

# **FUNCTIONAL SERVICING REPORT**

Water, Sanitary, and Stormwater Management

## **PROPOSED RESIDENTIAL DEVELOPEMENT**

1667 SUNNINGDALE BEND  
MISSISSAUGA, ONTARIO

**PREPARED FOR UNITED LANDS**

OUR FILE: 1407

**January 31, 2024**

### REVISION HISTORY

<b>DATE</b>	<b>REVISION</b>	<b>SUBMISSION</b>
2022-03-08	1	Revised per Region of Peel comments
2023-06-15	2	Revised per City of Mississauga and Peel Region comments
2024-01-31	3	<i>Revised per City of Mississauga and Peel Region comments</i>

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## 1.0 INTRODUCTION

This report is the consolidation of the previously submitted Functional Servicing and Stormwater Management Reports, updated to reflect agency comments. Changes to the body of this report are denoted in italics.

### 1.1 Scope of Functional Servicing Report

This report has been prepared in support of the Re-Zoning Application for a proposed five-lot single family condominium development located at 1667 Sunningdale Bend. This report discusses how the site can be serviced by the existing infrastructure for water, wastewater, and stormwater. This report may be updated and refined as the project moves through the planning process. A copy of the development concept plan is included in Appendix 'A' for reference.

This report should be read in conjunction with architectural plans prepared for the project.

For purposes of this report, north is defined as parallel to Meadow Wood Road.



**Figure 1: Location Plan**

## **1.2 Existing Condition**

The 0.51 ha subject site is located between the rear of 892-870 Meadow Wood Road and the rear of 875, 883 and 891 Sunningdale Bend. Immediately to the north of the subject lands is a tributary of the Sheridan Creek, located behind 898 Meadow Wood Road. Access to the subject lands is from Sunningdale Bend.

The subject lands were once part of a larger residential property, consisting of 890 and 898 Meadow Wood Road. The property at 898 Meadow Wood Road was originally approved to be severed in 1966 and conditions of severance were completed around 2002. The conditions of the severance required the granting of a drainage easement along the channel/sewer alignment. A home was built on this property immediately following the completion of the severance.

In 2010-2011 a second severance of the property was completed. This involved the creation of a single-family lot with frontage on Meadow Wood Road (892 Meadow Wood Road) and a retained parcel at the rear (subject lands, 1667 Sunningdale Bend). As part of the severance, the valley slope within the 890 Meadow Wood Road property was conveyed to the City of Mississauga. A single-family dwelling has been constructed on the lot.

Prior to the 2010-2011 severance, the subject lands contained a small cottage in the north-west corner of the site. A two-storey house was located south of the cottage along the west property line. A stand-alone garage, pool and substantial pool deck was located in the southern part of the property. An asphalt driveway interconnected the garage with the main house and was connected to Meadow Wood Road. As part of the construction of the new house at 892 Meadow Wood Road, the cottage, main house and garage were removed.

## **1.3 Proposed Condition**

The proposal for the subject property is the development of a five-lot single-family condominium development. Access to the proposed development will be from Sunningdale Bend and will require the extension of the municipal roadway with a non-standard municipal cul-de-sac. A private roadway will be extended into the development with a tee turnaround, provided for emergency vehicles and garbage trucks.

## **2.0 MUNICIPAL WATER AND WASTEWATER**

Existing and proposed servicing is discussed in further detail in the following sections. A copy of the Servicing Plan is included in Appendix 'E' and should be read in conjunction with this report.

## 2.1 Water

There is a 150 mm diameter watermain located along Sunningdale Bend adjacent to the subject lands. The original building on the site was serviced by the existing watermain. The existing watermain tees into the watermain located on two legs of Sunningdale Bend, approximately 45 m west of the subject lands.

**Table 1: Estimated Water Demands (L/min)**

Average Daily Demand	6.0
Minimum Hourly Demand	6.0
Maximum Hourly Demand	12.0
Maximum Daily Demand	6.0
Estimated Fire Demand (FUS 1999)	4000
Maximum Daily Plus Fire Demand	4006

A flow test was undertaken (May 18, 2021) along the watermain in Sunningdale Bend adjacent to the site. The results of the flow test are included in Appendix 'B' and are summarized as follows:

**Table 2: Fire Flow Test along Sunningdale Bend**

Static Pressure	66 psig
Flow 1256 usgpm (79 L/s)	residual 54 psig
Flow 1840 usgpm (116 L/s)	residual 48 psig
Theoretical Flow 3054 usgpm (193 L/s)	residual 20 psig
Estimated Max. Daily Plus Fire Service Pressure	57 psig

The proposal is to run a 150 mm diameter municipal watermain to the south side of the proposed cul-de-sac to provide water to a hydrant on the south side of the cul-de-sac. The hydrant will provide fire protection for the proposed development. *The municipal watermain has been looped as per Public Works Standard Drawing 1-7-4 for a typical 50mm Watermain on Cul-de-Sac.* A 50 mm diameter domestic water connection will be extended into the site to provide domestic water for the five-lot development.

Detailed calculations are provided in Appendix 'B'.

## 2.2 Wastewater

There is an existing 250 mm diameter sewer along Sunningdale Bend near the site. The end of the sanitary sewer is a manhole (Ex. San. MH1A) located approximately 12.5 m west of the west property line of the subject lands.

Crossing through the subject lands is a sanitary forcemain on a private easement. The forcemain services the property at 898 Meadow Wood Road. The forcemain terminates at a manhole located near the west property line of the subject lands. The manhole receives flow from the forcemain and at one time flows from the original house on the property. The manhole is connected to Ex. San. MH1A by a gravity sewer.

A second sanitary forcemain crosses through the subject property and services the house at 890 Meadow Wood Road. The forcemain is located on a private easement. The forcemain terminates at a gravity sanitary sewer lateral near the west property line of the subject property. The gravity sewer lateral connects to Ex. San. MH1A.

The proposal is to construct approximately 44 m of municipal sanitary sewer, from Ex. San MH1A, through the proposed cul-de-sac to the proposed condominium development. The existing forcemain will be connected to the new municipal sewer and the existing gravity lateral to Ex. San. MH1A will be plugged and abandoned.

The sanitary sewer will be extended into the proposed development lands and will be of sufficient depth to provide a gravity sewage connection for each of the proposed single-family dwellings.

The sewer constructed within the proposed cul-de-sac will be per the Regional of Peel requirements. The onsite sanitary sewer will be designed per the requirement of the Ontario Building Code.

Appendix 'B' provides a summary of the estimated sanitary sewer flows.

### **3.0 STORM DRAINAGE AND STORMWATER MANAGEMENT**

#### **3.1 Stormwater Management Requirements**

The stormwater management requirements are outlined in the City of Mississauga Transportation and Works, Development Requirements Manual. The subject site is in the Sheridan Creek tributary and the stormwater management requirements are outlined as follows:

- Stormwater Quantity Control to reduce post-development 100-yr flows to 2-yr pre-development flows.
- Stormwater Runoff Volume Reduction of 5 mm to be retained onsite, infiltrated or re-used.
- Water Quality to a minimum of 80% of the TSS.



### 3.2 Existing Storm Drainage

A review of the original topography for the site from 2007, prior to the disturbance from the construction of 892 Mead Wood Road and the removal of the original structures on the property, shows the lands to be divided into two watersheds.

The northern watershed (0.251 ha.) sheet flows to the valley located immediately north of the subject lands. The drainage from the valley is piped across Meadow Wood Road flowing through an open water course and is captured into a sewer system located approximately 70 m east of Meadow Wood Road. The sewer system outlets to the Sheridan Creek from Stonehaven Drive. The northern watershed is 87% pervious ( $C = 0.25$ ) in the existing condition, with small areas of paved/roof surfaces ( $C = 0.9$ ). The resulting composite runoff coefficient is  $C = 0.34$ .

The southern watershed (0.272 ha) sheet flows to the south across the rear of the large properties located at 854 and 844 towards Sheridan Creek, which is located approximately 120 m south of the subject lands. The southern watershed is 71% pervious ( $C = 0.25$ ) in the existing condition, with small areas of paved/roof surfaces ( $C = 0.9$ ). The resulting runoff coefficient is  $C = 0.44$ .

### 3.3 Proposed Drainage System

The implementation of the proposed grading plan will divide the site into four sub-catchments as outlined below. The boundaries of the four sub-catchments can be seen in Figure 3.

- **Area A** consists of the proposed municipal cul-de-sac, part of the existing Sunningdale Road allowance and a small portion of Lot 1. The area is 63% impervious with some small grass covered areas, around the cul-de-sac and side yard of Lot 1. The area of this sub-catchment is 0.071 ha and the composite runoff coefficient is  $C = 0.66$ . This area will be captured by the proposed DCB with a CB Shield installed to treat the runoff. The DCB will route flow towards a Stormceptor (ETO4), to further treat the runoff to achieve 80% TSS removal. The flow will then be conveyed to an ACO Stormbrixx located under the cul-de-sac. The flow from the ACO Stormbrixx will be controlled via a 75 mm orifice tube which connects into STM MH 1 to convey flow to the valley to the north.
- **Area B** includes a portion of the rear yard of Lot 5 and Compensation Area and will sheet flow to the adjacent valley (towards the north). It is not possible to collect this system by the sewer system. The area is 100% pervious with an area of 0.100 ha.
- **Area C** is the main part of the site and includes the private roadway, all the front yards, the proposed houses, part of Lot 4's rear yard and the rear yard of Unit 1. The area is 69% impervious with a total area of 0.286 ha. In calculating impervious areas for Area C, the impervious area assumed a maximized house occupying the entire possible building envelope. The composite runoff coefficient for this area is  $C = 0.71$ . This area will be

captured by the proposed CB's in the Condo Road ROW which will have CB Shields installed to treat the runoff. The site sewers will be sloped at a 0.3% slope to direct all the runoff from Area C to the ACO Stormbrixx infiltration tank. Catch basins located along the driveway and in the rear of Lot 1 and Lot 5 will collect the surface runoff. Rear downspouts from Lots 2, 3, 4 and 5 are directly connected to the tank through the storm sewer system to ensure capture for quantity control. A 75 mm orifice tube will connect into STM MH 3 to control the flow from Area C.

- **Area D** includes the rear yard of Lot 2, the entire yard of Lot 3, and the rear and side yard of Lot 4. The area is 100% pervious with an area of 0.069 ha. These areas are too low to be collected into the storm sewer system and will sheet flow following the natural drainage path along the rear of 854 and 844 Meadow Wood Road and the Sheridan Creek tributary as in the existing condition.

Due to grading and tree constraints, it will be impractical to address the water quantity control for all the sub-catchments.

- Areas B and D are areas that will sheet flow to the adjacent creeks with no stormwater management control. These areas will primarily be pervious landscaped areas.
- The primary focus of the water quality control will be on the condominium site, Area C, and the cul-de-sac and existing portion of Sunningdale Bend, Area A.

To maximize the area to be controlled by onsite stormwater management works, an onsite sewer system has been designed to collect runoff from the largest potential area. In addition to rear lot catch basins, it is proposed to directly connect the *roof leaders* from all five lots to the storm sewer system. Although, contrary to the City's current policy, it will allow runoff from a greater area to be collected and controlled to the 2-year pre-development flow. Without the direct connection areas, it would contribute the uncontrolled flow in drainage Area B and D.

### **3.4 Stormwater Quantity Control (Peak Flow Control)**

As per City of Mississauga Storm Drainage Design Requirements, the development is required to control post-development flows from the 100-year event to the 2-year pre-development event.

The pre-development flows are calculated using the Modified Rational Method and the City of Mississauga IDF data. In accordance with good engineering practice, a frequency adjustment factor of 1.1, 1.2, and 1.25 (for a minimum of  $C = 0.5$  according to section 8.3.3 of the City's Storm Drainage Design Requirements) has been applied to the 25-, 50-, and 100-year events respectively. The pre-development flows for the northern and southern watersheds are provided in the table below.

**Table 3: Pre-Development Flows**

Return	Intensity (mm/hr)	To North (L/s)	To South (L/s)	Total Flow (L/s)
2-yr	59.9	14	20	34
5-yr	80.5	19	27	46
10-yr	99.2	24	33	57
25-yr	113.9	30	42	72
50-yr	127.1	36	48	84
100-yr	140.7	42	53	95

Flows for each post-development area were calculated using the Modified Rational Method, with a time of concentration of 15 minutes and the City of Mississauga IDF data. Composite runoff coefficients for each area were calculated using  $C = 0.25$  for pervious areas and  $C = 0.90$  for impervious areas. Result of the calculations and a comparison with the pre-development flows is provided the following tables.

**Table 4: Uncontrolled Post-Development Flows**

Return	Intensity (mm/hr)	Area A Flows* (L/s)	Area B Flows (L/s)	Area C Flows* (L/s)	Area D Flows (L/s)	Total Flow (L/s)
2-yr	59.9	8	4	33	3	48
5-yr	80.5	10	6	45	4	65
10-yr	99.2	13	7	55	5	80
25-yr	113.9	16	9	69	6	100
50-yr	127.1	20	11	85	7	123
100-yr	140.7	23	12	97	8	140

\*SWM Facility in-flow

The allowable release rate to the valley to the north is  $Q = 0.014 \text{ m}^3/\text{s}$ , which is applicable for Areas A and C. Areas B and D will sheet flow uncontrolled to the valley to the north and Sheridan Creek to the south, respectively.

To control the site discharge to the allowable rate, an orifice tube is required on the site discharge sewer and onsite ponding is required. A 75 mm diameter orifice tube will be installed to control the flow for Area A and C separately. Orifice tubes will be installed at STM MH2 and STM MH 3, for Area A and C respectively.

The proposed site provides little room to provide surface storage and underground storage will be required. Modeling simulation using the HydroCAD software results in a storage volume of  $10.3 \text{ m}^3$  and  $104.7 \text{ m}^3$  being required to control the runoff to the required release rate for Areas A and C, respectively.

**Table 5: Area A – Controlled Outflow and Required Storage Volume**

<b>Return</b>	<b>Storage (m<sup>3</sup>)</b>	<b>Outflow (L/s)</b>	<b>Allowable Flow (L/s)</b>
2-yr	1.8	3	14
5-yr	3.6	5	14
10-yr	5.6	6	14
25-yr	7.5	7	14
50-yr	9.3	8	14
100-yr	10.3	16	14

In order to control the post-development flow for Area A to the pre-development flow of  $Q = 0.014 \text{ m}^3/\text{s}$ , approximately  $10.3 \text{ m}^3$  of storage is required for the 100-year event. The storage will be provided using an ACO Stormbrixx HD providing  $10.8 \text{ m}^3$  of storage.

**Table 6: Area C – Controlled Outflow and Required Storage Volume**

<b>Return</b>	<b>Storage (m<sup>3</sup>)</b>	<b>Outflow (L/s)</b>	<b>Allowable Flow (L/s)</b>
2-yr	25.5	4	14
5-yr	42.7	7	14
10-yr	60.8	9	14
25-yr	75.9	11	14
50-yr	90.1	12	14
100-yr	104.4	13	14

In order to control the post-development flow for Area C to the pre-development flow of  $Q = 0.014 \text{ m}^3/\text{s}$ , approximately  $104.7 \text{ m}^3$  of storage is required for the 100-year event. The storage will be provided using an ACO Stormbrixx HD providing  $107.0 \text{ m}^3$  of storage.

**Table 7: Total Flows with Controlled Site Flows**

<b>Return</b>	<b>Area A Flows (L/s)</b>	<b>Area B Flows (L/s)</b>	<b>Area C Flows (L/s)</b>	<b>Area D Flows (L/s)</b>	<b>Total Flow (L/s)</b>
2-yr	3	4	4	3	14
5-yr	5	6	7	4	22
10-yr	6	7	9	5	27
25-yr	7	9	11	6	33
50-yr	8	11	12	7	38
100-yr	16	12	13	8	49

**Table 8: Comparison of Pre-development Flow to Controlled Post-Development Flows**

<b>Return</b>	<b>Pre-Dev Total (L/s)</b>	<b>Post-Dev Total (L/s)</b>	<b>Percent Change</b>
2-yr	34	14	-59%
5-yr	46	22	-52%
10-yr	57	27	-53%
25-yr	72	33	-54%
50-yr	84	38	-55%
100-yr	95	49	-48%

A review of the above tables shows that the site flows have been controlled to less than the 2-yr pre-development flow. In addition, the total post-development flow is less than the pre-development flow for the corresponding storm.

The subject site’s storm sewer system will connect to the municipal storm sewer installed within the new cul-de-sac bulb.

An outlet sewer will run from the cul-de-sac bulb to the adjacent valley floor. A small channel will be constructed from the end of the outlet to the existing channel. To preserve the trees along the valley slope, the proposed outlet will be installed by directional drilling.

### **3.5 Water Quality Control**

The City’s Storm Drainage Design Requirements requires the site to provide a minimum treatment of 80% TSS removal to provide enhanced protection.

Water quality for the site will be achieved using CB Shields in each of the catch basins to remove the larger particles and the storage tank operating as an infiltration device. Based on an average drainage area of 0.07 ha to each of the site’s catch basins and an impervious ratio of 73%, the TSS removal by the CB Shields will be approximately 73%.

In accordance with Table 3.2 of the MOE Stormwater Management and Design Manual, 35 m<sup>3</sup>/ha of storage is required in an infiltration system providing 80% TSS removal. The required storage is 0.28 ha x 35 m<sup>3</sup>/ha = 9.8 m<sup>3</sup>. The required storage is provided.

The combination of CB Shield with the proposed infiltration system will address the site’s water quality requirements.

### **3.6 Stormwater Runoff Volume Reduction (Water Balance/Erosion Criteria)**

As per City of Mississauga’s Storm Drainage Design Requirements, the first 5 mm of runoff shall be retained on-site and managed by way of infiltration and evapotranspiration.

For Area A the estimated impervious area of 0.044 ha, the first 5 mm of runoff results in a volume of 2.22 m<sup>3</sup>. In order to address the erosion control requirement, the approach is to collect the first 5 mm of runoff in the ACO Stormbrixx HD and storm sewers and allow it to infiltrate the surrounding soil. Below the orifice invert of 93.72, the storm drainage system of sewers and ACO Stormbrixx HD has a storage volume of 2.4 m<sup>3</sup>. This exceeds the volume required to retain the first 5 mm of runoff. The geotechnical investigation for the site noted the underlying soils to be sandy and they recommended an infiltration capacity of 60 mm/hr. The proposed storm tank will have a footprint of approximately 18.0 m<sup>2</sup>. Based on this area, the 2.22 m<sup>3</sup> of water retained in the system will drain into the ground in approximately 12.85 hours, assuming a factor of safety of 2.5. Supporting calculations of the drawdown time can be found in Appendix 'D'.

For Area C the estimated impervious area of 0.197 ha, the first 5 mm of runoff results in a volume of 9.9 m<sup>3</sup>. The same approach will be implemented as in Area A. Below the orifice invert of 93.70, the storm drainage system of sewers and ACO Stormbrixx HD has a storage volume of 14.25 m<sup>3</sup>. This exceeds the volume required to retain the first 5 mm of runoff. The proposed storm tank will have a footprint of approximately 75.0 m<sup>2</sup>. Based on this area, the 9.9 m<sup>3</sup> of water retained in the system will drain into the ground in approximately 13.75 hours, assuming a factor of safety of 2.5. Supporting calculations of the drawdown time can be found in Appendix 'D'.

#### **4.0 SITE DESIGN AND GRADING**

To service the proposed development, an irregular cul-de-sac bulb will be constructed between the existing roadway and the adjacent valley lands. The face of the east curb line of the cul-de-sac will be located 5.2 m from the surveyed top-of-bank for the adjacent valley.

The existing ground falls in by approximately 2 m between the end of the existing roadway and the top-of-bank. To accommodate the fall in grade, a retaining wall is proposed along the top-of-bank with a 3.0 m level boulevard provided between the wall and the proposed curb line. The level boulevard area will provide an area for snow storage and utilities as well as providing a safety zone from the roadway.

The cul-de-sac bulb will be sloped to a catch basin located near the south side of the cul-de-sac. The private driveway for the residential development will be located on the southern part of the cul-de-sac bulb.

Between the end of the proposed cul-de-sac and the existing ground at the south side of the subject property the ground falls approximately 1.0 m. To minimize the grade differential between the private driveway and the existing grade, a "saw tooth" profile is proposed for the roadway. The south end of the roadway will be approximately 36 cm higher than the elevation at the cul-de-sac bulb.

To facilitate garbage trucks and other large vehicles to turn around on the site, a tee turnaround has been provided.

The proposed development will have five single family houses constructed on the property. Lots 1, 2 and 3 are located on the west side driveway. Lot 4 is located south of the turn around tee and Lot 5 is located north of the tee. North of Lot 5 and adjacent to the valley is the NHS & Buffer Compensation Area.

Tree preservation areas are located around the boundary of the site at the rear of the proposed residential lots. The grades of the rear lot areas will match the existing elevations of the TPZ.

At the end of the private driveway on the south side will be a 1.3 m high retaining wall to compensate for the grade difference between the private driveway and the adjacent tree preservation zone. The grade of the proposed private roadway needs to be raised to provide gravity sanitary services to the units and to direct the emergency overland flow towards the valley located at the north end of the development.

Lot 3 has the potential for a walkout basement with the remaining of the lots being look-out basements to varying degrees.

A copy of the Preliminary Grading Plan is provided in Appendix 'E' and should be read in conjunction with this report.

## 5.0 SUMMARY

1. The proposed development will be serviced from the existing 250 mm diameter sanitary sewer and the existing 150 mm watermain located on Sunningdale Bend. These services will be extended as municipal services to the proposed development site.
2. Within the proposed development site, sanitary sewers and a domestic watermain will be provided to service the five-lot development.
3. To control the 100-year post-development flows to the existing 2-year pre-development rate for Areas A and C, *underground storage tanks with 10.8 m<sup>3</sup> and 107.0 m<sup>3</sup> of storage is required for each area respectively*. An ACO Stormbrixx HD unit will be installed to provide the necessary storage volumes.
4. To control the flow to the allowable release rate for Area A and C, *75 mm diameter orifice tubes will be installed*.
5. The required 5 mm of infiltration will be addressed through the underground storage tank.

6. Water quality requirements are addressed through CB Shields installed in the site's catch basins and Stormceptors between CBs and underground storage tank to achieve 80% TSS removal.
7. To maximize the capture of site flows, it is proposed that the *roof leaders* from *all lots* will be directly connected to the site's storm sewer system.
8. All houses within the development will require sump pumps with backflow preventors.
9. An emergency overland flow path is provided to direct flows to the small creek at the north end of the site.
10. To preserve trees within the adjacent valley, the outlet sewer will need to be installed using directional drill or other trenchless technology.
11. To enable the site to be serviced by a gravity sanitary sewer and to direct overland flows to the creek, the site will need to be raised above the existing grades at the south end of the site. This will require the use of retaining walls and look-out or walk-out basements.

PREPARED BY TRAFALGAR ENGINEERING LTD.

*Andy Prejs*

**Andy Prejs, MASC, EIT**  
Intermediate Designer

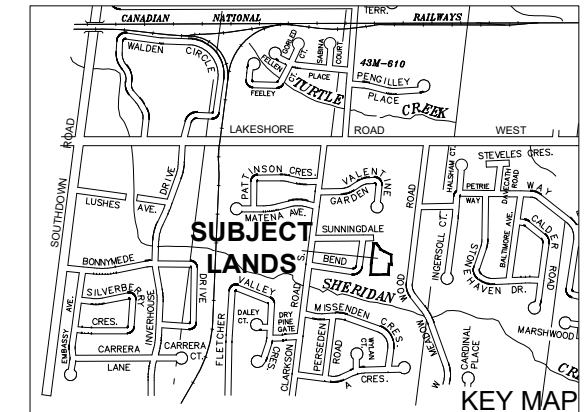
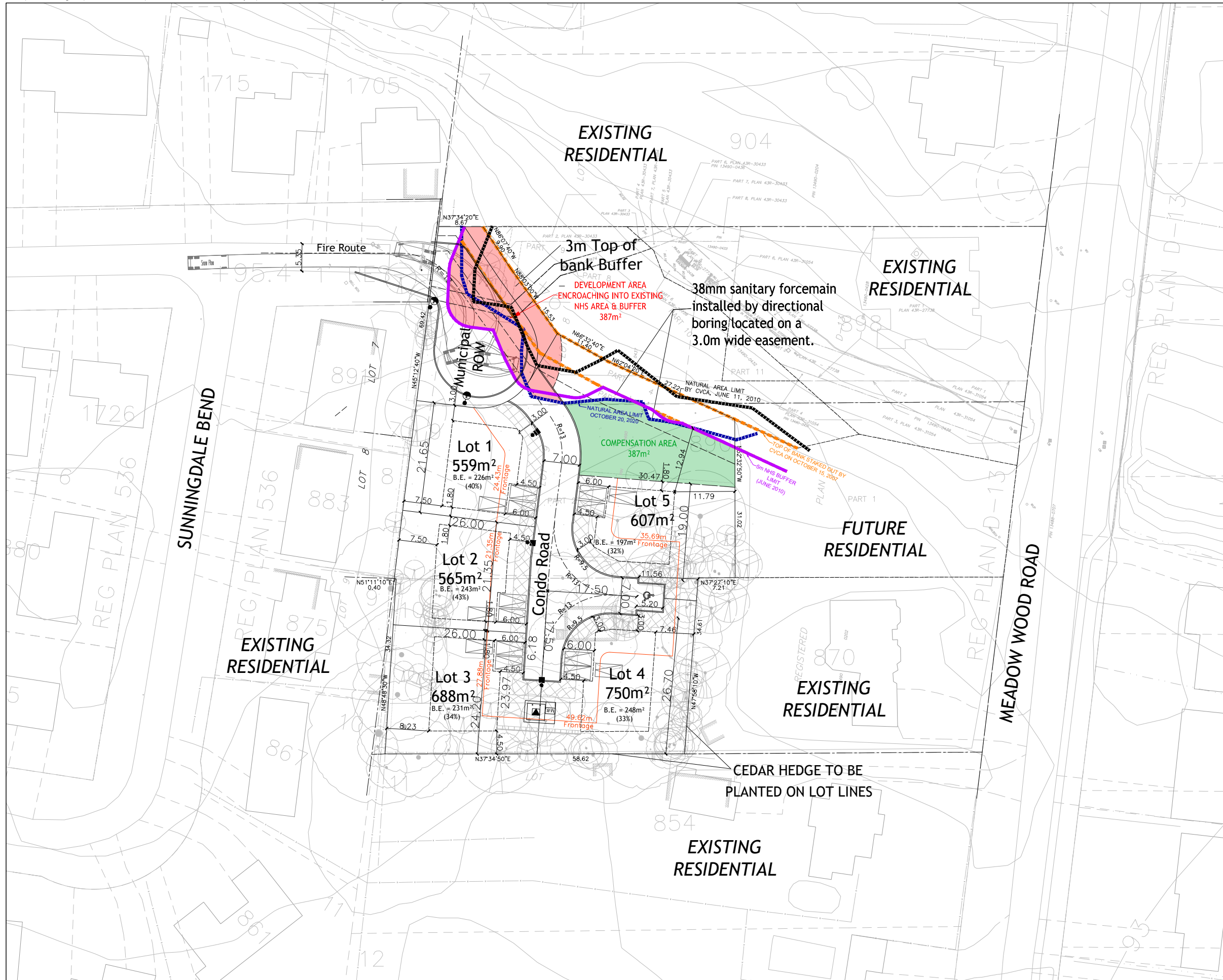
**J.T. Nelson, P.Eng.**  
Principal, Design Services





***APPENDIX 'A'***

*Development Concept Plan, Glen Schnarr & Associates Inc.*  
*Topographic Survey 2007, Tarasick McMillan Kubicki Limited*  
*Topographic Survey 2020, Tarasick McMillan Kubicki Limited*



## URBAN DESIGN CONCEPT PLAN OPTION 2

1667 SUNNINGDALE BEND  
PART OF LOTS 8, 9, & 10  
REGISTERED PLAN D-13  
CITY OF MISSISSAUGA  
REGION OF PEEL

### DEVELOPMENT STATISTICS

SITE AREA: 0.51ha (1.26ac)  
TOTAL UNITS: 5 UNITS

### REQUIRED PARKING SPACES

RESIDENT (2/Unit):	10
VISITOR (0.25/Unit):	2
ACCESSIBLE:	1
<b>TOTAL REQUIRED PARKING:</b>	<b>13</b>

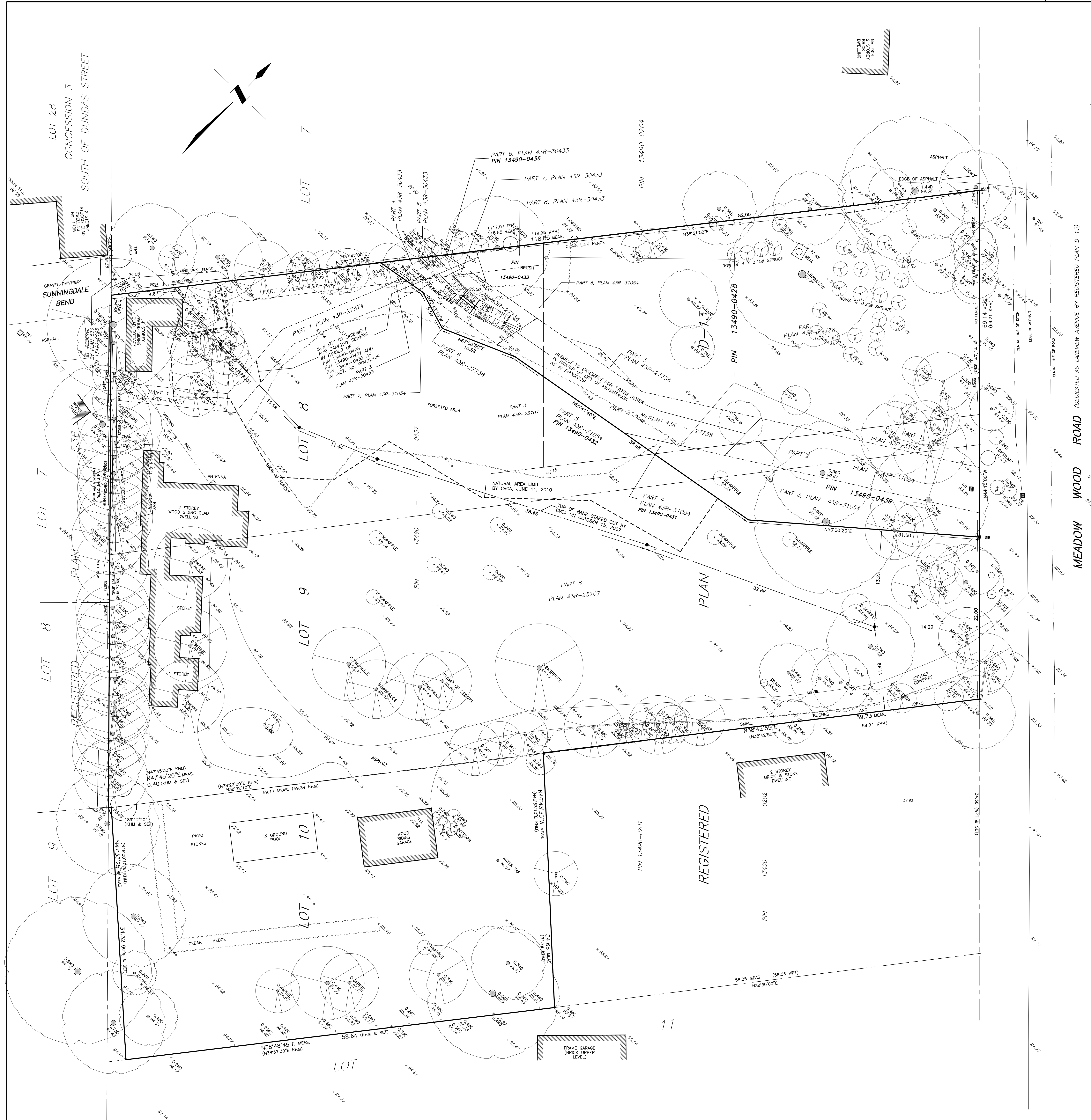
### PROVIDED PARKING SPACES

RESIDENT (2/Unit)	10
(One space located internally and one driveway space)*	
VISITOR (1/UNIT)	5
(Located in driveway)	
ACCESSIBLE:	1
<b>TOTAL PROVIDED PARKING:</b>	<b>16</b>

### Notes

\*Internal driveway space is conceptual only  
Typical Visitor Parking Space: 2.6m x 5.2m  
\*Lot 5 Area includes Potential NHS & Buffer Compensation Area





COMPILED PLAN OF  
**PART OF LOTS 8, 9 AND 10**  
**REGISTERED PLAN D-13**  
**CITY OF MISSISSAUGA**  
**REGIONAL MUNICIPALITY OF PEEL**

SCALE 1 : 200

TARASICK McMILLAN KUBICKI LIMITED  
 ONTARIO LAND SURVEYORS

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METRIC  
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND  
 CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BEARING NOTE  
 BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHWESTERLY  
 LIMIT OF MEADOW WOOD ROAD AS SHOWN ON REGISTERED PLAN D-13,  
 HAVING A BEARING OF N44°15'00"W.

- LEGEND**
- DENOTES SURVEY MONUMENT FOUND
  - SB DENOTES IRON BAR
  - SIB DENOTES STANDARD IRON BAR
  - SIBB DENOTES SHORT STANDARD IRON BAR
  - TC DENOTES TOP OF CURB
  - BC DENOTES BOTTOM OF CURB
  - CCY DENOTES CURB CUT
  - MB DENOTES MARKING
  - CB DENOTES CATCH BASIN
  - WUP DENOTES WOOD UTILITY POLE
  - WV DENOTES WATER VALVE
  - KHM DENOTES K.H. MCCONNELL, O.L.S.
  - WPT DENOTES W. P. TARASICK, O.L.S.

NATURAL AREA LIMIT ADDED TO PLAN JUNE 11, 2010  
 TOP OF BANK STAKED OUT BY CVCA ADDED TO PLAN OCTOBER 15, 2007

**SURVEYOR'S CERTIFICATE**  
 THIS PLAN IS COMPILED FROM SURVEY RECORDS OF  
 TARASICK McMILLAN KUBICKI LIMITED AND RECORDS OF THE LAND  
 REGISTRY OFFICE.

SEPTEMBER 7, 2007  
 DATE \_\_\_\_\_ BORYS KUBICKI  
 ONTARIO LAND SURVEYOR

**TARASICK McMILLAN KUBICKI LIMITED**  
 ONTARIO LAND SURVEYORS  
 4181 SLADEVIEW CRESCENT, UNIT 42, MISSISSAUGA, ONTARIO L5L 5R2  
 TEL: (905) 569-8849 FAX: (905) 569-3160  
 E-MAIL: tsm@tdmli.com

DRAWN BY: P. N. FILE No. 4985-COMP

PLAN OF TOPOGRAPHY OF  
**PART OF LOTS 8, 9 AND 10**  
**REGISTERED PLAN D-13**  
**CITY OF MISSISSAUGA**  
**REGIONAL MUNICIPALITY OF PEEL**

SCALE 1 : 200

**TARASICK McMILLAN KUBICKI LIMITED**  
 ONTARIO LAND SURVEYORS  
 © COPYRIGHT, 2020

**METRIC**  
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND  
 CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

**EASEMENTS**  
 SUBJECT TO AN EASEMENT FOR SANITARY SEWER OVER PARTS 6, 7 AND 8,  
 PLAN 43R-34084 IN FAVOUR OF PARTS 1, 2, 3 AND 4 PLAN 43R-27738  
 AS IN PR402929.  
 SUBJECT TO AN EASEMENT FOR SANITARY SEWER OVER PARTS 3 AND 6,  
 PLAN 43R-34084 IN FAVOUR OF PART 1, PLAN 43R-34084 AS IN  
 PR2133778.  
 SUBJECT TO AN EASEMENT FOR SANITARY SEWER OVER PARTS 1 AND 2,  
 PLAN 43R-37524 IN FAVOUR OF PART 1, PLAN 43R-34084 AS IN  
 PR3089005.

**ELEVATION NOTE**  
 ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC VERTICAL DATUM-1928,  
 AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 713,  
 HAVING A PUBLISHED ELEVATION OF 96.649 metres.

**BOUNDARY INFORMATION**  
 THE SUBJECT PARCEL BOUNDARIES SHOWN ON THIS PLAN ARE COMPILED  
 BASED ON PLAN 43R-34084.

**LEGEND**

MH	DENOTES	MANHOLE
CB	DENOTES	CATCH BASIN
WUP	DENOTES	WOOD UTILITY POLE
WV	DENOTES	WATER VALVE
TW	DENOTES	TOP OF RETAINING WALL
WIP	DENOTES	...

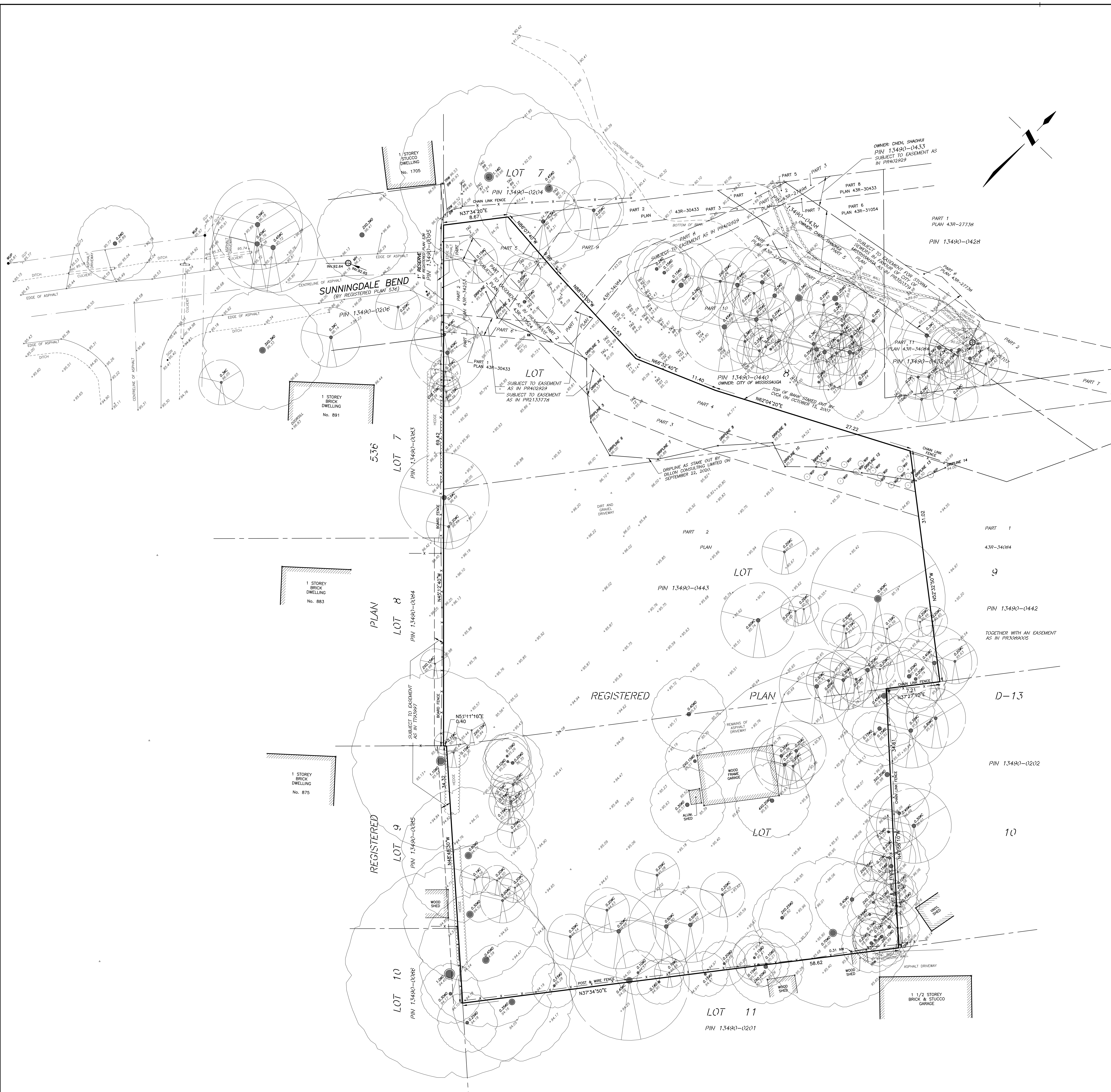
○ 0.20øD DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER  
 ○ 0.20øC DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER  
 TREE CANOPIES ARE DRAWN TO SCALE.

PLAN AMENDED FEBRUARY 12, 2021  
 PLAN AMENDED JANUARY 26, 2021  
 OCTOBER 20, 2020  
 DATE

BORIS KUBICKI  
 ONTARIO LAND SURVEYOR

**TARASICK McMILLAN KUBICKI LIMITED**  
 ONTARIO LAND SURVEYORS  
 4181 SLADEVIEW CRESCENT, UNIT 42, MISSISSAUGA, ONTARIO L5L 5R2  
 TEL: (905) 569-8849 FAX: (905) 569-3160  
 E-MAIL: office@tmksurveyors.com

DRAWN BY: H.P. / JMH FILE No. 4985-20-T



***APPENDIX 'B'***

*Estimated Water Demand*

*Estimated Demand Pressure*

*Fire Flow Test Results*

*Estimated Sanitary Flow*

*Connection Single Use Demand Table*

**TRAFALGAR ENGINEERING LTD.**

**ESTIMATED WATER DEMAND**

**Project:** Welton  
**Desc:** FSR-rev1

**Project No.:** 1407  
**Prepared By:** KZ  
**Checked By:** SP

Land Use / Occupancy Type	Occupancy Data			Peaking Factors			Demand Flow				
	Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Demand (L/min)	Min. Hour	Peak Hour	Max. Daily	Min. Hour Demand (L/min)	Max. Hour Demand (L/min)	Max. Daily Demand (L/min)
Single Family Detached	0.374	50.0	19	280	4	1.00	3.00	2.00	4	11	7
*Per Cap. Demand based on O.B.C. Table 8.2.1.3.B. – 5 L/1.0m <sup>2</sup> Stores											
<b>TOTAL</b>	<b>0</b>		<b>19</b>		<b>4</b>				<b>4</b>	<b>11</b>	<b>7</b>

**Fire Flow**

Using Fire Underwriters Survey Methodology: **Shortcut method used per note J**

**4000 L/min 67(L/s)**  
**Average Daily Demand: 0.1 (L/s)**  
**Minimum Hourly Demand: 0.1 (L/s)**  
**Maximum Hourly Demand: 0.2 (L/s)**  
**Maximum Daily Demand: 0.1 (L/s)**  
**Max. Daily Plus Fire: 67 (L/s)**

1. **An estimate of the fire flow is given by the formula**  $F = 220C\sqrt{A}$   
Where:  
F = The required fire flow in litres per minute  
C = Coefficient related to the type of construction  
A = The total floor area in square metres (including all storeys but excluding basements at least 50% below grade)

Type of Construction: **Ordinary** Coefficient: 1.00 Total Floor Area: **0** (m<sup>2</sup>)  
F = **0 (L/min)** Adequately Protected Vertical Openings: **Yes**

2. **Adjust the value in No. 1 for occupancy surcharge/reduction**

Occupancy Contents: **Limited Combustible** Factor: -15%  
F = **0 (L/min)**

3. **Adjust the value in No. 2 for sprinkler**

NFPA 13 Sprinkler:	<b>No</b>	Reduction:	<b>20%</b>
Standard Water Supply:	<b>Yes</b>	Reduction:	<b>10%</b>
Fully Supervised:	<b>No</b>	Reduction:	<b>10%</b>

**Total Reduction: 40%**  
**Sprinkler Reduction: 0 (L/min)**

4. **Adjust the value in No. 2 for exposure**

	Separation (m)	Charge
North	<b>0</b>	25%
East	<b>0</b>	25%
South	<b>0</b>	25%
West	<b>0</b>	25%

**Total Charge: 75%**  
**Exposure Charge: 0 (L/min)**

**Area Note:** For fire resistive buildings, consider the two largest adjoining floors plus 50% of the remaining floors up to eight, when openings are inadequately protected. For adequately protected vertical openings consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors

5. **Estimated Fire Flow is value in No. 2 less Sprinkler Reduction plus Exposure Charge, rounded to the nearest 1000**

F = **0 (L/min)**

## TRAFALGAR ENGINEERING LTD.

### ESTIMATED DEMAND PRESSURE (AT MAIN)

**Project:** Welton  
**Desc:** Fire Calcs

**Project No.:** 1407  
**Prepared By:** KZ  
**Checked By:** SP

#### Hydrant Residual Flow (Refer to Attached Flow Test Results)

Coefficient	$C =$	0.9
Port Diameter	$D =$	2.5 (inch)
Pitot Pressure	$P_{pit} =$	56 (psig)
Residual Flow	$Q_R =$	1256 (us gpm)
Residual Flow	$Q_R =$	4754 (L/min)

#### Hydrant Theoretical Flow (Refer to Attached Flow Test Results)

Static Pressure	$P_{stat} =$	66 (psig)
Residual Pressure	$P_{res} =$	54 (psig)
Theoretical Pressure	$P_{theo} =$	20 (psig)
Theoretical Flow	$Q_T =$	2595 (us gpm)
Theoretical Flow	$Q_T =$	9822 (L/min)

#### Max. Demand Pressure

Maximum Demand	$Q_D =$	4007 (L/min)
Maximum Demand	$Q_D =$	1059 (us gpm)
Calculated Pressure	$P =$	57 (psig)

Where:

$$Q_R = 29.84 \times C \times D^2 \times P_{pit}^{0.5}$$

$$Q_T = Q_R \times [(P_{stat} - P_{theo}) / (P_{stat} - P_{res})]^{0.54}$$

$$P = P_{stat} - (Q_D / Q_R)^{1.852} \times (P_{stat} - P_{res})$$

Notes:

Refer to attached hydrant flow test results for 300mm main on Church Street prepared by Jackson Waterworks dated May 2, 2016.



81 Todd Road Suite 202 Georgetown Ont. L7G 4R8

( o ) 905-467-5853 ( C ) 905-971-9956 ( e ) [mark@aquacom.ca](mailto:mark@aquacom.ca)

**SITE NAME** SUNNINGDALE BEND

**TEST DATE TIME** TUESDAY 18 MAY 2021 @ 11:45

**SITE ADDRESS** SUNNINDALE BEND, C OF MISSISSAUGA, R OF PEEL

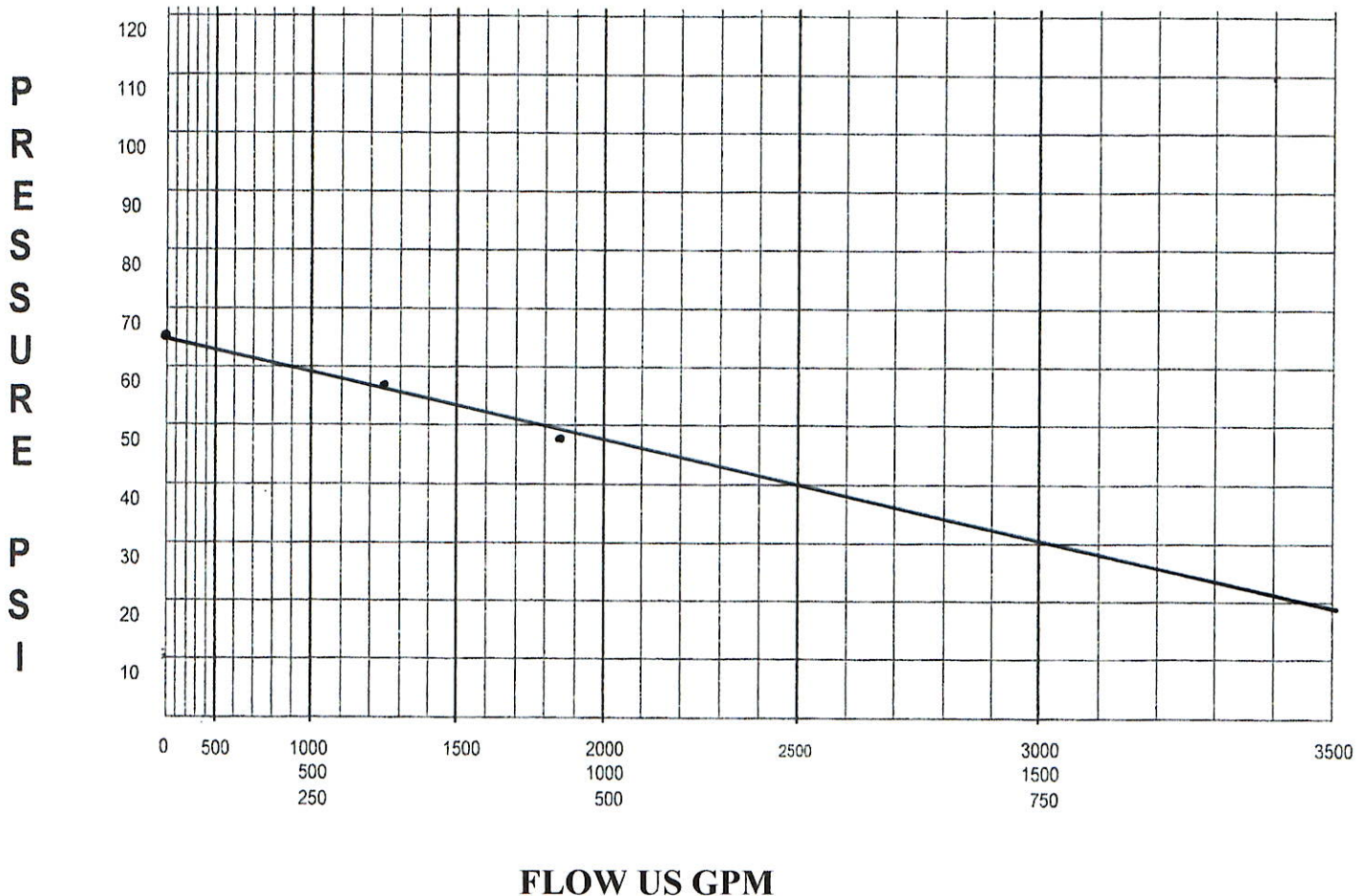
**TECHNICIANS** MARC COULTER & MARK KILBOURNE

**COMMENTS** MUNICIPAL HYDRANTS

**LOCATION OF FLOW HYDRANT**  
1730 SUNNINGDALE BEND

**LOCATION OF RESIDUAL HYDRANT**  
845 SUNNINGDALE BEND

# OUTLETS	SIZE INCHES	PITO PSI	FLOW USGPM	RESIDUAL PSI	STATIC PSI	PIPE DIA. MM
ONE	2.50	56	1256	54	66	150MM
TWO	2.50	30	1840	48		
		<b>THEORETICAL</b>	3054	<b>20</b>	<b>TEST #</b>	<b>ONE</b>
<b>NOZZLE COEFF.</b>		<b>.90</b>				







# HYDRANT FLOW TEST REPORT

81 Todd Road Suite 202 Georgetown Ont. L7G 4R8

( o ) 905-467-5853 ( c ) 905-971-9956 ( e ) [mark@aquacom.ca](mailto:mark@aquacom.ca)

	HYDRANT	SEC. VALVE	TECH.	TIME	STATIC	PITO 1-2.50"	FLOW 1-2.50"	RESIDUAL 1-2.50"	PITO 2-2.50"	FLOW 2-2.50"	RESIDUAL 2-2.50"	COLOUR
	MAKE	CONDITION			PSI	PSI	US GPM	PSI	PSI	US GPM	PSI	CODE
F1	1730 SUNNINGDALE	CV	OK/OPEN	MC		56	1256		30	1840		BLUE
R1	1731 SUNNINGDALE	CV	OK/OPEN	MK	66			54			48	
F2												
R2												
F3												
R3												
F4												
R4												
F5												
R5												

CUSTOMER

TRAFALGAR ENGINEERING

LOCATION

SUNNINGDALE BEND
C OF MISSISSAUGA, R OF PEEL

CONTACTS ON SITE

RofP OPERATOR



Imagery ©2021 First Base Solutions, Maxar Technologies, Map data ©2021 50 m

# TRAFALGAR ENGINEERING LTD.

## ESTIMATED SANITARY FLOW

**Project:** Welton  
**Desc:** FSR-rev1

**Project No.:** 1407  
**Prepared By:** KZ  
**Checked By:** SP

### Residential

Land Use / Occupancy Type	Units	Pop. Density (per/unit)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
Proposed Development (Singles)	5	4.2	21.0	303	0.07
898 Meadow Wood (Single)	1	4.2	4.2	303	0.01
892 Meadow Wood (Single)	1	4.2	4.2	303	0.01
<hr/>					
<hr/>					
<hr/>					
<b>TOTAL</b>	<b>7</b>		<b>29</b>		<b>0.1</b>

### Industrial / Commercial / Institutional

Land Use / Occupancy Type	GFA	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/Ha. Day)	Average Daily Dry Weather Flow (L/s)
<hr/>					
<hr/>					
<hr/>					
<hr/>					
<b>TOTAL</b>	<b>0</b>		<b>0</b>		<b>0.0</b>

Residential Peaking Factor:	4.36
ICI Peaking Factor:	4.50
Include ICI Peaking?	No
Tributary Area:	0.37 (ha)
Infiltration Allowance:	0.20 (L/s ha)
Foundation Drain Allowance:	0.00 (L/s ha)
Residential Average Flow:	0.2 (L/s)
ICI Average Flow:	0.0 (L/s)
<b>Total Average Flow:</b>	<b>0.2 (L/s)</b>
Residential Peak Flow:	0.5 (L/s)
ICI Peak Flow:	0.0 (L/s)
<b>Total Peak Flow:</b>	<b>0.5 (L/s)</b>

# Connection Single Use Demand Table

## WATER CONNECTION

<b>Connection point</b> <sup>3)</sup>			
Ex. water main at the end of Sunningdale Bend			
<b>Pressure zone of connection point</b>			
<b>Total equivalent population to be serviced</b> <sup>1)</sup>		19	
<b>Total lands to be serviced</b>		0.37 Ha	
<b>Hydrant flow test</b>			
Hydrant flow test location		1730 Sunningdale Bend	
	Pressure (kPa)	Flow (in l/s)	Time
Minimum water pressure	330	116	
Maximum water pressure	455	static	

No.	Water demands		
	Demand type	Demand	Units
1	Average day flow	0.1	l/s
2	Maximum day flow	0.1	l/s
3	Peak hour flow	0.2	l/s
4	Fire flow <sup>2)</sup>	67	l/s
<b>Analysis</b>			
5	Maximum day plus fire flow	67.1	l/s

## WASTEWATER CONNECTION

<b>Connection point</b> <sup>4)</sup>		Ex. San. Sunningdale Bend
<b>Total equivalent population to be serviced</b> <sup>1)</sup>		29
<b>Total lands to be serviced</b>		0.37 Ha
6	Wastewater sewer effluent (in l/s)	0.5

<sup>1)</sup> The calculations should be based on the development estimated population (employment or residential).

<sup>2)</sup> Please reference the Fire Underwriters Survey Document

<sup>3)</sup> Please specify the connection point ID

<sup>4)</sup> Please specify the connection point (wastewater line or manhole ID)

Also, the "total equivalent population to be serviced" and the "total lands to be serviced" should reference the connection point. (The FSR should contain one copy of Site Servicing Plan)

Please include the graphs associated with the hydrant flow test information table

Please provide Professional Engineer's signature and stamp on the demand table

All required calculations must be submitted with the demand table submission.

***APPENDIX 'C'***

*Correspondence with Planning & Development Services*

**From:** [Sniatenchuk, Bernadette](#)  
**To:** [Stephen Potter](#)  
**Subject:** FSR for RZ-21-019B - 1667 Sunningdale Bend  
**Date:** February 16, 2022 5:53:48 PM  
**Attachments:** [single use demand table - Mar 2016.pdf](#)

---

Hi Stephen, I received the FSR submitted for the RZ noted above, which is dated June 10, 2021. Modelling for water and wastewater capacity is required prior to the RZ approval. I require some revisions prior to sending it for modelling.

Firstly, since the road within the development is a condo road, our jurisdiction will end at the end of the municipal ROW, which appears to be the limit of the cul de sac. Therefore, after the municipal ROW the services will be private. The Servicing plan should be adjusted so that the connections for the private road and the transfer of the existing forcemain connections are in accordance with Peel Standards, showing appurtenances at the Right of Way property limit.

#### Water

- Just a note that the Region does not recommend dead ends on private or public side.
- For appendix A water demands, please fill in the attached demand table. We require the flows to be in L/s for our model.

#### Wastewater

- Connection from the existing private forcemains to municipal gravity sewer shall transition from forcemain to gravity prior to entering the municipal sanitary sewer. Sewage from private property shall enter the Region's municipal sewer by gravity. Please incorporate this into the design
- For Appendix A sanitary flow, can you please include the flows from 898 and 892 Meadow Wood so we have the total flows.
- Also in appendix A, for the design flow calculations, since this is infill with existing municipal services in the road allowance, please consider the following PPU's, which are found in the Region of Peel 2020 DC Background Study - Singles/Semi – 4.2 persons per unit (this was conveyed with my DARC comments)

When these revisions have been made you can send me the updated report and demand table and I can send it for modelling.

If you have any questions, please let me know.

Thank you,

**Bernadette Sniatenchuk, B.Sc.**

Project Manager – Servicing Connections

Planning & Development Services  
Public Works, Region of Peel  
10 Peel Centre Drive, Suite B, 4th Floor  
Brampton, On L6T 4B9  
Mobile: 647-285-5919



In response to the emergence of the novel coronavirus, the Region of Peel is implementing various measures to protect our customers, employees and workplaces. Development Services will endeavour to maintain the continuity of our business operations, however delays in service may still be experienced. We appreciate your patience during this time.

This e-mail is for the sole use of the intended recipient and may contain confidential or privileged information. Unauthorized use of its contents is prohibited. If you have received this e-mail in error, please notify sender immediately via return e-mail and then delete the original e-mail.

***APPENDIX 'D'***

*Stormwater Drainage Calculations*

*HydroCAD Results Report*

*Figure 2, Pre-Development Drainage Plan*

*Figure 3, Post-Development Drainage Plan*



**TRAFALGAR ENGINEERING LTD.**

**Area Parameters**

**Project:** 1667 Sunningdale Bend

**Desc:** Single Family Condo

**Project No.:** 1407

**Prepared By:** AJP

**Checked By:** JN

$C_{per}$ : 0.25

$C_{imp}$ : 0.9

Area Number	Description	Area <sub>imp</sub> (ha)	Area <sub>per</sub> (ha)	Area <sub>total</sub> (ha)	Composite Runoff Coef., 'C'	% Imp
	<b><u>Pre-Development</u></b>					
A	North part of Site	0.028	0.215	0.243	0.33	12%
	Ex. Sunningdale Bend	0.005	0.003	0.008	0.64	60%
	To Valley	0.033	0.218	0.251	0.34	13%
B	To South	0.078	0.194	0.272	0.44	29%
	<b><u>Post Development</u></b>					
A	Sunningdale Bend & Cul-de-sac to Sewer	0.044	0.026	0.071	0.66	63%
C	Site Area to Sewer	0.197	0.089	0.286	0.70	69%
B	Site Area Direct to Valley	0	0.090	0.090	0.25	0%
	Cul-de-sac Direct to Valley	0	0.011	0.011	0.25	0%
	Area Direct to Valley	0	0.100	0.100	0.25	0%
<u>D</u>	Site Area to South	0.000	0.069	0.069	0.25	0%

# TRAFALGAR ENGINEERING LTD.

## INFILTRATION IN STORAGE TANK FOR AREA A

Based on MOE SWM Design Manual

**Project:** 1667 Sunningdale Bend

**Desc:** Single Family Condo

**Project No.:** 1407

**Prepared By:** AJP

**Checked By:** JN

### Infiltration of 5mm Storm

Required Vol. (V)      2.22 m<sup>3</sup>      Volume below pipe free outflow

t=1000V/(PnA)

MOE Stormwater Management Design Manual.

P =      60 mm/hr      Per Geotechnical Engineer

n =      0.4

A =      18 m<sup>2</sup>

FS =      2.5

t=      12.85 hr

# TRAFALGAR ENGINEERING LTD.

## INFILTRATION IN STORAGE TANK FOR AREA C

Based on MOE SWM Design Manual

**Project:** 1667 Sunningdale Bend

**Desc:** Single Family Condo

**Project No.:** 1407

**Prepared By:** AJP

**Checked By:** JN

### Infiltration of 5mm Storm

Required Vol. (V)            9.9 m<sup>3</sup>            Volume below pipe free outflow

t=1000V/(PnA)

MOE Stormwater Management Design Manual.

P =        60 mm/hr    Per Geotechnical Engineer

n =        0.4

A =        75 m<sup>2</sup>

FS =       2.5

t=            13.75 hr

## TRAFALGAR ENGINEERING LTD.

### AREA A: ORIFICE TUBE SIZING DESIGN SHEET - INLET CONTROL

**Project:** 1667 Sunningdale Bend  
**Desc:** 2nd Submission RZ

**Project No.:** 1407  
**Prepared By:** AJP  
**Checked By:** JN

#### Orifice Tube Geometric Information

Orifice Tube Dia. 75 (mm) (Calculation based on Imperial ID)  
 Pipe Material Circular  
 Inlet Configuration Beveled

K	0.0018
M	2.5
C	0.03
Y	0.74
K <sub>s</sub>	0.7

Where Unsubmerged:

$$\frac{HW}{D} = \frac{H_c}{D} + K + \left[ \frac{K_u Q}{AD^{0.5}} \right]^M + K_s S$$

Where Submerged:

$$\frac{HW}{D} = C \left[ \frac{K_u Q}{AD^{0.5}} \right]^2 + Y + K_s S$$

#### HDS-5 METHODOLOGY - INLET CONTROL "HAND CALCULATIONS"

Inlet Control Headwater Elevation	Tube Discharge, Q (cms)	Critical Flow Area, A (m <sup>2</sup> )	Critical Velocity, V <sub>c</sub> (m/s)	Specific Head, H <sub>c</sub> (m)	Unsubm. HW/D	Subm. HW/D	Unsubm. HW (m)	Subm. HW (m)	Q/AD <sup>0.5</sup>	Outlet Control Headwater Elevation	Control Type	Governing Headwater Elevation
93.79	0.001	0.002	0.507	0.047	0.613	0.816	0.050	0.060	0.794	93.81	Outlet	93.81
93.82	0.002	0.003	0.254	0.052	1.000	1.002	0.080	0.080	1.589	93.84	Outlet	93.84
93.84	0.003	0.004	0.248	0.063	1.260	1.313	0.100	0.100	2.383	93.86	Outlet	93.86
93.87	0.004	0.004	0.232	0.070	1.482	1.747	0.110	0.130	3.177	93.86	Inlet	93.87
93.92	0.005	0.004	0.209	0.074	1.670	2.306	0.130	0.180	3.972	93.89	Inlet	93.92
93.97	0.006	0.005	0.181	0.076	1.852	2.989	0.140	0.230	4.766	93.94	Inlet	93.97
94.03	0.007	0.005	0.152	0.076	2.052	3.796	0.160	0.290	5.561	93.98	Inlet	94.03
94.10	0.008	0.005	0.126	0.076	2.289	4.728	0.170	0.360	6.355	94.03	Inlet	94.10
94.18	0.009	0.005	0.103	0.076	2.570	5.783	0.200	0.440	7.149	94.09	Inlet	94.18
94.72	0.014	0.008	0.085	0.100	5.235	12.923	0.400	0.980	11.121	94.48	Inlet	94.72

## TRAFALGAR ENGINEERING LTD.

### AREA A: ORIFICE TUBE SIZING DESIGN SHEET - OUTLET CONTROL

**Project:** 1667 Sunningdale Bend  
**Desc:** 2nd Submission RZ

**Project No.:** 1407  
**Prepared By:** AJP  
**Checked By:** JN

#### Orifice Tube Geometric Information

Orifice Tube Dia. 75 (mm) (Calculation based on Imperial ID)  
 Orifice Tube Length 0.23 (m)  
 Orifice Tube Slope 0.020 (m/m)

Note: It is recommended that the orifice tube length is between two and three diameters. Based on the selection above, a range of 150mm to 225mm in length is recommended for true orifice flow. Lengths exceeding the recommended range for true orifice flow are culvert flow.

#### Orifice Tube Properties

Entrance Loss Coeff. 0.2  
 Exit/Transition Loss Coeff. 1.00  
 Orifice Tube Manning's 'n' 0.013  
 Gravitational Constant 9.81 (m/s<sup>2</sup>)

Maximum Allowable Q 0.014 (cms)  
 Tube D/S Invert 93.74 (m)

#### STAGE-DISCHARGE AND HYDRAULIC PROPERTIES TABLE - OUTLET CONTROL

Outlet Control Headwater Elevation	Tube Discharge, Q (cms)	Flow Area, A (m <sup>2</sup> )	Friction Loss, H <sub>f</sub> (m)	Inlet Velocity, V <sub>1</sub> (m/s)	Outlet Velocity, V <sub>2</sub> (m/s)	Entrance Loss, H <sub>e</sub> (m)	Exit Loss, H <sub>t</sub> (m)	Total Headloss, H <sub>L</sub> (cms)	Critical Depth, d <sub>c</sub> (m)	Tailwater Elevation (D+d <sub>c</sub> )/2 (m)
93.81	0.001	0.001	0.00	0.67	0.26	0.00	0.00	0.01	0.03	93.80
93.84	0.002	0.003	0.00	0.80	0.52	0.01	0.03	0.04	0.05	93.80
93.86	0.003	0.003	0.00	0.87	0.68	0.01	0.04	0.05	0.06	93.81
93.86	0.004	0.005	0.01	0.88	0.91	0.01	0.04	0.05	0.07	93.81
93.89	0.005	0.005	0.01	1.10	1.14	0.01	0.06	0.08	0.07	93.81
93.94	0.006	0.005	0.01	1.32	1.32	0.02	0.09	0.12	0.07	93.82
93.98	0.007	0.005	0.02	1.53	1.54	0.02	0.12	0.16	0.07	93.82
94.03	0.008	0.005	0.02	1.75	1.75	0.03	0.16	0.21	0.08	93.82
94.09	0.009	0.005	0.03	1.97	1.97	0.04	0.20	0.27	0.08	93.82
94.48	0.014	0.005	0.07	3.07	3.07	0.10	0.48	0.65	0.10	93.83

## TRAFALGAR ENGINEERING LTD.

### AREA C: ORIFICE TUBE SIZING DESIGN SHEET - INLET CONTROL

**Project:** 1667 Sunningdale Bend  
**Desc:** 2nd Submission RZ

**Project No.:** 1407  
**Prepared By:** AJP  
**Checked By:** JN

#### Orifice Tube Geometric Information

Orifice Tube Dia. 75 (mm) (Calculation based on Imperial ID)  
 Pipe Material Circular  
 Inlet Configuration Beveled

K	0.0018
M	2.5
C	0.03
Y	0.74
K <sub>s</sub>	0.7

Where Unsubmerged:

$$\frac{HW}{D} = \frac{H_c}{D} + K + \left[ \frac{K_u Q}{AD^{0.5}} \right]^M + K_s S$$

Where Submerged:

$$\frac{HW}{D} = C \left[ \frac{K_u Q}{AD^{0.5}} \right]^2 + Y + K_s S$$

#### HDS-5 METHODOLOGY - INLET CONTROL "HAND CALCULATIONS"

Inlet Control Headwater Elevation	Tube Discharge, Q (cms)	Critical Flow Area, A (m <sup>2</sup> )	Critical Velocity, V <sub>c</sub> (m/s)	Specific Head, H <sub>c</sub> (m)	Unsubm. HW/D	Subm. HW/D	Unsubm. HW (m)	Subm. HW (m)	Q/AD <sup>0.5</sup>	Outlet Control Headwater Elevation	Control Type	Governing Headwater Elevation
93.60	0.001	0.015	0.066	0.087	1.141	0.804	0.090	0.060	0.794	93.60	Outlet	93.60
93.70	0.002	0.025	0.254	0.127	2.488	0.990	0.190	0.080	1.589	93.65	Inlet	93.70
93.61	0.003	0.032	0.248	0.157	3.108	1.301	0.240	0.100	2.383	93.67	Outlet	93.67
93.64	0.004	0.038	0.232	0.181	3.663	1.735	0.280	0.130	3.177	93.69	Outlet	93.69
93.68	0.005	0.043	0.209	0.201	4.174	2.294	0.320	0.170	3.972	93.73	Outlet	93.73
93.74	0.006	0.046	0.181	0.217	4.644	2.977	0.350	0.230	4.766	93.78	Outlet	93.78
93.80	0.007	0.048	0.152	0.229	5.076	3.784	0.390	0.290	5.561	93.82	Outlet	93.82
93.87	0.008	0.049	0.126	0.238	5.478	4.716	0.420	0.360	6.355	93.88	Outlet	93.88
93.95	0.009	0.050	0.103	0.243	5.865	5.771	0.450	0.440	7.149	93.94	Inlet	93.95
94.49	0.014	0.050	0.085	0.247	8.136	12.911	0.620	0.980	11.121	94.32	Inlet	94.49

## TRAFALGAR ENGINEERING LTD.

### AREA C: ORIFICE TUBE SIZING DESIGN SHEET - OUTLET CONTROL

**Project:** 1667 Sunningdale Bend  
**Desc:** 2nd Submission RZ

**Project No.:** 1407  
**Prepared By:** AJP  
**Checked By:** JN

#### Orifice Tube Geometric Information

Orifice Tube Dia. 75 (mm) (Calculation based on Imperial ID)  
 Orifice Tube Length 0.23 (m)  
 Orifice Tube Slope 0.003 (m/m)

Note: It is recommended that the orifice tube length is between two and three diameters. Based on the selection above, a range of 150mm to 225mm in length is recommended for true orifice flow. Lengths exceeding the recommended range for true orifice flow are culvert flow.

#### Orifice Tube Properties

Entrance Loss Coeff. 0.2  
 Exit/Transition Loss Coeff. 1.00  
 Orifice Tube Manning's 'n' 0.013  
 Gravitational Constant 9.81 (m/s<sup>2</sup>)

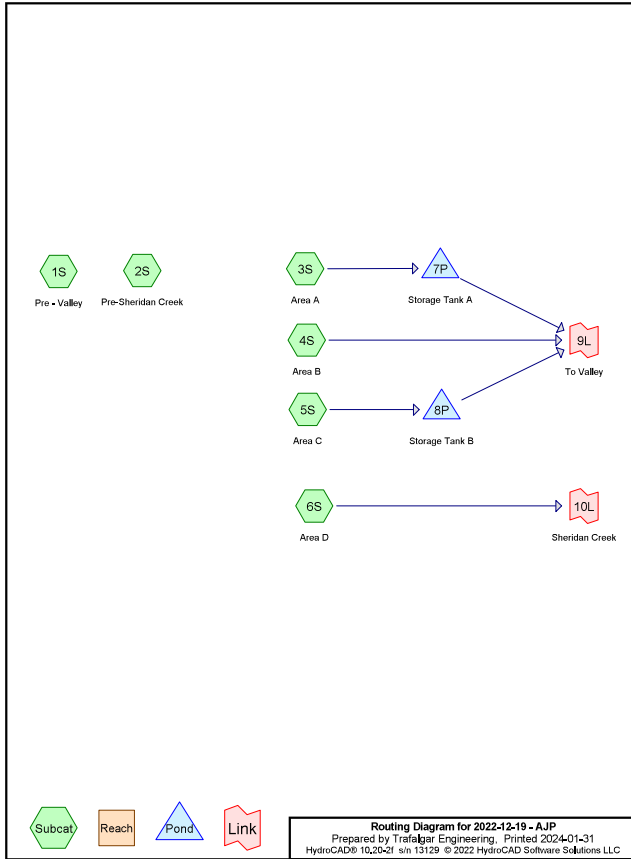
Maximum Allowable Q 0.014 (cms)  
 Tube D/S Invert 93.51 (m)

#### STAGE-DISCHARGE AND HYDRAULIC PROPERTIES TABLE - OUTLET CONTROL

Outlet Control Headwater Elevation	Tube Discharge, Q (cms)	Flow Area, A (m <sup>2</sup> )	Friction Loss, H <sub>f</sub> (m)	Inlet Velocity, V <sub>1</sub> (m/s)	Outlet Velocity, V <sub>2</sub> (m/s)	Entrance Loss, H <sub>e</sub> (m)	Exit Loss, H <sub>t</sub> (m)	Total Headloss, H <sub>L</sub> (cms)	Critical Depth, d <sub>c</sub> (m)	Tailwater Elevation (D+d <sub>c</sub> )/2 (m)
93.60	0.001	0.001	0.00	0.67	0.22	0.00	0.00	0.01	0.09	93.59
93.65	0.002	0.003	0.00	0.80	0.44	0.01	0.03	0.04	0.12	93.61
93.67	0.003	0.003	0.00	0.87	0.66	0.01	0.04	0.05	0.15	93.62
93.69	0.004	0.005	0.01	0.88	0.88	0.01	0.04	0.05	0.18	93.64
93.73	0.005	0.005	0.01	1.10	1.10	0.01	0.06	0.08	0.20	93.65
93.78	0.006	0.005	0.01	1.32	1.32	0.02	0.09	0.12	0.22	93.66
93.82	0.007	0.005	0.02	1.53	1.54	0.02	0.12	0.16	0.23	93.66
93.88	0.008	0.005	0.02	1.75	1.75	0.03	0.16	0.21	0.24	93.67
93.94	0.009	0.005	0.03	1.97	1.97	0.04	0.20	0.27	0.24	93.67
94.32	0.014	0.005	0.07	3.07	3.07	0.10	0.48	0.65	0.25	93.67

**Project Notes**

Copied 6 events from ON Mississauga 24hr storm



**Rainfall Events Listing**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (mm)	AMC
1	2-Year	ON Mississauga 24hr	2-Year	Default	24.00	1	50	2
2	5-Year	ON Mississauga 24hr	5-Year	Default	24.00	1	67	2
3	10-Year	ON Mississauga 24hr	10-Year	Default	24.00	1	83	2
4	25-Year	ON Mississauga 24hr	25-Year	Default	24.00	1	95	2
5	50-Year	ON Mississauga 24hr	50-Year	Default	24.00	1	106	2
6	100-Year	ON Mississauga 24hr	100-Year	Default	24.00	1	118	2

**Area Listing (all nodes)**

Area (hectares)	CN	Description (subcatchment-numbers)
0.6985	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S)
0.2412	98	Paved roads w/curbs & sewers, HSG B (3S, 5S)
0.1116	98	Unconnected roofs, HSG C (1S, 2S)
<b>1.0513</b>	<b>73</b>	<b>TOTAL AREA</b>



**Soil Listing (all nodes)**

Area (hectares)	Soil Group	Subcatchment Numbers
0.0000	HSG A	
0.9397	HSG B	1S, 2S, 3S, 4S, 5S, 6S
0.1116	HSG C	1S, 2S
0.0000	HSG D	
0.0000	Other	
<b>1.0513</b>	<b>TOTAL AREA</b>	

**Ground Covers (all nodes)**

HSG-A (hectares)	HSG-B (hectares)	HSG-C (hectares)	HSG-D (hectares)	Other (hectares)	Total (hectares)	Ground Cover	Subcat Number
0.0000	0.6985	0.0000	0.0000	0.0000	0.6985	>75% Grass cover, Good	
0.0000	0.2412	0.0000	0.0000	0.0000	0.2412	Paved roads w/curbs & sewers	
0.0000	0.0000	0.1116	0.0000	0.0000	0.1116	Unconnected roofs	
<b>0.0000</b>	<b>0.9397</b>	<b>0.1116</b>	<b>0.0000</b>	<b>0.0000</b>	<b>1.0513</b>	<b>TOTAL AREA</b>	

Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

- Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m<sup>2</sup> 13.40% Impervious Runoff Depth=2 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min UJ Adjusted CN=63 Runoff=0.000 m<sup>3</sup>/s 0.006 MI
- Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m<sup>2</sup> 28.54% Impervious Runoff Depth=4 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min UJ Adjusted CN=66 Runoff=0.001 m<sup>3</sup>/s 0.010 MI
- Subcatchment 3S: Area A** Runoff Area=707.0 m<sup>2</sup> 62.66% Impervious Runoff Depth=18 mm  
 Tc=15.0 min CN=84 Runoff=0.004 m<sup>3</sup>/s 0.013 MI
- Subcatchment 4S: Area B** Runoff Area=1,000.0 m<sup>2</sup> 0.00% Impervious Runoff Depth=2 mm  
 Tc=15.0 min CN=61 Runoff=0.000 m<sup>3</sup>/s 0.002 MI
- Subcatchment 5S: Area C** Runoff Area=2,859.0 m<sup>2</sup> 68.87% Impervious Runoff Depth=21 mm  
 Tc=15.0 min CN=86 Runoff=0.021 m<sup>3</sup>/s 0.060 MI
- Subcatchment 6S: Area D** Runoff Area=690.0 m<sup>2</sup> 0.00% Impervious Runoff Depth=2 mm  
 Tc=15.0 min CN=61 Runoff=0.000 m<sup>3</sup>/s 0.001 MI
- Pond 7P: Storage Tank A** Peak Elev=93.828 m Storage=1.8 m<sup>3</sup> Inflow=0.004 m<sup>3</sup>/s 0.013 MI  
 Discarded=0.000 m<sup>3</sup>/s 0.000 MI Primary=0.003 m<sup>3</sup>/s 0.013 MI Outflow=0.003 m<sup>3</sup>/s 0.013 MI
- Pond 8P: Storage Tank B** Peak Elev=93.594 m Storage=24.5 m<sup>3</sup> Inflow=0.021 m<sup>3</sup>/s 0.060 MI  
 Discarded=0.000 m<sup>3</sup>/s 0.009 MI Primary=0.004 m<sup>3</sup>/s 0.039 MI Outflow=0.004 m<sup>3</sup>/s 0.048 MI
- Link 9L: To Valley** Inflow=0.006 m<sup>3</sup>/s 0.053 MI  
 Primary=0.006 m<sup>3</sup>/s 0.053 MI
- Link 10L: Sheridan Creek** Inflow=0.000 m<sup>3</sup>/s 0.001 MI  
 Primary=0.000 m<sup>3</sup>/s 0.001 MI

Total Runoff Area = 1.0513 ha Runoff Volume = 0.092 MI Average Runoff Depth = 9 mm  
 66.44% Pervious = 0.6985 ha 33.56% Impervious = 0.3528 ha

**Summary for Subcatchment 1S: Pre - Valley**

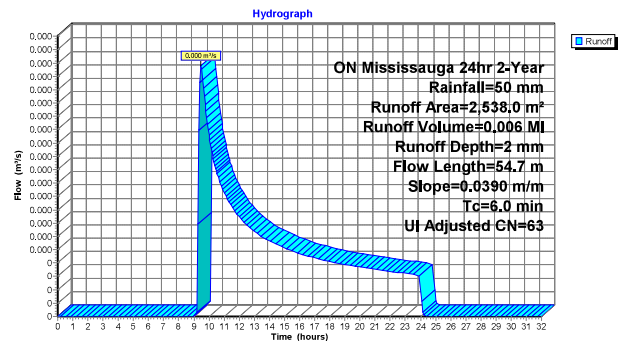
Runoff = 0.000 m<sup>3</sup>/s @ 9.48 hrs, Volume= 0.006 MI, Depth= 2 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m <sup>2</sup> )	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, UJ Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

**Subcatchment 1S: Pre - Valley**



**Summary for Subcatchment 2S: Pre-Sheridan Creek**

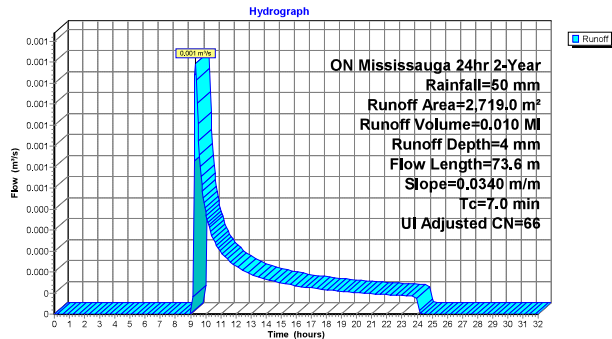
Runoff = 0.001 m³/s @ 9.35 hrs, Volume= 0.010 MI, Depth= 4 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m²)	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, UI Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

**Subcatchment 2S: Pre-Sheridan Creek**



**Summary for Subcatchment 3S: Area A**

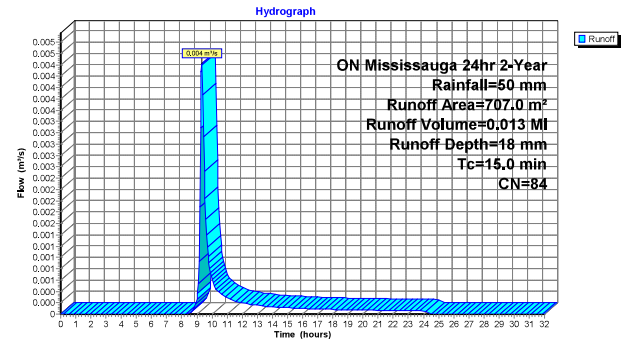
Runoff = 0.004 m³/s @ 9.33 hrs, Volume= 0.013 MI, Depth= 18 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m²)	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

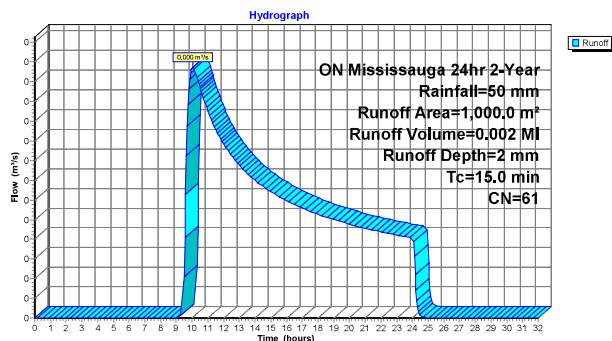
Runoff = 0.000 m³/s @ 10.03 hrs, Volume= 0.002 MI, Depth= 2 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m²)	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

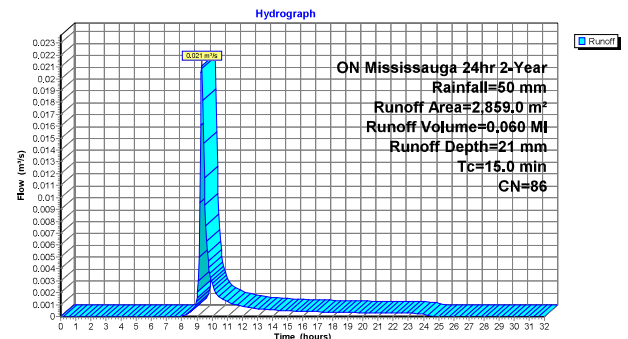
Runoff = 0.021 m³/s @ 9.33 hrs, Volume= 0.060 MI, Depth= 21 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m²)	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

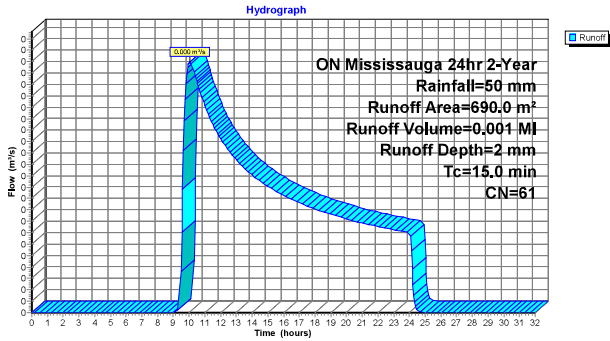
Runoff = 0.000 m³/s @ 10.03 hrs, Volume= 0.001 MI, Depth= 2 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 2-Year Rainfall=50 mm

Area (m²)	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 6S: Area D**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 18 mm for 2-Year event  
 Inflow = 0.004 m³/s @ 9.33 hrs, Volume= 0.013 MI  
 Outflow = 0.003 m³/s @ 9.45 hrs, Volume= 0.013 MI, Atten= 29%, Lag= 7.2 min  
 Discarded = 0.000 m³/s @ 9.45 hrs, Volume= 0.000 MI  
 Primary = 0.003 m³/s @ 9.45 hrs, Volume= 0.013 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 93.828 m @ 9.45 hrs Surf.Area= 18.0 m² Storage= 1.8 m³

Plug-Flow detention time= 20.9 min calculated for 0.013 MI (100% of inflow)  
 Center-of-Mass det. time= 20.2 min ( 739.6 - 719.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	93.720 m	10.3 m³	Custom Stage Data (Conic) Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids

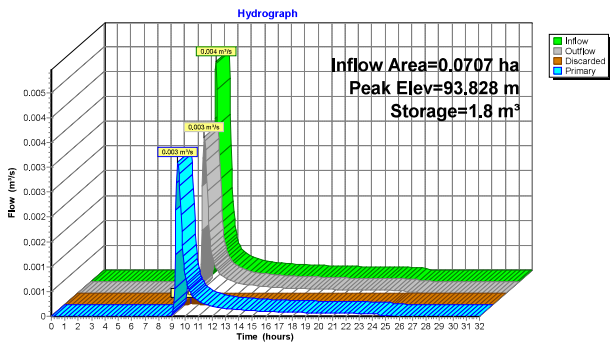
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m Conductivity to Groundwater Elevation = 91.900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to verify flow at low heads

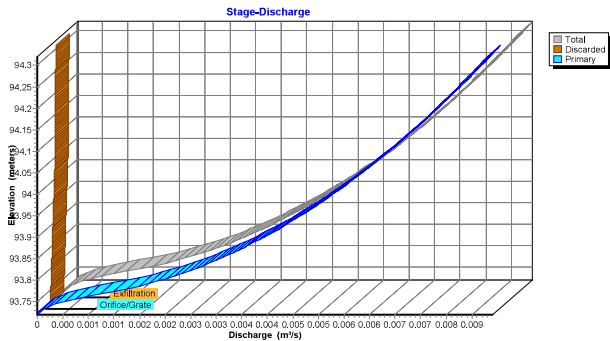
Discarded OutFlow Max=0.000 m³/s @ 9.45 hrs HW=93.827 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.003 m³/s @ 9.45 hrs HW=93.827 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Grate (Orifice Controls 0.003 m³/s @ 0.70 m/s)

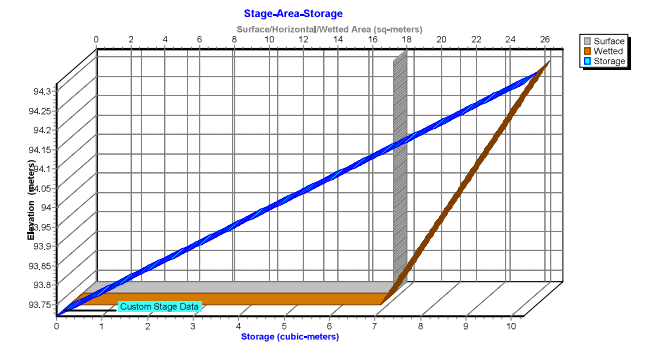
**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 8P: Storage Tank B**

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 21 mm for 2-Year event  
 Inflow = 0.021 m³/s @ 9.33 hrs, Volume= 0.060 MI  
 Outflow = 0.004 m³/s @ 9.79 hrs, Volume= 0.048 MI, Atten= 80%, Lag= 27.6 min  
 Discarded = 0.000 m³/s @ 9.79 hrs, Volume= 0.009 MI  
 Primary = 0.004 m³/s @ 9.79 hrs, Volume= 0.039 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 93.594 m @ 9.79 hrs Surf.Area= 75.0 m² Storage= 24.5 m³

Plug-Flow detention time= 231.7 min calculated for 0.048 MI (81% of inflow)  
 Center-of-Mass det. time= 133.1 min ( 843.0 - 709.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	93.250 m	106.9 m³	Custom Stage Data (Conic) Listed below (Recalc) 112.5 m³ Overall x 95.0% Voids

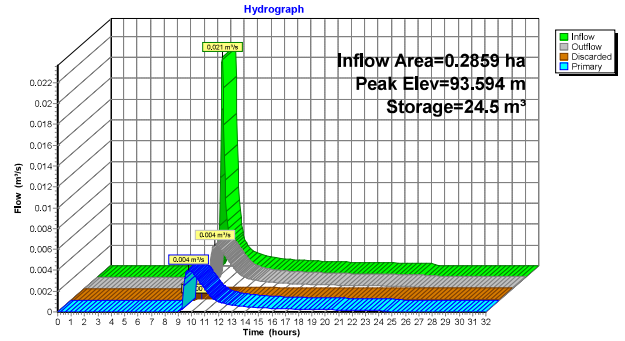
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.250	75.0	0.0	0.0	75.0
94.750	75.0	112.5	112.5	121.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.250 m	60.00 mm/hr Exfiltration over Wetted area from 93.250 m - 94.950 m Conductivity to Groundwater Elevation = 91.700 m Excluded Wetted area = 75.0 m²
#2	Primary	93.440 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

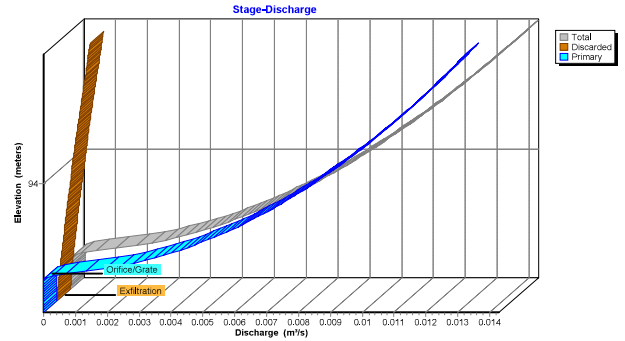
Discarded OutFlow Max=0.000 m³/s @ 9.79 hrs HW=93.594 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.004 m³/s @ 9.79 hrs HW=93.594 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Grate (Orifice Controls 0.004 m³/s @ 0.91 m/s)

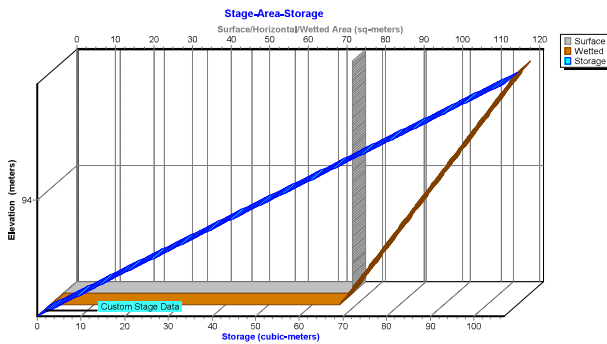
**Pond 8P: Storage Tank B**



**Pond 8P: Storage Tank B**



**Pond 8P: Storage Tank B**

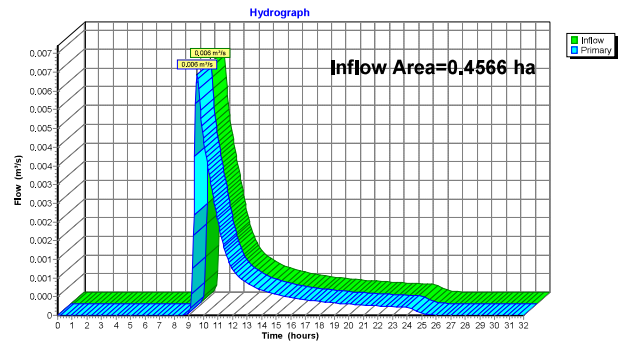


**Summary for Link 9L: To Valley**

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 12 mm for 2-Year event  
 Inflow = 0.006 m³/s @ 9.57 hrs, Volume= 0.053 MI  
 Primary = 0.006 m³/s @ 9.57 hrs, Volume= 0.053 MI, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

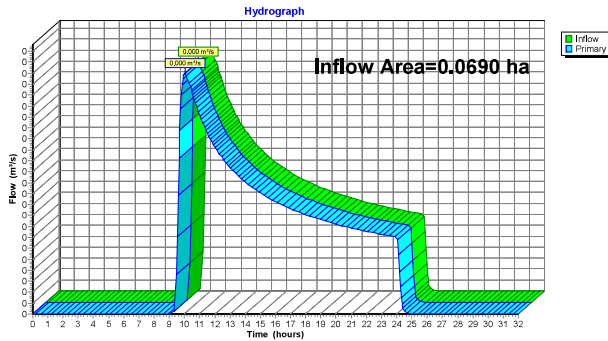
**Link 9L: To Valley**



**Summary for Link 10L: Sheridan Creek**

Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 2 mm for 2-Year event  
 Inflow = 0.000 m³/s @ 10.03 hrs, Volume= 0.001 MI  
 Primary = 0.000 m³/s @ 10.03 hrs, Volume= 0.001 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 10L: Sheridan Creek



Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

- Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m² 13.40% Impervious Runoff Depth=7 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min Uf Adjusted CN=63 Runoff=0.004 m³/s 0.019 MI
- Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m² 28.54% Impervious Runoff Depth=10 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min Uf Adjusted CN=66 Runoff=0.008 m³/s 0.027 MI
- Subcatchment 3S: Area A** Runoff Area=707.0 m² 62.66% Impervious Runoff Depth=31 mm  
 Tc=15.0 min CN=84 Runoff=0.008 m³/s 0.022 MI
- Subcatchment 4S: Area B** Runoff Area=1,000.0 m² 0.00% Impervious Runoff Depth=6 mm  
 Tc=15.0 min CN=61 Runoff=0.001 m³/s 0.006 MI
- Subcatchment 5S: Area C** Runoff Area=2,859.0 m² 68.87% Impervious Runoff Depth=35 mm  
 Tc=15.0 min CN=86 Runoff=0.036 m³/s 0.099 MI
- Subcatchment 6S: Area D** Runoff Area=690.0 m² 0.00% Impervious Runoff Depth=6 mm  
 Tc=15.0 min CN=61 Runoff=0.001 m³/s 0.004 MI
- Pond 7P: Storage Tank A** Peak Elev=93,932 m Storage=3.6 m³ Inflow=0.008 m³/s 0.022 MI  
 Discarded=0.000 m³/s 0.000 MI Primary=0.005 m³/s 0.022 MI Outflow=0.005 m³/s 0.022 MI
- Pond 8P: Storage Tank B** Peak Elev=93,833 m Storage=41.5 m³ Inflow=0.036 m³/s 0.099 MI  
 Discarded=0.000 m³/s 0.011 MI Primary=0.007 m³/s 0.077 MI Outflow=0.007 m³/s 0.087 MI
- Link 9L: To Valley** Inflow=0.012 m³/s 0.104 MI  
 Primary=0.012 m³/s 0.104 MI
- Link 10L: Sheridan Creek** Inflow=0.001 m³/s 0.004 MI  
 Primary=0.001 m³/s 0.004 MI

Total Runoff Area = 1,0513 ha Runoff Volume = 0.177 MI Average Runoff Depth = 17 mm  
 66,44% Pervious = 0.6985 ha 33,56% Impervious = 0.3528 ha

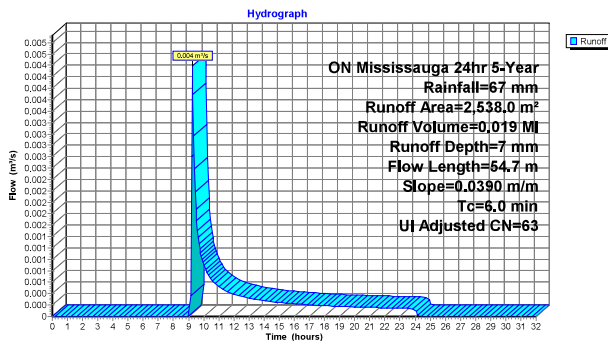
**Summary for Subcatchment 1S: Pre - Valley**

Runoff = 0.004 m³/s @ 9.26 hrs, Volume= 0.019 MI, Depth= 7 mm  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m²)	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, Uf Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

Subcatchment 1S: Pre - Valley



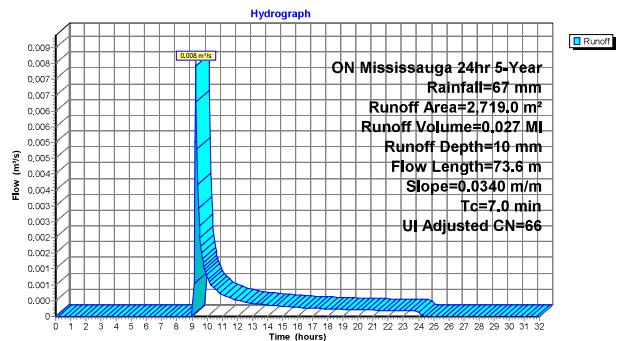
**Summary for Subcatchment 2S: Pre-Sheridan Creek**

Runoff = 0.008 m³/s @ 9.26 hrs, Volume= 0.027 MI, Depth= 10 mm  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m²)	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, Uf Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

Subcatchment 2S: Pre-Sheridan Creek



**Summary for Subcatchment 3S: Area A**

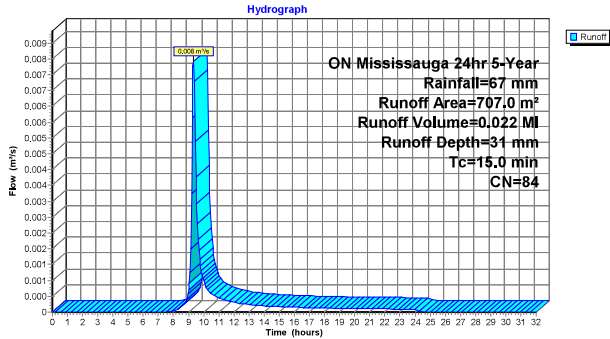
Runoff = 0.008 m<sup>3</sup>/s @ 9.33 hrs, Volume= 0.022 MI, Depth= 31 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m <sup>2</sup> )	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

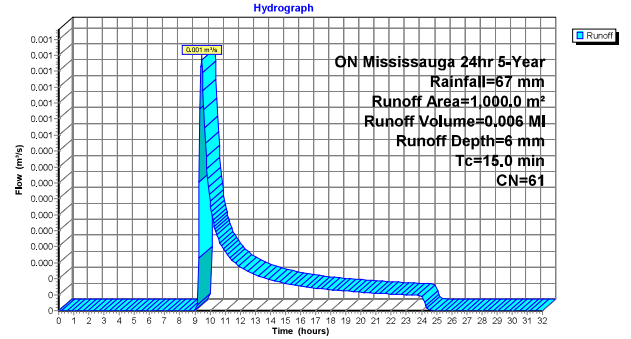
Runoff = 0.001 m<sup>3</sup>/s @ 9.44 hrs, Volume= 0.006 MI, Depth= 6 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m <sup>2</sup> )	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

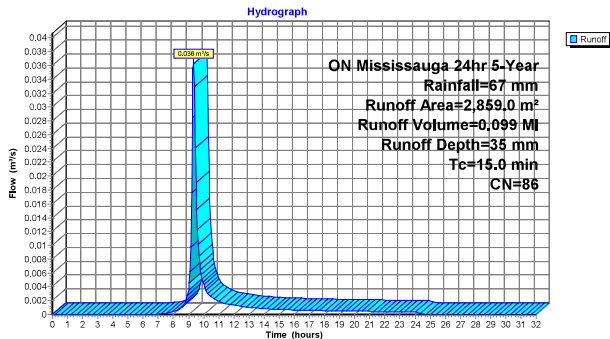
Runoff = 0.036 m<sup>3</sup>/s @ 9.32 hrs, Volume= 0.099 MI, Depth= 35 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m <sup>2</sup> )	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

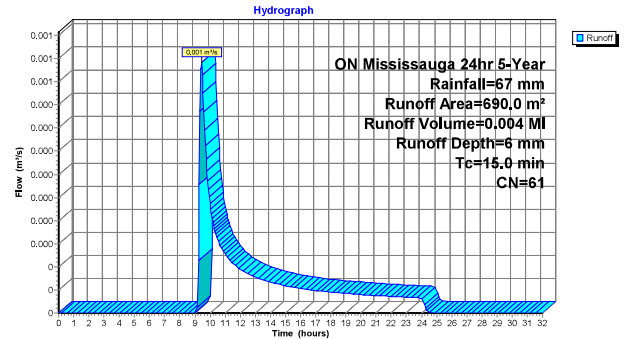
Runoff = 0.001 m<sup>3</sup>/s @ 9.44 hrs, Volume= 0.004 MI, Depth= 6 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 5-Year Rainfall=67 mm

Area (m <sup>2</sup> )	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 6S: Area D**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 31 mm for 5-Year event  
 Inflow = 0.008 m³/s @ 9.33 hrs, Volume= 0.022 MI  
 Outflow = 0.005 m³/s @ 9.47 hrs, Volume= 0.022 MI, Atten= 37%, Lag= 8.6 min  
 Discarded = 0.000 m³/s @ 9.47 hrs, Volume= 0.000 MI  
 Primary = 0.005 m³/s @ 9.47 hrs, Volume= 0.022 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 93.932 m @ 9.47 hrs Surf.Area= 18.0 m² Storage= 3.6 m³

Plug-Flow detention time= 17.8 min calculated for 0.022 MI (100% of inflow)  
 Center-of-Mass det. time= 17.3 min ( 719.5 - 702.3 )

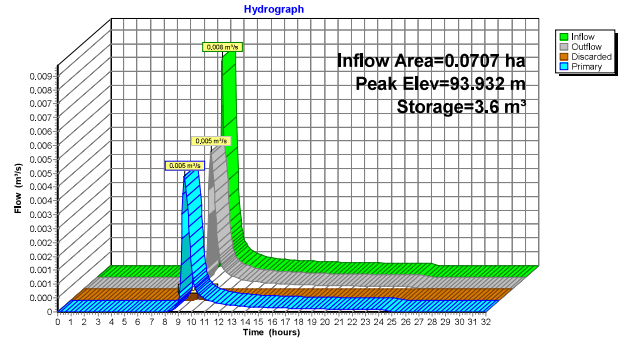
Volume	Invert	Avail.Storage	Storage Description	
#1	93.720 m	10.3 m³	Custom Stage Data (Conic) Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m Conductivity to Groundwater Elevation = 91.900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	75 mm Vert. Orifice/Gate C= 0.600 Limited to weir flow at low heads

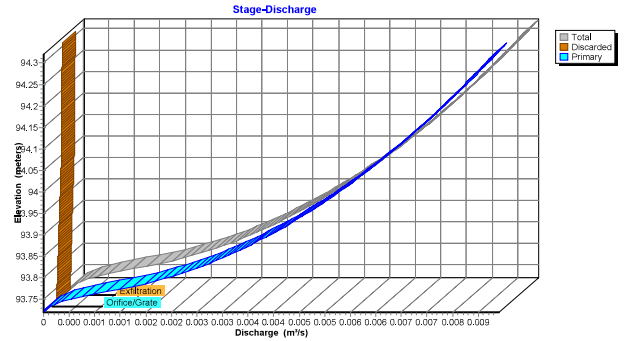
Discarded OutFlow Max=0.000 m³/s @ 9.47 hrs HW=93.930 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.005 m³/s @ 9.47 hrs HW=93.930 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.005 m³/s @ 1.10 m/s)

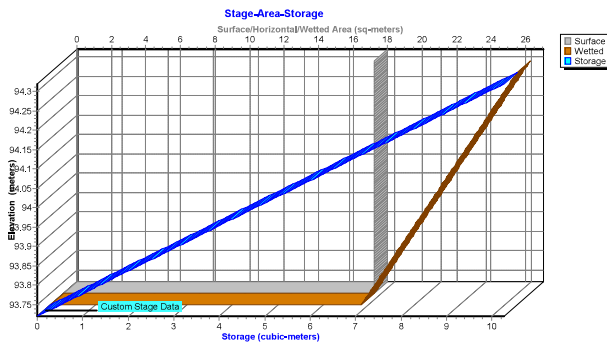
**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 8P: Storage Tank B**

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 35 mm for 5-Year event  
 Inflow = 0.036 m³/s @ 9.32 hrs, Volume= 0.099 MI  
 Outflow = 0.007 m³/s @ 9.75 hrs, Volume= 0.087 MI, Atten= 80%, Lag= 25.7 min  
 Discarded = 0.000 m³/s @ 9.75 hrs, Volume= 0.011 MI  
 Primary = 0.007 m³/s @ 9.75 hrs, Volume= 0.077 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 93.833 m @ 9.75 hrs Surf.Area= 75.0 m² Storage= 41.5 m³

Plug-Flow detention time= 168.2 min calculated for 0.087 MI (88% of inflow)  
 Center-of-Mass det. time= 98.6 min ( 793.0 - 694.4 )

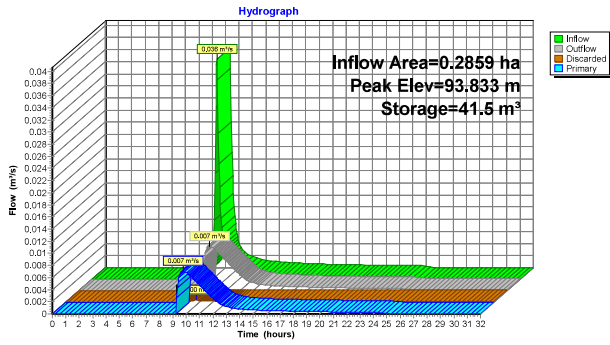
Volume	Invert	Avail.Storage	Storage Description	
#1	93.250 m	106.9 m³	Custom Stage Data (Conic) Listed below (Recalc) 112.5 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.250	75.0	0.0	0.0	75.0
94.750	75.0	112.5	112.5	121.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.250 m	60.00 mm/hr Exfiltration over Wetted area from 93.250 m - 94.950 m Conductivity to Groundwater Elevation = 91.700 m Excluded Wetted area = 75.0 m²
#2	Primary	93.440 m	75 mm Vert. Orifice/Gate C= 0.600 Limited to weir flow at low heads

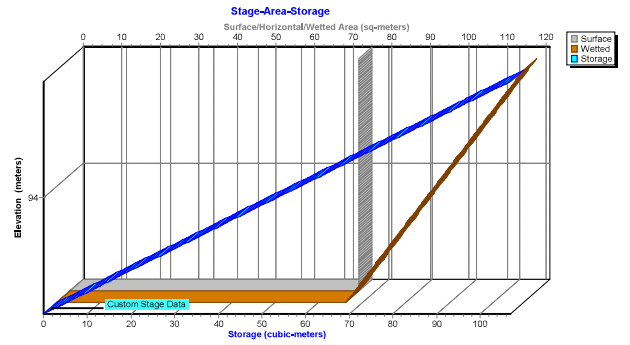
Discarded OutFlow Max=0.000 m³/s @ 9.75 hrs HW=93.833 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.007 m³/s @ 9.75 hrs HW=93.833 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.007 m³/s @ 1.58 m/s)

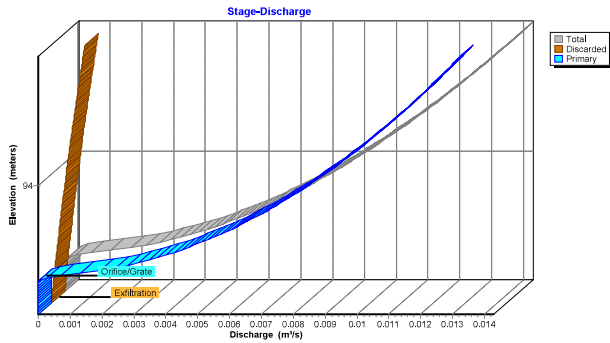
Pond 8P: Storage Tank B



Pond 8P: Storage Tank B



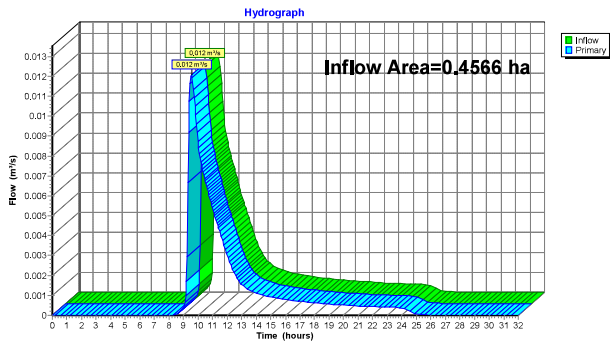
Pond 8P: Storage Tank B



Summary for Link 9L: To Valley

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 23 mm for 5-Year event  
 Inflow = 0.012 m³/s @ 9.54 hrs, Volume= 0.104 MI  
 Primary = 0.012 m³/s @ 9.54 hrs, Volume= 0.104 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

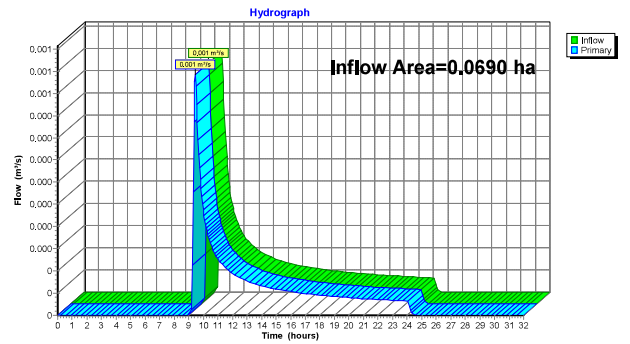
Link 9L: To Valley



Summary for Link 10L: Sheridan Creek

Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 6 mm for 5-Year event  
 Inflow = 0.001 m³/s @ 9.44 hrs, Volume= 0.004 MI  
 Primary = 0.001 m³/s @ 9.44 hrs, Volume= 0.004 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 10L: Sheridan Creek





Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m<sup>2</sup> 13.40% Impervious Runoff Depth=14 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min UI Adjusted CN=63 Runoff=0.012 m<sup>3</sup>/s 0.035 MI

**Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m<sup>2</sup> 28.54% Impervious Runoff Depth=17 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min UI Adjusted CN=66 Runoff=0.018 m<sup>3</sup>/s 0.046 MI

**Subcatchment 3S: Area A** Runoff Area=707.0 m<sup>2</sup> 62.66% Impervious Runoff Depth=44 mm  
 Tc=15.0 min CN=84 Runoff=0.011 m<sup>3</sup>/s 0.031 MI

**Subcatchment 4S: Area B** Runoff Area=1,000.0 m<sup>2</sup> 0.00% Impervious Runoff Depth=12 mm  
 Tc=15.0 min CN=61 Runoff=0.002 m<sup>3</sup>/s 0.012 MI

**Subcatchment 5S: Area C** Runoff Area=2,859.0 m<sup>2</sup> 68.87% Impervious Runoff Depth=48 mm  
 Tc=15.0 min CN=86 Runoff=0.051 m<sup>3</sup>/s 0.137 MI

**Subcatchment 6S: Area D** Runoff Area=690.0 m<sup>2</sup> 0.00% Impervious Runoff Depth=12 mm  
 Tc=15.0 min CN=61 Runoff=0.002 m<sup>3</sup>/s 0.008 MI

**Pond 7P: Storage Tank A** Peak Elev=94.050 m Storage=5.6 m<sup>3</sup> Inflow=0.011 m<sup>3</sup>/s 0.031 MI  
 Discarded=0.000 m<sup>3</sup>/s 0.000 MI Primary=0.006 m<sup>3</sup>/s 0.031 MI Outflow=0.006 m<sup>3</sup>/s 0.031 MI

**Pond 8P: Storage Tank B** Peak Elev=94.090 m Storage=59.8 m<sup>3</sup> Inflow=0.051 m<sup>3</sup>/s 0.137 MI  
 Discarded=0.001 m<sup>3</sup>/s 0.012 MI Primary=0.009 m<sup>3</sup>/s 0.113 MI Outflow=0.010 m<sup>3</sup>/s 0.125 MI

**Link 9L: To Valley** Inflow=0.017 m<sup>3</sup>/s 0.155 MI  
 Primary=0.017 m<sup>3</sup>/s 0.155 MI

**Link 10L: Sheridan Creek** Inflow=0.002 m<sup>3</sup>/s 0.008 MI  
 Primary=0.002 m<sup>3</sup>/s 0.008 MI

**Total Runoff Area = 1.0513 ha Runoff Volume = 0.270 MI Average Runoff Depth = 26 mm**  
**66.44% Pervious = 0.6985 ha 33.56% Impervious = 0.3528 ha**

**Summary for Subcatchment 1S: Pre - Valley**

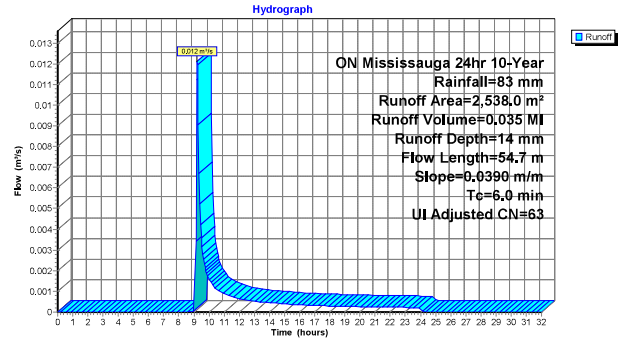
Runoff = 0.012 m<sup>3</sup>/s @ 9.23 hrs, Volume= 0.035 MI, Depth= 14 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m <sup>2</sup> )	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, UI Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

**Subcatchment 1S: Pre - Valley**



**Summary for Subcatchment 2S: Pre-Sheridan Creek**

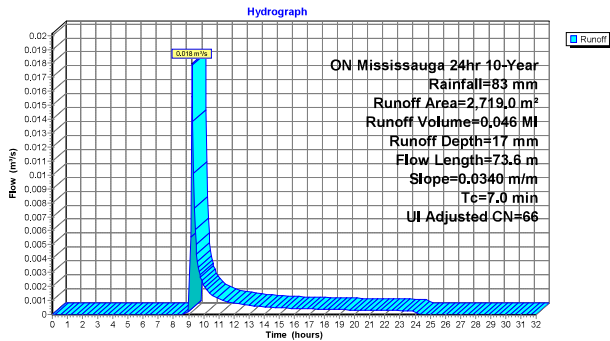
Runoff = 0.018 m<sup>3</sup>/s @ 9.24 hrs, Volume= 0.046 MI, Depth= 17 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m <sup>2</sup> )	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, UI Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

**Subcatchment 2S: Pre-Sheridan Creek**



**Summary for Subcatchment 3S: Area A**

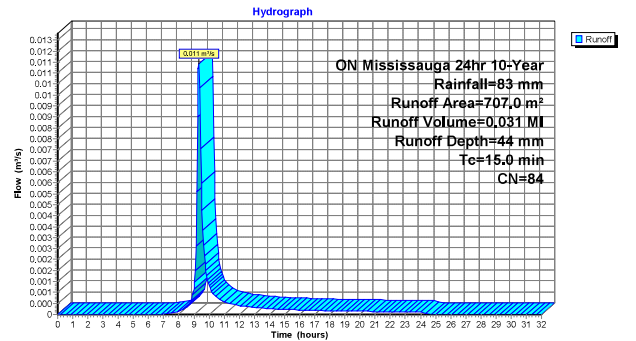
Runoff = 0.011 m<sup>3</sup>/s @ 9.32 hrs, Volume= 0.031 MI, Depth= 44 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m <sup>2</sup> )	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

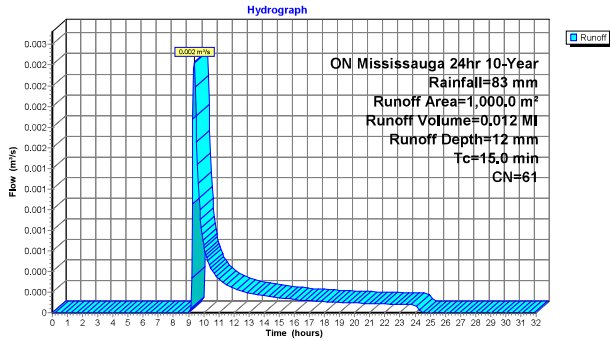
Runoff = 0.002 m³/s @ 9.38 hrs, Volume= 0.012 MI, Depth= 12 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m²)	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

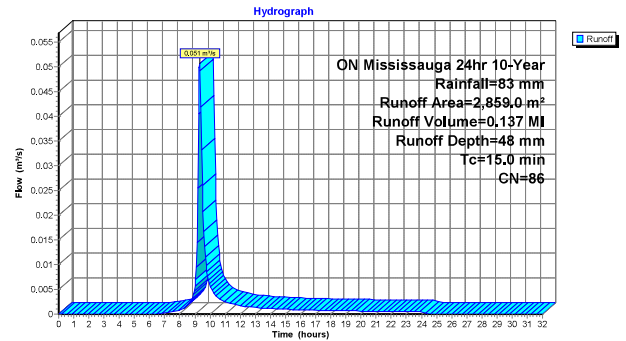
Runoff = 0.051 m³/s @ 9.32 hrs, Volume= 0.137 MI, Depth= 48 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m²)	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

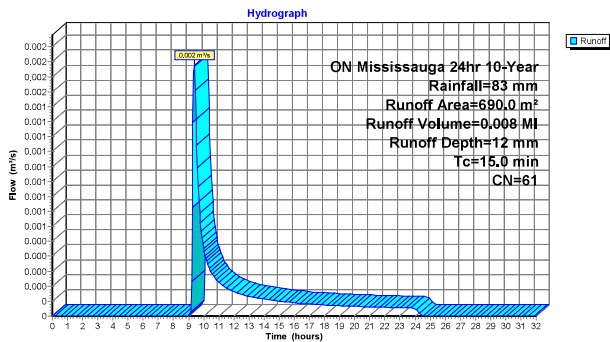
Runoff = 0.002 m³/s @ 9.38 hrs, Volume= 0.008 MI, Depth= 12 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 10-Year Rainfall=83 mm

Area (m²)	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 6S: Area D**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 44 mm for 10-Year event  
 Inflow = 0.011 m³/s @ 9.32 hrs, Volume= 0.031 MI  
 Outflow = 0.006 m³/s @ 9.49 hrs, Volume= 0.031 MI, Atten= 44%, Lag= 9.8 min  
 Discarded = 0.000 m³/s @ 9.49 hrs, Volume= 0.000 MI  
 Primary = 0.006 m³/s @ 9.49 hrs, Volume= 0.031 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.050 m @ 9.49 hrs Surf.Area= 18.0 m² Storage= 5.6 m³

Plug-Flow detention time= 16.5 min calculated for 0.031 MI (100% of inflow)  
 Center-of-Mass det. time= 16.5 min ( 708.4 - 692.0 )

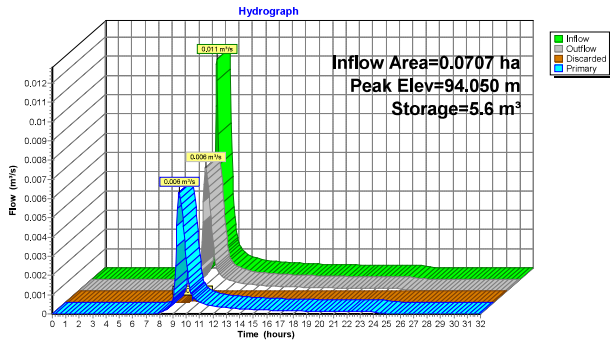
Volume	Invert	Avail.Storage	Storage Description	
#1	93.720 m	10.3 m³	Custom Stage Data (Conic) Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m Conductivity to Groundwater Elevation = 91,900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

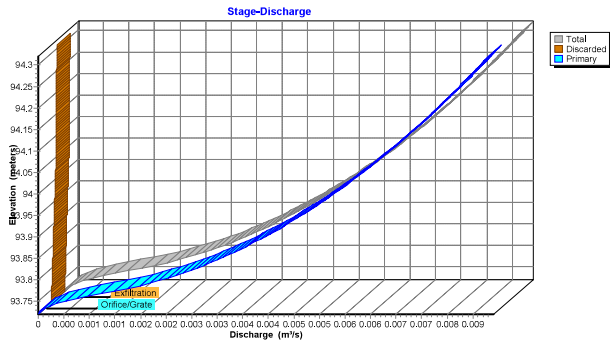
Discarded OutFlow Max=0.000 m³/s @ 9.49 hrs HW=94.049 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.006 m³/s @ 9.49 hrs HW=94.049 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Grate (Orifice Controls 0.006 m³/s @ 1.43 m/s)

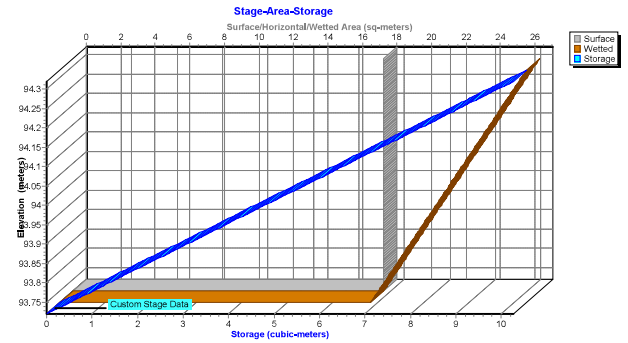
Pond 7P: Storage Tank A



Pond 7P: Storage Tank A



Pond 7P: Storage Tank A



Summary for Pond 8P: Storage Tank B

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 48 mm for 10-Year event  
 Inflow = 0.051 m³/s @ 9.32 hrs, Volume= 0.137 MI  
 Outflow = 0.010 m³/s @ 9.76 hrs, Volume= 0.125 MI, Atten= 81%, Lag= 26.1 min  
 Discarded = 0.001 m³/s @ 9.76 hrs, Volume= 0.012 MI  
 Primary = 0.009 m³/s @ 9.76 hrs, Volume= 0.113 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.090 m @ 9.76 hrs Surf.Area= 75.0 m² Storage= 59.8 m³

Plug-Flow detention time= 146.3 min calculated for 0.125 MI (91% of inflow)  
 Center-of-Mass det. time= 92.2 min ( 777.1 - 684.9 )

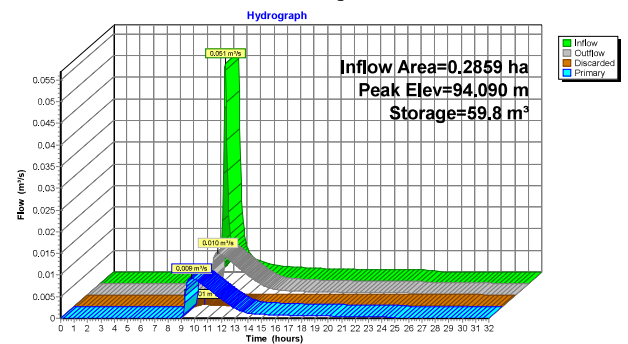
Volume	Invert	Avail.Storage	Storage Description	
#1	93,250 m	106.9 m³	Custom Stage Data (Conic) Listed below (Recalc) 112.5 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93,250	75.0	0.0	0.0	75.0
94,750	75.0	112.5	112.5	121.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93,250 m	60.00 mm/hr Exfiltration over Wetted area from 93,250 m - 94,950 m Conductivity to Groundwater Elevation = 91,700 m Excluded Wetted area = 75.0 m²
#2	Primary	93,440 m	75 mm Vert. Orifice/Gate C= 0.600 Limited to weir flow at low heads

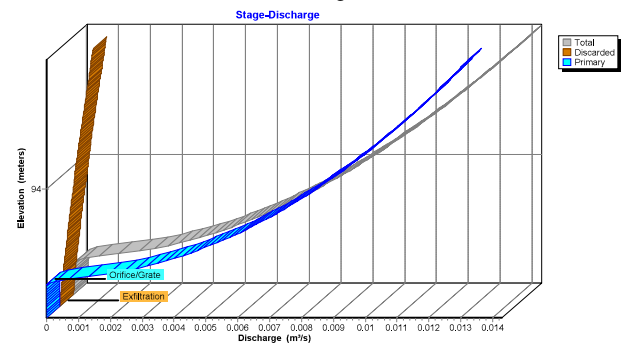
Discarded OutFlow Max=0.001 m³/s @ 9.76 hrs HW=94,090 m (Free Discharge)  
 1=Exfiltration ( Controls 0.001 m³/s)

Primary OutFlow Max=0.009 m³/s @ 9.76 hrs HW=94,090 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.009 m³/s @ 2.08 m/s)

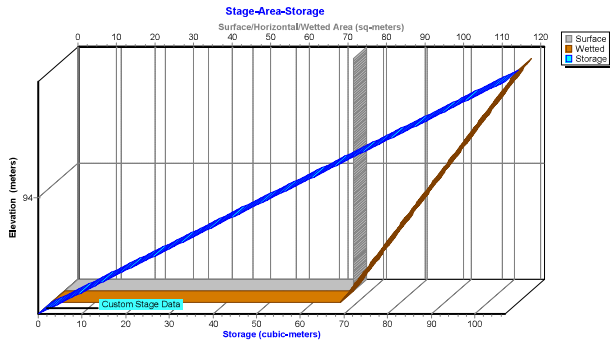
Pond 8P: Storage Tank B



Pond 8P: Storage Tank B



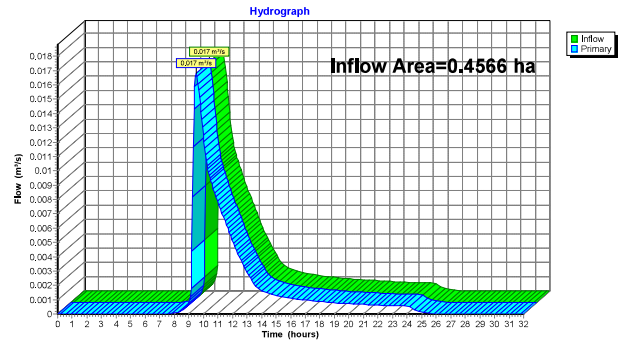
**Pond 8P: Storage Tank B**



**Summary for Link 9L: To Valley**

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 34 mm for 10-Year event  
 Inflow = 0.017 m³/s @ 9.51 hrs, Volume= 0.155 MI  
 Primary = 0.017 m³/s @ 9.51 hrs, Volume= 0.155 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

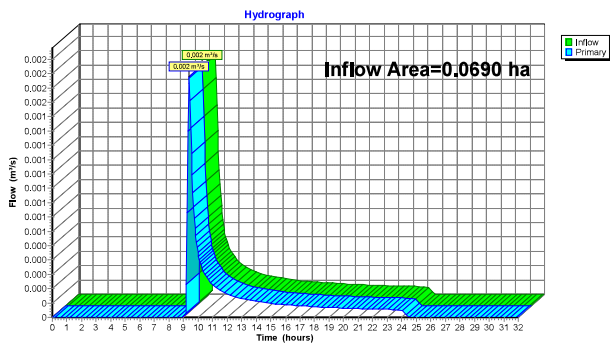
**Link 9L: To Valley**



**Summary for Link 10L: Sheridan Creek**

Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 12 mm for 10-Year event  
 Inflow = 0.002 m³/s @ 9.38 hrs, Volume= 0.008 MI  
 Primary = 0.002 m³/s @ 9.38 hrs, Volume= 0.008 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

**Link 10L: Sheridan Creek**



Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

- Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m² 13.40% Impervious Runoff Depth=20 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min UJ Adjusted CN=63 Runoff=0.021 m³/s 0.050 MI
- Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m² 28.54% Impervious Runoff Depth=24 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min UJ Adjusted CN=66 Runoff=0.028 m³/s 0.065 MI
- Subcatchment 3S: Area A** Runoff Area=707.0 m² 62.66% Impervious Runoff Depth=54 mm  
 Tc=15.0 min CN=84 Runoff=0.014 m³/s 0.039 MI
- Subcatchment 4S: Area B** Runoff Area=1,000.0 m² 0.00% Impervious Runoff Depth=17 mm  
 Tc=15.0 min CN=61 Runoff=0.004 m³/s 0.017 MI
- Subcatchment 5S: Area C** Runoff Area=2,859.0 m² 68.87% Impervious Runoff Depth=59 mm  
 Tc=15.0 min CN=86 Runoff=0.063 m³/s 0.168 MI
- Subcatchment 6S: Area D** Runoff Area=690.0 m² 0.00% Impervious Runoff Depth=17 mm  
 Tc=15.0 min CN=61 Runoff=0.003 m³/s 0.012 MI
- Pond 7P: Storage Tank A** Peak Elev=94.157 m Storage=7.5 m³ Inflow=0.014 m³/s 0.039 MI  
 Discarded=0.000 m³/s 0.001 MI Primary=0.007 m³/s 0.038 MI Outflow=0.008 m³/s 0.038 MI
- Pond 8P: Storage Tank B** Peak Elev=94.306 m Storage=75.3 m³ Inflow=0.063 m³/s 0.168 MI  
 Discarded=0.001 m³/s 0.014 MI Primary=0.011 m³/s 0.142 MI Outflow=0.011 m³/s 0.156 MI
- Link 9L: To Valley** Inflow=0.021 m³/s 0.198 MI  
 Primary=0.021 m³/s 0.198 MI
- Link 10L: Sheridan Creek** Inflow=0.003 m³/s 0.012 MI  
 Primary=0.003 m³/s 0.012 MI

**Total Runoff Area = 1,0513 ha Runoff Volume = 0.351 MI Average Runoff Depth = 33 mm**  
 66.44% Pervious = 0.6985 ha 33.56% Impervious = 0.3528 ha

**Summary for Subcatchment 1S: Pre - Valley**

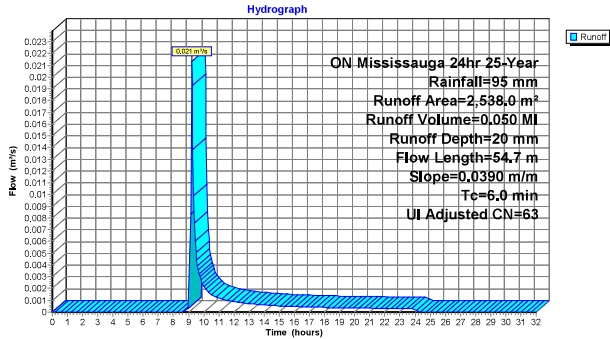
Runoff = 0.021 m³/s @ 9.22 hrs, Volume= 0.050 MI, Depth= 20 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, UI Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

**Subcatchment 1S: Pre - Valley**



**Summary for Subcatchment 2S: Pre-Sheridan Creek**

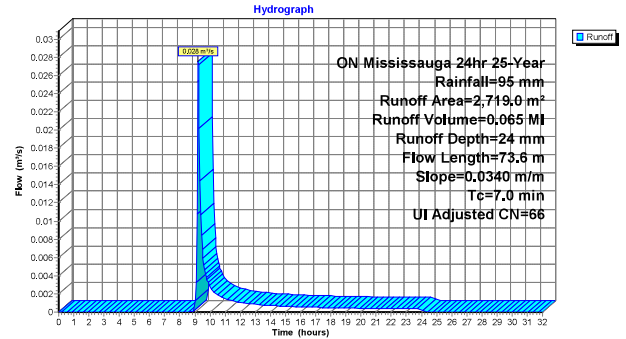
Runoff = 0.028 m³/s @ 9.24 hrs, Volume= 0.065 MI, Depth= 24 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, UI Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

**Subcatchment 2S: Pre-Sheridan Creek**



**Summary for Subcatchment 3S: Area A**

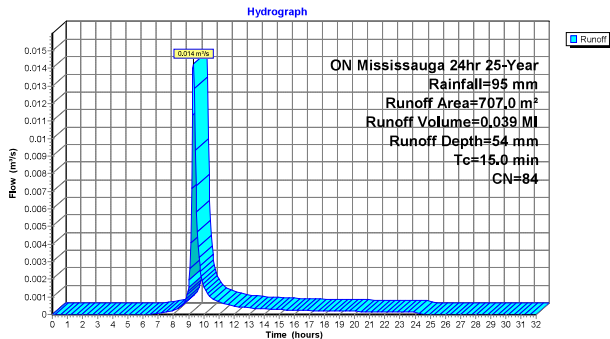
Runoff = 0.014 m³/s @ 9.32 hrs, Volume= 0.039 MI, Depth= 54 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

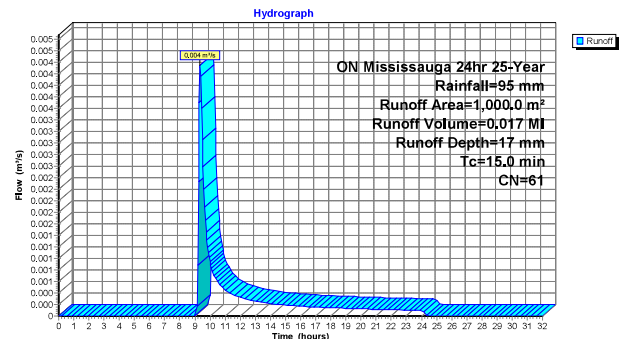
Runoff = 0.004 m³/s @ 9.36 hrs, Volume= 0.017 MI, Depth= 17 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

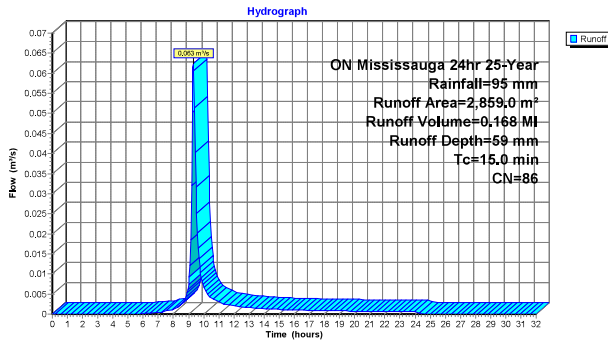
Runoff = 0.063 m³/s @ 9.32 hrs, Volume= 0.168 MI, Depth= 59 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

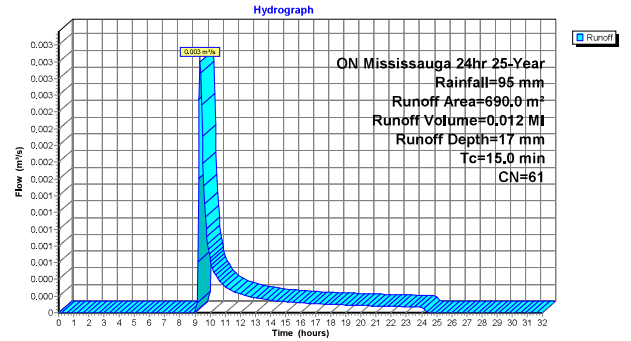
Runoff = 0.003 m³/s @ 9.36 hrs, Volume= 0.012 MI, Depth= 17 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 25-Year Rainfall=95 mm

Area (m²)	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 6S: Area D**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 54 mm for 25-Year event  
 Inflow = 0.014 m³/s @ 9.32 hrs, Volume= 0.039 MI  
 Outflow = 0.008 m³/s @ 9.50 hrs, Volume= 0.038 MI, Atten= 47%, Lag= 10.6 min  
 Discarded = 0.000 m³/s @ 9.50 hrs, Volume= 0.001 MI  
 Primary = 0.007 m³/s @ 9.50 hrs, Volume= 0.038 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.157 m @ 9.50 hrs Surf.Area= 18.0 m² Storage= 7.5 m³

Plug-Flow detention time= 16.7 min calculated for 0.038 MI (100% of inflow)  
 Center-of-Mass det. time= 16.3 min ( 702.1 - 685.7 )

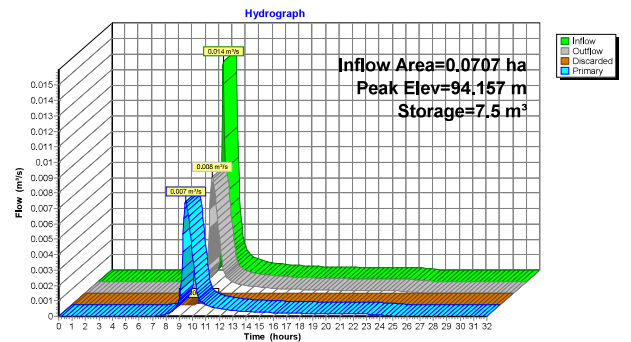
Volume	Invert	Avail.Storage	Storage Description	
#1	93.720 m	10.3 m³	Custom Stage Data (Conic) Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m Conductivity to Groundwater Elevation = 91,900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	75 mm Vert. Orifice/Gate C= 0.600 Limited to weir flow at low heads

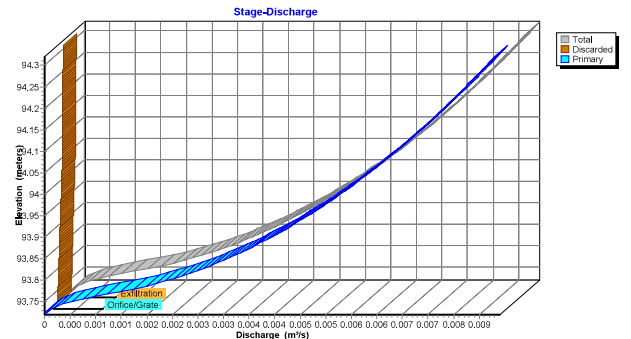
Discarded OutFlow Max=0.000 m³/s @ 9.50 hrs HW=94.157 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.007 m³/s @ 9.50 hrs HW=94.157 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.007 m³/s @ 1.68 m/s)

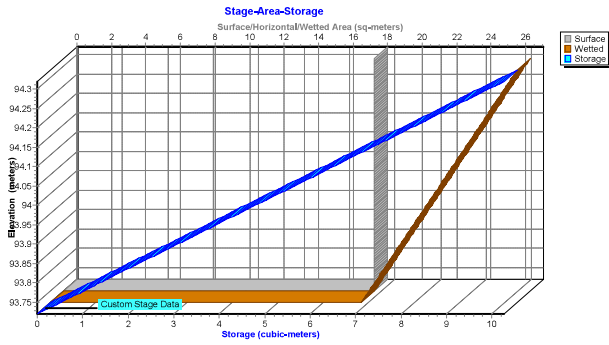
**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 8P: Storage Tank B**

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 59 mm for 25-Year event  
 Inflow = 0.063 m<sup>3</sup>/s @ 9.32 hrs, Volume= 0.168 MI  
 Outflow = 0.011 m<sup>3</sup>/s @ 9.77 hrs, Volume= 0.156 MI, Atten= 82%, Lag= 26.7 min  
 Discarded = 0.001 m<sup>3</sup>/s @ 9.77 hrs, Volume= 0.014 MI  
 Primary = 0.011 m<sup>3</sup>/s @ 9.77 hrs, Volume= 0.142 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.306 m @ 9.77 hrs Surf.Area= 75.0 m<sup>2</sup> Storage= 75.3 m<sup>3</sup>

Plug-Flow detention time= 137.1 min calculated for 0.156 MI (93% of inflow)  
 Center-of-Mass det. time= 92.2 min ( 771.4 - 679.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	93,250 m	106.9 m <sup>3</sup>	Custom Stage Data (Conic) Listed below (Recalc) 112.5 m <sup>3</sup> Overall x 95.0% Voids

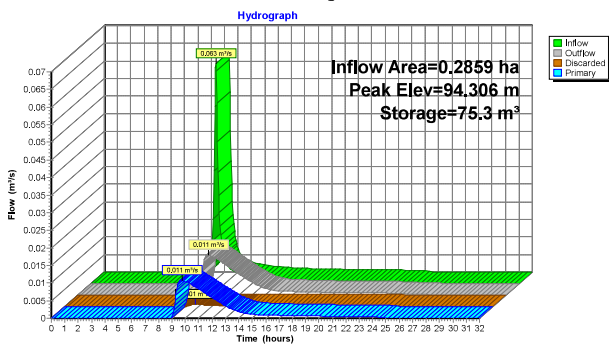
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93,250	75,0	0,0	0,0	75,0
94,750	75,0	112,5	112,5	121,0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93,250 m	60,00 mm/hr Exfiltration over Wetted area from 93,250 m - 94,950 m Conductivity to Groundwater Elevation = 91,700 m Excluded Wetted area = 75,0 m <sup>2</sup>
#2	Primary	93,440 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

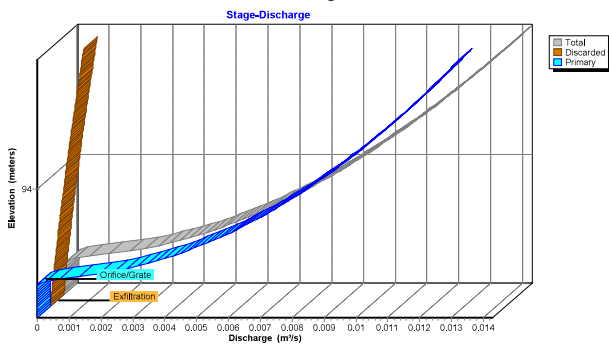
Discarded OutFlow Max=0,001 m<sup>3</sup>/s @ 9.77 hrs HW=94,306 m (Free Discharge)  
 1-Exfiltration ( Controls 0,001 m<sup>3</sup>/s)

Primary OutFlow Max=0,011 m<sup>3</sup>/s @ 9.77 hrs HW=94,306 m TW=0,000 m (Dynamic Tailwater)  
 2-Orifice/Grate (Orifice Controls 0,011 m<sup>3</sup>/s @ 2.42 m/s)

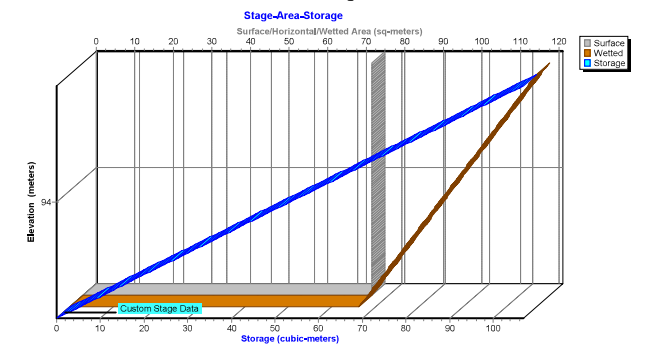
**Pond 8P: Storage Tank B**



**Pond 8P: Storage Tank B**



**Pond 8P: Storage Tank B**

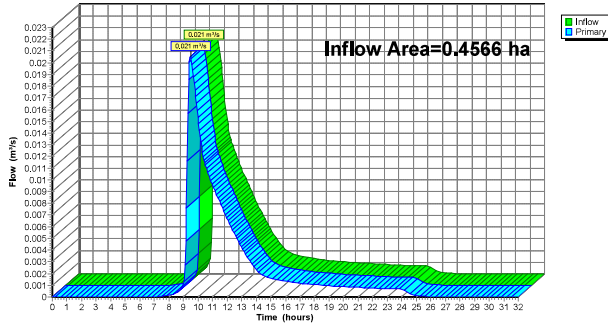


Summary for Link 9L: To Valley

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 43 mm for 25-Year event  
 Inflow = 0.021 m³/s @ 9.47 hrs, Volume= 0.198 MI  
 Primary = 0.021 m³/s @ 9.47 hrs, Volume= 0.198 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 9L: To Valley

Hydrograph

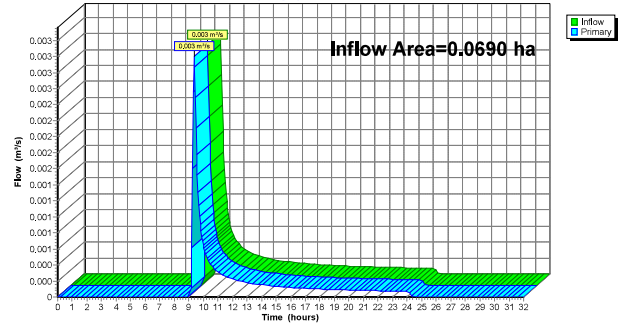


Summary for Link 10L: Sheridan Creek

Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 17 mm for 25-Year event  
 Inflow = 0.003 m³/s @ 9.36 hrs, Volume= 0.012 MI  
 Primary = 0.003 m³/s @ 9.36 hrs, Volume= 0.012 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 10L: Sheridan Creek

Hydrograph



Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m² 13.40% Impervious Runoff Depth=26 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min UI Adjusted CN=63 Runoff=0.030 m³/s 0.066 MI

**Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m² 28.54% Impervious Runoff Depth=31 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min UI Adjusted CN=66 Runoff=0.037 m³/s 0.083 MI

**Subcatchment 3S: Area A** Runoff Area=707.0 m² 62.66% Impervious Runoff Depth=65 mm  
 Tc=15.0 min CN=84 Runoff=0.017 m³/s 0.046 MI

**Subcatchment 4S: Area B** Runoff Area=1,000.0 m² 0.00% Impervious Runoff Depth=23 mm  
 Tc=15.0 min CN=61 Runoff=0.006 m³/s 0.023 MI

**Subcatchment 5S: Area C** Runoff Area=2,859.0 m² 68.87% Impervious Runoff Depth=69 mm  
 Tc=15.0 min CN=86 Runoff=0.073 m³/s 0.198 MI

**Subcatchment 6S: Area D** Runoff Area=690.0 m² 0.00% Impervious Runoff Depth=23 mm  
 Tc=15.0 min CN=61 Runoff=0.004 m³/s 0.016 MI

**Pond 7P: Storage Tank A** Peak Elev=94,264 m Storage=9.3 m³ Inflow=0.017 m³/s 0.046 MI  
 Discarded=0.000 m³/s 0.001 MI Primary=0.008 m³/s 0.045 MI Outflow=0.008 m³/s 0.046 MI

**Pond 8P: Storage Tank B** Peak Elev=94,511 m Storage=89.9 m³ Inflow=0.073 m³/s 0.198 MI  
 Discarded=0.001 m³/s 0.016 MI Primary=0.012 m³/s 0.170 MI Outflow=0.013 m³/s 0.186 MI

**Link 9L: To Valley** Inflow=0.024 m³/s 0.238 MI  
 Primary=0.024 m³/s 0.238 MI

**Link 10L: Sheridan Creek** Inflow=0.004 m³/s 0.016 MI  
 Primary=0.004 m³/s 0.016 MI

Total Runoff Area = 1,0513 ha Runoff Volume = 0.431 MI Average Runoff Depth = 41 mm  
 66.44% Pervious = 0.6985 ha 33.56% Impervious = 0.3528 ha

Summary for Subcatchment 1S: Pre - Valley

Runoff = 0.030 m³/s @ 9.22 hrs, Volume= 0.066 MI, Depth= 26 mm

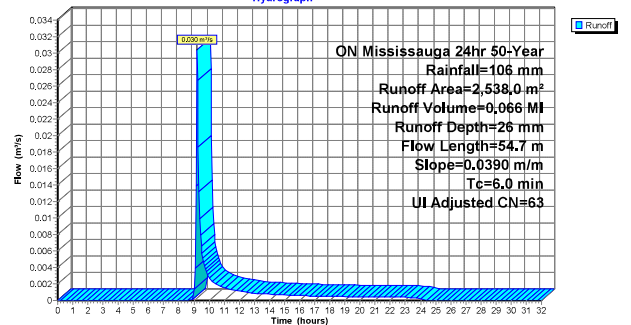
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

Area (m²)	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, UI Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

Subcatchment 1S: Pre - Valley

Hydrograph





**Summary for Subcatchment 2S: Pre-Sheridan Creek**

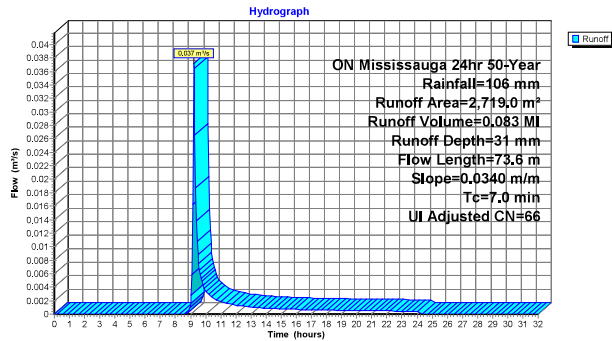
Runoff = 0.037 m<sup>3</sup>/s @ 9.23 hrs, Volume= 0.083 MI, Depth= 31 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

Area (m <sup>2</sup> )	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, UI Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

**Subcatchment 2S: Pre-Sheridan Creek**



**Summary for Subcatchment 3S: Area A**

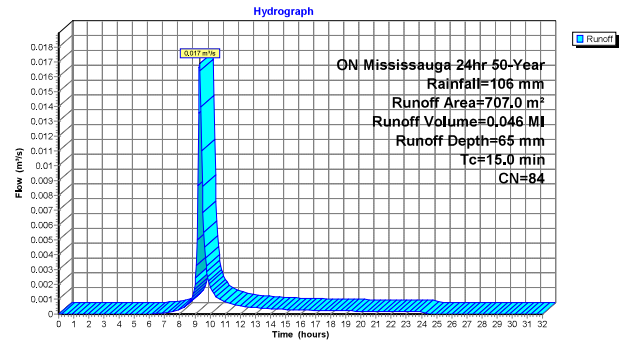
Runoff = 0.017 m<sup>3</sup>/s @ 9.32 hrs, Volume= 0.046 MI, Depth= 65 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

Area (m <sup>2</sup> )	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

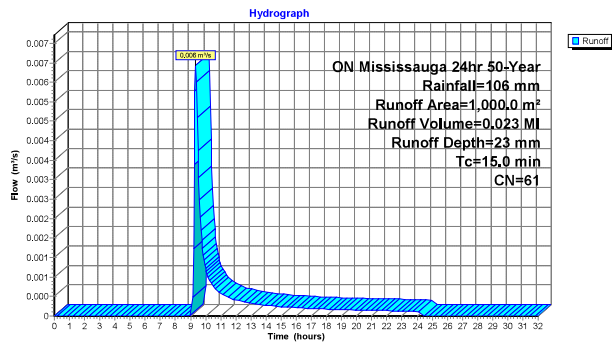
Runoff = 0.006 m<sup>3</sup>/s @ 9.36 hrs, Volume= 0.023 MI, Depth= 23 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

Area (m <sup>2</sup> )	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

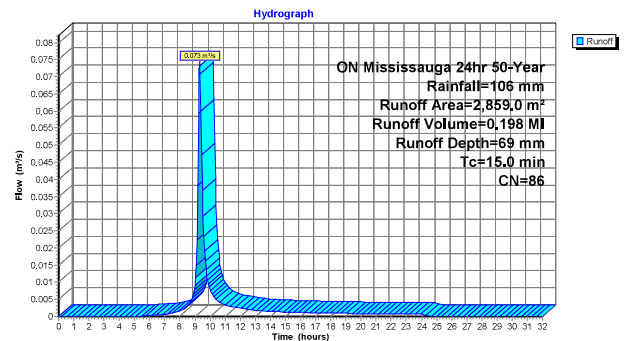
Runoff = 0.073 m<sup>3</sup>/s @ 9.32 hrs, Volume= 0.198 MI, Depth= 69 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

Area (m <sup>2</sup> )	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

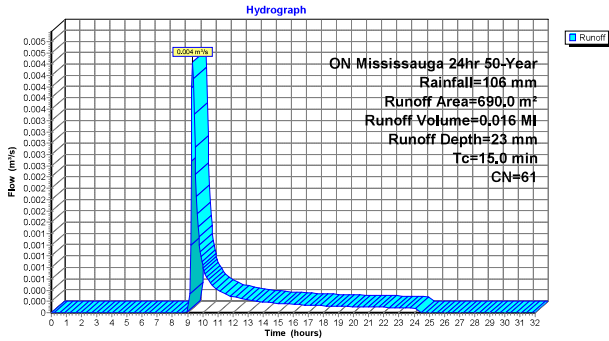
Runoff = 0.004 m³/s @ 9.36 hrs, Volume= 0.016 MI, Depth= 23 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 50-Year Rainfall=106 mm

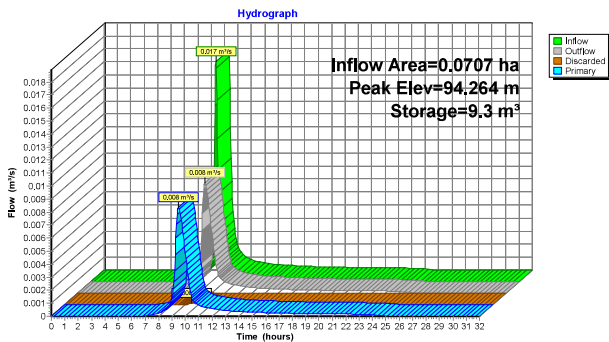
Area (m²)	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

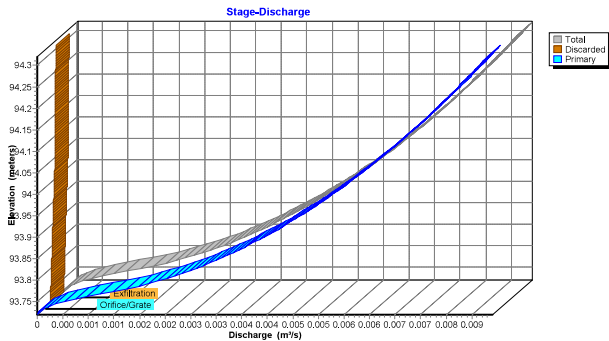
**Subcatchment 6S: Area D**



**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 65 mm for 50-Year event  
 Inflow = 0.017 m³/s @ 9.32 hrs, Volume= 0.046 MI  
 Outflow = 0.008 m³/s @ 9.51 hrs, Volume= 0.046 MI, Atten= 50%, Lag= 11.2 min  
 Discarded = 0.000 m³/s @ 9.51 hrs, Volume= 0.001 MI  
 Primary = 0.008 m³/s @ 9.51 hrs, Volume= 0.045 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.264 m @ 9.51 hrs Surf.Area= 18.0 m² Storage= 9.3 m³

Plug-Flow detention time= 16.8 min calculated for 0.046 MI (100% of inflow)  
 Center-of-Mass det. time= 16.4 min ( 697.4 - 680.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	93.720 m	10.3 m³	Custom Stage Data (Conic) Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids

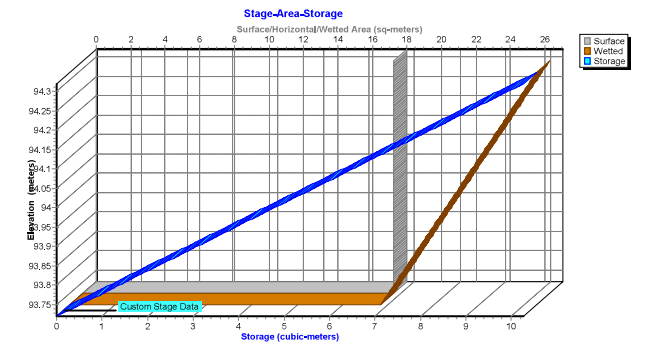
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m Conductivity to Groundwater Elevation = 91.900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.000 m³/s @ 9.51 hrs HW=94.263 m (Free Discharge)  
 1-Exfiltration ( Controls 0.000 m³/s)

Primary OutFlow Max=0.008 m³/s @ 9.51 hrs HW=94.263 m TW=0.000 m (Dynamic Tailwater)  
 2-Orifice/Grate (Orifice Controls 0.008 m³/s @ 1.89 m/s)

**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 8P: Storage Tank B**

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 69 mm for 50-Year event  
 Inflow = 0.073 m³/s @ 9.32 hrs, Volume= 0.198 MI  
 Outflow = 0.013 m³/s @ 9.78 hrs, Volume= 0.186 MI, Atten= 83%, Lag= 27.3 min  
 Discarded = 0.001 m³/s @ 9.78 hrs, Volume= 0.016 MI  
 Primary = 0.012 m³/s @ 9.78 hrs, Volume= 0.170 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.511 m @ 9.78 hrs Surf.Area= 75.0 m² Storage= 89.9 m³

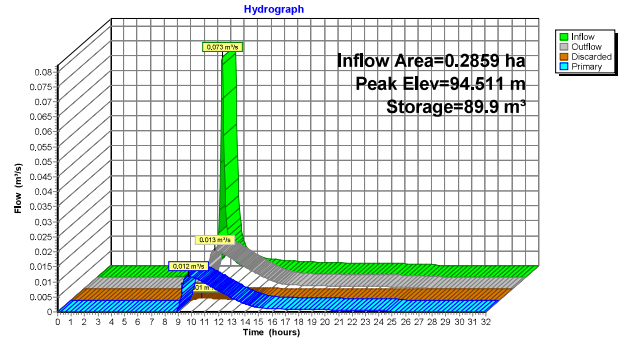
Plug-Flow detention time= 132.9 min calculated for 0.165 MI (94% of inflow)  
 Center-of-Mass det. time= 93.8 min ( 768.4 - 674.7 )

Volume	Invert	Avail.Storage	Storage Description	
#1	93.250 m	106.9 m³	Custom Stage Data (Conic) Listed below (Recalc) 112.5 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.250	75.0	0.0	0.0	75.0
94.750	75.0	112.5	112.5	121.0

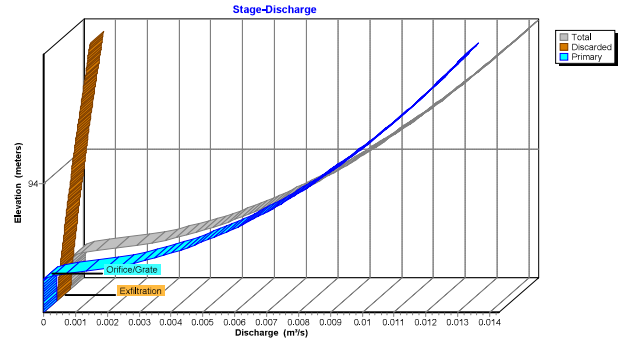
Device	Routing	Invert	Outlet Devices
#1	Discarded	93.250 m	60.00 mm/hr Exfiltration over Wetted area from 93.250 m - 94.950 m Conductivity to Groundwater Elevation = 91.700 m Excluded Wetted area = 75.0 m²
#2	Primary	93.440 m	75 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.001 m³/s @ 9.78 hrs HW=94.511 m (Free Discharge)  
 1=Exfiltration ( Controls 0.001 m³/s)  
 Primary OutFlow Max=0.012 m³/s @ 9.78 hrs HW=94.511 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Grate (Orifice Controls 0.012 m³/s @ 2.70 m/s)

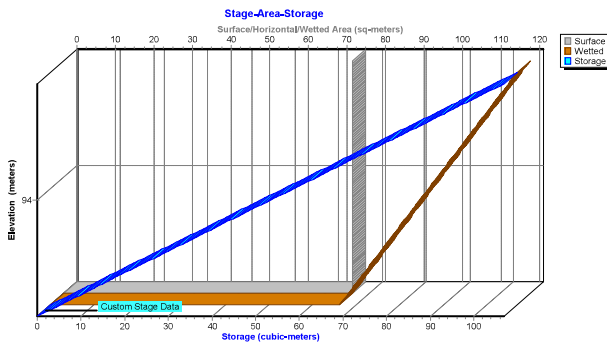
**Pond 8P: Storage Tank B**



**Pond 8P: Storage Tank B**



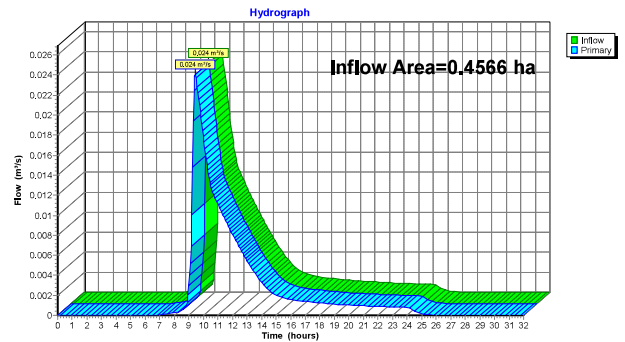
**Pond 8P: Storage Tank B**



**Summary for Link 9L: To Valley**

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 52 mm for 50-Year event  
 Inflow = 0.024 m³/s @ 9.45 hrs, Volume= 0.238 MI  
 Primary = 0.024 m³/s @ 9.45 hrs, Volume= 0.238 MI, Atten= 0%, Lag= 0.0 min  
 Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

**Link 9L: To Valley**

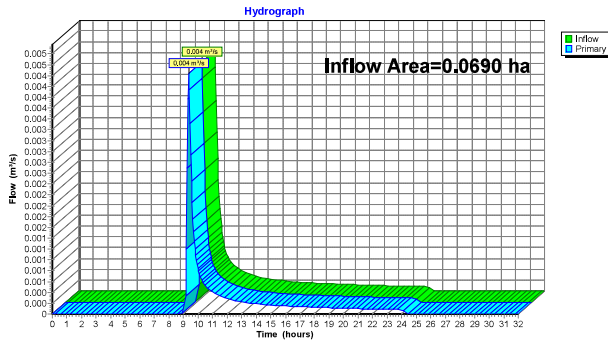


**Summary for Link 10L: Sheridan Creek**

Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 23 mm for 50-Year event  
 Inflow = 0.004 m³/s @ 9.36 hrs, Volume= 0.016 MI  
 Primary = 0.004 m³/s @ 9.36 hrs, Volume= 0.016 MI, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

**Link 10L: Sheridan Creek**



Time span=0.00-32.00 hrs, dt=0.05 hrs, 641 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

- Subcatchment 1S: Pre - Valley** Runoff Area=2,538.0 m² 13.40% Impervious Runoff Depth=33 mm  
 Flow Length=54.7 m Slope=0.0390 m/m Tc=6.0 min UI Adjusted CN=63 Runoff=0.040 m³/s 0.083 MI
- Subcatchment 2S: Pre-Sheridan Creek** Runoff Area=2,719.0 m² 28.54% Impervious Runoff Depth=38 mm  
 Flow Length=73.6 m Slope=0.0340 m/m Tc=7.0 min UI Adjusted CN=66 Runoff=0.047 m³/s 0.103 MI
- Subcatchment 3S: Area A** Runoff Area=707.0 m² 62.66% Impervious Runoff Depth=75 mm  
 Tc=15.0 min CN=84 Runoff=0.020 m³/s 0.053 MI
- Subcatchment 4S: Area B** Runoff Area=1,000.0 m² 0.00% Impervious Runoff Depth=29 mm  
 Tc=15.0 min CN=61 Runoff=0.009 m³/s 0.029 MI
- Subcatchment 5S: Area C** Runoff Area=2,859.0 m² 68.87% Impervious Runoff Depth=80 mm  
 Tc=15.0 min CN=86 Runoff=0.084 m³/s 0.228 MI
- Subcatchment 6S: Area D** Runoff Area=690.0 m² 0.00% Impervious Runoff Depth=29 mm  
 Tc=15.0 min CN=61 Runoff=0.006 m³/s 0.020 MI
- Pond 7P: Storage Tank A** Peak Elev=95,555 m Storage=10.3 m³ Inflow=0.020 m³/s 0.053 MI  
 Discarded=0.000 m³/s 0.001 MI Primary=0.016 m³/s 0.052 MI Outflow=0.016 m³/s 0.053 MI
- Pond 8P: Storage Tank B** Peak Elev=94,720 m Storage=104.7 m³ Inflow=0.084 m³/s 0.228 MI  
 Discarded=0.001 m³/s 0.018 MI Primary=0.013 m³/s 0.198 MI Outflow=0.014 m³/s 0.216 MI
- Link 9L: To Valley** Inflow=0.034 m³/s 0.280 MI  
 Primary=0.034 m³/s 0.280 MI
- Link 10L: Sheridan Creek** Inflow=0.006 m³/s 0.020 MI  
 Primary=0.006 m³/s 0.020 MI

**Total Runoff Area = 1,0513 ha Runoff Volume = 0.516 MI Average Runoff Depth = 49 mm**  
 66,44% Pervious = 0.6985 ha 33,56% Impervious = 0.3528 ha

**Summary for Subcatchment 1S: Pre - Valley**

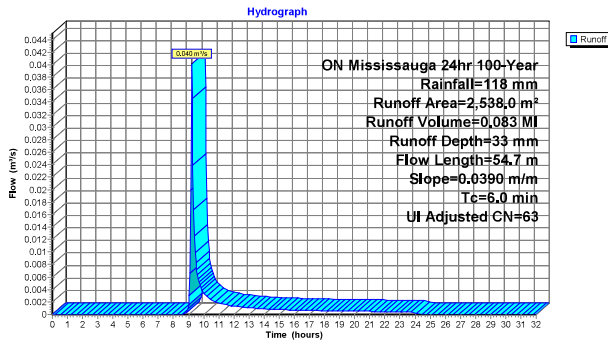
Runoff = 0.040 m³/s @ 9.22 hrs, Volume= 0.083 MI, Depth= 33 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Adj	Description
340.0	98		Unconnected roofs, HSG C
2,198.0	61		>75% Grass cover, Good, HSG B
2,538.0	66	63	Weighted Average, UI Adjusted
2,198.0			86.60% Pervious Area
340.0			13.40% Impervious Area
340.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
6.0	54.7	0.0390	0.15		Lag/CN Method,

**Subcatchment 1S: Pre - Valley**



**Summary for Subcatchment 2S: Pre-Sheridan Creek**

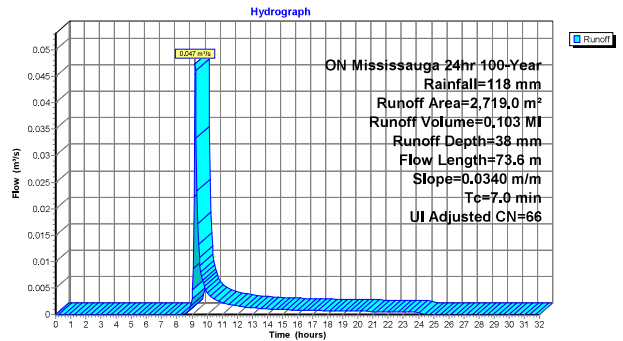
Runoff = 0.047 m³/s @ 9.23 hrs, Volume= 0.103 MI, Depth= 38 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Adj	Description
776.0	98		Unconnected roofs, HSG C
1,943.0	61		>75% Grass cover, Good, HSG B
2,719.0	72	66	Weighted Average, UI Adjusted
1,943.0			71.46% Pervious Area
776.0			28.54% Impervious Area
776.0			100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
7.0	73.6	0.0340	0.18		Lag/CN Method,

**Subcatchment 2S: Pre-Sheridan Creek**



**Summary for Subcatchment 3S: Area A**

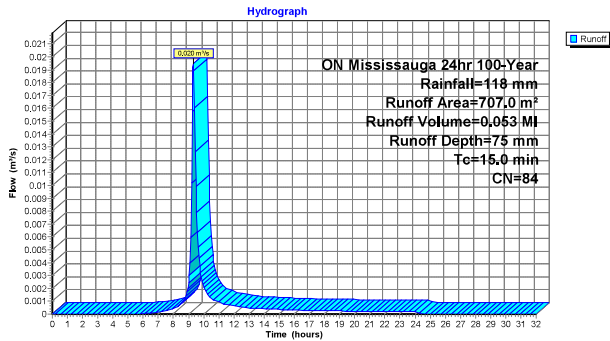
Runoff = 0.020 m³/s @ 9.32 hrs, Volume= 0.053 MI, Depth= 75 mm  
 Routed to Pond 7P : Storage Tank A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Description
443.0	98	Paved roads w/curbs & sewers, HSG B
264.0	61	>75% Grass cover, Good, HSG B
707.0	84	Weighted Average
264.0		37.34% Pervious Area
443.0		62.66% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 3S: Area A**



**Summary for Subcatchment 4S: Area B**

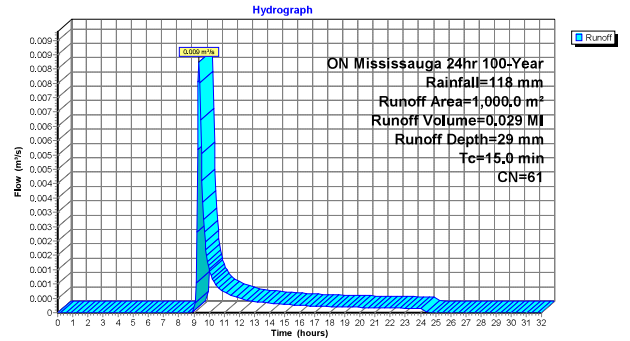
Runoff = 0.009 m³/s @ 9.35 hrs, Volume= 0.029 MI, Depth= 29 mm  
 Routed to Link 9L : To Valley

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Description
1,000.0	61	>75% Grass cover, Good, HSG B
1,000.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 4S: Area B**



**Summary for Subcatchment 5S: Area C**

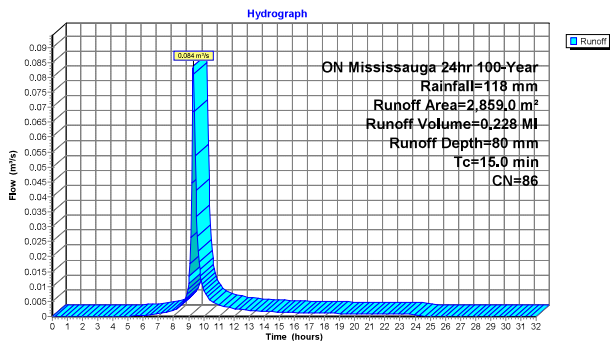
Runoff = 0.084 m³/s @ 9.32 hrs, Volume= 0.228 MI, Depth= 80 mm  
 Routed to Pond 8P : Storage Tank B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Description
1,969.0	98	Paved roads w/curbs & sewers, HSG B
890.0	61	>75% Grass cover, Good, HSG B
2,859.0	86	Weighted Average
890.0		31.13% Pervious Area
1,969.0		68.87% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 5S: Area C**



**Summary for Subcatchment 6S: Area D**

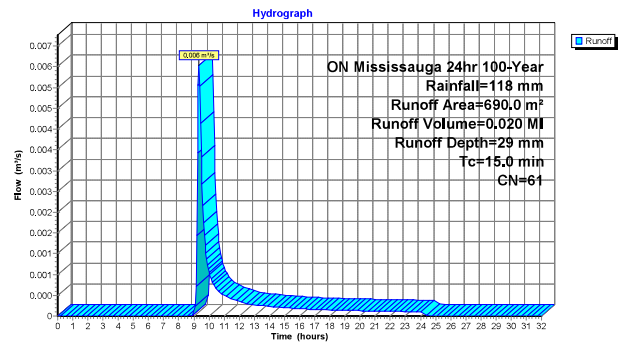
Runoff = 0.006 m³/s @ 9.35 hrs, Volume= 0.020 MI, Depth= 29 mm  
 Routed to Link 10L : Sheridan Creek

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 ON Mississauga 24hr 100-Year Rainfall=118 mm

Area (m²)	CN	Description
690.0	61	>75% Grass cover, Good, HSG B
690.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
15.0					Direct Entry,

**Subcatchment 6S: Area D**



**Summary for Pond 7P: Storage Tank A**

Inflow Area = 0.0707 ha, 62.86% Impervious, Inflow Depth = 75 mm for 100-Year event  
 Inflow = 0.020 m³/s @ 9.32 hrs, Volume= 0.053 MI  
 Outflow = 0.016 m³/s @ 9.45 hrs, Volume= 0.053 MI, Atten= 19%, Lag= 7.8 min  
 Discarded = 0.000 m³/s @ 9.45 hrs, Volume= 0.001 MI  
 Primary = 0.016 m³/s @ 9.45 hrs, Volume= 0.052 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 95.555 m @ 9.45 hrs Surf.Area= 18.0 m² Storage= 10.3 m³

Plug-Flow detention time= 16.4 min calculated for 0.053 MI (100% of inflow)  
 Center-of-Mass det. time= 16.0 min ( 692.5 - 676.5 )

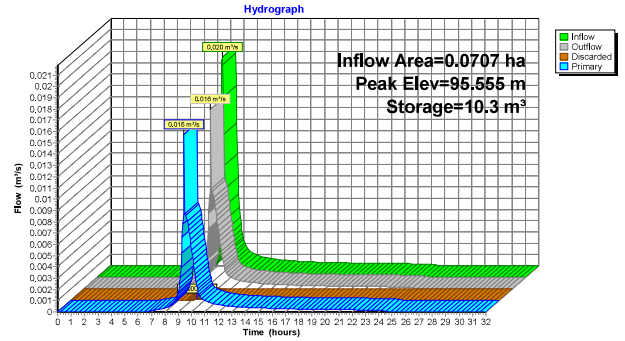
Volume	Invert	Avail.Storage	Storage Description	
#1	93.720 m	10.3 m³	<b>Custom Stage Data (Conic)</b> Listed below (Recalc) 10.8 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.720	18.0	0.0	0.0	18.0
94.320	18.0	10.8	10.8	27.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.720 m	<b>60.00 mm/hr Exfiltration over Wetted area from 93.720 m - 94.060 m</b> Conductivity to Groundwater Elevation = 91.900 m Excluded Wetted area = 18.0 m²
#2	Primary	93.720 m	<b>75 mm Vert. Orifice/Gate C= 0.600</b> Limited to weir flow at low heads

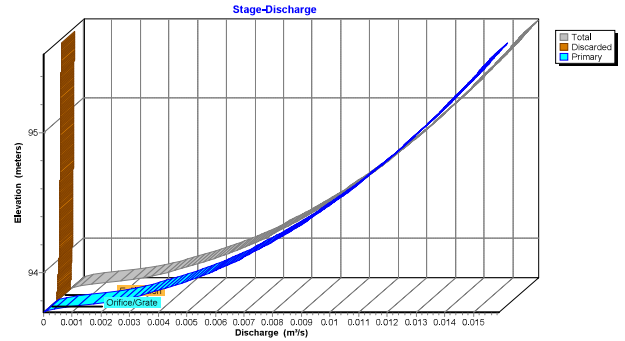
**Discarded OutFlow** Max=0.000 m³/s @ 9.45 hrs HW=95.553 m (Free Discharge)  
 1=Exfiltration ( Controls 0.000 m³/s)

**Primary OutFlow** Max=0.016 m³/s @ 9.45 hrs HW=95.552 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.016 m³/s @ 3.56 m/s)

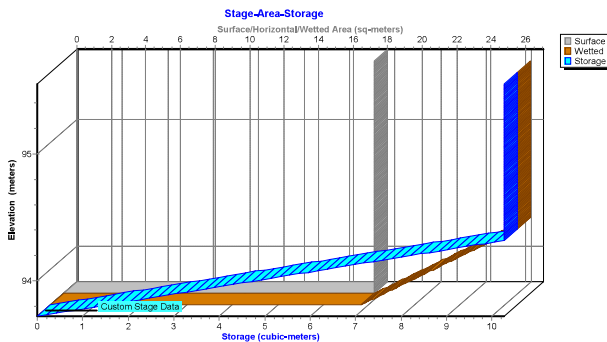
**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Pond 7P: Storage Tank A**



**Summary for Pond 8P: Storage Tank B**

Inflow Area = 0.2859 ha, 68.87% Impervious, Inflow Depth = 80 mm for 100-Year event  
 Inflow = 0.084 m³/s @ 9.32 hrs, Volume= 0.228 MI  
 Outflow = 0.014 m³/s @ 9.79 hrs, Volume= 0.216 MI, Atten= 83%, Lag= 28.1 min  
 Discarded = 0.001 m³/s @ 9.79 hrs, Volume= 0.018 MI  
 Primary = 0.013 m³/s @ 9.79 hrs, Volume= 0.198 MI  
 Routed to Link 9L : To Valley

Routing by Dyn-Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.720 m @ 9.79 hrs Surf.Area= 75.0 m² Storage= 104.7 m³

Plug-Flow detention time= 130.7 min calculated for 0.215 MI (95% of inflow)  
 Center-of-Mass det. time= 96.0 min ( 766.5 - 670.5 )

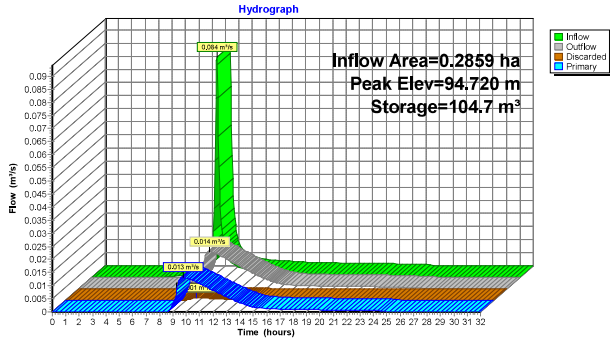
Volume	Invert	Avail.Storage	Storage Description	
#1	93.250 m	106.9 m³	<b>Custom Stage Data (Conic)</b> Listed below (Recalc) 112.5 m³ Overall x 95.0% Voids	
Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.250	75.0	0.0	0.0	75.0
94.750	75.0	112.5	112.5	121.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.250 m	<b>60.00 mm/hr Exfiltration over Wetted area from 93.250 m - 94.950 m</b> Conductivity to Groundwater Elevation = 91.700 m Excluded Wetted area = 75.0 m²
#2	Primary	93.440 m	<b>75 mm Vert. Orifice/Gate C= 0.600</b> Limited to weir flow at low heads

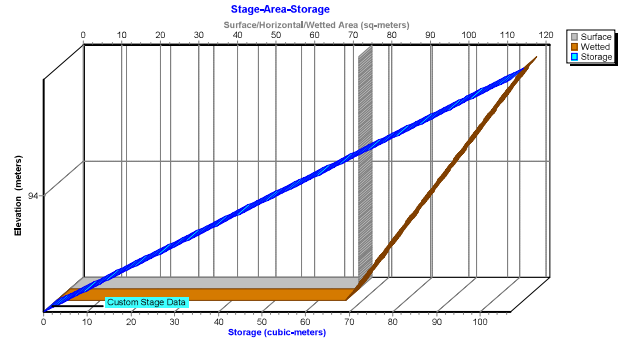
**Discarded OutFlow** Max=0.001 m³/s @ 9.79 hrs HW=94.719 m (Free Discharge)  
 1=Exfiltration ( Controls 0.001 m³/s)

**Primary OutFlow** Max=0.013 m³/s @ 9.79 hrs HW=94.719 m TW=0.000 m (Dynamic Tailwater)  
 2=Orifice/Gate (Orifice Controls 0.013 m³/s @ 2.96 m/s)

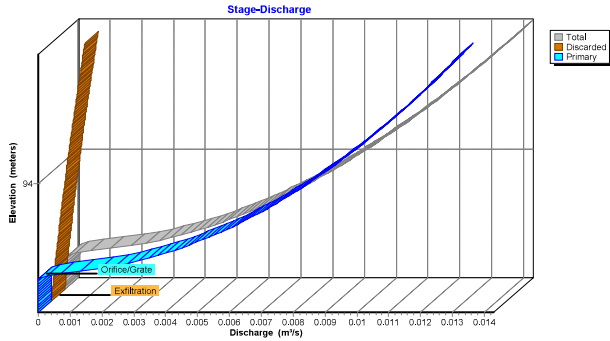
Pond 8P: Storage Tank B



Pond 8P: Storage Tank B



Pond 8P: Storage Tank B

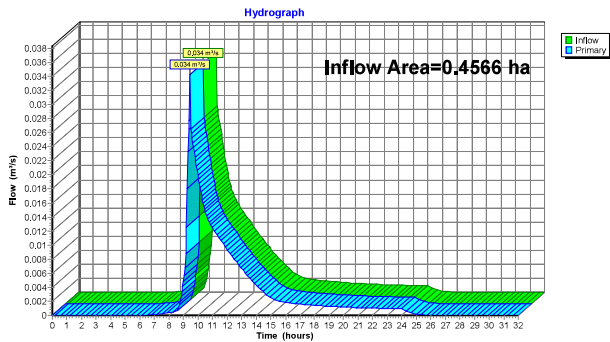


Summary for Link 9L: To Valley

Inflow Area = 0.4566 ha, 52.83% Impervious, Inflow Depth = 61 mm for 100-Year event  
 Inflow = 0.034 m³/s @ 9.45 hrs, Volume= 0.280 MI  
 Primary = 0.034 m³/s @ 9.45 hrs, Volume= 0.280 MI, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 9L: To Valley

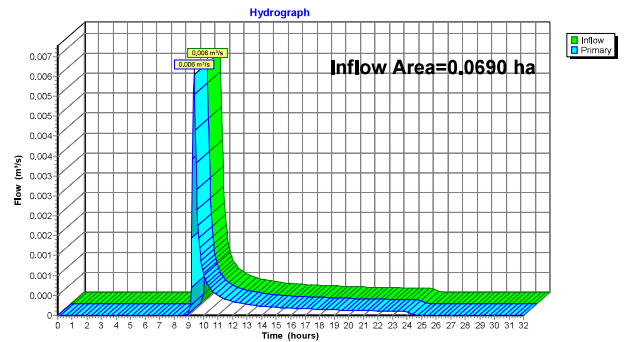


Summary for Link 10L: Sheridan Creek

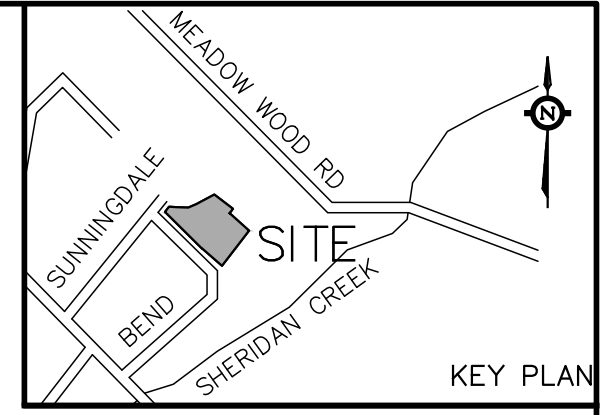
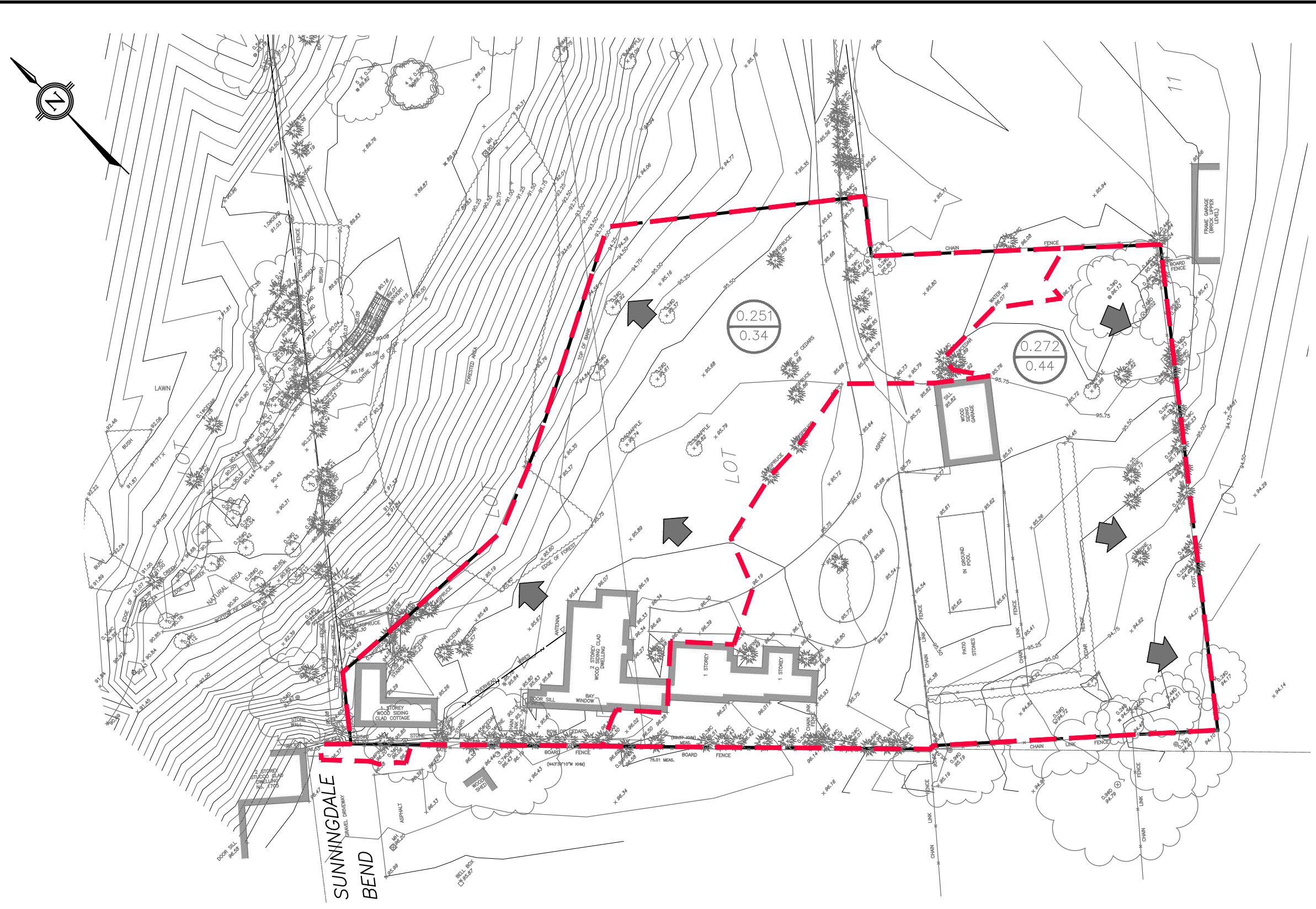
Inflow Area = 0.0690 ha, 0.00% Impervious, Inflow Depth = 29 mm for 100-Year event  
 Inflow = 0.006 m³/s @ 9.35 hrs, Volume= 0.020 MI  
 Primary = 0.006 m³/s @ 9.35 hrs, Volume= 0.020 MI, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-32.00 hrs, dt= 0.05 hrs

Link 10L: Sheridan Creek



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**LEGEND**

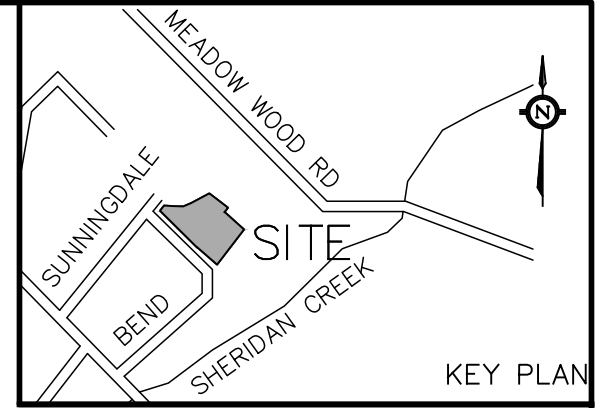
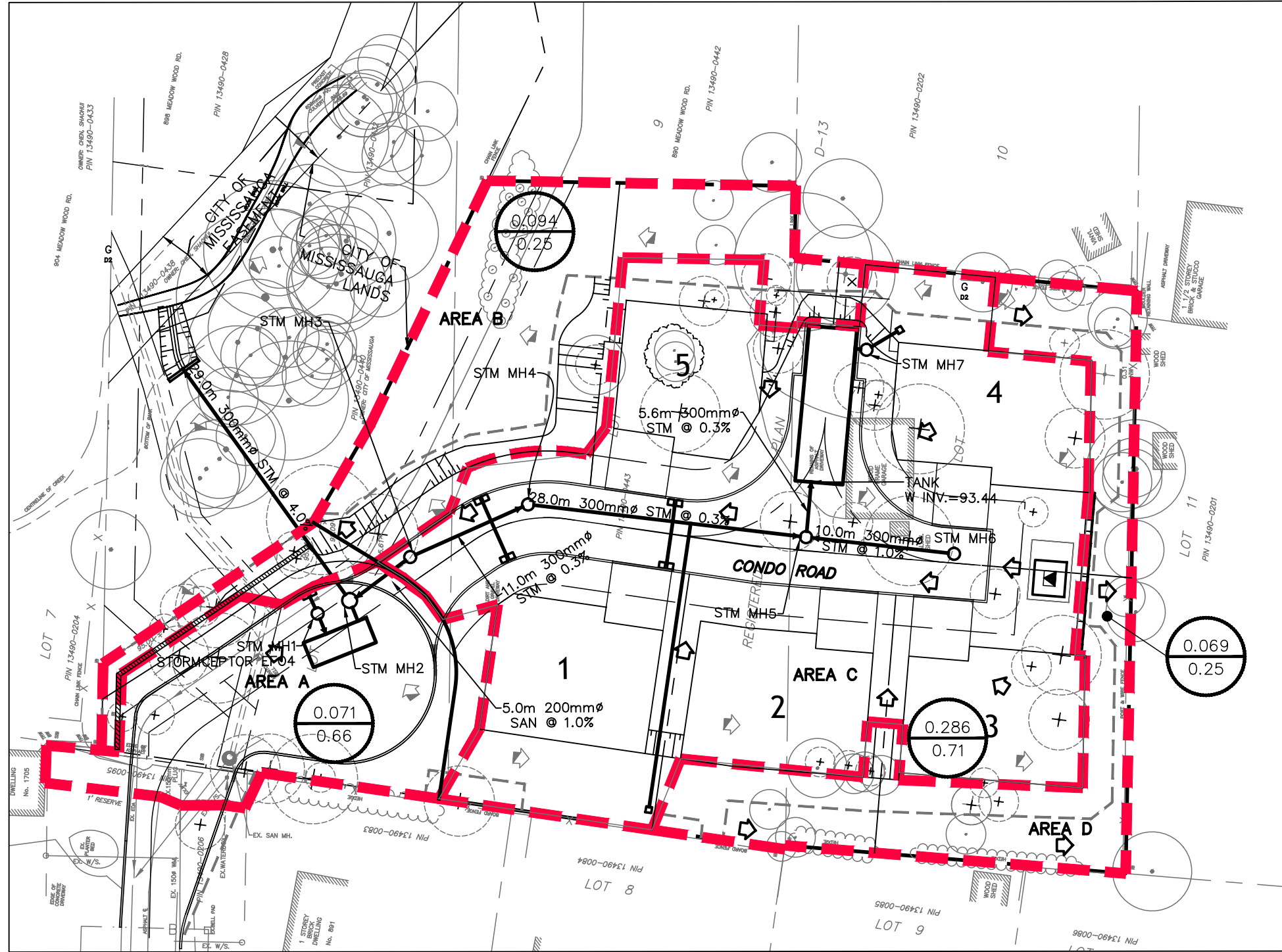
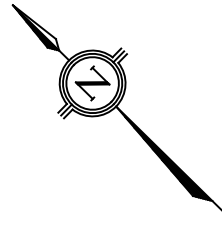
- EXISTING DRAINAGE AREA
- EXISTING DRAINAGE DIRECTION
- STORM AREA IN HECTARES  
STORM RUN-OFF COEFFICIENT

PROJECT TITLE	
<b>RESIDENTIAL DEVELOPMENT</b> 1667 SUNNINGDALE BEND MISSISSAUGA ON	
DRAWING TITLE	
<b>PRE-DEVELOPMENT DRAINAGE PLAN</b>	

<b>TRAFALGAR ENGINEERING</b> <small>#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6 www.trafalgareng.com</small>		DRAWING No.	
		Figure 2	
DESIGN BY	SP	SCALE	1:500
DRAWN BY	ZG	DATE	Feb 07, 2023



FILENAME: P:\1407 Welton\Drawings\DWG\1407GS.dwg  
 PLOTDATE: Jan 31, 2024 - 11:08am



**LEGEND**

- PROPOSED DRAINAGE AREA
- PROPOSED DRAINAGE DIRECTION
- STORM AREA IN HECTARES  
STORM RUN-OFF COEFFICIENT

PROJECT TITLE	
<b>RESIDENTIAL DEVELOPMENT</b> 1667 SUNNINGDALE BEND MISSISSAUGA ON	
DRAWING TITLE	
<b>POST-DEVELOPMENT DRAINAGE AREA PLAN</b>	

**TRAFALGAR ENGINEERING**  
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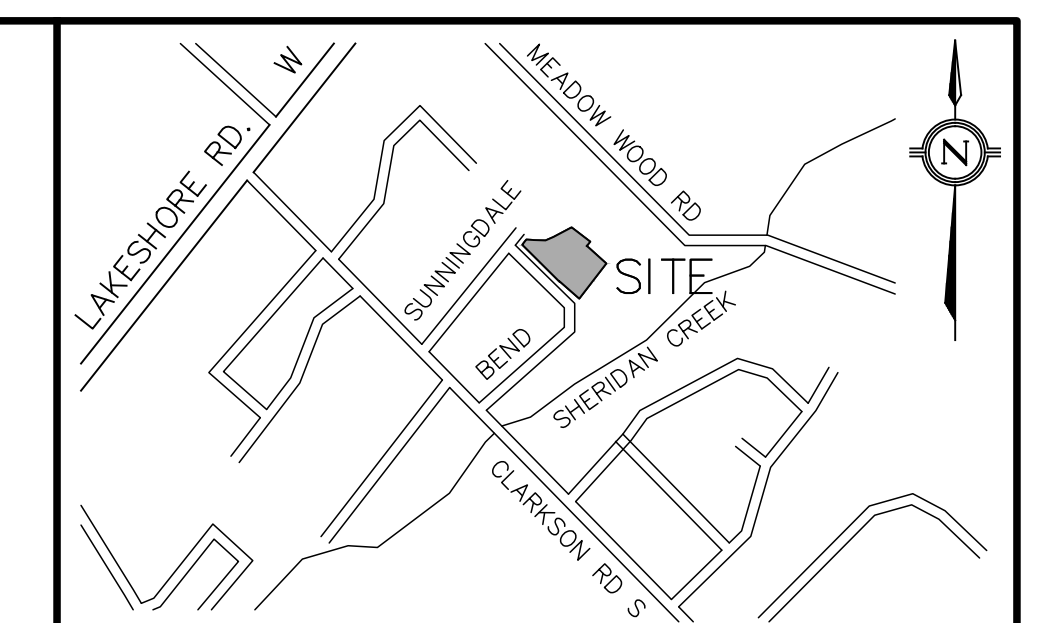
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DRAWN BY	AJP	DATE	Jan 31, 2024	
				<b>Figure 3</b>

***APPENDIX 'E'***

*Grading Plan (G1)*

*Servicing Plan (S1)*

*Cross-section (D1, D2)*



- LEGEND**
- PROPOSED CATCHBASIN
  - PROPOSED DOUBLE CATCHBASIN
  - PROPOSED STORM MANHOLE
  - PROPOSED SANITARY MANHOLE
  - ⊕ PROPOSED FIRE HYDRANT
  - ⊕ PROPOSED VALVE & BOX
  - PROPOSED PLUG
  - PROPOSED STORM SEWER
  - PROPOSED SANITARY SEWER
  - PROPOSED WATERMAIN
  - PROPOSED PROPERTY BOUNDARY
  - PROPOSED STORM CONNECTION
  - PROPOSED SANITARY CONNECTION
  - PROPOSED WATERMAIN CONNECTION
  - PROPOSED SLOPE (MAX 3:1)
  - PROPOSED OVERLAND FLOW
  - EXISTING OVERLAND FLOW
  - DCB\* DOUBLE CATCHBASIN WITH CB HEAD
  - ⊕ SUMP PUMP REQUIRED
  - 104 TREE NUMBER
  - ⊕ TREE TO BE REMOVED
  - TREE TO REMAIN
  - TREE HOARDING
  - STREET LIGHT POST
  - ◻ TRANSFORMER
  - EROSION ACCESS ALLOWANCE SETBACK
  - 100-YEAR FLOODLINE (96.05m)

NO.	DATE	BY/DRAWN	REVISIONS
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2	23/02/24	AJP/JN	RE-ISSUED FOR RE-ZONING
1	21/08/19	SP/ZG	ISSUED

CAD FILE: 1407GS.dwg PLOT SCALE: 1:1 PLOT DATE: Jan 31, 2024

**BENCHMARK**  
 ELEVATIONS SHOWN HEREIN ARE GEODETIC VERTICAL DATUM—1928, AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 713, HAVING ELEVATIONS OF 96.649m.

**NOTE**  
 EXISTING TOPOGRAPHIC INFORMATION WAS COMPLETED ON THE 20TH DAY OF OCTOBER, 2020 AND PREPARED BY TARASIK McMILLAN LTD. ONTARIO LAND SURVEYORS. File No.4985-20-T

DESIGNED BY

APPROVED BY

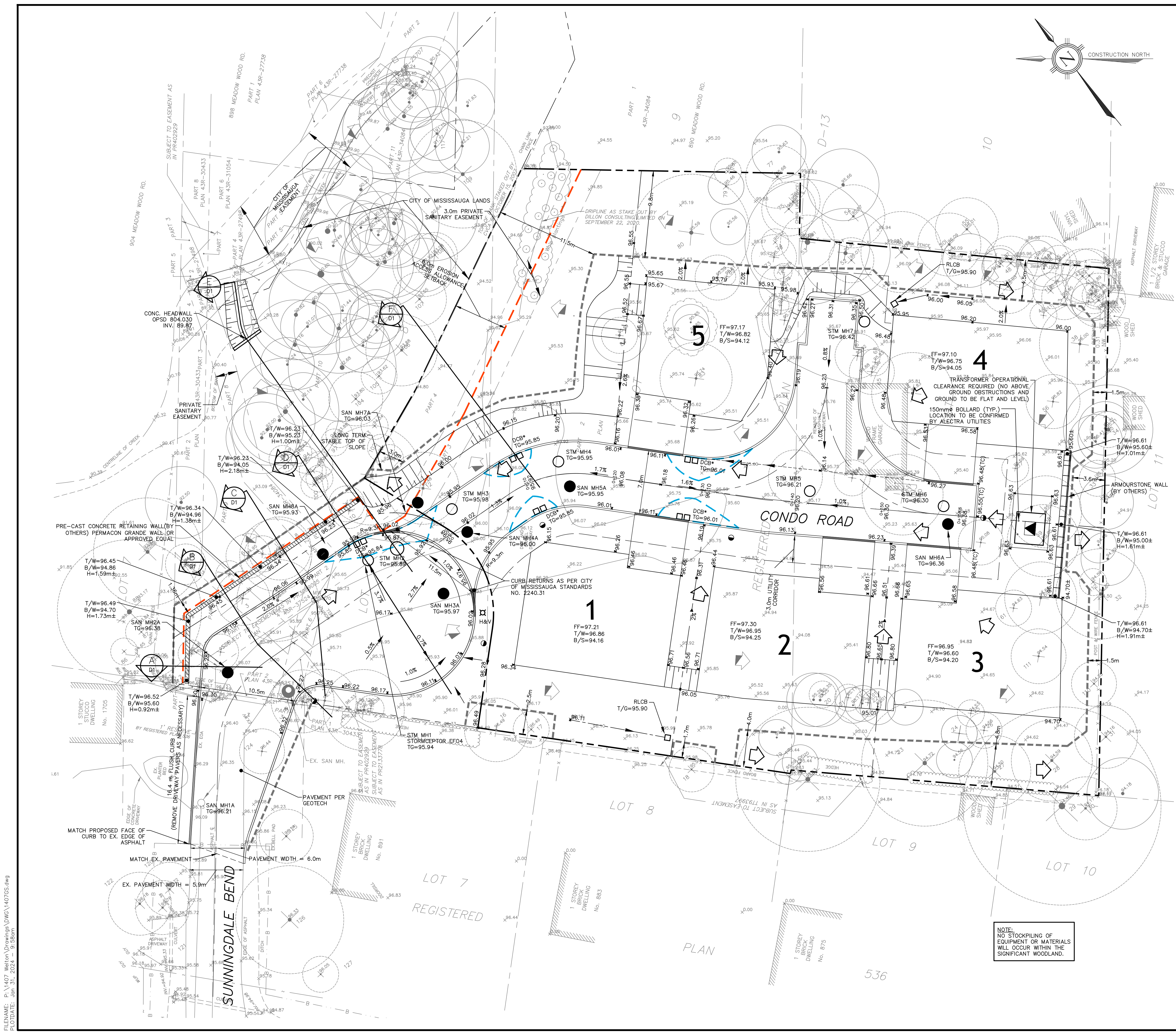
**TRAFALGAR ENGINEERING**  
 #1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6  
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PROJECT TITLE  
**RESIDENTIAL DEVELOPMENT**

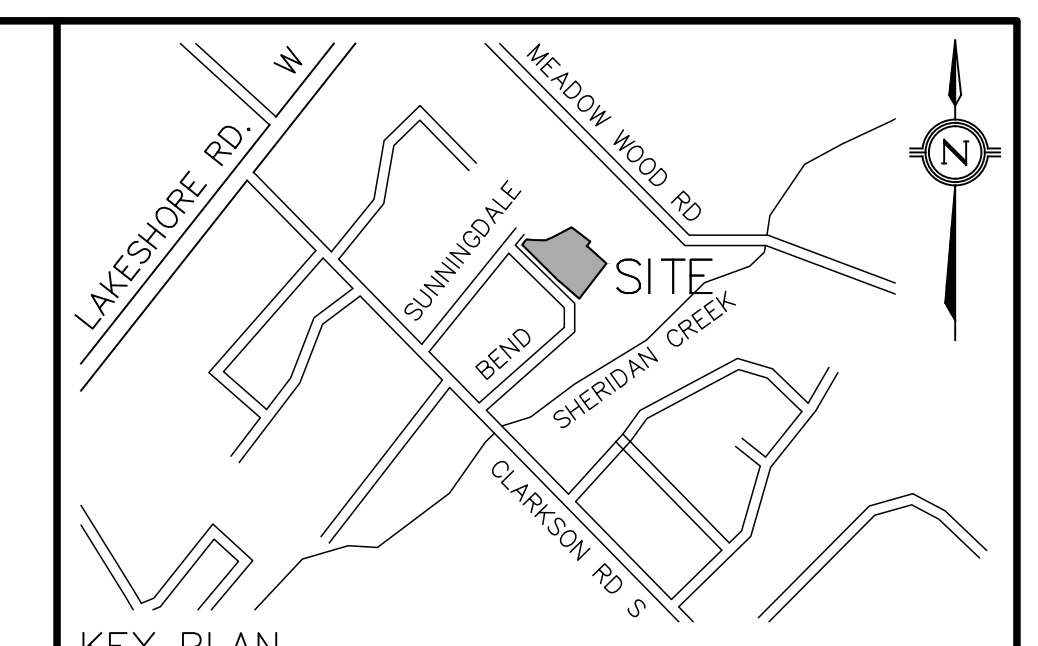
LOCATION  
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 MISSISSAUGA ON**

DRAWING TITLE  
**GRADING PLAN**

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DRAWN BY	ZG	CHECKED BY	JN	PLAN No.	G1
DATE	2023/06/15	SHEET	1 OF 1		



FILENAME: P:\1407 Welton\Drawings\DWG\1407GS.dwg  
 PLOTTED: Jan 31, 2024 - 9:58am



- LEGEND**
- PROPOSED CATCHBASIN
  - PROPOSED DOUBLE CATCHBASIN
  - PROPOSED STORM MANHOLE
  - PROPOSED SANITARY MANHOLE
  - ⊕ PROPOSED FIRE HYDRANT
  - ⊕ PROPOSED VALVE & BOX
  - PROPOSED PLUG
  - PROPOSED STORM SEWER
  - PROPOSED SANITARY SEWER
  - PROPOSED WATERMAIN
  - PROPOSED PROPERTY BOUNDARY
  - PROPOSED STORM CONNECTION
  - PROPOSED SANITARY CONNECTION
  - PROPOSED SLOPE (MAX 3:1)
  - PROPOSED OVERLAND FLOW
  - EXISTING OVERLAND FLOW
  - DCB\* DOUBLE CATCHBASIN WITH CB SHIELD
  - ⊕ SUMP PUMP REQUIRED
  - 104 TREE NUMBER
  - ⊕ TREE TO BE REMOVED
  - TREE TO REMAIN
  - TREE HOARDING
  - STREET LIGHT POST
  - ◻ TRANSFORMER
  - EROSION ACCESS ALLOWANCE SETBACK
  - 100-YEAR FLOODLINE (96.05m)

NO.	DATE	BY/DRAWN	REVISIONS
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2	23/01/10	AJP/JN	RE-ISSUED FOR RE-ZONING
1	21/08/09	SP/ZG	ISSUED

CAD FILE: 1407GS.dwg PLOT SCALE: 1:1 PLOT DATE: Jan 31, 2024

**BENCHMARK**  
ELEVATIONS SHOWN HEREON ARE GEODETIC VERTICAL DATUM—1928, AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 713, HAVING ELEVATIONS OF 96.649m.

**NOTE**  
EXISTING TOPOGRAPHIC INFORMATION WAS COMPLETED ON THE 20TH DAY OF OCTOBER, 2020 AND PREPARED BY TARASIK McMILLAN LTD. ONTARIO LAND SURVEYORS. File No. 4985-20-T

DESIGNED BY

APPROVED BY

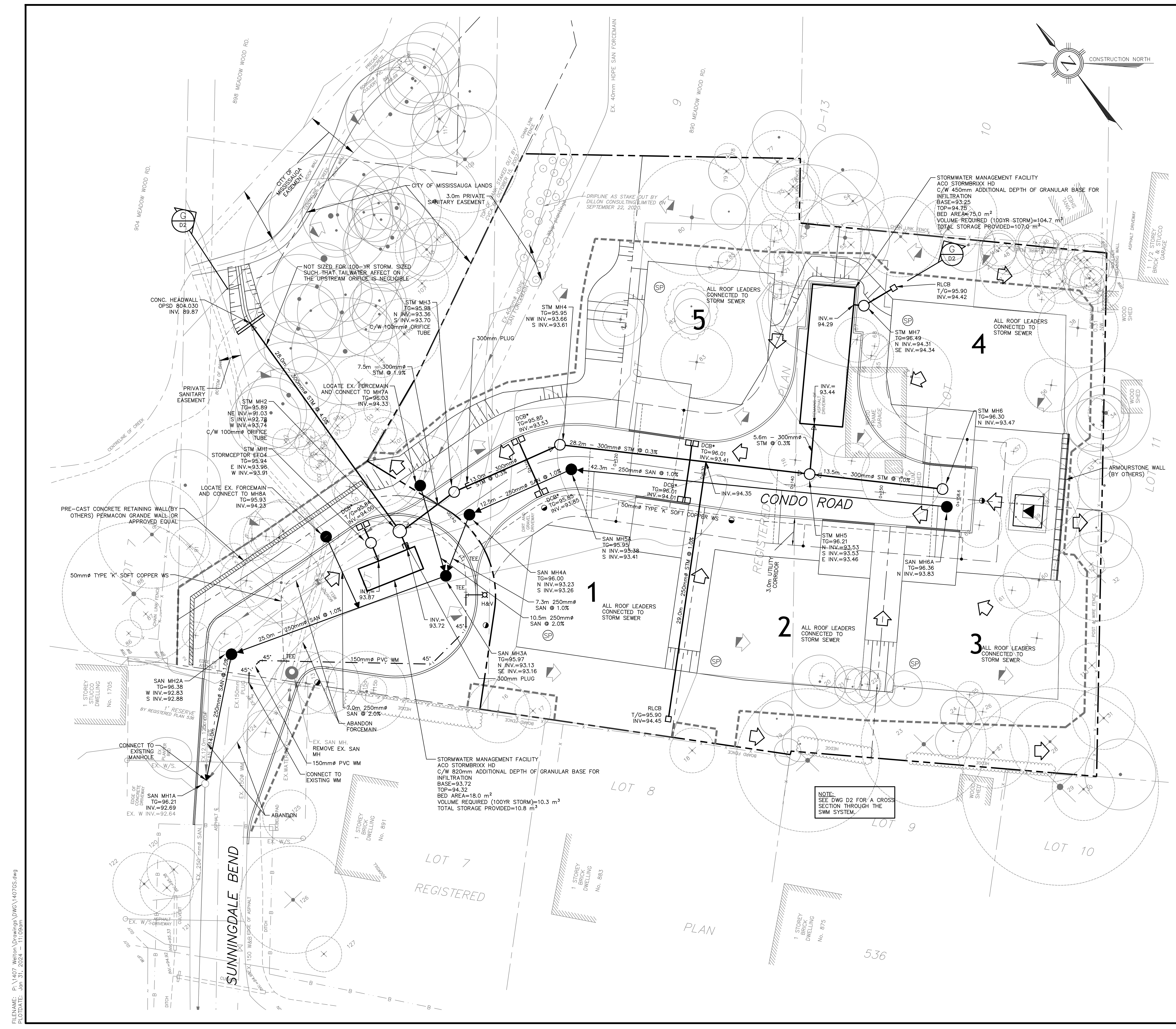
**TRAFALGAR ENGINEERING**  
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6  
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PROJECT TITLE  
**RESIDENTIAL DEVELOPMENT**

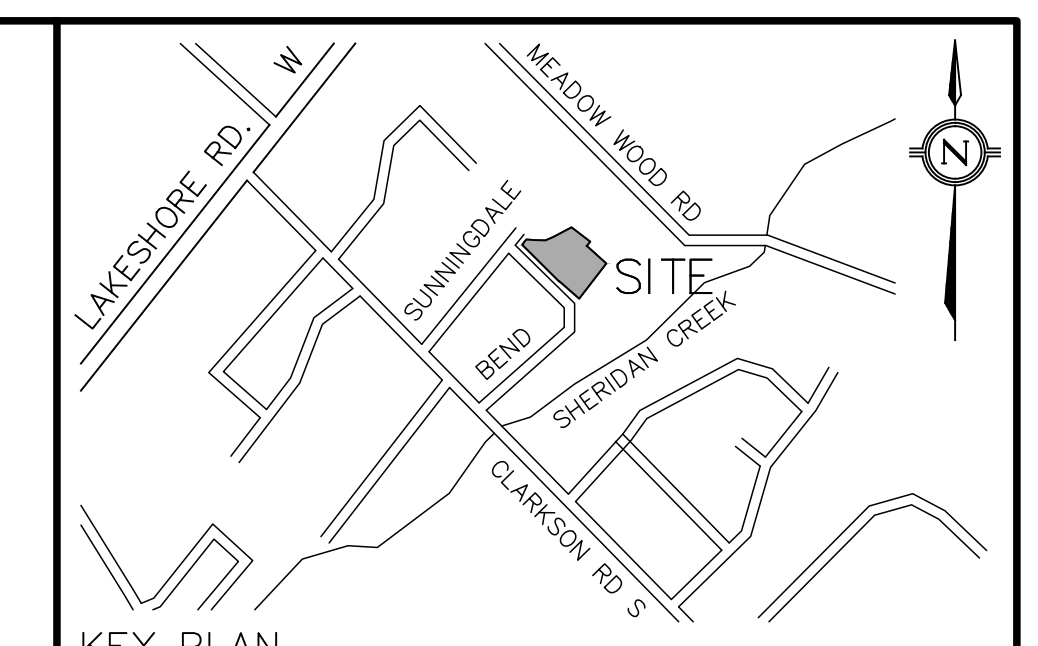
LOCATION  
**1667 SUNNINGDALE BEND  
MISSISSAUGA ON**

DRAWING TITLE  
**SERVICING PLAN**

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DRAWN BY	AJP	CHECKED BY	JN	PLAN No.	S1
DATE	2023/06/15	SHEET	1 OF 1		



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KEY PLAN

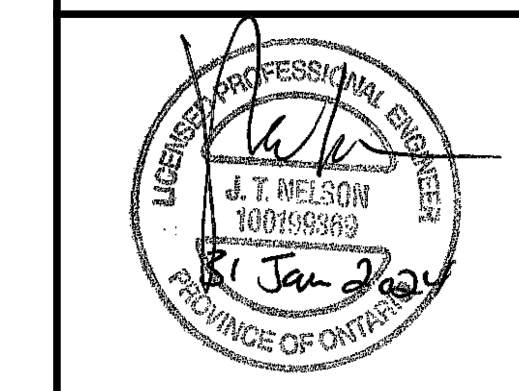
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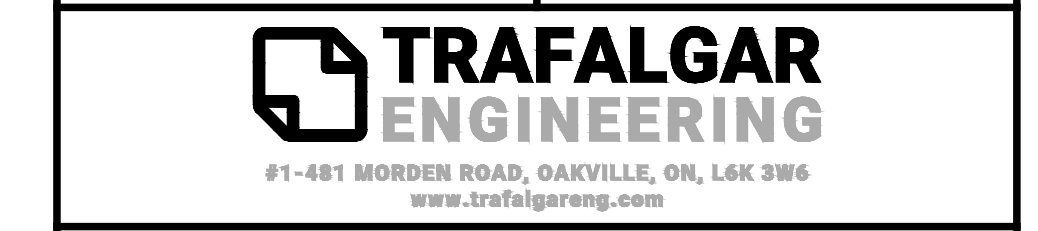
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**BENCHMARK**  
ELEVATIONS SHOWN HEREON ARE GEODETIC VERTICAL DATUM-1928, AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 713, HAVING ELEVATIONS OF 96.649m.

**NOTE**  
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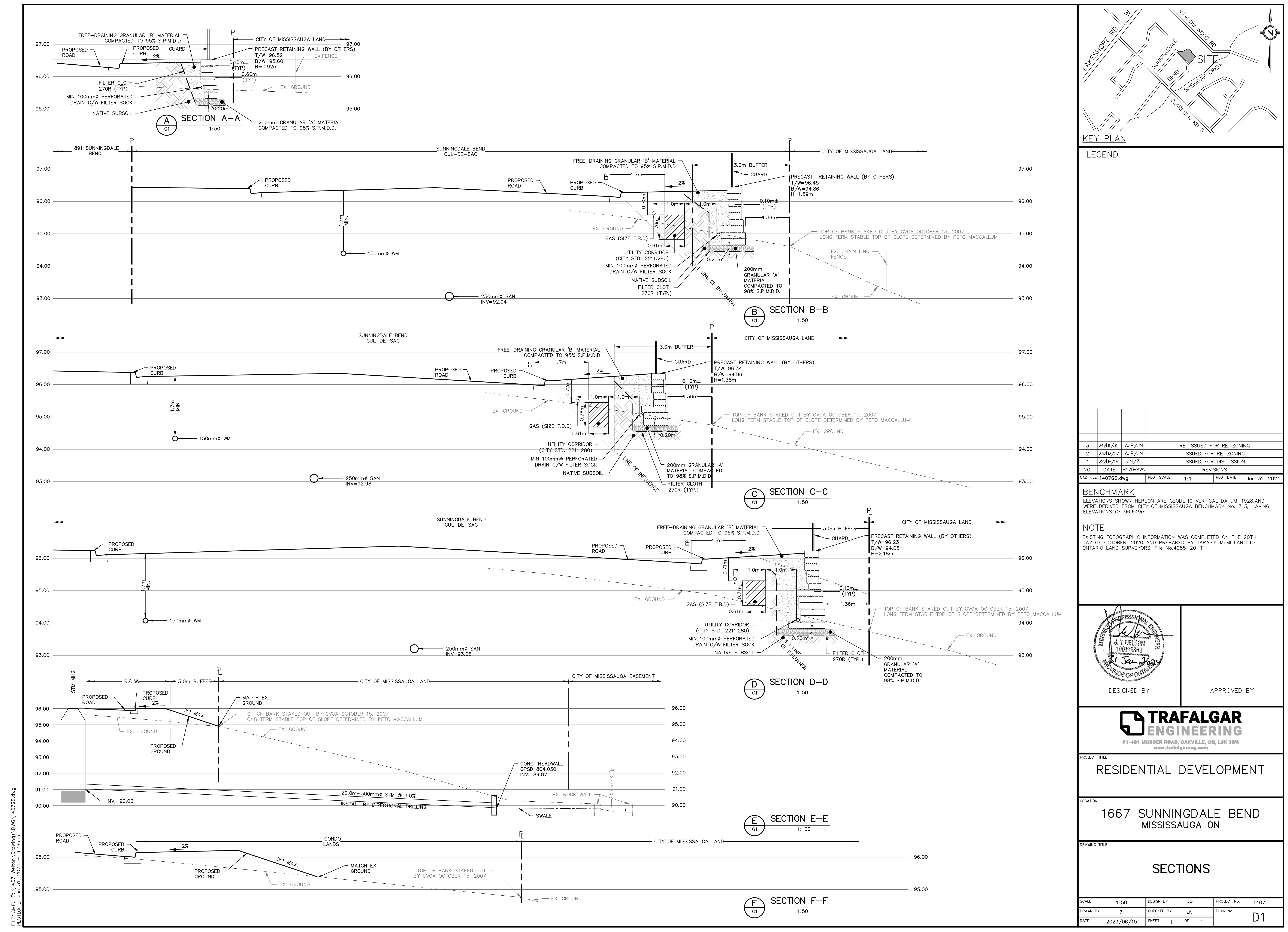


PROJECT TITLE  
**RESIDENTIAL DEVELOPMENT**

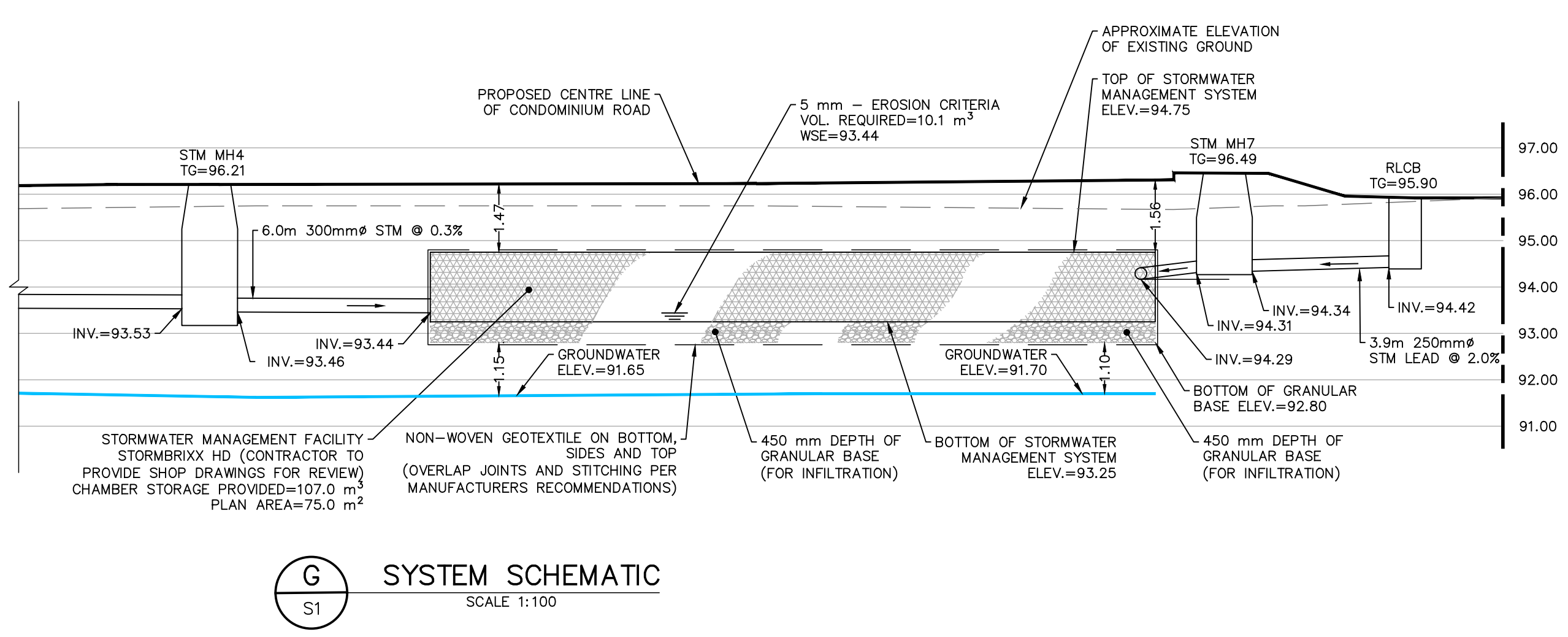
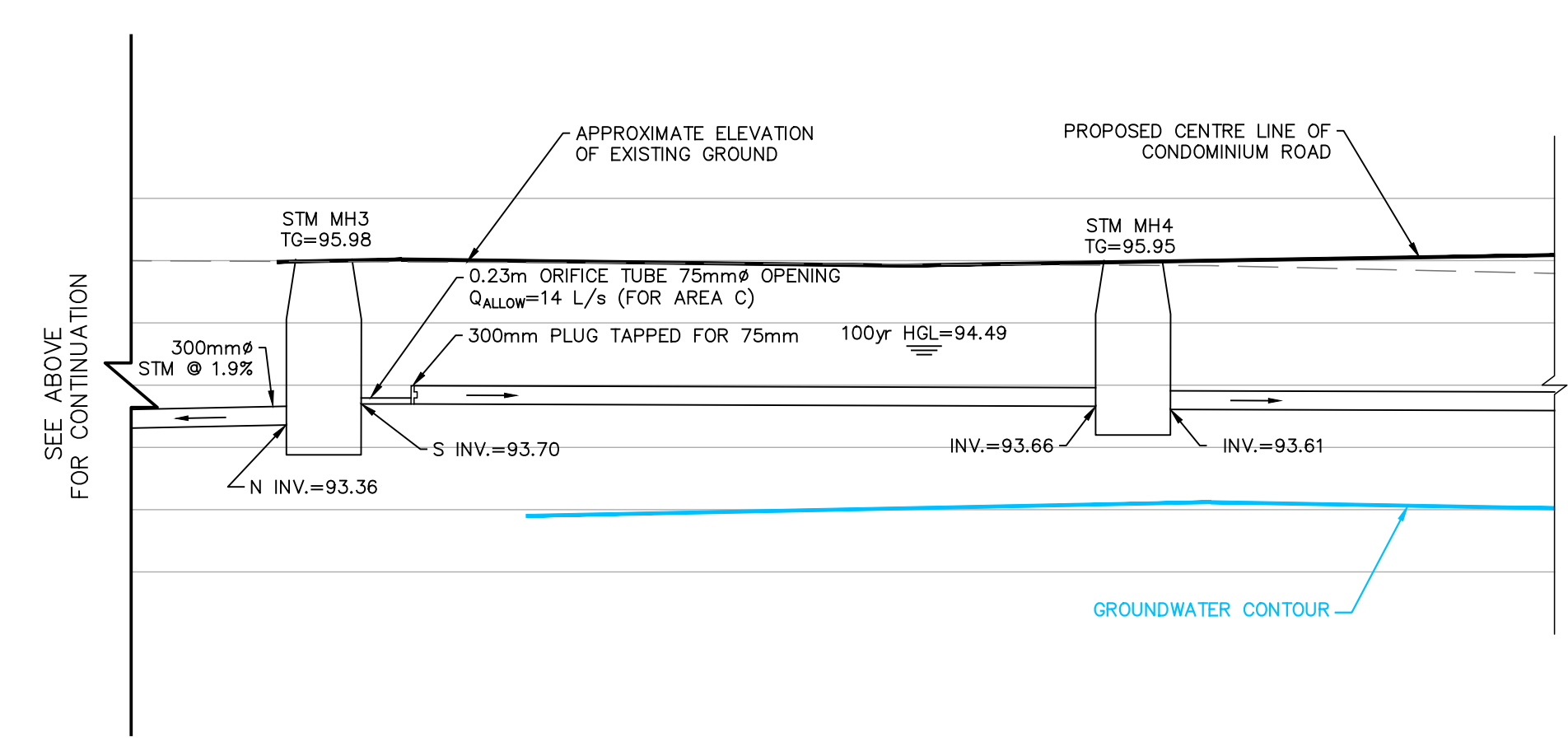
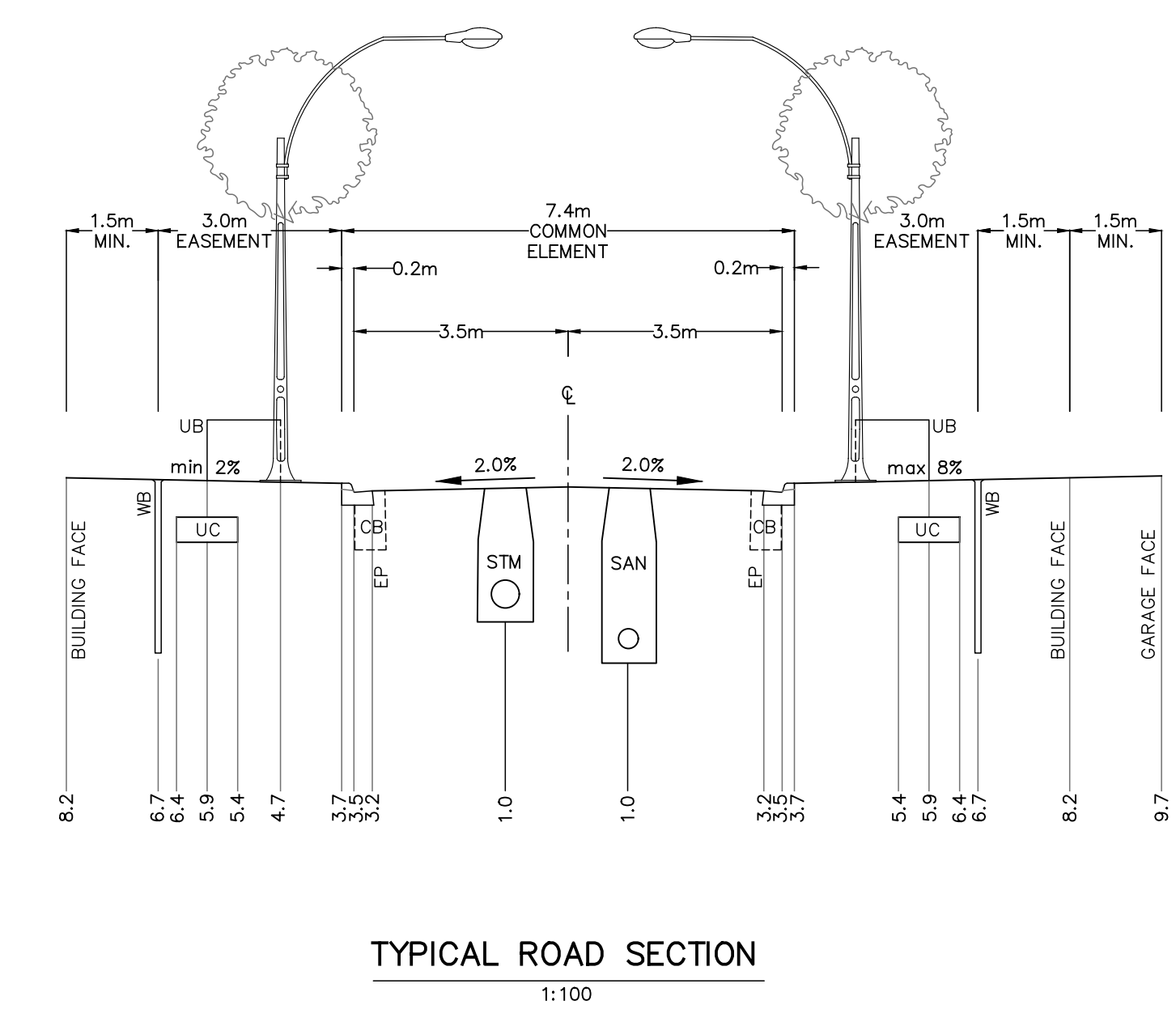
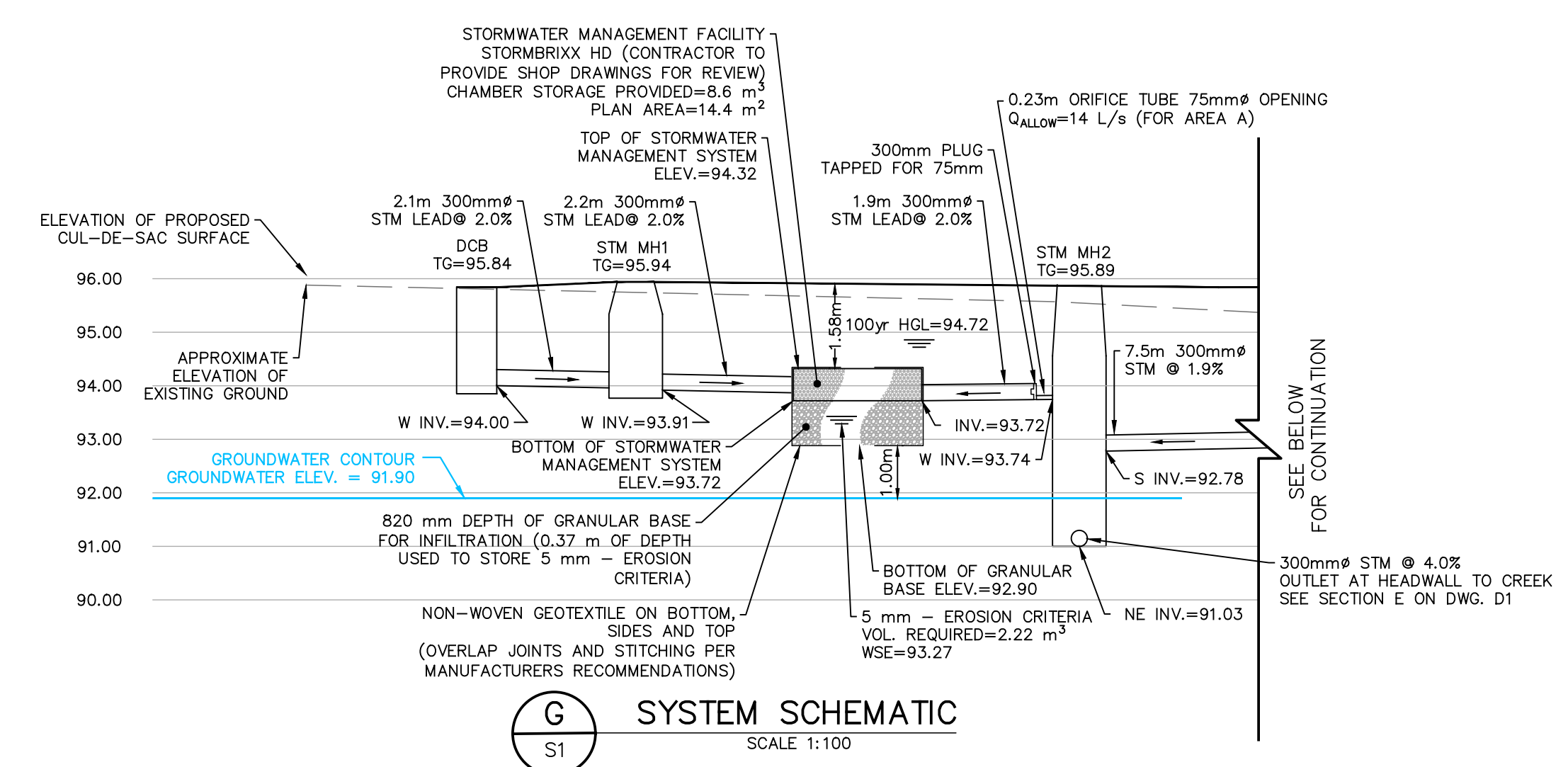
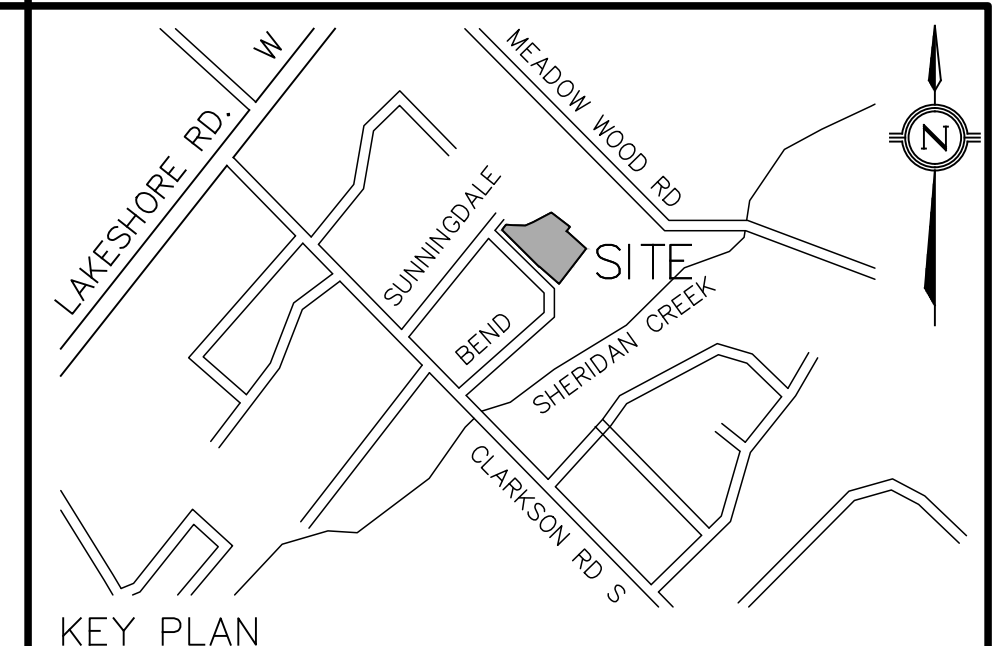
LOCATION  
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MISSISSAUGA ON**

DRAWING TITLE  
**SECTIONS**

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DRAWN BY	ZI	CHECKED BY	JN	PLAN No.	
DATE	2023/06/15	SHEET	1 OF 1		D1



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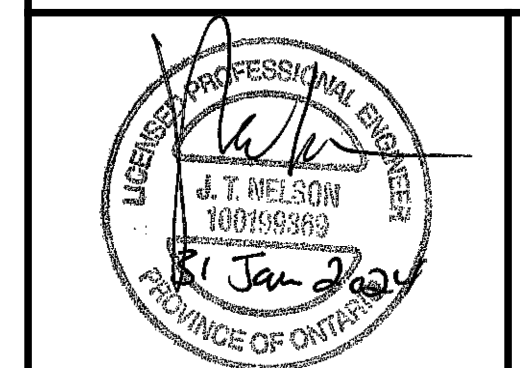


NO.	DATE	BY/DRAWN	REVISIONS
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CAD FILE: 1407GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Jan 31, 2024

**BENCHMARK**  
ELEVATIONS SHOWN HEREON ARE GEODETIC VERTICAL DATUM—1928, AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 713, HAVING ELEVATIONS OF 96.649m.

**NOTE**  
EXISTING TOPOGRAPHIC INFORMATION WAS COMPLETED ON THE 20TH DAY OF OCTOBER, 2020 AND PREPARED BY TARASHK McMILLAN LTD. ONTARIO LAND SURVEYORS. File No.4985-20-T



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81-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6  
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PROJECT TITLE: **RESIDENTIAL DEVELOPMENT**

LOCATION: **1667 SUNNINGDALE BEND MISSISSAUGA ON**

DRAWING TITLE: **ACO STORMBRIXX CROSS-SECTIONS**

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DATE	2023/06/15	SHEET	1 OF 1		