included in **Appendix J**. Paterson Group recommended that a toe erosion control program be implemented along various areas of McKinnon's Creek to "eliminate toe erosion setback and reduce or eliminate potential future slope failures." Details of the recommended toe erosion control measures are shown in Paterson Dwg. PG5072-2 noted in **Appendix J.**

Full copies of the GEO Morphix and Paterson reports, including all appendices, are available for viewing at the Robinson Consultants Inc. office. RCI has reviewed the conclusions and recommendations made in the GEO Morphix and Paterson reports and has incorporated the additional slope stability and toe protection measures as part of this report.

Noted on Dwg. Nos. 16070A2.1 through A2.3, Profiles 16070-P2 through P4, and Cross Sections 16070-X1 through X3, are areas that require specialized toe erosion control measures, as recommended by the Paterson Report, are identified as "Proposed Rock Protection / Erosion Control (Toe Protection)" and are to be constructed in accordance with Paterson Dwg. PG5072-2 noted in **Appendix J.** Outside of the recommended areas, additional areas for rock protection are identified as "Proposed Rock Protection / Erosion Control (Surface Erosion)" and are to be constructed in accordance with RCI Std. Dwg. D & E, noted in **Appendix A.**

5.5 Capacity of Culverts and Bridges

5.5.1 General

The capacities of existing culverts along the proposed McKinnons Creek Municipal Drain were obtained using MTO nomographs. The modeled flow at these culverts was then used to verify if sufficient capacity exists. A summary of capacities and flows is included in **Table 5.2.**

Table 5.2
Summary of Culvert Capacities

Culvert No. and Location	Existing Capacity* (m^3/s)	Peak Flow (m^3/s)					
		2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
Roadway Culverts							
Perrault Road (15+914.2)	30.15	4.59	7.89	10.34	13.64	16.17	18.82
Access Culverts							
Farm Lane (13+590.6)	22.00	4.59	7.89	10.34	13.64	16.17	18.82
Farm Lane (13+938.7)	25.00	4.59	7.89	10.34	13.64	16.17	18.82
Farm Lane (14+404.1)	6.25	4.59	7.89	10.34	13.64	16.17	18.82
Residential (14+593.5)	22.00	4.59	7.89	10.34	13.64	16.17	18.82

Notes: Culvert Stations are listed to the approximate centerline of the culvert
**Existing capacity is based on inlet control with a HW/D equal to 1.*

The freeboard of existing bridges along the proposed McKinnons Creek Municipal Drain was calculated using the water elevations at each crossing for the specific design return period of each structure. A summary of flows and existing freeboards is included in **Table 5.3.**

Table 5.3
Summary of Bridge Capacities

Location	Design Return Period (yr)	Design Flow (m^3/s)	Required Freeboard (m)	Existing Freeboard (m)
Roadway Bridges				
Navan Road (11+098)	50	15.78	1.0	>1.0
Smith Road (12+115.3)	50	15.78	1.0	>1.0
Rail Corridor (12+660.7)	25	13.64	1.0	>1.0
Access Bridges				
Farm Lane (14+982.8)	50	16.17	0.3	>0.3
Farm Lane (15+509.7)	50	16.17	0.3	>0.3

5.5.2 Culverts Requiring Replacement

In accordance with Section 26 of The Drainage Act, R.S.O. 1990, c. D.17, any increase in cost of the work caused by the existence of a utility is chargeable directly to the road authority or public utility in addition to all other normal assessment sums charged against the road authority or public utility when the work is required as part of the Engineer's Report. Based on the Drainage Act, R.S.O. 1990, c. D.17, the road or other authority shall be assessed only for the actual increased cost of the project due to the existence of the roadway or utility and such work shall be provided under separate construction items.

Under Section 69 of the Drainage Act, R.S.O. 1990, c. D.17, a road authority or other public utility has the option to carry out this work itself. When a road authority or public utility carries out this work, any respective Special Assessments will be reduced to reflect only the actual accrued engineering costs that will remain as a Special Assessment against the respective road authority or public utility. The cost of replacing the road authority culverts is not included in the report. Therefore, all assessments against the road authority have already been reduced by the cost of the culverts and represent the net amount payable.

It is the responsibility of the individual authority to advise the Municipality of its intentions regarding the bridge/culvert sites under Section 69 of the Drainage Act, R.S.O. 1990, c. D.17. If the authority or public utility does not complete the work in a timely fashion, then the Municipality will complete the work and charge the cost to the authority or utility as an assessment under the Drainage Act, R.S.O. 1990, c. D.17 and in accordance with this report.

The Road Authority structures have been inspected throughout the course of the proposed drainage works and improvements are recommended where needed to provide satisfactory drainage of the adjacent lands. Recommendations for improvements to Road Authority structures are made only when such structures are deficient in elevation or capacity necessary for drainage. Roadway culverts should be sized to accommodate the 25 years return period flow at a minimum in order to provide satisfactory drainage of the lands for rural purposes. Design standards for roadway culverts are typically based on criteria established by the Road Authority. The design return period for each structure depends on its type, location, and function. For the McKinnons Creek Municipal Drain the sizing will also be dictated by the design considerations and allowable water level elevations within the proposed and existing developments.

The closest standard culvert size was chosen to accommodate the design flow. The selection of the design return period culvert size (greater or equal to the minimum indicated), and culvert material is to be made by the Road Authority, based on the most current design standards and hydrologic/hydraulic information.

The initial cost of replacing the culverts under any existing road on the McKinnons Creek Municipal Drain is to be the responsibility of the property owners of Blocks F1, F2, and F3 since the replacement is as a direct result of the proposed development. Future maintenance and repair of the culverts under existing roads will be the responsibility of the Road Authority. The Road Authority has the option to replace the structure on its own, or to have the municipality replace the structure as part of the Drainage Works.

The private farm and residential culverts that require replacement to increase capacity or added for access are noted in **Table 5.4**. Where the alignment of the drain segments a property, each property owner is entitled to the installation (or replacement where required) of one standard access crossing (up to 10 meters in length). Additional crossings (existing or otherwise), or non-standard crossings (additional length, decorative headwalls, etc.) will be installed or replaced at the individual owner's expense.

The cost of replacing roadway, rail corridor, and private culverts identified in this report is to be paid through the assessed cost to the property owners of Blocks F1, F2, and F3 as part of the Modifications of the McKinnons Creek Municipal Drain. No private culverts, other than those noted in Table 5.4, will be replaced, or added as part of these improvements.

Table 5.4
Capacity of Private and Farm Crossings that Require Replacement

Culvert Location	Design Return Period	Existing		Proposed	
		Size/Type (mm)	Capacity* (m^3/s)	Size/Type (mm)	Capacity * (m^3/s)
Farm Lane (13+590.6)	**50 years**	**4400x2500 CSPA**	**22.00**	**3890x2690 CSPA**	**20.00**
Farm Lane (13+938.7)	**50 years**	**3500 Ø CSP**	**25.00**	**3890x2690 CSPA**	**20.00**
Farm Lane (14+404.1)	**50 years**	**2000 Ø CSP**	**6.25**	**3890x2690 CSPA**	**20.00**
Residential (14+593.5)	**50 years**	**4400x2500 CSPA**	**22.00**	**4200x2100 Conc. Box**	**18.00**
Farm Lane (14+982.8)	**50 years**	**4200x2200 Conc. Bridge**	**18.90**	**4200x2100 Conc. Box**	**18.00**
Residential (15+509.7)	**50 years**	**3700x2400 Conc. Bridge**	**18.90**	**4200x2100 Conc. Box**	**18.00**

Notes: Culvert Stations are listed to the approximate centerline of the culvert
**Capacity is based on inlet control with a HW/D equal to 1.*

5.5.3 Future Private or Roadway Culverts

Future private crossing culverts or public roadway culverts installed on the drain shall not impact upstream land usage by obstructing the drainage flow. The proponent of new culvert installation shall obtain approvals from all governing agencies as well as the Drainage Superintendent. Provided that the full cost of the culvert is paid for by the proponent and is installed under the direction of the Drainage Superintendent there is no requirement to complete an amendment report to this drainage report for new private or roadway culverts. A record of the additional culverts must be appended to the original by-Law and Engineer's Report.

5.6 Clearing

Property owners are advised, the Contractor will clear only those trees which may affect its operation within the working space, as defined in Section 10 – Working Space. All trees with a diameter of 150 mm or greater shall be cleared of limbs and cut in reasonable lengths and neatly piled clear of the drain so the wood may be salvaged by the property owners.

For construction in non-agricultural fields, all trees under 150mm diameter, brush, limbs, and woodchips resulting from the clearing operation shall be buried beneath spread excavated materials. Stumps and tree roots shall be cut flush with the ground. Stones (greater than 75mm diameter) shall be disposed of at a location on the property chosen by the property owner and reviewed by the Drainage Engineer.

For construction in agricultural fields, all stumps, tree roots, and other debris generated from the clearing operation shall be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Engineer. Stones (greater than 75mm diameter) shall be disposed of at a location on the property chosen by the property owner and reviewed by the Drainage Engineer.

For future maintenance, disposal of all brush, limbs, large stones, stumps, tree roots and other debris resulting from the clearing operation shall be removed at the discretion of the Drainage Superintendent when future maintenance is being completed.

5.7 Excavation

The construction of the McKinnons Creek Municipal Main Drain will be an open channel with design grades, side slopes and ditch bottom widths as specified on the RCI design profile Dwg. Nos. 16070-P1 through 16070-P10 and Cross-Section Dwg. Nos. 16070-C1, 16070-C2, and 16070-X1 through 16070-X3, and Arcadis Group Dwg. Nos. 710 through 721, 730 through 736, 740, 741, 750 and 751.

Associated with the drain improvements for the existing drain, erosion control measures will be placed at bends which are subject to erosion, at tile outlets, at culvert crossings, confluences, and areas of bank instability. Erosion control measures will be of an engineering type, primarily rock protection with filter cloth.

5.8 Fisheries Act and Special Design Considerations

The existing McKinnons Creek and Richard Clark Municipal Drains, from Sta. 0+000.00 to Sta. 13+180.00 are classified as "NR", or not rated, Municipal Drains (ID No. 105501) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2018. The remainder of the Municipal Drain, from Sta. 13+180.00 to Sta. 16+741.50, is classified as a "Type E" Municipal Drain (ID No. 96710) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2017.

Typical consideration for both "Type E" and "Type F" municipal drains are provided in the following sections.

5.8.1 "Type E" Drain

Typical conditions for a "Type E" drain include permanent warm water flow but with sensitive species present. Consultation with the DFO regarding the portion of the drain identified as "Type E" will be required.

The "Type E" portion of the drain is located in the downstream portion of the drain which drains into the Bear River Municipal Drain, also a "Type E" Municipal Drain. The drain is very deep at this location with steep side-slopes, prone to erosion and poses a safety risk.

Mitigation of the "Type E" portion of the drain is provided through the implementation of the following measures:

- Maintaining or enhancing swift flow and riffle habitat through the provision of variable and moderately increased profile slope.
- Salvage and replace large boulders or cobbles (where applicable) which provide day-time shelter.
- Replace overhanging "tree cover" along the west bank of the relocated drain through the implementation of randomized willow-staking along the west bank.
- Limited rock protection erosion control placed at slope transitions.
- Typical measures as provided for "Type F" Drains (excluding two-stage profile),
- Connectivity is provided to the remainder of the drain which receives fish habitat enhancement per the "Type F" conditions.

5.8.2 "Type F" Drain

Typical conditions for a "Type F" drain include periods of the year where the drain is subject to low or no flows, may be periodically dry and has no sensitive species present that use the drain. As such, where work is completed within the prescribed time frame, there is a limited impact on fish and fish habitat. However, the drain classification/class authorization process is for the purpose of maintenance of an existing drain. The drain classification is provided for reference only. The modifications to the existing municipal

drain and the increase in the overall width of the existing drain to provide for additional depth to accommodate upstream changes in land use as required exceeds class authorization condition which normally limits action to maintenance as per the existing report. As this condition cannot be met, a site-specific review may be required by the Department of Fisheries and Oceans.

While the proposed work will provide for additional depth it is not anticipated that the work will change the nature of the drain or the fish that utilize the drain. As such we propose that the standard conditions for the maintenance of a "Type F" Municipal Drain (except as noted above) be implemented for the reconstruction of the drain.
Typical conditions for work on a "Type F" Municipal Drain are listed below:

Based on the site assessment several recommendations which are likely to enhance and protect fish habitat and improve water quality will be implemented as part of the drain reconstruction. These recommendations are as follows:

- Timing - All work to be completed within prescribed timing windows.
- Complete all work in dry or low flow conditions.
- Seed all banks within 48 hours of construction.
- Sediment control features to be in place prior to the commencement of work and to remain in place until permanent features (such as vegetation) are in place.

Reconstruction is proposed to be completed from the north/east side of the drain where possible. The primary method for addressing bank instability will be slope flattening (to the standard 2h:1v side-slope. Where there is existing bank erosion rock protection will be installed as required.

5.8.3 Design Considerations

Existing features are maintained to the fullest extent possible (riffles, ponds, etc.). The natural meanders found along the drain are maintained to the extent possible. Natural meanders will be incorporated into the design to ensure minimal impact.

Reconstruction is proposed to be completed from the north/east side of the drain where possible. The primary method for addressing bank instability will be slope flattening (to the standard 2h:1v side-slope. Where there is existing bank erosion rock protection will be installed as required.

During construction, a series of check dams will be installed to the relevant Ontario Provincial Standard (Straw Bale Check Dam – OPSD 219.180 or Rock Check Dam – OPSD 219.211) to control sediment movement to downstream areas. Where prescribed, sediment traps will be constructed upstream and in conjunction with check dams. Sediment Traps are constructed as per RCI Std. Dwg. I (a modified version of OPSD 219.220). The standard sediment trap excavation is 500 mm deep and 15 metres long, with the width as per the prescribed width of the channel for the section where it is installed. Once construction has been completed the check dams will be removed along with the sediment and the excavations will remain. Depending on placement, these

excavations form areas of concentrated future cleanout (where close to roads), limiting the need for full maintenance activities, or provide pool habitat/refuge (remote locations).

Culverts will be installed with invert elevations below that of the adjacent drain profile by 150mm for culverts sized 600mm to 1500mm, or by 10% of the height for circular, arches, or box culverts greater than 1500mm in height. The proposed culvert inset complies with the intent of DFO recommendations, while preserving culvert capacity, and ensures barrier-free fish passage.

Rock or straw bale check dams, complete with sediment traps, will be installed at locations as shown on Dwg. No. 16070-A2 (A2.1 through A2.8 in detail).

Tree removal will be required to complete the work.

Where possible, excavation will be limited to one side of the drain (south/west preferably), leaving one side of the drain intact, while providing the required additional channel width. Where possible, work is to be limited to a bottom clean-out, leaving the sides of the drain intact, with access from the south/west side. This is anticipated to minimize impacts of full riparian zone removal. In zones of current bank instability banks will be repaired and/or protected as necessary, with efforts made to maintain as much of the natural conditions as possible.

Where a profile is shown on Profile and Cross Sections Drawings, excavation will be completed to the invert shown on the Engineer's Drawings. Where the proposed profile is indicated above the existing profile, the profile is provided for future maintenance only (fill is not to be completed).

Following construction, the disturbed areas (excluding spread areas on agricultural fields outside of the scheduled buffer area) will be seeded with a seed mix composed of perennial rye, white clover, red top, creeping red fescue and Canada bluegrass, as detailed in Section 6.1 of the Engineer's Report.

Seeding will be completed as soon as possible after the channel is excavated. Erosion and sediment control works will be implemented and maintained throughout the length of the drain during and following construction, until other measures implemented, such as seeding, become effective. The locations and details of proposed erosion and sediment control works are shown on Dwg. No. 16070-A2 (A2.1 through A2.8 in detail).

Other erosion or sediment control works may be implemented by the contractor, if reviewed by the Drainage Engineer, in an effort to maintain the required sediment free conditions downstream of the work area.

The "Mer Bleue Urban Expansion Area McKinnons Creek Enhancement" Engineer's Report prepared by Arcadis has resulted in the loss of habitat for aquatic species. As a result, the DFO requires offsetting measures to be implemented into design in order to obtain a Fisheries Act Authorization.

Offsetting measures for the Fisheries Act Authorization include the construction of a "habitat enhancement area" in the form of an offline pond located between Sta. 0+800 and 1+000. The "habitat enhancement area" is planned to contain 4 meandering peninsulas, 6 deep pools, and 7 root wads, for a total area of approximately 6,700 square metres (m2).

Since the DFO Fisheries Act Authorization was issued to Arcadis, they will be responsible to complete the maintenance and monitoring required by the Authorization following the completion of construction. Typically, warranty monitoring is only required for 1 year following completion, however for the "habitat enhancement area" Arcadis will be responsible for maintenance and monitoring for 5 years following completion, as described in the DFO Fisheries Act Authorization.

5.9 Environmental Authority Mitigation Measures

Typical measures recommended by the reviewing environmental authorities, including (but not limited to) the South Nation Conservation Authority (SNCA), Ministry of Environment Conservation and Parks (MECP), Ministry of Natural Resources and Forestry (MNRF) and the Department of Fisheries and Oceans (DFO) for the type of work are listed below. When implemented, these measures should allow for reasonable mitigation of the proposed reconstruction.

The proposed Municipal Drain construction must abide by timing window restrictions, which include "no in-water work between March 15th and July 15th to protect local fish spawning populations".

- Finished channel to be as narrow and deep as possible.
- Riparian vegetation can be removed from either bank (preferably not both).
- Minimize tree removal.
- Install sediment & erosion control measures.
- Bends in channel to be stabilized.
- Work in water only when flows not elevated.
- Where applicable, measures must be implemented to protect any hibernating turtles during the period from October 15th to March 15th and nesting turtles from March 15th to June 30th.

The requirements associated with Species at Risk (SAR) legislation are included in the Special Provisions of this report.

The above noted requirements have been addressed in the design of the proposed works and are anticipated to form part of the permitting requirements by the SNCA, MNRF, MECP and DFO. Where applicable, the permit conditions will be incorporated into the construction contract.

5.10 Disposal of Excavated Materials

The excavation of the drain shall be completed along all sections as previously described and all materials including silt, debris, etc. shall be removed from the drain.

In excavation areas during construction, all suitable material(s) will be placed outside the required buffer area. Typically, the construction and spreading is completed on the north/east side of the drain. However, the alternate side may be prescribed by the Drainage Engineer in consideration of special circumstances (i.e., where clearing is not required for disposal). The excavated material shall be spread and seeded, except in areas of tilled agricultural fields, where excavated material will be spread but not seeded.

All material shall be spread on the adjacent lands no closer than 5 meters to the top of the slope and no further than the prescribed working space outlined in Section 10.0 of the Engineer's Report. All material shall be spread to a maximum depth of 150mm for agricultural fields, and 300mm for non-agricultural fields. Spreading is to be completed in conformance with RCI Std. Dwg. A, provided in **Appendix A**.

Seeding is to be completed as soon as possible after the channel is excavated (within 48 hours of construction) with a seed mix composed of perennial rye, white clover, red top, creeping red fescue and Canada bluegrass, as detailed in Section 6.1 of the Engineer's Report.

Drainage openings shall be constructed wherever required throughout the disposal area at a maximum spacing of 50 meters for agricultural land and 100 meters for non-agricultural land. All drainage openings shall be maintained, and the soil spread to accommodate these drainage openings to ensure that the drainage from adjacent land is not impeded.

Property owners may procure a Contractor privately, at the expense of the property owner, to dispose of the excavated material off site, subject to approval by the Drainage Engineer. It remains the responsibility of the property owner to adhere to all applicable legislation, including excess soil regulations, for the disposal and transportation of such material.

In areas of smaller lots up to 2.0ha in size, and where work is complete immediately adjacent to roads, all excavated material will be removed from the area and disposed of off-site in an area specified where the material can be utilized for land development purposes.

Due to high quantities of proposed excavation, within Section 4 and 5 of the drain (Sta. 0+000.00 to 4+053.00) all excavated material is to be removed from riparian/adjacent lands and placed in an area subject to approval by the Drainage Engineer.

5.11 Permit Requirements and Underground Utilities

The Contractor is expected to fill out an application for an encroachment permit within the City Right-of-Ways prior to the commencement of construction. Underground utility lines may be encountered during the construction of the project. A copy of the drawings must be submitted by the Contractor to all area utilities, so they may show underground plant on the plan. A copy of the drawings so marked must be returned to the Drainage Engineer prior to commencing construction.

The Contractor will also be required to arrange with all Utilities to mark underground cables or pipelines in the field before commencing construction. If any owner knows of other underground utilities, they should make the Drainage Engineer aware of such. In conjunction with the circulation of the Engineer's Report, consultation occurred with UCC-Ottawa to determine if any Utilities will be present during construction.

Typical contract methodology including the impoundment and by-pass pumping of water or passive instream diversion no longer require Ministry of Environment Conservation and Parks (MECP) registration or a Permit-To-Take-Water provided the prescribed procedures are met. The Contractor may be required to obtain a Permit-To-Take-Water (PTTW) from the MECP should its methodology exceed the MECP conditions for exemption.

5.12 Site Access and Access Plan

It is intended, for the purpose of construction and future maintenance, that the Drain be accessed from adjacent roads with equipment moving along the side of the Drain scheduled for construction, within the designated work area as specified. Equipment may only cross the Drain at existing or constructed crossings as shown on the Culvert and Sediment/Erosion Control Plan Dwg. No. 16070-A2 (A2.1 through A2.8 in detail)

Wherever possible, isolated work areas are to be accessed by existing roads (farm lanes/unpaved driveways) on adjacent lands. This is to limit the disturbance of non-work areas adjacent to the Drain.

The Contractor will be required to make the arrangements for access and notify the Drainage Engineer of the proposed access routes. The Contractor is required to submit an Access Plan, complete with a photo inventory, subject to review by the Drainage Engineer. The Access Plan must include the following items:

- Protection and reinstatement of trees/vegetation that are key to providing stable bank faces.
- Temporary dewatering and maintenance of dry conditions for completing sloped excavations.
- Stockpiling of materials and setbacks associated with slope stability for stockpiling of soils and other fills.

- Maintaining safe temporary side slopes and excavations; excavation sequencing for maintaining safe temporary excavations for undertaking erosion protection installation.
- Preparing site conditions to handle inclement weather.
- Additional items to be advised by Paterson Group at the time of preparing the contract specific SPs.

The Contractor is required to provide notification to the property owner of the intended use of existing farm lanes in advance of the usage (minimum 48 hours). The Contractor will be responsible for the repair and maintenance of any access used, and for the restoration of the access following the construction to existing or better conditions.

6.0 EROSION CONTROL

6.1 Seeding

To help protect the drain banks against erosion the following shall be required:

For agricultural areas, all disturbed banks, and a 5 metres buffer strip adjacent to the drain, shall be hand seeded. Beyond the 5-meter buffer strip, spoils are not to be seeded. It is anticipated that property owners will till these areas and fields will be returned to normal crop production.

For non-agricultural areas, all disturbed banks, and a 5 metres buffer strip adjacent to the drain, shall be hand seeded. Beyond the 5-meter buffer strip, spoils are to be seeded in areas where clearing and grubbing has occurred. However, where spreading is placed around trees and/or over brush, seeding is not to be placed as it is anticipated these areas will be subject to natural regeneration.

All identified areas are to be seeded a maximum of 48 hours after construction, except for the 5-meter buffer strip. The 5-meter buffer strip can be seeded once work in the working space has been completed.

The seed mixture (or an alternate reviewed by the Drainage Engineer) is to be as follows:

Sow Rate (minimum)	100 kg/ha
Creeping Red Fescue	60%
Canada Bluegrass	20%
White Clover	3%
Perennial Rye	12%
Red Top	5%

Canada Bluegrass establishes a deep creeping root system and tough sod ideal for stabilizing low-fertile rocky or clay soils and is drought, flood, and salt tolerant. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation that is shade and water tolerant with limited requirement for seed bed preparation. White clover provides quick cover and produces nitrogen to aid in the establishment of other vegetation and red top's root system is well suited for holding soils on wetlands, waterways, and ditch banks.

6.2 Buffer Strips

It is recognized that buffer strips have a role in reducing bank erosion, reducing pollution (pesticides and nutrient runoff), and improving fish and wildlife habitat by providing shading and habitable areas, as well as reducing water temperatures. The provision and maintenance of adequate buffer strips is environmentally friendly and reduces long term costs associated with drain maintenance and repair for all properties assessed on the drain and is a benefit to all. As such, it is strongly recommended that where the drain passes through cropland, where soil erosion is now occurring, or land where the farmer indicates the intention of tilling the soil for continuous field crop production, a strip of uncultivated land at least 5 m wide along the edge of the drain be retained. It is recommended that the owners take hay off this buffer strip, but that the soil not to be tilled.

6.3 Fencing

Where fences are encountered or for access to the drain, it will be the Contractor's responsibility to remove the existing fence and re-erect the fence in a condition equal to or better than the condition of the fence prior to the commencement of the work.

6.4 Rock Protection

Associated with the drain improvements, Rock Protection with filter cloth will be placed at typical areas as per Dwg. Nos. 16070-A2 (A2.1 through A2.8 in detail) and 16070-P1 through 16070-P10 and Standard Drawings, as provided in **Appendix A** and in locations on the Arcadis Group drawings included in **Appendix A1.** In general, Rock Protection will be installed at all locations as indicated below (at the discretion of the Drainage Engineer) and may not necessarily be indicated on plans and profiles.

- Rock Protection at channel ends of realignment sections (Std. Dwg. D)
- Rock Protection at significant bends (Std. Dwg. D)
- Rock Protection at storm sewer outlets (Std. Dwg. D)
- Rock Protection at tile drain outlets (Std. Dwg. F)
- Rock Protection at culvert crossings and concrete structures (Std. Dwg. C)
- Rock Protection at confluence of branch drains (Std. Dwg. E)
- Rock Protection at areas of current or on-going erosion (Std. Dwg. D)
- Toe Protection at areas of concern (Paterson Std. Dwg. PG5072-2)

6.5 Flow Checks and Sediment Traps

6.5.1 Excavation

Sediment trap excavation shall be 15 m in length and 0.5 m below the proposed grade (drain bottom), constructed as per RCI Std. Dwg. I (a modified version of OPSD 219.220). Flow Check Dams, installed to the relevant Ontario Provincial Standard (Straw Bale Check Dam – OPSD 219.180 or Rock Check Dam – OPSD 219.211) are constructed directly upstream in conjunction with sediment traps.

Where sediment control features are proposed for rock-cut areas, sediment trap excavation is only completed to the extent of existing rock (no rock removal for sediment traps) and the check dam control feature is installed as scheduled.

Standard Drawings are provided in **Appendix A**.

6.5.2 Sediment Removal

Accumulated sediment in sediment traps shall be removed as necessary to affect maintenance repairs and immediately prior to the removal of the flow checks.

6.5.3 Locations

Flow Check Dams, installed to the relevant Ontario Provincial Standard (Straw Bale Check Dam – OPSD 219.180 or Rock Check Dam – OPSD 219.211) shall be installed as indicated to prevent sediment passage from the upstream to the downstream side of the flow check at all locations as specified on Dwg. Nos. 16070-A2 (A2.1 through A2.8 in detail), and 16070-P1 through 16070-P10. Standard Drawings are provided in **Appendix A**.

6.5.4 Long-Term Use

Excavated sediment basins will remain in place following removal of the flow checks. It is anticipated that these basins will continue to serve as localized concentrated cleanout areas and will serve as interim fish refugia pools following completion of construction. Removal of sediment in these cleanout areas is expected to have long term fish habitat benefits by reducing the need for full scale maintenance and repair along the length of the drain.

7.0 ASSESSMENTS

7.1 General

The Drainage Act, R.S.O. 1990, c. D.17 requires that the total estimated cost be assessed against the affected lands and roads under the categories of benefit (Section 22), outlet liability (Section 23), injuring liability (Section 23), special benefit (Section 24) and special assessment of public utility or road authority (Section 26). Definitions of each of the above noted considerations are provided along with additional details in **Appendix F**. As noted in Section 7.4 the initial costs associated with the improvements will be assessed to the properties subject to development (Blocks F1, F2 and F3), the criteria outlined below is used in calculating the Assessment Schedules for future maintenance.

The primary considerations for the calculation of assessments are as follows:

- ***Benefit*** - Consideration for the advantages provided to any lands or roads by the Municipal Drain. Typically, these advantages may include (but are not limited to) a higher market value, increased crop production, improved appearance, or better control of surface or subsurface water, etc. Assessment for Benefit is typically made to all properties directly adjacent to the Municipal Drain.

- ***Outlet*** - All lands and roads that ultimately use the Municipal Drain (by direct or indirect contribution of flow) as an outlet are assessed a portion of the cost for Outlet. Assessment for Outlet is based on location, area, and rate of flow which are given consideration via modifying factors (see "Factors Affecting Assessment," below).

- ***Special Benefit*** - Special Benefit is typically considered where a special feature or consideration is required for a property that is not otherwise required for the function of the drain. This may include (but is not limited to) additional culverts or improved culvert length, ornamental features, special alignment considerations, improvements to accommodate land use changes, etc. The cost of the special feature is assessed as a Special Benefit to the property where it is provided.

- ***Injuring Liability*** – Injuring Liability is typically considered where there is no other reasonable means to provide sufficient outlet. An allowance is given to the properties that are "injured" by the insufficient outlet and an assessment made against all other properties that contribute flow.

- ***Block Assessment*** – A block assessment is typically considered where there is a significant number of small properties in an area (villages, subdivisions, etc.). For the purpose of assessment, properties are combined for one overall assessment to the block. Costs are then distributed proportionally on the basis of the assessed value of the land and buildings.

7.2 Factors Affecting Assessment

Assessments are based on location, area, and rate of flow for each property within the overall drainage area. To account for these considerations the following modifying factors are applied:

- ***Maintenance Section(s) and Distance Factors*** – The Municipal Drain may be split into one or more "Maintenance Sections." This consideration allows for factors to be adjusted where work for construction and future maintenance is completed. This factor accounts for how much of the drain each property uses and allows for other factors such as the Distance Factor to be applied (reducing assessments the further away from the drain that the property is located). Maintenance Sections and Distance Factors are indicated on **Figure 7.1** and **Figure 7.2.**

- ***Sub-Section*** – Each Maintenance Section is further divided into sub-sections to account for where flow from an individual property or group of properties enters the Maintenance Section. This factor ensures that a property is not assessed for the portion of the Maintenance Section upstream of where the drainage from the property enters the drain, therefore, is not utilized for drainage from the property.

- ***Land Use Factor*** - A land use factor is provided to account for the varying use and nature of the land. Lands considered typical or standard throughout the drainage area (agricultural or other rural land use) are applied a LUF of 1.0. Whereas lands considered to have a lower runoff are applied at a factor of less than 1.0 (reducing assessment) and lands with greater runoff are applied a factor of greater than 1.0 (increasing assessment) to account for the increased or decreased flow and usage of the drain.

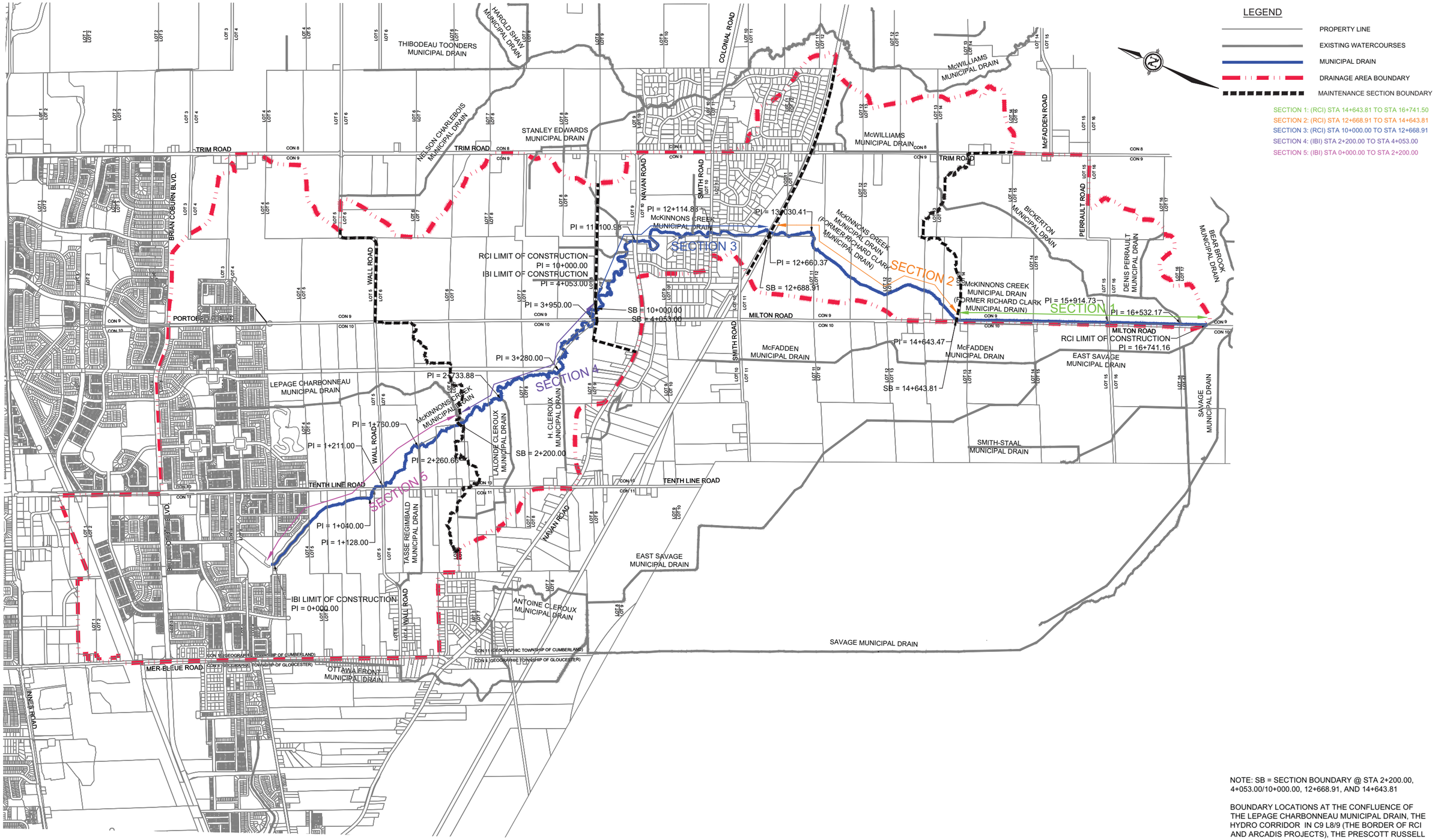
- ***Grants*** – Grants for eligible agricultural properties may be offered by the Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) under the Agricultural Drainage Infrastructure Program (ADIP). Program availability and property eligibility requirements are dynamic and subject to change.

- ***Allowances*** – Allowances may be offered to affected properties for land lost due to the widening of the existing drain/watercourse and/or for crops lost due to construction. Allowances are not provided for future maintenance.

Additional details of these Factors Affecting Assessment are provided in **Appendix F**.

7.3 Injuring Liability

Section 32 of the Drainage Act, R.S.O. 1990, c. D.17, provides for an allowance for damage due to insufficient outlet, where in the opinion of the engineer, the cost of continuing a drainage works to a sufficient outlet or the cost of constructing or improving a drainage works with sufficient capacity to carry off the water will exceed the amount of injury likely to be caused to low-lying lands along the course of or below the termination of the drainage works, instead of continuing the works to such an outlet, or making it of



NOT FOR CONSTRUCTION

NOTE: SB = SECTION BOUNDARY @ STA 2+200.00, 4+053.00/10+000.00, 12+668.91, AND 14+643.81

BOUNDARY LOCATIONS AT THE CONFLUENCE OF THE LEPAGE CHARBONNEAU MUNICIPAL DRAIN, THE HYDRO CORRIDOR IN C9 L8/9 (THE BORDER OF RCI AND ARCADIS PROJECTS), THE PRESCOTT RUSSELL TRAIL, AND BEND WHERE THE DRAIN BECOMES A ROADSIDE DITCH

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

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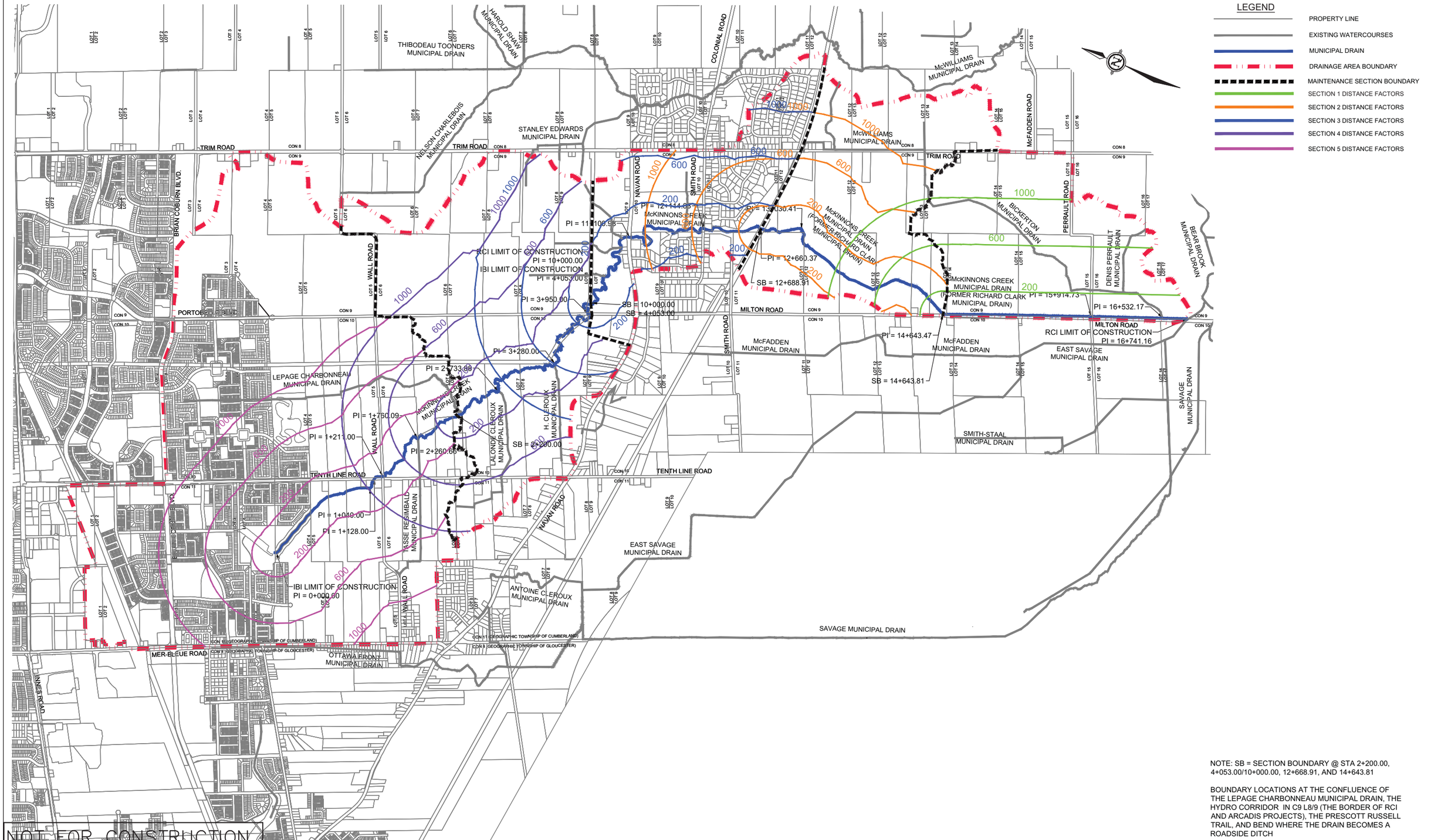
DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

MAINTENANCE SECTIONS and SECTION DRAINAGE AREAS

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	FIG 7.1



NOTE: SB = SECTION BOUNDARY @ STA 2+200.00, 4+053.00/10+000.00, 12+668.91, AND 14+643.81

BOUNDARY LOCATIONS AT THE CONFLUENCE OF THE LEPAGE CHARBONNEAU MUNICIPAL DRAIN, THE HYDRO CORRIDOR IN C9 L8/9 (THE BORDER OF RCI AND ARCADIS PROJECTS), THE PRESCOTT RUSSELL TRAIL, AND BEND WHERE THE DRAIN BECOMES A ROADSIDE DITCH

NOT FOR CONSTRUCTION

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
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DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

DISTANCE FACTORS

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	FIG 7.2

such capacity, the engineer may include in the estimated cost a sufficient sum to compensate the owners of such low–lying lands for any injuries they may sustain from the drainage works, and in the report the engineer shall determine the amount to be paid to the owners of such low-lying lands in respect of such injuries.

For the initial construction injuring liability assessment is made against the properties in Blocks F1, F2, and F3 for Bear River Municipal Drain maintenance and compensation for insufficient outlet related to the increase in the volume of runoff that will impact the Bear River Municipal Drain and properties that are negatively impacted by the increase in volume of runoff resulting from the change in land usage. The McKinnons Creek Municipal Drain is tributary to the Bear River Municipal Drain.

A calculation of the cost of Injuring Liability, including for maintenance of the Bear River Municipal Drain and compensation for insufficient outlet, as included in the overall assessed cost for initial construction, is provided in **Appendix E**.

The funds collected for maintenance will be held in a special maintenance account by the City of Ottawa for future maintenance, which shall be governed by the existing Engineer's Report Bear River Municipal Drain Maintenance and Improvements, August 1990 by McNeely Engineering Limited.

The Bear River Municipal Drain has a long history of flooding during the growing season when crops are susceptible to the impact of direct flooding or saturation of the root zone. A full discussion of the history of flooding and considerations for alleviating the impact of summer floods is available in the above noted Engineer's Report. It was determined that it was not feasible to lower the drain in order to relieve the regular summer flooding, so an alternative was required. As introduced above, where it is not possible to provide a sufficient outlet, Section 32 of the Drainage Act, R.S.O. 1990, c. D.17and its previous versions has a provision to compensate property owners whose land is being impacted by drainage from upstream properties by assessing this land for injuring liability in the form of an allowance for damage due to insufficient outlet.

As noted in the 1990 Engineer's Report referenced above, the project as presented included the following: 1) Compensation for insufficient outlet under the Drainage Act, 2) Buffer Strips along the drain to assist in stream slope stabilization and to reduce sediment loads reaching the drain, 3) Low level crossings to permit access for some owners owning lands on both sides of the drain, 4) Allowances for fencing and watering facilities in order to assist in keeping farm animals out of the drain, 5) Maintenance and improvements to the channel.

The maintenance funds collected under this Engineer's Report will be deposited in an account with the City of Ottawa to be used to complete maintenance of the Bear River Municipal Drain as partial compensation to the owners of impacted property in accordance with the provisions in the noted 1990 Engineer's Report. The maintenance funds will be held in an account until there is a sufficient amount to permit maintenance

to be completed to the plans and profiles included in the 1990 Engineer's Report. The funds collected will be utilized for maintenance initially or in the future. If the amount collected for maintenance exceeds the initial cost of maintenance the remaining funds will be held in the designated account for future maintenance.

The funds collected for compensation for insufficient outlet will be paid to the owners of property identified for compensation in the 1990 Engineer's Report.

Any future land use changes within the watershed that will result in an increase in the total volume of runoff shall be assessed an injuring liability maintenance assessment which shall be assigned to the special maintenance account referenced in this section. This amount will be in addition to any other assessment resulting from the change in land use.

7.4 Assessment for Special Benefit

For the initial construction, as provided for in this Report, all costs associated with the initial design, construction, other costs, and the Engineer's Report are assessed as a Special Benefit Assessment to the properties in Blocks F1, F2, and F3.

No other private property Special Benefits are anticipated for this project.

Any Assessment for Special Benefit for initial construction is shown on the Schedules of Assessment **(Appendix C)** as "Assessment for Special Benefit" and is calculated in the Detailed Cost Estimate **(Appendix E)**. There will be no Special Benefit Assessment for future maintenance.

7.5 Block Assessment

Details with regard to block assessments are provided in **Appendix F**.

For the purpose of this Report, affected lands are assigned to Blocks A, B, C, D, E1, E2, E3, E4, and Blocks F1, F2, and F3 as shown on Property Plan 16070-A3 (A-3.1 through A-3.3 in detail)

7.6 Assessments to Property Owners

7.6.1 Initial Construction

All costs associated with this report, the initial design, allowances, other costs, and construction are as a result of the land use changes to accommodate the proposed development and are charged as a Special Benefit Assessment to the property owners in Block F1, F2, and F3.

As such, there is no distribution of costs to other property owners for the Engineer's Report, allowances, other costs, or initial construction.

The Schedules of Assessment for Construction is provided in **Appendix C**.

7.6.2 Future Maintenance

Following the completion of the initial construction, the cost for any future maintenance and repair is to be distributed to all property owners within the drainage area as shown on Dwg. 16070-A3 (A-3.1 through A-3.3 in detail) and in the Schedules of Assessment for Future Maintenance. As part of this Engineer's Report assessment schedules have been developed for the McKinnons Creek Municipal Drain that reflects an equitable distribution of costs for future maintenance. The Schedules of Assessment for Future Maintenance are provided in **Appendix D**.

7.7 Maintenance Sections

For consideration of the assessments, this drain is divided into five (5) maintenance sections. The land area, land use factor, section or subsection factor and distance factor have been entered into an Excel spreadsheet for each section of the drain.

In developing the Assessment Schedule for Future Maintenance, the cost for outlet and benefit has been set to reflect the relative use of the drain by immediate benefiting property owners including the property owners in the commercial/urbanized part of the watershed. The Assessment Schedules have been developed with the percentage split between Outlet Assessment and Benefit Assessment as follows:

- Section 1 is from Sta. 14+643.81 to Sta. 16+741.50
- Section 2 is from Sta. 12+688.91 to Sta. 14+643.81
- Section 3 is from Sta. 10+000.00 to Sta. 12+688.91
- Section 4 is from Sta. 2+200.00 to Sta. 4+053.00
- Section 5 is from Sta. 0+000.00 to Sta. 2+200.00

Summary Schedule of Assessment

Section 1 Sta. 14+643.81 to Sta. 16+741.50
- Outlet Assessment – 90%
- Benefit Assessment – 10%

Section 2 Sta. 12+688.91 to Sta. 14+643.81
- Outlet Assessment – 90%
- Benefit Assessment – 10%

Section 3 Sta. 10+000.00 to Sta. 12+688.91
- Outlet Assessment – 90%
- Benefit Assessment – 10%

Section 4 Sta. 2+200.00 to Sta. 4+053.00
- Outlet Assessment – 90%
- Benefit Assessment – 10%

Section 5 Sta. 0+000.00 to Sta. 2+200.00
- Outlet Assessment – 90%
- Benefit Assessment – 10%

Details regarding the consideration of maintenance sections are provided in **Appendix F**.

7.8 Grants

Properties currently eligible (at the time of this report) for grants are marked with a "*" notation in the "ADIP (Grant) Eligibility" column of the Schedules of Assessment.

Details regarding grant eligibility are provided in **Appendix F**.

7.9 Allowances

For the purposes of construction, the standard Working Space adjacent to the Drain has been prescribed along the side of the drain that is best suited for access and constructability, in effort to maintain appropriate construction quality and cost. Typically, construction is to be completed from the North/East bank, to satisfy various environmental permitting requirements, except where otherwise specified or authorized by the Drainage Engineer. The following table outlines the prescribed location of the working space for construction purposes along the drain:

Properties eligible for allowances are marked with a "**" notation in the "Allowance Eligibility" column of the Schedules of Assessment. Typically, active agricultural lands, where excavated material is generated and disposed of within the working space as a result of the construction or improvement of the drain, will be provided an allowance for loss of crops pursuant to S.30 of the Drainage Act; and, where properties have a permanent loss of land, as a result of the construction or improvement of the drain, allowances will be provided pursuant to S.29 of the Drainage Act.

Crop and land allowances, under Section 29 and 30 of the Drainage Act, are determined based on the prescribed working space as outlined in the table above and the engineering design for construction or improvements as outlined in this report.

Where work is prescribed on one side of the drain but, the opposite side of the drain is determined to be a more realistic working space during construction, allowances must be reallocated to the appropriate properties accordingly.

The Schedule of Allowances, as included in **Appendix E**, outlines the primary distribution of allowances based on the prescribed working spaces as identified in **Table 7.1**. This distribution of allowances is located under the column heading marked as "Primary."

Where necessary, an alternative distribution of allowances has been calculated under the column heading marked as "Alternate." These alternate allowances will only be provided in the case where construction is completed on the opposite side of the drain from the prescribed working space as indicated in **Table 7.1**. Please note, that where the "Alternate" allowance is provided to the respective property owner, the "Primary" allowances will not be provided.

The parcels of land that have been assigned allowances or potential allowances (as an alternate) associated with the initial construction are outlined in the Schedule of Allowances provided in **Appendix D**.

Details with regard to the calculation of allowances are provided in **Appendix F**. Land values for the properties assigned allowances were calculated using an appraiser report. Details of the calculations are provided in **Appendix F**, and a copy of the appraiser report is provided in **Appendix E1**.

8.0 COST ESTIMATE

8.1 General

All costs associated with the initial construction, engineering, contract administration, Engineer's Report, allowances, other costs, and contingencies for the drain modifications will be paid directly by the property owners of the lands in Blocks F1, F2, and F3 in conjunction with the development of these lands. There is no assessment to the remaining property owners for the initial construction between Sta. 0+000.00, the outlet channel from the Stormwater Management Pond and Sta. 4+053.00 and between Sta. 10+000.00 and Sta. 16+741.50 at the confluence with the East Savage Municipal Drain. The total cost of the improvements to the McKinnons Creek Municipal Drain, subdivided by sections, is included in **Table 8.1**, following this page**.** A detailed cost estimate is included in **Appendix E.**

The cost estimates for maintenance and compensation for insufficient outlet related to the Bear River Municipal Drain are included in **Appendix E**. The cost estimate for maintenance is based on the value of the cost of maintenance in the 1990 Engineers report projected to the present using the RS Means Cost Index.

The estimate of compensation for insufficient outlet is based on an allowance of 10% of the amount included in the 1990 Engineer's Report to reflect an estimate of the impact of the increase in the volume of runoff as a result of the change in land use of the lands in question, projected to the present using the RS Means Cost Index.

8.2 Allowances

Where applicable, allowances as outlined in Section 7 of this report are provided to affected properties.

TABLE 8.1
COST ESTIMATE SUMMARY
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Item	Section 1	Section 2	Section 3	Section 4	Section 5	Total
Routine						
Construction	$ 320,540.00	$ 482,316.00	$ 550,716.00	$ 6,441,052.80	$ 8,894,787.20	$ 16,689,412.00
Contingency	$ 49,000.00	$ 73,000.00	$ 83,000.00	$ 967,000.00	$ 1,335,000.00	$ 2,507,000.00
Engineering/Administr	$ 198,892.50	$ 212,567.50	$ 335,056.25	$ 349,017.50	$ 467,817.50	$ 1,563,351.25
Other (Incl.	$ 161,130.15	$ 143,155.99	$ 247,899.39	$ 337,099.44	$ 382,747.84	$ 1,272,032.81
Sub-Total - Routine	**$ 729,562.65**	**$ 911,039.49**	**$ 1,216,671.64**	**$ 8,094,169.74**	**$ 11,080,352.54**	**$ 22,031,796.06**
Special Benefit						
Blocks F1, F2, and F3	$ 729,562.65	$ 911,039.49	$ 1,216,671.64	$ 8,094,169.74	$ 11,080,352.54	$ 22,031,796.06
Sub-Total - Routine	**$ 729,562.65**	**$ 911,039.49**	**$ 1,216,671.64**	**$ 8,094,169.74**	**$ 11,080,352.54**	**$ 22,031,796.06**
Net Total (Assessed to Properties)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Allowances are deducted from the total assessment. Payment to a property owner may be made where the amount of the allowance exceeds the value of the assessment.

8.3 ADIP Grants

Where applicable, at the time of assessment, grants (subject to program availability and property eligibility) as prescribed by the Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) within the Agricultural Drainage Infrastructure Program (ADIP) policies and outlined in Section 7 of this report can be deducted from the assessment of the properties that qualify for the grant.

9.0 LOCATION OF TILE DRAIN OUTLETS

Tile drainage and tile outlets are anticipated to be encountered within the Drainage Area for the McKinnons Creek Municipal Drain. Where they exist, property owners are requested to mark the location of any tile outlets prior to the commencement of construction. Future maintenance and repair of tile outlets shall be the responsibility of the individual property owners.

The Contractor will be responsible for adjusting the tile outlets, including CSP outlet (or alternative approved product), rodent grate and Rock Protection in accordance with RCI Std. Dwg. F

10.0 WORKING SPACE – INITIAL CONSTRUCTION & FUTURE MAINTENACE

As per S.63(1) of the Ontario Drainage Act, R.S.O. 1990, c. D.17 (provided below) a "Working Space" must be available for the purpose of construction and future maintenance.

> *63 (1) The contractor and the contractor's assistants when engaged in the construction, maintenance, improvement, or repair of a drainage works may, with their equipment, enter upon whatever lands are necessary to complete the work within the working space designated in the engineer's report. R.S.O. 1990, c. D.17, s. 63 (1).*

For the purpose of construction, the standard Working Space adjacent to the Drain must be available along the side that is best suited for construction. In some sections of the Drain, it may be necessary to complete construction or maintenance from both sides of the Drain. The designated Working Space is set at 40m from the top of the new bank on both sides and is necessary to allow construction to be carried out and excavated material to be spread.

Where the "Working Space" impacts small (residential) lots, less than 2.0ha in size, the Construction Working Space is reduced to 8.0m and is understood to be in general conformance with typical zoning/official plan and other regulatory setbacks.

For the purpose of future maintenance and repair, the standard Working Space adjacent to the Drain must be available along the side of the Drain where maintenance is required (either or both sides). The designated Working Space is set at 25m from the top of bank and is necessary to allow maintenance to be carried out and excavated material spread. Where the "Working Space" impacts small (residential) lots, less than 2.0ha in size, the Maintenance Working Space is reduced to 5.0m.

The working space shall be kept free of permanent obstructions including (but not limited to), plantings (trees), non-removable fences, structures and/or other permanent landscaping features. Obstructions for future maintenance or repair, with the exception of natural vegetation, shall be removed by the Drainage Superintendent or the landowner, at the expense of the landowner.

Access to the Working Space for the purpose of construction, inspection, or maintenance is restricted to persons prescribed under the authority of the Ontario Drainage Act, R.S.O. 1990, c. D.17 being the Drainage Engineer (or assistants) – S.12(1), the Contractor (or assistants) – S.63(1) and/or the Drainage Superintendent (or assistants) – S.95(3). Where possible (excluding emergencies) it is recommended that a minimum 48 hours advance notice (in writing) or direct communication with the affected property owner be provided before accessing the drain working space.

11.0 CHANGING THE SCOPE OF THE WORK

Should changes, deletions or extensions in construction be requested or required after the bylaw is passed, the report must be amended, and a revised bylaw must be passed. Since this project will be constructed through provisions of the Drainage Act, a bylaw must first be passed to authorize the work. If it is desired to make any substantial increase or decrease in the scope of work as designed it will be necessary that either a revised report be prepared and processed or, if the desired works are considered to be a gross error in accordance with the Drainage Act, that an application be made to the Agricultural, Food and Rural Affairs Appeal Tribunal (Drainage Tribunal) pursuant to Section 58(4) of the Drainage Act, R.S.O. 1990, c. D.17 to obtain approval for such change. If any individual or group of owners require additional work and are prepared to apply for such and do not wish to be part of the drainage works, they may make their own arrangements with the Contractor, but the Drainage Engineer must approve such in order to ensure that no detrimental effect to the drain or its maintenance results.

12.0 MAINTENANCE

The Contractor shall be responsible for making good any construction defects found in the works for a period of one year from the date of final acceptance of the work. This obligation shall include such items as culvert crossings, fencing, grass (seeding), abnormal erosion/ sedimentation, and rock protection but shall not include for normal erosion or sedimentation of the Drain.

Following the acceptance of work one year after completion, future maintenance and repair of the Drain shall be the responsibility of the City of Ottawa, although the individual owners shall be responsible for periodic inspection of the Drain and reporting maintenance problems to the City. The City's Drainage Superintendent will monitor the slope stabilization works on a regular basis to identify any failures that require restoration of the works.

The cost of future maintenance and repair is to be assessed in proportion to the Schedules of Assessment for Future Maintenance of the McKinnons Creek Municipal Drain, excluding allowances and special benefits. Maintenance costs are to be assessed on a pro rata basis for the section where maintenance is completed (summarized in Schedule A) provided in **Appendix D** of this report.

Therefore, maintenance costs are to be levied against the properties upstream from the location of the maintenance work pro rata with the assessments for Benefit and Outlet (excluding Special Benefits) in the Schedules of Assessment for Future Maintenance, all of which is in accordance with the Drainage Act.

The maintenance of the McKinnons Creek Municipal Drain considered under the terms of this report, including channel and erosion control maintenance, shall be the responsibility of the City of Ottawa as previously noted.

Maintenance of public road culverts shall be the responsibility of the Road Authority; however, if the Road Authority does not complete the maintenance, then the City will complete the maintenance and charge the cost to the Road Authority.

As per the conditions of the Drainage Act and the Agricultural Drainage Infrastructure Program (ADIP/Grants), property owners are entitled to one standard crossing per property dissected by the Drain. Culverts identified and prescribed by this Report form part of the Drain for construction and future maintenance. At the discretion of the Drainage Superintendent, owners may seek approval for additional or non-standard crossings (increased length, decorative headwalls, etc.). Where approved these items do not form part of the Report for assessment purposes and are the responsibility of the associated owner. Additional features installed without written approval may be removed as necessary during maintenance (at the cost of the property owner) and will not be replaced.

Future maintenance and repair of tile outlets shall be the responsibility of and shall be at the cost of the affected property owners.

13.0 MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS SPECIES AT RISK

The Ministry of the Environment, Conservation and Parks (MECP) – Ontario is responsible for review regarding the Endangered Species Act (ESA) Legislation. The draft Engineer's Report for the McKinnons Creek Municipal Drain was circulated to Ministry of Environment Conservation and Parks (MECP) for review and screening regarding Species at Risk (SAR). Where received, a copy of the screening report and any associated advice is provided in **Appendix G** of this Report.

In advance of consultation, the MECP recommends self-screening of the project area using data available on the Ontario Natural Heritage Information Centre (NHIC). The NHIC provides documentation for Species at Risk (SAR) in 1km square grids. The self-screening process found 8 reports for specific SAR for grids along the alignment of the drain.

Endangered Species are dynamic and subject to change. Typical species associated with and anticipated to be found within the general vicinity of Municipal Drains, specific SAR found through the self-screening process, and a general categorization of species and standard mitigation measures, are provided in **Appendix G** of this Report.

14.0 SOUTH NATION CONSERVATION AUTHORITY PERMIT

Review of the proposed work area regarding Conservation Authority Regulations is completed in conjunction with draft circulation for agency review. The draft Engineer's Report for the McKinnons Creek Municipal Drain was circulated to South Nation Conservation Authority (SNCA) for review and permit. The SNCA provides permission under the Conservation Authorities Act, O.Reg. 41/24, for the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses".

A copy of the Permit under O.Reg. 41/24 including conditions is attached in **Appendix H.**

15.0 DEPARTMENT OF FISHERIES AND OCEANS

The Federal Department of Fisheries and Oceans (DFO) provides review of projects where additional review is required by the completion of a self-screening process. Authorization under the Fisheries Act may be required as an outcome of the review process.

In conjunction with the preparation of the Draft Engineer's Report, preliminary self-screening was completed regarding fish and fish habitat. The self-screening indicated that the existing McKinnons Creek and Richard Clark Municipal Drains, from Sta. 0+000.00 to Sta. 13+180.00 are classified as "NR", or not rated, Municipal Drains (ID No. 105501) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2018. The remainder of the Municipal Drain, from Sta. 13+180.00 to Sta. 16+741.50, is classified as a "Type E" Municipal Drain (ID No. 96710) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2017.'

For authorization of this work RCI proposes the implementation of modified Class Authorization measures, typical of a "Class E" Municipal Drain in addition to site specific mitigation measures for both the Class E and Class F portion of the drain. Implementation of these measures will minimize or eliminate the impact on this or adjacent watercourses, fish or fish habitat and have been incorporated into this report and the related plans and specifications.

Consultation and the required site-specific review by the DFO was completed in conjunction with draft circulation of the Engineer's Report, and all applicable conditions have been addressed by this Report

A copy of the DFO Authorization is included in **Appendix I** of this Report. Additionally, a copy of the DFO Authorization for the proposed municipal drain between Sta. 0+000.00 and Sta. 4+053.00 as part of the "Mer Bleue Urban Expansion Area McKinnons Creek Enhancement" by Arcadis is also included in **Appendix I** of this Report.

16.0 CITY OF OTTAWA – CONSOLIDATED LINEAR INFRASTRUCTURE ENVIRONMENTAL CERTIFICATE OF APPROVAL (CLIECA)

Circulation of the Draft Engineer's Report was competed with the City of Ottawa for CLIECA review and a determination if the standard CLIECA was required. Typical Municipal Drain projects are exempt from ECA requirements; however, the exemption does not apply to projects where the primary purpose is to provide drainage for urban development.

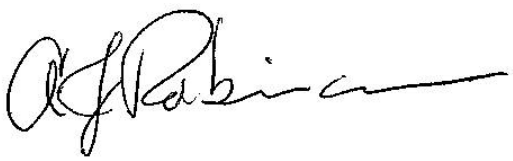
Where applicable (and required through CLIECA review) the CLIECA will be provided by the City of Ottawa. The CLIEAC may be appended to this Report (and subsequent By-Law) but is not provided here.

17.0 PERMITS AND AUTHORIZATIONS

All required permits and authorizations required for the initial construction, including, but not limited to, Department of Fisheries and Oceans (DFO), Ministry of Environment Conservation and Parks – Species at Risk (MECP-SAR), the South Nation Conservation Authority (SNCA) and Consolidated Linear Infrastructure Environmental Compliance Approvals (CLIECA) have been applied for in conjunction with the preparation of the Engineer's Report and, where available, are provided in **Appendix G, H and I**.

All of which is respectfully submitted,

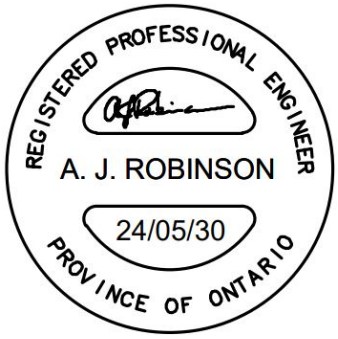
ROBINSON CONSULTANTS INC.





A.J. Robinson, P. Eng.
Drainage Engineer

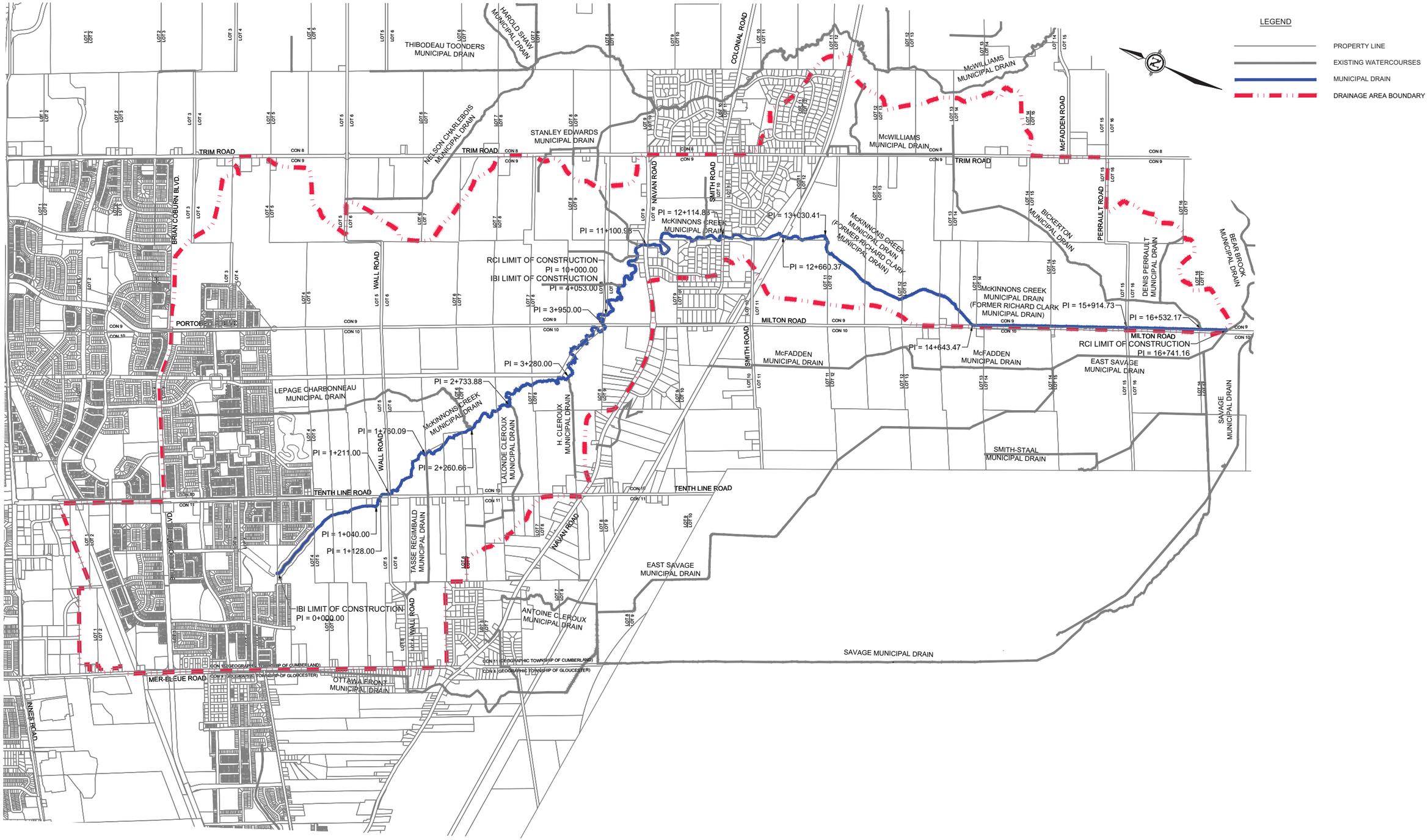
Lorne Franklin, L.E.T, C.E.T., rcca, CISEC
Licensed Engineering Technologist
Drainage Services





Appendix A

Drawings and Details



NOT FOR CONSTRUCTION

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

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HORIZONTAL

Robinson Consultants
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

DRAINAGE AREA PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A1

LEGEND

PROPERTY LINE
EXISTING WATERCOURSES
MUNICIPAL DRAIN
DRAINAGE AREA BOUNDARY

COLONIAL ROAD
McWILLIAMS MUNICIPAL DRAIN
McFADDEN ROAD
TRIM ROAD
NAVAN ROAD
SMITH ROAD
PERRAULT ROAD
BICKERTON MUNICIPAL DRAIN
DENIS PERRAULT MUNICIPAL DRAIN
BEAR BROOK MUNICIPAL DRAIN
McKINNONS CREEK MUNICIPAL DRAIN
McKINNONS CREEK MUNICIPAL DRAIN (FORMER RICHARD CLARK MUNICIPAL DRAIN)
McFADDEN MUNICIPAL DRAIN
EAST SAVAGE MUNICIPAL DRAIN
MILTON ROAD
CON 8
CON 9
CON 10
LOT 8 LOT 9
LOT 9 LOT 10
LOT 10 LOT 11
LOT 11 LOT 12
LOT 12 LOT 13
LOT 13 LOT 14
LOT 14 LOT 15
LOT 15 LOT 16
LOT 16 LOT 17
LOT 17 LOT 18

DWG A2.1
DWG A2.2
DWG A2.3
DWG A2.4
DWG A2.5
DWG A2.6
DWG A2.7
DWG A2.8

NOTE: PLEASE REFER TO ARCADIS PLAN DWG 700 AND PLAN 7 PROFILE DWG'S 710-721 FOR DETAIL UPSTREAM OF RCI DESIGN

NOT FOR CONSTRUCTION

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
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A. J. ROBINSON
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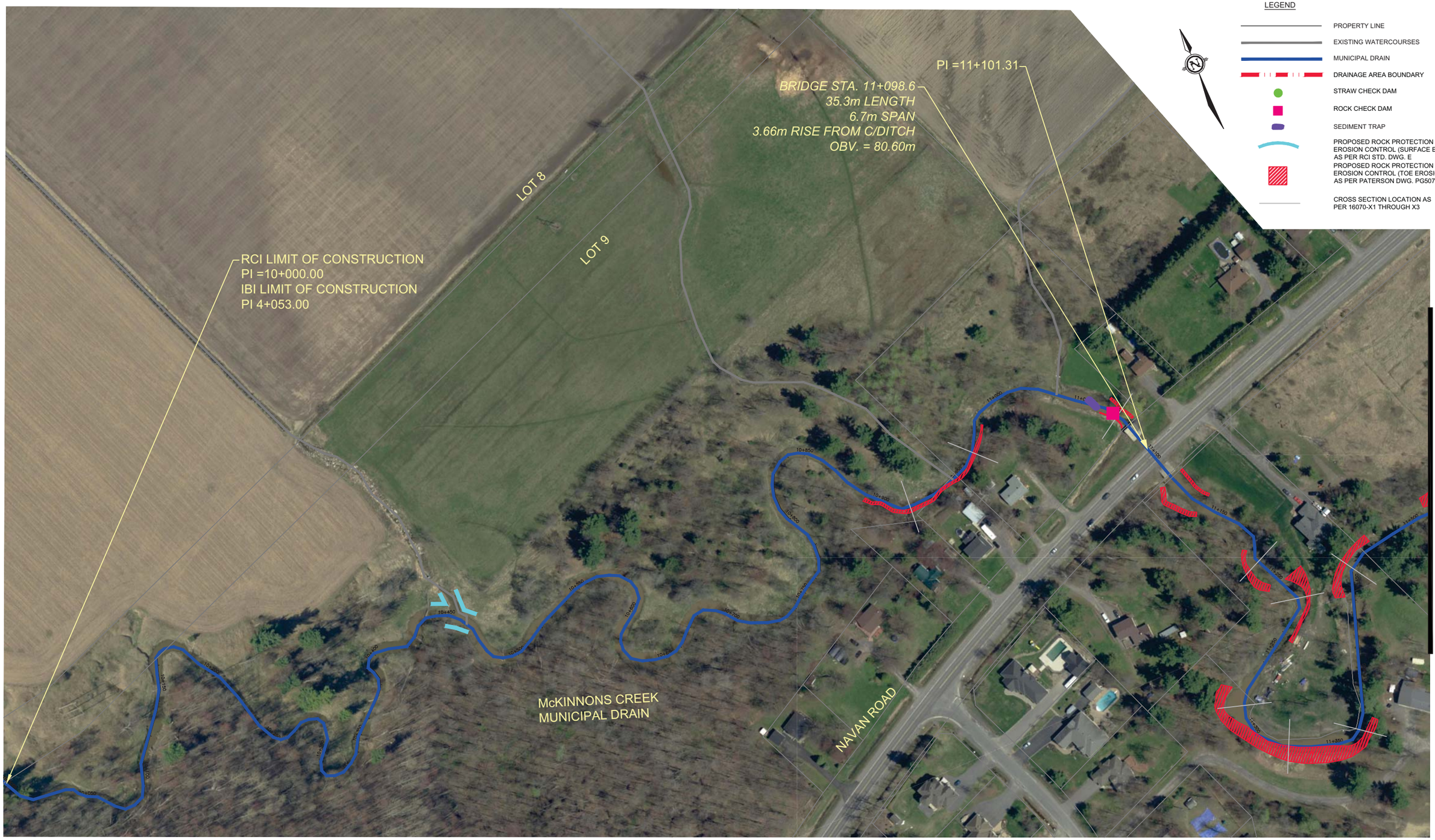
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APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL KEY PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2



NOT FOR CONSTRUCTION

NOTE: SITE CONDITIONS WERE SURVEYED IN 2016, AND CONFIRMED IN 2022

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

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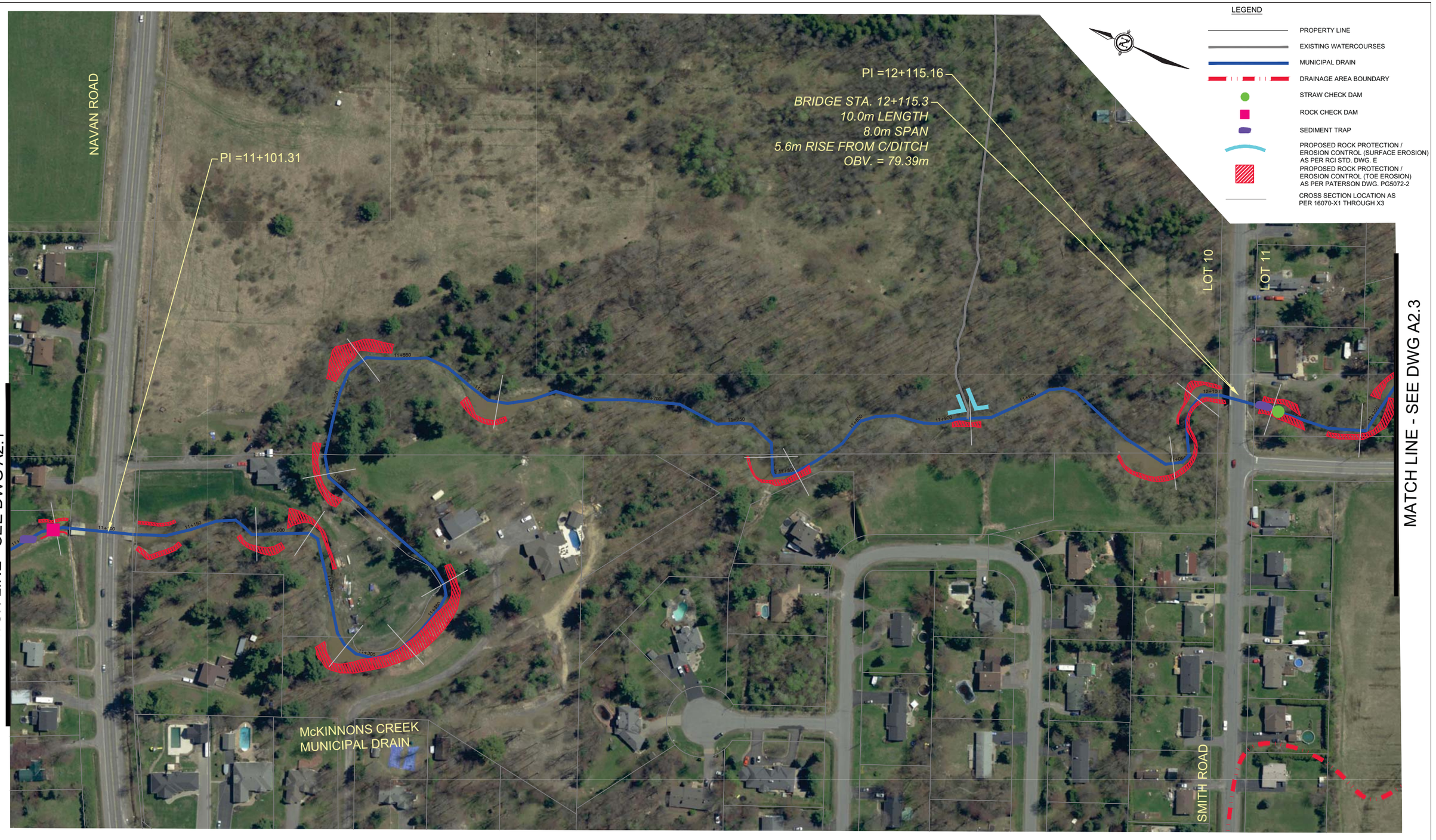
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DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.1



NOT FOR CONSTRUCTION

NOTE: SITE CONDITIONS WERE SURVEYED IN 2016, AND CONFIRMED IN 2022

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

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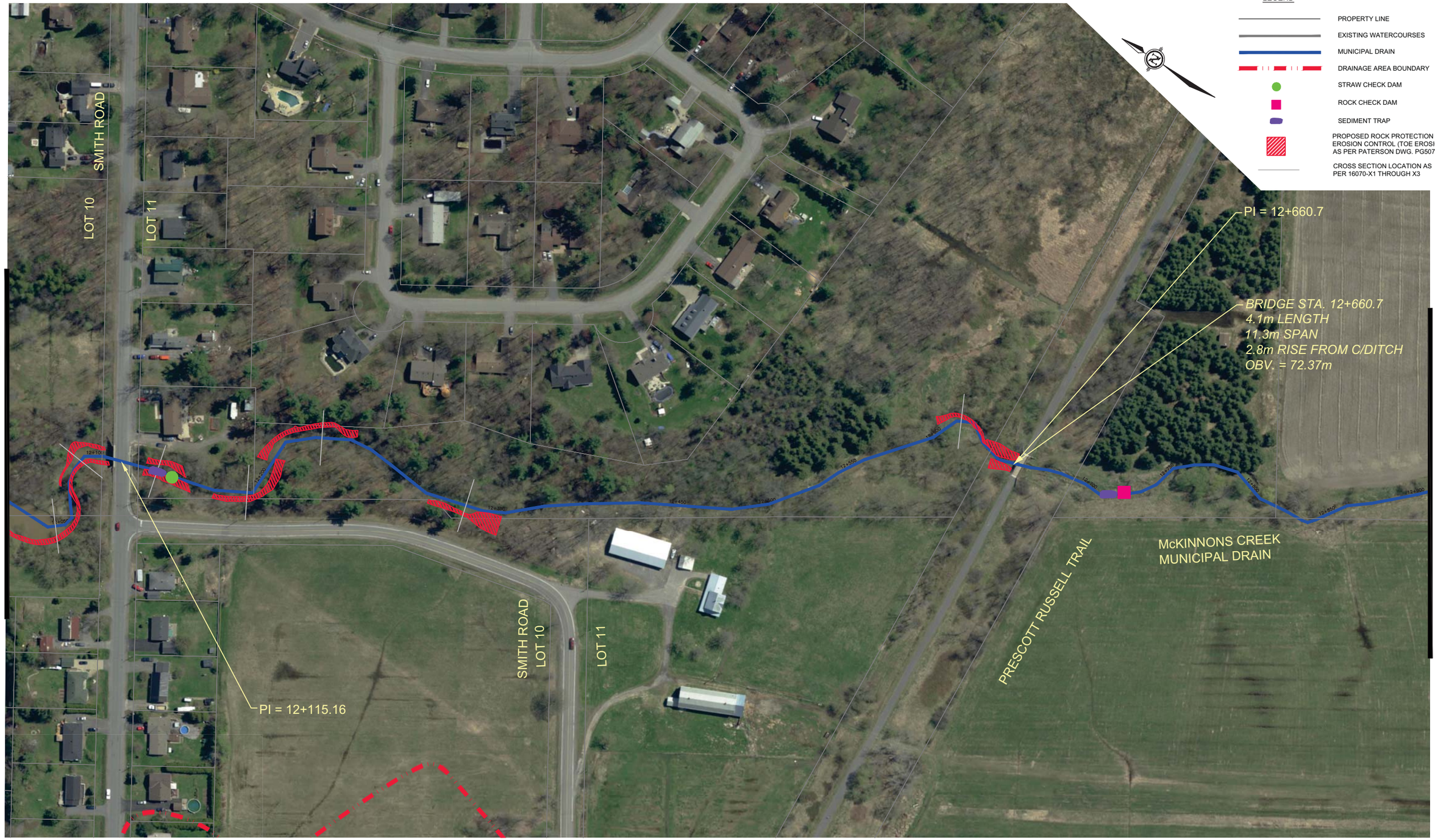
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CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.2



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CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.3

MATCH LINE - SEE DWG A2.3



LEGEND

- PROPERTY LINE
- EXISTING WATERCOURSES
- MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- STRAW CHECK DAM
- ROCK CHECK DAM
- SEDIMENT TRAP
- PROPOSED ROCK PROTECTION/EROSION CONTROL
- CROSSING LOCATION (WITH CULVERT END TREATMENT AS PER RCI STD. DWG. C)
- CROSSING LOCATION (NO WORK REQUIRED INITIALLY)
- TILE OUTLET LOCATION (WITH TILE OUTLET PROTECTION AS PER RCI STD. DWG. F)

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CITY OF OTTAWA

McKINNONS CREEK
MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.4

MATCH LINE - SEE DWG A2.4

FARM ENTRANCE CULVERT - STA 13+938.7
EXISTING - 3500mmØ CSP, 10.6m
PROPOSED - 3890mm x 2690mm CSPA, 12.0m
U/S 65.52
D/S 65.49

McKINNONS CREEK
MUNICIPAL DRAIN
(FORMER RICHARD CLARK
MUNICIPAL DRAIN)

LOT 12
LOT 13

CON 9

MILTON ROAD

CON 10

FARM ENTRANCE CULVERT - STA 14+404.1
EXISTING - 2000mmØ STEEL, 6.5m
PROPOSED - 3890mm x 2690mm CSPA, 12.0m
U/S 64.66
D/S 64.64

MATCH LINE - SEE DWG A2.6

LEGEND

- PROPERTY LINE
- EXISTING WATERCOURSES
- MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- STRAW CHECK DAM
- ROCK CHECK DAM
- SEDIMENT TRAP
- PROPOSED ROCK PROTECTION/EROSION CONTROL
- CROSSING LOCATION (WITH CULVERT END TREATMENT AS PER RCI STD. DWG. C)
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CITY OF OTTAWA

McKINNONS CREEK
MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.5



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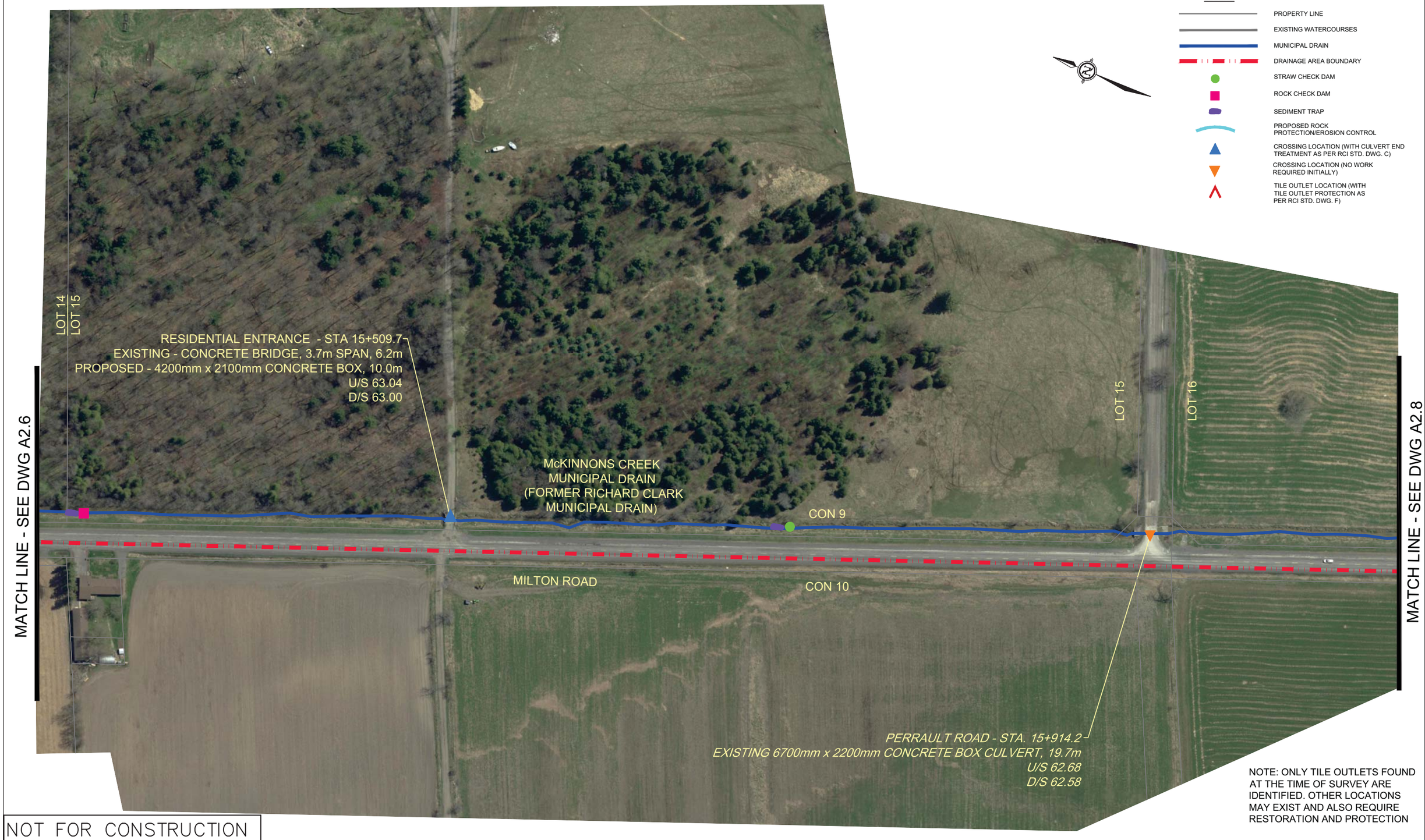
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APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK
MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.6



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24/05/30
PROVINCE OF ONTARIO

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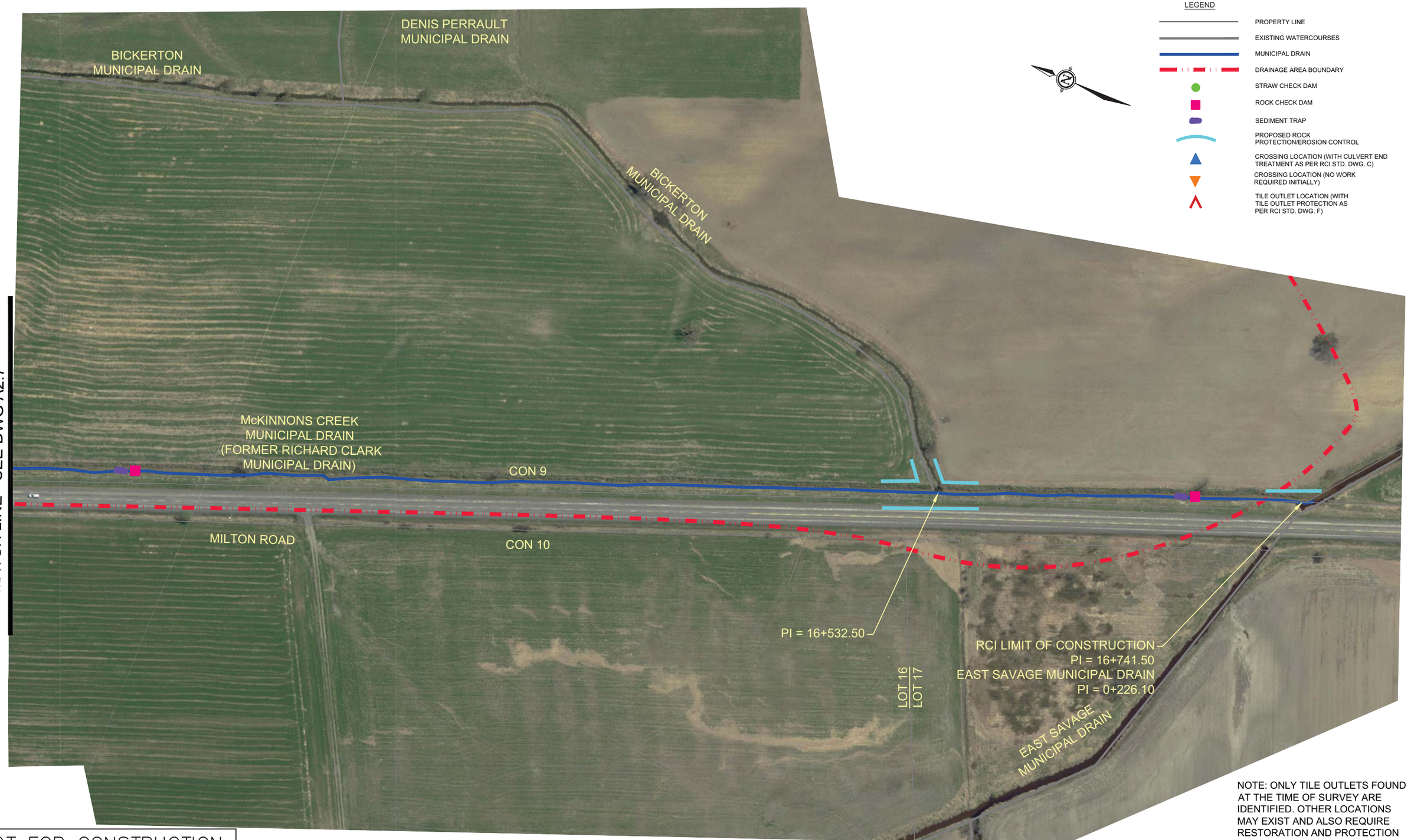
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APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.7



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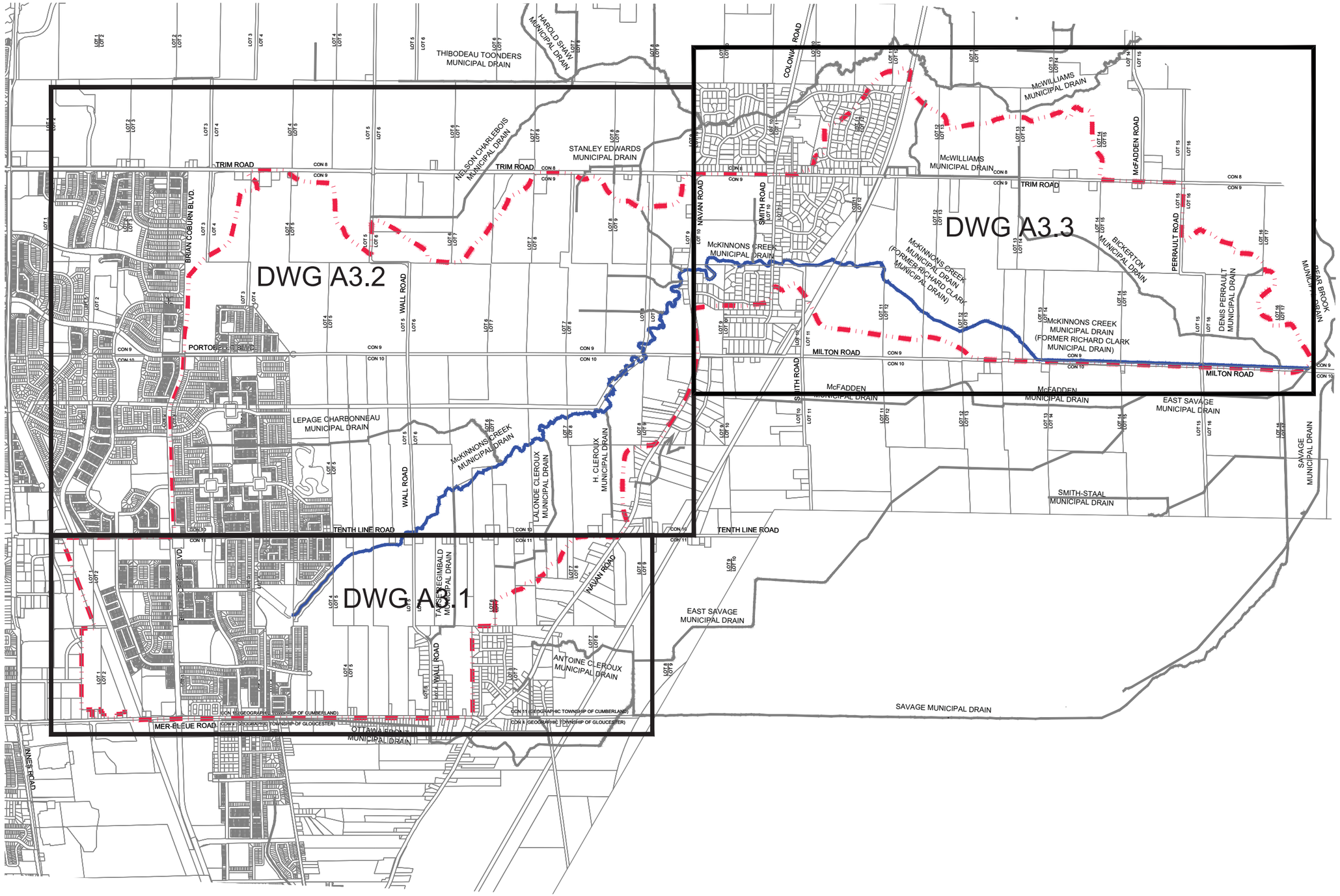
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CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CULVERT AND SEDIMENT AND EROSION CONTROL PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A2.8



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A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

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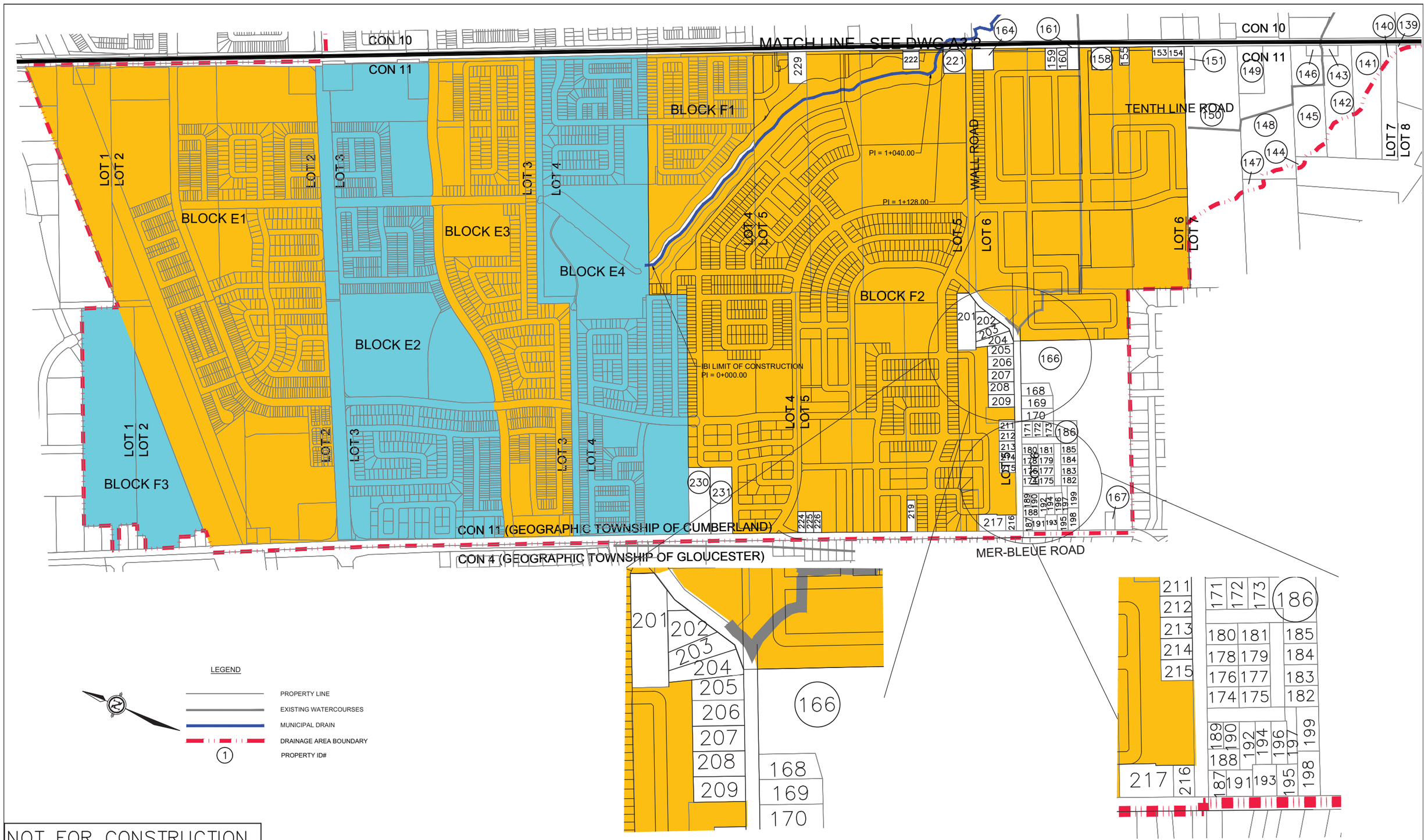
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APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

PROPERTY OWNERSHIP KEY PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A3



NOT FOR CONSTRUCTION

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A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100503335
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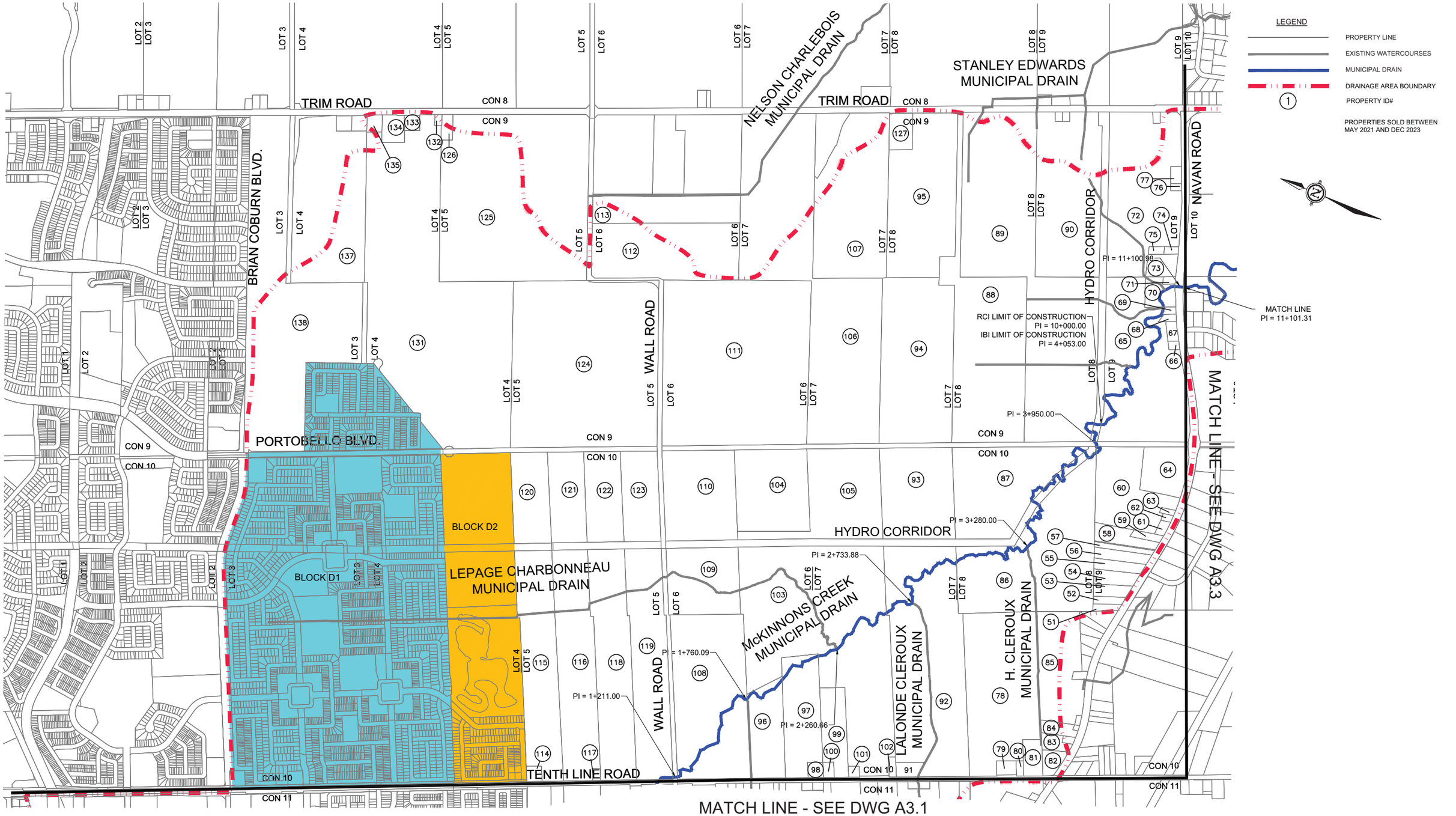
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APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A3.1



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PROVINCE OF ONTARIO

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McKINNONS CREEK MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A3.2

LEGEND

PROPERTY LINE
EXISTING WATERCOURSES
MUNICIPAL DRAIN
DRAINAGE AREA BOUNDARY
1 PROPERTY ID#

MATCH LINE - SEE DWG A3.2

MATCH LINE
PI = 11+101.31

NAVAN ROAD
SMITH ROAD
PRESCOTT RUSSELL TRAIL
TRIM ROAD
McFADDEN ROAD
PERRAULT ROAD
MILTON ROAD
SMITH ROAD

BLOCK A
BLOCK B
BLOCK C

McKINNONS CREEK MUNICIPAL DRAIN
PI = 12+114.33
PI = 12+660.37
PI = 13+030.41
McKINNONS CREEK MUNICIPAL DRAIN (FORMER RICHARD CLARK MUNICIPAL DRAIN)
PI = 14+643.47
PI = 15+914.73
PI = 16+532.17
RCI LIMIT OF CONSTRUCTION
PI = 16+741.16

McWILLIAMS MUNICIPAL DRAIN
McWILLIAMS MUNICIPAL DRAIN
BICKERTON MUNICIPAL DRAIN
DENIS PERRAULT MUNICIPAL DRAIN
BEAR BROOK MUNICIPAL DRAIN
McFADDEN MUNICIPAL DRAIN
McFADDEN MUNICIPAL DRAIN
EAST SAVAGE MUNICIPAL DRAIN

CON 8
CON 9
CON 10

LOT 10 LOT 11 LOT 12 LOT 13 LOT 14 LOT 15 LOT 16 LOT 17 LOT 18

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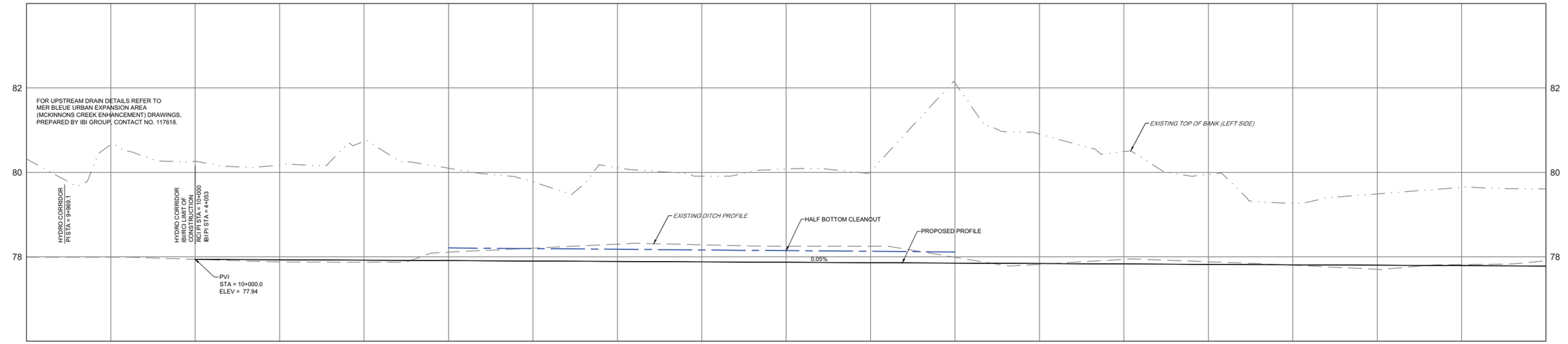
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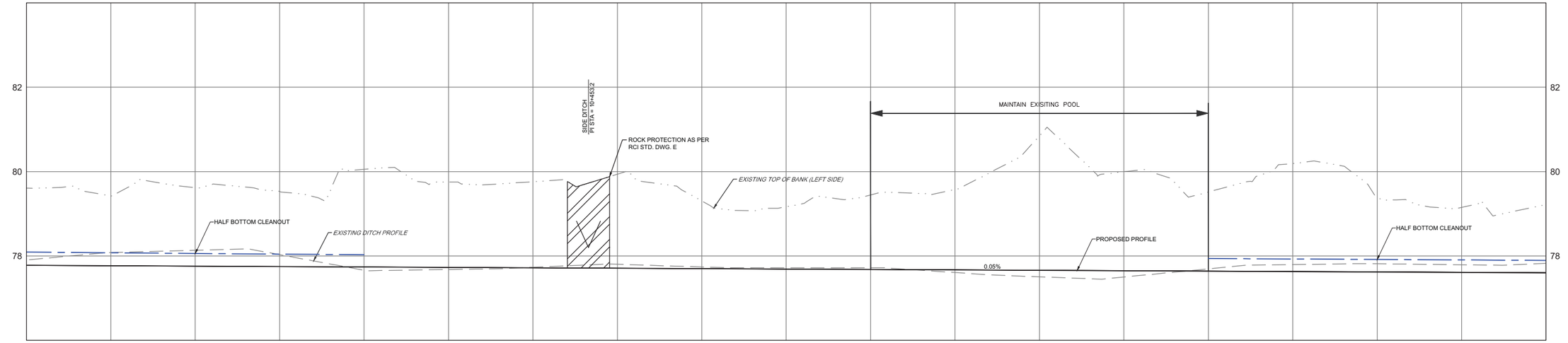
McKINNONS CREEK MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-A3.3



STATION	9+960	9+980	10+000	10+020	10+040	10+060	10+080	10+100	10+120	10+140	10+160	10+180	10+200	10+220	10+240	10+260	10+280	10+300	10+320
EXISTING FIRM BOTTOM	77.99	77.89	77.94	77.88	77.87	78.11	78.20	78.30	78.28	78.25	78.25	77.99	77.82	77.94	77.88	77.80	77.70	77.82	77.90
PROPOSED GRADE			77.94	77.93	77.92	77.91	77.90	77.89	77.88	77.87	77.86	77.85	77.84	77.83	77.82	77.81	77.80	77.79	77.78



STATION	10+320	10+340	10+360	10+380	10+400	10+420	10+440	10+460	10+480	10+500	10+520	10+540	10+560	10+580	10+600	10+620	10+640	10+660	10+680
EXISTING FIRM BOTTOM	77.90	78.08	78.14	78.03	77.66	77.68	77.73	77.80	77.74	77.72	77.72	77.61	77.51	77.50	77.69	77.80	77.82	77.79	77.83
PROPOSED GRADE	77.78	77.77	77.76	77.75	77.74	77.73	77.72	77.71	77.70	77.69	77.68	77.67	77.66	77.65	77.64	77.63	77.62	77.61	77.60

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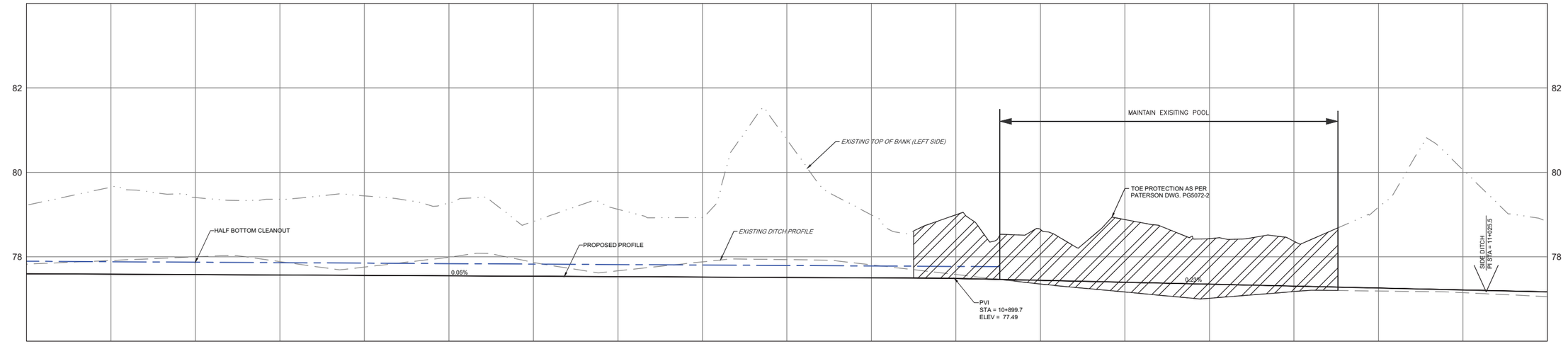
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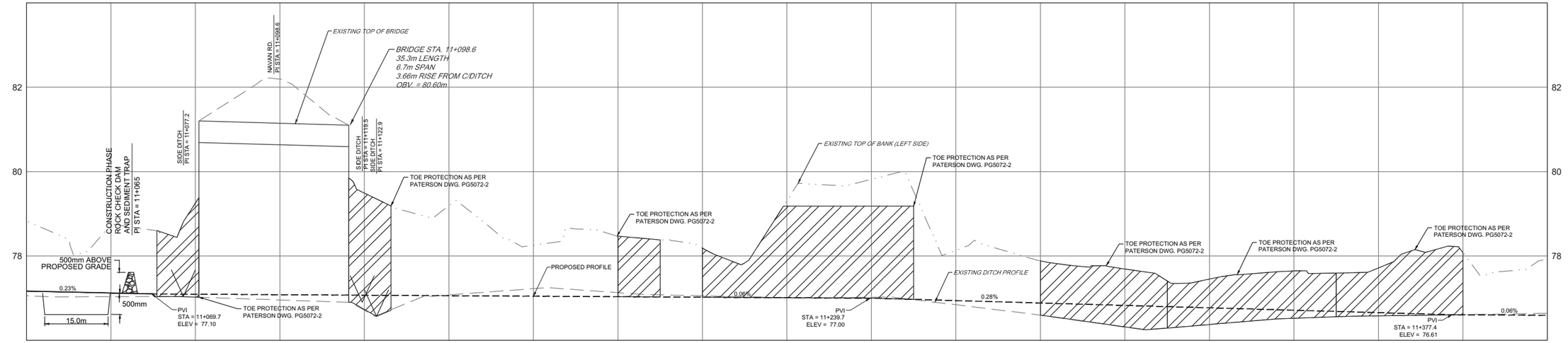
McKINNONS CREEK MUNICIPAL DRAIN

DRAIN PROFILE STA. 10+000 TO STA. 10+680

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P1



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
10+680	77.60	77.83
10+700	77.59	77.91
10+720	77.58	78.00
10+740	77.57	77.89
10+760	77.56	77.76
10+780	77.55	77.69
10+800	77.54	77.67
10+820	77.53	77.67
10+840	77.52	77.68
10+860	77.51	77.83
10+880	77.50	77.81
10+900	77.49	77.58
10+920	77.44	77.35
10+940	77.40	77.16
10+960	77.35	77.02
10+980	77.31	77.18
11+000	77.26	77.19
11+020	77.21	77.15
11+040	77.17	77.06



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
11+040	77.17	77.06
11+060	77.12	77.03
11+080	77.09	77.02
11+100	77.08	76.96
11+120	77.07	76.71
11+140	77.06	77.08
11+160	77.05	77.23
11+180	77.04	77.13
11+200	77.02	77.06
11+220	77.01	77.01
11+240	77.00	77.02
11+260	76.94	76.84
11+280	76.88	76.80
11+300	76.83	76.31
11+320	76.77	76.38
11+340	76.71	76.52
11+360	76.66	76.58
11+380	76.61	76.61
11+400	76.59	76.64

NOT FOR CONSTRUCTION

NOTE: SITE CONDITIONS WERE SURVEYED IN 2016,
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NOTE: NO EXCAVATION TO OCCUR FROM STA. 11+070 TO 12+670
PROPOSED PROFILE FOR FUTURE MAINTENANCE PURPOSES ONLY

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

SCALES
HORIZONTAL 5 0 10
VERTICAL 0.5 0 1

Robinson Consultants
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

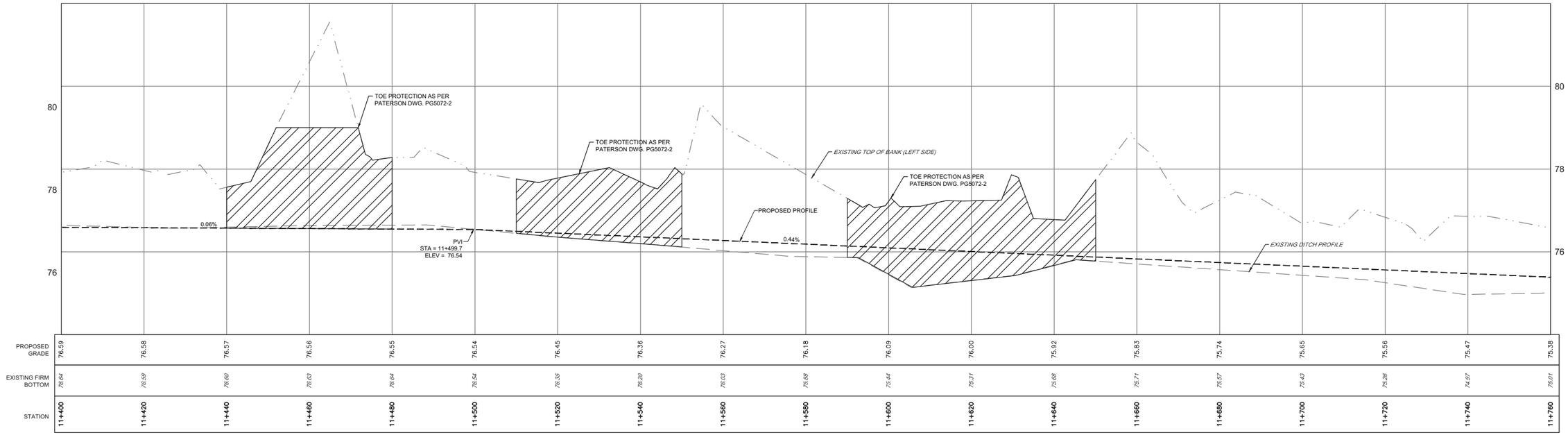
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APPROVED	AJR

CITY OF OTTAWA

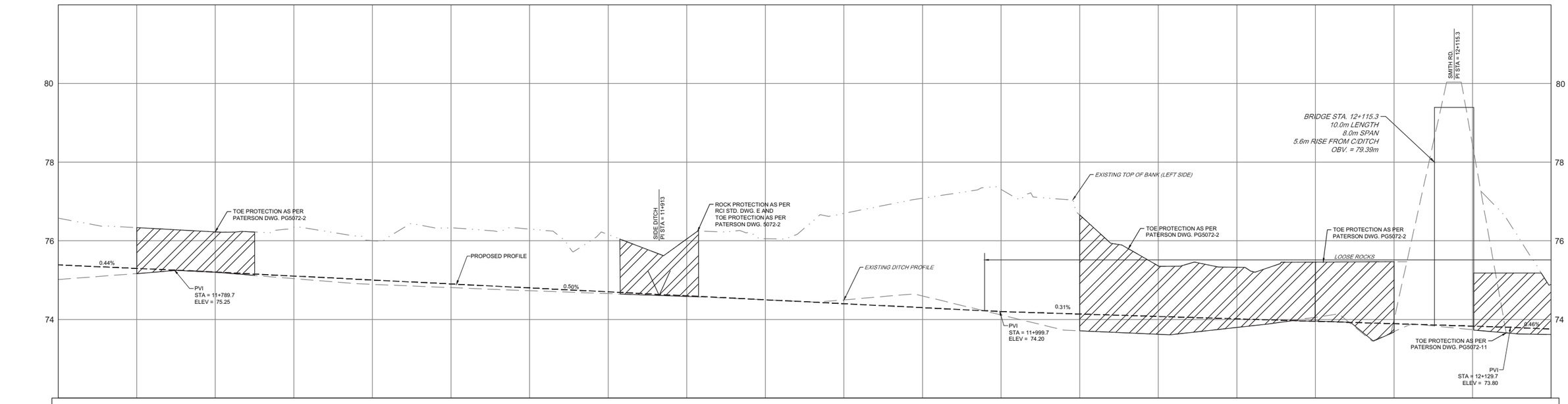
McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 10+680 TO STA. 11+400

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P2



STATION	EXISTING FIRM BOTTOM	PROPOSED GRADE
11+400	76.64	76.59
11+420	76.59	76.58
11+440	76.60	76.57
11+460	76.63	76.56
11+480	76.64	76.55
11+500	76.54	76.54
11+520	76.35	76.45
11+540	76.20	76.36
11+560	76.03	76.27
11+580	75.88	76.18
11+600	75.44	76.09
11+620	75.31	76.00
11+640	75.68	75.92
11+660	75.71	75.83
11+680	75.57	75.74
11+700	75.43	75.65
11+720	75.26	75.56
11+740	74.97	75.47
11+760	75.01	75.38



STATION	EXISTING FIRM BOTTOM	PROPOSED GRADE
11+760	75.01	75.38
11+780	75.17	75.29
11+800	75.20	75.20
11+820	75.04	75.10
11+840	74.89	75.00
11+860	74.81	74.90
11+880	74.73	74.80
11+900	74.66	74.70
11+920	74.58	74.60
11+940	74.50	74.50
11+960	74.50	74.40
11+980	74.60	74.30
12+000	74.11	74.20
12+020	73.71	74.14
12+040	73.62	74.08
12+060	73.80	74.01
12+080	74.06	73.95
12+100	73.69	73.89
12+120	73.74	73.83
12+140	73.62	73.75

NOT FOR CONSTRUCTION

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PROPOSED PROFILE FOR FUTURE MAINTENANCE PURPOSES ONLY

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5 0 10
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0.5 0 1
VERTICAL

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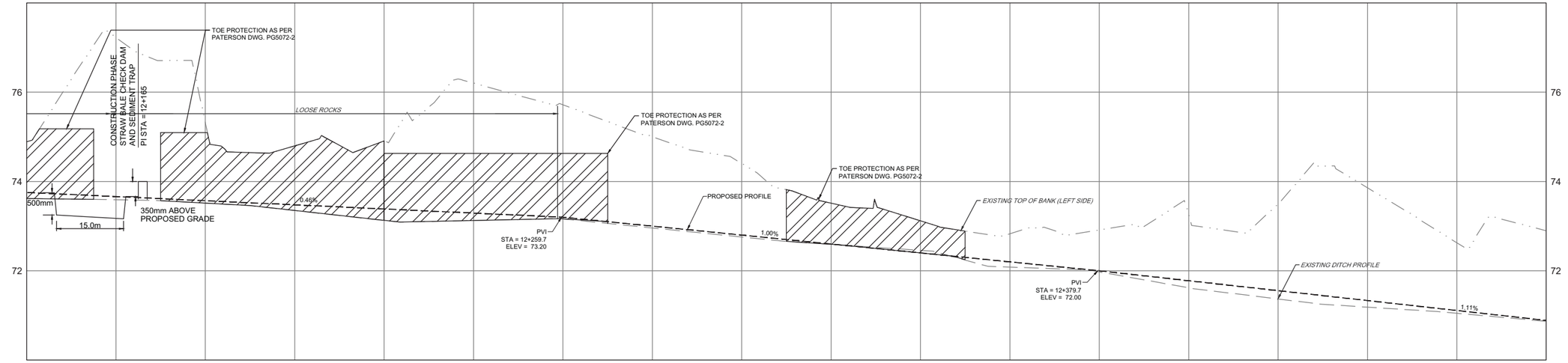
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APPROVED	AJR

CITY OF OTTAWA

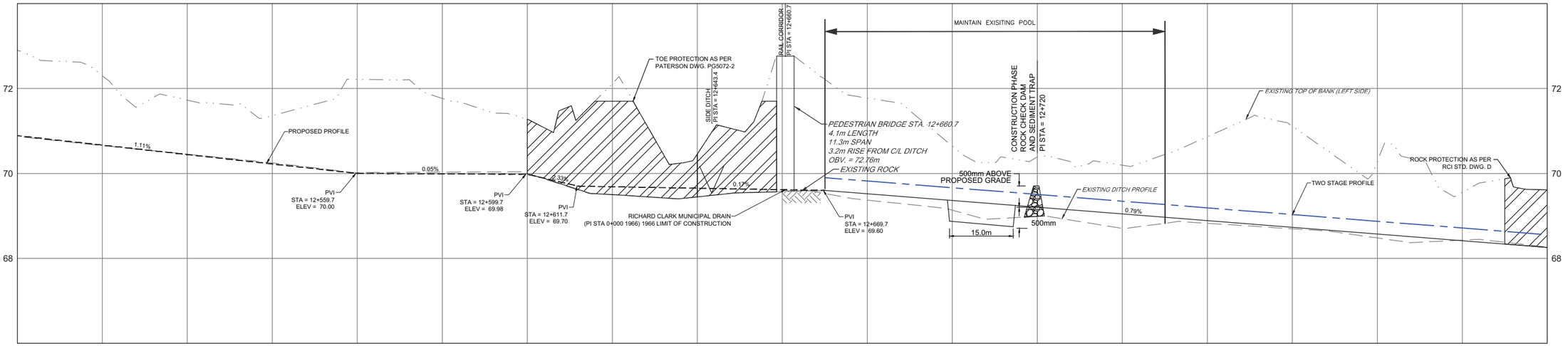
McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 11+400 TO STA. 12+140

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P3



PROPOSED GRADE	73.75	73.66	73.57	73.48	73.38	73.29	73.20	73.00	72.80	72.60	72.40	72.20	72.00	71.77	71.55	71.33	71.11	70.89
EXISTING FIRM BOTTOM	*73.62*	*73.59*	*73.51*	*73.35*	*73.13*	*73.13*	*73.16*	*72.96*	*72.76*	*72.59*	*72.46*	*72.08*	*71.97*	*71.62*	*71.37*	*71.19*	*71.05*	*70.87*
STATION	**12+140**	**12+160**	**12+180**	**12+200**	**12+220**	**12+240**	**12+260**	**12+280**	**12+300**	**12+320**	**12+340**	**12+360**	**12+380**	**12+400**	**12+420**	**12+440**	**12+460**	**12+480**



PROPOSED GRADE	70.89	70.66	70.44	70.22	70.00	69.99	69.97	69.69	69.65	69.62	69.52	69.36	69.20	69.04	68.89	68.73	68.57	68.41	68.26
EXISTING FIRM BOTTOM	*70.67*	*70.66*	*70.45*	*70.25*	*70.02*	*70.03*	*70.00*	*69.90*	*69.45*	*69.57*	*69.37*	*69.13*	*68.99*	*68.71*	*68.63*	*68.70*	*68.48*	*68.43*	*68.27*
STATION	**12+480**	**12+500**	**12+520**	**12+540**	**12+560**	**12+580**	**12+600**	**12+620**	**12+640**	**12+660**	**12+680**	**12+700**	**12+720**	**12+740**	**12+760**	**12+780**	**12+800**	**12+820**	**12+840**

NOT FOR CONSTRUCTION

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VERTICAL

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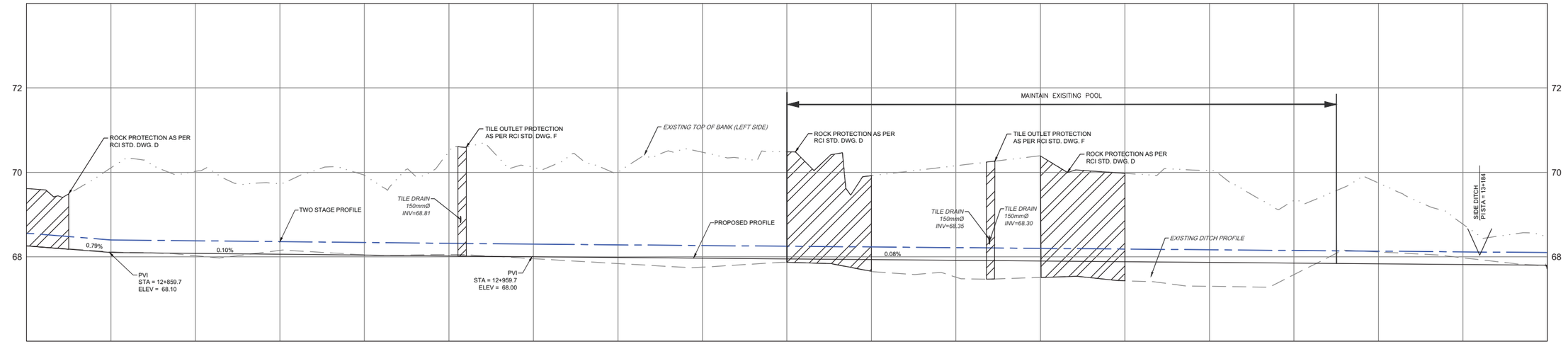
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CITY OF OTTAWA

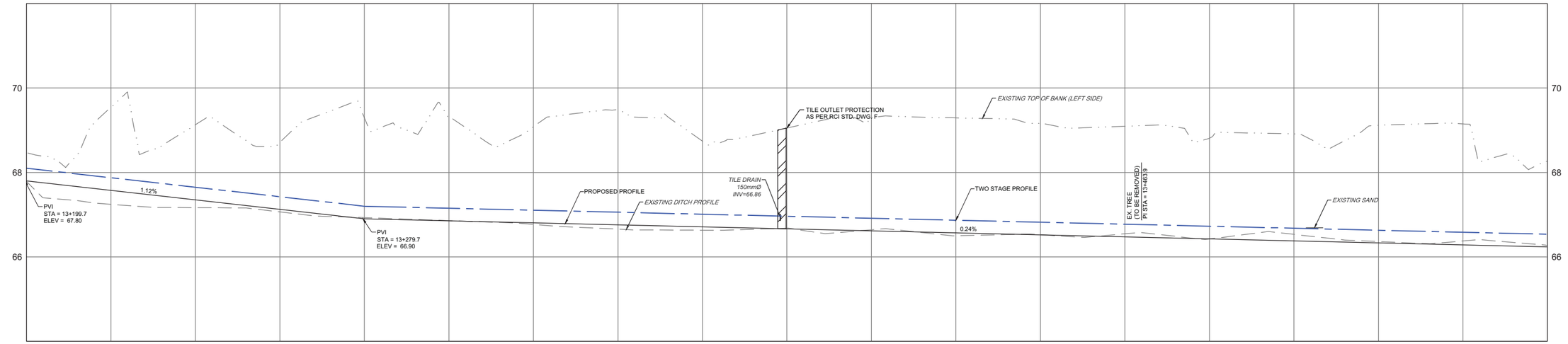
McKINNONS CREEK MUNICIPAL DRAIN

DRAIN PROFILE
STA. 12+140 TO STA. 12+840

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P4



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
12+840	68.26	68.27
12+860	68.10	68.12
12+880	68.08	68.03
12+900	68.06	68.15
12+920	68.04	68.04
12+940	68.02	68.05
12+960	68.00	67.96
12+980	67.98	67.94
13+000	67.97	67.75
13+020	67.95	67.87
13+040	67.93	67.65
13+060	67.92	67.52
13+080	67.90	67.51
13+100	67.88	67.43
13+120	67.87	67.30
13+140	67.85	67.58
13+160	67.83	68.12
13+180	67.82	67.98
13+200	67.80	67.78



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
13+200	67.80	67.78
13+220	67.57	67.24
13+240	67.35	67.17
13+260	67.12	67.07
13+280	66.90	66.83
13+300	66.85	66.86
13+320	66.80	66.77
13+340	66.76	66.66
13+360	66.71	66.63
13+380	66.66	66.68
13+400	66.61	66.64
13+420	66.57	66.50
13+440	66.52	66.52
13+460	66.47	66.55
13+480	66.43	66.42
13+500	66.38	66.53
13+520	66.33	66.36
13+540	66.28	66.39
13+560	66.24	66.28

NOT FOR CONSTRUCTION

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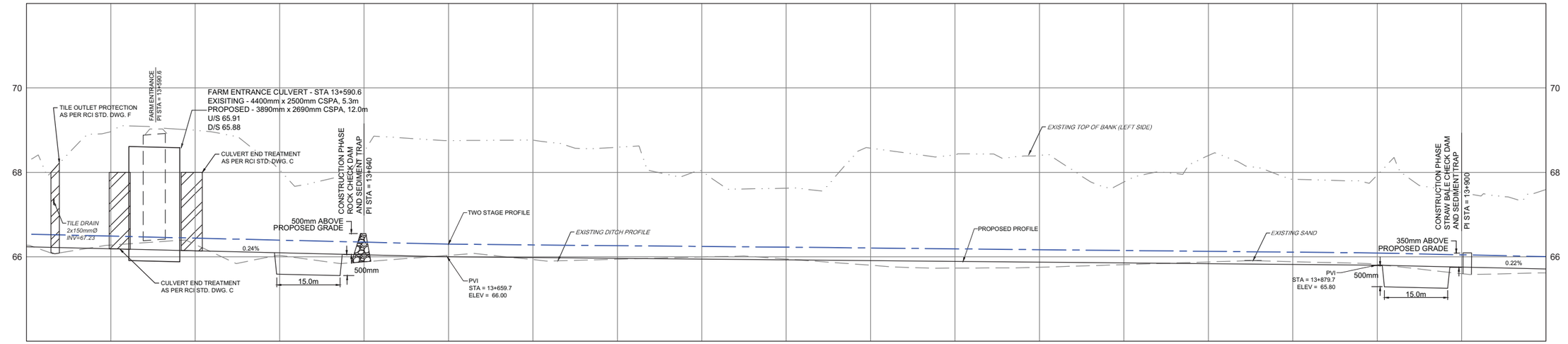
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APPROVED	AJR

CITY OF OTTAWA

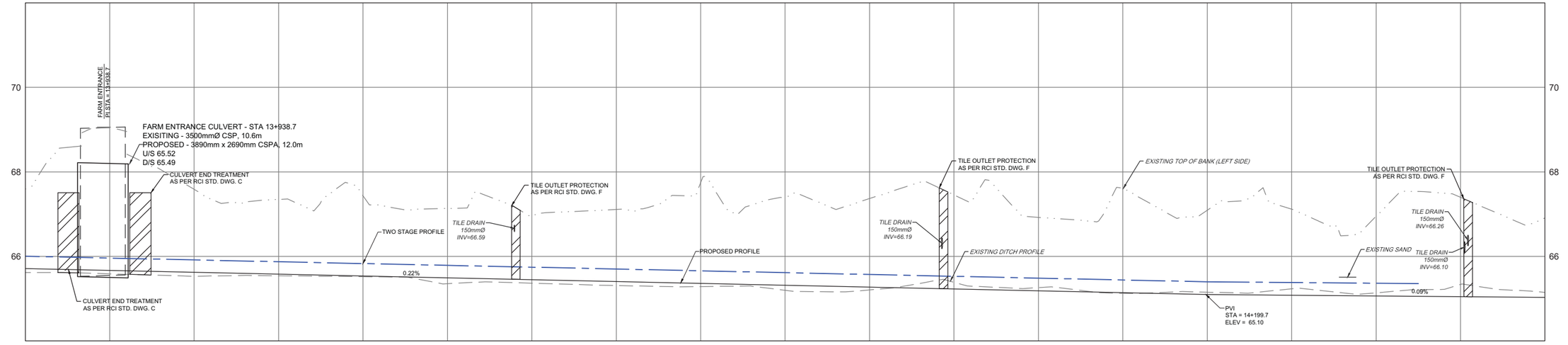
McKINNONS CREEK MUNICIPAL DRAIN

DRAIN PROFILE
STA. 12+840 TO STA. 13+560

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P5



STATION	EXISTING FIRM BOTTOM	PROPOSED GRADE
13+560	66.29	66.24
13+580	66.28	66.19
13+600	66.29	66.14
13+620	66.03	66.09
13+640	65.88	66.05
13+660	66.03	66.00
13+680	65.93	65.98
13+700	65.94	65.96
13+720	65.89	65.95
13+740	65.95	65.93
13+760	65.80	65.91
13+780	65.73	65.89
13+800	65.75	65.87
13+820	65.82	65.85
13+840	65.88	65.84
13+860	65.89	65.82
13+880	65.82	65.80
13+900	65.60	65.76
13+920	65.62	65.71



STATION	EXISTING FIRM BOTTOM	PROPOSED GRADE
13+920	65.62	65.71
13+940	65.59	65.67
13+960	65.53	65.62
13+980	65.54	65.58
14+000	65.52	65.54
14+020	65.36	65.49
14+040	65.37	65.45
14+060	65.31	65.41
14+080	65.29	65.36
14+100	65.20	65.32
14+120	65.21	65.27
14+140	65.39	65.23
14+160	65.26	65.19
14+180	65.13	65.14
14+200	65.15	65.10
14+220	65.23	65.08
14+240	65.14	65.06
14+260	65.34	65.05
14+280	65.15	65.03

NOT FOR CONSTRUCTION

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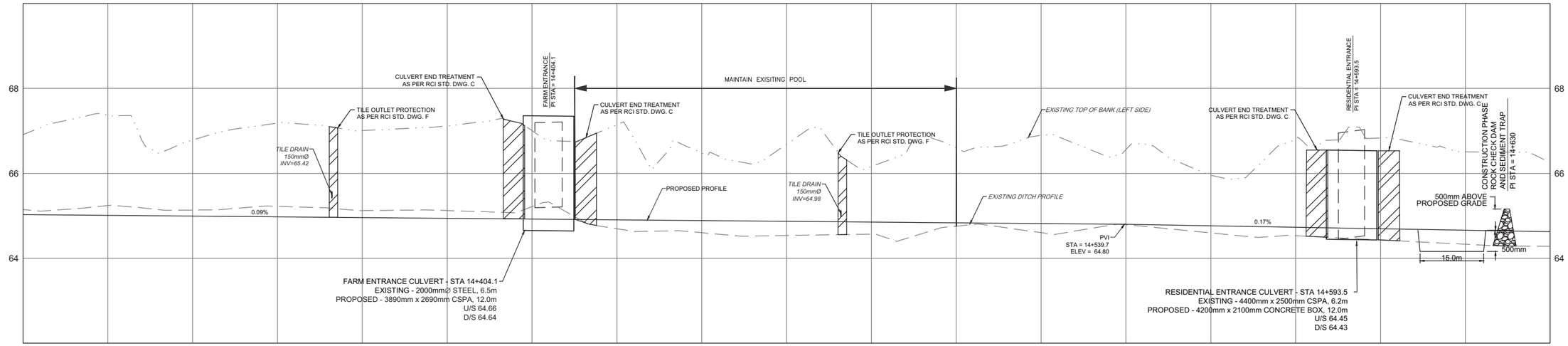
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CITY OF OTTAWA

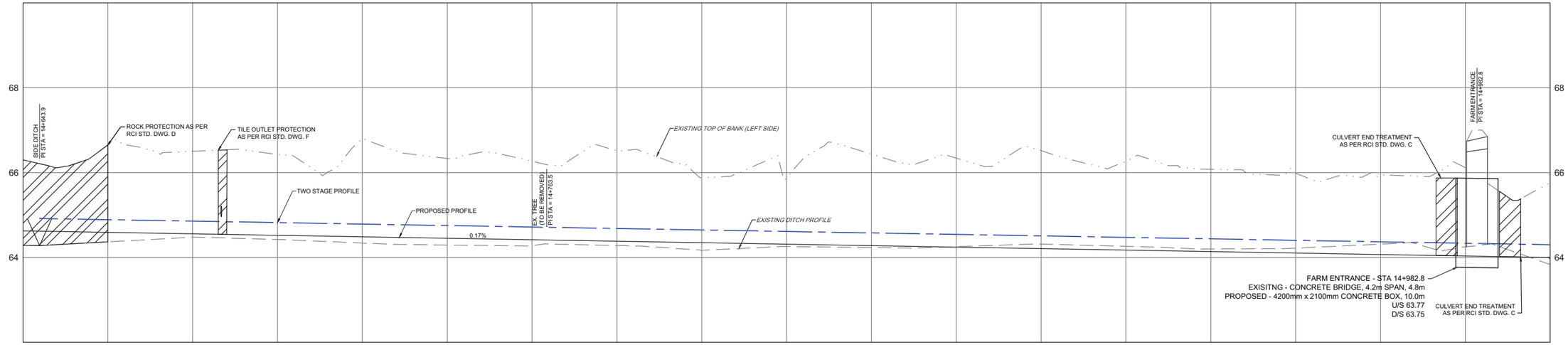
McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 13+560 TO STA. 14+280

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P6



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
14+280	65.03	65.15
14+300	65.01	65.24
14+320	64.99	65.14
14+340	64.98	65.22
14+360	64.96	65.12
14+380	64.94	65.12
14+400	64.92	65.22
14+420	64.91	64.70
14+440	64.89	64.60
14+460	64.87	64.54
14+480	64.85	64.57
14+500	64.83	64.76
14+520	64.82	64.60
14+540	64.80	64.79
14+560	64.76	64.60
14+580	64.73	64.53
14+600	64.70	64.43
14+620	64.66	64.33
14+640	64.63	64.28



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
14+640	64.63	64.28
14+660	64.59	64.37
14+680	64.56	64.48
14+700	64.52	64.42
14+720	64.49	64.34
14+740	64.45	64.29
14+760	64.42	64.28
14+780	64.38	64.28
14+800	64.35	64.17
14+820	64.31	64.26
14+840	64.28	64.23
14+860	64.24	64.25
14+880	64.21	64.32
14+900	64.17	64.26
14+920	64.14	64.20
14+940	64.10	64.22
14+960	64.07	64.31
14+980	64.03	64.25
15+000	64.00	63.83

NOT FOR CONSTRUCTION

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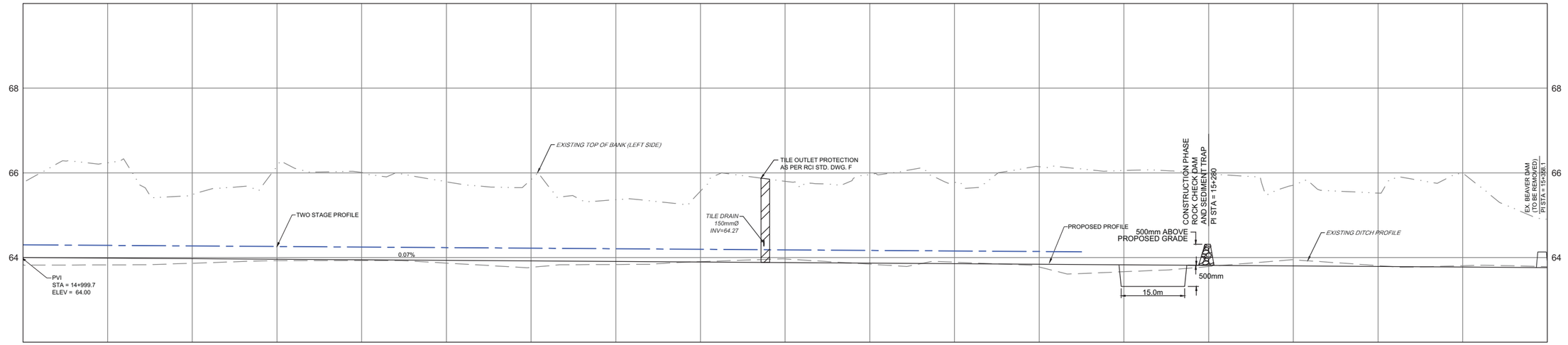
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APPROVED	AJR

CITY OF OTTAWA

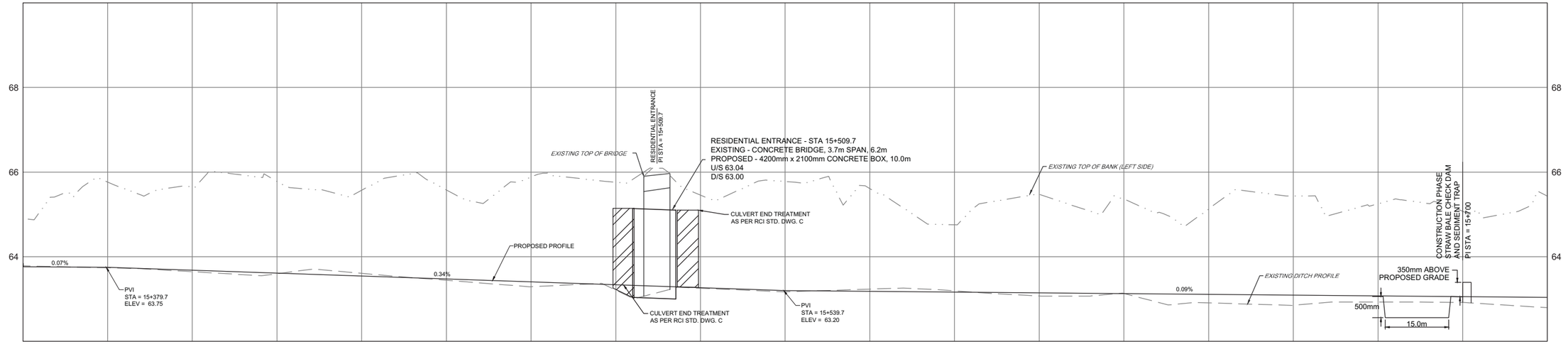
McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 14+280 TO STA. 15+000

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P7



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
15+000	64.00	63.83
15+020	63.99	63.83
15+040	63.97	63.87
15+060	63.96	63.93
15+080	63.95	63.93
15+100	63.93	63.87
15+120	63.92	63.77
15+140	63.91	63.84
15+160	63.89	63.90
15+180	63.88	63.97
15+200	63.87	63.84
15+220	63.86	63.89
15+240	63.84	63.78
15+260	63.83	63.67
15+280	63.82	63.79
15+300	63.80	63.95
15+320	63.79	63.81
15+340	63.78	63.81
15+360	63.76	63.79



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
15+360	63.76	63.79
15+380	63.75	63.74
15+400	63.68	63.65
15+420	63.61	63.60
15+440	63.54	63.61
15+460	63.47	63.44
15+480	63.41	63.29
15+500	63.34	63.21
15+520	63.27	63.26
15+540	63.20	63.17
15+560	63.18	63.23
15+580	63.16	63.20
15+600	63.15	63.07
15+620	63.13	63.13
15+640	63.11	62.91
15+660	63.09	62.85
15+680	63.07	62.93
15+700	63.06	62.82
15+720	63.04	62.80

NOT FOR CONSTRUCTION

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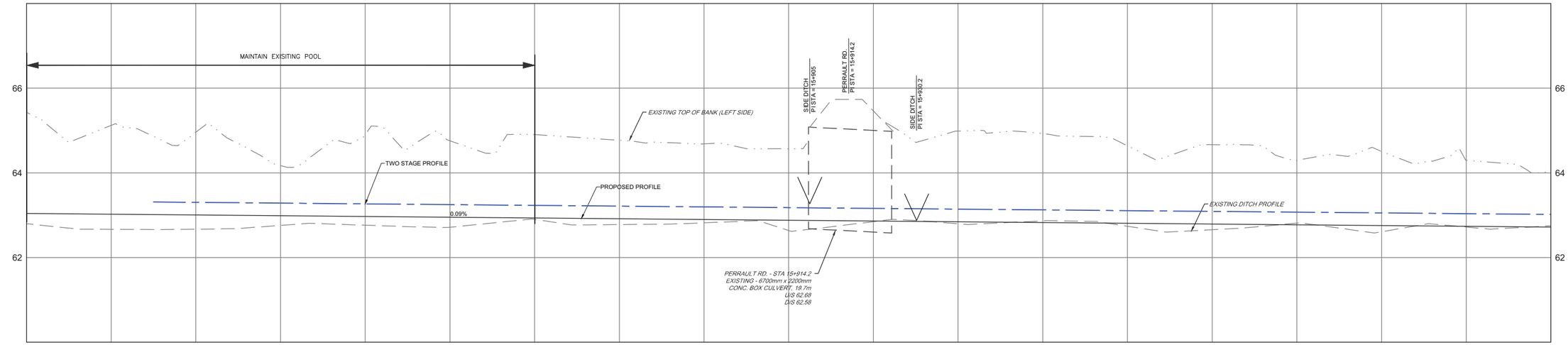
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APPROVED	AJR

CITY OF OTTAWA

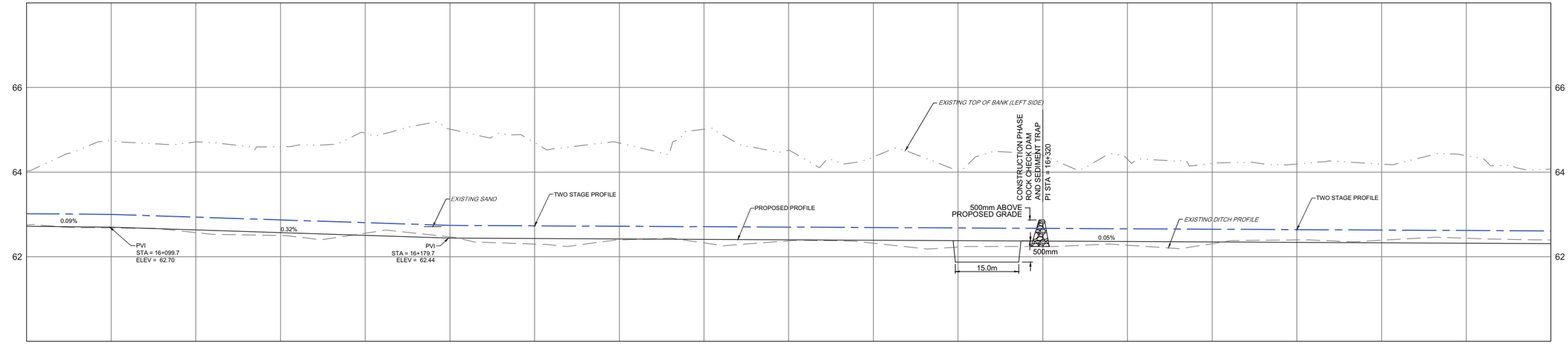
McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 15+000 TO STA. 15+720

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P8



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
15+720	63.04	62.80
15+740	63.02	62.67
15+760	63.00	62.67
15+780	62.99	62.76
15+800	62.97	62.76
15+820	62.95	62.72
15+840	62.93	62.90
15+860	62.91	62.78
15+880	62.90	62.82
15+900	62.88	62.64
15+920	62.86	62.85
15+940	62.84	62.80
15+960	62.82	62.87
15+980	62.81	62.74
16+000	62.79	62.66
16+020	62.77	62.81
16+040	62.75	62.61
16+060	62.74	62.72
16+080	62.72	62.75



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
16+080	62.72	62.75
16+100	62.70	62.68
16+120	62.63	62.57
16+140	62.57	62.50
16+160	62.50	62.56
16+180	62.44	62.47
16+200	62.43	62.30
16+220	62.42	62.39
16+240	62.41	62.33
16+260	62.40	62.37
16+280	62.39	62.32
16+300	62.38	62.23
16+320	62.37	62.24
16+340	62.36	62.27
16+360	62.35	62.31
16+380	62.34	62.40
16+400	62.33	62.39
16+420	62.32	62.44
16+440	62.31	62.39

NOT FOR CONSTRUCTION

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REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

SCALES
5 0 10
HORIZONTAL
0.5 0 1
VERTICAL

Robinson Consultants

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

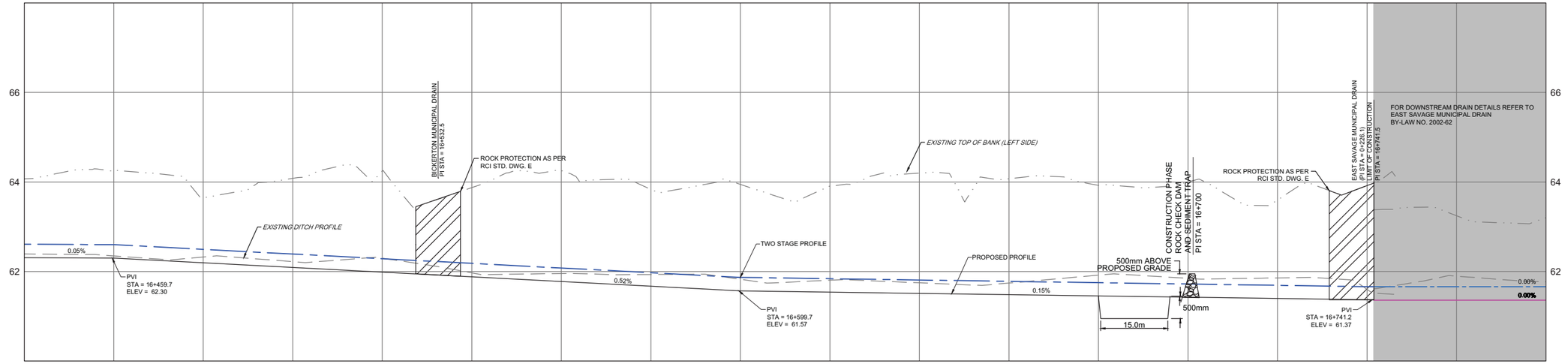
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CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 15+720 TO STA. 16+440

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P9



STATION	PROPOSED GRADE	EXISTING FIRM BOTTOM
16+440	62.31	62.39
16+460	62.30	62.35
16+480	62.19	62.32
16+500	62.09	62.22
16+520	61.99	62.30
16+540	61.88	61.97
16+560	61.78	61.96
16+580	61.67	61.93
16+600	61.57	61.83
16+620	61.54	61.81
16+640	61.51	61.75
16+660	61.48	61.74
16+680	61.46	61.92
16+700	61.43	61.85
16+720	61.40	61.86
16+740	61.37	61.60
16+760	61.36	61.19
16+780	61.36	59.19

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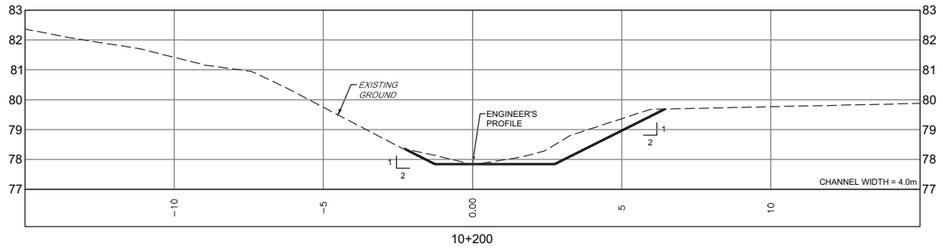
CITY OF OTTAWA

McKINNONS CREEK
MUNICIPAL DRAIN

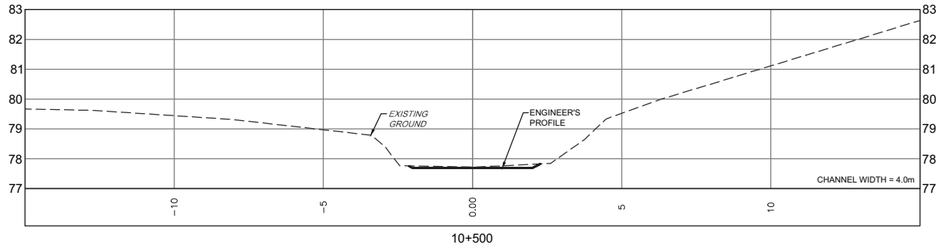
DRAIN PROFILE
STA. 16+440 TO STA. 16+760

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-P10

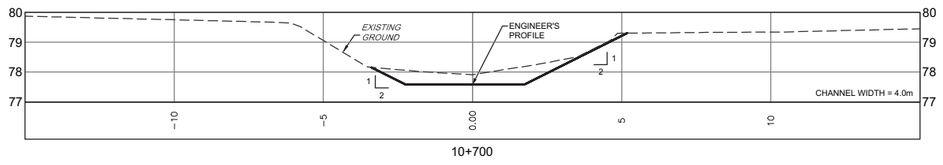
TYPICAL SECTION
STA. 10+000 TO STA. 10+350



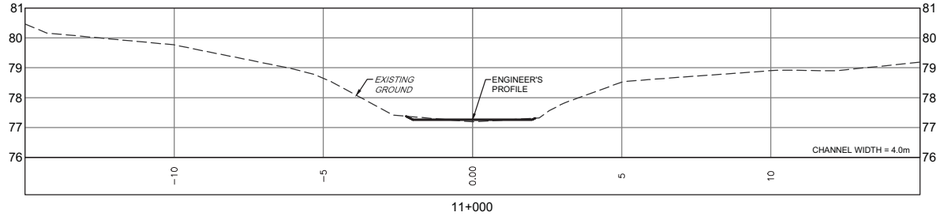
TYPICAL SECTION
STA. 10+350 TO STA. 10+600



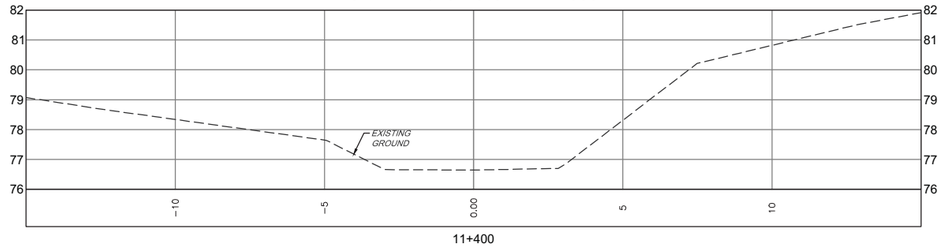
TYPICAL SECTION
STA. 10+600 TO STA. 10+850



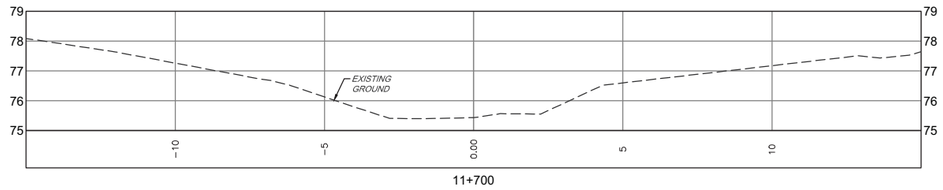
TYPICAL SECTION
STA. 10+850 TO STA. 11+070



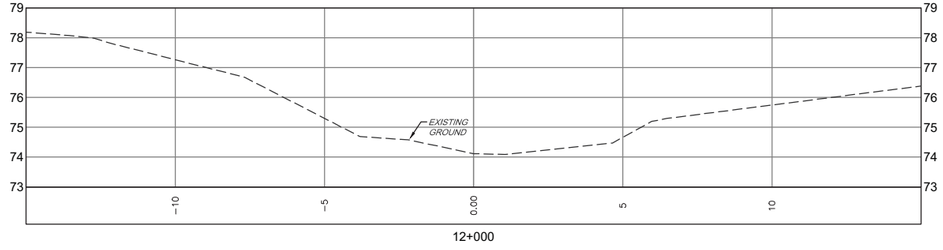
TYPICAL SECTION
STA. 11+070 TO STA. 11+550



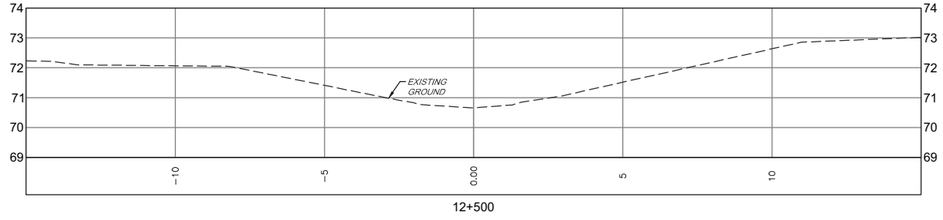
TYPICAL SECTION
STA. 11+550 TO STA. 11+850



TYPICAL SECTION
STA. 11+850 TO STA. 12+250



TYPICAL SECTION
STA. 12+250 TO STA. 12+670



NOTE: NO EXCAVATION TO OCCUR FROM STA. 11+070 TO 12+670

NOTE: THE CONSTRUCTION WORKING SPACE IS DEFINED IN SP1.0 - WORKING SPACE AND SP3.1 - EXCAVATION OF THE ENGINEER'S REPORT.

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REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 1005013335
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SCALES
HORIZONTAL 1 0 2
VERTICAL 1 0 2

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Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

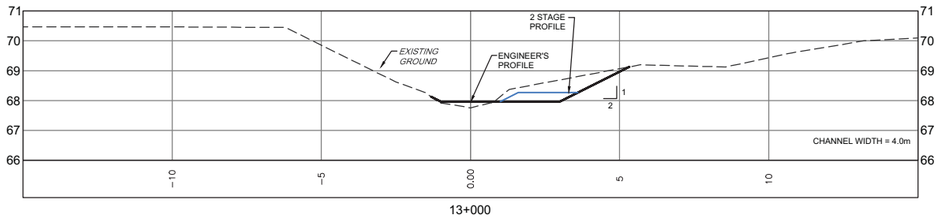
CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

CROSS SECTIONS

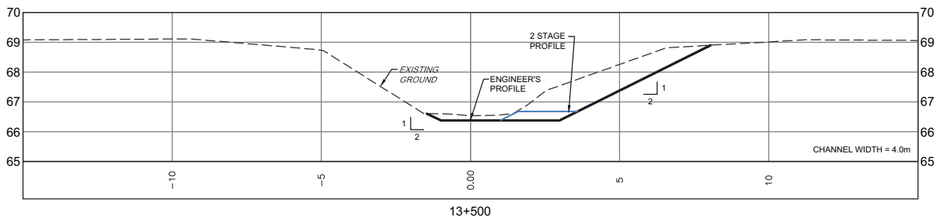
PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-C1

TYPICAL SECTION
STA. 12+670 TO STA. 13+250



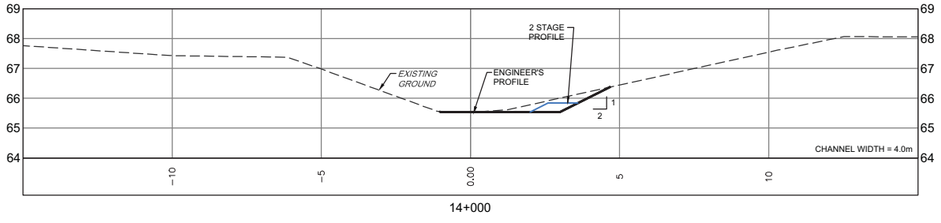
13+000

TYPICAL SECTION
STA. 13+250 TO STA. 13+750



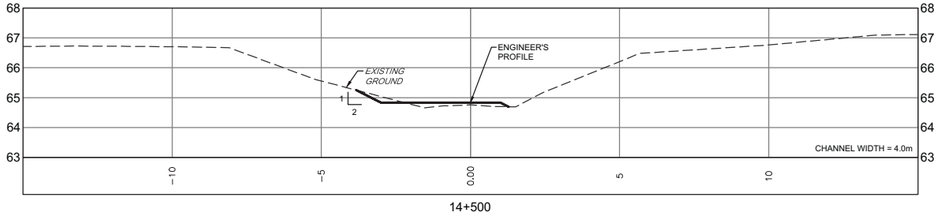
13+500

TYPICAL SECTION
STA. 13+750 TO STA. 14+250



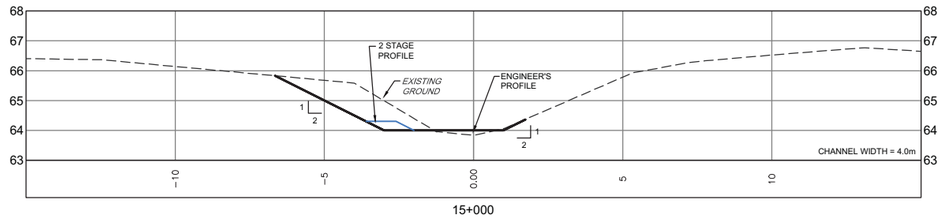
14+000

TYPICAL SECTION
STA. 14+250 TO STA. 14+643.81



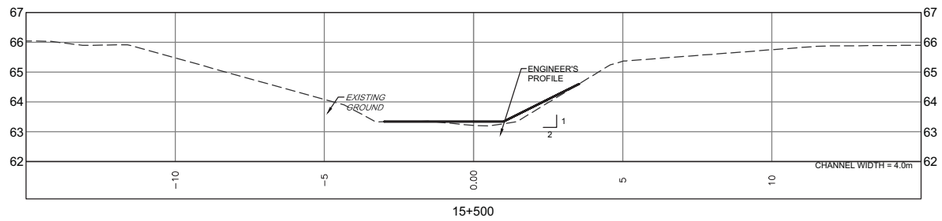
14+500

TYPICAL SECTION
STA. 14+643.81 TO STA. 15+250



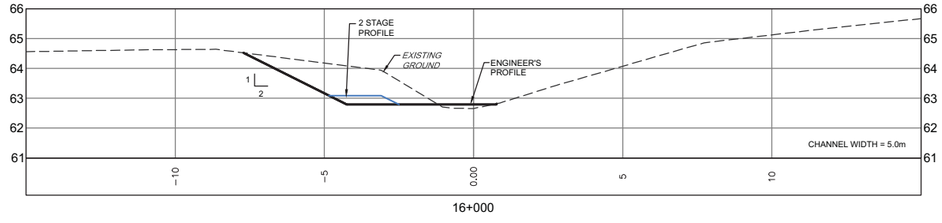
15+000

TYPICAL SECTION
STA. 15+250 TO STA. 15+750



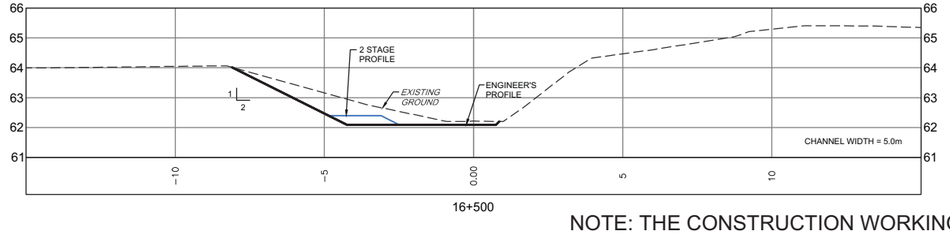
15+500

TYPICAL SECTION
STA. 15+750 TO STA. 16+250



16+000

TYPICAL SECTION
STA. 16+250 TO STA. 16+741.50



16+500

NOTE: THE CONSTRUCTION WORKING SPACE IS DEFINED IN SP1.0 - WORKING SPACE AND SP3.1 - EXCAVATION OF THE ENGINEER'S REPORT.

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A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
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Association of Professional Engineers of Ontario

SCALES
1 0 2
HORIZONTAL
1 0 2
VERTICAL

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Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

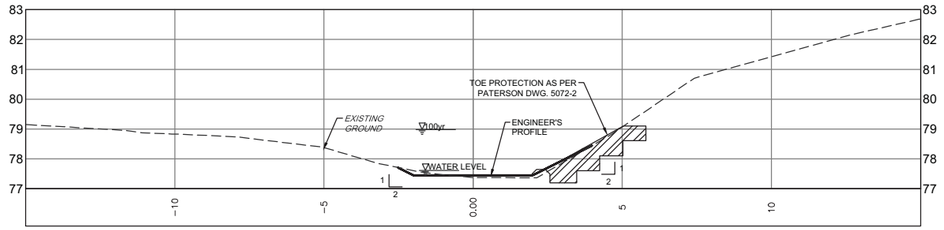
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DRAWN	DD
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APPROVED	AJR

CITY OF OTTAWA

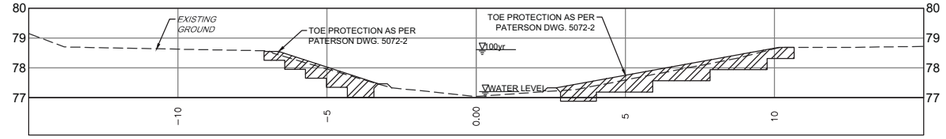
McKINNONS CREEK
MUNICIPAL DRAIN

CROSS SECTIONS

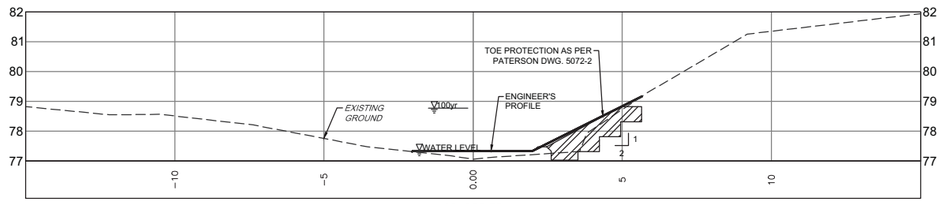
PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-C2



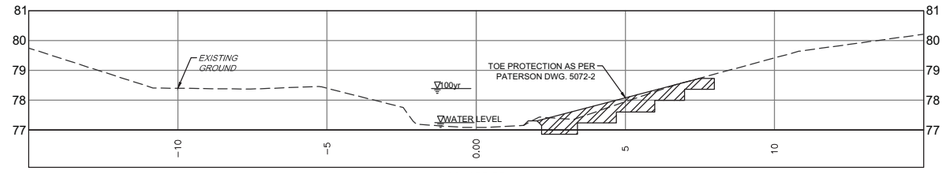
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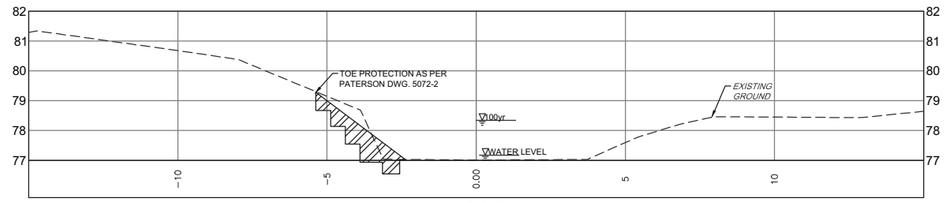
11+071.41



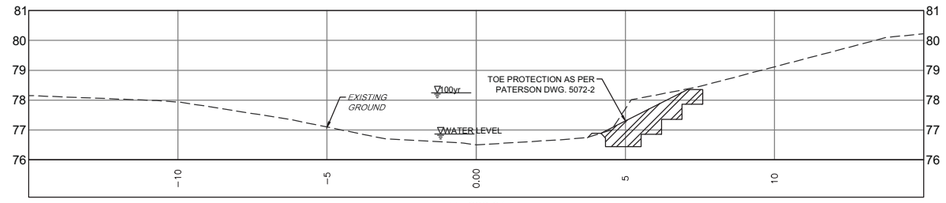
10+965.50



11+188.63



11+218.58



11+286.91

NOTE: NO EXCAVATION TO OCCUR FROM STA. 11+070 TO 12+670

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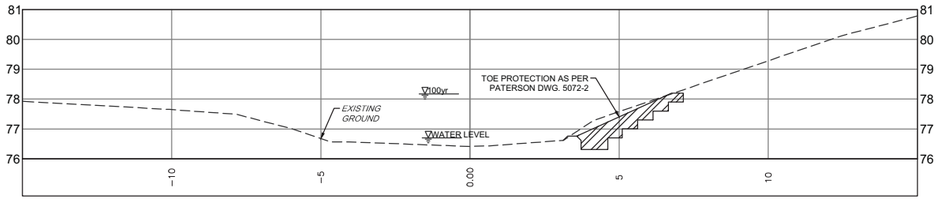
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APPROVED	AJR

CITY OF OTTAWA

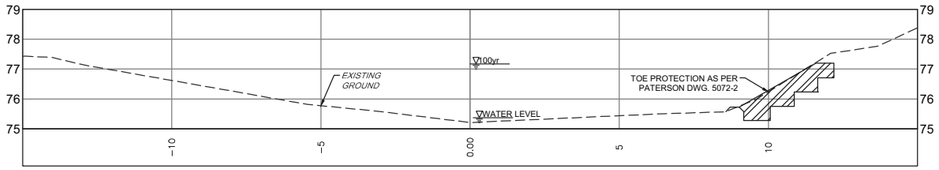
McKINNONS CREEK MUNICIPAL DRAIN

SPECIAL CROSS SECTIONS DETAILS (TOE PROTECTION)

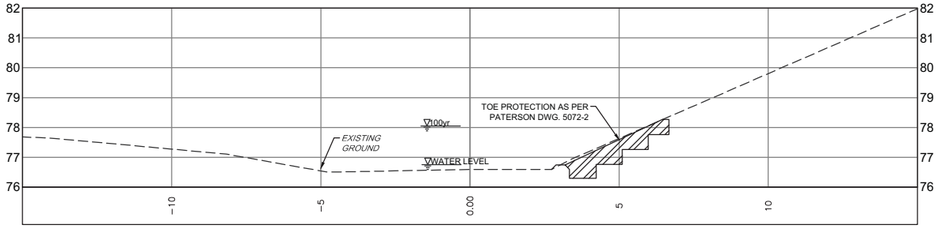
PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-X1



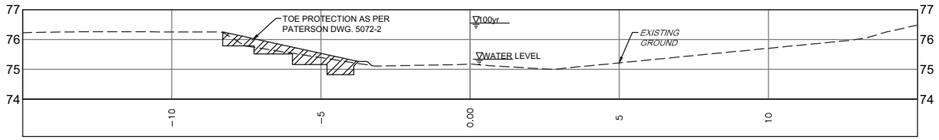
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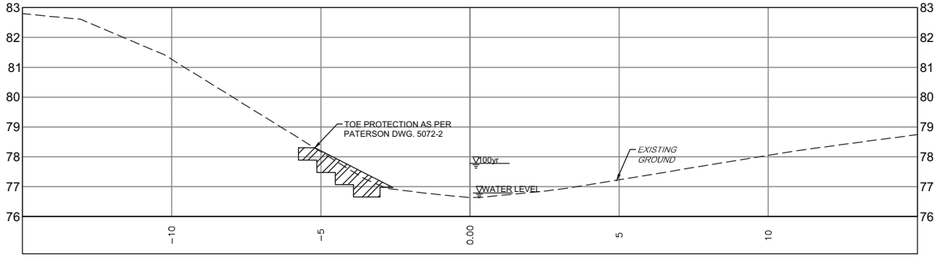
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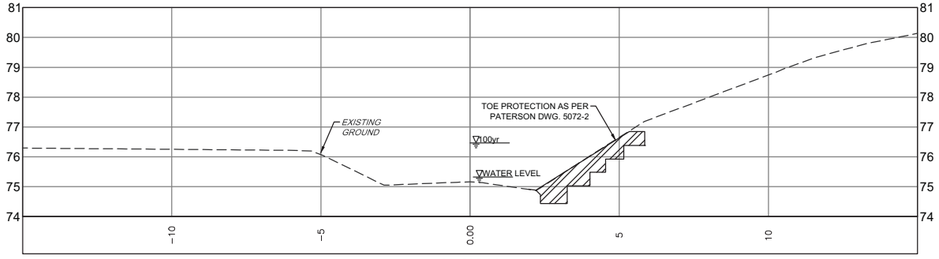
11+367.41



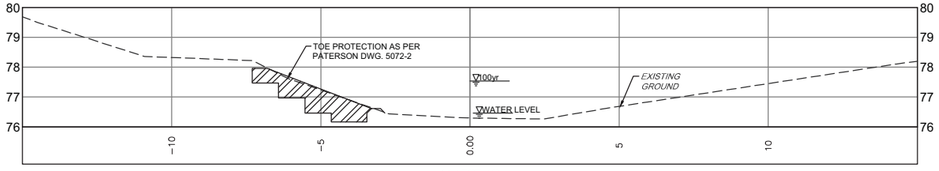
11+781.27



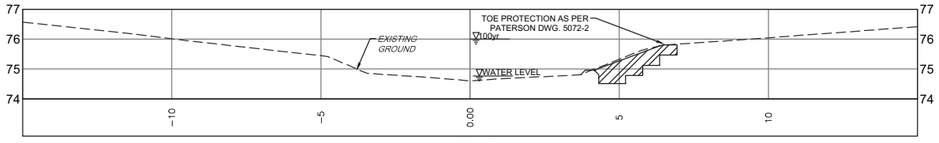
11+457.62



11+805.04



11+527.43



11+914.78

NOTE: NO EXCAVATION TO OCCUR FROM STA. 11+070 TO 12+670

NOTE: THE CONSTRUCTION WORKING SPACE IS DEFINED IN SP1.0 - WORKING SPACE AND SP3.1 - EXCAVATION OF THE ENGINEER'S REPORT.

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24/05/30
PROVINCE OF ONTARIO

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1 0 2
HORIZONTAL
1 0 2
VERTICAL

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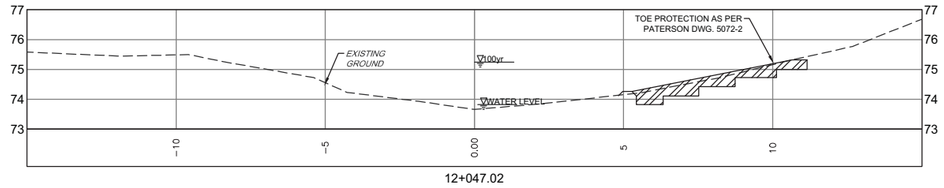
DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

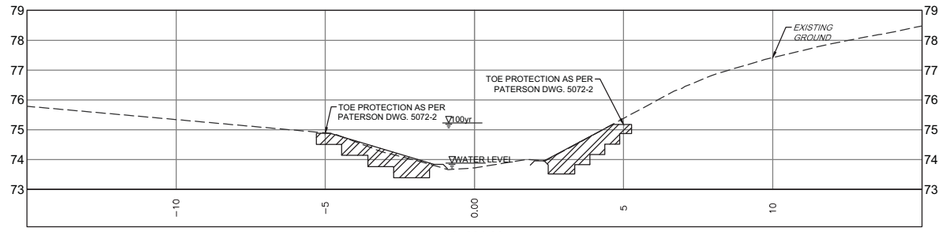
McKINNONS CREEK MUNICIPAL DRAIN

SPECIAL CROSS SECTIONS DETAILS (TOE PROTECTION)

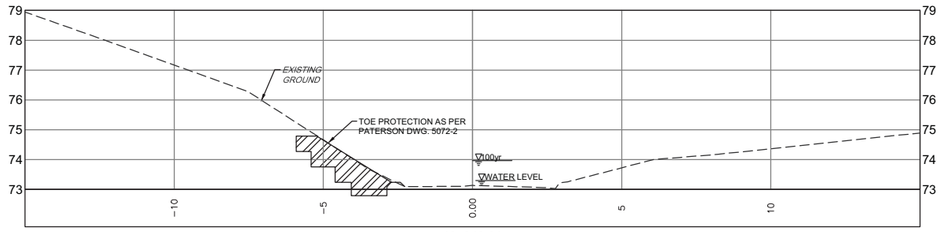
PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-X2



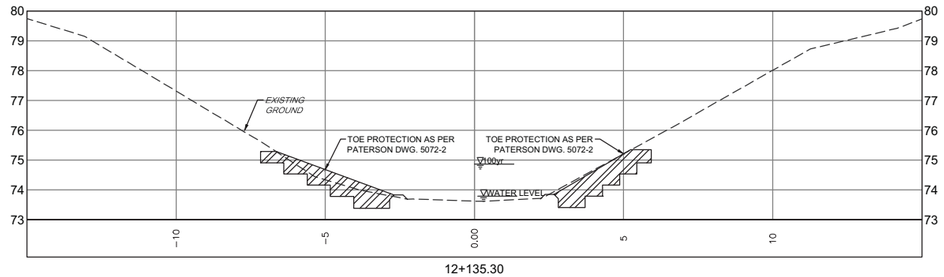
12+047.02



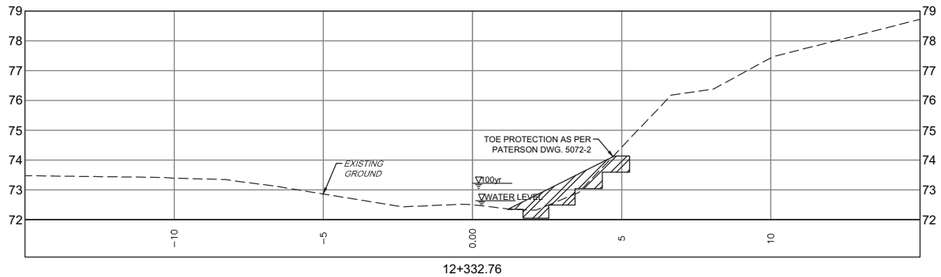
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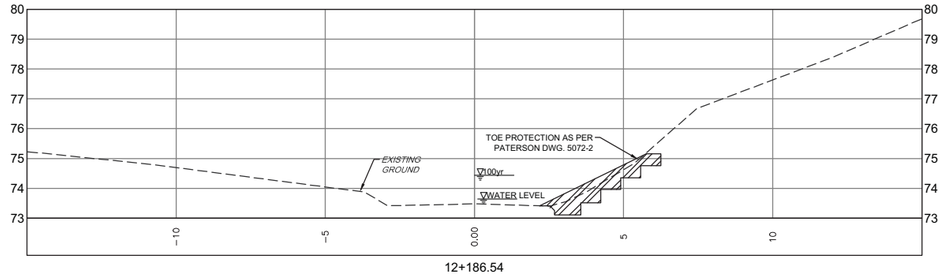
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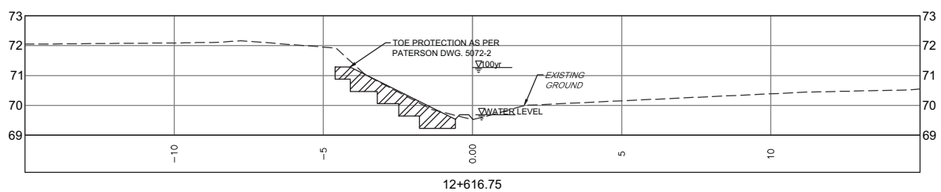
12+135.30



12+332.76



12+186.54



12+616.75

NOTE: NO EXCAVATION TO OCCUR FROM STA. 11+070 TO 12+670

NOTE: THE CONSTRUCTION WORKING SPACE IS DEFINED IN SP1.0 - WORKING SPACE AND SP3.1 - EXCAVATION OF THE ENGINEER'S REPORT.

NOT FOR CONSTRUCTION

NOTE: SITE CONDITIONS WERE SURVEYED IN 2016, AND CONFIRMED IN 2022

No.	DATE dd.mm.yy	REVISION	BY
1	03.06.22	ISSUED FOR CITY AND AGENCY REVIEW	AJR
2	17.09.24	ISSUED FOR SNC SECONDARY REVIEW	AJR
3	30.05.25	ISSUED FOR DISTRIBUTION	AJR

REGISTERED PROFESSIONAL ENGINEER
A. J. ROBINSON
24/05/30
PROVINCE OF ONTARIO

Professional Engineers Ontario
24/05/30
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501335
Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act.
Association of Professional Engineers of Ontario

SCALES
1 0 2
HORIZONTAL
1 0 2
VERTICAL

Robinson Consultants

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

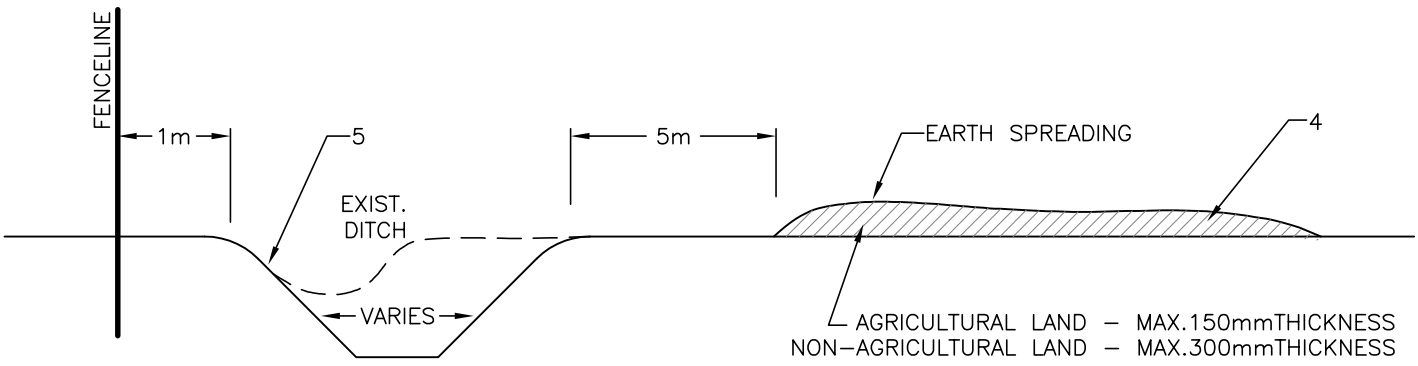
DESIGN	LF
CHECKED	AJR
DRAWN	DD
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

McKINNONS CREEK MUNICIPAL DRAIN

SPECIAL CROSS SECTIONS DETAILS (TOE PROTECTION)

PROJECT No.	16070
CONTRACT No.	
DATED	MAY 2025
DWG. No:	16070-X3



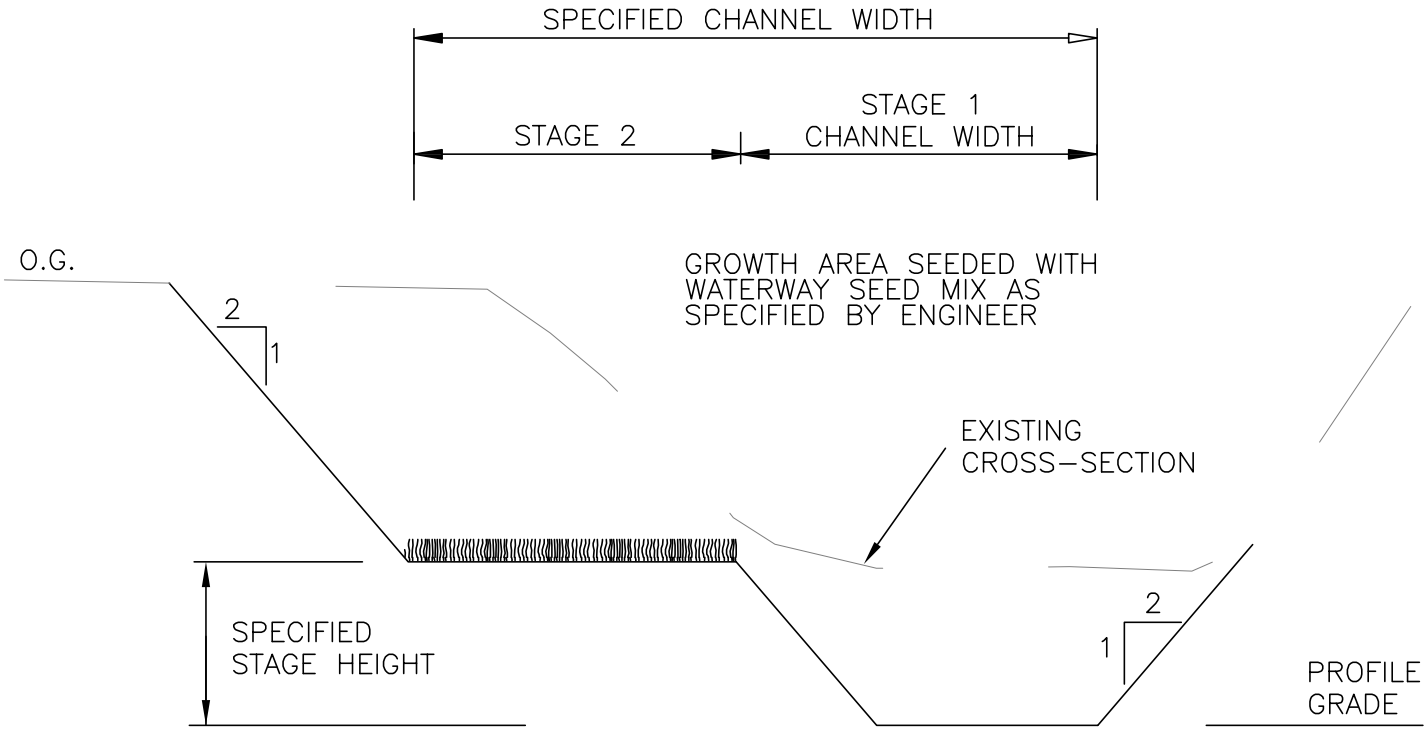
NOTES:

1. NO EXCAVATION WITHIN 1 METRE OF EXISTING FENCELINE.
2. SIDE SLOPES AND CHANNEL DIMENSIONS AS PER CONTRACT DRAWINGS.
3. NO SPOIL OR SPREADING WITHIN 5 METRES OF TOP OF BANK.
4. SPOIL THICKNESS, WIDTH, DRAINAGE OPENINGS AND SPREADING LOCATION AS NOTED IN THE SPECIAL PROVISIONS OR THE CONTRACT DOCUMENTS.
5. WHERE ONE–SIDED CONSTRUCTION IS SPECIFIED, THE EXISTING GRASSED SLOPE SHALL BE PRESERVED WHERE POSSIBLE.
6. SEEDING TO BE COMPLETED WITHIN 48 HOURS OF CONSTRUCTION.

DATED: FEB/21

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CONSULTING ENGINEERS
350 Palladium Dr.,Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592–6060

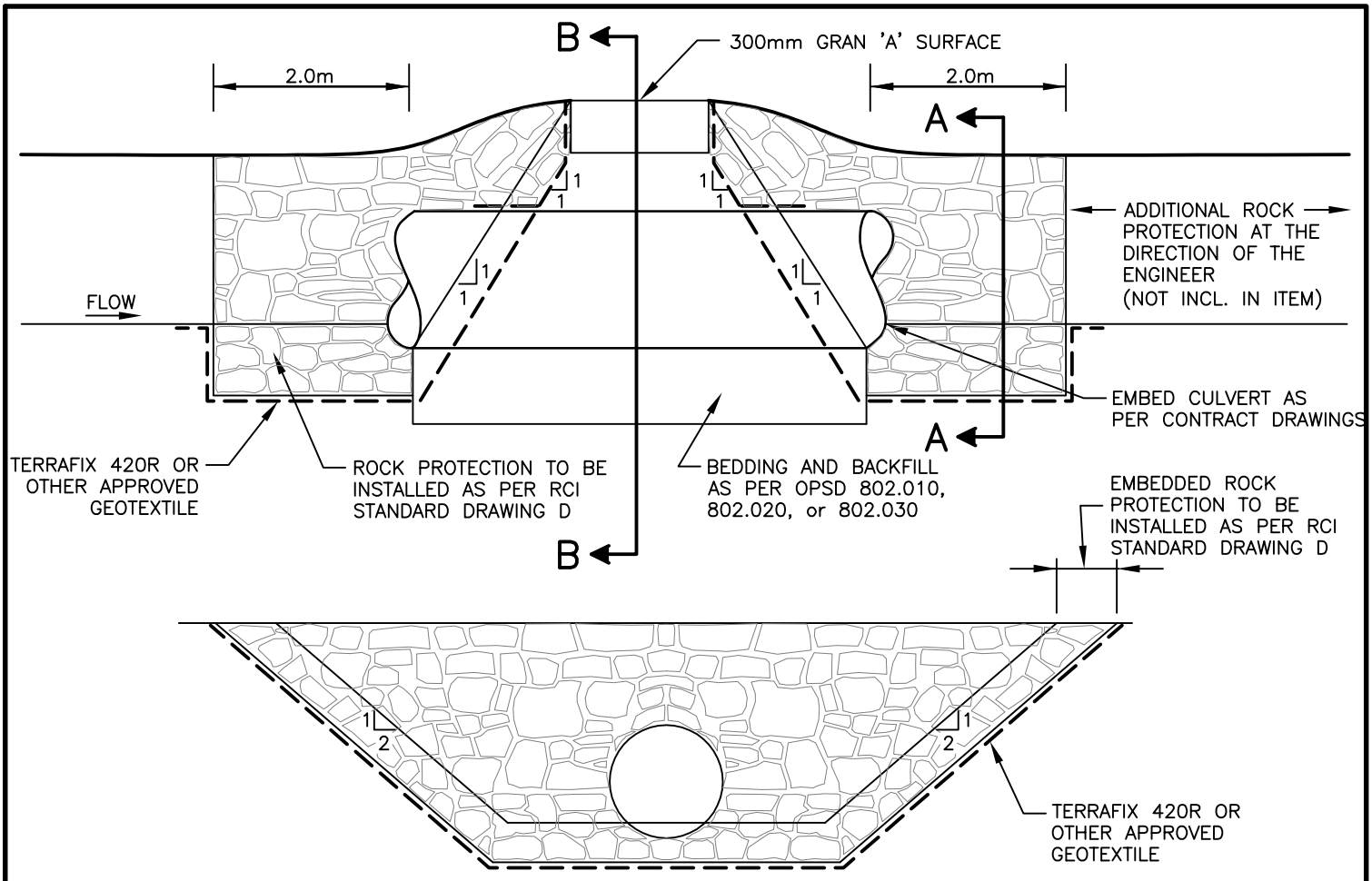
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	OPEN CHANNEL SYSTEMS EARTH CUT CHANNEL	STD.DWG.No. A
VERTICAL N.T.S.		



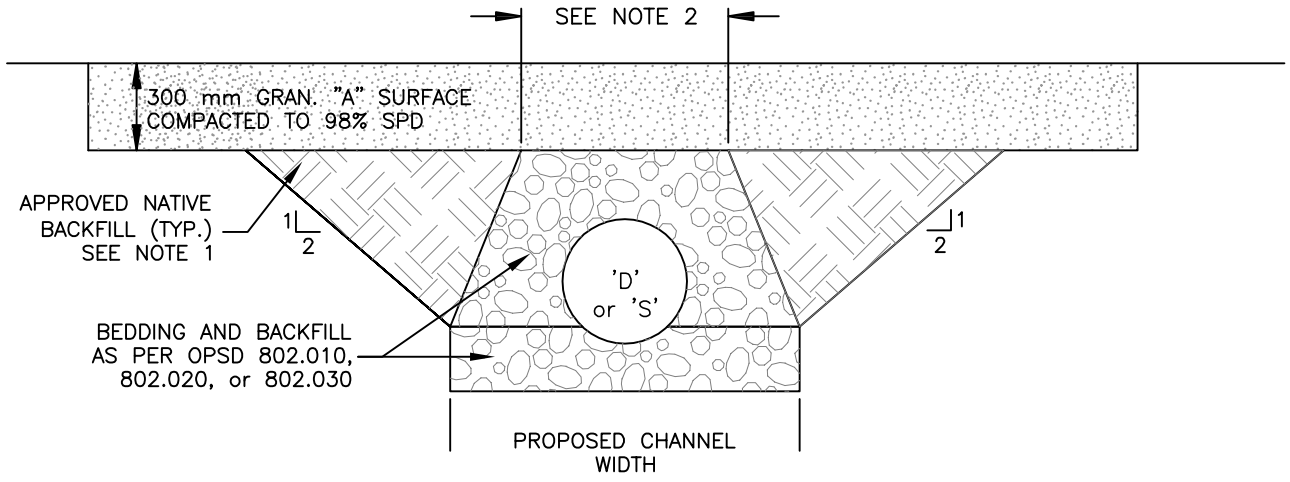
DATED: FEB/21

Robinson Consultants
CONSULTING ENGINEERS
350 Palladium Dr.,Suite 210
Kanata, Ontario, K2V 1A8
Telephone (613) 592-6060

SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.		
VERTICAL N.T.S.	TWO STAGE CHANNEL	STD.DWG.No. B



END SECTION A–A



SECTION B–B

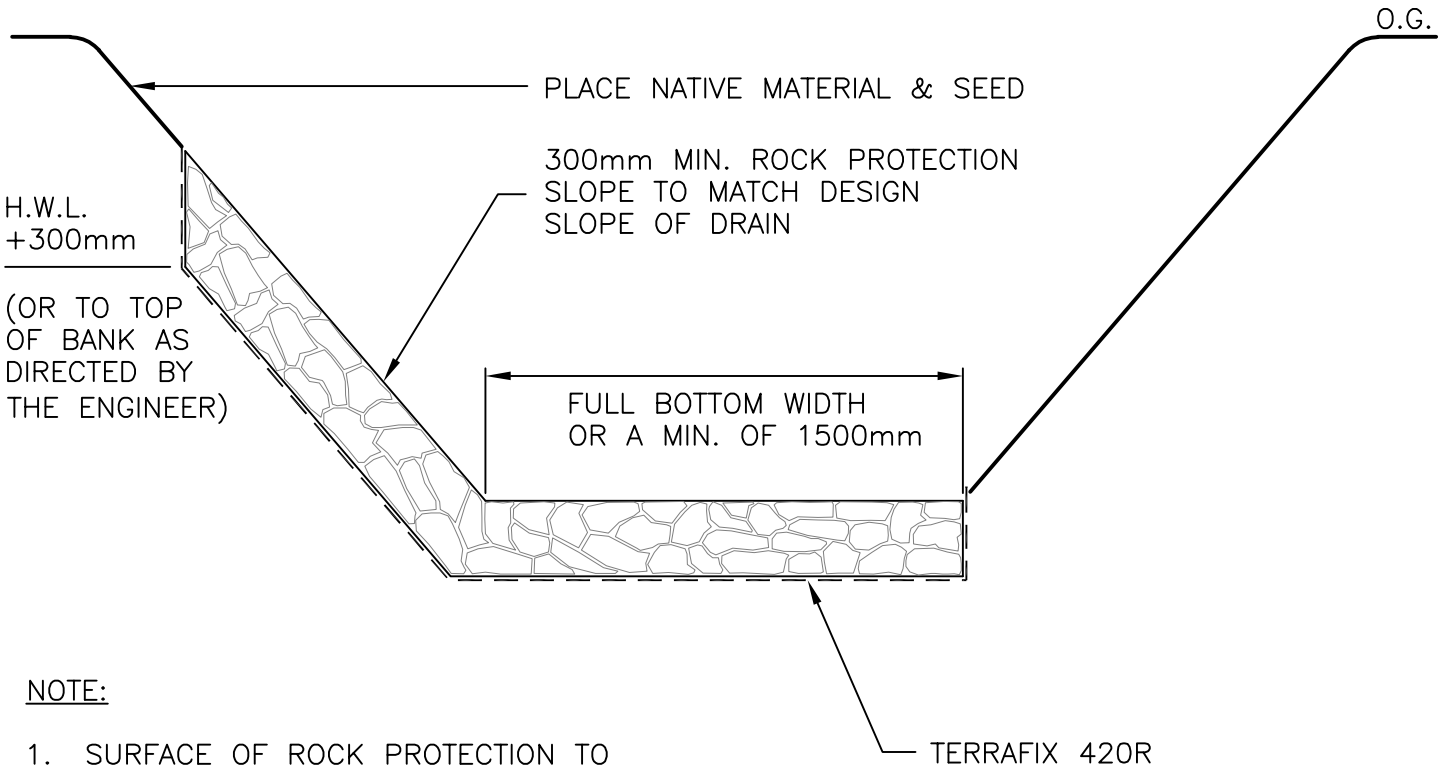
NOTES:

1. "Approved Native Backfill" material may consist of dry clay, sand or granular material with no large stones, boulders, debris, or organic material. Backfill must be placed in lifts not exceeding 300mm thick and compacted. All requirements for granular bedding, cover and surface course must be met prior to placing any backfill.
2. All dimensions to be in conformance with OPSD 802.010 (Flexible Pipe), 802.020 (Flexible Pipe Arch), or 802.030 (Rigid Pipe)
3. Follow manufacturers installation instructions for all pipes.

DATED: AUG/24

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SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	STANDARD FARM CROSSING AND CULVERT END TREATMENT DETAIL	STD.DWG.No. C
VERTICAL N.T.S.		



NOTE:

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

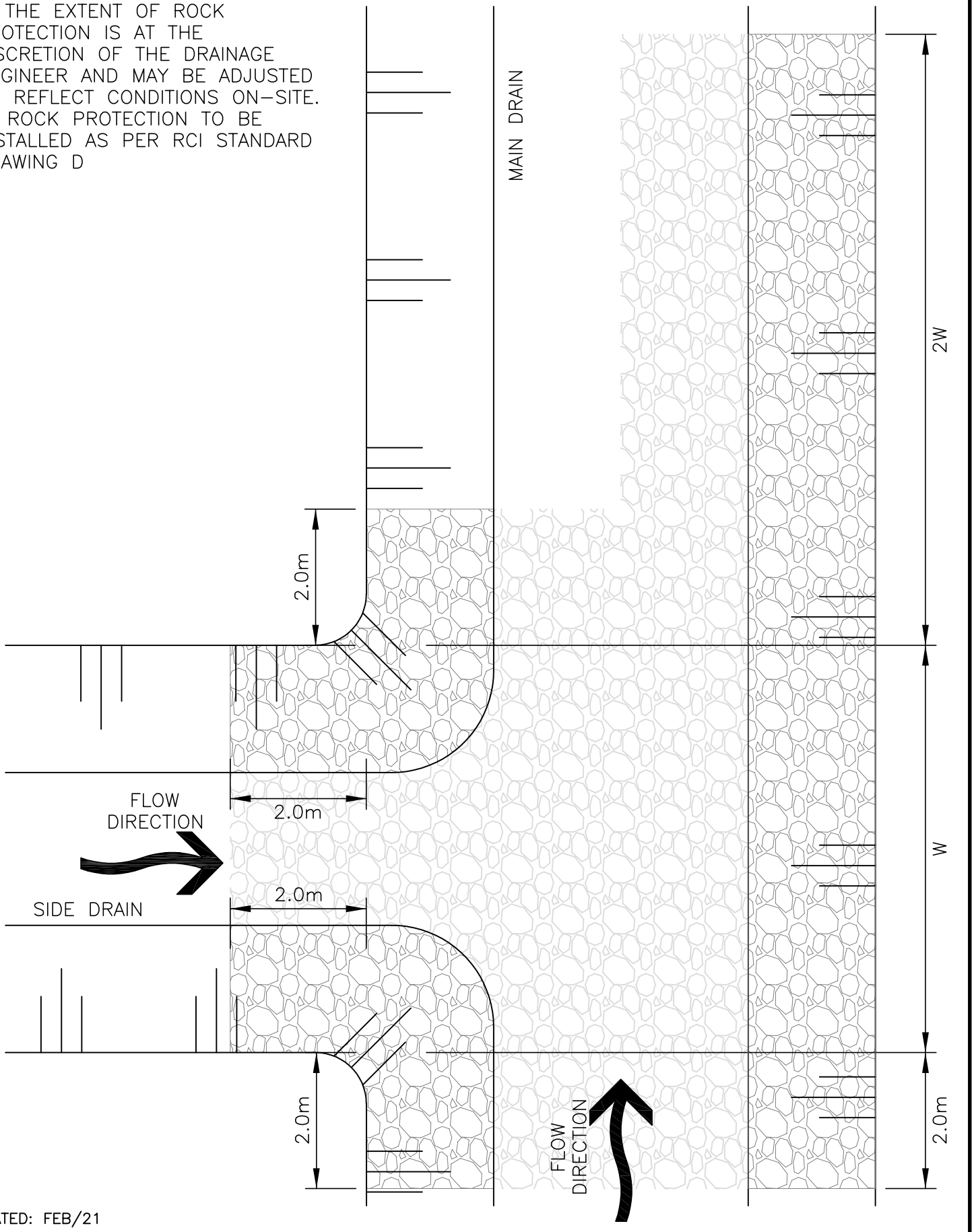
2. FOR ROCK PROTECTION, USE R–50 AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.

DATED: FEB/21

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Kanata, Ontario, K2V 1A8
Telephone (613) 592–6060

SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	TYPICAL ROCK PROTECTION EROSION CONTROL	STD.DWG.No. D
VERTICAL N.T.S.		

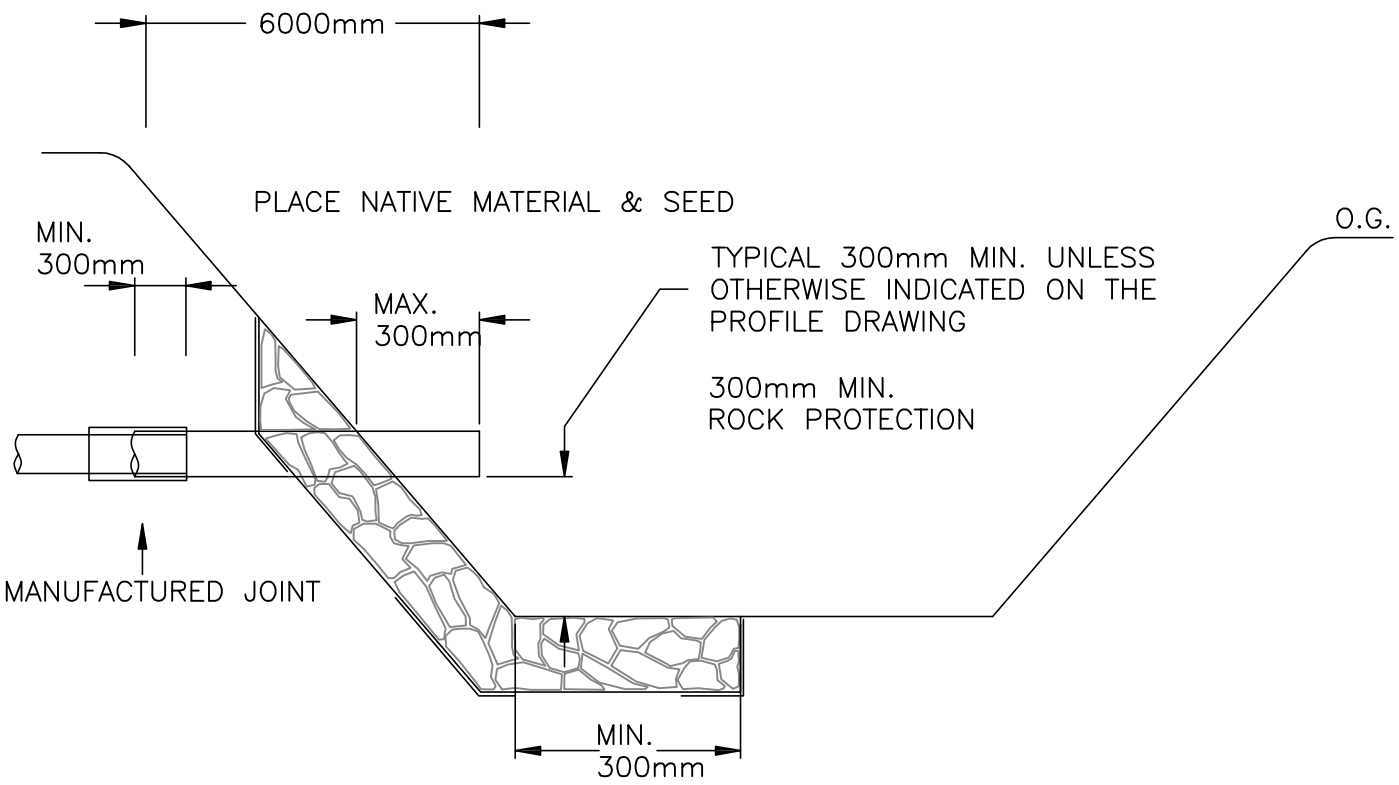
NOTE:
1. THE EXTENT OF ROCK PROTECTION IS AT THE DISCRETION OF THE DRAINAGE ENGINEER AND MAY BE ADJUSTED TO REFLECT CONDITIONS ON–SITE.
2. ROCK PROTECTION TO BE INSTALLED AS PER RCI STANDARD DRAWING D



DATED: FEB/21

Robinson Consultants CONSULTING ENGINEERS 350 Palladium Dr.,Suite 210 Kanata, Ontario, K2V 1A8 Telephone (613) 592–6060	SCALE HORIZONTAL N.T.S. VERTICAL N.T.S.	MUNICIPAL DRAIN STANDARD SIDE DITCH ROCK PROTECTION	PROJECT NO. STD.DWG.No. E

TILE OUTLET



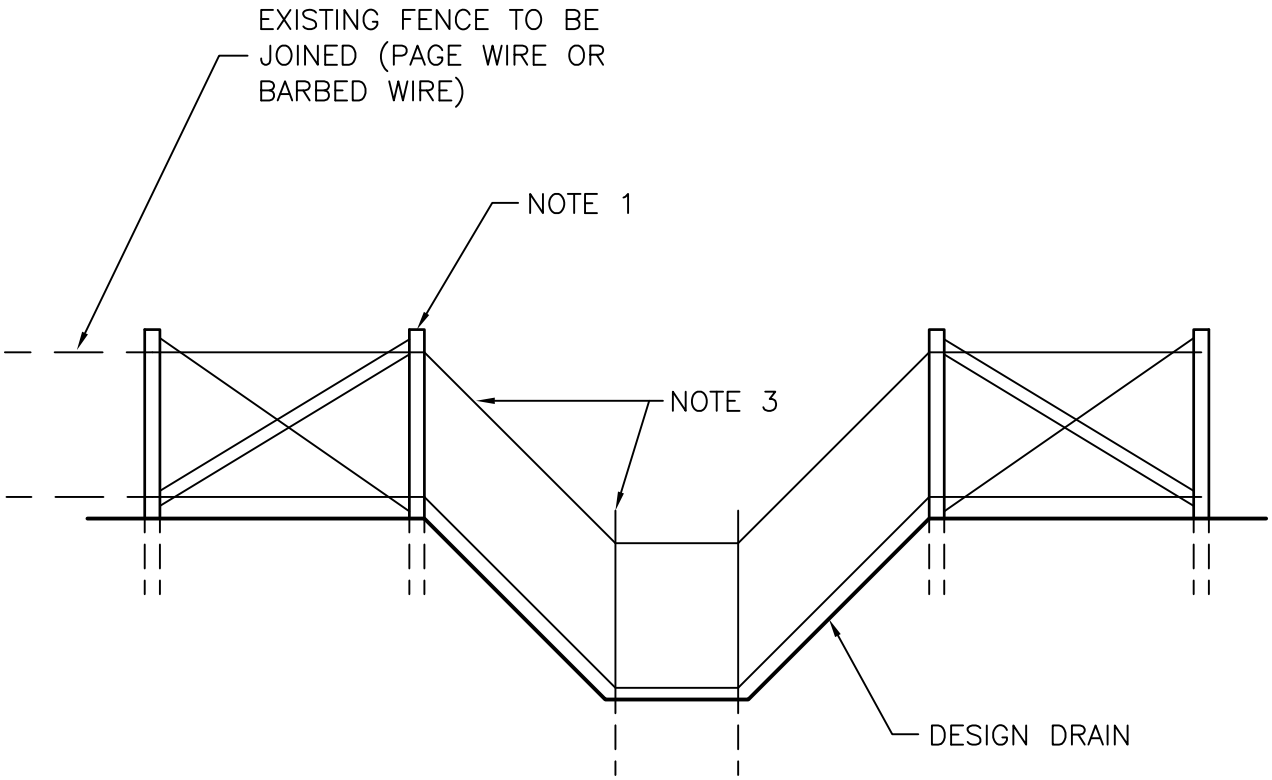
NOTES:

1. OUTLET TO BE CONTINUOUS HDPE (SMOOTHWALL – MIN. STIFFNESS OF 320KPa) AND A MIN. LENGTH OF 8.0m
2. ROCK PROTECTION TO BE PLACED AS REQUIRED TO PREVENT EROSION. THE SURFACE TO BE FLUSH WITH THE STREAM BED AND BANK. ROCK PROTECTION TO EXTEND A MINIMUM OF 1000mm UPSTREAM AND 1000mm DOWNSTREAM OF THE TILE OUTLET
3. THE PREFERRED CONNECTION BETWEEN THE OUTLET AND THE FIELD TILE IS TO BE A LOCKING MANUFACTURED JOINT, OTHER METHODOLOGY INCLUDES A TAPE SEALED JOINT ENCASED IN CONCRETE OR OVERLAP JOINT (MIN. 300mm) ENCASED IN CONCRETE.
4. A RODENT GRATE IS TO BE INSTALLED AT THE END OF THE TILE OUTLET WITHIN 48 HOURS OF CONNECTION COMPLETION.
5. MIN. SIDE SLOPE IS 1 VERT TO 2 HOR OR AS SPECIFIC IN THE ENGINEER'S REPORT
6. FOR ROCK PROTECTION, USE R–50 RIP–RAP AS PER OPSS MUNI 1004.05.05.02

DATED: OCT/23

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SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.		
VERTICAL N.T.S.	STANDARD TILE OUTLET	STD.DWG.No. F



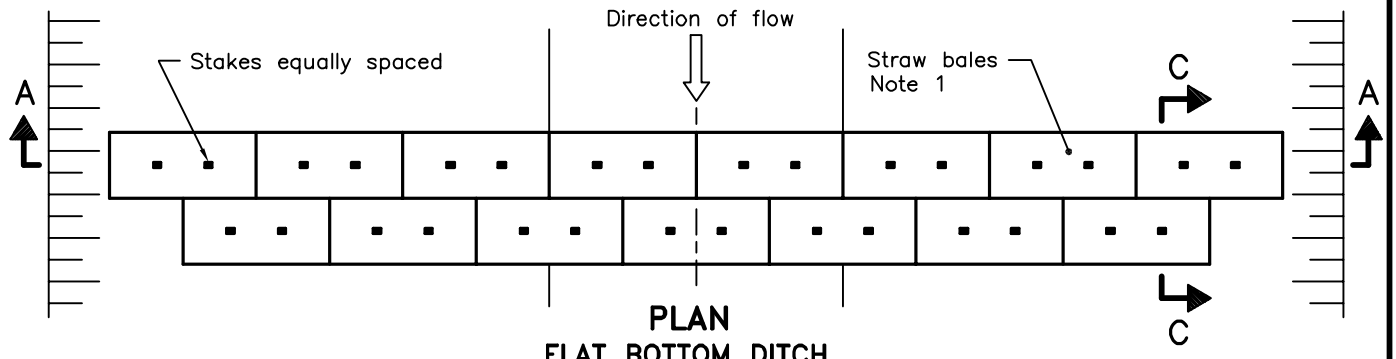
NOTES:

1. REFER TO OPSD DWG. No. 971.101 FOR BRACE PANEL DETAIL
2. USE OPSD 971.101 FOR REINSTATEMENT OF FENCE WHERE REQUIRED
3. T–RAILS SHALL BE NEW STEEL, MINIMUM LENGTH 2.4m.
4. CROSS–FENCE WIRE SHALL BE HEAVY GAUGE BARBED WIRE, MINIMUM 6 STRANDS AT EVEN SPACING

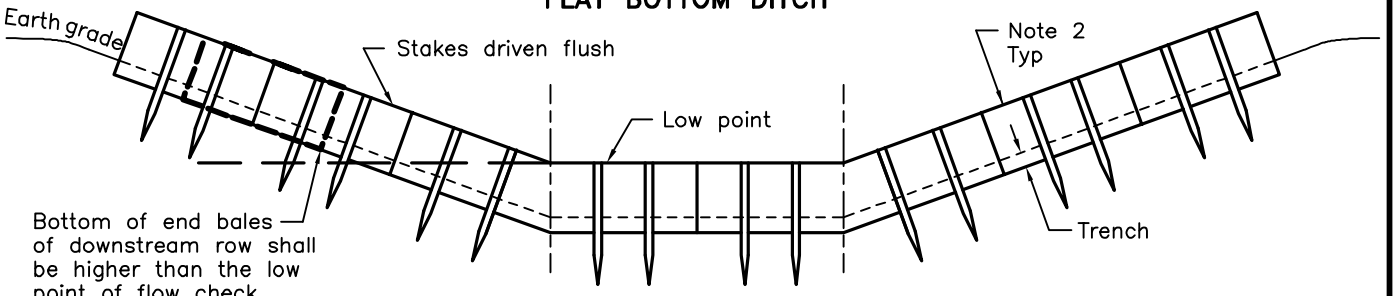
DATED: FEB/21

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350 Palladium Dr.,Suite 210
Kanata, Ontario, K2V 1A8
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SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	FENCE REINSTATEMENT AND CROSSING DETAIL	STD.DWG.No. H
VERTICAL N.T.S.		

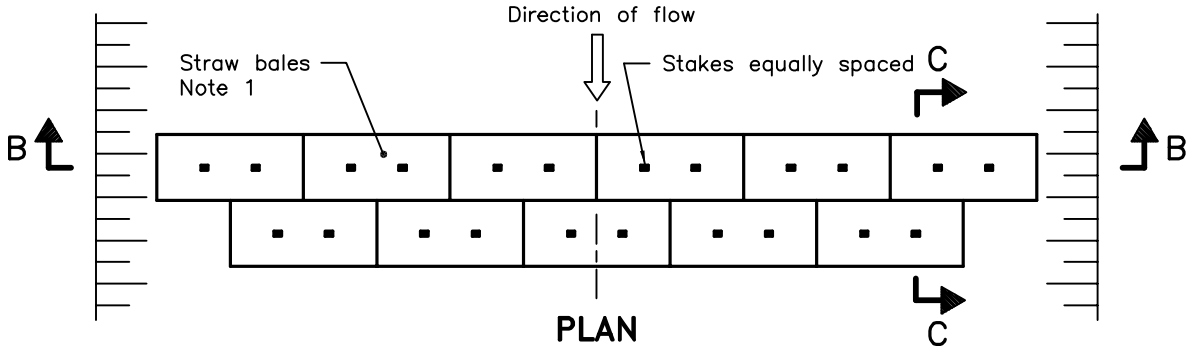


PLAN
FLAT BOTTOM DITCH

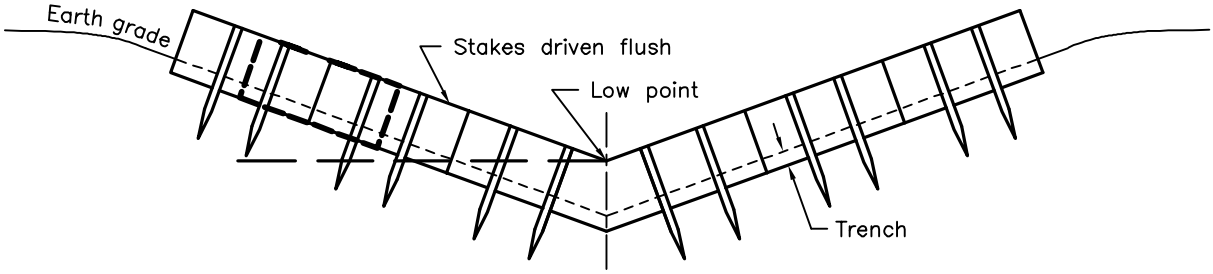


Bottom of end bales of downstream row shall be higher than the low point of flow check. Downstream bale position outlined. Typ

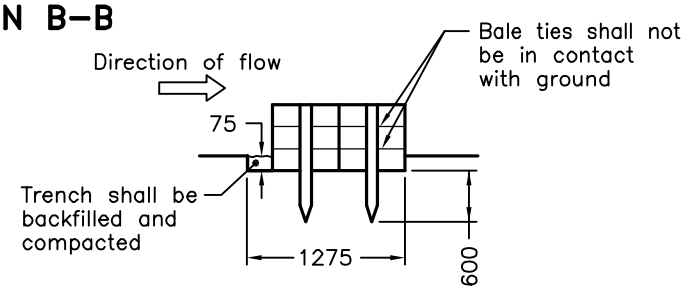
SECTION A–A



PLAN
V–DITCH



SECTION B–B



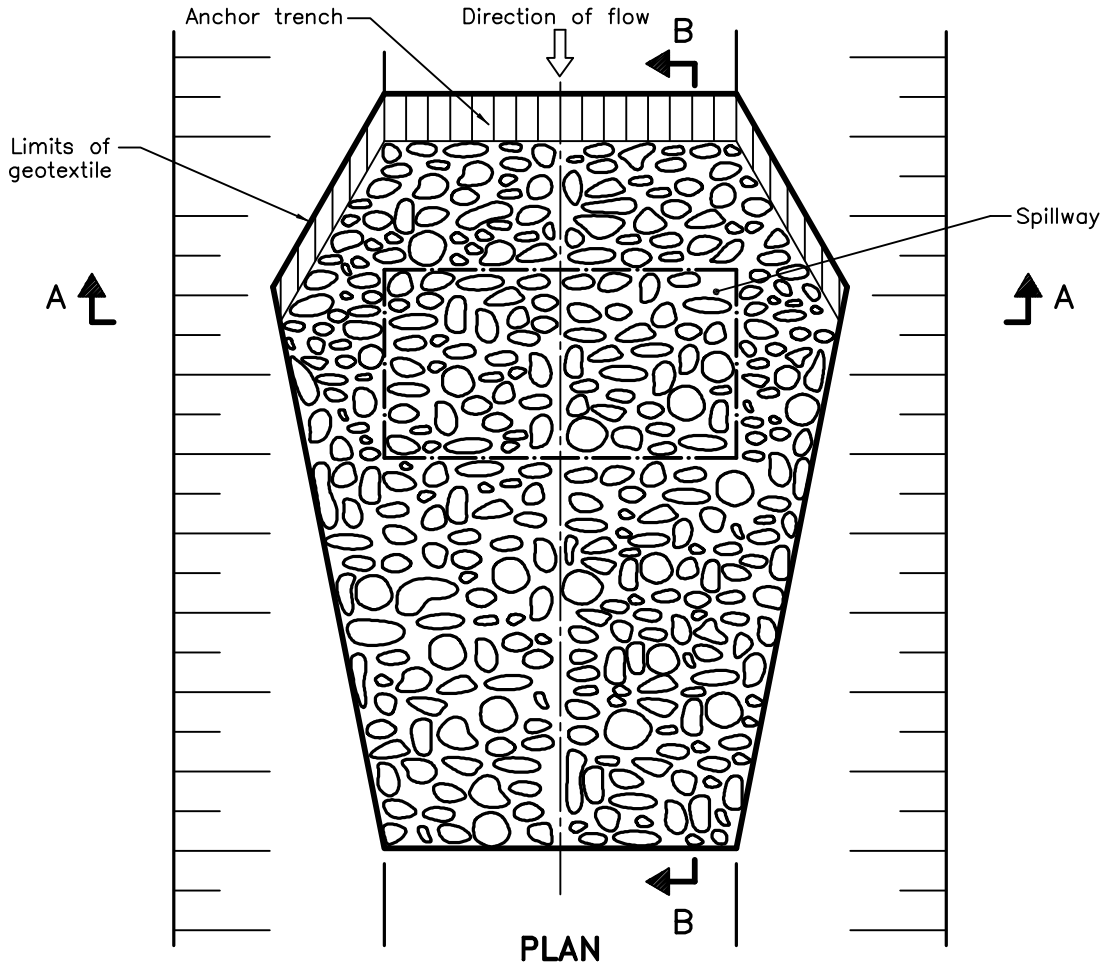
SECTION C–C

NOTES:

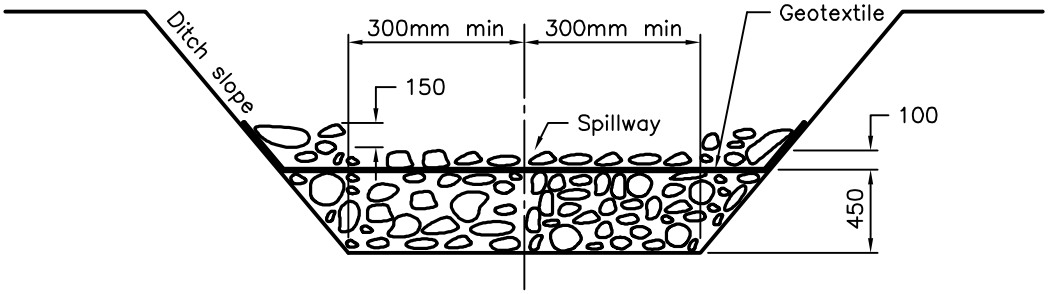
1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.

A All dimensions are in millimetres unless otherwise shown.

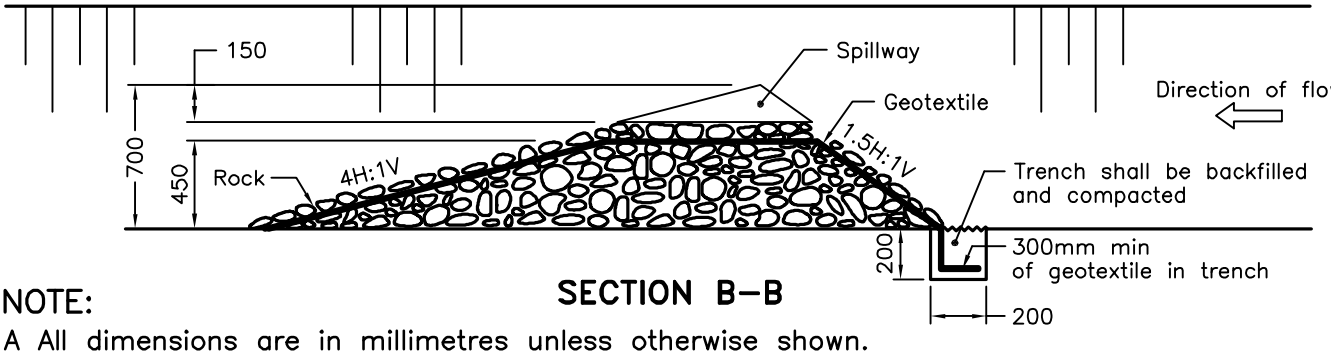
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
STRAW BALE FLOW CHECK DAM			
	OPSD 219.180		



PLAN
SPILLWAY



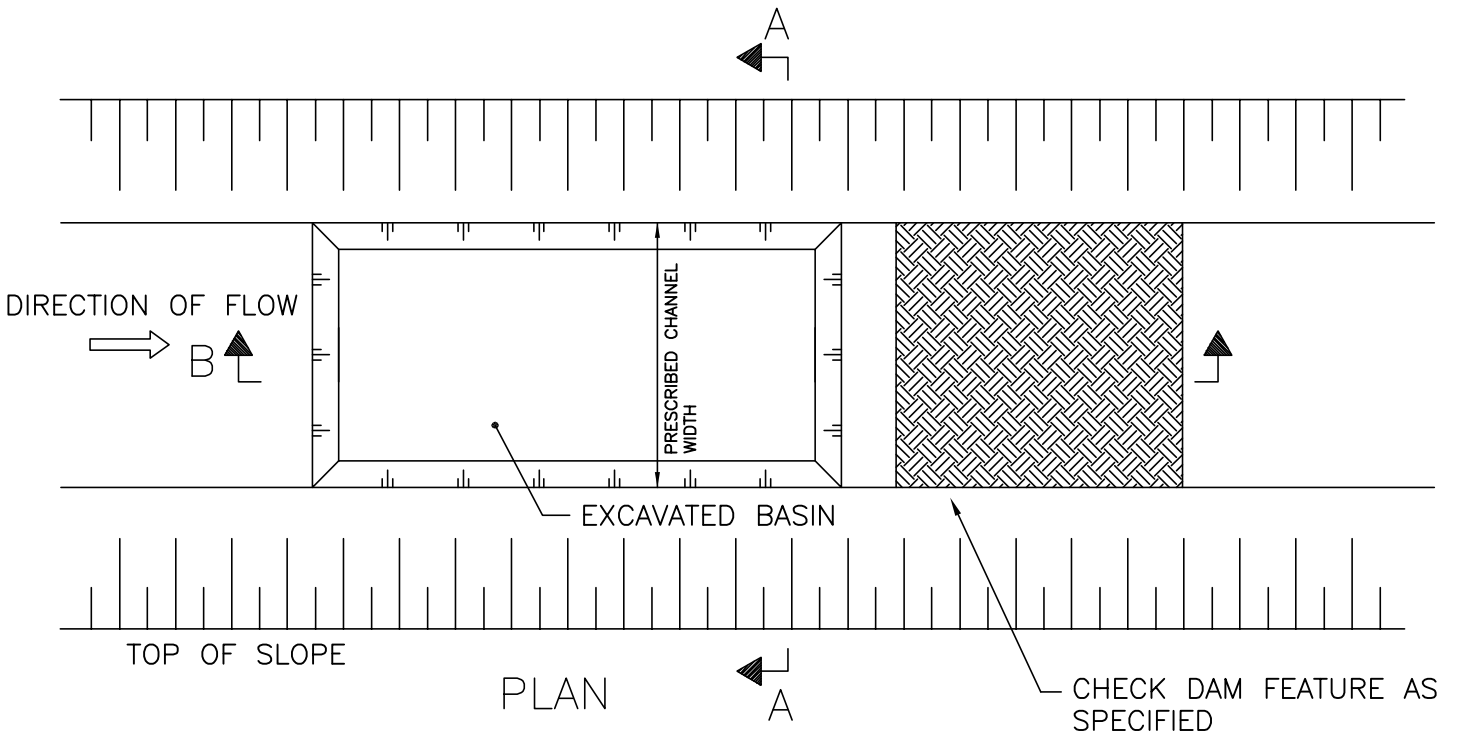
SECTION A–A

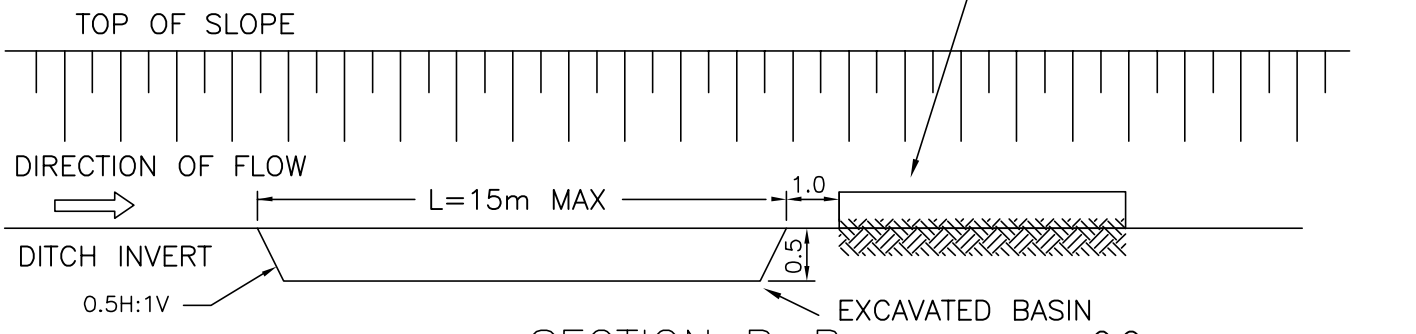


SECTION B–B

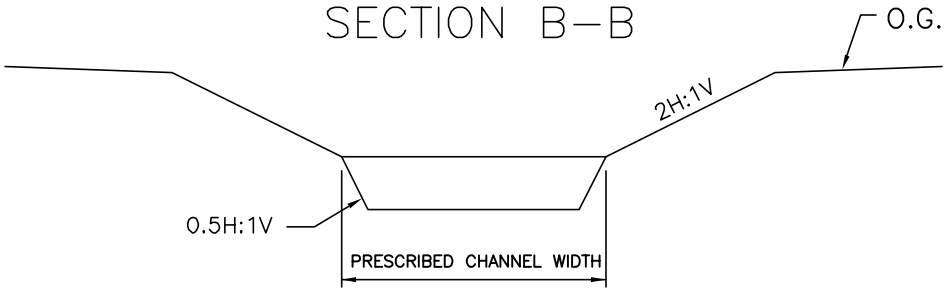
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
TEMPORARY ROCK FLOW CHECK DAM FLAT BOTTOM DITCH			
			OPSD 219.211





SECTION B–B



SECTION A–A

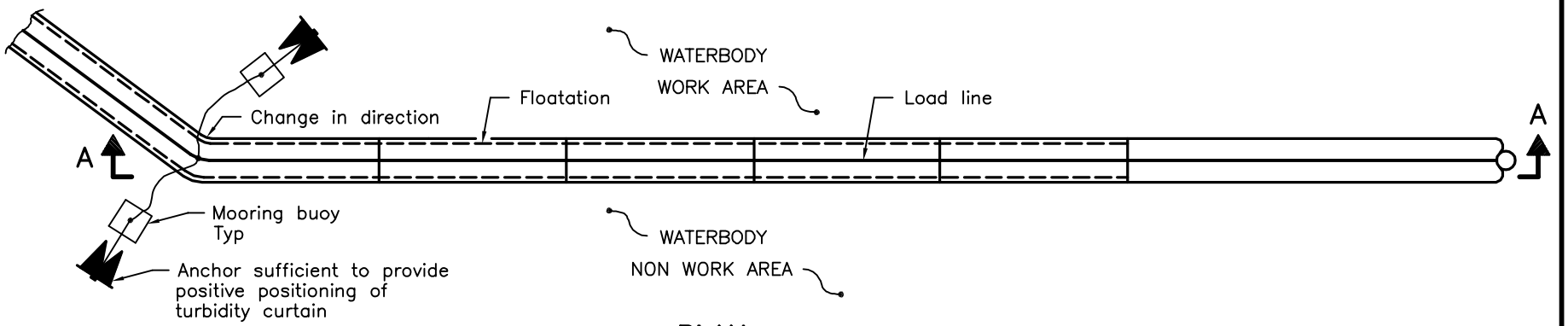
NOTES:

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. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

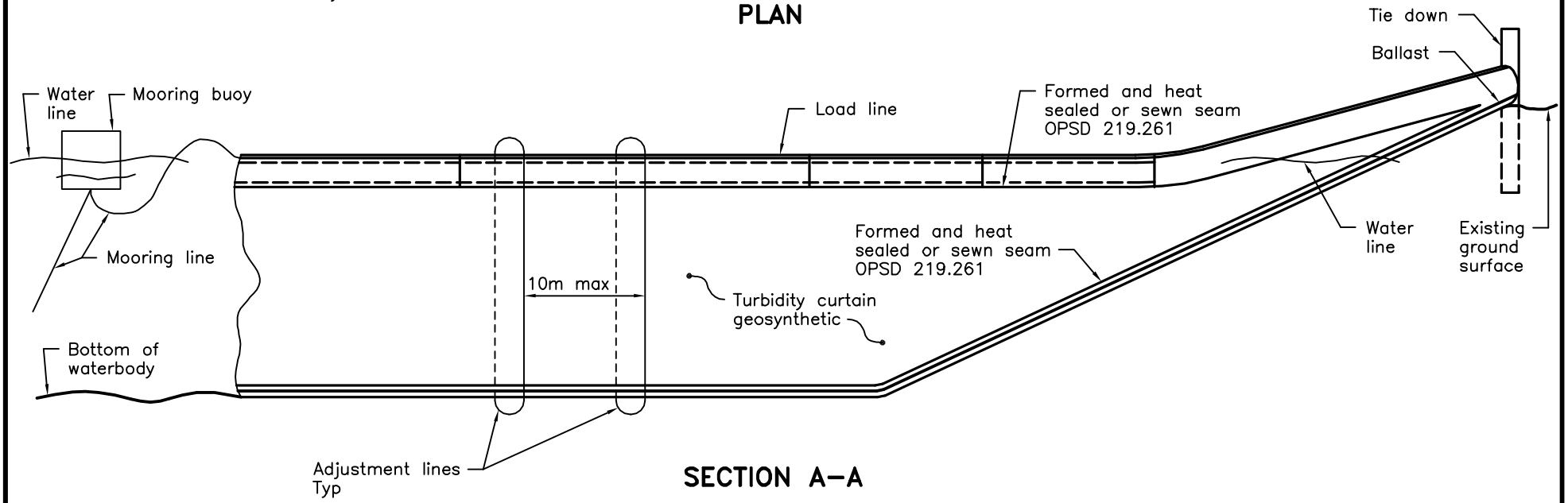
DATED: FEB/21

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Telephone (613) 592–6060

SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.		
VERTICAL N.T.S.	SEDIMENT TRAP	STD.DWG.No. 1



PLAN



SECTION A–A

NOTES:

A All dimensions are in millimeters unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
TURBIDITY CURTAIN			
	OPSD 219.260		

Appendix A-1

Arcadis Group Drawings

MER BLEUE URBAN EXPANSION AREA

(MCKINNONS CREEK ENHANCEMENT)

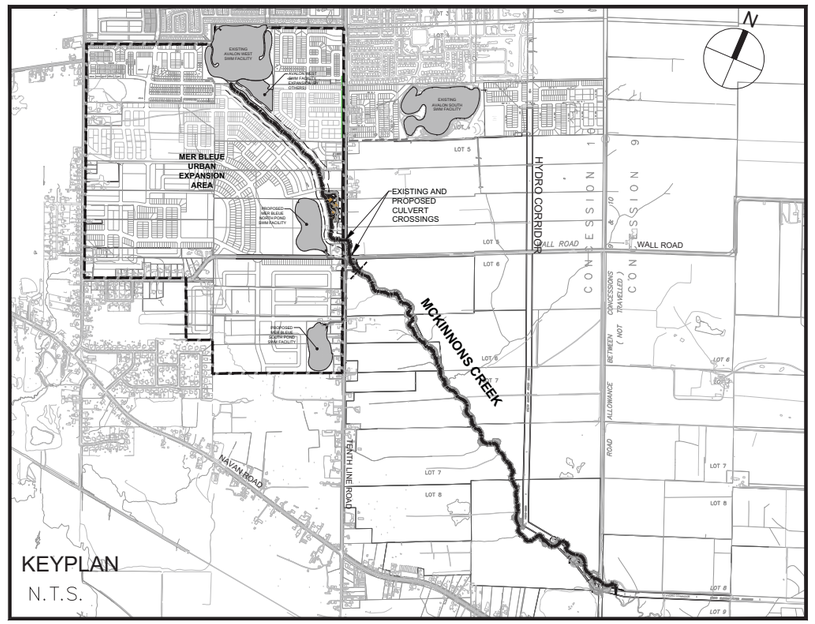
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Sheet List Table		
Sheet Number	Sheet Title	Sheet Description
000	COVER	
700	GENERAL PLAN	
710	PLAN AND PROFILE	STA. 0 - STA. 340
711	PLAN AND PROFILE	STA. 0+340 - STA. 0+680
712	PLAN AND PROFILE	STA. 0+680 - STA. 1+010
713	PLAN AND PROFILE	STA. 1+010 - STA. 1+360
714	PLAN AND PROFILE	STA. 1+360 - STA. 1+700
715	PLAN AND PROFILE	STA. 1+700 - STA. 2+040
716	PLAN AND PROFILE	STA. 2+040 - STA. 2+380
717	PLAN AND PROFILE	STA. 2+380 - STA. 2+720
718	PLAN AND PROFILE	STA. 2+720 - STA. 3+060
719	PLAN AND PROFILE	STA. 3+060 - STA. 3+400
720	PLAN AND PROFILE	STA. 3+400 - STA. 3+740
721	PLAN AND PROFILE	STA. 3+740 - STA. 4+053
730	CROSS-SECTIONS	STA. 0+050 — STA. 0+600
731	CROSS-SECTIONS	STA. 0+650 — STA. 1+200
732	CROSS-SECTIONS	STA. 1+250 — STA. 1+800
733	CROSS-SECTIONS	STA. 1+850 — STA. 2+400
734	CROSS-SECTIONS	STA. 2+450 — STA. 3+000
735	CROSS-SECTIONS	STA. 3+050 — STA. 3+600
736	CROSS-SECTIONS	STA. 3+650 — STA. 4+053
740	MCKINNONS CREEK	DETAILS I
741	MCKINNONS CREEK	DETAILS-II
750	TENTH LINE	CULVERT CROSSING
751	WALL ROAD	CULVERT CROSSING

MCKINNONS CREEK ENHANCEMENT

CONTRACT NO. 117618

REVISED AS PER SNCA COMMENTS 2024-05-15

d:\117618_MBBlaCreek\5.0 Drawings\5Sheet\Layout\Arcadis\000--Cover.dwg Layout Name: 000 COVER Plot Scale: 1:5.13 Plotted At: 7/3/2024 Last Saved By: jesse-sebastien.forg Last Saved At: May. 17, 24

EXISTING AVALON WEST SWM FACILITY
AVALON WEST SWM FACILITY EXPANSION (BY OTHERS)
TENTH LINE ROAD
EXISTING AVALON SOUTH SWM FACILITY
AVALON SOUTH SWMF OUTLET
McKINNONS CREEK
MCKINNONS CREEK CORRIDOR WITHIN URBAN AREA
Lepage Charbonneau Municipal Drain
HYDRO CORRIDOR
WALL ROAD
PROPOSED MER BLEUE NORTH POND SWM FACILITY
PROPOSED TENTH LINE ROAD LOW FLOW CULVERT
EXISTING TENTH LINE ROAD CULVERT
UPPER REACH
PROPOSED WALL ROAD LOW FLOW CULVERT
LOWER REACH
EXISTING WALL ROAD CULVERT
PROPOSED MER BLEUE OUTLET LOCATION
MER BLEUE URBAN EXPANSION AREA
Tasse Regimbald Municipal Drain
PROPOSED MER BLEUE SOUTH POND SWM FACILITY
MCKINNONS CREEK
PROPOSED CREEK CENTERLINE
EXISTING CREEK
Lalonde Cleroux Municipal Drain
HYDRO ELECTRIC POWER COMMISSION OF ONTARIO
PROPOSED MCKINNONS CREEK LOWER REACH ENHANCEMENT
MCKINNONS CREEK
LIMIT OF WORK
HYDRO CORRIDOR
H. Cleroux Municipal Drain
Aldema Cleroux Municipal Drain
Edward Cleroux Municipal Drain
NAVAN ROAD
ENTH LINE ROAD
CONCESSIONS TRAVELLED (NOT BETWEEN ALLOWANCE ROAD)
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
14563-0515
14563-0516
14563-0522
14563-0524
14563-0525
14563-0532
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14544-0178
14544-0179
14544-0180
14544-0181
14544-0182
14544-0183
14544-0184
14544-0185
14544-0186

AVALON WEST
SWMF

AVALON WEST
SWMF EXPANSION
(BY OTHERS)

PROPOSED ENHANCEMENT
TO TIE INTO EXISTING
PLUNGE POOL

RIP-RAP
±450MM IN SIZE
600MM IN DEPTH

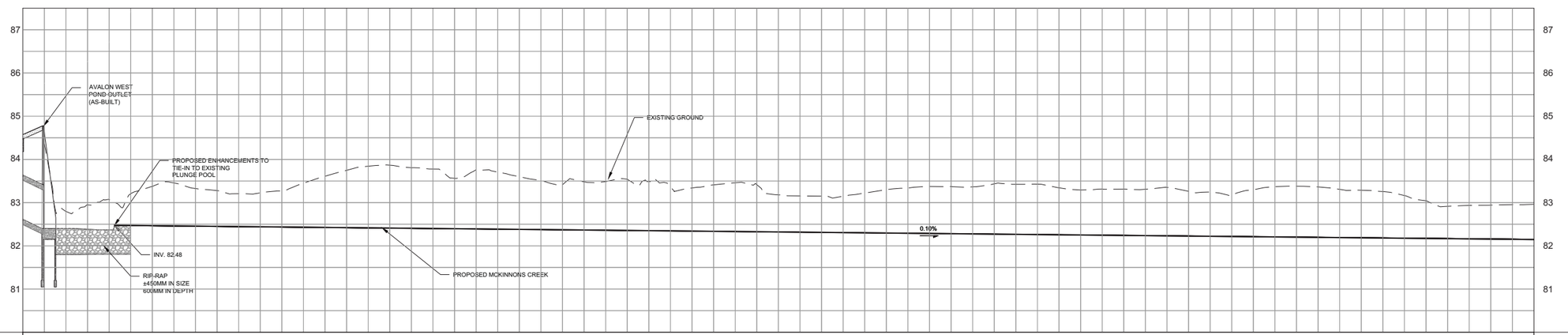
INV 82.48

PROPOSED
100 YEAR WATER EXTENT

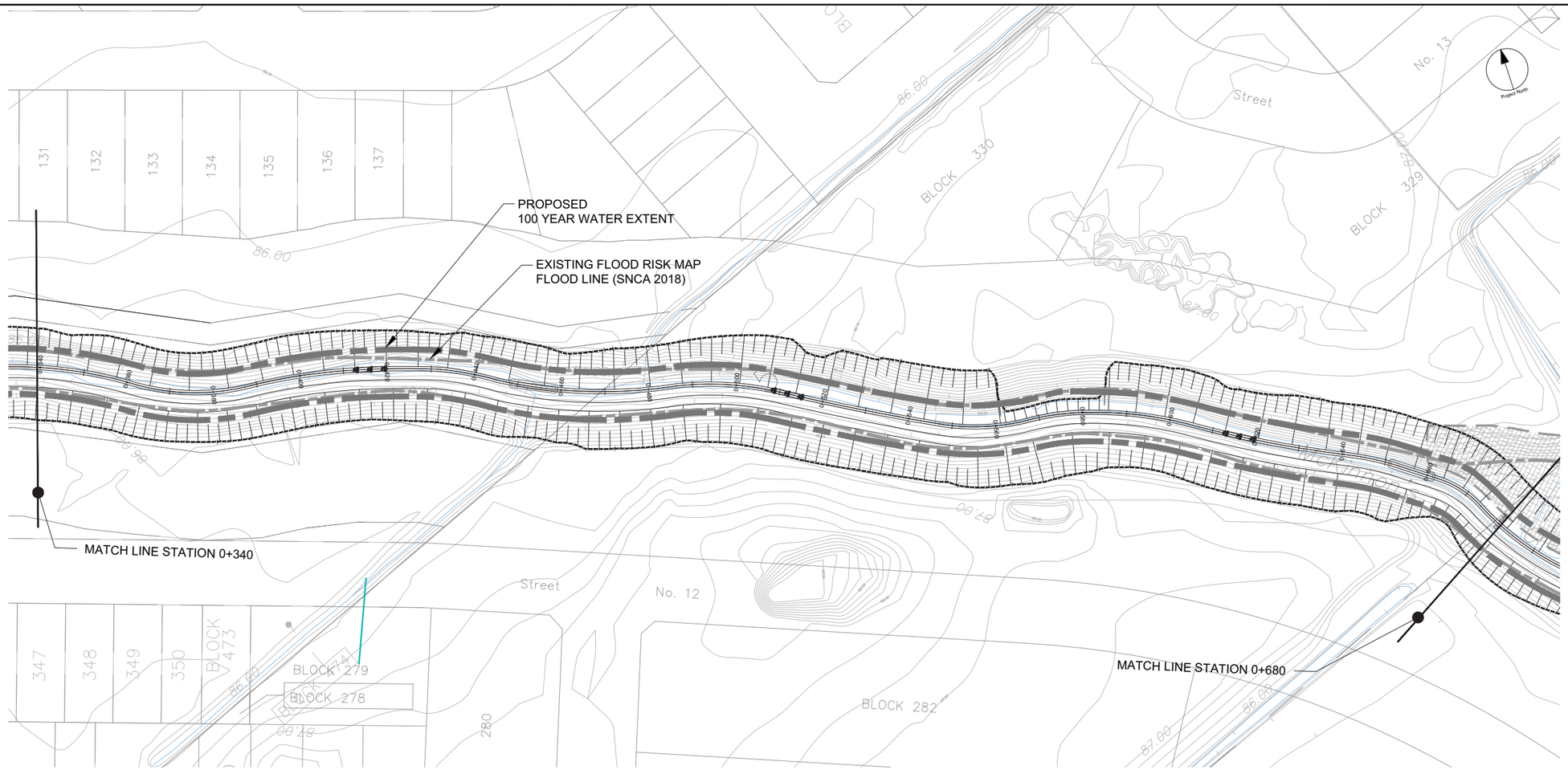
EXISTING FLOOD RISK MAP
FLOOD LINE (SNCA 2018)

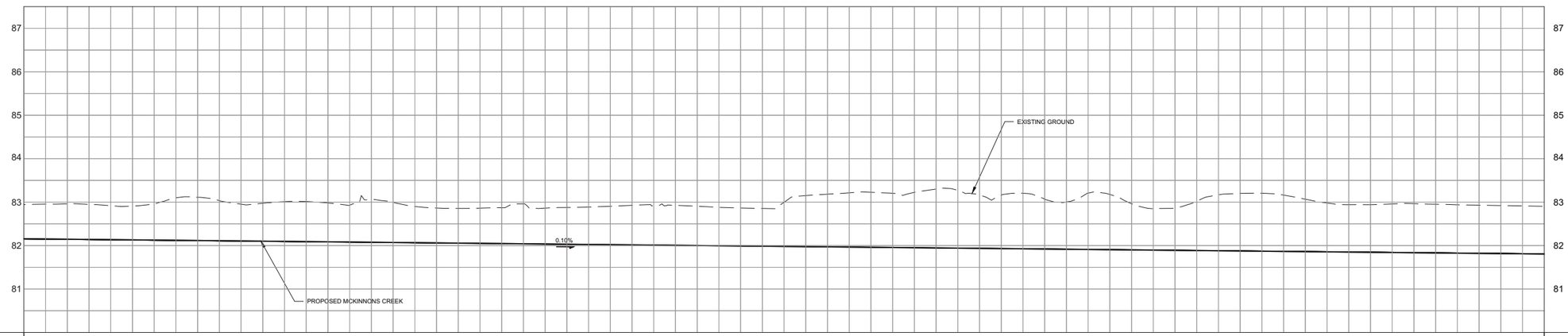
MATCH LINE STATION 0+340

BLOCK 488
BLOCK 489
BLOCK 484
BLOCK 481
WALKWAY



| | | |





PROP ℄ CHANNEL	82.15	82.13	82.11	82.09	82.07	82.05	82.03	82.01	81.99	81.97	81.95	81.93	81.91	81.89	81.87	81.85	81.83	81.81	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	82.95	82.91	83.04	83.01	83.00	82.86	82.88	82.91	82.86	83.18	83.23	83.16	83.21	82.87	83.21	82.94	82.95	82.91	EXIST ℄ CHANNEL
STATION	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	STATION

CLIENT

CLARIDGE HOMES
MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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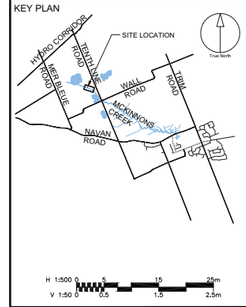
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7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



SEAL

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tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

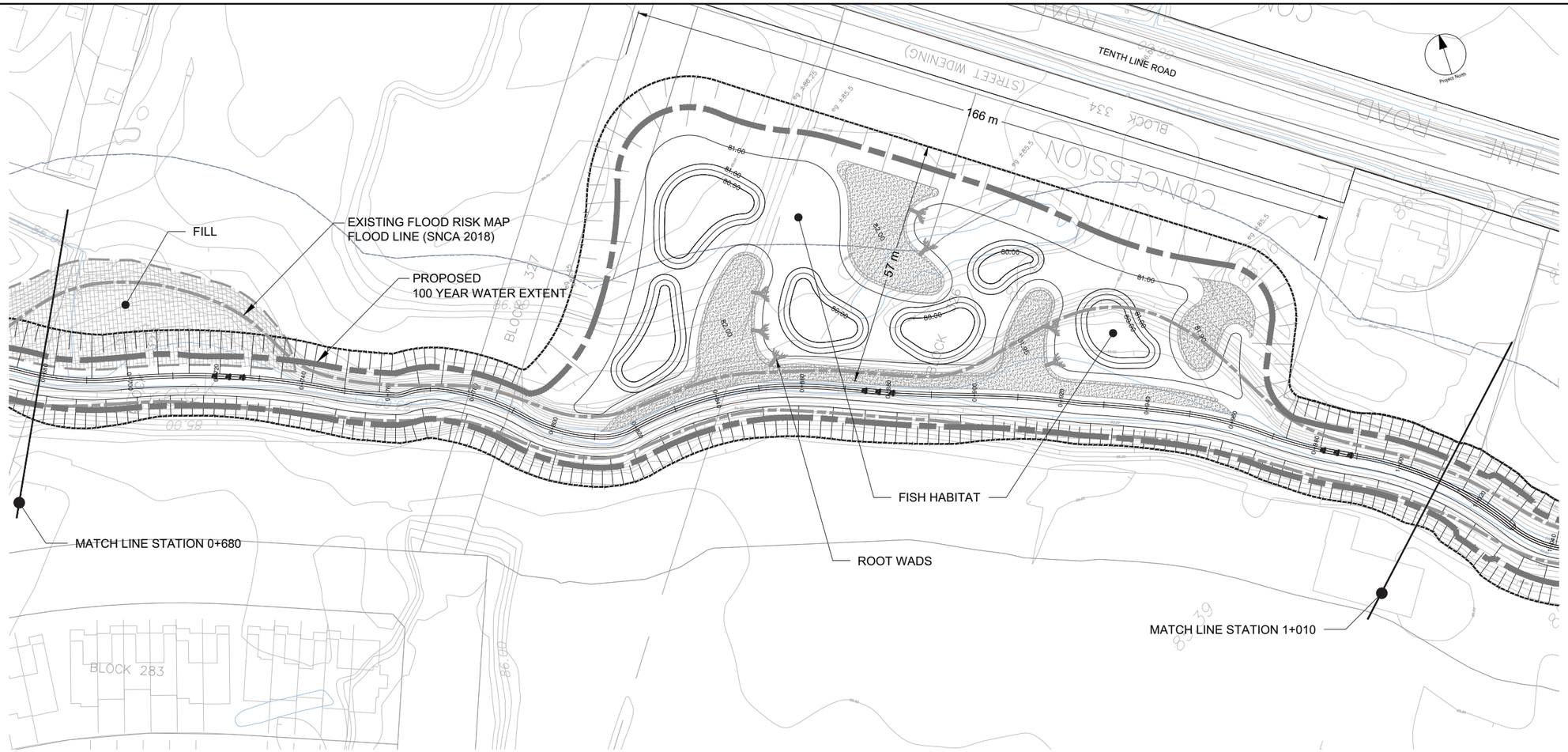
STA. 0+340 - STA. 0+680

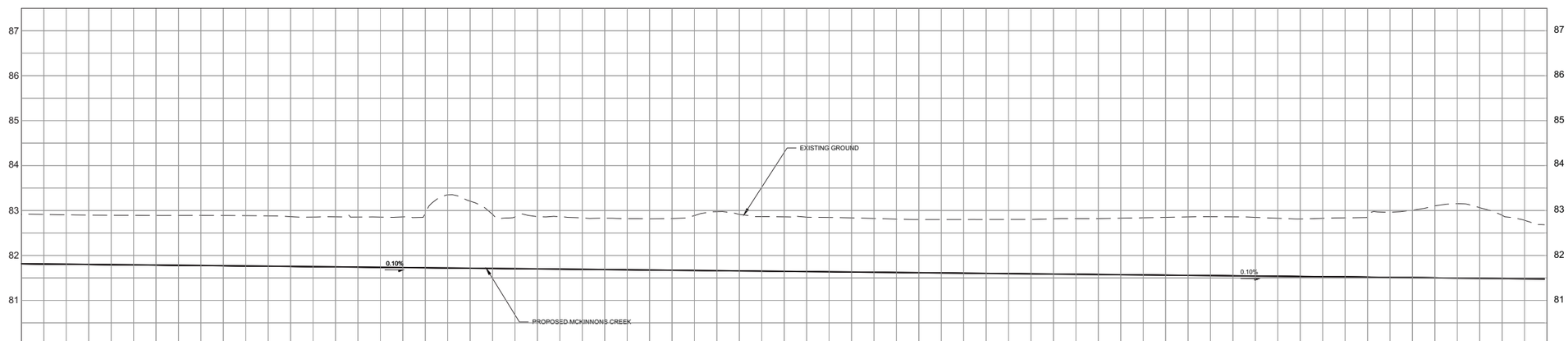
SHEET NUMBER	ISSUE
711	7

D07-16-22-0014

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SCALE CHECK 1m 10mm





PROP ℄ CHANNEL	81.81	81.79	81.77	81.75	81.73	81.71	81.69	81.67	81.65	81.63	81.61	81.59	81.57	81.55	81.53	81.51	81.49	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	82.91	82.89	82.89	82.85	82.86	82.92	82.84	82.82	82.86	82.84	82.80	82.80	82.83	82.86	82.81	82.96	83.06	EXIST ℄ CHANNEL
STATION	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	0+960	0+980	1+000	STATION

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

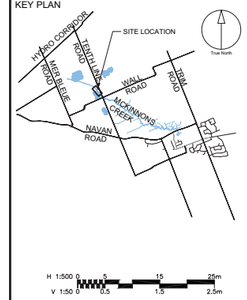
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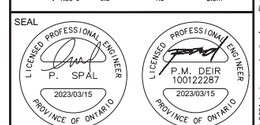
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7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

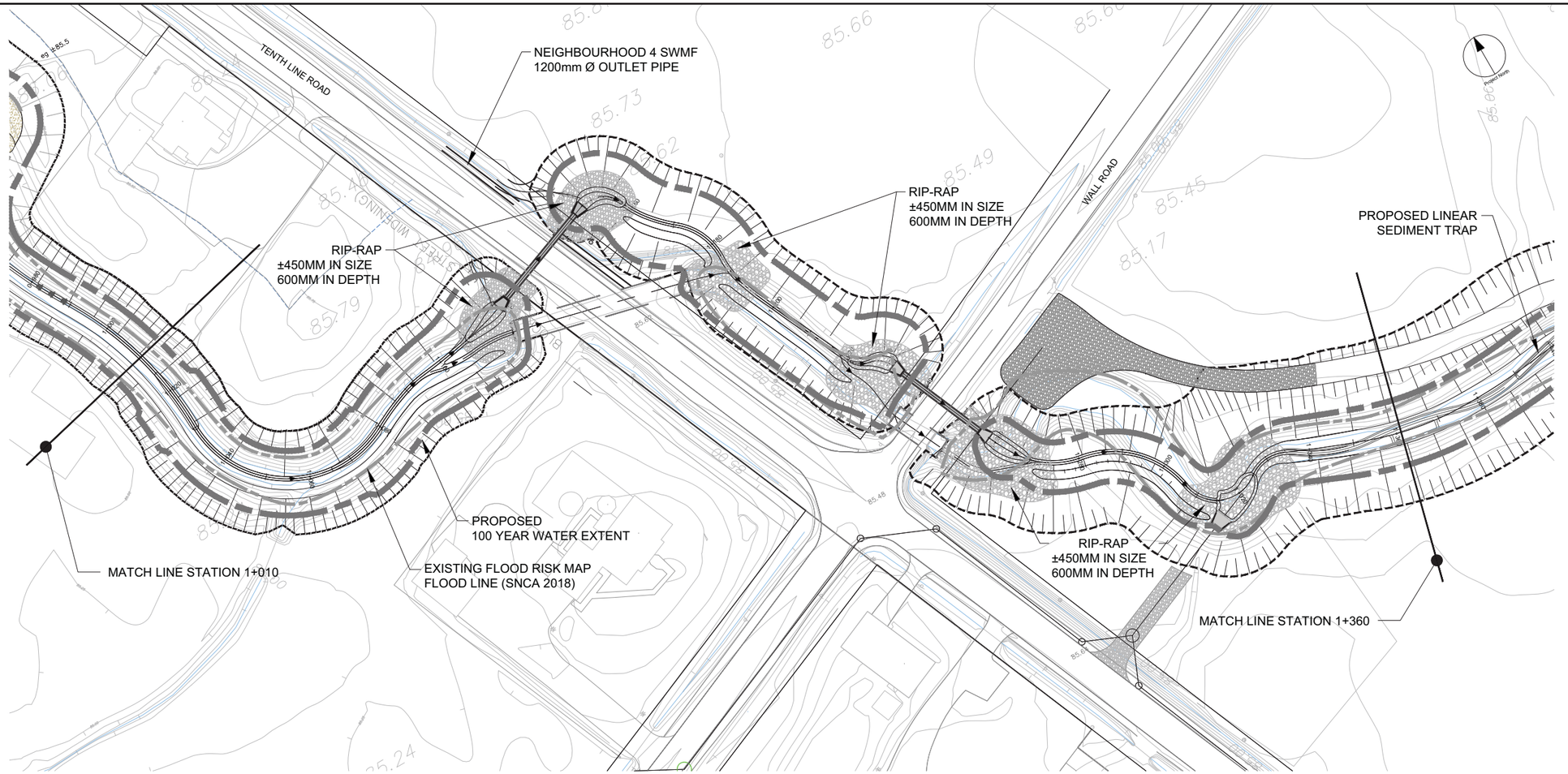
STA. 0+680 - STA. 1+020

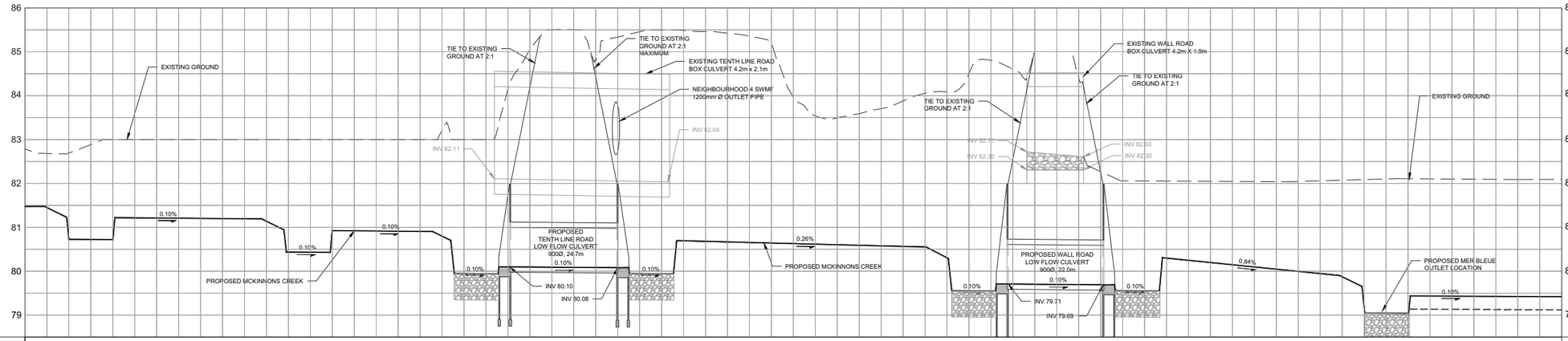
SHEET NUMBER	ISSUE
712	7

SCALE CHECK 10mm 1m

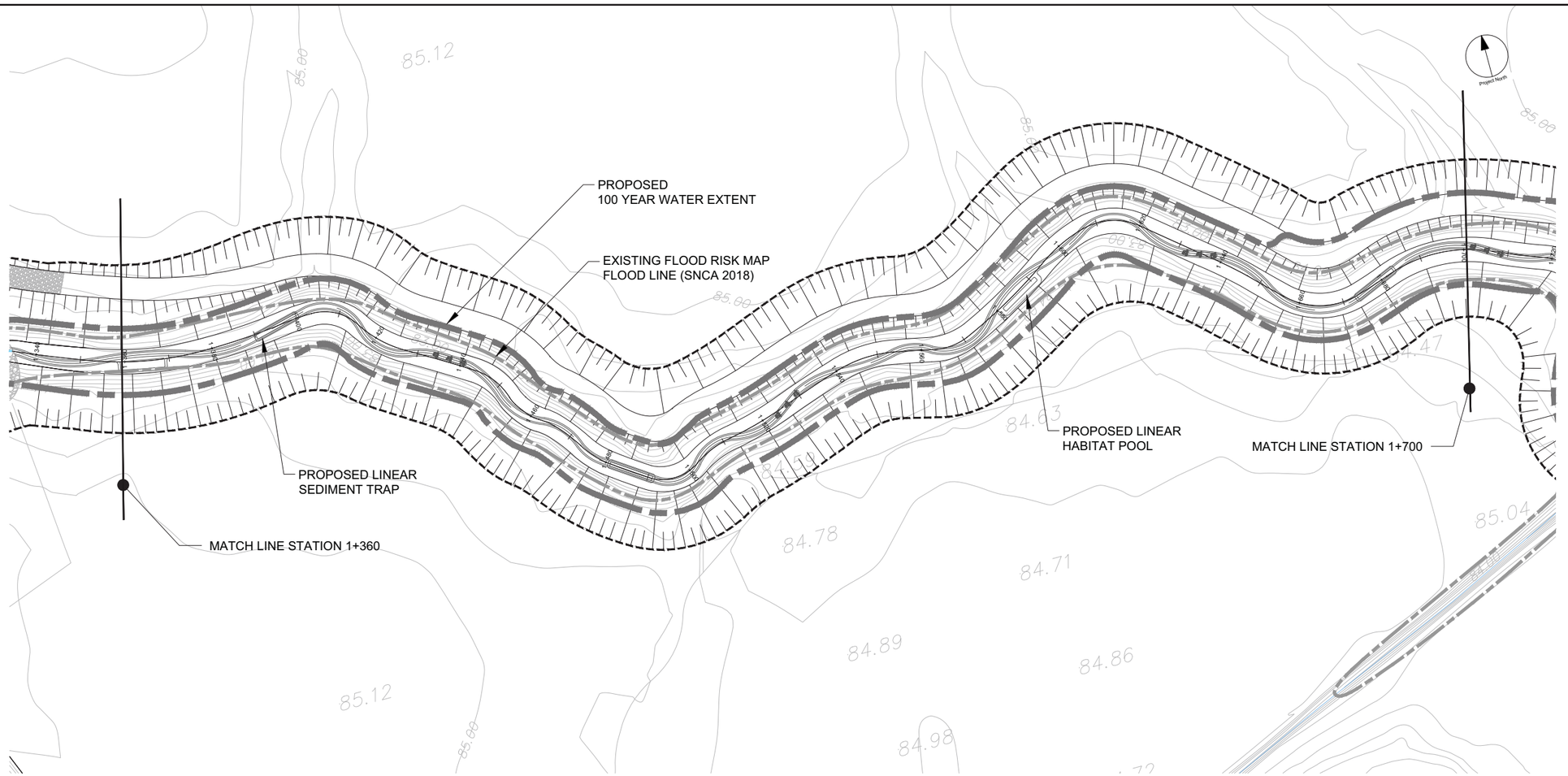
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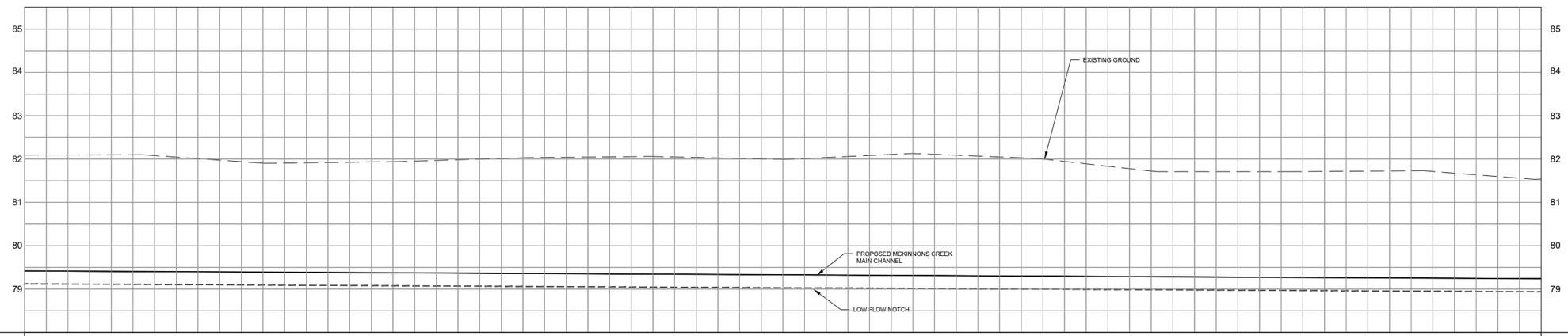
D07-16-22-0014


NEIGHBOURHOOD 4 SWMF
1200mm Ø OUTLET PIPE
TENTH LINE ROAD
WALL ROAD
RIP-RAP
±450MM IN SIZE
600MM IN DEPTH
RIP-RAP
±450MM IN SIZE
600MM IN DEPTH
RIP-RAP
±450MM IN SIZE
600MM IN DEPTH
PROPOSED LINEAR
SEDIMENT TRAP
PROPOSED
100 YEAR WATER EXTENT
EXISTING FLOOD RISK MAP
FLOOD LINE (SNCA 2018)
MATCH LINE STATION 1+010
MATCH LINE STATION 1+360
Project North


EXISTING GROUND
TIE TO EXISTING GROUND AT 2:1
TIE TO EXISTING GROUND AT 2:1 MAXIMUM
EXISTING TENTH LINE ROAD BOX CULVERT 4.2m x 2.1m
NEIGHBOURHOOD 4 SWMF 1200mm Ø OUTLET PIPE
INV 82.11
INV 82.04
PROPOSED TENTH LINE ROAD LOW FLOW CULVERT 900Ø, 24.7m
INV 80.10
INV 80.08
PROPOSED MCKINNONS CREEK
EXISTING WALL ROAD BOX CULVERT 4.2m X 1.9m
TIE TO EXISTING GROUND AT 2:1
INV 82.71
INV 82.30
INV 82.50
INV 82.30
PROPOSED WALL ROAD LOW FLOW CULVERT 900Ø, 22.0m
INV 79.71
INV 79.69
EXISTING GROUND
PROPOSED MER BLEUE OUTLET LOCATION
0.10%
0.26%
0.84%

| | | |





PROP ℄ CHANNEL	79.42	79.41	79.40	79.39	79.38	79.37	79.36	79.35	79.34	79.33	79.32	79.31	79.29	79.28	79.27	79.26	79.25	79.24	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	82.09	82.10	81.97	81.91	81.94	82.00	82.04	82.06	82.01	82.03	82.13	82.05	81.89	81.71	81.71	81.72	81.71	81.56	EXIST ℄ CHANNEL
STATION	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	STATION

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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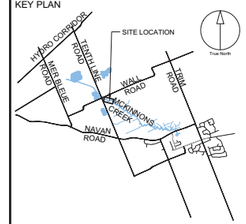
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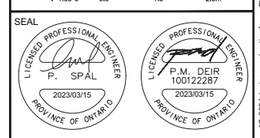
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7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



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tel 613 225 1311
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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

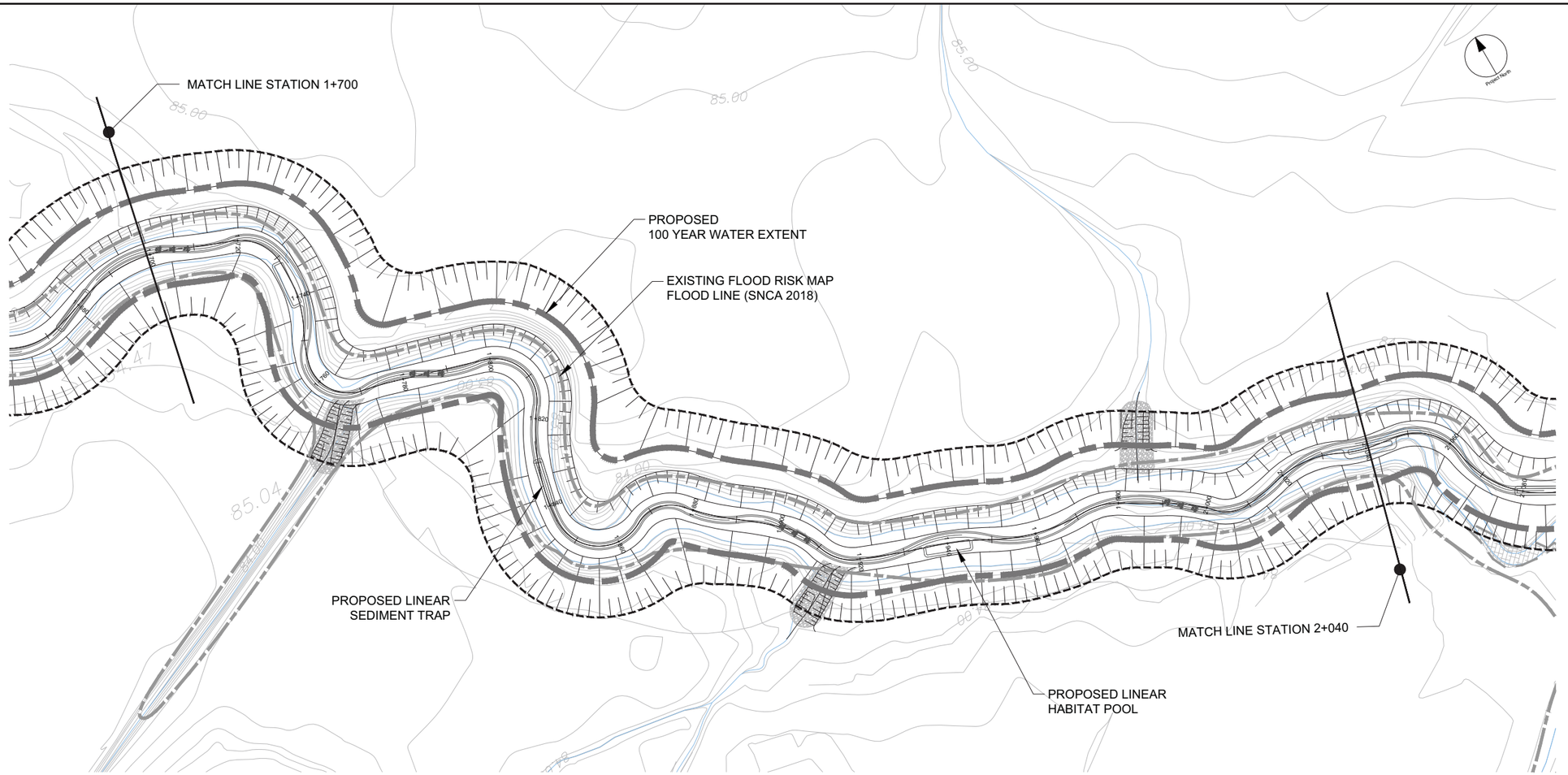
STA. 1+360 - STA. 1+700

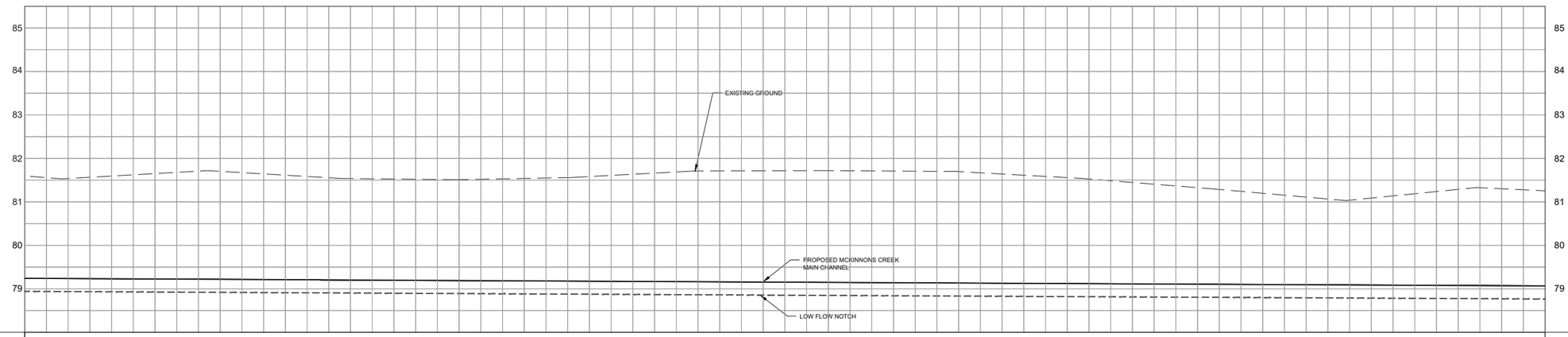
SHEET NUMBER 714 | ISSUE 7

SCALE CHECK 10mm 1 in

D07-16-22-0014

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PROP ℄ CHANNEL	79.24	79.23	79.22	79.21	79.21	79.20	79.19	79.18	79.17	79.16	79.15	79.14	79.13	79.12	79.11	79.10	79.09	79.08	79.07	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	81.56	81.62	81.70	81.58	81.53	81.52	81.56	81.66	81.71	81.72	81.71	81.64	81.53	81.37	81.20	81.04	81.24	81.28		EXIST ℄ CHANNEL
STATION	1+700	1+720	1+740	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920	1+940	1+960	1+980	2+000	2+020	2+040		STATION

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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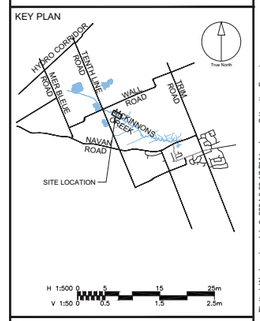
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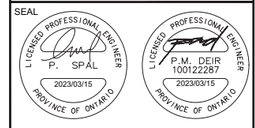
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PROJECT

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PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	**APPROVED BY:**
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

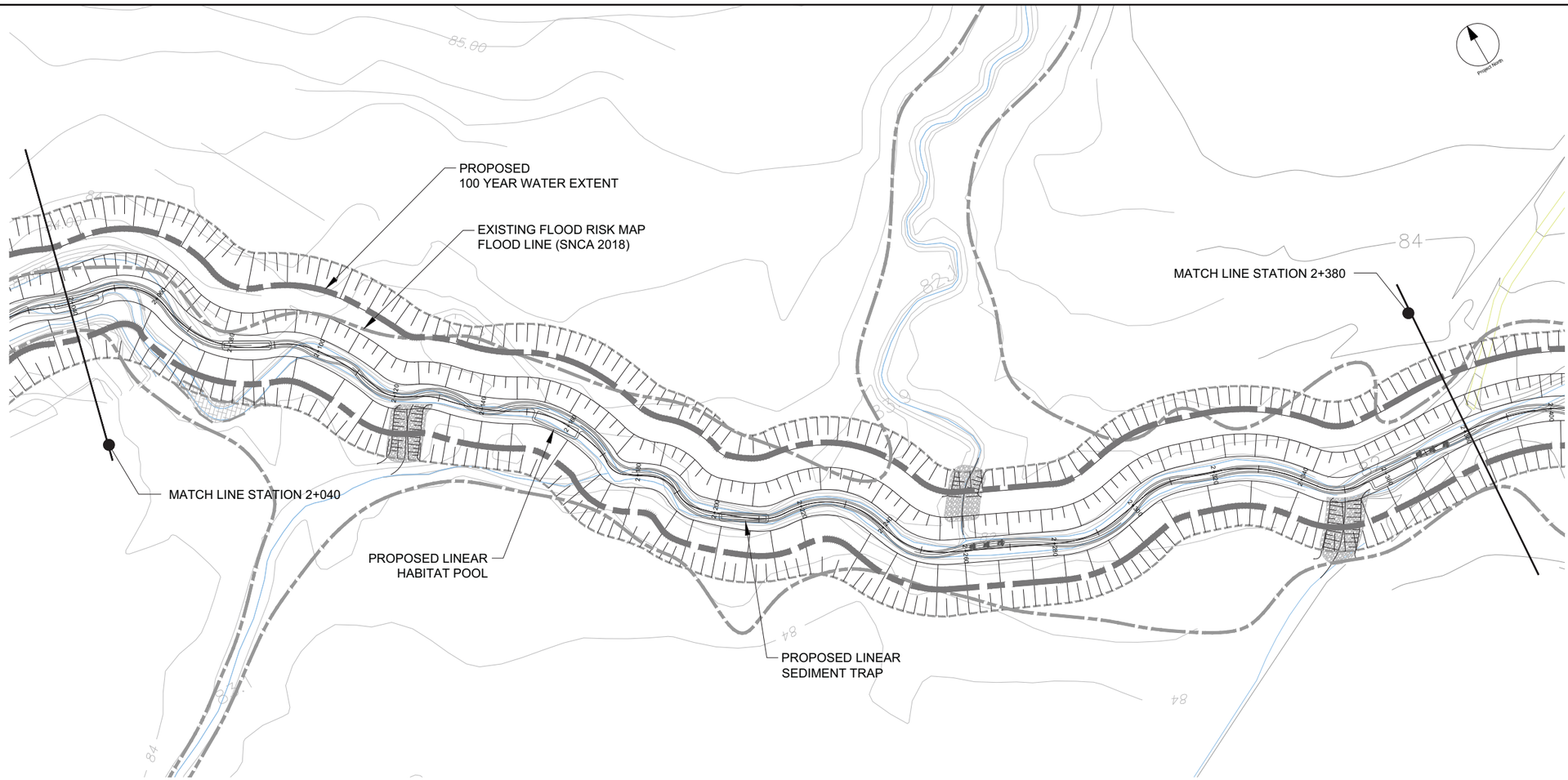
STA. 1+740 - STA. 2+040

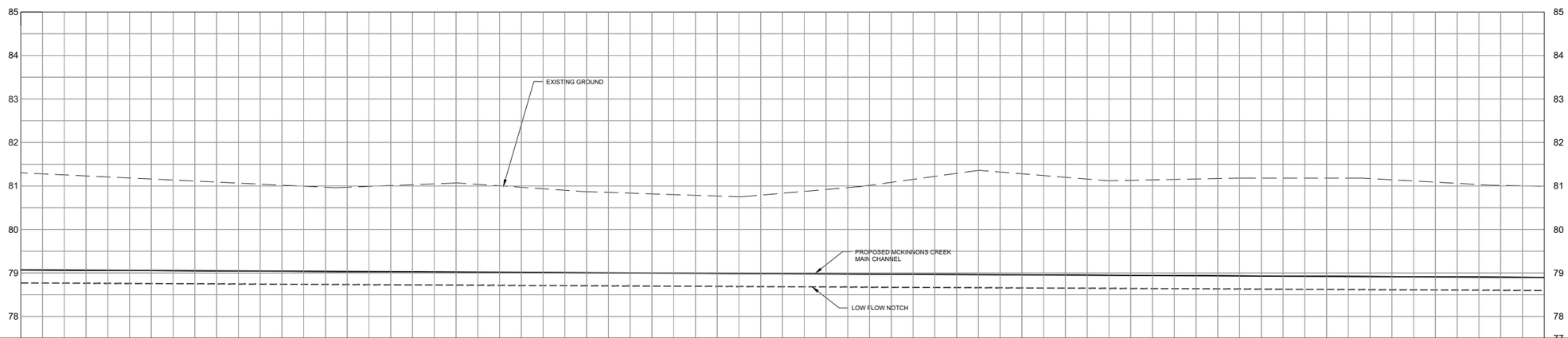
SHEET NUMBER 715 | ISSUE 7

D07-16-22-0014

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SCALE CHECK 10cm 1m





STATION	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	2+340	2+360	2+380	STATION
EXIST ℄ CHANNEL	81.28	81.18	81.09	80.99	81.01	81.04	80.90	80.82	80.75	80.92	81.15	81.32	81.16	81.15	81.18	81.18	81.09	81.00	EXIST ℄ CHANNEL
PROP ℄ CHANNEL	79.07	79.06	79.05	79.04	79.03	79.02	79.01	79.00	78.99	78.98	78.97	78.96	78.95	78.94	78.93	78.92	78.91	78.90	PROP ℄ CHANNEL

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MATTAMY HOMES
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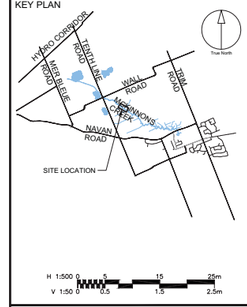
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PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

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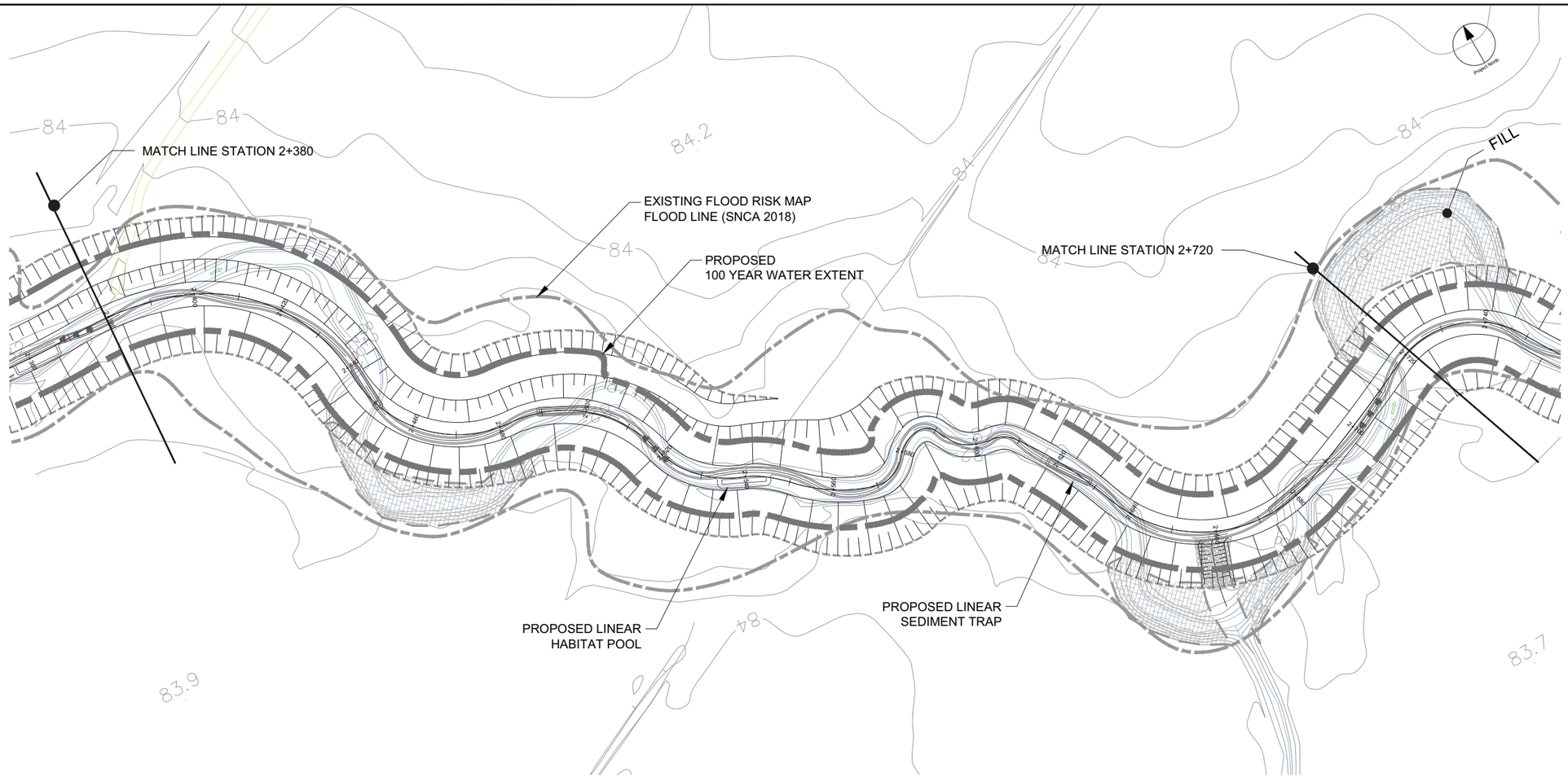
STA. 2+040 - STA. 2+380

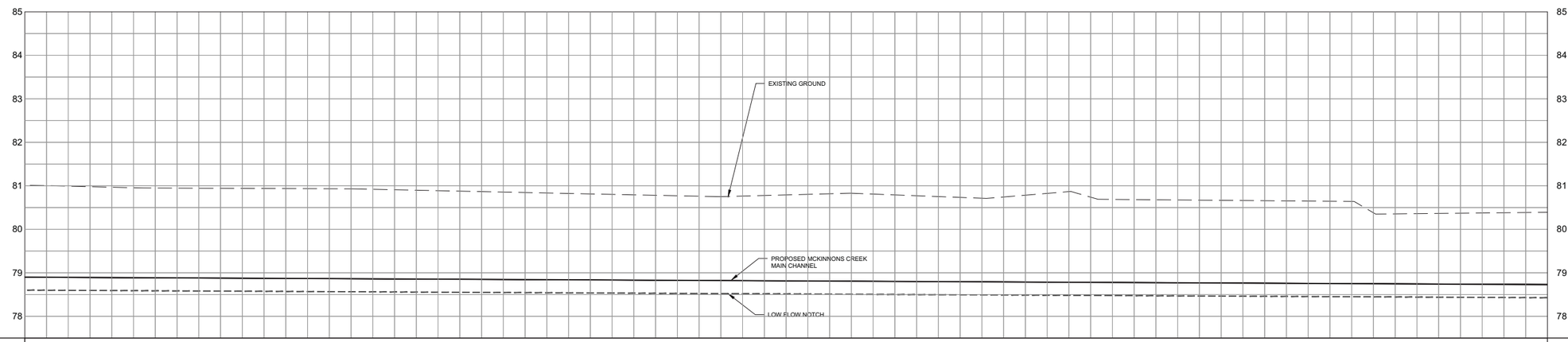
SHEET NUMBER	ISSUE
716	7

SCALE CHECK 10mm 1m

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D07-16-22-0014





PROP ℄ CHANNEL	78.90	78.89	78.88	78.87	78.86	78.85	78.84	78.83	78.82	78.81	78.80	78.79	78.78	78.77	78.76	78.75	78.74	78.73	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	81.00	80.96	80.94	80.93	80.91	80.87	80.82	80.78	80.76	80.82	80.77	80.74	80.74	80.67	80.66	80.64	80.36	80.39	EXIST ℄ CHANNEL
STATION	2+380	2+400	2+420	2+440	2+460	2+480	2+500	2+520	2+540	2+560	2+580	2+600	2+620	2+640	2+660	2+680	2+700	2+720	STATION

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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ISSUES

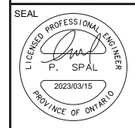
No.	DESCRIPTION	DATE
1	ISSUED FOR REVIEW	2019-10-04
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4	REVISED AS PER COMMENTS	2020-11-30
5	REVISED AS PER SNCA COMMENTS	2022-01-06
6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



H 1:500 0 5 15 25m
V 1:50 0 0.5 1.5 2.5m

SEAL





PRIME CONSULTANT

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tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

STA. 2+380 - STA. 2+720

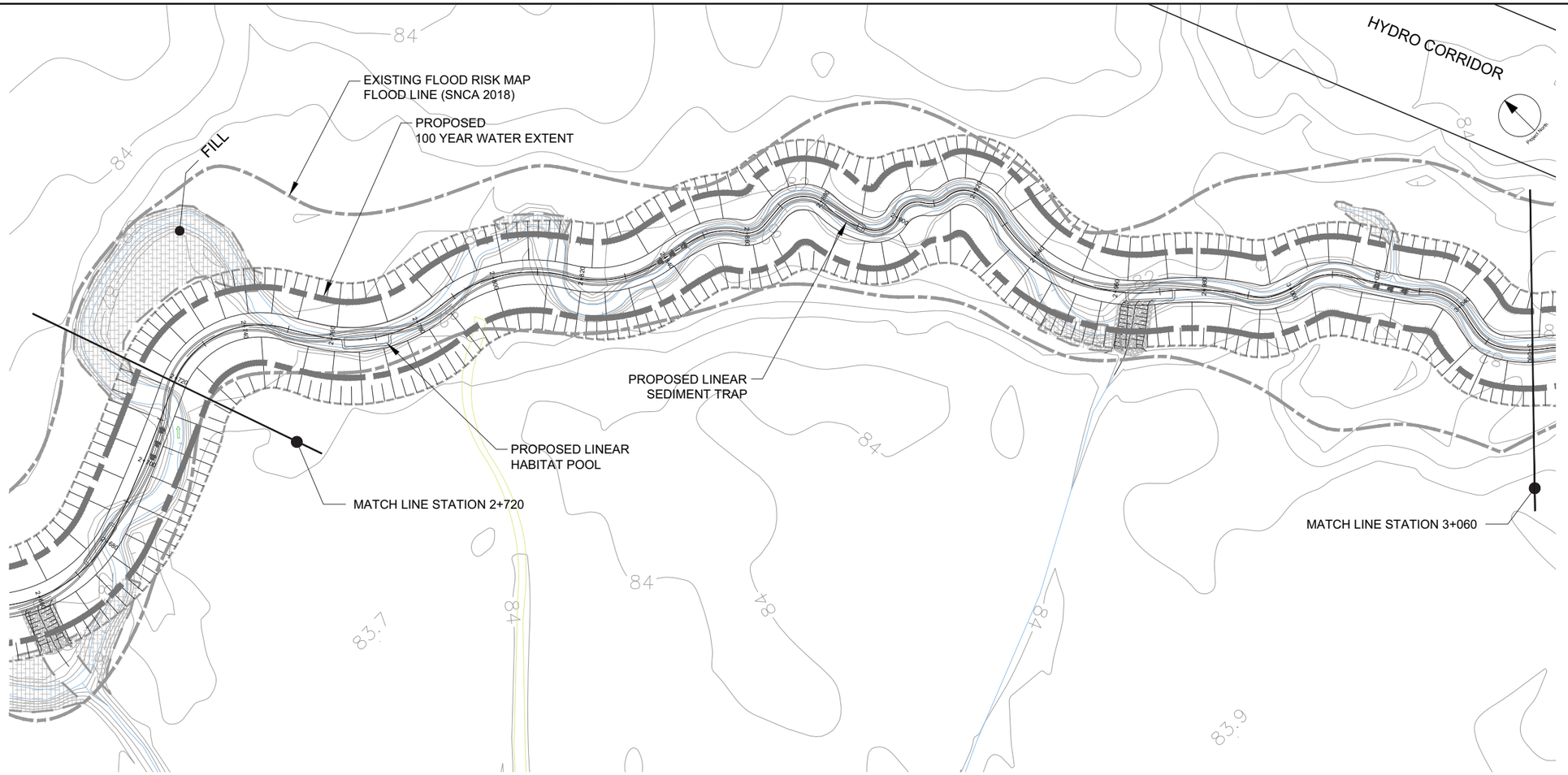
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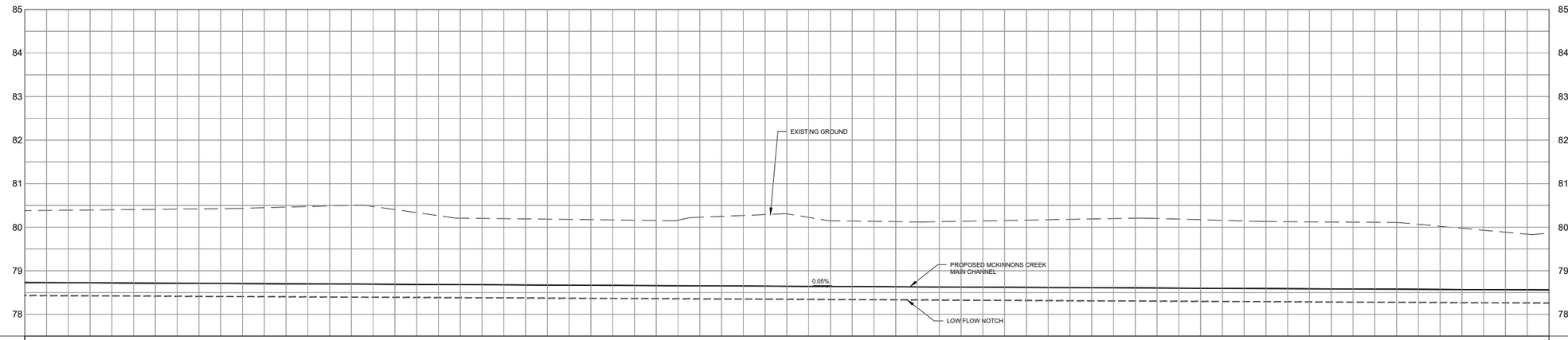
ISSUE 7

SCALE CHECK 1 in

D07-16-22-0014

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PROP ℄ CHANNEL	78.73	78.72	78.71	78.70	78.69	78.68	78.67	78.66	78.65	78.64	78.63	78.62	78.61	78.60	78.59	78.58	78.57	78.56	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	80.39	80.41	80.43	80.48	80.41	80.20	80.18	80.16	80.27	80.15	80.12	80.15	80.19	80.19	80.13	80.12	80.02	79.84	EXIST ℄ CHANNEL
STATION	2+720	2+740	2+760	2+780	2+800	2+820	2+840	2+860	2+880	2+900	2+920	2+940	2+960	2+980	3+000	3+020	3+040	3+060	STATION

CLIENT

CLARIDGE HOMES
MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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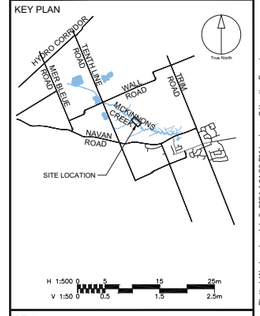
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5	REVISED AS PER SNCA COMMENTS	2022-01-06
6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



SEAL



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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

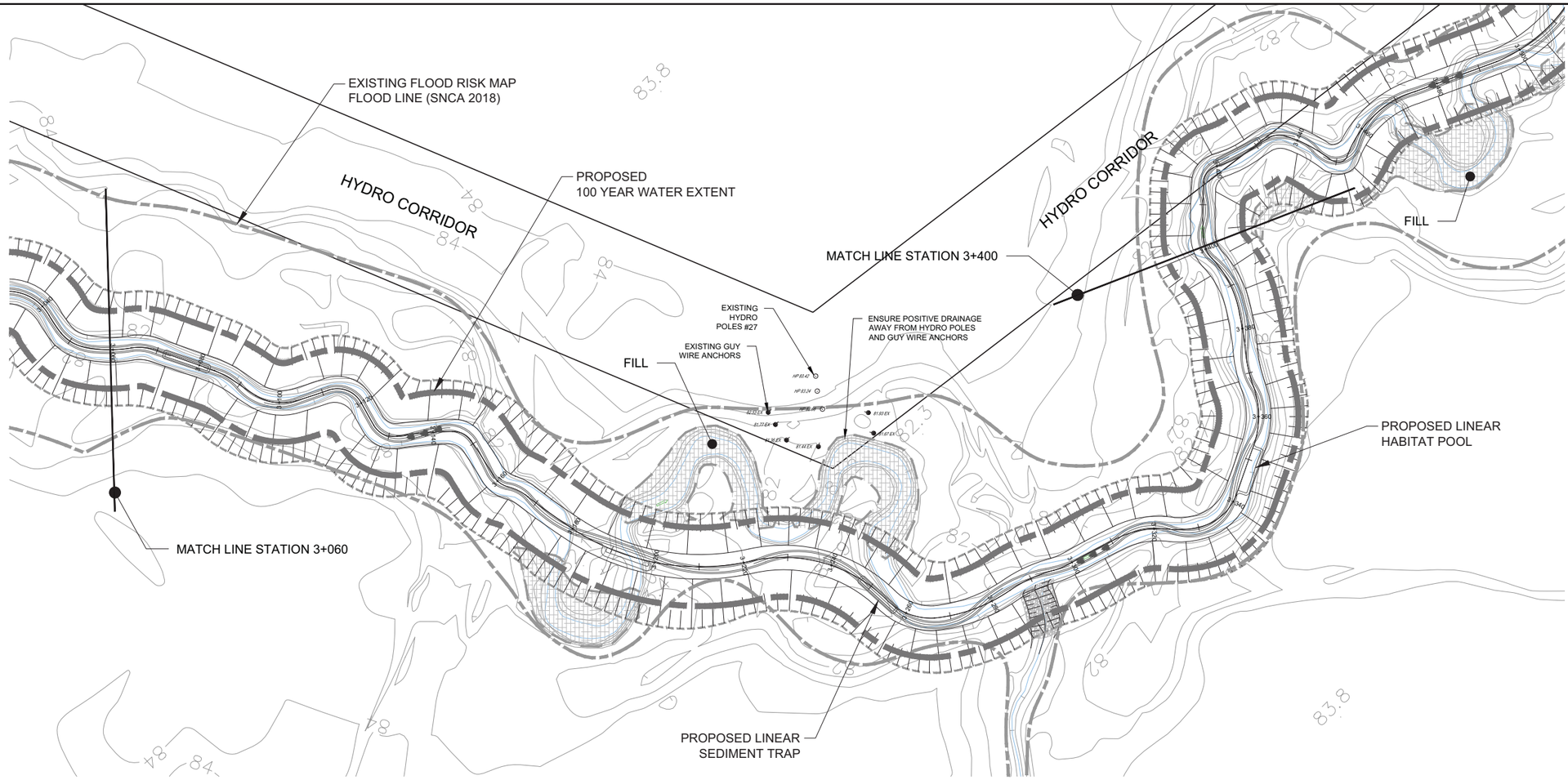
STA. 2+720 - STA. 3+060

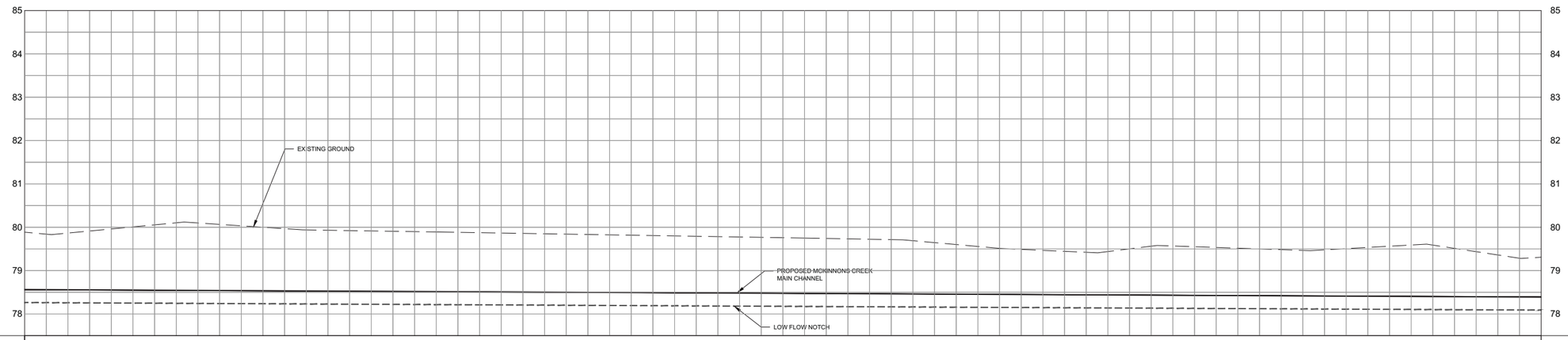
SHEET NUMBER	ISSUE
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D07-16-22-0014

SCALE CHECK 10mm 1m

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STATION	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240	3+260	3+280	3+300	3+320	3+340	3+360	3+380	3+400
EXIST ℄ CHANNEL	79.84	80.01	80.07	79.94	79.91	79.87	79.84	79.81	79.78	79.74	79.69	79.51	79.42	79.57	79.50	79.51	79.59	79.29
PROP ℄ CHANNEL	78.56	78.55	78.54	78.53	78.52	78.51	78.50	78.49	78.48	78.47	78.46	78.45	78.44	78.43	78.42	78.41	78.40	78.39

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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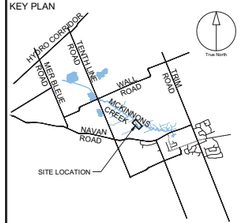
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ISSUES

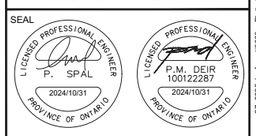
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5	REVISED AS PER SNCA COMMENTS	2022-01-06
6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15
8	ISSUED FOR HYDRO COORDINATION	2025-01-27

KEY PLAN



H 1:500 0 5 15 25m
V 1:50 0 0.5 1.5 2.5m

SEAL



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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.SF.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

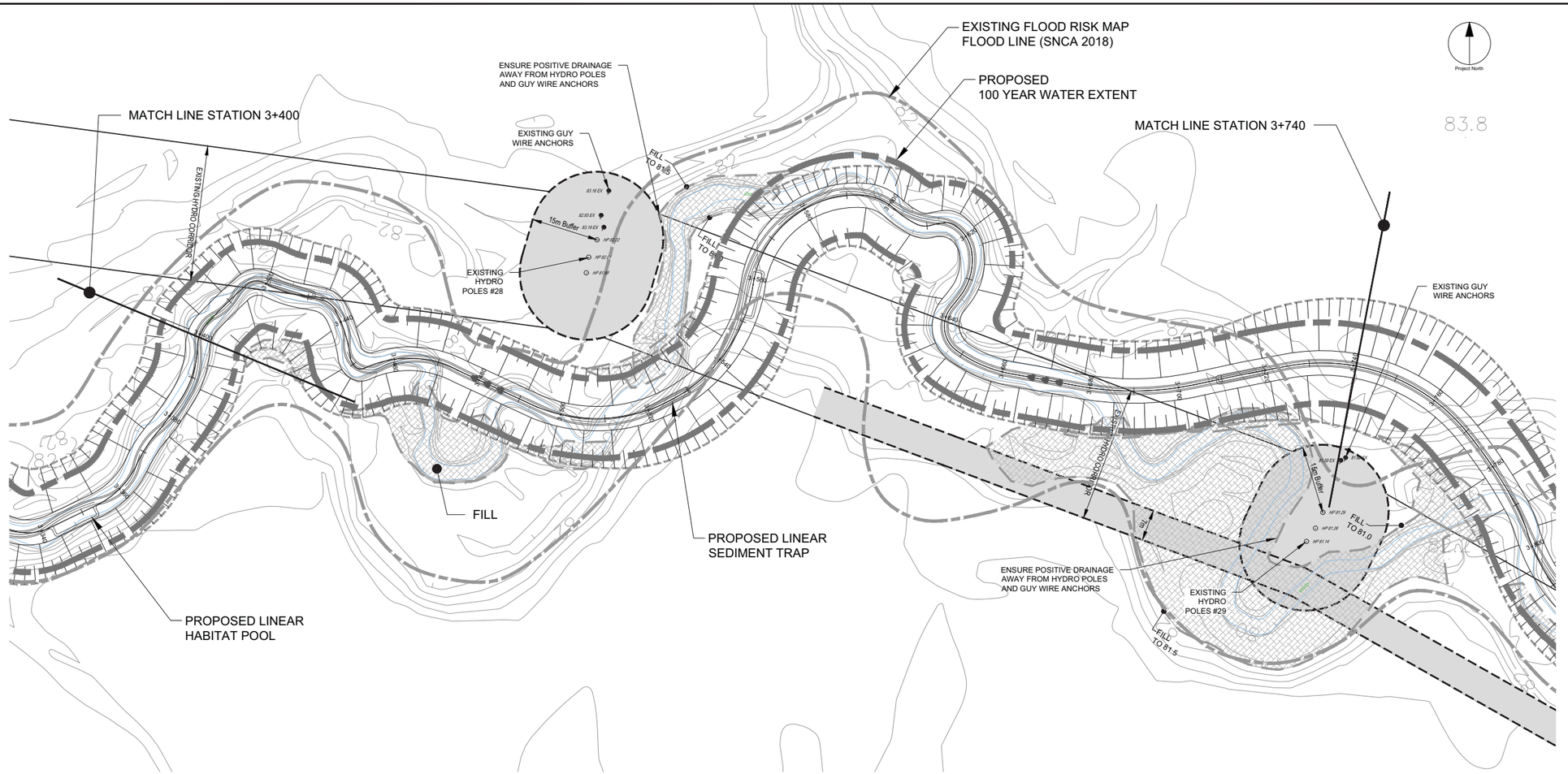
STA. 3+060 - STA. 3+400

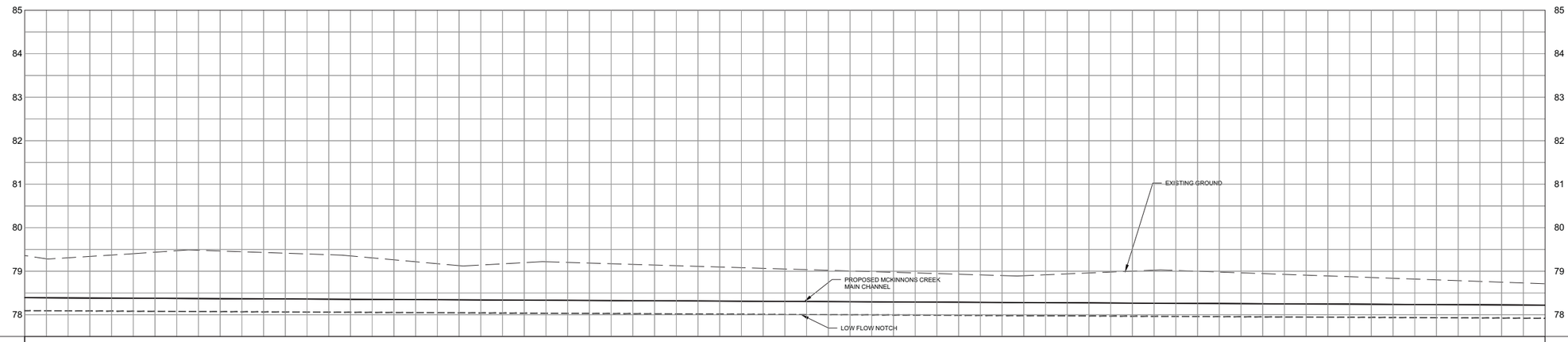
SHEET NUMBER	ISSUE
719	8

SCALE CHECK 10mm 1m

D07-16-22-0014

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PROP ℄ CHANNEL	78.39	78.38	78.37	78.36	78.35	78.34	78.33	78.32	78.31	78.30	78.29	78.28	78.27	78.26	78.25	78.24	78.23	78.22	PROP ℄ CHANNEL
EXIST ℄ CHANNEL	79.29	79.40	79.47	79.40	79.26	79.14	79.20	79.14	79.08	79.02	78.96	78.90	78.96	79.02	78.95	78.87	78.80	78.73	EXIST ℄ CHANNEL
STATION	3+400	3+420	3+440	3+460	3+480	3+500	3+520	3+540	3+560	3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	STATION

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

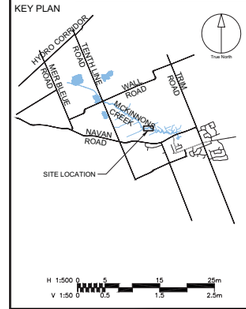
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7	REVISED FOR DFO FISH HABITAT	2023-03-15
8	ISSUED FOR HYDRO COORDINATION	2025-01-27

KEY PLAN



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PROJECT
MER BLEUE URBAN
EXPANSION AREA MCKINNONS
CREEK ENHANCEMENT

PROJECT NO:
117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

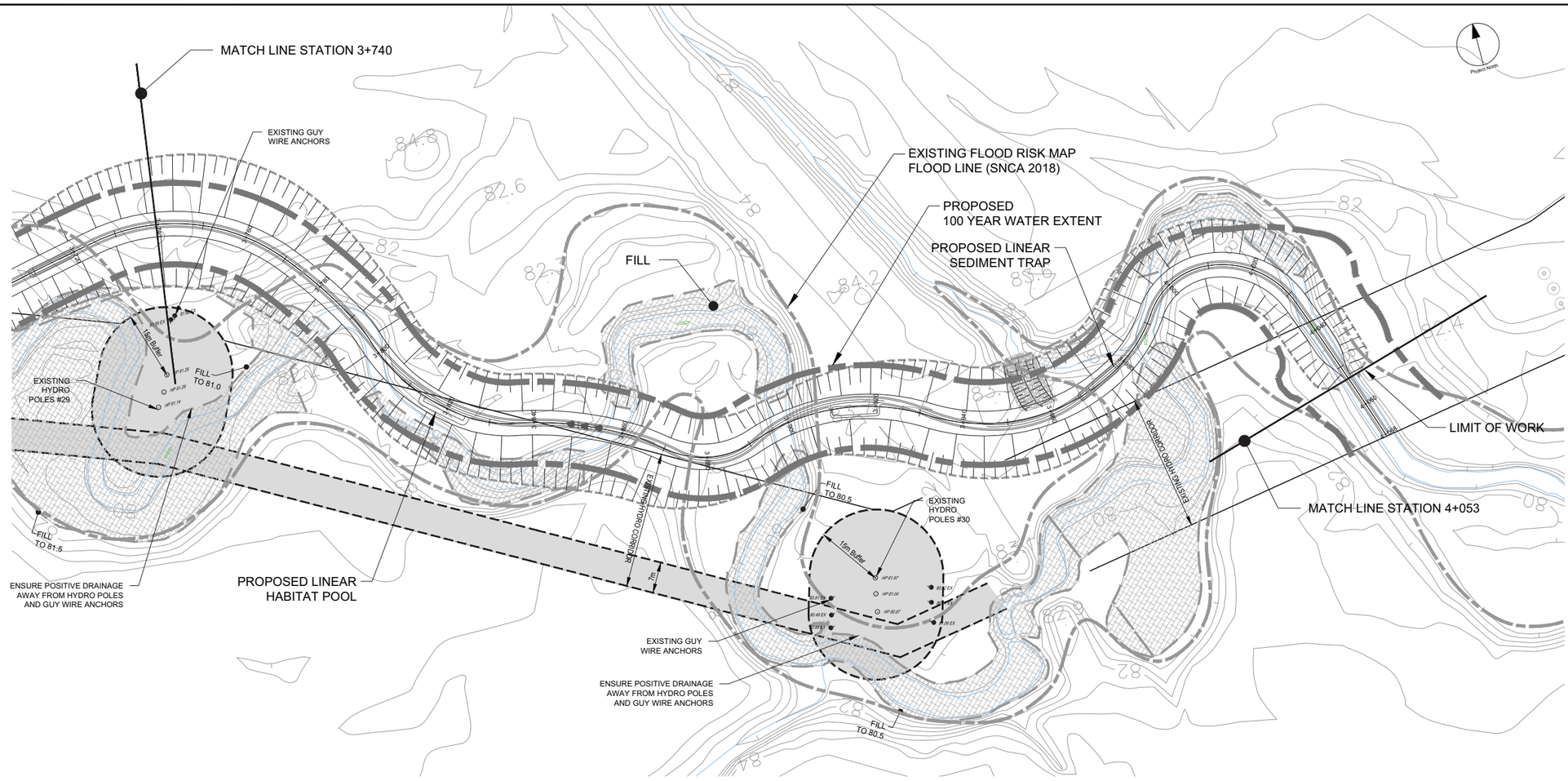
SHEET TITLE
PLAN AND PROFILE
STA. 3+400 - STA. 3+740

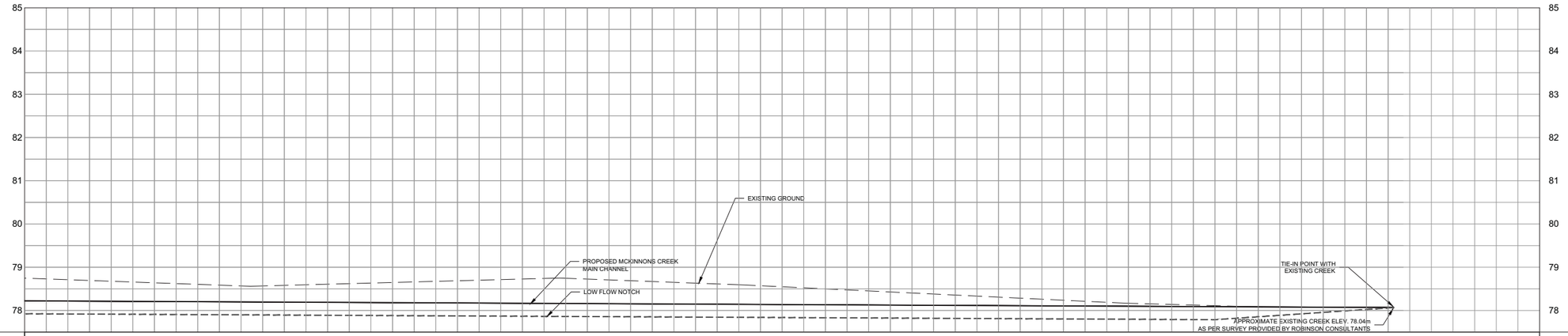
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SCALE CHECK 10mm 1 in

D07-16-22-0014

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EXIST ℄ CHANNEL	78.73	78.66	78.59	78.59	78.65	78.70	78.74	78.67	78.59	78.50	78.40	78.31	78.21	78.14	78.08	78.03		EXIST ℄ CHANNEL
STATION	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	3+940	3+960	3+980	4+000	4+020	4+040		STATION

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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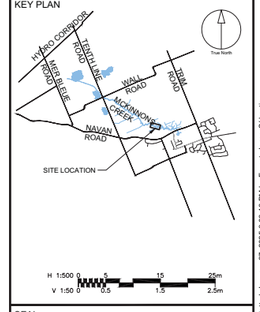
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7	REVISED FOR DFO FISH HABITAT	2023-03-15
8	ISSUED FOR HYDRO COORDINATION	2025-01-27

KEY PLAN



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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

PLAN AND PROFILE

STA. 3+740 - STA. 4+080

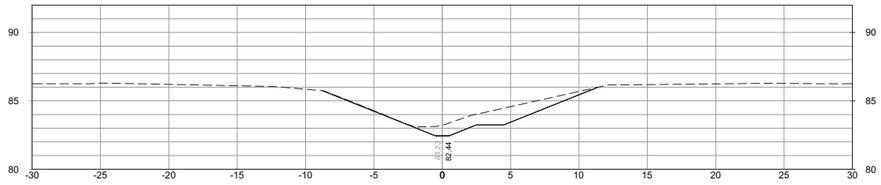
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SCALE CHECK 10mm 1 in

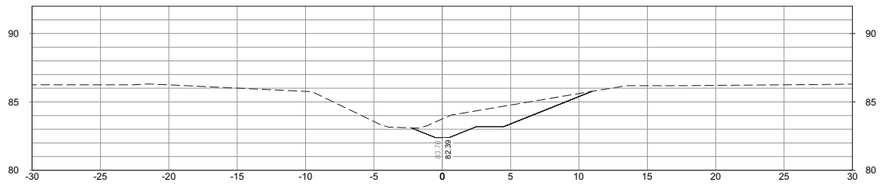
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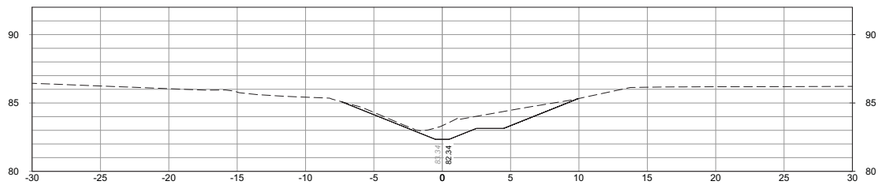
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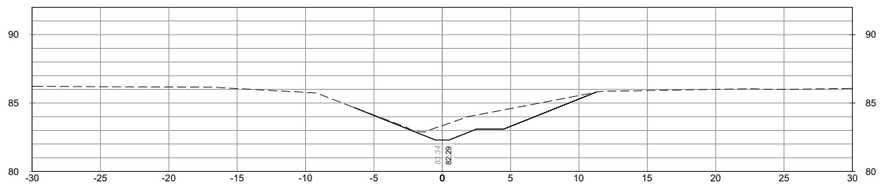
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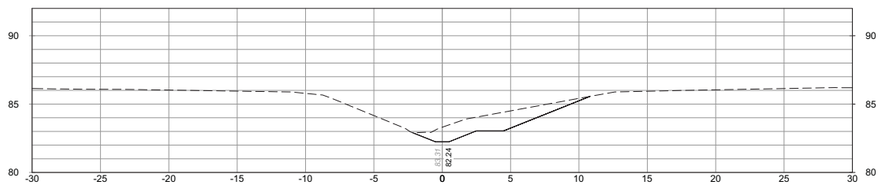
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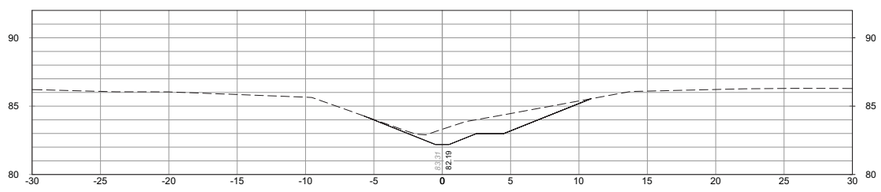
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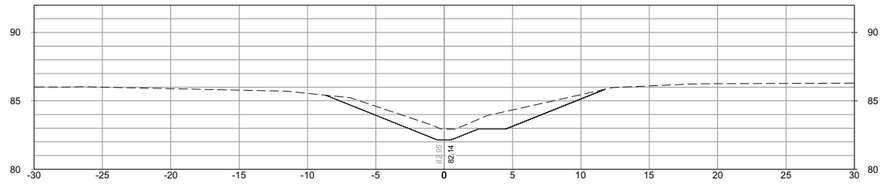
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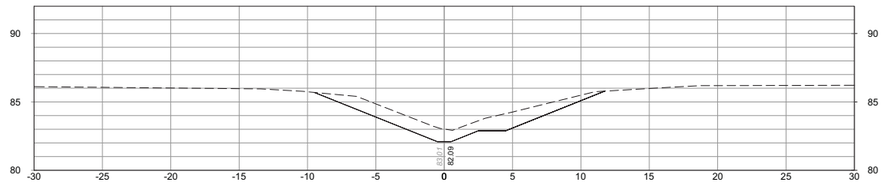
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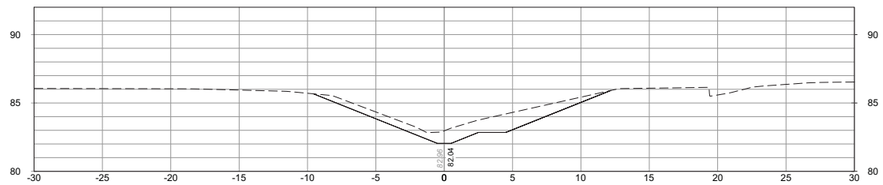
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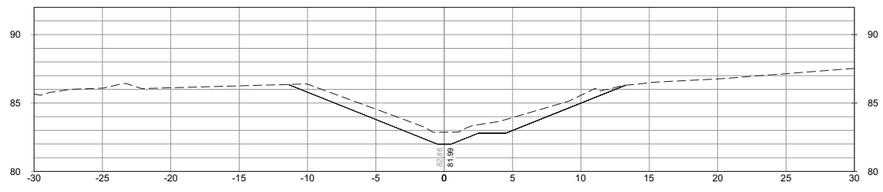
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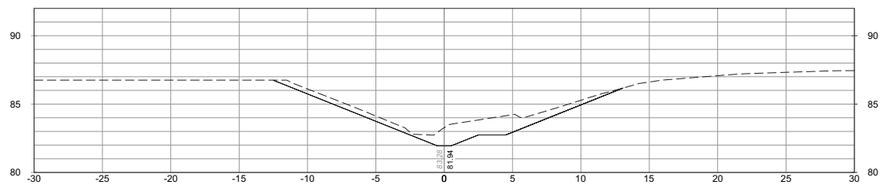
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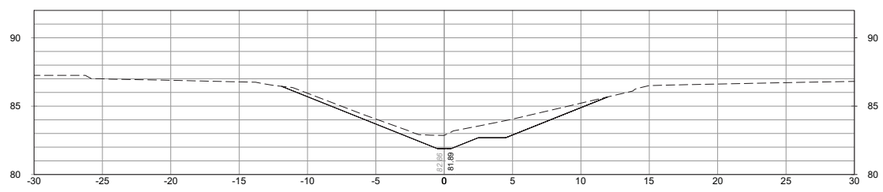
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0+600.00



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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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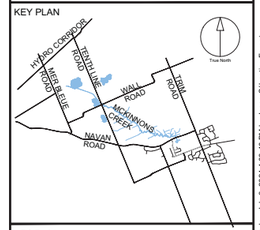
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formerly IBI Group Professional Services (Canada) Inc.

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5	REVISED AS PER SNCA COMMENTS	2022-01-06
6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 10m

SEAL



PRIME CONSULTANT

ARCADIS

333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 0+050 - STA. 0+600

SHEET NUMBER 730

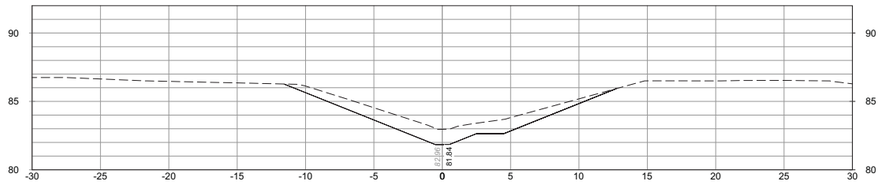
ISSUE 7

SCALE CHECK 10mm 1 in

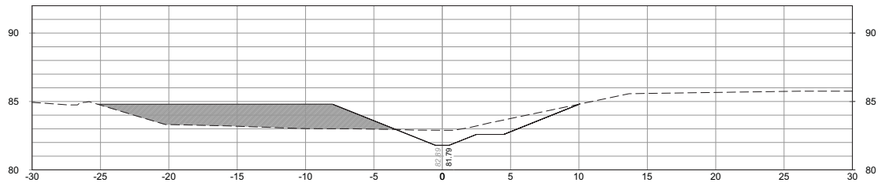
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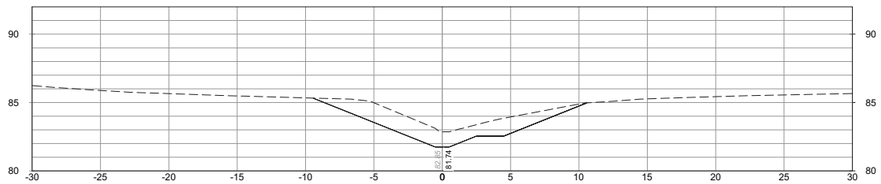
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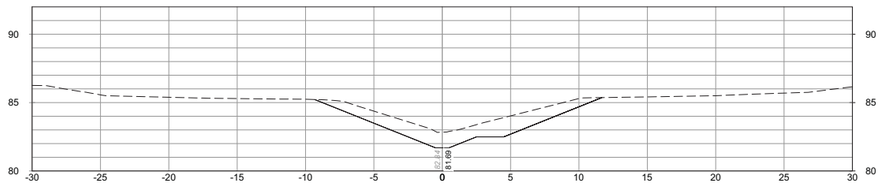
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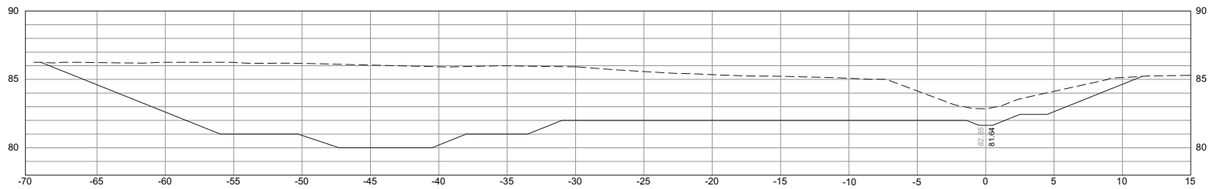
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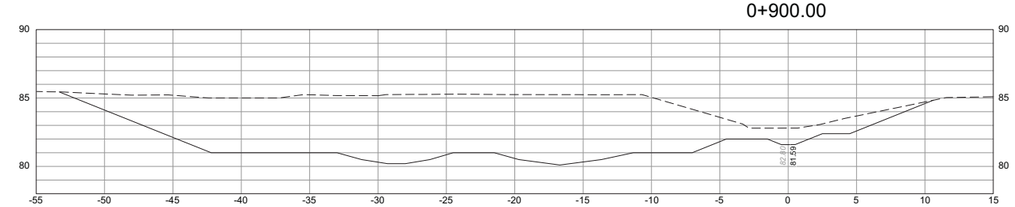
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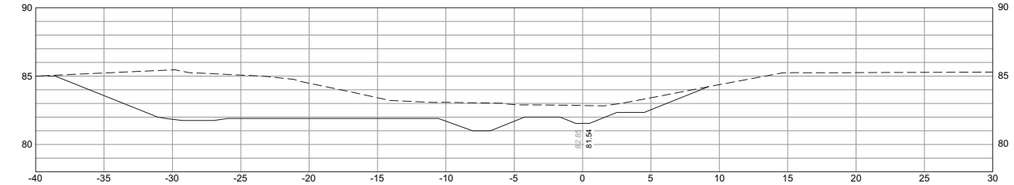
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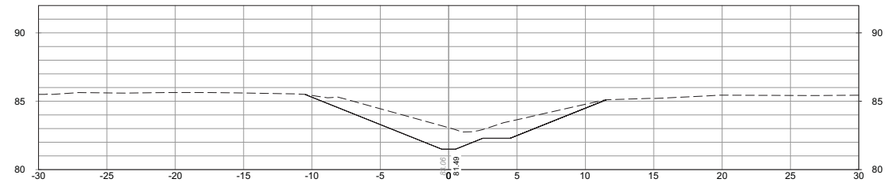
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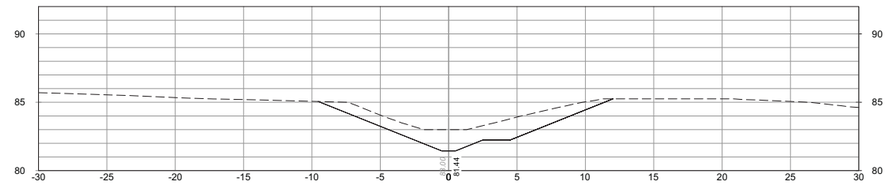
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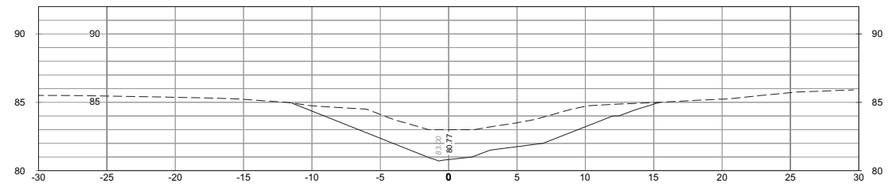
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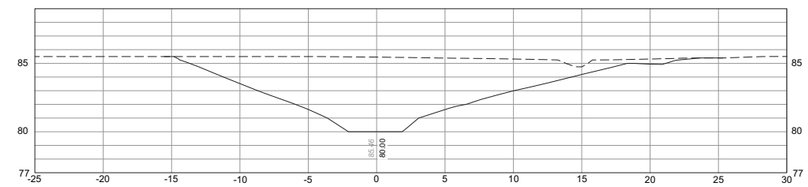
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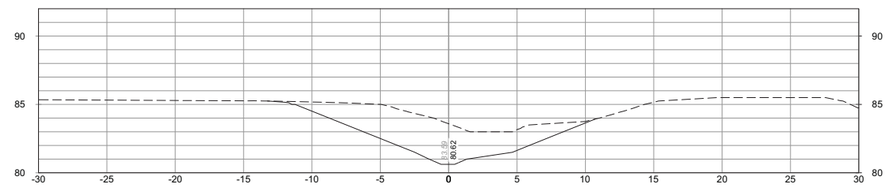
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1+200.00



LEGEND:

PROPOSED FILL

CLIENT

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MATTAMY HOMES
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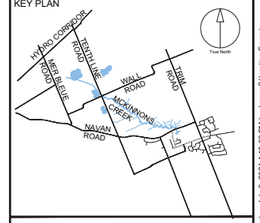
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7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 10m

SEAL



PRIME CONSULTANT

ARCADIS

333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 0+650 - STA. 1+200

SHEET NUMBER 731

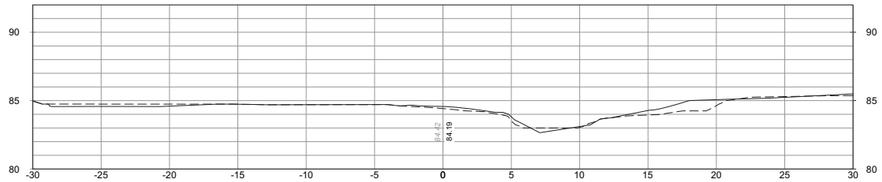
ISSUE 7

SCALE CHECK 10mm 1 in

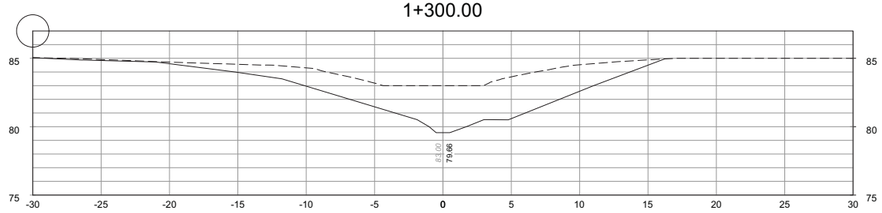
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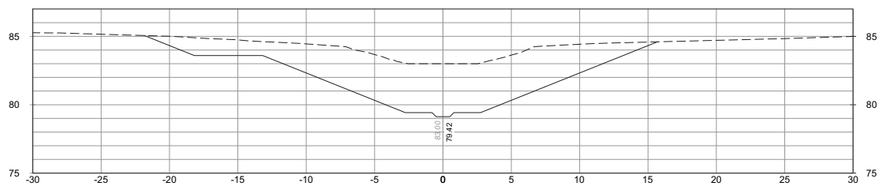
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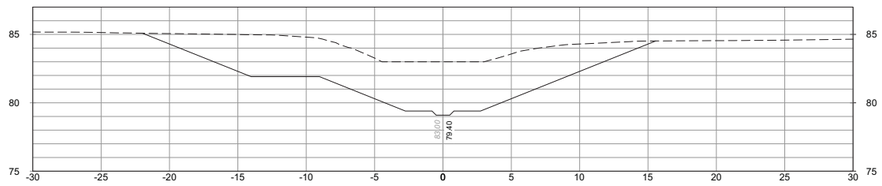
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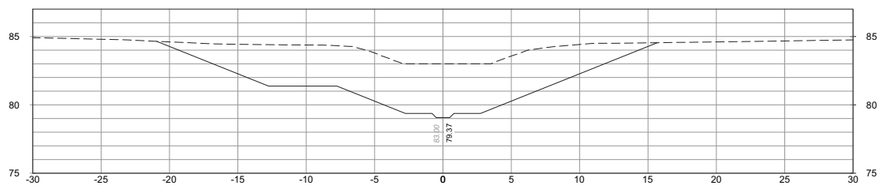
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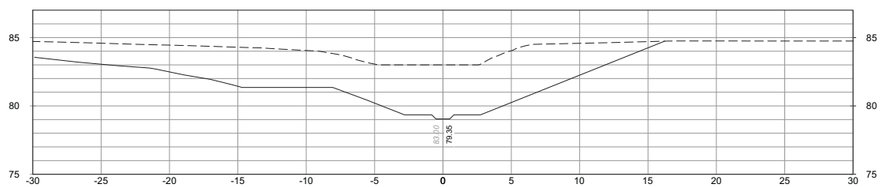
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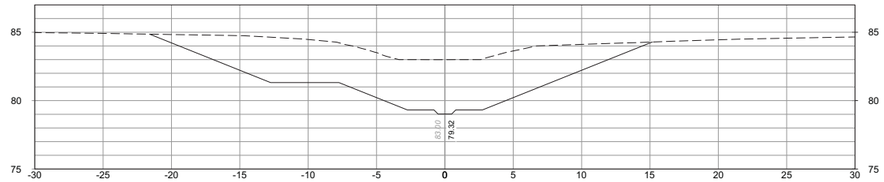
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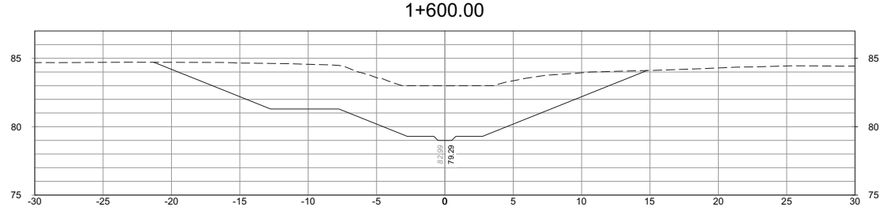
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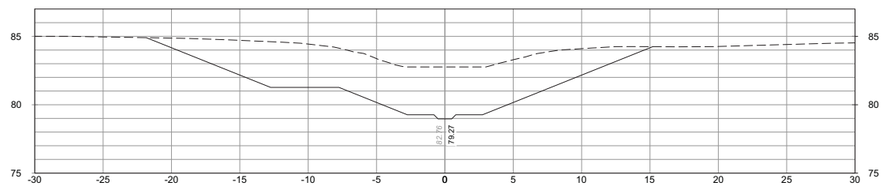
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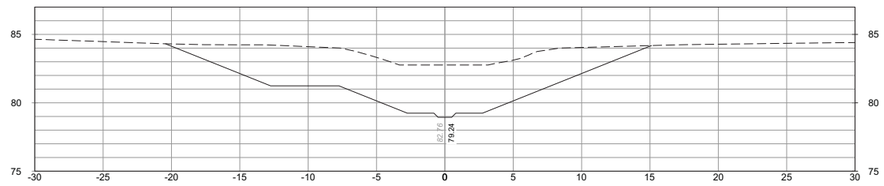
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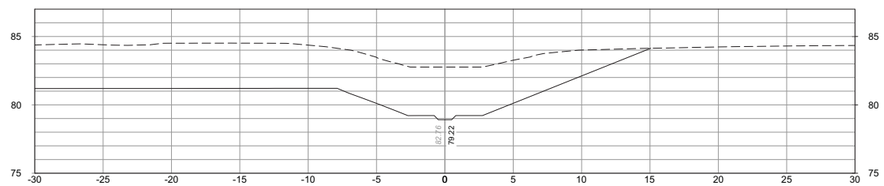
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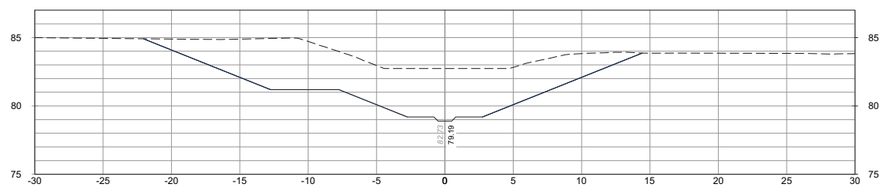
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1+750.00



1+800.00



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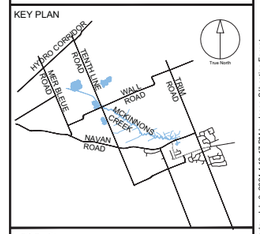
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KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 8 10m

SEAL



PRIME CONSULTANT

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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 1+250 - STA. 1+800

SHEET NUMBER 732

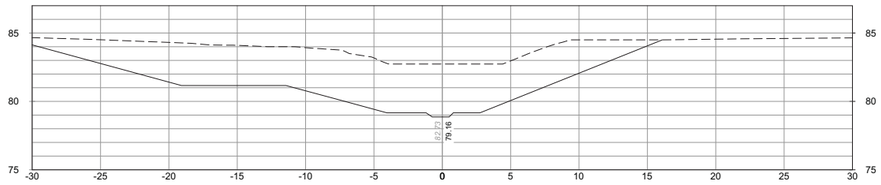
ISSUE 7

SCALE CHECK 10mm 1 in

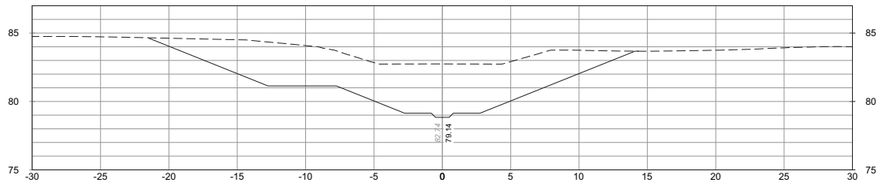
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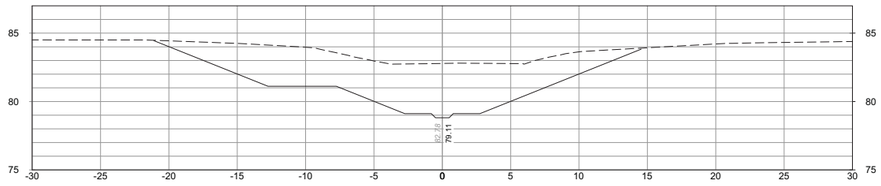
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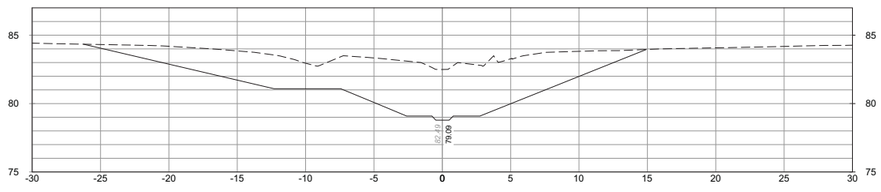
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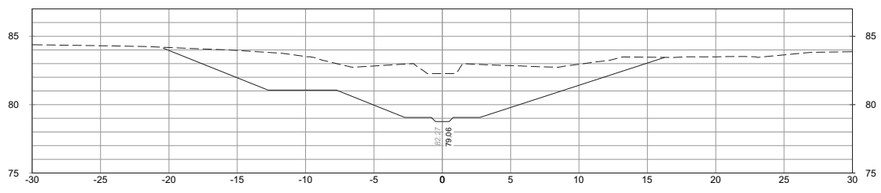
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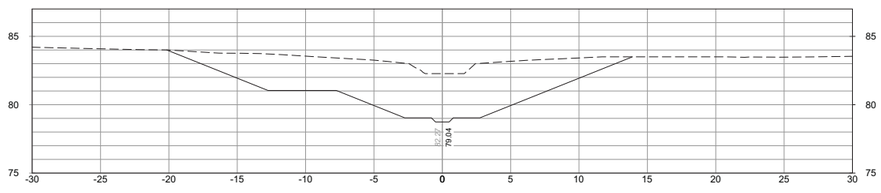
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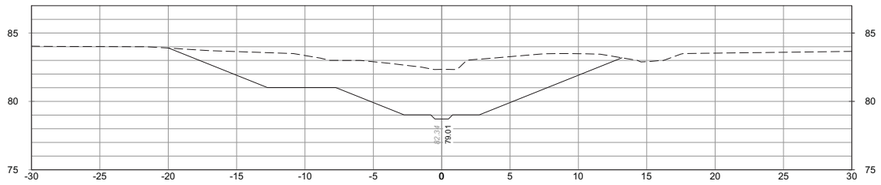
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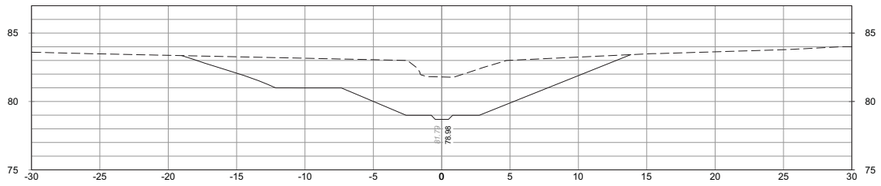
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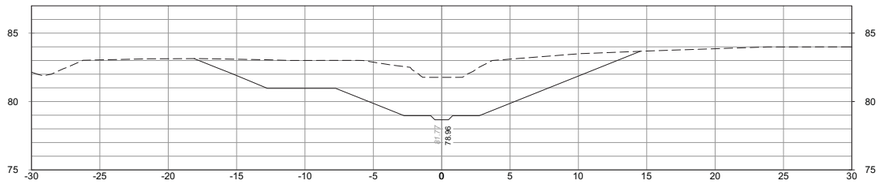
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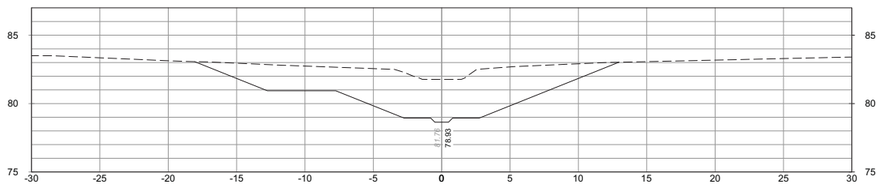
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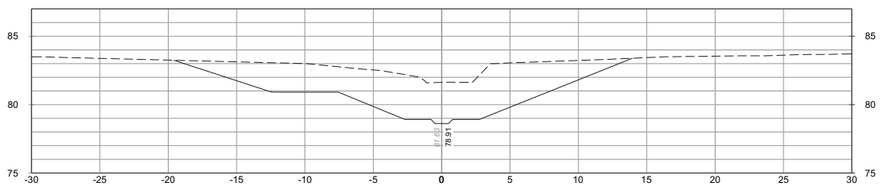
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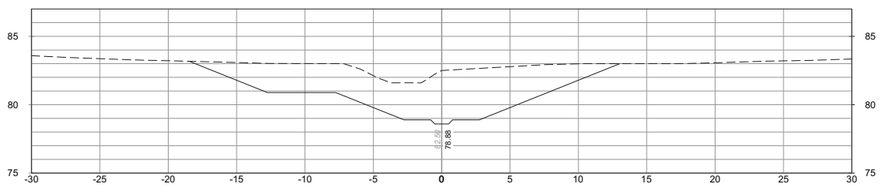
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2+350.00



2+400.00



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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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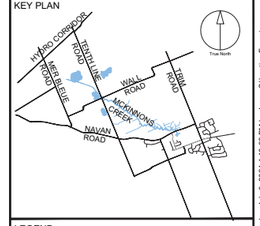
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Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc.

ISSUES

No.	DESCRIPTION	DATE
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4	REVISED AS PER COMMENTS	2020-11-30
5	REVISED AS PER SNCA COMMENTS	2022-01-06
6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 8 10m

SEAL



PRIME CONSULTANT

ARCADIS

333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 1+850 - STA. 2+400

SHEET NUMBER 733

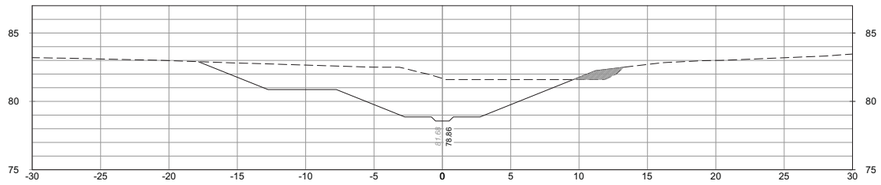
ISSUE 7

SCALE CHECK 10mm 1m

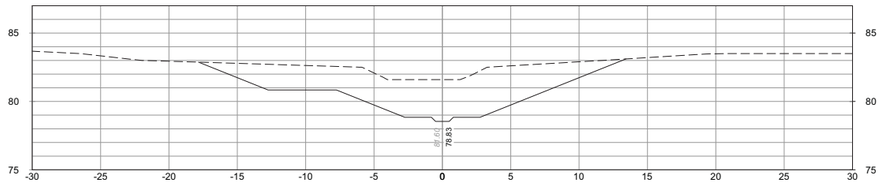
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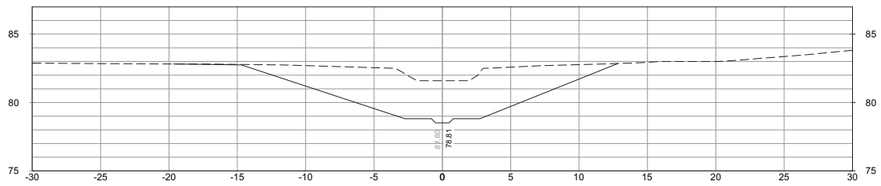
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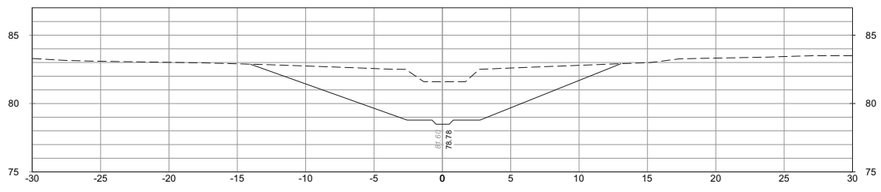
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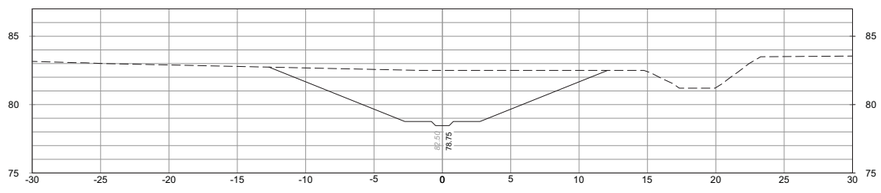
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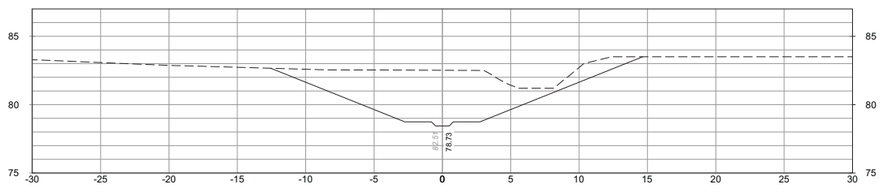
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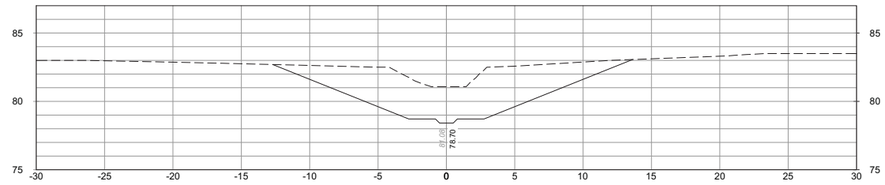
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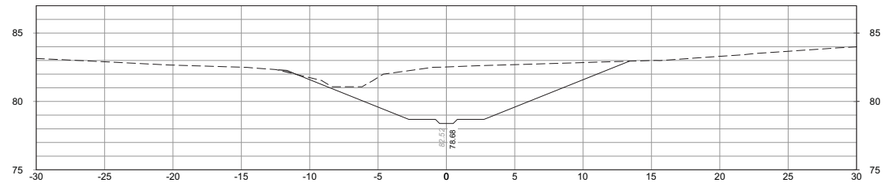
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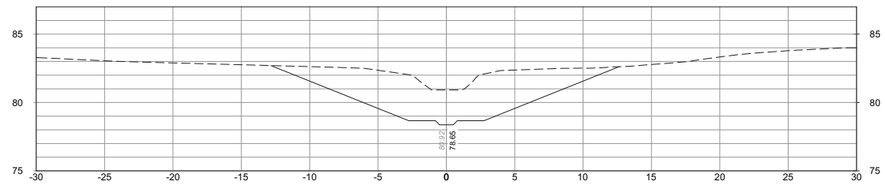
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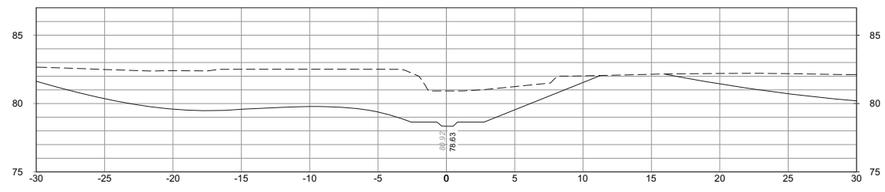
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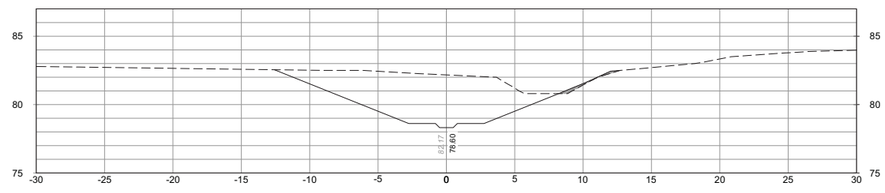
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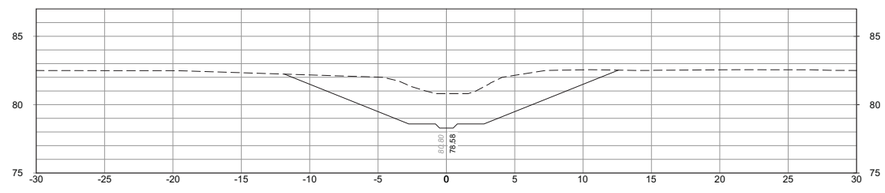
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2+950.00



3+000.00



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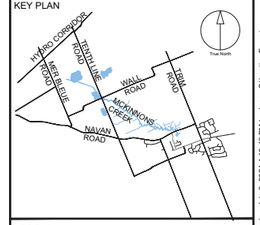
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KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 8 10m

SEAL



PRIME CONSULTANT

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www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618	
DRAWN BY: **J.S.F.**	CHECKED BY: **P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 2+450 - STA. 3+000

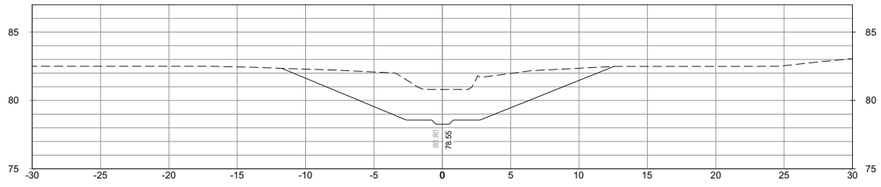
SHEET NUMBER	ISSUE
734	7

SCALE CHECK 10mm 1m

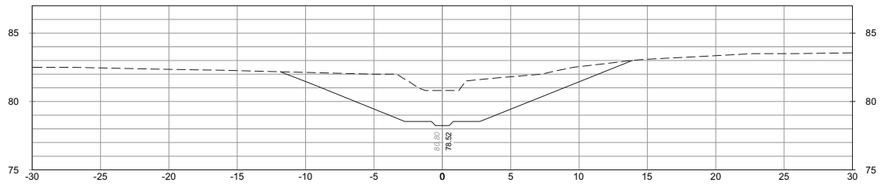
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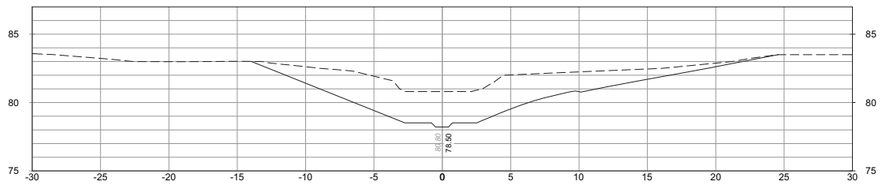
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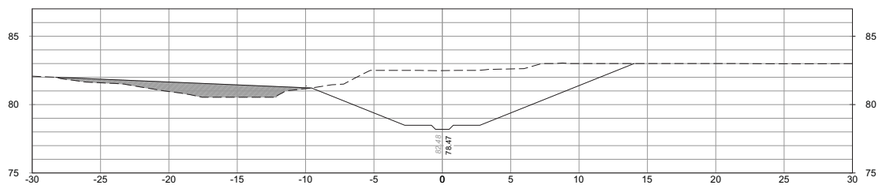
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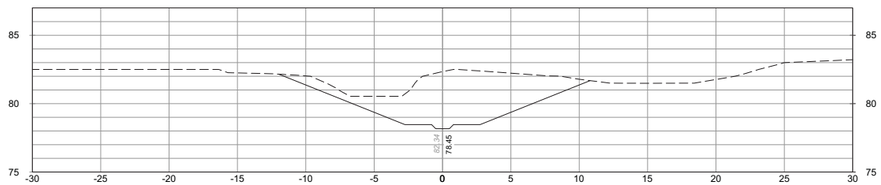
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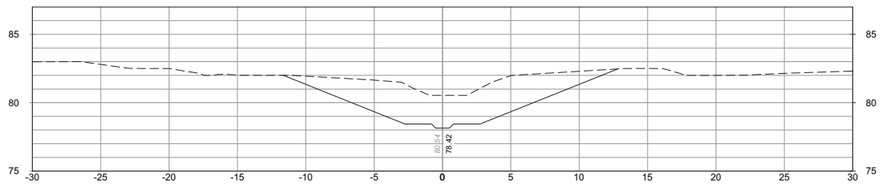
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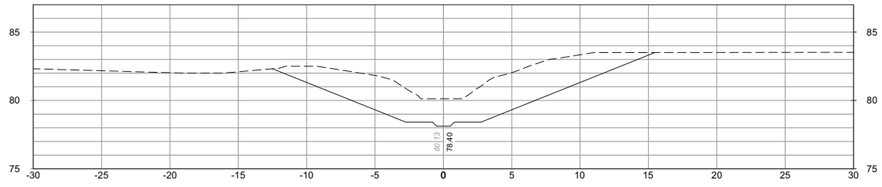
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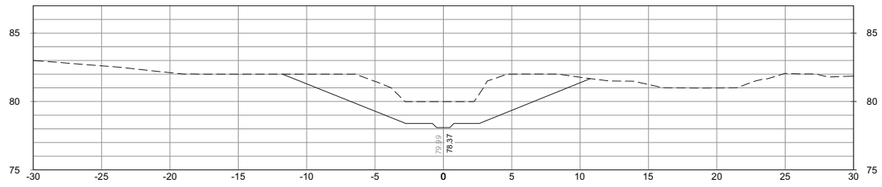
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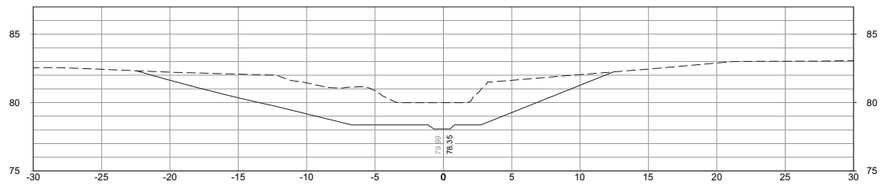
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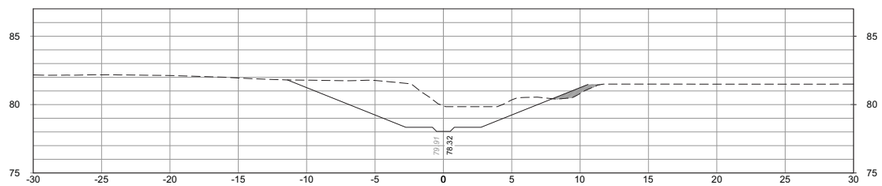
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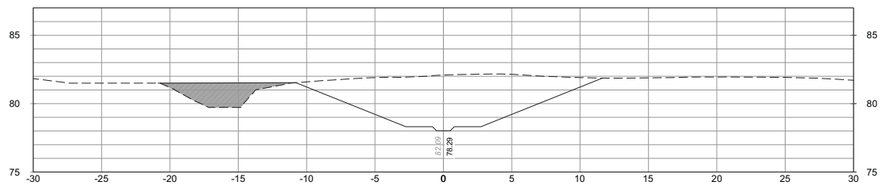
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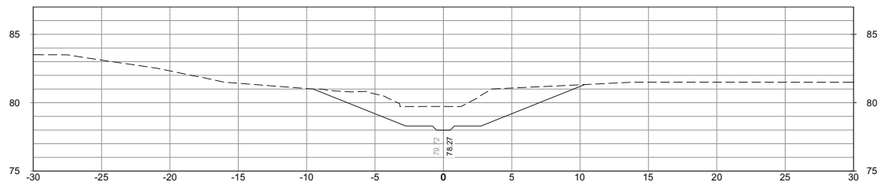
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3+550.00



3+600.00



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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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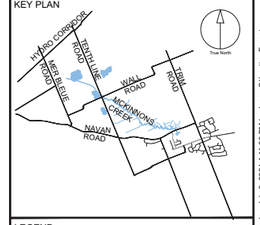
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7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN

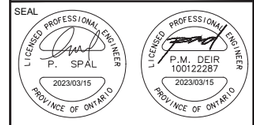


LEGEND:

PROPOSED FILL

1:200 0 2 6 10m

SEAL



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tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.F.S.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 3+050 - STA. 3+600

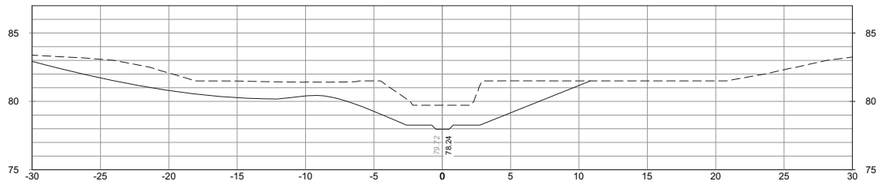
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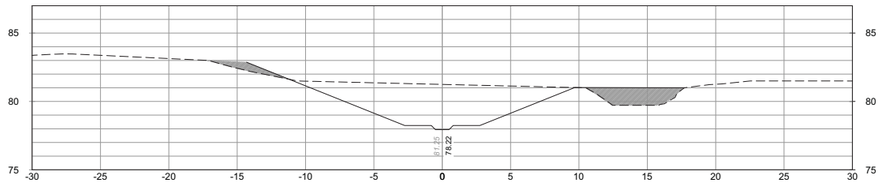
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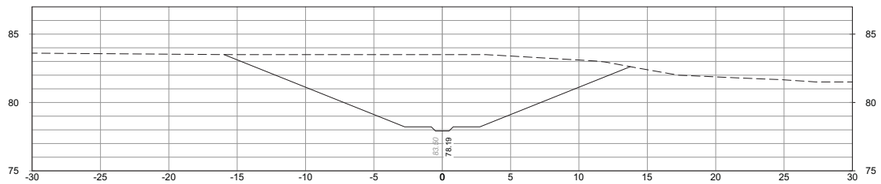
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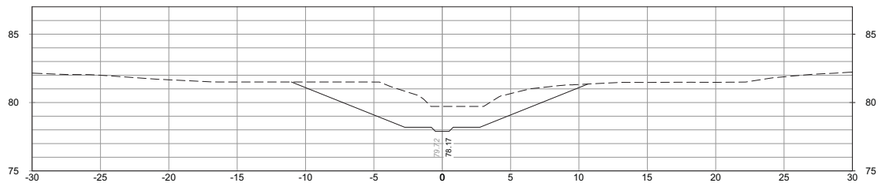
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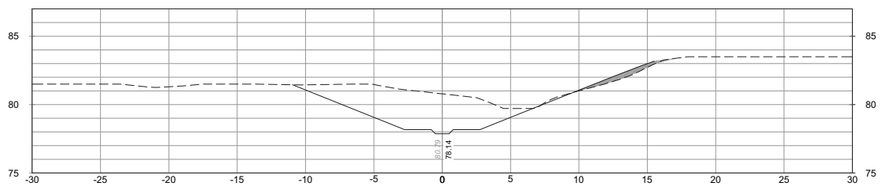
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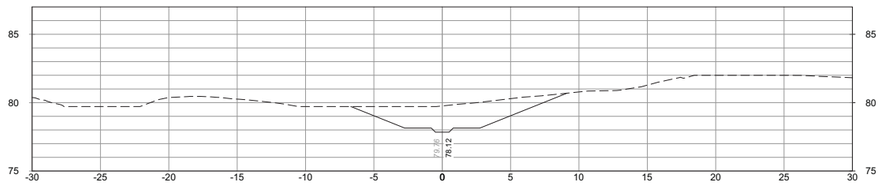
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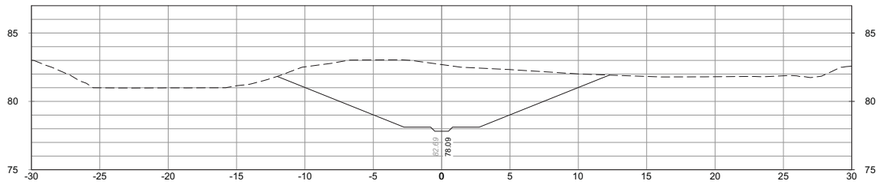
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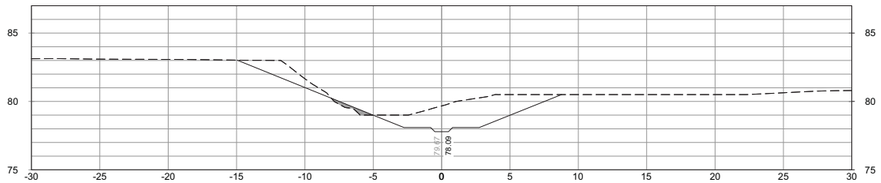
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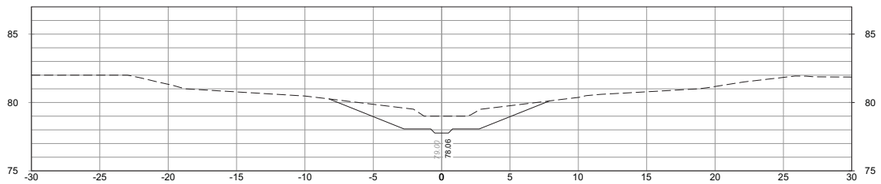
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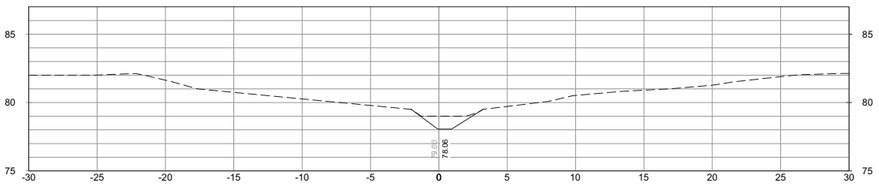
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4+050.00



4+053.31



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RICHCRAFT GROUP OF COMPANIES

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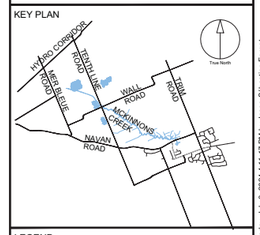
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KEY PLAN



LEGEND:

PROPOSED FILL

1:200 0 2 6 8 10m

SEAL



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PROJECT

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PROJECT NO: 117618

DRAWN BY:	CHECKED BY:
J.S.F	**P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

CROSS-SECTIONS

STA. 3+650 - STA. 4+053

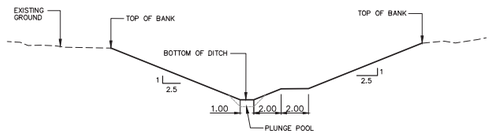
SHEET NUMBER 736

ISSUE 7

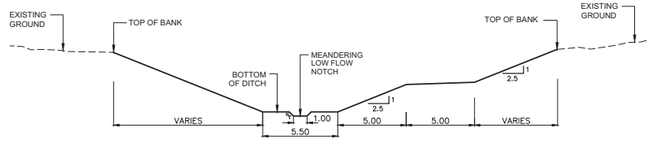
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D07-16-22-0014

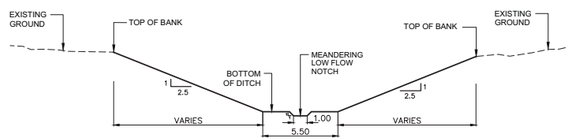
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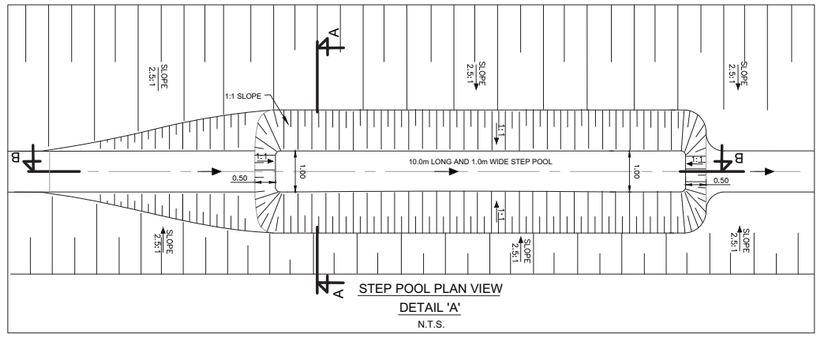
TYPICAL UPPER REACH CROSS - SECTION
NTS



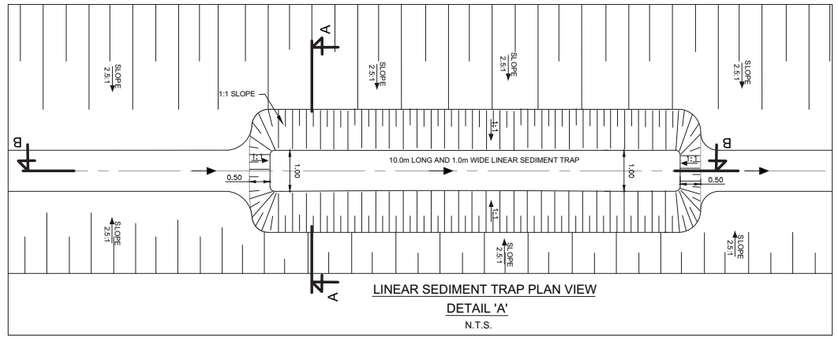
TYPICAL LOWER REACH CROSS - SECTION WITH BENCH
NTS



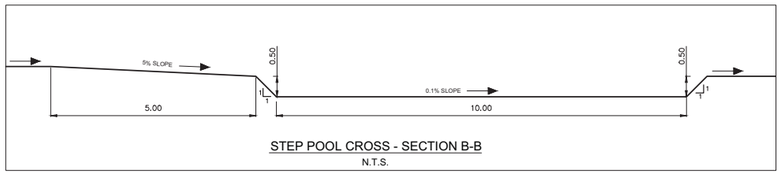
TYPICAL LOWER REACH CROSS - SECTION
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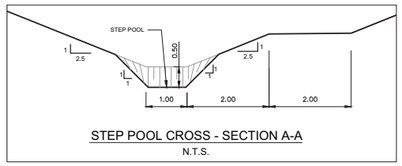
STEP POOL PLAN VIEW
DETAIL 'A'
N.T.S.



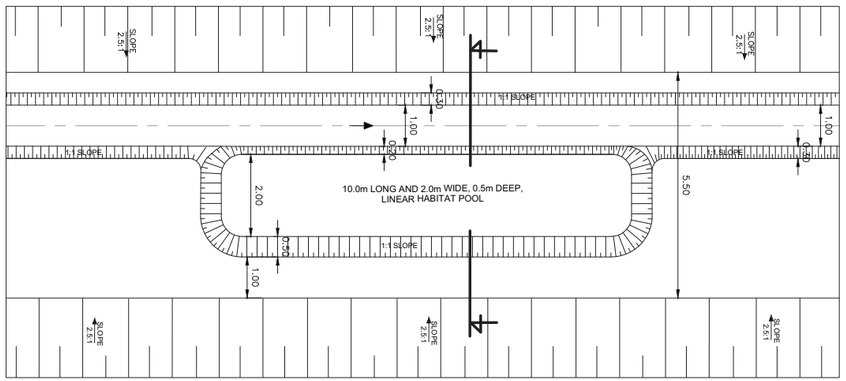
LINEAR SEDIMENT TRAP PLAN VIEW
DETAIL 'A'
N.T.S.



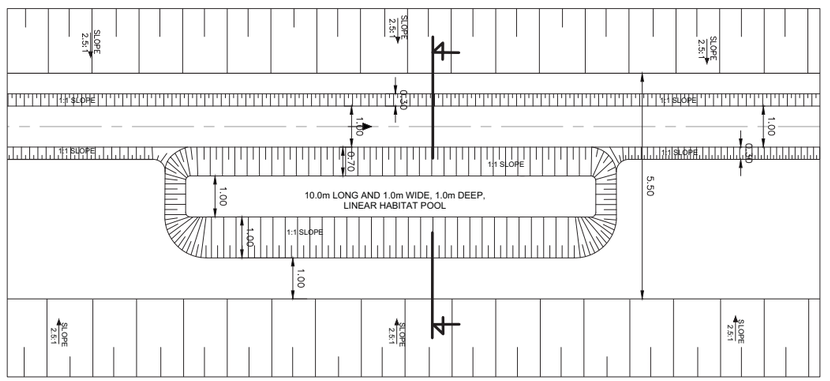
STEP POOL CROSS - SECTION B-B
N.T.S.



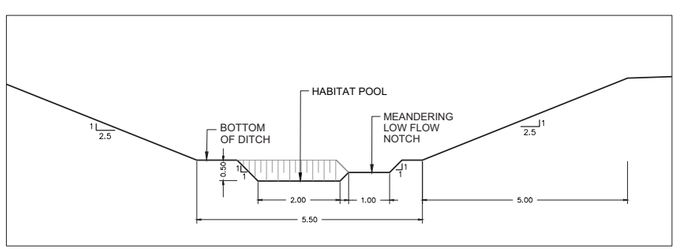
STEP POOL CROSS - SECTION A-A
N.T.S.



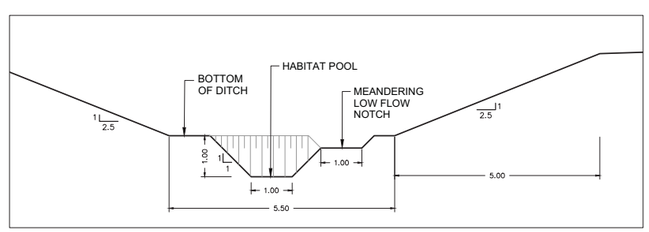
SHALLOW LINEAR HABITAT POOL
N.T.S.



DEEP LINEAR HABITAT POOL
N.T.S.



SHALLOW LINEAR HABITAT POOL (0.5m DEPTH) CROSS SECTION
N.T.S.



DEEP LINEAR HABITAT POOL (1.0m DEPTH) CROSS SECTION
N.T.S.

CLIENT

CLARIDGE HOMES
MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

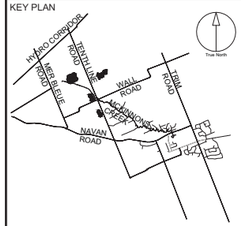
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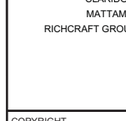
ISSUES

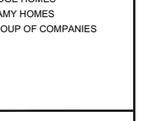
No.	DESCRIPTION	DATE
1	ISSUED FOR REVIEW	2019-10-04
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4	REVISED AS PER COMMENTS	2020-11-30
5	REVISED FOR DFO FISH HABITAT	2023-02-23
6	REVISED FOR DFO FISH HABITTAT	2023-03-15

KEY PLAN



SEAL





PRIME CONSULTANT

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tel 613 225 1311
www.arcadis.com

PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618	
DRAWN BY: **S.V.**	CHECKED BY: **P.D.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

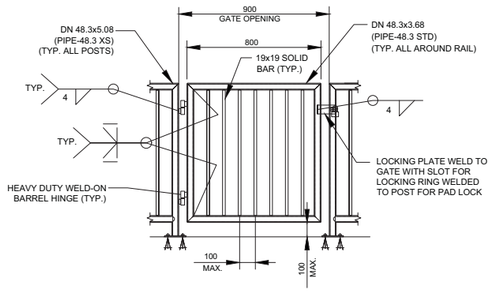
DETAILS-I

SHEET NUMBER	ISSUE
740	6

SCALE CHECK 10mm 1 in

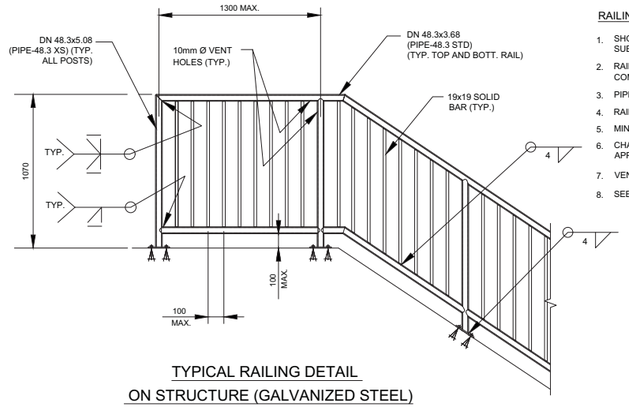
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RAILING GATE DETAIL (GALVANIZED STEEL)

N.T.S.

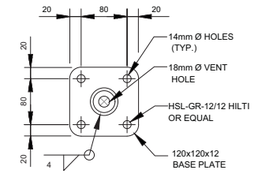


TYPICAL RAILING DETAIL
ON STRUCTURE (GALVANIZED STEEL)

N.T.S.

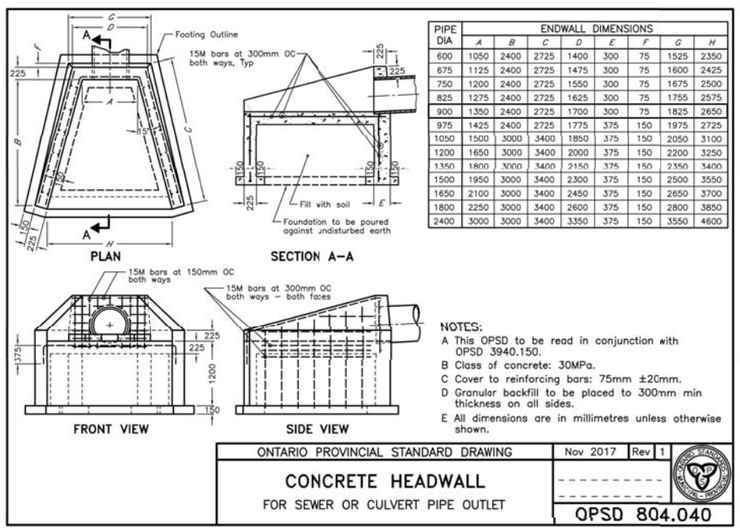
RAILING NOTES:

1. SHOP DRAWING OF THE RAILING PREPARED BY THE CONTRACTOR'S ENGINEER SHALL BE SUBMITTED TO CONTRACT ADMINISTRATOR FOR REVIEW.
2. RAILING TO BE DESIGNED AND MANUFACTURED TO FIELD DIMENSIONS OF COMPLETED STRUCTURES.
3. PIPE FOR RAILING TO ASTM A53-GRADE 240 MPa ELECTRODES E 410 X.
4. RAILING TO BE HOT DIP GALVANIZED UPON FABRICATION TO CSA G164-M94.
5. MINIMUM TENSILE WORKING LOAD FOR ANCHORS IS 14 kN.
6. CHANGE TO GEOMETRY AND MEMBERS SIZES REQUIRE CONTRACT ADMINISTRATOR APPROVAL.
7. VENT HOLES REQUIRED IN ALL MEMBERS.
8. SEE GRADING DRAWINGS FOR RAILING OUTLINE LOCATION AND DETAILS



TYPICAL ANCHOR PLATE DETAIL

N.T.S.



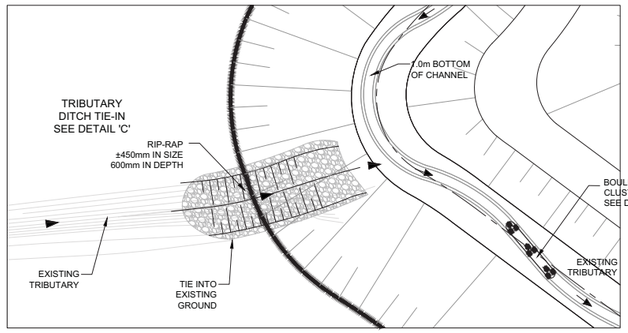
PIPE DIA	ENDWALL DIMENSIONS							
	A	B	C	D	E	F	G	H
600	1050	2400	2725	1400	300	75	1525	2350
675	1125	2400	2725	1475	300	75	1600	2425
750	1200	2400	2725	1550	300	75	1675	2500
825	1275	2400	2725	1625	300	75	1755	2575
900	1350	2400	2725	1700	300	75	1825	2650
975	1425	2400	2725	1775	375	150	1975	2725
1050	1500	3000	3400	1850	375	150	2050	3100
1200	1650	3000	3400	2000	375	150	2200	3250
1350	1800	3000	3400	2150	375	150	2350	3400
1500	1950	3000	3400	2300	375	150	2500	3550
1650	2100	3000	3400	2450	375	150	2650	3700
1800	2250	3000	3400	2600	375	150	2800	3850
2400	3000	3000	3400	3350	375	150	3550	4600

NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B Class of concrete: 30MPa.
C Cover to reinforcing bars: 75mm ±20mm.
D Granular backfill to be placed to 300mm min thickness on all sides.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2017 | Rev 1

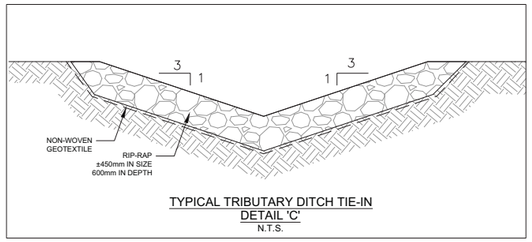
CONCRETE HEADWALL
FOR SEWER OR CULVERT PIPE OUTLET

OPSD 804.040



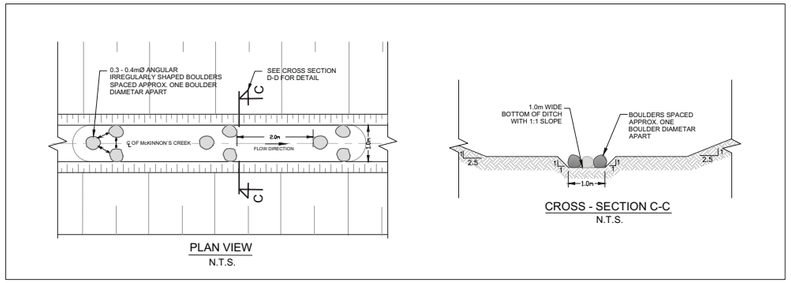
TYPICAL TRIBUTARY DITCH TIE-IN PLAN VIEW

N.T.S.



TYPICAL TRIBUTARY DITCH TIE-IN
DETAIL 'C'

N.T.S.



PLAN VIEW

N.T.S.

CROSS - SECTION C-C

N.T.S.

BOULDER CLUSTER DETAIL 'B'

N.T.S.

True North | Project North

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

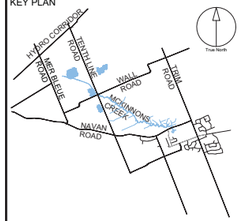
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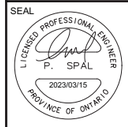
ISSUES

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6	REVISED FOR DFO FISH HABITTAT	2023-03-15

KEY PLAN



SEAL





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PROJECT
MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO:
117618

DRAWN BY:	CHECKED BY:
S.V.	**P.S.**
PROJECT MGR:	APPROVED BY:
P.D.	**P.S.**

SHEET TITLE
DETAILS-II

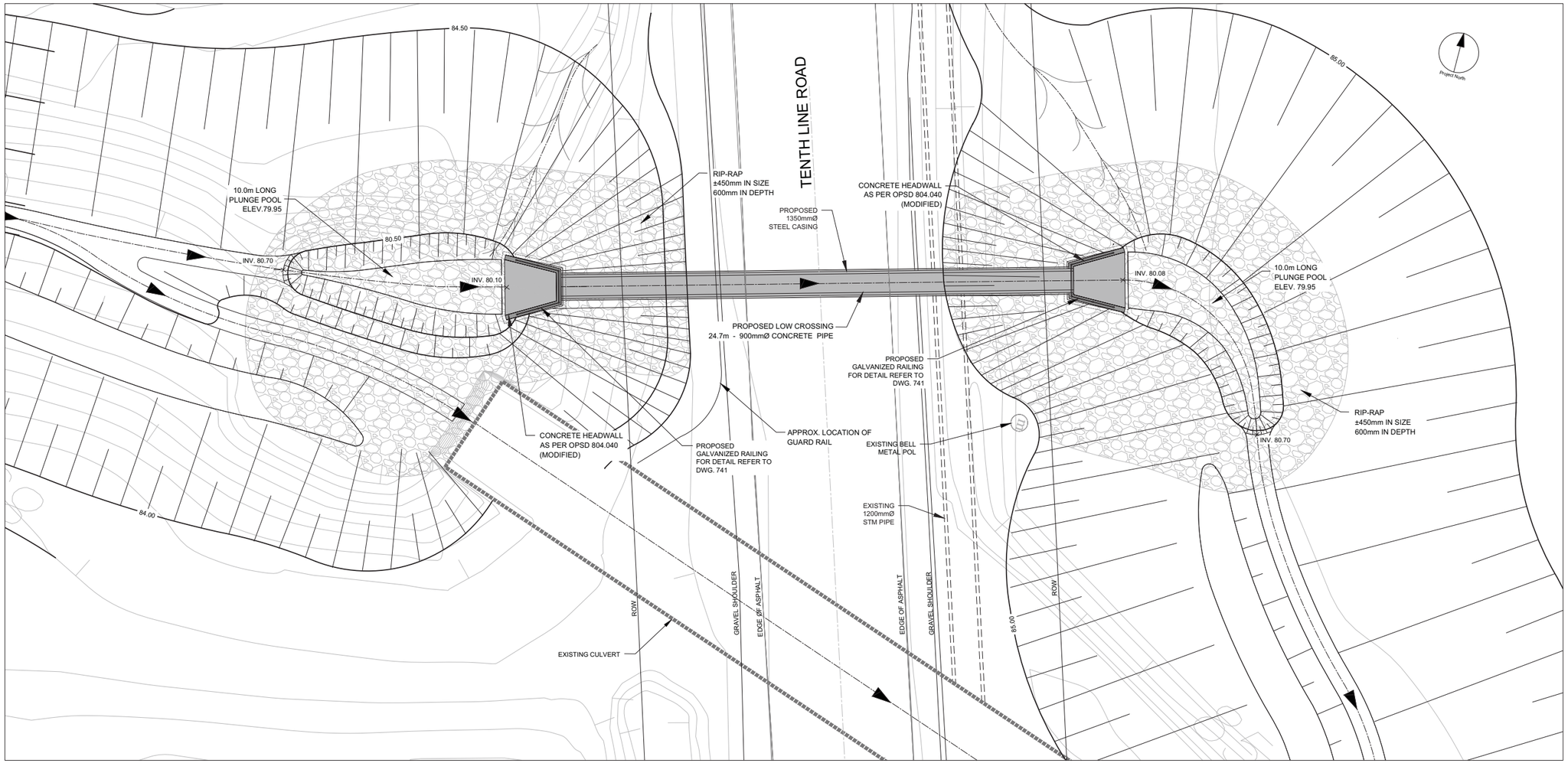
SHEET NUMBER
741

ISSUE
6

SCALE CHECK
10mm
1 in

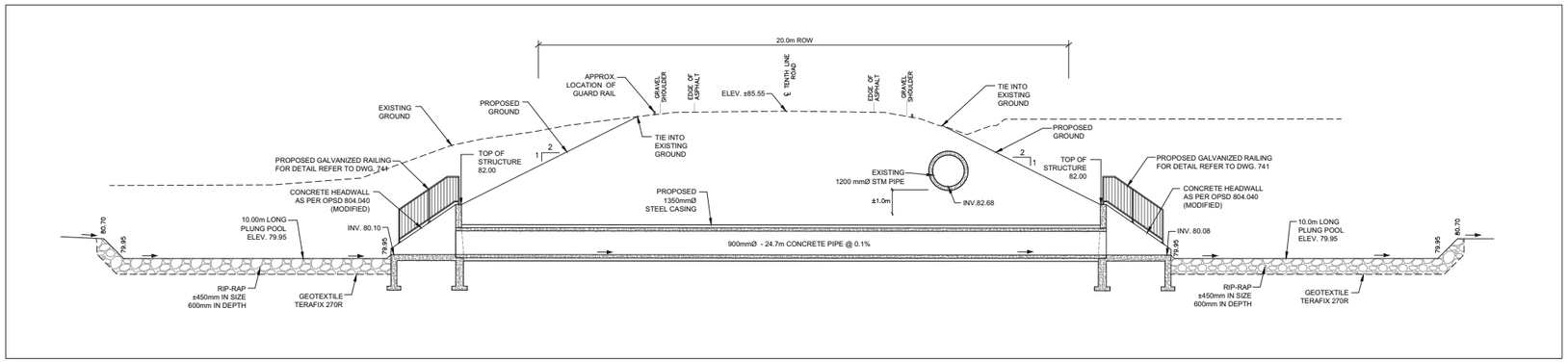
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D07-16-22-0014



PLAN VIEW

SCALE 1:100



PROFILE

SCALE 1:100

CLIENT

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MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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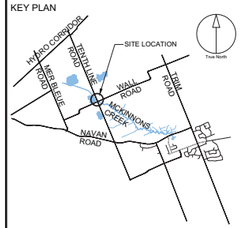
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6	REVISED FOR DFO FISH HABITTAT	2023-02-23
7	REVISED FOR DFO FISH HABITAT	2023-03-15

KEY PLAN



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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618	
DRAWN BY: **S.V.**	CHECKED BY: **P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

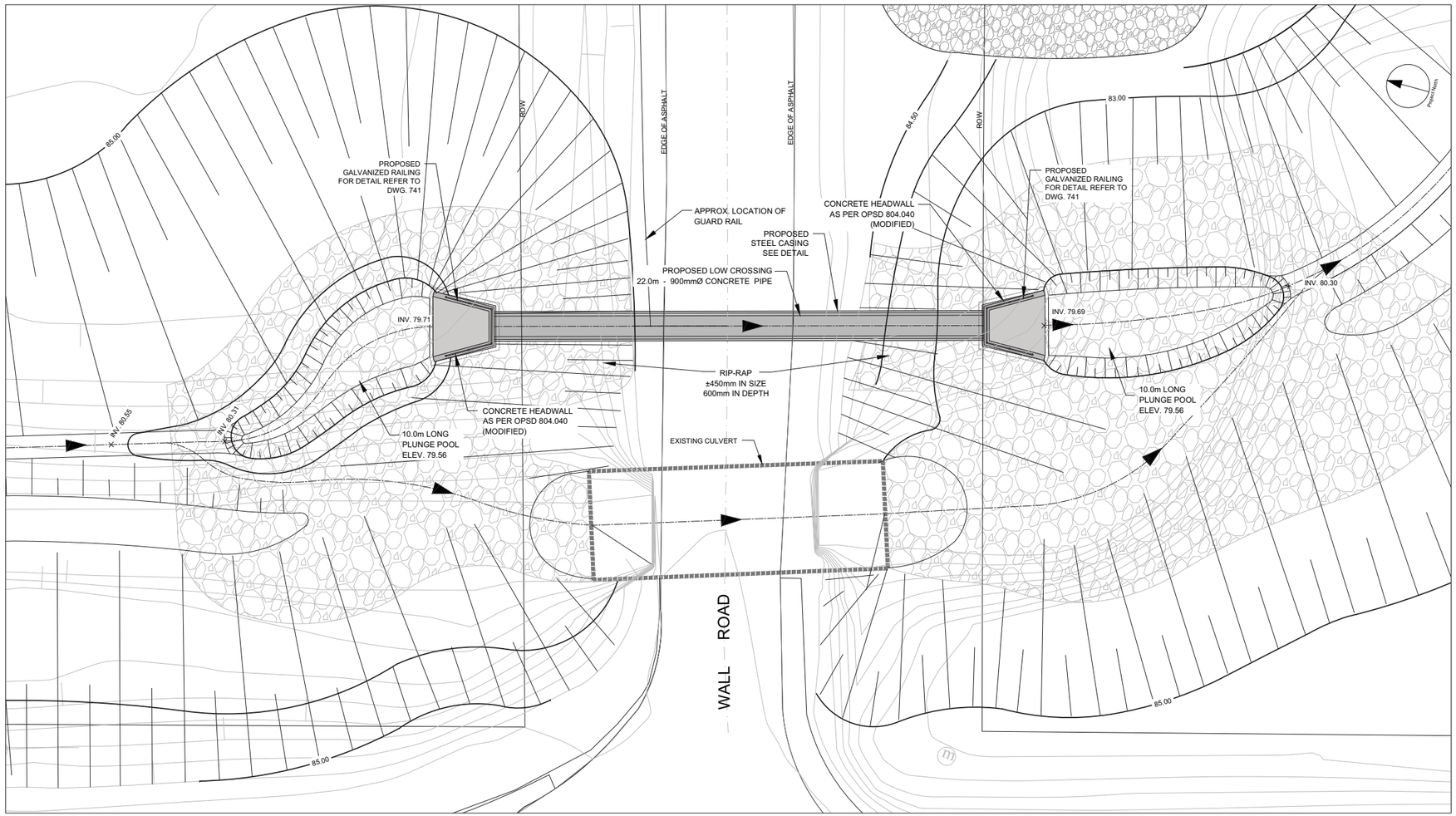
TENTH LINE CROSSING CULVERT

SHEET NUMBER	ISSUE
750	7

SCALE CHECK 10mm 1m

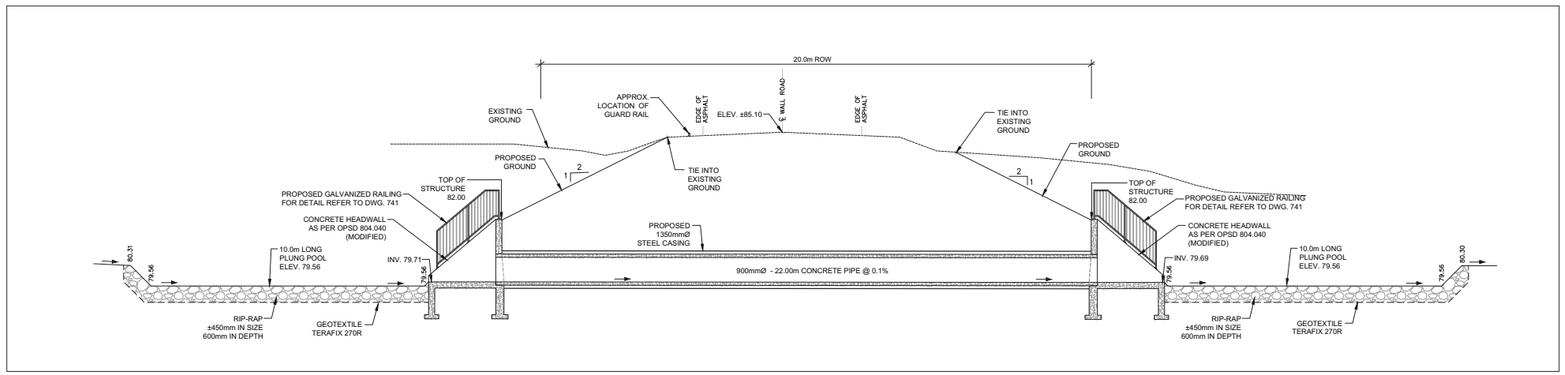
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PLAN VIEW

SCALE 1:100



PROFILE

SCALE 1:100

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RICHCRAFT GROUP OF COMPANIES

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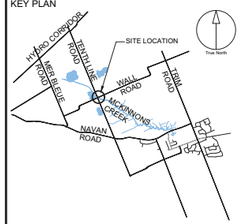
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ISSUES

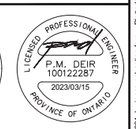
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KEY PLAN



SEAL





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PROJECT

MER BLEUE URBAN EXPANSION AREA MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618

DRAWN BY: **S.V.**	CHECKED BY: **P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

WALL ROAD CROSSING CULVERT

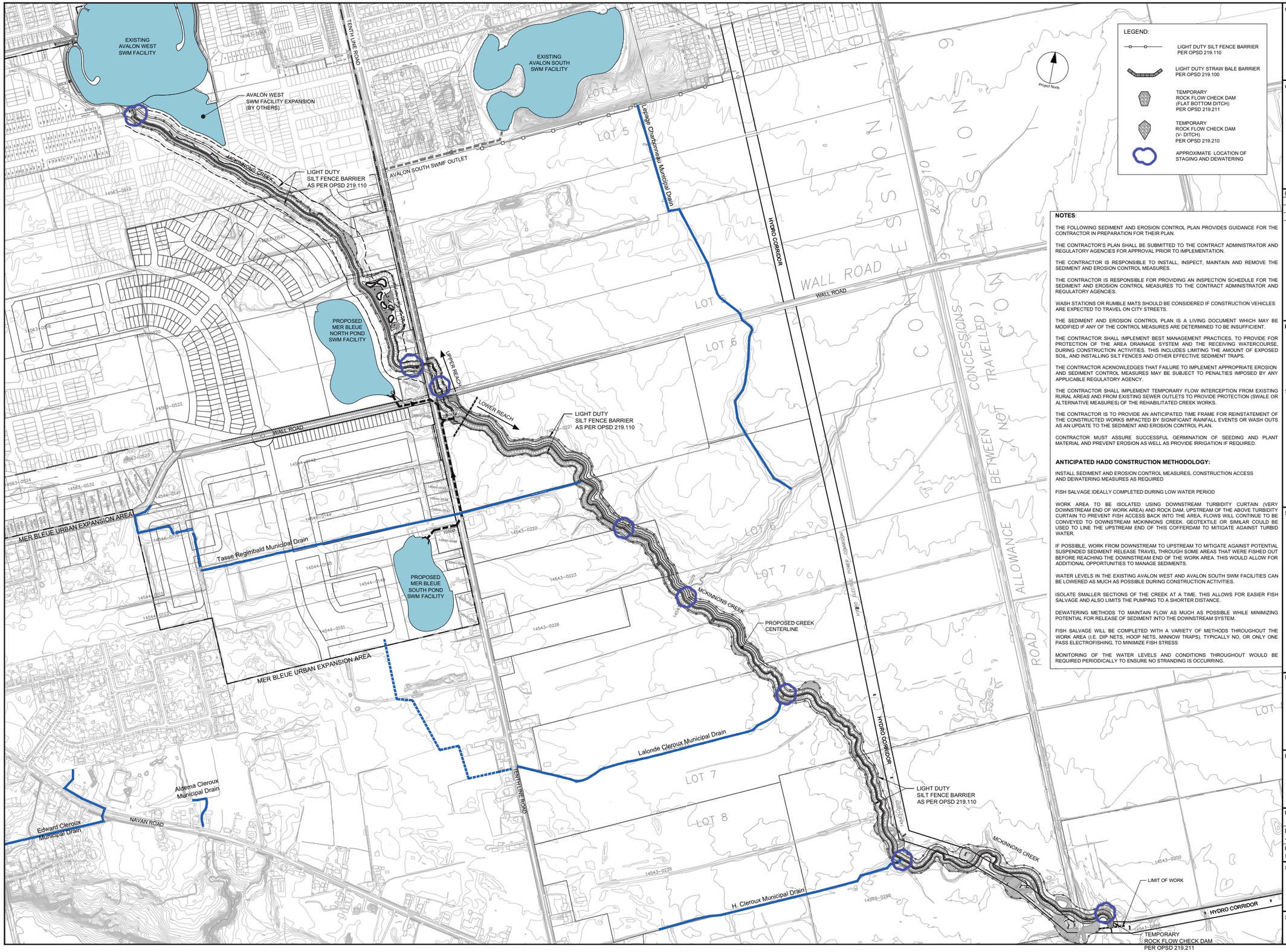
S.V.

SHEET NUMBER	ISSUE
751	7

SCALE CHECK 10mm 1m

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D07-16-22-0014



LEGEND:

- LIGHT DUTY SILT FENCE BARRIER PER OPSD 219.110
- LIGHT DUTY STRAW BALE BARRIER PER OPSD 219.100
- TEMPORARY ROCK FLOW CHECK DAM (FLAT BOTTOM DITCH) PER OPSD 219.211
- TEMPORARY ROCK FLOW CHECK DAM (V- DITCH) PER OPSD 219.210
- APPROXIMATE LOCATION OF STAGING AND DEWATERING

NOTES:

THE FOLLOWING SEDIMENT AND EROSION CONTROL PLAN PROVIDES GUIDANCE FOR THE CONTRACTOR IN PREPARATION FOR THEIR PLAN.

THE CONTRACTOR'S PLAN SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR AND REGULATORY AGENCIES FOR APPROVAL PRIOR TO IMPLEMENTATION.

THE CONTRACTOR IS RESPONSIBLE TO INSTALL, INSPECT, MAINTAIN AND REMOVE THE SEDIMENT AND EROSION CONTROL MEASURES.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN INSPECTION SCHEDULE FOR THE SEDIMENT AND EROSION CONTROL MEASURES TO THE CONTRACT ADMINISTRATOR AND REGULATORY AGENCIES.

WASH STATIONS OR RUMBLE MATS SHOULD BE CONSIDERED IF CONSTRUCTION VEHICLES ARE EXPECTED TO TRAVEL ON CITY STREETS.

THE SEDIMENT AND EROSION CONTROL PLAN IS A LIVING DOCUMENT WHICH MAY BE MODIFIED IF ANY OF THE CONTROL MEASURES ARE DETERMINED TO BE INSUFFICIENT.

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, AND INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS.

THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

THE CONTRACTOR SHALL IMPLEMENT TEMPORARY FLOW INTERCEPTION FROM EXISTING RURAL AREAS AND FROM EXISTING SEWER OUTLETS TO PROVIDE PROTECTION (SWALE OR ALTERNATIVE MEASURES) OF THE REHABILITATED CREEK WORKS.

THE CONTRACTOR IS TO PROVIDE AN ANTICIPATED TIME FRAME FOR REINSTATEMENT OF THE CONSTRUCTED WORKS IMPACTED BY SIGNIFICANT RAINFALL EVENTS OR WASH OUTS AS AN UPDATE TO THE SEDIMENT AND EROSION CONTROL PLAN.

CONTRACTOR MUST ASSURE SUCCESSFUL GERMINATION OF SEEDING AND PLANT MATERIAL AND PREVENT EROSION AS WELL AS PROVIDE IRRIGATION IF REQUIRED.

ANTICIPATED HADD CONSTRUCTION METHODOLOGY:

INSTALL SEDIMENT AND EROSION CONTROL MEASURES, CONSTRUCTION ACCESS AND DEWATERING MEASURES AS REQUIRED

FISH SALVAGE IDEALLY COMPLETED DURING LOW WATER PERIOD

WORK AREA TO BE ISOLATED USING DOWNSTREAM TURBIDITY CURTAIN (VERY DOWNSTREAM END OF WORK AREA) AND ROCK DAM, UPSTREAM OF THE ABOVE TURBIDITY CURTAIN TO PREVENT FISH ACCESS BACK INTO THE AREA. FLOWS WILL CONTINUE TO BE CONVEYED TO DOWNSTREAM MCKINNONS CREEK. GEOTEXTILE OR SIMILAR COULD BE USED TO LINE THE UPSTREAM END OF THIS COFFERDAM TO MITIGATE AGAINST TURBID WATER.

IF POSSIBLE, WORK FROM DOWNSTREAM TO UPSTREAM TO MITIGATE AGAINST POTENTIAL SUSPENDED SEDIMENT RELEASE TRAVEL THROUGH SOME AREAS THAT WERE FISHED OUT BEFORE REACHING THE DOWNSTREAM END OF THE WORK AREA. THIS WOULD ALLOW FOR ADDITIONAL OPPORTUNITIES TO MANAGE SEDIMENTS.

WATER LEVELS IN THE EXISTING AVALON WEST AND AVALON SOUTH SWM FACILITIES CAN BE LOWERED AS MUCH AS POSSIBLE DURING CONSTRUCTION ACTIVITIES.

ISOLATE SMALLER SECTIONS OF THE CREEK AT A TIME. THIS ALLOWS FOR EASIER FISH SALVAGE AND ALSO LIMITS THE PUMPING TO A SHORTER DISTANCE.

DEWATERING METHODS TO MAINTAIN FLOW AS MUCH AS POSSIBLE WHILE MINIMIZING POTENTIAL FOR RELEASE OF SEDIMENT INTO THE DOWNSTREAM SYSTEM.

FISH SALVAGE WILL BE COMPLETED WITH A VARIETY OF METHODS THROUGHOUT THE WORK AREA (I.E. DIP NETS, HOOP NETS, MINNOW TRAPS). TYPICALLY NO, OR ONLY ONE PASS ELECTROFISHING, TO MINIMIZE FISH STRESS

MONITORING OF THE WATER LEVELS AND CONDITIONS THROUGHOUT WOULD BE REQUIRED PERIODICALLY TO ENSURE NO STRANDING IS OCCURRING.

CLIENT

CLARIDGE HOMES
MATTAMY HOMES
RICHCRAFT GROUP OF COMPANIES

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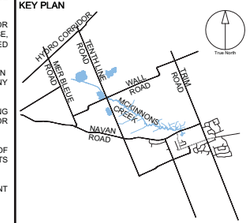
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Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc.

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SNCA PERMIT	2023-03-03
2	REVISED AS PER SNCA COMMENTS	2024-05-15

KEY PLAN



SEAL

LICENSED PROFESSIONAL ENGINEER
P. SPAL
2024/05/15
PROVINCE OF ONTARIO

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PROJECT

MER BLEUE URBAN EXPANSION AREA
MCKINNONS CREEK ENHANCEMENT

PROJECT NO: 117618	
DRAWN BY: **J.S.F.**	CHECKED BY: **P.S.**
PROJECT MGR: **P.D.**	APPROVED BY: **P.S.**

SHEET TITLE

SEDIMENT AND EROSION CONTROL PLAN

SHEET NUMBER	ISSUE
900	2

D07-16-22-0014

SCALE CHECK 10mm 1:m

File Location: j:\117618_MBMcConnell\ 9 Drawings\50cad\xrefmaps\xdAcad\s900-SEDIMENT AND EROSION CONTROL PLAN.dwg Last Saved: May 16, 2024, by jesse-sebastien.forget Plotted: Wednesday, July 3, 2024 4:15:47 PM by Jesse-Sébastien Forget

Appendix B

Special Provisions

SPECIAL PROVISIONS

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SP 9.0	Flow Checks & Sediment Traps
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SP 12.0	Guaranteed Maintenance
SP 13.0	Ministry of Environment Conservation and Parks -- Species at Risk
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SP1.0 WORKING SPACE

As per S.63(1) of the Ontario Drainage Act, R.S.O. 1990, c. D.17 (provided below) a "Working Space" is made available for the purpose of construction and future maintenance.

> *63 (1) The Contractor and the Contractor's assistants when engaged in the construction, maintenance, improvement, or repair of a drainage works may, with their equipment, enter upon whatever lands are necessary to complete the work within the working space designated in the engineer's report. R.S.O. 1990, c. D.17, s. 63 (1).*

For the purpose of construction, the standard Working Space adjacent to the Drain must be available along the side that is best suited for construction. In some sections of the Drain, it may be necessary to complete construction or maintenance from both sides of the Drain. The designated Working Space is set at 40m from the top of the new bank on both sides and is necessary to allow construction to be carried out and excavated material to be spread.

Where the "Working Space" impacts small (residential) lots, less than 2.0ha in size, the Construction Working Space is reduced to 8.0m and is understood to be in general conformance with typical zoning/official plan and other regulatory setbacks.

For the purpose of future maintenance and repair, the standard Working Space adjacent to the Drain must be available along the side of the Drain where maintenance is required (either or both sides). The designated Working Space is set at 25m from the top of bank and is necessary to allow maintenance to be carried out and excavated material spread. Where the "Working Space" impacts small (residential) lots, less than 2.0ha in size, the Maintenance Working Space is reduced to 5.0m.

The working space shall be kept free of permanent obstructions including (but not limited to), plantings (trees), non-removable fences, structures and/or other permanent landscaping features. Obstructions for future maintenance or repair, with the exception of natural vegetation, shall be removed by the Drainage Superintendent or the landowner, at the expense of the landowner.

Access to the Working Space for the purpose of construction, inspection or maintenance is restricted to persons prescribed under the authority of the Ontario Drainage Act, R.S.O. 1990, c. D.17 being the Drainage Engineer (or assistants) – S.12(1), the Contractor (or assistants) – S.63(1) and the Drainage Superintendent (or assistants) – S.95(3). Where possible (excluding emergencies) it is recommended that a minimum of 48 hours advance notice (in writing) or direct communication with the affected property owner be provided before accessing the drain working space.

SP1.1 Alignment

The constructed channel alignment shall be in general conformity with the existing alignment and Dwg. No. 16070-A1. Where necessary, the alignment shall be set out by the Drainage Engineer prior to the commencement of construction on this project. The Contractor is to coordinate with the Drainage Engineer to verify the coordinate and datum information.

The centerline alignment of the Municipal Drain will be provided to the Contractor for the purpose of layout. The Contractor may utilize this information as necessary (including, but not limited to, the generation of a model for the purpose of using GPS guided equipment). However, it is noted that this information should not be solely relied upon and is not intended to override the specified intent defined on the plan, profile, and cross-section information. In general, it is noted that natural meanders will occur along the Municipal Drain, which may not be fully accommodated/incorporated into the alignment provided to the Contractor or any generated model. The Contractor is responsible for ensuring that excavation is completed in general conformance with the intent of the work as indicated on the plans, profiles, and cross-sections.

SP2.0 CLEARING AND GRUBBING

For the purpose of construction and future maintenance, clearing and grubbing shall consist of the removal of all trees, brush, and windfalls from the following areas:

- Between the top of the North/East bank and the top of the South/West bank (bank to bank - including all material within the drain).
- The area required for machine access to allow for clean out of the drain and spreading of excavated material.
- All dead trees located near the drain that would in time fall into the drain.

When clearing is undertaken in an area of tillable land, all stumps shall be removed. In all other areas, stumps shall be cut flush with the ground.

Brush removal (grubbing) shall include the removal of brush which has grown up in previously cleared areas.

SP2.1 Disposal of Material

Property owners are advised that the Contractor will clear only those trees, which may affect its operation within the working space. All trees having a diameter of 150 mm or greater shall be cleared of limbs and cut in reasonable lengths (to a maximum of 5m) and neatly piled clear of the drain so that the wood may be salvaged by the property owners.

The Contractor and the property owner may make agreements for the removal/disposal of the wood, which would otherwise be left on the property, at a location on the property, chosen by the property owner subject to review by the Drainage Engineer.

SP2.1.1 Construction Phase

All brush, limbs, and other debris resulting from the clearing operation shall be chipped.

Where chipped in agricultural fields, materials are to be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Engineer (at the Contractor's expense).

Large stones, stumps, tree roots, and other debris shall also be disposed of at a location on the property chosen by the property owner and reviewed by the Drainage Engineer, except in agricultural fields.

In agricultural fields, all large stones, stumps, tree roots, and other debris shall be disposed of off-site at a location provided by the Contractor and reviewed by the Drainage Engineer.

From Sta. 0+000.00 to 4+053.00, disposal of all brush, limbs, large stones, stumps, tree roots and other debris resulting from the clearing operation shall be removed from riparian/adjacent lands and placed in an area subject to approval by the Drainage Engineer.

SP2.1.2 Future Maintenance Phase

All brush, limbs and other debris resulting from the clearing operation shall be chipped.

Large stones, stumps, tree roots, and other debris are to be disposed of along the drain to be removed by the landowner.

SP2.2 Payment

The cost of all labor, materials, and equipment for clearing and grubbing and disposing of material as discussed herein shall be deemed to have been included in the lump sum or unit price tendered for this item.

SP3.0 EXCAVATION AND DISPOSAL

SP3.1 Excavation

The construction of the Municipal Drain will be an open channel drain with side slopes and ditch bottom widths as specified on the design profiles and cross-sections.

Where possible, excavation will be limited to the bottom and/or one side of the drain (North or East, except where otherwise specified), leaving the one side of the drain intact, while providing the required additional channel width on the opposite side (construction side). This is anticipated to minimize impacts of full riparian zone removal. Clean-out of the bottom only may be specified where additional channel width is not required.

Where necessary, the bank of the non-construction side of the drain shall be protected and/or repaired in areas susceptible to, or are presenting sign of, erosion/slope failure. In these areas, efforts shall be made to maintain as much of the natural conditions as possible.

For this project, excavation is in general described as following:

Using the alignment provided, from Sta. 10+000.00 to 11+070.00, 14+250.00 to 14+643.81, and 15+250.00 to 15+750.00 bottom clean-out only is specified. In all areas where the existing channel width is greater than the design channel width (in cross-section), both banks are to remain untouched (excluding slope protection). Where the existing proposed profile is at or above the proposed grade a clean-out of excess vegetation only (i.e., cattails) is completed.

Using the alignment provided, from Sta. 12+670.00 to 14+250.00 the North/West bank is to remain untouched (excluding slope protection). Excavation commences from the toe of the North/West bank to the invert of the proposed profile at a 2h:1v slope, then across the channel to the width specified by the cross-section, then from the new toe of the South/East bank to the top of slope with the bank constructed at a 2h:1v slope.

Using the alignment provided, from Sta. 14+643.81 to 15+250.00, and 15+750.00 to 16+741.50 the South/East bank is to remain untouched (excluding slope protection). Excavation commences from the toe of the South/East bank to the invert of the proposed profile at a 2h:1v slope, then across the channel to the width specified by the cross-section, then from the new toe of the North/West bank to the top of slope with the bank constructed at a 2h:1v slope.

Excavation is to be completed from the North/West side of the drain from Sta. 10+000.00 to 11+070.00, and 12+670.00 to 14+643.81, and from the South/East side of the drain from Sta. 14+643.81 to 16+741.50 except where otherwise specified or authorized by the Drainage Engineer

Where indicated on profiles and cross sections, a two-stage profile is to be constructed. A two-stage profile is constructed only where material can be left in place during excavation and where material is firm enough to hold its shape. No fill will be required to construct a two-stage profile.

Excavation commences from the toe of the South/West bank to the invert of the proposed profile at a 2h:1v slope, then across the width of the channel to the two-stage profile, then up 300mm from the proposed profile, across the remaining width of the channel, and then from the new toe of the North/East bank to the top of slope up the bank constructed at a 2h:1v slope. Two-stage profiles are to be constructed in general conformance with RCI Std. Dwg. B, as provided in **Appendix A**.

No excavation will occur from Sta. 11+070.00 to 12+670.00.

SP3.2 Disposal of Excavated Earth Material

For the purpose of construction and future maintenance, the excavation of the drain shall be completed along all sections as previously described and all materials including silt, debris, etc. shall be removed from the drain.

All material shall be spread on the adjacent lands no closer than 5 meters to the top of the slope and no further than the prescribed working space outlined in Section 10.0 of the Engineer's Report. All material shall be spread to a maximum depth of 150mm for agricultural fields, and 300mm for non-agricultural fields. For the purpose of future maintenance, material can be spread within the 5 meters at the top of the slope.

Drainage openings shall be constructed wherever required through the spreading area but at a maximum of 50m for agricultural fields, and 100m for non-agricultural fields. All drainage openings shall be maintained, and the soil spread to accommodate these drainage openings to ensure that the drainage from adjacent land is not impeded. Spreading is to be completed in conformance with RCI Std. Dwg. A, provided in **Appendix A**.

In areas of agricultural land, all other unsuitable materials (SP3.5) are to be removed from spread material and to be disposed of off-site at a location arranged for by the Contractor and reviewed by the Drainage Engineer.

In areas of smaller lots up to 2.0ha in size, and where work is complete immediately adjacent to roads, all excavated material will be removed from the area and disposed of off-site in an area specified by Arcadis, where the material can be utilized for land development purposes.

Property owners who do not wish to have material spread within the working space, outlined in Section 10.0 of the Engineer's Report, must make independent arrangements with a Contractor, including payment of all associated costs, to have the material removed.

SP3.2.1 Off-Site Disposal of Excavated Earth Material

For off-site removal of excavated earth material, the Contractor is advised to comply with O.Reg. 406/19 On-Site and Excess Soil Management.

The Contractor is responsible for the management of all excavated earth material that is disposed of off-site, including, but not limited to, handling, storage, sampling and analysis, transportation, placement, and disposal, whether it is reused on-site, removed off-site, or used as fill material. It is recommended that the Contractor re-use the excavated earth material as fill material where applicable within the project area.

The Contractor is responsible for designating the Receiver Sites for the management of excess soil generated from the project, subject to review by the Drainage Engineer.

The Contractor will ensure that all excess soil is collected and transported by retained haulers in vehicles satisfying the requirements of O.Reg. 406/19.

SP3.3 Hardpan Excavation and Disposal

Hardpan is considered to be densely compacted clay material (similar in nature to shale) that requires the use of specialized equipment for the removal – typically a singular ripping tooth.

The Contractor is required to excavate hardpan and dispose of the material off-site at a location arranged for by the Contractor and agreed to by the Drainage Engineer.

SP3.4 Rock Excavation & Disposal

Rock Excavation is considered for areas of bedrock and boulders in excess of $1m^3$ where the use of specialized equipment (hoe-ram) is required for the removal.

The Contractor is required to excavate rock and dispose of the material off-site at a location arranged for by the Contractor and agreed to by the Drainage Engineer.

SP3.5 Other Unsuitable Material

Other Unsuitable Material is considered to be any other material that is not suitable for spreading, including (but not limited to) garbage or other debris. This material does not require the use of specialized equipment for the purpose of excavation,

The Contractor is required to excavate all unsuitable material. Excavation of this material and separation of the material from the excavation is considered to form part of the standard excavation item. Garbage, rocks, wood, and other debris (at the discretion of the Drainage Engineer) are to be disposed of off-site at a location arranged for by the Contractor and reviewed by the Drainage Engineer.

Stones (greater than 75mm diameter) and boulders (less than $1m^3$) are to be disposed of by the Contractor on the adjacent property outside of the prescribed working space, in an area of the property designated by the owner and reviewed by the Drainage Engineer.

SP3.6 Payment

Payment for earth excavation shall be by the unit price tendered per cubic metre or linear metre and shall be full compensation for all work required to excavate in the manner described previously.

Payment for spreading of earth excavation shall be by the unit price tendered per cubic meter or linear meter and shall be full compensation for all work required to spread the spoil in the manner described previously. Two (2) equal payments shall be made, 50% at the time of completion of the spreading operation, and 50% following verification by the Drainage Engineer that all material has been spread in conformance with standards and specifications, all unsuitable material has been removed, and all drainage openings have been constructed.

Where incurred, payment for hardpan excavation shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to excavate, move on-site, and dispose of the material in the manner described previously. Measurement for payment shall be from the calculated quantity using the measured depth of material to the theoretical trench width and proposed channel grade.

Where incurred, payment for rock excavation shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to excavate, remove off-site and dispose of the material in the manner described previously. Measurement for payment shall be from the calculated quantity using the surveyed top of rock (as exposed) to the theoretical trench width and proposed channel grade.

The excavation and separation of materials are considered to form part of the standard excavation item. However, where incurred, payment for the off-site disposal of unsuitable material shall be by the unit price tendered per cubic metre and shall be full compensation for all work required to remove off-site and dispose of the material in the manner described previously. Measurement for payment is to be determined by methodology agreed with the Contract Administrator in advance of completion.

SP4.0 PRIVATE CULVERT CROSSINGS

SP4.1 Supply and Placement or Lowering of Private Farm Culvert or Laneway Crossings

The culverts shall be installed so that the culvert invert is embedded 150mm below the invert of the drain for culverts with a height or diameter up to 1500 mm. For culverts with a height or diameter greater than 1500 mm the culvert shall be embedded by 10% of the height or diameter below the invert of the drain. The farm culvert bedding, backfill, surface course and rock protection end-treatment shall be as shown on RCI Std. Dwg. C. The standard length for supplied culverts shall be 10 meters, unless otherwise specified.

SP4.2 Culvert Location

Culverts that must be installed or lowered and reinstalled are shown on Dwg. Nos. 16070-A2 (A2.1 through A2.8 in detail) and 16070-P1 through 16070-P10.

SP4.3 Payment

Payment at the per metre or lump-sum unit price bid for each culvert crossing shall include for all excavation and disposal of materials and for the supply and installation of a new culvert or the reinstallation of the old culvert respectively and shall include backfill and Granular "A" material for the driving surface.

Payment at the unit price bid for removing existing structures shall include for all excavation and disposal of materials.

Rock protection with filter cloth at both ends of the culvert shall be paid under the item for culvert end treatments by the item unit price.

SP5.0 FENCING

Where fences are encountered which impede construction, or where the removal of fences is required for access to the drain or designated working space, it will be the Contractor's responsibility to remove the existing fence and reinstate the fence in a condition equal to or better than the condition of the fence prior to the commencement of the work. Fences are installed in conformance with the standards associated with the type of fence. Where fences cross the drain, the fences is to be installed in conformance with RCI Std. Dwg. H, provided in **Appendix A**.

SP5.1 Fencing - Replacement

Where fences are encountered which impede construction, or where the removal of fences is required for access to the drain or designated working space, the on-site representative of the Drainage Engineer shall determine if a fence is not in reasonable condition to be reinstated. If a fence is not in reasonable condition to be reinstated, the Contractor shall supply and install a similar fence to the OPSD that governs that type of fence, and to the satisfaction of the Drainage Engineer.

SP5.2 Payment

SP5.2.1 Payment – Fences in Good Condition

Fences encountered, which are in reasonable condition, are to be reinstalled in a condition equal to or better than the condition of the fence prior to the commencement of the work, at the Contractor's expense.

SP5.2.2 Payment – Fences in Poor Condition (to be replaced)

Payment for fences to be replaced (as per SP 5.1) will be by the tendered amount for the Provisional Item, on a per location basis.

SP6.0 SEEDING

SP6.1 Drain Seeding

For agricultural areas, all disturbed banks, and a 5 metres buffer strip adjacent to the drain, shall be hand seeded. Beyond the 5-meter buffer strip, spoils are not to be seeded. It is anticipated that property owners will till these areas and return to normal crop production.

For non-agricultural areas, seeding is placed on the disturbed banks, 5m buffer area and in all fully cleared and grubbed areas. Seeding is not typically required in forest or brush lands (not fully cleared) where spreading may occur around trees and over brush (typically razored) as these areas are anticipated too naturally regenerate.

Additional areas of seeding or additional seeding requirements may be identified by the Drainage Engineer.

All identified areas are to be seeded a maximum of 48 hours after construction, except for the 5-meter buffer strip. The 5-meter buffer strip can be seeded once work in the working space has been completed.

The seed mixture (or an alternate reviewed by the Drainage Engineer) is to be as follows:

Sow Rate (minimum)	100 kg/ha
Creeping Red Fescue	60%
Canada Bluegrass	20%
White Clover	3%
Perennial Rye	12%
Red Top	5%

Canada Bluegrass establishes a deep creeping root system and tough sod ideal for stabilizing low-fertile rocky or clay soils and is drought, flood, and salt tolerant. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation that is shade and water tolerant with limited requirement for seed bed preparation. White clover provides quick cover and produces nitrogen to aid in the establishment of other vegetation and red top's root system is well suited for holding soils on wetlands, waterways, and ditch banks.

SP6.2 Timing Restrictions

Seed shall not be placed from November 1st through April 30. Where excavation occurs between November 1st and April 30, seeding shall be completed as soon as possible after April 30, or as directed by the Drainage Engineer.

The Contractor is required to ensure a seed catch and may be required to re-seed areas as directed by the Drainage Engineer.

SP6.3 Measurement for Payment

Measurement for payment for the placement of the seed shall be by the square metre in place on the prescribed areas seeded. Payment will not be made for any area seeded beyond the prescribed area unless reviewed by the Drainage Engineer prior to placing the seed. The Contractor will not be paid for reinstatement of other areas disturbed by construction activities.

SP6.4 Payment

Payment for seeding shall be by the unit price tendered and shall be full compensation for all labour, materials and equipment required to complete the work as described above, and for any required reseeding during the maintenance period. Two (2) equal payments shall be made, 50% at the time of completion of the seeding operation, and 50% at the end of the Maintenance Period provided satisfactory seed growth has been established.

The Maintenance Period shall be six (6) months, beginning immediately following the seeding operation. The duration of the maintenance period shall be suspended during the winter dormant period, from October 30th to May 1st of the following year.

SP7.0 ROCK PROTECTION EROSION CONTROL

Rock Protection Erosion Control shall consist of quarried rock fragments which meet the standards as specified in the OPSS 1004.05.05.02 for R-50 Rip-Rap, and/or the standards for Rock Protection, OPSS 1004.05.05.03.

Fieldstones will not be accepted for rock protection.

Excavated rock from the site which meets the standards as specified above, and is reviewed by the Drainage Engineer for use, may, at the contractor's discretion, be used in place of imported Rock Protection.

The rock protection shall be inset into the bank and the bed of the drain so that the finished surface will be of the same cross-section and will be flush with upstream and downstream sections. Terrafix 420R (or approved equivalent), as indicated on the

Standard Drawing shall be installed on the excavated bank or drain bottom under the rock protection. Rock protection shall be installed in accordance with RCI Std. Dwg. D, E and F, and Paterson Std. Dwg. PG5072-2 (provided in **Appendix A**).

SP7.1 Rock Protection Erosion Control Location

Refer to Dwg. Nos. 16070-A2 (A2.1 through A2.8 – in detail), and 16070-P1 through 16070-P10 for Rock Protection and Toe Protection locations. Other locations may be identified in the field during construction.

SP7.2 Measurement for Payment

Measurement for placement of rock protection with filter cloth shall be by the square metre and measurement shall be made in place. Payment will only be made for the area of rock protection agreed to in advance by the Drainage Engineer.

SP7.3 Payment

Payment for rock protection shall be by the unit price tendered and shall be full compensation for all labour, material and equipment required to complete the work as described above.

SP8.0 UTILITIES

The Contractor shall be required to arrange with all Utilities to obtain field locates, to mark all underground cables or pipelines in the field prior to commencing construction, and to review any private utilities installed by the property owners. The Contractor shall be responsible for protecting the utilities during construction and repair of any damaged utilities.

SP9.0 FLOW CHECKS & SEDIMENT TRAPS

SP9.1 Straw Bale Flow Check

SP9.1.1 Straw Bales

Straw bales shall consist of oat or wheat straw, shall be dry, firm, tightly tied in at least two places, show no evidence of straw or tie decay, and be free of sediment. They shall be of standard agricultural rectangular conformation and dimensions, approximately 600 mm x 600 mm x 1200 mm.

SP9.1.2 Stakes

Stakes shall be of sufficient strength to satisfy straw bale flow check performance and maintenance requirements and shall be a minimum of 1200 mm in length and each bale shall be firmly anchored in place by two stakes spaced and driven firmly 150 mm from each end of each bale.

SP9.1.3 Installation

Straw bale flow checks shall be installed as indicated in the Standard Drawing to prevent sediment passage from the upstream to the downstream side of the flow check and shall be installed at all specified locations on Dwg. Nos. 16070-A2 (A2.1 through A2.8 in detail), and 16070-P1 through 16070-P10, all in accordance with accordance with OPSD 219.180 (provided in **Appendix A**).

Straw bale flow checks shall consist of a double row of bales in compliance with the following:

a) The two rows of bales shall be butted tightly beside one another without gaps.

b) The bales in the two rows shall be uniformly staggered, so that the ends of the upstream row of bales are adjacent to the centres of the downstream row of bales.

c) The upstream row of bales shall be one bale longer than the downstream row.

SP9.2 Rock Flow Checks

SP9.2.1 Rock

The rock flow check shall be constructed using clean quarried rock fragments which meet the standards as specified in the OPSS 1004.05.05.02 for R-50 Rip-Rap, and/or the standards for Rock Protection, OPSS 1004.05.05.03.

SP9.2.2 Geotextile

Geotextile shall be placed under the rock protection on the banks of the drain and over the rock check as shown on OPSD 219.211.

SP9.2.3 Installation

Rock flow checks shall be installed as shown on OPSD 219.211 (provided in **Appendix A**).

SP9.3 Sediment Traps

Sediment trap excavation shall be 15 m in length and 500 mm below the proposed grade (drain bottom), for the full width of the channel directly upstream of the straw bale or rock flow checks and constructed in conformance with RCI Std. Dwg. I.

SP9.4 Sediment Removal

Accumulated sediment in the sediment trap shall be removed as necessary to affect maintenance repairs and immediately prior to the removal of the flow check.

SP9.5 Flow Check Removal

The straw bale and rock flow checks shall be removed after all construction is complete on the drainage works.

SP9.6 Measurement for Payment

Measurement will be by the number of sediment trap and straw bale, or rock flow checks installed. Alternatively, erosion and sediment control items including flow checks may be combined into an overall lump-sum item for an all-inclusive erosion and sediment control plan and implementation item within the final contract.

SP9.7 Payment

Payment at the Contract price for the tender item "Sediment Traps" shall be full compensation for all labour, equipment and material required to complete the installation and removal of the sediment traps and straw bale or rock flow checks and sediment removal from the traps upon completion of the project. Alternatively, erosion and sediment control items including flow checks may be combined into an overall lump-sum item for an all-inclusive erosion and sediment control plan and implementation item within the final contract.

SP10.0 TILE OUTLET PROTECTION

Existing tile outlets shall be located by the Contractor and protected during construction. Where existing tile outlets are affected by the construction, they shall be restored by installing a CSP outlet pipe complete with a rodent grate (or alternative approved product). Rock protection, complete with geotextile filter cloth, shall be installed at the tile outlet to prevent erosion.

Restoration of the tile outlets shall be completed in accordance with RCI Std. Dwg. F (provided in **Appendix A**).

SP10.1 Material Specification

Rock protection and geotextile materials shall be in accordance with the specification for rock protection in these Special Provisions.

SP10.2 Measurement for Payment

Measurement will be by the unit price for each tile outlet restoration completed.

SP10.3 Payment

Payment for tile outlet restoration shall include for all materials, excavation, and installation, including CSP end piece, rodent grate, rock protection and geotextile in accordance with RCI Std. Dwg. F.

SP11.0 CULVERT END TREATMENTS

Culvert End Treatments shall be installed as indicated in the Standard Drawing to prevent erosion and scour from the upstream and downstream culvert ends. End treatments shall be installed on the upstream and downstream end of each culvert shown on Dwg. Nos. 16070-A2 (A2.1 through A2.8 – in detail), and 16070-P1 through 16070-P10, all in accordance with RCI Std. Dwg. C (provided in **Appendix A**).

SP11.1 Payment

Payment for culvert end treatments shall include for all materials, excavation, and installation, including rock protection and geotextile in accordance with RCI Std. Dwg. C.

SP12.0 GUARANTEED MAINTENANCE

Upon completion of the work the Contractor will be required to post a guaranteed maintenance security for a period of 12 months, in the amount of 10% of the value of the work completed.

This amount will guarantee workmanship of such items as fencing, rock protection, seeding and culvert crossing installation.

Should the Contractor schedule the work during months when seeding cannot be carried out, or should a seed catchment not be satisfactorily established, then subsequent repair of sloughed areas and excavation of the drains due to erosion of unseeded or inadequately seeded banks shall be carried out by the Contractor without any extra payment for such repair work.

SP13.0 MINISTRY OF ENVIRONMENT CONSERVATION AND PARK – SPECIES AT RISK

The Ministry of the Environment, Conservation and Parks (MECP) – Ontario is responsible for review with regard to the Endangered Species Act (ESA) Legislation.

The Contractor is responsible to ensure all necessary measures are taken to ensure no harm to any SAR or its habitat (if protected). The Contractor must be aware that the ESA Act and the individual species at risk are dynamic and subject to change.

Endangered Species are dynamic and subject to change. Typical species associated and anticipated to be found within the general vicinity of Municipal Drains, and a general categorization of species and standard mitigation measures, are provided in **Appendix G** of this Report.

The self-screening process found reports for eight specific SAR for grids along the alignment of the drain:

- Bobolink (Bird)
- Eastern Meadowlark (Bird)
- Least Bittern (Bird)
- Loggerhead Shrike (Bird)
- Short-eared Owl (Bird)
- Wood Thrush (Bird)
- Butternut (Plant)
- Snapping Turtle (Aquatic Species)

SP13.1 Specific Mitigation Measures (No Payment)

SP13.1.1 Birds

Where possible, it is preferred that tree clearing be completed during the winter months. It is recommended that the Contractor take all necessary precautions to avoid potential impacts to breading birds, however, no additional payment shall be considered beyond normal brush removal costs for the completion of this task.

SP13.1.2 Aquatic Species

While turtles and aquatic species at risk may exist within the general vicinity, the impact of the proposed work will be limited through adherence to timing windows and conditions prescribed by the Department of Fisheries and Oceans for the exclusion and relocation of fish.

Where necessary (where fish species are found to be present) de-fishing of the work area will be completed utilizing standard best management practices within all work completed with applicable timing windows.

SP13.1.3 General Mitigation

General mitigation measures include the following:

- Avoidance – Work on Municipal Drains is limited by prescribed in-water work timing windows to be within the period from July 15th to October 15th of any year. While protecting aquatic species, this timing window also affords general protection to breeding birds and nesting turtles.
- Avoidance – a general sweep of the work area is prescribed by contract conditions for each workday in the proposed work area. Where active nests or SAR are found, additional measures are implemented.
- Awareness – Contractors are required to be aware of potential SAR and to stop all work when the presence of SAR is suspected.

SP13.2 Specific Mitigation Measures

SP13.2.1 Butternut Trees

SP13.2.1.1 Butternut Trees – Procedures

Should a butternut tree be identified within 25 m of the closest construction, the tree will be documented and reviewed by a certified Butternut Health Assessor (BHA).

Should the tree be considered non retainable, the tree will remain in place should it not impede construction progress or be removed if it impedes construction progress. Note that butternut trees may not be transported from the site, nor processed.

Should the tree be considered retainable, work may not proceed within a 25m radius of the tree. In this case, the tree will be protected at the 25m radius using standard tree protection measures (snow fence or equivalent). Work may continue outside of the fenced radius. All reasonable measures to eliminate or alter the work such that no work would be completed within 25 m of the tree should be considered and implemented if possible.

Should alternative measures not be possible, a Ministry of the Environment, Conservation and Parks (MECP) permit for the removal of (or work within the 25m radius of) a retainable butternut will be applied for by the Contract Administrator on behalf of the Municipality. Typical permit remediation measures for the removal of a retainable butternut tree is the planting of butternut trees at a ratio of 20:1.

SP13.2.1.2 Butternut Trees – Payment

The removal of non-retainable butternut tree(s), following assessment, shall be considered part of the standard clearing operation (SP 2.0), with no additional payment. No additional payment will be considered for any delay associated with the review and consideration of the retainability of butternut trees, the permitting process, or progressing with work beyond a tree under consideration and returning to complete works following consideration.

Tree protection, remediation planting and any additional specific task assigned to the Contractor will, upon notice of intent to claim by the Contractor, be considered for additional payment as per the General Conditions of the Contract.

SP14.0 SOUTH NATION CONSERVATION AUTHORITY – PERMISSION (O.REG. 41/24)

The Permit(s) related to the "Permit For Activity Within A Regulated Area" (O.Reg. 41/24) for works to be completed on the McKinnons Creek Municipal Drain by SNCA is contained in **Appendix H** of the Engineer's Report. The Contractor shall insure that any conditions are adhered to.

SP15.0 DEPARTMENT OF FISHERIES AND OCEANS – CLASS AUTHORIZATION

The class authorization letter and associated advice related to the Fisheries Act for works to be completed on the McKinnons Creek Municipal Drain by the Department of Fisheries and Oceans (DFO) is contained in **Appendix I** of the Engineer's Report. The Contractor shall insure that any advice/conditions are adhered to.

Appendix C

Schedules of Assessment for Construction

SCHEDULE A
FOR THE CONSTRUCTION OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Special Benefit & Utilities	Total Net Cost %	Total Net Cost
		City of Ottawa -- BLOCKS		
	BLOCK F1	$ 1,546,756.07	7.02%	$ 1,546,756.07
	BLOCK F2	$ 18,639,493.94	84.61%	$ 18,639,493.94
	BLOCK F3	$ 1,843,273.80	8.37%	$ 1,843,273.80
Total		**$ 22,029,523.81**	**100.00%**	**$ 22,029,523.81**

Appendix D

Schedules of Assessment for Future Maintenance

SCHEDULE B - SUMMARY (ALL SECTIONS)
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Benefit Cost	Outlet Cost	Special Benefit & Utilities	ADIP ELIGIBILITY	Total Net Costs
		Lot	Con	Total	Total	Total	Total		Total
City of Ottawa -- Individual Landowners									
1	500 301 09600 0000	16-17	9	43.55	$ 312.93	$ 26.17	$ -	*	$ 339.10
2	500 301 09200 0000	16	9	14.73	$ -	$ 5.45	$ -	*	$ 5.45
3	500 301 09000 0000	15	9	40.47	$ 282.68	$ 23.64	$ -	*	$ 306.33
4	500 301 08900 0000	15	9	43.09	$ -	$ 12.39	$ -		$ 12.39
5	500 301 08901 0000	15	9	0.20	$ -	$ 0.09	$ -		$ 0.09
6	500 301 08902 0000	15	9	0.14	$ -	$ 0.06	$ -		$ 0.06
7	500 301 08800 0000	14	9	40.47	$ 282.98	$ 23.67	$ -	*	$ 306.65
8	500 301 08700 0000	14	9	39.63	$ -	$ 118.59	$ -	*	$ 118.59
9	500 301 08600 0000	14	9	0.39	$ -	$ 0.17	$ -		$ 0.17
10	500 301 08701 0000	14	9	0.45	$ -	$ 0.20	$ -		$ 0.20
11	500 201 42100 0000	14	8	27.47	$ -	$ 79.84	$ -	*	$ 79.84
12	500 201 42200 0000	14	8	0.80	$ -	$ 4.67	$ -		$ 4.67
13	500 201 42101 0000	14	8	0.41	$ -	$ 1.18	$ -		$ 1.18
14	500 301 08501 0000	13	9	9.94	$ 67.14	$ 72.47	$ -		$ 139.61
15	500 301 08500 0000	13	9	9.79	$ 63.39	$ 72.09	$ -	*	$ 135.47
16	500 301 08505 0000	13	9	0.30	$ -	$ 4.64	$ -		$ 4.64
17	500 301 08402 0000	13	9	10.12	$ -	$ 18.63	$ -	*	$ 18.63
18	500 301 08401 0000	13	9	0.40	$ -	$ 1.15	$ -		$ 1.15
19	500 201 41800 0000	13	8	13.96	$ -	$ 19.81	$ -	*	$ 19.81
20	500 301 08300 0000	13	9	52.18	$ 277.52	$ 263.59	$ -	*	$ 541.12
21	500 301 08403 0000	13	9	1.82	$ -	$ 6.81	$ -	*	$ 6.81
22	500 201 41600 0000	12	8	17.15	$ -	$ 44.29	$ -	*	$ 44.29
22a	500 201 41700 0000	13	8	12.68	$ -	$ 30.41	$ -	*	$ 30.41
23	500 201 41603 0000	12	8	0.22	$ -	$ 1.32	$ -		$ 1.32
24	500 201 41602 0000	12	8	0.19	$ -	$ 1.12	$ -		$ 1.12
25	500 201 41601 0000	12	8	0.19	$ -	$ 1.12	$ -		$ 1.12
26	500 201 41605 0000	12	8	0.41	$ -	$ 2.45	$ -		$ 2.45
27	500 201 41606 0000	12	8	0.48	$ -	$ 2.90	$ -		$ 2.90
28	500 301 08200 0000	12	9	39.02	$ 232.55	$ 253.74	$ -	*	$ 486.29
29	500 301 08000 0000	12	9	30.74	$ 209.05	$ 266.98	$ -	*	$ 476.03
30	500 301 08100 0000	12	9	3.23	$ -	$ 25.50	$ -		$ 25.50
31	500 301 07800 0000	11	9	23.08	$ 145.19	$ 187.36	$ -	*	$ 332.55
32	500 701 07500 0000	11	9	1.67	$ 24.54	$ 30.42	$ -	*	$ 54.97
33	500 201 41300 0000	12	8	1.38	$ -	$ 4.86	$ -		$ 4.86
34	500 201 41200 0000	12	8	1.19	$ -	$ 4.19	$ -		$ 4.19
35	500 701 08900 0000	11	9	3.46	$ -	$ 36.05	$ -	*	$ 36.05
36	500 701 09300 0000	10	9	2.65	$ -	$ 26.02	$ -	*	$ 26.02
37	500 701 17200 0000	10-11	9	6.14	$ 25.04	$ 65.05	$ -		$ 90.09
38	500 301 07100 0000	10	9	2.17	$ 19.04	$ 44.66	$ -		$ 63.69
39	500 301 07109 0000	10	9	1.15	$ 10.11	$ 21.63	$ -		$ 31.74
40	500 301 07105 0000	10	9	0.67	$ -	$ 12.28	$ -		$ 12.28
41	500 701 10500 0000	10	9	18.95	$ -	$ 189.41	$ -		$ 189.41
42	500 701 10000 0000	10	9	0.19	$ -	$ 4.54	$ -		$ 4.54
43	500 701 10100 0000	10	9	0.18	$ -	$ 4.18	$ -		$ 4.18
44	500 701 10200 0000	10	9	1.04	$ -	$ 20.06	$ -		$ 20.06
45	500 701 10300 0000	10	9	0.14	$ -	$ 2.66	$ -		$ 2.66
46	500 701 10400 0000	10	9	19.15	$ -	$ 164.60	$ -	*	$ 164.60
47	500 701 10301 0000	10	9	0.14	$ -	$ 2.60	$ -		$ 2.60
48	500 701 10405 0000	10	9	0.24	$ -	$ 3.98	$ -	*	$ 3.98
50	500 301 07140 0000	10	9	0.30	$ -	$ 5.43	$ -		$ 5.43
51	500 301 22300 0000	9	10	0.36	$ -	$ 7.38	$ -		$ 7.38
52	500 301 22400 0000	9	10	0.38	$ -	$ 7.79	$ -		$ 7.79
53	500 301 22500 0000	9	10	0.76	$ -	$ 15.34	$ -		$ 15.34
54	500 301 22600 0000	9	10	1.05	$ -	$ 21.28	$ -		$ 21.28
55	500 301 22601 0000	9	10	0.91	$ -	$ 20.22	$ -		$ 20.22
56	500 301 22700 0000	9	10	1.02	$ -	$ 24.18	$ -		$ 24.18
57	500 301 22800 0000	9	10	0.59	$ -	$ 14.02	$ -		$ 14.02
58	500 301 22701 0000	9	10	1.48	$ -	$ 35.29	$ -		$ 35.29
59	500 301 23100 0000	9	10	0.39	$ -	$ 9.29	$ -		$ 9.29
60	500 301 23403 0000	9	10	8.22	$ -	$ 93.66	$ -		$ 93.66
61	500 301 23101 0000	9	10	0.25	$ -	$ 6.04	$ -		$ 6.04

SCHEDULE B - SUMMARY (ALL SECTIONS)
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Benefit Cost	Outlet Cost	Special Benefit & Utilities	ADIP ELIGIBILITY	Total Net Costs
		Lot	Con	Total	Total	Total	Total		Total
62	500 301 23401 0000	9	10	0.13	$ -	$ 3.09	$ -		$ 3.09
63	500 301 23402 0000	9	10	0.14	$ -	$ 3.33	$ -		$ 3.33
64	500 301 23406 0000	9	10	3.67	$ -	$ 35.91	$ -		$ 35.91
65	500 301 07000 0000	9	9	19.95	$ 85.14	$ 227.79	$ -	*	$ 312.93
66	500 301 06900 0000	9	9	0.17	$ -	$ 3.02	$ -		$ 3.02
67	500 301 06800 0000	9	9	0.37	$ -	$ 6.69	$ -		$ 6.69
68	500 301 06700 0000	9	9	0.19	$ -	$ 3.53	$ -		$ 3.53
69	500 301 06600 0000	9	9	0.17	$ -	$ 3.05	$ -		$ 3.05
70	500 301 06500 0000	9	9	1.45	$ 12.73	$ 26.42	$ -		$ 39.15
71	500 301 06400 0000	9	9	0.16	$ -	$ 2.85	$ -		$ 2.85
72	500 301 05900 0000	9	9	13.74	$ -	$ 109.88	$ -	*	$ 109.88
73	500 301 06300 0000	9	9	1.17	$ -	$ 21.27	$ -		$ 21.27
74	500 301 06200 0000	9	9	0.19	$ -	$ 3.40	$ -		$ 3.40
75	500 301 06300 0000	9	9	0.21	$ -	$ 3.81	$ -		$ 3.81
76	500 301 06100 0000	9	9	0.13	$ -	$ 1.98	$ -		$ 1.98
77	500 301 06000 0000	9	9	0.29	$ -	$ 4.60	$ -		$ 4.60
78	500 301 20500 0000	8	10	17.90	$ -	$ 155.97	$ -	*	$ 155.97
79	500 301 20503 0000	8	10	0.48	$ -	$ 7.65	$ -		$ 7.65
80	500 301 20501 0000	8	10	0.19	$ -	$ 3.08	$ -		$ 3.08
81	500 301 20800 0000	8	10	1.21	$ -	$ 19.29	$ -		$ 19.29
82	500 301 20900 0000	8	10	0.83	$ -	$ 13.26	$ -		$ 13.26
83	500 301 20901 0000	8	10	0.68	$ -	$ 10.73	$ -		$ 10.73
84	500 301 21100 0000	8	10	0.45	$ -	$ 7.22	$ -		$ 7.22
85	500 301 21500 0000	8	10	4.64	$ -	$ 43.09	$ -		$ 43.09
86	500 301 20600 0000	8	10	23.57	$ 199.04	$ 270.29	$ -	*	$ 469.32
87	500 301 20600 0000	8	10	14.41	$ 119.68	$ 173.10	$ -	*	$ 292.78
88	500 301 05200 0000	8	9	22.36	$ -	$ 247.92	$ -	*	$ 247.92
89	500 301 05300 0000	8	9	40.35	$ 244.88	$ 450.88	$ -	*	$ 695.77
90	500 301 05900 0000	8	9	12.53	$ -	$ 121.99	$ -	*	$ 121.99
91	500 301 20200 0000	7	10	0.64	$ -	$ 13.81	$ -		$ 13.81
92	500 301 20300 0000	7	10	28.82	$ 215.89	$ 334.90	$ -		$ 550.79
93	500 301 20300 0000	7	10	11.61	$ -	$ 146.52	$ -		$ 146.52
94	500 301 04900 0000	7	9	20.03	$ -	$ 191.53	$ -	*	$ 191.53
95	500 301 05100 0000	7	9	17.61	$ -	$ 140.02	$ -	*	$ 140.02
96	500 301 19701 0000	6	10	5.73	$ 8.14	$ 82.11	$ -		$ 90.25
97	500 301 19700 0000	6	10	6.07	$ 8.61	$ 90.60	$ -		$ 99.22
98	500 301 19702 0000	6	10	0.41	$ -	$ 11.75	$ -		$ 11.75
99	500 301 19801 0000	7	10	3.59	$ -	$ 50.91	$ -		$ 50.91
100	500 301 19800 0000	7	10	0.29	$ -	$ 8.26	$ -		$ 8.26
101	500 301 20101 0000	7	10	0.21	$ -	$ 5.83	$ -		$ 5.83
102	500 301 20105 0000	7	10	0.24	$ -	$ 5.19	$ -		$ 5.19
103	500 301 20100 0000	6-7	10	40.85	$ 188.64	$ 598.73	$ -		$ 787.37
104	500 301 19500 0000	6	10	9.66	$ -	$ 114.69	$ -	*	$ 114.69
105	500 301 20100 0000	6-7	10	12.44	$ -	$ 164.79	$ -		$ 164.79
106	500 301 04800 0000	7	9	24.68	$ -	$ 196.08	$ -	*	$ 196.08
107	500 301 05000 0000	7	9	15.51	$ -	$ 114.12	$ -	*	$ 114.12
108	500 301 19600 0000	6	10	20.23	$ 28.71	$ 271.90	$ -	*	$ 300.61
109	500 301 19400 0000	6	10	8.43	$ -	$ 110.70	$ -	*	$ 110.70
110	500 301 19400 0000	6	10	11.39	$ -	$ 137.24	$ -	*	$ 137.24
111	500 301 04700 0000	6	9	40.47	$ -	$ 386.03	$ -	*	$ 386.03
112	500 301 04510 0000	6	9	8.40	$ -	$ 76.84	$ -	*	$ 76.84
113	500 301 04501 0000	6	9	1.12	$ -	$ 10.22	$ -		$ 10.22
114	500 301 18301 0000	5	10	0.40	$ -	$ 9.36	$ -		$ 9.36
115	500 301 18300 0000	5	10	14.30	$ -	$ 165.36	$ -		$ 165.36
116	500 301 18200 0000	5	10	14.88	$ -	$ 172.85	$ -		$ 172.85
117	500 301 18700 0000	5	10	0.17	$ -	$ 3.90	$ -		$ 3.90
118	500 301 18900 0000	5	10	14.66	$ -	$ 190.27	$ -	*	$ 190.27
119	500 301 19100 0000	5	10	14.77	$ 20.96	$ 197.08	$ -		$ 218.03
120	500 301 18300 0000	5	10	5.70	$ -	$ 59.02	$ -		$ 59.02
121	500 301 18200 0000	5	10	5.92	$ -	$ 61.27	$ -		$ 61.27
122	500 301 18900 0000	5	10	5.83	$ -	$ 60.47	$ -	*	$ 60.47
123	500 301 19100 0000	5	10	5.84	$ -	$ 64.63	$ -		$ 64.63

SCHEDULE B - SUMMARY (ALL SECTIONS)
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Benefit Cost	Outlet Cost	Special Benefit & Utilities	ADIP ELIGIBILITY	Total Net Costs
		Lot	Con	Total	Total	Total	Total		Total
124	500 301 04400 0000	5	9	42.29	$ -	$ 437.95	$ -		$ 437.95
125	500 301 04300 0000	5	9	25.99	$ -	$ 269.14	$ -	*	$ 269.14
126	PIN 145643045	5	9	0.29	$ -	$ 5.98	$ -	*	$ 5.98
127	500 301 05105 0000	8	9	1.49	$ -	$ 27.25	$ -		$ 27.25
131	500 301 04210 0000	4	9	55.39	$ -	$ 573.54	$ -		$ 573.54
132	500 301 04202 0000	4	9	0.09	$ -	$ 1.86	$ -		$ 1.86
133	500 301 04203 0000	4	9	0.41	$ -	$ 8.49	$ -		$ 8.49
134	500 301 04200 0000	4	9	1.07	$ -	$ 22.14	$ -		$ 22.14
135	500 301 04201 0000	4	9	0.42	$ -	$ 8.61	$ -		$ 8.61
137	500 301 04100 0000	4	9	8.28	$ -	$ 85.79	$ -		$ 85.79
138	500 301 05702 0000	3	9	23.49	$ -	$ 243.23	$ -		$ 243.23
139	500 301 42705 0000	8	11	0.08	$ -	$ 0.74	$ -		$ 0.74
140	500 301 41900 0000	7	11	0.20	$ -	$ 3.72	$ -		$ 3.72
141	500 301 41800 0000	7	11	1.14	$ -	$ 21.40	$ -		$ 21.40
142	500 301 41700 0000	7	11	1.69	$ -	$ 31.78	$ -	*	$ 31.78
143	500 301 41600 0000	7	11	0.14	$ -	$ 2.62	$ -		$ 2.62
144	500 301 43000 0000	7	11	0.07	$ -	$ 0.69	$ -	*	$ 0.69
145	500 301 41400 0000	7	11	2.66	$ -	$ 25.00	$ -		$ 25.00
146	500 301 41500 0000	7	11	0.14	$ -	$ 2.62	$ -		$ 2.62
147	500 301 43502 0000	7	11	0.17	$ -	$ 1.49	$ -	*	$ 1.49
148	500 301 41300 0000	7	11	4.65	$ -	$ 43.91	$ -		$ 43.91
149	500 301 41301 0000	7	11	1.01	$ -	$ 19.72	$ -		$ 19.72
150	500 301 41200 0000	7	11	7.05	$ -	$ 67.24	$ -		$ 67.24
151	500 301 41100 0000	7	11	0.20	$ -	$ 5.64	$ -		$ 5.64
153	500 301 41002 0000	6	11	0.15	$ -	$ 4.40	$ -		$ 4.40
154	500 301 41001 0000	6	11	0.15	$ -	$ 4.40	$ -		$ 4.40
155	500 301 40900 0000	6	11	0.14	$ -	$ 3.63	$ -		$ 3.63
158	500 301 40701 0000	6	11	0.21	$ -	$ 5.11	$ -		$ 5.11
159	500 301 40603 0000	6	11	0.14	$ -	$ 3.44	$ -		$ 3.44
160	500 301 40602 0000	6	11	0.19	$ -	$ 4.70	$ -		$ 4.70
161	500 301 40601 0000	6	11	0.21	$ -	$ 5.11	$ -		$ 5.11
164	500 301 40505 0000	6	11	0.19	$ -	$ 4.71	$ -		$ 4.71
166	500 301 45700 0000	6	11	9.50	$ -	$ 98.39	$ -		$ 98.39
167	500 301 44801 0000	6	11	0.14	$ -	$ 2.97	$ -		$ 2.97
168	500 301 45710 0000	6	11	0.31	$ -	$ 6.52	$ -		$ 6.52
169	500 301 45720 0000	6	11	0.33	$ -	$ 6.90	$ -		$ 6.90
170	500 301 45730 0000	6	11	0.33	$ -	$ 6.92	$ -		$ 6.92
171	500 301 45618 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
172	500 301 45619 0000	6	11	0.14	$ -	$ 2.90	$ -		$ 2.90
173	500 301 45620 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
174	500 301 45606 0000	6	11	0.14	$ -	$ 2.89	$ -		$ 2.89
175	500 301 45610 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
176	500 301 45607 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
177	500 301 45611 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
178	500 301 45608 0000	6	11	0.14	$ -	$ 2.89	$ -		$ 2.89
179	500 301 45612 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
180	500 301 45609 0000	6	11	0.14	$ -	$ 2.89	$ -		$ 2.89
181	500 301 45613 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
182	500 301 45614 0000	6	11	0.15	$ -	$ 3.06	$ -		$ 3.06
183	500 301 45615 0000	6	11	0.15	$ -	$ 3.05	$ -		$ 3.05
184	500 301 45616 0000	6	11	0.15	$ -	$ 3.04	$ -		$ 3.04
185	500 301 45617 0000	6	11	0.15	$ -	$ 3.03	$ -		$ 3.03
186	500 301 45605 0000	6	11	0.15	$ -	$ 3.18	$ -		$ 3.18
187	500 301 45500 0000	6	11	0.10	$ -	$ 2.05	$ -		$ 2.05
188	500 301 45501 0000	6	11	0.14	$ -	$ 2.88	$ -		$ 2.88
189	500 301 45503 0000	6	11	0.09	$ -	$ 1.84	$ -		$ 1.84
190	500 301 45600 0000	6	11	0.09	$ -	$ 1.84	$ -		$ 1.84
191	500 301 45400 0000	6	11	0.10	$ -	$ 2.10	$ -		$ 2.10
192	500 301 45601 0000	6	11	0.14	$ -	$ 2.85	$ -		$ 2.85
193	500 301 45300 0000	6	11	0.09	$ -	$ 1.84	$ -		$ 1.84
194	500 301 45602 0000	6	11	0.09	$ -	$ 1.84	$ -		$ 1.84
195	500 301 45200 0000	6	11	0.14	$ -	$ 2.90	$ -		$ 2.90

SCHEDULE B - SUMMARY (ALL SECTIONS)
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Benefit Cost	Outlet Cost	Special Benefit & Utilities	ADIP ELIGIBILITY	Total Net Costs
		Lot	Con	Total	Total	Total	Total		Total
196	500 301 45603 0000	6	11	0.14	$ -	$ 2.94	$ -		$ 2.94
197	500 301 45604 0000	6	11	0.12	$ -	$ 2.51	$ -		$ 2.51
198	500 301 45100 0000	6	11	0.14	$ -	$ 2.93	$ -		$ 2.93
199	500 301 45604 0000	6	11	0.14	$ -	$ 2.85	$ -		$ 2.85
201	500 301 39801 0000	5	11	0.32	$ -	$ 6.70	$ -		$ 6.70
202	500 301 39746 0000	5	11	0.21	$ -	$ 4.27	$ -		$ 4.27
203	500 301 39741 0000	5	11	0.26	$ -	$ 5.42	$ -		$ 5.42
204	500 301 39736 0000	5	11	0.29	$ -	$ 6.05	$ -		$ 6.05
205	500 301 39731 0000	5	11	0.25	$ -	$ 5.14	$ -		$ 5.14
206	500 301 39726 0000	5	11	0.26	$ -	$ 5.45	$ -		$ 5.45
207	500 301 39721 0000	5	11	0.26	$ -	$ 5.45	$ -		$ 5.45
208	500 301 39716 0000	5	11	0.27	$ -	$ 5.69	$ -		$ 5.69
209	500 301 39711 0000	5	11	0.27	$ -	$ 5.69	$ -		$ 5.69
211	500 301 39704 0000	5	11	0.14	$ -	$ 2.87	$ -		$ 2.87
212	500 301 39702 0000	5	11	0.14	$ -	$ 2.89	$ -		$ 2.89
213	500 301 39703 0000	5	11	0.14	$ -	$ 2.89	$ -		$ 2.89
214	500 301 39701 0000	5	11	0.14	$ -	$ 2.89	$ -		$ 2.89
215	500 301 40000 0000	5	11	0.14	$ -	$ 2.90	$ -		$ 2.90
216	500 301 39900 0000	5	11	0.14	$ -	$ 2.88	$ -		$ 2.88
217	500 301 39800 0000	5	11	0.14	$ -	$ 2.85	$ -	*	$ 2.85
219	500 301 39500 0000	5	11	0.14	$ -	$ 2.85	$ -		$ 2.85
221	500 301 40301 0000	5	11	0.44	$ -	$ 11.86	$ -		$ 11.86
222	500 301 40302 0000	5	11	0.24	$ -	$ 5.83	$ -		$ 5.83
224	500 301 39000 0000	5	11	0.14	$ -	$ 3.57	$ -		$ 3.57
225	500 301 39002 0000	5	11	0.14	$ -	$ 3.57	$ -		$ 3.57
226	500 301 39200 0000	5	11	0.14	$ -	$ 3.57	$ -		$ 3.57
229	500 301 38902 0000	5	11	0.49	$ -	$ 11.28	$ -		$ 11.28
230	500 301 38702 0000	4	11	0.14	$ -	$ 3.53	$ -		$ 3.53
231	500 301 38701 0000	4	11	1.20	$ -	$ 30.84	$ -	*	$ 30.84
City of Ottawa -- BLOCKS									
BLOCK A		11-12	8	31.53	$ -	$ 736.89	$ -		$ 736.89
BLOCK B		11-12	9	37.08	$ 483.75	$ 1,537.33	$ -		$ 2,021.08
BLOCK C		10	9	15.55	$ 262.27	$ 780.84	$ -		$ 1,043.11
BLOCK D1		3-4	9-10	142.16	$ -	$ 7,014.46	$ -		$ 7,014.46
BLOCK D2		4	10	40.72	$ -	$ 2,008.99	$ -		$ 2,008.99
BLOCK E1		1-2	11	83.04	$ -	$ 4,097.38	$ -		$ 4,097.38
BLOCK E2		3	11	53.64	$ -	$ 2,646.96	$ -		$ 2,646.96
BLOCK E3		3	11	36.41	$ -	$ 1,796.48	$ -		$ 1,796.48
BLOCK E4		4	11	45.51	$ -	$ 2,245.72	$ -		$ 2,245.72
BLOCK F1		4	11	12.80	$ -	$ 631.78	$ -		$ 631.78
BLOCK F2		4-6	11	154.30	$ 831.21	$ 7,741.36	$ -		$ 8,572.58
BLOCK F3		1-2	11	15.28	$ -	$ 753.82	$ -		$ 753.82
City of Ottawa -- Roads/Other									
Denise Ave.		6	11	0.22	$ -	$ 11.53	$ -		$ 11.53
Francois St.		6	11	0.25	$ -	$ 12.57	$ -		$ 12.57
Mer-Bleue Rd.		2-6	11	4.87	$ -	$ 249.49	$ -		$ 249.49
Milton Rd.		13-17	9	3.42	$ 102.02	$ 103.84	$ -		$ 205.86
Monique Ave.		6	11	0.22	$ -	$ 11.50	$ -		$ 11.50
Navan Rd.		8-10	9-10	5.18	$ 62.97	$ 216.80	$ -		$ 279.77
Perrault Rd		15-16	9	2.70	$ -	$ 16.24	$ -		$ 16.24
Prescott Russell Trail		11-12	8-9	6.71	$ -	$ 52.88	$ -		$ 52.88
ROW L3-4 C9		3-4	9	0.78	$ -	$ 8.05	$ -		$ 8.05
ROW L4-9 C9-10		4-9	9-10	6.27	$ 18.18	$ 79.29	$ -		$ 97.47
ROW L5-9 C9-10 (Hydro Corridor)		5-9	9-10	11.37	$ 41.71	$ 167.62	$ -		$ 209.33
Smith Rd.		10-11	9	2.48	$ 38.95	$ 90.38	$ -		$ 129.33
Tenth Line Rd.		3-8	10-11	9.66	$ 43.77	$ 503.69	$ -		$ 547.47
Trim Rd.		4-15	8-9	7.20	$ -	$ 181.58	$ -		$ 181.58
Wall Rd.		5-6	9-11	6.51	$ 30.57	$ 307.70	$ -		$ 338.27
TOTAL				2043.09	$ 5,000.00	$ 45,000.00	$ -		$ 50,000.00

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
City of Ottawa -- Individual Landowners																	
1	500 301 09600 0000	16-17	9	43.55	1.00	43.55	Y	0.81	35.35	$ 312.93	0.81	0.10	3.53	$ 26.17	$ 339.10	*	$ 339.10
2	500 301 09200 0000	16	9	14.73	1.00	14.73		0.50		$ -	0.50	0.10	0.74	$ 5.45	$ 5.45	*	$ 5.45
3	500 301 09000 0000	15	9	40.47	1.00	40.47	Y	0.79	31.93	$ 282.68	0.79	0.10	3.19	$ 23.64	$ 306.33	*	$ 306.33
4	500 301 08900 0000	15	9	43.09	1.00	43.09		0.39		$ -	0.39	0.10	1.67	$ 12.39	$ 12.39		$ 12.39
5	500 301 08901 0000	15	9	0.20	2.00	0.40		0.30		$ -	0.30	0.10	0.01	$ 0.09	$ 0.09		$ 0.09
6	500 301 08902 0000	15	9	0.14	2.00	0.28		0.30		$ -	0.30	0.10	0.01	$ 0.06	$ 0.06		$ 0.06
7	500 301 08800 0000	14	9	40.47	1.00	40.47	Y	0.79	31.97	$ 282.98	0.79	0.10	3.20	$ 23.67	$ 306.65	*	$ 306.65
8	500 301 08700 0000	14	9	39.63	1.00	39.63		0.39		$ -	0.39	1.00	15.44	$ 114.35	$ 114.35	*	$ 114.35
9	500 301 08600 0000	14	9	0.39	2.00	0.77		0.30		$ -	0.30	0.10	0.02	$ 0.17	$ 0.17		$ 0.17
10	500 301 08701 0000	14	9	0.45	2.00	0.90		0.30		$ -	0.30	0.10	0.03	$ 0.20	$ 0.20		$ 0.20
11	500 201 42100 0000	14	8	27.47	1.00	27.47		0.30		$ -	0.30	1.00	8.24	$ 61.01	$ 61.01	*	$ 61.01
12	500 201 42200 0000	14	8	0.80	2.00	1.61		0.30		$ -	0.30	1.00	0.48	$ 3.57	$ 3.57		$ 3.57
13	500 201 42101 0000	14	8	0.41	1.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.90	$ 0.90		$ 0.90
14	500 301 08501 0000	13	9	9.94	1.00	9.94	Y	0.78	2.19	$ 19.39	0.78	1.00	7.79	$ 57.70	$ 77.09		$ 77.09
15	500 301 08500 0000	13	9	9.79	1.00	9.79		0.72		$ -	0.72	1.00	7.09	$ 52.48	$ 52.48	*	$ 52.48
16	500 301 08505 0000	13	9	0.30	2.00	0.59		0.75		$ -	0.75	1.00	0.44	$ 3.29	$ 3.29		$ 3.29
17	500 301 08402 0000	13	9	10.12	1.00	10.12		0.38		$ -	0.38	0.33	1.28	$ 9.44	$ 9.44	*	$ 9.44
18	500 301 08401 0000	13	9	0.40	2.00	0.81		0.30		$ -	0.30	0.33	0.08	$ 0.59	$ 0.59		$ 0.59
19	500 201 41800 0000	13	8	13.96	1.00	13.96		0.30		$ -	0.30	0.33	1.38	$ 10.23	$ 10.23	*	$ 10.23
20	500 301 08300 0000	13	9	52.18	1.00	52.18		0.46		$ -	0.46	1.00	24.01	$ 177.75	$ 177.75	*	$ 177.75
21	500 301 08403 0000	13	9	1.82	2.00	3.63		0.30		$ -	0.30	0.33	0.36	$ 2.66	$ 2.66	*	$ 2.66
22	500 201 41600 0000	12	8	17.15	1.00	17.15		0.30		$ -	0.30	0.33	1.70	$ 12.57	$ 12.57	*	$ 12.57
22a	500 201 41700 0000	13	8	12.68	1.00	12.68		0.30		$ -	0.30	0.33	1.26	$ 9.30	$ 9.30	*	$ 9.30
23	500 201 41603 0000	12	8	0.22	2.00	0.44		0.30		$ -	0.30	0.33	0.04	$ 0.32	$ 0.32		$ 0.32
24	500 201 41602 0000	12	8	0.19	2.00	0.37		0.30		$ -	0.30	0.33	0.04	$ 0.27	$ 0.27		$ 0.27
25	500 201 41601 0000	12	8	0.19	2.00	0.37		0.30		$ -	0.30	0.33	0.04	$ 0.27	$ 0.27		$ 0.27
26	500 201 41605 0000	12	8	0.41	2.00	0.81		0.30		$ -	0.30	0.33	0.08	$ 0.59	$ 0.59		$ 0.59
27	500 201 41606 0000	12	8	0.48	2.00	0.96		0.30		$ -	0.30	0.33	0.10	$ 0.70	$ 0.70		$ 0.70
28	500 301 08200 0000	12	9	39.02	1.00	39.02		0.38		$ -	0.38	1.00	14.84	$ 109.88	$ 109.88	*	$ 109.88
29	500 301 08000 0000	12	9	30.74	1.00	30.74		0.31		$ -	0.31	1.00	9.59	$ 71.03	$ 71.03	*	$ 71.03
30	500 301 08100 0000	12	9	3.23	2.00	6.46		0.30		$ -	0.30	0.33	0.64	$ 4.74	$ 4.74		$ 4.74
31	500 301 07800 0000	11	9	23.08	1.00	23.08		0.30		$ -	0.30	1.00	6.92	$ 51.27	$ 51.27	*	$ 51.27
32	500 701 07500 0000	11	9	1.67	2.00	3.34		0.30		$ -	0.30	1.00	1.00	$ 7.42	$ 7.42	*	$ 7.42
33	500 201 41300 0000	12	8	1.38	1.00	1.38		0.30		$ -	0.30	0.33	0.14	$ 1.01	$ 1.01		$ 1.01
34	500 201 41200 0000	12	8	1.19	1.00	1.19		0.30		$ -	0.30	0.33	0.12	$ 0.87	$ 0.87		$ 0.87
35	500 701 08900 0000	11	9	3.46	1.00	3.46		0.30		$ -	0.30	1.00	1.04	$ 7.68	$ 7.68	*	$ 7.68
36	500 701 09300 0000	10	9	2.65	1.00	2.65		0.30		$ -	0.30	1.00	0.80	$ 5.89	$ 5.89	*	$ 5.89
37	500 701 17200 0000	10-11	9	6.14	1.00	6.14		0.30		$ -	0.30	1.00	1.84	$ 13.65	$ 13.65		$ 13.65

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
38	500 301 07100 0000	10	9	2.17	2.00	4.35		0.30		$ -	0.30	1.00	1.30	$ 9.66	$ 9.66		$ 9.66
39	500 301 07109 0000	10	9	1.15	2.00	2.31		0.30		$ -	0.30	1.00	0.69	$ 5.13	$ 5.13		$ 5.13
40	500 301 07105 0000	10	9	0.67	2.00	1.35		0.30		$ -	0.30	1.00	0.40	$ 3.00	$ 3.00		$ 3.00
41	500 701 10500 0000	10	9	18.95	1.00	18.95		0.30		$ -	0.30	1.00	5.68	$ 42.08	$ 42.08		$ 42.08
42	500 701 10000 0000	10	9	0.19	2.00	0.37		0.30		$ -	0.30	1.00	0.11	$ 0.83	$ 0.83		$ 0.83
43	500 701 10100 0000	10	9	0.18	2.00	0.36		0.30		$ -	0.30	1.00	0.11	$ 0.81	$ 0.81		$ 0.81
44	500 701 10200 0000	10	9	1.04	2.00	2.07		0.30		$ -	0.30	1.00	0.62	$ 4.60	$ 4.60		$ 4.60
45	500 701 10300 0000	10	9	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
46	500 701 10400 0000	10	9	19.15	1.00	19.15		0.30		$ -	0.30	1.00	5.74	$ 42.54	$ 42.54	*	$ 42.54
47	500 701 10301 0000	10	9	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
48	500 701 10405 0000	10	9	0.24	2.00	0.49		0.30		$ -	0.30	1.00	0.15	$ 1.08	$ 1.08	*	$ 1.08
50	500 301 07140 0000	10	9	0.30	2.00	0.60		0.30		$ -	0.30	1.00	0.18	$ 1.33	$ 1.33		$ 1.33
51	500 301 22300 0000	9	10	0.36	2.00	0.73		0.30		$ -	0.30	1.00	0.22	$ 1.62	$ 1.62		$ 1.62
52	500 301 22400 0000	9	10	0.38	2.00	0.77		0.30		$ -	0.30	1.00	0.23	$ 1.71	$ 1.71		$ 1.71
53	500 301 22500 0000	9	10	0.76	2.00	1.51		0.30		$ -	0.30	1.00	0.45	$ 3.36	$ 3.36		$ 3.36
54	500 301 22600 0000	9	10	1.05	2.00	2.10		0.30		$ -	0.30	1.00	0.63	$ 4.67	$ 4.67		$ 4.67
55	500 301 22601 0000	9	10	0.91	2.00	1.82		0.30		$ -	0.30	1.00	0.55	$ 4.04	$ 4.04		$ 4.04
56	500 301 22700 0000	9	10	1.02	2.00	2.03		0.30		$ -	0.30	1.00	0.61	$ 4.51	$ 4.51		$ 4.51
57	500 301 22800 0000	9	10	0.59	2.00	1.17		0.30		$ -	0.30	1.00	0.35	$ 2.61	$ 2.61		$ 2.61
58	500 301 22701 0000	9	10	1.48	2.00	2.95		0.30		$ -	0.30	1.00	0.89	$ 6.56	$ 6.56		$ 6.56
59	500 301 23100 0000	9	10	0.39	2.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 1.73	$ 1.73		$ 1.73
60	500 301 23403 0000	9	10	8.22	1.00	8.22		0.30		$ -	0.30	1.00	2.47	$ 18.27	$ 18.27		$ 18.27
61	500 301 23101 0000	9	10	0.25	2.00	0.51		0.30		$ -	0.30	1.00	0.15	$ 1.12	$ 1.12		$ 1.12
62	500 301 23401 0000	9	10	0.13	2.00	0.26		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57		$ 0.57
63	500 301 23402 0000	9	10	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
64	500 301 23406 0000	9	10	3.67	1.00	3.67		0.30		$ -	0.30	1.00	1.10	$ 8.15	$ 8.15		$ 8.15
65	500 301 07000 0000	9	9	19.95	1.00	19.95		0.30		$ -	0.30	1.00	5.99	$ 44.32	$ 44.32	*	$ 44.32
66	500 301 06900 0000	9	9	0.17	2.00	0.33		0.30		$ -	0.30	1.00	0.10	$ 0.74	$ 0.74		$ 0.74
67	500 301 06800 0000	9	9	0.37	2.00	0.74		0.30		$ -	0.30	1.00	0.22	$ 1.63	$ 1.63		$ 1.63
68	500 301 06700 0000	9	9	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86
69	500 301 06600 0000	9	9	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.75	$ 0.75		$ 0.75
70	500 301 06500 0000	9	9	1.45	2.00	2.91		0.30		$ -	0.30	1.00	0.87	$ 6.45	$ 6.45		$ 6.45
71	500 301 06400 0000	9	9	0.16	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.70	$ 0.70		$ 0.70
72	500 301 05900 0000	9	9	13.74	1.00	13.74		0.30		$ -	0.30	1.00	4.12	$ 30.52	$ 30.52	*	$ 30.52
73	500 301 06300 0000	9	9	1.17	2.00	2.34		0.30		$ -	0.30	1.00	0.70	$ 5.20	$ 5.20		$ 5.20
74	500 301 06200 0000	9	9	0.19	2.00	0.37		0.30		$ -	0.30	1.00	0.11	$ 0.83	$ 0.83		$ 0.83
75	500 301 06300 0000	9	9	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.93	$ 0.93		$ 0.93
76	500 301 06100 0000	9	9	0.13	2.00	0.25		0.30		$ -	0.30	1.00	0.08	$ 0.56	$ 0.56		$ 0.56
77	500 301 06000 0000	9	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.29	$ 1.29		$ 1.29

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
78	500 301 20500 0000	8	10	17.90	1.00	17.90		0.30		$ -	0.30	1.00	5.37	$ 39.75	$ 39.75	*	$ 39.75
79	500 301 20503 0000	8	10	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 2.14	$ 2.14		$ 2.14
80	500 301 20501 0000	8	10	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86
81	500 301 20800 0000	8	10	1.21	2.00	2.43		0.30		$ -	0.30	1.00	0.73	$ 5.39	$ 5.39		$ 5.39
82	500 301 20900 0000	8	10	0.83	2.00	1.67		0.30		$ -	0.30	1.00	0.50	$ 3.71	$ 3.71		$ 3.71
83	500 301 20901 0000	8	10	0.68	2.00	1.35		0.30		$ -	0.30	1.00	0.41	$ 3.00	$ 3.00		$ 3.00
84	500 301 21100 0000	8	10	0.45	2.00	0.91		0.30		$ -	0.30	1.00	0.27	$ 2.02	$ 2.02		$ 2.02
85	500 301 21500 0000	8	10	4.64	1.00	4.64		0.30		$ -	0.30	1.00	1.39	$ 10.31	$ 10.31		$ 10.31
86	500 301 20600 0000	8	10	23.57	1.00	23.57		0.30		$ -	0.30	1.00	7.07	$ 52.36	$ 52.36	*	$ 52.36
87	500 301 20600 0000	8	10	14.41	1.00	14.41		0.30		$ -	0.30	1.00	4.32	$ 32.01	$ 32.01	*	$ 32.01
88	500 301 05200 0000	8	9	22.36	1.00	22.36		0.30		$ -	0.30	1.00	6.71	$ 49.67	$ 49.67	*	$ 49.67
89	500 301 05300 0000	8	9	40.35	1.00	40.35		0.30		$ -	0.30	1.00	12.10	$ 89.62	$ 89.62	*	$ 89.62
90	500 301 05900 0000	8	9	12.53	1.00	12.53		0.30		$ -	0.30	1.00	3.76	$ 27.83	$ 27.83	*	$ 27.83
91	500 301 20200 0000	7	10	0.64	2.00	1.28		0.30		$ -	0.30	1.00	0.38	$ 2.84	$ 2.84		$ 2.84
92	500 301 20300 0000	7	10	28.82	1.00	28.82		0.30		$ -	0.30	1.00	8.65	$ 64.02	$ 64.02		$ 64.02
93	500 301 20300 0000	7	10	11.61	1.00	11.61		0.30		$ -	0.30	1.00	3.48	$ 25.78	$ 25.78		$ 25.78
94	500 301 04900 0000	7	9	20.03	1.00	20.03		0.30		$ -	0.30	1.00	6.01	$ 44.50	$ 44.50	*	$ 44.50
95	500 301 05100 0000	7	9	17.61	1.00	17.61		0.30		$ -	0.30	1.00	5.28	$ 39.11	$ 39.11	*	$ 39.11
96	500 301 19701 0000	6	10	5.73	1.00	5.73		0.30		$ -	0.30	1.00	1.72	$ 12.74	$ 12.74		$ 12.74
97	500 301 19700 0000	6	10	6.07	1.00	6.07		0.30		$ -	0.30	1.00	1.82	$ 13.49	$ 13.49		$ 13.49
98	500 301 19702 0000	6	10	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.82	$ 1.82		$ 1.82
99	500 301 19801 0000	7	10	3.59	1.00	3.59		0.30		$ -	0.30	1.00	1.08	$ 7.98	$ 7.98		$ 7.98
100	500 301 19800 0000	7	10	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.28	$ 1.28		$ 1.28
101	500 301 20101 0000	7	10	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.93	$ 0.93		$ 0.93
102	500 301 20105 0000	7	10	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 1.06	$ 1.06		$ 1.06
103	500 301 20100 0000	6-7	10	40.85	1.00	40.85		0.30		$ -	0.30	1.00	12.25	$ 90.74	$ 90.74		$ 90.74
104	500 301 19500 0000	6	10	9.66	1.00	9.66		0.30		$ -	0.30	1.00	2.90	$ 21.46	$ 21.46	*	$ 21.46
105	500 301 20100 0000	6-7	10	12.44	1.00	12.44		0.30		$ -	0.30	1.00	3.73	$ 27.64	$ 27.64		$ 27.64
106	500 301 04800 0000	7	9	24.68	1.00	24.68		0.30		$ -	0.30	1.00	7.40	$ 54.83	$ 54.83	*	$ 54.83
107	500 301 05000 0000	7	9	15.51	1.00	15.51		0.30		$ -	0.30	1.00	4.65	$ 34.45	$ 34.45	*	$ 34.45
108	500 301 19600 0000	6	10	20.23	1.00	20.23		0.30		$ -	0.30	1.00	6.07	$ 44.95	$ 44.95	*	$ 44.95
109	500 301 19400 0000	6	10	8.43	1.00	8.43		0.30		$ -	0.30	1.00	2.53	$ 18.72	$ 18.72	*	$ 18.72
110	500 301 19400 0000	6	10	11.39	1.00	11.39		0.30		$ -	0.30	1.00	3.42	$ 25.29	$ 25.29	*	$ 25.29
111	500 301 04700 0000	6	9	40.47	1.00	40.47		0.30		$ -	0.30	1.00	12.14	$ 89.89	$ 89.89	*	$ 89.89
112	500 301 04510 0000	6	9	8.40	1.00	8.40		0.30		$ -	0.30	1.00	2.52	$ 18.67	$ 18.67	*	$ 18.67
113	500 301 04501 0000	6	9	1.12	1.00	1.12		0.30		$ -	0.30	1.00	0.34	$ 2.48	$ 2.48		$ 2.48
114	500 301 18301 0000	5	10	0.40	2.00	0.81		0.30		$ -	0.30	1.00	0.24	$ 1.80	$ 1.80		$ 1.80
115	500 301 18300 0000	5	10	14.30	1.00	14.30		0.30		$ -	0.30	1.00	4.29	$ 31.75	$ 31.75		$ 31.75
116	500 301 18200 0000	5	10	14.88	1.00	14.88		0.30		$ -	0.30	1.00	4.46	$ 33.04	$ 33.04		$ 33.04

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
117	500 301 18700 0000	5	10	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.75	$ 0.75		$ 0.75
118	500 301 18900 0000	5	10	14.66	1.00	14.66		0.30		$ -	0.30	1.00	4.40	$ 32.57	$ 32.57	*	$ 32.57
119	500 301 19100 0000	5	10	14.77	1.00	14.77		0.30		$ -	0.30	1.00	4.43	$ 32.81	$ 32.81		$ 32.81
120	500 301 18300 0000	5	10	5.70	1.00	5.70		0.30		$ -	0.30	1.00	1.71	$ 12.66	$ 12.66		$ 12.66
121	500 301 18200 0000	5	10	5.92	1.00	5.92		0.30		$ -	0.30	1.00	1.78	$ 13.14	$ 13.14		$ 13.14
122	500 301 18900 0000	5	10	5.83	1.00	5.83		0.30		$ -	0.30	1.00	1.75	$ 12.95	$ 12.95	*	$ 12.95
123	500 301 19100 0000	5	10	5.84	1.00	5.84		0.30		$ -	0.30	1.00	1.75	$ 12.98	$ 12.98		$ 12.98
124	500 301 04400 0000	5	9	42.29	1.00	42.29		0.30		$ -	0.30	1.00	12.69	$ 93.95	$ 93.95		$ 93.95
125	500 301 04300 0000	5	9	25.99	1.00	25.99		0.30		$ -	0.30	1.00	7.80	$ 57.73	$ 57.73	*	$ 57.73
126	PIN 145643045	5	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.28	$ 1.28	*	$ 1.28
127	500 301 05105 0000	8	9	1.49	2.00	2.98		0.30		$ -	0.30	1.00	0.89	$ 6.62	$ 6.62		$ 6.62
131	500 301 04210 0000	4	9	55.39	1.00	55.39		0.30		$ -	0.30	1.00	16.62	$ 123.03	$ 123.03		$ 123.03
132	500 301 04202 0000	4	9	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.40	$ 0.40		$ 0.40
133	500 301 04203 0000	4	9	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.82	$ 1.82		$ 1.82
134	500 301 04200 0000	4	9	1.07	2.00	2.14		0.30		$ -	0.30	1.00	0.64	$ 4.75	$ 4.75		$ 4.75
135	500 301 04201 0000	4	9	0.42	2.00	0.83		0.30		$ -	0.30	1.00	0.25	$ 1.85	$ 1.85		$ 1.85
137	500 301 04100 0000	4	9	8.28	1.00	8.28		0.30		$ -	0.30	1.00	2.49	$ 18.40	$ 18.40		$ 18.40
138	500 301 05702 0000	3	9	23.49	1.00	23.49		0.30		$ -	0.30	1.00	7.05	$ 52.18	$ 52.18		$ 52.18
139	500 301 42705 0000	8	11	0.08	1.00	0.08		0.30		$ -	0.30	1.00	0.02	$ 0.17	$ 0.17		$ 0.17
140	500 301 41900 0000	7	11	0.20	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.88	$ 0.88		$ 0.88
141	500 301 41800 0000	7	11	1.14	2.00	2.27		0.30		$ -	0.30	1.00	0.68	$ 5.05	$ 5.05		$ 5.05
142	500 301 41700 0000	7	11	1.69	2.00	3.38		0.30		$ -	0.30	1.00	1.01	$ 7.50	$ 7.50	*	$ 7.50
143	500 301 41600 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
144	500 301 43000 0000	7	11	0.07	1.00	0.07		0.30		$ -	0.30	1.00	0.02	$ 0.16	$ 0.16	*	$ 0.16
145	500 301 41400 0000	7	11	2.66	1.00	2.66		0.30		$ -	0.30	1.00	0.80	$ 5.90	$ 5.90		$ 5.90
146	500 301 41500 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
147	500 301 43502 0000	7	11	0.17	1.00	0.17		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37	*	$ 0.37
148	500 301 41300 0000	7	11	4.65	1.00	4.65		0.30		$ -	0.30	1.00	1.40	$ 10.34	$ 10.34		$ 10.34
149	500 301 41301 0000	7	11	1.01	2.00	2.02		0.30		$ -	0.30	1.00	0.61	$ 4.49	$ 4.49		$ 4.49
150	500 301 41200 0000	7	11	7.05	1.00	7.05		0.30		$ -	0.30	1.00	2.12	$ 15.66	$ 15.66		$ 15.66
151	500 301 41100 0000	7	11	0.20	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.91	$ 0.91		$ 0.91
153	500 301 41002 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.68	$ 0.68		$ 0.68
154	500 301 41001 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.68	$ 0.68		$ 0.68
155	500 301 40900 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.63	$ 0.63		$ 0.63
158	500 301 40701 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.93	$ 0.93		$ 0.93
159	500 301 40603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.63	$ 0.63		$ 0.63
160	500 301 40602 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86
161	500 301 40601 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.94	$ 0.94		$ 0.94
164	500 301 40505 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
166	500 301 45700 0000	6	11	9.50	1.00	9.50		0.30		$ -	0.30	1.00	2.85	$ 21.11	$ 21.11		$ 21.11
167	500 301 44801 0000	6	11	0.14	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
168	500 301 45710 0000	6	11	0.31	2.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 1.40	$ 1.40		$ 1.40
169	500 301 45720 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.48	$ 1.48		$ 1.48
170	500 301 45730 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.48	$ 1.48		$ 1.48
171	500 301 45618 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
172	500 301 45619 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
173	500 301 45620 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
174	500 301 45606 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
175	500 301 45610 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
176	500 301 45607 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
177	500 301 45611 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
178	500 301 45608 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
179	500 301 45612 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
180	500 301 45609 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
181	500 301 45613 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
182	500 301 45614 0000	6	11	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 0.66	$ 0.66		$ 0.66
183	500 301 45615 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.65	$ 0.65		$ 0.65
184	500 301 45616 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.65	$ 0.65		$ 0.65
185	500 301 45617 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.65	$ 0.65		$ 0.65
186	500 301 45605 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.68	$ 0.68		$ 0.68
187	500 301 45500 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.44	$ 0.44		$ 0.44
188	500 301 45501 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
189	500 301 45503 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
190	500 301 45600 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.40	$ 0.40		$ 0.40
191	500 301 45400 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.45	$ 0.45		$ 0.45
192	500 301 45601 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
193	500 301 45300 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.40	$ 0.40		$ 0.40
194	500 301 45602 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.40	$ 0.40		$ 0.40
195	500 301 45200 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
196	500 301 45603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.63	$ 0.63		$ 0.63
197	500 301 45604 0000	6	11	0.12	2.00	0.24		0.30		$ -	0.30	1.00	0.07	$ 0.54	$ 0.54		$ 0.54
198	500 301 45100 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.63	$ 0.63		$ 0.63
199	500 301 45604 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
201	500 301 39801 0000	5	11	0.32	2.00	0.65		0.30		$ -	0.30	1.00	0.19	$ 1.44	$ 1.44		$ 1.44
202	500 301 39746 0000	5	11	0.21	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.92	$ 0.92		$ 0.92
203	500 301 39741 0000	5	11	0.26	2.00	0.52		0.30		$ -	0.30	1.00	0.16	$ 1.16	$ 1.16		$ 1.16
204	500 301 39736 0000	5	11	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.18	$ 1.30	$ 1.30		$ 1.30
205	500 301 39731 0000	5	11	0.25	2.00	0.50		0.30		$ -	0.30	1.00	0.15	$ 1.10	$ 1.10		$ 1.10

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
206	500 301 39726 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.17	$ 1.17		$ 1.17
207	500 301 39721 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.17	$ 1.17		$ 1.17
208	500 301 39716 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.22	$ 1.22		$ 1.22
209	500 301 39711 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.22	$ 1.22		$ 1.22
211	500 301 39704 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
212	500 301 39702 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
213	500 301 39703 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
214	500 301 39701 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
215	500 301 40000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
216	500 301 39900 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
217	500 301 39800 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61	*	$ 0.61
219	500 301 39500 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
221	500 301 40301 0000	5	11	0.44	2.00	0.89		0.30		$ -	0.30	1.00	0.27	$ 1.97	$ 1.97		$ 1.97
222	500 301 40302 0000	5	11	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 1.06	$ 1.06		$ 1.06
224	500 301 39000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
225	500 301 39002 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
226	500 301 39200 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
229	500 301 38902 0000	5	11	0.49	2.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.17	$ 2.17		$ 2.17
230	500 301 38702 0000	4	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
231	500 301 38701 0000	4	11	1.20	2.00	2.41		0.30		$ -	0.30	1.00	0.72	$ 5.35	$ 5.35	*	$ 5.35

SCHEDULE C -- SECTION 1
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S1 Total		S1 Total	S1	S1			S1	S1					
City of Ottawa -- BLOCKS																	
	BLOCK A	11-12	8	31.53	3.85	121.40		0.30		$ -	0.30	1.00	36.42	$ 269.66	$ 269.66		$ 269.66
	BLOCK B	11-12	9	37.08	3.85	142.77		0.30		$ -	0.30	1.00	42.83	$ 317.13	$ 317.13		$ 317.13
	BLOCK C	10	9	15.55	3.85	59.88		0.30		$ -	0.30	1.00	17.96	$ 133.01	$ 133.01		$ 133.01
	BLOCK D1	3-4	9-10	142.16	3.85	547.31		0.30		$ -	0.30	1.00	164.19	$ 1,215.74	$ 1,215.74		$ 1,215.74
	BLOCK D2	4	10	40.72	3.85	156.75		0.30		$ -	0.30	1.00	47.03	$ 348.20	$ 348.20		$ 348.20
	BLOCK E1	1-2	11	83.04	3.85	319.70		0.30		$ -	0.30	1.00	95.91	$ 710.16	$ 710.16		$ 710.16
	BLOCK E2	3	11	53.64	3.85	206.53		0.30		$ -	0.30	1.00	61.96	$ 458.77	$ 458.77		$ 458.77
	BLOCK E3	3	11	36.41	3.85	140.17		0.30		$ -	0.30	1.00	42.05	$ 311.37	$ 311.37		$ 311.37
	BLOCK E4	4	11	45.51	3.85	175.23		0.30		$ -	0.30	1.00	52.57	$ 389.23	$ 389.23		$ 389.23
	BLOCK F1	4	11	12.80	3.85	49.30		0.30		$ -	0.30	1.00	14.79	$ 109.50	$ 109.50		$ 109.50
	BLOCK F2	4-6	11	154.30	3.85	594.04		0.30		$ -	0.30	1.00	178.21	$ 1,319.55	$ 1,319.55		$ 1,319.55
	BLOCK F3	1-2	11	15.28	3.85	58.82		0.30		$ -	0.30	1.00	17.65	$ 130.65	$ 130.65		$ 130.65
City of Ottawa -- Roads/Other																	
	Denise Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 2.00	$ 2.00		$ 2.00
	Francois St.	6	11	0.25	4.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.18	$ 2.18		$ 2.18
	Mer-Bleue Rd.	2-6	11	4.87	4.00	19.47		0.30		$ -	0.30	1.00	5.84	$ 43.24	$ 43.24		$ 43.24
	Milton Rd.	13-17	9	3.42	4.00	13.70	Y	0.98	11.52	$ 102.02	0.98	1.00	13.46	$ 99.65	$ 201.67		$ 201.67
	Monique Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 1.99	$ 1.99		$ 1.99
	Navan Rd.	8-10	9-10	5.18	4.00	20.71		0.30		$ -	0.30	1.00	6.21	$ 46.01	$ 46.01		$ 46.01
	Perrault Rd	15-16	9	2.70	4.00	10.81		0.61		$ -	0.61	0.33	2.19	$ 16.24	$ 16.24		$ 16.24
	Prescott Russell Trail	11-12	8-9	6.71	1.00	6.71		0.30		$ -	0.30	1.00	2.01	$ 14.90	$ 14.90		$ 14.90
	ROW L3-4 C9	3-4	9	0.78	1.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 1.73	$ 1.73		$ 1.73
	ROW L4-9 C9-10	4-9	9-10	6.27	1.00	6.27		0.30		$ -	0.30	1.00	1.88	$ 13.93	$ 13.93		$ 13.93
	ROW L5-9 C9-10 (Hydro Corridor)	5-9	9-10	11.37	1.00	11.37		0.30		$ -	0.30	1.00	3.41	$ 25.25	$ 25.25		$ 25.25
	Smith Rd.	10-11	9	2.48	4.00	9.92		0.30		$ -	0.30	1.00	2.98	$ 22.04	$ 22.04		$ 22.04
	Tenth Line Rd.	3-8	10-11	9.66	4.00	38.63		0.30		$ -	0.30	1.00	11.59	$ 85.82	$ 85.82		$ 85.82
	Trim Rd.	4-15	8-9	7.20	4.00	28.79		0.30		$ -	0.30	1.00	8.64	$ 63.95	$ 63.95		$ 63.95
	Wall Rd.	5-6	9-11	6.51	4.00	26.06		0.30		$ -	0.30	1.00	7.82	$ 57.88	$ 57.88		$ 57.88
Total				**2043.09**		**4131.42**			**112.96**	**$ 1,000.00**			**1215.50**	**$ 9,000.00**	**$ 10,000.00**		**$ 10,000.00**

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
City of Ottawa -- Individual Landowners																	
8	500 301 08700 0000	14	9	4.96	1.00	4.96		0.37		$ -	0.37	0.33	0.61	$ 4.23	$ 4.23	*	$ 4.23
11	500 201 42100 0000	14	8	27.45	1.00	27.45		0.30		$ -	0.30	0.33	2.72	$ 18.83	$ 18.83	*	$ 18.83
12	500 201 42200 0000	14	8	0.80	2.00	1.61		0.30		$ -	0.30	0.33	0.16	$ 1.10	$ 1.10		$ 1.10
13	500 201 42101 0000	14	8	0.41	1.00	0.41		0.30		$ -	0.30	0.33	0.04	$ 0.28	$ 0.28		$ 0.28
14	500 301 08501 0000	13	9	7.15	1.00	7.15	Y	0.90	6.46	$ 47.75	0.90	0.33	2.13	$ 14.77	$ 62.52		$ 62.52
15	500 301 08500 0000	13	9	9.47	1.00	9.47	Y	0.91	8.57	$ 63.39	0.91	0.33	2.83	$ 19.61	$ 82.99	*	$ 82.99
16	500 301 08505 0000	13	9	0.30	2.00	0.59		1.00		$ -	1.00	0.33	0.20	$ 1.35	$ 1.35		$ 1.35
17	500 301 08402 0000	13	9	8.12	1.00	8.12		0.49		$ -	0.49	0.33	1.33	$ 9.19	$ 9.19	*	$ 9.19
18	500 301 08401 0000	13	9	0.40	2.00	0.81		0.30		$ -	0.30	0.33	0.08	$ 0.55	$ 0.55		$ 0.55
19	500 201 41800 0000	13	8	13.96	1.00	13.96		0.30		$ -	0.30	0.33	1.38	$ 9.58	$ 9.58	*	$ 9.58
20	500 301 08300 0000	13	9	52.16	1.00	52.16	Y	0.72	37.54	$ 277.52	0.72	0.33	12.39	$ 85.84	$ 363.37	*	$ 363.37
21	500 301 08403 0000	13	9	1.82	2.00	3.63		0.50		$ -	0.50	0.33	0.60	$ 4.15	$ 4.15	*	$ 4.15
22	500 201 41600 0000	12	8	17.15	1.00	17.15		0.40		$ -	0.40	0.66	4.58	$ 31.72	$ 31.72	*	$ 31.72
22a	500 201 41700 0000	13	8	12.68	1.00	12.68		0.36		$ -	0.36	0.66	3.05	$ 21.11	$ 21.11	*	$ 21.11
23	500 201 41603 0000	12	8	0.22	2.00	0.44		0.50		$ -	0.50	0.66	0.14	$ 1.00	$ 1.00		$ 1.00
24	500 201 41602 0000	12	8	0.19	2.00	0.37		0.50		$ -	0.50	0.66	0.12	$ 0.85	$ 0.85		$ 0.85
25	500 201 41601 0000	12	8	0.19	2.00	0.37		0.50		$ -	0.50	0.66	0.12	$ 0.85	$ 0.85		$ 0.85
26	500 201 41605 0000	12	8	0.41	2.00	0.81		0.50		$ -	0.50	0.66	0.27	$ 1.85	$ 1.85		$ 1.85
27	500 201 41606 0000	12	8	0.48	2.00	0.96		0.50		$ -	0.50	0.66	0.32	$ 2.19	$ 2.19		$ 2.19
28	500 301 08200 0000	12	9	39.02	1.00	39.02	Y	0.81	31.46	$ 232.55	0.81	0.66	20.76	$ 143.86	$ 376.41	*	$ 376.41
29	500 301 08000 0000	12	9	30.74	1.00	30.74	Y	0.92	28.28	$ 209.05	0.92	1.00	28.28	$ 195.95	$ 405.00	*	$ 405.00
30	500 301 08100 0000	12	9	3.23	2.00	6.46		0.70		$ -	0.70	0.66	3.00	$ 20.76	$ 20.76		$ 20.76
31	500 301 07800 0000	11	9	23.08	1.00	23.08	Y	0.85	19.64	$ 145.19	0.85	1.00	19.64	$ 136.09	$ 281.28	*	$ 281.28
32	500 701 07500 0000	11	9	1.67	2.00	3.34	Y	0.99	3.32	$ 24.54	0.99	1.00	3.32	$ 23.01	$ 47.55	*	$ 47.55
33	500 201 41300 0000	12	8	1.38	1.00	1.38		0.30		$ -	0.30	1.00	0.41	$ 2.86	$ 2.86		$ 2.86
34	500 201 41200 0000	12	8	1.19	1.00	1.19		0.30		$ -	0.30	1.00	0.36	$ 2.47	$ 2.47		$ 2.47
35	500 701 08900 0000	11	9	3.46	1.00	3.46		0.84		$ -	0.84	1.00	2.90	$ 20.08	$ 20.08	*	$ 20.08
36	500 701 09300 0000	10	9	2.65	1.00	2.65		0.75		$ -	0.75	1.00	1.99	$ 13.78	$ 13.78	*	$ 13.78
37	500 701 17200 0000	10-11	9	6.14	1.00	6.14		0.89		$ -	0.89	1.00	5.44	$ 37.70	$ 37.70		$ 37.70
38	500 301 07100 0000	10	9	2.17	2.00	4.35		0.47		$ -	0.47	1.00	2.04	$ 14.17	$ 14.17		$ 14.17
39	500 301 07109 0000	10	9	1.15	2.00	2.31		0.34		$ -	0.34	1.00	0.78	$ 5.44	$ 5.44		$ 5.44
40	500 301 07105 0000	10	9	0.67	2.00	1.35		0.30		$ -	0.30	1.00	0.40	$ 2.81	$ 2.81		$ 2.81
41	500 701 10500 0000	10	9	18.95	1.00	18.95		0.48		$ -	0.48	1.00	9.03	$ 62.55	$ 62.55		$ 62.55
42	500 701 10000 0000	10	9	0.19	2.00	0.37		0.75		$ -	0.75	1.00	0.28	$ 1.93	$ 1.93		$ 1.93
43	500 701 10100 0000	10	9	0.18	2.00	0.36		0.71		$ -	0.71	1.00	0.26	$ 1.80	$ 1.80		$ 1.80
44	500 701 10200 0000	10	9	1.04	2.00	2.07		0.56		$ -	0.56	1.00	1.16	$ 8.01	$ 8.01		$ 8.01
45	500 701 10300 0000	10	9	0.14	2.00	0.28		0.54		$ -	0.54	1.00	0.15	$ 1.04	$ 1.04		$ 1.04
46	500 701 10400 0000	10	9	19.15	1.00	19.15		0.42		$ -	0.42	1.00	8.05	$ 55.81	$ 55.81	*	$ 55.81

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
47	500 701 10301 0000	10	9	0.14	2.00	0.28		0.50		$ -	0.50	1.00	0.14	$ 0.97	$ 0.97		$ 0.97
48	500 701 10405 0000	10	9	0.24	2.00	0.49		0.50		$ -	0.50	1.00	0.24	$ 1.68	$ 1.68	*	$ 1.68
50	500 301 07140 0000	10	9	0.30	2.00	0.60		0.30		$ -	0.30	1.00	0.18	$ 1.24	$ 1.24		$ 1.24
51	500 301 22300 0000	9	10	0.36	2.00	0.73		0.30		$ -	0.30	1.00	0.22	$ 1.51	$ 1.51		$ 1.51
52	500 301 22400 0000	9	10	0.38	2.00	0.77		0.30		$ -	0.30	1.00	0.23	$ 1.60	$ 1.60		$ 1.60
53	500 301 22500 0000	9	10	0.76	2.00	1.51		0.30		$ -	0.30	1.00	0.45	$ 3.15	$ 3.15		$ 3.15
54	500 301 22600 0000	9	10	1.05	2.00	2.10		0.30		$ -	0.30	1.00	0.63	$ 4.37	$ 4.37		$ 4.37
55	500 301 22601 0000	9	10	0.91	2.00	1.82		0.30		$ -	0.30	1.00	0.55	$ 3.78	$ 3.78		$ 3.78
56	500 301 22700 0000	9	10	1.02	2.00	2.03		0.30		$ -	0.30	1.00	0.61	$ 4.22	$ 4.22		$ 4.22
57	500 301 22800 0000	9	10	0.59	2.00	1.17		0.30		$ -	0.30	1.00	0.35	$ 2.44	$ 2.44		$ 2.44
58	500 301 22701 0000	9	10	1.48	2.00	2.95		0.30		$ -	0.30	1.00	0.89	$ 6.14	$ 6.14		$ 6.14
59	500 301 23100 0000	9	10	0.39	2.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 1.62	$ 1.62		$ 1.62
60	500 301 23403 0000	9	10	8.22	1.00	8.22		0.30		$ -	0.30	1.00	2.47	$ 17.10	$ 17.10		$ 17.10
61	500 301 23101 0000	9	10	0.25	2.00	0.51		0.30		$ -	0.30	1.00	0.15	$ 1.05	$ 1.05		$ 1.05
62	500 301 23401 0000	9	10	0.13	2.00	0.26		0.30		$ -	0.30	1.00	0.08	$ 0.54	$ 0.54		$ 0.54
63	500 301 23402 0000	9	10	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
64	500 301 23406 0000	9	10	3.67	1.00	3.67		0.30		$ -	0.30	1.00	1.10	$ 7.63	$ 7.63		$ 7.63
65	500 301 07000 0000	9	9	19.95	1.00	19.95		0.30		$ -	0.30	1.00	5.99	$ 41.48	$ 41.48	*	$ 41.48
66	500 301 06900 0000	9	9	0.17	2.00	0.33		0.30		$ -	0.30	1.00	0.10	$ 0.69	$ 0.69		$ 0.69
67	500 301 06800 0000	9	9	0.37	2.00	0.74		0.30		$ -	0.30	1.00	0.22	$ 1.53	$ 1.53		$ 1.53
68	500 301 06700 0000	9	9	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.81	$ 0.81		$ 0.81
69	500 301 06600 0000	9	9	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.70	$ 0.70		$ 0.70
70	500 301 06500 0000	9	9	1.45	2.00	2.91		0.30		$ -	0.30	1.00	0.87	$ 6.04	$ 6.04		$ 6.04
71	500 301 06400 0000	9	9	0.16	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.65	$ 0.65		$ 0.65
72	500 301 05900 0000	9	9	13.74	1.00	13.74		0.30		$ -	0.30	1.00	4.12	$ 28.57	$ 28.57	*	$ 28.57
73	500 301 06300 0000	9	9	1.17	2.00	2.34		0.30		$ -	0.30	1.00	0.70	$ 4.86	$ 4.86		$ 4.86
74	500 301 06200 0000	9	9	0.19	2.00	0.37		0.30		$ -	0.30	1.00	0.11	$ 0.78	$ 0.78		$ 0.78
75	500 301 06300 0000	9	9	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.87	$ 0.87		$ 0.87
76	500 301 06100 0000	9	9	0.13	2.00	0.25		0.30		$ -	0.30	1.00	0.08	$ 0.52	$ 0.52		$ 0.52
77	500 301 06000 0000	9	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.21	$ 1.21		$ 1.21
78	500 301 20500 0000	8	10	17.90	1.00	17.90		0.30		$ -	0.30	1.00	5.37	$ 37.20	$ 37.20	*	$ 37.20
79	500 301 20503 0000	8	10	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 2.00	$ 2.00		$ 2.00
80	500 301 20501 0000	8	10	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.81	$ 0.81		$ 0.81
81	500 301 20800 0000	8	10	1.21	2.00	2.43		0.30		$ -	0.30	1.00	0.73	$ 5.05	$ 5.05		$ 5.05
82	500 301 20900 0000	8	10	0.83	2.00	1.67		0.30		$ -	0.30	1.00	0.50	$ 3.47	$ 3.47		$ 3.47
83	500 301 20901 0000	8	10	0.68	2.00	1.35		0.30		$ -	0.30	1.00	0.41	$ 2.81	$ 2.81		$ 2.81
84	500 301 21100 0000	8	10	0.45	2.00	0.91		0.30		$ -	0.30	1.00	0.27	$ 1.89	$ 1.89		$ 1.89
85	500 301 21500 0000	8	10	4.64	1.00	4.64		0.30		$ -	0.30	1.00	1.39	$ 9.65	$ 9.65		$ 9.65
86	500 301 20600 0000	8	10	23.57	1.00	23.57		0.30		$ -	0.30	1.00	7.07	$ 49.00	$ 49.00	*	$ 49.00

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
87	500 301 20600 0000	8	10	14.41	1.00	14.41		0.30		$ -	0.30	1.00	4.32	$ 29.95	$ 29.95	*	$ 29.95
88	500 301 05200 0000	8	9	22.36	1.00	22.36		0.30		$ -	0.30	1.00	6.71	$ 46.49	$ 46.49	*	$ 46.49
89	500 301 05300 0000	8	9	40.35	1.00	40.35		0.30		$ -	0.30	1.00	12.10	$ 83.87	$ 83.87	*	$ 83.87
90	500 301 05900 0000	8	9	12.53	1.00	12.53		0.30		$ -	0.30	1.00	3.76	$ 26.04	$ 26.04	*	$ 26.04
91	500 301 20200 0000	7	10	0.64	2.00	1.28		0.30		$ -	0.30	1.00	0.38	$ 2.66	$ 2.66		$ 2.66
92	500 301 20300 0000	7	10	28.82	1.00	28.82		0.30		$ -	0.30	1.00	8.65	$ 59.91	$ 59.91		$ 59.91
93	500 301 20300 0000	7	10	11.61	1.00	11.61		0.30		$ -	0.30	1.00	3.48	$ 24.13	$ 24.13		$ 24.13
94	500 301 04900 0000	7	9	20.03	1.00	20.03		0.30		$ -	0.30	1.00	6.01	$ 41.64	$ 41.64	*	$ 41.64
95	500 301 05100 0000	7	9	17.61	1.00	17.61		0.30		$ -	0.30	1.00	5.28	$ 36.60	$ 36.60	*	$ 36.60
96	500 301 19701 0000	6	10	5.73	1.00	5.73		0.30		$ -	0.30	1.00	1.72	$ 11.92	$ 11.92		$ 11.92
97	500 301 19700 0000	6	10	6.07	1.00	6.07		0.30		$ -	0.30	1.00	1.82	$ 12.63	$ 12.63		$ 12.63
98	500 301 19702 0000	6	10	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.70	$ 1.70		$ 1.70
99	500 301 19801 0000	7	10	3.59	1.00	3.59		0.30		$ -	0.30	1.00	1.08	$ 7.47	$ 7.47		$ 7.47
100	500 301 19800 0000	7	10	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.20	$ 1.20		$ 1.20
101	500 301 20101 0000	7	10	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.87	$ 0.87		$ 0.87
102	500 301 20105 0000	7	10	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 0.99	$ 0.99		$ 0.99
103	500 301 20100 0000	6-7	10	40.85	1.00	40.85		0.30		$ -	0.30	1.00	12.25	$ 84.92	$ 84.92		$ 84.92
104	500 301 19500 0000	6	10	9.66	1.00	9.66		0.30		$ -	0.30	1.00	2.90	$ 20.08	$ 20.08	*	$ 20.08
105	500 301 20100 0000	6-7	10	12.44	1.00	12.44		0.30		$ -	0.30	1.00	3.73	$ 25.87	$ 25.87		$ 25.87
106	500 301 04800 0000	7	9	24.68	1.00	24.68		0.30		$ -	0.30	1.00	7.40	$ 51.31	$ 51.31	*	$ 51.31
107	500 301 05000 0000	7	9	15.51	1.00	15.51		0.30		$ -	0.30	1.00	4.65	$ 32.24	$ 32.24	*	$ 32.24
108	500 301 19600 0000	6	10	20.23	1.00	20.23		0.30		$ -	0.30	1.00	6.07	$ 42.06	$ 42.06	*	$ 42.06
109	500 301 19400 0000	6	10	8.43	1.00	8.43		0.30		$ -	0.30	1.00	2.53	$ 17.52	$ 17.52	*	$ 17.52
110	500 301 19400 0000	6	10	11.39	1.00	11.39		0.30		$ -	0.30	1.00	3.42	$ 23.67	$ 23.67	*	$ 23.67
111	500 301 04700 0000	6	9	40.47	1.00	40.47		0.30		$ -	0.30	1.00	12.14	$ 84.13	$ 84.13	*	$ 84.13
112	500 301 04510 0000	6	9	8.40	1.00	8.40		0.30		$ -	0.30	1.00	2.52	$ 17.47	$ 17.47	*	$ 17.47
113	500 301 04501 0000	6	9	1.12	1.00	1.12		0.30		$ -	0.30	1.00	0.34	$ 2.32	$ 2.32		$ 2.32
114	500 301 18301 0000	5	10	0.40	2.00	0.81		0.30		$ -	0.30	1.00	0.24	$ 1.68	$ 1.68		$ 1.68
115	500 301 18300 0000	5	10	14.30	1.00	14.30		0.30		$ -	0.30	1.00	4.29	$ 29.72	$ 29.72		$ 29.72
116	500 301 18200 0000	5	10	14.88	1.00	14.88		0.30		$ -	0.30	1.00	4.46	$ 30.92	$ 30.92		$ 30.92
117	500 301 18700 0000	5	10	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.70	$ 0.70		$ 0.70
118	500 301 18900 0000	5	10	14.66	1.00	14.66		0.30		$ -	0.30	1.00	4.40	$ 30.48	$ 30.48	*	$ 30.48
119	500 301 19100 0000	5	10	14.77	1.00	14.77		0.30		$ -	0.30	1.00	4.43	$ 30.70	$ 30.70		$ 30.70
120	500 301 18300 0000	5	10	5.70	1.00	5.70		0.30		$ -	0.30	1.00	1.71	$ 11.85	$ 11.85		$ 11.85
121	500 301 18200 0000	5	10	5.92	1.00	5.92		0.30		$ -	0.30	1.00	1.78	$ 12.30	$ 12.30		$ 12.30
122	500 301 18900 0000	5	10	5.83	1.00	5.83		0.30		$ -	0.30	1.00	1.75	$ 12.12	$ 12.12	*	$ 12.12
123	500 301 19100 0000	5	10	5.84	1.00	5.84		0.30		$ -	0.30	1.00	1.75	$ 12.15	$ 12.15		$ 12.15
124	500 301 04400 0000	5	9	42.29	1.00	42.29		0.30		$ -	0.30	1.00	12.69	$ 87.92	$ 87.92		$ 87.92
125	500 301 04300 0000	5	9	25.99	1.00	25.99		0.30		$ -	0.30	1.00	7.80	$ 54.03	$ 54.03	*	$ 54.03

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
126	PIN 145643045	5	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.20	$ 1.20	*	$ 1.20
127	500 301 05105 0000	8	9	1.49	2.00	2.98		0.30		$ -	0.30	1.00	0.89	$ 6.20	$ 6.20		$ 6.20
131	500 301 04210 0000	4	9	55.39	1.00	55.39		0.30		$ -	0.30	1.00	16.62	$ 115.14	$ 115.14		$ 115.14
132	500 301 04202 0000	4	9	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37		$ 0.37
133	500 301 04203 0000	4	9	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.71	$ 1.71		$ 1.71
134	500 301 04200 0000	4	9	1.07	2.00	2.14		0.30		$ -	0.30	1.00	0.64	$ 4.45	$ 4.45		$ 4.45
135	500 301 04201 0000	4	9	0.42	2.00	0.83		0.30		$ -	0.30	1.00	0.25	$ 1.73	$ 1.73		$ 1.73
137	500 301 04100 0000	4	9	8.28	1.00	8.28		0.30		$ -	0.30	1.00	2.49	$ 17.22	$ 17.22		$ 17.22
138	500 301 05702 0000	3	9	23.49	1.00	23.49		0.30		$ -	0.30	1.00	7.05	$ 48.83	$ 48.83		$ 48.83
139	500 301 42705 0000	8	11	0.08	1.00	0.08		0.30		$ -	0.30	1.00	0.02	$ 0.16	$ 0.16		$ 0.16
140	500 301 41900 0000	7	11	0.20	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.82	$ 0.82		$ 0.82
141	500 301 41800 0000	7	11	1.14	2.00	2.27		0.30		$ -	0.30	1.00	0.68	$ 4.73	$ 4.73		$ 4.73
142	500 301 41700 0000	7	11	1.69	2.00	3.38		0.30		$ -	0.30	1.00	1.01	$ 7.02	$ 7.02	*	$ 7.02
143	500 301 41600 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
144	500 301 43000 0000	7	11	0.07	1.00	0.07		0.30		$ -	0.30	1.00	0.02	$ 0.15	$ 0.15	*	$ 0.15
145	500 301 41400 0000	7	11	2.66	1.00	2.66		0.30		$ -	0.30	1.00	0.80	$ 5.52	$ 5.52		$ 5.52
146	500 301 41500 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
147	500 301 43502 0000	7	11	0.17	1.00	0.17		0.30		$ -	0.30	1.00	0.05	$ 0.35	$ 0.35	*	$ 0.35
148	500 301 41300 0000	7	11	4.65	1.00	4.65		0.30		$ -	0.30	1.00	1.40	$ 9.68	$ 9.68		$ 9.68
149	500 301 41301 0000	7	11	1.01	2.00	2.02		0.30		$ -	0.30	1.00	0.61	$ 4.20	$ 4.20		$ 4.20
150	500 301 41200 0000	7	11	7.05	1.00	7.05		0.30		$ -	0.30	1.00	2.12	$ 14.66	$ 14.66		$ 14.66
151	500 301 41100 0000	7	11	0.20	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.85	$ 0.85		$ 0.85
153	500 301 41002 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
154	500 301 41001 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
155	500 301 40900 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.59	$ 0.59		$ 0.59
158	500 301 40701 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.87	$ 0.87		$ 0.87
159	500 301 40603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.59	$ 0.59		$ 0.59
160	500 301 40602 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.81	$ 0.81		$ 0.81
161	500 301 40601 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.88	$ 0.88		$ 0.88
164	500 301 40505 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.81	$ 0.81		$ 0.81
166	500 301 45700 0000	6	11	9.50	1.00	9.50		0.30		$ -	0.30	1.00	2.85	$ 19.75	$ 19.75		$ 19.75
167	500 301 44801 0000	6	11	0.14	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.60	$ 0.60		$ 0.60
168	500 301 45710 0000	6	11	0.31	2.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 1.31	$ 1.31		$ 1.31
169	500 301 45720 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.39	$ 1.39		$ 1.39
170	500 301 45730 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.39	$ 1.39		$ 1.39
171	500 301 45618 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
172	500 301 45619 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
173	500 301 45620 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
174	500 301 45606 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58

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		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
175	500 301 45610 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
176	500 301 45607 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
177	500 301 45611 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
178	500 301 45608 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
179	500 301 45612 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
180	500 301 45609 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
181	500 301 45613 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
182	500 301 45614 0000	6	11	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 0.61	$ 0.61		$ 0.61
183	500 301 45615 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.61	$ 0.61		$ 0.61
184	500 301 45616 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.61	$ 0.61		$ 0.61
185	500 301 45617 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.61	$ 0.61		$ 0.61
186	500 301 45605 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
187	500 301 45500 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.41	$ 0.41		$ 0.41
188	500 301 45501 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
189	500 301 45503 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37		$ 0.37
190	500 301 45600 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37		$ 0.37
191	500 301 45400 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.42	$ 0.42		$ 0.42
192	500 301 45601 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57		$ 0.57
193	500 301 45300 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37		$ 0.37
194	500 301 45602 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.37	$ 0.37		$ 0.37
195	500 301 45200 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
196	500 301 45603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.59	$ 0.59		$ 0.59
197	500 301 45604 0000	6	11	0.12	2.00	0.24		0.30		$ -	0.30	1.00	0.07	$ 0.50	$ 0.50		$ 0.50
198	500 301 45100 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.59	$ 0.59		$ 0.59
199	500 301 45604 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57		$ 0.57
201	500 301 39801 0000	5	11	0.32	2.00	0.65		0.30		$ -	0.30	1.00	0.19	$ 1.35	$ 1.35		$ 1.35
202	500 301 39746 0000	5	11	0.21	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86
203	500 301 39741 0000	5	11	0.26	2.00	0.52		0.30		$ -	0.30	1.00	0.16	$ 1.09	$ 1.09		$ 1.09
204	500 301 39736 0000	5	11	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.18	$ 1.22	$ 1.22		$ 1.22
205	500 301 39731 0000	5	11	0.25	2.00	0.50		0.30		$ -	0.30	1.00	0.15	$ 1.03	$ 1.03		$ 1.03
206	500 301 39726 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.09	$ 1.09		$ 1.09
207	500 301 39721 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.09	$ 1.09		$ 1.09
208	500 301 39716 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.14	$ 1.14		$ 1.14
209	500 301 39711 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.14	$ 1.14		$ 1.14
211	500 301 39704 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
212	500 301 39702 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
213	500 301 39703 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
214	500 301 39701 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
215	500 301 40000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
216	500 301 39900 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
217	500 301 39800 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57	*	$ 0.57
219	500 301 39500 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57		$ 0.57
221	500 301 40301 0000	5	11	0.44	2.00	0.89		0.30		$ -	0.30	1.00	0.27	$ 1.85	$ 1.85		$ 1.85
222	500 301 40302 0000	5	11	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 0.99	$ 0.99		$ 0.99
224	500 301 39000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
225	500 301 39002 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
226	500 301 39200 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.58	$ 0.58		$ 0.58
229	500 301 38902 0000	5	11	0.49	2.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.03	$ 2.03		$ 2.03
230	500 301 38702 0000	4	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.57	$ 0.57		$ 0.57
231	500 301 38701 0000	4	11	1.20	2.00	2.41		0.30		$ -	0.30	1.00	0.72	$ 5.00	$ 5.00	*	$ 5.00

SCHEDULE D -- SECTION 2
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S2 Total		S2 Total	S2	S2			S2	S2					
City of Ottawa -- BLOCKS																	
	BLOCK A	11-12	8	31.53	3.85	121.40		0.41		$ -	0.41	1.00	50.10	$ 347.17	$ 347.17		$ 347.17
	BLOCK B	11-12	9	37.08	3.85	142.77		0.70		$ -	0.70	1.00	99.70	$ 690.84	$ 690.84		$ 690.84
	BLOCK C	10	9	15.55	3.85	59.88		0.51		$ -	0.51	1.00	30.74	$ 212.98	$ 212.98		$ 212.98
	BLOCK D1	3-4	9-10	142.16	3.85	547.31		0.30		$ -	0.30	1.00	164.19	$ 1,137.76	$ 1,137.76		$ 1,137.76
	BLOCK D2	4	10	40.72	3.85	156.75		0.30		$ -	0.30	1.00	47.03	$ 325.86	$ 325.86		$ 325.86
	BLOCK E1	1-2	11	83.04	3.85	319.70		0.30		$ -	0.30	1.00	95.91	$ 664.60	$ 664.60		$ 664.60
	BLOCK E2	3	11	53.64	3.85	206.53		0.30		$ -	0.30	1.00	61.96	$ 429.34	$ 429.34		$ 429.34
	BLOCK E3	3	11	36.41	3.85	140.17		0.30		$ -	0.30	1.00	42.05	$ 291.39	$ 291.39		$ 291.39
	BLOCK E4	4	11	45.51	3.85	175.23		0.30		$ -	0.30	1.00	52.57	$ 364.26	$ 364.26		$ 364.26
	BLOCK F1	4	11	12.80	3.85	49.30		0.30		$ -	0.30	1.00	14.79	$ 102.48	$ 102.48		$ 102.48
	BLOCK F2	4-6	11	154.30	3.85	594.04		0.30		$ -	0.30	1.00	178.21	$ 1,234.90	$ 1,234.90		$ 1,234.90
	BLOCK F3	1-2	11	15.28	3.85	58.82		0.30		$ -	0.30	1.00	17.65	$ 122.27	$ 122.27		$ 122.27
City of Ottawa -- Roads/Other																	
	Denise Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 1.87	$ 1.87		$ 1.87
	Francois St.	6	11	0.25	4.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.04	$ 2.04		$ 2.04
	Mer-Bleue Rd.	2-6	11	4.87	4.00	19.47		0.30		$ -	0.30	1.00	5.84	$ 40.47	$ 40.47		$ 40.47
	Milton Rd.	13-17	9	0.49	4.00	1.97		0.93		$ -	0.93	0.33	0.61	$ 4.20	$ 4.20		$ 4.20
	Monique Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 1.87	$ 1.87		$ 1.87
	Navan Rd.	8-10	9-10	5.18	4.00	20.71		0.30		$ -	0.30	1.00	6.21	$ 43.06	$ 43.06		$ 43.06
	Prescott Russell Trail	11-12	8-9	6.71	1.00	6.71		0.68		$ -	0.68	1.00	4.58	$ 31.73	$ 31.73		$ 31.73
	ROW L3-4 C9	3-4	9	0.78	1.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 1.62	$ 1.62		$ 1.62
	ROW L4-9 C9-10	4-9	9-10	6.27	1.00	6.27		0.30		$ -	0.30	1.00	1.88	$ 13.03	$ 13.03		$ 13.03
	ROW L5-9 C9-10 (Hydro Corridor)	5-9	9-10	11.37	1.00	11.37		0.30		$ -	0.30	1.00	3.41	$ 23.63	$ 23.63		$ 23.63
	Smith Rd.	10-11	9	2.48	4.00	9.92		0.68		$ -	0.68	1.00	6.79	$ 47.02	$ 47.02		$ 47.02
	Tenth Line Rd.	3-8	10-11	9.66	4.00	38.63		0.30		$ -	0.30	1.00	11.59	$ 80.31	$ 80.31		$ 80.31
	Trim Rd.	4-15	8-9	5.91	4.00	23.63		0.42		$ -	0.42	1.00	9.89	$ 68.56	$ 68.56		$ 68.56
	Wall Rd.	5-6	9-11	6.51	4.00	26.06		0.30		$ -	0.30	1.00	7.82	$ 54.17	$ 54.17		$ 54.17
Total				**1812.85**		**3879.22**			**135.27**	**$ 1,000.00**			**1298.82**	**$ 9,000.00**	**$ 10,000.00**		**$ 10,000.00**

SCHEDULE E -- SECTION 3
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
City of Ottawa -- Individual Landowners																	
33	500 201 41300 0000	12	8	1.38	1.00	1.38		0.30		$ -	0.30	0.33	0.14	$ 0.99	$ 0.99		$ 0.99
34	500 201 41200 0000	12	8	1.19	1.00	1.19		0.30		$ -	0.30	0.33	0.12	$ 0.85	$ 0.85		$ 0.85
35	500 701 08900 0000	11	9	3.46	1.00	3.46		1.00		$ -	1.00	0.33	1.14	$ 8.29	$ 8.29	*	$ 8.29
36	500 701 09300 0000	10	9	2.65	1.00	2.65		1.00		$ -	1.00	0.33	0.87	$ 6.35	$ 6.35	*	$ 6.35
37	500 701 17200 0000	10-11	9	6.14	1.00	6.14	Y	0.93	5.72	$ 25.04	0.93	0.33	1.89	$ 13.70	$ 38.74		$ 38.74
38	500 301 07100 0000	10	9	2.17	2.00	4.35	Y	1.00	4.35	$ 19.04	1.00	0.66	2.87	$ 20.83	$ 39.87		$ 39.87
39	500 301 07109 0000	10	9	1.15	2.00	2.31	Y	1.00	2.31	$ 10.11	1.00	0.66	1.52	$ 11.06	$ 21.17		$ 21.17
40	500 301 07105 0000	10	9	0.67	2.00	1.35		1.00		$ -	1.00	0.66	0.89	$ 6.47	$ 6.47		$ 6.47
41	500 701 10500 0000	10	9	18.95	1.00	18.95		0.93		$ -	0.93	0.66	11.67	$ 84.78	$ 84.78		$ 84.78
42	500 701 10000 0000	10	9	0.19	2.00	0.37		1.00		$ -	1.00	0.66	0.25	$ 1.78	$ 1.78		$ 1.78
43	500 701 10100 0000	10	9	0.18	2.00	0.36		0.90		$ -	0.90	0.66	0.22	$ 1.57	$ 1.57		$ 1.57
44	500 701 10200 0000	10	9	1.04	2.00	2.07		0.75		$ -	0.75	0.66	1.03	$ 7.45	$ 7.45		$ 7.45
45	500 701 10300 0000	10	9	0.14	2.00	0.28		0.75		$ -	0.75	0.66	0.14	$ 1.00	$ 1.00		$ 1.00
46	500 701 10400 0000	10	9	19.15	1.00	19.15		0.72		$ -	0.72	0.66	9.12	$ 66.26	$ 66.26	*	$ 66.26
47	500 701 10301 0000	10	9	0.14	2.00	0.28		0.75		$ -	0.75	0.66	0.14	$ 1.01	$ 1.01		$ 1.01
48	500 701 10405 0000	10	9	0.24	2.00	0.49		0.52		$ -	0.52	0.66	0.17	$ 1.21	$ 1.21	*	$ 1.21
50	500 301 07140 0000	10	9	0.30	2.00	0.60		1.00		$ -	1.00	0.66	0.39	$ 2.86	$ 2.86		$ 2.86
51	500 301 22300 0000	9	10	0.36	2.00	0.73		0.50		$ -	0.50	1.00	0.36	$ 2.64	$ 2.64		$ 2.64
52	500 301 22400 0000	9	10	0.38	2.00	0.77		0.50		$ -	0.50	1.00	0.38	$ 2.79	$ 2.79		$ 2.79
53	500 301 22500 0000	9	10	0.76	2.00	1.51		0.50		$ -	0.50	1.00	0.76	$ 5.50	$ 5.50		$ 5.50
54	500 301 22600 0000	9	10	1.05	2.00	2.10		0.50		$ -	0.50	1.00	1.05	$ 7.63	$ 7.63		$ 7.63
55	500 301 22601 0000	9	10	0.91	2.00	1.82		0.64		$ -	0.64	1.00	1.16	$ 8.41	$ 8.41		$ 8.41
56	500 301 22700 0000	9	10	1.02	2.00	2.03		0.74		$ -	0.74	1.00	1.51	$ 10.97	$ 10.97		$ 10.97
57	500 301 22800 0000	9	10	0.59	2.00	1.17		0.75		$ -	0.75	1.00	0.88	$ 6.39	$ 6.39		$ 6.39
58	500 301 22701 0000	9	10	1.48	2.00	2.95		0.75		$ -	0.75	1.00	2.22	$ 16.09	$ 16.09		$ 16.09
59	500 301 23100 0000	9	10	0.39	2.00	0.78		0.75		$ -	0.75	1.00	0.58	$ 4.24	$ 4.24		$ 4.24
60	500 301 23403 0000	9	10	8.22	1.00	8.22		0.80		$ -	0.80	1.00	6.60	$ 47.93	$ 47.93		$ 47.93
61	500 301 23101 0000	9	10	0.25	2.00	0.51		0.75		$ -	0.75	1.00	0.38	$ 2.75	$ 2.75		$ 2.75
62	500 301 23401 0000	9	10	0.13	2.00	0.26		0.75		$ -	0.75	1.00	0.19	$ 1.41	$ 1.41		$ 1.41
63	500 301 23402 0000	9	10	0.14	2.00	0.28		0.75		$ -	0.75	1.00	0.21	$ 1.52	$ 1.52		$ 1.52
64	500 301 23406 0000	9	10	3.67	1.00	3.67		0.76		$ -	0.76	1.00	2.77	$ 20.14	$ 20.14		$ 20.14
65	500 301 07000 0000	9	9	19.95	1.00	19.95	Y	0.98	19.44	$ 85.14	0.98	1.00	19.52	$ 141.74	$ 226.88	*	$ 226.88
66	500 301 06900 0000	9	9	0.17	2.00	0.33		1.00		$ -	1.00	0.66	0.22	$ 1.59	$ 1.59		$ 1.59
67	500 301 06800 0000	9	9	0.37	2.00	0.74		1.00		$ -	1.00	0.66	0.49	$ 3.52	$ 3.52		$ 3.52
68	500 301 06700 0000	9	9	0.19	2.00	0.39		1.00		$ -	1.00	0.66	0.26	$ 1.86	$ 1.86		$ 1.86
69	500 301 06600 0000	9	9	0.17	2.00	0.34		1.00		$ -	1.00	0.66	0.22	$ 1.61	$ 1.61		$ 1.61
70	500 301 06500 0000	9	9	1.45	2.00	2.91	Y	1.00	2.91	$ 12.73	1.00	0.66	1.92	$ 13.93	$ 26.65		$ 26.65
71	500 301 06400 0000	9	9	0.16	2.00	0.31		1.00		$ -	1.00	0.66	0.21	$ 1.50	$ 1.50		$ 1.50

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		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
72	500 301 05900 0000	9	9	13.74	1.00	13.74		0.77		$ -	0.77	0.66	6.99	$ 50.79	$ 50.79	*	$ 50.79
73	500 301 06300 0000	9	9	1.17	2.00	2.34		1.00		$ -	1.00	0.66	1.54	$ 11.21	$ 11.21		$ 11.21
74	500 301 06200 0000	9	9	0.19	2.00	0.37		1.00		$ -	1.00	0.66	0.25	$ 1.79	$ 1.79		$ 1.79
75	500 301 06300 0000	9	9	0.21	2.00	0.42		1.00		$ -	1.00	0.66	0.28	$ 2.01	$ 2.01		$ 2.01
76	500 301 06100 0000	9	9	0.13	2.00	0.25		0.75		$ -	0.75	0.66	0.12	$ 0.90	$ 0.90		$ 0.90
77	500 301 06000 0000	9	9	0.29	2.00	0.58		0.75		$ -	0.75	0.66	0.29	$ 2.09	$ 2.09		$ 2.09
78	500 301 20500 0000	8	10	17.90	1.00	17.90		0.34		$ -	0.34	1.00	6.03	$ 43.77	$ 43.77	*	$ 43.77
79	500 301 20503 0000	8	10	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 2.10	$ 2.10		$ 2.10
80	500 301 20501 0000	8	10	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.85	$ 0.85		$ 0.85
81	500 301 20800 0000	8	10	1.21	2.00	2.43		0.30		$ -	0.30	1.00	0.73	$ 5.29	$ 5.29		$ 5.29
82	500 301 20900 0000	8	10	0.83	2.00	1.67		0.30		$ -	0.30	1.00	0.50	$ 3.64	$ 3.64		$ 3.64
83	500 301 20901 0000	8	10	0.68	2.00	1.35		0.30		$ -	0.30	1.00	0.41	$ 2.94	$ 2.94		$ 2.94
84	500 301 21100 0000	8	10	0.45	2.00	0.91		0.30		$ -	0.30	1.00	0.27	$ 1.98	$ 1.98		$ 1.98
85	500 301 21500 0000	8	10	4.64	1.00	4.64		0.40		$ -	0.40	1.00	1.86	$ 13.54	$ 13.54		$ 13.54
86	500 301 20600 0000	8	10	23.57	1.00	23.57		0.60		$ -	0.60	1.00	14.24	$ 103.41	$ 103.41	*	$ 103.41
87	500 301 20600 0000	8	10	14.41	1.00	14.41		0.69		$ -	0.69	1.00	9.88	$ 71.75	$ 71.75	*	$ 71.75
88	500 301 05200 0000	8	9	22.36	1.00	22.36		0.66		$ -	0.66	1.00	14.80	$ 107.50	$ 107.50	*	$ 107.50
89	500 301 05300 0000	8	9	40.35	1.00	40.35		0.67		$ -	0.67	1.00	27.10	$ 196.77	$ 196.77	*	$ 196.77
90	500 301 05900 0000	8	9	12.53	1.00	12.53		0.70		$ -	0.70	0.66	5.82	$ 42.27	$ 42.27	*	$ 42.27
91	500 301 20200 0000	7	10	0.64	2.00	1.28		0.30		$ -	0.30	1.00	0.38	$ 2.79	$ 2.79		$ 2.79
92	500 301 20300 0000	7	10	28.82	1.00	28.82		0.33		$ -	0.33	1.00	9.48	$ 68.83	$ 68.83		$ 68.83
93	500 301 20300 0000	7	10	11.61	1.00	11.61		0.50		$ -	0.50	1.00	5.77	$ 41.92	$ 41.92		$ 41.92
94	500 301 04900 0000	7	9	20.03	1.00	20.03		0.50		$ -	0.50	1.00	9.97	$ 72.39	$ 72.39	*	$ 72.39
95	500 301 05100 0000	7	9	17.61	1.00	17.61		0.36		$ -	0.36	1.00	6.31	$ 45.82	$ 45.82	*	$ 45.82
96	500 301 19701 0000	6	10	5.73	1.00	5.73		0.30		$ -	0.30	1.00	1.72	$ 12.49	$ 12.49		$ 12.49
97	500 301 19700 0000	6	10	6.07	1.00	6.07		0.30		$ -	0.30	1.00	1.82	$ 13.23	$ 13.23		$ 13.23
98	500 301 19702 0000	6	10	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.78	$ 1.78		$ 1.78
99	500 301 19801 0000	7	10	3.59	1.00	3.59		0.30		$ -	0.30	1.00	1.08	$ 7.83	$ 7.83		$ 7.83
100	500 301 19800 0000	7	10	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.25	$ 1.25		$ 1.25
101	500 301 20101 0000	7	10	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.91	$ 0.91		$ 0.91
102	500 301 20105 0000	7	10	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 1.04	$ 1.04		$ 1.04
103	500 301 20100 0000	6-7	10	40.85	1.00	40.85		0.30		$ -	0.30	1.00	12.25	$ 88.99	$ 88.99		$ 88.99
104	500 301 19500 0000	6	10	9.66	1.00	9.66		0.30		$ -	0.30	1.00	2.90	$ 21.04	$ 21.04	*	$ 21.04
105	500 301 20100 0000	6-7	10	12.44	1.00	12.44		0.32		$ -	0.32	1.00	3.97	$ 28.80	$ 28.80		$ 28.80
106	500 301 04800 0000	7	9	24.68	1.00	24.68		0.33		$ -	0.33	1.00	8.09	$ 58.71	$ 58.71	*	$ 58.71
107	500 301 05000 0000	7	9	15.51	1.00	15.51		0.30		$ -	0.30	1.00	4.65	$ 33.79	$ 33.79	*	$ 33.79
108	500 301 19600 0000	6	10	20.23	1.00	20.23		0.30		$ -	0.30	1.00	6.07	$ 44.08	$ 44.08	*	$ 44.08
109	500 301 19400 0000	6	10	8.43	1.00	8.43		0.30		$ -	0.30	1.00	2.53	$ 18.36	$ 18.36	*	$ 18.36
110	500 301 19400 0000	6	10	11.39	1.00	11.39		0.30		$ -	0.30	1.00	3.42	$ 24.81	$ 24.81	*	$ 24.81

SCHEDULE E -- SECTION 3
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
111	500 301 04700 0000	6	9	40.47	1.00	40.47		0.30		$ -	0.30	1.00	12.14	$ 88.16	$ 88.16	*	$ 88.16
112	500 301 04510 0000	6	9	8.40	1.00	8.40		0.30		$ -	0.30	1.00	2.52	$ 18.31	$ 18.31	*	$ 18.31
113	500 301 04501 0000	6	9	1.12	1.00	1.12		0.30		$ -	0.30	1.00	0.34	$ 2.44	$ 2.44		$ 2.44
114	500 301 18301 0000	5	10	0.40	2.00	0.81		0.30		$ -	0.30	1.00	0.24	$ 1.76	$ 1.76		$ 1.76
115	500 301 18300 0000	5	10	14.30	1.00	14.30		0.30		$ -	0.30	1.00	4.29	$ 31.14	$ 31.14		$ 31.14
116	500 301 18200 0000	5	10	14.88	1.00	14.88		0.30		$ -	0.30	1.00	4.46	$ 32.41	$ 32.41		$ 32.41
117	500 301 18700 0000	5	10	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.73	$ 0.73		$ 0.73
118	500 301 18900 0000	5	10	14.66	1.00	14.66		0.30		$ -	0.30	1.00	4.40	$ 31.94	$ 31.94	*	$ 31.94
119	500 301 19100 0000	5	10	14.77	1.00	14.77		0.30		$ -	0.30	1.00	4.43	$ 32.18	$ 32.18		$ 32.18
120	500 301 18300 0000	5	10	5.70	1.00	5.70		0.30		$ -	0.30	1.00	1.71	$ 12.42	$ 12.42		$ 12.42
121	500 301 18200 0000	5	10	5.92	1.00	5.92		0.30		$ -	0.30	1.00	1.78	$ 12.89	$ 12.89		$ 12.89
122	500 301 18900 0000	5	10	5.83	1.00	5.83		0.30		$ -	0.30	1.00	1.75	$ 12.70	$ 12.70	*	$ 12.70
123	500 301 19100 0000	5	10	5.84	1.00	5.84		0.30		$ -	0.30	1.00	1.75	$ 12.73	$ 12.73		$ 12.73
124	500 301 04400 0000	5	9	42.29	1.00	42.29		0.30		$ -	0.30	1.00	12.69	$ 92.14	$ 92.14		$ 92.14
125	500 301 04300 0000	5	9	25.99	1.00	25.99		0.30		$ -	0.30	1.00	7.80	$ 56.62	$ 56.62	*	$ 56.62
126	PIN 145643045	5	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.26	$ 1.26	*	$ 1.26
127	500 301 05105 0000	8	9	1.49	2.00	2.98		0.30		$ -	0.30	1.00	0.89	$ 6.49	$ 6.49		$ 6.49
131	500 301 04210 0000	4	9	55.39	1.00	55.39		0.30		$ -	0.30	1.00	16.62	$ 120.66	$ 120.66		$ 120.66
132	500 301 04202 0000	4	9	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
133	500 301 04203 0000	4	9	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 1.79	$ 1.79		$ 1.79
134	500 301 04200 0000	4	9	1.07	2.00	2.14		0.30		$ -	0.30	1.00	0.64	$ 4.66	$ 4.66		$ 4.66
135	500 301 04201 0000	4	9	0.42	2.00	0.83		0.30		$ -	0.30	1.00	0.25	$ 1.81	$ 1.81		$ 1.81
137	500 301 04100 0000	4	9	8.28	1.00	8.28		0.30		$ -	0.30	1.00	2.49	$ 18.05	$ 18.05		$ 18.05
138	500 301 05702 0000	3	9	23.49	1.00	23.49		0.30		$ -	0.30	1.00	7.05	$ 51.17	$ 51.17		$ 51.17
139	500 301 42705 0000	8	11	0.08	1.00	0.08		0.30		$ -	0.30	1.00	0.02	$ 0.17	$ 0.17		$ 0.17
140	500 301 41900 0000	7	11	0.20	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.86	$ 0.86		$ 0.86
141	500 301 41800 0000	7	11	1.14	2.00	2.27		0.30		$ -	0.30	1.00	0.68	$ 4.96	$ 4.96		$ 4.96
142	500 301 41700 0000	7	11	1.69	2.00	3.38		0.30		$ -	0.30	1.00	1.01	$ 7.36	$ 7.36	*	$ 7.36
143	500 301 41600 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
144	500 301 43000 0000	7	11	0.07	1.00	0.07		0.30		$ -	0.30	1.00	0.02	$ 0.16	$ 0.16	*	$ 0.16
145	500 301 41400 0000	7	11	2.66	1.00	2.66		0.30		$ -	0.30	1.00	0.80	$ 5.79	$ 5.79		$ 5.79
146	500 301 41500 0000	7	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
147	500 301 43502 0000	7	11	0.17	1.00	0.17		0.30		$ -	0.30	1.00	0.05	$ 0.36	$ 0.36	*	$ 0.36
148	500 301 41300 0000	7	11	4.65	1.00	4.65		0.30		$ -	0.30	1.00	1.40	$ 10.14	$ 10.14		$ 10.14
149	500 301 41301 0000	7	11	1.01	2.00	2.02		0.30		$ -	0.30	1.00	0.61	$ 4.41	$ 4.41		$ 4.41
150	500 301 41200 0000	7	11	7.05	1.00	7.05		0.30		$ -	0.30	1.00	2.12	$ 15.36	$ 15.36		$ 15.36
151	500 301 41100 0000	7	11	0.20	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.89	$ 0.89		$ 0.89
153	500 301 41002 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.67	$ 0.67		$ 0.67
154	500 301 41001 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.67	$ 0.67		$ 0.67

SCHEDULE E -- SECTION 3
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
155	500 301 40900 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.62	$ 0.62		$ 0.62
158	500 301 40701 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.92	$ 0.92		$ 0.92
159	500 301 40603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62
160	500 301 40602 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.84	$ 0.84		$ 0.84
161	500 301 40601 0000	6	11	0.21	2.00	0.42		0.30		$ -	0.30	1.00	0.13	$ 0.92	$ 0.92		$ 0.92
164	500 301 40505 0000	6	11	0.19	2.00	0.39		0.30		$ -	0.30	1.00	0.12	$ 0.85	$ 0.85		$ 0.85
166	500 301 45700 0000	6	11	9.50	1.00	9.50		0.30		$ -	0.30	1.00	2.85	$ 20.70	$ 20.70		$ 20.70
167	500 301 44801 0000	6	11	0.14	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.63	$ 0.63		$ 0.63
168	500 301 45710 0000	6	11	0.31	2.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 1.37	$ 1.37		$ 1.37
169	500 301 45720 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.45	$ 1.45		$ 1.45
170	500 301 45730 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.45	$ 1.45		$ 1.45
171	500 301 45618 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
172	500 301 45619 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
173	500 301 45620 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
174	500 301 45606 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
175	500 301 45610 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
176	500 301 45607 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
177	500 301 45611 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
178	500 301 45608 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
179	500 301 45612 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
180	500 301 45609 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
181	500 301 45613 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
182	500 301 45614 0000	6	11	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
183	500 301 45615 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
184	500 301 45616 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
185	500 301 45617 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.64	$ 0.64		$ 0.64
186	500 301 45605 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.67	$ 0.67		$ 0.67
187	500 301 45500 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.43	$ 0.43		$ 0.43
188	500 301 45501 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
189	500 301 45503 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
190	500 301 45600 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
191	500 301 45400 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.44	$ 0.44		$ 0.44
192	500 301 45601 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60		$ 0.60
193	500 301 45300 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
194	500 301 45602 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.39	$ 0.39		$ 0.39
195	500 301 45200 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
196	500 301 45603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.62	$ 0.62		$ 0.62
197	500 301 45604 0000	6	11	0.12	2.00	0.24		0.30		$ -	0.30	1.00	0.07	$ 0.53	$ 0.53		$ 0.53
198	500 301 45100 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.62	$ 0.62		$ 0.62

SCHEDULE E -- SECTION 3
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
199	500 301 45604 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60		$ 0.60
201	500 301 39801 0000	5	11	0.32	2.00	0.65		0.30		$ -	0.30	1.00	0.19	$ 1.41	$ 1.41		$ 1.41
202	500 301 39746 0000	5	11	0.21	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 0.90	$ 0.90		$ 0.90
203	500 301 39741 0000	5	11	0.26	2.00	0.52		0.30		$ -	0.30	1.00	0.16	$ 1.14	$ 1.14		$ 1.14
204	500 301 39736 0000	5	11	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.18	$ 1.27	$ 1.27		$ 1.27
205	500 301 39731 0000	5	11	0.25	2.00	0.50		0.30		$ -	0.30	1.00	0.15	$ 1.08	$ 1.08		$ 1.08
206	500 301 39726 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.15	$ 1.15		$ 1.15
207	500 301 39721 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.15	$ 1.15		$ 1.15
208	500 301 39716 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.20	$ 1.20		$ 1.20
209	500 301 39711 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.20	$ 1.20		$ 1.20
211	500 301 39704 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60		$ 0.60
212	500 301 39702 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
213	500 301 39703 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
214	500 301 39701 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
215	500 301 40000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
216	500 301 39900 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
217	500 301 39800 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60	*	$ 0.60
219	500 301 39500 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60		$ 0.60
221	500 301 40301 0000	5	11	0.44	2.00	0.89		0.30		$ -	0.30	1.00	0.27	$ 1.94	$ 1.94		$ 1.94
222	500 301 40302 0000	5	11	0.24	2.00	0.48		0.30		$ -	0.30	1.00	0.14	$ 1.04	$ 1.04		$ 1.04
224	500 301 39000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
225	500 301 39002 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
226	500 301 39200 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.61	$ 0.61		$ 0.61
229	500 301 38902 0000	5	11	0.49	2.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.12	$ 2.12		$ 2.12
230	500 301 38702 0000	4	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.60	$ 0.60		$ 0.60
231	500 301 38701 0000	4	11	1.20	2.00	2.41		0.30		$ -	0.30	1.00	0.72	$ 5.24	$ 5.24	*	$ 5.24

SCHEDULE E -- SECTION 3
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Robinson Consultants

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		Lot	Con	S3 Total		S3 Total	S3	S3			S3	S3					
City of Ottawa -- BLOCKS																	
	BLOCK A	11-12	8	31.53	3.85	121.40		0.41		$ -	0.41	0.33	16.53	$ 120.06	$ 120.06		$ 120.06
	BLOCK B	11-12	9	37.08	3.85	142.77	Y	0.77	110.45	$ 483.75	0.77	0.66	72.90	$ 529.36	$ 1,013.11		$ 1,013.11
	BLOCK C	10	9	15.55	3.85	59.88	Y	1.00	59.88	$ 262.27	1.00	1.00	59.88	$ 434.84	$ 697.12		$ 697.12
	BLOCK D1	3-4	9-10	142.16	3.85	547.31		0.30		$ -	0.30	1.00	164.19	$ 1,192.34	$ 1,192.34		$ 1,192.34
	BLOCK D2	4	10	40.72	3.85	156.75		0.30		$ -	0.30	1.00	47.03	$ 341.49	$ 341.49		$ 341.49
	BLOCK E1	1-2	11	83.04	3.85	319.70		0.30		$ -	0.30	1.00	95.91	$ 696.48	$ 696.48		$ 696.48
	BLOCK E2	3	11	53.64	3.85	206.53		0.30		$ -	0.30	1.00	61.96	$ 449.94	$ 449.94		$ 449.94
	BLOCK E3	3	11	36.41	3.85	140.17		0.30		$ -	0.30	1.00	42.05	$ 305.37	$ 305.37		$ 305.37
	BLOCK E4	4	11	45.51	3.85	175.23		0.30		$ -	0.30	1.00	52.57	$ 381.73	$ 381.73		$ 381.73
	BLOCK F1	4	11	12.80	3.85	49.30		0.30		$ -	0.30	1.00	14.79	$ 107.39	$ 107.39		$ 107.39
	BLOCK F2	4-6	11	154.30	3.85	594.04		0.30		$ -	0.30	1.00	178.21	$ 1,294.14	$ 1,294.14		$ 1,294.14
	BLOCK F3	1-2	11	15.28	3.85	58.82		0.30		$ -	0.30	1.00	17.65	$ 128.14	$ 128.14		$ 128.14
City of Ottawa -- Roads/Other																	
	Denise Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 1.96	$ 1.96		$ 1.96
	Francois St.	6	11	0.25	4.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.14	$ 2.14		$ 2.14
	Mer-Bleue Rd.	2-6	11	4.87	4.00	19.47		0.30		$ -	0.30	1.00	5.84	$ 42.41	$ 42.41		$ 42.41
	Monique Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 1.95	$ 1.95		$ 1.95
	Navan Rd.	8-10	9-10	5.18	4.00	20.71	Y	0.81	14.38	$ 62.97	0.81	1.00	16.77	$ 121.76	$ 184.73		$ 184.73
	Prescott Russell Trail	11-12	8-9	4.05	1.00	4.05		0.64		$ -	0.64	0.33	0.86	$ 6.24	$ 6.24		$ 6.24
	ROW L3-4 C9	3-4	9	0.78	1.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 1.69	$ 1.69		$ 1.69
	ROW L4-9 C9-10	4-9	9-10	6.27	1.00	6.27		0.50		$ -	0.50	1.00	3.13	$ 22.71	$ 22.71		$ 22.71
	ROW L5-9 C9-10 (Hydro Corridor)	5-9	9-10	11.37	1.00	11.37		0.57		$ -	0.57	1.00	6.52	$ 47.35	$ 47.35		$ 47.35
	Smith Rd.	10-11	9	2.48	4.00	9.92	Y	0.90	8.89	$ 38.95	0.90	0.33	2.93	$ 21.31	$ 60.27		$ 60.27
	Tenth Line Rd.	3-8	10-11	9.66	4.00	38.63		0.30		$ -	0.30	1.00	11.59	$ 84.16	$ 84.16		$ 84.16
	Trim Rd.	4-15	8-9	3.08	4.00	12.32		0.46		$ -	0.46	1.00	5.69	$ 41.31	$ 41.31		$ 41.31
	Wall Rd.	5-6	9-11	6.51	4.00	26.06		0.30		$ -	0.30	1.00	7.82	$ 56.76	$ 56.76		$ 56.76
Total				**1550.83**		**3597.55**			**228.32**	**$ 1,000.00**			**1239.37**	**$ 9,000.00**	**$ 10,000.00**		**$ 10,000.00**

SCHEDULE F -- SECTION 4
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S4 Total		S4 Total	S4	S4			S4	S4					
City of Ottawa -- Individual Landowners																	
51	500 301 22300 0000	9	10	0.36	2.00	0.73		0.75		$ -	0.75	0.33	0.18	$ 1.60	$ 1.60		$ 1.60
52	500 301 22400 0000	9	10	0.38	2.00	0.77		0.75		$ -	0.75	0.33	0.19	$ 1.69	$ 1.69		$ 1.69
53	500 301 22500 0000	9	10	0.76	2.00	1.51		0.75		$ -	0.75	0.33	0.37	$ 3.33	$ 3.33		$ 3.33
54	500 301 22600 0000	9	10	1.05	2.00	2.10		0.75		$ -	0.75	0.33	0.52	$ 4.62	$ 4.62		$ 4.62
55	500 301 22601 0000	9	10	0.91	2.00	1.82		0.75		$ -	0.75	0.33	0.45	$ 4.00	$ 4.00		$ 4.00
56	500 301 22700 0000	9	10	1.02	2.00	2.03		0.75		$ -	0.75	0.33	0.50	$ 4.47	$ 4.47		$ 4.47
57	500 301 22800 0000	9	10	0.59	2.00	1.17		0.75		$ -	0.75	0.33	0.29	$ 2.58	$ 2.58		$ 2.58
58	500 301 22701 0000	9	10	1.48	2.00	2.95		0.75		$ -	0.75	0.33	0.73	$ 6.49	$ 6.49		$ 6.49
59	500 301 23100 0000	9	10	0.39	2.00	0.78		0.75		$ -	0.75	0.33	0.19	$ 1.71	$ 1.71		$ 1.71
60	500 301 23403 0000	9	10	4.36	1.00	4.36		0.81		$ -	0.81	0.33	1.17	$ 10.37	$ 10.37		$ 10.37
61	500 301 23101 0000	9	10	0.25	2.00	0.51		0.75		$ -	0.75	0.33	0.13	$ 1.11	$ 1.11		$ 1.11
62	500 301 23401 0000	9	10	0.13	2.00	0.26		0.75		$ -	0.75	0.33	0.06	$ 0.57	$ 0.57		$ 0.57
63	500 301 23402 0000	9	10	0.14	2.00	0.28		0.75		$ -	0.75	0.33	0.07	$ 0.61	$ 0.61		$ 0.61
65	500 301 07000 0000	9	9	0.08	1.00	0.08		1.00		$ -	1.00	0.33	0.03	$ 0.24	$ 0.24	*	$ 0.24
78	500 301 20500 0000	8	10	17.90	1.00	17.90		0.67		$ -	0.67	0.33	3.97	$ 35.24	$ 35.24	*	$ 35.24
79	500 301 20503 0000	8	10	0.48	2.00	0.96		0.50		$ -	0.50	0.33	0.16	$ 1.41	$ 1.41		$ 1.41
80	500 301 20501 0000	8	10	0.19	2.00	0.39		0.50		$ -	0.50	0.33	0.06	$ 0.57	$ 0.57		$ 0.57
81	500 301 20800 0000	8	10	1.21	2.00	2.43		0.50		$ -	0.50	0.33	0.40	$ 3.56	$ 3.56		$ 3.56
82	500 301 20900 0000	8	10	0.83	2.00	1.67		0.50		$ -	0.50	0.33	0.28	$ 2.45	$ 2.45		$ 2.45
83	500 301 20901 0000	8	10	0.68	2.00	1.35		0.50		$ -	0.50	0.33	0.22	$ 1.98	$ 1.98		$ 1.98
84	500 301 21100 0000	8	10	0.45	2.00	0.91		0.50		$ -	0.50	0.33	0.15	$ 1.33	$ 1.33		$ 1.33
85	500 301 21500 0000	8	10	4.64	1.00	4.64		0.70		$ -	0.70	0.33	1.08	$ 9.59	$ 9.59		$ 9.59
86	500 301 20600 0000	8	10	23.57	1.00	23.57	Y	0.95	22.36	$ 199.04	0.95	0.33	7.38	$ 65.52	$ 264.55	*	$ 264.55
87	500 301 20600 0000	8	10	14.41	1.00	14.41	Y	0.93	13.44	$ 119.68	0.93	0.33	4.44	$ 39.40	$ 159.08	*	$ 159.08
88	500 301 05200 0000	8	9	22.36	1.00	22.36		0.68		$ -	0.68	0.33	4.98	$ 44.26	$ 44.26	*	$ 44.26
89	500 301 05300 0000	8	9	40.35	1.00	40.35	Y	0.68	27.51	$ 244.88	0.68	0.33	9.08	$ 80.61	$ 325.49	*	$ 325.49
90	500 301 05900 0000	8	9	12.53	1.00	12.53		0.70		$ -	0.70	0.33	2.91	$ 25.85	$ 25.85	*	$ 25.85
91	500 301 20200 0000	7	10	0.64	2.00	1.28		0.74		$ -	0.74	0.66	0.62	$ 5.52	$ 5.52		$ 5.52
92	500 301 20300 0000	7	10	28.82	1.00	28.82	Y	0.84	24.25	$ 215.89	0.84	0.66	16.00	$ 142.13	$ 358.03		$ 358.03
93	500 301 20300 0000	7	10	11.61	1.00	11.61		0.80		$ -	0.80	0.66	6.16	$ 54.69	$ 54.69		$ 54.69
94	500 301 04900 0000	7	9	20.03	1.00	20.03		0.56		$ -	0.56	0.33	3.72	$ 33.00	$ 33.00	*	$ 33.00
95	500 301 05100 0000	7	9	17.61	1.00	17.61		0.36		$ -	0.36	0.33	2.08	$ 18.49	$ 18.49	*	$ 18.49
96	500 301 19701 0000	6	10	5.73	1.00	5.73		0.75		$ -	0.75	1.00	4.28	$ 38.01	$ 38.01		$ 38.01
97	500 301 19700 0000	6	10	6.07	1.00	6.07		0.81		$ -	0.81	1.00	4.94	$ 43.90	$ 43.90		$ 43.90
98	500 301 19702 0000	6	10	0.41	2.00	0.82		0.75		$ -	0.75	1.00	0.61	$ 5.45	$ 5.45		$ 5.45
99	500 301 19801 0000	7	10	3.59	1.00	3.59		0.78		$ -	0.78	1.00	2.81	$ 24.94	$ 24.94		$ 24.94
100	500 301 19800 0000	7	10	0.29	2.00	0.58		0.75		$ -	0.75	1.00	0.43	$ 3.83	$ 3.83		$ 3.83
101	500 301 20101 0000	7	10	0.21	2.00	0.42		0.75		$ -	0.75	1.00	0.31	$ 2.79	$ 2.79		$ 2.79

SCHEDULE F -- SECTION 4
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S4 Total		S4 Total	S4	S4			S4	S4					
102	500 301 20105 0000	7	10	0.24	2.00	0.48		0.75		$ -	0.75	0.66	0.24	$ 2.10	$ 2.10		$ 2.10
103	500 301 20100 0000	6-7	10	40.85	1.00	40.85	Y	0.85	18.04	$ 160.62	0.85	1.00	34.92	$ 310.15	$ 470.77		$ 470.77
104	500 301 19500 0000	6	10	9.66	1.00	9.66		0.58		$ -	0.58	1.00	5.61	$ 49.82	$ 49.82	*	$ 49.82
105	500 301 20100 0000	6-7	10	12.44	1.00	12.44		0.74		$ -	0.74	1.00	9.15	$ 81.28	$ 81.28		$ 81.28
106	500 301 04800 0000	7	9	24.68	1.00	24.68		0.43		$ -	0.43	0.33	3.52	$ 31.22	$ 31.22	*	$ 31.22
107	500 301 05000 0000	7	9	15.51	1.00	15.51		0.30		$ -	0.30	0.33	1.54	$ 13.64	$ 13.64	*	$ 13.64
108	500 301 19600 0000	6	10	20.23	1.00	20.23		0.65		$ -	0.65	1.00	13.09	$ 116.28	$ 116.28	*	$ 116.28
109	500 301 19400 0000	6	10	8.43	1.00	8.43		0.61		$ -	0.61	1.00	5.17	$ 45.88	$ 45.88	*	$ 45.88
110	500 301 19400 0000	6	10	11.39	1.00	11.39		0.49		$ -	0.49	1.00	5.59	$ 49.67	$ 49.67	*	$ 49.67
111	500 301 04700 0000	6	9	40.47	1.00	40.47		0.34		$ -	0.34	1.00	13.95	$ 123.85	$ 123.85	*	$ 123.85
112	500 301 04510 0000	6	9	8.40	1.00	8.40		0.30		$ -	0.30	1.00	2.52	$ 22.39	$ 22.39	*	$ 22.39
113	500 301 04501 0000	6	9	1.12	1.00	1.12		0.30		$ -	0.30	1.00	0.34	$ 2.98	$ 2.98		$ 2.98
114	500 301 18301 0000	5	10	0.40	2.00	0.81		0.30		$ -	0.30	1.00	0.24	$ 2.16	$ 2.16		$ 2.16
115	500 301 18300 0000	5	10	14.30	1.00	14.30		0.30		$ -	0.30	1.00	4.29	$ 38.09	$ 38.09		$ 38.09
116	500 301 18200 0000	5	10	14.88	1.00	14.88		0.31		$ -	0.31	1.00	4.55	$ 40.41	$ 40.41		$ 40.41
117	500 301 18700 0000	5	10	0.17	2.00	0.34		0.30		$ -	0.30	1.00	0.10	$ 0.90	$ 0.90		$ 0.90
118	500 301 18900 0000	5	10	14.66	1.00	14.66		0.46		$ -	0.46	1.00	6.73	$ 59.73	$ 59.73	*	$ 59.73
119	500 301 19100 0000	5	10	14.77	1.00	14.77		0.50		$ -	0.50	1.00	7.38	$ 65.58	$ 65.58		$ 65.58
120	500 301 18300 0000	5	10	5.70	1.00	5.70		0.30		$ -	0.30	1.00	1.71	$ 15.18	$ 15.18		$ 15.18
121	500 301 18200 0000	5	10	5.92	1.00	5.92		0.30		$ -	0.30	1.00	1.78	$ 15.76	$ 15.76		$ 15.76
122	500 301 18900 0000	5	10	5.83	1.00	5.83		0.30		$ -	0.30	1.00	1.76	$ 15.65	$ 15.65	*	$ 15.65
123	500 301 19100 0000	5	10	5.84	1.00	5.84		0.38		$ -	0.38	1.00	2.22	$ 19.68	$ 19.68		$ 19.68
124	500 301 04400 0000	5	9	42.29	1.00	42.29		0.30		$ -	0.30	1.00	12.69	$ 112.68	$ 112.68		$ 112.68
125	500 301 04300 0000	5	9	25.99	1.00	25.99		0.30		$ -	0.30	1.00	7.80	$ 69.25	$ 69.25	*	$ 69.25
126	PIN 145643045	5	9	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 1.54	$ 1.54	*	$ 1.54
127	500 301 05105 0000	8	9	1.49	2.00	2.98		0.30		$ -	0.30	1.00	0.89	$ 7.94	$ 7.94		$ 7.94
131	500 301 04210 0000	4	9	55.39	1.00	55.39		0.30		$ -	0.30	1.00	16.62	$ 147.57	$ 147.57		$ 147.57
132	500 301 04202 0000	4	9	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.48	$ 0.48		$ 0.48
133	500 301 04203 0000	4	9	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 2.19	$ 2.19		$ 2.19
134	500 301 04200 0000	4	9	1.07	2.00	2.14		0.30		$ -	0.30	1.00	0.64	$ 5.70	$ 5.70		$ 5.70
135	500 301 04201 0000	4	9	0.42	2.00	0.83		0.30		$ -	0.30	1.00	0.25	$ 2.22	$ 2.22		$ 2.22
137	500 301 04100 0000	4	9	8.28	1.00	8.28		0.30		$ -	0.30	1.00	2.49	$ 22.07	$ 22.07		$ 22.07
138	500 301 05702 0000	3	9	23.49	1.00	23.49		0.30		$ -	0.30	1.00	7.05	$ 62.58	$ 62.58		$ 62.58
139	500 301 42705 0000	8	11	0.08	1.00	0.08		0.50		$ -	0.50	0.66	0.03	$ 0.23	$ 0.23		$ 0.23
140	500 301 41900 0000	7	11	0.20	2.00	0.39		0.50		$ -	0.50	0.66	0.13	$ 1.16	$ 1.16		$ 1.16
141	500 301 41800 0000	7	11	1.14	2.00	2.27		0.50		$ -	0.50	0.66	0.75	$ 6.67	$ 6.67		$ 6.67
142	500 301 41700 0000	7	11	1.69	2.00	3.38		0.50		$ -	0.50	0.66	1.11	$ 9.90	$ 9.90	*	$ 9.90
143	500 301 41600 0000	7	11	0.14	2.00	0.28		0.50		$ -	0.50	0.66	0.09	$ 0.82	$ 0.82		$ 0.82
144	500 301 43000 0000	7	11	0.07	1.00	0.07		0.50		$ -	0.50	0.66	0.02	$ 0.21	$ 0.21	*	$ 0.21

SCHEDULE F -- SECTION 4
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Robinson Consultants

Project No.: B16070
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ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S4 Total		S4 Total	S4	S4			S4	S4					
145	500 301 41400 0000	7	11	2.66	1.00	2.66		0.50		$ -	0.50	0.66	0.88	$ 7.79	$ 7.79		$ 7.79
146	500 301 41500 0000	7	11	0.14	2.00	0.28		0.50		$ -	0.50	0.66	0.09	$ 0.82	$ 0.82		$ 0.82
147	500 301 43502 0000	7	11	0.17	1.00	0.17		0.41		$ -	0.41	0.66	0.05	$ 0.40	$ 0.40	*	$ 0.40
148	500 301 41300 0000	7	11	4.65	1.00	4.65		0.50		$ -	0.50	0.66	1.55	$ 13.75	$ 13.75		$ 13.75
149	500 301 41301 0000	7	11	1.01	2.00	2.02		0.56		$ -	0.56	0.66	0.75	$ 6.62	$ 6.62		$ 6.62
150	500 301 41200 0000	7	11	7.05	1.00	7.05		0.51		$ -	0.51	0.66	2.39	$ 21.21	$ 21.21		$ 21.21
151	500 301 41100 0000	7	11	0.20	2.00	0.41		0.69		$ -	0.69	1.00	0.28	$ 2.50	$ 2.50		$ 2.50
153	500 301 41002 0000	6	11	0.15	2.00	0.31		0.75		$ -	0.75	1.00	0.23	$ 2.04	$ 2.04		$ 2.04
154	500 301 41001 0000	6	11	0.15	2.00	0.31		0.75		$ -	0.75	1.00	0.23	$ 2.04	$ 2.04		$ 2.04
155	500 301 40900 0000	6	11	0.14	2.00	0.28		0.57		$ -	0.57	1.00	0.16	$ 1.44	$ 1.44		$ 1.44
158	500 301 40701 0000	6	11	0.21	2.00	0.42		0.50		$ -	0.50	1.00	0.21	$ 1.87	$ 1.87		$ 1.87
159	500 301 40603 0000	6	11	0.14	2.00	0.28		0.50		$ -	0.50	1.00	0.14	$ 1.26	$ 1.26		$ 1.26
160	500 301 40602 0000	6	11	0.19	2.00	0.39		0.50		$ -	0.50	1.00	0.19	$ 1.72	$ 1.72		$ 1.72
161	500 301 40601 0000	6	11	0.21	2.00	0.42		0.50		$ -	0.50	1.00	0.21	$ 1.87	$ 1.87		$ 1.87
164	500 301 40505 0000	6	11	0.19	2.00	0.39		0.50		$ -	0.50	1.00	0.19	$ 1.73	$ 1.73		$ 1.73
166	500 301 45700 0000	6	11	9.50	1.00	9.50		0.30		$ -	0.30	1.00	2.85	$ 25.32	$ 25.32		$ 25.32
167	500 301 44801 0000	6	11	0.14	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.76	$ 0.76		$ 0.76
168	500 301 45710 0000	6	11	0.31	2.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 1.68	$ 1.68		$ 1.68
169	500 301 45720 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.78	$ 1.78		$ 1.78
170	500 301 45730 0000	6	11	0.33	2.00	0.67		0.30		$ -	0.30	1.00	0.20	$ 1.78	$ 1.78		$ 1.78
171	500 301 45618 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
172	500 301 45619 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.75	$ 0.75		$ 0.75
173	500 301 45620 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
174	500 301 45606 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
175	500 301 45610 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
176	500 301 45607 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
177	500 301 45611 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
178	500 301 45608 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
179	500 301 45612 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
180	500 301 45609 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
181	500 301 45613 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
182	500 301 45614 0000	6	11	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 0.79	$ 0.79		$ 0.79
183	500 301 45615 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.78	$ 0.78		$ 0.78
184	500 301 45616 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.78	$ 0.78		$ 0.78
185	500 301 45617 0000	6	11	0.15	2.00	0.29		0.30		$ -	0.30	1.00	0.09	$ 0.78	$ 0.78		$ 0.78
186	500 301 45605 0000	6	11	0.15	2.00	0.31		0.30		$ -	0.30	1.00	0.09	$ 0.82	$ 0.82		$ 0.82
187	500 301 45500 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.53	$ 0.53		$ 0.53
188	500 301 45501 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
189	500 301 45503 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.47	$ 0.47		$ 0.47

SCHEDULE F -- SECTION 4
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S4 Total		S4 Total	S4	S4			S4	S4					
190	500 301 45600 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.47	$ 0.47		$ 0.47
191	500 301 45400 0000	6	11	0.10	2.00	0.20		0.30		$ -	0.30	1.00	0.06	$ 0.54	$ 0.54		$ 0.54
192	500 301 45601 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.73	$ 0.73		$ 0.73
193	500 301 45300 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.47	$ 0.47		$ 0.47
194	500 301 45602 0000	6	11	0.09	2.00	0.18		0.30		$ -	0.30	1.00	0.05	$ 0.47	$ 0.47		$ 0.47
195	500 301 45200 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.75	$ 0.75		$ 0.75
196	500 301 45603 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.09	$ 0.76	$ 0.76		$ 0.76
197	500 301 45604 0000	6	11	0.12	2.00	0.24		0.30		$ -	0.30	1.00	0.07	$ 0.64	$ 0.64		$ 0.64
198	500 301 45100 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.75	$ 0.75		$ 0.75
199	500 301 45604 0000	6	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.73	$ 0.73		$ 0.73
201	500 301 39801 0000	5	11	0.32	2.00	0.65		0.30		$ -	0.30	1.00	0.19	$ 1.73	$ 1.73		$ 1.73
202	500 301 39746 0000	5	11	0.21	2.00	0.41		0.30		$ -	0.30	1.00	0.12	$ 1.10	$ 1.10		$ 1.10
203	500 301 39741 0000	5	11	0.26	2.00	0.52		0.30		$ -	0.30	1.00	0.16	$ 1.39	$ 1.39		$ 1.39
204	500 301 39736 0000	5	11	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.18	$ 1.56	$ 1.56		$ 1.56
205	500 301 39731 0000	5	11	0.25	2.00	0.50		0.30		$ -	0.30	1.00	0.15	$ 1.32	$ 1.32		$ 1.32
206	500 301 39726 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.40	$ 1.40		$ 1.40
207	500 301 39721 0000	5	11	0.26	2.00	0.53		0.30		$ -	0.30	1.00	0.16	$ 1.40	$ 1.40		$ 1.40
208	500 301 39716 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.46	$ 1.46		$ 1.46
209	500 301 39711 0000	5	11	0.27	2.00	0.55		0.30		$ -	0.30	1.00	0.16	$ 1.46	$ 1.46		$ 1.46
211	500 301 39704 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
212	500 301 39702 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
213	500 301 39703 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
214	500 301 39701 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
215	500 301 40000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.75	$ 0.75		$ 0.75
216	500 301 39900 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
217	500 301 39800 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.73	$ 0.73	*	$ 0.73
219	500 301 39500 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.73	$ 0.73		$ 0.73
221	500 301 40301 0000	5	11	0.44	2.00	0.89		0.50		$ -	0.50	1.00	0.44	$ 3.95	$ 3.95		$ 3.95
222	500 301 40302 0000	5	11	0.24	2.00	0.48		0.38		$ -	0.38	1.00	0.18	$ 1.59	$ 1.59		$ 1.59
224	500 301 39000 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
225	500 301 39002 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
226	500 301 39200 0000	5	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.74	$ 0.74		$ 0.74
229	500 301 38902 0000	5	11	0.49	2.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.60	$ 2.60		$ 2.60
230	500 301 38702 0000	4	11	0.14	2.00	0.28		0.30		$ -	0.30	1.00	0.08	$ 0.73	$ 0.73		$ 0.73
231	500 301 38701 0000	4	11	1.20	2.00	2.41		0.30		$ -	0.30	1.00	0.72	$ 6.41	$ 6.41	*	$ 6.41

SCHEDULE F -- SECTION 4
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S4 Total		S4 Total	S4	S4			S4	S4					
City of Ottawa -- BLOCKS																	
	BLOCK D1	3-4	9-10	142.16	3.85	547.31		0.30		$ -	0.30	1.00	164.19	$ 1,458.17	$ 1,458.17		$ 1,458.17
	BLOCK D2	4	10	40.72	3.85	156.75		0.30		$ -	0.30	1.00	47.03	$ 417.63	$ 417.63		$ 417.63
	BLOCK E1	1-2	11	83.04	3.85	319.70		0.30		$ -	0.30	1.00	95.91	$ 851.77	$ 851.77		$ 851.77
	BLOCK E2	3	11	53.64	3.85	206.53		0.30		$ -	0.30	1.00	61.96	$ 550.25	$ 550.25		$ 550.25
	BLOCK E3	3	11	36.41	3.85	140.17		0.30		$ -	0.30	1.00	42.05	$ 373.45	$ 373.45		$ 373.45
	BLOCK E4	4	11	45.51	3.85	175.23		0.30		$ -	0.30	1.00	52.57	$ 466.84	$ 466.84		$ 466.84
	BLOCK F1	4	11	12.80	3.85	49.30		0.30		$ -	0.30	1.00	14.79	$ 131.33	$ 131.33		$ 131.33
	BLOCK F2	4-6	11	154.30	3.85	594.04		0.33		$ -	0.33	1.00	196.04	$ 1,740.96	$ 1,740.96		$ 1,740.96
	BLOCK F3	1-2	11	15.28	3.85	58.82		0.30		$ -	0.30	1.00	17.65	$ 156.70	$ 156.70		$ 156.70
City of Ottawa -- Roads/Other																	
	Denise Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 2.40	$ 2.40		$ 2.40
	Francois St.	6	11	0.25	4.00	0.98		0.30		$ -	0.30	1.00	0.29	$ 2.61	$ 2.61		$ 2.61
	Mer-Bleue Rd.	2-6	11	4.87	4.00	19.47		0.30		$ -	0.30	1.00	5.84	$ 51.86	$ 51.86		$ 51.86
	Monique Ave.	6	11	0.22	4.00	0.90		0.30		$ -	0.30	1.00	0.27	$ 2.39	$ 2.39		$ 2.39
	Navan Rd.	8-10	9-10	0.74	4.00	2.95		0.69		$ -	0.69	0.33	0.67	$ 5.97	$ 5.97		$ 5.97
	ROW L3-4 C9	3-4	9	0.78	1.00	0.78		0.30		$ -	0.30	1.00	0.23	$ 2.07	$ 2.07		$ 2.07
	ROW L4-9 C9-10	4-9	9-10	5.53	1.00	5.53	Y	0.56	2.04	$ 18.18	0.56	1.00	3.08	$ 27.36	$ 45.54		$ 45.54
	ROW L5-9 C9-10 (Hydro Corridor)	5-9	9-10	9.83	1.00	9.83	Y	0.77	4.69	$ 41.71	0.77	1.00	7.53	$ 66.87	$ 108.58		$ 108.58
	Tenth Line Rd.	3-8	10-11	9.66	4.00	38.63		0.41		$ -	0.41	1.00	15.77	$ 140.08	$ 140.08		$ 140.08
	Trim Rd.	4-15	8-9	0.59	4.00	2.37		0.30		$ -	0.30	1.00	0.71	$ 6.31	$ 6.31		$ 6.31
	Wall Rd.	5-6	9-11	6.51	4.00	26.06		0.37		$ -	0.37	1.00	9.76	$ 86.65	$ 86.65		$ 86.65
Total				**1346.14**		**3114.04**			**112.32**	**$ 1,000.00**			**1013.42**	**$ 9,000.00**	**$ 10,000.00**		**$ 10,000.00**

SCHEDULE G -- SECTION 5
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S5 Total		S5 Total	S5	S5			S5	S5					
City of Ottawa -- Individual Landowners																	
96	500 301 19701 0000	6	10	5.73	1.00	5.73	Y	1.00	5.73	$ 8.14	1.00	0.33	1.89	$ 6.95	$ 15.09		$ 15.09
97	500 301 19700 0000	6	10	6.07	1.00	6.07	Y	1.00	6.07	$ 8.61	1.00	0.33	2.00	$ 7.36	$ 15.97		$ 15.97
98	500 301 19702 0000	6	10	0.41	2.00	0.82		1.00		$ -	1.00	0.33	0.27	$ 0.99	$ 0.99		$ 0.99
99	500 301 19801 0000	7	10	2.21	1.00	2.21		1.00		$ -	1.00	0.33	0.73	$ 2.68	$ 2.68		$ 2.68
100	500 301 19800 0000	7	10	0.29	2.00	0.58		1.00		$ -	1.00	0.33	0.19	$ 0.70	$ 0.70		$ 0.70
101	500 301 20101 0000	7	10	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.33	$ 0.33		$ 0.33
103	500 301 20100 0000	6-7	10	19.75	1.00	19.75	Y	1.00	19.75	$ 28.02	1.00	0.33	6.52	$ 23.94	$ 51.95		$ 51.95
104	500 301 19500 0000	6	10	1.88	1.00	1.88		1.00		$ -	1.00	0.33	0.62	$ 2.28	$ 2.28	*	$ 2.28
105	500 301 20100 0000	6-7	10	0.99	1.00	0.99		1.00		$ -	1.00	0.33	0.33	$ 1.20	$ 1.20		$ 1.20
108	500 301 19600 0000	6	10	20.23	1.00	20.23	Y	1.00	20.23	$ 28.71	1.00	0.33	6.68	$ 24.53	$ 53.24	*	$ 53.24
109	500 301 19400 0000	6	10	8.43	1.00	8.43		1.00		$ -	1.00	0.33	2.78	$ 10.22	$ 10.22	*	$ 10.22
110	500 301 19400 0000	6	10	11.38	1.00	11.38		1.00		$ -	1.00	0.33	3.76	$ 13.79	$ 13.79	*	$ 13.79
114	500 301 18301 0000	5	10	0.40	2.00	0.81		1.00		$ -	1.00	0.66	0.53	$ 1.96	$ 1.96		$ 1.96
115	500 301 18300 0000	5	10	14.30	1.00	14.30		1.00		$ -	1.00	0.66	9.43	$ 34.66	$ 34.66		$ 34.66
116	500 301 18200 0000	5	10	14.88	1.00	14.88		1.00		$ -	1.00	0.66	9.82	$ 36.06	$ 36.06		$ 36.06
117	500 301 18700 0000	5	10	0.17	2.00	0.34		1.00		$ -	1.00	0.66	0.22	$ 0.82	$ 0.82		$ 0.82
118	500 301 18900 0000	5	10	14.66	1.00	14.66		1.00		$ -	1.00	0.66	9.68	$ 35.55	$ 35.55	*	$ 35.55
119	500 301 19100 0000	5	10	14.77	1.00	14.77	Y	1.00	14.77	$ 20.96	1.00	0.66	9.75	$ 35.81	$ 56.76		$ 56.76
120	500 301 18300 0000	5	10	5.70	1.00	5.70		1.00		$ -	1.00	0.33	1.88	$ 6.91	$ 6.91		$ 6.91
121	500 301 18200 0000	5	10	5.92	1.00	5.92		1.00		$ -	1.00	0.33	1.95	$ 7.17	$ 7.17		$ 7.17
122	500 301 18900 0000	5	10	5.83	1.00	5.83		1.00		$ -	1.00	0.33	1.92	$ 7.07	$ 7.07	*	$ 7.07
123	500 301 19100 0000	5	10	5.84	1.00	5.84		1.00		$ -	1.00	0.33	1.93	$ 7.08	$ 7.08		$ 7.08
124	500 301 04400 0000	5	9	42.29	1.00	42.29		1.00		$ -	1.00	0.33	13.96	$ 51.27	$ 51.27		$ 51.27
125	500 301 04300 0000	5	9	25.99	1.00	25.99		1.00		$ -	1.00	0.33	8.58	$ 31.51	$ 31.51	*	$ 31.51
126	PIN 145643045	5	9	0.29	2.00	0.58		1.00		$ -	1.00	0.33	0.19	$ 0.70	$ 0.70	*	$ 0.70
131	500 301 04210 0000	4	9	55.39	1.00	55.39		1.00		$ -	1.00	0.33	18.28	$ 67.14	$ 67.14		$ 67.14
132	500 301 04202 0000	4	9	0.09	2.00	0.18		1.00		$ -	1.00	0.33	0.06	$ 0.22	$ 0.22		$ 0.22
133	500 301 04203 0000	4	9	0.41	2.00	0.82		1.00		$ -	1.00	0.33	0.27	$ 0.99	$ 0.99		$ 0.99
134	500 301 04200 0000	4	9	1.07	2.00	2.14		1.00		$ -	1.00	0.33	0.71	$ 2.59	$ 2.59		$ 2.59
135	500 301 04201 0000	4	9	0.42	2.00	0.83		1.00		$ -	1.00	0.33	0.27	$ 1.01	$ 1.01		$ 1.01
137	500 301 04100 0000	4	9	8.28	1.00	8.28		1.00		$ -	1.00	0.33	2.73	$ 10.04	$ 10.04		$ 10.04
138	500 301 05702 0000	3	9	23.49	1.00	23.49		1.00		$ -	1.00	0.33	7.75	$ 28.47	$ 28.47		$ 28.47
150	500 301 41200 0000	7	11	0.28	1.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
151	500 301 41100 0000	7	11	0.20	2.00	0.41		1.00		$ -	1.00	0.33	0.13	$ 0.50	$ 0.50		$ 0.50
153	500 301 41002 0000	6	11	0.15	2.00	0.31		1.00		$ -	1.00	0.33	0.10	$ 0.37	$ 0.37		$ 0.37
154	500 301 41001 0000	6	11	0.15	2.00	0.31		1.00		$ -	1.00	0.33	0.10	$ 0.37	$ 0.37		$ 0.37
155	500 301 40900 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
158	500 301 40701 0000	6	11	0.21	2.00	0.42		1.00		$ -	1.00	0.33	0.14	$ 0.51	$ 0.51		$ 0.51

SCHEDULE G -- SECTION 5
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S5 Total		S5 Total	S5	S5			S5	S5					
159	500 301 40603 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
160	500 301 40602 0000	6	11	0.19	2.00	0.39		1.00		$ -	1.00	0.33	0.13	$ 0.47	$ 0.47		$ 0.47
161	500 301 40601 0000	6	11	0.21	2.00	0.42		1.00		$ -	1.00	0.33	0.14	$ 0.51	$ 0.51		$ 0.51
164	500 301 40505 0000	6	11	0.19	2.00	0.39		1.00		$ -	1.00	0.33	0.13	$ 0.47	$ 0.47		$ 0.47
166	500 301 45700 0000	6	11	9.50	1.00	9.50		1.00		$ -	1.00	0.33	3.14	$ 11.52	$ 11.52		$ 11.52
167	500 301 44801 0000	6	11	0.14	2.00	0.29		1.00		$ -	1.00	0.33	0.09	$ 0.35	$ 0.35		$ 0.35
168	500 301 45710 0000	6	11	0.31	2.00	0.63		1.00		$ -	1.00	0.33	0.21	$ 0.76	$ 0.76		$ 0.76
169	500 301 45720 0000	6	11	0.33	2.00	0.67		1.00		$ -	1.00	0.33	0.22	$ 0.81	$ 0.81		$ 0.81
170	500 301 45730 0000	6	11	0.33	2.00	0.67		1.00		$ -	1.00	0.33	0.22	$ 0.81	$ 0.81		$ 0.81
171	500 301 45618 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
172	500 301 45619 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
173	500 301 45620 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
174	500 301 45606 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
175	500 301 45610 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
176	500 301 45607 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
177	500 301 45611 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
178	500 301 45608 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
179	500 301 45612 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
180	500 301 45609 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
181	500 301 45613 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
182	500 301 45614 0000	6	11	0.15	2.00	0.30		1.00		$ -	1.00	0.33	0.10	$ 0.36	$ 0.36		$ 0.36
183	500 301 45615 0000	6	11	0.15	2.00	0.29		1.00		$ -	1.00	0.33	0.10	$ 0.36	$ 0.36		$ 0.36
184	500 301 45616 0000	6	11	0.15	2.00	0.29		1.00		$ -	1.00	0.33	0.10	$ 0.36	$ 0.36		$ 0.36
185	500 301 45617 0000	6	11	0.15	2.00	0.29		1.00		$ -	1.00	0.33	0.10	$ 0.36	$ 0.36		$ 0.36
186	500 301 45605 0000	6	11	0.15	2.00	0.31		1.00		$ -	1.00	0.33	0.10	$ 0.37	$ 0.37		$ 0.37
187	500 301 45500 0000	6	11	0.10	2.00	0.20		1.00		$ -	1.00	0.33	0.07	$ 0.24	$ 0.24		$ 0.24
188	500 301 45501 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
189	500 301 45503 0000	6	11	0.09	2.00	0.18		1.00		$ -	1.00	0.33	0.06	$ 0.21	$ 0.21		$ 0.21
190	500 301 45600 0000	6	11	0.09	2.00	0.18		1.00		$ -	1.00	0.33	0.06	$ 0.22	$ 0.22		$ 0.22
191	500 301 45400 0000	6	11	0.10	2.00	0.20		1.00		$ -	1.00	0.33	0.07	$ 0.25	$ 0.25		$ 0.25
192	500 301 45601 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.33	$ 0.33		$ 0.33
193	500 301 45300 0000	6	11	0.09	2.00	0.18		1.00		$ -	1.00	0.33	0.06	$ 0.22	$ 0.22		$ 0.22
194	500 301 45602 0000	6	11	0.09	2.00	0.18		1.00		$ -	1.00	0.33	0.06	$ 0.22	$ 0.22		$ 0.22
195	500 301 45200 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
196	500 301 45603 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
197	500 301 45604 0000	6	11	0.12	2.00	0.24		1.00		$ -	1.00	0.33	0.08	$ 0.29	$ 0.29		$ 0.29
198	500 301 45100 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
199	500 301 45604 0000	6	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.33	$ 0.33		$ 0.33
201	500 301 39801 0000	5	11	0.32	2.00	0.65		1.00		$ -	1.00	0.33	0.21	$ 0.78	$ 0.78		$ 0.78

SCHEDULE G -- SECTION 5
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S5 Total		S5 Total	S5	S5			S5	S5					
202	500 301 39746 0000	5	11	0.21	2.00	0.41		1.00		$ -	1.00	0.33	0.14	$ 0.50	$ 0.50		$ 0.50
203	500 301 39741 0000	5	11	0.26	2.00	0.52		1.00		$ -	1.00	0.33	0.17	$ 0.63	$ 0.63		$ 0.63
204	500 301 39736 0000	5	11	0.29	2.00	0.58		1.00		$ -	1.00	0.33	0.19	$ 0.71	$ 0.71		$ 0.71
205	500 301 39731 0000	5	11	0.25	2.00	0.50		1.00		$ -	1.00	0.33	0.16	$ 0.60	$ 0.60		$ 0.60
206	500 301 39726 0000	5	11	0.26	2.00	0.53		1.00		$ -	1.00	0.33	0.17	$ 0.64	$ 0.64		$ 0.64
207	500 301 39721 0000	5	11	0.26	2.00	0.53		1.00		$ -	1.00	0.33	0.17	$ 0.64	$ 0.64		$ 0.64
208	500 301 39716 0000	5	11	0.27	2.00	0.55		1.00		$ -	1.00	0.33	0.18	$ 0.67	$ 0.67		$ 0.67
209	500 301 39711 0000	5	11	0.27	2.00	0.55		1.00		$ -	1.00	0.33	0.18	$ 0.67	$ 0.67		$ 0.67
211	500 301 39704 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
212	500 301 39702 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
213	500 301 39703 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
214	500 301 39701 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
215	500 301 40000 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
216	500 301 39900 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.34	$ 0.34		$ 0.34
217	500 301 39800 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.33	$ 0.33	*	$ 0.33
219	500 301 39500 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	0.33	0.09	$ 0.33	$ 0.33		$ 0.33
221	500 301 40301 0000	5	11	0.44	2.00	0.89		1.00		$ -	1.00	0.66	0.59	$ 2.15	$ 2.15		$ 2.15
222	500 301 40302 0000	5	11	0.24	2.00	0.48		1.00		$ -	1.00	0.66	0.31	$ 1.15	$ 1.15		$ 1.15
224	500 301 39000 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	1.00	0.28	$ 1.02	$ 1.02		$ 1.02
225	500 301 39002 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	1.00	0.28	$ 1.02	$ 1.02		$ 1.02
226	500 301 39200 0000	5	11	0.14	2.00	0.28		1.00		$ -	1.00	1.00	0.28	$ 1.02	$ 1.02		$ 1.02
229	500 301 38902 0000	5	11	0.49	2.00	0.98		1.00		$ -	1.00	0.66	0.64	$ 2.36	$ 2.36		$ 2.36
230	500 301 38702 0000	4	11	0.14	2.00	0.28		1.00		$ -	1.00	1.00	0.28	$ 1.01	$ 1.01		$ 1.01
231	500 301 38701 0000	4	11	1.20	2.00	2.41		1.00		$ -	1.00	1.00	2.41	$ 8.84	$ 8.84	*	$ 8.84

SCHEDULE G -- SECTION 5
FOR THE FUTURE MAINTENANCE OF THE
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property (located in)		Area	Land Use Factor	Factored Area	Backs on Drain	Distance Factor	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP ELIGIBILITY	Total Net Cost
		Lot	Con	S5 Total		S5 Total	S5	S5			S5	S5					
City of Ottawa -- BLOCKS																	
	BLOCK D1	3-4	9-10	142.16	3.85	547.31		1.00		$ -	1.00	1.00	547.31	$ 2,010.45	$ 2,010.45		$ 2,010.45
	BLOCK D2	4	10	40.72	3.85	156.75		1.00		$ -	1.00	1.00	156.75	$ 575.81	$ 575.81		$ 575.81
	BLOCK E1	1-2	11	83.04	3.85	319.70		1.00		$ -	1.00	1.00	319.70	$ 1,174.37	$ 1,174.37		$ 1,174.37
	BLOCK E2	3	11	53.64	3.85	206.53		1.00		$ -	1.00	1.00	206.53	$ 758.66	$ 758.66		$ 758.66
	BLOCK E3	3	11	36.41	3.85	140.17		1.00		$ -	1.00	1.00	140.17	$ 514.90	$ 514.90		$ 514.90
	BLOCK E4	4	11	45.51	3.85	175.23		1.00		$ -	1.00	1.00	175.23	$ 643.66	$ 643.66		$ 643.66
	BLOCK F1	4	11	12.80	3.85	49.30		1.00		$ -	1.00	1.00	49.30	$ 181.08	$ 181.08		$ 181.08
	BLOCK F2	4-6	11	152.16	3.85	585.80	Y	1.00	585.80	$ 831.21	1.00	1.00	585.80	$ 2,151.82	$ 2,983.03		$ 2,983.03
	BLOCK F3	1-2	11	15.28	3.85	58.82		1.00		$ -	1.00	1.00	58.82	$ 216.06	$ 216.06		$ 216.06
City of Ottawa -- Roads/Other																	
	Denise Ave.	6	11	0.22	4.00	0.90		1.00		$ -	1.00	1.00	0.90	$ 3.30	$ 3.30		$ 3.30
	Francois St.	6	11	0.25	4.00	0.98		1.00		$ -	1.00	1.00	0.98	$ 3.60	$ 3.60		$ 3.60
	Mer-Bleue Rd.	2-6	11	4.87	4.00	19.47		1.00		$ -	1.00	1.00	19.47	$ 71.51	$ 71.51		$ 71.51
	Monique Ave.	6	11	0.22	4.00	0.90		1.00		$ -	1.00	1.00	0.90	$ 3.30	$ 3.30		$ 3.30
	ROW L3-4 C9	3-4	9	0.78	1.00	0.78		1.00		$ -	1.00	0.33	0.26	$ 0.94	$ 0.94		$ 0.94
	ROW L4-9 C9-10	4-9	9-10	1.86	1.00	1.86		1.00		$ -	1.00	0.33	0.62	$ 2.26	$ 2.26		$ 2.26
	ROW L5-9 C9-10 (Hydro Corridor)	5-9	9-10	3.71	1.00	3.71		1.00		$ -	1.00	0.33	1.23	$ 4.50	$ 4.50		$ 4.50
	Tenth Line Rd.	3-8	10-11	7.71	4.00	30.85	Y	1.00	30.85	$ 43.77	1.00	1.00	30.85	$ 113.32	$ 157.10		$ 157.10
	Trim Rd.	4-15	8-9	0.30	4.00	1.19		1.00		$ -	1.00	0.33	0.39	$ 1.45	$ 1.45		$ 1.45
	Wall Rd.	5-6	9-11	5.39	4.00	21.55	Y	1.00	21.55	$ 30.57	1.00	0.66	14.22	$ 52.24	$ 82.81		$ 82.81
Total				**947.48**		**2678.90**			**704.75**	**$ 1,000.00**			**2450.10**	**$ 9,000.00**	**$ 10,000.00**		**$ 10,000.00**

Appendix E

Cost Estimate, Injuring Liability, and Allowances

Robinson Consultants

BEAR RIVER MUNICIPAL DRAIN
(Insufficient Outlet (Injurious Liability) Compensation- $120,000)

Areas of Development-Amazon & CRRRC

Block A	Amazon Site	Regimbald	39.39 Ha
Block B	CRRRC	Regimbald	26.51 Ha
		Total Regimbald	65.90 Ha
Block C	CRRRC	Simpson	76.55 Ha
Block E	CRRRC	Wilson-Johnston	39.11 Ha

Area Tributary to East Savage Drain (EUC) and McKinnon's Creek

	EUC & Savage Drain	Proposed Development	240 Ha
	McKinnon's Creek	Proposed Development	300 Ha

Total Area of Development

EUC & Savage	240 Ha
McKinnon's Creek	300 Ha
Regimbald	65.9 Ha
Simpson	76.55 Ha
Wilson Johnson	39.11 Ha
Total Proposed	**721.56 Ha**
Total Rounded	**721 Ha**

Using a figure of $120,000 for Injurious Liability Compensation and using the total area of proposed development, the cost per Ha will be $120,000/721 = $166.44 or $166. The amount of $120,000 was determined by using 10% of the amount of compensation in the 1991 Engineer's Report projected to the 2019 value as an estimate to account for the additional volume of water resulting from development of the areas outlined herein impacting the properties in the area of compensation from the 1991 Engineer's Report.

Insufficient Outlet Compensation Contribution-EUC Tributary to E Savage Municipal Drain and Area Tributary to Proposed McKinnon's Creek Municipal Drain

EUC E Savage	Proposed	240 ($166)	$39,840
McKinnon's Cr.	Proposed	300 ($166)	$49,800

Robinson Consultants

BEAR RIVER MUNICIPAL DRAIN
(Maintenance Compensation- $500K)

Areas of Development-Amazon & CRRRC

Block A	Amazon Site	Regimbald	39.39 Ha
Block B	CRRRC	Regimbald	26.51 Ha
		Total Regimbald	65.90 Ha
Block C	CRRRC	Simpson	76.55 Ha
Block E	CRRRC	Wilson-Johnston	39.11 Ha

Area Tributary to East Savage Drain and McKinnon's Creek

	EUC & Savage Drain	Proposed	240 Ha
	McKinnon's Creek	Proposed	300 Ha

Total Area of Development

EUC & Savage	240 Ha
McKinnon's Creek	300 Ha
Regimbald	65.9 Ha
Simpson	76.55 Ha
Wilson Johnson	39.11 Ha
Total	**721.56 Ha**
Total Rounded	**721 Ha**

Based on $500,000 for maintenance compensation
Cost/Ha = $694 charge per proposed development areas (721 Ha)

The final cost for maintenance compensation is not yet known, but we used a figure of $500,000 on the basis of the maintenance cost in 1991 brought forward to 2019. Using the total area of proposed development, the cost per Ha will be $500,000/721 = 693.48 or $694.

Maintenance Compensation Contribution-EUC Tributary to E Savage Municipal Drain and Area Tributary to Proposed McKinnon' Creek Municipal Drain

EUC E Savage	Proposed	240 ($694)	$160,560
McKinnon's Cr.	Proposed	300 ($694)	$208,200

CALCULATION OF INJURING LIABILITY
BEAR RIVER MUNICIPAL DRAIN
INJURING LIABILITY FOR MAINTENANCE

The Maintenance Cost Estimate for the August 1990 Engineer`s Report made provisions for the following items:

Excavation	$	50,000.00
Rip Rap	$	8,000.00
Maintenance	$	45,000.00
Clearing	$	5,000.00
Seeding	$	3,180.00
Allowance for Disposal	$	5,650.00
Miscellaneous	$	25,000.00
Tender, Inspection and Administration	$	40,000.00
Total	**$**	**181,830.00**

For determination of the 2019 Constuction Cost Value in comparison to the Estimated 1990 Connstuction Cost Value (adjusting for inflation) the RS Means Cost Index is applied to the estimated value.

RS Means Cost Index

Cost Index 1990	94.3
Cost Index June 2019	227.3

The inflation adjusted 2019 maintenance cost value is then calculated by appling the ratio of the 2019 Index Value vs. the 1990 Index Value to the original 1990 Construction Cost Estimate

1990:	$	181,830.00
INDEX RATIO:		227.30 : 94.30
2019 Value:	$	438,281.64

For the pupose of estimation a rounded value is utilzied.

USE FOR 2022:	**$**	**500,000.00**

SCHEDULE H
ALLOWANCES FOR LANDS USED IN THE CONSTRUCTION OF
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property		Area (ha)	Land Allowance										Total Value
		Lot	Con		S1		S2		S3		S4		S5		
					Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	
City of Ottawa -- Individual Landowners															
1	500 301 09600 0000	16-17	9	43.55	0.50	$ 18,315.00	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	$ 18,315.00
3	500 301 09000 0000	15	9	40.47	0.44	$ 16,187.50	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	$ 16,187.50
7	500 301 08800 0000	14	9	40.47	0.55	$ 20,313.00	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	$ 20,313.00
14	500 301 08501 0000	13	9	9.94	0.02	$ 740.00	0.08	$ 2,960.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 3,700.00
15	500 301 08500 0000	13	9	9.79	0.00	$ -	0.11	$ 4,070.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 4,070.00
20	500 301 08300 0000	13	9	52.18	0.00	$ -	0.17	$ 6,105.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 6,105.00
28	500 301 08200 0000	12	9	39.02	0.00	$ -	0.25	$ 9,065.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 9,065.00
29	500 301 08000 0000	12	9	30.74	0.00	$ -	0.31	$ 11,470.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 11,470.00
31	500 301 07800 0000	11	9	23.08	0.00	$ -	0.07	$ 2,590.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 2,590.00
32	500 701 07500 0000	11	9	1.67	0.00	$ -	0.08	$ 2,960.00	0.00	$ -	0.00	$ -	0.00	$ -	$ 2,960.00
38	500 301 07100 0000	10	9	2.17	0.00	$ -	0.00	$ -	0.10	$ 41,087.50	0.00	$ -	0.00	$ -	$ 41,087.50
39	500 301 07109 0000	10	9	1.15	0.00	$ -	0.00	$ -	0.09	$ 38,925.00	0.00	$ -	0.00	$ -	$ 38,925.00
41	500 701 10500 0000	10	9	18.95	0.00	$ -	0.00	$ -	0.29	$ 21,147.00	0.00	$ -	0.00	$ -	$ 21,147.00
65	500 301 07000 0000	9	9	19.95	0.00	$ -	0.00	$ -	0.46	$ 34,132.00	0.00	$ -	0.00	$ -	$ 34,132.00
70	500 301 06500 0000	9	9	1.45	0.00	$ -	0.00	$ -	0.08	$ 32,437.50	0.00	$ -	0.00	$ -	$ 32,437.50
86	500 301 20600 0000	8	10	23.57	0.00	$ -	0.00	$ -	0.00	$ -	1.48	$ 54,575.00	0.00	$ -	$ 54,575.00
87	500 301 20600 0000	8	10	14.41	0.00	$ -	0.00	$ -	0.00	$ -	0.78	$ 28,860.00	0.00	$ -	$ 28,860.00
89	500 301 05300 0000	8	9	40.35	0.00	$ -	0.00	$ -	0.00	$ -	0.11	$ 4,070.00	0.00	$ -	$ 4,070.00
92	500 301 20300 0000	7	10	28.82	0.00	$ -	0.00	$ -	0.00	$ -	1.05	$ 38,850.00	0.00	$ -	$ 38,850.00
96	500 301 19701 0000	6	10	5.73	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	0.50	$ 18,500.00	$ 18,500.00
97	500 301 19700 0000	6	10	6.07	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	0.50	$ 18,500.00	$ 18,500.00
103	500 301 20100 0000	6-7	10	40.85	0.00	$ -	0.00	$ -	0.00	$ -	0.30	$ 11,100.00	0.81	$ 29,970.00	$ 41,070.00
108	500 301 19600 0000	6	10	20.23	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	1.56	$ 57,720.00	$ 57,720.00
119	500 301 19100 0000	5	10	14.77	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	0.18	$ 6,660.00	$ 6,660.00
Total					**1.50**	**$ 55,555.50**	**1.06**	**$ 39,220.00**	**1.01**	**$ 167,729.00**	**$ 3.72**	**$ 137,455.00**	**$ 3.55**	**$ 131,350.00**	**$ 531,309.50**

SCHEDULE I
ALLOWANCES FOR CROPS LOST IN THE CONSTRUCTION OF
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16070
Date: 30-May-25

ID	Roll No.	Property		Area (ha)	Land Allowance										Total Value
					S1					S2					
		Lot	Con		W (Y1)	W (Y2/3)	Area (Y1)	Area (Y2/3)	Value	W (Y1)	W (Y2/3)	Area (Y1)	Area (Y2/3)	Value	
City of Ottawa -- Individual Landowners															
1	500 301 09600 0000	16-17	9	43.55	40.00	39.11	3.30	3.23	$ 14,631.05			0.00	0.00	$ -	$ 14,631.05
3	500 301 09000 0000	15	9	40.47	40.00	24.55	2.50	1.53	$ 9,043.88			0.00	0.00	$ -	$ 9,043.88
7	500 301 08800 0000	14	9	40.47	40.00	20.34	2.44	1.24	$ 8,251.31			0.00	0.00	$ -	$ 8,251.31
14	500 301 08501 0000	13	9	9.94	40.00	18.43	0.16	0.07	$ 523.99	40.00	18.43	0.64	0.29	$ 2,095.96	$ 2,619.96
15	500 301 08500 0000	13	9	9.79			0.00	0.00	$ -	40.00	25.30	0.88	0.56	$ 3,220.69	$ 3,220.69
20	500 301 08300 0000	13	9	52.18			0.00	0.00	$ -	40.00	22.56	1.32	0.74	$ 4,628.33	$ 4,628.33
28	500 301 08200 0000	12	9	39.02			0.00	0.00	$ -	40.00	25.97	1.40	0.91	$ 5,176.59	$ 5,176.59
29	500 301 08000 0000	12	9	30.74			0.00	0.00	$ -	40.00	32.27	2.48	2.00	$ 10,045.77	$ 10,045.77
31	500 301 07800 0000	11	9	23.08			0.00	0.00	$ -	40.00	27.99	0.56	0.39	$ 2,133.90	$ 2,133.90
Total							**8.40**	**6.07**	**$ 32,450.24**			**7.28**	**4.90**	**$ 27,301.24**	**$ 59,751.48**

TABLE 7.1 -- PRIMARY AND ALTERNATE ALLOWANCES

FOR LANDS USED IN THE CONSTRUCTION OF THE McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultan

Project No.: B16070

Date: 30-May-25

ID	Roll No.	Area (ha)	Primary					ID	Roll No.	Area (ha)	Alternate					
			Section	Side of Drain	Station Range		Area	Value				Section	Side of Drain	Station Range		Area	Value
City of Ottawa -- Individual Landowners																	
29	500 301 08000 0000	30.74	2	West	13+180	13+580	0.20	$ -	29	500 301 08000 0000	30.74	2	East*	12+820	13+580	0.38	$ -
		30.74	2	West	12+850	13+070	0.39	$ 3,900.00									
31	500 301 07800 0000	23.08	2	West	13+070	13+180	0.06	$ -									
		23.08	2	West	12+820	12+850	0.05	$ 500.00									
38	500 301 07100 0000	2.17	3	West	11+280	11+470	0.10	$ -	39	500 301 07109 0000	19.95	3	East	11+000	11+470	0.24	$ 6,094.42
39	500 301 07109 0000	1.15	3	West	11+000	11+280	0.14	$ -									
41	500 701 10500 0000	18.95	3	West	12+060	12+110	0.03	$ -	41	500 701 10500 0000	18.95	3	East	11+470	12+110	0.32	$ -
		18.95	3	West	11+820	12+030	0.32	$ 3,200.00									
		18.95	3	West	11+470	11+780	0.32	$ 3,200.00									

Note*: ID 29 may be subject to additional crop loss allowance if the alternative side of the drain is used for construction

DETAILED COST ESTIMATE
SECTION 1
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No: B16070
Date: 30-May-25

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 1						
		Construction				
Construction	**Site Preparation Activities**					
		Mobilization (maximum 2% of total consturction cost)	LS	$ 5,800.00	100%	$ 5,800.00
		Erosion and Sediment Control Plan	LS	$ 90,000.00	25%	$ 22,500.00
		Erosion and Sediment Control Measures -- Minimum as Follows:				
		- (2) Rock Check Dam c/w Sediment Trap	each	$ 1,000.00	3.00	$ 3,000.00
		- (1) Straw BaleDam c/w Sediment Trap	each	$ 500.00	1.00	$ 500.00
		Clearing/Grubbing (including individual tree removals)	ha	$ 6,000.00	2.00	$ 12,000.00
		Fence removal and reinstatement	m	$ 30.00	80.00	$ 2,400.00
	Excavation Activities					
		Earth Ex. - Ditch (full construction)	m^3 (P)	$ 12.50	2345.00	$ 29,312.50
		Earth Ex. - Spreading	m^3 (P)	$ 7.50	2345.00	$ 17,587.50
		Access Culvert(s) -- 4200mm x 2100mm Concrete Box	m	$ 10,349.00	20.00	$ 206,980.00
		Culvert Removal	each	$ 500.00	2.00	$ 1,000.00
	Reinstatement Activities					
		Tile Outlet Restoration/Protection	each	$ 600.00	2.00	$ 1,200.00
		Hand Seeding	m^2	$ 0.60	23100.00	$ 13,860.00
		Rock Protection - Erosion Control	m^3	$ 40.00	110.00	$ 4,400.00
		Rock Protection - Culvert End Treatments	each	$ 1,000.00	4.00	$ 4,000.00
		Sub-Total - Construction Costs				**$ 320,540.00**
		Contingency Allowance - Construction				**$ 49,000.00**
		Total - Construction Costs				**$ 369,540.00**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 500,000.00	19%	$ 95,000.00
		SNCA Enviromental Review and Permitting (apportioned for Sections 1, 2, 4 & 5)	LS	$ 10,870.00	25%	$ 2,717.50
		Tendering Assistance (apportioned by Section)	LS	$ 30,000.00	19%	$ 5,700.00
		Contract Administration/Inspection (apportioned for Sections 1-3)	LS	$ 380,000.00	25%	$ 95,000.00
		OMAFA Certification (apportioned by Section)	LS	$ 2,500.00	19%	$ 475.00
		Sub-Total - Routine Engineering				**$ 198,892.50**
Total - Engineering/Administration						**$ 198,892.50**
		Other				
		Injuring Liability -- Bear River Liability Copensation	LS	$ 66,000.00	20%	$ 13,200.00
		Injuring Liability -- Bear River Maintenance Compensation	LS	$ 249,600.00	20%	$ 49,920.00
		HST	LS	(1.76% OF Costs Above)		$ 10,004.41
		Allowances	LS	(See Schedule)		$ 88,005.74
Total - Other Costs						**$ 161,130.15**
Sub-Total - Net Costs						**$ 729,562.65**
		Special Benefits				
Blocks F1,F2, and F3 Special Consideration - Section 1		*Consideration is given that all work associated with the current construction and Engineer's Report are fully for the benefit of the properties located in Blocks F1, F2, and F3. A "Special Benefit" is assessed to Blocks F1, F2, and F3 for work associated with the current engineering and construction in the amount prescribed below.*				
		Special Benefit -- Initial Construction	LS	$ 369,540.00	100%	$ 369,540.00
		Engineering/Administration and Other	LS	$ 360,022.65	100%	$ 360,022.65
		Sub-Total - (Special Benefit)				**$ 729,562.65**
Sub-Total - Special Benefits						**$ 729,562.65**
Total Net Costs - Section 1 (For Distribution to Properties)						**$ -**

DETAILED COST ESTIMATE
SECTION 2
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No: B16070
Date: 30-May-25

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 2						
		Construction				
Construction		**Site Preparation Activities**				
		Mobilization (maximum 2% of total consturction cost)	LS	$ 7,000.00	100%	$ 7,000.00
		Erosion and Sediment Control Plan	LS	$ 90,000.00	30%	$ 27,000.00
		Erosion and Sediment Control Measures -- Minimum as Follows:				
		- (1) Rock Check Dam c/w Sediment Trap	each	$ 1,000.00	3.00	$ 3,000.00
		- (1) Straw BaleDam c/w Sediment Trap	each	$ 500.00	1.00	$ 500.00
		Clearing/Grubbing (including individual tree removals)	ha	$ 6,000.00	1.30	$ 7,800.00
		Fence removal and reinstatement	m	$ 30.00	160.00	$ 4,800.00
		Excavation Activities				
		Earth Ex. - Ditch (full construction)	m^3 (P)	$ 12.50	6318.00	$ 78,975.00
		Earth Ex. - Spreading	m^3 (P)	$ 7.50	6318.00	$ 47,385.00
		Access Culvert(s) -- 4200mm x 2100mm Concrete Box	m	$ 10,349.00	12.00	$ 124,188.00
		Access Culvert(s) -- 3890mm x 2690mm CSPA	m	$ 4,000.00	36.00	$ 144,000.00
		Culvert Removal	each	$ 500.00	4.00	$ 2,000.00
		Reinstatement Activities				
		Tile Outlet Restoration/Protection	each	$ 600.00	11.00	$ 6,600.00
		Hand Seeding	m^2	$ 0.60	21780.00	$ 13,068.00
		Rock Protection - Erosion Control	m^3	$ 40.00	200.00	$ 8,000.00
		Rock Protection - Culvert End Treatments	each	$ 1,000.00	8.00	$ 8,000.00
		Sub-Total - Construction Costs				**$ 482,316.00**
		Contingency Allowance - Construction				**$ 73,000.00**
		Total - Construction Costs				**$ 555,316.00**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 500,000.00	18%	$ 90,000.00
		SNCA Enviromental Review and Permitting (apportioned for Sections 1, 2, 4 & 5)	LS	$ 10,870.00	25%	$ 2,717.50
		Tendering Assistance (apportioned by Section)	LS	$ 30,000.00	18%	$ 5,400.00
		Contract Administration/Inspection (apportioned for Sections 1-3)	LS	$ 380,000.00	30%	$ 114,000.00
		OMAFA Certification (apportioned by Section)	LS	$ 2,500.00	18%	$ 450.00
		Sub-Total - Engineering				**$ 212,567.50**
Total - Engineering/Administration						**$ 212,567.50**
		Other				
		Injuring Liability -- Bear River Liability Copensation	LS	$ 66,000.00	20%	$ 13,200.00
		Injuring Liability -- Bear River Maintenance Compensation	LS	$ 249,600.00	20%	$ 49,920.00
		HST	LS	(1.76% OF Costs Above)		$ 13,514.75
		Allowances	LS	(See Schedule)		$ 66,521.24
Total - Other Costs						**$ 143,155.99**
Sub-Total - Net Costs						**$ 911,039.49**
		Special Benefits				
Blocks F1,F2, and F3 Special Consideration - Section 2		*Consideration is given that all work associated with the current construction and Engineer's Report are fully for the benefit of the properties located in Blocks F1, F2, and F3. A "Special Benefit" is assessed to Blocks F1, F2, and F3 for work associated with the current engineering and construction in the amount prescribed below.*				
		Special Benefit -- Initial Construction	LS	$ 555,316.00	100%	$ 555,316.00
		Engineering/Administration and Other	LS	$ 355,723.49	100%	$ 355,723.49
		Sub-Total - (Special Benefit)				**$ 911,039.49**
Sub-Total - Special Benefits						**$ 911,039.49**
Total Net Costs - Section 2 (For Distribution to Properties)						**$ -**

DETAILED COST ESTIMATE
SECTION 3
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No: B16070
Date: 30-May-25

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 3						
		Construction				
Construction	**Site Preparation Activities**					
		Mobilization (maximum 2% of total consturction cost)	LS	$ 6,600.00	100%	$ 6,600.00
		Erosion and Sediment Control Plan	LS	$ 90,000.00	45%	$ 40,500.00
		Erosion and Sediment Control Measures -- Minimum as Follows:				
		- (1) Rock Check Dam c/w Sediment Trap	each	$ 1,000.00	1.00	$ 1,000.00
		- (1) Straw BaleDam c/w Sediment Trap	each	$ 500.00	1.00	$ 500.00
		Clearing/Grubbing (including individual tree removals)	ha	$ 6,000.00	5.90	$ 35,400.00
		Fence removal and reinstatement	m	$ 30.00	180.00	$ 5,400.00
	Excavation Activities					
		Earth Ex. - Ditch (full construction)	m^3 (P)	$ 12.50	9588.00	$ 119,850.00
		Earth Ex. - Spreading	m^3 (P)	$ 7.50	9588.00	$ 71,910.00
	Reinstatement Activities					
		Hand Seeding	m^2	$ 0.60	29260.00	$ 17,556.00
		Rock Protection - Erosion Control	m^3	$ 40.00	50.00	$ 2,000.00
		Slope Stabilization	m^3	$ 100.00	2500.00	$ 250,000.00
		Sub-Total - Construction Costs				**$ 550,716.00**
		Contingency Allowance - Construction				**$ 83,000.00**
		Total - Construction Costs				**$ 633,716.00**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 500,000.00	25%	$ 125,000.00
		SNCA Enviromental Review and Permitting	LS	$ 30,931.25	100%	$ 30,931.25
		Tendering Assistance (apportioned by Section)	LS	$ 30,000.00	25%	$ 7,500.00
		Contract Administration/Inspection (apportioned for Sections 1-3)	LS	$ 380,000.00	45%	$ 171,000.00
		OMAFA Certification (apportioned by Section)	LS	$ 2,500.00	25%	$ 625.00
		Sub-Total - Engineering				**$ 335,056.25**
Total - Engineering/Administration						**$ 335,056.25**
		Other				
		Injuring Liability -- Bear River Liability Copensation	LS	$ 66,000.00	20%	$ 13,200.00
		Injuring Liability -- Bear River Maintenance Compensation	LS	$ 249,600.00	20%	$ 49,920.00
		HST	LS	(1.76% OF Costs Above)		$ 17,050.39
		Allowances	LS	(See Schedule)		$ 167,729.00
Total - Other Costs						**$ 247,899.39**
Sub-Total - Net Costs						**$ 1,216,671.64**
		Special Benefits				
Blocks F1,F2, and F3 Special Consideration - Section 2		*Consideration is given that all work associated with the current construction and Engineer's Report are fully for the benefit of the properties located in Blocks F1, F2, and F3. A "Special Benefit" is assessed to Blocks F1, F2, and F3 for work associated with the current engineering and construction in the amount prescribed below.*				
		Special Benefit -- Initial Construction	LS	$ 633,716.00	100%	$ 633,716.00
		Engineering/Administration and Other	LS	$ 582,955.64	100%	$ 582,955.64
		Sub-Total - (Special Benefit)				**$ 1,216,671.64**
Sub-Total - Special Benefits						**$ 1,216,671.64**
Total Net Costs - Section 3 (For Distribution to Properties)						**$ -**

DETAILED COST ESTIMATE
SECTION 4
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No: B16070
Date: 30-May-25

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 4						
		Construction				
Arcadis Construction	**Arcadis Design -- Construction/Implementation**					
		Construction/Implementation	L.S	$ 15,335,840.00	42%	$ 6,441,052.80
		Sub-Total - Construction Costs				**$ 6,441,052.80**
		Contingency Allowance - Construction				**$ 967,000.00**
		Total - Construction Costs				**$ 7,408,052.80**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 500,000.00	17%	$ 85,000.00
		SNCA Enviromental Review and Permitting (apportioned for Sections 1, 2, 4 & 5)	LS	$ 10,870.00	25%	$ 2,717.50
		Tendering Assistance (apportioned by Section)	LS	$ 30,000.00	17%	$ 5,100.00
		Contract Administration/Inspection (apportioned for Sections 4-5)	LS	$ 610,000.00	42%	$ 256,200.00
		OMAFA Certification (apportioned by Section)	LS	$ 2,500.00	17%	$ 425.00
		Sub-Total - Engineering				**$ 349,017.50**
Total - Engineering/Administration						**$ 349,017.50**
		Other				
		Injuring Liability -- Bear River Liability Copensation	LS	$ 66,000.00	20%	$ 13,200.00
		Injuring Liability -- Bear River Maintenance Compensation	LS	$ 249,600.00	20%	$ 49,920.00
		HST	LS	(1.76% OF Costs Above)		$ 136,524.44
		Allowances	LS	(See Schedule)		$ 137,455.00
Total - Other Costs						**$ 337,099.44**
Sub-Total - Net Costs						**$ 8,094,169.74**
		Special Benefits				
Blocks F1,F2, and F3 Special Consideration - Section 4		*Consideration is given that all work associated with the current construction and Engineer's Report are fully for the benefit of the properties located in Blocks F1, F2, and F3. A "Special Benefit" is assessed to Blocks F1, F2, and F3 for work associated with the current engineering and construction in the amount prescribed below.*				
		Special Benefit -- Initial Construction	LS	$ 7,408,052.80	100%	$ 7,408,052.80
		Engineering/Administration and Other	LS	$ 686,116.94	100%	$ 686,116.94
		Sub-Total - (Special Benefit)				**$ 8,094,169.74**
Sub-Total - Special Benefits						**$ 8,094,169.74**
Total Net Costs - Section 4 (For Distribution to Properties)						**$ -**

DETAILED COST ESTIMATE
SECTION 5
McKINNONS CREEK MUNICIPAL DRAIN

Robinson Consultants

Project No: B16070
Date: 30-May-25

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 5						
		Construction				
Arcadis Construction	**Arcadis Design -- Construction/Implementation**					
		Construction/Implementation	L.S	$ 15,335,840.00	58%	$ 8,894,787.20
		Sub-Total - Construction Costs				**$ 8,894,787.20**
		Contingency Allowance - Construction				**$ 1,335,000.00**
		Total - Construction Costs				**$ 10,229,787.20**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 500,000.00	21%	$ 105,000.00
		SNCA Enviromental Review and Permitting (apportioned for Sections 1, 2, 4 & 5)	LS	$ 10,870.00	25%	$ 2,717.50
		Tendering Assistance (apportioned by Section)	LS	$ 30,000.00	21%	$ 6,300.00
		Contract Administration/Inspection (apportioned for Sections 4-5)	LS	$ 610,000.00	58%	$ 353,800.00
		OMAFA Certification (apportioned by Section)	LS	$ 2,500.00	21%	$ 525.00
		Sub-Total - Engineering				**$ 467,817.50**
Total - Engineering/Administration						**$ 467,817.50**
		Other				
		Injuring Liability -- Bear River Liability Copensation	LS	$ 66,000.00	20%	$ 13,200.00
		Injuring Liability -- Bear River Maintenance Compensation	LS	$ 249,600.00	20%	$ 49,920.00
		HST	LS	(1.76% OF Costs Above)		$ 188,277.84
		Allowances	LS	(See Schedule)		$ 131,350.00
Total - Other Costs						**$ 382,747.84**
Sub-Total - Net Costs						**$ 11,080,352.54**
		Special Benefits				
Blocks F1,F2, and F3 Special Consideration - Section 5		*Consideration is given that all work associated with the current construction and Engineer's Report are fully for the benefit of the properties located in Blocks F1, F2, and F3. A "Special Benefit" is assessed to Blocks F1, F2, and F3 for work associated with the current engineering and construction in the amount prescribed below.*				
		Special Benefit -- Initial Construction	LS	$ 10,229,787.20	100%	$ 10,229,787.20
		Engineering/Administration and Other	LS	$ 850,565.34	100%	$ 850,565.34
		Sub-Total - (Special Benefit)				**$ 11,080,352.54**
Sub-Total - Special Benefits						**$ 11,080,352.54**
Total Net Costs - Section 5 (For Distribution to Properties)						**$ -**

Appendix E-1

Benchmark Values for the Different Land Types Adjoining the McKinnons Creek Municipal Drain
Juteau Johnson Comba Inc - February 14, 2025

Juteau Johnson Comba Inc
Real Estate Appraisers & Consultants

Consulting Letter on:
Benchmark Values for the Different Land Types Adjoining the McKinnons Creek Municipal Drain In the City of Ottawa

Effective Date:
February 14, 2025

Report Date:
January 20, 2025

Prepared For:
Robinson Consultants Inc.

2255 St. Laurent Blvd.
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Juteau Johnson Comba Inc
Real Estate Appraisers & Consultants

February 20, 2025

Reference No. 061-24-30

Robinson Consultants Inc.
210-350 Palladium Drive
Ottawa, Ontario
K2V 1A8

Attention: Mr. Lucas Gibson, C.E.T.

Re: Consulting Letter on Benchmark Values for the Different Land Types Adjoining McKinnons Creek Municipal Drain, in the City of Ottawa

Juteau Johnson Comba Inc. was engaged by Robinson Consultants Inc. on December 19, 2024 to provide benchmark values for the different land uses/types adjoining the McKinnons Creek Municipal Drain, in the City of Ottawa.

The impacted parcels in the study area are legally described as forming Part of Lots 12-14 Concession 8; Part of Lots 3-17 Concession 9; Part of Lots 5-9 Concession 10; and Part of Lots 4-8 Concession 11; all of which in Cumberland now in the City of Ottawa. A property list with property identification numbers and municipal addresses is presented in Appendix A to this report. Property ownership plans illustrating the municipal drain and drainage area boundary outlet extensions are presented in Appendix B to this report.

The McKinnons Creek study area is located in the east end of the City of Ottawa and generally bounded by Brian Coburn Boulevard to the north, Trim Road to the east, Navan and Perrault Roads to the south and Tenth Line and Milton Roads to the west.



The northerly area of study area, bounded by Trim Road to the east, Brian Coburn Boulevard to the north, Wall Road to the south and Tenth Line Road to the west, abuts the existing urban area of Orleans in the Official Plan and is designated as a Category 1 - Future Neighbourhood Overlay Schedule C17 - Urban Expansion Areas of the Official Plan. Refer to a reproduction of Schedule C17 to the right with the green arrows illustrating the subject area.

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Orleans is a suburban community in the east end of Ottawa. It straddles the two former municipalities of Gloucester and Cumberland. Cumberland is primarily a rural township, with the exception of the community of Orleans, which is a prosperous suburb of Ottawa that is characterised by a high concentration of younger households and a rapid growth in the number of new dwellings. Orleans is comprised of a number of residential neighbourhoods, a major retail strip along St. Joseph Boulevard and a commercial node along Innes Road between Tenth Line and Mer Bleue Roads, and a number of small industrial parks that are slowly developing. Residential development over the past couple of years has been concentrated in the southeast and east parts of Orleans, in the former Township of Cumberland, along Tenth Line and Trim Roads.

According to the latest City of Ottawa Development Report 2022, Orleans had a population of 126,380 and 50,140 households. This represents a growth of 8,550 persons (7.3%) and 4,090 households (8.9%) since 2018. While being fifth in terms of percentage growth in the five urban areas outside of the Greenbelt, in real terms the population and household growth rates are the third of of all five urban areas. Refer to the table below reproduced from the 2022 development report.

Population & Household Growth
In Urban Areas outside Greenbelt

	Population				Household			
Sub-Market	2018	2022	Growth	% Change	2018	2022	Growth	% Change
Kanata-Stittsville	126,180	142,990	16,810	13.3%	47,400	54,560	7,160	15.1%
South Nepean	89,040	100,930	11,890	13.4%	33,170	37,900	4,730	14.3%
Riverside South	16,610	22,950	6,340	38.2%	5,940	8,060	2,120	35.7%
Leitrim	10,080	17,970	7,890	78.3%	3,340	5,870	2,530	75.7%
Orleans	117,830	126,380	8,550	7.3%	46,050	50,140	4,090	8.9%

The southerly area of the study area includes land parcels designated Village in the Official Plan forming part of the Village of Navan. The remaining land parcels in the study area are for the most part designated Agricultural Resource Area and Rural Countryside in the Official Plan.

In order to provide benchmark values, the parcels located in the McKinnons Creek study area have been categorized by type and/or land use designation and size.

A. AGRICULTURAL RESOURCE AREA LANDS

These include the subject parcels designated Agricultural Resource Area in the City of Ottawa Official Plan. A list of these parcels within the study area is provided in Appendix C to this report. The properties within this category have been sorted by size. A LEAR score has also been identified for parcels above 10 acres. The higher the score, the greater the agricultural potential.

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The LEAR system's primary purpose is to identify those broad areas of a municipality that should be protected for long-term agricultural use. The subject parcels designated Agricultural Resource Area in the Official Plan of less than 10 acres have been categorized as building lots.

In order to provide benchmark values for this category, consideration was given to agricultural land sales #6 presented in Appendix D to this report and in summary below.

Agricultural Land Sales

Sale #	Address	PIN(s)	Zoning	Site Area (ac)	LEAR Score	Sale Price	Sale Date	Price/Acre
1	1961 Sarsfield Road, Cumberland	14540-0447	AG4	110.97	130	$1,375,000	Jul/24	$12,391
2	4486 Milton Road, Cumberland	04352-0403	AG	152.97	140	$1,800,000	Mar/24	$11,767
3	6086 Frontier Road, Cumberland	14558-0423 & 0424	AG5	94.02	160	$1,412,500	Oct/24	$15,023
4	5578 William McEwen Drive, North Gower	03901-0599	AG6	50.57	150	$787,500	Jan/25	$15,572
5	Victoria Street, Metcalfe	04311-0097 & 0100	AG2	105.79	168	$1,575,000	Jan/25	$14,888
				102.86	**150**			**$13,928**
6	2989 Tenth Line Road, Cumberland (Parcels 103-105)	14543-0229 & 0230	AG2 & AG3	131.36	142	$4,550,000	Jan/22	$34,638
				107.61	**148**			**$17,380**

The sales comprised land parcels varying in size between 50.57 and 152.97 acres and LEAR scores varying between 130 and 168. The sales transacted between January 2022 and January 2025 at per acre rates between $11,767 and $34,638. The lowest price per acre was indicated by Sale #2 (4486 Milton Road) and was reflective of land that was almost all subject to floodplain. The highest price per acre was demonstrated by Sale #6 (subject parcels 103 & 105 - Tenth Line Road) located just southeast of the existing urban area and south of the Urban Expansion Area of the Official Plan. The remaining sales were between $12,391 and $15,572 per acre and averaged $14,469 per acre.

Some consideration is also given to a current listing for sale of two adjoining agricultural resource land parcels totalling 152.69 acres located on the southwest corner of Wall and Frank Kenny Roads, about 700 metres from the Urban Expansion Area of the Official Plan. The property is currently listed at $5,000,000 or $32,746 per acre.

Conclusion - Agricultural Rescource Area Lands

In conclusion, benchmark values of $12,000 to $15,000 per acre are considered to be reasonable for the subject parcels within this category with a benchmark value of up to $35,000 per acre for the subject parcels in close proximity to the urban boundary of the Official Plan.

Reference should be made to the property list in Appendix C which identifies the parcels that are abutting or in close proximity to the urban boundary.

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B. URBAN EXPANSION AREA LANDS

This category comprises the northerly area of study area, bounded by Trim Road to the east, Brian Coburn Boulevard to the north, Wall Road to the south and Tenth Line Road to the west, abuts the existing urban area of Orleans in the Official Plan and is designated as a Category 1 - Future Neighbourhood Overlay Schedule C17 - Urban Expansion Areas of the Official Plan. A list of these parcels within the study area is provided in Appendix E to this report. The properties within this category have been sorted by size. Distance to the urban area has also been identifed for each parcel.

In order to provide benchmark values for this category, consideration was given to expansion area land sales #7-10 presented in Appendix D to this report and in summary below.

Urban Expansion Land Sales

Sale #	Address	PIN	Zoning	Site Area (ac)	LEAR Score	Sale Price	Sale Date	Price/Acre
7	2656 Trim Road, Cumberland (Parcel 125)	14564-0019	RU	105.14		$13,703,300	Jan/23	$130,334
8	2653 Mer Bleue Road , Notre-Dame-des-Champs	14544-0284	V1E[822-r] & RU	38.74		$12,212,382	Apr/23	$315,240
9	4850 Bank Street, Findlay Creek	04328-3419	RU	54.22		$18,000,000	Mar/24	$331,981
10	4570 Hawthorne Road, Findlay Creek	04326-0009	RU	125.93		$36,250,000	Apr/23	$287,858
				81.01				**$266,353**

The sales comprised land parcels varying in size between 38.74 and 125.93 acres and all represent future urban residential land. The sales transacted between January 2023 and March 2024 at per acre rates between $130,334 and $331,981, with three of the four sales between $287,858 and $331,981 per acre. The average sale price per acre of the four sales is calculated at $266,263. Sale #7 (subject Parcel #125) at $130,334 per acre represents our oldest sale. All sales were acquired by residential developers.

Conclusion - Urban Expansion Area Lands

In conclusion, benchmark values of $250,000 to $300,000 per acre are considered to be reasonable for the subject parcels within this category.

C. RURAL LANDS (10 - 50 +/- ACRES)

These include the subject parcels designated Rural Countryside and Village in the the City of Ottawa Official Plan. A list of these parcels within the study area is provided in Appendix F to this report. The properties within this category have been sorted by size. The subject parcels designated Rural Countryside and Village in the Official Plan of less than 10 acres have been categorized as building lots.

In order to provide benchmark values for this category, consideration was given to rural land sales #11-18 presented in Appendix D to this report and in summary on the following page.

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Rural Land Sales (10-50 +/- Acres)

Sale #	Address	PIN	Zoning	Site Area (ac)	LEAR Score	Sale Price	Sale Date	Price/Acre
11	1943 Sarsfield Road, Cumberland	14540-0370	RU	20.35		$500,000	Mar/24	$24,570
12	3596 Old Montreal Road, Cumberland	14535-0023	RU	10.09		$500,000	Dec/24	$49,554
12a	1721 Old Montreal Road, Cumberland	14530-0426	RU	57.27		$2,200,000	24-Apr	$38,415
13	5900 Frontier Road, Vars	14558-0090	RU	15.10		$505,000	Mar/24	$33,444
14	6247 Russell Road, Carlsbad Springs	04352-0462 & 0463	RU	44.47		$835,000	Apr/24	$18,777
15	6135 Snake Island Road, Greely	04291-0252	RU	24.69		$540,000	Nov/24	$21,871
16	1474 Parkway Road, Greely	04321-0238	RU	26.07		$955,000	May/24	$36,632
17	3710 Frank Kenny Road, Navan	14562-0149	AG2, V1E & O1	48.21		$1,246,800	Mar/24	$25,862
18	5351 Downey Road, Greely	04329-0046	AG2	48.99		$1,515,191	Dec/24	$30,929
				32.80				**$31,117**

The sales comprised land parcels varying in size between 10.09 and 57.27 acres and transacted between March 2024 and December 2024 at per acre rates ranging between $18,777 and $49,554, with an average price per acre of $31,117.

Some consideration is also given to a current listing for sale of three adjoining parcels (subject Parcels 78, 86 & 87) of 140.55 acres with frontage on the east side of Tenth Line Road, roughly 550 metres south of the urban boundary. The parcels are designated Rural Countryside and are listed at $4,500,000 or $32,017 per acre.

Conclusion - Rural Lands (10 - 50 +/- Acres)

In conclusion, benchmark values of $25,000 to $35,000 per acre are considered to be reasonable for the subject parcels within this category, and up to $40,000 per acre for the subject parcels within the Village designation of the Official Plan.

D. BUILDING LOTS (2-10 ACRES)

These include all subject parcels of 2 to 10 acres in size designated Agricultural Resource, Rural Countryside, Village and Neighbourhood in the Official Plan. The subject parcels are sorted by size and a list of these parcels (outlined in yellow) is presented in Appendices C and F to this letter.

In order to provide benchmark values for this category, consideration was given to lot sales #19-23 presented in Appendix D to this report and in summary below.

Lot Sales (2-10 acres)

Sale #	Address	PIN	Zoning	Site Area (ac)	LEAR Score	Sale Price	Sale Date	Price/Acre
19	3388 Milton Road, Navan	14543-0265	RU	2.02		$425,000	Sep/24	$210,396
20	1 Meadow Lane Road, Cumberland	14530-0050	RR1	4.69		$430,000	Mar/24	$91,684
21	817 Serendib Court, Cumberland	14534-0193	RR1 & EP	1.97		$475,000	Apr/24	$241,117
22	809 Serendib Court, Cumberland	14534-0194	RR1	1.99		$510,000	May/24	$256,281
23	1675 Wilhaven Drive, Cumberland	14527-0245	RR1	1.99		$400,000	Oct/24	$201,005
24	3596 Old Montreal Road, Cumberland	14535-0023	RU	10.09		$500,000	Dec/24	$49,554
				3.79		**$456,667**		**$175,006**

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The sales comprised land parcels varying in size between 1.97 and 10.09 acres and transacted between March 2024 and December 2024 at bulk prices ranging between $425,000 and $510,000. The price per acre varied widely between $49,554 for the larger parcel of 10.09 acres to $256,281 for an estate subdivision ravine lot. On average, the sales indicated a price per acre of $175,006.

Conclusion - Building Lots (2 - 10 Acres)

Based on the foregoing sales, it is our opinion that benchmark values ranging between $425,000 and $500,000 per lot apply to the subject parcels in this category.

E. BUILDING LOTS (2 ACRES OR LESS)

These include all subject parcels of less than 2 acres in size designated Agricultural Resource, Rural Countryside, Village and Neighbourhood in the Official Plan. The subject parcels are sorted by size and a list of these parcels (outlined in green) is presented in Appendices C and F to this letter.

In order to provide benchmark values for this category, consideration was given to lot sales #25-30 presented in Appendix D to this report and in summary below.

Lot Sales (2 acres or less)

Sale #	Address	PIN	Zoning	Site Area (ac)	LEAR Score	Sale Price	Sale Date	Price/Acre
25	3379 Trim Road, Navan	14543-023	VIE	0.43		$210,000	Apr/24	$488,372
26	2560 Mer Bleue Road, Navan	04352-0075	DR	0.34		$250,000	Jun/24	$735,294
27	3419 Old Montreal Road, Cumberland	14536-0037	RU	1.25		$350,000	Nov/24	$280,000
28	6732 Notre Dame Street, Orleans	04417-0500	R1W	0.25		$275,000	Feb/24	$1,100,000
29	6281 Beausejour Drive, Orleans	04415-0022	R1W	0.09		$270,000	Aug/24	$3,000,000
30	1551 Vercheres Street, Orleans	04419-0590	R1W	0.16		$340,000	Jul/24	$2,125,000
				0.42		**$282,500**		

The sales comprised land parcels varying in size between 0.09 and 1.25 acres and transacted between February 2024 and November 2024 at bulk prices varying between $210,000 and $350,000 depending on size and municipal services available, with an average bulk price of $282,500.

Sales #28-30 are smaller lots but located in the urban area and provided with full municipal services. Sale #27 is the largest lot at 1.25 acres and is situated outside the village boundary of Cumberland, with no municipal services available. Sale #25 along Trim Road is located within the limits of the Village of Navan but is provided with no services. Sale #26 along Mer Bleue Road is within the urban boundary and serviced with municpal water.

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Conclusion - Building Lots (2 Acres or less)

Based on the foregoing sales, it is our opinion that benchmark values ranging between $200,000 to $300,000 per lot apply to the subject parcels in this category depending on size and municipal services available.

We have prepared this consulting letter for you and your associates for your information and guidance. It is not to be reproduced, in whole or in part, without the written consent of the undersigned. Neither our name nor the material submitted may be included as part of any printed material, or used in offerings or representations in connection with the sale of securities or participation interests to the public, without our prior written consent. The report is only valid if it bears the original signature of the author.

If we can be of further assistance in these or other matters, please do not hesitate to contact us.

Yours truly,

JUTEAU JOHNSON COMBA INC.



Michel Menard, AACI, P.App.

Appendix F

Assessment Methodology

AS1.0 General

The exact method of determining the appropriate assessment and the distribution between outlet and benefit is left to the Drainage Engineer using best judgment to provide a system of assessments that is fair to all concerned. There are several basic principles that apply to the assessment for future maintenance and repair of the McKinnons Creek Municipal Drain. The principles are:

1. You cannot assess a property for any part of the cost of work that is completed upstream from it, unless there is a special circumstance.

2. You cannot make a benefit assessment against a property for work completed some distance downstream, although you do assess the property for outlet liability for this work.

3. You can only assess benefit for lands that are reasonably close to the drain. These usually are properties abutting the drain or which otherwise have direct access to the drain.

4. You cannot assess those lands that are too low to make use of the works, such as a gravel pit or quarry, unless they are clearly connected by an outlet to the drain.

5. You must assess public utilities and road authorities for the increase in the actual cost of the proposed drainage work caused by the existence of the works of the public utility or road authority. An example is a culvert on a public roadway.

6. In assessing lands covered with bush and trees, if the situation is such that once the drain is in place, the property owner will be able to clear the bush and cultivate the land, then the property should be assessed in the same way as land already under cultivation, unless there is an agreement or legal restrictions which prevent clearing and cultivation.

The principles of assessment for municipal drains have evolved over time. At present, the recommended approach is to divide the drain into a series of sections in arriving at the ultimate benefit and outlet assessment schedules. This permits the cost estimates to be developed for each section and should result in a fair distribution of costs throughout the drainage basin. The division of the drain into sections is most beneficial for assessing the cost of future maintenance and repair.

A technique that is employed to simplify the assessment process involves converting all the lands within the watershed into a factored or equivalent area. In the case of benefit assessment, this includes the area of the land within the basin and a factor that is related to land use. For outlet assessment, the area of the land within the drainage basin is calculated along with the land use and a factor that represents the location of the land relative to the drain. For the location factor (or the distance from the drain), the principle is to apply a higher factor for lands that are closer to the drain, or to an outlet

that connects directly into the drain, and a lower factor to lands that are more remote from the drain. The factored area method allows the Drainage Engineer to recognize that the volume and rate of flow of water differs with different land uses, soil types, surface conditions and distance from the drain. This method brings the entire area within a watershed to a common denominator and simplifies the application of outlet assessments.

Based on the principle that properties are only assessed for works that are undertaken downstream of the property in question, a factor is included within each section which divides the section into three equal parts (subsections) and applies a subsection factor to the outlet assessment. Therefore, the properties with an outlet within the downstream one-third of a section of drain are in essence only using one-third of the total section of drain, whereas the lands that are in the upstream one-third or beyond, are using the whole section of the drain. Hence, a subsection factor is applied to the lands within the section of the drain where maintenance will be carried out. All of the lands upstream of the section where maintenance is being undertaken are also assessed a portion of the costs of the drainage works. The assessment on the lands upstream of the section where maintenance is being completed are charged a section factor equal to the most upstream portion of the lands within the section where the work is being completed.

AS2.0 Calculation of Assessments

AS2.1 Benefit Assessment

Benefit by definition under the Drainage Act, R.S.O. 1990, c. D.17, is the "advantages to any lands, roads, building or other structures from the construction, improvement, repair or maintenance of a drainage works that will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings, or other structures".

Lands that are located immediately adjacent to the drain are charged a benefit assessment. A Benefit Assessment for maintenance is only charged against properties in the section where work is being completed. The benefit factored area is determined by multiplying the individual assessed area of each property that is immediately adjacent to the drain, by the land use factor. Using the benefit factored area for all of the properties and the cost of maintenance assigned to benefit assessment, a cost per unit benefit factored area (factored hectare) is determined. This amount is then multiplied by the total benefit factored area of each property to calculate the benefit assessment that is applied to that property.

AS2.2 Outlet Assessment

Outlet by definition under the Drainage Act, R.S.O. 1990, c. D.17, is the "outlet liability" and means the part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet. Lands and roads that may be assessable for outlet liability are those lands that use a drainage

works as an outlet or for which after construction or improvement of the drainage works an improved outlet is provided. The outlet or improved outlet may be provided either directly or indirectly through any drainage works, overland flow, swale, ravine, creek, or watercourse. Assessment for outlet is based on location, area, and rate of flow.

Each parcel of land that lies within the drainage basin and is upstream of the location where maintenance is being undertaken pays for a portion of the cost of the maintenance through an outlet assessment.

The outlet assessment factored area for each property is determined by multiplying the area of each property in the drainage basin by the land use factor, the distance factor and the section or subsection factor. Using the outlet assessment factored area for all of the properties being assessed and the cost of future maintenance and repair assigned to outlet assessment, a cost per unit outlet factored area (factored hectare) is determined. This is then multiplied by the total outlet assessment factored area of each property to calculate the outlet assessment that is applied to that property.

AS2.3 Assessment for Special Benefit

Special Benefit as defined under the Drainage Act, R.S.O. 1990, c. D.17 is "any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works." An assessment for Special Benefit and/or a Special Assessment is charged against any owner, public utility, agency, authority, or municipality for which special consideration was required to accommodate special design consideration or a special feature.

AS2.4 Injuring Liability Assessment

Injuring Liability as defined under the Drainage Act, R.S.O. 1990, c. D.17 is "If, from any land or road, water is artificially caused by any means to flow upon and injure any other land or road, the land or road from which the water is caused to flow may be assessed for injuring liability with respect to a drainage works to relieve the injury so caused to such other land or road."

AS2.5 Block Assessment

Engineer may assess a block, etc.

25. (1) of the Drainage Act: The council of the local municipality may direct the engineer to assess as a block, a built-up area designated by the council, and the sum assessed therefore may be levied against all the ratable properties in the designated area proportionately on the basis of the assessed value of the land and buildings. R.S.O. 1990, c. D.17, s. 25 (1).

Assessment to be charged against public roads.

(2) Where the engineer makes a block assessment under subsection (1), the engineer shall designate the proportion of the assessment to be charged against the public roads in the designated area. R.S.O. 1990, c. D.17, s. 25 (2).

As such, the costs as noted above (where applicable), associated with each block are charged as a block assessment to the individual blocks.

For the distribution of costs associated with future maintenance and repair within the identified Block the costs for roads, utility corridors and other public lands (if there are any public lands) are to be excluded from the property portion of the block and charged as a separate assessment to the road authority, owner of public lands or utility authority (Utility Corridors) in proportion to the area of such public or private land as a percentage of the total area of the block respectively, based on the amounts shown in Assessment Schedules for future maintenance costs for the block. This provision applies to future maintenance, but not the initial construction and related charges.

For the initial distribution of costs (or assessments) all lands, including roads, within the development areas have been included in the Special Benefit Assessment charged to the lands in Blocks F1, F2, and F3.

AS3.0 Factors Affecting Assessments

AS3.1 Maintenance Sections

The consideration of maintenance sections allows for factors to be adjusted where work for construction and future maintenance is completed. This factor accounts for how much of the drain each property uses and allows for other factors such as the Distance Factor to be applied (reducing assessments the further away from the drain the property is located). The area that is tributary to each section has been determined based on the subcatchment areas that convey flow to each section.

AS3.2 Sub-Section Factor

For each maintenance section as defined in the Report, the section is further divided into three subsections or parts. The upstream subsection is assigned a factor of 1.00, the middle subsection of the drain is assigned a factor of 0.67 and the downstream subsection is assigned a factor of 0.33. Each individual property is assigned a subsection factor corresponding to the location where the drainage from the property enters the drain. All properties upstream of a section are assigned a subsection factor of 1.0.

The use of the subsection or section factor is based on the principle that all land is assessed for maintenance that is undertaken downstream of the location where the runoff from the land enters the drain.

AS3.3 Land Use Factor

A land use factor is included in the assessment calculation to account for the volume of runoff from lands used for different purposes. A numeric value of 1.0 is assigned to all agricultural, rural use, large lot residential (greater than 2.0ha) and vacant lands, or any land where an alternative factor is not otherwise specified. A numerical value of 0.7 is assigned to unprotected forest lands (not subject to a registered management agreement). A value of 2.0 is assigned to small lots of 2.0ha (5.0 acres) or less. A value of 4.0 is assigned to land classified as higher density residential, institutional, and commercial or is a road right-of-way. A value of 2.0 is assigned for a Hydro right-of-way. A value of 0.5 is assigned to all lands designated as Provincially Significant Wetland (PSW) and subsequently protected by legislation. A value of 0.5 may be applied to forested land where the Drainage Engineer has been provided with documentation confirming that the forested land is subject to a registered Forest Management Agreement and subsequently protected from modification by the agreement.

The area of each parcel of land within the drainage basin is multiplied by the land use factor to arrive at a factored area, which is used to determine the final benefit and outlet assessment. For example, one hectare of road right-of-way is assessed at four times the rate applied to one hectare of agricultural land.

AS3.4 Distance Factor

A distance factor was developed to account for the proximity of land to the drain and the relative amount of water that will enter the drain. A band is drawn on each side of the drain at a distance of approximately 200 meters, a second band is drawn at a distance of approximately 600 metres from the drain, and a third at 1000 meters from the drain. A property that is included entirely within the first band is given a distance factor of 1.0. A property that falls entirely within the second band is given a distance factor of 0.75. A property that falls entirely within the third band is given a distance factor of 0.5 and the land that is located beyond 1000 metres from the drain (outside the third band), is given a distance factor of 0.3. In many cases, a property will not be entirely included within one of the bands. For example, one-half of a property might fall within the first band and the other half might fall in the second band. In this case, a distance factor of 0.875 is assigned to that property.

AS3.5 Grants

Grants are applied at the time of assessment, typically one (1) year or greater following the construction or maintenance of the drain based on eligibility at that time. As such, current grant eligibility should not be considered to indicate that a property will be grant eligible at the time of assessment. Additionally, it is noted that program eligibility and/or availability is subject to change at the discretion of the Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) within the Agricultural Drainage Infrastructure Program (ADIP).

To accurately provide the cost of the drain and provide property owners with the full cost for their consideration exclusive of any deductions that may be made under the Drainage Act, "grants" are not summarized in conjunction with the assessments and must be deducted separately.

Where program availability and property eligibility are confirmed at the time of assessment, the grant (currently set at 33%) will be applied to the total net assessment.

AS3.6 Allowances

Properties eligible for allowances are marked with a "**" notation in the "Allowance Eligibility" column of the Schedules of Assessment. In order to accurately provide the cost of the drain and provide property owners with the full cost of their assessment, exclusive of any deductions that may be made under the Drainage Act, allowances are not summarized in conjunction with the assessments and must be viewed separately.

The allowances have been established in accordance with Sections 29, 30 and 31 of the Drainage Act, R.S.O. 1990, c. D.17.

The allowance for the land (Section 29) is for the land lost due to ditch widening and relocation. The allowance is calculated using the following:

- The width of any land lost to the proposed construction (new – excludes the existing channel), multiplied by;
- The length of the proposed modification on the property, multiplied by;
- The unit rate (value) of lands are based on information provided by Juteau Johnson Comba Inc (JJCI) in an Appraisal Report entitled "Benchmark Values for the Different Land Types Adjoining the McKinnons Creek Municipal Drain in the City of Ottawa", dated February 14, 2025. This report is provided in **Appendix E1** for reference.

The allowance for crops lost due to the use of the working space (Sections 29 & 30) is provided for agricultural lands (only) as that area is anticipated to be out of production during construction, with reduced productivity for a period of two years thereafter. The area associated with the allowance is calculated using the following:

- The anticipated width (for spreading of material) plus the width of the prescribed buffer area, multiplied by;
- the length of the disturbed area on the property, multiplied by;
- The value of the crops.

The value of crops used in the allowance is calculated using an average of corn and soya beans, based on the latest published AgriCorp market prices for the area and the average area yield as published by the Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) to determine an average value per hectare of crops.

The allowance for existing drains (Section 31) is to compensate property owners for the costs associated with improvements to drainage works which were not constructed by requisition or petition under the Act but which will be incorporated in whole or in part in the drainage works. Section 31 of the Drainage Act, R.S.O. 1990, c. D.17 stipulates that the Engineer shall estimate and allow in money to the owner of such drain the value of such drainage works and shall include the sum in the estimated initial cost of construction, improvement or repair of the drainage works.

These allowances are fixed amounts and are in accordance with Section 62 (3) and 62(4) of the Drainage Act, R.S.O. 1990, c. D.17. The allowance shown for each property may be deducted from the final assessment levied before the assessment is collected from the affected owner. No allowance is paid to the side of the drain where no work has occurred.

Payment to the owner would only be made when the allowance is greater than the assessment against the property. The allowances can only be changed if modified prior to adoption of the report by bylaw. Where the allowance is greater than any assessment the municipality shall collect the amount and pay the amount to the respective property owners.

The allowance for land lost due to the municipal drain construction or widening has been calculated using information provided by the JJCI Appraisal Report.

The allowance for crop loss assumes full loss for the first year, 60% reduction for the second year and 40% reduction for the third year in areas where excavated material has been spread or for equipment access for construction on lands presently under cultivation.

Appendix G

Ministry of Environment
Conservation and Parks

- ARCADIS – SAR Screening and Natural Heritage Constraints Assessment

- RCI SAR Screening

October 6, 2023

Jim Burghout, Manager, Development
Claridge Homes
505 Preston St.
2nd floor
Ottawa, ON
K1S 4N7

RE : Species at Risk Screening and Natural Heritage Constraints Assessment – McKinnon's Creek, Ottawa, Ontario

Mr. Burghout,

Arcadis Professional Services (Canada) Inc. (Arcadis) was retained by Claridge Homes (Claridge) to complete a Species at Risk (SAR) habitat screening and subsequent targeted SAR surveys for terrestrial species, as well as a search for nests listed under Schedule 1 of the *Migratory Bird Regulations, 2022,* and general habitat characterization within the McKinnon's Creek corridor between Sweet Valley Park and Navan Road, Ottawa, Ontario. Proposed improvements within the McKinnon's Creek corridor include channel alterations, implementation of erosion control measures, and general wildlife habitat improvement. To accommodate proposed activities, removal of riparian vegetation is likely required.

Study Area

The Study Area for the McKinnon's Creek corridor extends from south of Sweet Valley Park south to Navan Rd. This includes a 120 m buffer from the centre line of the existing channel as required by provincial policy. Surrounding land use is dominated by medium and low-density residential subdivisions, natural areas (woodland), and agricultural fields.

Natural Heritage Policy Framework

This constraints assessment references the regulatory agencies and legislative authorities mandated to protect elements of the natural heritage system within municipal, provincial, and federal jurisdictions. The applicable policies and legislation and their associated reference materials and supporting documents are provided in **Table 1**.

October 6, 2023

Table 1: Relevant Policy and Legislation

POLICY / LEGISLATION	GOVERNING BODY, GUIDELINES, AND RESOURCES
Federal Government of Canada	
Migratory Birds Convention Act, 1994, S.C. 1994, c. 22 **(MBCA)**	**Environment and Climate Change Canada (ECCC)** - *Migratory Birds Regulations, 2022, SOR/2022-105* - *Guidelines to Avoid Harm to Migratory Birds* (ECCC 2022) - *Fact sheet: Nest Protection under the Migratory Birds Regulations, 2022 (ECCC 2022)* - *Nesting Calendars* (ECCC 2018)
Species at Risk Act, S.C. 2002, c. 29 **(SARA)**	**Environment and Climate Change Canada (ECCC)** - *Federal Species at Risk Public Registry* (ECCC 2022) - *Aquatic Species at Risk Map* (DFO 2023) - ECCC Open Data: Range Map Extents and Critical Habitat for Aquatic SAR, Provincial SAR, and National SAR (ECCC 2022c, 2022)
Provincial Government of Ontario	
Fish and Wildlife Conservation Act, 1997, S.O. 1997, c. 41 **(FWCA)**	**Ministry of Natural Resources and Forestry (MNRF)** - *Wildlife Schedules (O. Reg. 669/98)*
Endangered Species Act, 2007, S.O. 2007, c. 6 **(ESA)**	**Ministry of Environment, Conservation and Parks (MECP)** - *Species at Risk in Ontario List (O. Reg. 230/08)*
Planning Act, R.S.O. 1990, c. P.13	**Ministry of Municipal Affairs and Housing (MMAH)** - *Provincial Policy Statement, 2020*
	Wildlife Atlases and Databases: - *Ontario Breeding Bird Atlas* (BSC et al. 2006) - *Ontario Reptile and Amphibian Atlas* (Ontario Nature 2019) - *Ontario Butterfly Atlas* (TEA 2022) - *iNaturalist* Observation Records (iNaturalist 2023) - *eBird* HotSpot species lists (eBird 2023) - *Atlas of the Mammals of Ontario* (Dobbyn 1994)
	Natural Heritage Information Centre (NHIC) Database (MNRF 2023): - Species at Risk occurrence records - Species of Conservation Concern records - Natural Heritage Feature mapping
	Other resources: - *Significant Wildlife Habitat Technical Guide* (MNR 2000) - Significant Wildlife Habitat Criterion Schedule for Ecoregion 6E (MNRF 2015)
Municipal Policy	
City of Ottawa Official Plan, 2022	**City of Ottawa** - *Environmental Impact Study Guidelines* (City of Ottawa 2022) - *Protocol for Wildlife Protection During Construction* (City of Ottawa 2022)
Site Alteration By-law No. 2018-164	**City of Ottawa** - A by-law of the City of Ottawa to protect its agricultural resources and natural heritage features from negative impacts caused by site alteration.

Background Review

A desktop background review of available online databases (**Table 1**) was conducted to identify SAR occurrence records within the Study Area.

Under the ESA, all species listed as Threatened or Endangered in Ontario receive immediate 'general habitat protection'. This includes places that are used as dens, nests, hibernacula, or other residences. For some species, agencies have defined general habitat descriptions that provide science-based criteria for the habitat to be protected for some SAR species.

A review of aerial imagery was used to identify general candidate habitat for SAR based on the description of habitat provided in the MNRF's *Significant Wildlife Habitat Technical Guide, 2020*.

Field Work

Arcadis completed field work during the spring/summer of 2023. Field work was completed using standardized surveys including systematic searches for Butternut trees, Marsh Bird Monitoring for Least Bittern, SAR turtle basking surveys, Pileated Woodpecker cavity nest searches, as well as general wildlife habitat characterization.

The field work undertaken in 2023 was completed to assess potential SAR habitat surrounding the McKinnon's Creek corridor based on review of available background information, and aerial imagery.

Constraint Assessment/Mitigation

The following sections summarize the likelihood for SAR, or SAR habitat to occur within the McKinnon's Creek corridor supported with rationale that is informed by the findings from the 2023 field surveys undertaken by Arcadis.

Least Bittern:

Arcadis requested information via email from the MECP regarding the potential for Least Bittern habitat within the McKinnon's Creek corridor. MECP responded with a generic email pertaining to SAR with the following guidance:

> *"Seeking an ESA authorization or exemption is a proponent-led process.* ***This means that the person carrying out an activity is responsible for determining whether SAR and their habitat are present on or around the site of the activity, and ultimately ensuring their actions do not contravene the ESA****…*
>
> *You may proceed with the screening on your own or you may wish to consider hiring a qualified professional to perform a screening on your behalf. MECP recommends that the services of a professional environmental consultant be retained to assist in the completion of a screening, field assessments and surveys. An environmental consultant will be able to provide advice and direction on the type of surveys that should be performed and will be able to interpret the results of any surveys carried out."*

To determine next steps, Arcadis ecologists recommended completing appropriate surveys to determine habitat suitability for the Least Bittern within the McKinnon's Creek corridor.

Arcadis completed surveys on May 24, May 25 ,June 15, June 19, July 5, and July 6, 2023, using the National Least Bittern Survey Protocol to assess the suitability of the reach of McKinnon's Creek for the presence of Least Bitterns. 7 survey stations were set up along the corridor, in areas deemed "suitable" for nesting as per the survey protocol and total of 3 surveys were completed at each station. Auditory surveys are conducted by playing the Least Bittern's call and documenting any response calls made by Least Bitterns for a total of 13 minutes. The survey also requires a detailed inventory of vegetation types, avian species observed, and recording water levels at all stations.

The McKinnon's Creek corridor is a flashy water system that receives it's flows from stormwater inputs, and lacks hemi-marsh habitat (i.e., where habitat is made up of at least 50% open water to 50% vegetation ratio).

The email from the MECP states that:

> *"If after carrying out a thorough SAR screening, including any field assessments and surveys that might be necessary, there is* ***no evidence of SAR or SAR habitat located on or adjacent to the site of your activity and your activity will therefore not cause any prohibited impacts, an exemption or authorization under the ESA would not be necessary to proceed.*** *The ministry strongly recommends that you document your SAR screening and assessment and rationale for avoiding prohibited impacts for future reference if needed. Proponents are responsible for ensuring their actions do not contravene the ESA."*

Survey results provided **no evidence of Least Bittern occurrences within the impacted reach of the Mckinnon's Creek corridor.**

Furthermore, due to the unpredictable fluctuating water levels of the watercourse, the occurrence of turbid water, and lack of suitable hemi-marsh habitat for foraging and nesting, **Arcadis noted that there is no suitable habitat for SAR Least Bittern within the evaluated reach, or in adjacent lands that may be impacted by staging/lay areas.**

Butternut:

Searches for Butternut were completed in accessible lands, within 50 m of the McKinnon's Creek corridor.

Butternuts were identified at the southern extent of the evaluated corridor and are not predicted to be impacted by construction activities.

It should be noted that the trees are heavily impacted by Butternut Canker. These Butternuts would likely qualify for an exemption under *O Reg 830/21 – Exemptions of the Species at Risk Act, S.C. 2002, c. 29*. Should it be deemed that these Butternuts would be impacted by construction activities, a Butternut Health Assessment Report would have to be submitted to the MECP and registered prior to their removals.

No other butternuts were observed throughout the creek corridor.

To prevent delays due to the presence of Butternuts within adjacent lands that were not surveyed, Arcadis recommends that the following be considered when setting up road access, staging and lay areas:

- Avoid impacts to any heavily wooded areas south of Wall Road,
- Avoid impacts to forest edges south of Wall Road,
- Where possible, make use of existing access corridors (ie. the existing future ROW easements), and
- Where possible, use easements that limit the extent of vegetation clearing.

SAR Turtles:

Basking surveys and habitat assessments were undertaken during 6 site visits. No turtles were observed within or adjacent to McKinnon's Creek. Limited basking structures were available within the assessed reach of McKinnon's Creek. The substrates within the creek were mostly composed of hardened clays and silt, with limited pockets of in-water vegetation, providing little suitable foraging opportunity, and overall low-quality habitat for turtle species.

Based on these observations, the McKinnon's Creek corridor provides low quality turtle habitat. However, it may be suitable as a corridor to facilitate movement between wetlands. General avoidance measure should be considered including the following:

- Avoiding clearing the work area during sensitive timing windows for nesting turtles (March-August),
- Retain a biologist for on-site wildlife briefing for contractors, and the relocation of wildlife prior to commencing work (permits will be required from the MNRF for relocation), and
- Install exclusion fencing around the perimeter of the construction area to prevent turtles from entering the work area.

Schedule 1 Bird Nests:

No Schedule 1 Bird nests were identified within the McKinnon's Creek Corridor. General mitigation measures should be adhered to for tree removal to ensure compliance with the *Migratory Bird Conservation Act, 1994*, and the *Migratory Bird Regulations, 2022*. This includes clearing trees outside of the breeding bird window (March – August).

Other notable observations:

There appear to be several muskrat dens and at least one lodge along the corridor, as well as a beaver dam.

Dens/burrows and lodges are protected under the Fish and Wildlife Conservation Act, as stated below:

> ***"Dens: furbearing mammals***
>
> *(2) A person shall not intentionally damage or destroy the den or habitual dwelling of a furbearing mammal, other than a fox or skunk, unless the person holds a licence to trap furbearing mammals."*

The City of Ottawa should seek the services of a trapper to remove the animals from the corridor before the work begins.

Conclusion

This memo provides a summary and evaluation of the likelihood for SAR or SAR habitat to occur within the McKinnon's Creek corridor. The rationale and the recommended mitigation measures are based off on field investigations completed in 2023.

The SAR study found confirmed presence of one SAR (Butternut). The Butternuts were located within the forested community just north of Navan Road, with all trees showing advanced signs of impact from Butternut canker.

No SAR birds (Bobolink, Eastern Meadowlark) were identified during breeding bird surveys, or subsequent field visits, and no suitable habitat was identified within the Study Area.

No SAR turtles were identified during site visits, and it was determined that the reach of McKinnon's Creek provides limited basking structures, or foraging opportunities for turtles. However, it may be suitable as a corridor to facilitate movement between wetlands.

The mitigation and avoidance measures described in this report have been developed to avoid or limit negative environmental impacts associated with the proposed improvements of McKinnon's Creek. Based on the information available, it is our opinion that this proposed activities, which are required to ensure the functionality of a municipal drain, will not impact SAR or SAR habitat.

If you have any questions regarding this SAR screening and constraints assessment, please do not hesitate to contact me at 613-225-1311 ext. 64067, or alternatively at lindsay.jackson@arcadis.com.

Sincerely,



Lindsay Jackson, HBSc.
Senior Ecologist

Robinson Consultants

SPECIES AT RISK (SAR)
McKINNONS CREEK MUNICIPAL DRAIN PROJECT No. 16070
FIGURE F-1

Birds	SAR Level	Anticipated?	Description
Bobolink	Threatened	No	The Government of Ontario SAR website defines the habitat for Bobolink as follows: “Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping" It is not anticipated that Bobolink habitat will be distrubed by this project. Adjacent agriculture is typically actively farmed in soybean or corn production (not hay fields or pasture). If habitat is disturbed, the disturbance will only occur in a small portion of the existing habitat and is not expected to cause any long term affects to the species. “Avoidance” is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.
Eastern Meadowlark	Threatened	No	The Government of Ontario SAR website defines the habitat for Eastern Meadowlarks as follows: “Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.” It is not anticipated that Eastern Meadowlark habitat will be distrubed by this project. Adjacent agriculture is typically actively farmed in soybean or corn production (not hay fields or pasture). If habitat is disturbed, the disturbance will only occur in a small portion of the existing habitat and is not expected to cause any long term affects to the species. “Avoidance” is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.

Least Bittern	Threatened	No	The Government of Ontario SAR website defines the habitat for Eastern Whip-Poor-Will as follows: “Least bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.” It is not anticipated that Least Bittern habitat will be distrubed by this project. “Avoidance” is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.
Loggerhead Shrike	Endangered	No	The Government of Ontario SAR website defines the habitat for Loggerhead Shrike as follows: “In Ontario, the Loggerhead shrike prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.It builds its nest in small trees or shrubs and hunts by waiting patiently in tree branches until it swoops down and attacks its unsuspecting prey – usually large insects, such as grasshoppers. Loggerhead shrikes also require spiny, multi-branched shrubs where they can impale prey before eating it. Barbed wired fencing can also be used for this.” It is not anticipated that Loggerhead Shrike habitat will be distrubed by this project. “Avoidance” is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.

Robinson Consultants

SPECIES AT RISK (SAR)
McKINNONS CREEK MUNICIPAL DRAIN PROJECT No. 16070
FIGURE F-1

Short-Eared Owl	Threatened	No	The Government of Ontario SAR website defines the habitat for Short-Eared Owl as follows: "The Short-eared Owl lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for small mammals, especially voles." It is not anticipated that Short-Eared Owl habitat will be distrubed by this project. "Avoidance" is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.
Wood Thrush	Threatened	No	The Government of Ontario SAR website defines the habitat for Wood Thrush as follows: "The wood thrush lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests, but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech. The wood thrush flies south to Mexico and Central America for the winter" It is not anticipated that Wood Thrush habitat will be distrubed by this project. "Avoidance" is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting season. Should active nests be found additional measures will be implemented. It is recommended that clearing of tress be completed in the winter months in advance of construction to avoid having active nests near the construction area. Where this is not possible a sweep of the area for active nests will be completed daily during construction.

Robinson Consultants

SPECIES AT RISK (SAR)
McKINNONS CREEK MUNICIPAL DRAIN PROJECT No. 16070
FIGURE F-1

Plants	SAR Level	Anticipated?	Description
Butternut	Endangered	No	Butternut trees may exist in this area. Specific locations are unknown. Butternut trees, as a species, are subject to a disease known as “Butternut Canker”. Some butternut trees are resilient despite some canker (known as retainable), and some are resistant to the butternut canker disease (known as “archivable butternut trees”). Only retainable and archivable butternut trees are afforded protection under the SAR Act. Where identified within the construction work area, the status of a butternut tree must be verified by a “Qualified Butternut Health Assessor” (BHA). Protection measures will be put in place if a protected tree is identified. Compensation measures as prescribed by the Ontario Ministry of Environment Conservation and Parks (MECP) will be implemented should the removal of a protected tree be required.

Robinson Consultants

SPECIES AT RISK (SAR)
McKINNONS CREEK MUNICIPAL DRAIN PROJECT No. 16070
FIGURE F-1

Aquatic Species Turtles	SAR Level	Anticipated?	Description
Snapping Turtle	Special Concern	No	The Government of Ontario SAR website defines the habitat for Snapping Turtles as follows: "Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits" It is not anticipated that primary Snapping Turtle habitat will be distrubed by this project. General awareness is provided for species of “Special Concern”.

Appendix H

South Nation Conservation Authority
Permit (O.Reg. 41/24)

PERMIT FOR 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: City of Ottawa
110 Laurier Avenue West
Ottawa, Ontario
K2P 2H9

Decision: **Approved with Conditions**

Issued: **April 14, 2025**
Expires: **April 14, 2030**

Project Description: Watercourse alterations, erosion protection and culvert installations.

Location: McKinnons Creek, Orleans (City of Ottawa)

- Avalon West Stormwater Management Facility Outlet to the outlet of the Richard Clark Municipal Drain at its outlet to East Savage Municipal Drain.
- UTM 18 462084 5032033 to UTM 18 466719 5025436.
- Model Sta. 0+000.00 to Sta. 4+053.0 and Sta. 10+000.00 to Sta. 16+741.50.

The attached Schedules form part of this permit for the approved project. The permitted activity must be undertaken in accordance with the stated conditions.

Schedule A - Conditions
Schedule B - General Comments
Schedule C - Project Description, Plans, and Reports
Schedule D - General Terms
Schedule E - Public Notice Poster

A copy of this permit must be kept at the subject property and the public notice poster must be posted in a publicly visible area at the subject property when work is taking place. The Permit Holder shall provide written notice within **30 days** of project completion.

Permit review completed by J. Holland, Senior Planner. Technical review completed by S. Zand, Water Resource Engineer.

Dated at Finch, Ontario, this 14th day of April 2025.

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

SCHEDULE A: CONDITIONS

The Permit Holder must adhere to the following conditions:

General

1. The Project shall be carried out as per the project description, plans, and reports (Schedule “C”).

2. The Permit Holder shall abide by the recommendations and conclusions of the supporting technical studies and plans (Schedule “C”).

3. No changes to the Project shall take place without prior SNC authorization or duly enacted amendments to the permit.

Reporting, Notification, and Monitoring

4. The Permit Holder shall provide written notice to regulations@nation.on.ca no less than 28 days prior to commencing work.

5. The Permit Holder shall provide written notice to regulations@nation.on.ca no more than 30 days following project completion.

6. The public notice poster shall be posted in a publicly visible area at the Project location when work is taking place (Schedule “E”).

7. The Permit Holder shall maintain a copy of this permit on-site and shall ensure that all individuals involved in carrying out the Project are aware of the permit and its conditions.

8. Where an amendment to the Project is completed during the construction phase that would not be considered in conformance with the report, an as-built Engineer’s Report under Section 78 of the *Drainage Act* and O. Reg 500/21 will be completed describing the amendment that occurred. An amendment to the Project that does not conform to Schedule “C” may require a new permit and revisions to technical studies. Proposed additional works within or along McKinnons Creek that do not conform to Schedule “C” may require a new permit and revisions to technical studies. To obtain a permit, the amendments must not have an effect on the control of flooding and erosion; or create conditions or circumstances that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property.

9. The Permit Holder shall submit a detailed construction methodology for review and approval by SNC prior to the commencement of the Project. The Permit Holder shall submit the documents to SNC following the selection of the contractor undertaking the Project. The construction methodology must not have an effect on the control of flooding and erosion; or create conditions or circumstances that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property. The submissions shall address the following where applicable:

    a. duration of work and contingency/emergency response plans (minor and major floods);
    b. applicant and contractor's obligations;
    c. staging requirements;
    d. temporary material storage and equipment maintenance area;
    e. spoil material locations;
    f. method of diversion (dewatering plan);
    g. by-pass pump stations;
    h. dewatering hose and outlet layout;
    i. energy dissipators; and
    j. construction access route plan.

10. The Permit Holder shall submit an Erosion and Sediment Control (ESC) Technical Memo and Plan for review and approval by SNC prior to the commencement of the Project. The Permit Holder shall submit the documents to SNC following the selection of the contractor undertaking the Project. The ESC Technical Memo and Plan shall be in accordance with Schedule "C" and shall:
    a. identify who is responsible to install inspect, maintain and remove the control measures;
    b. identify the inspection and maintenance schedule (how, when, how often i.e. daily/weekly);
    c. indicate which control measures are proposed, their location and corresponding OPSD number; and
    d. indicate that it is to be considered a "Living Document" which may be modified in the event the control measures are insufficient.

11. The Permit Holder shall submit monthly Monitoring Reports showing the advancement of the project during the construction period. The Monitoring Reports shall describe the geographic extents and completed work, and provide georeferenced site photos upstream and downstream of each structure and at a 50 metre interval along the watercourse, captured from either side.

12. The Permit Holder shall submit a one-year Post Construction Monitoring Strategy to SNC prior to the commencement of the Project. The Post Construction Monitoring Strategy shall require a Certificate of Compliance issued by the Drainage Engineer to demonstrate that the Project was completed in accordance with Schedule “C”.

13. Site disturbance shall be limited to the area required for the works prescribed in the Engineer’s Report for the McKinnons Creek Municipal Drain. Other than activities allowed under this permit, there shall be no development activity nor encroachment of construction equipment or materials into adjacent hazardous lands, provincially significant wetlands, or valley lands.

SCHEDULE B: GENERAL COMMENTS

1. The Permit Holder is responsible for ensuring all necessary approvals and permission are obtained prior to undertaking the Project. The Project may be subject to other legislation and regulations including:

    - *Planning Act,* RSO 1990, c P.13
    - *Building Code Act, 1992*, S.O. 1992, c. 23
    - *Drainage Act,* RSO 1990, c D.17
    - *Ontario Water Resources Act*, R.S.O. 1990, c. O.40
    - *Public Lands Act,* RSO 1990, c P.43
    - *Lakes and Rivers Improvement Act*, RSO 1990, c L.3
    - *Endangered Species Act, 2007,* S.O. 2007, c. 6
    - *Fisheries Act,* R.S.C., 1985, c. F-14

2. Work on or adjacent to shorelines and the beds of most water bodies may require a permit from the Ministry of Natural Resources (MNR). SNC encourages the Permit Holder to contact the Ministry of Natural Resources Kemptville District Office prior to commencing the Project.

3. The Ministry of Natural Resources and the Department of Fisheries and Oceans Canada prohibit in water works on the St. Lawrence River, Ottawa River, and the lower South Nation River below the Plantagenet Weir between March 15 and July 15 of any given year. In water works are prohibited on the remainder of the South Nation River and its tributaries between March 15 and June 30 of any given year. SNC encourages the Permit Holder to contact these ministries for more information prior to commencing the Project.

SCHEDULE C: PROJECT DESCRIPTION, PLANS, AND REPORTS

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

1. Modifications to the existing McKinnons Creek channel that lower, straighten and widen the watercourse, resulting in a new profile and cross-sections.

2. Low flow channels at:
    a. STA 0+860, Tenth Line Road (462977 5031460 UTM 18) having a diameter of 900mm
    b. STA 0+943, Wall Road (463021 5031401 UTM 18) having a diameter of 900mm

3. Modifications to the existing McKinnons Creek channel involving rock protection/erosion control for surface erosion and toe erosion, installation and removal of straw and rock check dams and sediment traps.

4. Culverts at STA. 13+590.6, STA 13+938.7, STA 14+404.1, STA 14+593.5, STA 14+982.8, STA 15+509.7.

The details of the Project are outlined in the following documents provided to SNC:

1. South Nation Conservation Section 28.1 Permit Application Form. Signed by Dave Ryan, City of Ottawa on April 10, 2025.

2. Engineer's Report for the McKinnons Creek Municipal Drain and Amendments to the Richard Clark Municipal Drain. Prepared by Robinson Consulting. Signed and dated September 17, 2024.

3. Mer Bleue Urban Expansion Area McKinnons Creek Enhancement Design Brief. Prepared by Arcadis Professional Services Ltd. Dated June 2024. Signed, stamped and dated by Peter Deir P.Eng., October 3, 2024.

4. Mer Bleue Expansion Area McKinnons Creek Enhancement. Dwg. 700, 711 to 721, 730 to 736, 740, 741, 750, 751, 900. Prepared by Arcadis Professional Services Ltd. Signed, stamped and dated by Peter Deir, P.Eng. and P.Spal, P.Eng. March 15, 2023.

5. Mer Bleue Expansion Area McKinnons Creek Enhancement - Plan and Profile. Dwg. 710. Prepared by Arcadis Professional Services Ltd. Signed, stamped and dated by Peter Deir, P.Eng. and P.Spal, P.Eng. July 3, 2024.

6. Mer Bleue Expansion Area McKinnons Creek Enhancement – Sediment and Erosion Control Plan. Dwg. 900. Prepared by Arcadis Professional Services Ltd.

Signed, stamped and dated by Peter Deir, P.Eng. and P.Spal, P.Eng. May 15, 2024.

7. Special Cross Sections Details (Toe Protection). Dwg. 16070-X1 to 16070-X3. Prepared by Paterson Group. Signed, stamped and dated by D.J. Petahtegoose P.Eng., Paterson Group, October 2, 2024.

8. Slope Stability Assessment – Proposed Drainage Act Improvements McKinnons Creek Municipal Drain Mer Bleue Urban Expansion Area 10 – Ottawa, ON. Prepared by Paterson Group. Revision 8. Signed, stamped, and dated by D.J. Petahtegoose P.Eng. September 12, 2024.

9. McKinnons Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements. Prepared by GEO Matrix Ltd. Dated December 14, 2023. Signed and stamped by P. Villard P.Geo.

10. Landscape Planting Plan. Dwg. L-200 to L-204, Prepared by IBI Group. Dated September 2021. Revised March 15, 2023.

11. Erosion and Sediment Control Plan, Monitoring and Measures. S.P. No: F-1004. Dated March 2014.

12. General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks. OPSS MUNI 182. Dated November 2021.

SCHEDULE D: GENERAL TERMS

1. Period of Validity

This permit is valid for the duration stated on page one. No notice will be issued on expiration. It is the responsibility of the Permit Holder to ensure a valid permit is in effect while work on the Project is taking place. The Permit Holder may, at least 60 days before the expiry of the permit, submit an application and pay a fee to request an extension. The period of validity cannot be extended beyond 60 months.

2. Modifying the Permit

This permit is for the Project as described in Schedule "C". Proposed changes to the Project must be submitted in writing to SNC for review and approval prior to undertaking the changes. Additional fees for permit amendments may apply.

3. Other Permits and Approvals

Nothing in this permit relieves the Permit Holder from the obligation of obtaining, where necessary, regulatory approval from other agencies or government bodies including federal ministries, provincial ministries, the municipality, landowner, or authority having legal jurisdiction regarding development at the above noted location or any adjacent lands that may be impacted by the Project. SNC makes no representation as to whether the Permit Holder must obtain any other approval(s) regarding the Project. SNC hereby confirms that it is the Permit Holder's sole responsibility to ensure that it applies for and obtains all necessary regulatory approvals prior to undertaking the Project. This permit does not relieve the Permit Holder of the obligation to maintain ongoing landowner permission to undertake the Project where the Permit Holder is not the owner of the subject property. This permit does not review, certify, or provide permission for any works that may be located outside the subject property boundaries.

4. Right to Hearing

A Permit Holder who disagrees with the conditions attached to their permit may request a hearing before the SNC Board of Directors within 30 days of the date of issuance of their permit and prior to the commencement of work. Please contact SNC for further details.

5. Permit Cancellation

SNC may cancel a permit if it is of the opinion that the conditions of the permit have not been met or if false information is submitted as part of the permit application.

6. Offence

It is an offence 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 Project 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 Project.

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.

PERMIT NOTICE
AVIS DE PERMIS

PERMIT ISSUED UNDER SECTION 28.1
PERMIS DÉLIVRRÉ EN VERTU DE L'ARTICLE 28.1

CONSERVATION AUTHORITIES ACT, R.S.O. 1990, c. C.27
OFFICES DE PROTECTION DE LA NATURE (LOI SUR LES), L.R.O. 1990, CHAP. C.27

2025-CUM-R033

Date Issued/
Date de délivrance **April 14, 2025**

Expiry Date/
Date d'expiration **April 14, 2030**

Subject Property/
Propriété visée McKinnons Creek watercourse alterations, erosion protection and culvert installations.

To be posted in a publicly visible location while work is taking place.
À afficher dans un endroit visible par le public pendant les travaux.

SOUTH NATION CONSERVATION
DE LA NATION SUD

38 rue Victoria Street, Finch, ON K0C 1K0 Tel: 613-984-2948 Fax: 613-984-2872 Toll Free: 1-877-984-2948 www.nation.on.ca

Appendix I

Department of Fisheries and Oceans

- RCI – Letter of Advice
- ARCADIS – Fisheries Act Authorization

Fisheries and Oceans Canada
Pêches et Océans Canada

Ontario and Prairie 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

August 26, 2024

Our file *Notre référence*

22-HCAA-01663

Robinson Consultants Inc.
Attention: Lorne Franklin
350 Palladium Drive
Kanata, ON, K2V 1A1

Subject: Engineer's Report, McKinnon's Creek and Richard Clark Municipal Drain, City of Ottawa – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Mr. Franklin:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on June 29, 2022. We understand that you propose to incorporate additional drainage areas and update the existing drainage report within approximately 6471 linear m of McKinnon's Creek and Richard Clark Municipal Drain to include the following:

- Deepen and widen approximately 3780 linear metres (m) of Richard Clark Municipal Drain, as well as approximatively 950m of McKinnon's Creek and designate part of the creek as a municipal drain under the Drainage Act.
- Conduct half-bottom only cleanouts for approximately 530 linear m in McKinnon's Creek.
- Incorporate a two-stage low flow channel design for approximately 1980 linear metres of Richard Clark Municipal Drain.
- Stabilize eroding bank slopes with riprap in McKinnon's Creek and Richard Clark Municipal Drain, covering an area of approximately 1,400 square metres (m^2).
- Limit bottom cleanout activities until future maintenance, when needed, for 290 linear m in McKinnon's Creek and 130 linear m in Richard Clark Municipal Drain.
- Leave areas with coarse substrate (i.e., cobble and boulders) untouched.
    - In areas where cleanout activities are required, salvage existing coarse substrate and replace back into the watercourse following cleanout activities.

- Limit brushing to one bank, leaving the south and west bank undisturbed where possible.
- Maintain riparian buffer strips of ≥ 5 metres wide on both sides where the drain passes through cropland and along eroding banks.
- Install a total of approximately 10 sediment traps.
- Replace six existing culverts within Richard Clark Municipal Drain using 10-12m concrete box and CSPA culverts, with additional rock protection around culvert end treatments, maintaining improved fish passage.

Our review considered the following information:

- Request for Review received on June 29, 2022.
- Site visit conducted by Scott Blair and Chris Strand on August 31, 2022.
- Email and telephone correspondences between Scott Blair, Lorne Franklin and Dakota Dumont (Robinson Consultants Inc.) between July 5, 2022 – July 20, 2023, including updated engineer's report.

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*;
- 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*.

The aforementioned impacts 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:

- Conduct work outside the spring timing window (i.e. No in-water work between March 15 to July 15).
- A qualified environmental professional shall be on-site to conduct fish salvage and relocation activities from the isolated work area within McKinnon's Creek.
- Reseed and/or replant any disturbed banks caused by the construction activities with suitable native species.
- Install appropriate sediment erosion controls downstream of construction activities (e.g. silt curtain, straw-bale check dam, rock check dam etc.).

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 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

.../3

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 the DFO assessor (Scott.Blair@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 Scott Blair at (365) 292-2751 or by email at Scott.Blair@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Andrea Doherty

Andrea Doherty
Senior Biologist
Fish and Fish Habitat Protection Program

CC:
Scott Blair – DFO
David Ryan – City of Ottawa
Dakota Dumont – Robinson Consultants Inc.

Fisheries and Oceans Canada
Pêches et Océans Canada

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

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

August 23, 2024

Our file *Notre référence*
21-HCAA-02525

Claridge Homes (Mer Bleue)
Attention to: Jim Burghout
210 Gladstone Avenue, Suite 2001
Ottawa, ON, K2P 0Y6

Subject: Channel Alterations, McKinnon's Creek, Ottawa – *Fisheries Act* Authorization

Dear Mr. Burghout:

Pursuant to Paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*, Fisheries and Oceans Canada (DFO) authorizes the carrying on of your proposed work, undertaking or activity that results 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*.

The Authorized work(s), undertaking(s) or activity(ies) include:

- The destruction of approximately 4,500 square metres (m^2) and harmful alteration of 11,290 square metres (m^2) of McKinnon's Creek resulting from the infilling, deepening and widening of natural river channel habitat, suitable for all fish life stages.
- A permanent reduction in the water level of McKinnon's Creek will result in the destruction of approximately 1,013 square metres (m^2) of intermittent tributary habitat, suitable for spring spawning and rearing by various fish species, including Northern Pike (*Esox lucius*).
- Site isolation measures will result in a disruption of approximately 15,790 square metres (m^2) of McKinnon's Creek for the two year duration of the proposed works.

The authorization under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act* is attached.

Failure to comply with any of the terms or conditions of the attached authorization may lead to prosecution under the *Fisheries Act*.

Please note: It is understood that the attached *Fisheries Act* authorization will be incorporated into the final Drainage Engineer's Report prior to the start of any in-water works pertaining to the Authorized work(s), undertaking(s) or activity(ies) listed above.

A copy of this authorization should be kept on site while the work is in progress and, upon request, be provided to relevant federal or provincial officials. The authorization holder is responsible for ensuring work crews are familiar with, and able to adhere to, the conditions.

As you are aware, Bill C-68 included new provisions (sections 42.2 to 42.5) in the *Fisheries Act* that require the Minister of Fisheries and Oceans to establish a public registry to facilitate public access to certain records, including amongst other items, authorizations issued pursuant to paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act.* While the public registry provisions of the *Fisheries Act* are not yet in force, the Department has begun to post a list of authorizations issued since August 28, 2019, when amendments to the fish and fish habitat protection provisions of the Act came into force.

Information pertaining to this authorization will be posted to the *Fisheries Act* Registry and accessible from the Department's website at https://www.dfo-mpo.gc.ca/pnw-ppe/registry-registre-eng.html as well as from the Open Government Portal at https://open.canada.ca/data/en/dataset/2c09d2fd-9a8e-4d8c-b5af-95747e36eaac and the Common Project Search at https://common-project-search.canada.ca/. Information and data will be updated as the Department continues to develop the *Fisheries Act* Registry.

Any disclosure of information will be conducted in accordance with the *Access to Information Act* and the *Privacy Act*. Should you have any documents that contain sensitive or proprietary information that you believe should be protected from public disclosure, please contact us to discuss whether and how the information may be protected.

If you or anyone conducting work on your behalf have any questions please contact Scott Blair at (365) 292-2751 or by email at Scott.Blair@dfo-mpo.gc.ca.

Yours sincerely,

Hilary Oakman
A/ Regional Director General
Ontario & Prairie Region
Fisheries and Oceans Canada

CC: Peter Deir – Arcadis Group
Peter Spal – Arcadis Group
Michelle Lavictoire – CIMA+

Scott Blair, DFO – Fish and Fish Habitat Protection Program

ATTACHMENT: AUTHORIZATION

Paragraphs 34.4(2)(b) and 35(2)(b) *Fisheries Act* Authorization

Authorization issued to
Claridge Homes (Mer Bleue) *(hereafter referred to as the "Proponent")*

Attention to: Jim Burghout
210 Gladstone Avenue, Suite 2001
Ottawa, ON, K2P 0Y6

Location of Proposed Project

Nearest community (city, town, village):	Orléans
Municipality, district, township, county:	City of Ottawa
Province:	Ontario
Name of watercourse, waterbody:	McKinnon's Creek
Longitude and latitude, UTM Coordinates:	Longitude -75.4729°, Latitude 45.4352°

Valid Authorization Period

This Authorization remains in force from the **Date of Issuance** until **November 30, 2031**.

Please note that this Authorization may contain more specific timing requirements and limitations. These are set out in the Conditions of Authorization section.

Description of Proposed Project

The proposed project of which the work, undertaking or activity authorized is a part of involves:

> Stream-wide channel alterations to create a positive gravity stormwater outlet for a residential development and designate part of McKinnon's Creek as a municipal drain under the Drainage Act. The project works will include: deepening and widening approximately 3961 linear metres (m) of McKinnon's Creek; infilling some bank slopes and existing channel meanders with riprap and fill material; the installation of two new 20.6m x 900mm concrete culverts; and, a fish salvage prior to construction.

Description of Authorized work(s), undertaking(s) or activity(ies) likely to result in the harmful alteration, disruption or destruction of fish habitat:

The work(s), undertaking(s), or activity(ies) associated with the proposed project described above, that are likely to result in the harmful alteration, disruption or destruction of fish habitat, are:

- Deepening, widening, and infilling of the existing McKinnon's Creek channel.

The authorized work(s), undertaking(s), or activity(ies) are likely to result in the following impacts to fish and fish habitat:

- The destruction of approximately 4,500 square metres (m^2) and harmful alteration of 11,290 square metres (m^2) of McKinnon's Creek resulting from the infilling, deepening, and widening of natural river channel habitat which is suitable for all fish life stages.
- A permanent reduction in the water level of McKinnon's Creek will result in the destruction of approximately 1,013 square metres (m^2) of intermittent tributary habitat, suitable for spring spawning and rearing by various fish species, including Northern Pike (*Esox lucius*).
- Site isolation measures will result in a disruption of approximately 15,790 square metres (m^2) of McKinnon's Creek for the two year duration of the proposed works.

Conditions of Authorization

The above described work, undertaking or activity must be carried on in accordance with the following conditions.

1. **Conditions that relate to the period during which the work, undertaking or activity can be carried on**

   The work, undertaking or activity that is/are authorized to be carried on during the following period:

   From **Date of Issuance** to **December 31, 2026**.

   If the Proponent cannot complete the work, undertaking or activity during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above time period. An application for amendment, suspension or cancellation of the authorization should be submitted to DFO.

   The periods during which other conditions of this authorization must be complied with are provided in their respective sections below.

2. **Conditions that relate to measures and standards to avoid and mitigate impacts to fish and fish habitat**

2.1 Sediment and erosion control: Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity.

- 2.1.1 Effective erosion and sediment control measures shall be in place prior to, during, and after construction activities and shall remain in place until revegetation or other permanent measures are sufficient to control erosion.
- 2.1.2 Erosion and sediment control measures shall be inspected regularly and repaired or upgraded as required and temporary measures removed once the site is stabilized.
- 2.1.3 All fill material, including construction rubble, rock, and soil, to be used in construction shall be clean and free of fine materials and debris prior to placement.
- 2.1.4 Clearing of riparian vegetation shall be kept to a minimum and where removal is necessary, proper clearing techniques shall be used.
- 2.1.5 Stockpiled material shall be stored in a manner that prevents entry into nearby waterbodies.
- 2.1.6 All areas disturbed by any work, undertaking or activity associated with the project shall be stabilized through revegetation with native species, suitable for the site, upon completion of the work.

2.1.7 In-water works and activities shall be completed during low-flow or dry conditions, where possible, and avoid precipitation events.

2.1.8 A qualified environmental professional shall be on-site to conduct regular inspections of erosion and sediment control measures, as well as to conduct turbidity monitoring following CCME Environment Water Quality Guidelines for the Protection of Aquatic Life, for the duration of the in-water works.

2.1.8.1 If turbidity levels exceed water quality thresholds, all works shall be halted until turbidity returns below threshold conditions.

2.2 List of measures and standards to avoid and mitigate impacts to fish and fish habitat, described below and as set out in the Proponent's plan titled "***20230320_FAA Application McKinnonsCreek***", dated March 21, 2023, including all relevant documents referenced within the Proponent's plan (hereafter referred to as the "Offsetting Plan"):

2.2.1 No in-water work shall occur during the restricted activity period of **March 15 to July 15,** in any year, to protect the local fish community during their spawning and other critical life history stages.

2.2.2 All machinery shall arrive on site in a clean condition and be maintained free of fluid leaks, invasive species, and noxious weeds. Machinery shall be washed, refuelled, and serviced in such a way as to prevent any deleterious substance from entering the water.

2.2.3 A Spill Response Plan shall be prepared, available on site, and adhered to throughout construction.

2.2.4 Machinery shall operate on land above the high water mark (HWM) in a manner that reduces disturbances to the banks and bed of the watercourse.

2.2.4.1 Maintain an undisturbed vegetated riparian zone on one bank, leaving the west and south bank undisturbed where possible.

2.2.4.2 Conduct all future drain maintenance from the north/east side, leaving the west and south bank undisturbed.

2.2.5 A qualified environmental professional shall be on-site to conduct fish salvage and relocation from the isolated area, as required, for the duration of the in-water works.

2.2.6 Site isolation measures, including temporary cofferdams and screened intake pipes, shall be installed according to DFO's Interim Codes of Practice, and shall be inspected regularly and repaired or upgraded as required and temporary measures removed once the site is stabilized.

2.2.7 Maintain fish passage through new culverts.

2.2.8 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:

2.2.8.1 Clean, drain, and dry any equipment used in the water; and,

2.2.8.2 Never move organisms or water from one body of water to another

2.3 DFO shall be notified immediately and contingency measures shall be put in place by the Proponent if monitoring required in section 3 below indicates that the measures and standards to avoid and mitigate impacts to fish and fish habitat are not successful. In the event of failed measures and standards to avoid and mitigate impacts to fish and fish habitat, the Proponent shall develop and implement contingency measures in consultation with, and to the satisfaction of, DFO to correct the situation and minimize the impact. Monitoring and regular reporting of the corrective actions taken shall be provided to DFO until the contingency measures are successful.

2.4 Dates by which these measures and standards shall be implemented: Measures and standards to avoid and mitigate impacts to fish and fish habitat shall be implemented prior to the initiation of works, undertakings or activities and maintained until project completion.

3. **Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate impacts to fish and fish habitat**

3.1 Monitoring of avoidance and mitigation measures: The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and report to DFO by **May 1** each year on all measures implemented during construction the previous year, and indicate whether the measures and standards to avoid and mitigate impacts to fish and fish habitat were conducted according to the conditions of this authorization. This shall be done, by:

- 3.1.1 Demonstration of effective implementation and functioning: Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the impacts to fish and fish habitat to what is covered by this authorization.
- 3.1.2 Contingency measures: Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.
- 3.1.3 As-built survey: An as-built survey shall be undertaken to show the project has been constructed as proposed. A copy of the as-built survey shall be provided to DFO as part of the construction monitoring report.
- 3.1.4 A record of all fish removal efforts that were conducted with the abundance and species of fish removed, number of mortalities, and relocation locations.

4. **Conditions that relate to offsetting**

4.1 Letter of credit: DFO may draw upon funds available to DFO as the beneficiary of the Letter of Credit (in the amount of $1,414,300.00) provided to DFO as part of the application for this authorization, to cover the costs of implementing the offsetting measures required to be implemented under this authorization, including the associated monitoring and reporting measures included in section 5, in instances where the Proponent fails to implement these required measures.

4.2 Scale and description of offsetting measures: The offsetting measures shall be undertaken at McKinnon's Creek and shall be carried out in accordance with the measures set out in the Offsetting Plan, approved by DFO. The Offsetting Plan is summarized as follows:

- 4.2.1 Creation of a meandering two stage low-flow channel with an average bottom width of 1.0m for the extent of McKinnon's Creek downstream of Wall Road, for a total area of approximately 2,800 linear metres.
- 4.2.2 Creation of a "habitat enhancement area" that is hydrologically connected to McKinnon's Creek, containing 4 meandering peninsulas, 6 deep pools, and 7 root wads, for a total area of approximately 6,700 square metres (m^2).
- 4.2.3 Creation of step and pool habitats located at the downstream side of the new culverts, as well as pool habitat at the upstream side of the new culverts, each with a length of approximately 10 linear metres for a total area of 70 linear metres.
- 4.2.4 Creation of 15 linear habitat pools: 10 with a depth of 0.5m and 5 with a depth of 1.0m, each covering an area of $22m^2$, for a total area of $330m^2$.
- 4.2.5 Addition of 20 linear sediment traps, each covering an area of $22m^2$, for a total area of $440m^2$.
- 4.2.6 Addition of 27 boulder clusters throughout the new channel using clean 300–400m angular irregularly shaped boulders, with each cluster containing groups of 3 boulders.
- 4.2.7 Revegetate the riparian habitat as per the landscaping plan. This shall include a combination of deciduous and coniferous trees and herbaceous shrubs; approximately 1,129 deciduous trees, 1,201 coniferous trees, and 4,854 herbaceous shrubs.

4.3 Offsetting criteria to assess the implementation and effectiveness of the offsetting measures: All fish habitat offsetting measures shall be completed and functioning according to the criteria below and as described in the Offsetting Plan, including:

4.3.1 All habitat enhancements and features shall be shown to be constructed and installed as per the design specifications and demonstrated to be stable using visual assessments and pre- and post-construction data.
4.3.2 Maintain a minimum bottom elevation of 80.00masl for the 6 deep pools within the habitat enhancement area.
4.3.3 Demonstrate the presence of at least 5 native fish species in the newly created habitat enhancement area, including multiple life stages and at least 3 different families of fish (e.g., Minnows, Sticklebacks, Suckers, Sunfishes, Pikes).
4.3.4 Monitor survival success (minimum 80%) of the riparian vegetation plantings.

4.4 Contingency measures: If the results of monitoring as required in section 5 indicate that the offsetting measures are not completed by the date specified and/or are not functioning according to the above criteria in 4.3, the Proponent shall give written notice to DFO and shall implement the contingency measures and associated monitoring measures, as contained within the approved offsetting plan (attached to this authorization or referenced in section 4.2), and as set out in section 5 of this authorization, to ensure the implementation of the offsetting measures is completed and/or functioning as required by this authorization.
4.4.1 Scale and description of contingency measures:
4.4.1.1 Should the habitat enhancements and/or features in section 4.3.1 be deemed unstable by the end of Year 5 post construction (**2031**), additional measures shall be taken to meet the design specifications.
4.4.1.2 Should the 6 deep pools within the habitat enhancement area fail to maintain the minimum bottom elevation depth as described in section 4.3.2 by the end of Year 5 post construction (**2031**), additional measures shall be taken to meet the design specifications.
4.4.1.3 Should the fish community surveys fail to demonstrate fish presence as described in section 4.3.3 by the end of Year 5 post construction (**2031**), alternative approaches for identifying fish presence shall be developed, to be reviewed and approved by DFO, and completed within one year to meet the offsetting criteria.
4.4.1.4 Should the riparian vegetation plantings not meet the success criteria as described in section 4.3.4, by the end of Year 5 post construction (**2031**), supplemental vegetation plantings shall be completed within one year.

4.4.2 Monitoring measures to ensure offsetting contingency is completed and/or functioning as required:
4.4.2.1 Should the habitat enhancements and/or features be deemed unstable or deficient, and/or fail to meet the design specifications and require additional contingency offsetting measures as stated in sections 4.4.1, the Proponent shall prepare a comprehensive monitoring plan, to be reviewed and approved by DFO, prior to implementation of the contingency measures.

4.5 The Proponent shall not carry on any work, undertaking or activity that will adversely impact the offsetting measures.

4.6 The Proponent shall obtain written permission for the Proponent, DFO, and anyone authorized to act on behalf of DFO, to access lands, water sources, or water bodies that are not owned by or under the care, control, or administration of the Proponent that must be accessed in order to implement the offsetting measures in this section and the monitoring of said measures.

4.7 The Proponent shall provide the written permission to DFO prior to the commencement of the Authorized work(s), undertakings(s) or activity(ies) that are likely to result in impacts to fish and fish habitat, described herein, and prior to the commencement of the implementation of the Proponent's offsetting plan referred to in condition 4.2 and dated March 21, 2023 that is to take place on lands or

in water sources or water bodies not owned by or under the care, control, or administration of the Proponent.

4.8 Other conditions related to offsetting: All offsetting measures shall be maintained in perpetuity including during all future municipal drain maintenance activities.

5. **Conditions that relate to monitoring and reporting of implementation of offsetting measures (described in section 4):**

5.1 Schedule(s) and criteria: The Proponent shall conduct monitoring of the implementation of offsetting measures according to the timeline and criteria in the Offsetting Plan approved by DFO, and as listed below:

5.1.1 List of timeline(s) and monitoring and reporting criteria:

5.1.1.1 A digital photographic record of pre-construction, during construction and post-construction conditions shall be compiled using the same vantage points and direction to show that the approved works have been completed and are stable in accordance with the Offsetting Plan.

5.1.1.2 Final as-built design shall be assessed within three months of construction through as-built surveys identifying the habitat enhancement area, channel morphology, placement of habitat features within the new channel, and associated elevations match those identified in the Offsetting Plan.

5.1.1.3 The stability of the habitat enhancements and features shall be assessed through bathymetry and visual assessments during the summer during Year 1 (**2027**), Year 3 (**2029**), and Year 5 (**2031**) post construction.

5.1.1.4 The bottom elevation depths of the deep pools within the habitat enhancement area shall be assessed through bathymetric surveys during the summer during Year 1 (**2027**), Year 3 (**2029**), and Year 5 (**2031**) post construction.

5.1.1.5 Fish presence shall be monitored during Year 1 (**2027**), Year 3 (**2029**), and Year 5 (**2031**) post construction.

5.1.1.6 Riparian planting success shall be assessed annually, and shall be re-evaluated in Year 3 (**2029**) to determine if additional vegetation planting may be required to meet the success criteria by Year 5 (**2031**) post construction.

5.2 List of reports to be provided to DFO: The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this authorization by providing the following:

5.2.1 Photographic record (as described in section 5.1.1.1) and as-built survey (as described in 5.1.1.2) shall be submitted to DFO by **May 1, 2027** for the associated offsetting works.

5.2.2 The results of the offsetting measures (as described in sections 5.1.1.3, 5.1.1.4, 5.1.1.5, and 5.1.1.6) shall be submitted in a biennial (every other year) report to DFO following the end of each monitoring year, by **November 30, 2027, November 30, 2029, and November 30, 2031**.

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this authorization and for all design, safety and workmanship aspects of all the works associated with this authorization.

The holder of this authorization is hereby authorized under the authority of Paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*. R.S.C., 1985, c.F-14, to carry on the work(s), undertaking(s) and/or activity(ies) that are likely to result in impacts to fish and fish habitat as described herein.

This authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

This authorization does not permit the killing, harming, harassment, capture or taking of individuals of any aquatic species listed under the *Species at Risk Act* (SARA) (s. 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).

At the date of issuance of this authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized works, undertakings or activities.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the unauthorized 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).

The failure to comply with any condition of this authorization constitutes an offence under Paragraph 40(3)(a) of the *Fisheries Act*, and may result in charges being laid under the *Fisheries Act*.

A copy of this authorization should be kept on site while the work is in progress and upon request be provided to relevant federal or provincial officials. The authorization holder is responsible for ensuring work crews are familiar with, and able to adhere to, the conditions.

This authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this authorization shall advise DFO in advance.

Date of Issuance: August 23, 2024

Approved by:

FOR

Tricia Mitchell
Regional Director General
Ontario and Prairie Region
Fisheries and Oceans Canada

Appendix J

Reports and Technical Memorandum

Mer Bleue Expansion Area McKinnons Creek Enhancement,
Arcadis Professional Services - August 16, 2024

Andy Robinson, P.Eng., FEC
Drainage Engineer
Robinson Consultants
350 Palladium Drive, Suite 210
Ottawa, ON K2V 1A8

Arcadis Professional Services
(Canada) Inc.
333 Preston Street
Suite 500
Ottawa, Ontario K1S 5N4
Canada
Phone: 613 241 3300
www.arcadis.com

Date: August 16, 2024
Our Ref: 117618
Subject: Executive Summary: Mer Bleue Expansion Area McKinnons Creek Enhancements

Dear Mr. Robinson,

Arcadis (formerly IBI Group) has been retained by Claridge Homes, on behalf of the Mer Bleue Owners Group, to prepare the detailed design of the McKinnons Creek improvements to service the Mer Bleue Urban Expansion Area (MBUEA). The study area is generally bound by Brian Coburn Blvd. to the north, Mer Bleue Rd. to the west, Trim Rd. to the east and Navan Rd. to the south.

The purpose of the below "executive summary" is to summarize the proposed enhancement of McKinnons Creek from the outlet of the existing Avalon West SWM facility to just north of where the creek crosses Navan Rd. The design brief contains all the detailed design information for the proposed McKinnons Creek enhancements to service the MBUEA lands in support of the regulatory review and approvals that will be incorporated with the Engineers Report for the McKinnons Creek Municipal Drain as part of the Drainage Act process currently underway.

Executive Summary

Synopsis of Previous Studies

In December of 2017, Morrison Hershfield Ltd. completed the "Mer Bleue Urban Expansion Study Area Environmental Management Plan," henceforth referred to as the EMP. That study outlined the environmental constraints and opportunities associated with the MBUEA, and provided environmental management plan recommendations.

The EMP also provided a recommended implementation plan, which included the creation of a McKinnon's Creek Corridor detailed rehabilitation plan including hazard, geomorphologic, and riparian setbacks and planting plan. This plan is recommended to be completed as part of the Draft Plan of Subdivision phase prior to development to determine the development limits and phasing. As well, as part of the Draft Plan of Subdivision, the EMP recommended the conveyance of the McKinnon's Creek Corridor as part of the Natural Heritage System and incorporation as an Urban Natural Feature on Schedule B of the Official Plan.

In December of 2017, IBI Group completed the "Mer Bleue Urban Expansion Area 10 Master Servicing Study", henceforth referred to as the MSS. That study outlined the recommended stormwater management servicing of

the proposed Mer Bleue area including new stormwater management facilities discharging to McKinnons Creek as well as proposed improvements to McKinnons Creek downstream of Wall Rd. (lower reach) to accommodate the proposed MBUEA development.

In March 2018, South Nation Conservation Authority published the “McKinnons Creek Subwatershed (McKinnons, McFadden and East Savage Creeks) Flood Risk Mapping Report” (SNCA, March 27, 2018), henceforth referred to as the Flood Risk Mapping Report. That study provided a summary of the hydrologic and hydraulic modeling of the McKinnons Creek subwatershed used to generate the Regulatory Floodplain mapping for McKinnons, McFadden, and East Savage Creeks. It should be noted that that study presented modeling of the McKinnons Creek watershed and Area 10 under interim development conditions. This scenario did not include the proposed improvements to McKinnons Creek but did include development of a portion of the Area 10 lands tributary to the Avalon West SWMF that could develop in advance of the downstream creek works. The modeling from that study has been provided by SNCA for use in the current study.

In November of 2018, DSEL submitted the “Functional Servicing Report for Summerside West – Phase 4/5/6 2464 Tenth Line Road (DSEL, November 2018). That study outlined the servicing strategy for the Summerside West Phase 4/5/6 lands tributary to the Avalon West SWMF. As part of that study, JFSA submitted the “Summerside West Phase 4 / Avalon West Stormwater Management Pond Expansion” (JFSA, September 2018). That study provided analysis and evaluation of the proposed expansion of the Avalon West SWM facility to accommodate the Phase 4/5/6 lands. For the purposes of that study, the 2017 pre-development McKinnons Creek HEC-RAS model was imported into the December 2017 “pre-development” XPSWMM model, in order to model the interaction between the pond and the downstream creek dynamically. The study presented model results for pre-development peak flows in McKinnons Creek at previously established key points along the system to the study limit of Navan Rd. It should be noted that the XPSWMM model of McKinnons Creek has been carried forward and used as a basis for the current study.

In May 2019, IBI Group completed the “Mer Bleue Urban Expansion Area McKinnons Creek Stage 1 Evaluation of Enhancement Concepts for Upper Reach”, henceforth referred to as the ECUR report. That study outlined the conceptual options to enhance the upper reach of McKinnons Creek from the outlet of the Avalon West SWM facility to downstream of Wall Rd. and carried forward the preliminary design of the lower reach south of Wall Rd. to north of Navan Rd. That study provided a recommended option to be carried forward to detailed design.

In October 2021, Arcadis (IBI Group) prepared the “Mer Bleue Urban Expansion Area Northern Stormwater Management Facility” Design Brief. That design brief outlines the detailed design of the proposed Northern SWMF to service the first phase of the Mer Bleue development area. That report outlines the design constraints and regulatory requirements, along with the hydrologic and Hydraulic evaluation of the proposed SWMF. The modeling information from that study has been carried forward as required for the current analysis.

In October 2023 Arcadis prepared the “2127-2159 Mer Bleue Rd. Stormwater Management Report.” That report outlines the stormwater management evaluation and conceptual servicing of the lands at 2127-2159 Mer Bleue Rd. in support of the regulatory review of the draft plan application. That site is located east of Mer Bleue Rd., south of the existing development within the Billberry Creek Industrial Park, and north of the existing Hydro easement and future Transitway. The site will be serviced with a proposed dry pond and conveyance of outflows to the existing Avalon West SWMF via storm trunk sewer within the Avalon West development. The current analysis includes the updated information from that study.

Andy Robinson, P.Eng., FEC
Robinson Consultants
August 16, 2024

Summary of Proposed Works

The enhancement for the upper reach consists of a lowering of McKinnons Creek by approximately 0.6m at the upstream extents (at existing Avalon West SWMF outlet) with an increase in longitudinal slope to 0.1%. The channel cross-section would be updated with 2.5 horizontal to 1 vertical side slopes, 1.0m wide bottom.

A new low-flow culvert crossing of 10th Line Rd. and Wall Rd. will be required. Additionally, step pools will be implemented at the new low flow culverts to minimize the overall grade differential between the upper reach and lower reach.

The upper reach enhancements will terminate at the future Mer Bleue SWM outlet that is proposed to be located approximately 100m downstream of Wall Rd. The proposed creek enhancements will transition from the upper reach to the lower reach at the future SWM outlet.

The lower reach of McKinnons Creek will be enhanced from the future outlet of the Mer Bleue SWMF to approximately 750m upstream of Navan Road. The longitudinal slope will be 0.05%. The design cross-section established within the MSS for the lower reach has been refined to satisfy the directives provided by the Drainage Engineer and SNCA. The side slopes for the proposed channel have been design at 2.5:1 to respect the direction of the Drainage Engineer as well as the Geotechnical constraints of the site. Based on the 2 year discharge, the channel has been established with a bankfull width of 8.5 m and a bankfull depth of 1.0m with side slopes 2.5H:1V. Also based on direction of the Drainage Superintendent, a 5m wide maintenance bench will be provided at 2m above the bottom of the channel.

Control of sediment and erosion during the period following construction of the creek up to full build out of the adjacent residential lands will be critical to ensure the works are not negatively impacted by migration of sediment and possible deposition within the channel. A comprehensive staging, sediment and erosion control plan and monitoring will be provided as part of the construction contract stage of the works for both the Upper and Lower Reaches.

A post-construction monitoring program will be developed to assess the performance of the implemented design. Monitoring of McKinnon's Creek would document any impacts to the channel as a result of the proposed changes in the upstream conditions (ie upstream development). The program would be based on a geomorphological monitoring approach, which would follow the BACI (Before, After, Control, Impact) method. As such, monitoring would be initiated at several locations (control and impact areas) prior to any proposed land use changes upstream and downstream, that contribute runoff from the Stormwater Management Facility.

The design objective for the recommended enhancement strategy includes the need to minimize long term maintenance requirements and associated costs. Regular inspections will ensure the conveyance functionality of the creek. The creek will fall under the jurisdiction of the Drainage Act and it is recommended that the City Superintendent of Municipal Drains initiate a regular inspection and maintenance program for McKinnons Creek.

The conveyance functionality of the creek will be secured by regular City of Ottawa inspection and maintenance program such as:

- Inspection of the ditch, plus the inlet and outlet on an annual basis, with consideration for inspection during the following times:
    - During winter thaws and spring freshet;
    - Following less frequent storm events (greater than 50 mm of rain).
- All site visits to the ditch should include identification of any debris, vegetation or sedimentation which could potentially obstruct the outlet and prevent it from draining
- Remedial action plan to remove identified debris, vegetation and sedimentation

Andy Robinson, P.Eng., FEC
Robinson Consultants
August 16, 2024

Summary of Approvals for Proposed Works

South Nation Conservation Authority has provided input and direction through the detailed design review process. A copy of the South Nation Conservation Authority approval permits for the creek enhancements are provided in the Design Brief. Also, DFO has provided review and input on harmful alteration, disruption or destruction (HADD) to Fish under the Authorization of the Fisheries Act for the enhancement of the Upper and Lower reaches of McKinnon's Creek. Approval of the McKinnons Creek enhancement and compensation was secured from DFO through the formal review process. A copy of the DFO HADD Authorization is provided in the Design Brief.

In conclusion, the above approvals along with this executive summary will be incorporated into the draft Engineers Report by the Drainage Engineer. It is understood that the draft Report will be circulated to relevant agencies for their review and comment/feedback, including the Ministry of Environment, Conservation and Parks. At that time, ECA applications (potentially one for upstream of Navan Rd. works, one for downstream of Navan Rd. works) will be coordinated between Arcadis, the Drainage Superintendent and/or Drainage Engineer, respectively. We also understand that a letter from the Drainage Superintendent and/or Drainage Engineer will be provided to MECP which outlines the project and confirms that adjacent landowners permission will be secured through the Drainage Act. We trust the above is clear. If you should have any questions or concerns regarding the above, please feel free to contact our office.

Sincerely,
Arcadis Professional Services (Canada) Inc.

Peter Deir, P. Eng.
Water Resources

Peter Spal, P.Eng.
Associate Director

Slope Stability Assessment – Proposed Drainage Act Improvements McKinnon's Creek Municipal Drain Mer Bleue Urban Expansion Area 10

September 12, 2024

PATERSON GROUP

Consulting Engineers
9 Auriga Drive
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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Temporary Shoring Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

September 12, 2024
PG5072-LET.01 Revision 8

Arcadis Professional Services (Canada) Inc.
333 Preston Street
Suite 500
Ottawa, Ontario
K1S 5N4

Attention: **Peter Deir**

Subject: **Slope Stability Assessment – Proposed Drainage Act Improvements**
McKinnon's Creek Municipal Drain
Mer Bleue Urban Expansion Area 10 – Ottawa, ON

Further to your request and authorization, Paterson Group (Paterson) prepared the current letter report to document the slope stability assessment for the aforementioned site. The general site location is shown on Drawing PG5072-6 – Limit of Hazard Lands – Key Plan attached to the present letter report.

1.0 Background

It is understood that segments along the subject alignment of McKinnon's Creek will be improved and reinforced against future erosion from peak flow events. The subject alignment of McKinnon's Creek is located approximately between the western property boundary of 3234 Navan Road and 999 Smith Road (refer to Figure 1 - Key Plan).

It is further understood that several meander bends within the watercourse alignment have been selected by others to be provided with erosion protection as part of the proposed drainage act improvement works. Based on this, it had been requested that the watercourse alignment be reviewed from a geotechnical and slope stability perspective. It has been further requested that a Limit of Hazard Lands setback be determined as based on these analyses. Therefore, Paterson completed a desktop and field review of existing conditions of the sloped lands surrounding the subject portions of McKinnon's Creek.

2.0 Field Investigation Observations

2.1 Field Investigation

In accordance with the City of Ottawa's *Slope Stability Guidelines for Development Application in the City of Ottawa* (2004) and the Ontario Ministry of Natural Resource *Technical Guide – River and Stream Systems: Erosion Hazard Limit* (2002) Paterson has completed a detailed field review of existing slope conditions throughout the subject alignment to complete the slope stability assessment of the subject portions of McKinnon's Creek.

A summary of the subsurface information coverage available for the slope stability assessment is discussed below.

Current Field Program

A field investigation program considering the use of a drill-rig was completed by Paterson throughout the table lands throughout portions of the subject creek. The field investigation program consisted of advancing a total of four (4) boreholes to a maximum depth of 9.7 m below ground surface, and a total of 20 hand-augured holes. Test hole locations are shown on Drawing PG5072-6 - Limit of Hazard Lands - Key Plan attached to the present letter report.

At the time of the investigation, soil samples were recovered from the boreholes using a 50 mm diameter split-spoon sampler or from the auger flights.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as "N" values on the Soil Profile and Test Data sheets. The "N" value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at all boreholes. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment. Undrained shear strength testing was carried out in cohesive soils using a field vane apparatus in all test holes.

The subsurface conditions observed in the test holes were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data sheets attached to the present letter report.

Existing Adjacent Coverage

Paterson also completed a review of subsurface information based on existing adjacent coverage from investigations undertaken by Paterson or others for nearby projects. The corresponding investigations consisted of a total of 18 boreholes,18 test pits and 25 hand-auger holes advanced to a maximum of depth of 16.4, 2.5 and 1.2 m below ground surface, respectively.

The location of the existing adjacent test hole coverage is shown on all of the drawings attached to the present letter report. Reference should be made to the Soil Profile and Test Data sheets attached to this letter report for specific details of the soil profiles encountered at each test hole location.

Existing Regional Coverage

A review of regional subsurface information obtained at field investigation programs previously completed by Paterson throughout the area was also conducted. The corresponding investigations consisted of a total of fourteen (14) boreholes advanced to a maximum depth of 9.0 m below ground surface.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at several boreholes. Undrained shear strength testing was also carried out in cohesive soils using a field vane apparatus.

The general test hole location of the existing regional coverage is shown on Drawing PG5072-10 – Site Plan attached to the present letter report. Reference should be made to the Soil Profile and Test Data sheets attached to this letter report for specific details of the soil profiles encountered at each test hole location.

2.2 Subsurface Profile

Based on the existing subsurface information, the subsurface profile encountered through the subject portion of the alignment generally consists of topsoil underlain by a silty clay deposit. The silty clay deposit was observed to be further underlain by a glacial till deposit throughout the southern portion of the subject alignment.

The silty clay deposit was observed to consist of a weathered very stiff to stiff brown silty clay. The weathered silty clay layer was underlain by a stiff to firm grey silty clay deposit throughout the northern portion of the subject alignment.

The glacial till deposit was generally observed to consist of a compact to very dense glacial till. The fine matrix of the glacial till deposit generally consisted of silty sand. Gravel, cobbles and boulders were also present throughout the glacial till deposit.

Based on available geological mapping, the bedrock in the subject area consists of shale of the Billings formation, with an overburden drift thickness generally ranging between 10 and 25 m depth, with localized areas ranging between 5 to 50 m depth.

Reference should be made to the Soil Profile and Test Data sheets attached to this letter report for specific details of the soil profiles encountered at each test hole location.

2.3 Summary of Slope Observations

The existing slope conditions were reviewed by Paterson field personnel between November 21 and November 25, 2022. Prior to completing the field review, Paterson completed a desktop review of existing LiDAR and topographical maps to verify slope height, steepness, valley floor width and other features associated with slope stability. Based on this review, fourteen sections were considered for detailed topographical surveying using a high-precision GPS to further analyze the sections using a 2D slope analysis software. The remainder of the channel was reviewed thoroughly by our staff during the site visit.

The field review consisted of observing surface conditions along the length of the watercourse, including identifying the presence of vegetation, erosion, signs of movement, subsurface soil profile and groundwater information, and other features associated with the stability of the subject slopes. Paterson field personnel verified subsurface information and in-situ shear strength of cohesive soils at select slope sections using a hand-auger and field vane apparatus, respectively.

Water levels and flow within the creek were generally observed by Paterson personnel, including identifying signs of recent high-water marks or other signs of previous rises in the water levels. The top of slope alignment was determined in the field by Paterson personnel based on our field observations and assessed using a high-precision handheld GPS unit.

Overall, a total of fourteen (14) slope cross sections throughout the above-noted locations were analyzed as part of the slope stability analysis. Topographic surface elevations measured at select cross-section locations in combination with LiDAR information was evaluated to model the corresponding slopes, and as indicated in preceding paragraphs. The select slope locations were analyzed using SLIDE, a computer program for two-dimensional slope stability analysis using limit equilibrium analysis methods. The cross-section locations and associated Limit of Hazard Lands setbacks are presented on Drawing PG5072-6 – Limit of Hazard Lands – Key Plan.

The following section is a summary of our observations during the time of our field review of the subject slopes. Photographs of the subject slopes have also been attached to the present letter report.

Slope Sections A to C

The slope profile across the area of slope sections A to C was observed to range between approximate steepness's of 1.5H:1V to 2H:1V. Further, the slopes were observed to be between 1.9 to 3.8 m in height. The width of the creek was noted to be between approximately 4 and 5 m wide.

Based on hand auger holes and general observations, the subsurface conditions of the aforementioned slope areas consisted of a hard to very stiff brown silty clay underlain by a firm grey silty clay. Erosion was observed throughout the select slope sections and some meander bends. This generally consisted of shallow slip failures at some meander bends where the toe of slope abutted against the watercourse, undercutting in some of the bank and bare soil without mature vegetation being exposed along some portions of the bank edges. However, vegetation was observed to be intact and mature across the majority of the subject area along the slopes, valley corridors and overlying lands and consisted of brush and some large trees.

Slope Sections E to G

The slope profile across the area of slope sections E to G was observed to range between approximate steepness's of 1.3H:1V to 3H:1V. Further, the slopes were observed to be between 3.1 to 4.0 m in height. The width of the creek was noted to be between approximately 4 and 8 m wide.

Based on our review, the subsurface conditions of the slopes throughout this portion of the site generally consisted of a deposit of hard to very stiff brown silty clay underlain by firm grey silty clay and further underlain by compact glacial till. The glacial till deposit was observed to contain cobbles and boulders visible near the edge of the creek. It should also be noted that the channel bed was observed to consist of glacial till, with several cobbles and boulders protruding above the channel's water level surface.

Erosion was observed throughout the select slope sections and some meander bends. This generally consisted of shallow slip failures at some meander bends where the toe of slope abutted against the watercourse, undercutting in some of the bank and bare soil without mature vegetation being exposed along some portions of the bank's edges. However, vegetation was observed to be intact and mature across the majority of the subject area along the slopes, valley corridors and overlying lands and consisted of brush and some trees.

Slope Section H to K

The slope profile across the area of slope sections H to K was observed to range between approximate steepness's of 1.5H:1V to 3H:1V. Further, the slopes were observed to be between 5.3 to 6.4 m in height. The width of the creek was noted to be between approximately 5 and 12 m wide.

Based on our review, the subsurface conditions of the slopes throughout this portion of the site generally consisted of a deposit of hard to very stiff brown silty clay underlain by firm grey silty clay and further underlain by compact glacial till. The glacial till deposit was observed to contain cobbles and boulders visible near the edge of and within the creek.

Erosion was observed and consisted of near-vertical surfaces formed by shallow slip surfaces from toe erosion, exposed root systems near the base of the slope and some undercutting of the bank edge. Overall, minimal vegetation was observed on the slope face, with increasing vegetation on the abutting table lands of the aforementioned slope areas.

Slope Section L and M

The slope profile across the area of slope Section L and Section M was observed to range between approximate steepness's of 1.8H:1V to 2.3H:1V. Further, the slopes were observed to be between 4.2 to 5.8 m in height. The width of the creek was noted to be between approximately 8 and 17 m wide.

Based on our review, the subsurface conditions of the slopes throughout this portion of the site generally consisted of a deposit of hard to very stiff brown silty clay underlain by firm grey silty clay and further underlain by compact glacial till. The glacial till deposit was observed to contain cobbles and boulders visible near the edge of the creek. It should also be noted that the channel bed was observed to consist of glacial till, with several cobbles and boulders protruding above the water level surface in the channel.

Erosion was observed throughout the select slope sections and some meander bends. This generally consisted of shallow slip failures at some meander bends where the toe of slope abutted against the watercourse, trees with bent alignments indicating general signs of historical movement, undercutting in some of the bank and bare soil without mature vegetation being exposed along some portions of the bank's edges. However, vegetation was observed to be intact and mature across the majority of the subject area along the slopes, valley corridors and overlying lands and consisted of brush and some trees.

Slope Sections N to O and Slope Section D

The slope profile across the area of slope sections L to O and slope section D was observed to range between approximate steepness' of 1.4H:1V to 2.6H:1V. Further, the slopes were observed to be between 4.8 to 7.7 m in height. The width of the creek was noted to be between approximately 6 and 8 m wide.

Based on hand auger holes conducted by Paterson at the time if the field investigation, the subsurface conditions of the aforementioned slope areas consisted of brown silty clay, which was underlain by grey silty clay and further underlain by a glacial till deposit with some cobbles and boulders visible near the edge of the creek. Active erosion was observed throughout the slope section. This generally consisted of slip failure surfaces, near vertical surfaces, undercutting and exposed silty clay and roots near the base of the slope. Overall, vegetation was observed to be mature across the majority of the aforementioned slope areas.

Reference should be made to Drawing PG5072-6 – Limit of Hazard Lands – Key Plan attached to the current report which depicts the above-noted section of the watercourse and the associated slope stability cross-sections and setback information. Photographs from the site visit are attached following this letter report.

3.0 Slope Stability Assessment

As noted above, a slope stability assessment has been conducted to determine the applicable geotechnical Limit of Hazard Lands setback at this site and to provide recommendations associated with the proposed Drainage Act improvements.

A total of fourteen (14) slope cross-sections were analyzed under static and seismic conditions. The cross-section locations are presented on Drawing PG5072-6 – Limit of Hazard Lands – Key Plan, which is attached to the current letter report.

Slope Stability Analysis

The analyses of the stability of the slopes were carried out using SLIDE, a computer program which permits a two-dimensional slope stability analysis using limit equilibrium analysis, including the Bishop's method, which is a widely used and accepted analysis method. The program calculates a factor of safety, which represents the ratio of the forces resisting failure to those favoring failure. Theoretically, a factor of safety of 1.0 represents a condition where the slope is stable.

However, due to intrinsic limitations of the calculation methods and the variability of the subsoil and groundwater conditions, a factor of safety greater than one is usually required to ascertain that the risks of failure are acceptable. A minimum factor of safety of 1.5 is generally recommended for conditions where the failure of the slope would endanger permanent structures and in accordance with the City of Ottawa's *Slope Stability Guidelines for Development Application in the City of Ottawa* (2004)

The cross-sections were analyzed based on the existing conditions observed during our site visits. The slope profiles were modeled based on topographic information obtained by Paterson field personnel using a high-precision handheld GPS unit and supplemented with publicly available LiDAR information, as depicted on Drawings PG5072-6.1 to PG5072-9.1 attached to the current letter report. Based on a review of LiDAR data and aerial photography no clear evidence of landslides along the McKinnons Creek valley. Subsoil conditions at the cross-sections were determined based on the existing subsurface information collected during the current and previous geotechnical investigations throughout the subject alignment.

The location of the cross-sections was conservatively chosen to analyze the worst-case scenarios encountered throughout the subject alignment from a slope stability perspective. Further, observations included in the desktop historical assessment and field assessment completed by GEO-Morphix in the technical report *McKinnons Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements*, dated January 23, 2023, were also considered as part of our analysis and review.

The slope stability analysis was completed at each slope cross-section by modeling the slope geometry in a 2D section, assigning the appropriate parameters to the individual subsoil layers and assigning fully saturated conditions. The effective strength soil parameters used for static analysis were chosen based on the subsoil information recovered during the current and previous geotechnical investigations. The effective strength soil parameters used for static analysis are presented in Table 1.

Table 1 – Effective Strength Soil and Material Parameters (Static Analysis)

Soil Layer	Unit Weight (kN/m^3)	Friction Angle (degrees)	Cohesion (kPa)
Brown Silty Clay	17	33	5
Grey Silty Clay	16	33	10
Glacial Till	20	35	1

The total strength soil parameters used for seismic analysis were also chosen based on the subsoil information recovered during the current and previous geotechnical field investigations. The strength parameters used for seismic analysis at the slope cross-sections are presented in Table 2.

Table 2 - Total Strength Soil and Material Parameters (Seismic Analysis)			
Soil Layer	**Unit Weight (kN/m^3)**	**Friction Angle (degrees)**	**Cohesion (kPa)**
Brown Silty Clay	17	33	120
Grey Silty Clay	16	33	25
Glacial Till	20	35	1

Static Loading Analysis

The results for the slope stability analysis are shown in Figures 3A to 16A, attached to the present letter report. The factor of safety was found to be less than 1.5 at the majority of slope sections with the exception of Section B and Section K. As such all slopes that were found to have a factor of safety less than 1.5 have been provided a suitable stable slope allowance to attain a factor of safety of 1.5 for the static loading scenario. The applicable stable slope allowance setback, corresponding to where the factor of safety is a minimum of 1.5, has been provided in Table 4 – Summary of Limit of Hazard Lands Setbacks.

Seismic Loading Analysis

An analysis considering seismic loading and the groundwater at ground surface was also completed. A horizontal acceleration of 0.16g was considered for all slopes. This acceleration is considered as half of the peak (horizontal) ground acceleration (PGA) of 0.32g. A factor of safety of 1.1 is considered to be satisfactory for stability analyses including seismic loading. The results of the analysis including seismic loading are shown in Figures 3B to 16B attached to the present letter report.

The results indicated the factor of safety exceeded 1.1 at all slope sections analyzed for stability analyses considering seismic loading. As such, a stable slope allowance considering seismic loading conditions is not considered applicable for the subject slopes. Based on our review, the slopes reviewed as part of this assessment are considered stable from a geotechnical perspective.

Toe Erosion Allowance

Since the slopes are in close proximity to an active watercourse, erosion of the toe of slope is considered to be a notable factor in maintaining slope stability. The majority of the banks abutting the watercourse were observed to be affected by minor to notable signs of erosion. As discussed, these signs generally consisted of some sloughing, undercutting of banks, bare soil being exposed along the bank face and exposed roots for mature vegetation along sloped areas and as observed during the field review.

The severity of the erosion generally depended on channel geometry that would be favorable in eroding bank material when flow regimes would be at their strongest. Less severe erosion was observed along relatively straight and long portions of the channel which was observed to consist of small patches of a lack of vegetation or minor undercutting along the bank face. Moderate erosion was observed in areas where several consecutive sharp meander bends in the watercourse alignment occurred within a relatively short distance.

Subsurface conditions at the toe of slope varied between in-situ, stiff silty clay and compact clayey or sandy glacial till. Based on this, a toe erosion allowance based on existing conditions of 5 and 6 m is considered suitable for slopes whose existing and non-improved toe of slope was observed to consist of either in-situ, stiff silty clay and compact glacial till, respectively.

This value was based on our field observations of the existing in-situ soil conditions and the toe erosion setback value ranges provided in the Ministry of Natural Resource's *Technical Guide – River and Stream Systems: Erosion Hazard Limit* (2002). Based on our observations, the nature of the erosion throughout the subject site has not been observed to severely impact the stability of the table lands or affect the functionality of the existing channel. Areas where moderate erosion has persisted were generally observed to be stable, indicating that higher setback allowances may be too conservative for the nature of the subject channel.

Overall, erosion activity and erosion risk throughout the channel was considered low to moderate, and as noted by the fluvial geomorphological assessment. In addition, in discussion with GEO-Morphix, it is understood that the 100-year erosion distance was calculated to range between 2.5 and 10 m within the subject site, resulting in the toe erosion setback assigned in this report to be located within the middle of the aforementioned range. Based on the above and given the low severity of the risk associated with the observed erosion and the nature of subsoil forming the valley corridor slopes, the recommended toe erosion setbacks provided herein are considered appropriate for the subject site form a geotechnical perspective.

It should be noted that portions of the slope that would be improved with erosion protection using the methodology described in Section 4.0 - *Recommendations* of this letter report, would not be subject to on-going toe erosion of the natural bank. Based on this, the Toe Erosion Allowance component of the Limit of Hazard Lands designation line could be considerably reduced from the aforementioned existing condition Toe Erosion Allowance advised herein where erosion protection measures are implemented as indicated herein and under the supervision and approval of Paterson personnel at the time construction.

This type of reduction would be assessed by a Licensed Professional Engineer in the Province of Ontario specializing in geotechnical engineering and experienced in evaluating the stability of slopes for confined watercourses and in accordance with the current guidelines associated with those evaluations. The assessment would be completed at a later stage of review should a landowner choose to establish a site-specific Limit of Hazard Lands designation line for their property as part of undertaking development/improvement throughout their property and in accordance with the associated approvals and permitting processes in place.

Erosion Access Setback Allowance

An erosion access allowance setback of 6 m was provided to all portions of the subject slopes assessed as part of this review.

Limit of Hazard Lands

Based on these observations, channel measurements, discussion with GEO-Morphix personnel, and the results of slope stability analysis, Paterson assigned a Limit of Hazard Lands setback from the observed top of slope alignment. The Limit of Hazard Lands is a geotechnical setback formed by a combination of allowances considering stable slope, toe erosion and erosion access. The allowances were selected based on our field observations and in accordance with the City of Ottawa's *Slope Stability Guidelines for Development Applications* (2004) and the Ontario Ministry of Natural Resource *Technical Guide – River and Stream Systems: Erosion Hazard Limit* (2002).

The Limit of Hazard Lands setback for each slope cross-section is shown in Table 4 below and is illustrated on the attached Drawing PG5072-6 - Limit of Hazard Lands - Key Plan.

It should be noted that the suggested Limit of Hazard Lands designation line provided in this report is based on an evaluation of the information available throughout the subject sections of McKinnon's Creek and is only considered applicable to this project. Based on this, the Limit of Hazard Lands designation line that would be required to be determined by others to assess the feasibility for development of parcels encroaching onto McKinnon's Creek may and can be different than the designation line presented in this study, since it would be expected those parcels would undertake site-specific testing and reviews in accordance with the aforementioned guidelines and regulated approvals processes. The currently proposed Limit of Hazard Lands designation line is not considered valid for assessing parcel-specific development potential since it is only considered valid for the purpose of this study and report and will need to be determined on a parcel specific-basis as part of future development applications.

Therefore, development-specific Limits of Hazard Lands setbacks could differ from those presented herein provided the slope and subsoil conditions are investigated appropriately by a qualified licensed engineer and justified in accordance with the pertinent guidelines (such as the City of Ottawa's *Slope Stability Guidelines for Development Application in the City of Ottawa* (2004) and the Ontario Ministry of Natural Resource *Technical Guide – River and Stream Systems: Erosion Hazard Limit* (2002) and others designated by the City of Ottawa and associated review agencies).

Table 3 – Summary Limit of Hazard Lands Setbacks

Slope Cross Sections	Stable Slope Allowance [m]	Toe Erosion Allowance [m]	Erosion Access Allowance [m]	Limit of Hazard Lands [m]
A	3	5	6	14
B	0	5	6	11
C	2	5	6	13
D	5.5	6	6	17.5
E	9	6	6	21
F	7	6	6	19
G	8	6	6	20
H	6	5	6	17
J	10	5	6	21
K	0	6	6	12
L	5.5	6	6	17.5
M	13	6	6	25
N	15.5	6	6	27.5
O	12	6	6	24

Assessment For Potential of Earth Flow Sliding

Factors that are documented to contribute to the susceptibility for progressive failures to occur within slopes located within the Ottawa area are based on overburden characteristics such as its sensitivity (for clay soils), topographic relief, and proximity to historic landslides and/or earth flows. At the time of preparing this report, based on available mapping complete by the Geological Survey of Canada (Open Files 5311, 7432 and 8600), there are no landslides inventories throughout the footprint of McKinnon's Creek. The nearest landslide, landslide "Mbu12", has been inventoried to be located approximately 1.6 km from the subject site and described as having "retrogressed into the scarp slope forming the northern margin of the Mer Bleue paleochannel of the proto-Ottawa River" (OF8600, 2021).

This landslide, along with others adjacent to and west of its footprint, were formed along the Mer Bleue paleochannel of the proto-Ottawa River. These landslides have not been dated; however, it is not believed the setting that may have triggered these landslides is similar to those throughout the subject site. This is due to the differences between the assumed previous paleochannel footprint and bank height landforms and the relatively smaller channel throughout McKinnon's Creek footprint. Therefore, the nearby historical and inventoried landslides are not anticipated to be relevant in assessing landslides susceptibility throughout the subject site.

Historically, landslides throughout the Ottawa area have affected mostly deep marine clay deposits. Should a slope failure occur within a clay deposit, the potential for retrogression can be assessed by estimating the stability number, N_s, as outlined in *Flowsliding in Sensitive Soil* (Mitchell & Markell, 1974) and described below:

$$N_s = yH/S_u,$$

where y represents the unit weight of the overburden material throughout the slope (kN/m^3), H depicts the height of the bank (m), and S_u represents the peak undrained shear strength (kPa). Mitchell & Markell (1974) completed analysis of forty landslides and determined that N_s should be greater than or equal to 6 for the soil to have the potential to undergo a retrogressive event.

Based on these measurements completed along the alignment, the stability number for the subject site was estimated to be below 6. Therefore, the subject site is not considered to present the characteristics for a potential earth flow to develop by retrogression. Portions of the slopes/banks that are comprised of glacial till slopes have not historically been documented to undergo earth flow slides throughout the Ottawa-area, and therefore, do not present as having a meaningful likelihood to undergo earth flow sliding.

Topographic relief (i.e., slope height) is also a significant factor contributing to the potential for landslides and earth flows to develop (i.e., unlikely in small slopes, but more likely in higher in slopes). In particular, landslides occur more frequently in areas with more than 10 m of topographic relief. The height of slope ranges between 1.9 and 7.7 m, and do not reach up to 10 m. Although this does not rule out the possibility of the flow slide to occur, the likelihood would be considered significantly reduced for the potential of earth flow sliding to develop throughout the majority of the subject site. It should be noted the portion of the creek south of 3510 Birchtree Crescent and up to 3540 Birchtree Crescent present slopes reaching up to and exceeding 8 m in height.

Another major contributing factor to triggering earth flows would be active erosion at the toe of slopes. Previous shallow slip surfaces have developed locally throughout the area of the subject creek alignment and as a result of active erosion. However, given the geotechnical and geomorphological field review that has been undertaken as part of this study, areas that were observed to be most susceptible to being extensively impacted by on-going erosion, as well as areas that could in the future become majorly impacted, have been identified and recommended to be remediate with erosion protection measures. The erosion protection will serve to mitigate the potential for a slope failure triggered by erosion where it is implemented and mitigates the risk associated with earth flows throughout erosion-susceptible areas.

The remainder of the creek appeared to either not be undergoing active erosion, or active erosion appeared to be minor and/or in areas with relatively shallow topographic relief which would have a lower likelihood to result in earth flow slides. Therefore, based on the low severity of the risk associated with the observed erosion and the nature of subsoil forming the valley corridor slopes, as well as the proposed placement of toe erosion protection along portions of the bottom of the slopes, the subject slopes are not considered susceptible to develop earth flow sliding from a geotechnical perspective.

4.0 Recommendations

Several areas were identified based on our field observations and our review of information provided by GEO-Morphix, where erosion is actively occurring or is likely to occur. These areas are depicted in the plans attached to our present report. In required areas, a toe erosion control program can be implemented to eliminate the toe erosion setback and reduce or eliminate potential future slope failures. Therefore, the following erosion protection procedure is to be undertaken in the proposed areas from a geotechnical perspective for required areas:

- Once the water level is lowered, it is recommended that any eroded sections be cleaned from deleterious material such as loose eroded material or broken tree branches.

- The slope should be excavated in a benched fashion with minimum 500 mm wide benches, leaving a 300 mm toe at the base of the slope to maintain separation between the channel and the excavation area. The slope should be excavated in a benched fashion with 300 to 600 mm high benches (varies based on bend-specific geometry and as advised by Paterson).
- After excavating to an approved subgrade surface, it is recommended that a Class II non-woven geotextile liner, such as Terrafix 360R or equivalent, be placed directly against the approved subgrade. Additional geotextile should be provided to allow the rip-rap material to be wrapped as required.
- Rip-rap consisting of sound and durable rock, such as quarried limestone within the site range of 0.15 to 0.6 m, should be placed directly above the non-woven geotextile liner.
    - The rip-rap material for the majority of the erosion protection areas should have minimal fines (less than 5%) with a minimum of 50% of the stones being 500 mm diameter in size and the finer stone quantity should be insufficient to fill the voids in the larger stones. The finer stones should be angular to provide maximum interlock. Local quarries sometimes classify this coarse rip-rap material as “MTO rip-rap”, but it is more specifically referenced as “rock protection” under OPSS MUNI 1004.
    - The basic thickness of the rip-rap layer in these areas should generally be of the order of 1.5 times the thickness of the stones. Considering that 0.4 m is expected to be the size of most of the coarser stones, a nominal maximum rip-rap layer thickness of 0.6 m has been recommended.
    - The rip-rap material for the erosion protection at the bend located at STA 12+200 should have minimal fines (less than 5%) with a minimum of 50% of the stones being 700 to 800 mm diameter in size and the finer stone quantity should be insufficient to fill the voids in the larger stones. The finer stones should be angular to provide maximum interlock. The thickness of the nominal maximum rip-rap layer thickness for this bend may be considered as between 0.9 to 1.0 m
- The rip-rap should be placed starting at the base of the excavation and in a manner to provide a solid base for the wedge of the rip-rap up the sidewalls of the exposed bank. The inclination of the finished surface should either match the adjacent slope surfaces in areas where the bank face has not been heavily eroded and up to a maximum steepness of 2H:1V unless advised otherwise by Paterson.
- It should be noted that the existing vegetation above the repaired area should remain in place. Any affected areas should be re-vegetated using a minimum of 100 to 150 mm of topsoil mixed with a hardy grass seed and/or an erosion control blanket, placed across the affected slope face.
- Channel bioengineering to be incorporated within above-noted sequence as advised and detailed on *Figure 2 – Toe Protection at Toe of Slope.*
- It is expected some existing drainage features/gullies will need to be addressed at the time of construction by the design team and Paterson personnel to ensure adequate tie-in of these features to the proposed erosion control measures.

- All portions of the above-noted work, including preparing the slopes, sub-excavations, preparation of benched cuts, placement of geotextiles, rip-rap, bioengineered (to be reviewed by project geomorphologist), tie-ins to gullies/existing drainage features and reinstatement works are to be reviewed at the time of construction by Paterson personnel for each bend these works are implemented. It is recommended the pre-construction meetings take place with Paterson and the earthworks contractor (and other design and construction team members) prior to undertaking the proposed work.

Reference should be made to *Figure 2 – Toe Protection at Toe of Slope* attached to this report for additional information pertaining to the proposed erosion protection. It is recommended that the above-noted erosion protection measures be coordinated with Paterson personnel at the pre-construction phase and be verified by Paterson personnel at the time of construction. Based on our current assessment of the existing slopes and watercourse conditions, the Limit of Hazard Lands setback may be reduced by several considerations such as the re-shaping of slopes/table lands where the factor of safety has been estimated to be less than 1.5, implementation of erosion protection systems and re-construction or re-alignment of the channels, among other options. It is recommended that the aforementioned options or any other alternatives considered be reviewed with Paterson to assess suitability from a geotechnical perspective.

5.0 Statement of Limitations

The recommendations provided in this letter report are in accordance with our present understanding of the project. We request permission to review our recommendations when the drawings and specifications are completed.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine its suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

We trust that this information meets your immediate requirements.

Best Regards,

Paterson Group Inc.



Fernanda Carozzi, PhD. Geoph. Drew Petahtegoose, P.Eng.

Attachments

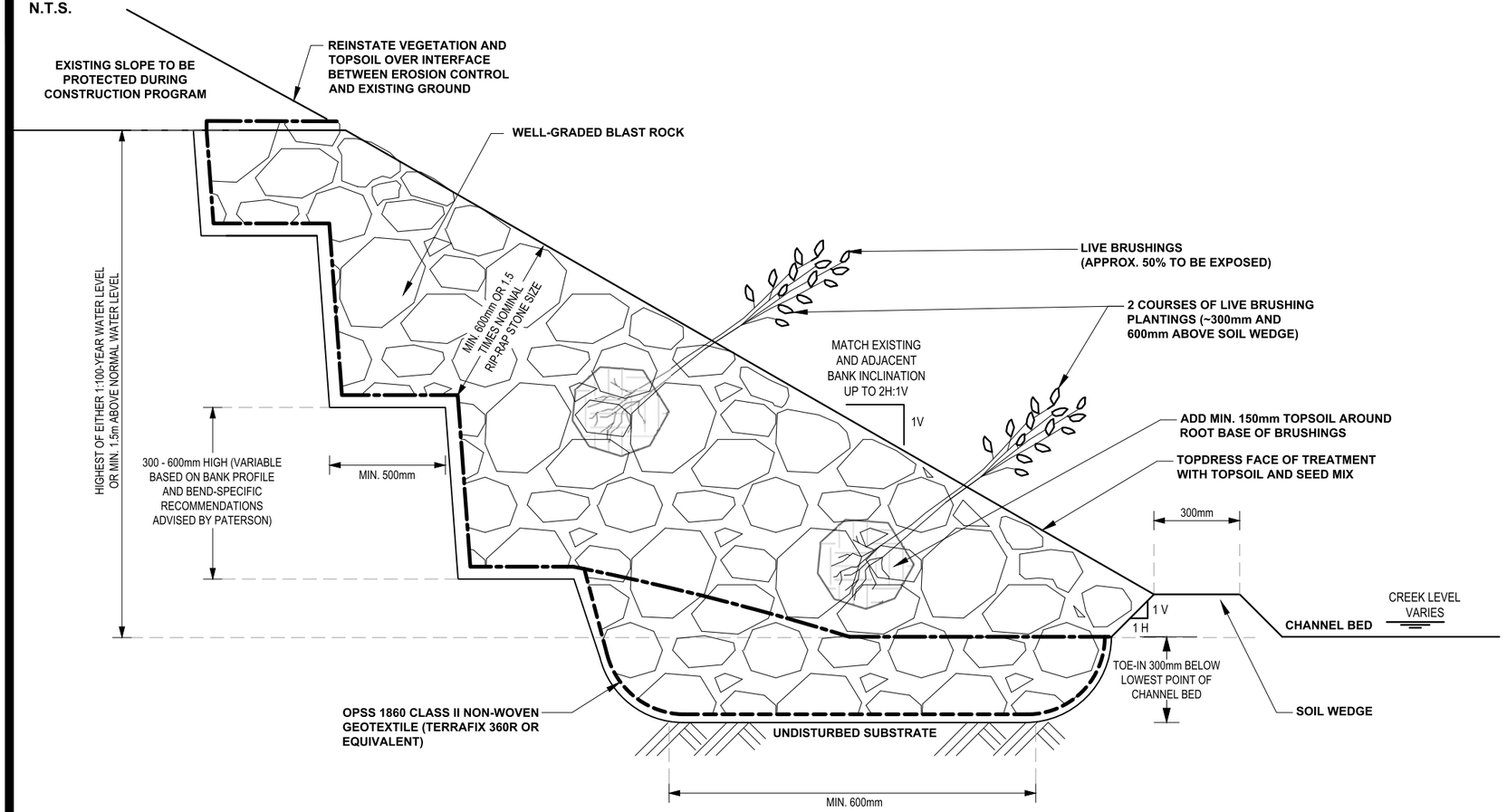
- ❏ Soil Profile and Test Data Sheets
- ❏ Symbols and Terms
- ❏ Figure 1 – Key Plan
- ❏ Figure 2 – Toe Protection at Toe of Slope
- ❏ Photographs from Site Visit
- ❏ Figure 3A to 16B – Slope Stability Cross-Sections
- ❏ Drawing PG5072-6 & 6.1 - Limit of Hazard Lands Key Plan
- ❏ Drawing PG5072-7 & 7.1 - Limit of Hazard Lands
- ❏ Drawing PG5072-8 & 8.1 - Limit of Hazard Lands
- ❏ Drawing PG5072-9 & 9.1 - Limit of Hazard Lands
- ❏ Drawing PG5072-10 - Site Plan

Report Distribution

- ❏ Arcadis Professional Services (Canada) Inc. (e-mail copy)
- ❏ Paterson Group Inc. (1 copy)

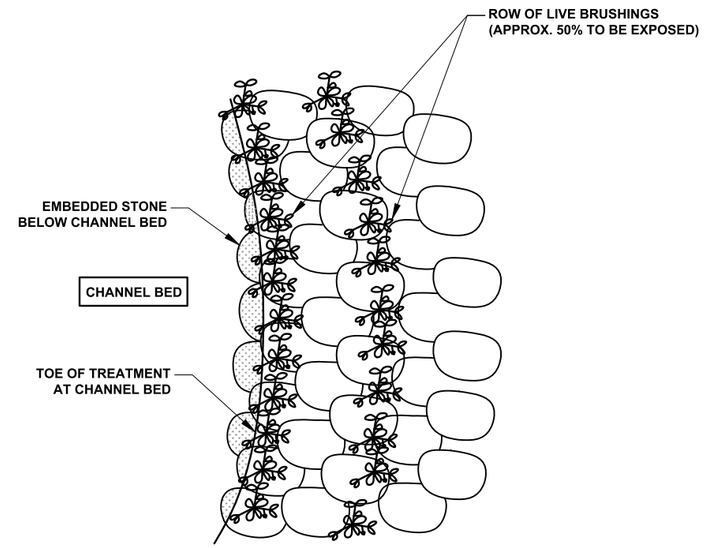
CROSS-SECTION VIEW:

N.T.S.



PLAN VIEW:

N.T.S.



PLANTING SPECIFICATIONS

COMMON NAME	SCIENTIFIC NAME	QTY	CONDITION
RED-OSIER DOGWOOD	*Cornus sericea*	XX	1 m, LIVE BRUSHINGS
PEACH-LEAVED WILLOW	*Salix amygdaloides*	XX	1 m, LIVE BRUSHINGS
BEBB'S WILLOW	*Salix bebbiana*	XX	1 m, LIVE BRUSHINGS
PUSSY WILLOW	*Salix discolor*	XX	1 m, LIVE BRUSHINGS

GENERAL NOTES:

1. BEFORE PLACING THE BLAST ROCK LAYER, THE SLOPE SHOULD BE EXCAVATED IN A BENCHED FASHION AND LEAVING A MINIMUM 300 mm SOIL WEDGE AT THE BASE OF THE SLOPE, INCLUDING REMOVAL OF ANY EXISTING SLOUGH MATERIAL.
2. THE EXCAVATED APPROVED SUBGRADE SHOULD BE WRAPPED WITH AN OPSS 1860 CLASS IN NON-WOVEN GEOTEXTILE LINER (SUCH AS TERRAFIX 360R) BEFORE PLACEMENT OF BLAST ROCK FILL MATERIAL.
3. AREAS ALONG THE BOTTOM OF THE BANK THAT HAVE BEEN OVER-STEEPENED AS A RESULT OF ACTIVE EROSION ARE RECOMMENDED TO BE IN-FILLED UPON AS INDICATED HEREIN, AND SHOULD NOT REQUIRE ADDITIONAL SUB-EXCAVATIONS WITHIN THE EXISTING EROSION FACE AND AS ADVISED BY PATERSON FIELD PERSONNEL AT THE TIME OF CONSTRUCTION.
4. HOWEVER, SUB-EXCAVATIONS MAY BE REQUIRED ABOVE THE ERODED PORTION TO MATCH THE RECOMMENDED INCLINATION FOR THE PROPOSED EROSION PROTECTION FILL MATERIAL. THE ERODED RIVERBANK SHOULD BE IN-FILLED WITH THE WELL-GRADED BLAST ROCK AS INDICATED ON THIS DETAIL.
5. LIVE BRUSHINGS ARE TO BE REPLACED WITH CONTAINER GROWN (POTTED) PLANTS IF PLANTING IS TO OCCURS OUTSIDE OF THE DORMANT PERIOD (FALL/WINTER)
6. ALL TOE EROSION PROTECTION IMPLEMENTATION EFFORTS UNDERTAKEN AT THE TIME OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY PATERSON FIELD PERSONNEL IN ACCORDANCE WITH OUR RECOMMENDATIONS.

SEQUENCE OF CONSTRUCTION:

1. CONSTRUCT AS PER DETAILS PROVIDED HEREIN.
2. ONCE AT HEIGHT STATED FOR LIVE BRUSHING PLACEMENT, INSTALL CONTINUOUS ROW OF LIVE BRUSHINGS / PLANTINGS OVERTOP OF NEWLY PLACED STONE LIFT AND ADD MIN. 150 mm LAYER OF TOPSOIL AROUND BASE OF BRUSHINGS.
3. REPEAT STEP 2 ONCE AT NEXT LIFT OF STONE AND STATED HEIGHT FOR PLANTING.
4. TOPDRESS STONE TREATMENT WITH TOPSOIL TO FILL VOIDS AND SEED WITH APPROVED SEED MIX.

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NO.	REVISIONS	DATE	INITIAL
1	GENERAL NOTES UPDATED	23/08/2024	FC

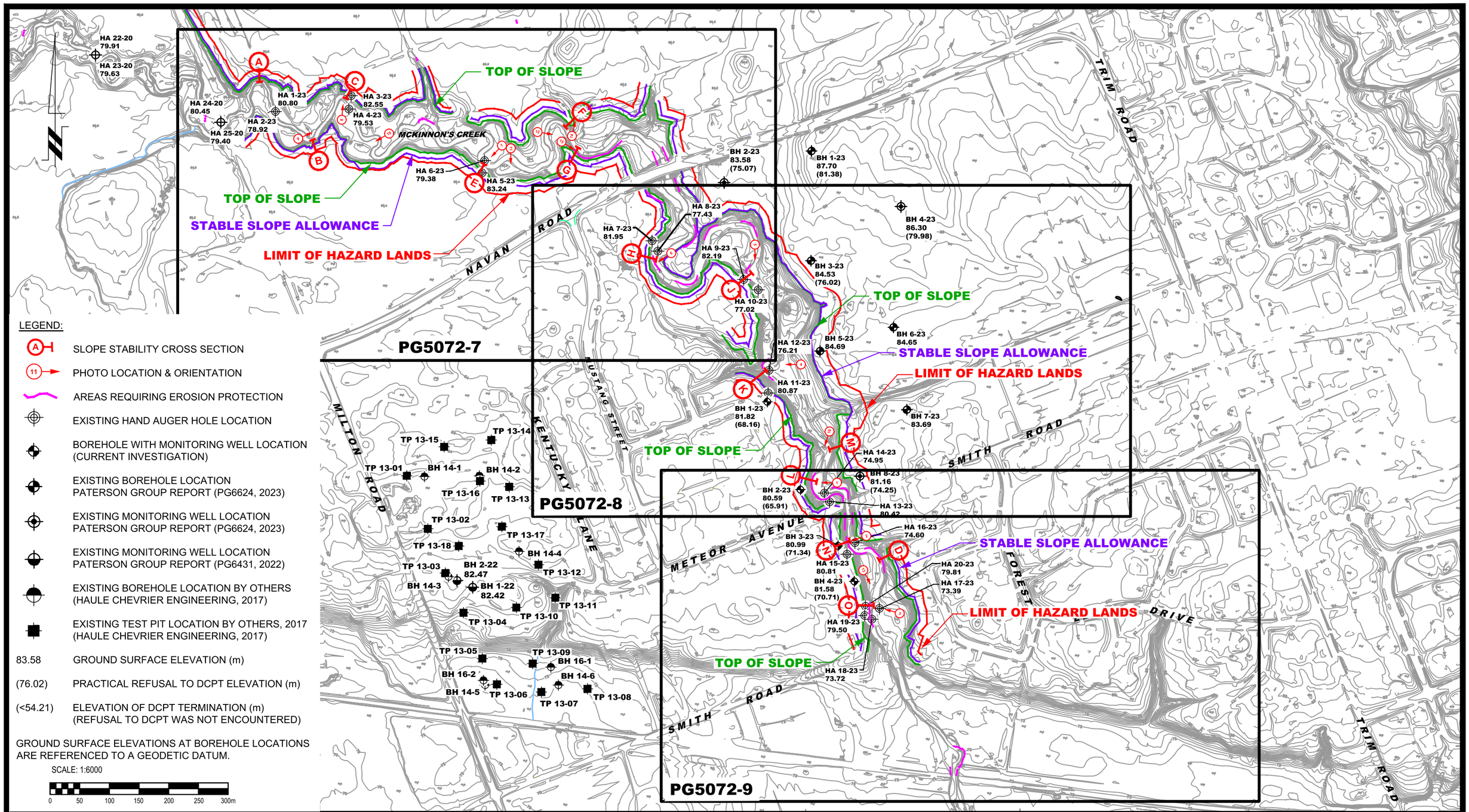
CLARIDGE HOMES, MATTAMY HOMES & RICHCRAFT HOMES

SLOPE STABILITY ASSESSMENT - PROPOSED DRAINAGE ACT IMPROVEMENTS
McKINNON'S CREEK MUNICIPAL DRAIN
OTTAWA, MER BLEUE URBAN EXPANSION LANDS ONTARIO

Title: **TOE PROTECTION AT TOE OF SLOPE DETAILS**

Scale: NTS	Date: 07/2024
Drawn by: NFRV	Report No.: PG5072-LET.01
Checked by: DP	Dwg. No.: PG5072-2
Approved by: DP	Revision No.: 1

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LEGEND:

- SLOPE STABILITY CROSS SECTION
- PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- EXISTING HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- EXISTING BOREHOLE LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- EXISTING MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- EXISTING MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6431, 2022)
- EXISTING BOREHOLE LOCATION BY OTHERS (HAULE CHEVRIER ENGINEERING, 2017)
- EXISTING TEST PIT LOCATION BY OTHERS, 2017 (HAULE CHEVRIER ENGINEERING, 2017)

83.58 GROUND SURFACE ELEVATION (m)

(76.02) PRACTICAL REFUSAL TO DCPT ELEVATION (m)

(<54.21) ELEVATION OF DCPT TERMINATION (m) (REFUSAL TO DCPT WAS NOT ENCOUNTERED)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:6000

0 50 100 150 200 250 300m

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NO.	REVISIONS	DATE	INITIAL
4	AS PER REVISED LIMIT OF HAZARD LANDS	08/08/2024	DP
3	AS PER REVISED LIMIT OF HAZARD LANDS	23/07/2024	DP
2	STABLE SLOPE ALLOWANCE LOCATIONS ADDED	07/02/2024	DP
1	ADDED EXISTING TEST HOLE COVERAGE TO PLAN	05/12/2023	DP

CLARIDGE HOMES, MATTAMY HOMES AND RICHCRAFT HOMES

SLOPE STABILITY ASSESSMENT - PROPOSED DRAINAGE ACT IMPROVEMENTS
McKINNON'S CREEK MUNICIPAL DRAIN
MER BLEUE URBAN EXPANSION AREA 10

OTTAWA, ONTARIO

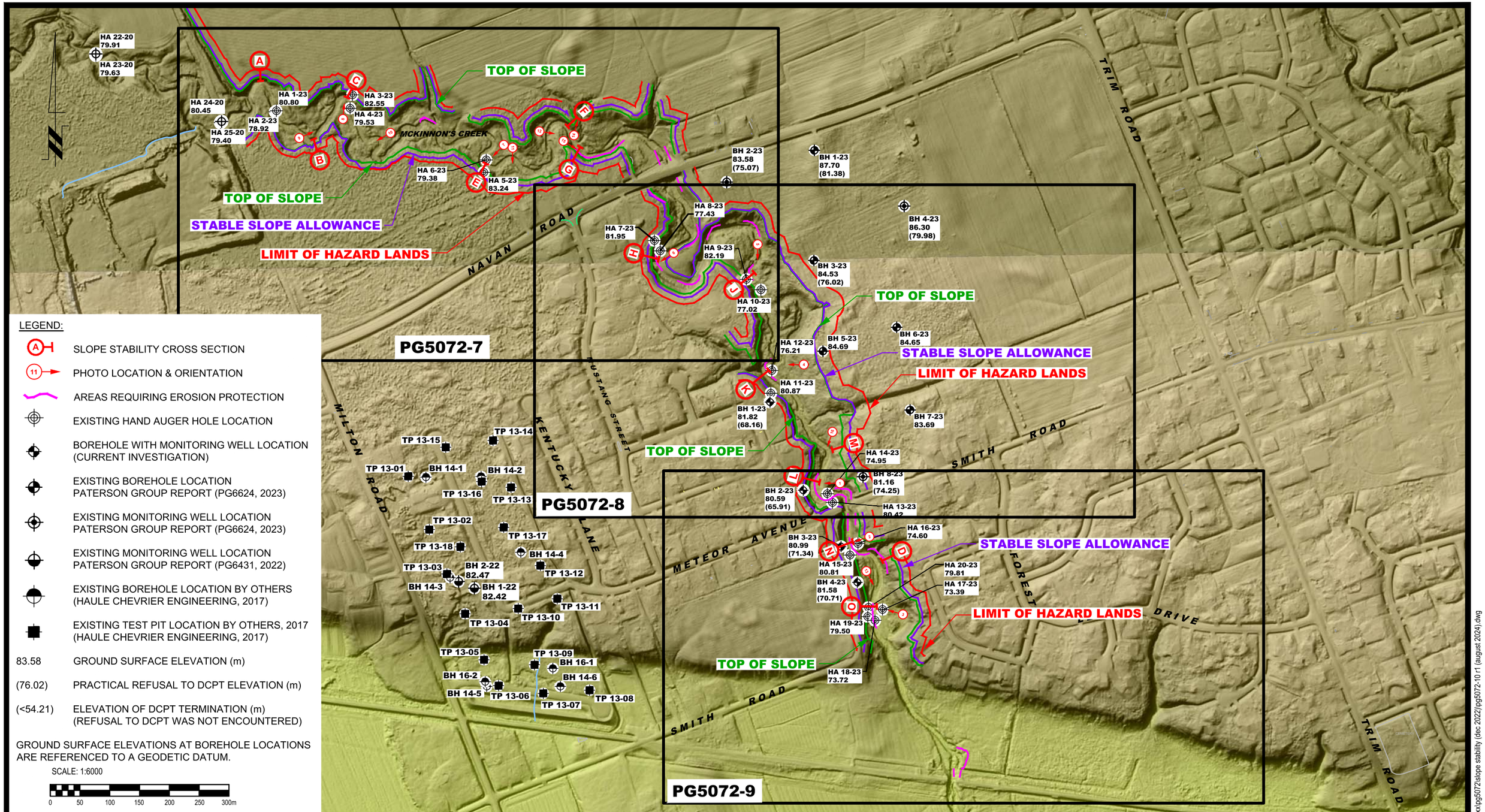
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LIMIT OF HAZARD LANDS - KEY PLAN

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Drawn by: NFRV	Report No.: PG5072-1
Checked by: DP	Dwg. No.: PG5072-6
Approved by: DJG	Revision No.: 4

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LEGEND:

- SLOPE STABILITY CROSS SECTION
- PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- EXISTING HAND AUGER HOLE LOCATION
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83.58 GROUND SURFACE ELEVATION (m)

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(<54.21) ELEVATION OF DCPT TERMINATION (m) (REFUSAL TO DCPT WAS NOT ENCOUNTERED)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:6000

0 50 100 150 200 250 300m

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SLOPE STABILITY ASSESSMENT - PROPOSED DRAINAGE ACT IMPROVEMENTS
McKINNON'S CREEK MUNICIPAL DRAIN
MER BLEUE URBAN EXPANSION AREA 10

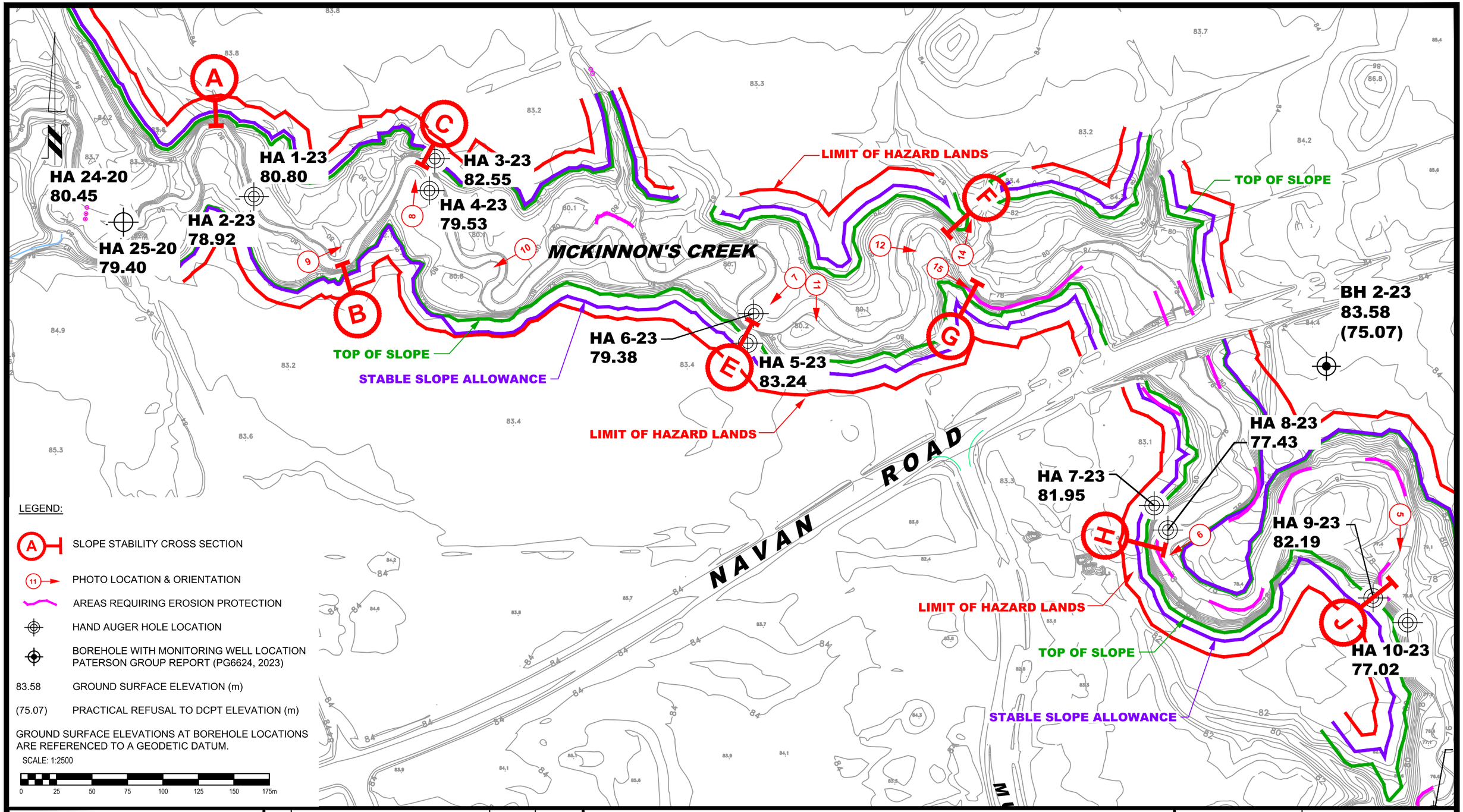
OTTAWA, ONTARIO

Title: LIMIT OF HAZARD LANDS PLAN - KEY PLAN (NRCAN LIDAR COLOR HILLSHADE OVERLAY)

Scale: 1:6000	Date: 12/2022
Drawn by: NFRV	Report No.: PG5072-1
Checked by: DP	Dwg. No.: PG5072-6.1
Approved by: DJG	Revision No.: 4

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11x17



LEGEND:

- A — SLOPE STABILITY CROSS SECTION
- 11 → PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- 83.58 GROUND SURFACE ELEVATION (m)
- (75.07) PRACTICAL REFUSAL TO DCPT ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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McKINNON'S CREEK MUNICIPAL DRAIN
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OTTAWA, ONTARIO

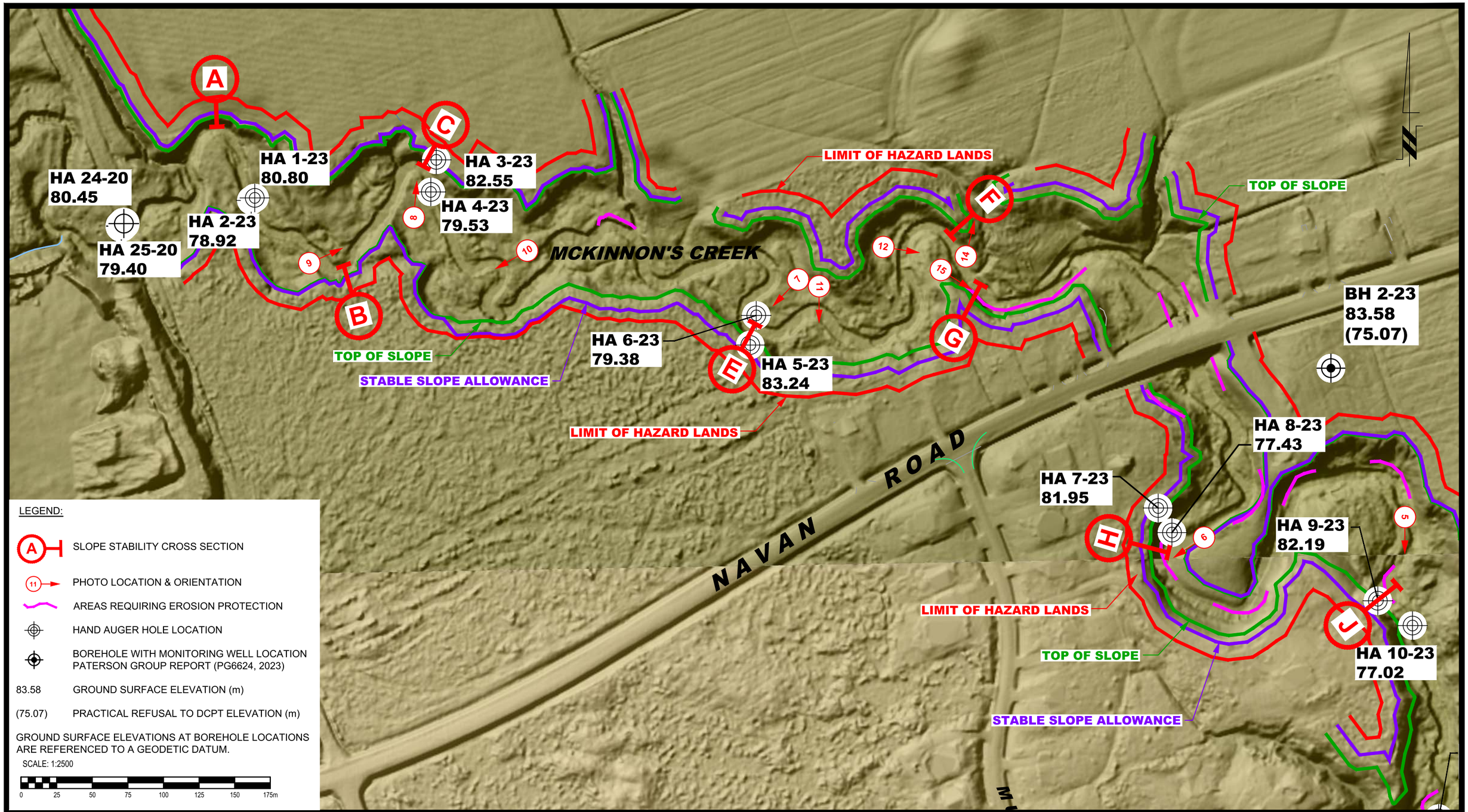
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LIMIT OF HAZARD LANDS PLAN

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Checked by: DP	Dwg. No.: PG5072-7
Approved by: DJG	Revision No.: 4

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11x17



LEGEND:

- A — SLOPE STABILITY CROSS SECTION
- 11 — PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- 83.58 — GROUND SURFACE ELEVATION (m)
- (75.07) — PRACTICAL REFUSAL TO DCPT ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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2	STABLE SLOPE ALLOWANCE LOCATIONS ADDED	07/02/2024	DP
1	ADDED EXISTING TEST HOLE COVERAGE TO PLAN	05/12/2023	DP

CLARIDGE HOMES, MATTAMY HOMES AND RICHCRAFT HOMES

SLOPE STABILITY ASSESSMENT - PROPOSED DRAINAGE ACT IMPROVEMENTS
McKINNON'S CREEK MUNICIPAL DRAIN
MER BLEUE URBAN EXPANSION AREA 10

OTTAWA, ONTARIO

Title: **LIMIT OF HAZARD LANDS PLAN (NRCAN LIDAR COLOR HILLSHADE OVERLAY)**

Scale: 1:2500	Date: 06/2023
Drawn by: NFRV	Report No.: PG5072-1
Checked by: DP	Dwg. No.: PG5072-7.1
Approved by: DJG	Revision No.: 4

11x17

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ROAD

HA 8-23
77.43

HA 7-23
81.95

HA 9-23
82.19

BH 4-23
86.30
(79.98)

BH 3-23
84.53
(76.02)

HA 10-23
77.02

TOP OF SLOPE

LIMIT OF HAZARD LANDS

STABLE SLOPE ALLOWANCE

BH 6-23
84.65

BH 5-23
84.69

HA 12-23
76.21

HA 11-23
80.87

1049 m

BH 1-23
81.82
(68.16)

BH 7-23
83.69

STABLE SLOPE ALLOWANCE

HA 14-23
74.95

BH 8-23
81.16
(74.25)

BH 2-23
80.59
(65.91)

HA 13-23
80.42

SMITH ROAD

LEGEND:

- SLOPE STABILITY CROSS SECTION
- PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- BOREHOLE LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- BOREHOLE WITH MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)

83.58 GROUND SURFACE ELEVATION (m)

(75.7) PRACTICAL REFUSAL TO DCPT ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:2500

0 25 50 75 100 125 150 175m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
4	AS PER REVISED LIMIT OF HAZARD LANDS	08/08/2024	DP
3	AS PER REVISED LIMIT OF HAZARD LANDS	23/07/2024	DP
2	STABLE SLOPE ALLOWANCE LOCATIONS ADDED	07/02/2024	DP
1	ADDED EXISTING TEST HOLE COVERAGE TO PLAN	05/12/2023	DP

CLARIDGE HOMES, MATTAMY HOMES AND RICHCRAFT HOMES

SLOPE STABILITY ASSESSMENT - PROPOSED DRAINAGE ACT IMPROVEMENTS
McKINNON'S CREEK MUNICIPAL DRAIN
MER BLEUE URBAN EXPANSION AREA 10

OTTAWA, ONTARIO

Title:

LIMIT OF HAZARD LANDS PLAN

Scale: 1:2500	Date: 12/2022
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11x17

ROAD

HA 8-23
77.43

HA 7-23
81.95

HA 9-23
82.19

BH 4-23
86.30
(79.98)

BH 3-23
84.53
(76.02)

TOP OF SLOPE

LIMIT OF HAZARD LANDS

STABLE SLOPE ALLOWANCE

HA 10-23
77.02

BH 6-23
84.65

BH 5-23
84.69

HA 12-23
76.21

HA 11-23
80.87

BH 1-23
81.82
(68.16)

BH 7-23
83.69

STABLE SLOPE ALLOWANCE

SMITH ROAD

HA 14-23
74.95

BH 8-23
81.16
(74.25)

BH 2-23
80.59
(65.91)

HA 13-23
80.42

LEGEND:

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SCALE: 1:2500

0 25 50 75 100 125 150 175m

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11x17

METEOR AVENUE

FOREST LEA DRIVE

BH 2-23
80.59
(65.91)

BH 8-23
81.16
(74.25)

HA 13-23
80.42

HA 16-23
74.60

BH 3-23
80.99
(71.34)

HA 15-23
80.81

BH 4-23
81.58
(70.71)

STABLE SLOPE ALLOWANCE

HA 20-23
79.81

HA 17-23
73.39

HA 19-23
79.50

LIMIT OF HAZARD LANDS

HA 18-23
73.72

TOP OF SLOPE

LEGEND:

- SLOPE STABILITY CROSS SECTION
- PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)

81.16 GROUND SURFACE ELEVATION (m)

(74.25) PRACTICAL REFUSAL TO DCPT ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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McKINNON'S CREEK MUNICIPAL DRAIN
MER BLEUE URBAN EXPANSION AREA 10

OTTAWA, ONTARIO

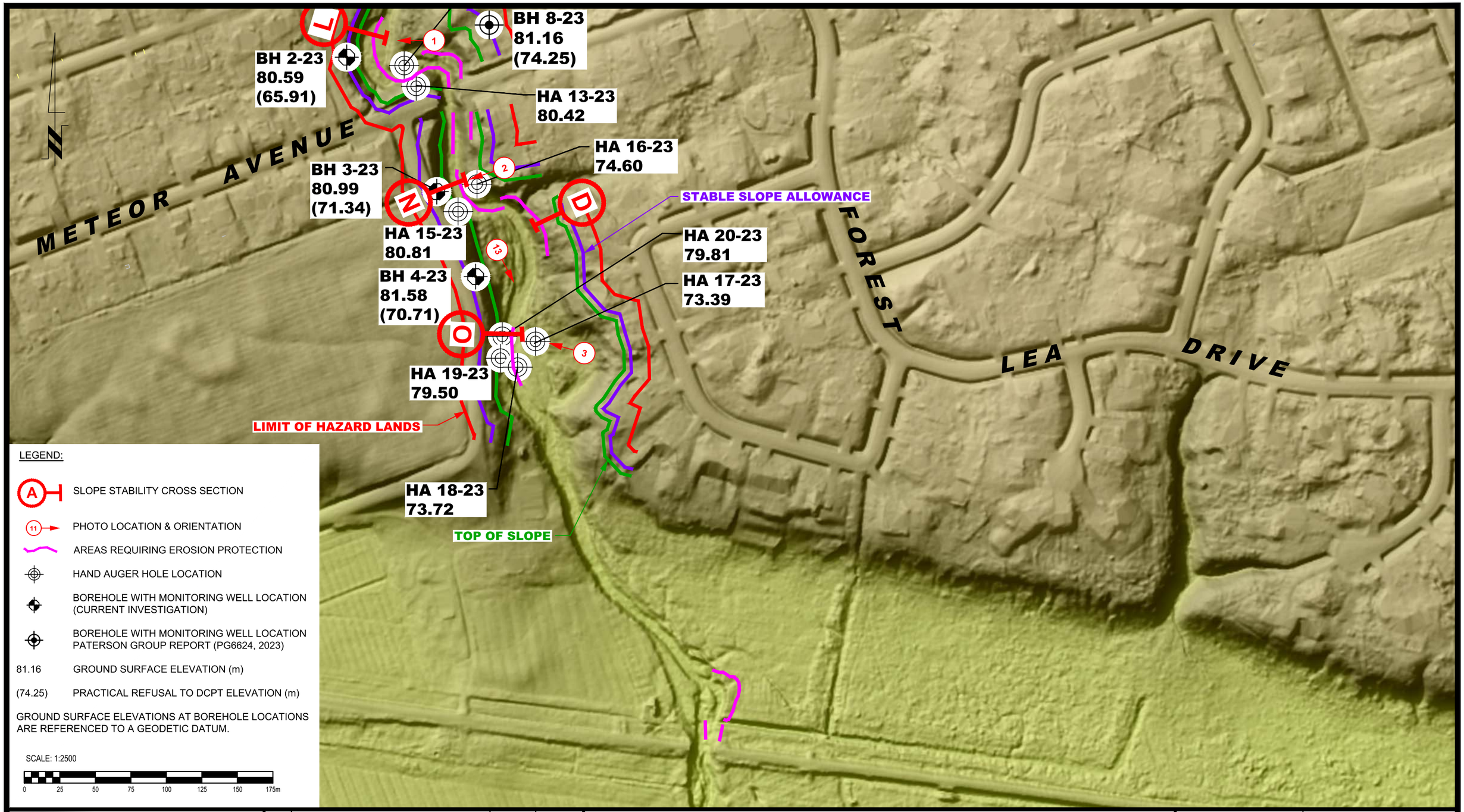
Title:

LIMIT OF HAZARD LANDS PLAN

Scale: 1:2500	Date: 12/2022
Drawn by: NFRV	Report No.: PG5072-1
Checked by: DP	Dwg. No.: PG5072-9
Approved by: DJG	Revision No.: 4

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LEGEND:

- A — SLOPE STABILITY CROSS SECTION
- 11 — PHOTO LOCATION & ORIENTATION
- AREAS REQUIRING EROSION PROTECTION
- HAND AUGER HOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- BOREHOLE WITH MONITORING WELL LOCATION PATERSON GROUP REPORT (PG6624, 2023)
- 81.16 — GROUND SURFACE ELEVATION (m)
- (74.25) — PRACTICAL REFUSAL TO DCPT ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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Approved by: DJG	Revision No.: 4

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McKinnon's Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements, Project No. PN22106
December 14, 2023

McKinnon's Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements



Prepared for:
IBI Group
Suite 500, 333 Preston Street
Ottawa, Ontario
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December 14, 2023
PN22106a

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Report Title:	McKinnon's Creek Fluvial Geomorphological Assessment in Support of Drainage Act Improvements
Project Number:	PN22106
Status:	**Final**
Version:	2.0
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Prepared by:	Kelsey Serviss, M.Sc. Jan Franssen, Ph.D.
Approved by:	Paul Villard, Ph.D., P.Geo. CAN-CISEC, CERP, EP
Approval Date:	December 14, 2023

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Appendices

Appendix A. Reach and Bend Map

Appendix B. Surficial Geology

Appendix C. Historical Aerial Photographs

Appendix D. Digital Terrain Analysis

Appendix E. Field Photographic Record

Appendix F. Field Sheets

Appendix G. Bend Characteristics Summary Table

1 Introduction

GEO Morphix Ltd. (GEO Morphix) conducted a fluvial geomorphological assessment along McKinnon's Creek Municipal Drain in Navan, Ontario in support of a Drainage Engineers report prepared by Robinson Consultants Inc. titled *Engineer's Report for the McKinnon's Creek Municipal Drain* (Robinson Consultants, 2022). The Drainage Engineers report identified 11 locations within the study area for erosion protection. It is our understanding that the South Nation Conservation Authority (SNCA) subsequently recommended a review of the remaining meander bends within the study area to confirm whether protection works were required at these locations. The current report provides the requested geomorphological assessment of a section of McKinnon's Creek that extends from the Hydro Corridor north of Navan Rd. to the south side of the Prescott-Russell Trail in Navan, Ontario. A map of the assessment area including the locations of the protection works proposed by Robinson Consultants is provided in **Appendix A**.

The overall objective of the current fluvial geomorphic assessment is to confirm the general location of the required erosion protection works outlined in the Engineer's Report for the McKinnon's Creek Municipal Drain (Robinson, 2022) and to confirm that additional works are not required to address potential erosion risk at locations where no protection works were proposed. The specific tasks undertaken to complete this assessment were outlined in the original report and included the following:

- Review of available and relevant reports and mapping related to channel form and function
- Assessment of historical aerial photographs to identify change to the channel due to erosion or past channel modifications
- Field investigations using standard using standard, industry-accepted tools such as the rapid geomorphic assessment (RGA) and rapid stream assessment technique to evaluate existing instream conditions (e.g., evidence of ongoing channel processes, active erosion/deposition)
- Complete a bank-by-bank assessment of erosion risk following previously accepted protocols

After a technical review of an earlier version of this report by Palmer (May 2023) the following tasks were added to the initial scope of work as agreed upon and outlined in an email correspondence from Paul Villard (GEO Morphix) to Robin McKillop (Palmer) on August 9, 2023:

- Estimation of historical bank migration rates using aerial imagery from 1991 and 2021 for bends where it was possible (**Section 3.2**)
- Geomorphic analysis of a LiDAR derived high-resolution bare-earth digital elevation model (OMNRF, 2019-2020) for the purposes of mapping valley and channel geomorphic features and characteristics (**Section 3.3**)
- Differential analysis of the OMNRF high-resolution terrain model (2019-2020) and topographic data from a City of Ottawa 1:2000 mapping program (2003) for the purpose of identifying locations within the stream valley with significant topographic change (**Section 3.3**)

- Review of the extent of the areas of proposed restoration and provision of comments regarding impacts and regarding erosion control at valley constrictions and crossings (**Section 6**)
- Coordination of findings from the current geomorphic assessment with findings of a slope stability assessment prepared by Paterson Group for the same study area

The following report summarizes the assessment methods and results, and based on those results provides recommendations regarding the location of erosion protection works proposed for the subject segment of McKinnon's Creek.

2 Background Review

2.1 Watershed Characteristics

McKinnon's Creek is located east of the Mer Bleue wetlands within the Bear Brook Subwatershed of the South Nation River east of the City of Ottawa. The section of the creek examined in the assessment flows through the community of Navan. A figure showing the extent of the study area is provided in **Appendix A**.

The McKinnons Creek drainage area from the headwaters upstream of the study area to approximately the confluence of the Lalaonde Cleroux Municipal Drain is approximately 1076 ha (Morrison Hershfield Limited, 2017). Many of the tributaries upstream of the study area are existing municipal drains flowing through agricultural fields. The McKinnons Creek main channel begins at the outlet of a stormwater management pond within the community of Avalon, west of 10th Line Road. The watercourse travels approximately southeast in a realigned channel then crosses under 10th Line Road just north of Wall Road. The watercourse continues in a southeastward alignment downstream of this crossing where it begins to meander. From the 10th Line Road crossing until the Navan Road crossing, the watercourse is primarily bordered by relatively narrow riparian buffers separating it from agricultural fields, although some sections are bordered by fragmented forest and fallow fields. Meander amplitude increases and the meanders become more tortuous and irregular with distance downstream throughout this section. The McKinnons Creek drainage area from the headwaters to Navan Road is approximately 1474 ha (Morrison Hershfield Limited, 2017).

The section of the creek examined in the assessment flows through the community of Navan, within which it crosses two municipal roads (i.e., Navan Road; Smith Road) and the Prescott-Russell Trail. The watercourse continues to meander and the alignment turns closer to south. Downstream of the Smith Road crossing the meanders are less tortuous and have smaller amplitudes. The surrounding land use through the community of Navan is a combination of fragmented forest, low and medium density urban residential dwellings, and rural agricultural and fallow fields. Downstream of the study area McKinnons Creek flows through straightened sections within relatively narrow riparian buffers through agricultural fields until it meets Milton Road. The watercourse is straightened and runs immediately adjacent and parallel to Milton Road until it drains into Bear Brook east of the Mer Bleue Bog.

2.2 Physiography and Surficial Geology

Physiography and surficial geology act as primary controls regarding channel development, as they influence the hydrological and sediment characteristics of a given drainage system. Physiography describes landform patterns within areas that share common bedrock, surficial deposits, and topography, which lend them their defining characteristics. Surficial geology describes the material and features deposited during and following the last period of glaciation which ended in the Ottawa Region approximately 10,000 years ago. Channel morphodynamics are largely governed by the flow regime and the availability and type of sediments within the stream corridor. These factors are explored as they offer insight into existing conditions and into potential evolution of the geomorphic features within the study area. A map showing the surficial geology within the subject area is provided in **Appendix B**.

The subject area lies within the St. Lawrence-Ottawa Lowlands physiographic region, an area of low relief with elevations approaching sea-level (approximately 200 feet asl or lower; Chapman and Putnam, 1984). There are two minor physiographic regions within the subject area: a relatively coarse and elongate section of the Russel and Prescott sand plains (region 50; Chapman and Putnam, 1984) northeast of Mer Bleue, and the Ottawa Valley clay flats (region 49; Chapman and Putnam, 1984). Both physiographic regions were formed by drainage of the postglacial Ottawa River into the Champlain Sea with sediments originating from the Canadian Shield. The sand plains were deposited as deltas near the confluence, while the clay flats were deposited in the deeper waters of the Champlain Sea. Chapman and Putnam (1984) describe the clay deposits in this area as deep, fine textured, poorly drained, and very plastic. The sand is described as well-drained, depending on topography, as the best drainage is found where the region borders bluffs along the former channel margins of the postglacial Ottawa River.

The two primary surficial geology units within the study area include glacial till and fine to course textured glaciomarine deposits (OGS, 2010). Upstream of Navan Road McKinnon's Creek meanders along the boundary between fine-textured (silt and clay; Unit 10a) and coarse-textured (sand and gravel; Unit 11a) glaciomarine deposits with most of the stream channel located within the boundary of the fine-textured unit (Unit 10a). South of Navan Road the channel flows across the fine-textured sediments (Unit 10a) for approximately 100 m, then the surficial deposits transition to medium to fine-grained sands (Unit 11a) for the next 280 m. The largest amplitude meander (Bend 23) in the study area is located within this section. The channel transitions again to the finer-textured sediments (Unit 10a) for approximately 65 m. Downstream of this the channel flows across a short section of sandy-silty till (35 m; Unit 5b). From this point through to approximately 300 m south of Smith Road the deposits are comprised of the coarser textured glaciomarine deposits (Unit 11a). Between this transition and the downstream extent of the study area at the Prescott-Russell Trail, the surficial geology is again comprised of (Unit 10a) for approximately 130 m before transitioning to modern alluvial deposits ranging in size from clay to gravel (Unit 19) approximately 100 m upstream of the Prescott-Russell Trail.

2.3 Previous Studies

An Environmental Management Plan (EMP) was developed by Morrison Hershfield Limited for an area that encapsulates a length of McKinnon's Creek to a location just west of the Navan Road crossing (Morrison Hershfield Limited, 2017). The EMP documents existing conditions for the Mer Bleue Urban Expansion Area (UEA) and additional rural areas within the McKinnons Creek watershed east of the City of Ottawa. The Mer Bleue UAE is approximately 219 ha in size and is bounded by 10th Line Road to the east, Mer Bleue Road to the west, Hepatica Way in the North, and the southern border follows the alignment of Saulnier Lane in the community of Notre-Dame-Des-Champs without overlapping with the existing subdivision in that community. Studies completed for the EMP include natural heritage, drainage and hydrology, geomorphology, geotechnical, and hydrogeological. Development limits and opportunities for restoration and enhancement for the Mer Bleue UAE recommended in the EMP were based on the results of these studies. A stormwater management strategy was also developed based on the results of the studies.

A geomorphic assessment was completed for the length of McKinnons Creek that travels through the EMP study area by Matrix Solutions Inc. (Matrix) in 2017. The work included a historical assessment, rapid assessments, channel migration delineation, meander belt width analysis, and an erosion threshold assessment. Field assessments for this study were conducted in November of 2013. **Reach MC4** as delineated by GEO Morphix during field assessments in November 2022 (described below) overlaps with part of Reach MB-R1, delineated by Matrix. Reach MB-R1 extends farther upstream to about double the length of MC4. Reach MB-R1 received and RGA score of 0.46, indicating the reach was 'In Adjustment' and an RSAT score of 22, indicating the reach was in a state of 'Fair' ecological health during the time of the assessment.

3 Desktop Assessment

3.1 Reach Delineation

Reaches are homogeneous segments of channel used in geomorphological investigations. They are studied semi-independently as each is expected to function at least slightly different from adjoining reaches. This allows for a meaningful characterization of a watercourse as the aggregate of reaches, or an understanding of a reach, for example, as it relates to a proposed activity.

Reaches are delineated based on changes in the following:

- Channel planform
- Channel gradient
- Physiography
- Land cover (land use or vegetation)
- Flow, due to tributary inputs
- Soil type and surficial geology
- Certain types of anthropogenic channel modifications

Reaches are first delineated as a desktop exercise using available data and information such as aerial photography, topographic maps, geology information, and physiography maps. The results are then verified in the field. This follows scientifically defensible methodology proposed by Montgomery and Buffington (1997), Richards et al. (1997), and the Toronto and Region Conservation Authority (2004) and others.

Reach delineation resulted in four defined reaches within the study area: a reach from the Hydro Corridor (upstream extent of study area) to Navan Road (**Reach MC4**); a reach from Navan Road to Smith Road (**Reach MC3**); a reach from Smith Road to the end of the confined valley portion of the study area (**Reach MC2**; approximately 300 m downstream of Smith Road) and the remaining unconfined portion of the McKinnons Creek study area extending to the Prescott-Russell Trail located approximately 500 m downstream of Smith Road (**Reach MC1**).

3.2 Historical Airphoto Analysis

A historical air photograph analysis was conducted to understand temporal changes in stream channel morphology. Where historical aerial photographs are available over a long period, the systematic review can provide a long-term perspective on the evolution of channel morphology. Typically, historical images spanning several decades are required to identify the patterns and trends in river channel adjustments such as meander migration, bank erosion, planform adjustment, and sediment deposition. The review of historical imagery also provides insights into landscape change in the areas adjacent to the channel as well as the timing of the installation of public and private infrastructure within the area of study. While historical air photo analysis is a particularly useful tool for understanding temporal changes in river channel morphology and contemporary channel morphodynamics its usefulness is limited to areas where the channel is visible. Older aerial images are often of insufficient resolution to clearly identify the channel planform of lower order (i.e., narrower) stream channels, and in forested settings significant portions of the channel can be obscured by tree cover. For this reason, the review of images acquired outside the growing season (i.e., leaf-off imagery) is often necessary to accurately map channel features in forested areas.

For this study, multiple aerial photographs and satellite images spanning the period from 1976 to 2021 were retrieved from geoOttawa (https://maps.ottawa.ca/geoottawa/). Specifically, images from 1976, 1999, 2005, 2014, and 2021 were reviewed with a focus on identifying changes observed at channel bends, including those where protection works were proposed (Robinson Consultants, 2022).

A field assessment of McKinnon's creek, detailed below, identified 35 bends in the study area and this bend classification was used for the air photo analysis. Additionally, four more subtle planform features (A1 to A4) were identified. Over the 45-year period of assessment, insignificant to slight changes in channel planform were observed at 26 of the 35 bends (74%), with significant changes in channel planform observed at 9 of 35 (26%). Channel protection works proposed by Robinson Consultants included 4 of the 9 bends where significant changes were observed in this historical air photo assessment. Of the 5 remaining bends without proposed protection only 1 is in proximity to infrastructure (i.e., Bend 16; see the following section for details).

Changes identified at each of the assessed channel bends are summarized in **Table 1** below with bends where protection works are proposed by Robinson Consultants in **bold**.

Table 1: Summary of historical changes for individual meander bends in the study area

Reach	Bend ID	General Description of Changes
MC4	1	Changes were limited.
	2	The outside bank of the bend migrated northeast and its radius of curvature decreased between 1976 and 2021. Changes were limited between 2014 and 2021.
	3	Changes were limited.
	4	The outside bank of the bend migrated slightly in a northward direction and its radius of curvature increased between 1976 and 2021. Several trees that were visible on the outside of the bend in 2005 imagery were gone in 2014 imagery (eroded out). Changes were limited between 2014 and 2021.
	5	The outside bank of the bend migrated in a southwest direction and its radius of curvature decreased between 1976 and 2021.
	6	The outside bank of the bend migrated slightly in an eastward direction between 1976 and 1999 and its radius of curvature increased between 1976 and 2021
	7	A log/debris jam that appears to have originated from treefall across the channel at the upstream end of the bend after 1999 has caused the flow to outflank and widen the channel, mostly along the outside bend. The debris jam has progressively moved towards the downstream end of the bend. Major changes occurred between 2014 and 2021.
	8	Changes were limited.
	9	The inside bank of the bend migrated northward between 1976 and 2021, and a tree visible in the 2005 imagery was gone in the 2014 imagery widening and straightening the channel overall at this location.
	10	**The upstream end of the outside bank migrated slightly northward between 1976 and 2014; changes were limited between 2014 and 2021.**
	11	Both banks migrated southward between 1976 and 1999. Vegetation and soil were scoured from the downstream end of the inside bank between 1999 and 2021.
	12	The downstream end of the outside bank migrated slightly southward between 1976 and 1999. Changes were limited between 1999 and 2021.
	13	Changes were limited.
	14	Changes were limited.
	15	Changes were limited.
	16	Both banks migrated eastward between 1976 and 2005. Changes were limited between 2005 and 2021.
	17	Both banks migrated slightly northward between 1976 and 2014. Changes were limited between 1976 and 2021.
	18	This section of channel is obscured by tree cover in most imagery, however, the bend appears to remain in the same location over time.
	19	The upstream section of the outside bank migrated slightly northward, while the downstream section migrated slightly eastward, between 1999 and 2021.
MC3	20	This section of channel is obscured by tree cover in most imagery, however, the bend appears to remain in the same location over time.
	21	This section of channel is obscured by tree cover in most imagery, however, the bend appears to remain in the same location over time.

Reach	Bend ID	General Description of Changes
	22	The outside bank migrated in a southeastern direction between 1999 and 2014. Changes were limited between 2014 and 2021.
	23	**The middle section of the outside bank migrated (23b) in a southwestern direction between 1976 and 1999, then between 1999 and 2005 trees were removed from this section and the bank was artificially modified.**
	24	**Changes were limited.**
	25	**Both banks migrated slightly eastward between 1976 and 2005. Changes were limited between 2005 and 2021.**
	26	**The outside bank migrated slightly westward between 1976 and 2021.**
	A1	This section of channel is obscured by tree cover in most imagery, however, the banks appear to remain in the same location over time.
	27	The outside bank of the meander bend migrated slightly eastward, while the inside bank migrated slightly southward, between 1976 and 2021.
	28	**The upstream end of the outside bank migrated slightly northward between 1976 and 2021, while the downstream end of the outside bank migrated slightly westward during that time.**
	29	Both banks migrated eastward between 1976 and 2005. Changes are limited between 2005 and 2021.
	30	Changes were limited.
	A2	This section of channel is obscured by tree cover in most imagery, however, the banks appear to remain in the same location over time.
	31	**The outside bank migrated westward between 1976 and 2021. The inside bank migrated eastward between 1976 and 2005, widening the channel overall.**
	32	**Both banks migrated in a northeast direction, and the outside bank radius of curvature decreased between 1976 and 2021.**
MC2	33	Both banks were obscured in imagery, however, changes were limited.
	34	**The banks are obscured in the 1976 imagery. Both banks migrated slightly eastward between 1999 and 2021.**
	A3	This section of channel is obscured by tree cover in most imagery, however, the banks appear to remain in the same location over time.
MC1	A4	Changes were limited.
	35	**Both banks migrated eastward, and the outside bank radius of curvature decreased between 1976 and 2021.**
Bolded bends are those with proposed protection.		

All historical aerial photographs used in the analysis described above are provided in **Appendix C** for reference.

For this study, channel migration rates could not be accurately measured or substantiated in most locations owing to the presence of trees and vegetation obscuring the channel banks. Also, the time period for which high-resolution aerial imagery was available for most bends was insufficient to quantify bend migration rates, as at least 25 years is required. However, there was sufficient imagery to estimate migration rates at 4 of the 35 bends.

Imagery from 1991 and 2021 was used to estimate meander bend migration rates at Bends 10, 23B, 26, and 31. The measured migration over the 30-year period ranged from 0.75-3.02 m,

while the estimated 100-year migration rate based on the observed changes ranged from 2.49-10.06 m. For reference, the median bankfull channel widths for Reaches MC3 and MC4 were 8.7 m and 7.7 m, respectively (details provided below under 'Field Assessment'), indicating that the maximum estimated migration rate is about 1.2 – 1.3 channel widths per 100 years. Figures showing the bend migration measurements and estimated migration rates for each respective bend are provided in **Appendix C**. The meander bend migration assessment did not identify any specific locations of erosion concern. Bend 10 does not have any nearby infrastructure, and Bends 10, 23B, 26, and 31 are all locations where protection works were proposed by Robinson Consultants.

3.3 Digital terrain analysis of geomorphic features

Terrain analysis of two high-resolution spatial datasets was used to map and interpret channel and valley geomorphic features within the study area. Stream channels are inherently dynamic features of the natural landscape, and the detailed observation of channel, floodplain, and valley geomorphology using spatial datasets is useful to gain insight into how a given fluvial system has adjusted, and is likely to adjust, over time. In particular, the use of high-resolution bare-earth digital elevation models derived from airborne LiDAR surveys allows for detailed broad-scale mapping and analysis of geomorphic features. In cases where two or more elevation surveys are available, analyzing the detailed topographic data from these surveys can provide useful insights into the nature and rate of geomorphic adjustment during the intervening period.

For this study, elevation contours and remote sensing data were used for detailed analysis of geomorphic features adjacent to and within the creek valley. Elevation contours were obtained from a series of 1 to 2000 scale maps created by the City of Ottawa using survey data from 2003. Remote sensing data in the form of a LiDAR derived bare-earth digital elevation model was obtained from a publicly available dataset maintained by OMNRF (Ottawa-Gatineau 2019-2020). The bare-earth elevation raster was used to generate a hillshade model to aid in the interpretation and analysis of geomorphic features. The following specific geomorphic features and terrain metrics were mapped and analyzed using the high-resolution elevation data:

- Tributaries to the creek
- Abandoned/elevated meander bends within the floodplain
- Chutes within the floodplain
- Gullies along the valley wall
- Slope gradient
- Top and toe of valley wall
- Top and toe of channel bank
- Land surface changes between 2003 and 2020

The OMNRF bare-earth elevation raster was also used to generate a slope raster with a slope classification scheme that highlighted slopes with gradients of >3:1, >2:1, and >1:1. The minimum stable slope gradient recommended by OMNRF is 3:1 (horizontal:vertical) ratio (OMNRF, 2001). The resulting slope classification raster was overlayed on the hillshade raster to show the spatial distribution of the relatively higher slope areas adjacent to the creek and within its valley. This analysis was done to identify where the steepest slopes were in contact or close to the

channel. The resulting slope raster and hillshade map which also shows the locations of proposed erosion protection works (Robinson Consultants, 2022) is provided in **Appendix D**.

The top and toes of the valley walls and channel banks were delineated using the hillshade model generated from the OMNRF bare-earth elevation raster. These features were delineated by visual interpretation of slope inflection points observed in cross-sectional profiles perpendicular to the valley walls and channel banks. The delineation of these features was also aided by the interpretation of the hillshade and slope gradient raster layers. This analysis was completed to determine the proximity of infrastructure to the valley walls. The shortest distances between permanent infrastructure (e.g., houses, pools, garages, etc.) identified on the 2020 satellite imagery (Google, 2023) and the top of the valley wall were measured and these results are presented in **Table 2**.

Additionally, changes in valley slope profiles were analyzed at select locations by plotting elevation profiles derived from the OMNRF bare-earth DEM (2019-2020) and a DEM modelled generated from the 2003 1:2000 scale City of Ottawa topographic maps which have a contour interval of 0.5 m. This analysis allowed for the identification of locations where the relative position and/or slope of valley walls changed significantly between 2003 and 2019-2020. Figures showing 2003 and 2019-2020 valley slope profiles for a selection of locations along McKinnons Creek are provided in **Appendix D**.

3.3.1 Results

The active channel, floodplain, and valley walls are all clearly visible on the hillshade model generated from the 2020 bare-earth DEM (OMNRF; 2020). Along **Reaches MC2**, **MC3**, and **MC4** the 8-10 m wide river channel is nested in a 50-100 m wide river valley. Downstream of Smith Road McKinnons creek flows out of the confined setting with no obvious valley confinement through to the downstream end of the study area. Along the confined portion of McKinnons Creek gully density was highest along **Reaches MC3** and **MC4** with a relatively large and bifurcated gully system located adjacent to Galaxie Avenue. Gullies form along drainage pathways were concentrated runoff accelerates erosional processes, and their density and morphology indicate the intensity of erosional processes occurring at these locations.

Abandoned meanders and chutes were identified along McKinnons Creek as these features provide insight into the contemporary and historic geomorphic change within the river valley. Six (6) abandoned meanders were identified along Reaches MC2, M3, MC4. Abandoned meanders are remnants of previous river courses and their presence indicates the channel has migrated and incised within the valley bottom. Note, bend protection is not proposed at any of the locations with abandoned meanders as these features provide a natural setback between valley wall and the contemporary channel.

Additionally, two chutes were identified within the study area; both within Reach MC4. Chutes form across meander bends and are typically active during higher flows where they provide a shorter, straighter flowpath relative to the main channel. The formation of chutes across meander bends suggests the potential for river channel planform adjustment at these locations as chutes

formation can lead to meander cutoffs (abandonment). Both chutes are in locations along the river valley where there is no adjacent infrastructure and where bend protection works were not recommended by Robinson Consultants.

A map highlighting the geomorphic features described above is included in **Appendix D**.

Areas within the river valley with slope gradients greater than 33%, 3:1 horizontal:vertical slope, were mapped to identify areas where the stream channel was in contact or near the more steeply sloping sections of the river valley. Here the areas shaded 'red' are those with slopes greater than 45 degrees (i.e, >1:1 slope) and within the study area these were locations where the outside meander bend of the channel is in contact with the valley wall. These locations are particularly susceptible to slope toe erosion and slope protection measures were proposed for many of the steepest slopes with nearby infrastructure including Bends 23, 24, 25, 31, and 34. Embankments supporting road crossings over the creek also show steep slopes and erosion protection works were proposed for these locations. Some areas with >1:1 slope gradient and nearby infrastructure without proposed protection works include Bends 18 and 22, which are adjacent to houses and outbuildings, and Bends 33 and A3, which are adjacent to Smith Road.

Using the top of valley tracing from the 2020 LiDAR elevation model, the distances between permanent infrastructure and the top of valley slopes were measured. **Table 2** below presents these distances along with: i) nearest bend ID; ii) type of infrastructure as observed on the 2020 satellite imagery; iii) whether there is proposed protection adjacent to the bend, and iv) whether the top of valley wall has migrated since 2003. Valley wall migration since 2003 was determined through a visual assessment, as well as slope morphology and profile comparisons, which are shown in the topographic change analysis and slope profile figures provided in **Appendix D**.

Note that a separate and concurrent slope stability analysis of McKinnons Creek was prepared by the Paterson Group for the same study area assessed here.

Table 2: Distance between top of valley wall and infrastructure

Reach	Bend ID	Type of Infrastructure	Distance to Top of Valley Wall (m)	Channel in contact with toe of slope	Proposed Protection	Significant Change 2003-2020
MC4	16	House	0	No	No	No
	18	House	17.9	Yes	No	No
	18	House	18.1	Yes	No	No
	18	Garage	6.6	Yes	No	No
	18	House	13.2	Yes	No	No
	19	Shed	0	No	No	No
	19	House	0	No	No	No
MC3	20	Driveway	3.4	Yes	No	Yes*
	22/**24**	House	3.6/**7.8**	Yes	No/**Yes**	No/**No**
	22/**24**	Paved Patio	1.9/**7.9**	Yes	No/**Yes**	No/**No**
	22	Shed	0	Yes	No	No
	23	**Driveway**	**0**	**Yes**	**Yes**	**Yes***
	23	**House**	**3.4**	**Yes**	**Yes**	**Yes***
	23	**House**	**28.9**	**Yes**	**Yes**	**Yes***
	28	**Deck**	**1.4**	**Yes**	**Yes**	**No**
	28	**House**	**6**	**Yes**	**Yes**	**No**
	31	**House**	**24.3**	**Yes**	**Yes**	**No**
MC2	33	Road	0	Yes	No	No
	34	**House**	**35.3**	**Yes**	**Yes**	**No**
	34	Pool	7.6	Yes	No	No
	34	House	11.5	Yes	No	No
	A3a	Road	0	Yes	No	Yes*
	A3b	House	20	Yes	No	Yes*
MC1	A4	Garage	3.5	Yes	No	Yes*

Bolded bends are those with protection proposed by Robinson Consultants.
*These changes appear to be anthropogenic and associated with construction or fill activities at these locations between 2003 and 2020
**Infrastructure at these locations is situated along the inside bank/slope of the meander bend

Multiple factors are relevant when assessing erosion risk due to fluvial processes at bends where infrastructure is situated adjacent to the top of the valley wall. In the context of the present study, bend protection measures have been proposed at 5 of the 14 locations that are in proximity to infrastructure (e.g., Bends 23, 24, 28, 31, and 34). Additionally, at bends where the channel is in contact with the toe of the valley slope there is an elevated hazard due to slope toe erosion. A total of 12 of 14 subject bends that are adjacent to infrastructure are also locations where the channel is in contact with the toe of the valley wall. Locations where the valley wall contact is on the outside of a meander bend are particularly susceptible to slope toe erosion. The proximity of infrastructure to the top of valley wall and the type of structure is also an important element in assessing risk and the potential need for bend protection measures. Finally, indications of changes in channel and/or slope morphology can indicate locations more susceptible to future erosion risk and/or vulnerability to slope failures associated with valley toe erosion. For this purpose, two high-resolution topographic surveys (i.e., 2003 and 2019-2020; details provided above) were used to

identify locations with notable changes in valley slope profiles. Figures illustrating these locations and including slope profiles derived from the 2003 and 2019-2020 elevation models are provided in **Appendix D**.

Based on the results of the desktop terrain analysis described above, the locations where erosion due to fluvial processes may pose a risk to adjacent infrastructure and where protections are not yet proposed include Bends 18, 22, 33, 34, and A3a. At all five locations the risk to the adjacent infrastructure is considered high owning the absence of proposed protection measures, the proximity of infrastructure to the top of valley slope, and channel contact with the toe of the valley slope. Although, we have assessed that these 5 locations are strong candidates for erosion protection measures our desktop assessment of changes in valley wall profiles between the 2003 to 2019-2020 elevation datasets did not indicate that these locations are particularly active sites of erosion over that time. In sum, our assessment indicates that Bends 18, 22, 33, 34, and A3a would benefit from erosion protection to reduce the hazard associated to fluvial process at bends where infrastructure is presently located. For conclusions and recommendations following from the slope stability analysis of these locations please consult the report prepared by the Paterson Group (Paterson, 2023).

4 Field Assessments

The study area was divided into four (4) reaches based on differences in surficial geology underlying the channel and relative lateral channel confinement (by a natural valley or man-made infrastructure) and road crossings (i.e., culverts and/or bridges). Field investigations were completed on November 23rd and 24th, 2022 to evaluate existing conditions and document evidence of ongoing channel processes. General observations, rapid geomorphic assessments (RGAs), and rapid stream assessment techniques (RSATs) were completed for each reach.

The results from these assessments are summarized in **Table 3** and **Table 4** below. It is important to note that during the time of the assessment, snow and ice were present on the water surface and banks. Despite this, the channel was still accessible and observable, and staff were able to break through ice and shovel snow allowing for acceptable field measurements. The field descriptions are supplemented and supported with representative photographs, included in Appendix E. Field sheets completed for rapid assessments are provided in Appendix F.

Table 3: Summary of general reach characteristics

Reach	Average Bankfull Width (m)	Average Bankfull Depth (m)	Substrate		Riparian Vegetation	Notes
			Riffles	Pools		
MC1	7.52	0.55	Clay/silt, Sand, Gravel, Cobble, Boulder	Clay/silt, Sand, Gravel	Grasses, Herbaceous, Hardwoods	Downed trees due to recent storm, slumping bank materials, exposed soil and roots present throughout.

Reach	Average Bankfull Width (m)	Average Bankfull Depth (m)	Substrate		Riparian Vegetation	Notes
			Riffles	Pools		
MC2	8.65	0.80	Clay/silt, Sand, Gravel, Cobble, Boulder	Clay/silt, Sand, Gravel	Grasses, Herbaceous, Hardwoods	Downed trees due to recent storm. Valley wall contact present throughout the reach. Multiple flow paths present within the valley at larger meanders
MC3	9.01	0.73	Clay/silt, Sand, Gravel, Cobble, Boulder	Clay/silt, Sand, Gravel	Grasses, Herbaceous, Hardwoods	Downed trees due to recent storm. Valley wall contact present throughout. Sections with multiple flow paths observed. Some bank protection treatments observed.
MC4	8.60	1.11	Clay/silt, Gravel. Cobble	Clay/silt, Sand	Grasses, Herbaceous, Hardwoods	Slumping sediment along channel banks and valley wall. Multiple flow paths observed at larger meanders

Reach MC1 is located at the most downstream extent of McKinnon's Creek within the study area, flowing for approximately 550 m from the northern to southern extent. The reach was characterized as confined with a perennial flow regime. The surficial geology is comprised of low permeability clay and silt overlain by thin sands of glaciomarine (offshore) origins in the northern half of the reach and modern alluvial deposits in the southern half of the reach. The channel throughout this reach exhibited minimal sinuosity and contained both pool and riffle features. The riparian zone was classified as continuous with mature grasses and hardwoods with no encroachment. Bankfull widths and depths ranged from 6.12 m to 8.50 m and 0.50 m to 0.60 m, respectively. Wetted widths and depths ranged from 5.3 m to 8.0 m and 0.14 m to 0.18 m, respectively. Bank materials were comprised of clay/silt, sand, gravel, and cobbles, with moderately steep angles (60°-90°). Undercutting up to 0.30 m was observed. Exposed soils and roots, valley wall contacts, and multiple dry flow paths were identified. Many downed trees due to a recent storm were observed within the creek valley.

Reach MC2 extends from Meteor Avenue to Smith Road, flowing for approximately 310 m from the northern to southern extent. The reach was characterized as confined with a perennial flow regime. The surficial geology is comprised of high permeability medium to fine-grained sands of glaciomarine (deltaic and estuarine) origin. The channel throughout this reach exhibited low sinuosity and both pool and riffle features were present. Within the riparian zone, continuous cover of mature grasses and hardwoods were present with no encroachment into the channel. Bankfull widths ranged between 8.2 m and 9.10 m, and bankfull depths ranged between 0.7 m and 1.0 m. At the time of the assessment wetted widths and depths ranged between 7.6 m to 8.7 m and 0.15 m to 0.33 m, respectively. Bank materials were composed of clay/silt, sand, gravel, and cobbles with moderately steep angles (60°-90°). Undercutting up to 0.2 m was observed. Multiple dry

flow paths were identified, and downed trees due to a recent storm were observed within the channel. A bank treatment of cobbles and small boulders was observed on the left bank at the most upstream extent of the reach.

Reach MC3 extends from Navan Road to Smith Road, flowing for approximately 915 m from the northern to southern extent. The reach was characterized as confined with a perennial flow regime. The surficial geology is comprised of high permeability medium to fine-grained sands of glaciomarine (deltaic and estuarine) origin throughout most of the reach, and low to medium permeability compact, well-laminated silt and sand glacial till in the most northern section of the reach. The channel throughout this reach meandered within the valley walls, with several large, tortuous meanders at the most downstream and upstream extents. Both pool and riffle features were observed. The riparian zone was classified as continuous with mature grasses and hardwoods with no channel encroachment observed. Bankfull widths and depths ranged from 7.9 m to 10.3 m and 0.50 m to 0.90 m, respectively. At the time of the assessment, wetted widths and depths ranged from 7.6 m to 9.2 m and 0.14 m to 0.37 m, respectively. Bank materials were comprised of clay/silt, sand, gravel, and cobbles with moderately steep angles (60°-90°). Undercutting up to 0.50 m was observed. Multiple dry flow paths were observed along the reach.

Reach MC4 extends from the northwestern corner of the study site, where the power lines cross over the watercourse, to Navan Road, flowing for approximately 1.5 km in a southeastern direction. The reach was characterized as partially confined with a perennial flow regime. The surficial geology is comprised of low to medium permeability compact, well-laminated silt and sand glacial till throughout most of the reach, with some small pockets of sandy glaciomarine deposits in the southern margins of stream valley. The channel exhibited regular meanders with several tortuous meanders within the reach and contained both pool and riffle features. Continuous cover of mature grasses and shrubs was present throughout the riparian zone with minimal encroachment into the channel. Bankfull widths ranged from 7.5 m to 9.5 m and bankfull depths ranged from 1.0 m to 1.25 m. At the time of the assessment wetted widths and depths ranged between 6.8 m to 8.6 m and 0.6 m to 0.8 m, respectively. Banks were composed of clay/silt with moderately steep angles (60°-90°). Undercutting up to 0.50 m was observed. A large beaver dam about 1.0 m in height causing a backwater effect was observed near Bend 15.

4.1 Rapid Geomorphological Assessment Tools

Channel instability was objectively quantified through the application of the Ontario Ministry of the Environment's (2003) Rapid Geomorphic Assessment (RGA). Observations were quantified using an index that identifies channel sensitivity based on evidence of aggradation, degradation, channel widening, and planimetric adjustment. The index produces values that indicate whether a channel is stable/in regime (score <0.20), stressed/transitional (score 0.21-0.40), or adjusting (score >0.41).

The Rapid Stream Assessment Technique (RSAT) was also employed to provide a broader view of the system as it considers the ecological function of the watercourse (Galli, 1996). Observations were made of channel stability, channel scouring or sediment deposition, instream and riparian

habitats, and water quality. The RSAT score ranks the channel as maintaining a poor (<13), fair (13-24), good (25-34), or excellent (35-42) degree of stream health.

These observations and measurements are summarized below. It is important to note that during the time of the assessment, snow and ice was present on the water surface and banks. Despite this, the channel was still accessible and observable, and staff were able to break through ice and shovel snow allowing for acceptable observations. All RGA and RSAT results are summarized in **Table 4**.

Table 4: Summary of rapid assessment results

Reach	RGA (MOE, 2003)			RSAT (Galli, 1996)		
	Score	Condition	Dominant Systematic Adjustment	Score	Condition	Limiting Feature(s)
MC1	0.30	In Transition/stress	Evidence of Widening	30	Good	Channel Stability
MC2	0.38	In Transition/stress	Evidence of Widening	29	Good	Channel Stability
MC3	0.38	In Transition/stress	Evidence of Widening	29	Good	Channel Stability
MC4	0.30	In Transition/stress	Evidence of Widening	30	Good	Channel Stability

Reach MC1 achieved an RGA score of 0.30, indicating that the reach was in a state of transition/stress. The dominant systematic adjustment was evidence of widening. The channel had fallen and leaning trees, exposed roots, accumulation of large woody debris and erosion on the valley walls. The RSAT resulted in a score of 26, or 'good'. The factor limiting the score was channel stability, as signs of instability were present throughout the reach such as bank slumping and undercuts.

Reach MC2 achieved an RGA score of 0.38, indicating the reach was in a state of transition/stress. The dominant systematic adjustment was also evidence of widening due to the observation of erosion indicators along portions of the reach such as fallen and leaning trees. The RSAT resulted in a score of 29, or 'good'. The factor limiting the score was channel stability, as signs of instability were present throughout the reach such as exposed tree roots and undercuts.

Reach MC3 achieved an RGA score of 0.38, indicating that this reach was also in a state of transition/stress. The dominant systematic adjustment was also evidence of widening, which included slumping bank material, large woody debris, and leaning/fallen trees with exposed roots. The RSAT score was 29, or 'good'. The factor that impacted the score most was channel stability, slumping bank materials and exposed tree roots were observed.

Reach MC4 achieved an RGA score of 0.30, indicating that the reach was in a state of transition/stress. The dominant systematic adjustment was evidence of widening due to large woody debris in the channel, slumping bank materials, and exposed tree roots. The RSAT resulted

in a score of 30, or 'good'. This was due to channel stability being the limiting factor, as slumping bank materials and exposed tree roots were observed.

5 Meander Bend Erosion Assessment

Multiple meander bends within the study area show evidence of erosion. The evidence includes undercutting along the banks, exposed roots, leaning trees, fracture lines along the top of slope and slumps along the banks. There are erosion protection structures proposed in an existing draft Drainage Report for 11 out of 35 bends within the study area. All 35 bends were assessed for the analysis presented herein to ensure a thorough review of additional areas which may require local restoration and/or protection to mitigate potential erosion. These locations are indicated on the reach map provided within **Appendix A**.

5.1 Methods

To assess the local erosion risk associated with these 35 bends, field observations and desktop exercises were used to inform an in-house qualitative assessment method. The additional four (4) locations where subtle bends were documented were not analyzed using the method, as they were too subtle to be considered meanders. The qualitative assessment tool applied here builds upon the Bank Erosion Hazard Index (BEHI) developed by Rosgen (2001), which was developed for bank erosion at a reach scale. Our method uses bank angle, vegetation, and substrate, considers evidence of recent erosion, and local geomorphic context (e.g. gradient, geomorphic unit, etc.) to evaluate erosion potential at individual meander bends. Each of these characteristics is assigned to a relative hazard category based on ratios obtained through field measurements, then summed to derive an erosion potential score for each bend (**Table 5**). This score is adjusted based on observed bank materials and whether stratification is present, and then each bend is assigned an overall hazard rating ranging from 0 to 50. The scores are organized into four (4) relative erosion hazard categories (Very Low, Low, Moderate, or High), included in Table 6 (Rosgen, 2001). This qualitative approach does not provide absolute measures of erosion. However, clusters of high-hazard bends can be identified using the erosion hazard categories.

Table 5: Bank Erosion Hazard Index indices and relative hazard categories

Relative Hazard Categories	Bank Height / Bankfull Height	Root Depth / Bank Height	Root Density (%)	Bank Angle	Surface Protection (%)
Very Low	1.0-1.1	1.0-0.9	80-100	0-20	100-80
Low	1.11-1.19	0.89-0.5	55-79	21-60	79-55
Moderate	1.2-1.5	0.49-0.3	30-54	61-80	54-30
High	1.6-2.0	0.29-0.15	15-29	81-90	29-15
Very High	2.1-2.8	0.14-0.05	5-14	91-119	14-10
Extreme	<2.8	<0.05	<5	>119	<10

The scores from the augmented BEHI method were combined with results from the Historical Aerial Photograph Review to derive an erosion activity level. Changes observed in the Historical

Review were organized into four (4) categories (None, Limited, Moderate, or Active) based on the geomorphological changes observed over time at each meander bend. The categories capture a gradient of change, in which the category 'None' denotes bends where there were no significant changes observed, while the category 'Active' denotes bends where significant changes were observed. Locations where vegetation cover obscured the meander bends and prevented meaningful observations are denoted as 'Obscured'. The erosion activity levels were also organized into three (3) categories (Low, Moderate, or High). Where the Historical Review and the BEHI classification were separated by more than one level (i.e., 'Active' and 'Low', respectively), the erosion activity level was determined to be the median between the two levels (i.e., 'Moderate'). Where the Historical Review and the BEHI classification were separated by only one level (i.e., 'Moderate' and 'Low', respectively), the erosion activity level deferred to the higher category (i.e., 'Moderate').

The erosion activity was then considered against the proximity to infrastructure to derive a final erosion risk level. Bends where there was no existing infrastructure nearby, or where there is proposed erosion protection, received a 'Low' erosion risk level. Bends where there is existing infrastructure nearby and no proposed erosion protection received an erosion risk level that matched the erosion activity level.

5.2 Results

A summary of erosion risk levels determined from the combination of all assessments for each of the identified meander bends is provided in **Table 6**, and a summary of the bend characteristics observed and measured for modelling input is provided in **Appendix E**. Further, a photographic record of representative erosion concern areas is provided within **Appendix C**.

Table 6: Risk levels for individual meander bends within the study area

Reach	Bend ID	Historical Review Observations	BEHI Classification	Erosion Activity	Proximity to Infrastructure	Erosion Risk
MC4	1	None	Very Low	Low	No	Low
	2	Limited	Low	Low	No	Low
	3	None	Low	Low	No	Low
	4	Active	Low	Moderate	No	Low
	5	Limited	Very Low	Low	No	Low
	6	Limited	Low	Low	No	Low
	7	Active	Low	Moderate	No	Low
	8	None	Very Low	Low	No	Low
	9	Moderate	Low	Moderate	No	Low
	10	**Limited**	**Low**	**Low**	No	**Low**
	11	Limited	Low	Low	No	Low
	12	Limited	Low	Low	No	Low
	13	None	Low	Low	No	Low
	14	None	Very Low	Low	No	Low

Reach	Bend ID	Historical Review Observations	BEHI Classification	Erosion Activity	Proximity to Infrastructure	Erosion Risk
	15	None	Very Low	Low	No	Low
	16	Limited	Low	Low	No	Low
	17	Limited	Moderate	Moderate	No	Low
	18	**Obscured**	**Low**	**Low**	**Yes**	**Low**
	19	Limited	Low	Low	Yes	Low
MC3	20	Obscured	Low	Low	Yes	Low
	21	Obscured	Moderate	Moderate	No	Low
	22	**Moderate**	**Low**	**Low**	**Yes**	**Moderate**
	23A	**Limited**	**Low**	**Low**	**Yes**	**Low**
	23B	**Moderate**	**Low**	**Low**	**Yes**	**Low**
	23C	**Limited**	**Low**	**Low**	**Yes**	**Low**
	24	**None**	**Low**	**Low**	**Yes**	**Low**
	25	**Limited**	**Very Low**	**Low**	**No**	**Low**
	26	**Limited**	**-***	**Low**	**No**	**Low**
	27	Limited	Low	Low	No	Low
	28	**Limited**	**Very Low**	**Low**	**Yes**	**Low**
	29	Limited	Moderate	Moderate	No	Low
	30	None	Moderate	Low	No	Low
	31A	**Moderate**	**Low**	**Low**	**Yes**	**Low**
	31B	**Moderate**	**Low**	**Low**	**Yes**	**Low**
	31C	**Moderate**	**-***	**Low**	**Yes**	**Low**
	32	**Limited**	**Very Low**	**Low**	**Yes**	**Low**
MC2	**33**	**Obscured**	**Very Low**	**Low**	**Yes**	**Low**
	34	**Limited**	**Very Low**	**Low**	**Yes**	**Low**
MC1	**35**	**Limited**	**Low**	**Low**	**Yes**	**Low**

Bolded bends are those with protection proposed by Robinson Consultants
Bolded and Underlined bends and those locations identified in Section 3.3 (Digital terrain analysis of geomorphic features)
*** Field measurement unavailable due to thick ice cover.**

Of the 35 bends identified, none were classified as 'High' risk sites in terms of erosion activity or erosion risk. Seven (7) sites were classified as 'Moderate' in terms of erosion activity and one (1) site was classified as 'Moderate' in terms of erosion risk.

Stream channels naturally migrate due to baseline geomorphic activity, thus the outcome that seven (7) bends were classified as having 'Moderate" erosion activity is expected. The difference between those classified as 'Moderate' for erosion activity and erosion risk, respectively, is the proximity to infrastructure. Bend 22 in reach MC3 is the bend that received a 'Moderate' erosion risk classification, as it is located along private property upon which there is a residential dwelling, and there is currently no proposed erosion protection at this location.

6 Recommendations for Protection Works

As detailed above, a total of 19 locations (16 bends and 3 road/trail crossings), including 6 locations proposed in this report (5 bends and 1 trail crossing), are recommended for erosion protection. These locations can be classified into 5 distinct geomorphic contexts: i) outside of meander bends with valley wall contact; ii) outside of meander bends without valley wall contact; iii) chute cutoffs; iv) gully-channel confluences; and v) channel crossings. Below we provide specific recommendations regarding the implementation erosion protection works specific to the geomorphic context of the treatment.

Outside of meander bends with valley wall contact (e.g., B22; B26). Treatments at these locations should extend from the riffle immediately upstream of entry to the pool. The treatments should be feathered into the existing bank avoiding abrupt changes in the current angle of the channel meander. Along the meander apex and where the meander is in contact with the valley wall, the treatment should be inset to the channel, limiting the loss of the channel cross-sectional area but reducing the bend radius of curvature. In direct contact with the valley wall, a bench should be provided to provide ballast and reduce cutting into the existing valley toe. If required, the inside point bar should be sculpted to reduce pressure on the bend, maintain cross-sectional area, and reduce overall instream velocity. The downstream terminus of the treatment should extend to a point tangential to the bend and enter the riffle. This treatment should also be feathered into the existing channel. Treatments should consist of both hydraulically sized stone and vegetation, which will provide additional roughness, reducing shear stress acting on the bend. The final treatments should be shown to limit (maintain) cross-sectional area, provide roughness on the outside bend, and limit significant changes in the upstream and downstream flow fields. The slope gradient maps and slope profiles provided in **Appendix D** can be used to provide a general indication to ensure the steepest gradient slopes are captured in the treatment. However, the provided slopes gradient maps and slope profiles may not accurately reflect existing conditions and therefore detailed surveys may be required at the time of installation to confirm and ensure the steepest gradient slopes are capture by the treatment works.

Outside of meander bends without valley wall contact (e.g., B10; B35). Treatments at these locations should extend from the riffle immediately upstream of entry to the pool. The treatments should be feathered into the existing bank avoiding abrupt changes in the current angle of the channel meander. If required, the inside point bar should be sculpted to reduce pressure on the bend, maintain cross-sectional area, and reduce overall instream velocity. The downstream terminus of the treatment should extend to a point tangential to the bend and enter the riffle. This treatment should also be feathered into the existing channel. Treatments should consist of both hydraulically sized stone and vegetation, which will provide additional roughness, reducing shear stress acting on the bend. The final treatments should be shown to limit (maintain) cross-sectional area, provide roughness on the outside bend, and limit significant changes in the upstream and downstream flow fields. As per above, the maps and slope profiles provided in **Appendix D** can be used to provide a general indication to ensure the placement of the treatment. However, the provided maps may not accurately reflect existing conditions.

Chute cutoffs (e.g., B33). Banks at these locations should be lowered slightly to allow relief flow during larger events. Treatment should extend to cover both access and egress of the chute. This will limit the potential for an avulsion while maintaining the benefits of reduced shear stress in the channel during higher flows. Aggressive planting of chute channels can be considered as a means of increasing roughness and providing additional protection for floodplain sediments.

Confluences on the outside bend of meanders (e.g., B28). Treatments should extend one geomorphic unit upstream of the confluence and be feathered into the banks of the smaller confluence channels. The treatment should be widened at the confluence to reduce expansion scour at the toe of the treatments on the main channel. To maintain the integrity of the bank treatments upstream and downstream of the confluence, a vortex rock weir in the smaller tributary may be required to direct flows away from the downstream bank and lock the smaller channel in place. Treatments should consist of hydraulically sized stone and vegetation, such as a vegetated rock buttress or vegetated riprap.

Entrance and exit of channel crossings (e.g. at Navan Rd). Treatments should extend along both banks, should not reduce cross-sectional area, and should provide a perpendicular approach to the crossing. On the downstream side, attention should be given to expansion scour, providing an oversized pool to accommodate changes in the flow. Treatments should extend one geomorphic unit upstream and downstream of the crossing and should be feathered into the existing channel. Treatments should consist of hydraulically sized stone and vegetation, such as a vegetated rock buttress, or vegetated riprap. Vegetated root wads reinforced with stone are also appropriate for downstream pools as they also provide habitat benefits for aquatic species.

7 Conclusion

Erosion susceptibility at 35 stream bends was evaluated using a combination of desktop and field based geomorphic assessment approaches. The erosion risk at each bend was determined as a product of the erosion susceptibility and the proximity of infrastructure at each of the subject channel bends. The outcome of this assessment is in general agreement with the Draft Drainage Report titled: *Engineer's Report for the McKinnon's Creek Municipal Drain* (2022) prepared by Robinson Consultants Inc., which previously identified 11 meander bends for proposed protection. In coordination with the Paterson Group, who conducted a separate and concurrent slope stability analysis of McKinnons Creek, GEO Morphix has identified six (6) additional locations that could benefit from erosion protection due to erosion potential and erosion risk at these locations. These locations include Bends 18, 22, 23, 33, and 34, as well as Subtle Bend A3. GEO Morphix also recommends extending the road crossing protection along the slopes/banks both upstream and downstream of crossings, plus adding protection on the upstream side of the trail crossing.

Note that recommendations provided in this report situate the general locations that may benefit from erosion protection works and provide recommendations for the application of treatments specific to the geomorphic context at those locations. We suggest that erosion protection within the channel's existing footprint can be achieved by sculpting banks to reduce local concentration of erosive forces. Bank treatments such as vegetated rock buttresses and vegetated stone layering could be used in combination with the strategic use of wood and boulders to enhance bank

stability. The maps and profiles provided in Appendix D may be used to provide a general indication for the extent of the proposed treatment locations, however, the provided maps and profiles as well as the proximity of the infrastructure to the channel may not accurately reflect existing conditions at the time of treatment and therefore detailed surveys may be required at the time of treatment to confirm and ensure the optimal locations for the treatment works.

We trust this report meets your current requirements. If you have any questions or concerns, please contact the undersigned.

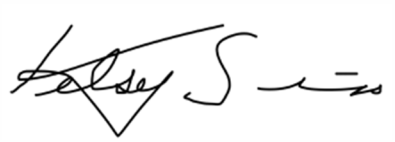
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Appendix A – Reach and Bend Map



Legend

- Reach Break and ID (MC-1)
- Extent Accessed
- Watercourse
- 1 m Contour
- Proposed Protection (Robinson)

Study Area

McKinnons Creek

Ottawa, Ontario

GEO MORPHIX™

N

0 75 150

Metres

Imagery: City of Ottawa, 2021. 1 m Contour: MNRF, 2020 (LiDAR Derived). Watercourse: MNRF, 2021/GEO Morphix Ltd., 2022. Reach Break and ID, Extent Accessed, Photo Location: GEO Morphix Ltd., 2022. Proposed Protection: Robinson, 2022. PN22106. Print Date: November 2023. Drawn By: J.F., M.O.

McKinnons Creek Municipal Drain
SNC
HEC-RAS Model Revisions
Technical Memo, Cody Newton, P.Eng.,
Robinson Consultants Inc., August 2024

DETAILS

DATE: August 12th, 2024

TO: South Nation Conservation

FROM: Cody Newton, P. Eng.

SUBJECT: McKinnon's Creek Municipal Drain SNC HEC-RAS Model Revisions

1.0 INTRODUCTION

As part of the McKinnon's Creek Municipal Drain project, an analysis of the existing and proposed conditions was completed utilizing the existing South Nation Conservation (SNC) HEC-RAS model. This analysis was completed to determine the impacts of the proposed improvements on the 100-year flood plain water elevations.

The following activities were undertaken as part of this assignment:

- Update the existing model geometry with channel and structure data surveyed by RCI in 2017.
- Input proposed channel sections at each cross section.
- Modify existing overbanks at each cross section with proposed spread material.
- Input proposed structures.
- Incorporate channel sections and proposed structures from Arcadis' McKinnon's Creek Enhancement design.
- Compare water elevations and velocities for the existing and proposed models at the 100-year event.

This Technical Memorandum describes the methods and assumptions that were used to complete this assignment.

2.0 EXISTING HEC-RAS MODEL

An existing HEC-RAS model was provided by SNC on August 25, 2020, for the East Savage/McKinnon's Creek drainage basins. The design peak flows used by SNC were reviewed and selected as the design peak flows to be used for this assignment. The geometry of the drain was reviewed and the SNC cross sections and structures were modified based on field survey data collected by RCI in 2017.

As part of the McKinnon's Creek Municipal Drain project, a full detailed survey of the drain was completed and with this, up to date structure details for each crossing. This information included the inverts of the structures as well as dimensions including span, rise, and length. This data was used to update the existing geometry. The model was run with the modified geometry file and existing design peak flows to obtain the baseline water elevations and velocities through the drain.

The profile of the channel in the existing model was found to be higher than the surveyed profile along the entire drain (three exceptions existed where the model profile was lower than the surveyed profile). The difference ranges between -0.16 m and 0.78 m. The profile was modified to match the field surveyed elevations.

The stationing in the HEC-RAS model differs from the design stationing shown on the drawings. This is because the model stationing increases from downstream to upstream whereas the stationing in the design drawings increases from upstream to downstream. The design drawings also only include from

1 km north of the Navan Road crossing (limits of IBI development work) to the outlet of McKinnon's Creek Municipal Drain at the East Savage Municipal Drain. To find equivalent stationing between the model and design drawings the design stationing was subtracted from 16741 m and then 255 m was added.

3.0 PROPOSED DRAIN MODIFICATIONS

3.1 Channel Cross Sections

A new profile for the drain was selected which included a new cross section for the channel. These cross sections were designed to contain the 5-year design event at a minimum. The proposed side slopes are 2:1 throughout the drain and the proposed channel bottom width is 4.0 m.

The existing cross sections in the drain were updated with the proposed channel sections. The proposed cross-sections are presented in drawings 16070-C1 and 16070-C2 appended to this memorandum.

3.2 Spread Material

To construct the proposed profile and cross sections, material needs to be excavated from the drain. For a municipal drain project, the excess material is typically spread on the lands adjacent to the drain. The material is placed outside of a 5 m buffer from top of bank of the channel and to a maximum depth of 150 mm.

The required width of the spread material was determined by calculating the excavated material volumes between specific stations and then dividing by the maximum fill depth of 150 mm. The spread length was kept to a maximum of 50 m from the buffer strip.

The cross sections in the model were then modified by increasing the existing points outside of the 5 m buffer strip up to the required spread length by 150 mm to account for the change in elevation through these areas.

Only the area between Sta. 12+689 and Sta. 14+644 is suitable for the placement of spread material. For the other areas of the drain there is no suitable location to spread the material and it will have to be removed and disposed of off site.

3.3 Structures

It is proposed to replace the culverts listed in **Table 3.1** as part of the scope of work. The proposed structures were sized based on the appropriate design event and the design peak flows were taken from the HEC-RAS model. These proposed structures were updated in the model for the proposed conditions.

Table 3.1: Culverts Requiring Replacement

Culvert Location	Existing Size/Type (mm)	Proposed Size/Type (mm)
Farm Lane (13+590)	4400x2500 CSPA	3890x2690 CSPA
Farm Lane (13+938)	3500 Ø CSP	3890x2690 CSPA
Residential (14+593)	4400x2500 CSPA	4200x2100 Conc. Box
Farm Lane (14+983)	4200x2200 Conc. Bridge	4200x2100 Conc. Box
Farm Lane (15+509)	3700x2400 Conc. Bridge	4200x2100 Conc. Box

3.4 McKinnon's Creek Enhancement

The design of McKinnon's Creek upstream of Sta. 7+077 in the HEC-RAS model was completed by Arcadis as part of the proposed development work. All cross section and structure changes were taken directly from the HEC-RAS model provided by Arcadis.

4.0 RESULTS

The existing conditions model and proposed conditions model were both run with the 100-year design event flows (1D+2D flows) that were included in the SNC model. The results are attached to this memorandum. Due to station changes throughout the Arcadis proposed design a direct comparison of water levels and velocities was not possible through that portion of the drain. A direct comparison was completed for the remainder of the drain.

The final (after improvements) water levels along most of the drain are equal to or below the existing conditions. There are ten cross sections where the water levels increase under proposed conditions, the water elevation increases between 0.01 and 0.06 m. At seven of these locations this is due to the design profile being higher than the existing. In these situations, the bottom of channel elevation is left at existing levels when constructed. The design profile is only for future maintenance requirements. If sediment were to build up in the drain it would only be removed to the design profile. For more frequent design events more of the water volume is captured and maintained within the design channel due to the proposed profile and cross section modifications.

The velocities are comparable between the existing and proposed conditions. The peak velocity through the RCI portion of the drain is reduced from 2.73 m/s to 2.57 m/s, with the average velocity decreasing from 1.06 m/s to 0.99 m/s during the 100-year event. Velocity increases are located near the inlet and outlet of structures. As part of the proposed drain works erosion protection measures (rock protection) are proposed at the inlet and outlet of all structures.

For the Arcadis improvements, due to the lowering of the channel water levels are all lower than the existing conditions. In general, the velocities through this upper portion of the drain are lower than existing conditions with exceptions at the inlet and outlet of the two structures located at Tenth Line Road and Wall Road. Appropriate erosion protection measures should be implemented at these structures.

Prepared by:



Cody Newton, P. Eng.