Robinson Consultants

Amendment to the Engineer's Report for the Faulkner Municipal Drain

Prepared For:

Ottawa

Prepared By:

Robinson Consultants Inc.
Consulting Engineers

Our Project No. 16013
December 2020

December 14th, 2020

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

Attention: **Mr. Rick O'Connor**
City Clerk

Reference: **Amendment to the Engineer's Report**
Faulkner Municipal Drain, Stittsville
Our Project No. 16013

Dear Sir:

This Amendment to the Engineer's Report for the Faulkner Municipal Drain, which is respectfully submitted for Council's consideration, was initiated by the City of Ottawa under Section 78 of the Drainage Act, RSO 1990. The purpose of the report is to accommodate a change in land use, from rural/agricultural to urban development, for portions of the lands within the drainage area of the Faulkner Municipal Drain. The report also makes provisions to move the municipal drain off the Shea Road Allowance, in areas where the depth of the existing drain is considered a significant safety hazard, and to improve the cross-sectional area to reduce erosion of the banks.

This Report makes modifications to the existing Engineer's Report entitled "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants Limited and incorporates the modifications and improvements included in the "Engineer's Report Faulkner Municipal Drain Modifications and Improvements" by Robinson Consultants Inc., dated June 2003 and the "Engineer's Report Subsequent Subdivision of lands, Faulkner Municipal Drain, Area 6 Stittsville", by Robinson Consultants Inc., dated May 2017. All sections of the Faulkner Municipal Main Drain covered by the previous reports have been incorporated into this report. Therefore, the Engineer's Report entitled "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants Limited for the main drain, the "Engineer's Report Faulkner Municipal Drain Modifications and Improvements" by Robinson Consultants Inc., dated June 2003 and the "Engineer's Report Subsequent Subdivision of lands, Faulkner Municipal Drain, Area 6 Stittsville", by Robinson Consultants Inc., dated May 2017 will no longer have any status under the Drainage Act, RSO 1990 for the Main Drain once the by-law for this report is enacted. However, the "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants will continue to be in force for the various branch drains associated with the report.

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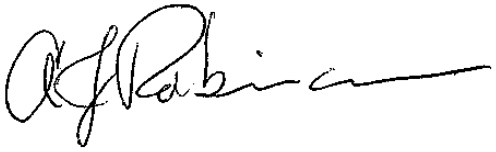
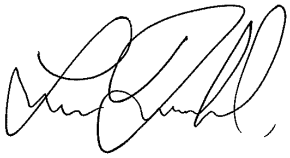
All costs associated with this Engineer's Report and the recommended modifications and improvements will be assessed in accordance with the Assessment Schedules for Construction and Future Maintenance of the Faulkner Municipal Drain, provided by this Report.

If you have any questions, please feel free to contact Andy Robinson at 613-592-6060 extension 104 or Lorne Franklin at extension 123.

Yours very truly,

ROBINSON CONSULTANTS INC.





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1.0 INTRODUCTION

Robinson Consultants Inc. was appointed by the City of Ottawa on April 27, 2016 to complete an Engineer's Report to amend the existing Engineer's Report for the Faulkner Municipal Drain. The Amendment to the Engineer's Report for the modifications to the municipal drain was initiated by the City of Ottawa under Section 78 of the Drainage Act to accommodate the proposed development of lands within the Stittsville development area.

1.1 On-Site Meeting

An on-site meeting of the affected landowners and concerned parties was held on February 1, 2017.

2.0 PURPOSE OF THE AMENDMENT REPORT

The City of Ottawa initiated the Amendment to the Engineer's Report under Section 78 of the Drainage Act, RSO 1990, in conjunction with the development of lands within the drainage area. The purpose of the Report is to accommodate the change in land use from rural or agricultural to urban development for the lands identified as Block 20-E and Block 20-F, and to incorporate the changes for Block 17-A, Block 17-B, Block 17-C and Block 17-D on Dwg. No. 16013-A3 and 16013-A3.1. The land use changes for Bocks 17-A through 17-D where the subject of the "Engineer's Report Subsequent Subdivision of lands, Faulkner Municipal Drain, Area 6 Stittsville", by Robinson Consultants Inc., May 2017.

This Report makes modifications to the existing Engineer's Report entitled "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants Limited and incorporates the modifications and improvements included in the "Engineer's Report Faulkner Municipal Drain Modifications and Improvements" by Robinson Consultants Inc., dated June 2003 and the "Engineer's Report Subsequent Subdivision of lands, Faulkner Municipal Drain, Area 6 Stittsville", by Robinson Consultants Inc., dated May 2017. All sections of the Faulkner Municipal Drain for the main drain covered by the previous reports have been incorporated into this report. Therefore, the Engineer's Report entitled "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants Limited, the "Engineer's Report Faulkner Municipal Drain Modifications and Improvements" by Robinson Consultants Inc., dated June 2003 and the "Engineer's Report Subsequent Subdivision of lands, Faulkner Municipal Drain, Area 6 Stittsville", by Robinson Consultants Inc., dated May 2017 will no longer have any status under the Drainage Act, RSO 1990 for the main drain once the by-law for this report is enacted. However, the "Engineer's Report Faulkner Municipal Drainage Works", September 1975, by A. J. Graham Engineering Consultants will continue to be in force for the various branch drains associated with the report.

Modifications are as detailed in the following sections.

2.1 Modifications – Main Drain

Modifications to the existing Faulkner Municipal Drain include relocating a portion of the drain, lowering the profile, and modifying the cross-section of the drain to increase the capacity and to reduce the potential for erosion of the steep banks. The proposed modifications will accommodate the drainage from the stormwater management systems for the development area and will relocate the drain outside the road allowance for Shea Road where it is very deep and presents a safety hazard.

3.0 EXISITNG CONDITIONS

3.1 Location of the Drain

The portion of the main drain, as identified by this Report, commences at Flowing Creek Municipal Drain at Station 0+000 and extends to Station 5+445.00, which incorporates the section of the drain which was improved under the report "Engineer's Report Faulkner Municipal Drain Modifications and Improvements", by Robinson Consultants Inc., dated June 2003. The chainage (stationing) from the 2003 report has been modified to reflect the revised chainage (stationing) used in this report.

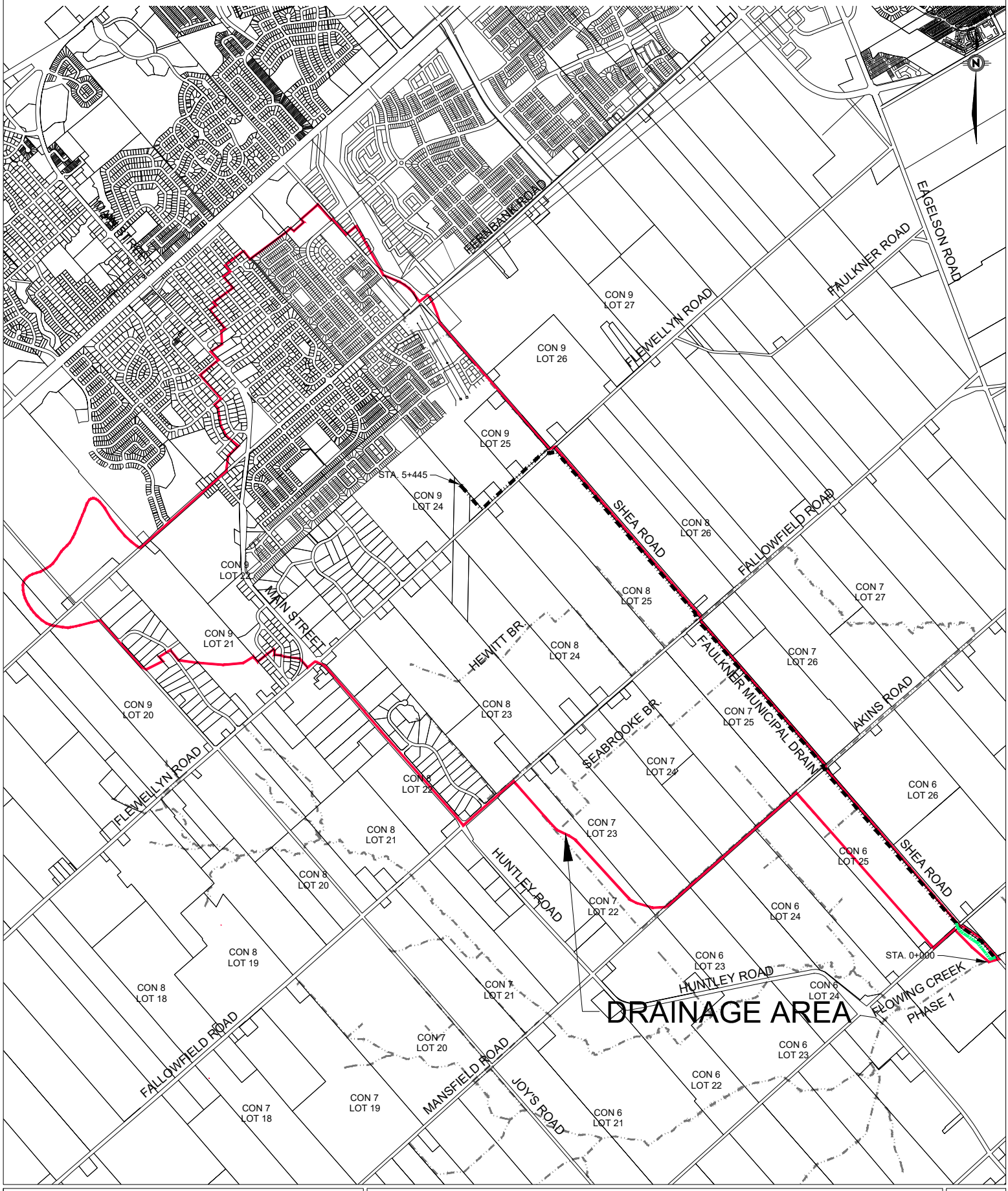
The location of the drain is shown on the Location Plan - **Figure 3.1**.

3.2 Drainage Basin and Limits

The drainage basin for the Faulkner Municipal Drain is modified by the drainage scheme for the proposed development and to reflect current drainage conditions for the drainage area. The drainage basin area includes parts of the following Lots and Concessions (former Twp. of Goulbourn):

- Lot 25, Con 5
- Lot 25, Con 6
- Lots 23 through 25, Con 7
- Lots 22 through 25, Con 8
- Lots 20 through 26, Con 9
- Lots 20 through 26, Con 10

The drainage area of the Faulkner Municipal drain is approximately 1085 hectares (2,681 acres). The limits of the drainage boundary (drainage basin) are shown on Dwg. No. 16013-A1. These limits have been determined by the drainage design of the proposed development, the previous Engineer's Reports, and the drainage area boundaries of adjacent drains.



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Title: LOCATION PLAN		Fig. No. 3.1
Project: FAULKNER MUNICIPAL DRAIN		Job No. 16013
	Scale:	Date: DEC. 2020

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 approved area will be required.

3.3 Drawings Forming Part of the Engineer's Report

Dwg. No. 16013-A1, has been prepared showing the drainage area boundary in a bold-solid line (red where provided in colour) and the location of the drain in a bold dash-dot-dot line. Branches of the Faulkner Municipal Drain and adjacent drains are indicated with a grey dash-dot-dot line.

Dwg. No. 16013-A2 has been prepared showing existing and proposed culverts as well as proposed minimum measures for construction phase sediment and erosion control (rock and straw bale check dams) as well as permanent erosion control measures (rock protection).

Dwg. No. 16013-A2.1 has been prepared showing details of the proposed relocation of the drain between Station 0+000 and 0+336.10.

Dwg. No. 16013-A3 (and 16013-A3.1 in detail for Blocks) has been prepared indicating individual properties and blocks which form part of the drainage area, identified by a property ID number or Block number for reference to the Schedule of Assessment, and indicating the hectarage which forms part of the drainage area.

Dwg. No. 16013-P1 through to P8 provides a profile of the full extent of the main drain (excluding branches).

Dwg. No. 16013-C1 through C5 have been prepared indicating existing and proposed cross-sections for the main drain.

Standard Municipal Drain details are provided on Robinson Consultants Inc. Std. Dwg. 1 through 6 (inclusive), Dwg. 10 and Dwg. 15.

All above noted drawings are provided in **Appendix A.**

4.0 DESIGN CONSIDERATIONS

The drainage design, including stormwater management facilities and controls for Blocks 20-E, 20-F and 20-H was completed by the engineers retained for the development of the lands in question and has been approved by the City of Ottawa and the Rideau Valley Conservation Authority in conjunction with the development application process.

4.1 Hydrology

The engineering consideration of the impact of the land use change included a review of the "Stittsville South Subdivision City of Ottawa, Faulkner Drain Hydrotechnical Update" (SWM Report) as prepared by Novatech Engineering Consultants Ltd., dated "Revised July 15, 2016". The Hydrology in the Novatech Engineering Consultants Ltd., July 2016 report was based on full development in accordance with the approved Community Development Plan, referred to Scenario 3. The hydrology from this report has been reviewed and approved by the City of Ottawa and has been used as the basis for design of the improvements to the Faulkner Municipal Drain included in the current report.

Peak flow Estimates for scenario 3 conditions are shown in **Table 4.1**.

Table 4.1
Peak Flow Estimates for Scenario 3 Conditions

Station	Peak Flow m^3/s		
	2 yr.	5 yr.	100 yr.
5+445.00	3.05	5.95	10.97
4+663.10	3.17	6.38	12.53
3+065.60	4.13	7.64	18.59
1+741.50	6.46	11.54	27.93
0+000.00	7.03	12.22	28.89

4.2 Hydraulic Modeling

A steady state flow model was produced using HEC-RAS software. The model was developed with watercourse cross-section data based on the following:

- LiDAR mapping provided by the City of Ottawa
- Faulkner Municipal Drain Engineer's Report (A. J. Graham, 1975)
- Faulkner Municipal Drain Engineer's Report (RCI, June 2003)
- On-Site Investigations and Photographs
- RCI topographical survey completed April 2016, June 2016, October 2017, November 2017, and June 2019.
- Technical Memorandum, Faulkner Drain HEC-RAS Model Development and Results Summary prepared by Robinson Consultants Inc., dated July 11, 2016.
- Novatech supplied tributary drawings north of the Faulkner Drain – 113004-DRN1 and 113004-DRN2 (both Rev#7, April 5, 2016 and emailed on June 13, 2016)
- Faulkner Drain Hydrotechnical Update (Novatech, Revised July 15, 2016)
- Fernbank SWM Pond 4 – Storm Outlet Assessment and Preferred Conceptual Drainage Option (Stantec, September 11, 2018)

This model was used to generate water levels for the 2, 5, and 100 years design storms for both existing and proposed conditions.

Proposed conditions include channel relocation and modifications as shown on the profile and cross section drawings. The channel is relocated from Station 0+000 to 0+330 (Brownlee Road) and modified from Station 0+330 to 4+627.63. The existing channel design is adequate between Station 4+627.63 and Station 5+445. This existing channel should be maintained to the design profile and cross-section.

4.3 Side Slopes and Typical Cross Section

In general conformance with and in recognition of current requirements and best management practices for municipal drains, channel widths are specified to accommodate higher return frequency flows with a minimum 2:1

4.4 Capacity of Existing and Proposed Culverts

4.4.1 General

The capacity of existing culverts on the Faulkner Municipal Drain was calculated using MTO nomographs. The modeled flow at these culverts was then used to verify if the culverts had sufficient capacity to convey the design flows. A summary of capacities and flows is included in **Table 4.2**.

Table 4.2
Summary of Culvert Capacities

Culvert No. and Location	Existing Capacity* (m^3/s)	Peak Flow (m^3/s)		
		2 yr	5 yr	100 yr
Roadway Culverts				
Flewellyn Road (4+633.10)	15.7	3.17	6.38	12.53
Fallowfield Road (3+065.60)	36.6	4.13	7.64	18.59
Brownlee Road (0+336.10)	26.0	7.03	12.22	28.89
Access Culverts				
Residential Entrance (5+185.40)	11.3	3.05	5.95	10.97
Residential Entrance (5+055.00)	11.0	3.05	5.95	10.97
Residential Entrance (4+882.90)	9.8	3.05	5.95	10.97
Residential Entrance (3+838.50)	16	3.17	6.38	12.53
Residential Entrance (0+867.60)	15	6.46	11.54	27.93

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.*

4.4.2 Culverts Requiring Replacement

In accordance with Section 26 of The Drainage Act, 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. 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, 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 which 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, The Drainage Act RSO, 1990. 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 RSO, 1990 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 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 Faulkner Municipal Drain, the sizing will also be dictated by the design considerations and allowable water level elevations. **Table 4.3** lists roadway culverts which require replacement to increase capacity or must be lowered to accommodate the drain profile.

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 Faulkner Municipal Drain will be the responsibility of the Road Authority. Future maintenance of the culverts under existing roads will also 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 which require replacement to increase capacity or are added for access are noted in **Table 4.4**. Where the alignment of the drain segments a property, each landowner is entitled to the installation (or replacement where required) of one standard access crossing up to 12 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 initial construction and future maintenance for replacing existing private farm and residential culverts will be included in the cost estimate assessed in this report.

Table 4.3
Capacity of Roadway Culverts Which Require Replacement

Culvert Location	Type	Existing		Proposed	
		Size/Type	Capacity* (m^3/s)	Size/Type	Capacity* (m^3/s)
Sta. 0+336.10	Brownlee Road	2 – 2650mm dia. CSP	26.0	2 – 2650mm dia. CSP	26.0

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

Table 4.4
Capacity of Residential Entrance Culverts Which Require Replacement

Culvert Location	Type	Existing		Proposed	
		Size/Type	Capacity* (m^3/s)	Size/Type	Capacity* (m^3/s)
Sta. 3+838.50	Residential Entrance	2400mm x 3750mm CSPA	16.0	2400mm x 3750mm CSPA	16.0
Sta. 0+867.60	Residential Entrance	2800mm dia. CSP	15.0	2400mm x 3750mm CSPA	16.0

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

4.4.3 Future Private and 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 culverts shall obtain approvals from all governing agencies as well as the Drainage Superintendent. Provided 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 a new private or roadway culvert. A record of the additional culvert must be appended to the original by-Law and report.

4.5 Channel Modeling Results

Water surface elevations for proposed conditions remain the same or decrease at all stations along the channel. A comparison of water surface elevation data for existing and proposed conditions is shown in **Table 4.5.**

Table 4.5
Water Surface Elevation Comparison

Station	Water Surface Elevation (m)					
	Existing Conditions			Proposed Conditions		
	2 yr.	5 yr.	100 yr.	2 yr.	5 yr.	100 yr.
5+229.82	101.66	102.22	102.74	101.66	102.21	102.74
4+633.10	100.50	101.01	101.79	100.35	100.62	101.05
3+200.00	98.53	98.89	99.29	98.38	98.70	98.98
1+800.00	97.63	97.73	98.01	97.42	97.72	97.85
0+400.00	94.63	95.15	96.53	94.52	94.89	95.68

4.6 Drain Relocation and Modification

The section of the existing Faulkner Municipal Drain between its outlet at Flowing Creek Municipal Drain at Station 0+000 and Station 0+336.10 at Brownlee Road is partially located within the road allowance for Shea Road. The drain in this location is very deep, with steep side slopes and as a result is a safety hazard. Therefore, it is necessary to relocate this portion of the drain westerly to a location outside of the road allowance. Details for the relocation are shown on Dwg. A2.1, provided in **Appendix A.**

Between Station 0+336.10 and 4+633.10 there will be modifications to accommodate the width of the drain and to provide for a 2:1 backslope on the west side of the drain.

4.7 Clearing

Landowners are advised the Contractor will clear only those trees, which may affect its operation within the working area. All trees having 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. All brush, limbs and other debris resulting from the clearing operation shall be removed from the site at the Contractor's expense (note restrictions may apply to Ash – Emerald Ash Borer).

4.8 Excavation

The construction of the Faulkner Municipal Main Drain will be an open channel with design grades, side slopes and ditch bottom widths as specified on the design profile Dwg. No. 16013-P1 through 16013-P8 and Cross-Section Drawings No. 16013-C1 through 16013-C5.

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 culverts, confluences, and areas of bank instability. Erosion control measures will be of an engineering type, primarily rock protection with filter cloth.

4.9 Fisheries Act and Special Design Considerations

The majority (full extent of the main drain upstream of Brownlee Road) of existing Faulkner Municipal Drain is classified as a "Type C" Municipal Drain (ID No. 98114) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2017. The extent of the drain downstream of Brownlee Road (approximately 336m) to the Outlet at Flowing Creek – Phase 1 Municipal Drain is classified as a "Type E" Municipal Drain (ID No. 98114) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2017.

The use of the Drain Classification System is limited to maintenance of existing drains only. An increase in the overall width of the drain to provide capacity and the relocation of portions of the drain exceed these limitations. Therefore, the conditions of the Drain Classification System cannot be met, and a site-specific review may be required by the Department of Fisheries and Oceans.

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

4.9.1 "Type C" Drain

Typical conditions for a "Type C" drain include permanent warm water flow with no sensitive species which currently use the drain. As such, where work is completed within specified in-water work windows and measures are put in place to defish work areas and protect against the release of sediment downstream there is a limited impact on fish and fish habitat.

It is proposed the standard conditions for the maintenance of a "Type C" Municipal Drain be implemented for the reconstruction of the drain.

While the proposed work will provide for additional capacity and some relocation it is not anticipated the work will change the general nature, substrate or remove any special feature of the drain, and ultimately will not result in a change to fish species utilizing the drain. Additionally, construction from one-bank (where possible) and the implementation of a two-stage channel will result in existing vegetation remaining which may quickly colonize disturbed areas.

Significant portions of the drain provide a narrow deep channel and are generally anticipated to meet typical preferred conditions for fisheries as prescribed by the Department of Fisheries and Oceans. However, where the proposed channel is wider, a two-stage profile is implemented by the proposed construction. The existing channel width will be maintained in general conformance with the proposed profile. However, the cross-sectional width is proposed to be increased in some areas to partially relocate the drain off the road allowance. Stage 1 of the two-stage channel is provided by the existing section with the bank of the east side unmodified and the bottom maintained as necessary to the proposed profile. Additional width excavation then commences from the west bank at 300mm above the proposed grade to the specified channel width and forms stage 2 of the two-stage profile.

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.
- De-fish work areas.
- 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 west side of the drain as there are areas of bank instability on this side to be addressed. The primary method for addressing bank instability will be slope flattening (to the standard 2h:1v side-slope.

During construction, a series of check dams (Straw Bale – Std. Dwg 3. or Rock –Std. Dwg 6) will be installed to control sediment movement to downstream areas. Sediment traps will be constructed upstream of the check dams. These excavations are typically 500 mm deep, 15 metres long and the width of the channel as shown on the standard drawings. 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 of the adjacent drain 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 in this regard, 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 Drawing No. 16013-A2.

Tree removal will be required to complete the work. It is recognized, mature vegetation plays an important role in slope stability and fish habitat (shading for water temperature control, etc.). As such, in areas identified by the DFO as environmentally sensitive to vegetation removal it is proposed trees and/or shrubs be replaced. In this case willow (shrub) staking of the banks is proposed for the west side of the drain between Sta. 0+000 and 0+280 and spruce (tree) planting is proposed for Sta. 1+780 to 2+600 where a windrow of mature spruce trees are being impacted or removed.

Where possible, excavation will be limited to one side of the drain, leaving one side of the drain intact, while providing the required additional channel width. 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.

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 5.1 of the Engineer's Report. Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation which 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. The 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. 16013-A2. Other erosion or sediment control works may be implemented by the contractor, if approved by the Drainage Engineer, to maintain the required sediment free conditions downstream of the work area.

4.9.2 "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" indicated the classification was based on the presence of Longnose Dace as a "sensitive" species. However, the presence of Longnose Dace (and the classification) was based on historic data and classification which was completed prior to the current DFO classification.

Longnose Dace are generally considered to prefer moderately cool water (temperatures up to 22 °C), with rock and gravel substrate, hide under rocks (during the day) and prefer shallow, fast-moving riffles in streams.

The "Type E" portion of the drain is located within the open road allowance of Shea Road, directly adjacent to the edge of the shoulder of the road. The drain is very deep at this location (+/- 4m below the centerline of the road) with steep side-slopes, prone to erosion and poses a safety risk, therefore, must be relocated. Relocation will result in the removal of trees (typically Manitoba Maple) along the west bank – trees do not currently exist along the proposed relocated west bank.

Mitigation for the relocation 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 C" Drains (excluding two-stage profile),
- Connectivity is provided to the remainder of the drain which receives fish habitat enhancement per the "Type C" conditions.

4.10 Rideau Valley Conservation Authority

Typical measures recommended by the Rideau Valley Conservation Authority (RVCA) 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 June 30th 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 provided in **Appendix D**.

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 RVCA and DFO. Where applicable, the permit conditions will be incorporated into the construction contract.

4.11 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, with the exception of the section to be relocated between Stations 0+000 and 0+330, all suitable material(s) will be placed outside the required buffer area, on the side of the drain best suited for the owner and/or where clearing is not required for disposal. The excavated material shall be spread and seeded (except in areas of tilled agricultural fields). All material shall be spread on the adjacent lands no closer than 5 metres to the top of slope (buffer strip) and to a maximum depth of 150mm for agricultural fields, and 300 mm for non-agricultural areas. 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 drainage from adjacent land is not impeded. Any non-suitable material, such as rock, boulders, hard-pan, or garbage/debris, shall be disposed of on the adjacent property, in an area of the property designated by the owner.

In areas scheduled for the spreading of material, owners who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site rather than spread the material may make arrangements directly with the Contractor, subject to approval by the Drainage Engineer.

Suitable excavated material from the section of the drain being relocated between Stations 0+000 and 0+330 shall first be used to fill the existing drain including regrading to accommodate the new roadside ditch. All excess and/or unsuitable material shall be disposed of off site at a location arranged for by the Contractor and approved by the Drainage Engineer.

4.12 Permit Requirements and Underground Utilities

It may be expected of the Contractor to fill out an application for an encroachment permit within the City right-of-ways prior to the commencement of construction. It is also expected when 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 plans. 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, please make the Drainage Engineer aware of such.

Typical contract methodology including the impoundment and by-pass pumping of water or passive in stream diversion no longer require Ministry of Environment Conservation and Parks (MECP) registration or a Permit-To-Take-Water provided 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.

4.13 Site Access and Access Plan

It is intended for the purpose of construction and future maintenance, 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 in SP1.0, and designated future Drain Right-of-Way. Equipment may only cross the drain at existing or constructed crossings as shown on the Culvert and Sediment/Erosion Control Plan, Drawing 16013-A2.

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 is required to provide notification to the landowner 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. The contractor will be required to make the arrangements for access and notify the Drainage Engineer of the proposed access routes.

5.0 EROSION CONTROL

5.1 Seeding

To help protect the drain banks against erosion, all disturbed banks and spread spoils shall be hand seeded within 48 hours of construction. The seed mixture 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%

Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation which 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.

5.2 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 for all properties assessed on the drain and is a benefit to all. As such, it is strongly recommended 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 the owners take hay off this buffer strip, but the soil not to be tilled. Typical spreading locations and the buffer strip location are shown on Robinson Consultants Inc. Std. Dwg. No. 5, provided in **Appendix A**.

5.3 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.

It is noted in some locations, fence existed parallel to the drain along the west bank, however, the fence is in a general state of disrepair, has fallen into the drain, or no longer exists. Fence found in locations parallel to the drain, but not standing or in good condition will be removed but not replaced.

5.4 Rock Protection

Associated with the drain improvements, Rock Protection with filter cloth will be placed at typical areas as per Drawing Nos. 16013-A2 and 16013-P1 through 16013-P8 and Standard Drawing No. 1. Rock Protection at tile drain outlets shall be installed at all existing outlets in accordance with Standard Drawing No. 2. Standard Drawings are provided in **Appendix A**. 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
Rock Protection at significant bends
Rock Protection at storm sewer outlets
Rock Protection at tile drain outlets
Rock Protection at culverts and concrete structures
Rock Protection at confluence of branch drains
Rock Protection at areas of current or on-going erosion

5.5 Flow Checks and Sediment Traps

5.5.1 Excavation

Sediment trap excavation shall be 15 m in length and 0.5 m below the proposed grade (drain bottom), directly upstream of the flow checks, as per Standard Drawing No. 3, Straw Bale Checks or Standard Drawing No. 6, Rock Checks. Standard Drawings are provided in **Appendix A**.

5.5.2 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.

5.5.3 Locations

Straw Bale or Rock flow checks shall be installed as indicated in Standard Drawing No. 3 and No. 6 to prevent sediment passage from the upstream to the downstream side of the flow check, and shall be installed at all specified locations as per Drawing No. 16013-A2 and 16013-P1 through 16013-P8. Standard Drawings are provided in **Appendix A**.

5.5.4 Long-Term Use

Excavated sediment basins will remain in place following removal of the flow check. It is anticipated these basins will continue to serve as localized concentrated cleanout areas, and possible interim pool refuge fish habitat. Removal of sediment in these cleanout areas is expected to have long term fish habitat benefits by reducing the need for full scale maintenance along the length of the drain.

6.0 ASSESSMENTS

6.1 General

The Drainage Act requires 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). On this project there is no assessment for injuring liability.

6.2 Benefit

Benefit by definition under the Drainage Act, RSO 1990 is the "advantages to any lands, roads, building or other structures from the construction, improvement, repair or maintenance of a drainage works such as 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".

6.3 Outlet

Lands and roads which may be assessable for outlet liability are those lands which 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.

6.4 Special Benefit/Special Assessment

Special Benefit under the Drainage Act, RSO 1990 is "any additional work or feature included in the construction, repair or improvement of a drainage works which has no effect on the functioning of the drainage works." A Special Benefit Assessment 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.

6.5 Assessment Schedules

As part of this Engineer's Report new assessment schedules have been developed for the Faulkner Municipal Drain for construction and future maintenance. They reflect a fair and equitable distribution on costs, including special assessments related to the initial construction.

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 which is fair to all concerned. There are several basic principles which apply to the assessment for future maintenance of the Faulkner 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.

A technique employed is to simplify the assessment process, which 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 which is related to land use. In the case of outlet assessment, the area of the land within the drainage basin is used, the land use and a factor which 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 which are closer to the drain, or to an outlet which connects directly into the drain, and a lower factor to lands which are more remote from the drain. The factored area method allows the Drainage Engineer to recognize the volume and rate of flow of water differ 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 where properties are only assessed for works which are undertaken downstream of the property in question, we have further introduced a factor 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 which are in the upstream one-third or beyond, are using the whole section of the drain. Hence, we have applied a subsection factor to the lands within the section of the drain where maintenance is being carried out. All 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.

In the case of Section 4 of this drain, specific properties which form part of Section 4 use only the most downstream point of the section (being the Road Authority Culvert). As the Road Authority works are assessed entirely to the Road Authority and no other work is downstream in this section, in keeping with the principles noted above, affected properties are assigned a sub-section factor of 0.00 and effectively pay no assessment to Section 4.

6.5.1 Initial Construction

All costs associated with this report, the initial design, allowances, other costs, and construction are assessed to the landowners within the drainage basin in accordance with the Schedule of Assessment for Construction and Future Maintenance. An Assessment for Special Benefit is assigned to the lands within the drainage area which are the subject of urban development. Lands assigned an Assessment for Special Benefit are included in Blocks 20-E, 20-F and 20-H which are in the process of receiving approval for development, as well as previously collected contributions from lands in Blocks 17-A and 17-B. An Assessment for Special Benefit is also assigned to the future development lands in Block 17-D. A Special Benefit Assessment is assigned to the

Road Authority for the relocation of the existing drain (adjacent to Shea Road) between Brownlee Road and Flowing Creek Municipal Drain (outlet of Faulkner Municipal Drain). The Schedule of Assessment for Construction and Future Maintenance (including all above noted costs) is included in **Appendix B**.

6.5.2 Future Maintenance

Following the completion of the initial construction, the cost for any future maintenance is to be distributed to all landowners within the drainage area as shown on Dwg. 16013-A3, and the Schedule of Assessment for Construction and Future Maintenance. Costs for future maintenance are to be distributed in proportion to the Schedules of Assessment for Construction, excluding allowances and special benefits. The Schedule of Assessment for Construction and Future Maintenance is provided in **Appendix B**.

6.6 Maintenance Section

The drain has been subdivided into separate maintenance sections to develop schedules for future maintenance charges for the Faulkner Municipal Drain, as such there are four sections as follows:

Section 1 From the outlet of the drain at Flowing Creek Municipal Drain (Station 0+000) to the centerline of the Right-Of-Way (ROW) for Akins Road (Station 1+741.50.)

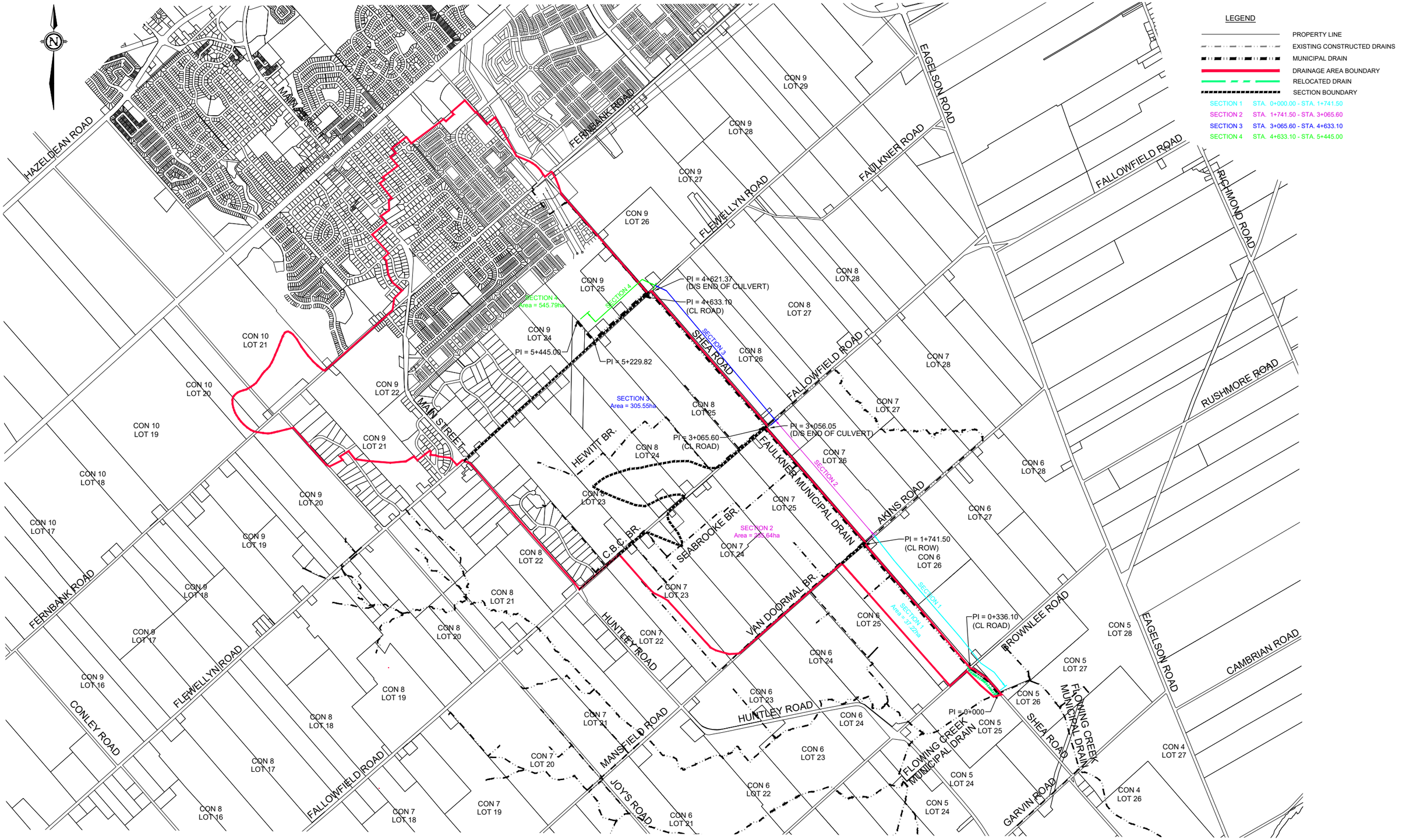
Section 2 From the centerline of the Akins Road ROW (Station 1+741.50) to the downstream end of the Culvert under Fallowfield Road (Station 3+055.75).

Section 3 From the downstream end of the culvert under Fallowfield Road (Station 3+055.75) to the downstream end of the culvert under Flewellyn Road (Station 4+620.60).

Section 4 From the downstream end of the culvert under Flewellyn Road (Station 4+620.60) to the upstream Limit of Construction (Station 5+445)

Note: The station for the downstream end of culverts is utilized such that in general the centerline of the roadway forms the boundary between sections and ensures drainage from the roadside ditch on the downstream side is incorporated in the lower section, while the full length of the culvert is incorporated in the upper section. Stationing may vary where culverts are replaced in the future, however it is intended the centerline of the road continues to form the section boundary.

The locations of the sections are shown on **Figure 6.1**.



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APPROVED	AJR

CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

MAINTENANCE SECTIONS and
SECTION DRAINAGE AREAS

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	FIG 6.1

The tributary area to each section has been determined based on the sub-drainage basins. In calculating the outlet assessment for the sections of the Faulkner Municipal Drain indicated in the previous paragraph, each section has been 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 the section where maintenance is being undertaken are assigned a subsection factor of 1.0.

The use of the subsection or section factor is based on the principle, all land is assessed for maintenance and is undertaken downstream of the location where the runoff from the land enters the drain.

6.7 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 given to all agricultural, rural use, large lot residential (greater than 2.0ha), vacant lands, unprotected forest lands (not subject to a registered management agreement), or any land where an alternative factor is not otherwise specified. A value of 2.0 is given to small lots of 5 acres (2.0 Ha) or less. A value of 4.0 is given to land classified as higher density residential, institutional, and commercial or is a road right-of-way. A value of 2.0 is used for the Hydro right-of-way. A value of 0.5 is provided for all lands designated as Provincially Significant Wetland (PSW) and subsequently protected by legislation. A value of 0.7 may be applied to forested land where the Drainage Engineer has been provided documentation confirming 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. Similarly, the assessed area is multiplied by the appropriate factor to determine the factored area.

6.8 Distance Factor

A distance factor was developed to account for the proximity of land to the drain and the relative amount of water entering the drain. A band is drawn on each side of the drain at approximately 200 meters, a second band is drawn at approximately 600 metres from the drain, and a third at 1000 meters from the drain. A property entirely within the first band is given a distance factor of 1.0. A property entirely within the second band is given a distance factor of 0.75. A property entirely within the third band is given a distance factor of 0.5 and the land 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 the property. The distance factor information is included on **Figure 6.2**.

6.9 Outlet Assessment

Each parcel of land which 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 properties being assessed and the cost of the future maintenance 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 applied to the property.

6.10 Benefit Assessment

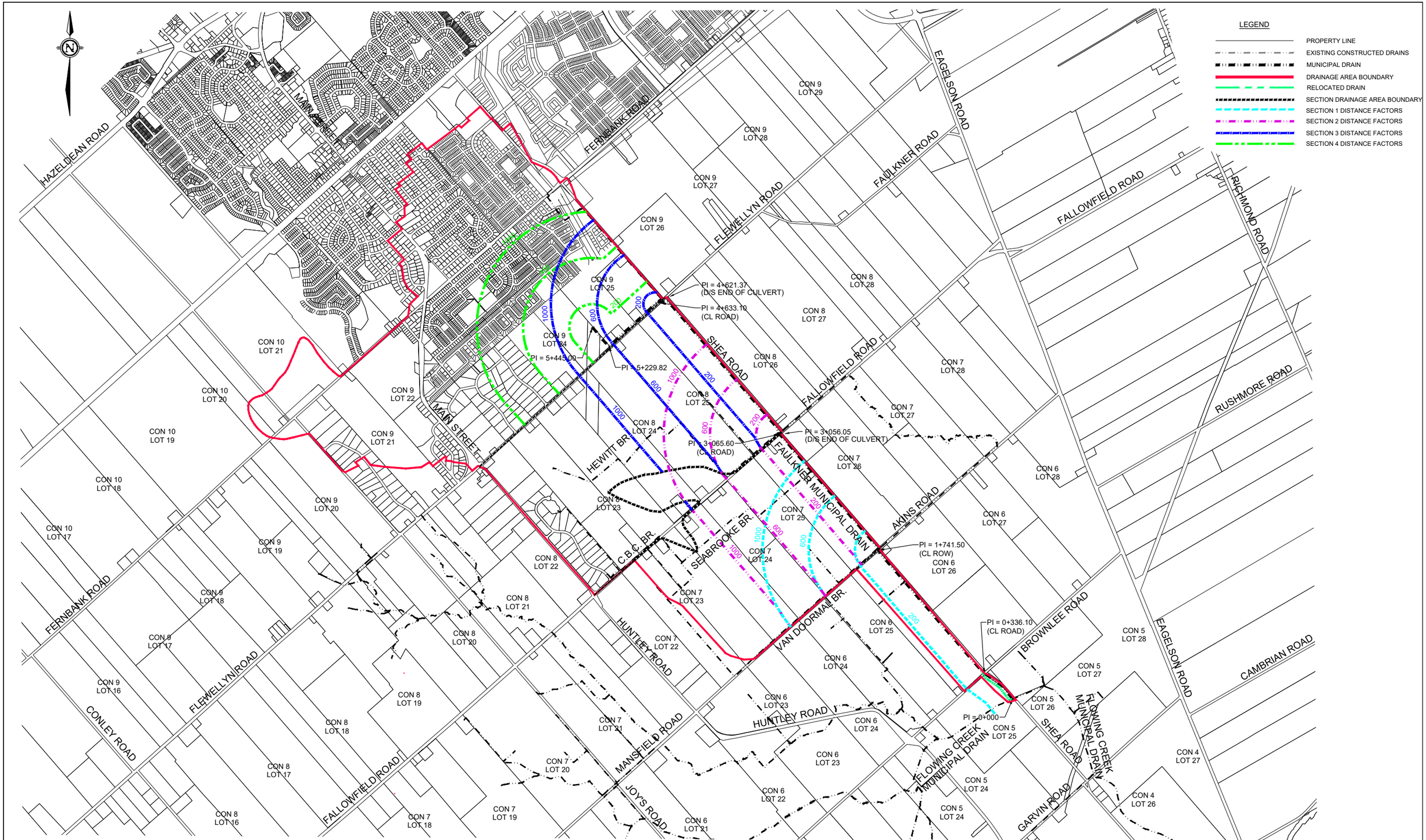
Lands located immediately adjacent to the drain are charged a benefit assessment. A benefit assessment for construction or maintenance is only charged against properties in the section where work is being completed. The benefit factored area is determined by multiplying the individual assessed area of each property immediately adjacent to the drain, by the land use factor. Using the benefit factored area for all properties and the cost of construction or 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 applied to the property.

6.11 Assessment for Special Benefit

For the initial construction an assessment for special benefit is assigned to the lands in Blocks 17-A, 17-B, 17-D, 20-E, 20-F and 20-H as a contribution towards modifications to the drain related to the land use changes from rural or agricultural to urban development. An assessment for special benefit is also assigned to the Road Authority for costs related to relocating the drain outside the road allowance between Stations 0+000 and 0+330.

6.12 Block Assessment

Lands which are located within Blocks, as indicated on Dwg. No. 16013-A3.1, are charged a Block Assessment. Block assessments are also shown on the Assessment Schedules for Initial Construction and Future Maintenance. Regarding Block Assessments the Drainage Act states the following:



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CITY OF OTTAWA

FAULKNER MUNICIPAL DRAIN

DISTANCE FACTORS

PROJECT No.	16013
CONTRACT No.	
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DWG. No:	FIG 6.2

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 cost regarding the assessments as noted above (where applicable), associated with each block, is charged as a block assessment to the individual block.

For the initial distribution of costs all lands, including roads, within the development areas have been included in the Special Assessment charged to the initial property owners in Block 17-A, 17-B, 17-D, 20-E, 20-F and 20-H subject to any internal agreement in this regard.

For the distribution of costs associated with future maintenance within the identified Blocks the costs for roads, (including transitway), utility corridors and other 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) respectively based on the amounts shown in **Table 6.1.** following this page. Future maintenance costs within the block for all properties are distributed to the individual properties within the block proportionately based on the current assessed property value at the time of assessment.

6.13 Assessment Schedules

As described in this report, the drain is divided into four 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. The total area of each land parcel is further divided as required, placing the appropriate portion of area in each sub-section of the drain. Once the total cost of future maintenance is determined, this amount can be entered on the spreadsheet and the outlet, benefit and total assessments are calculated. Where the one-third grant on agricultural land is applicable, this is calculated and deducted from the total assessment to arrive at the net cost assessed against the property. For lands where the agricultural grant is available the Drainage Superintendent should modify the schedules to apply the amount of grant is in existence at the time maintenance is undertaken.

Table 6.1
Distribution of Costs by Land Use Within Blocks
For Future Maintenance

Property Type	% Total (For Distribution)	Assessed To
BLOCK 03-1		
Individual Properties	65.00%	Landowners
City of Ottawa -- Roads	35.00%	City of Ottawa -- Roads
BLOCK 03-2		
Individual Properties	47.00%	Landowners
City of Ottawa -- Roads	23.00%	City of Ottawa -- Roads
City of Ottawa -- Parks	2.00%	City of Ottawa -- Parks
School	28.00%	School Board
BLOCK 03-3		
Individual Properties	57.00%	Landowners
City of Ottawa -- Roads	30.00%	City of Ottawa -- Roads
City of Ottawa -- Parks	2.00%	City of Ottawa -- Parks
School	11.00%	School Board
BLOCK 03-4		
Individual Properties R-Plan(s) 4M-674, 4M-687, 4M-688	64.00%	Landowners
City of Ottawa -- Roads	36.00%	City of Ottawa -- Roads
BLOCK 03-5		
Individual Properties R-Plan(s) 4M-413, 731, 633, 4M-606, 655, 4M-766, 4M-667, 528. 722, 584, 4M-524, 632, 776, 571, M-146, 4M-1002	76.00%	Landowners
City of Ottawa -- Roads	22.00%	City of Ottawa -- Roads
City of Ottawa -- Parks	2.00%	City of Ottawa -- Parks
BLOCK 03-6		
Individual Properties R-Plan 4M-930	83.00%	Landowners
City of Ottawa -- Roads	17.00%	City of Ottawa -- Roads
BLOCK 03-7		
Individual Properties R-Plan 661	72.00%	Landowners
City of Ottawa -- Roads	28.00%	City of Ottawa -- Roads
BLOCK 17-A		
Individual Properties	64.16%	Landowners
City of Ottawa -- Roads	23.24%	City of Ottawa -- Roads
City of Ottawa -- Parks	3.90%	City of Ottawa -- Parks
City of Ottawa -- SWM	8.70%	City of Ottawa -- SWM
BLOCK 17-B		
Individual Properties	54.02%	Landowners
City of Ottawa -- Roads	32.72%	City of Ottawa -- Roads
City of Ottawa -- Parks	5.69%	City of Ottawa -- Parks
Hydro Easment	7.57%	Hydro One Networks Inc.
BLOCK 17-C		
City of Ottawa -- SWM	100.00%	City of Ottawa -- SWM
BLOCK 17-D		
Commercial Properties	44.97%	Landowners
Hydro Easment	55.03%	Hydro One Networks Inc.
BLOCK 20-E		
Individual Properties	52.80%	Landowners
City of Ottawa -- Roads	44.08%	City of Ottawa -- Roads
City of Ottawa -- Parks	3.12%	City of Ottawa -- Parks
BLOCK 20-F		
Individual Properties	9.99%	Landowners
High Density Residential	31.58%	Landowners
City of Ottawa -- Roads	46.48%	City of Ottawa -- Roads
City of Ottawa -- Parks	2.14%	City of Ottawa -- Parks
School	9.81%	School Board
BLOCK 20-G		
City of Ottawa -- SWM	100.00%	City of Ottawa -- SWM
BLOCK 20-H		
Commercial Properties	100.00%	Landowners
BLOCK 20-8		
Individual Properties	76.68%	Landowners
City of Ottawa -- Roads	23.32%	City of Ottawa -- Roads
BLOCK 20-9		
Individual Properties	80.51%	Landowners
City of Ottawa -- Roads	19.49%	City of Ottawa -- Roads
BLOCK 20-10		
Individual Properties	100.00%	Landowners
BLOCK 20-11		
Individual Properties	77.86%	Landowners
City of Ottawa -- Roads	14.82%	City of Ottawa -- Roads
City of Ottawa -- SWM	7.32%	City of Ottawa -- SWM

In developing the Assessment Schedule, the cost for outlet and benefit has been varied to reflect the relative use of the drain by immediate benefiting landowners and the landowners in the urbanized upstream part of the watershed. Benefit has not been assessed against the urban development area since all flows are diverted to the storm water management ponds which control the run-off to pre-development levels. The Assessment Schedules have been developed with the percentage split between Outlet Assessment and Benefit Assessment as follows:

Summary Schedule of Assessment

Section 1 - Station 0+000 to Station 1+741.50

Outlet Assessment - 95%
Benefit Assessment - 5%

Section 2 - Station 1+741.50 to Station 3+055.75

Outlet Assessment - 95%
Benefit Assessment - 5%

Section 3 - Station 3+055.75 to Station 4+620.60

Outlet Assessment - 95%
Benefit Assessment- 5%

Section 4 - Station 4+620.60 to Station 5+445.00

Outlet Assessment - 100%
Benefit Assessment- 0%

7.0 COST ESTIMATE

7.1 General

The total estimated cost associated with the construction, engineering, contract administration, allowances, report, and contingencies will be charged in accordance with the Assessment Schedule for Initial Construction. The total allowances to be paid directly to the affected landowners and a description for the purpose of the allowances is contained in Section 7.2. The amount of the allowances is included in Appendix B. The total cost of the improvements to the Faulkner Municipal Drain, subdivided by sections is included in **Table 7.1**. A detailed cost estimate is included in Appendix B.

Table 7.1
Cost Estimate Summary

Item	Section 1	Section 2	Section 3	Section 4	Total
Routine					
Construction	$198,999.00	$65,740.50	$108,488.75	$10,150.00	$383,378.25
Contingency	$25,000.00	$10,000.00	$16,000.00	$1,500.00	$52,500.00
Engineering/Admin.	$88,200.00	$75,950.00	$75,950.00	$4,900.00	$245,000.00
Other (Incl. Allowances)	$50,706.95	$31,430.37	$19,631.48	$662.00	$102,430.80
Subtotal Routine	**$362,905.95**	**$183,120.87**	**$220,070.23**	**$17,212.00**	**$783,309.05**
Special Benefit					
City – Drain Relocation	$174,073.12	$0.00	$0.00	$0.00	$174,073.12
City – Road Authority	$6,945.35	$5,369.02	$9,558.15	$0.00	$21,872.51
Developer Costs	$160,087.48	$161,201.85	$190,912.08	$5,562.00	$517,763.41
Subtotal Special Benefit	**$341,105.95**	**$166,570.87**	**$200,470.23**	**$5,562.00**	**$713,709.05**
Net Total (Assessed to Properties)	**$21,800.00**	**$16,550.00**	**$19,600.00**	**$11,650.00**	**$69,600.00**

7.2 Allowances

The parcels of land which have been granted allowances are outlined in the Schedule of Allowances provided in **Appendix B**. The allowances have been established in accordance with Sections 29, 30 and 31 of the Drainage Act, RSO 1990. The allowance for the land (Section 29) is for the land lost due to ditch widening and relocation. The allowance for use of the working area and for damage to lands and crops in the working area (Sections 29 & 30) is only on agricultural lands anticipated to be out of production during construction and for a period thereafter. The area damaged is calculated using the length and width of the access route and the area for spreading excavated material. 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 stipulates 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 cost of construction, improvement, repair or maintenance of the drainage works.

These allowances are fixed amounts and are in accordance with Section 62 (3) and 62(4) of the Drainage Act, RSO 1990. The allowance shown for each property may be deducted from the final assessment levied before the assessment is collected from the affected owner.

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 landowners.

The allowance for land lost due to the Municipal Drain construction or widening has been calculated using local area estimated land values.

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.

Local crops were determined to be grains, corn, and beans. The allowance for crops lost due to the construction or spreading of material has been calculated using the averaged value for the above noted crops as posted by AgriCorp as the value of this type of crop for production insurance.

8.0 CHANGING THE SCOPE OF 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 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, an application be made to the Agricultural, Food and Rural Affairs Appeal Tribunal (Drainage Tribunal) pursuant to Section 58(4) of the Drainage Act 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 no detrimental effect to the drain or its maintenance results.

9.0 MAINTENANCE

Future maintenance of the project 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's Drainage Superintendent.

The cost of future maintenance is to be assessed in proportion to the Schedule(s) of Assessment for Construction and Future Maintenance, excluding allowances and special benefits, provided in **Appendix B**. The schedule of distribution for properties within Blocks is provided on **Table 6.1**. Therefore, maintenance costs are to be levied against the lands upstream from the location of the maintenance work pro-rata with the assessments for Benefit and Outlet in the Schedule for Future Maintenance, which is in accordance with the requirements of the Drainage Act. For the purpose of calculation, the schedules are based on the estimated initial construction values, however, the actual value of the maintenance undertaken will be used in determining the amount to be assessed in proportion to the schedule when maintenance is undertaken.

Maintenance of fences shall be the responsibility of the adjacent landowners at their own cost. Maintenance of public road or railroad culverts shall be the responsibility of the Road or Rail Authority, however, if the Road or Rail Authority does not complete the maintenance, then the City of Ottawa will complete the maintenance and charge the cost to the Road or Rail Authority.

Maintenance of Private Access Culverts is completed at the discretion of the Drainage Superintendent and is to be assessed as a cost to the drain in accordance with the section where the work is completed and associated Schedule of Assessment.

Future maintenance of tile outlets shall be the responsibility of and shall be at the cost of the affected landowners.

10.0 WORKING SPACE – FUTURE MAINTENACE

A right-of-way or working area must be available, preferably along the east and north sides of the proposed drain, or the side best suited for construction. For open drainage works, a right-of-way of up to 40 m from the proposed top of bank is necessary to allow construction to be carried out and excavated material to be spread. A right-of-way of 25m from the constructed top of the bank is designated for future access and maintenance along the side of the drain best suited for clean-out as determined by the Drainage Superintendent.

11.0 MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS – SPECIES AT RISK

Screening of the proposed work area for Species at Risk (SAR) is completed in conjunction with draft circulation for agency review. The Ministry of the Environment, Conservation and Parks (MECP) – Ontario is responsible for review regarding the SAR Legislation. Specific advice for identified SAR, which may exist in the general vicinity of the drain, will be accounted for in contract specific measures and/or applicable MECP approved exemptions.

Where provided, a copy of MECP identified SAR in the general vicinity of the drain and a summary of advice is provided in **Appendix C** of this report.

Species at Risk generally anticipated to occur within the vicinity of the work area for this project and general mitigation measures for the SAR are provided in the following sections.

Where additional SAR are identified by the MECP in conjunction with the screening details are provided in Section 11.4 of this Report.

11.1 Barn and Bank Swallows – Location and Mitigation

Occurrences of barn swallows are anticipated in the general vicinity of the work area. Barn swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures which include ledges where they can build their nests. Bank swallows' nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits.

It is not anticipated the Barn or Bank Swallow habitat will be disturbed by this project. Culverts on this project do not typically provide suitable habitat due to their smaller size and frequent full capacity flows. Banks on this project are typically heavier clay materials and do not provide suitable habitat. Should active nests be found additional measures will be implemented.

11.2 Butternut Trees – Location and Mitigation

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 Natural Resources and Forestry will be implemented should the removal of a protected tree be required.

11.3 Turtles and Aquatic Species at Risk – Location and Mitigation

While turtles and aquatic species at risk may exist within the general vicinity, the impact of the proposed work will be limited and/or mitigated in conjunction with procedures identified in Section 4.10 "Fisheries Act and Special Design Considerations" of this report and/or in conformance with Department of Fisheries and Oceans advice or Letter of Authorization conditions. Additionally, work within the prescribed timing windows will limit the potential impact during breeding or hibernating windows.

11.4 Additional Species at Risk – Location and Mitigation

Where identified in conjunction with MECP Screening, project specific Species at Risk (SAR) location and mitigation measures are provided below.

The following additional species were identified in MECP screening as provided in **Appendix C.**

Birds

- Bobolink
- Eastern Meadowlark
- Wood Thrush
- Peregrine Falcon
- Canada Warbler
- Chimney Swift

Turtles (Specific)

- Snapping Turtle
- Blanding's Turtle

Insects

- Monarch

Additional species locations, habitat descriptions and proposed mitigation measures are provided in the following sections.

11.5 BIRDS

Bird Species at Risk (SAR) were documented as noted by the Ministry of Environment Conservation and Parks (MECP) as being in the "general vicinity" of the project. The proposed work involves the cleanout and modification of an existing municipal drain, primarily adjacent to tilled agricultural fields and primarily utilized as a standard roadside ditch. As such, it is generally not anticipated that the proposed work area provides habitat for SAR and SAR will be unaffected by the proposed work.
General awareness is provided for species of "Special Concern". Avoidance and mitigation measures put in place for other "Endangered" or "Threatened" species will also provide some protection for species of "Special Concern", however, no direct measures are prescribed by the MECP for species of "Special Concern".

11.5.1 Bobolink and Meadowlark (Threatened)

The Government of Ontario SAR web site defines the habitat for Bobolink and Meadowlark 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."

"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 Bobolink or Meadowlark habitat will be disturbed by this project. Adjacent agriculture is typically actively farmed in soybean or corn production (not hay fields or pasture).

"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.

11.5.2 Chimney Swift (Threatened)

The Government of Ontario SAR web site defines the habitat for Chimney Swift as follows:

"Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate."

It is not anticipated that Chimney Swift habitat will be disturbed by this project.

"Avoidance" is prescribed as the primary mitigation measure – standard timing windows limit work during the nesting bird season. Should active nests be found additional measures will be implemented.

11.5.3 Wood Thrush (Special Concern)

The Government of Ontario SAR web site 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."

General awareness is provided for species of "Special Concern".

11.5.4 Peregrine Falcon (Special Concern)

The Government of Ontario SAR web site defines the habitat for Peregrine Falcon as follows:

"Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on."

General awareness is provided for species of "Special Concern".

11.5.5 Canadian Warbler (Special Concern)

The Government of Ontario SAR web site defines the habitat for Canadian Warbler as follows:

"The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well- developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks. It winters in South America. In its wintering range in South America, the Canada Warbler prefers the dense shrub understories of mature cloud and rain forests, second-growth forests, as well as coffee plantations and farm field edges."

It is not anticipated that Canadian Warbler habitat will be disturbed by this project.

General awareness is provided for species of "Special Concern".

11.6 Turtles (Specific) -- Species At Risk

Specific Turtle Species at Risk (SAR), were documented as noted by the Ministry of Environment Conservation and Parks (MECP) as being in the "general vicinity" of the project. The proposed work involves the cleanout and modification of an existing municipal drain. The existing Faulkner Municipal Drain is classified "Type C" Municipal Drain (ID No. 98114) by the Department of Fisheries and Oceans (DFO). The Classification was last reviewed by the DFO in 2017. Typical conditions for a "Type C" drain include permanent warm-water flows with no sensitive (fish) species present that use the drain. Typical water levels in the drain are highly variable but very shallow under normal flow conditions, as such, the drain does not provide suitable hibernating habitat.

Work within the prescribed timing windows will limit the potential impact during breeding or hibernating windows.

General awareness is provided for species of "Special Concern". Avoidance and mitigation measures put in place for other "Endangered" or "Threatened" species will also provide some protection for species of "Special Concern", however, no direct measures are prescribed by the MECP for species of "Special Concern".

11.6.1 Blanding's Turtle (Threatened)

The Government of Ontario SAR web site defines the habitat for Blanding's Turtles as follows:

"Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.

It is not anticipated that Blanding's Turtle habitat will be disturbed by this project.

"Avoidance" is prescribed as the primary mitigation measure – standard timing windows limit work during the turtle nesting season. Should active nests be found additional measures will be implemented.

11.6.2 Snapping Turtle (Special Concern)

The Government of Ontario SAR web site 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 Snapping Turtle habitat will be disturbed by this project.

General awareness is provided for species of "Special Concern".

11.7 Insect Species at Risk

Insect Species at Risk (SAR) – Monarch Butterflies (Special Concern), were documented as noted by the Ministry of Environment Conservation and Parks (MECP) as being in the "general vicinity" of the project.

The Government of Ontario SAR web site defines the habitat for Monarch Butterflies as follows:

"Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico."

It is not anticipated that Monarch Butterfly habitat will be significantly disturbed by this project. As a roadside ditch, vegetation is managed (cut) throughout the summer in existing conditions.

General awareness is provided for species of "Special Concern".

12.0 RIDEAU VALLEY 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 Faulkner Municipal Drain was circulated to Rideau Valley Conservation Authority (RVCA) for review and permit. The RVCA provides permission under the Conservation Authorities Act, O. Reg. 175/06, for the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses".

A copy of the Permit under O. Reg. 175/06 including conditions is attached as **Appendix C.**

13.0 DEPARTMENT OF FISHERIES AND OCEANS – CLASS AUTHORIZATION

Review of the proposed work area regarding Fisheries Act Regulations is completed in conjunction with draft circulation for agency review. 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 Draft Engineer's Report consultation was conducted with the DFO to determine suitable mitigation measures such that work may be completed with no net impact on fish and fish habitat.

Robinson Consultants proposed the implementation of modified Class Authorization measures, typical of a "Class C" Municipal Drain in addition to site specific mitigation measures for both the Class C and Class E 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.

A copy of the Authorization under the Fisheries Act including conditions is included in **Appendix C.**

14.0 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) and the Rideau Valley Conservation Authority (RVCA) have been applied for in conjunction with the preparation of the Engineer's Report.

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

16013-A1	Drainage Area Plan
16013-A2	Culvert and Sediment and Erosion Control Plan
16013-A2.1	Drain Relocation Detail Plan
16013-A3	Property Ownership Plan
16013-A3.1	Property Ownership Plan (Block Detail)
16013-P1- P8	Profiles
16013-C1- C5	Cross-Sections

Standard Detail Dwg. (1 through 6, 10 and 15)

No.	DATE dd.mm.yy	REVISION	BY
1	15.04.20	ISSUED FOR MUNICIPAL REVIEW	AJR
2	27.05.20	ISSUED FOR AGENCY REVIEW	AJR
3	02.09.20	ISSUED FOR ECA APPLICATION	AJR
4	14.12.20	FINAL - ISSUED FOR DISTRIBUTION	AJR

LICENSED PROFESSIONAL ENGINEER — A. J. ROBINSON — 20/12/14 — PROVINCE OF ONTARIO

Professional Engineers Ontario — 20/12/14 — Licensed Engineering Technologist — Name: L. FRANKLIN — Number: 100501[illegible] — Limitations: Preamy 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: 150 0 300 — HORIZONTAL

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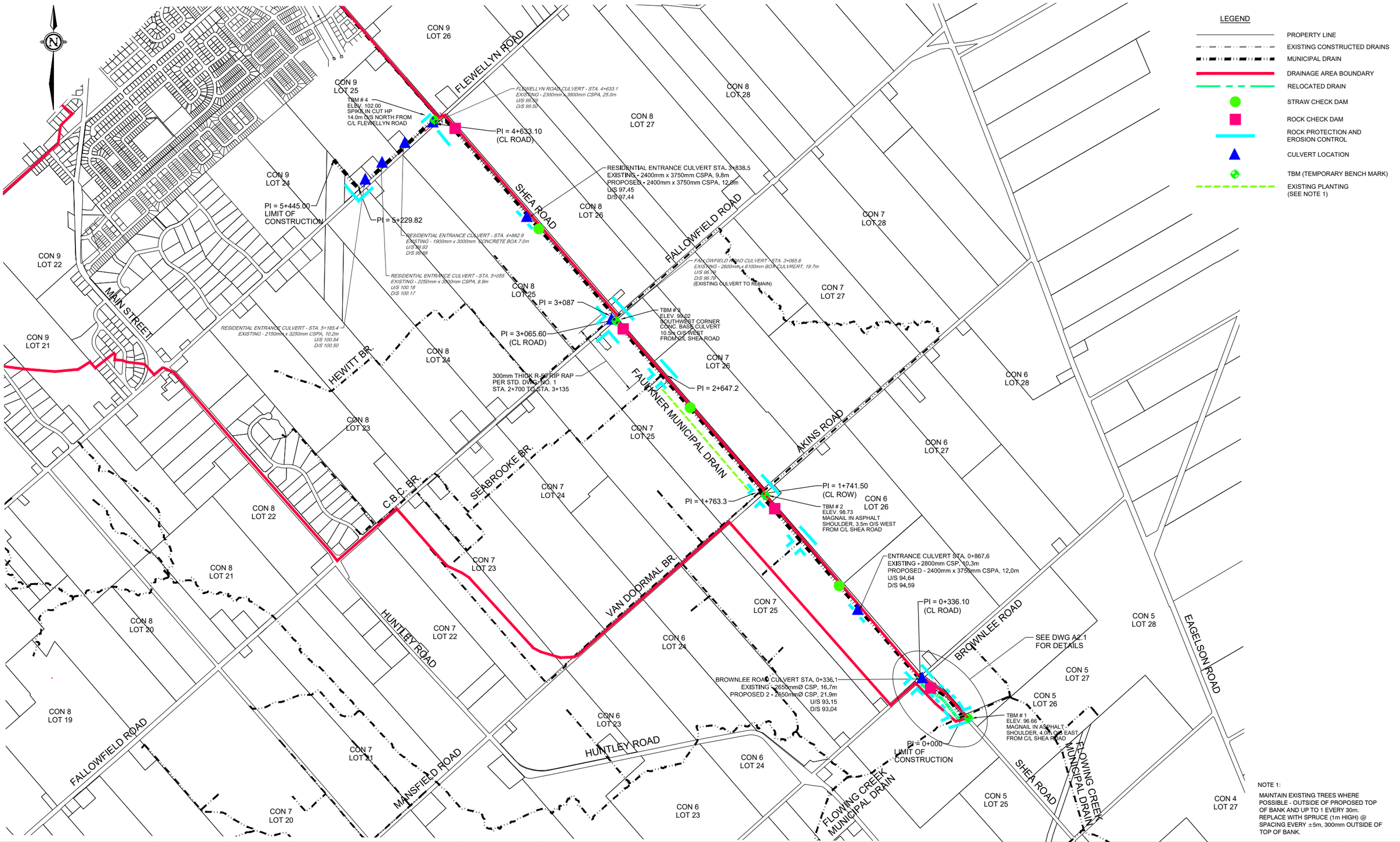
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

FAULKNER MUNICIPAL DRAIN

DRAINAGE AREA PLAN

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-A1



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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CULVERT AND SEDIMENT EROSION CONTROL PLAN

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-A2

LEGEND

- PROPERTY LINE
- EXISTING CONSTRUCTED DRAINS
- MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- RELOCATED DRAIN
- STRAW CHECK DAM
- ROCK CHECK DAM
- ROCK PROTECTION AND EROSION CONTROL
- CULVERT LOCATION
- TBM (TEMPORARY BENCH MARK)

PI = 0+336.10
(CL ROAD)

BROWNLEE ROAD

BROWNLEE ROAD CULVERT STA. 0+336.1
EXISTING - 2650mmØ CSP, 16.7m
PROPOSED 2 - 2650mmØ CSP, 21.9m
U/S 93.15
D/S 93.04

CON 5
LOT 27

CON 5
LOT 26

TBM # 1
ELEV. 96.66
MAGNAIL IN ASPHALT
SHOULDER, 4.0m O/S EAST
FROM C/L SHEA ROAD

PI = 0+000
LIMIT OF
CONSTRUCTION

SHEA ROAD

FLOWING CREEK
MUNICIPAL DRAIN

FLOWING CREEK
MUNICIPAL DRAIN

No.	DATE dd.mm.yy	REVISION	BY
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DESIGN	LF
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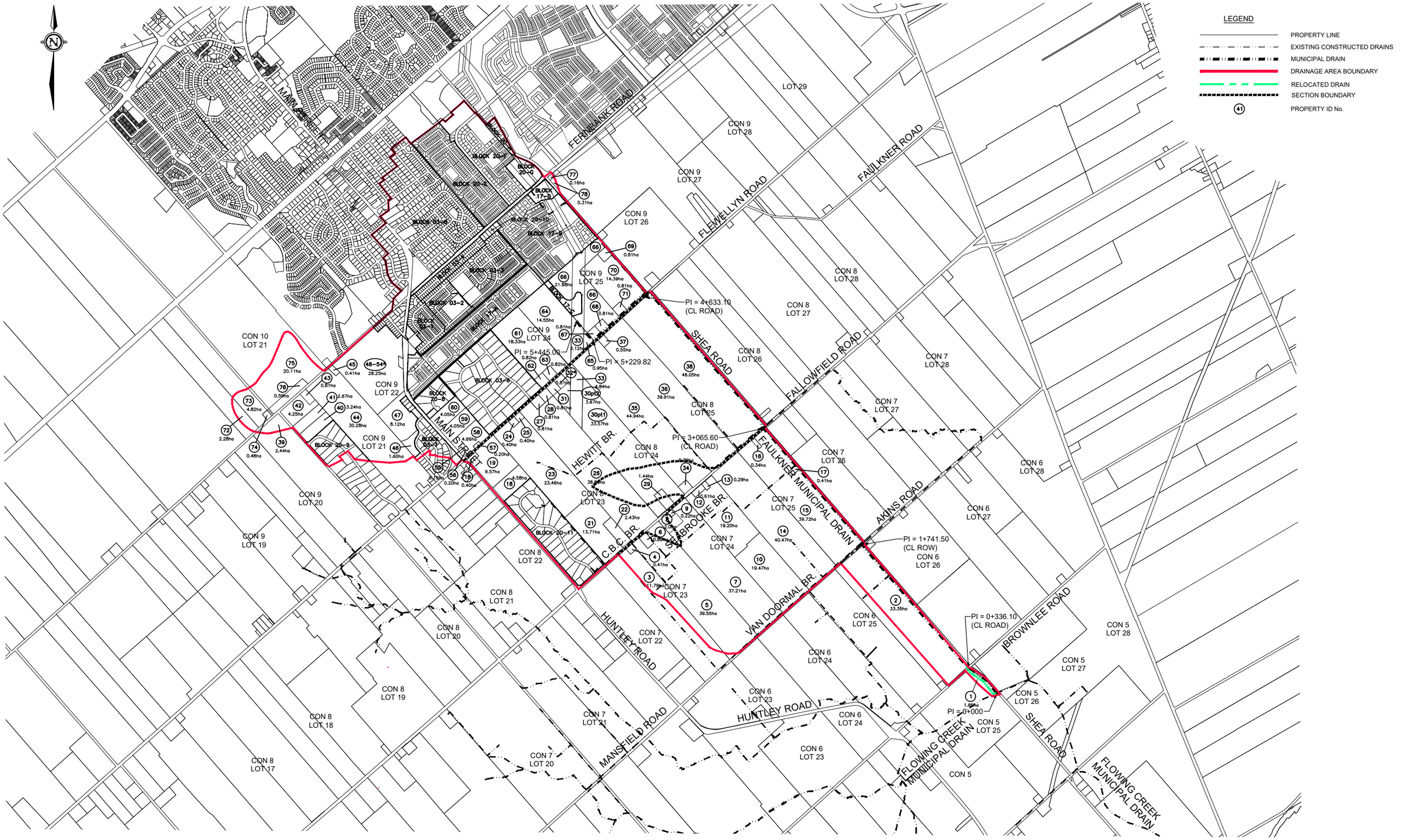
APPROVED	AJR

CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CULVERT AND SEDIMENT
EROSION CONTROL PLAN

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-A2.1



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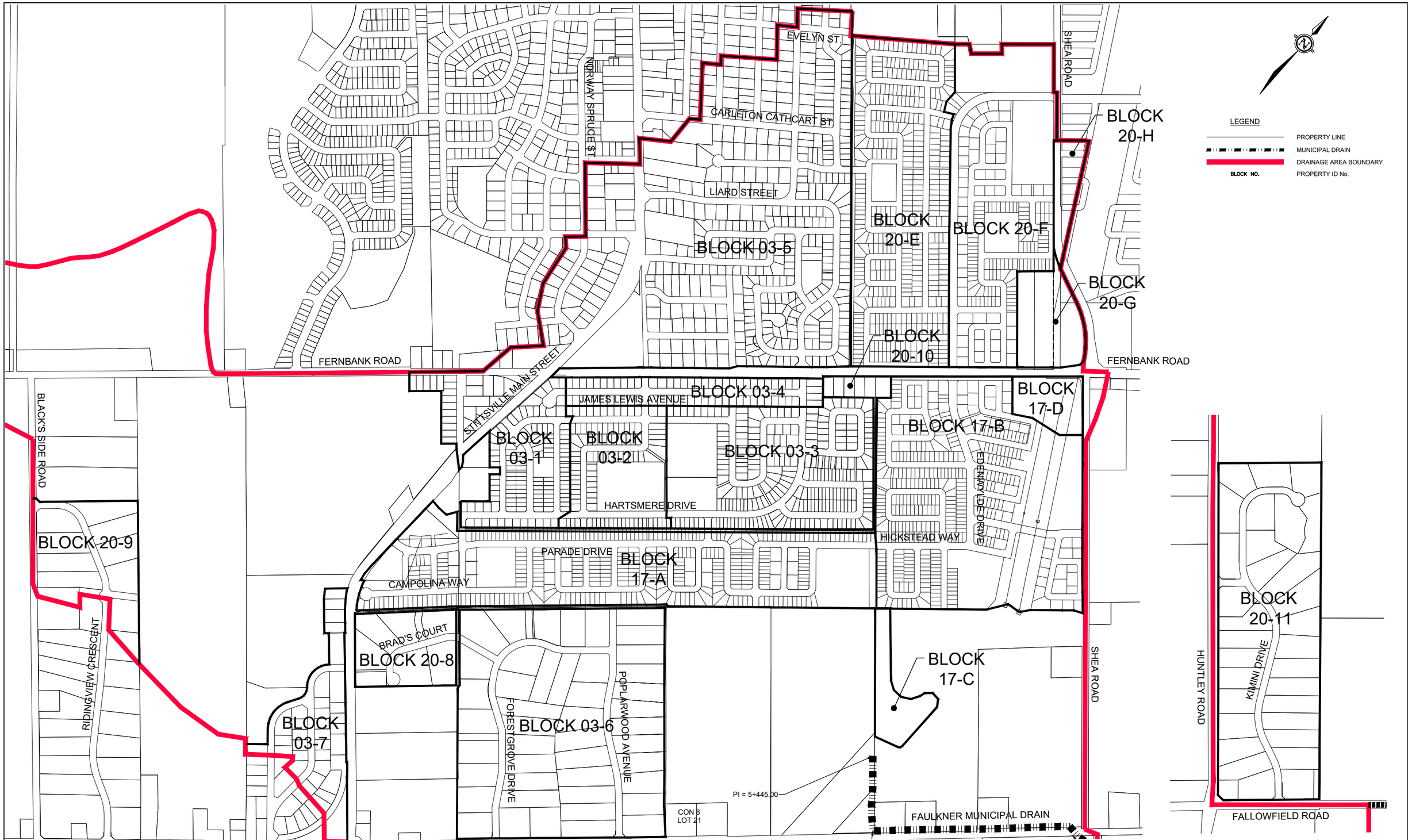
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

FAULKNER MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-A3



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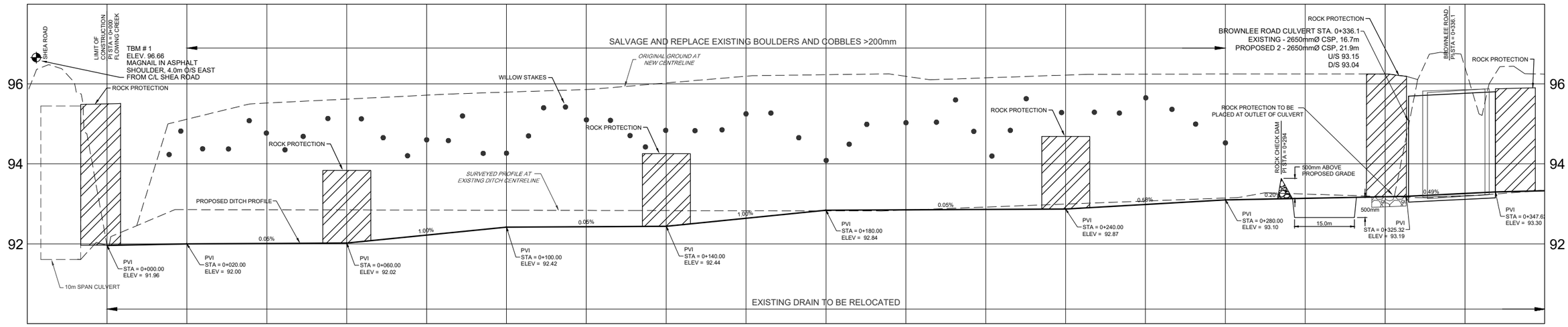
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

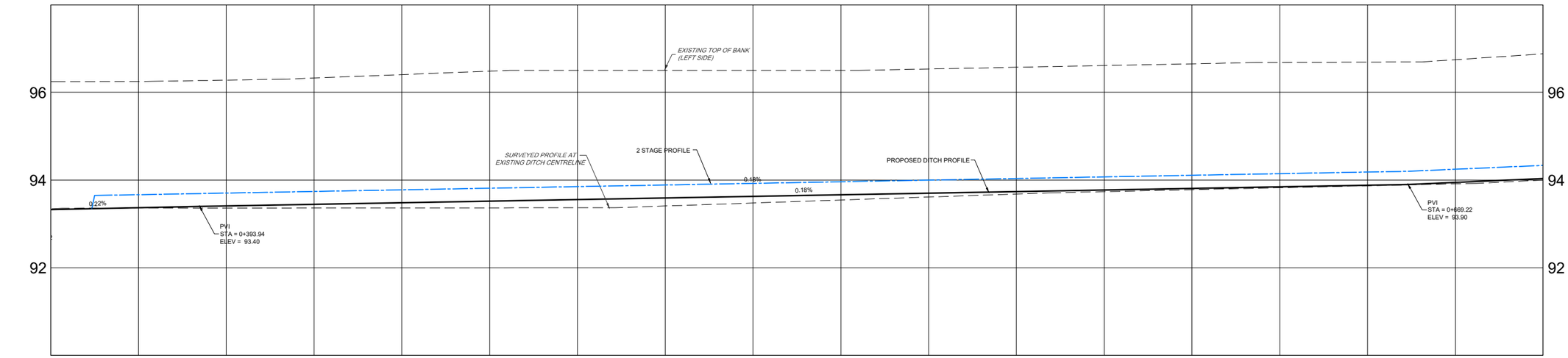
FAULKNER MUNICIPAL DRAIN

PROPERTY OWNERSHIP PLAN (BLOCK DETAILS)

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-A3.1



PROPOSED GRADE	91.96	92.00	92.01	92.02	92.22	92.42	92.43	92.44	92.84	92.84	92.85	92.86	92.87	92.99	93.10	93.14	93.18	93.26	93.33
EXISTING BOTTOM	*91.96*	*92.86*	*92.85*	*92.85*	*92.84*	*92.84*	*92.84*	*92.83*	*92.83*	*92.82*	*92.85*	*92.92*	*92.89*	*93.07*	*93.14*	*93.25*	*93.18*	*93.20*	*93.34*
STATION	-0+020	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360



PROPOSED GRADE	93.33	93.37	93.41	93.45	93.48	93.52	93.56	93.59	93.63	93.67	93.70	93.74	93.77	93.81	93.85	93.88	93.95	94.03	
EXISTING BOTTOM	*93.34*	*93.36*	*93.36*	*93.36*	*93.37*	*93.37*	*93.37*	*93.41*	*93.48*	*93.55*	*93.61*	*93.68*	*93.74*	*93.79*	*93.82*	*93.87*	*93.91*	*94.00*	
STATION	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	0+700	

No.	DATE dd.mm.yy	REVISION	BY
1	15.04.20	ISSUED FOR MUNICIPAL REVIEW	AJR
2	27.05.20	ISSUED FOR AGENCY REVIEW	AJR
3	02.09.20	ISSUED FOR ECA APPLICATION	AJR
4	14.12.20	FINAL - ISSUED FOR DISTRIBUTION	AJR

LICENSED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501334
Limitations: Provides 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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(613) 592-6060 rcii.com

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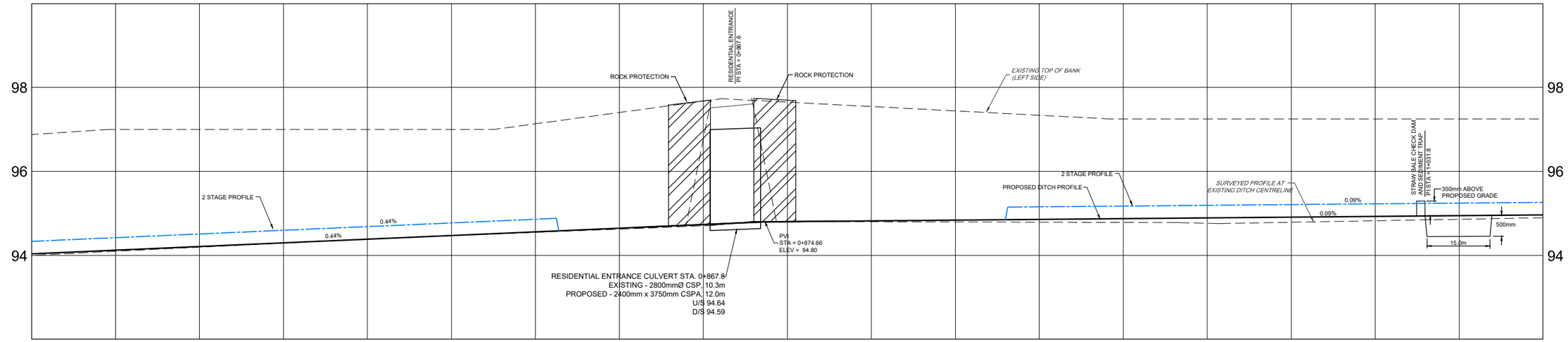
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

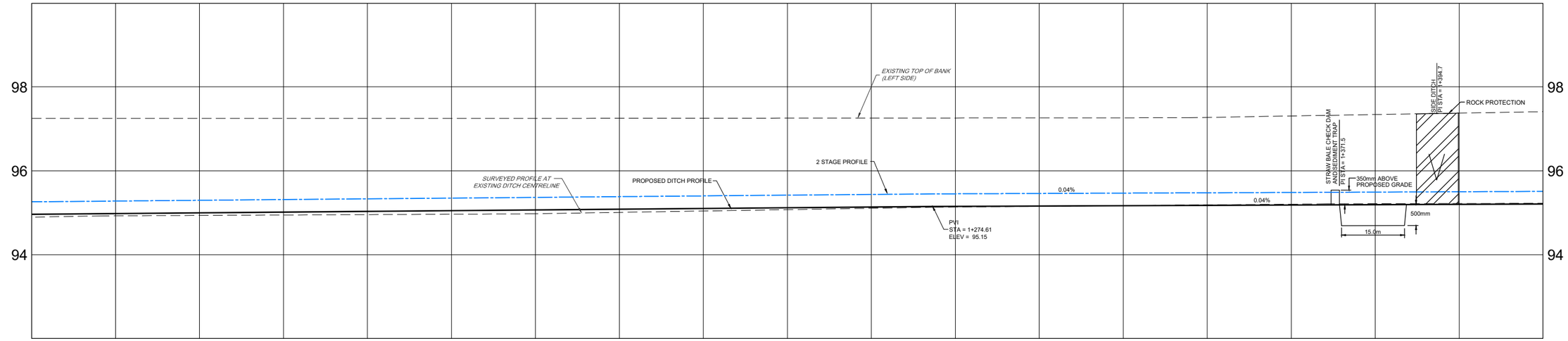
FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. -0+020 TO STA. 0+700

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P1



PROPOSED GRADE	94.03	94.12	94.21	94.30	94.39	94.47	94.56	94.65	94.74	94.80	94.82	94.84	94.86	94.87	94.89	94.91	94.93	94.94	94.96
EXISTING BOTTOM	*94.00*	*94.10*	*94.20*	*94.29*	*94.39*	*94.47*	*94.55*	*94.63*	*94.70*	*94.81*	*94.80*	*94.80*	*94.79*	*94.78*	*94.76*	*94.79*	*94.82*	*94.86*	*94.90*
STATION	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	1+020	1+040	1+060



PROPOSED GRADE	94.96	94.98	95.00	95.01	95.03	95.05	95.07	95.08	95.10	95.12	95.14	95.15	95.16	95.17	95.18	95.18	95.19	95.20	95.21
EXISTING BOTTOM	*94.90*	*94.93*	*94.94*	*94.95*	*94.96*	*94.97*	*94.99*	*95.01*	*95.04*	*95.08*	*95.11*	*95.14*	*95.15*	*95.17*	*95.19*	*95.21*	*95.22*	*95.22*	*95.23*
STATION	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420

No.	DATE dd.mm.yy	REVISION	BY
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PROVINCE OF ONTARIO

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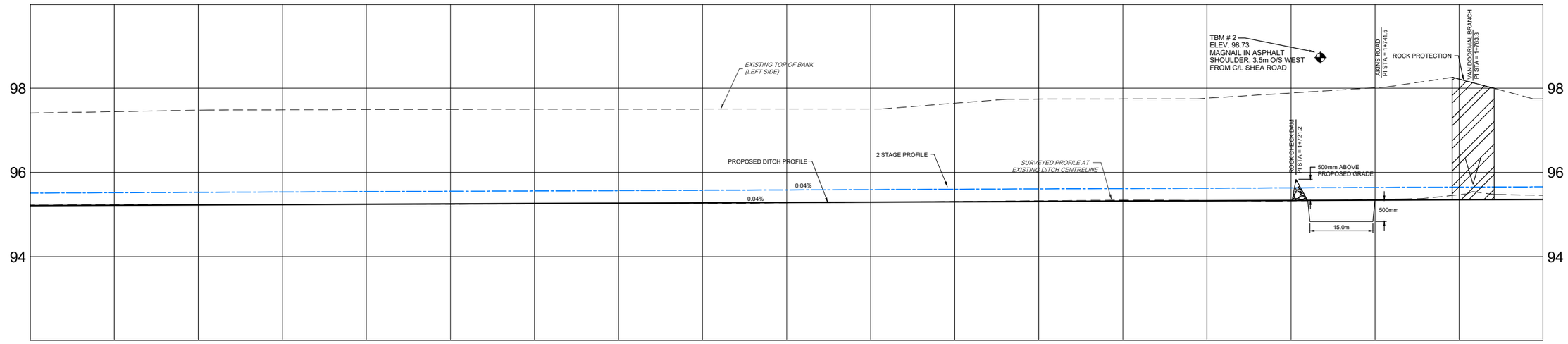
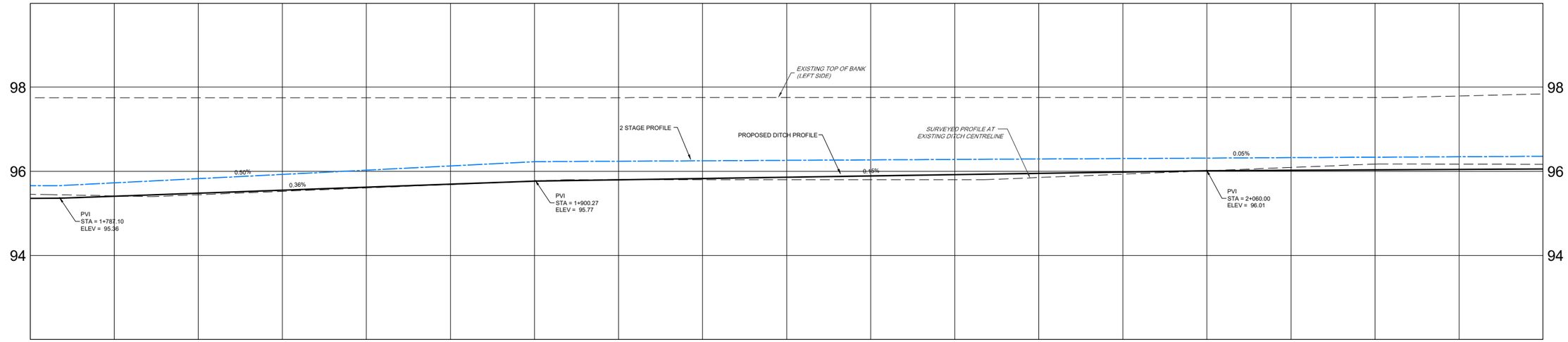
FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 0+700 TO STA. 1+420

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P2



PROPOSED GRADE	95.21	95.22	95.23	95.23	95.24	95.25	95.26	95.27	95.27	95.28	95.29	95.30	95.31	95.32	95.32	95.33	95.34	95.35	95.36
EXISTING BOTTOM	*95.23*	*95.23*	*95.24*	*95.24*	*95.24*	*95.24*	*95.25*	*95.25*	*95.26*	*95.27*	*95.29*	*95.31*	*95.32*	*95.34*	*95.33*	*95.32*	*95.36*	*95.47*	*95.45*
STATION	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	1+760	1+780



PROPOSED GRADE	95.36	95.41	95.48	95.55	95.62	95.70	95.77	95.80	95.83	95.86	95.89	95.92	95.95	95.98	96.01	96.02	96.04	96.05	96.06
EXISTING BOTTOM	*95.45*	*95.42*	*95.44*	*95.52*	*95.61*	*95.69*	*95.77*	*95.80*	*95.80*	*95.80*	*95.80*	*95.80*	*95.85*	*95.93*	*96.01*	*96.09*	*96.17*	*96.17*	*96.17*
STATION	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	2+060	2+080	2+100	2+120	2+140

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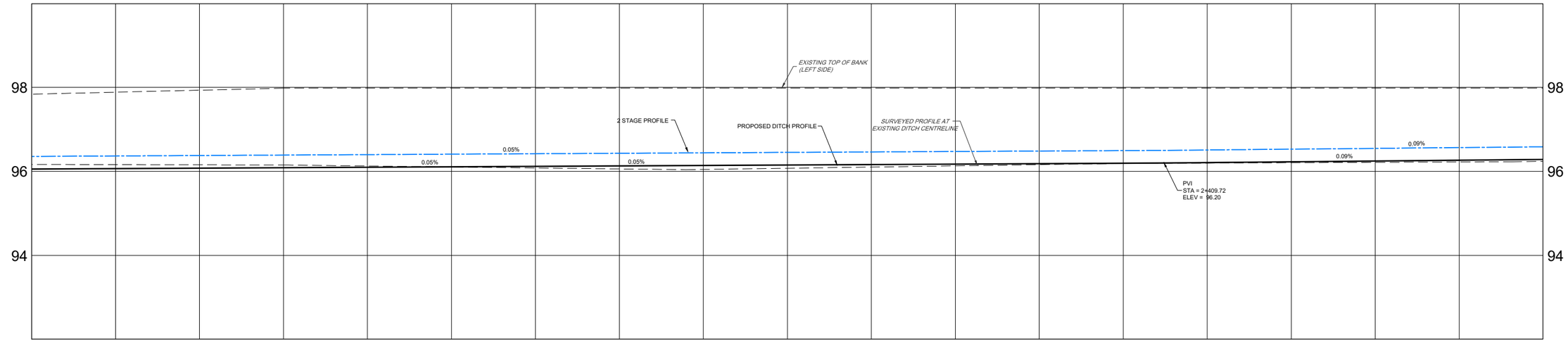
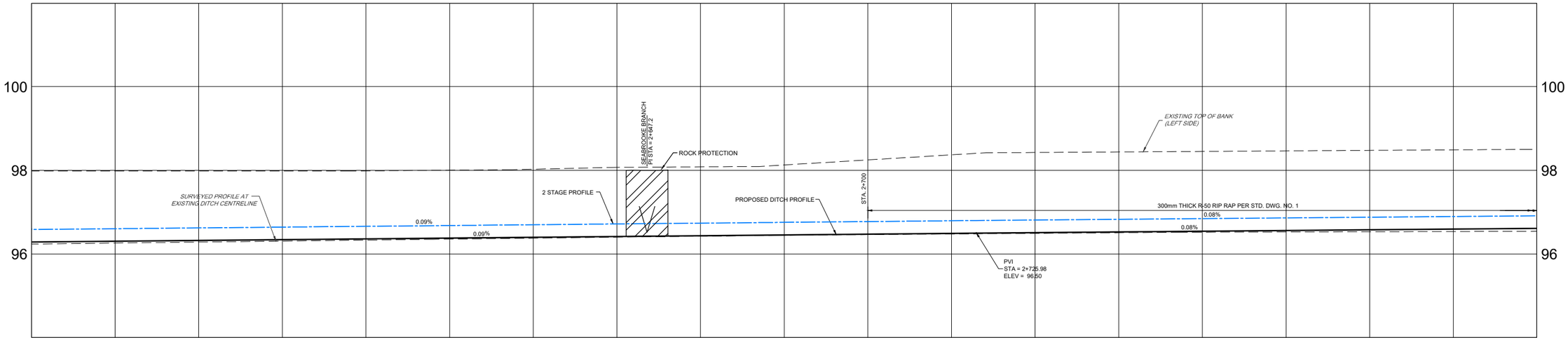
FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 1+420 TO STA. 2+140

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P3



PROPOSED GRADE	96.06	96.07	96.08	96.09	96.10	96.11	96.12	96.13	96.14	96.15	96.16	96.17	96.18	96.19	96.21	96.23	96.25	96.27	96.29
EXISTING BOTTOM	96.17	96.16	96.16	96.15	96.13	96.11	96.08	96.06	96.05	96.07	96.10	96.13	96.16	96.19	96.20	96.21	96.22	96.22	96.24
STATION	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	2+400	2+420	2+440	2+460	2+480	2+500



PROPOSED GRADE	96.29	96.30	96.32	96.34	96.36	96.38	96.40	96.42	96.44	96.46	96.48	96.49	96.51	96.53	96.55	96.56	96.58	96.60	96.61
EXISTING BOTTOM	96.24	96.26	96.29	96.31	96.33	96.36	96.39	96.40	96.43	96.45	96.46	96.48	96.49	96.51	96.52	96.53	96.53	96.54	96.54
STATION	2+500	2+520	2+540	2+560	2+580	2+600	2+620	2+640	2+660	2+680	2+700	2+720	2+740	2+760	2+780	2+800	2+820	2+840	2+860

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LICENCED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
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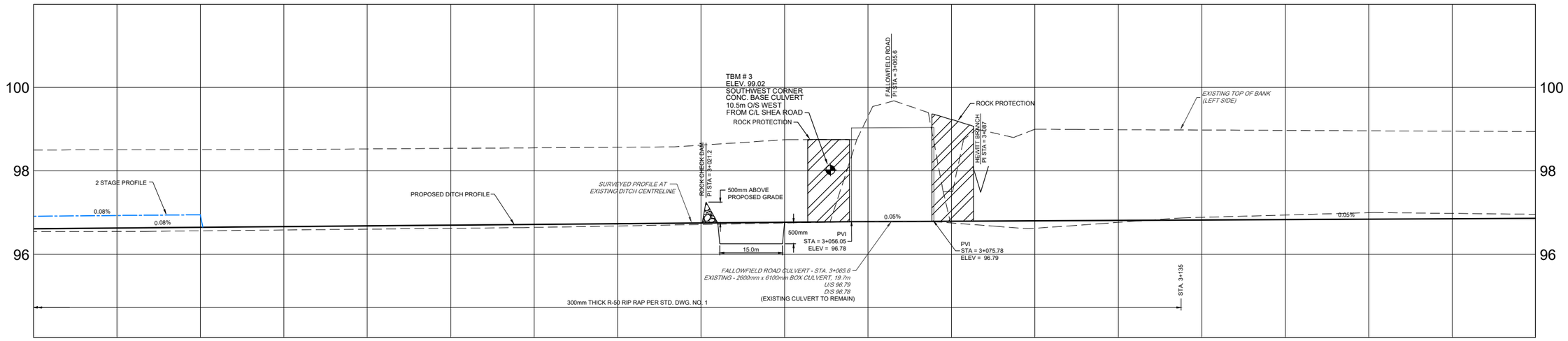
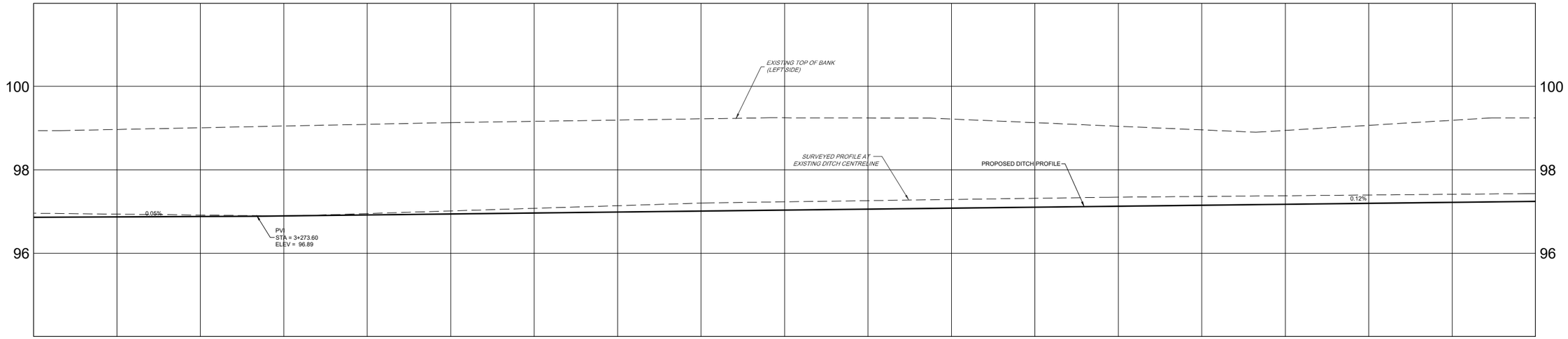
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 2+140 TO STA. 2+860

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P4



STATION	EXISTING BOTTOM	PROPOSED GRADE
2+860	96.54	96.61
2+880	96.55	96.63
2+900	96.56	96.65
2+920	96.58	96.66
2+940	96.60	96.68
2+960	96.62	96.70
2+980	96.64	96.72
3+000	96.68	96.73
3+020	96.72	96.75
3+040	96.75	96.77
3+060	96.78	96.78
3+080	96.75	96.79
3+100	96.62	96.80
3+120	96.77	96.81
3+140	96.89	96.82
3+160	96.94	96.83
3+180	97.00	96.84
3+200	96.98	96.85
3+220	96.96	96.86



STATION	EXISTING BOTTOM	PROPOSED GRADE
3+220	96.96	96.86
3+240	96.94	96.87
3+260	96.92	96.88
3+280	96.89	96.90
3+300	96.85	96.92
3+320	97.01	96.94
3+340	97.09	96.97
3+360	97.14	96.99
3+380	97.20	97.01
3+400	97.23	97.04
3+420	97.26	97.06
3+440	97.29	97.08
3+460	97.32	97.10
3+480	97.34	97.13
3+500	97.36	97.15
3+520	97.38	97.17
3+540	97.40	97.20
3+560	97.41	97.22
3+580	97.43	97.24

No.	DATE dd.mm.yy	REVISION	BY
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20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
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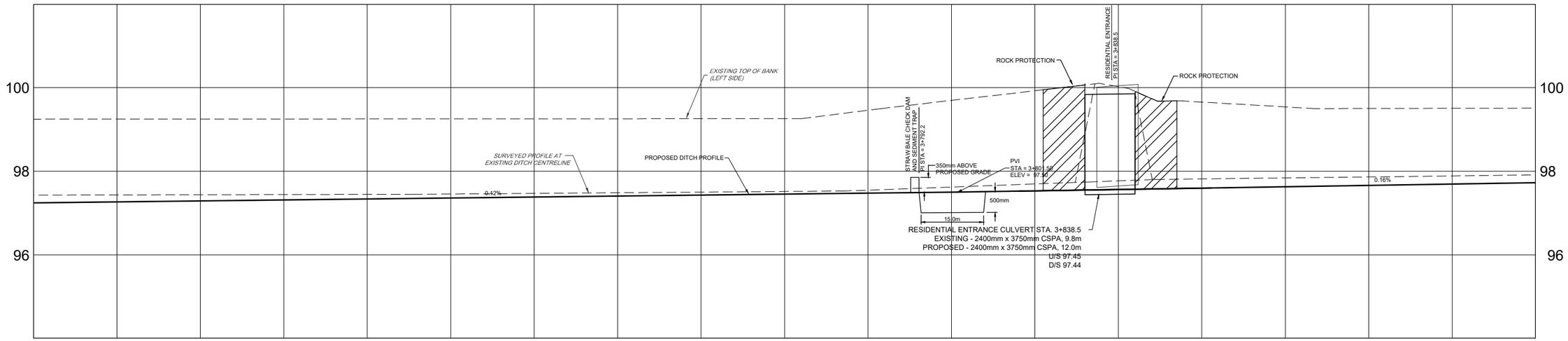
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

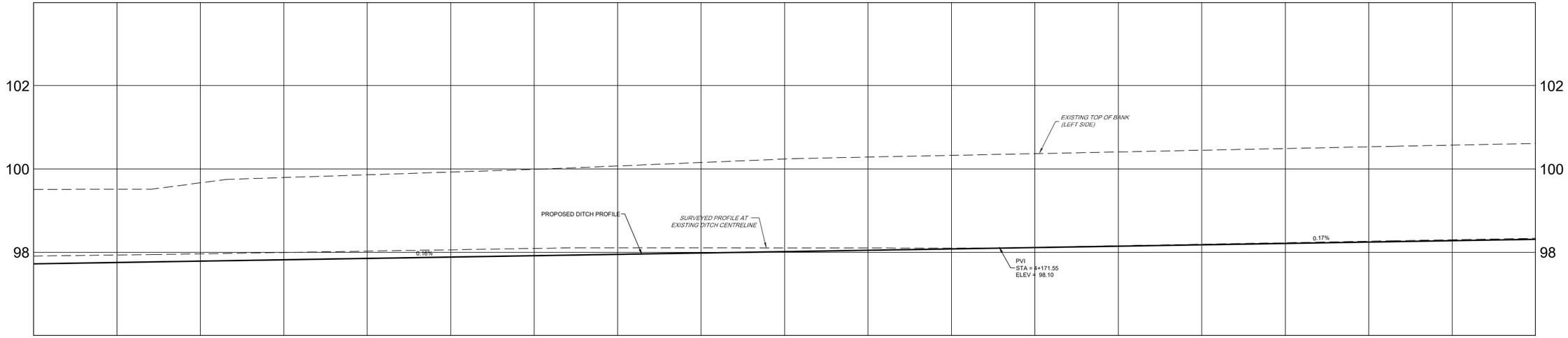
FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 2+860 TO STA. 3+580

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P5



PROPOSED GRADE	97.24	97.27	97.29	97.31	97.34	97.36	97.38	97.41	97.43	97.45	97.48	97.50	97.53	97.56	97.59	97.63	97.66	97.69	97.72
EXISTING BOTTOM	*97.43*	*97.43*	*97.44*	*97.44*	*97.45*	*97.45*	*97.47*	*97.49*	*97.50*	*97.52*	*97.55*	*97.62*	*97.70*	*97.77*	*97.82*	*97.84*	*97.86*	*97.89*	*97.91*
STATION	3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	3+940



PROPOSED GRADE	97.72	97.76	97.79	97.82	97.85	97.89	97.92	97.95	97.98	98.02	98.05	98.08	98.11	98.15	98.18	98.21	98.25	98.28	98.31
EXISTING BOTTOM	*97.91*	*97.94*	*97.96*	*98.00*	*98.03*	*98.06*	*98.09*	*98.11*	*98.11*	*98.11*	*98.10*	*98.10*	*98.12*	*98.16*	*98.19*	*98.23*	*98.27*	*98.30*	*98.34*
STATION	3+940	3+960	3+980	4+000	4+020	4+040	4+060	4+080	4+100	4+120	4+140	4+160	4+180	4+200	4+220	4+240	4+260	4+280	4+300

No.	DATE dd.mm.yy	REVISION	BY
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CHECKED	LF
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CITY OF OTTAWA

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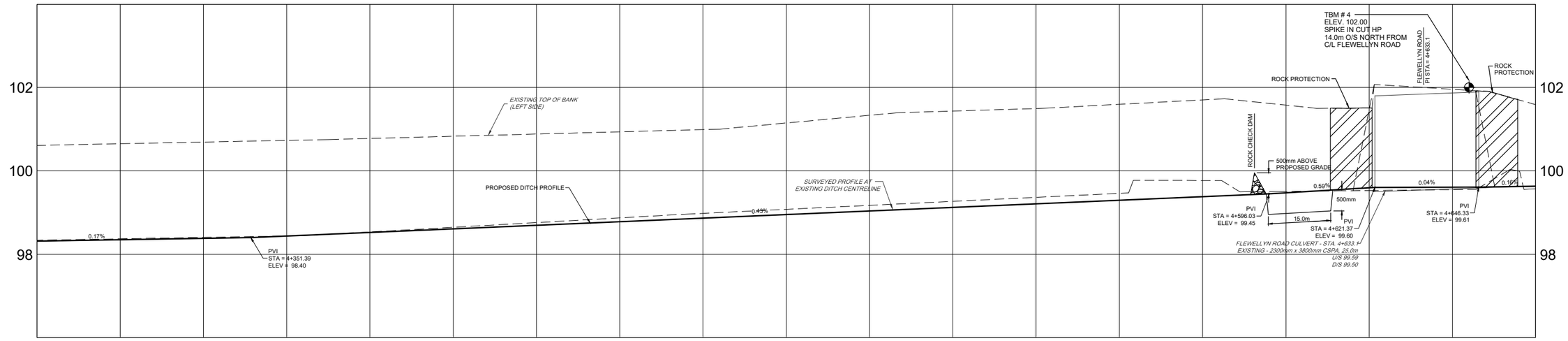
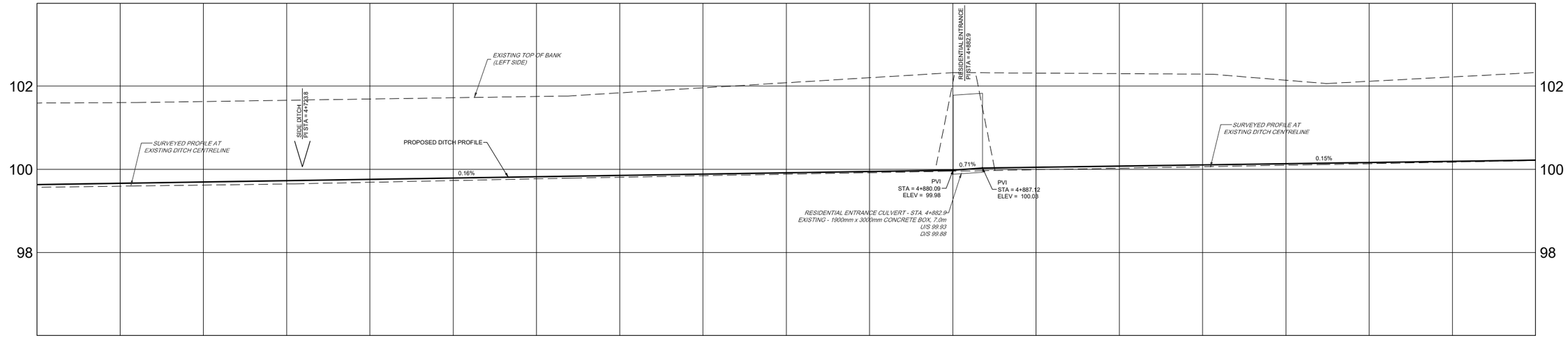
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 3+580 TO STA. 4+300

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P6



PROPOSED GRADE	98.31	98.35	98.38	98.44	98.52	98.61	98.69	98.78	98.87	98.95	99.04	99.12	99.21	99.30	99.38	99.47	99.59	99.61	99.63
EXISTING BOTTOM	*98.34*	*98.37*	*98.41*	*98.44*	*98.54*	*98.65*	*98.76*	*98.87*	*98.98*	*99.08*	*99.17*	*99.27*	*99.37*	*99.46*	*99.77*	*99.51*	*99.53*	*99.55*	*99.57*
STATION	4+300	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660



PROPOSED GRADE	99.63	99.66	99.70	99.73	99.76	99.79	99.82	99.85	99.89	99.92	99.95	99.98	100.05	100.08	100.11	100.14	100.16	100.19	100.22
EXISTING BOTTOM	*99.57*	*99.59*	*99.62*	*99.65*	*99.69*	*99.73*	*99.77*	*99.81*	*99.85*	*99.88*	*99.92*	*99.95*	*99.99*	*100.03*	*100.06*	*100.10*	*100.14*	*100.17*	*100.21*
STATION	4+660	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020

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4	14.12.20	FINAL - ISSUED FOR DISTRIBUTION	AJR

LICENSED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501334
Limitations: Provides 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, Ontario K2V 1A8
(613) 592-6060 rcii.com

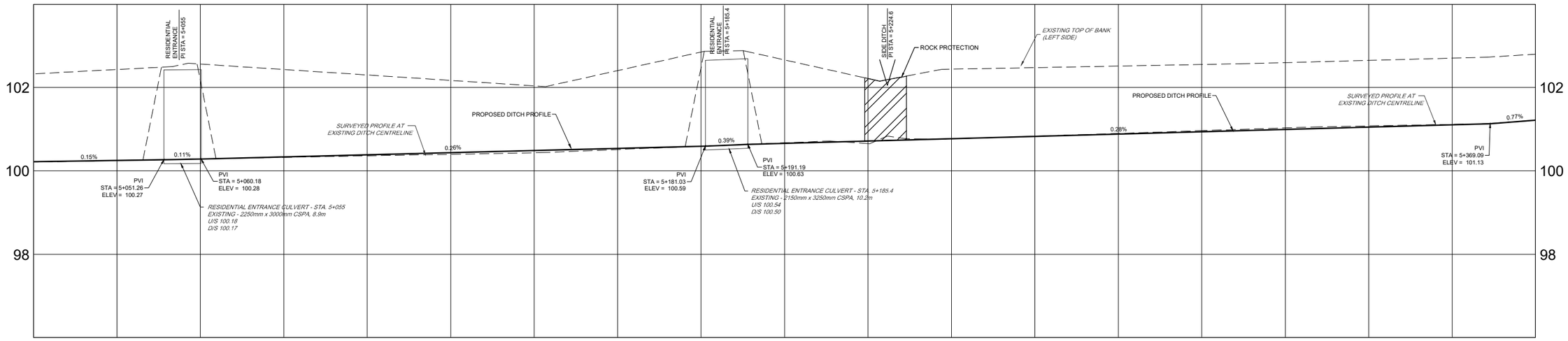
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

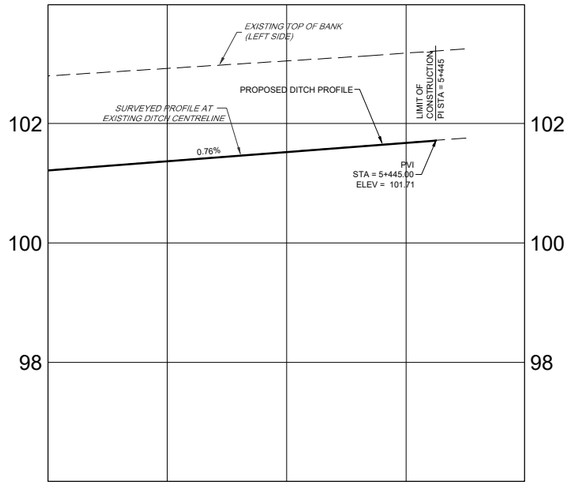
FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 4+300 TO STA. 5+020

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P7



PROPOSED GRADE	100.22	100.25	100.28	100.34	100.39	100.44	100.49	100.54	100.59	100.66	100.72	100.77	100.83	100.88	100.94	100.99	101.05	101.11	101.22
EXISTING BOTTOM	*100.21*	*100.25*	*100.29*	*100.32*	*100.36*	*100.40*	*100.44*	*100.51*	*100.59*	*100.67*	*100.65*	*100.77*	*100.83*	*100.90*	*100.96*	*101.03*	*101.08*	*101.12*	*101.22*
STATION	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	5+260	5+280	5+300	5+320	5+340	5+360	5+380



PROPOSED GRADE	101.22	101.37	101.52	101.68	
EXISTING BOTTOM	*101.22*	*101.37*	*101.53*	*101.68*	
STATION	5+380	5+400	5+420	5+440	5+460

No.	DATE dd.mm.yy	REVISION	BY
1	15.04.20	ISSUED FOR MUNICIPAL REVIEW	AJR
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LICENCED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501334
Limitations: Provides 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

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

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

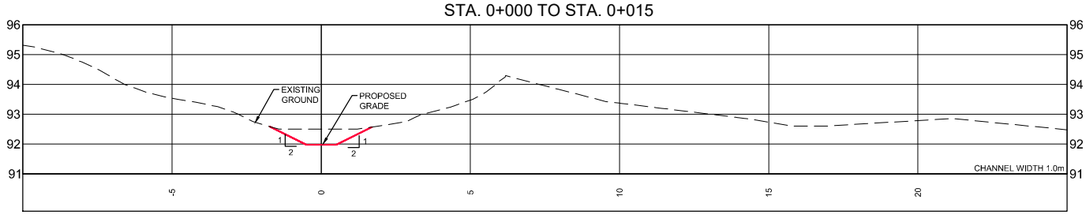
CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

DRAIN PROFILE
STA. 5+020 TO STA. 5+460

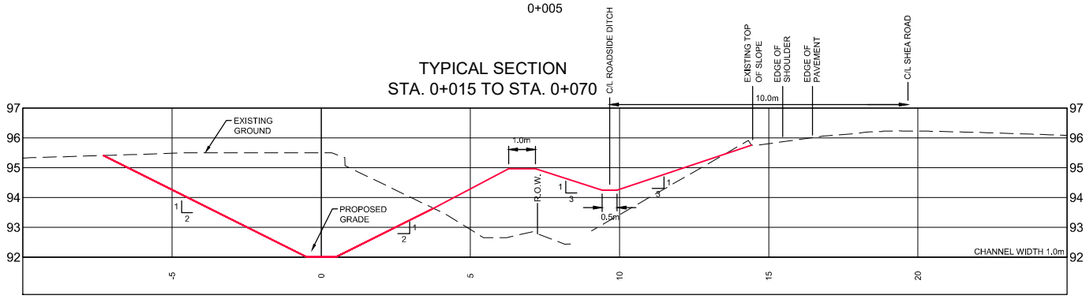
PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-P8

TYPICAL SECTION
STA. 0+000 TO STA. 0+015



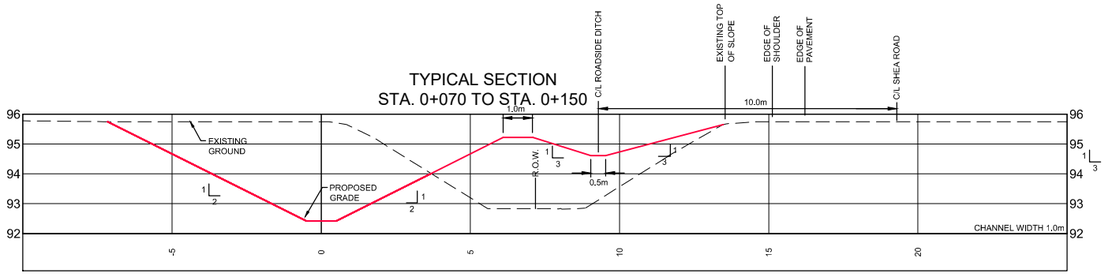
0+005

TYPICAL SECTION
STA. 0+015 TO STA. 0+070



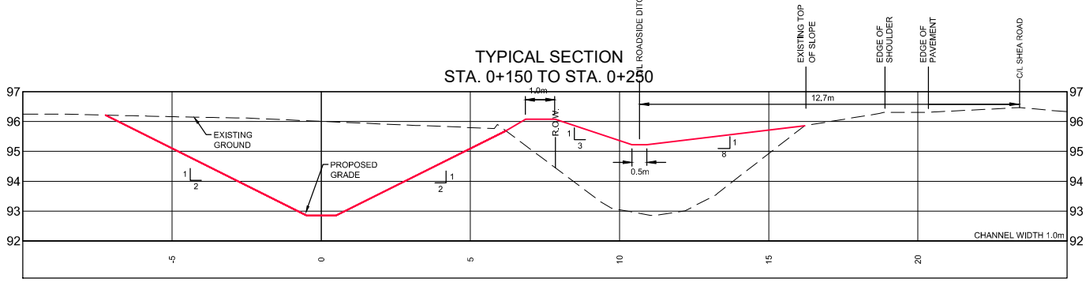
0+040

TYPICAL SECTION
STA. 0+070 TO STA. 0+150



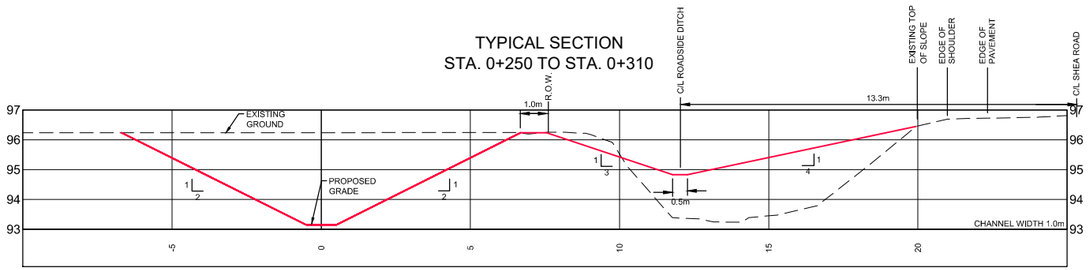
0+100

TYPICAL SECTION
STA. 0+150 TO STA. 0+250



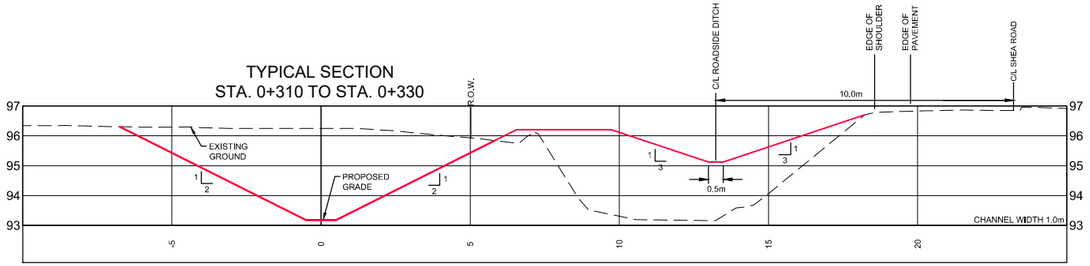
0+200

TYPICAL SECTION
STA. 0+250 TO STA. 0+310



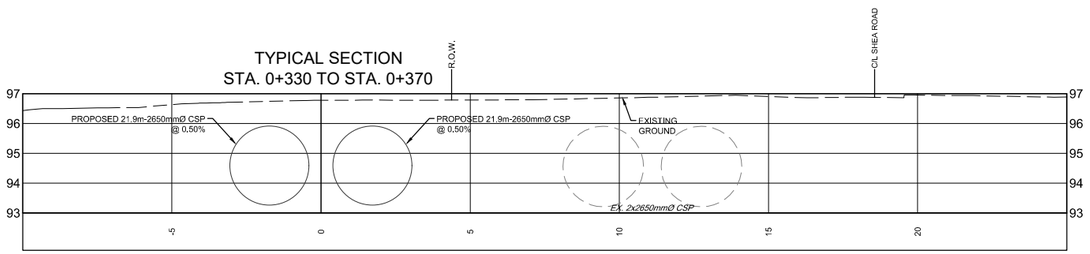
0+300

TYPICAL SECTION
STA. 0+310 TO STA. 0+330



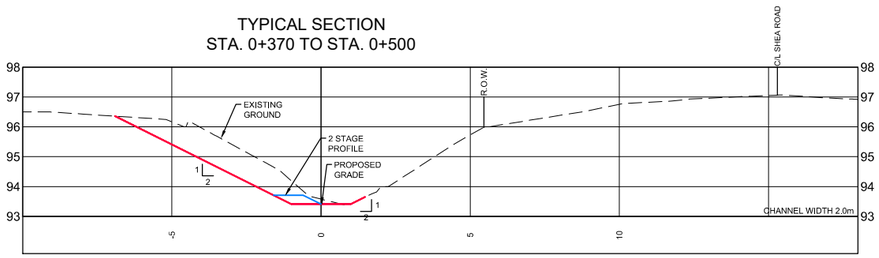
0+320

TYPICAL SECTION
STA. 0+330 TO STA. 0+370



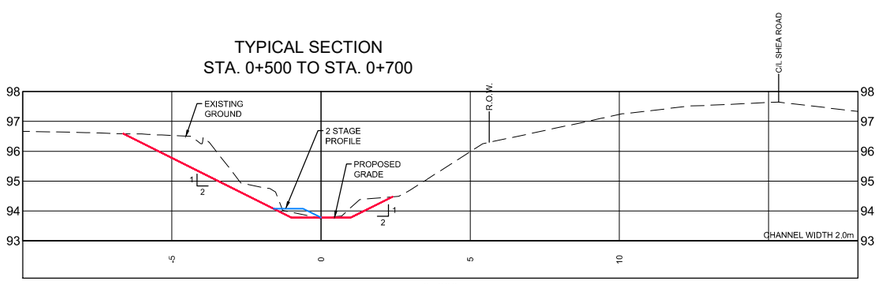
0+340

TYPICAL SECTION
STA. 0+370 TO STA. 0+500



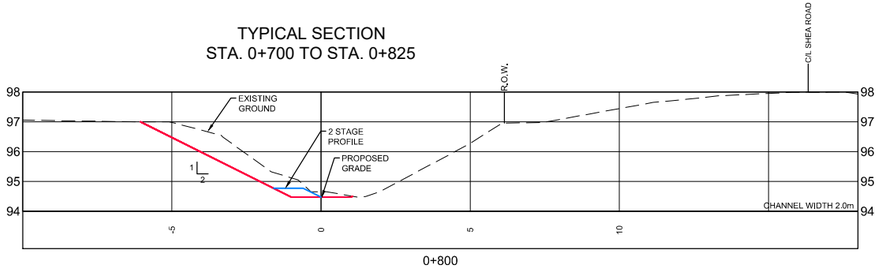
0+400

TYPICAL SECTION
STA. 0+500 TO STA. 0+700



0+600

TYPICAL SECTION
STA. 0+700 TO STA. 0+825



0+800

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LICENSED PROFESSIONAL ENGINEER — A. J. ROBINSON — 20/12/14 — PROVINCE OF ONTARIO

Professional Engineers Ontario — 20/12/14 — Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501314
Limitations: Preamble 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

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

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

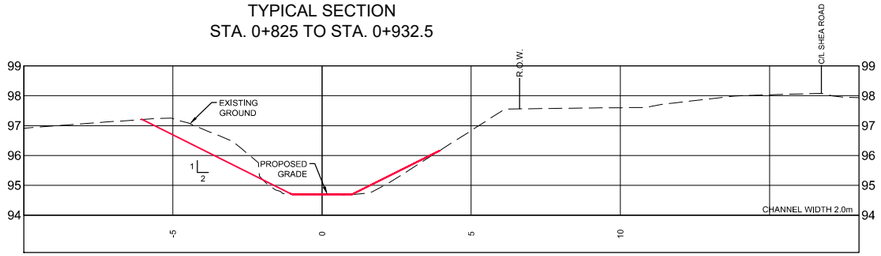
CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN
STA. 0+000 TO STA. 0+825

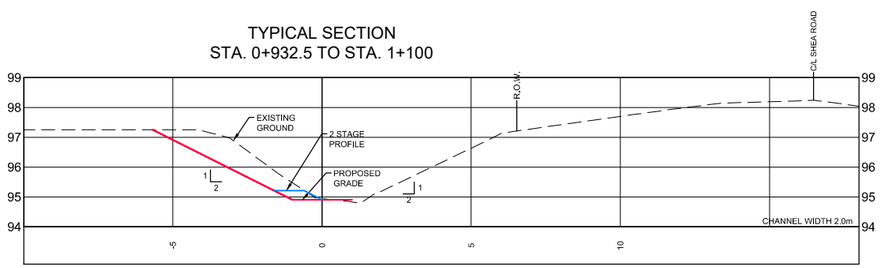
PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-C1

TYPICAL SECTION
STA. 0+825 TO STA. 0+932.5



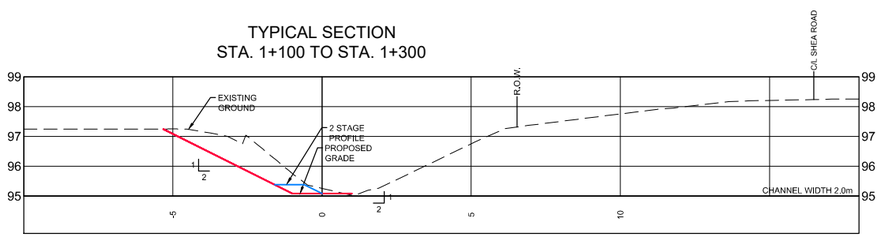
0+850

TYPICAL SECTION
STA. 0+932.5 TO STA. 1+100



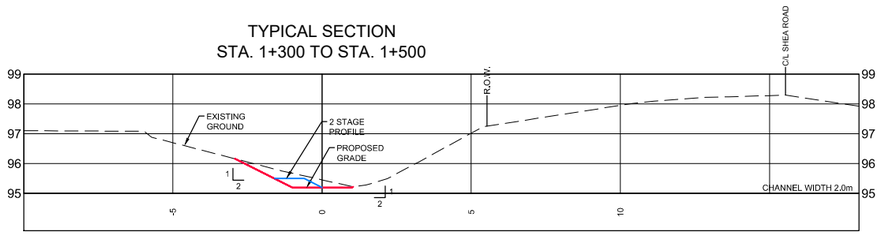
1+000

TYPICAL SECTION
STA. 1+100 TO STA. 1+300



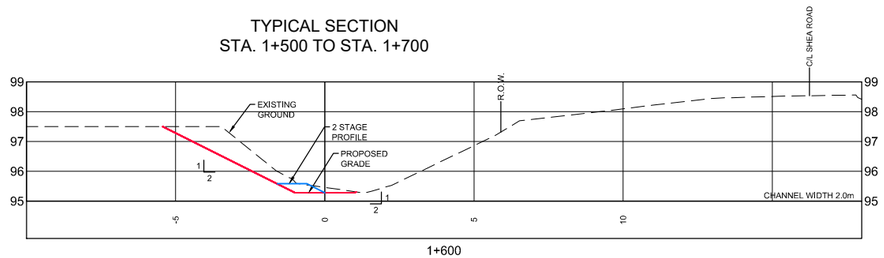
1+200

TYPICAL SECTION
STA. 1+300 TO STA. 1+500



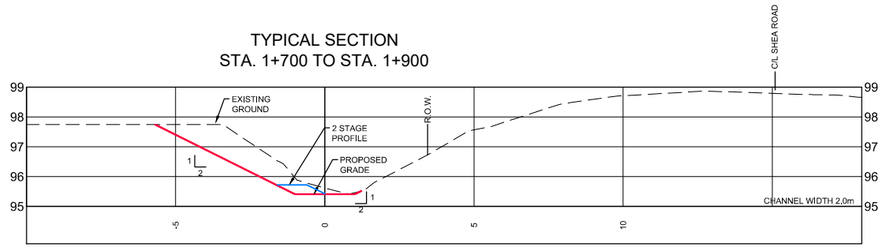
1+400

TYPICAL SECTION
STA. 1+500 TO STA. 1+700



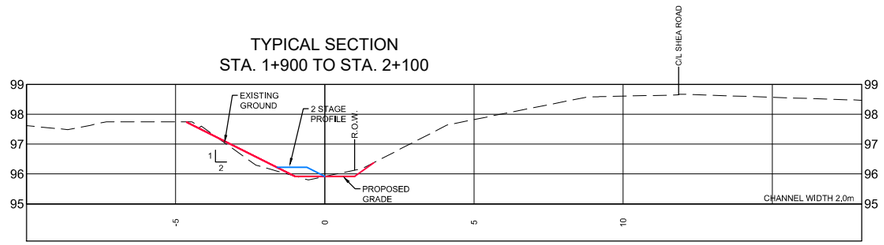
1+600

TYPICAL SECTION
STA. 1+700 TO STA. 1+900



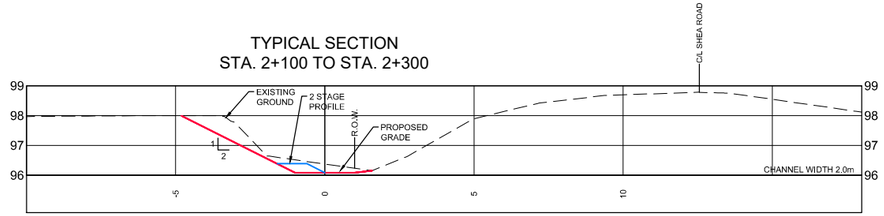
1+800

TYPICAL SECTION
STA. 1+900 TO STA. 2+100



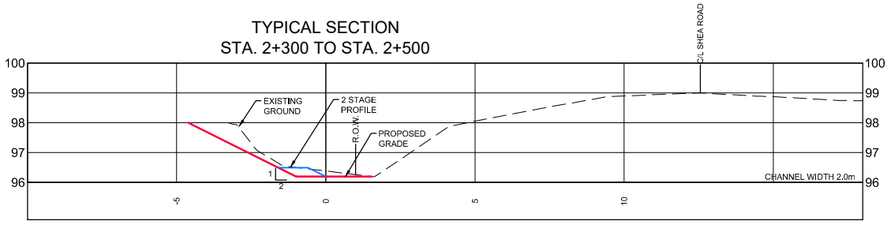
2+000

TYPICAL SECTION
STA. 2+100 TO STA. 2+300



2+200

TYPICAL SECTION
STA. 2+300 TO STA. 2+500



2+400

No.	DATE dd.mm.yy	REVISION	BY
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LICENSED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501[illegible]
Limitations: Prelim 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, Ontario K2V 1A8
(613) 592-6060 rcii.com

DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

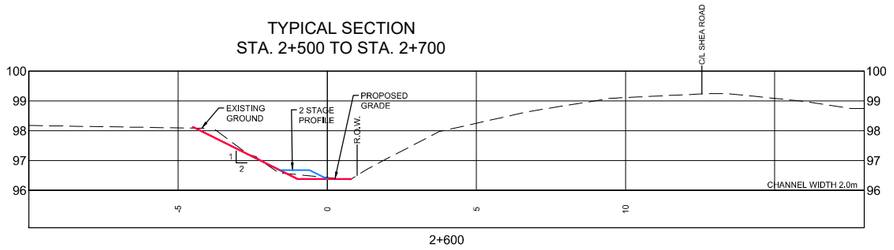
CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN
STA. 0+825 TO STA. 2+500

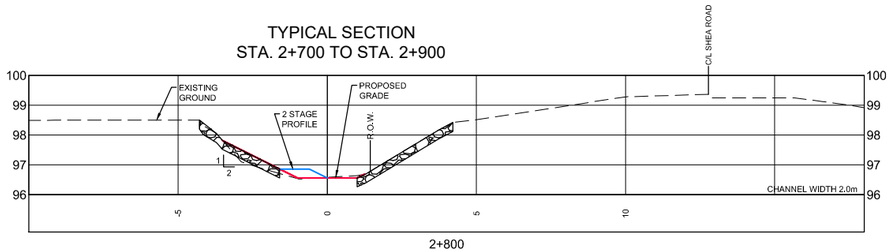
PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-C2

TYPICAL SECTION
STA. 2+500 TO STA. 2+700



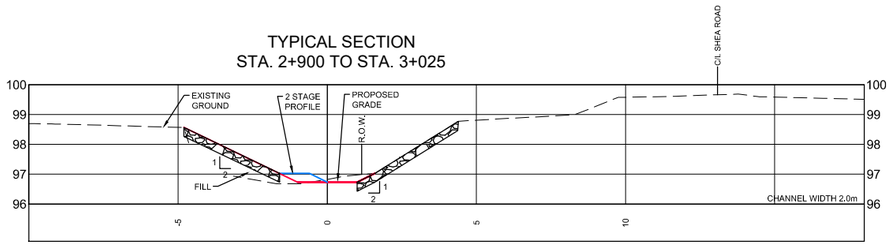
2+600

TYPICAL SECTION
STA. 2+700 TO STA. 2+900



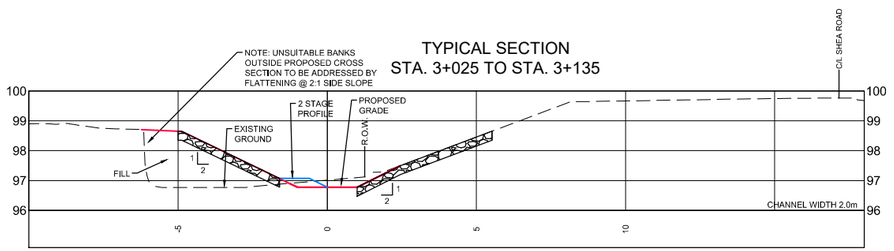
2+800

TYPICAL SECTION
STA. 2+900 TO STA. 3+025



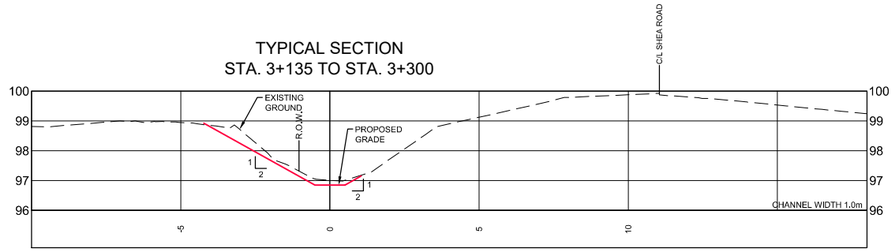
3+000

TYPICAL SECTION
STA. 3+025 TO STA. 3+135



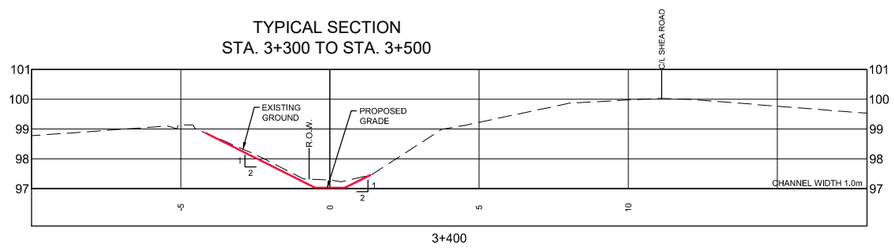
3+050

TYPICAL SECTION
STA. 3+135 TO STA. 3+300



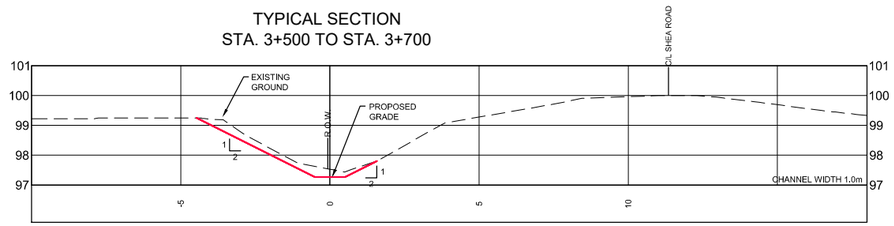
3+200

TYPICAL SECTION
STA. 3+300 TO STA. 3+500



3+400

TYPICAL SECTION
STA. 3+500 TO STA. 3+700



3+600

No.	DATE dd.mm.yy	REVISION	BY
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LICENSED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
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SCALES
1 0 2
HORIZONTAL
1 0 2
VERTICAL

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(613) 592-6060 rcii.com

DESIGN	LF
CHECKED	AJR
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CHECKED	LF
APPROVED	AJR

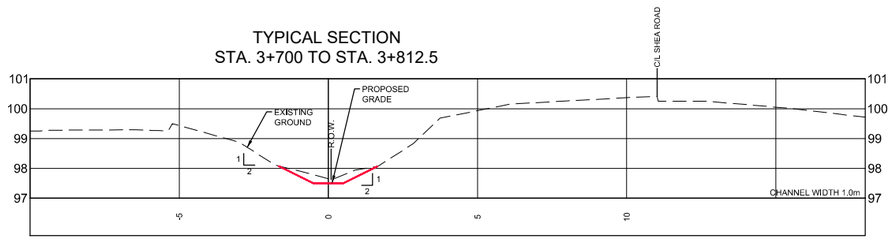
CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN
STA. 2+500 TO STA. 3+700

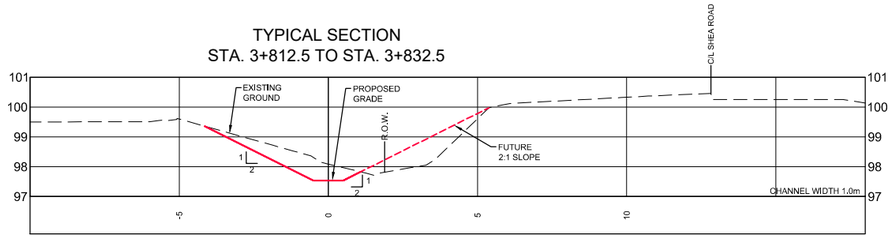
PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-C3

TYPICAL SECTION
STA. 3+700 TO STA. 3+812.5



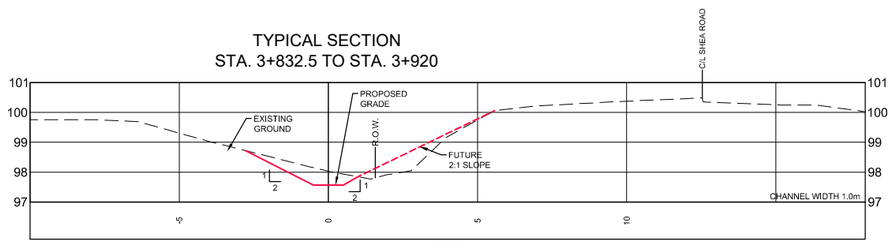
3+800

TYPICAL SECTION
STA. 3+812.5 TO STA. 3+832.5



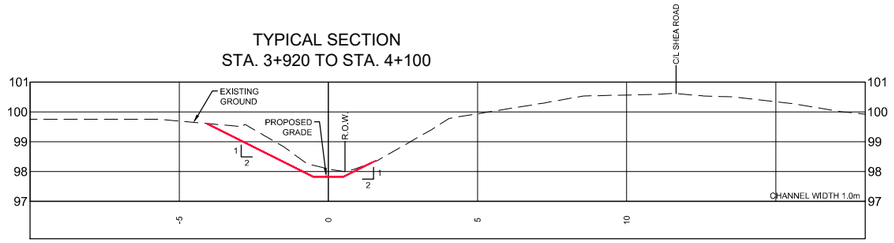
3+825

TYPICAL SECTION
STA. 3+832.5 TO STA. 3+920



3+840

TYPICAL SECTION
STA. 3+920 TO STA. 4+100



4+000

No.	DATE dd.mm.yy	REVISION	BY
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LICENSED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L FRANKLIN
Number: 100501XX
Limitations: Priority dams, 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

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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

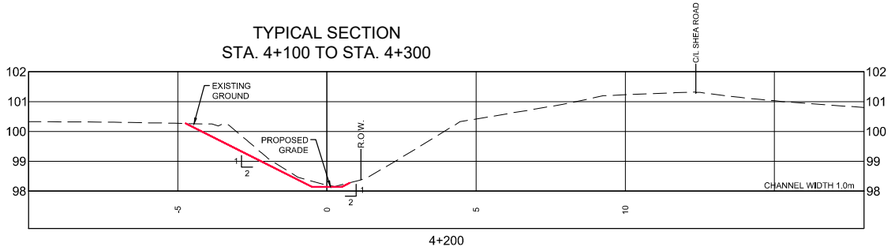
CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN
STA. 3+700 TO STA. 4+100

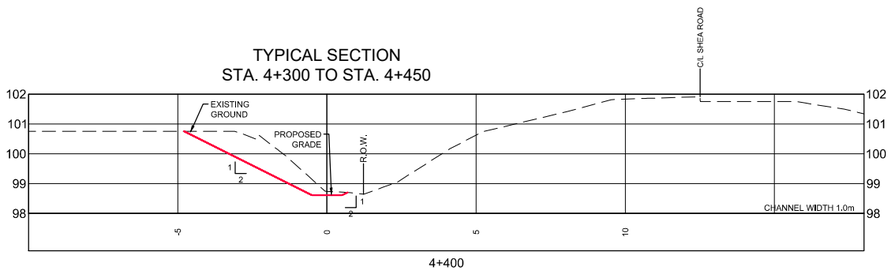
PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-C4

TYPICAL SECTION
STA. 4+100 TO STA. 4+300



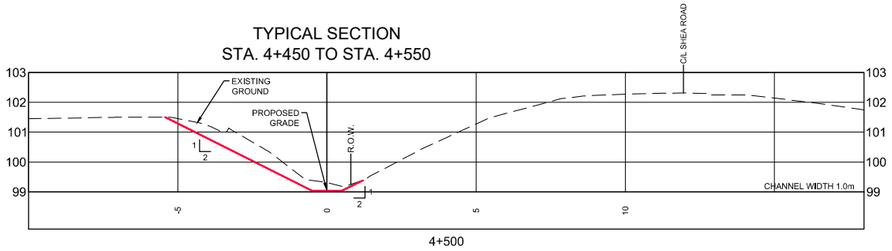
4+200

TYPICAL SECTION
STA. 4+300 TO STA. 4+450



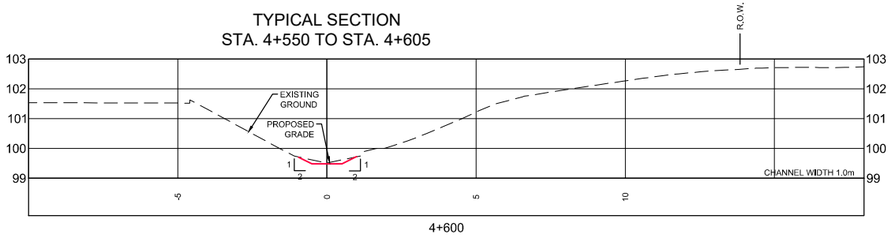
4+400

TYPICAL SECTION
STA. 4+450 TO STA. 4+550



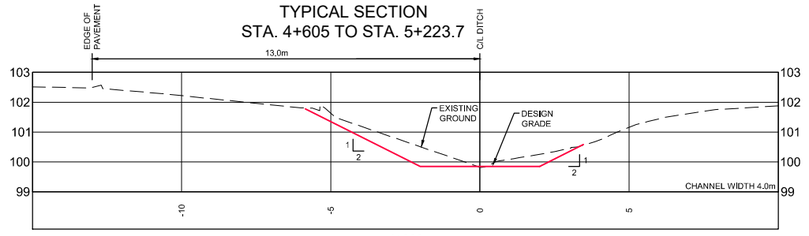
4+500

TYPICAL SECTION
STA. 4+550 TO STA. 4+605



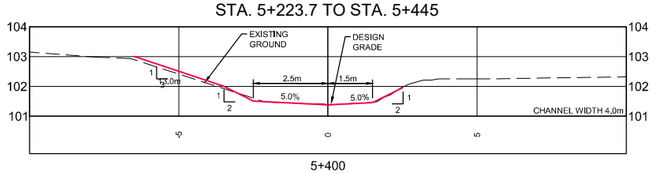
4+600

TYPICAL SECTION
STA. 4+605 TO STA. 5+223.7



4+800

TYPICAL SECTION
STA. 5+223.7 TO STA. 5+445



5+400

No.	DATE dd.mm.yy	REVISION	BY
1	15.04.20	ISSUED FOR MUNICIPAL REVIEW	AJR
2	27.05.20	ISSUED FOR AGENCY REVIEW	AJR
3	02.09.20	ISSUED FOR ECA APPLICATION	AJR
4	14.12.20	FINAL - ISSUED FOR DISTRIBUTION	AJR

LICENCED PROFESSIONAL ENGINEER
A. J. ROBINSON
20/12/14
PROVINCE OF ONTARIO

Professional Engineers Ontario
20/12/14
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: 100501334
Limitations: Provides 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, Ontario K2V 1A8
(613) 592-6060 rcii.com

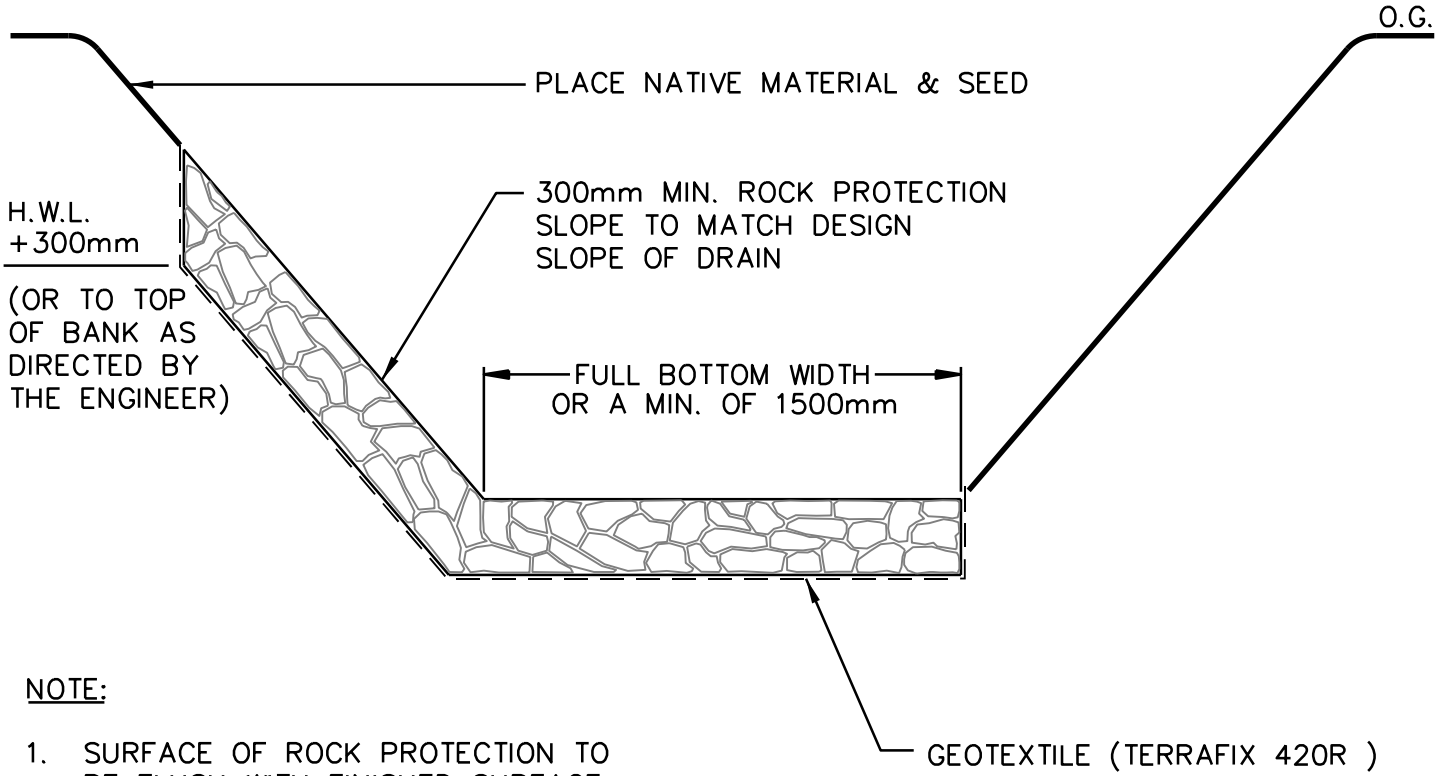
DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

FAULKNER
MUNICIPAL DRAIN

CROSS SECTIONS
MAIN DRAIN
STA. 4+100 TO STA. 5+445

PROJECT No.	16013
CONTRACT No.	
DATED	DEC. 2020
DWG. No:	16013-C5



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.

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: AUG/13

Robinson Consultants
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350 Palladium Dr.,Suite 210
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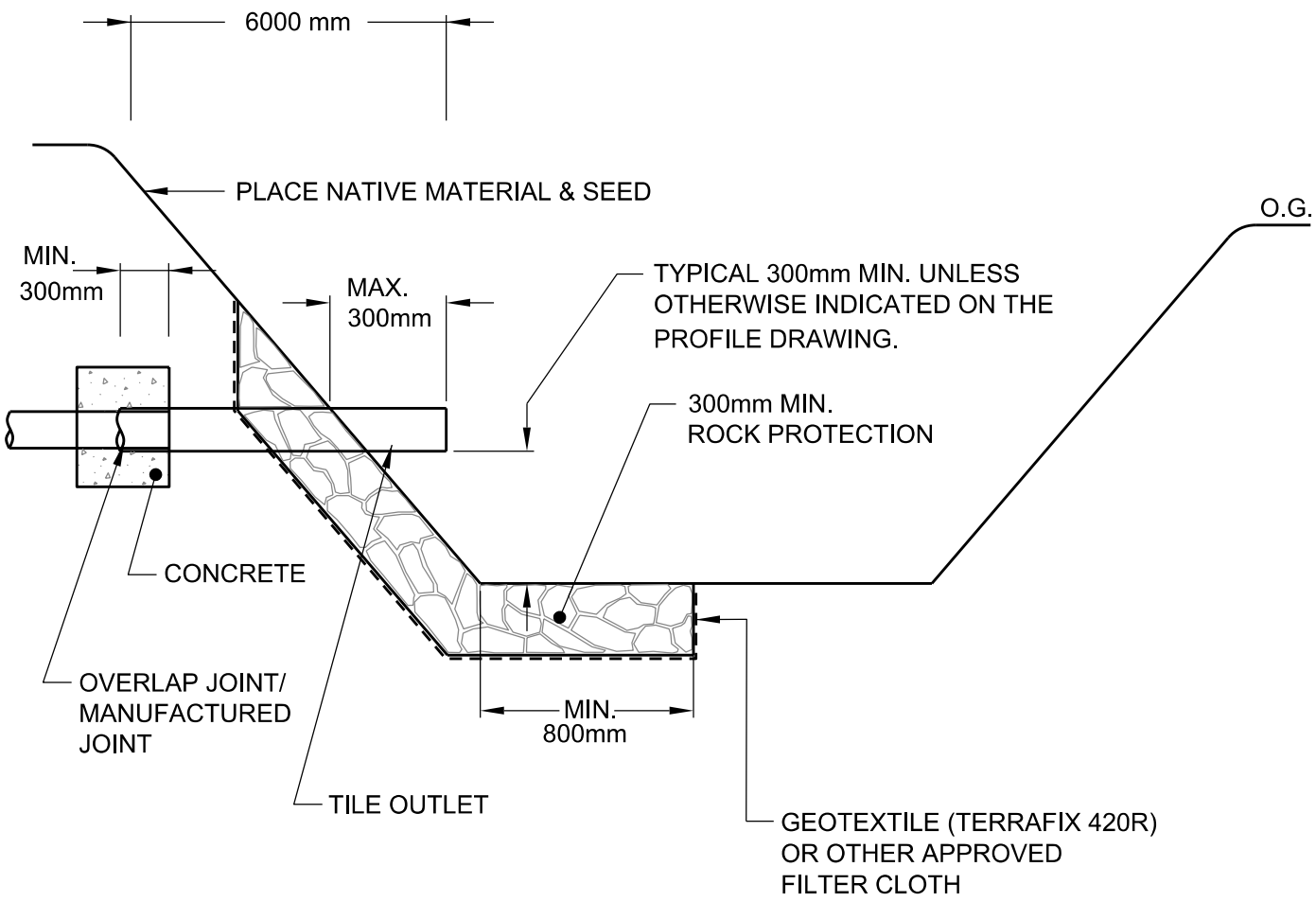
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	TYPICAL ROCK PROTECTION EROSION CONTROL	STD.DWG.No. 1
VERTICAL N.T.S.		



NOTES:

1. OUTLET TO BE CONTINUOUS HDPE (SMOOTHWALL - MIN. STIFFNESS OF 320KPa) AND A MIN. LENGTH OF 6.0m.

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 CONNECTION BETWEEN THE OUTLET AND THE FIELD TILE IS TO BE A LOCKING MANUFACTURED JOINT - TAPE SEALED OR OVERLAP JOINT (MIN. 300mm) AND ENCASED IN CONCRETE.

4. A RODENT GRATE IS TO BE INSTALLED AT THE END OF THE C.S.P. OUTLET.

5. MIN. SIDE SLOPE IS 1 VERT TO 2 HOR OR AS SPECIFIED IN ENGINEER'S REPORT.

6. FOR ROCK PROTECTION, USE R-50 RIP-RAP AS PER OPSS MUNI 1004.05.05.02

DATED: JUL/17

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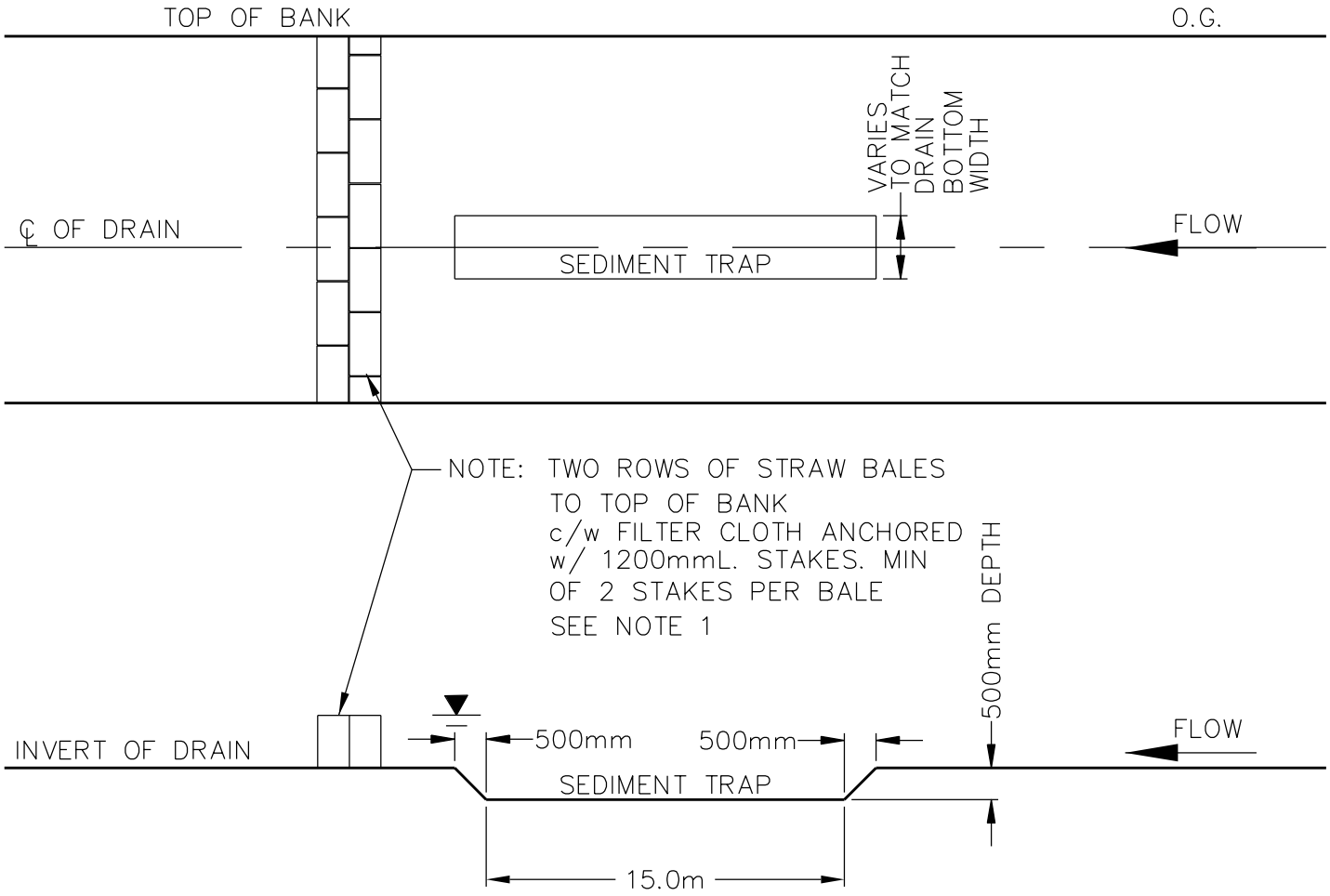
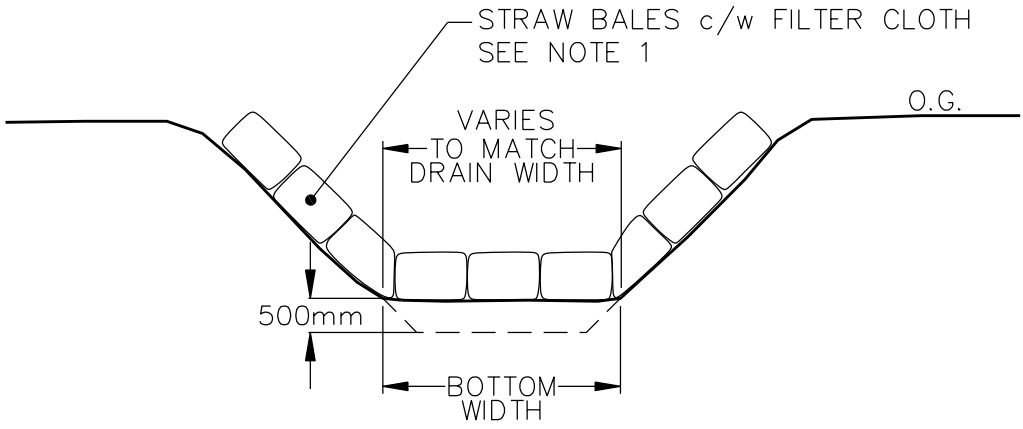
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.		
VERTICAL N.T.S.	STANDARD TILE OUTLET	STD.DWG.No. 2





NOTE 1: GEOTEXTILE TO BE TERRAFIX 420R OR OTHER APPROVED FILTER CLOTH

DATED: APRIL 2020

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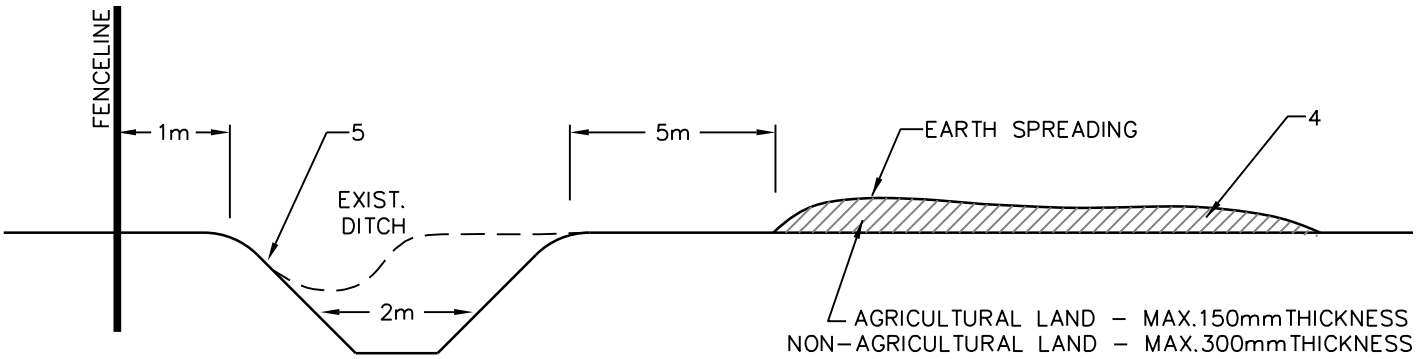
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	TYPICAL STRAW BALE CHECK DAM AND SEDIMENT TRAP	STD.DWG.No. 3
VERTICAL N.T.S.		



NOTES:

1. NO EXCAVATION WITHIN 1 METRE (3 FEET) OF EXISTING FENCELINE.
2. SIDE SLOPES AND CHANNEL DIMENSIONS AS PER PROFILE DRAWING.
3. NO SPOIL OR SPREADING WITHIN 5 METRES (16 FEET) OF TOP OF BANK.
4. SPOIL THICKNESS, WIDTH, DRAINAGE OPENINGS AND SPREADING LOCATION TO BE AS PER SPECIAL PROVISIONS.
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. SEE ENGINEER'S REPORT FOR DETAILS.

DATED: AUG/13

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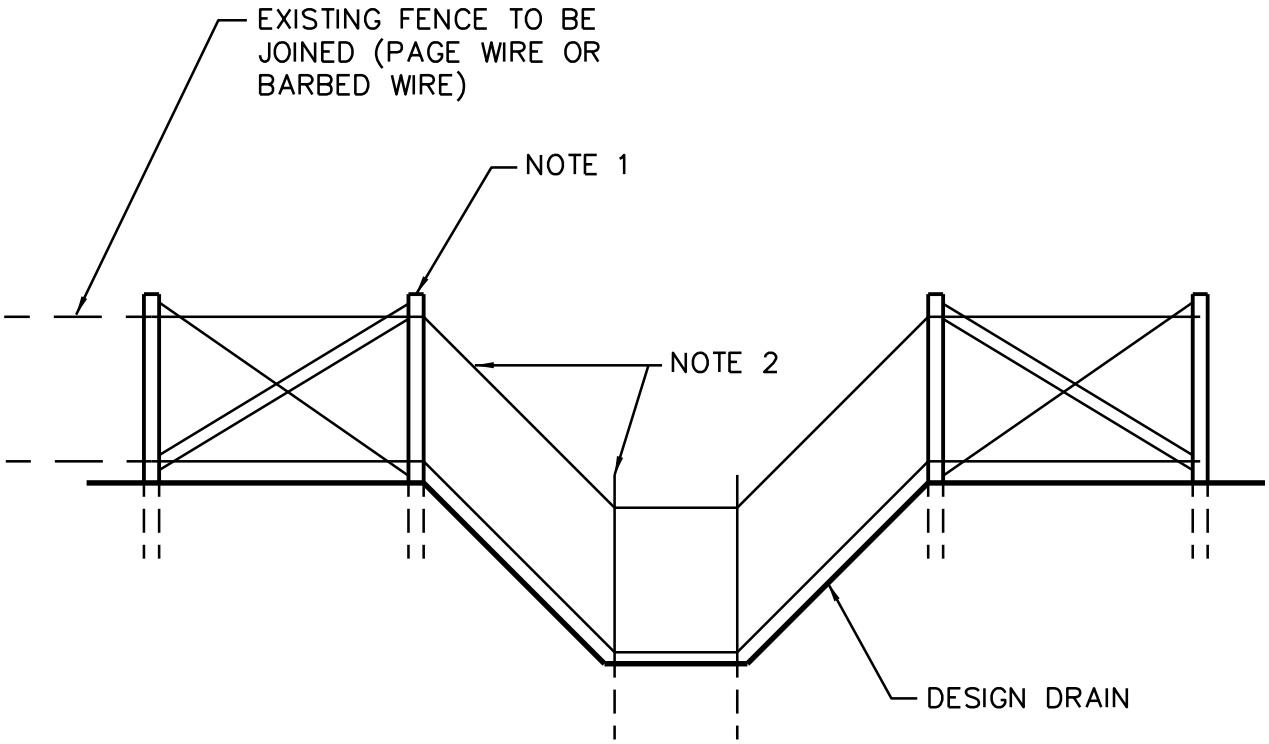
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	OPEN CHANNEL SYSTEMS EARTH CUT CHANNEL	STD.DWG.No. 4
VERTICAL N.T.S.		



NOTES:

1. REFER TO OPSD DWG. No. 901.01 FOR BRACE PANEL DETAIL.
2. T-RAILS SHALL BE NEW STEEL, MINIMUM LENGTH 2.4m (8 FEET).
3. CROSS-FENCE WIRE SHALL BE HEAVY GAUGE BARBED WIRE, MINIMUM 6 STRANDS AT EVEN SPACING.

DATED: AUG/13

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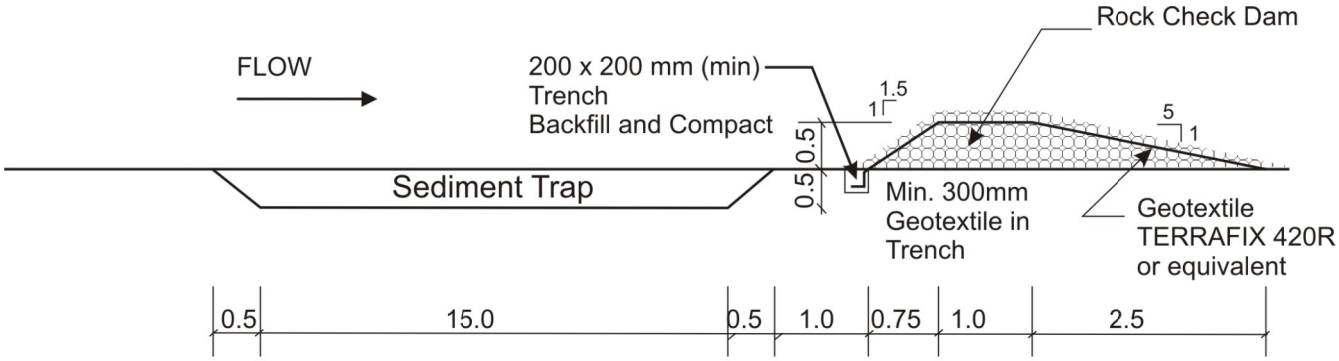
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	CROSS FENCE DETAIL	STD.DWG.No. 5
VERTICAL N.T.S.		

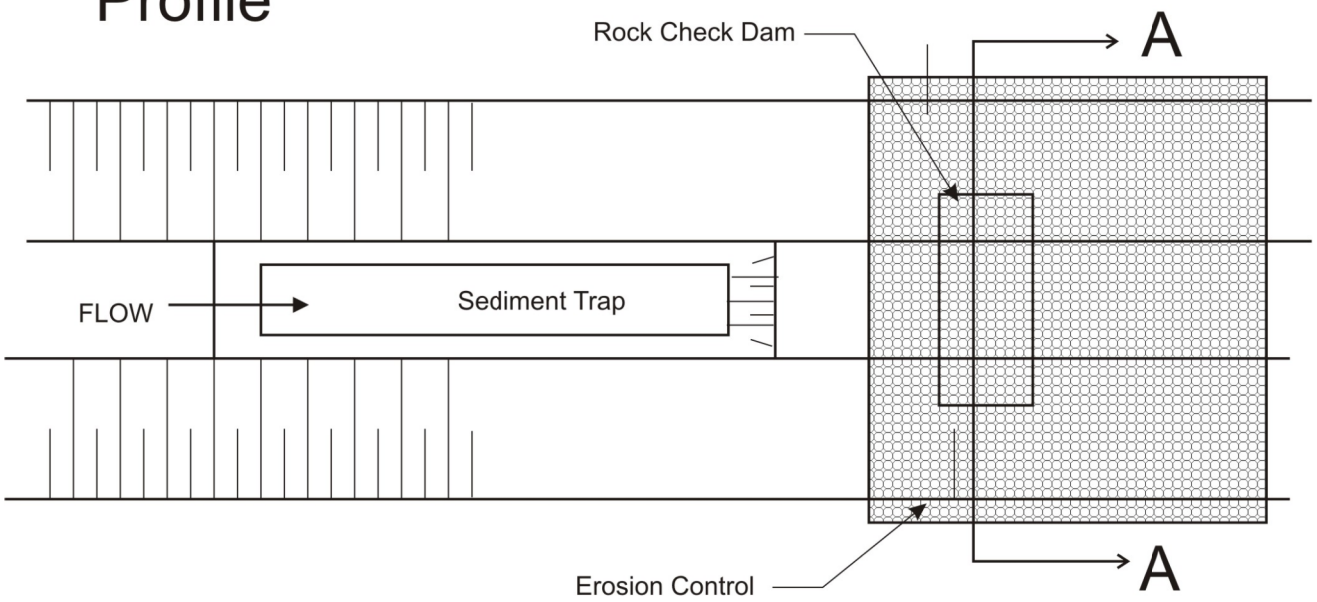
NOTE:

1. FOR ROCK CHECK DAM AND EROSION CONTROL, USE R-50 RIP-RAP AS PER OPSS 1004.05.05.02 OR ROCK PROTECTION AS PER OPSS 1004.05.05.03.

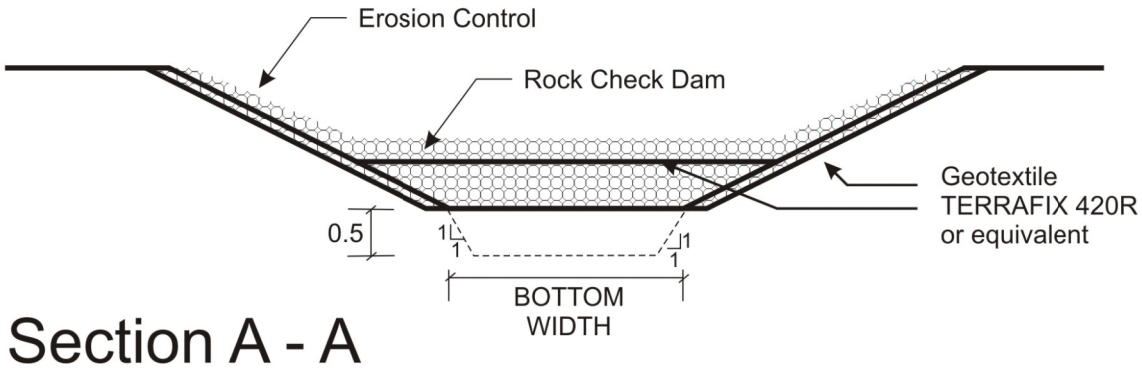
2. REFER TO OPSD 219.211 & 219.220 FOR ADDITIONAL DETAILS



Profile



Plan



Section A - A

NOTE: All dimensions in metres unless noted

DATED: AUG/13

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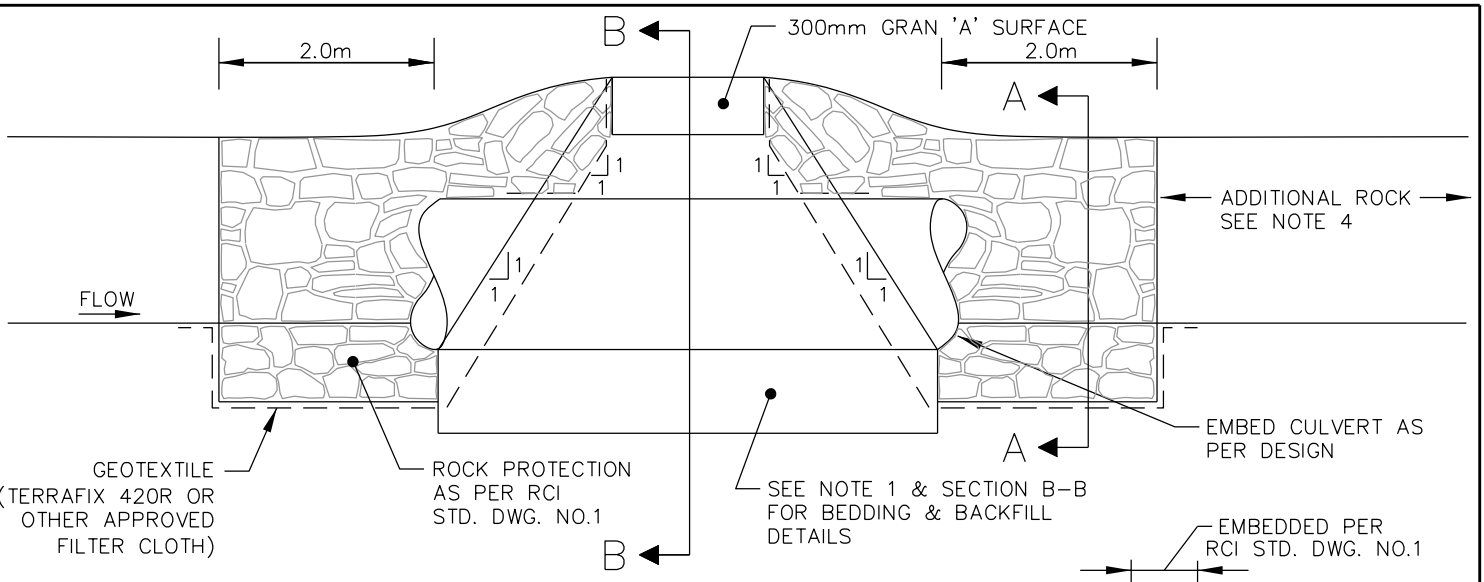
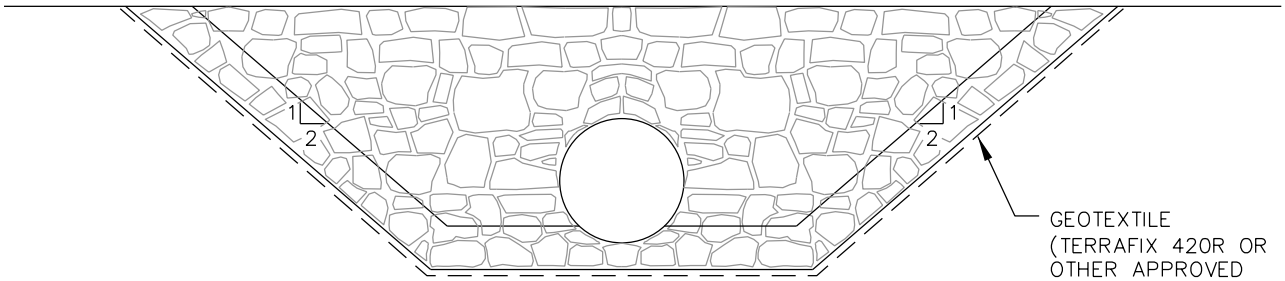
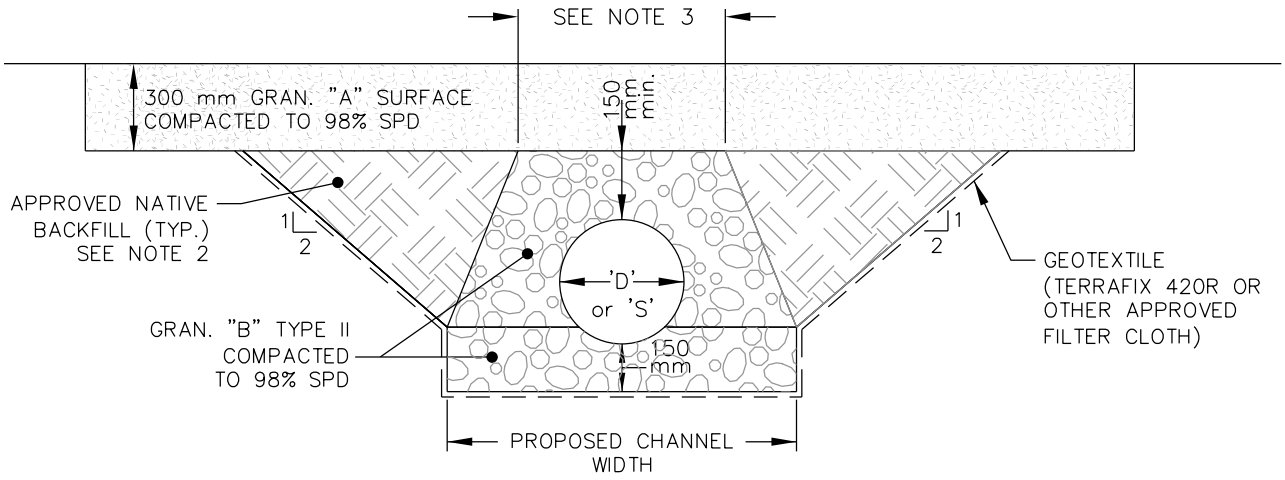
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	TEMPORARY ROCK CHECK DAM AND SEDIMENT TRAP	STD.DWG.No. 6
VERTICAL N.T.S.		





END SECTION A–A



SECTION B–B

NOTES

1. All bedding, backfill and cover material to be placed as per section B-B and in general conformity with OPSD 802.010 (for circular pipes) and 802.020 for arch pipes.
2. "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.
3. For circular culverts, the top-width of cover material shall be a minimum of the diameter of the pipe ('D') plus 0.5 x 'D' each way for a total of 2.0 x 'D'. For arch culverts, the top-width of cover material shall be a minimum of the span of the pipe ('S') plus 0.75 x 'S' each way for a total of 2.5 x 'S'. The minimum bottom width shall conform with the proposed channel width upstream/downstream of the culvert.
4. Additional Rock Protection may be placed where required at the discretion of the Drainage Engineer. Length to be determined in the field. Additional Rock Protection is paid under its own item and not included in the culvert end treatment item.
5. Follow manufacturers installation instructions for all pipes.

DATED: APRIL 2020

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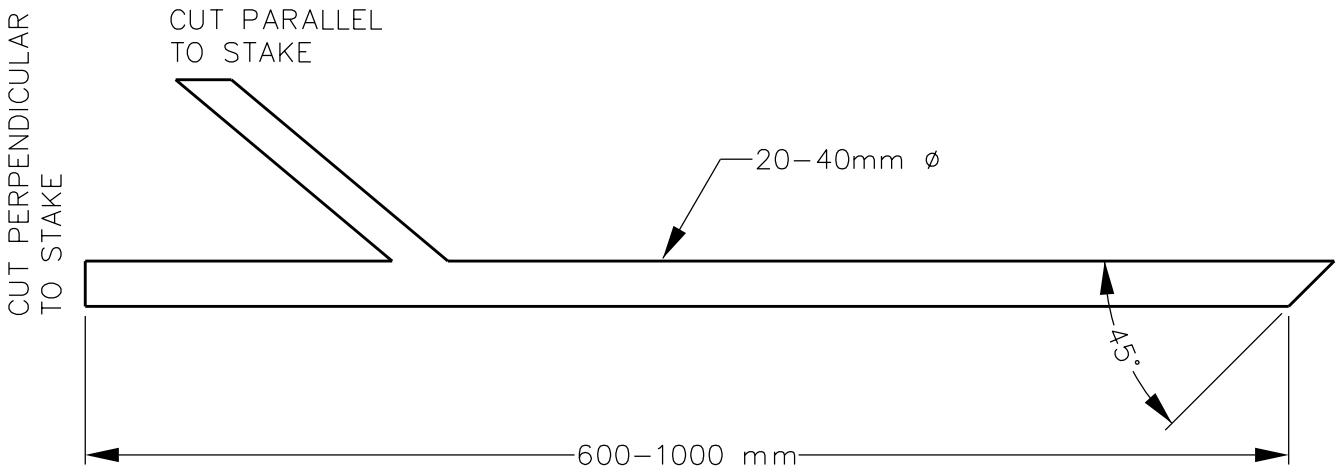
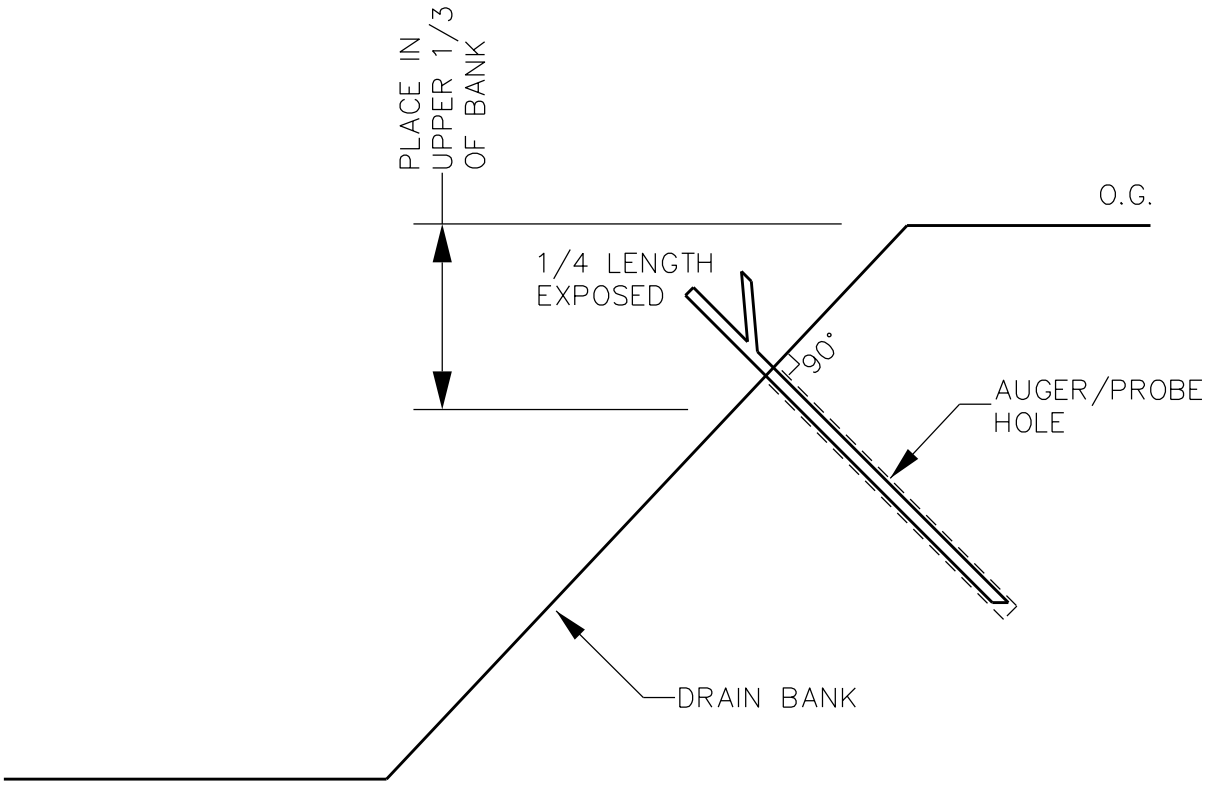
SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.	STANDARD FARM CROSSING AND CULVERT END TREATMENT DETAIL	STD.DWG.No. 10
VERTICAL N.T.S.		





NOTES

1. Live stakes may be cut from Redosier Dogwood or Shrub (Pussy) Willow or other approved species that has a strong root systems to stabilize banks and is self–rooting and wet/flood tolerant. Dogwood is shade tolerant and preferred in highly shaded areas.
2. Materials may be site–sourced from areas prescribed for clearing and grubbing or from other areas of the property with landowner permission. Materials may also be nursery sourced
3. Place or drive stakes into an auger or probe hole equal or slightly less than the diameter of the stake.
4. Lineal spacing as prescribed on plans and specifications
5. Best suited to placement during the dormant season (after the first frost)

DATED: JUNE 2020

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SCALE	MUNICIPAL DRAIN	PROJECT NO.
HORIZONTAL N.T.S.		
VERTICAL N.T.S.	LIVE STAKING	STD.DWG.No. 15

Appendix B

Schedule of Assessment and Cost Estimate

Schedule of Assessment for Construction and Future Maintenance

Schedule of Allowances

Detailed Cost Estimate

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area	Benefit Cost	Outlet Cost	Sub-total Costs	Special Benefit & Utilities	Grants	Allowances	Total Net Costs
		Total	Total	Total		Total	Total	Total	Total
City of Ottawa -- Individual Landowners									
1	271810153000000	1.85	$ 54.03	$ 17.13	$ 71.16	$ -	$ 23.48	$ 7,997.27	(-$ 7,949.60)
2	271825027000000	33.35	$ 937.90	$ 603.68	$ 1,541.58	$ -	$ 508.72	$ 30,221.72	(-$ 29,188.86)
3	271825060000000	11.79	$ -	$ 174.35	$ 174.35	$ -	$ 57.54	$ -	$ 116.82
4	271825060010000	0.41	$ -	$ 12.13	$ 12.13	$ -	$ -	$ -	$ 12.13
5	271825061010000	39.55	$ -	$ 501.72	$ 501.72	$ -	$ -	$ -	$ 501.72
6	271825061000000	0.89	$ -	$ 26.32	$ 26.32	$ -	$ 8.69	$ -	$ 17.64
7	271825062010000	37.21	$ -	$ 506.27	$ 506.27	$ -	$ -	$ -	$ 506.27
8	271825062050000	2.00	$ -	$ 59.15	$ 59.15	$ -	$ -	$ -	$ 59.15
9	271825062000000	0.22	$ -	$ 6.51	$ 6.51	$ -	$ -	$ -	$ 6.51
10	271825063000000	19.47	$ -	$ 333.95	$ 333.95	$ -	$ -	$ -	$ 333.95
11	271825064010000	19.20	$ -	$ 372.23	$ 372.23	$ -	$ -	$ -	$ 372.23
12	271825064000000	0.61	$ -	$ 23.22	$ 23.22	$ -	$ -	$ -	$ 23.22
13	unknown	0.29	$ -	$ 11.04	$ 11.04	$ -	$ -	$ -	$ 11.04
14	271825065000000	40.47	$ -	$ 1,007.48	$ 1,007.48	$ -	$ 332.47	$ -	$ 675.01
15	271825066000000	39.72	$ 678.25	$ 1,166.54	$ 1,844.79	$ -	$ 608.78	$ 24,458.44	(-$ 23,222.43)
16	271825066010000	0.34	$ -	$ 20.17	$ 20.17	$ -	$ -	$ -	$ 20.17
17	271825066050000	0.40	$ 14.92	$ 22.61	$ 37.53	$ -	$ 12.38	$ 904.31	(-$ 879.17)
18	271825101020000	4.58	$ -	$ 438.07	$ 438.07	$ -	$ -	$ -	$ 438.07
19	271825102000000	9.57	$ -	$ 915.36	$ 915.36	$ -	$ -	$ -	$ 915.36
20	271825103000000	0.46	$ -	$ 44.00	$ 44.00	$ -	$ -	$ -	$ 44.00
21	unknown	13.71	$ -	$ 244.03	$ 244.03	$ -	$ -	$ -	$ 244.03
22	271825104020000	2.43	$ -	$ 43.25	$ 43.25	$ -	$ -	$ -	$ 43.25
23	271825104000000	23.46	$ -	$ 1,670.27	$ 1,670.27	$ -	$ -	$ -	$ 1,670.27
24	271825105000000	0.40	$ -	$ 19.13	$ 19.13	$ -	$ -	$ -	$ 19.13
25	271825106000000	0.40	$ -	$ 19.13	$ 19.13	$ -	$ -	$ -	$ 19.13
26	271825107000000	38.85	$ -	$ 751.76	$ 751.76	$ -	$ 248.08	$ -	$ 503.68
27	271825107010000	0.81	$ -	$ 38.74	$ 38.74	$ -	$ 12.78	$ -	$ 25.95
28	271825107020000	0.81	$ -	$ 38.74	$ 38.74	$ -	$ -	$ -	$ 38.74
29	271825108030000	1.44	$ -	$ 51.26	$ 51.26	$ -	$ -	$ -	$ 51.26
30 pt 1	271825108000000	3.67	$ -	$ 101.76	$ 101.76	$ -	$ 33.58	$ -	$ 68.18
30 pt 2	271825108000000	33.57	$ -	$ 863.71	$ 863.71	$ -	$ 285.03	$ -	$ 578.69
31	271825108010000	0.81	$ -	$ 50.78	$ 50.78	$ -	$ -	$ -	$ 50.78

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area	Benefit Cost	Outlet Cost	Sub-total Costs	Special Benefit & Utilities	Grants	Allowances	Total Net Costs
		Total	Total	Total		Total	Total	Total	Total
32	271825108020000	0.81	$ -	$ 50.78	$ 50.78	$ -	$ 16.76	$ -	$ 34.02
33	271825027010000	7.96	$ -	$ 639.33	$ 639.33	$ -	$ -	$ -	$ 639.33
34	271825109010000	0.79	$ -	$ 30.08	$ 30.08	$ -	$ -	$ -	$ 30.08
35	271825109000000	44.94	$ -	$ 1,087.09	$ 1,087.09	$ -	$ -	$ -	$ 1,087.09
36	271825110000000	39.91	$ -	$ 1,200.57	$ 1,200.57	$ -	$ 396.19	$ -	$ 804.38
37	271825110020000	0.55	$ -	$ 41.36	$ 41.36	$ -	$ -	$ -	$ 41.36
38	271825110010000	46.05	$ 734.29	$ 1,550.87	$ 2,285.15	$ -	$ 754.10	$ 11,613.93	(-$ 10,082.87)
39	271825151000000	2.44	$ -	$ 78.29	$ 78.29	$ -	$ 25.84	$ -	$ 52.46
40	271825154020000	3.24	$ -	$ 103.96	$ 103.96	$ -	$ -	$ -	$ 103.96
41	271825154050000	2.67	$ -	$ 85.67	$ 85.67	$ -	$ -	$ -	$ 85.67
42	271825154010000	4.23	$ -	$ 135.73	$ 135.73	$ -	$ -	$ -	$ 135.73
43	271825154070000	0.80	$ -	$ 51.34	$ 51.34	$ -	$ -	$ -	$ 51.34
44	271825156000000	38.77	$ -	$ 996.47	$ 996.47	$ -	$ -	$ -	$ 996.47
45	271825156020000	0.41	$ -	$ 12.19	$ 12.19	$ -	$ -	$ -	$ 12.19
46	271825164000000	1.61	$ -	$ 90.16	$ 90.16	$ -	$ -	$ -	$ 90.16
47	271825163000000	8.12	$ -	$ 227.36	$ 227.36	$ -	$ -	$ -	$ 227.36
48	271825176950000	7.58	$ -	$ 121.61	$ 121.61	$ -	$ -	$ -	$ 121.61
49	271825175950000	0.66	$ -	$ 42.35	$ 42.35	$ -	$ -	$ -	$ 42.35
50	271825166100000	2.23	$ -	$ 71.55	$ 71.55	$ -	$ -	$ -	$ 71.55
51	271825166050000	0.84	$ -	$ 53.91	$ 53.91	$ -	$ -	$ -	$ 53.91
52	271825177200000	0.99	$ -	$ 63.53	$ 63.53	$ -	$ -	$ -	$ 63.53
53	271825177450000	1.18	$ -	$ 75.72	$ 75.72	$ -	$ -	$ -	$ 75.72
54	271825177750000	1.62	$ -	$ 103.96	$ 103.96	$ -	$ -	$ -	$ 103.96
55	271825169070000	0.15	$ -	$ 8.40	$ 8.40	$ -	$ -	$ -	$ 8.40
56	271825165000000	0.20	$ -	$ 11.20	$ 11.20	$ -	$ -	$ -	$ 11.20
57	271825173000000	0.20	$ -	$ 11.20	$ 11.20	$ -	$ -	$ -	$ 11.20
58	271825169060000	4.68	$ -	$ 524.15	$ 524.15	$ -	$ -	$ -	$ 524.15
59	271825169050000	4.05	$ -	$ 113.40	$ 113.40	$ -	$ -	$ -	$ 113.40
60	271825169040000	4.05	$ -	$ 113.40	$ 113.40	$ -	$ -	$ -	$ 113.40
61	272810280000000	18.33	$ -	$ 616.37	$ 616.37	$ -	$ 203.40	$ -	$ 412.97
62	2728 102 800 10000	0.82	$ -	$ 55.97	$ 55.97	$ -	$ -	$ -	$ 55.97
63	2728 102 800 20000	0.82	$ -	$ 55.97	$ 55.97	$ -	$ -	$ -	$ 55.97
64	272810300000000	14.55	$ -	$ 523.27	$ 523.27	$ -	$ 172.68	$ -	$ 350.59

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area	Benefit Cost	Outlet Cost	Sub-total Costs	Special Benefit & Utilities	Grants	Allowances	Total Net Costs
		Total	Total	Total		Total	Total	Total	Total
65	272810300010000	0.95	$ -	$ 108.76	$ 108.76	$ -	$ -	$ -	$ 108.76
66	271825177000000	21.88	$ -	$ 1,197.20	$ 1,197.20	$ -	$ 395.07	$ -	$ 802.12
67	271825177010000	0.81	$ -	$ 58.76	$ 58.76	$ -	$ -	$ -	$ 58.76
68	271825177020000	0.81	$ -	$ 75.48	$ 75.48	$ -	$ -	$ -	$ 75.48
69	271825178010000	0.81	$ -	$ 60.91	$ 60.91	$ -	$ -	$ -	$ 60.91
70	271825178000000	14.39	$ -	$ 620.30	$ 620.30	$ -	$ -	$ -	$ 620.30
71	271825178020000	0.81	$ -	$ 75.48	$ 75.48	$ -	$ -	$ -	$ 75.48
72	271825206050000	2.28	$ -	$ 73.16	$ 73.16	$ -	$ -	$ -	$ 73.16
73	2718 252 060 00000	4.82	$ -	$ 618.63	$ 618.63	$ -	$ -	$ -	$ 618.63
74	271825207000000	0.48	$ -	$ 30.80	$ 30.80	$ -	$ -	$ -	$ 30.80
75	271825208000000	20.11	$ -	$ 645.26	$ 645.26	$ -	$ 212.94	$ -	$ 432.32
76	unknown	0.59	$ -	$ 37.86	$ 37.86	$ -	$ -	$ -	$ 37.86
77	271825181000000	0.16	$ -	$ 9.56	$ 9.56	$ -	$ -	$ -	$ 9.56
78	271825206000000	0.31	$ -	$ 18.53	$ 18.53	$ -	$ -	$ -	$ 18.53

SCHEDULE A - SUMMARY
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF ALL SECTIONS OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area	Benefit Cost	Outlet Cost	Sub-total Costs	Special Benefit & Utilities	Grants	Allowances	Total Net Costs
		Total	Total	Total		Total	Total	Total	Total
City of Ottawa -- Block Assessments									
BLOCK 03-1		9.38	$ -	$ 1,203.89	$ 1,203.89	$ -	$ -	$ -	$ 1,203.89
BLOCK 03-2		10.32	$ -	$ 1,348.95	$ 1,348.95	$ -	$ -	$ -	$ 1,348.95
BLOCK 03-4		6.15	$ -	$ 789.33	$ 789.33	$ -	$ -	$ -	$ 789.33
BLOCK 03-5		75.51	$ -	$ 9,691.42	$ 9,691.42	$ -	$ -	$ -	$ 9,691.42
BLOCK 03-6		40.93	$ -	$ 4,859.05	$ 4,859.05	$ -	$ -	$ -	$ 4,859.05
BLOCK 03-7		8.79	$ -	$ 984.46	$ 984.46	$ -	$ -	$ -	$ 984.46
BLOCK 17-A		33.99	$ -	$ 4,923.55	$ 4,923.55	$121,934.82	$ -	$ -	$ 126,858.37
BLOCK 17-B		38.14	$ -	$ 6,005.45	$ 6,005.45	$121,934.82	$ -	$ -	$ 127,940.27
BLOCK 17-C		3.20	$ -	$ 695.38	$ 695.38	$ -	$ -	$ -	$ 695.38
BLOCK 17-D		2.87	$ -	$ 368.35	$ 368.35	$ 19,841.87	$ -	$ -	$ 20,210.22
BLOCK 20-E		26.64	$ -	$ 2,548.10	$ 2,548.10	$119,342.93	$ -	$ -	$ 121,891.03
BLOCK 20-F		26.67	$ -	$ 2,550.97	$ 2,550.97	$119,342.93	$ -	$ -	$ 121,893.90
BLOCK 20-G		3.59	$ -	$ 343.38	$ 343.38	$ -	$ -	$ -	$ 343.38
BLOCK 20-H		2.32	$ -	$ 221.91	$ 221.91	$ 15,366.04	$ -	$ -	$ 15,587.95
BLOCK 20-8		6.59	$ -	$ 738.07	$ 738.07	$ -	$ -	$ -	$ 738.07
BLOCK 20-9		9.60	$ -	$ 1,232.12	$ 1,232.12	$ -	$ -	$ -	$ 1,232.12
BLOCK 20-10		1.19	$ -	$ 152.73	$ 152.73	$ -	$ -	$ -	$ 152.73
BLOCK 20-11		29.18	$ -	$ 2,077.52	$ 2,077.52	$ -	$ -	$ -	$ 2,077.52
City of Ottawa -- Roads									
SHEA ROAD		5.59	$ 189.25	$ 404.42	$ 593.66	$195,945.63	$ -	$ -	$ 196,539.29
BROWLEE ROAD		0.27	$ 31.54	$ 10.00	$ 41.54	$ -	$ -	$ -	$ 41.54
MANSFIELD ROAD (UN-OPENED ROW)		1.68	$ 23.60	$ 52.93	$ 76.53	$ -	$ -	$ -	$ 76.53
FALLOWFIELD ROAD		4.69	$ 156.37	$ 400.04	$ 556.41	$ -	$ -	$ -	$ 556.41
FLEWELLYN ROAD		4.82	$ 77.36	$ 697.14	$ 774.50	$ -	$ -	$ -	$ 774.50
FERNBANK ROAD		6.65	$ -	$ 853.50	$ 853.50	$ -	$ -	$ -	$ 853.50
HUNTLEY ROAD		2.27	$ -	$ 217.12	$ 217.12	$ -	$ -	$ -	$ 217.12
STITTSVILLE MAIN STREET		4.02	$ -	$ 515.95	$ 515.95	$ -	$ -	$ -	$ 515.95
BLACK'S SIDE ROAD		0.50	$ -	$ 64.17	$ 64.17	$ -	$ -	$ -	$ 64.17
BLACK'S SIDE ROAD (UN-OPENED ROW)		0.63	$ -	$ 20.21	$ 20.21	$ -	$ -	$ -	$ 20.21
TOTAL		1084.38	$ 2,897.50	$ 66,702.50	$ 69,600.00	$713,709.05	$ 4,308.51	$ 75,195.67	$ 703,804.87

SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1 Total	S1	S1			S1	S1							S1	
City of Ottawa -- Individual Landowners																		
1	271810153000000	1.85	1.00	1.85	Y	1.00	1.85	$ 54.03	1.00	0.33	0.61	$ 17.13	$ 71.16	100%	$ -	$ 23.48	$ 7,997.27	(-$ 7,949.60)
2	271825027000000	33.35	1.00	33.35	Y	0.96	32.12	$ 937.90	0.96	0.67	21.52	$ 603.68	$ 1,541.58	100%	$ -	$ 508.72	$30,221.72	(-$ 29,188.86)
3	271825060000000	11.79	1.00	11.79		0.30		$ -	0.30	1.00	3.54	$ 99.23	$ 99.23	100%	$ -	$ 32.75	$ -	$ 66.49
4	271825060010000	0.41	2.00	0.82		0.30		$ -	0.30	1.00	0.25	$ 6.90	$ 6.90	0%	$ -	$ -	$ -	$ 6.90
5	271825061010000	39.55	1.00	39.55		0.30		$ -	0.30	1.00	11.87	$ 332.89	$ 332.89	0%	$ -	$ -	$ -	$ 332.89
6	271825061000000	0.89	2.00	1.78		0.30		$ -	0.30	1.00	0.53	$ 14.98	$ 14.98	100%	$ -	$ 4.94	$ -	$ 10.04
7	271825062010000	37.21	1.00	37.21		0.30		$ -	0.30	1.00	11.16	$ 313.19	$ 313.19	0%	$ -	$ -	$ -	$ 313.19
8	271825062050000	2.00	2.00	4.00		0.30		$ -	0.30	1.00	1.20	$ 33.67	$ 33.67	0%	$ -	$ -	$ -	$ 33.67
9	271825062000000	0.22	2.00	0.44		0.30		$ -	0.30	1.00	0.13	$ 3.70	$ 3.70	0%	$ -	$ -	$ -	$ 3.70
10	271825063000000	19.47	1.00	19.47		0.49		$ -	0.49	1.00	9.47	$ 265.72	$ 265.72	0%	$ -	$ -	$ -	$ 265.72
11	271825064010000	19.20	1.00	19.20		0.31		$ -	0.31	1.00	6.00	$ 168.35	$ 168.35	0%	$ -	$ -	$ -	$ 168.35
12	271825064000000	0.61	2.00	1.22		0.30		$ -	0.30	1.00	0.37	$ 10.27	$ 10.27	0%	$ -	$ -	$ -	$ 10.27
13	unknown	0.29	2.00	0.58		0.30		$ -	0.30	1.00	0.17	$ 4.88	$ 4.88	0%	$ -	$ -	$ -	$ 4.88
14	271825065000000	40.47	1.00	40.47		0.51		$ -	0.51	1.00	20.52	$ 575.59	$ 575.59	100%	$ -	$ 189.94	$ -	$ 385.64
15	271825066000000	39.72	1.00	39.72		0.58		$ -	0.58	1.00	23.13	$ 649.07	$ 649.07	100%	$ -	$ 214.19	$ -	$ 434.88
16	271825066010000	0.34	2.00	0.68		0.30		$ -	0.30	1.00	0.20	$ 5.72	$ 5.72	0%	$ -	$ -	$ -	$ 5.72
17	271825066050000	0.40	2.00	0.80		0.50		$ -	0.50	1.00	0.40	$ 11.22	$ 11.22	100%	$ -	$ 3.70	$ -	$ 7.52
18	271825101020000	4.58	4.00	18.32		0.30		$ -	0.30	1.00	5.50	$ 154.20	$ 154.20	0%	$ -	$ -	$ -	$ 154.20
19	271825102000000	9.57	4.00	38.28		0.30		$ -	0.30	1.00	11.48	$ 322.20	$ 322.20	0%	$ -	$ -	$ -	$ 322.20
20	271825103000000	0.46	4.00	1.84		0.30		$ -	0.30	1.00	0.55	$ 15.49	$ 15.49	0%	$ -	$ -	$ -	$ 15.49
21	unknown	13.71	1.00	13.71		0.30		$ -	0.30	1.00	4.11	$ 115.39	$ 115.39	0%	$ -	$ -	$ -	$ 115.39
22	271825104020000	2.43	1.00	2.43		0.30		$ -	0.30	1.00	0.73	$ 20.45	$ 20.45	0%	$ -	$ -	$ -	$ 20.45
23	271825104000000	23.46	4.00	93.84		0.30		$ -	0.30	1.00	28.15	$ 789.83	$ 789.83	0%	$ -	$ -	$ -	$ 789.83
24	271825105000000	0.40	2.00	0.80		0.30		$ -	0.30	1.00	0.24	$ 6.73	$ 6.73	0%	$ -	$ -	$ -	$ 6.73
25	271825106000000	0.40	2.00	0.80		0.30		$ -	0.30	1.00	0.24	$ 6.73	$ 6.73	0%	$ -	$ -	$ -	$ 6.73
26	271825107000000	38.85	1.00	38.85		0.30		$ -	0.30	1.00	11.66	$ 326.99	$ 326.99	100%	$ -	$ 107.91	$ -	$ 219.09
27	271825107010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	100%	$ -	$ 4.50	$ -	$ 9.14
28	271825107020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
29	271825108030000	1.44	2.00	2.88		0.30		$ -	0.30	1.00	0.86	$ 24.24	$ 24.24	0%	$ -	$ -	$ -	$ 24.24
30 pt 1	271825108000000	3.67	1.00	3.67		0.30		$ -	0.30	1.00	1.10	$ 30.89	$ 30.89	100%	$ -	$ 10.19	$ -	$ 20.70
30 pt 2	271825108000000	33.57	1.00	33.57		0.30		$ -	0.30	1.00	10.07	$ 282.55	$ 282.55	100%	$ -	$ 93.24	$ -	$ 189.31
31	271825108010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
32	271825108020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	100%	$ -	$ 4.50	$ -	$ 9.14
33	271825027010000	7.96	2.00	15.92		0.30		$ -	0.30	1.00	4.78	$ 134.00	$ 134.00	0%	$ -	$ -	$ -	$ 134.00
34	271825109010000	0.79	2.00	1.58		0.30		$ -	0.30	1.00	0.47	$ 13.30	$ 13.30	0%	$ -	$ -	$ -	$ 13.30
35	271825109000000	44.94	1.00	44.94		0.30		$ -	0.30	1.00	13.48	$ 378.25	$ 378.25	0%	$ -	$ -	$ -	$ 378.25
36	271825110000000	39.91	1.00	39.91		0.30		$ -	0.30	1.00	11.97	$ 335.92	$ 335.92	100%	$ -	$ 110.85	$ -	$ 225.06
37	271825110020000	0.55	2.00	1.10		0.30		$ -	0.30	1.00	0.33	$ 9.26	$ 9.26	0%	$ -	$ -	$ -	$ 9.26
38	271825110010000	46.05	1.00	46.05		0.30		$ -	0.30	1.00	13.82	$ 387.59	$ 387.59	100%	$ -	$ 127.91	$ -	$ 259.69
39	271825151000000	2.44	1.00	2.44		0.30		$ -	0.30	1.00	0.73	$ 20.54	$ 20.54	100%	$ -	$ 6.78	$ -	$ 13.76
40	271825154020000	3.24	1.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 27.27	$ 27.27	0%	$ -	$ -	$ -	$ 27.27
41	271825154050000	2.67	1.00	2.67		0.30		$ -	0.30	1.00	0.80	$ 22.47	$ 22.47	0%	$ -	$ -	$ -	$ 22.47

SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1 Total	S1	S1			S1	S1							S1	
42	271825154010000	4.23	1.00	4.23		0.30		$ -	0.30	1.00	1.27	$ 35.60	$ 35.60	0%	$ -	$ -	$ -	$ 35.60
43	271825154070000	0.80	2.00	1.60		0.30		$ -	0.30	1.00	0.48	$ 13.47	$ 13.47	0%	$ -	$ -	$ -	$ 13.47
44	271825156000000	38.77	0.80	31.06		0.30		$ -	0.30	1.00	9.32	$ 261.39	$ 261.39	0%	$ -	$ -	$ -	$ 261.39
45	271825156020000	0.41	0.93	0.38		0.30		$ -	0.30	1.00	0.11	$ 3.20	$ 3.20	0%	$ -	$ -	$ -	$ 3.20
46	271825164000000	1.61	2.00	3.22		0.30		$ -	0.30	1.00	0.97	$ 27.10	$ 27.10	0%	$ -	$ -	$ -	$ 27.10
47	271825163000000	8.12	1.00	8.12		0.30		$ -	0.30	1.00	2.44	$ 68.34	$ 68.34	0%	$ -	$ -	$ -	$ 68.34
48	271825176950000	7.58	0.50	3.79		0.30		$ -	0.30	1.00	1.14	$ 31.90	$ 31.90	0%	$ -	$ -	$ -	$ 31.90
49	271825175950000	0.66	2.00	1.32		0.30		$ -	0.30	1.00	0.40	$ 11.11	$ 11.11	0%	$ -	$ -	$ -	$ 11.11
50	271825166100000	2.23	1.00	2.23		0.30		$ -	0.30	1.00	0.67	$ 18.77	$ 18.77	0%	$ -	$ -	$ -	$ 18.77
51	271825166050000	0.84	2.00	1.68		0.30		$ -	0.30	1.00	0.50	$ 14.14	$ 14.14	0%	$ -	$ -	$ -	$ 14.14
52	271825177200000	0.99	2.00	1.98		0.30		$ -	0.30	1.00	0.59	$ 16.67	$ 16.67	0%	$ -	$ -	$ -	$ 16.67
53	271825177450000	1.18	2.00	2.36		0.30		$ -	0.30	1.00	0.71	$ 19.86	$ 19.86	0%	$ -	$ -	$ -	$ 19.86
54	271825177750000	1.62	2.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 27.27	$ 27.27	0%	$ -	$ -	$ -	$ 27.27
55	271825169070000	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 2.53	$ 2.53	0%	$ -	$ -	$ -	$ 2.53
56	271825165000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.37	$ 3.37	0%	$ -	$ -	$ -	$ 3.37
57	271825173000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.37	$ 3.37	0%	$ -	$ -	$ -	$ 3.37
58	271825169060000	4.68	4.00	18.72		0.30		$ -	0.30	1.00	5.62	$ 157.56	$ 157.56	0%	$ -	$ -	$ -	$ 157.56
59	271825169050000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 34.09	$ 34.09	0%	$ -	$ -	$ -	$ 34.09
60	271825169040000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 34.09	$ 34.09	0%	$ -	$ -	$ -	$ 34.09
61	272810280000000	18.33	1.00	18.33		0.30		$ -	0.30	1.00	5.50	$ 154.28	$ 154.28	100%	$ -	$ 50.91	$ -	$ 103.37
62	2728 102 800 10000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 13.80	$ 13.80	0%	$ -	$ -	$ -	$ 13.80
63	2728 102 800 20000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 13.80	$ 13.80	0%	$ -	$ -	$ -	$ 13.80
64	272810300000000	14.55	1.00	14.55		0.30		$ -	0.30	1.00	4.37	$ 122.46	$ 122.46	100%	$ -	$ 40.41	$ -	$ 82.05
65	272810300010000	0.95	2.00	1.90		0.30		$ -	0.30	1.00	0.57	$ 15.99	$ 15.99	0%	$ -	$ -	$ -	$ 15.99
66	271825177000000	21.88	1.00	21.88		0.30		$ -	0.30	1.00	6.56	$ 184.16	$ 184.16	100%	$ -	$ 60.77	$ -	$ 123.39
67	271825177010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
68	271825177020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
69	271825178010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
70	271825178000000	14.39	1.00	14.39		0.30		$ -	0.30	1.00	4.32	$ 121.12	$ 121.12	0%	$ -	$ -	$ -	$ 121.12
71	271825178020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 13.64	$ 13.64	0%	$ -	$ -	$ -	$ 13.64
72	271825206050000	2.28	1.00	2.28		0.30		$ -	0.30	1.00	0.68	$ 19.19	$ 19.19	0%	$ -	$ -	$ -	$ 19.19
73	2718 252 060 00000	4.82	4.00	19.28		0.30		$ -	0.30	1.00	5.78	$ 162.28	$ 162.28	0%	$ -	$ -	$ -	$ 162.28
74	271825207000000	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 8.08	$ 8.08	0%	$ -	$ -	$ -	$ 8.08
75	271825208000000	20.11	1.00	20.11		0.30		$ -	0.30	1.00	6.03	$ 169.26	$ 169.26	100%	$ -	$ 55.86	$ -	$ 113.41
76	unknown	0.59	2.00	1.18		0.30		$ -	0.30	1.00	0.35	$ 9.93	$ 9.93	0%	$ -	$ -	$ -	$ 9.93
77	271825181000000	0.16	2.50	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.37	$ 3.37	0%	$ -	$ -	$ -	$ 3.37
78	271825206000000	0.31	2.50	0.78		0.30		$ -	0.30	1.00	0.23	$ 6.52	$ 6.52	0%	$ -	$ -	$ -	$ 6.52

SCHEDULE B
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 1 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S1 Total		S1 Total	S1	S1			S1	S1							S1	
City of Ottawa -- Block Assessments																		
BLOCK 03-1		9.38	4.00	37.52		0.30		$ -	0.30	1.00	11.26	$ 315.80	$ 315.80	0%	$ -	$ -	$ -	$ 315.80
BLOCK 03-2		10.32	4.00	41.28		0.30		$ -	0.30	1.00	12.38	$ 347.45	$ 347.45	0%	$ -	$ -	$ -	$ 347.45
BLOCK 03-4		6.15	4.00	24.60		0.30		$ -	0.30	1.00	7.38	$ 207.05	$ 207.05	0%	$ -	$ -	$ -	$ 207.05
BLOCK 03-5		75.51	4.00	302.04		0.30		$ -	0.30	1.00	90.61	$ 2,542.22	$ 2,542.22	0%	$ -	$ -	$ -	$ 2,542.22
BLOCK 03-6		40.93	4.00	163.72		0.30		$ -	0.30	1.00	49.12	$ 1,378.00	$ 1,378.00	0%	$ -	$ -	$ -	$ 1,378.00
BLOCK 03-7		8.79	4.00	35.16		0.30		$ -	0.30	1.00	10.55	$ 295.94	$ 295.94	0%	$ -	$ -	$ -	$ 295.94
BLOCK 17-A		33.99	4.00	135.96		0.30		$ -	0.30	1.00	40.79	$ 1,144.35	$ 1,144.35	0%	$ 37,300.38	$ -	$ -	$ 38,444.73
BLOCK 17-B		38.14	4.00	152.56		0.30		$ -	0.30	1.00	45.77	$ 1,284.07	$ 1,284.07	0%	$ 37,300.38	$ -	$ -	$ 38,584.45
BLOCK 17-C		3.20	4.00	12.80		0.30		$ -	0.30	1.00	3.84	$ 107.74	$ 107.74	0%	$ -	$ -	$ -	$ 107.74
BLOCK 17-D		2.87	4.00	11.48		0.30		$ -	0.30	1.00	3.44	$ 96.63	$ 96.63	0%	$ 6,083.32	$ -	$ -	$ 6,179.95
BLOCK 20-E		26.64	4.00	106.56		0.30		$ -	0.30	1.00	31.97	$ 896.90	$ 896.90	0%	$ 37,300.38	$ -	$ -	$ 38,197.28
BLOCK 20-F		26.67	4.00	106.68		0.30		$ -	0.30	1.00	32.00	$ 897.91	$ 897.91	0%	$ 37,300.38	$ -	$ -	$ 38,198.29
BLOCK 20-G		3.59	4.00	14.36		0.30		$ -	0.30	1.00	4.31	$ 120.87	$ 120.87	0%	$ -	$ -	$ -	$ 120.87
BLOCK 20-H		2.32	4.00	9.28		0.30		$ -	0.30	1.00	2.78	$ 78.11	$ 78.11	0%	$ 4,802.62	$ -	$ -	$ 4,880.73
BLOCK 20-8		6.59	4.00	26.36		0.30		$ -	0.30	1.00	7.91	$ 221.87	$ 221.87	0%	$ -	$ -	$ -	$ 221.87
BLOCK 20-9		9.60	4.00	38.40		0.30		$ -	0.30	1.00	11.52	$ 323.21	$ 323.21	0%	$ -	$ -	$ -	$ 323.21
BLOCK 20-10		1.19	4.00	4.76		0.30		$ -	0.30	1.00	1.43	$ 40.06	$ 40.06	0%	$ -	$ -	$ -	$ 40.06
BLOCK 20-11		29.18	4.00	116.72		0.30		$ -	0.30	1.00	35.02	$ 982.41	$ 982.41	0%	$ -	$ -	$ -	$ 982.41
City of Ottawa -- Roads																		
SHEA ROAD		5.59	4.00	22.36	Y	0.50	2.00	$ 58.36	0.50	0.50	5.59	$ 156.69	$ 215.05	0%	$ 181,018.47	$ -	$ -	$ 181,233.52
BROWLEE ROAD		0.27	4.00	1.08	Y	1.00	1.08	$ 31.54	1.00	0.33	0.36	$ 10.00	$ 41.54	0%	$ -	$ -	$ -	$ 41.54
MANSFIELD ROAD (UN-OPENED ROW)		1.68	1.00	1.68	Y	1.00	0.28	$ 8.18	1.00	1.00	1.68	$ 47.13	$ 55.31	0%	$ -	$ -	$ -	$ 55.31
FALLOWFIELD ROAD		4.69	4.00	18.76		0.30		$ -	0.30	1.00	5.63	$ 157.90	$ 157.90	0%	$ -	$ -	$ -	$ 157.90
FLEWELLYN ROAD		4.82	4.00	19.28		0.30		$ -	0.30	1.00	5.78	$ 162.28	$ 162.28	0%	$ -	$ -	$ -	$ 162.28
FERNBANK ROAD		6.65	4.00	26.60		0.30		$ -	0.30	1.00	7.98	$ 223.89	$ 223.89	0%	$ -	$ -	$ -	$ 223.89
HUNTLEY ROAD		2.27	4.00	9.08		0.30		$ -	0.30	1.00	2.72	$ 76.42	$ 76.42	0%	$ -	$ -	$ -	$ 76.42
STITTSVILLE MAIN STREET		4.02	4.00	16.08		0.30		$ -	0.30	1.00	4.82	$ 135.34	$ 135.34	0%	$ -	$ -	$ -	$ 135.34
BLACK'S SIDE ROAD		0.50	4.00	2.00		0.30		$ -	0.30	1.00	0.60	$ 16.83	$ 16.83	0%	$ -	$ -	$ -	$ 16.83
BLACK'S SIDE ROAD (UN-OPENED ROW)		0.63	1.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 5.30	$ 5.30	0%	$ -	$ -	$ -	$ 5.30
Total		**1084.38**		**2342.96**			**37.32**	**$ 1,090.00**			**738.16**	**$ 20,710.00**	**$ 21,800.00**		**$ 341,105.95**	**$ 1,651.57**	**$ 38,218.99**	**$ 323,035.39**

SCHEDULE C
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 2 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area S2 Total	Land Use Factor	Factored Area S2 Total	Backs on Drain S2	Distance Factor S2	Benefit Factored Area	Benefit Cost	Distance Factor S2	Sub-Section Factor S2	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance S2	Total Net Cost
City of Ottawa -- Individual Landowners																		
3	271825060000000	11.79	1.00	11.79	N	0.30		$ -	0.30	1.00	3.54	$ 75.12	$ 75.12	100%	$ -	$ 24.79	$ -	$ 50.33
4	271825060010000	0.41	2.00	0.82	N	0.30		$ -	0.30	1.00	0.25	$ 5.22	$ 5.22	0%	$ -	$ -	$ -	$ 5.22
5	271825061010000	39.55	1.00	39.55	N	0.30		$ -	0.30	0.67	7.95	$ 168.83	$ 168.83	0%	$ -	$ -	$ -	$ 168.83
6	271825061000000	0.89	2.00	1.78	N	0.30		$ -	0.30	1.00	0.53	$ 11.34	$ 11.34	100%	$ -	$ 3.74	$ -	$ 7.60
7	271825062010000	37.21	1.00	37.21	N	0.36		$ -	0.36	0.67	9.09	$ 193.08	$ 193.08	0%	$ -	$ -	$ -	$ 193.08
8	271825062050000	2.00	2.00	4.00	N	0.30		$ -	0.30	1.00	1.20	$ 25.49	$ 25.49	0%	$ -	$ -	$ -	$ 25.49
9	271825062000000	0.22	2.00	0.44	N	0.30		$ -	0.30	1.00	0.13	$ 2.80	$ 2.80	0%	$ -	$ -	$ -	$ 2.80
10	271825063000000	19.47	1.00	19.47	N	0.50		$ -	0.50	0.33	3.21	$ 68.23	$ 68.23	0%	$ -	$ -	$ -	$ 68.23
11	271825064010000	19.20	1.00	19.20	N	0.50		$ -	0.50	1.00	9.60	$ 203.88	$ 203.88	0%	$ -	$ -	$ -	$ 203.88
12	271825064000000	0.61	2.00	1.22	N	0.50		$ -	0.50	1.00	0.61	$ 12.96	$ 12.96	0%	$ -	$ -	$ -	$ 12.96
13	unknown	0.29	2.00	0.58	N	0.50		$ -	0.50	1.00	0.29	$ 6.16	$ 6.16	0%	$ -	$ -	$ -	$ 6.16
14	271825065000000	40.47	1.00	40.47	N	0.75		$ -	0.75	0.67	20.34	$ 431.90	$ 431.90	100%	$ -	$ 142.53	$ -	$ 289.37
15	271825066000000	39.72	1.00	39.72	Y	0.92	36.37	$ 678.25	0.92	0.67	24.37	$ 517.46	$ 1,195.72	100%	$ -	$ 394.59	$24,458.44	(-$ 23,657.31)
16	271825066010000	0.34	2.00	0.68	N	1.00		$ -	1.00	1.00	0.68	$ 14.44	$ 14.44	0%	$ -	$ -	$ -	$ 14.44
17	271825066050000	0.40	2.00	0.80	Y	1.00	0.80	$ 14.92	1.00	0.67	0.54	$ 11.38	$ 26.30	100%	$ -	$ 8.68	$ 904.31	(-$ 886.69)
18	271825101020000	4.58	4.00	18.32		0.30		$ -	0.30	1.00	5.50	$ 116.72	$ 116.72	0%	$ -	$ -	$ -	$ 116.72
19	271825102000000	9.57	4.00	38.28		0.30		$ -	0.30	1.00	11.48	$ 243.90	$ 243.90	0%	$ -	$ -	$ -	$ 243.90
20	271825103000000	0.46	4.00	1.84		0.30		$ -	0.30	1.00	0.55	$ 11.72	$ 11.72	0%	$ -	$ -	$ -	$ 11.72
21	unknown	13.71	1.00	13.71		0.30		$ -	0.30	1.00	4.11	$ 87.35	$ 87.35	0%	$ -	$ -	$ -	$ 87.35
22	271825104020000	2.43	1.00	2.43		0.30		$ -	0.30	1.00	0.73	$ 15.48	$ 15.48	0%	$ -	$ -	$ -	$ 15.48
23	271825104000000	23.46	4.00	93.84		0.30		$ -	0.30	1.00	28.15	$ 597.89	$ 597.89	0%	$ -	$ -	$ -	$ 597.89
24	271825105000000	0.40	2.00	0.80		0.30		$ -	0.30	1.00	0.24	$ 5.10	$ 5.10	0%	$ -	$ -	$ -	$ 5.10
25	271825106000000	0.40	2.00	0.80		0.30		$ -	0.30	1.00	0.24	$ 5.10	$ 5.10	0%	$ -	$ -	$ -	$ 5.10
26	271825107000000	38.85	1.00	38.85		0.30		$ -	0.30	1.00	11.66	$ 247.53	$ 247.53	100%	$ -	$ 81.68	$ -	$ 165.84
27	271825107010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	100%	$ -	$ 3.41	$ -	$ 6.92
28	271825107020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	0%	$ -	$ -	$ -	$ 10.32
29	271825108030000	1.44	2.00	2.88		0.30		$ -	0.30	1.00	0.86	$ 18.35	$ 18.35	0%	$ -	$ -	$ -	$ 18.35
30 pt 1	271825108000000	3.67	1.00	3.67		0.65		$ -	0.65	1.00	2.39	$ 50.66	$ 50.66	100%	$ -	$ 16.72	$ -	$ 33.94
30 pt 2	271825108000000	33.57	1.00	33.57		0.32		$ -	0.32	1.00	10.59	$ 224.80	$ 224.80	100%	$ -	$ 74.18	$ -	$ 150.62
31	271825108010000	0.81	2.00	1.62		0.65		$ -	0.65	1.00	1.05	$ 22.36	$ 22.36	0%	$ -	$ -	$ -	$ 22.36
32	271825108020000	0.81	2.00	1.62		0.65		$ -	0.65	1.00	1.05	$ 22.36	$ 22.36	100%	$ -	$ 7.38	$ -	$ 14.98
33	271825027010000	7.96	2.00	15.92		0.65		$ -	0.65	1.00	10.35	$ 219.77	$ 219.77	0%	$ -	$ -	$ -	$ 219.77
34	271825109010000	0.79	2.00	1.58		0.50		$ -	0.50	1.00	0.79	$ 16.78	$ 16.78	0%	$ -	$ -	$ -	$ 16.78
35	271825109000000	44.94	1.00	44.94		0.38		$ -	0.38	1.00	17.29	$ 367.14	$ 367.14	0%	$ -	$ -	$ -	$ 367.14
36	271825110000000	39.91	1.00	39.91		0.48		$ -	0.48	1.00	19.28	$ 409.48	$ 409.48	100%	$ -	$ 135.13	$ -	$ 274.35
37	271825110020000	0.55	2.00	1.10		0.30		$ -	0.30	1.00	0.33	$ 7.01	$ 7.01	0%	$ -	$ -	$ -	$ 7.01
38	271825110010000	46.05	1.00	46.05		0.54		$ -	0.54	1.00	24.81	$ 526.94	$ 526.94	100%	$ -	$ 173.89	$ -	$ 353.05
39	271825151000000	2.44	1.00	2.44		0.30		$ -	0.30	1.00	0.73	$ 15.55	$ 15.55	100%	$ -	$ 5.13	$ -	$ 10.42
40	271825154020000	3.24	1.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 20.64	$ 20.64	0%	$ -	$ -	$ -	$ 20.64
41	271825154050000	2.67	1.00	2.67		0.30		$ -	0.30	1.00	0.80	$ 17.01	$ 17.01	0%	$ -	$ -	$ -	$ 17.01
42	271825154010000	4.23	1.00	4.23		0.30		$ -	0.30	1.00	1.27	$ 26.95	$ 26.95	0%	$ -	$ -	$ -	$ 26.95
43	271825154070000	0.80	2.00	1.60		0.30		$ -	0.30	1.00	0.48	$ 10.19	$ 10.19	0%	$ -	$ -	$ -	$ 10.19

SCHEDULE C
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 2 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S2 Total		S2 Total	S2	S2			S2	S2							S2	
44	271825156000000	38.77	0.80	31.06		0.30		$ -	0.30	1.00	9.32	$ 197.87	$ 197.87	0%	$ -	$ -	$ -	$ 197.87
45	271825156020000	0.41	0.93	0.38		0.30		$ -	0.30	1.00	0.11	$ 2.42	$ 2.42	0%	$ -	$ -	$ -	$ 2.42
46	271825164000000	1.61	2.00	3.22		0.30		$ -	0.30	1.00	0.97	$ 20.52	$ 20.52	0%	$ -	$ -	$ -	$ 20.52
47	271825163000000	8.12	1.00	8.12		0.30		$ -	0.30	1.00	2.44	$ 51.74	$ 51.74	0%	$ -	$ -	$ -	$ 51.74
48	271825176950000	7.58	0.50	3.79		0.30		$ -	0.30	1.00	1.14	$ 24.15	$ 24.15	0%	$ -	$ -	$ -	$ 24.15
49	271825175950000	0.66	2.00	1.32		0.30		$ -	0.30	1.00	0.40	$ 8.41	$ 8.41	0%	$ -	$ -	$ -	$ 8.41
50	271825166100000	2.23	1.00	2.23		0.30		$ -	0.30	1.00	0.67	$ 14.21	$ 14.21	0%	$ -	$ -	$ -	$ 14.21
51	271825166050000	0.84	2.00	1.68		0.30		$ -	0.30	1.00	0.50	$ 10.70	$ 10.70	0%	$ -	$ -	$ -	$ 10.70
52	271825177200000	0.99	2.00	1.98		0.30		$ -	0.30	1.00	0.59	$ 12.62	$ 12.62	0%	$ -	$ -	$ -	$ 12.62
53	271825177450000	1.18	2.00	2.36		0.30		$ -	0.30	1.00	0.71	$ 15.04	$ 15.04	0%	$ -	$ -	$ -	$ 15.04
54	271825177750000	1.62	2.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 20.64	$ 20.64	0%	$ -	$ -	$ -	$ 20.64
55	271825169070000	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 1.91	$ 1.91	0%	$ -	$ -	$ -	$ 1.91
56	271825165000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 2.55	$ 2.55	0%	$ -	$ -	$ -	$ 2.55
57	271825173000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 2.55	$ 2.55	0%	$ -	$ -	$ -	$ 2.55
58	271825169060000	4.68	4.00	18.72		0.30		$ -	0.30	1.00	5.62	$ 119.27	$ 119.27	0%	$ -	$ -	$ -	$ 119.27
59	271825169050000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 25.80	$ 25.80	0%	$ -	$ -	$ -	$ 25.80
60	271825169040000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 25.80	$ 25.80	0%	$ -	$ -	$ -	$ 25.80
61	272810280000000	18.33	1.00	18.33		0.30		$ -	0.30	1.00	5.50	$ 116.79	$ 116.79	100%	$ -	$ 38.54	$ -	$ 78.25
62	2728 102 800 10000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 10.45	$ 10.45	0%	$ -	$ -	$ -	$ 10.45
63	2728 102 800 20000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 10.45	$ 10.45	0%	$ -	$ -	$ -	$ 10.45
64	272810300000000	14.55	1.00	14.55		0.30		$ -	0.30	1.00	4.37	$ 92.70	$ 92.70	100%	$ -	$ 30.59	$ -	$ 62.11
65	272810300010000	0.95	2.00	1.90		0.30		$ -	0.30	1.00	0.57	$ 12.11	$ 12.11	0%	$ -	$ -	$ -	$ 12.11
66	271825177000000	21.88	1.00	21.88		0.30		$ -	0.30	1.00	6.56	$ 139.41	$ 139.41	100%	$ -	$ 46.00	$ -	$ 93.40
67	271825177010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	0%	$ -	$ -	$ -	$ 10.32
68	271825177020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	0%	$ -	$ -	$ -	$ 10.32
69	271825178010000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	0%	$ -	$ -	$ -	$ 10.32
70	271825178000000	14.39	1.00	14.39		0.30		$ -	0.30	1.00	4.32	$ 91.68	$ 91.68	0%	$ -	$ -	$ -	$ 91.68
71	271825178020000	0.81	2.00	1.62		0.30		$ -	0.30	1.00	0.49	$ 10.32	$ 10.32	0%	$ -	$ -	$ -	$ 10.32
72	271825206050000	2.28	1.00	2.28		0.30		$ -	0.30	1.00	0.68	$ 14.53	$ 14.53	0%	$ -	$ -	$ -	$ 14.53
73	2718 252 060 00000	4.82	4.00	19.28		0.30		$ -	0.30	1.00	5.78	$ 122.84	$ 122.84	0%	$ -	$ -	$ -	$ 122.84
74	271825207000000	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 6.12	$ 6.12	0%	$ -	$ -	$ -	$ 6.12
75	271825208000000	20.11	1.00	20.11		0.30		$ -	0.30	1.00	6.03	$ 128.13	$ 128.13	100%	$ -	$ 42.28	$ -	$ 85.85
76	unknown	0.59	2.00	1.18		0.30		$ -	0.30	1.00	0.35	$ 7.52	$ 7.52	0%	$ -	$ -	$ -	$ 7.52
77	271825181000000	0.16	2.50	0.40		0.30		$ -	0.30	1.00	0.12	$ 2.55	$ 2.55	0%	$ -	$ -	$ -	$ 2.55
78	271825206000000	0.31	2.50	0.78		0.30		$ -	0.30	1.00	0.23	$ 4.94	$ 4.94	0%	$ -	$ -	$ -	$ 4.94
City of Ottawa -- Block Assessments																		
BLOCK 03-1		9.38	4.00	37.52		0.30		$ -	0.30	1.00	11.26	$ 239.05	$ 239.05	0%	$ -	$ -	$ -	$ 239.05
BLOCK 03-2		10.32	4.00	41.28		0.30		$ -	0.30	1.00	12.38	$ 263.01	$ 263.01	0%	$ -	$ -	$ -	$ 263.01
BLOCK 03-4		6.15	4.00	24.60		0.30		$ -	0.30	1.00	7.38	$ 156.74	$ 156.74	0%	$ -	$ -	$ -	$ 156.74
BLOCK 03-5		75.51	4.00	302.04		0.30		$ -	0.30	1.00	90.61	$ 1,924.41	$ 1,924.41	0%	$ -	$ -	$ -	$ 1,924.41
BLOCK 03-6		40.93	4.00	163.72		0.30		$ -	0.30	1.00	49.12	$ 1,043.12	$ 1,043.12	0%	$ -	$ -	$ -	$ 1,043.12
BLOCK 03-7		8.79	4.00	35.16		0.30		$ -	0.30	1.00	10.55	$ 224.02	$ 224.02	0%	$ -	$ -	$ -	$ 224.02
BLOCK 17-A		33.99	4.00	135.96		0.30		$ -	0.30	1.00	40.79	$ 866.25	$ 866.25	0%	$ 37,560.03	$ -	$ -	$ 38,426.28
BLOCK 17-B		38.14	4.00	152.56		0.30		$ -	0.30	1.00	45.77	$ 972.01	$ 972.01	0%	$ 37,560.03	$ -	$ -	$ 38,532.05
BLOCK 17-C		3.20	4.00	12.80		0.30		$ -	0.30	1.00	3.84	$ 81.55	$ 81.55	0%	$ -	$ -	$ -	$ 81.55
BLOCK 17-D		2.87	4.00	11.48		0.30		$ -	0.30	1.00	3.44	$ 73.14	$ 73.14	0%	$ 6,125.67	$ -	$ -	$ 6,198.81
BLOCK 20-E		26.64	4.00	106.56		0.30		$ -	0.30	1.00	31.97	$ 678.93	$ 678.93	0%	$ 37,560.03	$ -	$ -	$ 38,238.96
BLOCK 20-F		26.67	4.00	106.68		0.30		$ -	0.30	1.00	32.00	$ 679.70	$ 679.70	0%	$ 37,560.03	$ -	$ -	$ 38,239.73
BLOCK 20-G		3.59	4.00	14.36		0.30		$ -	0.30	1.00	4.31	$ 91.49	$ 91.49	0%	$ -	$ -	$ -	$ 91.49
BLOCK 20-H		2.32	4.00	9.28		0.30		$ -	0.30	1.00	2.78	$ 59.13	$ 59.13	0%	$ 4,836.06	$ -	$ -	$ 4,895.18
BLOCK 20-8		6.59	4.00	26.36		0.30		$ -	0.30	1.00	7.91	$ 167.95	$ 167.95	0%	$ -	$ -	$ -	$ 167.95

SCHEDULE C
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 2 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S2 Total		S2 Total	S2	S2			S2	S2							S2	
BLOCK 20-9		9.60	4.00	38.40		0.30		$ -	0.30	1.00	11.52	$ 244.66	$ 244.66	0%	$ -	$ -	$ -	$ 244.66
BLOCK 20-10		1.19	4.00	4.76		0.30		$ -	0.30	1.00	1.43	$ 30.33	$ 30.33	0%	$ -	$ -	$ -	$ 30.33
BLOCK 20-11		29.18	4.00	116.72		0.30		$ -	0.30	1.00	35.02	$ 743.67	$ 743.67	0%	$ -	$ -	$ -	$ 743.67
City of Ottawa -- Roads																		
SHEA ROAD		4.59	4.00	18.36	Y	0.40	2.17	$ 40.48	0.40	0.50	3.64	$ 77.22	$ 117.70	0%	$ 5,369.02	$ -	$ -	$ 5,486.72
MANSFIELD ROAD (UN-OPENED ROW)		1.40	1.00	1.40	Y	0.59	0.83	$ 15.42	0.59	0.33	0.27	$ 5.80	$ 21.22	0%	$ -	$ -	$ -	$ 21.22
FALLOWFIELD ROAD		4.69	4.00	18.76	Y	0.50	4.20	$ 78.42	0.50	1.00	9.30	$ 197.55	$ 275.98	0%	$ -	$ -	$ -	$ 275.98
FLEWELLYN ROAD		4.82	4.00	19.28		0.30		$ -	0.30	1.00	5.78	$ 122.84	$ 122.84	0%	$ -	$ -	$ -	$ 122.84
FERNBANK ROAD		6.65	4.00	26.60		0.30		$ -	0.30	1.00	7.98	$ 169.48	$ 169.48	0%	$ -	$ -	$ -	$ 169.48
HUNTLEY ROAD		2.27	4.00	9.08		0.30		$ -	0.30	1.00	2.72	$ 57.85	$ 57.85	0%	$ -	$ -	$ -	$ 57.85
STITTSVILLE MAIN STREET		4.02	4.00	16.08		0.30		$ -	0.30	1.00	4.82	$ 102.45	$ 102.45	0%	$ -	$ -	$ -	$ 102.45
BLACK'S SIDE ROAD		0.50	4.00	2.00		0.30		$ -	0.30	1.00	0.60	$ 12.74	$ 12.74	0%	$ -	$ -	$ -	$ 12.74
BLACK'S SIDE ROAD (UN-OPENED ROW)		0.63	1.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 4.01	$ 4.01	0%	$ -	$ -	$ -	$ 4.01
Total		**1047.63**					**44.37**	**$ 827.50**			**740.31**	**$ 15,722.50**	**$ 16,550.00**		**$ 166,570.87**	**$ 1,229.26**	**$ 25,362.75**	**$ 156,528.86**

SCHEDULE D
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 3 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area S3 Total	Land Use Factor	Factored Area S3 Total	Backs on Drain S3	Distance Factor S3	Benefit Factored Area	Benefit Cost	Distance Factor S3	Sub-Section Factor S3	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance S3	Total Net Cost
City of Ottawa -- Individual Landowners																		
18	271825101020000	4.58	4.00	18.32	N	0.30		$ -	0.30	1.00	5.50	$ 167.15	$ 167.15	0%	$ -	$ -	$ -	$ 167.15
19	271825102000000	9.57	4.00	38.28	N	0.30		$ -	0.30	1.00	11.48	$ 349.27	$ 349.27	0%	$ -	$ -	$ -	$ 349.27
20	271825103000000	0.46	4.00	1.84	N	0.30		$ -	0.30	1.00	0.55	$ 16.79	$ 16.79	0%	$ -	$ -	$ -	$ 16.79
21	unknown	13.71	1.00	13.71	N	0.30		$ -	0.30	0.33	1.36	$ 41.28	$ 41.28	0%	$ -	$ -	$ -	$ 41.28
22	271825104020000	2.43	1.00	2.43	N	0.30		$ -	0.30	0.33	0.24	$ 7.32	$ 7.32	0%	$ -	$ -	$ -	$ 7.32
23	271825104000000	23.46	4.00	93.84	N	0.30		$ -	0.30	0.33	9.29	$ 282.55	$ 282.55	0%	$ -	$ -	$ -	$ 282.55
24	271825105000000	0.40	2.00	0.80	N	0.30		$ -	0.30	1.00	0.24	$ 7.30	$ 7.30	0%	$ -	$ -	$ -	$ 7.30
25	271825106000000	0.40	2.00	0.80	N	0.30		$ -	0.30	1.00	0.24	$ 7.30	$ 7.30	0%	$ -	$ -	$ -	$ 7.30
26	271825107000000	38.85	1.00	38.85	N	0.30		$ -	0.30	0.50	5.83	$ 177.24	$ 177.24	100%	$ -	$ 58.49	$ -	$ 118.75
27	271825107010000	0.81	2.00	1.62	N	0.30		$ -	0.30	1.00	0.49	$ 14.78	$ 14.78	100%	$ -	$ 4.88	$ -	$ 9.90
28	271825107020000	0.81	2.00	1.62	N	0.30		$ -	0.30	1.00	0.49	$ 14.78	$ 14.78	0%	$ -	$ -	$ -	$ 14.78
29	271825108030000	1.44	2.00	2.88	N	0.30		$ -	0.30	0.33	0.29	$ 8.67	$ 8.67	0%	$ -	$ -	$ -	$ 8.67
30 pt 1	271825108000000	3.67	1.00	3.67	N	0.36		$ -	0.36	0.50	0.66	$ 20.21	$ 20.21	100%	$ -	$ 6.67	$ -	$ 13.54
30 pt 2	271825108000000	33.57	1.00	33.57	N	0.35		$ -	0.35	1.00	11.72	$ 356.36	$ 356.36	100%	$ -	$ 117.60	$ -	$ 238.76
31	271825108010000	0.81	2.00	1.62	N	0.30		$ -	0.30	1.00	0.49	$ 14.78	$ 14.78	0%	$ -	$ -	$ -	$ 14.78
32	271825108020000	0.81	2.00	1.62	N	0.30		$ -	0.30	1.00	0.49	$ 14.78	$ 14.78	100%	$ -	$ 4.88	$ -	$ 9.90
33	271825027010000	7.96	2.00	15.92	N	0.41		$ -	0.41	1.00	6.59	$ 200.56	$ 200.56	0%	$ -	$ -	$ -	$ 200.56
35	271825109000000	44.94	1.00	44.94	N	0.50		$ -	0.50	0.50	11.24	$ 341.70	$ 341.70	0%	$ -	$ -	$ -	$ 341.70
36	271825110000000	39.91	1.00	39.91	N	0.75		$ -	0.75	0.50	14.97	$ 455.18	$ 455.18	100%	$ -	$ 150.21	$ -	$ 304.97
37	271825110020000	0.55	2.00	1.10	N	0.75		$ -	0.75	1.00	0.83	$ 25.09	$ 25.09	0%	$ -	$ -	$ -	$ 25.09
38	271825110010000	46.05	1.00	46.05	Y	0.91	41.85	$ 734.29	0.91	0.50	20.92	$ 636.33	$ 1,370.62	100%	$ -	$ 452.30	$11,613.93	(-$ 10,695.61)
39	271825151000000	2.44	1.00	2.44		0.30		$ -	0.30	1.00	0.73	$ 22.26	$ 22.26	100%	$ -	$ 7.35	$ -	$ 14.92
40	271825154020000	3.24	1.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 29.56	$ 29.56	0%	$ -	$ -	$ -	$ 29.56
41	271825154050000	2.67	1.00	2.67		0.30		$ -	0.30	1.00	0.80	$ 24.36	$ 24.36	0%	$ -	$ -	$ -	$ 24.36
42	271825154010000	4.23	1.00	4.23		0.30		$ -	0.30	1.00	1.27	$ 38.60	$ 38.60	0%	$ -	$ -	$ -	$ 38.60
43	271825154070000	0.80	2.00	1.60		0.30		$ -	0.30	1.00	0.48	$ 14.60	$ 14.60	0%	$ -	$ -	$ -	$ 14.60
44	271825156000000	38.77	0.80	31.06		0.30		$ -	0.30	1.00	9.32	$ 283.36	$ 283.36	0%	$ -	$ -	$ -	$ 283.36
45	271825156020000	0.41	0.93	0.38		0.30		$ -	0.30	1.00	0.11	$ 3.47	$ 3.47	0%	$ -	$ -	$ -	$ 3.47
46	271825164000000	1.61	2.00	3.22		0.30		$ -	0.30	1.00	0.97	$ 29.38	$ 29.38	0%	$ -	$ -	$ -	$ 29.38
47	271825163000000	8.12	1.00	8.12		0.30		$ -	0.30	1.00	2.44	$ 74.09	$ 74.09	0%	$ -	$ -	$ -	$ 74.09
48	271825176950000	7.58	0.50	3.79		0.30		$ -	0.30	1.00	1.14	$ 34.58	$ 34.58	0%	$ -	$ -	$ -	$ 34.58
49	271825175950000	0.66	2.00	1.32		0.30		$ -	0.30	1.00	0.40	$ 12.04	$ 12.04	0%	$ -	$ -	$ -	$ 12.04
50	271825166100000	2.23	1.00	2.23		0.30		$ -	0.30	1.00	0.67	$ 20.35	$ 20.35	0%	$ -	$ -	$ -	$ 20.35
51	271825166050000	0.84	2.00	1.68		0.30		$ -	0.30	1.00	0.50	$ 15.33	$ 15.33	0%	$ -	$ -	$ -	$ 15.33
52	271825177200000	0.99	2.00	1.98		0.30		$ -	0.30	1.00	0.59	$ 18.07	$ 18.07	0%	$ -	$ -	$ -	$ 18.07
53	271825177450000	1.18	2.00	2.36		0.30		$ -	0.30	1.00	0.71	$ 21.53	$ 21.53	0%	$ -	$ -	$ -	$ 21.53
54	271825177750000	1.62	2.00	3.24		0.30		$ -	0.30	1.00	0.97	$ 29.56	$ 29.56	0%	$ -	$ -	$ -	$ 29.56
55	271825169070000	0.15	2.00	0.30		0.30		$ -	0.30	1.00	0.09	$ 2.74	$ 2.74	0%	$ -	$ -	$ -	$ 2.74
56	271825165000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.65	$ 3.65	0%	$ -	$ -	$ -	$ 3.65
57	271825173000000	0.20	2.00	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.65	$ 3.65	0%	$ -	$ -	$ -	$ 3.65
58	271825169060000	4.68	4.00	18.72		0.30		$ -	0.30	1.00	5.62	$ 170.80	$ 170.80	0%	$ -	$ -	$ -	$ 170.80
59	271825169050000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 36.95	$ 36.95	0%	$ -	$ -	$ -	$ 36.95
60	271825169040000	4.05	1.00	4.05		0.30		$ -	0.30	1.00	1.22	$ 36.95	$ 36.95	0%	$ -	$ -	$ -	$ 36.95
61	272810280000000	18.33	1.00	18.33		0.30		$ -	0.30	1.00	5.50	$ 167.25	$ 167.25	100%	$ -	$ 55.19	$ -	$ 112.05
62	2728 102 800 10000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 14.96	$ 14.96	0%	$ -	$ -	$ -	$ 14.96

SCHEDULE D
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 3 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
		S3 Total		S3 Total	S3	S3			S3	S3							S3	
63	2728 102 800 20000	0.82	2.00	1.64		0.30		$ -	0.30	1.00	0.49	$ 14.96	$ 14.96	0%	$ -	$ -	$ -	$ 14.96
64	272810300000000	14.55	1.00	14.55		0.34		$ -	0.34	1.00	4.89	$ 148.75	$ 148.75	100%	$ -	$ 49.09	$ -	$ 99.67
65	272810300010000	0.95	2.00	1.90		0.50		$ -	0.50	1.00	0.95	$ 28.89	$ 28.89	0%	$ -	$ -	$ -	$ 28.89
66	271825177000000	21.88	1.00	21.88		0.59		$ -	0.59	1.00	12.83	$ 390.06	$ 390.06	100%	$ -	$ 128.72	$ -	$ 261.34
67	271825177010000	0.81	2.00	1.62		0.41		$ -	0.41	1.00	0.67	$ 20.24	$ 20.24	0%	$ -	$ -	$ -	$ 20.24
68	271825177020000	0.81	2.00	1.62		0.75		$ -	0.75	1.00	1.22	$ 36.95	$ 36.95	0%	$ -	$ -	$ -	$ 36.95
69	271825178010000	0.81	2.00	1.62		0.75		$ -	0.75	1.00	1.22	$ 36.95	$ 36.95	0%	$ -	$ -	$ -	$ 36.95
70	271825178000000	14.39	1.00	14.39		0.76		$ -	0.76	1.00	10.98	$ 333.94	$ 333.94	0%	$ -	$ -	$ -	$ 333.94
71	271825178020000	0.81	2.00	1.62		0.75		$ -	0.75	1.00	1.22	$ 36.95	$ 36.95	0%	$ -	$ -	$ -	$ 36.95
72	271825206050000	2.28	1.00	2.28		0.30		$ -	0.30	1.00	0.68	$ 20.80	$ 20.80	0%	$ -	$ -	$ -	$ 20.80
73	2718 252 060 00000	4.82	4.00	19.28		0.30		$ -	0.30	1.00	5.78	$ 175.91	$ 175.91	0%	$ -	$ -	$ -	$ 175.91
74	271825207000000	0.48	2.00	0.96		0.30		$ -	0.30	1.00	0.29	$ 8.76	$ 8.76	0%	$ -	$ -	$ -	$ 8.76
75	271825208000000	20.11	1.00	20.11		0.30		$ -	0.30	1.00	6.03	$ 183.49	$ 183.49	100%	$ -	$ 60.55	$ -	$ 122.94
76	unknown	0.59	2.00	1.18		0.30		$ -	0.30	1.00	0.35	$ 10.77	$ 10.77	0%	$ -	$ -	$ -	$ 10.77
77	271825181000000	0.16	2.50	0.40		0.30		$ -	0.30	1.00	0.12	$ 3.65	$ 3.65	0%	$ -	$ -	$ -	$ 3.65
78	271825206000000	0.31	2.50	0.78		0.30		$ -	0.30	1.00	0.23	$ 7.07	$ 7.07	0%	$ -	$ -	$ -	$ 7.07

SCHEDULE D
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 3 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Area S3 Total	Land Use Factor	Factored Area S3 Total	Backs on Drain S3	Distance Factor S3	Benefit Factored Area	Benefit Cost	Distance Factor S3	Sub-Section Factor S3	Outlet Factored Area	Outlet Cost	Sub-Total Cost	ADIP Eligibility	Special Benefit & Utilities	1/3 Grant	Allowance S3	Total Net Cost
City of Ottawa -- Block Assessments																		
BLOCK 03-1		9.38	4.00	37.52		0.30		$ -	0.30	1.00	11.26	$ 342.34	$ 342.34	0%	$ -	$ -	$ -	$ 342.34
BLOCK 03-2		10.32	4.00	41.28		0.30		$ -	0.30	1.00	12.38	$ 376.65	$ 376.65	0%	$ -	$ -	$ -	$ 376.65
BLOCK 03-4		6.15	4.00	24.60		0.30		$ -	0.30	1.00	7.38	$ 224.45	$ 224.45	0%	$ -	$ -	$ -	$ 224.45
BLOCK 03-5		75.51	4.00	302.04		0.30		$ -	0.30	1.00	90.61	$ 2,755.86	$ 2,755.86	0%	$ -	$ -	$ -	$ 2,755.86
BLOCK 03-6		40.93	4.00	163.72		0.30		$ -	0.30	1.00	49.12	$ 1,493.81	$ 1,493.81	0%	$ -	$ -	$ -	$ 1,493.81
BLOCK 03-7		8.79	4.00	35.16		0.30		$ -	0.30	1.00	10.55	$ 320.81	$ 320.81	0%	$ -	$ -	$ -	$ 320.81
BLOCK 17-A		33.99	4.00	135.96		0.30		$ -	0.30	1.00	41.20	$ 1,252.93	$ 1,252.93	0%	$ 44,482.51	$ -	$ -	$ 45,735.44
BLOCK 17-B		38.14	4.00	152.56		0.37		$ -	0.37	1.00	56.26	$ 1,711.20	$ 1,711.20	0%	$ 44,482.51	$ -	$ -	$ 46,193.72
BLOCK 17-C		3.20	4.00	12.80		0.50		$ -	0.50	1.00	6.40	$ 194.65	$ 194.65	0%	$ -	$ -	$ -	$ 194.65
BLOCK 17-D		2.87	4.00	11.48		0.30		$ -	0.30	1.00	3.44	$ 104.75	$ 104.75	0%	$ 7,254.66	$ -	$ -	$ 7,359.40
BLOCK 20-E		26.64	4.00	106.56		0.30		$ -	0.30	1.00	31.97	$ 972.27	$ 972.27	0%	$ 44,482.51	$ -	$ -	$ 45,454.78
BLOCK 20-F		26.67	4.00	106.68		0.30		$ -	0.30	1.00	32.00	$ 973.36	$ 973.36	0%	$ 44,482.51	$ -	$ -	$ 45,455.88
BLOCK 20-G		3.59	4.00	14.36		0.30		$ -	0.30	1.00	4.31	$ 131.02	$ 131.02	0%	$ -	$ -	$ -	$ 131.02
BLOCK 20-H		2.32	4.00	9.28		0.30		$ -	0.30	1.00	2.78	$ 84.67	$ 84.67	0%	$ 5,727.36	$ -	$ -	$ 5,812.03
BLOCK 20-8		6.59	4.00	26.36		0.30		$ -	0.30	1.00	7.91	$ 240.51	$ 240.51	0%	$ -	$ -	$ -	$ 240.51
BLOCK 20-9		9.60	4.00	38.40		0.30		$ -	0.30	1.00	11.52	$ 350.37	$ 350.37	0%	$ -	$ -	$ -	$ 350.37
BLOCK 20-10		1.19	4.00	4.76		0.30		$ -	0.30	1.00	1.43	$ 43.43	$ 43.43	0%	$ -	$ -	$ -	$ 43.43
BLOCK 20-11		29.18	4.00	116.72	N	0.30		$ -	0.30	0.33	11.56	$ 351.44	$ 351.44	0%	$ -	$ -	$ -	$ 351.44
City of Ottawa -- Roads																		
SHEA ROAD		3.22	4.00	12.88	Y	0.72	5.15	$ 90.41	0.72	0.50	4.66	$ 141.73	$ 232.14	0%	$ 9,558.15	$ -	$ -	$ 9,790.28
FALLOWFIELD ROAD		2.57	4.00	10.28	Y	0.43	4.44	$ 77.95	0.43	0.33	1.47	$ 44.58	$ 122.53	0%	$ -	$ -	$ -	$ 122.53
FLEWELLYN ROAD		4.82	4.00	19.28	Y	0.49	4.41	$ 77.36	0.49	1.00	9.44	$ 287.23	$ 364.59	0%	$ -	$ -	$ -	$ 364.59
FERNBANK ROAD		6.65	4.00	26.60		0.30		$ -	0.30	1.00	7.98	$ 242.70	$ 242.70	0%	$ -	$ -	$ -	$ 242.70
HUNTLEY ROAD		2.27	4.00	9.08	N	0.30		$ -	0.30	1.00	2.72	$ 82.85	$ 82.85	0%	$ -	$ -	$ -	$ 82.85
STITTSVILLE MAIN STREET		4.02	4.00	16.08		0.30		$ -	0.30	1.00	4.82	$ 146.72	$ 146.72	0%	$ -	$ -	$ -	$ 146.72
BLACK'S SIDE ROAD		0.50	4.00	2.00		0.30		$ -	0.30	1.00	0.60	$ 18.25	$ 18.25	0%	$ -	$ -	$ -	$ 18.25
BLACK'S SIDE ROAD (UN-OPENED ROW)		0.63	1.00	0.63		0.30		$ -	0.30	1.00	0.19	$ 5.75	$ 5.75	0%	$ -	$ -	$ -	$ 5.75
Total		**830.17**					**55.85**	**$ 980.00**			**612.22**	**$ 18,620.00**	**$ 19,600.00**		**$ 200,470.23**	**$ 1,095.92**	**$ 11,613.93**	**$ 207,360.38**

SCHEDULE E
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 4 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
			S4 Total	S4	S4			S4	S4							S4	
City of Ottawa -- Individual Landowners																	
33	271825027010000	2.00	6.24	N	1.00		$ -	1.00	0.50	3.12	$ 85.01	$ 85.01	0%	$ -	$ -	$ -	$ 85.01
39	271825151000000	1.00	2.44	N	0.30		$ -	0.30	1.00	0.73	$ 19.95	$ 19.95	100%	$ -	$ 6.58	$ -	$ 13.36
40	271825154020000	1.00	3.24	N	0.30		$ -	0.30	1.00	0.97	$ 26.48	$ 26.48	0%	$ -	$ -	$ -	$ 26.48
41	271825154050000	1.00	2.67	N	0.30		$ -	0.30	1.00	0.80	$ 21.83	$ 21.83	0%	$ -	$ -	$ -	$ 21.83
42	271825154010000	1.00	4.23	N	0.30		$ -	0.30	1.00	1.27	$ 34.58	$ 34.58	0%	$ -	$ -	$ -	$ 34.58
43	271825154070000	2.00	1.60	N	0.30		$ -	0.30	1.00	0.48	$ 13.08	$ 13.08	0%	$ -	$ -	$ -	$ 13.08
44	271825156000000	0.80	31.06	N	0.30		$ -	0.30	1.00	9.32	$ 253.86	$ 253.86	0%	$ -	$ -	$ -	$ 253.86
45	271825156020000	0.93	0.38	N	0.30		$ -	0.30	1.00	0.11	$ 3.11	$ 3.11	0%	$ -	$ -	$ -	$ 3.11
46	271825164000000	2.00	3.22	N	0.30		$ -	0.30	0.50	0.48	$ 13.16	$ 13.16	0%	$ -	$ -	$ -	$ 13.16
47	271825163000000	1.00	8.12	N	0.30		$ -	0.30	0.50	1.22	$ 33.19	$ 33.19	0%	$ -	$ -	$ -	$ 33.19
48	271825176950000	0.50	3.79	N	0.30		$ -	0.30	1.00	1.14	$ 30.98	$ 30.98	0%	$ -	$ -	$ -	$ 30.98
49	271825175950000	2.00	1.32	N	0.30		$ -	0.30	1.00	0.40	$ 10.79	$ 10.79	0%	$ -	$ -	$ -	$ 10.79
50	271825166100000	1.00	2.23	N	0.30		$ -	0.30	1.00	0.67	$ 18.23	$ 18.23	0%	$ -	$ -	$ -	$ 18.23
51	271825166050000	2.00	1.68	N	0.30		$ -	0.30	1.00	0.50	$ 13.73	$ 13.73	0%	$ -	$ -	$ -	$ 13.73
52	271825177200000	2.00	1.98	N	0.30		$ -	0.30	1.00	0.59	$ 16.18	$ 16.18	0%	$ -	$ -	$ -	$ 16.18
53	271825177450000	2.00	2.36	N	0.30		$ -	0.30	1.00	0.71	$ 19.29	$ 19.29	0%	$ -	$ -	$ -	$ 19.29
54	271825177750000	2.00	3.24	N	0.30		$ -	0.30	1.00	0.97	$ 26.48	$ 26.48	0%	$ -	$ -	$ -	$ 26.48
55	271825169070000	2.00	0.30	N	0.30		$ -	0.30	0.50	0.05	$ 1.23	$ 1.23	0%	$ -	$ -	$ -	$ 1.23
56	271825165000000	2.00	0.40	N	0.30		$ -	0.30	0.50	0.06	$ 1.63	$ 1.63	0%	$ -	$ -	$ -	$ 1.63
57	271825173000000	2.00	0.40	N	0.30		$ -	0.30	0.50	0.06	$ 1.63	$ 1.63	0%	$ -	$ -	$ -	$ 1.63
58	271825169060000	4.00	18.72	N	0.30		$ -	0.30	0.50	2.81	$ 76.51	$ 76.51	0%	$ -	$ -	$ -	$ 76.51
59	271825169050000	1.00	4.05	N	0.30		$ -	0.30	0.50	0.61	$ 16.55	$ 16.55	0%	$ -	$ -	$ -	$ 16.55
60	271825169040000	1.00	4.05	N	0.30		$ -	0.30	0.50	0.61	$ 16.55	$ 16.55	0%	$ -	$ -	$ -	$ 16.55
61	272810280000000	1.00	18.33	N	0.71		$ -	0.71	0.50	6.54	$ 178.06	$ 178.06	100%	$ -	$ 58.76	$ -	$ 119.30
62	2728 102 800 10000	2.00	1.64	N	0.75		$ -	0.75	0.50	0.62	$ 16.76	$ 16.76	0%	$ -	$ -	$ -	$ 16.76
63	2728 102 800 20000	2.00	1.64	N	0.75		$ -	0.75	0.50	0.62	$ 16.76	$ 16.76	0%	$ -	$ -	$ -	$ 16.76
64	272810300000000	1.00	14.55	N	0.80		$ -	0.80	0.50	5.85	$ 159.34	$ 159.34	100%	$ -	$ 52.58	$ -	$ 106.76
65	272810300010000	2.00	1.90	Y	1.00	1.90	$ -	1.00	1.00	1.90	$ 51.77	$ 51.77	0%	$ -	$ -	$ -	$ 51.77
66	271825177000000	1.00	21.88	Y	0.81	17.75	$ -	0.81	1.00	17.75	$ 483.57	$ 483.57	100%	$ -	$ 159.58	$ -	$ 323.99
67	271825177010000	2.00	1.62	Y	1.00	1.62	$ -	1.00	0.33	0.53	$ 14.57	$ 14.57	0%	$ -	$ -	$ -	$ 14.57
68	271825177020000	2.00	1.62	Y	1.00	1.62	$ -	1.00	0.33	0.53	$ 14.57	$ 14.57	0%	$ -	$ -	$ -	$ 14.57
70	271825178000000	1.00	14.39	Y	0.57	8.18	$ -	0.57	0.33	2.70	$ 73.55	$ 73.55	0%	$ -	$ -	$ -	$ 73.55
71	271825178020000	2.00	1.62	Y	1.00	1.62	$ -	1.00	0.33	0.53	$ 14.57	$ 14.57	0%	$ -	$ -	$ -	$ 14.57
72	271825206050000	1.00	2.28	N	0.30		$ -	0.30	1.00	0.68	$ 18.64	$ 18.64	0%	$ -	$ -	$ -	$ 18.64
73	2718 252 060 00000	4.00	19.28	N	0.30		$ -	0.30	1.00	5.78	$ 157.60	$ 157.60	0%	$ -	$ -	$ -	$ 157.60
74	271825207000000	2.00	0.96	N	0.30		$ -	0.30	1.00	0.29	$ 7.85	$ 7.85	0%	$ -	$ -	$ -	$ 7.85
75	271825208000000	1.00	20.11	N	0.30		$ -	0.30	1.00	6.03	$ 164.38	$ 164.38	100%	$ -	$ 54.25	$ -	$ 110.14
76	unknown	2.00	1.18	N	0.30		$ -	0.30	1.00	0.35	$ 9.65	$ 9.65	0%	$ -	$ -	$ -	$ 9.65

SCHEDULE E
FOR THE CONSTRUCTION AND FUTURE MAINTENANCE OF SECTION 4 OF THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	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	Special Benefit & Utilities	1/3 Grant	Allowance	Total Net Cost
			S4 Total	S4	S4			S4	S4							S4	
City of Ottawa -- Block Assessments																	
BLOCK 03-1		4.00	37.52	N	0.30		$ -	0.30	1.00	11.26	$ 306.70	$ 306.70	0%	$ -	$ -	$ -	$ 306.70
BLOCK 03-2		4.00	41.28	N	0.32		$ -	0.32	1.00	13.28	$ 361.85	$ 361.85	0%	$ -	$ -	$ -	$ 361.85
BLOCK 03-4		4.00	24.60	N	0.30		$ -	0.30	1.00	7.38	$ 201.09	$ 201.09	0%	$ -	$ -	$ -	$ 201.09
BLOCK 03-5		4.00	302.04	N	0.30		$ -	0.30	1.00	90.61	$ 2,468.94	$ 2,468.94	0%	$ -	$ -	$ -	$ 2,468.94
BLOCK 03-6		4.00	163.72	N	0.42		$ -	0.42	0.50	34.65	$ 944.12	$ 944.12	0%	$ -	$ -	$ -	$ 944.12
BLOCK 03-7		4.00	35.16	N	0.30		$ -	0.30	0.50	5.27	$ 143.70	$ 143.70	0%	$ -	$ -	$ -	$ 143.70
BLOCK 17-A		4.00	135.96	N	0.45		$ -	0.45	1.00	60.92	$ 1,660.02	$ 1,660.02	0%	$ 2,591.89	$ -	$ -	$ 4,251.91
BLOCK 17-B		4.00	152.56	N	0.49		$ -	0.49	1.00	74.80	$ 2,038.16	$ 2,038.16	0%	$ 2,591.89	$ -	$ -	$ 4,630.05
BLOCK 17-C		4.00	12.80	Y	0.89	11.43	$ -	0.89	1.00	11.43	$ 311.44	$ 311.44	0%	$ -	$ -	$ -	$ 311.44
BLOCK 17-D		4.00	11.48	N	0.30		$ -	0.30	1.00	3.44	$ 93.84	$ 93.84	0%	$ 378.22	$ -	$ -	$ 472.06
BLOCK 20-8		4.00	26.36	N	0.30		$ -	0.30	0.50	3.95	$ 107.74	$ 107.74	0%	$ -	$ -	$ -	$ 107.74
BLOCK 20-9		4.00	38.40	N	0.30		$ -	0.30	1.00	11.52	$ 313.89	$ 313.89	0%	$ -	$ -	$ -	$ 313.89
BLOCK 20-10		4.00	4.76	N	0.30		$ -	0.30	1.00	1.43	$ 38.91	$ 38.91	0%	$ -	$ -	$ -	$ 38.91
City of Ottawa -- Roads																	
SHEA ROAD		4.00	5.76	Y	0.56	3.20	$ -	0.56	0.33	1.06	$ 28.77	$ 28.77	0%	$ -	$ -	$ -	$ 28.77
FLEWELLYN ROAD		4.00	10.28	Y	0.66	6.84	$ -	0.66	0.67	4.58	$ 124.80	$ 124.80	0%	$ -	$ -	$ -	$ 124.80
FERNBANK ROAD		4.00	26.60	N	0.30		$ -	0.30	1.00	7.98	$ 217.43	$ 217.43	0%	$ -	$ -	$ -	$ 217.43
STITTSVILLE MAIN STREET		4.00	16.08	N	0.30		$ -	0.30	1.00	4.82	$ 131.44	$ 131.44	0%	$ -	$ -	$ -	$ 131.44
BLACK'S SIDE ROAD		4.00	2.00	N	0.30		$ -	0.30	1.00	0.60	$ 16.35	$ 16.35	0%	$ -	$ -	$ -	$ 16.35
BLACK'S SIDE ROAD (UN-OPENED ROW)		1.00	0.63	N	0.30		$ -	0.30	1.00	0.19	$ 5.15	$ 5.15	0%	$ -	$ -	$ -	$ 5.15
Total						**54.15**	**$ -**			**427.56**	**$ 11,650.00**	**$ 11,650.00**		**$ 5,562.00**	**$ 331.75**	**$ -**	**$ 16,880.25**

Robinson Consultants

SCHEDULE F
ALLOWANCES FOR LANDS USED IN THE CONSTRUCTION OF THE FAULKNER MUNICIPAL DRAIN

Project No.: B16013
Date: 14-Dec-20

ID	Roll No.	Land Allowance								Total Value
		S1		S2		S3		S4		
		Area	Value	Area	Value	Area	Value	Area	Value	
City of Ottawa -- Individual Landowners										
1	271810153000000	0.33	$ 5,684.25	0.00	$ -	0.00	$ -	0.00	$ -	$ 5,684.25
2	271825027000000	0.90	$ 15,502.50	0.00	$ -	0.00	$ -	0.00	$ -	$ 15,502.50
15	271825066000000		$ -	0.60	$ 10,335.00	0.00	$ -	0.00	$ -	$ 10,335.00
17	271825066050000		$ -	0.05	$ 904.31	0.00	$ -	0.00	$ -	$ 904.31
38	271825110010000		$ -	0.00	$ -	0.47	$ 8,009.63	0.00	$ -	$ 8,009.63
Total		**1.23**	**$ 21,186.75**	**0.65**	**$ 11,239.31**	**0.47**	**$ 8,009.63**	**0.00**	**$ -**	**$ 40,435.69**

Robinson Consultants

SCHEDULE G
ALLOWANCES FOR CROPS LOST IN THE CONSTRUCTION OF SECTIONS OF THE FAULKNER MUNICIPAL DRAIN

Project No: B16013
Date: 14-Dec-20

ID	Roll No.	Crop Allowance								Total Value
		S1		S2		S3		S4		
		Area	Total	Area	Total	Area	Total	Area	Total	
City of Ottawa -- Individual Landowners										
1	271810153000000	0.66	$ 2,313.02	0.00	$ -	0.00	$ -	0.00	$ -	$ 2,313.02
2	271825027000000	4.20	$ 14,719.22	0.00	$ -	0.00	$ -	0.00	$ -	$ 14,719.22
15	271825066000000	0.00	$ -	4.03	$ 14,123.44	0.00	$ -	0.00	$ -	$ 14,123.44
38	271825110010000	0.00	$ -	0.00	$ -	3.31	$ 11,613.46	0.00	$ -	$ 11,613.46
Total		**4.86**	**$ 17,032.24**	**4.03**	**$ 14,123.44**			**0.00**	**$ -**	**$ 42,769.14**

DETAILED COST ESTIMATE
SECTION 1
THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No: B16013
Date: Dec-20

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 1 (Sta 0+000 to Sta 1+741.50)						**1,741.50m**
		Construction				
Construction		**Site Preparation Activities**				
		Mobilization & Bonding (Max. 2% of Construction Costs)	LS	$ 5,000.00	1.00	$ 5,000.00
		Erosion and Sediment Control Plan	LS	$ 10,000.00	34%	$ 3,400.00
		S1 -- Erosion and Sediment Control Measures -- Minimum as Follows: - (2) Rock Check Dam c/w Sediment Trap - (1) Straw BaleDam c/w Sediment Trap - (1) Turbidity Curtain - Additional Silt Fence (where required)	LS	$ 5,000.00	1.00	$ 5,000.00
		Clearing/Grubbing (including individual tree removals)	L.S.	$ 7,750.00	1.00	$ 7,750.00
		Fence removal and off-sie disposal	m	$ 4.00	1742.00	$ 6,968.00
		Excavation Activities				
		Earth Ex. -- Ditch Excavation	m^3	$ 2.25	11276.00	$ 25,371.00
		Earth Ex. -- Ditch Fill and Grading	m^3	$ 9.00	4702.00	$ 42,318.00
		Disposal -- Spreading and Grading On-Site (max 150mm thick)	m^3	$ 3.00	4074.00	$ 12,222.00
		Disposal -- Off-Site Removal	m^3	$ 15.00	2500.00	$ 37,500.00
		Access Culvert(s) -- 3750x2400mm CSPA	m	$ 760.00	12.00	$ 9,120.00
		Reinstatement Activities				
		Tile Outlet Restoration/Protection	each	$ 500.00	5.00	$ 2,500.00
		Hand Seeding	m^2	$ 0.50	35000.00	$ 17,500.00
		Willow Staking	each	$ 15.00	80.00	$ 1,200.00
		Rock Protection - Erosion Control	m^2	$ 27.50	780.00	$ 21,450.00
		Rock Protection - Culvert End Treatments	each	$ 850.00	2.00	$ 1,700.00
		Sub-Total - Construction Costs				**$ 198,999.00**
		Contingency Allowance - Construction				**$ 25,000.00**
		Total - Construction Costs				**$ 223,999.00**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 175,000.00	36%	$ 63,000.00
		Contract Administration/Inspection	LS	$ 70,000.00	36%	$ 25,200.00
		Sub-Total - Routine Engineering				**$ 88,200.00**
Total - Engineering/Administration						**$ 88,200.00**
		Other				
		Carrying Cost(s)	L.S	(4% OF Costs Above)		$ 12,487.96
		Allowances	LS	(See Schedule)		$ 38,218.99
Total - Other Costs						**$ 50,706.95**
Sub-Total - Net Costs						**$ 362,905.95**
		Special Benefits				
Road Authority (City of Ottawa) Section 1		*General consideration is given that the relocation of the drain outside of the Shea Rd, ROW is primarily for the benefit and improved use of the City of Ottawa Road Authority. A "Special Benefit" is assessed to Shea. Rd. (Road Authoity) for the additional work associated with the relocation (including portions of clearing, ditch excvation, ditch fill and off-site disposal) in the amount perscribed below.*				
		Special Benefit -- Drain Relocation Constuction (All Construction Costs Between Sta. 0+000 to 0+330)	LS	$ 122,297.50	1.00	$ 122,297.50
		Special Benefit -- Drain Relocation Engineering/Administration and Other - Engineering - Contract Administrtion - Land Allowance (Property ID #1) - Carrying Cost (4% of Above)		 $ 63,000.00 $ 25,200.00 $ 5,684.25 $ 49,784.25	 50% 50% 100% 4%	 $ 31,500.00 $ 12,600.00 $ 5,684.25 $ 1,991.37
		Sub-Total - Road Authority Costs				**$ 174,073.12**
Road Authority (City of Ottawa) Section 1		*Under Section 69 of the Drainage Act, the "Road Authority" has the option to construct the required drainage works within the Road Right-Of-Way. It is assumed for the purpose of this estimate that the Road Authority will exercise this option. As such, the items required to complete the Road Authority works have been excluded from this estimate. However, the Engineering/Administration and Other fees, associated with the required Road Authority works, where required downstream of the works as noted below are considered payable as a Special Benefit by the Township Road Authority. It is estimated that 5% of the costs noted below are due to the required Road Authority Works.*				
		Engineering/Administration and Other	LS	$ 138,906.95	5%	$ 6,945.35
		Sub-Total - Road Authority Costs				**$ 6,945.35**
Land Development Developers -- Blocks 17A - 17-D and Developers -- Blocks 20E - 20H		*General consideration is given that the initial construction is primarily for the benefit and improved use of the development of lands associated with Blocks 17A through 17D and Blocks 20-E through 20-H. A "Special Benefit" is assessed to the developers of the noted blocks. A benefit charge was previously assessed for the development of blocks 17-A through 17-D and is to be applied to the proportional amount owing in this regard.*				
		Engineering/Administration and Other	LS	$ 160,087.48	1.00	$ 160,087.48
		Sub-Total - Developer Costs				**$ 160,087.48**
Total - Special Benefits						**$ 341,105.95**
Total Net Costs - Section 1 (For Distribution to Properties)						**$ 21,800.00**

DETAILED COST ESTIMATE
SECTION 2
THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No: B16013
Date: Dec-20

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 1 (Sta 1+741.50 to Sta 3+065.60)						**1,324.10m**
		Construction				
Construction		**Site Preparation Activities**				
		Mobilization & Bonding (Max. 2% of Construction Costs)	LS	$ 2,600.00	1.00	$ 2,600.00
		Erosion and Sediment Control Plan	LS	$ 10,000.00	33%	$ 3,300.00
		S2 -- Erosion and Sediment Control Measures -- Minimum as Follows: - (1) Rock Check Dam c/w Sediment Trap - (1) Straw BaleDam c/w Sediment Trap - (0) Turbidity Curtain - Additional Silt Fence (where required)	LS	$ 2,500.00	1.00	$ 2,500.00
		Clearing/Grubbing (including individual tree removals)	L.S.	$ 1,000.00	1.00	$ 1,000.00
		Fence removal and off-site disposal	m	$ 4.00	1325.00	$ 5,300.00
		Excavation Activities				
		Earth Ex. -- Ditch Excavation	m^3	$ 2.25	5622.00	$ 12,649.50
		Disposal -- Spreading and Grading On-Site (max 150mm thick)	m^3	$ 3.00	5622.00	$ 16,866.00
		Reinstatement Activities				
		Tile Outlet Restoration/Protection	each	$ 500.00	5.00	$ 2,500.00
		Hand Seeding	m^2	$ 0.50	26500.00	$ 13,250.00
		Rock Protection - Erosion Control	m^2	$ 27.50	210.00	$ 5,775.00
		Sub-Total - Construction Costs				**$ 65,740.50**
		Contingency Allowance - Construction				**$ 10,000.00**
		Total - Construction Costs				**$ 75,740.50**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 175,000.00	31%	$ 54,250.00
		Contract Administration/Inspection	LS	$ 70,000.00	31%	$ 21,700.00
		Sub-Total - Routine Engineering				**$ 75,950.00**
Total - Engineering/Administration						**$ 75,950.00**
		Other				
		Carrying Cost(s)	L.S	(4% OF Costs Above)		$ 6,067.62
		Allowances	LS	(See Schedule)		$ 25,362.75
Total - Other Costs						**$ 31,430.37**
Sub-Total - Net Costs						**$ 183,120.87**
		Special Benefits				
Road Authority (City of Ottawa) Section 2		*Under Section 69 of the Drainage Act, the "Road Authority" has the option to construct the required drainage works within the Road Right-Of-Way. It is assumed for the purpose of this estimate that the Road Authority will exercise this option. As such, the items required to complete the Road Authority works have been excluded from this estimate. However, the Engineering/Administration and Other fees, associated with the required Road Authority works, where required downstream of the works as noted below are considered payable as a Special Benefit by the Township Road Authority. It is estimated that 5% of the costs noted below are due to the required Road Authority Works.*				
		Engineering/Administration and Other	LS	$ 107,380.37	5%	$ 5,369.02
		Sub-Total - Road Authority Costs				**$ 5,369.02**
Land Development Developers -- Blocks 17A - 17-D and Developers -- Blocks 20E - 20H		*General consideration is given that the initial construction is primarily for the benefit and improved use of the development of lands associated with Blocks 17A through 17D and Blocks 20-E through 20-H. A "Special Benefit" is assessed to the developers of the noted blocks. A benefit charge was previously assessed for the development of blocks 17-A through 17-D and is to be applied to the proportional amount owing in this regard.*				
		Engineering/Administration and Other	LS	$ 161,201.85	1.00	$ 161,201.85
		Sub-Total - Developer Costs				**$ 161,201.85**
Total - Special Benefits						**$ 166,570.87**
Total Net Costs - Section 2 (For Distribution to Properties)						**$ 16,550.00**

DETAILED COST ESTIMATE
SECTION 3
THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No: B16013
Date: Dec-20

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 3 (Sta 3+065.60 to Sta 4+633.10)						**1,567.50m**
		Construction				
Construction	**Site Preparation Activities**					
		Mobilization & Bonding (Max. 2% of Construction Costs)	LS	$ 5,000.00	1.00	$ 5,000.00
		Erosion and Sediment Control Plan	LS	$ 10,000.00	34%	$ 3,400.00
		S3 -- Erosion and Sediment Control Measures -- Minimum as Follows: - (1) Rock Check Dam c/w Sediment Trap - (1) Straw BaleDam c/w Sediment Trap - (0) Turbidity Curtain - Additional Silt Fence (where required)	LS	$ 2,500.00	1.00	$ 2,500.00
		Clearing/Grubbing (including individual tree removals)	L.S.	$ 1,000.00	1.00	$ 1,000.00
		Fence removal and off-site disposal	m	$ 4.00	1570.00	$ 6,280.00
	Excavation Activities					
		Earth Ex. -- Ditch Excavation	m^3	$ 2.25	1905.00	$ 4,286.25
		Disposal -- Spreading and Grading On-Site (max 150mm thick)	m^3	$ 3.00	1905.00	$ 5,715.00
		Access Culvert(s) -- 3750x2400mm CSPA	m	$ 760.00	12.00	$ 9,120.00
	Reinstatement Activities					
		Tile Outlet Restoration/Protection	each	$ 500.00	5.00	$ 2,500.00
		Hand Seeding	m^2	$ 0.50	31600.00	$ 15,800.00
		Tree Planting (Coniferous, 100cm)	each	$ 150.00	80.00	$ 12,000.00
		Rock Protection - Erosion Control	m^2	$ 27.50	1425.00	$ 39,187.50
		Rock Protection - Culvert End Treatments	each	$ 850.00	2.00	$ 1,700.00
		Sub-Total - Construction Costs				**$ 108,488.75**
		Contingency Allowance - Construction				**$ 16,000.00**
		Total - Construction Costs				**$ 124,488.75**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 175,000.00	31%	$ 54,250.00
		Contract Administration/Inspection	LS	$ 70,000.00	31%	$ 21,700.00
		Sub-Total - Routine Engineering				**$ 75,950.00**
Total - Engineering/Administration						**$ 75,950.00**
		Other				
		Carrying Cost(s)	L.S	(4% OF Costs Above)		$ 8,017.55
		Allowances	LS	(See Schedule)		$ 11,613.93
Total - Other Costs						**$ 19,631.48**
Sub-Total - Net Costs						**$ 220,070.23**
		Special Benefits				
Road Authority (City of Ottawa) Section 3		*Under Section 69 of the Drainage Act, the "Road Authority" has the option to construct the required drainage works within the Road Right-Of-Way. It is assumed for the purpose of this estimate that the Road Authority will exercise this option. As such, the items required to complete the Road Authority works have been excluded from this estimate. However, the Engineering/Administration and Other fees, associated with the required Road Authority works, where required downstream of the works as noted below are considered payable as a Special Benefit by the Township Road Authority. It is estimated that 5% of the costs noted below are due to the required Road Authority Works.*				
		Engineering/Administration and Other	LS	$ 95,581.48	10%	$ 9,558.15
		Sub-Total - Road Authority Costs				**$ 9,558.15**
Land Development Developers -- Blocks 17A - 17-D and Developers -- Blocks 20E - 20H		*General consideration is given that the initial construction is primarily for the benefit and improved use of the development of lands associated with Blocks 17A through 17D and Blocks 20-E through 20-H. A "Special Benefit" is assessed to the developers of the noted blocks. A benefit charge was previously assessed for the development of blocks 17-A through 17-D and is to be applied to the proportional amount owing in this regard.*				
		Engineering/Administration and Other	LS	$ 190,912.08	1.00	$ 190,912.08
		Sub-Total - Developer Costs				**$ 190,912.08**
Total - Special Benefits						**$ 200,470.23**
Total Net Costs - Section 1 (For Distribution to Properties)						**$ 19,600.00**

DETAILED COST ESTIMATE
SECTION 4
THE FAULKNER MUNICIPAL DRAIN

Robinson Consultants

Project No: B16013
Date: Dec-20

Type	Item No.	Item	Unit	Cost/Unit	Quantity	Total
Section 4 (Sta 4+633.10 to Sta 5+445)						**811.90m**
		Construction				
Construction	**Excavation Activities**					
		Drain Maintenance (bottom clean-out)	Lm	$ 12.50	812.00	$ 10,150.00
		Sub-Total - Construction Costs				**$ 10,150.00**
		Contingency Allowance - Construction				**$ 1,500.00**
		Total - Construction Costs				**$ 11,650.00**
		Engineering/Administration				
		Engineer's Report (apportioned by Section)	LS	$ 175,000.00	2%	$ 3,500.00
		Contract Administration/Inspection	LS	$ 70,000.00	2%	$ 1,400.00
		Sub-Total - Routine Engineering				**$ 4,900.00**
Total - Engineering/Administration						**$ 4,900.00**
		Other				
		Carrying Cost(s)	L.S	(4% OF Costs Above)		$ 662.00
		Allowances	LS	(See Schedule)		$ -
Total - Other Costs						**$ 662.00**
Sub-Total - Net Costs						**$ 17,212.00**
		Special Benefits				
Land Development Developers -- Blocks 17A - 17-D and Developers -- Blocks 20E - 20H		*General consideration is given that the initial construction is primarily for the benefit and improved use of the development of lands associated with Blocks 17A through 17D and Blocks 20-E through 20-H. A "Special Benefit" is assessed to the developers of the noted blocks. A benefit charge was previously assessed for the development of blocks 17-A through 17-D and is to be applied to the proportional amount owing in this regard.*				
		Engineering/Administration and Other	LS	$ 5,562.00	1.00	$ 5,562.00
		Sub-Total - Developer Costs				**$ 5,562.00**
Total - Special Benefits						**$ 5,562.00**
Total Net Costs - Section 1 (For Distribution to Properties)						**$ 11,650.00**

Appendix C

Authorization and Permits

RVCA Letter of Permission
DFO Class Authorization
MECP Species at Risk

RVCA Letter of Permission —

Ont. Reg. 174/06, S. 28 *Conservation Authorities Act* 1990, As Amended.

July 9, 2020
File: RV5-1520
Contact: hal.stimson@rvca.ca (613) 692-3571 Ext 1127

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504
F 613-692-0831 | www.rvca.ca

Mr. David Ryan
City of Ottawa
2155 Roger Stevens Dr.
North Gower, ON
K0A 2T0

Permit to alter a waterway under Section 28 of the *Conservation Authorities Act* for alterations to a municipal drain at Lots 20 to 25, Concessions 5 to 10, Goulbourn township, now in the City of Ottawa.

Dear Mr. David Ryan,

The Rideau Valley Conservation Authority has reviewed your application on behalf of the City of Ottawa and understands the proposal to be for:

> **The realignment and modifications of the Faulkner Municipal Drain in accordance with the amended engineers report as prepared by Robinson Consulting dated May 2020. The work is the result of changes in land use from rural/agricultural to urban development in accordance with community design plans and includes relocating the drain from the road allowance on Shea Road. The watercourse is a tributary of Flowing Creek which is tributary to the Jock River.**

This proposal was reviewed under Ontario Regulation 174/06, the "*Development, Interference with Wetlands, and Alteration to Watercourse and Shorelines*" regulation and the RVCA Development Policies (approved by the RVCA, Board of Directors), specifically Section 3.0 Alteration to Waterways. The proposal is not expected to impact the control of flooding, pollution, erosion or conservation of land providing conditions are followed.

PERMISSION AND CONDITIONS

By this letter the Rideau Valley Authority hereby grants you approval to undertake this project as outlined in your permit application but subject to the following conditions:

1. Approval is subject to the understanding of the project as described above and outlined in the application and submitted plans including:
    - Report titled "Amendment to the Engineer's Report for the Faulkner Municipal Drain", Project No. 16013 prepared by Robinson Consultants Inc. Consulting Engineers dated May 2020 (86 Pages).

2. **A De-watering Plan and Sediment and Erosion Control Plan must be submitted by the contractor to this office for review prior to construction activities commencing.**

3. Any excess excavated material, as a result of the work or on-going maintenance, must be disposed of ~~off-site~~ in accordance with the Engineers Report or in a suitable location outside any regulatory floodplain and fill regulated area. RVCA must be consulted to ensure fill is not placed elsewhere within a flood plain or regulated wetland area.

4. It is recommended that you retain the services of a professional engineer to conduct on-site inspections to ensure adequacy of the work, verify stability of the final grade and slopes and confirm all imported fill is of suitable type and has been adequately placed and compacted.

5. Work in-water shall not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods. Existing stream flows must be maintained downstream of the de-watered work area without interruption, during all stages of the work. There must be no increase in water levels upstream of the de-watered work area.

6. Only clean non-contaminated fill material will be used, and all work is to occur on your property, or if on other property, only with full authorization of the owner(s).

7. Sediment barriers should be used on site in an appropriate method according to the Ontario Provincial Standard Specifications (OPSS) for silt barriers as a minimum. If the sediment and erosion control methods include silt fence it should be placed along the shoreline to prevent overland flow on disturbed areas from entering the watercourse. Soil type, slope of land, drainage area, weather, predicted sediment load and deposition should be considered when selecting the type of sediment/erosion control.

8. Demolition or construction debris is not to be deposited in the waters of any creek; inert concrete/asphalt debris will be considered a deleterious substance. An emergency spill kit should be kept on site in case of fluid leaks or spills from machinery.

9. Sediment and erosion control measures shall be in place before any excavation or construction works commence. All sediment/erosion control measures are to be monitored regularly by experienced personnel and maintained as necessary to ensure good working order. If the erosion and sedimentation control measures are deemed not to be performing adequately, the contractor shall undertake immediate additional measures as appropriate to the situation to the satisfaction of the Conservation Authority.

10. All materials and equipment used for the purpose of site preparation and project completion must be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, debris etc.) from entering the water.

11. The waters of the creek are NOT to be considered as machine staging areas. Activities such as equipment refuelling, and maintenance must be conducted away from the water to prevent entry of petroleum products, debris, or other deleterious substances into the water. All in-stream work on the new channel should be completed in the dry.

12. Operate machinery from outside the water, or on the water in a manner that minimizes disturbance to the banks or bed of the watercourse. Equipment shall not be cleaned in the watercourse or where wash-water can enter any watercourse. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

13. All disturbed soil areas must be appropriately stabilized to prevent erosion.

14. It is recommended that you ensure your contractor(s) are provided with a copy of this letter to ensure compliance with the conditions listed herein.

15. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. This plan is to include measures to: a) stop work, contain sediment-laden water and other deleterious substances and prevent their further migration into the watercourse and downstream receiving watercourses; b) notify the RVCA and all applicable authorities in the area c) promptly clean-up and appropriately dispose of the sediment-laden water and deleterious substances; and d) ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.

16. **There will be no in-water works between March 15 and June 30, of any given year to protect local aquatic species populations during their spawning and nursery time periods.**

17. Any aquatic species (fish, turtles) trapped within an enclosed work area are to be safely relocated outside of the enclosed area to the main watercourse downstream of the work zone.

18. The RVCA is to receive 48 hours' notice of the proposed commencement of the works to ensure compliance with all conditions. The applicant agrees that Authority staff may visit the subject property before, during and after project completion to ensure compliance with the conditions as set out in this letter of permission.

19. All other approvals as might be required from the Municipality, and/or other Provincial or Federal Agencies must be obtained prior to initiation of work. This includes but is not limited to the Drainage Act, the Endangered Species Act, the Ontario Water Resources Act, Environmental Protection Act, Public Lands Act, or the Fisheries Act.

20. A new application must be submitted should any work as specified in this letter be ongoing or planned for or after July 9, 2022.

By this letter the Rideau Valley Conservation Authority assumes no responsibility or liability for any flood, erosion, or slope failure damage which may occur either to your property or the structures on it or if any activity undertaken by you adversely affects the property or interests of adjacent landowners. This letter does not relieve you of the necessity or responsibility for obtaining any other federal, provincial or municipal permits. This permit is not transferable to subsequent property owners.

Should you have any questions regarding this letter, please contact Hal Stimson.

Terry K. Davidson

Terry K. Davidson P.Eng
Conservation Authority S. 28 Signing delegate
O. Reg. 174/06

c.c. L. Franklin, Robinson Consultants

- Pursuant to the provisions of S. 28(12) of the Conservation Authorities Act (R.S.O.1990, as amended.) any or all of the conditions set out above may be appealed to the Executive Committee of the Conservation Authority in the event that they are not satisfactory or cannot be complied with.
- Failure to comply with the conditions of approval or the scope of the project may result in the cancelling of the permission and/or initiation of legal action under S. 28(16) of the Act.
- Commencement of the work **and/or** a signed and dated copy of this letter indicates acknowledgement and acceptance of the conditions of the RVCA's approval letter concerning the application and the undertaking and scope of the project.

Name: DAVE RYAN (print)

Signed: _____ Date: JULY 16/20

Fisheries and Oceans Canada | Pêches et Océans Canada

Ontario and Prairie Region
Fish and Fish Habitat Protection Program
867 Lakeshore Rd.
Burlington, ON
L7S 1A1

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

November 9, 2020

Our file *Notre référence*

20-HCAA-00944

City of Ottawa
Attention: David Ryan
2155 Roger Stevens Drive,
Ottawa, Ontario
K0A 2T0

Subject: Faulkner Municipal Drain, Class E and C, Ottawa – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat, and Prohibited Effects on Listed Aquatic Species at Risk

Dear Mr. Ryan:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on June 1, 2020. We understand that you propose to:

- Widen and deepen the existing drain channel along approximately 5115 linear metres.
- Realign a portion of the drain at the downstream extent of the work area, along approximately 330 linear metres.
- Replace three culverts in the work area.
- Construct seven sediment traps in the work area with rock check dams or straw bale check dams.
- Construct a low flow channel throughout the work area where the channel is wide enough to accommodate a low bench.

Our review considered the following information:

- Correspondence between Lorne Franklin (Robinson Consultants) and Luke Ridgway (DFO) between March 11 and September 25, 2020.
- Correspondence with staff from Rideau Valley Conservation Authority between March 19 and March 24, 2020.
- The initial draft of the Faulkner Drain Engineer's Report for Agency Review, received on June 1, 2020.
- The updated draft of the Faulkner Drain Engineer's Report, received September 9, 2020.

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).
- Conduct work in low or no flow.
- Limit works to one bank of the channel except in areas where both banks require regrading and/or stabilization.
- Reseed and/or replant any disturbed banks caused by the construction activities, including live staking and planting saplings in areas where mature trees are removed (as per SP6.1 to SP6.4 in the Engineer's Report).
- If any open water is isolated from the main stem of the channel during the drain realignment, conduct a fish salvage in the isolated work zone prior to backfilling.

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 to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and to avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals.

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).

Please notify this office at least 10 days before starting your project. 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.

.../3

If you have any questions with the content of this letter, please contact Luke Ridgway at 289-440-2387 or by email at Luke.Ridgway@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Christopher Biberhofer
A/Senior Biologist

Copy:
Luke Ridgway – DFO
Lorne Franklin – Robinson Consultants
Andy Robinson – Robinson Consultants
Jennifer Lamoureux – RVCA
Eldon Hutchings – City of Ottawa

Lorne Franklin

From: Species at Risk (MECP) <SAROntario@ontario.ca>
Sent: November 26, 2020 1:52 PM
To: Lorne Franklin
Subject: 2020-11-26_DRAFT Engineer's Report -- Falkner Municipal Drain

"CAUTION: External Sender"
Hi Lorne,

I have reviewed the report for the Faulkner Municipal Drain. MECP has the following occurrences of species at risk in the area of the work for consideration:

- Butternut
- Barn Swallow
- Bank Swallow
- Bobolink
- Eastern Meadowlark
- Wood Thrush
- Peregrine Falcon
- Canada Warbler
- Chimney Swift
- Snapping Turtle
- Blanding's Turtle
- Monarch

There is also the potential for the following species/habitat:

- SAR Bats (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat)

Also please note there is occurrence information for a Federally listed species: Western Chorus Frog

It remains the client's responsibility:

- Carry out preliminary screening for their project,
- Obtain the best available information for all applicable information sources,
- Conduct necessary field studies or inventories to identify and confirm the presence of absence of species at risk or their habitat,
- Consider any potential impacts to species at risk that a proposed activity might cause, and
- Comply with the Endangered Species Act (ESA).

Additionally, while this data represents MECP's best current available information, it is important to note that a lack of information for a site does not mean that species at risk or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in more remote parts of the province. On-site assessments can better verify site conditions, identify and confirm presence of species at risk and/or their habitats. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

Additional information that would be helpful in providing guidance:

- What is the proposed timing of the work and how long will it last?

- What mitigation measures are being considered for species at risk at this time?
- Is there any potential habitat for nesting turtles in the area of the work?
- Are there any Butternuts that might be impacted by the proposed work?
- Will habitat for Eastern Meadowlark or Bobolink be impacted by the proposed project?
- Will areas where drain works are occurring be isolated and will there be a fish/wildlife salvage completed?
- Will turtles be excluded from the work areas?

Once additional information is provided for species at risk there may be additional mitigation/avoidance to consider.

Some general mitigation that should be incorporated at this time includes:

- Vegetation removal should occur outside of the Breeding Bird Season which is April 15 to August 15.
- If trees are being removed that may support species at risk bats they should be removed outside of the bat active season April 1 to September 30.

Please note that there are Blanding's Turtle Occurrences within 2 km of the drain which could result in Blanding's Turtle habitat being on site. The proponent may consider registering the project under the regulation noted below for this species and any other species at risk or species at risk habitat that occur on site. If the project is not eligible under the regulation the proponent may require authorization under the ESA for this species or any other species at risk and their habitat that are found on site that are impacted by the project.

Please note that under O.Reg. 242/08 section 23.9 Drainage Works you may be able to register the activity. Please review the regulation to determine if you can or need to register the activity. It can be reviewed here: https://www.ontario.ca/laws/regulation/080242#BK36

Hope this helps.

Best,

Carolyn Hann

Management Biologist | Permissions and Compliance Section | Ontario Ministry of Environment, Conservation and Parks | 10-1 Campus Drive, Kemptville, Ontario, K0G 1J0 | PH: 613.355.7312 | Email: carolyn.hann@ontario.ca

---

From: Lorne Franklin <lfranklin@rcii.com>
Sent: June-01-20 12:46 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Andy Robinson <ajrobinson@rcii.com>; Ryan, David W <David.Ryan@Ottawa.ca>; 'erinjennifer.moore@ottawa.ca' <erinjennifer.moore@ottawa.ca>
Subject: FW: DRAFT Engineer's Report -- Falkner Municipal Drain

Please provide SAR Screening for the attached project.

Sincerely,

Lorne Franklin, L.E.T, C.E.T., rcca, CISEC | Drainage Services

Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
T.(613) 592-6060 ext. 123 | rcii.com

From: Lorne Franklin
Sent: June 1, 2020 12:03 PM
To: FPP.CA / PPP.CA (DFO/MPO) <fisheriesprotection@dfo-mpo.gc.ca>; 'Hal Stimson' <hal.stimson@rvca.ca>
Cc: Ridgway, Luke <Luke.Ridgway@dfo-mpo.gc.ca>; 'David.Ryan@ottawa.ca' <David.Ryan@ottawa.ca>; 'erinjennifer.moore@ottawa.ca' <erinjennifer.moore@ottawa.ca>; Andy Robinson <ajrobinson@rcii.com>
Subject: DRAFT Engineer's Report -- Falkner Municipal Drain

Please See attached for a draft of the Engineer's Report for the Faulkner Municipal Drain.

The Report is submitted in Draft with the intent that any comments or concerns may be address in the Final Report and that any Permits or Authorizations also be incorporated in the final report. This version of the report is not "stamped" – where required, a stamped version may be sent prior to the issuing of permits/authorization and/or will be stamped for final distribution.

The report is submitted electronically (attached PDF) only at this time. Should you prefer to also receive a hard copy, please let us know and we will make arrangements.

Should you have any questions or concerns, please contact us.

Sincerely,

Lorne Franklin, L.E.T, C.E.T., rcca, CISEC | Drainage Services

Robinson Consultants 350 Palladium Drive, Suite 210, Ottawa ON, K2V 1A8
T.(613) 592-6060 ext. 123 | rcii.com

Appendix D

Special Provisions

SPECIAL PROVISIONS

INDEX

SP1.0 WORKING AREA

A working area of 40 metres from the top-of-bank is designated along both sides of the drain.

The designated working area shall be deemed to include an area for spreading of excavated material, access roads for fuel and service and material haul routes, as approved by the Drainage Engineer. These access points to the designated working area should be along existing farm lanes or access points where possible and are to be approved by the Drainage Engineer. It is the contractor's responsibility to obtain final approval for access locations and to reinstate the access to original condition or better, at the contractor's expense.

SP1.1 Alignment

The constructed channel alignment shall be in general conformity with the existing alignment, except for the section being relocated between Station 0+000 and 0+330 as shown on Dwg. No. 16013-A1. Where necessary, the alignment shall be set out by the Drainage Engineer prior to the commencement of construction on this project.

SP2.0 CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of all trees, brush, and windfalls within the top of slopes for the drain and the area required for machine access, for clean out of the drain and spreading of excavated material. All dead trees located near the drain which would in time fall into the drain are to be removed. When clearing is undertaken in an area of tillable land all stumps shall be removed and 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

Landowners are advised that the Contractor will clear only those trees, which may affect its operation within the working area. 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 the wood may be salvaged by the property owners.

All brush, limbs and other debris resulting from the clearing operation shall be chipped and buried beneath spread excavated materials except in agricultural fields where chipped materials are to be disposed of off-site at a location provided by the contractor and approved by the Drainage Engineer and at the Contractor's expense (note restrictions may apply with regard to Ash – Emerald Ash Borer).

For the initial clearing and construction large stones, stumps, tree roots and other debris shall be removed from the site and disposed of at a location arranged for by the Contractor and approved by the Drainage Engineer.

For future maintenance, all material shall be disposed of on the adjacent property at a location chosen by the owner and approved by the Drainage Superintendent.

SP2.2 Payment

The cost of all labour, 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 Faulkner Municipal Drain will be an open channel drain with side slopes and ditch bottom widths as specified on the design profiles and cross-sections Drawing No. 16013-P1 through 16013-P8 and 16013-C1 through 16013-C5. The Faulkner Municipal Drain will be located between Station 0+000 and Station 5+445.

To accommodate fisheries concerns a two-stage profile is implemented by the proposed construction. The existing channel width will be maintained in general conformance with the proposed profile. However, the cross-sectional width is proposed to be increased in some areas. Stage 1 of the two-stage channel is provided by the existing section with the bank of the east side unmodified and the bottom maintained as necessary to the proposed profile. Additional width excavation then commences from the west bank at 300mm above the proposed grade to the specified channel width and forms stage 2 of the two-stage profile.

SP3.2 Disposal of Excavated Earth Material

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.

With the exception of the portion of the drain being relocated between Station 0+000 and 0+330, in the non-agricultural land all material shall be spread on the adjacent lands no closer than 5 meters to the top of slope and to a maximum depth of 300 mm. Drainage openings shall be constructed wherever required throughout the disposal area but at a maximum spacing of 100 meters. All drainage openings shall be maintained, and the soil spread to accommodate these drainage openings to ensure the drainage from adjacent land is not impeded.

In areas of agricultural land, all suitable earth material shall be spread no closer than 5 m to the top of the slope and to a maximum depth of 150 mm on the adjacent land with drainage openings provided wherever required, but at a maximum spacing of 50 meters.

In areas where the drain is relocated between Station 0+000 and 0+330 suitable earth material shall first be utilized to fill the existing drain and to reconstruct the roadside ditch. Any excess and/or unsuitable material not used for the filling and construction of the roadside ditch shall be disposed of off site at a location arranged for by the contractor and approved by the Drainage Engineer.

Property owners, outside of the above noted area for off-site disposal, who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site which would otherwise be spread or deposited on the property may arrange directly with the Contractor, subject to approval by the Drainage Engineer.

SP3.3 Hardpan Excavation and Disposal

All unsuitable material and debris including boulders, hardpan, etc. shall be disposed of by the contractor on the adjacent property, in an area of the property designated by the owner and as approved by the Drainage Engineer. Note: item excludes boulders and cobbles for salvage as noted in the following section.

Hard pan is considered as densely compacted clay which requires the use of a ripping tooth (singular) to break-up the material prior to excavating.

SP3.4 Boulders and Cobbles for Salvage

For the relocated section of drain between Station 0+000 and 0+330, all boulders and cobbles greater than 200mm in size found along the bottom of the existing alignment are to be salvaged and replaced in the proposed alignment.

SP3.5 Rock Excavation & Disposal

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

Rock excavation is for bedrock material which requires the use of a hydraulic ram to break-up the material prior to excavating.

SP3.6 Payment

Payment for earth excavation shall be by the unit price tendered per cubic meter or linear meter and shall be full compensation for all work required for excavation, filling and construction of the roadside ditch, disposal of excess material between Station 0+000 and 0+330 and spreading the spoil in the manner described previously.

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, 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 hardpan (as exposed) 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.

Payment for Boulder and Cobble Salvage shall be by the lump-sum unit price tendered.

SP3.6 Disposal Off-Site at Property Owner's Expense

Property owners outside of specific areas designated for off-site disposal, who wish to pay the Contractor to have the Contractor dispose of the excavated material off-site which would otherwise be spread or deposited on the property may arrange directly with the Contractor, subject to approval by the Drainage Engineer.

SP4.0 PRIVATE CULVERTS

SP4.1 Supply and Placement or Lowering of Private Farm Culverts

The culverts shall be installed in which 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 Robinson Consultants Std. Dwg. 10. The standard length for supplied culverts shall be 12 meters, unless otherwise specified.

SP4.2 Culvert Location

Culverts to be installed or lowered and reinstalled are shown on Drawing No. 16013-A2 and 16013-P1 through 16013-P8.

SP4.3 Payment

Payment at the per metre or lump-sum unit price bid for each culvert 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 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.

SP5.1 Fencing - Replacement

Where fences are encountered or for access to the drain, where it is the determination of the on-site representative of the Drainage Engineer the fence is not in a reasonable condition for the Contractor to remove the existing fence and re-erect the fence in a suitable condition, the Contractor shall supply and install similar fence to the OPSD which governs the type of fence, and to the satisfaction of the Drainage Engineer.

It is noted, in some locations, fence existed parallel to the drain along the west bank, however, the fence is in a general state of disrepair, has fallen into the drain, or no longer exists. Fence found in locations parallel to the drain, but not standing or in good condition will be removed but not replaced.

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.

SP5.2.1 Payment – Fences Poor Condition (to be replaced)

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

SP5.2.2 Payment – Fence Parallel to the Drain

The removal (but non-replacement) of fence parallel to the drain is to be completed as part of the excavation (no extra cost), including disposal off-site at the Contractor's expense.

SP6.0 SEEDING AND PLANTING

SP6.1 Main Drain Seeding

All disturbed banks shall be hand seeded within 48 hours of construction. Additionally, the "buffer zone" (the first 5m from the top of bank) must be seeded following the completion of access activities in the area. Any spread areas outside of agricultural fields must also be seeded, except where spreading occurs in a forest/bush area.

The minimum sow rate will be 100 kg/ha and the following seed mixture, or an alternate mixture presented by the contractor and approved by the Drainage Engineer shall be used.

Creeping Red Fescue	60%
Canada Bluegrass	20%
White Clover	3%
Perennial Rye	12%
Red Top	5%

Perennial rye will encourage quick establishment of a ground cover, while red fescue provides deeper rooting vegetation which 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. Any proposed alternative mix should make accommodation for all attributes described above.

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 Willow Staking

At identified locations the contractor is required to complete "live staking" of shrub willow (or alternative approved species) along portions of the west bank of Faulkner Municipal Drain from Station 0+000 to Station 0+330. Willow Staking is to be placed at randomized locations within the upper 2m of the bank (vertically) and at +/- 5m spacing (horizontally (approximately 68 stakings).

All work must be completed during the dormancy period of the shrub but prior to any significant frost in ground or snow cover.

SP6.4 Tree Planting

At identified locations the contractor is required to complete planting of spruce trees (1000mm height). Trees shall be nursery stock or approved site-sourced trees (and planting methodology) along portions of the west bank of Faulkner Municipal Drain from Station 1+780 to Station 2+600. Where possible, existing mature trees will remain in place and be worked around. It is anticipated (1) mature tree every +/- 30m may remain in place and allow for reasonable working access. Planted trees are to be placed at 5m intervals adjacent to the top of bank on the west side of the drain.

All work must be completed in conformance with appropriate planting practices.

SP6.5 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 approved by the Drainage Engineer prior to placing the seed. The Contractor will not be paid for reinstatement of other areas disturbed by construction activities.

Willow staking shall be lump sum by the unit price tendered for the item.

Spruce Trees shall be by the unit price (each) tendered for the item. Working around mature trees (to be left in place) is completed at no additional cost to the contract.

SP6.6 Payment

Payment for seeding and willow staking 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 or restaking during the maintenance period.

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 unless they are enclosed in gabion baskets or other materials to be approved by the Drainage Engineer, at no extra cost to the drain or project.

Excavated rock from the site which meets the standards as specified above, and is approved 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 the finished surface will be of the same cross-section and will be flush with upstream and downstream sections. The rock protection shall be placed on a geotextile Terrafix 420R (or approved equivalent) as indicated on the Standard Drawing. Rock protection shall be installed in accordance with Standard Drawing No. 1 and No. 2 (provided in **Appendix A**).

SP7.1 Rock Protection Erosion Control Location

Refer to Drawing Nos. 16013-A2, and 16013-P1 through 16013-P8 for Rock 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 mark all underground cables or pipelines in the field prior to commencing construction and 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 Drawing Nos. 16013-A2, and 16013-P1 through 16013-P8, all in accordance with Standard Drawing No. 3 (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 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 Standard Drawing No. 6. The geotextile over the rock check is to permit drainage while filtering sediments and must be covered with a layer of rock.

SP9.2.3 Installation

Rock flow checks shall be installed as shown on Standard Drawing No. 6 (provided in **Appendix A**).

SP9.3 Excavation

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.

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 work.

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 Standard Drawing No. 2 (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 Standard Drawing No. 2.

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 Drawing No. 16013-A2, all in accordance with Standard Drawing No. 10 (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 Standard Drawing No. 10.

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 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 PARKS – SPECIES AT RISK

Pre-Screening of the local area for the proposed Faulkner Municipal Drain was completed in conjunction with the Ministry of Environment, Conservation and Parks (MECP) regarding the Species at Risk (SAR) Legislation. Correspondence related to MECP review of SAR Legislation is included in **Appendix D.**

The documented occurrences of Species at Risk of note for this project as identified by the MECP or anticipated to be within the local area are included in the following sections.

The contractor must be aware of the SAR Act and the individual species at risk are dynamic and subject to change. The contractor is responsible to ensure all necessary measures are taken to ensure no harm to any SAR or its habitat (if protected).
No specific species were noted for this project. However, Butternut Trees, and Barn Swallows may exist in the local vicinity.

Turtles and Aquatic SAR may also exist in the area, however, are not anticipated to be impacted where working in dry conditions.

The general procedures to be followed are outlined in the following sections. However, the contractor is advised these procedures may not eliminate the possibility of harm to a protected species if followed. The contractor is responsible to ensure all necessary measures are taken to ensure no harm to any SAR or its habitat (if protected). Following these procedures and/or any additional required measures implemented by the contractor are to be performed at the contractor's expense, except as otherwise noted.

SP13.1 Species at Risk – Procedures (Barn Swallow)

Barn swallows have been documented in general/greater area of this site and typical habitats may exist adjacent to the proposed works. For work within the specified working area, it is not anticipated barn swallows will be encountered, however, the contractor shall avoid unnecessarily disturbing structures and a sweep of all culverts to be removed (especially larger diameter or box culverts) shall be completed. Where barn swallows are found, all work would directly affect the habitat (i.e. removal of the structure) shall stop, and the sighting be reported to the contract administrator.

SP13.2 Species at Risk – Procedures (Turtles and Aquatic Species)

Turtles and Aquatic SAR may also exist in the area, however, are not anticipated to be impacted where working in dry conditions.

13.4.1 Species at Risk – Payment (Barn Swallow)

Following the procedures as noted for the barn swallow shall be considered part of the normal procedures with no additional payment made.

It is not anticipated additional tasks shall be required in this regard, however, 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.

13.4.2 Species at Risk – Payment (Turtles and Aquatic Species)

Following the procedures as noted for turtles shall be considered part of the normal excavation procedure with no additional payment made. It is not anticipated additional tasks shall be required in this regard, however, 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 RIDEAU VALLEY CONSERVATION AUTHORITY (RVCA) – PERMISSION (O.REG. 175/06)

The Permit for the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" (O.Reg. 175/06) for works to be completed on the Faulkner Municipal Drain by RVCA is contained in **Appendix D** of the Engineer's Report. The Contractor shall insure 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 Faulkner Municipal Drain by the Department of Fisheries and Oceans (DFO) is contained in **Appendix D** of the Engineer's Report. The Contractor shall insure any advice/conditions are adhered to.