

**FUNCTIONAL SERVICING & PRELIMINARY  
STORMWATER MANAGEMENT REPORT**

**1725 BARBERTOWN ROAD  
RESIDENTIAL DEVELOPMENT**

**CITY OF MISSISSAUGA  
REGION OF PEEL**

**PREPARED FOR:**

**BARBERTOWN VENTURES INC.**

**PREPARED BY:**

**C.F. CROZIER & ASSOCIATES INC.  
2800 HIGH POINT DRIVE, SUITE 100  
MILTON, ON L9T 6P4**

**MARCH 2019**

**CFCA FILE NO. 1019-3988**

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<b>Revision Number</b>	<b>Date</b>	<b>Comments</b>
Rev.0	January 2017	Issued for Zoning By-law Amendment
Rev.1	May 2018	Re-Issued for Zoning By-Law Amendment
Rev. 2	March 2019	Re-Issued for Zoning By-Law Amendment

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## 1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Barbertown Ventures Inc. to prepare a Functional Servicing and Preliminary Stormwater Management Report in support of a Zoning By-law Amendment for a proposed residential development in the City of Mississauga, Region of Peel.

The subject site located at 1725 Barbertown Road has an area of 4.63 ha. The site currently features a private driveway, three single-detached homes, and landscaped areas. The property is bound by:

- Canadian Pacific Railway to the north and east
- Barbertown Road to the south
- Credit River to the west

The lands surrounding the proposed development include existing residential developments.

The proposed development lies within Subwatershed 2 of the Credit River watershed, and is situated north and west of Carolyn Creek and east of the Credit River. As a result of the development's close proximity to Carolyn Creek and the Credit River, following regulation setbacks from the flood lines of the two watercourses and other environmental constraints, the total developable area is roughly 2.60 ha (RN Design Ltd. – Concept Site Plan - Barbertown Ventures Inc., revised March 2019). Refer to the Composite Constraints Plan (Figure 1) for details of the environmental site features. This developable area is used in sizing the site services and evaluating the required stormwater management measures outlined in the proceeding sections.

It is proposed to develop the property as a residential community consisting of 75 units, internal roadways, amenity areas, and landscaped areas. These units are proposed in the form of townhouses in a mix of block sizes.

### 1.1 Background Information

The following reports and design standards were referenced during the preparation of this report:

- Soil Investigation, prepared by Soil Engineers Ltd., dated July 2012
- Slope Stability Study Letter, prepared by Soil Engineers Ltd., dated December 9, 2016
- Overland Flow – Slope Stability Memorandum, prepared by Soil Engineers Ltd., dated March 7, 2019
- Hydraulic Assessment Memo, prepared by C.F. Crozier and Associates, dated March 15, 2019
- Ministry of Environment Stormwater Management Planning and Design Manual, 2003.
- City of Mississauga Transportation and Works Department Development Requirements Manual, 2016.
- Credit Valley Conservation Stormwater Management Criteria, 2012
- Greater Golden Horseshoe Area Conservation Authorities – Erosion & Sediment Control Guideline for Urban Construction (December 2006)

## 2.0 Water Servicing

### 2.1 Existing Water Servicing

According to review of the Region of Peel's EPAL database, there is an existing 150 mm diameter watermain along Barbertown Road which services a fire hydrant east of the driveway entrance along the south property line. The water service terminates as a 50 mm diameter copper pipe just before the Credit River water course. It is proposed that this 150 mm diameter watermain will be extended to provide water services to the proposed development.

### 2.2 Water Design Demand

The Region of Peel guidelines were used to estimate the proposed water demands for domestic purposes. A summary of the results is presented in Table 1, with detailed calculations provided in Appendix A.

**Table 1: Estimated Domestic Water Demand**

Method	Average Day (L/s)	Maximum Daily Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel	0.66	1.31	1.97

The Fire Underwriters Survey method was used to estimate the required fire flows demand for the proposed development. Flow requirements were calculated based on the proposed footprint of two townhouse units, as we have assumed fire break walls will be used between every other unit. The proposed fire water service line will be required to accommodate a fire flow of 100.0 L/s (1,585 USGPM) for a duration of 2.0 hours as per the Fire Underwriters Survey calculation provided in Appendix A. Final determination for fire protection will be prepared by the architect once the building design drawings and occupancy are complete.

Note that this Fire Underwriter's Survey value is a conservative estimate for this calculation and is for comparison purposes only. The mechanical engineer for this development will complete the required analysis for water demands as per the OBC and the architect will design the fire separation methods as per the determined fire flow rate in order to match municipally available flows and pressures during the detailed design stage.

A hydrant flow testing was carried out by Corix Water Services Inc. on November 26, 2015 on the existing 150 mm diameter municipal watermain along Barbertown Road. Based on the hydrant test results we anticipate that at 20 psi residual pressure in the municipal watermain, a minimum of 171.8 L/s (2,723 USGPM) projected flow is available within the municipal water system. As such, the existing water services with an extension to the 150 mm diameter watermain along Barbertown Road is sufficient to meet the demands of the proposed development. Detailed results of the hydrant flow testing are provided in Appendix A.

### 2.3 Proposed Water Servicing

As mentioned in Section 2.1, it is proposed to extend the existing 150 mm watermain from Barbertown Road along the private road to service the development. The individual units will be serviced with individual services from the proposed internal 150 mm watermain, as per Region of Peel Standard Drawing 1-8-2. The preliminary water system design is illustrated on the Site Servicing Plan (Figure 2).

### 3.0 Sanitary Servicing

#### 3.1 Existing Sanitary Servicing

According to Region of Peel as-built drawing 13204-D, dated March 1985, there is an existing 675 mm diameter sanitary sewer flowing west along Barbertown Road.

#### 3.2 Sanitary Design Flows

To estimate the proposed sanitary design flow, the Region of Peel Sanitary Sewer Design Criteria was consulted to determine the design flows generated by the proposed development. A summary of the results is presented in Table 2, with detailed calculations provided in Appendix B.

**Table 2: Estimated Sanitary Design Flows**

Design Criteria	Average Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Flow (L/s)	Design Flow (L/s)
Region of Peel	0.71	4.15	2.94	0.52	3.46	13.00

Per Region of Peel's standard guidelines, Table 2-5-2 suggests a design peak flow of 13.0 L/s for a population up to 1000 people. Since the calculated peak flows are lower than the Region of Peel peak flows from Table 2-5-2, the proposed development will be sized to accommodate the peak design flow of 13.0 L/s.

#### 3.3 Proposed Sanitary Servicing

It is proposed to install an internal 200 mm diameter sanitary sewer along the private roads, discharging to the existing 675 mm sanitary sewer at Barbertown Road. The individual units will be serviced in pairs using a "Y" connection, as per Region of Peel Standard Drawing 1-8-2. The preliminary sanitary system design is illustrated on the Site Servicing Plan (Figure 2).

### 4.0 Drainage Conditions

#### 4.1 Existing Drainage Conditions

The site lies within the Credit River watershed and currently consists of a private driveway, three single detached residential units and surrounding landscaped area. Site runoff is generally split, with runoff from the north-eastern portion of the site flowing uncontrolled via sheet flow towards Carolyn Creek, and runoff from the south-western portion flowing uncontrolled via sheet flow towards the Credit River. There are no existing stormwater management controls on-site.

Runoff from Catchment 101 (2.7 ha), located within the north-eastern portion of the site, discharges to Carolyn Creek and runoff from Catchment 102 (4.44 ha), located within the south-western portion of the site, discharges to the Credit River. Carolyn Creek flows south through an existing 3 m wide by 1.8 m high concrete box culvert beneath Barbertown Road. The culvert discharges to a drainage channel on the south side of Barbertown Road running parallel to the road. Carolyn Creek outlets to the Credit River approximately 150 m west of the Barbertown Road culvert.

The existing drainage conditions and catchment areas are illustrated on Figure 5.

## 4.2 Proposed Drainage Conditions

The proposed residential development consists of 75 townhome units, an internal road network, amenity areas, and landscaped areas. The development's road network will be constructed to a fully urbanized cross-section complete with curb and gutter and storm sewer system per the City of Mississauga guidelines. The development will incorporate a "dual" drainage system consisting of storm sewer, catch basins and lot drainage swales (minor system), and the use of the roadway and overland flow routes (major system). The minor system must convey stormwater runoff up to the 10-year design storm event, per City of Mississauga Guidelines.

The site has been discretized into various sub-catchments based on the proposed site grading. Figure 6 illustrates the proposed catchment areas and overland flow routes. The Post-Development drainage catchments are summarized in Table 3.

**Table 3: Post-Development Catchment Areas**

Catchment	Area (ha)	Runoff Coefficient	Outlet	Ultimate Outlet
201	2.69	0.25	Carolyn Creek – uncontrolled via sheet flow	Credit River
202	2.16	0.25	Credit River – uncontrolled via sheet flow	
203	1.96	0.65	Minor System: Carolyn Creek – controlled via internal storm sewer network Major System: Credit River – uncontrolled via internal roadway & overland flow routes	
204	0.34	0.65	Credit River – via sheet flow	

Catchment 201 and 202 will remain unchanged in the post-development condition, with runoff directed uncontrolled directly to Carolyn Creek and the Credit River, respectively. Runoff from Catchment 204 will discharge uncontrolled via sheet flow towards the Credit River to the south. A memo prepared by Soil Engineers Ltd. confirms that uncontrolled flow overland in Catchment 204 is acceptable. Refer to Appendix C for details.

Minor flows from Catchment 203 will be collected by the proposed storm sewer system and discharge to Carolyn Creek through the site's drainage block located adjacent to the site entrance. The stormwater will pass through a proposed stormwater tank located within the drainage block, before discharging to Carolyn Creek. Major flows will be conveyed via the internal road network to a low point adjacent to the drainage block and outlet overland towards the Credit River.

The internal storm sewer outlets to the drainage channel south of Barbertown Road. In the report prepared by GEO Morphix dated September 2017, it was demonstrated that the gabion basket drainage channel adjacent to Barbertown Road will not be affected by the proposed site outlet.

The storm sewers downstream of the stormwater retention system are physically constrained by the existing ground elevations, the proposed flood relief culvert invert, and the drainage channel south of Barbertown Road. Due to these constraints, the obvert of the outlet pipe is located below the 25-year flood elevation of the Carolyn Creek and Credit River floodplain. The upstream storm sewer system and stormwater retention system is located above the Regulatory flood elevation of 137.06 m. Although the storm sewer system outlet will be submerged in flooding conditions, the upstream storm sewer network will not be subject to flooding backwater conditions during large storm events.

Site stormwater management is discussed further in Section 5.0.

### **4.3 Site Safe Access**

Crozier has completed a Safe Access Assessment to investigate possible solutions to flooding occurring at the site entrance and Barbertown Road intersection. As a proposed solution, Crozier proposes:

- The installation of three (3) 7.3 m x 1.5 m Con-Span Arch culverts beneath the site entrance road in addition to the existing 3 m x 1.8 m culvert beneath Barbertown Road
- Raising Barbertown Road by approximately 1 m at the intersection with the site entrance road

In implementing this design, Carolyn Creek will not overtop Barbertown Road more than 0.30 m during the 100-year or Regional Storm event. Refer to the Safe Access Assessment prepared by Crozier dated March 2019 for additional details.

### **5.0 Stormwater Management**

As the site is located within the City of Mississauga, the proposed stormwater management drainage scheme must comply with the following guidelines:

- City of Mississauga – Transportation and Works Development Requirements – Section 2 (September, 2016)
- Credit Valley Conservation Authority – Stormwater Management Criteria (August 2012)
- Greater Golden Horseshoe Area Conservation Authorities – Erosion & Sediment Control Guideline for Urban Construction (December 2006)

#### City of Mississauga – Transportation and Works Development Requirements – Section 2

The City of Mississauga stormwater design requirements dictate that storm sewers must be sized to convey at least the 10-year storm event, with the minimum size for a storm sewer on streets of 300 mm in diameter.

#### Credit Valley Conservation Authority – Stormwater Management Criteria (August 2012)

The CVC stormwater management criteria detail the required erosion control, water quality control, and flood controls required for the subject lands. The following are the proposed stormwater management controls for the subject lands:

- Quantity Control: Not required for the development
- Water Quality Control: Enhanced Protection providing 80% TSS removal for 90% of the runoff volume as dictated by the MECP
- Water Balance: Infiltration of 5 mm of rainfall over the impervious site area

#### Greater Golden Horseshoe Area Conservation Authorities – Erosion & Sediment Control Guideline for Urban Construction

The ESC guideline outlines the overall ESC control requirements for land developments. Where possible, measures outlined in the ESC guideline will be implemented into the site design drawings. Refer to Section 6.0 of this report for further details.

## 5.1 Stormwater Quantity Control

As confirmed with the City and CVC staff, stormwater quantity controls are not required for the proposed development given the close proximity to the Credit River.

The Rational Method was used to calculate the site pre-development and post-development flow rates. City of Mississauga Intensity-Duration-Frequency (IDF) Parameters were used in the calculation as well as runoff coefficient adjustment factors for storm events greater than the 10-year storm event. The stormwater flows were estimated to determine the magnitude of the runoff leaving the site and to size the preliminary storm sewer network.

Appendix C contains the Rational Method calculations.

A summary of the total site pre-development and post-development peak stormwater flows are provided in Table 4.

**Table 4: Pre and Post-Development Peak Flow Rates**

Return Period (year)	Peak Flow Rate	
	Pre-Development (m <sup>3</sup> /s)	Post-Development (m <sup>3</sup> /s)
2	0.34	0.45
5	0.45	0.61
10	0.56	0.75
25	0.70	0.95
50	0.86	1.16
100	0.99	1.33

Per the City of Mississauga guidelines, the storm sewer network has been sized to convey the anticipated stormwater flows from the 10-year design storm event from Catchment 203. Storm sewers with a 450 mm diameter can achieve this criterion for conveyance. The free-flow conveyance capacity of a 450 mm diameter storm sewer with a slope of 2 % is 0.40 m<sup>3</sup>/s, which is greater than the estimated 10-year peak flow of 0.35 m<sup>3</sup>/s from Catchment 203. The size of all storm sewers will be refined during the detailed design stage.

## 5.2 Stormwater Quality Control

City of Mississauga and CVC criteria require that the proposed development provide 80% TSS removal for 90% of the runoff volume. As previously mentioned in Section 4.2 stormwater runoff from the site will be directed to a drainage block. An oil-grit separator (OGS) is proposed upstream of the stormwater retention facility. The OGS will provide 80% TSS removal for 90% of the runoff volume. OGS sizing will be confirmed through coordination with the manufacturer during the detailed design stage of this project. The OGS is proposed in conjunction with an isolator row provided within the stormwater retention facility is proposed to meet the overall site water quality criteria. An infiltrating stormwater chamber retention system is proposed within the drainage block to meet the required water balance criteria. The retention facility will be fitted with a header row which will provide additional water quality removal benefits. This treatment train approach will be sufficient to meet the water quality control criteria.

The Oil Grit Separator and proposed storage chamber footprint are illustrated on Figure 2 and additional details from these systems can be found in Appendix C.

### **5.3 Water Balance**

In order to meet Water Balance criteria as outlined by the CVC, infiltration of 5 mm of rainfall over the impervious area ( $2.60 \text{ ha} \times 0.65 \times 5 \text{ mm} = 85 \text{ m}^3$ ) is required, assuming a site impervious area of 65%. This criterion can be achieved using an underground Triton storage chamber (or approved equivalent). The required storage volume will be provided below the outlet elevation of the proposed storage chamber, which has been sized to provide a total volume of  $140 \text{ m}^3$ , including  $85 \text{ m}^3$  below the outlet invert elevation. The stormwater storage chamber will have an open bottom, allowing infiltration of the 5 mm volume from the impervious site area. In-situ infiltration testing of the underlying soils in the location of the proposed storage chambers will be completed during the detailed design stage to confirm the infiltration rates of underlying soils. The preliminary storage tank detention calculations are included in Appendix C.

### **6.0 Sustainable Stormwater Management Measures**

Low Impact Development (LID) techniques will be incorporated into the grading and drainage design of the site in the form of an underground chamber stormwater retention system. This technique has been specified with reference to the CVC/TRCA guidelines on Low Impact Development Stormwater Management Planning & Design Guide (Version 1.0, 2010), as described below.

The proposed underground storage chamber is proposed to have an open bottom, allowing infiltration of approximately  $85 \text{ m}^3$ . The chambers will provide temporary storage of runoff and promote infiltration to the underlying soils. The proposed isolator row of the underground stormwater chamber system will provide additional quality control in a treatment train approach with the upstream Oil Grit Separator.

Implementation of the above described LID techniques are sustainable means for providing stormwater quality and quantity treatment. Further details will be provided at the detailed design stage.

### **7.0 Erosion and Sediment Control During Construction**

Erosion and sediment controls will be installed prior to the commencement of any construction activities and will be maintained until the site is stabilized or as directed by the Site Engineer and/or the City of Mississauga. Controls will be inspected after each significant rainfall event and maintained in proper working condition.

The following sediment and erosion controls will be included during construction on the site:

#### Heavy Duty Silt Fencing

Heavy Duty Silt fence will be installed on the perimeter of the site to intercept sheet flow. Additional silt fence may be added based on field decisions by the Site Engineer and Owner, prior to, during and following construction.

#### Rock Mud Mat

A rock mud mat will be installed at the entrance to the construction zone in order to prevent mud tracking from the site onto the surrounding lands and perimeter roadway network. All construction traffic will be restricted to this access only.

### Silt sack's in Catch basins

A silt sack shall be installed in the existing nearby storm sewer catch basins.

### Interceptor Swales with Check Dams

Interceptor swales will be required during site construction because of the large elevation changes throughout the site and proximity to both the Credit River and Carolyn Creek. Rock check dams will be proposed throughout the interceptor swales where runoff velocities are too high.

## **8.0 Conclusions & Recommendations**

The proposed development can be serviced for water, sanitary and stormwater in accordance with the City of Mississauga, Region of Peel and Credit Valley Conservation Authority requirements. Based on the information contained in this report, we offer the following conclusions:

1. At a population of approximately 203 persons in the proposed 75 townhome units, the peak water demand is equal to 1.97 L/s. A fire flow of 100 L/s for 2 hours is required. Water demand for the proposed development will be met using a 150 mm diameter water service connection to the existing 150 mm municipal watermain along Barbertown Road, with an extension to the existing watermain.
2. The peak sanitary flow for the proposed townhome development is 3.46 L/s, however per Region of Peel Standards, a design rate of 13.0 L/s must be used for populations under 1000 persons. Sanitary flow for the proposed development will be met using a new 200 mm diameter PVC sanitary sewer connection, which will connect to the existing 675 mm sanitary sewer along Barbertown Road.
3. Stormwater management quantity controls are not required for the development.
4. Stormwater quality control for the proposed development will be met by an Oil Grit Separator, providing an enhanced level of protection as stated by the MOECP (80% removal of suspended solids from 90% of the runoff volume), in a treatment train with an isolator row of an underground storage chamber system.
5. Water balance will be provided by a proposed Triton underground infiltration chamber system which has been sized for 5 mm of rainfall over the impervious development area (85 m<sup>3</sup>).

Based on the aforementioned conclusions and recommendations, we support the approval of the Zoning By-law Amendment application from the perspective of functional servicing and stormwater management.

Respectfully submitted,

**C.F. CROZIER & ASSOCIATES INC.**



Lucas Parsons, E.I.T  
Water Resources

**C.F. CROZIER & ASSOCIATES INC.**



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# APPENDIX A

## Water Demand Calculations



Project: 1725 Barbertown Rd  
 Project No.: 1019-3988

Date: 2015-10-22  
 Revised: 2019-03-15  
 Designed By: LP/JV  
 Checked By: NM

**WATER DEMAND CALCULATIONS**

**Region fo Peel - Design Criteria**

Developable Site Area            2.60 ha  
**Total Number of Units            75 units**

Domestic Water Demand

Population Density =            2.7 PPU  
**Population =                        203 persons**

Average Daily Demand =        280 L/cap/d  
 Max Day Factor =                2.0  
 Peak Hour Factor =               3.0

**Average Day Demand                56,700 L/d**  
**0.66 L/s**

**Peak Hourly Demand                170,100 L/d**  
**1.97 L/s**

**Maximum Daily Demand            113,400 L/d**  
**1.31 L/s**

References

*\* As per Site Plan prepared by RN Design Inc., March 2019*

*\* Region of Peel - Public Works Sanitary Sewer Design Criteria - Section 2.1*

*\* Population density for townhouses according to Region of Peel - Public Works Watermain Design Criteria - Section 2.3*



**Water Supply for Public Fire Protection - 1999  
Fire Underwriters Survey**

**Part II - Guide for Determination of Required Fire Flow**

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \text{sqrt } A$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

- = 1.5 for wood frame construction (structure essentially all combustible)
- = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
- = 0.8 for non-combustible construction (unprotected metal structural components)
- = 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

**Proposed Buildings**

A = 340.0 sq.m. Approximate GFA for 2 townhouse units (2 - 5.0m 3-storey units) per RN Design LTD. Site Plan received April, 2018 (assumed fire break walls between every other unit)

C = 1.0 assume ordinary construction

**Therefore F = 4,057 L/min**

Fire flow determined above shall not exceed:

- 30,000 L/min for wood frame construction
- 30,000 L/min for ordinary construction
- 25,000 L/min for non-combustible construction
- 25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Combustible 0% reduction

**0 L/min reduction  
4,057 L/min**

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

**Building does not have any sprinkler system**

**0 L/min reduction**

**Water Supply for Public Fire Protection - 1999**  
**Fire Underwriters Survey**

**Part II - Guide for Determination of Required Fire Flow**

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

**NOTE:** Calculation for building separation assumed using two unit townhouse block (with fire break walls to the immediately adjacent units) in the middle of the development.

**Exposed buildings**

Name	Distance (m)	Charge (%)	Surcharge (L/s)
North Adjacent Dwelling	-	0%	0
South Adjacent Dwelling	18	15%	608.5
East Adjacent Dwelling	14	15%	608.5
West Adjacent Dwelling	18	15%	608.5
			<b>1,825 L/min Surcharge</b>

**Determine Required Fire Flow**

No.1	4,057	
No. 2	0 reduction	
No. 3	0 reduction	
No. 4	<u>1,825</u> surcharge	
<b>Required Flow:</b>	<b>5,882 L/min</b>	
<b>Rounded to nearest 1000 L/min:</b>	<b>6,000 L/min</b>	or 100.0 L/s 1,585 USGPM

**Required Duration of Fire Flow**

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
<b>6,000</b>	<b>2.0</b>
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

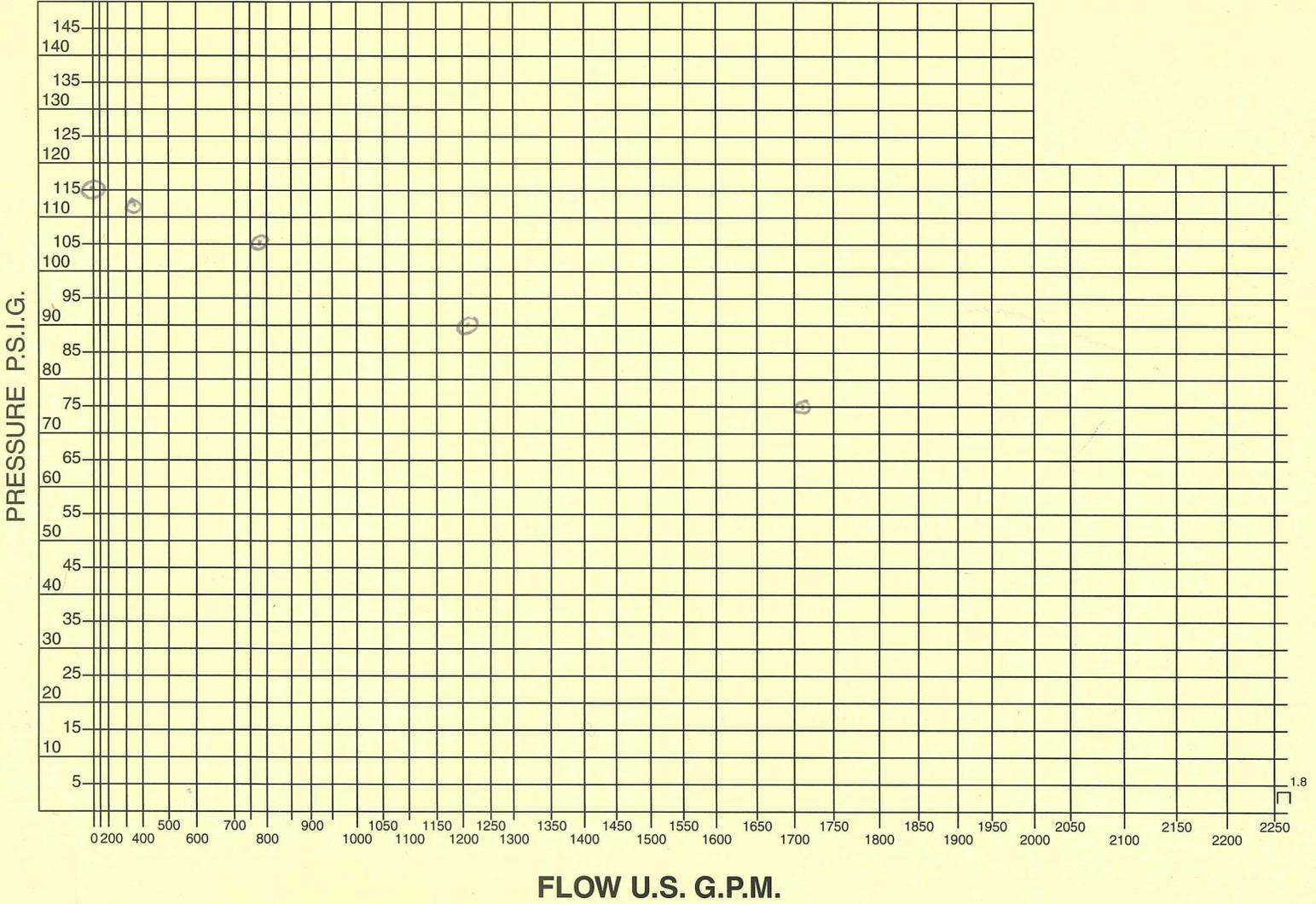
# CORIX®

## Water Services

10 Estate Drive, Toronto, Ontario M1H 2Z1  
 Phone: 416.282.1665 Fax: 416.282.7702 Toll Free: 1.888.349.2493  
[www.corix.com](http://www.corix.com)

SITE NAME: CROZIER & ASSO. DATE: 26 NOV'15 THU  
 LOCATION: 1725 BARGERTOWN RD. MISS.  
 TEST DATA TIME OF TEST: 1:20PM  
 LOCATION OF TEST: (FLOW) #5063 MANDY COURT., MISS  
 (RESIDUAL) # 1725 BARGERTOWN RD. MISS.  
 MAIN SIZE: 6" φ  
 STATIC PRESSURE: 115 \*

	NUMBER OF OUTLETS & ORIFICE SIZE	PITOT PRESSURE	FLOW (U.S. G.P.M.)	RESIDUAL PRESSURE
# 1	1 1/8" φ	88	352	112
# 2	1 3/4" φ	74	782	105
# 3	1 x 2 1/2" φ	52	1207	90
# 4	2 x 2 1/2" φ	26	1707	75



COMMENTS: PERFORM COMPLETE FLOWTESTING AS PER  
NFPA 291.

Authorized Signature \_\_\_\_\_ Corix Water Services Signature Doug Taylor / Roberto Guido



PROJECT: 1725 Barbertown  
Road  
PROJECT No.: 1019-3988  
FILE: Demand  
DATE: 6/6/2016  
UPDATE: 1/17/2017  
DESIGN: LP  
CHECK: AS

**Date of Flow Tests - Nov 26, 2015**

Test	Hydrant Location / ID	Static Pressure	Residual Pressure during Test	Flow from Hydrant Test	Desired Residual Pressure	Projected Fire Flow Available at 20 psi
		Ps	Pt	Qt	Pr	Qr
		(psi)	(psi)	(USGPM)	(psi)	(USGPM)
1	5063 Mandy Court	115	112	352	20	2,274
2			105	782		2,637
3			90	1207		2,482
4			75	1707		2,723

$Q_r = Q_t \times ((P_s - P_r)/(P_s - P_t))^{0.54}$       Formula to determine available flow as per AWWA M17 (1989)

NOTE: Projected fire flows are calculated on the basis of hydrant tests carried out by Corix Water Services Inc. on Nov.26, 2015 at 1:20pm.



Project: Barbertown  
 Project No.: 1019-3988  
 File: RoP Connection Table  
 Design: LP  
 Date: 2017.01.17  
 Revised: 2019.03.13  
 Check: NM

Connection Demand Table				
Water Connection		5063 Mandy Court		
<b>Connection point</b>		Connects to 150 mm diameter watermain on Mandy Court		
<b>Pressure zone of connection point</b>		3		
<b>Total equivalent population to be serviced</b>		203		
<b>Total lands to be serviced</b>		2.6 ha		
<b>Hydrant flow test:</b>				
1)	Hydrant flow test location	5063 Mandy Court		
2)	Date of test	26-Nov-15		
		Pressure (kPa)	Flow (in l/s)	Time
	Minimum water pressure	517.11	107.69	1:20pm
	Maximum water pressure	792.9	-	1:20pm
<b>Water Demands</b>				
No.	Demand Type	Demand (in l/s)		Total
1	Average day flow	0.66		0.66
2	Maximum day flow	1.31		1.31
3	Peak hour flow	1.97		1.97
4	Fire flow	100		100
<b>Analysis</b>				
5	Maximum day plus fire flow	101.31		101.31
<b>WASTEWATER CONNECTION</b>				
				<b>Total</b>
<b>Connection Point</b>		Connects to 200 mm diameter sanitary sewer on Mandy Court		
<b>Total equivalent population to be serviced</b>		203		203
<b>Total lands to be serviced (ha)</b>		2.6		2.6
6	Wastewater sewer effluent (in l/s)	<b>3.46</b>		<b>3.46</b>



# APPENDIX B

## Sanitary Flow Calculations



**SANITARY DEMAND CALCULATIONS**

**City of Mississauga / Region of Peel - Design Criteria**

**References**

Developable Site Area            2.60 ha  
**Total Number of Units            75 units**

*\* As per Site Plan prepared by RN Design Inc., January 2019*

**Sanitary Design**

Population Density =            2.7 PPU  
**Population =                        203 persons**

*\* Region of Peel - Public Works Sanitary Sewer Design Criteria - Section 2.1*

$$\text{Harmon Peaking Factor (KH)} = 1 + \frac{14}{4 + P^{(0.5)}}$$

Where:

P is population in thousands

KH =                        4.15

Average Daily Demand =        302.8 L/cap/d  
Infiltration Flow =                0.20 L/ha/s

*\*According to Region of Peel - Public Works Sanitary Sewer Design Criteria - Standard Drawing 2-5-2*

**Average Day Flow                    61,317 L/d**  
**0.71 L/s**

**Peak Flow                                254,224 L/d**  
**2.94 L/s**

**Infiltration Flow                        44,928 L/d**  
**0.52 L/s**

**TOTAL PROPOSED SANITARY FLOW            3.46 L/s**

# APPENDIX C

## Stormwater Management Calculations



**Project:** 1725 Barbertown Road  
**Project No.:** 1019-3988  
**Created By:** LP  
**Checked By:** JV/NM  
**Date:** 2018-04-11  
**Updated:** 2019-03-13

### Modified Rational Calculations - Input Parameters

**Storm Data: City of Mississauga**

**Time of Concentration:**  $T_c = 15$  min (per city of Mississauga standards)

Return Period	A	B	C	I (mm/hr)
2 yr	610	4.6	0.78	59.89
5 yr	820	4.6	0.78	80.51
10 yr	1010	4.6	0.78	99.17
25 yr	1160	4.6	0.78	113.89
50 yr	1300	4.7	0.78	127.13
100 yr	1450	4.9	0.78	140.69

Intensity  
 $i(T_d) = A / (T + B)^C$

Pre - Development Conditions				
Land Use	Area (ha)	Area (m <sup>2</sup> )	C	Weighted Average C <sup>1</sup>
Catchment 101	2.71	27100	0.25	0.68
Catchment 102	4.44	44400	0.30	1.33
<b>Total Area</b>	<b>7.15</b>	<b>71500</b>	-	<b>0.28</b>

Post - Development Conditions				
Land Use	Area (ha)	Area (m <sup>2</sup> )	C	Weighted Average C
Catchment 201	2.69	26900	0.25	0.67
Catchment 202	2.16	21600	0.25	0.54
Catchment 203	1.96	19600	0.65	1.27
Catchment 204	0.34	3400	0.65	0.22
<b>Total Area</b>	<b>7.15</b>	<b>71500</b>	-	<b>0.38</b>

RC value of 0.65 for townhome areas from City of Mississauga Development Requirements Manual, 2016

Pre- and Post-Development Adjusted Runoff Coefficients			
Return Period	Adjustment Factor	Pre-Development Adjusted RC	Post-Development Adjusted RC
2	1.00	0.28	0.38
5	1.00	0.28	0.38
10	1.00	0.28	0.38
25	1.10	0.31	0.42
50	1.20	0.34	0.45
100	1.25	0.35	0.47

## Modified Rational Calculations - Peak Flows Summary

Peak Flows (m <sup>3</sup> /s)			
Return Period	Q <sub>pre-total</sub> <sup>1</sup>	Q <sub>post-total</sub> <sup>2</sup>	Q <sub>203</sub> <sup>3</sup>
<b>2 yr</b>	0.34	0.45	0.21
<b>5 yr</b>	0.45	0.61	0.29
<b>10 yr</b>	0.56	0.75	0.35
<b>25 yr</b>	0.70	0.95	0.45
<b>50 yr</b>	0.86	1.16	0.54
<b>100 yr</b>	0.99	1.33	0.63

- Notes
- 1 Area Pre-Total = Catchments 101 & 102
  - 2 Area Post-Total = Catchments 201, 202, 203 & 204
  - 3 Area 203 calculated to estimate pipe sizing for minor system

**Equations:**

Peak Flow

$$Q_{\text{post}} = 0.0028 \cdot C_{\text{post}} \cdot i(T_d) \cdot A$$

# Triton System Calculator

## Site Calculator

### Parameters

Units:  ▼

Storage Volume:  Cu. m

Chamber Selection:  ▼

Header Row Position:  ▼

Fill Over Embedment Stone:  mm

Controlled By:  ▼  m

---

**Embedment Stone: (mm)**

Over:  Under:  Porosity:

Min. 150mm over and under

---

**Double Stacked**

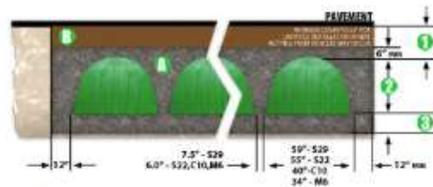
Double Stacked?:

Stone Between:

Note: After making any input change you must hit calculate to update the Field Diagram and Project Results.  
This calculator is provided for your convenience only and is not meant for final quotation and/or engineering purposes.  
\*Please contact Triton for more information.  
\* This image generation will not save if using Microsoft Edge

**CALCULATE**

### Project Results



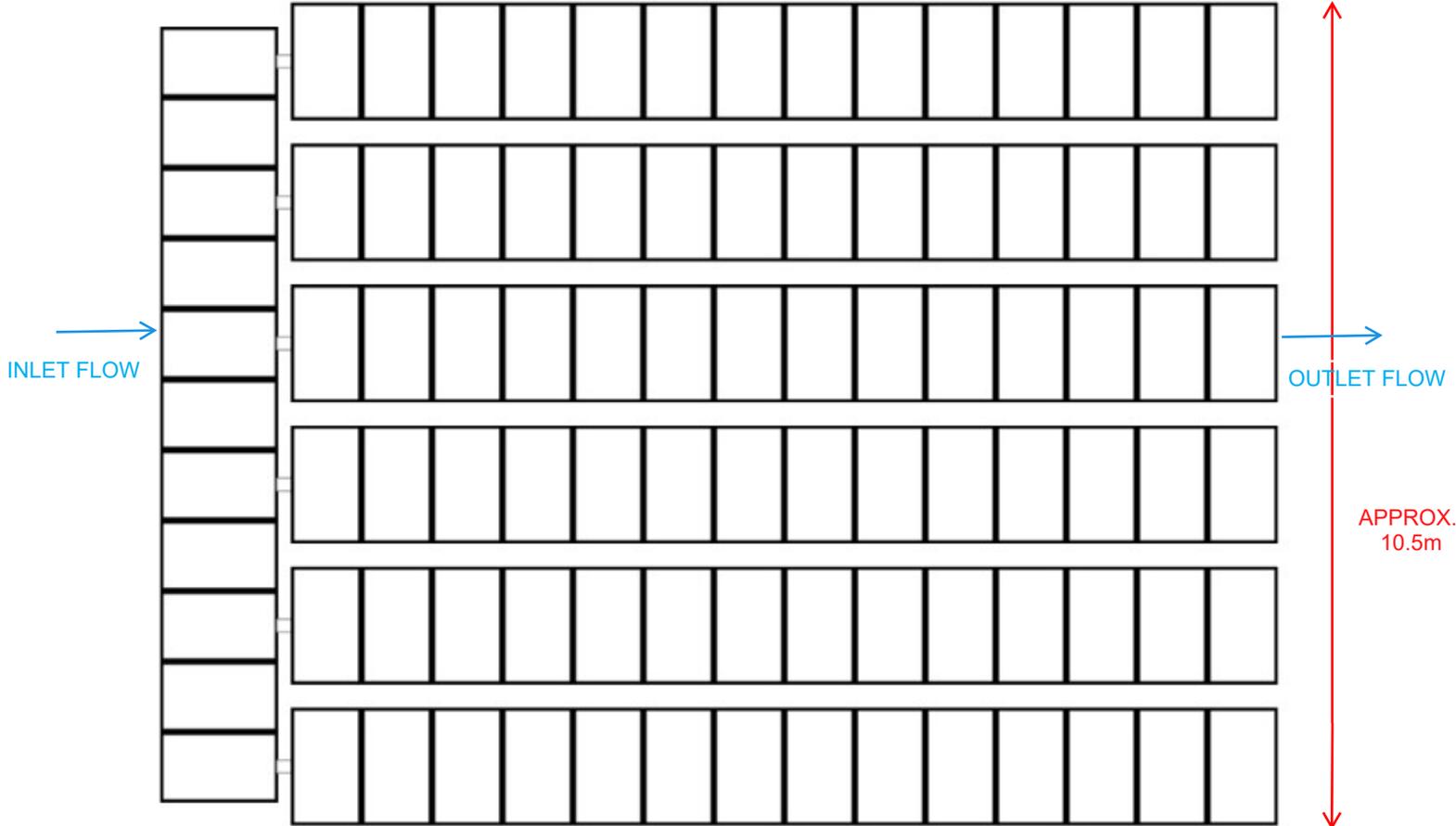
1 Total Cover Over Chambers:	600 mm
2 Height Of Chamber:	914 mm
3 Embedment Stone Under Chambers:	300 mm
4 Volume of Embedment Stone Required:	169 Cu. m
5 Volume of Fill Material Required:	46 Cu. m

Total Storage Provided:	137 Cu. m
Type Of Chambers:	S-29
# Of Chambers Required:	95
# Of End Caps Required:	14
Required Bed Size:	154 Sq. m
Volume of Excavation:	280 Cu. m
* Area of Filter Fabric:	230 Sq. m
# of Chambers long:	14
# of rows:	6
Actual Trench Length:	14.56 m
Actual Trench Width:	10.55 m

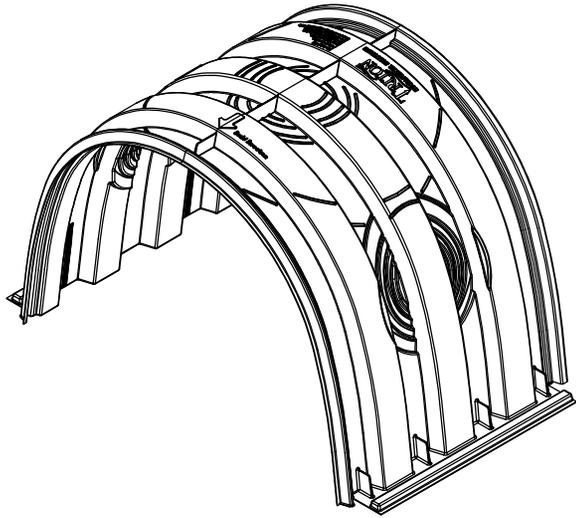
\* Filter fabric quantity for Fabric on Top and Sides of System Only, does not include overlap

# Triton System Layout

← APPROX. 14m →



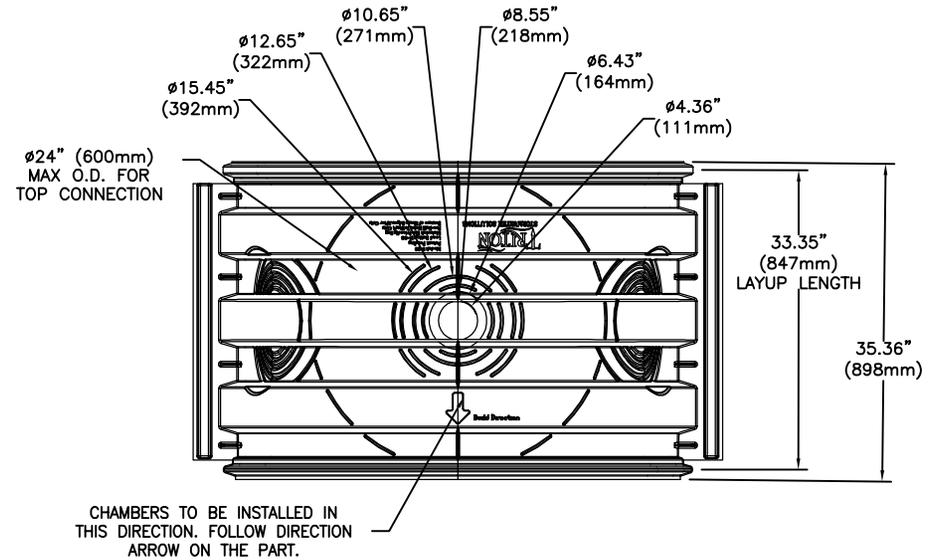
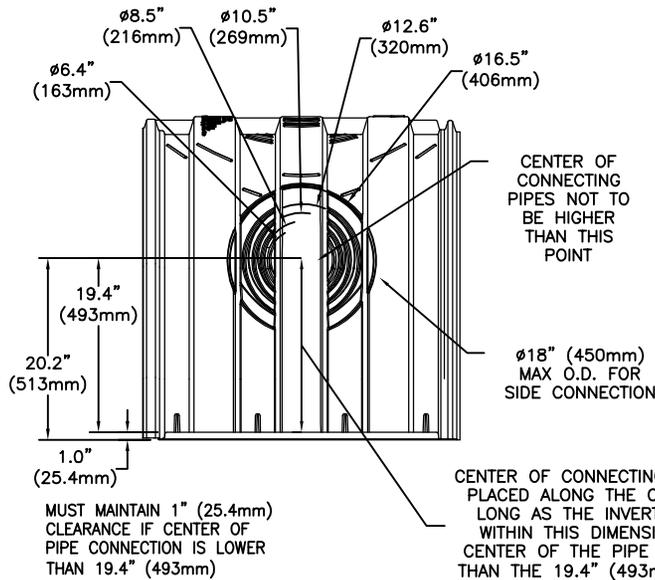
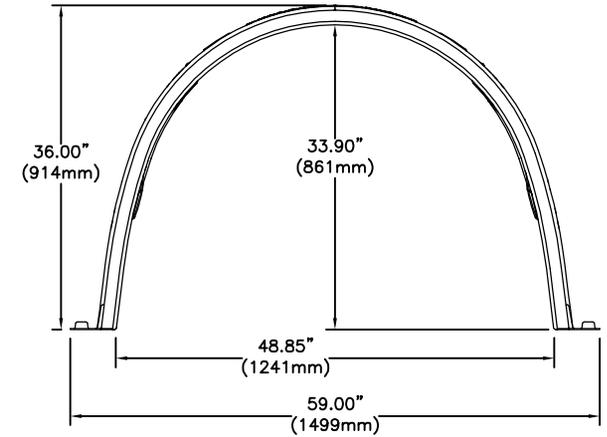
N.T.S.



S-29 CHAMBER SPECS	
NOMINAL DIMENSIONS (LAYOUT LENGTH X WIDTH X HEIGHT)	33.35" X 59.00" X 36.00" (847mm X 1499mm X 914mm)
BARE CHAMBER STORAGE	27.35 CUBIC FEET (0.774 CUBIC METERS)
*MIN INSTALLED STORAGE	41.05 CUBIC FEET (1.162 CUBIC METERS)
CHAMBER WEIGHT	32 lbs (14.515 kg)
STORAGE PER LINEAR FOOT WITHOUT STONE	9.84 CUBIC FEET (0.279 CUBIC METERS)
STORAGE PER LINEAR FOOT WITH STONE	14.77 CUBIC FEET (0.418 CUBIC METERS)

\*ASSUMING A MIN OF 6" (152mm) STONE ABOVE AND BELOW AND 7.5" (191mm) BETWEEN ROWS WITH 40% STONE POROSITY (DOES NOT INCLUDE 12" (305mm) PERIMETER STONE VOLUME)

NOTE: S-29 CHAMBER DETAILS TESTED AND RATED FOR H-30 LOAD CONDITIONS WITH 18" (457mm) OF COVER AND NO PAVEMENT.



**CONCEPTUAL PLAN DISCLAIMER**  
THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE TRITON CHAMBER SYSTEM FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. TRITON PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH TRITON'S MINIMUM REQUIREMENTS. TRITON STORMWATER SOLUTIONS DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

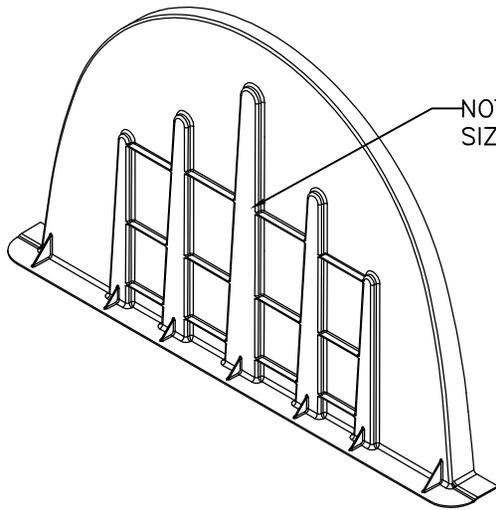


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# S-29 CHAMBER DETAIL

TRITON - STANDARD DETAILS

REVISED:  
02-26-16 JWM



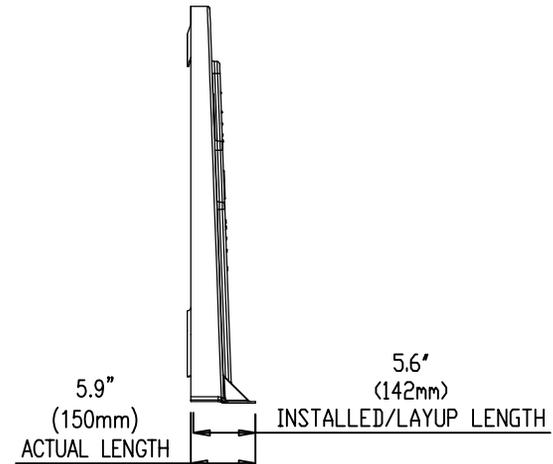
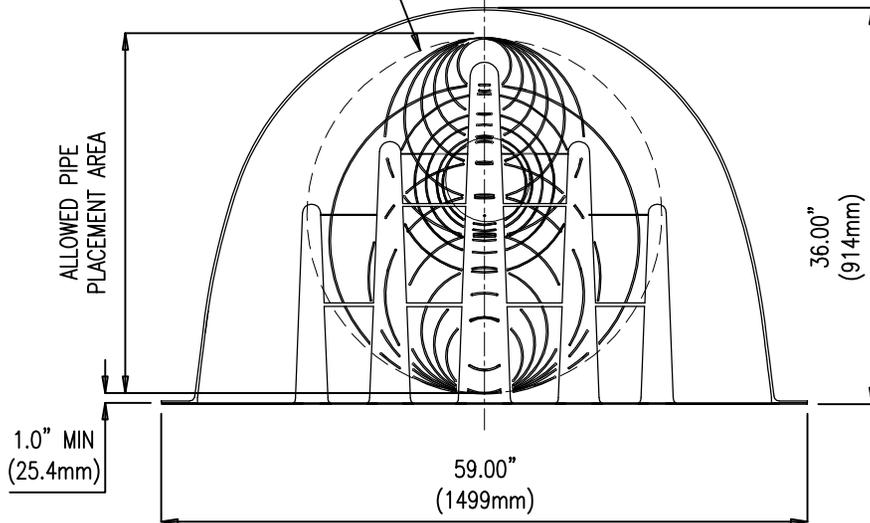
NOTE: REFER TO PAGE 2 FOR SIZES OF DIAMETER CUT GUIDES.

S-29 END CAP SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X WIDTH X HEIGHT)	5.90" X 59.00" X 36.00" (150mm X 1499mm X 914mm)
BARE END CAP STORAGE	1.031 CUBIC FEET (0.029 CUBIC METERS)
*MIN INSTALLED STORAGE	4.98 CUBIC FEET (0.141 CUBIC METERS)

\*ASSUMING A MIN OF 6" (152mm) STONE ABOVE AND BELOW AND 7.5" (191mm) BETWEEN ROWS WITH 40% STONE POROSITY (DOES NOT INCLUDE 12" (305mm) PERIMETER STONE VOLUME)

ø32" (810mm) MAX O.D.  
FOR END CONNECTION  
(see page 2 for guide diameters)

ALL PIPE CONNECTIONS  
MUST BE INSTALLED ALONG  
CHAMBER CAP CENTERLINE.



THE END CAP FITS UP ON THE OUTSIDE OF THE S-29 CHAMBER. REFER TO INSTALLATION MANUAL FOR FURTHER DETAIL.

**CONCEPTUAL PLAN DISCLAIMER**

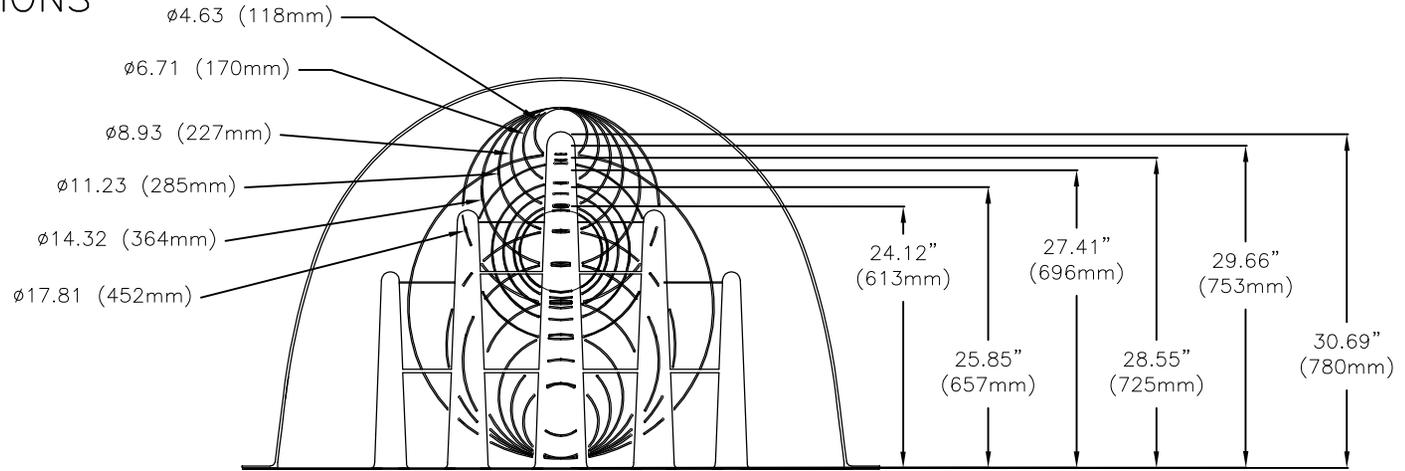
THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE TRITON CHAMBER SYSTEM FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. TRITON PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH TRITON'S MINIMUM REQUIREMENTS. TRITON STORMWATER SOLUTIONS DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.



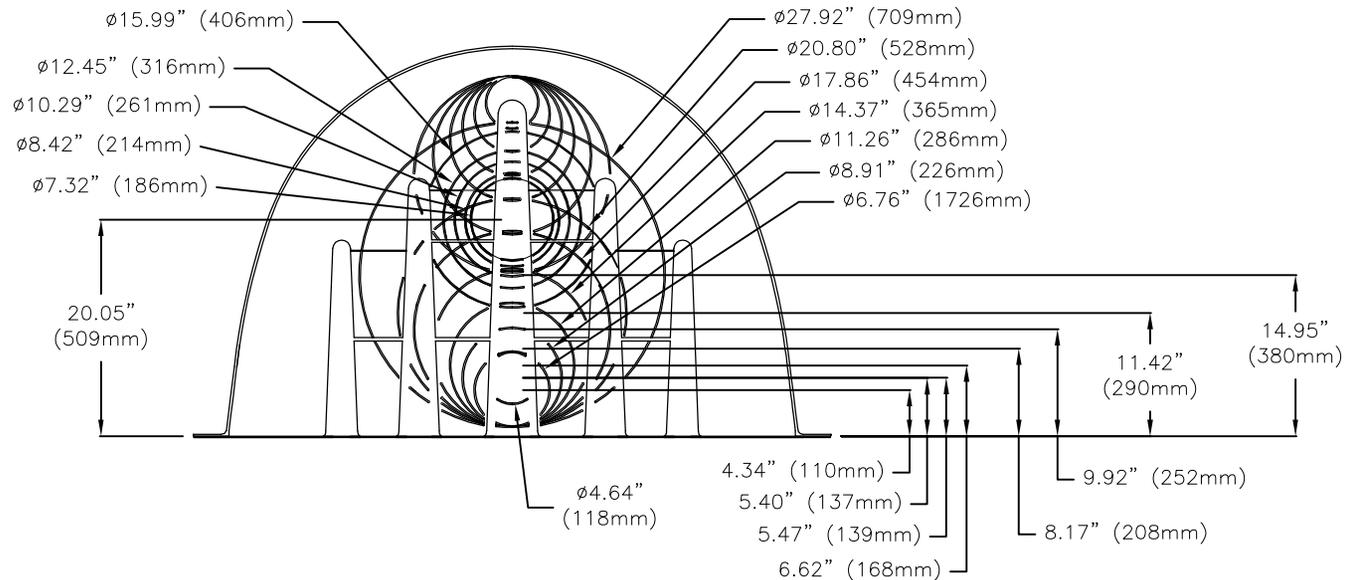
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# S-29 CHAMBER END CAP DETAIL

## S-29 END CAP: TOP HOLE DIMENSIONS



## S-29 END CAP: CENTER AND BOTTOM HOLE DIMENSIONS



### CONCEPTUAL PLAN DISCLAIMER

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## S-29 CHAMBER END CAP DETAIL

TRITON - STANDARD DETAILS

PAGE 2 OF 2

REVISED:  
02-26-16 JWM

# TRITON S-29 PRODUCT SPECIFICATIONS

## 1.0 General

1.1 Triton chambers are designed to control stormwater runoff. As a subsurface retention or detention system, Triton chambers retain and allow effective infiltration of water into the soil. As a subsurface detention system, Triton chambers detain and allow for the metered flow of water to an outfall.

## 2.0 Chamber Parameters

2.1 The chamber shall be injection compression molded of a structural grade 1010 green soy resin composite to be inherently resistant to environmental stress cracking (ESCR), creep, and to maintain proper stiffness through temperature ranges of -40 degrees F to 180 degrees F.

2.2 The material property for the chamber and end cap must meet or exceed the following:

Tensile Strength- Ultimate: 21,755 PSI

Tensile Strength-Yield: 17,404 PSI

Tensile Modulus: 1,750-2,240 PSI

Flex Modulus: 1,600 KSI

Flex Yield Strength: 33,100 PSI

Compressive Strength: 30,457,000 PSI

Shear Strength: 11,500 PSI

2.3 The nominal chamber dimensions of the Triton S-29 shall be 36.0 inches tall, 59.0 inches wide and 35.0 inches long. Lay-up length is 33.35"

2.4 The chamber shall have an elliptical curved section profile.

2.5 The chamber shall be open-bottomed.

2.6 The chamber shall incorporate an overlapping corrugation joint system to allow chamber rows to be constructed.

2.7 The nominal storage volume of a Triton S-29 chamber shall be 41.06 cubic feet per chamber when installed per Triton's typical details. This equates to 2.67 cubic feet of storage/square foot of bed. This does not include perimeter stone.

2.8 The chamber shall have both of its ends open to allow for unimpeded hydraulic flows and visual inspections down a row's entire length.

2.9 The chamber shall have five corrugations to achieve strengths defined above.

2.10 The chamber shall have five circular and elliptical, indented and raised, surfaces on the top to the chamber for a maximum of 33 inch diameter optional top feed inlets, inspection ports and or clean-out access ports.

2.11 The chamber shall have 5 elliptical, indented, surfaces on either side of the chamber for optional feed inlets, outlets. Capable of accepting pipe O.D. up to 18 inches.

2.12 The chamber shall be analyzed, designed and field tested using AASHTO LRFD bridge design specifications 1. Design live load shall meet or exceed the AASHTO HS30 or a rear axle load of 48,000 pounds. Design shall consider earth and live loads without pavement as appropriate for the minimum of 18" of total cover to a maximum total cover of 50'.

2.13 The chamber shall be manufactured in an ISO 9001:2008 certified facility

2.14 The service life of the product is over 60 years under a constant sustained load of 10,000 PSI which is equal to the H-20 loading condition. Under typical loading conditions the Chamber and End Cap has a useful lifespan of 120 years from date of when manufactured.

2.15 Designed to exceed ASTM F2418, F2787, F2922 standard and AASHTO LRFD Bridge specifications. Validated through independent third party performance testing.

## 3.0 End Cap Parameters

3.1 The end cap shall be Injection Compression molded of 1010 green soy resin to be inherently resistant to environmental stress cracking (ESCR), creep and to maintain proper stiffness through temperature ranges of -40 degrees F to 180 degrees F.

3.2 The end cap shall be designed to fit over the last corrugation of a chamber, which allows: the capping of each end of the chamber row.

3.3 The end cap shall have six upper saw guides capable of accepting pipe O.D. up to 18.2" Six middle saw guides and eight lower saw guides capable of accepting pipe O.D. up to 28.2" to allow easy cutting for various diameters of pipe that may be used to inlet or outlet the system.

3.4 The end cap shall have excess structural adequacies to allow cutting an orifice of any size at any invert elevation.

3.5 The primary face of an end cap shall have 5 corrugations and be angled outward to resist horizontal loads generated near the edges of beds.

3.6 The end cap shall be manufactured in an ISO 9001:2008 certified facility.

3.7 The service life of the product to be over 60 years under a sustained load of 10,000 PSI which is equal to the H-20 loading condition.

## 4.0 Installation

4.1 Installation shall be in accordance with the latest Triton Installation manual that can be downloaded from the Triton website:  
www.tritonsws.com/support/downloads

### CONCEPTUAL PLAN DISCLAIMER

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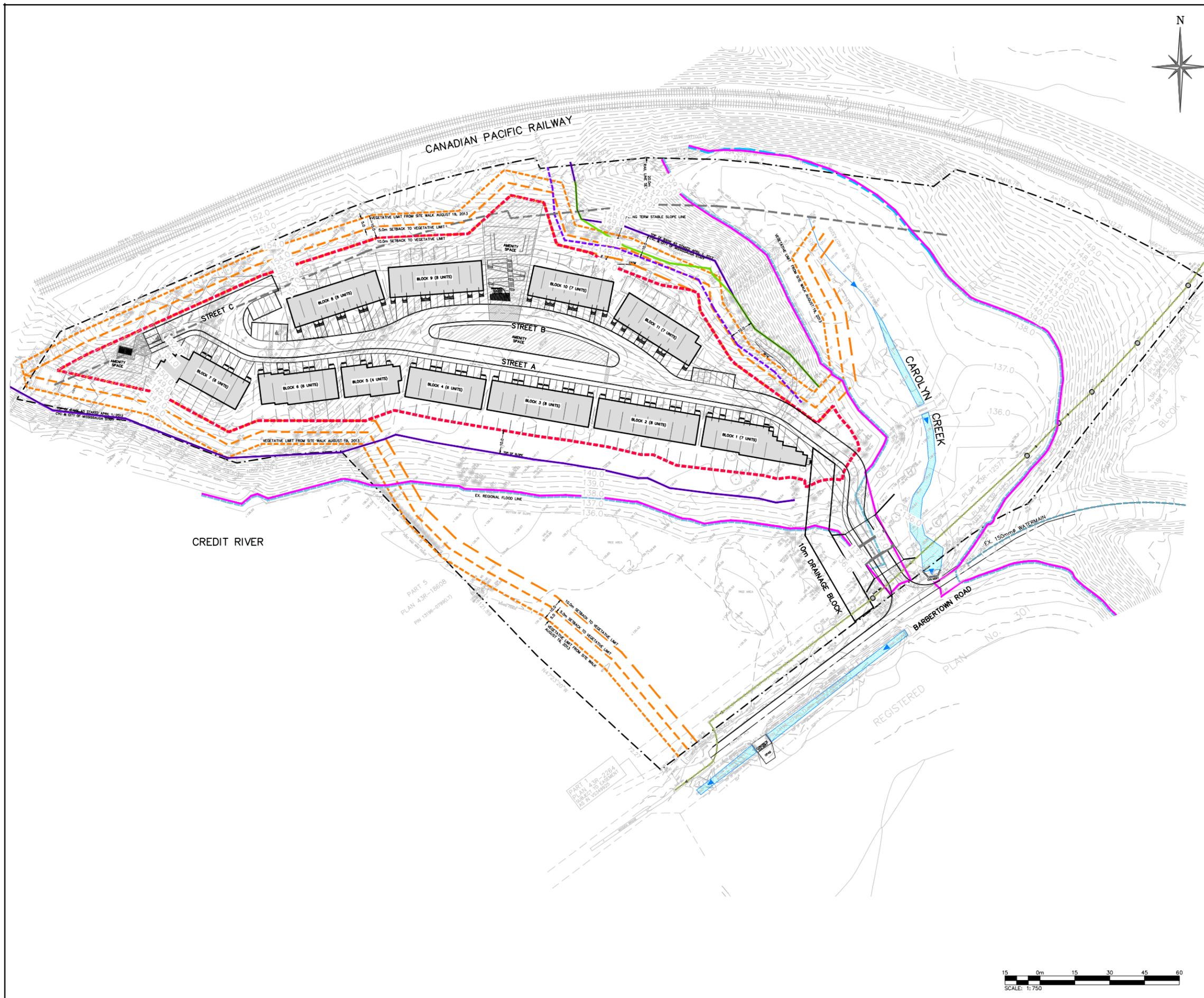
# S-29 PRODUCT SPECIFICATIONS

TRITON - STANDARD DETAILS

REVISED:

05-25-17 JWM

# FIGURES



**LEGEND**

EXISTING FEATURES (EX.)	
---	PROPERTY LINE
- - - 142.50	EXISTING CONTOUR (0.5m)
- - - 142.00	EXISTING CONTOUR (1.0m)
- - - 142.00	EXISTING GRADE
(Tree symbol)	EX. TREE / TREED AREA
- - -	EX. CHAIN LINK FENCE
○ LS	EX. LIGHT STANDARD
- - -	EX. WATERMAIN & GATE VALVE
⊕	EX. FIRE HYDRANT
- - -	EX. SANITARY SEWER & MANHOLE
- - -	EX. WATERCOURSE
- - -	EX. RAILWAY TRACKS
- - -	20.0m RAIL SETBACK TO BUILDINGS
- - -	EX. FLOODLINE
- - -	PR. FLOODLINE
- - -	VEGETATIVE LIMIT FROM SITE WALK AUGUST 19, 2013
- - -	VEGETATIVE LIMIT (5.0m SETBACK)
- - -	VEGETATIVE LIMIT (10.0m SETBACK)
- - -	STAKED TOP OF BANK LINE
- - -	STAKED TOP OF BANK LINE (10.0m SETBACK)
- - -	LONG TERM STABLE SLOPE LINE
- - -	COMPOSITE CONSTRAINT (10.0m SETBACK)

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20
No.	ISSUE / REVISION	YYYY/MM/DD

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 970 & No. 971

**BENCHMARK No. 970:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF MISSISSAUGA ROAD AND EGLINTON AVENUE WEST HAVING AN ELEVATION OF 148.702m

**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC.  
REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD.  
PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

**DRAWING NOTES:**  
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THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.  
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.  
ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.



Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

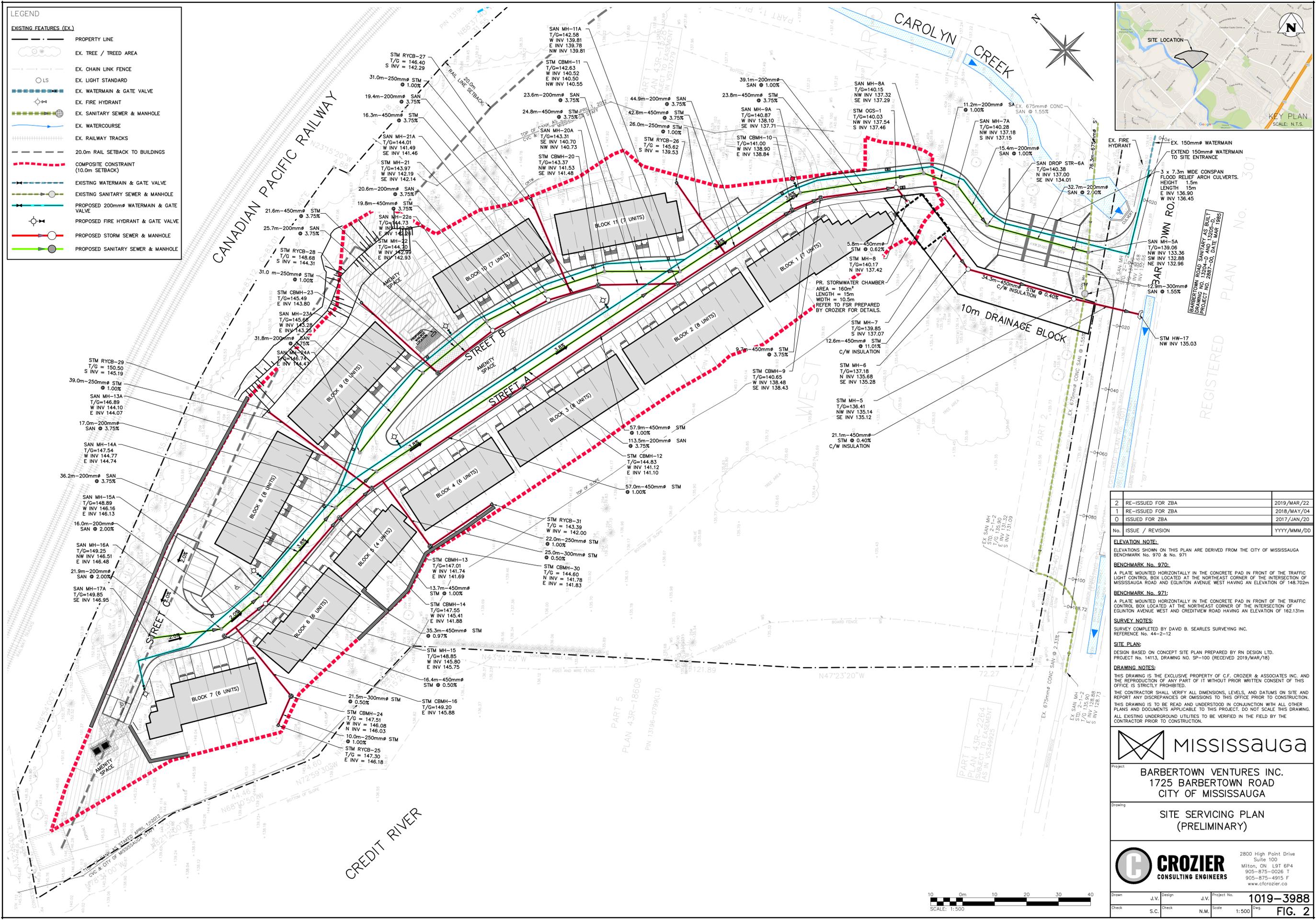
Drawing  
**COMPOSITE CONSTRAINT PLAN**

**CROZIER CONSULTING ENGINEERS**  
2800 High Point Drive  
Suite 100  
Milton, ON L9T 6P4  
905-875-0026 T  
905-875-4915 F  
www.cfcrozier.ca

Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	1:750
				Dwg.	FIG. 1



N:\005\1019-3988-1725-Barbertown\CAD\CD\DRG\DRG\1019-3988\_700.dwg - HE. 1. 2019-03-22 10:07:04 AM  
 DWG TO PDF PLOT: ARCH D (6000 x 2400) (Metric)



No.	ISSUE / REVISION	DATE
2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 970 & No. 971

**BENCHMARK No. 970:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF MISSISSAUGA ROAD AND EGLINTON AVENUE WEST HAVING AN ELEVATION OF 148.702m

**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC. REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD. PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

**DRAWING NOTES:**  
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ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.



Project: **BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing: **SITE SERVICING PLAN (PRELIMINARY)**



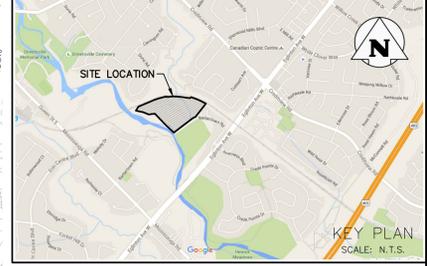
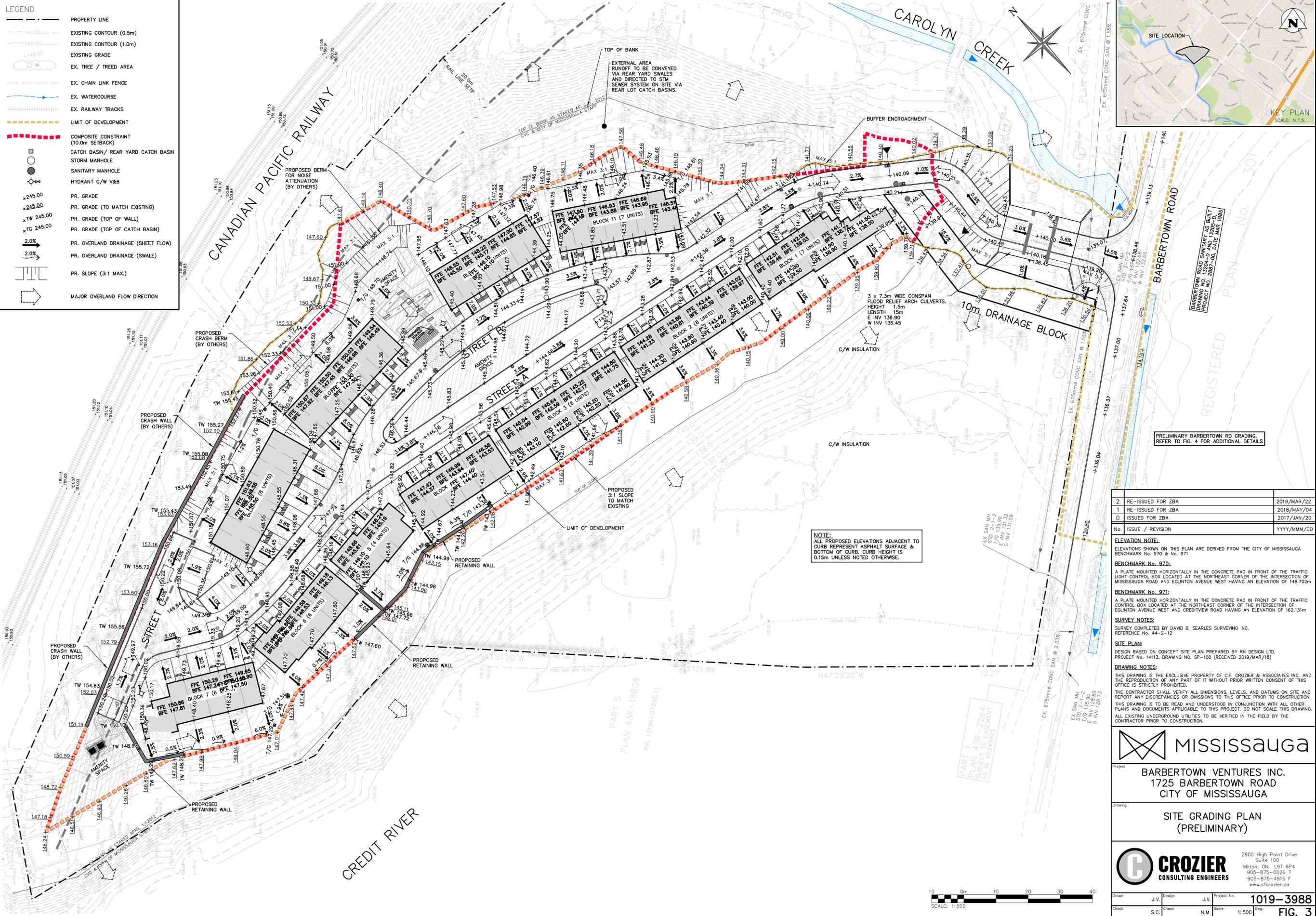
Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	1:500
				Dwg.	FIG. 2



I:\1005\1019-3988-1725 Barbertown\CAD\CADD\1019-3988\_1725.dwg, FIG. 2, 2019-03-22 9:44:43 AM, DWG TO PDF (Acad) (1:500.0 x 24.00 Inches)

**LEGEND**

- PROPERTY LINE
- - - 142.50 EXISTING CONTOUR (0.5m)
- - - 142.00 EXISTING CONTOUR (1.0m)
- - - 142.00 EXISTING GRADE
- ☉ EX. TREE / TREED AREA
- - - EX. CHAIN LINK FENCE
- - - EX. WATERCOURSE
- - - EX. RAILWAY TRACKS
- - - LIMIT OF DEVELOPMENT
- - - COMPOSITE CONSTRAINT (10.0m SETBACK)
- CATCH BASIN/ REAR YARD CATCH BASIN
- STORM MANHOLE
- SANITARY MANHOLE
- HYDRANT C/W V&B
- PR. GRADE
- x245.00 PR. GRADE (TO MATCH EXISTING)
- x245.00 PR. GRADE (TOP OF WALL)
- x245.00 PR. GRADE (TOP OF CATCH BASIN)
- 2.0% PR. OVERLAND DRAINAGE (SHEET FLOW)
- 2.0% PR. OVERLAND DRAINAGE (SWALE)
- PR. SLOPE (3:1 MAX.)
- ➔ MAJOR OVERLAND FLOW DIRECTION



**REGISTERED**

PLAN No. 301

BARBERTOWN ROAD SANITARY AS BUILT DRAWING NO. 2887-00, DATE MAR 1985

PRELIMINARY BARBERTOWN RD GRADING, REFER TO FIG. 4 FOR ADDITIONAL DETAILS

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20
No.	ISSUE / REVISION	YYYY/MM/DD

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 970 & No. 971

**BENCHMARK No. 970:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF MISSISSAUGA ROAD AND EGLINTON AVENUE WEST HAVING AN ELEVATION OF 148.702m

**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC. REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RY DESIGN LTD. PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/19)

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**NOTE:**  
ALL PROPOSED ELEVATIONS ADJACENT TO CURB REPRESENT ASPHALT SURFACE & BOTTOM OF CURB, CURB HEIGHT IS 0.15m UNLESS NOTED OTHERWISE.



**MISSISSAUGA**

Project: **BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing: **SITE GRADING PLAN (PRELIMINARY)**

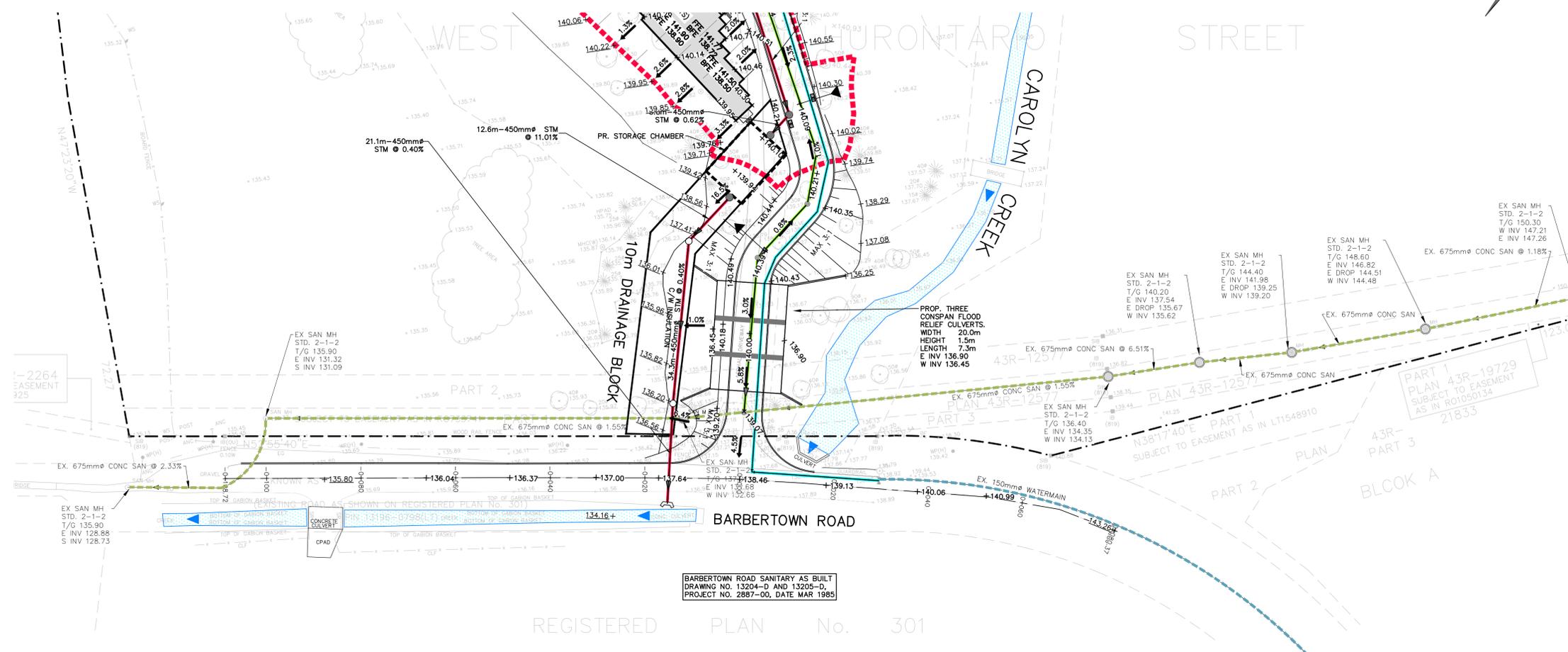
**CROZIER CONSULTING ENGINEERS**  
2800 High Point Drive  
Suite 100  
Mississauga, ON L5T 6P4  
905-875-0026 T  
905-875-4915 F  
www.cfrozier.ca

Drawn: J.V. Design: J.V. Project No: **1019-3988**  
Check: S.C. Check: N.M. Scale: 1:500 Date: **FIG. 3**

I:\1000\019-Stirling\3988-1725 Barbertain\CAD\CADD\SHETS\3988\_700.dwg, FIG. 3, 2019-03-22, 10:19:24 AM, DWG TO PDF, PLOT, ACCT: C:\Users\j.v.2000\Documents\...

**BARBERTOWN ROAD PLAN VIEW**

SCALE 1:500

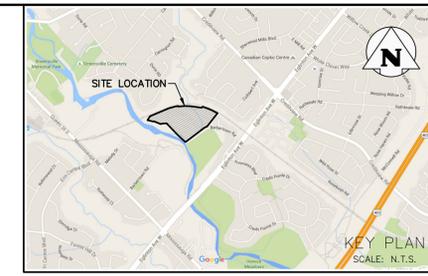
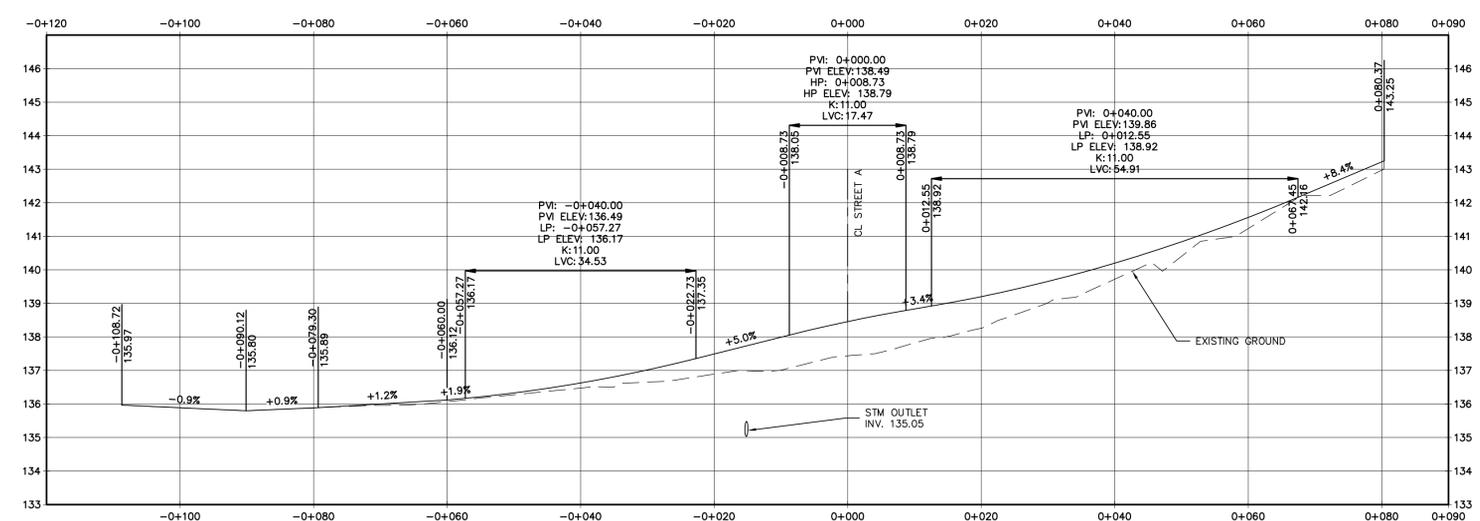


BARBERTOWN ROAD SANITARY AS BUILT  
DRAWING NO. 13204-D AND 13205-D  
PROJECT NO. 2887-00, DATE MAR 1985

REGISTERED PLAN No. 301

**BARBERTOWN ROAD PROFILE**

SCALE: H 1:500  
V 1:100



**LEGEND**

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING GRADE
- EX. TREE / TREE AREA
- EX. CHAIN LINK FENCE
- EX. WATERCOURSE
- EX. RAILWAY TRACKS
- 20.0m RAIL SETBACK TO BUILDINGS
- COMPOSITE CONSTRAINT (10.0m SETBACK)
- EXISTING WATERMAIN & GATE VALVE
- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED 200mm WATERMAIN & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- STORM MANHOLE
- SANITARY MANHOLE
- HYDRANT C/W V&B
- PR. GRADE
- PR. GRADE (TO MATCH EXISTING)
- PR. GRADE (TOP OF WALL)
- PR. OVERLAND DRAINAGE (SHEET FLOW)
- PR. OVERLAND DRAINAGE (SWALE)
- PR. SLOPE (3:1 MAX.)

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20

No.	ISSUE / REVISION	YYYY/MM/DD
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**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 970 & No. 971

**BENCHMARK No. 970:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF MISSISSAUGA ROAD AND EGLINTON AVENUE WEST HAVING AN ELEVATION OF 148.702m

**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC. REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD. PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

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**MISSISSAUGA**

Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing  
**BARBERTOWN ROAD**  
PLAN & PROFILE (PRELIMINARY)

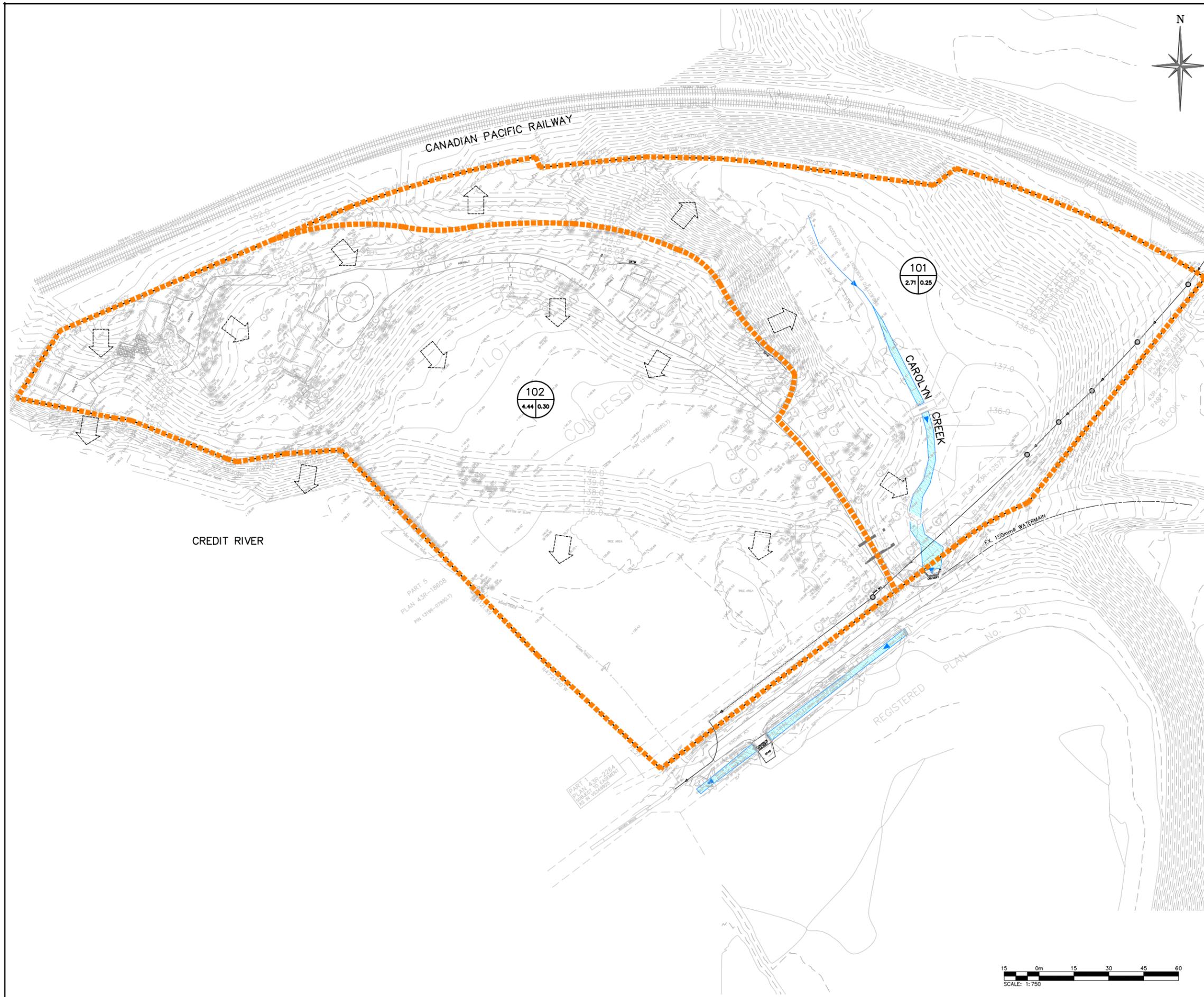
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2800 High Point Drive  
Suite 100  
Milton, ON L9T 6P4  
905-875-0026 T  
905-875-4915 F  
www.cfcrozier.ca

Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	H 1:500 V 1:100

I:\1005\019-Stirling\3988-1725-Barbertown\CAD\CDS\SHETS\3988\_170.dwg, FIG. 4, 2019-03-21 11:40:04 AM.  
 DWG TO PDF PLOT, ARCH, PLOT, A3 (24.00 x 36.00 inches)





**LEGEND**

- PROPERTY LINE
- - - EXISTING CONTOUR (0.5m)
- - - EXISTING CONTOUR (1.0m)
- EXISTING WATERCOURSE
- EXISTING GRADE
- STORM DRAINAGE CATCHMENT
- XXX  
X.XX | X.XX CATCHMENT I.D.  
AREA (ha) | RUNOFF COEFFICIENT
- EXISTING OVERLAND FLOW DIRECTION

No.	ISSUE / REVISION	YYYY/MM/DD
2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20

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**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC.  
REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD.  
PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

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Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

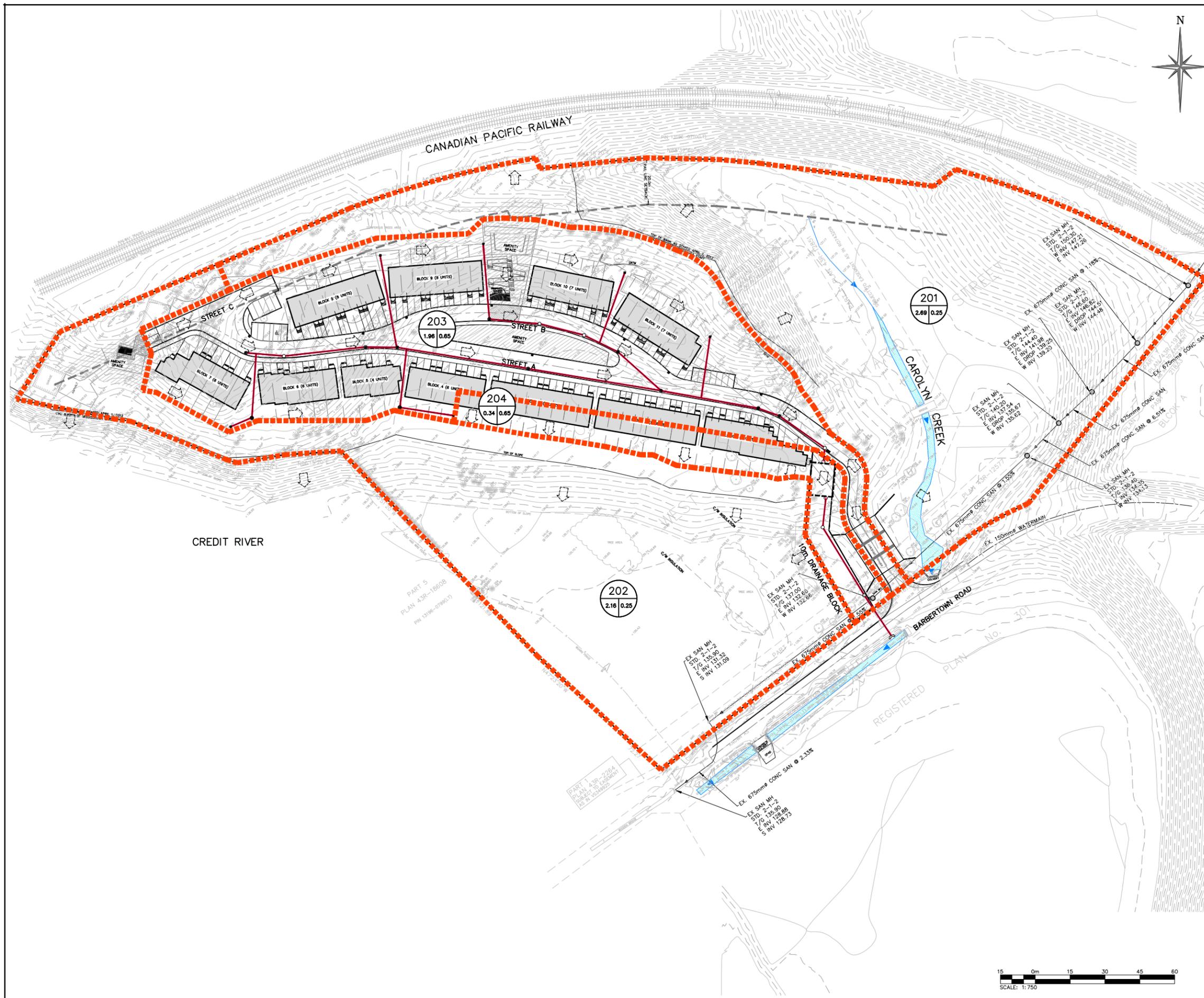
Drawing  
**PRE-DEVELOPMENT DRAINAGE PLAN  
(PRELIMINARY)**

**CROZIER** CONSULTING ENGINEERS  
2800 High Point Drive  
Suite 100  
Milton, ON L9T 6P4  
905-875-0026 T  
905-875-4915 F  
www.cfcrozier.ca

Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	1:750
				Dwg.	FIG. 5



N:\005\1019-3988-1725-Barbertown\CADD\DRG\DRG\005\005-001.dwg, HE: 5, 2019-03-21 11:47:21 AM  
 DWG TO PDF PLOT, ARCH D, 3600 x 2400 (Metric)



**LEGEND**

- PROPERTY LINE
- - - EXISTING CONTOUR (0.5m)
- - - EXISTING CONTOUR (1.0m)
- EXISTING WATERCOURSE
- EXISTING GRADE
- STORM DRAINAGE CATCHMENT
- PROPOSED STORM SEWER & MANHOLE
- CATCH BASIN / REAR YARD CATCH BASIN
- XXX CATCHMENT I.D.
- X.XX X.XX AREA (ha) | RUNOFF COEFFICIENT
- EXISTING OVERLAND FLOW DIRECTION

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20
No.	ISSUE / REVISION	YYYY/MM/DD

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PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

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Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing  
**POST-DEVELOPMENT DRAINAGE PLAN (PRELIMINARY)**

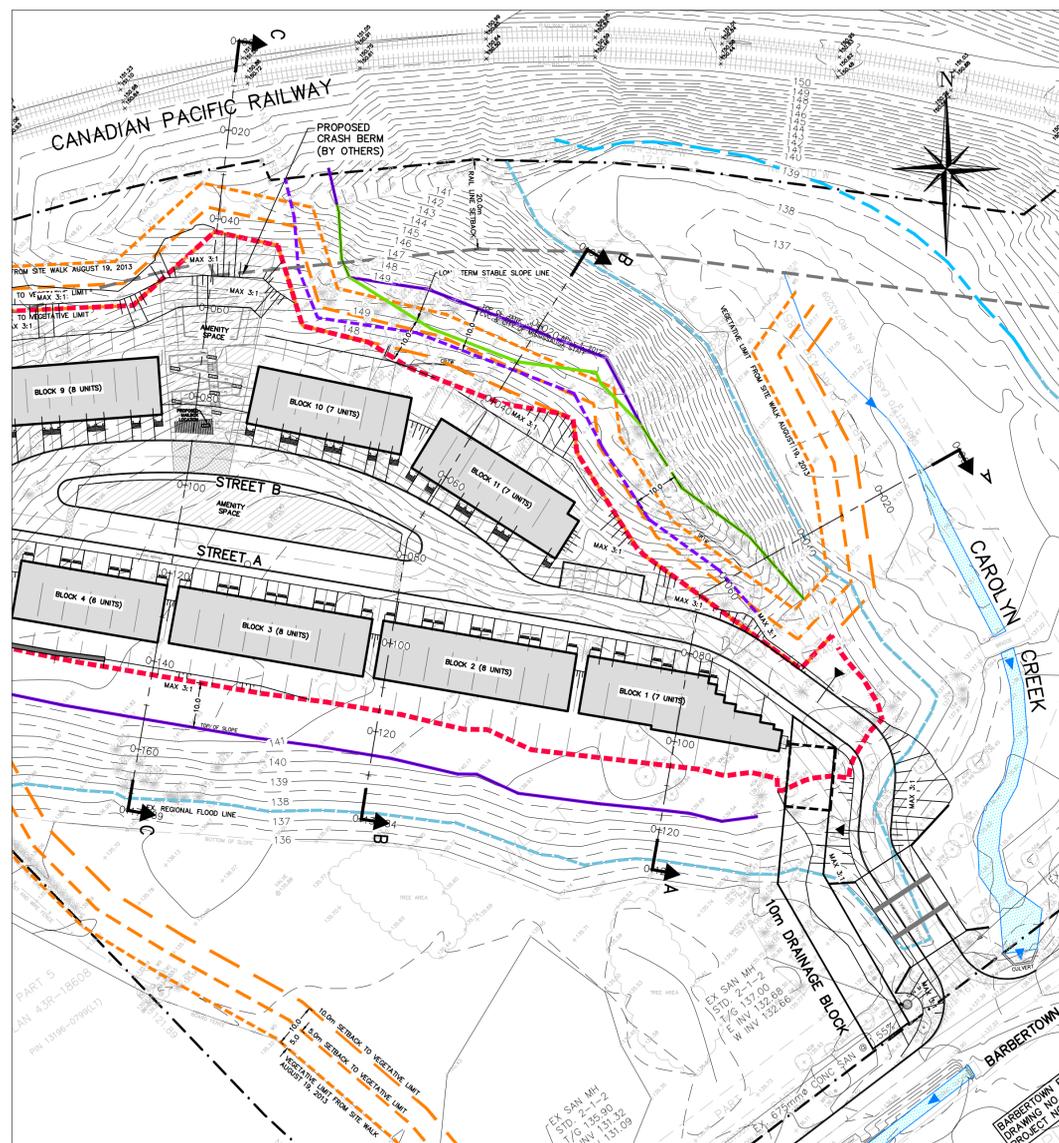


Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	Fig. 6

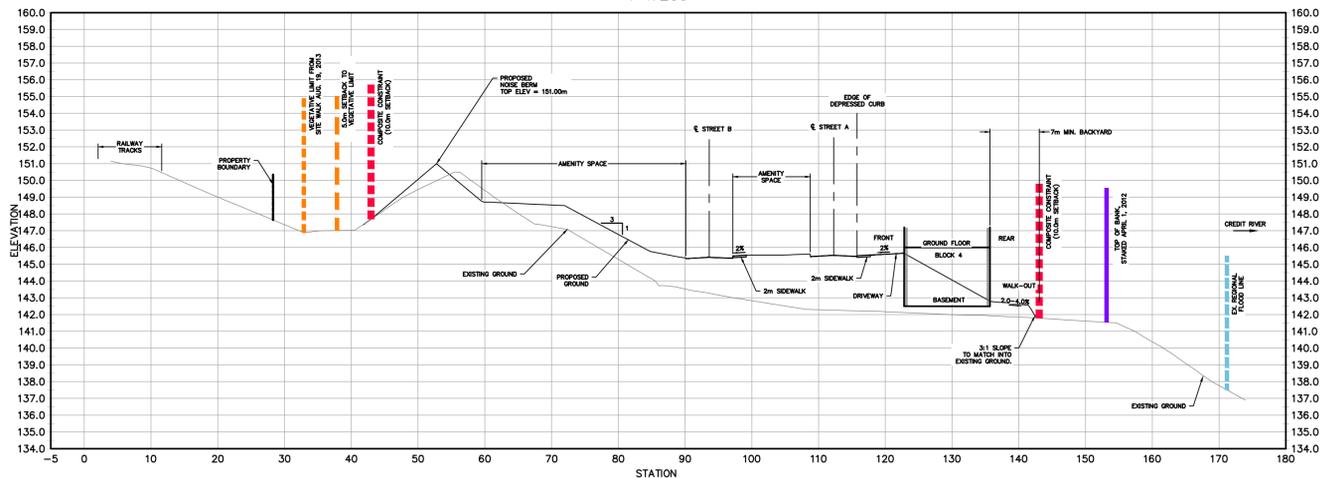


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 DWG TO PDF PLOT: ARCH D (3600 x 2400) (Metric)

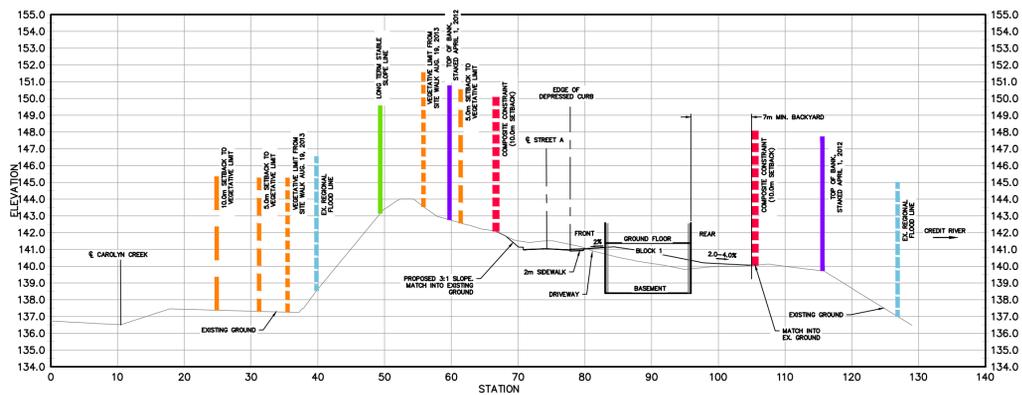
SITE SECTIONS A-A, B-B, C-C  
PLAN VIEW  
SCALE: 1:750



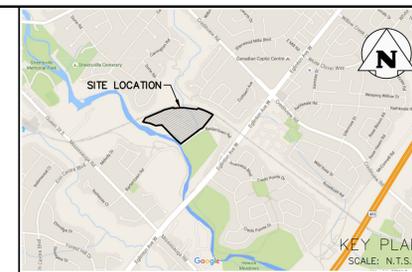
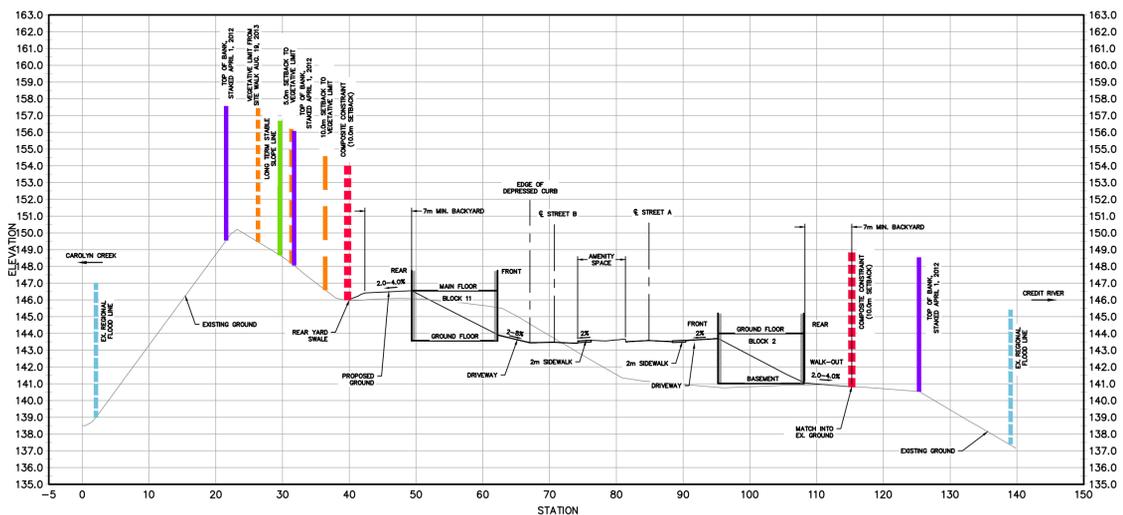
SITE SECTION C-C  
PROFILE VIEW  
SCALE: H 1:500  
V 1:200



SITE SECTION A-A  
PROFILE VIEW  
SCALE: H 1:500  
V 1:200



SITE SECTION B-B  
PROFILE VIEW  
SCALE: H 1:500  
V 1:200



**LEGEND**

**EXISTING FEATURES (EX.)**

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EX. TREE / TREED AREA
- EX. CHAIN LINK FENCE
- EX. WATERCOURSE
- EX. RAILWAY TRACKS
- 20.0m RAIL SETBACK TO BUILDINGS
- EX. FLOODLINE
- VEGETATIVE LIMIT FROM SITE WALK AUGUST 19, 2013
- VEGETATIVE LIMIT (5.0m SETBACK)
- VEGETATIVE LIMIT (10.0m SETBACK)
- STAKED TOP OF BANK LINE (10.0m SETBACK)
- LONG TERM STABLE SLOPE LINE
- COMPOSITE CONSTRAINT (10.0m SETBACK)

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20
No.	ISSUE / REVISION	YYYY/MM/DD

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**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC.  
REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD.  
PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

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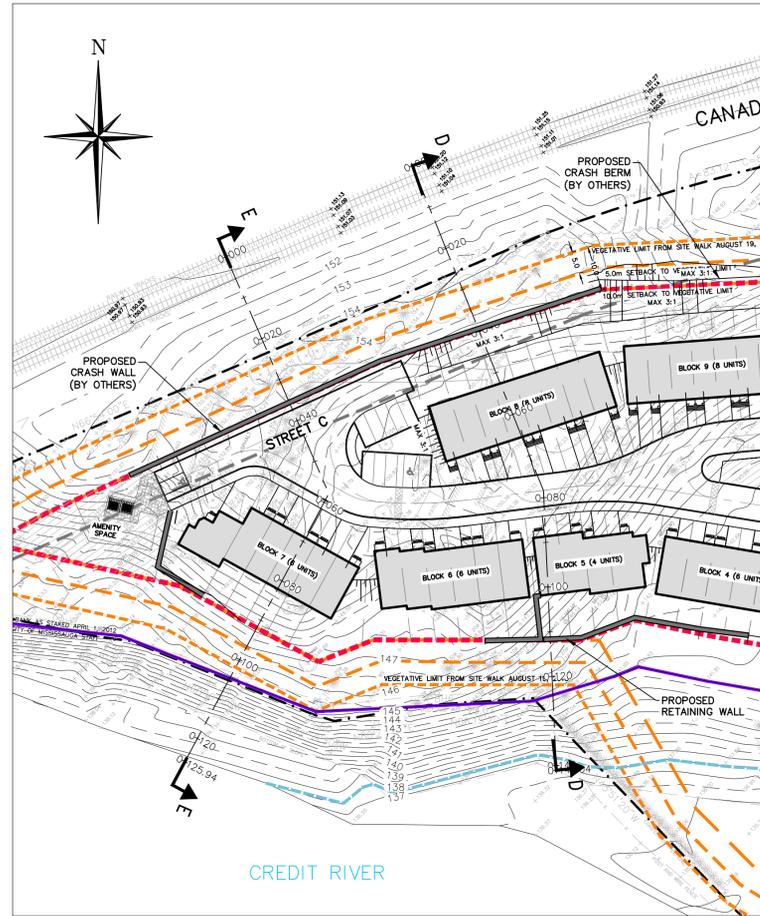
Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing  
**SITE SECTIONS**

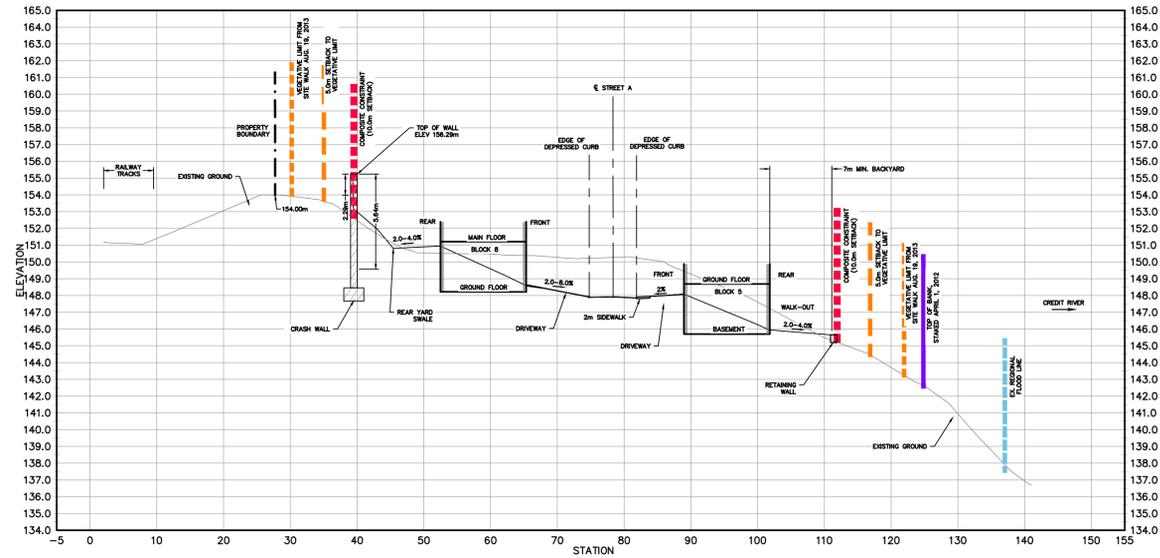


Drawn	J.V.	Design	J.V.	Project No.	1019-3988	
Check	S.C.	Check	N.M.	Scale	AS SHOWN	
					Dwg.	FIG. 7

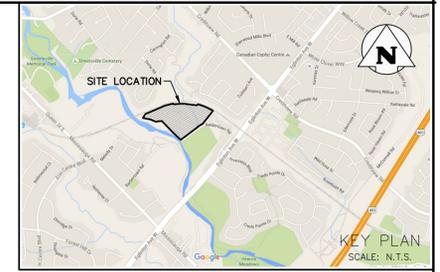
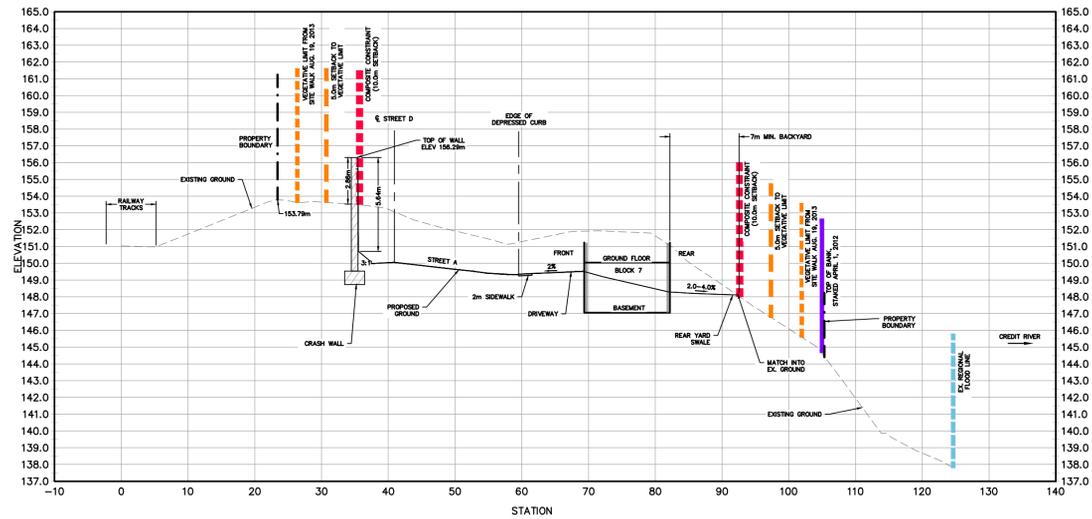
SITE SECTIONS D-D, E-E  
PLAN VIEW  
SCALE: 1:750



SITE SECTION D-D  
PROFILE VIEW  
SCALE: H 1:500  
V 1:200



SITE SECTION E-E  
PROFILE VIEW  
SCALE: H 1:500  
V 1:200



**LEGEND**

**EXISTING FEATURES (EX.)**

- PROPERTY LINE
- - - 142.50 EXISTING CONTOUR (0.5m)
- - - 142.00 EXISTING CONTOUR (1.0m)
- ☉ EX. TREE / TREED AREA
- - - EX. CHAIN LINK FENCE
- - - EX. WATERCOURSE
- - - EX. RAILWAY TRACKS
- - - 20.0m RAIL SETBACK TO BUILDINGS
- - - EX. FLOODLINE
- - - VEGETATIVE LIMIT FROM SITE WALK AUGUST 19, 2013
- - - VEGETATIVE LIMIT (5.0m SETBACK)
- - - VEGETATIVE LIMIT (10.0m SETBACK)
- - - STAKED TOP OF BANK LINE
- - - STAKED TOP OF BANK LINE (10.0m SETBACK)
- - - LONG TERM STABLE SLOPE LINE
- - - COMPOSITE CONSTRAINT (10.0m SETBACK)

2	RE-ISSUED FOR ZBA	2019/MAR/22
1	RE-ISSUED FOR ZBA	2018/MAY/04
0	ISSUED FOR ZBA	2017/JAN/20
No.	ISSUE / REVISION	YYYY/MM/DD

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 970 & No. 971

**BENCHMARK No. 970:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC LIGHT CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF MISSISSAUGA ROAD AND EGLINTON AVENUE WEST HAVING AN ELEVATION OF 148.702m

**BENCHMARK No. 971:**  
A PLATE MOUNTED HORIZONTALLY IN THE CONCRETE PAD IN FRONT OF THE TRAFFIC CONTROL BOX LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF EGLINTON AVENUE WEST AND CREDITVIEW ROAD HAVING AN ELEVATION OF 162.131m

**SURVEY NOTES:**  
SURVEY COMPLETED BY DAVID B. SEARLES SURVEYING INC.  
REFERENCE No. 44-2-12

**SITE PLAN:**  
DESIGN BASED ON CONCEPT SITE PLAN PREPARED BY RN DESIGN LTD.  
PROJECT No. 14113, DRAWING NO. SP-100 (RECEIVED 2019/MAR/18)

**DRAWING NOTES:**  
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.  
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.  
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.  
ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.



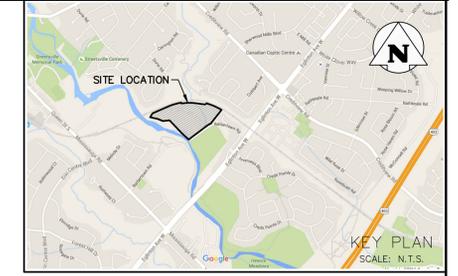
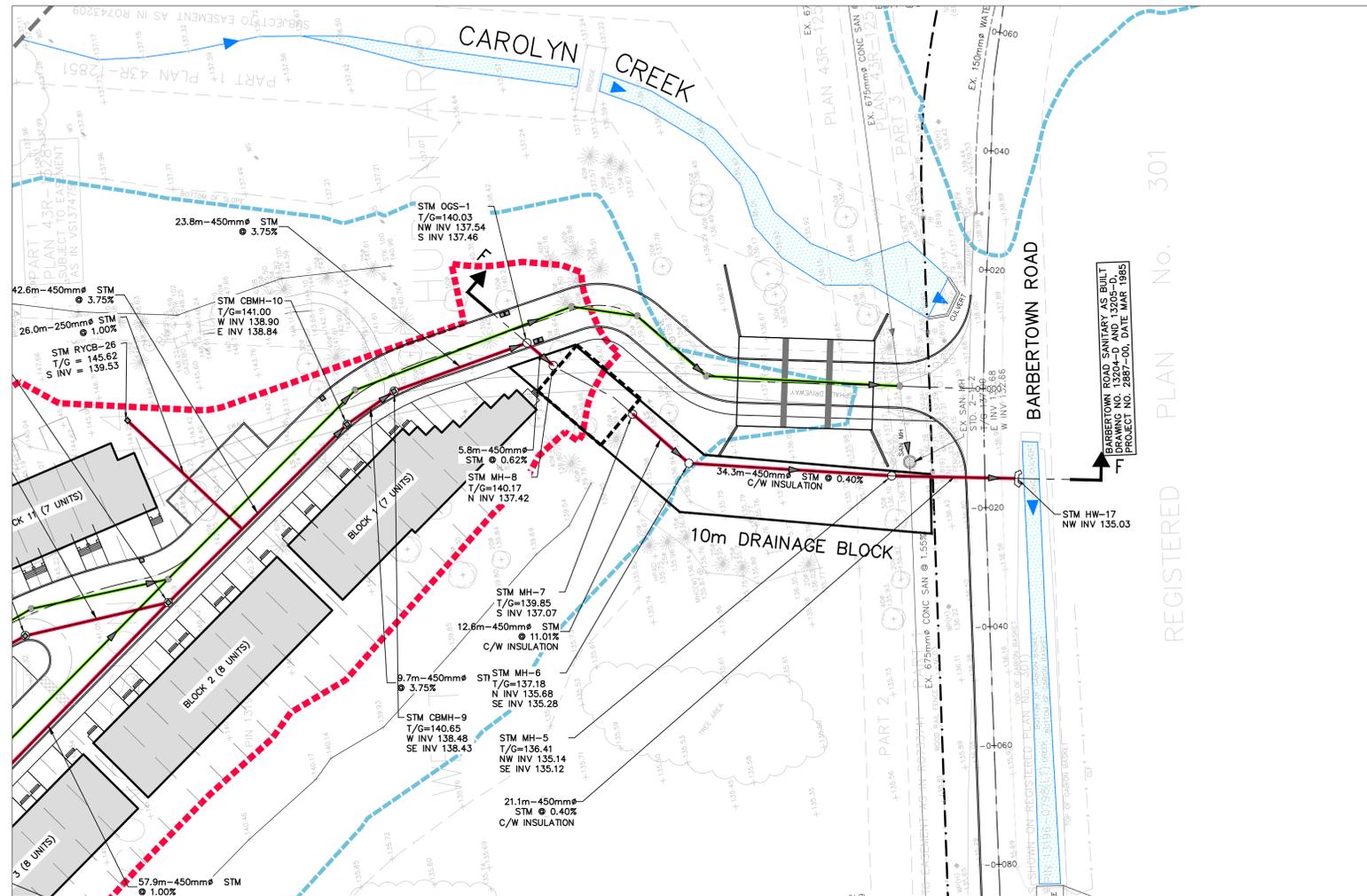
Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing  
**SITE SECTIONS**



Drawn	J.V.	Design	J.V.	Project No.	1019-3988	
Check	S.C.	Check	N.M.	Scale	AS SHOWN	
					Dwg.	FIG. 8

SITE SECTION F-F  
PLAN VIEW  
SCALE: 1:500

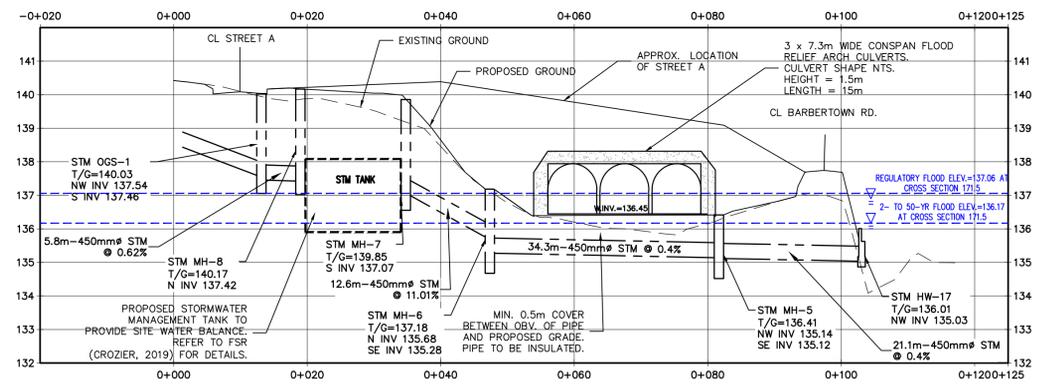


**LEGEND**

**EXISTING FEATURES (EX.)**

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EX. TREE / TREED AREA
- EX. CHAIN LINK FENCE
- EX. WATERCOURSE
- EX. FLOODLINE
- COMPOSITE CONSTRAINT (10.0m SETBACK)

SITE SECTION F-F  
PROFILE VIEW  
SCALE: H 1:500  
V 1:100



No.	ISSUE / REVISION	YYYY/MM/DD
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Project  
**BARBERTOWN VENTURES INC.**  
1725 BARBERTOWN ROAD  
CITY OF MISSISSAUGA

Drawing  
**SITE SECTIONS**

**CROZIER**  
CONSULTING ENGINEERS  
2800 High Point Drive  
Suite 100  
Milton, ON L9T 6P4  
905-875-0028 T  
905-875-4915 F  
www.ccrozier.ca

Drawn	J.V.	Design	J.V.	Project No.	1019-3988
Check	S.C.	Check	N.M.	Scale	Fig. 9

I:\1000\1019-3988\1725 Barbartown\CD\1019-3988-APP.dwg, FIG. 9, 2019-03-22 10:37:10 AM, DWG TO PDF.pcpl, ARCT full, based on 01600A, 24.00 inches