TRAFALGAR ENGINEERING

FUNCTIONAL SERVICING REPORT

Water, Sanitary, and Stormwater Management

PROPOSED RESIDENTIAL DEVELOPEMENT

1667 SUNNINGDALE BEND
MISSISSAUGA, ONTARIO

PREPARED FOR UNITED LANDS

OUR FILE: 1407

June 15, 2023

(905) 338-3366 #1-481 Morden Road, Oakville, ON, L6K 3W6 www.trafalgareng.com

REVISION HISTORY

DATE	REVISION	SUBMISSION
2022-03-08	1	Revised per Region of Peel comments
2023-06-15	*2*	*Revised per City of Mississauga and Peel Region comments*

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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 watermains 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.

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 (ET04), 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 100 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 0.090 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 70% impervious with a total area of 0.278 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 100 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 0.083 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 rear downspout 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-yr 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*	*5*	*44*	*5*	*64*
10-yr	*99.2*	*13*	*6*	*54*	*6*	*79*
25-yr	*113.9*	*16*	*8*	*68*	*7*	*99*
50-yr	*127.1*	*20*	*10*	*83*	*9*	*122*
100-yr	*140.7*	*23*	*11*	*96*	*10*	*140*

*SWM Facility in-flow

The allowable release rate to the valley to the north is Q = 0.014 m^3/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 100 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 *7.7 m^3* and *95.8 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

Return	Storage (m^3)	Outflow (L/s)	Allowable Flow (L/s)
2-yr	1.1	7	14
5-yr	1.7	12	14
10-yr	2.5	16	14
25-yr	3.2	20	14
50-yr	3.9	23	14
100-yr	4.7	25	14

In order to control the post-development flow for Area A to the pre-development flow of Q = 0.014 m^3/s, approximately 7.7 m^3 of storage is required for the 100-year event. The storage will be provided using an ACO Stormbrixx HD providing 8.6 m^3 of storage.

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

Return	Storage (m^3)	Outflow (L/s)	Allowable Flow (L/s)
2-yr	23.7	6	14
5-yr	38.1	13	14
10-yr	53.4	17	14
25-yr	65.9	20	14
50-yr	77.5	23	14
100-yr	88.2	31	14

In order to control the post-development flow for Area C to the pre-development flow of Q = 0.014 m^3/s, approximately 95.8 m^3 of storage is required for the 100-year event. The storage will be provided using an ACO Stormbrixx HD providing 103.7 m^3 of storage.

Table 7: Total Flows with Controlled Site Flows

Return	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	7	5	6	4	22
5-yr	12	6	13	6	37
10-yr	16	8	17	7	48
25-yr	20	10	20	9	59
50-yr	23	12	23	11	69
100-yr	25	14	31	13	83

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

Return	Pre-Dev Total (L/s)	Post-Dev Total (L/s)	Percent Change
2-yr	*34*	*22*	*-35%*
5-yr	*46*	*37*	*-20%*
10-yr	*57*	*48*	*-16%*
25-yr	*72*	*59*	*-18%*
50-yr	*84*	*69*	*-18%*
100-yr	*95*	*83*	*-20%*

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^3/ha of storage is required in an infiltration system providing 80% TSS removal. The required storage is 0.28 ha x 35 m^3/ha = 9.8 m^3. 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^3. 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 93.22, the storm drainage system of sewers and ACO Stormbrixx HD has a storage volume of 2.4 m^3. 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 14.4 m^2. Based on this area, the 2.22 m^3 of water retained in the system will drain into the ground in approximately 16.06 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 *0.196 ha*, the first 5 mm of runoff results in a volume of *9.8* m^3. *The same approach will be implemented as in Area A.* Below the orifice invert of 93.52, the storm drainage system of sewers and *ACO Stormbrixx HD* has a storage volume of 10.8 m^3. This exceeds the volume required to retain the *first* 5 mm *of runoff.* The proposed storm tank will have a footprint of approximately 69.1 m^2. Based on this area, the 10.8 m^3 of water retained in the system will drain into the ground in approximately 16.28 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 250mm 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-yr post-development flows to the existing 2-yr pre-development rate for Areas A and C*, underground storage tanks with 8.6 m^3 and 103.7 m^3 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, 100 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 rear downspouts from Lots 2, 3, 4 and 5 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
Junior Designer

Digitally signed by James Tarleton Nelson -- P.Eng. - PEO
Date: 2023.06.16 09:14:24 -04'00'

LICENSED PROFESSIONAL ENGINEER
J.T. NELSON
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PROVINCE OF ONTARIO

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

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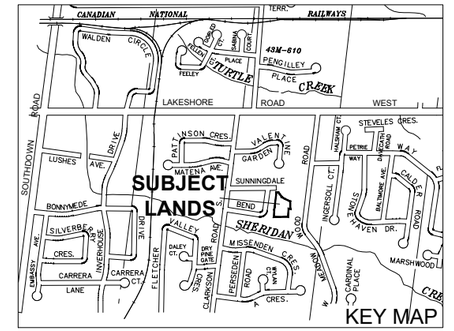


DEVELOPMENT CONCEPT PLAN
UNITED LANDS

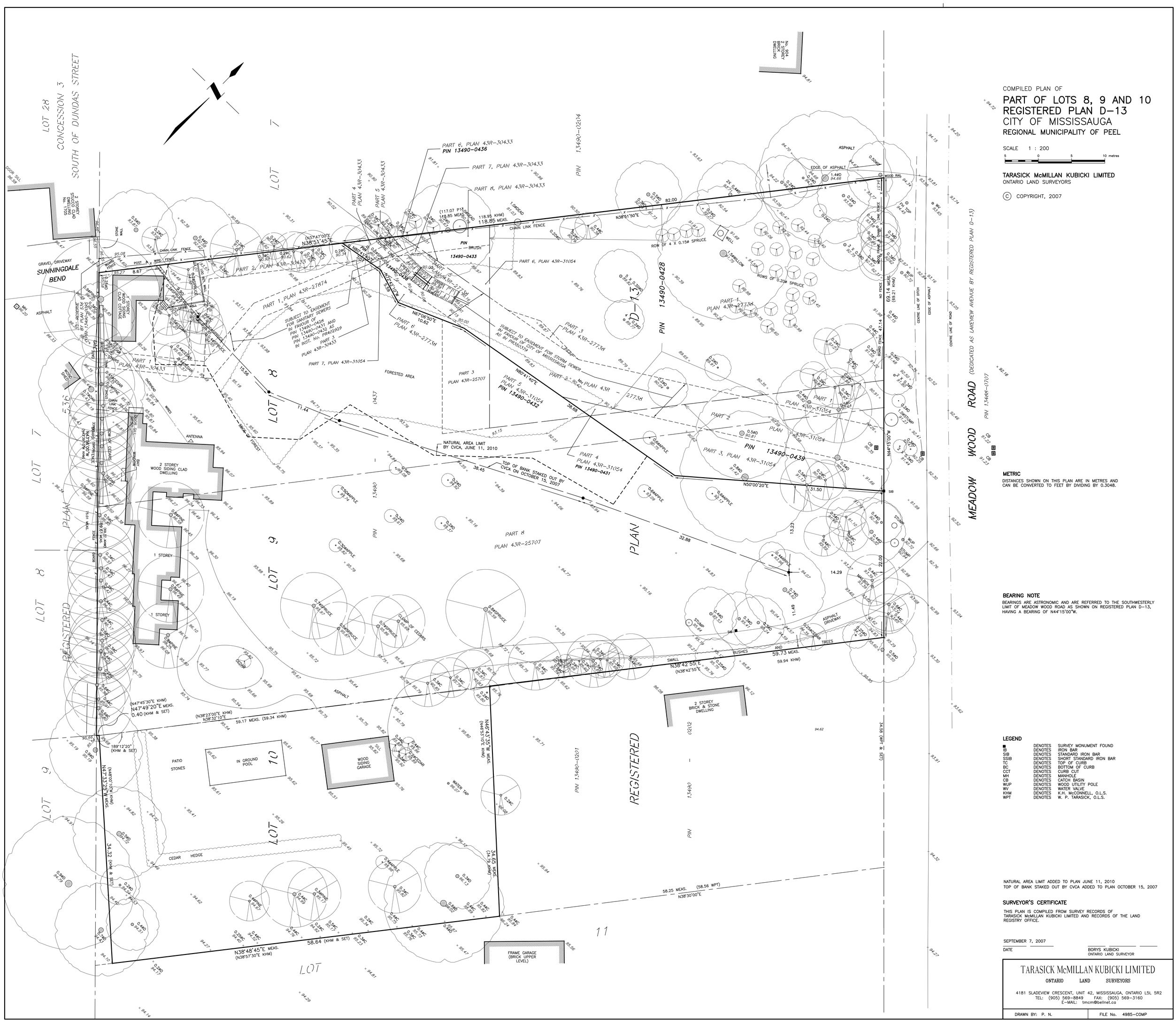
890 MEADOW WOOD ROAD
PART OF LOTS 8, 9, & 10
REGISTERED PLAN D-13
CITY OF MISSISSAUGA
REGION OF PEEL

DEVELOPMENT STATISTICS

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

SCALE 1:750
MAY 18, 2021

GSAI
Glen Schnarr & Associates Inc.



COMPILED PLAN OF

PART OF LOTS 8, 9 AND 10 REGISTERED PLAN D–13 CITY OF MISSISSAUGA

REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 200

5 0 5 10 metres

TARASICK McMILLAN KUBICKI LIMITED
ONTARIO LAND SURVEYORS

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
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
TC	DENOTES	TOP OF CURB
BC	DENOTES	BOTTOM OF CURB
CCT	DENOTES	CURB CUT
MH	DENOTES	MANHOLE
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
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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

5 0 5 10 metres

TARASICK McMILLAN KUBICKI LIMITED
ONTARIO LAND SURVEYORS

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 MISSISSAUAG 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
TRW	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

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: office@tmksurveyors.com

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

(30" X 36")

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

	Occupancy Data					Peaking Factors			Demand Flow		
Land Use / Occupancy Type	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^2 Stores											
TOTAL	**0**		**19**		**4**				**4**	**11**	**7**

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)**

Fire Flow

Using Fire Underwriters Survey Methodology: **Shortcut method used per note J** **4000** **L/min** **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^2)

F = **0** **(L/min)** Adequately Protected Vertical Openings: Yes

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

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:	No	Reduction:	20%
Standard Water Supply:	Yes	Reduction:	10%
Fully Supervised:	No	Reduction:	10%
		Total Reduction:	**40%**
		Sprinkler Reduction:	**0 (L/min)**

4. Adjust the value in No. 2 for exposure

	Separation (m)	Charge
North	0	25%
East	0	25%
South	0	25%
West	0	25%
	Total Charge:	**75%**
	Exposure Charge:	**0 (L/min)**

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.

AQUACOM CONTRACTING
81 Todd Road Suite 202 Georgetown Ont. L7G 4R8
(o) 905-467-5853 (C) 905-971-9956 (e) 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

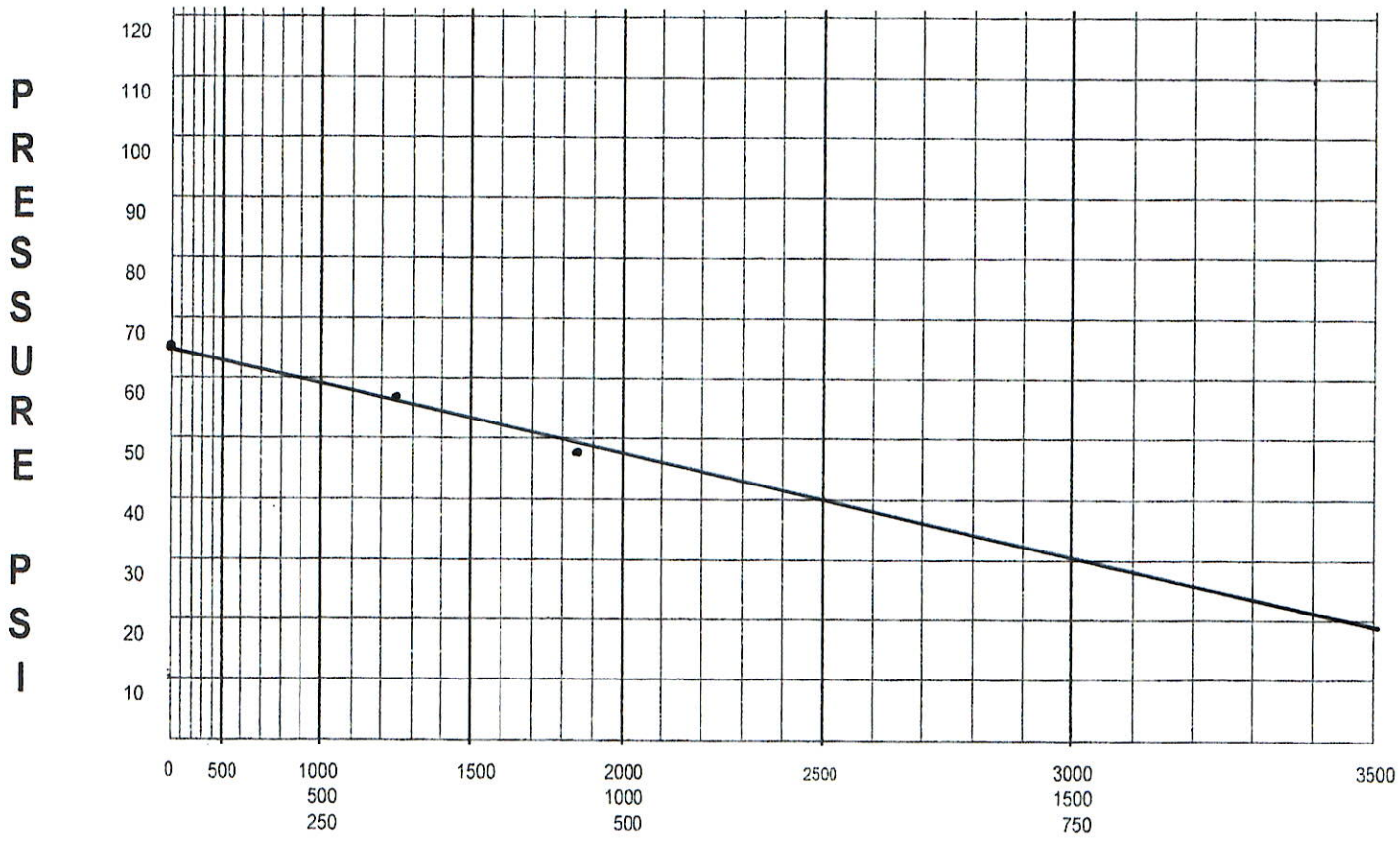
LOCATION OF FLOW HYDRANT

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		
		THEORETICAL	3054	20	TEST #	ONE
NOZZLE COEFF.		.90				



AQUACOM CONTRACTING

81 Todd Road Suite 202 Georgetown Ont. L7G 4R8

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

HYDRANT FLOW TEST REPORT

		HYDRANT MAKE	SEC. VALVE CONDITION	TECH.	TIME	STATIC PSI	PITO 1-2.50" PSI	FLOW 1-2.50" US GPM	RESIDUAL 1-2.50" PSI	PITO 2-2.50" PSI	FLOW 2-2.50" US GPM	RESIDUAL 2-2.50" PSI	COLOUR 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	LOCATION	CONTACTS ON SITE
TRAFALGAR ENGINEERING	SUNNINGDALE BEND	RofP OPERATOR
	C OF MISSISSAUGA, R OF PEEL	

Google Maps

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
TOTAL	**7**		**29**		**0.1**

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)
TOTAL	**0**		**0**		**0.0**

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)
Total Average Flow:	**0.2**	**(L/s)**
Residential Peak Flow:	0.5	(L/s)
ICI Peak Flow:	0.0	(L/s)
Total Peak Flow:	**0.5**	**(L/s)**

Connection Single Use Demand Table

WATER CONNECTION

Connection point [3]				
Ex. water main at the end of Sunningdale Bend				
Pressure zone of connection point				
Total equivalent population to be serviced [1]			19	
Total lands to be serviced			0.37 Ha	
Hydrant flow test				
	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 [2]	67	l/s
Analysis			
5	Maximum day plus fire flow	67.1	l/s

WASTEWATER CONNECTION

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

[1] The calculations should be based on the development estimated population (employment or residential).

[2] Please reference the Fire Underwriters Survey Document

[3] Please specify the connection point ID

[4] Please specify the connection point (wastewater line or manhole ID)
Also, the "total equivalent popopulation 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

Region of Peel
working with you

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.

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	$Area_{imp}$ (ha)	$Area_{per}$ (ha)	$Area_{total}$ (ha)	Composite Runoff Coef., 'C'	% Imp
	Pre-Development					
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%
	Post Development					
A	Sunningdale Bend & Cul-de-sac to Sewer	0.044	0.026	0.071	0.66	63%
C	Site Area to Sewer	0.196	0.082	0.278	0.71	70%
B	Site Area Direct to Valley	0	0.080	0.080	0.25	0%
	Cul-de-sac Direct to Valley	0	0.010	0.010	0.25	0%
	Area Direct to Valley	0	0.090	0.090	0.25	0%
D	Site Area to South	0	0.083	0.083	0.25	0%

TRAFALGAR ENGINEERING LTD.

INFILRTATION 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

Infitration of 5mm Storm

Required Vol. (V) 2.22 m^3 Volume below pipe free outflow

t=1000V/(PnA) MOE Stormwater Management Design Manual.

P = 60 mm/hr Per Geotechnical Engineer
n = 0.4
A = 14.4 m^2
FS = 2.5

t= 16.06 hr

TRAFALGAR ENGINEERING LTD.

INFILRTATION 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

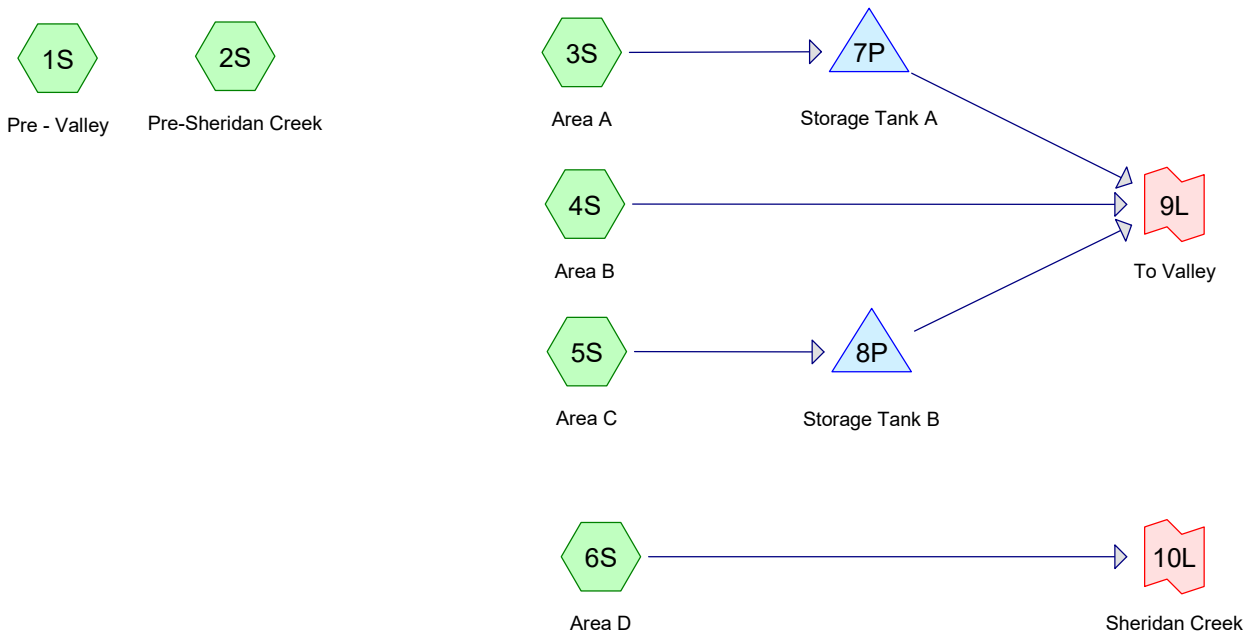
Infitration of 5mm Storm

Required Vol. (V) 10.8 m^3 Volume below pipe free outflow

t=1000V/(PnA) MOE Stormwater Management Design Manual.

P = 60 mm/hr Per Geotechnical Engineer
n = 0.4
A = 69.1 m^2
FS = 2.5

t= 16.28 hr



Subcat Reach Pond Link

Routing Diagram for 2022-12-19 - AJP
Prepared by Trafalgar Engineering, Printed 2023-02-07

Project Notes

Copied 6 events from ON Mississauga 24hr storm

Area Listing (all nodes)

Area (hectares)	CN	Description (subcatchment-numbers)
0.6953	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S)
0.2400	98	Paved roads w/curbs & sewers, HSG B (3S, 5S)
0.1116	98	Unconnected roofs, HSG C (1S, 2S)
1.0469	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (hectares)	Soil Group	Subcatchment Numbers
0.0000	HSG A	
0.9353	HSG B	1S, 2S, 3S, 4S, 5S, 6S
0.1116	HSG C	1S, 2S
0.0000	HSG D	
0.0000	Other	
1.0469		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (hectares)	HSG-B (hectares)	HSG-C (hectares)	HSG-D (hectares)	Other (hectares)	Total (hectares)	Ground Cover	Subcatch Numbers
0.0000	0.6953	0.0000	0.0000	0.0000	0.6953	>75% Grass cover, Good	
0.0000	0.2400	0.0000	0.0000	0.0000	0.2400	Paved roads w/curbs & sewers	
0.0000	0.0000	0.1116	0.0000	0.0000	0.1116	Unconnected roofs	
0.0000	**0.9353**	**0.1116**	**0.0000**	**0.0000**	**1.0469**	**TOTAL AREA**	

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 Ml

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 Ml

Subcatchment 3S: Area A Runoff Area=707.0 m² 62.66% Impervious Runoff Depth=75 mm
Flow Length=28.4 m Slope=0.0200 m/m Tc=3.0 min CN=84 Runoff=0.035 m³/s 0.053 Ml

Subcatchment 4S: Area B Runoff Area=902.0 m² 0.00% Impervious Runoff Depth=29 mm
Flow Length=31.0 m Slope=0.0300 m/m Tc=5.0 min CN=61 Runoff=0.013 m³/s 0.027 Ml

Subcatchment 5S: Area C Runoff Area=2,778.0 m² 70.45% Impervious Runoff Depth=82 mm
Flow Length=63.0 m Slope=0.0200 m/m Tc=5.0 min CN=87 Runoff=0.135 m³/s 0.228 Ml

Subcatchment 6S: Area D Runoff Area=825.0 m² 0.00% Impervious Runoff Depth=29 mm
Flow Length=47.8 m Slope=0.0300 m/m Tc=7.0 min CN=61 Runoff=0.010 m³/s 0.024 Ml

Pond 7P: Storage Tank A Peak Elev=93.740 m Storage=7.7 m³ Inflow=0.035 m³/s 0.053 Ml
Discarded=0.000 m³/s 0.001 Ml Primary=0.019 m³/s 0.052 Ml Outflow=0.019 m³/s 0.053 Ml

Pond 8P: Storage Tank B Peak Elev=94.709 m Storage=95.8 m³ Inflow=0.135 m³/s 0.228 Ml
Discarded=0.001 m³/s 0.017 Ml Primary=0.022 m³/s 0.196 Ml Outflow=0.023 m³/s 0.213 Ml

Link 9L: To Valley Inflow=0.050 m³/s 0.274 Ml
Primary=0.050 m³/s 0.274 Ml

Link 10L: Sheridan Creek Inflow=0.010 m³/s 0.024 Ml
Primary=0.010 m³/s 0.024 Ml

Total Runoff Area = 1.0469 ha Runoff Volume = 0.517 Ml Average Runoff Depth = 49 mm
66.42% Pervious = 0.6953 ha 33.58% Impervious = 0.3516 ha

Summary for Subcatchment 1S: Pre - Valley

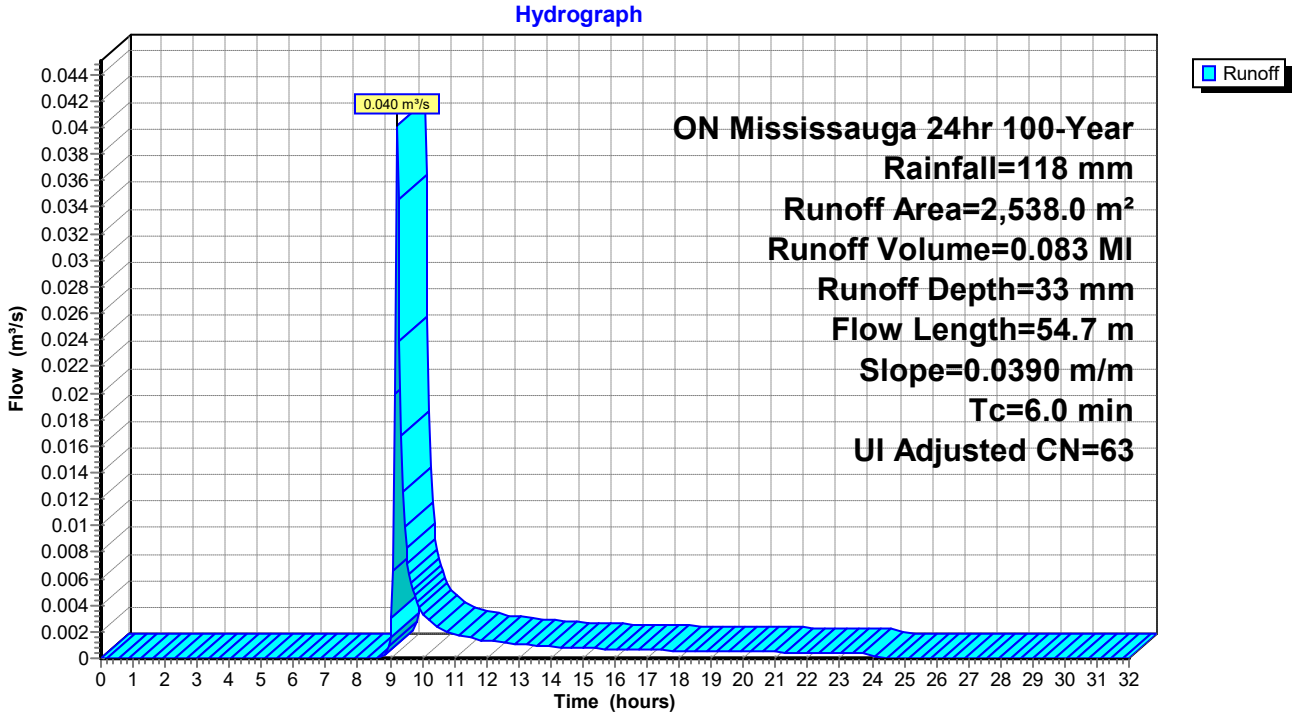
Runoff = 0.040 m³/s @ 9.22 hrs, Volume= 0.083 Ml, Depth= 33 mm

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

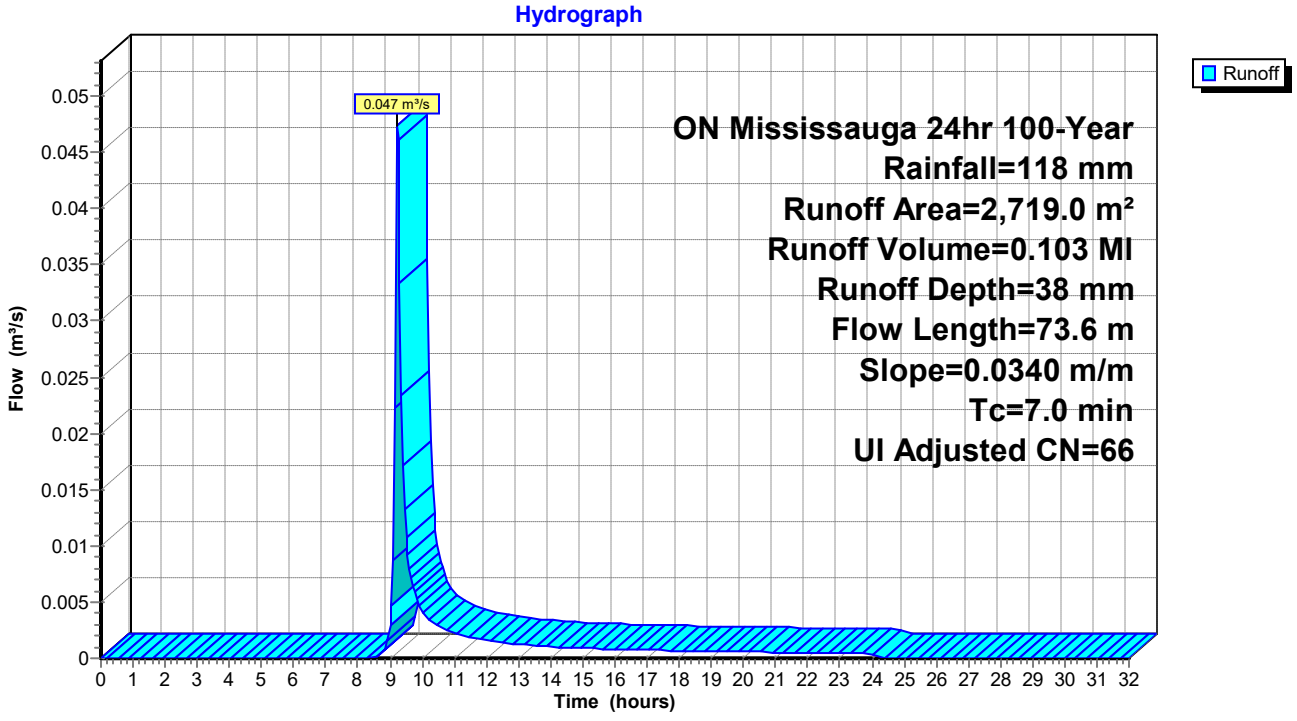
Runoff = 0.047 m³/s @ 9.23 hrs, Volume= 0.103 Ml, Depth= 38 mm

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

[49] Hint: Tc<2dt may require smaller dt

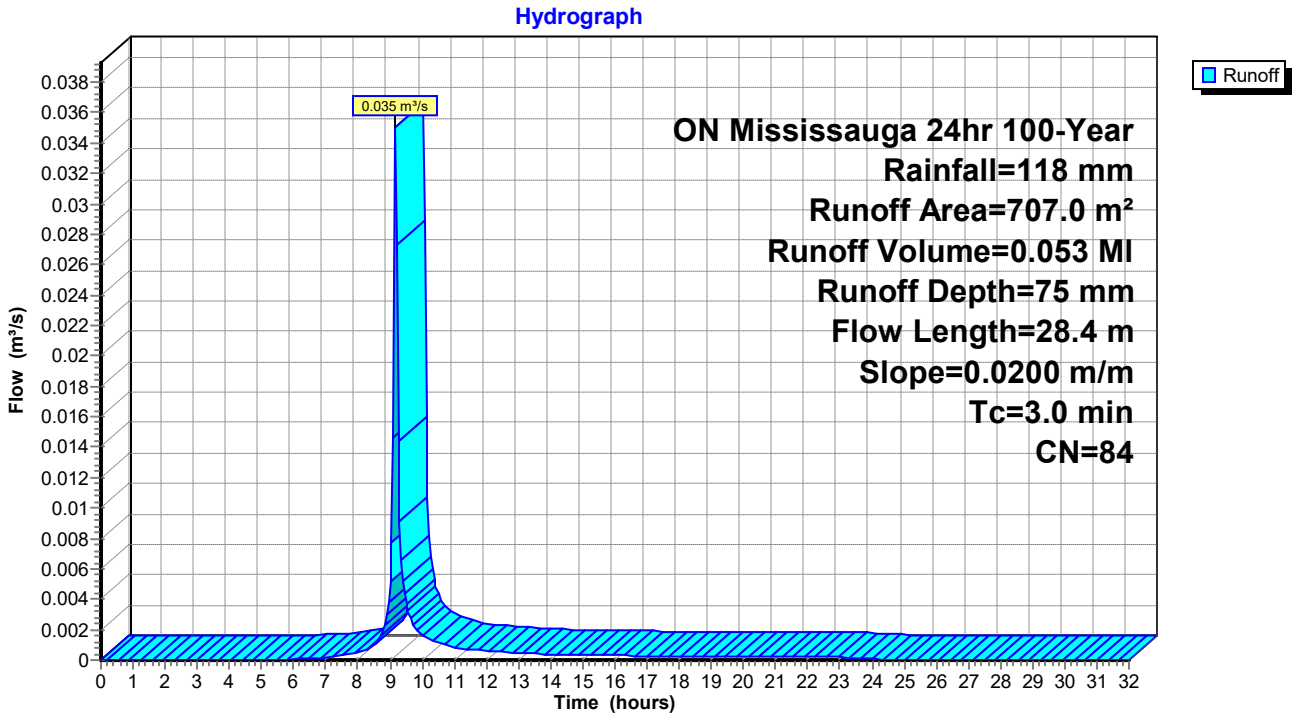
Runoff = 0.035 m³/s @ 9.16 hrs, Volume= 0.053 Ml, Depth= 75 mm
Routed to Pond 7P : Storage Tank A

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
3.0	28.4	0.0200	0.16		**Lag/CN Method,**

Subcatchment 3S: Area A



Summary for Subcatchment 4S: Area B

[49] Hint: Tc<2dt may require smaller dt

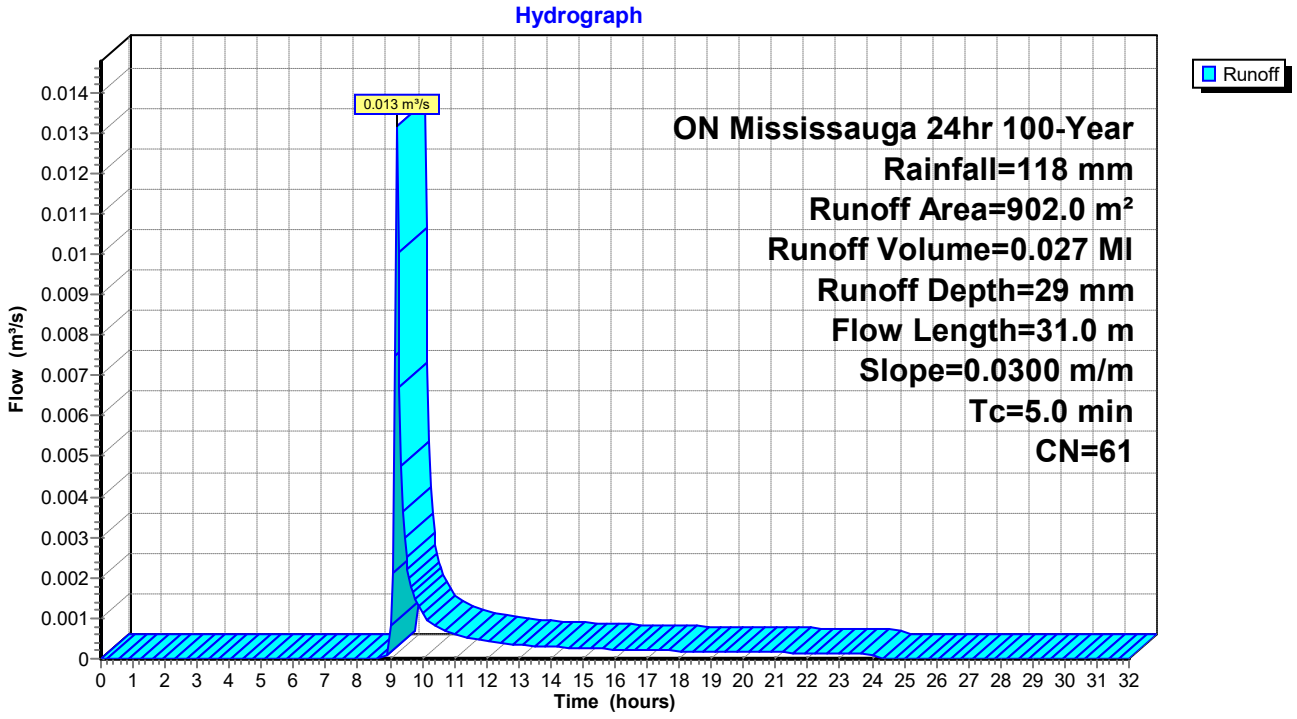
Runoff = 0.013 m³/s @ 9.21 hrs, Volume= 0.027 Ml, Depth= 29 mm
Routed to Link 9L : To Valley

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
902.0	61	>75% Grass cover, Good, HSG B
902.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0	31.0	0.0300	0.10		**Lag/CN Method,**

Subcatchment 4S: Area B



Summary for Subcatchment 5S: Area C

[49] Hint: Tc<2dt may require smaller dt

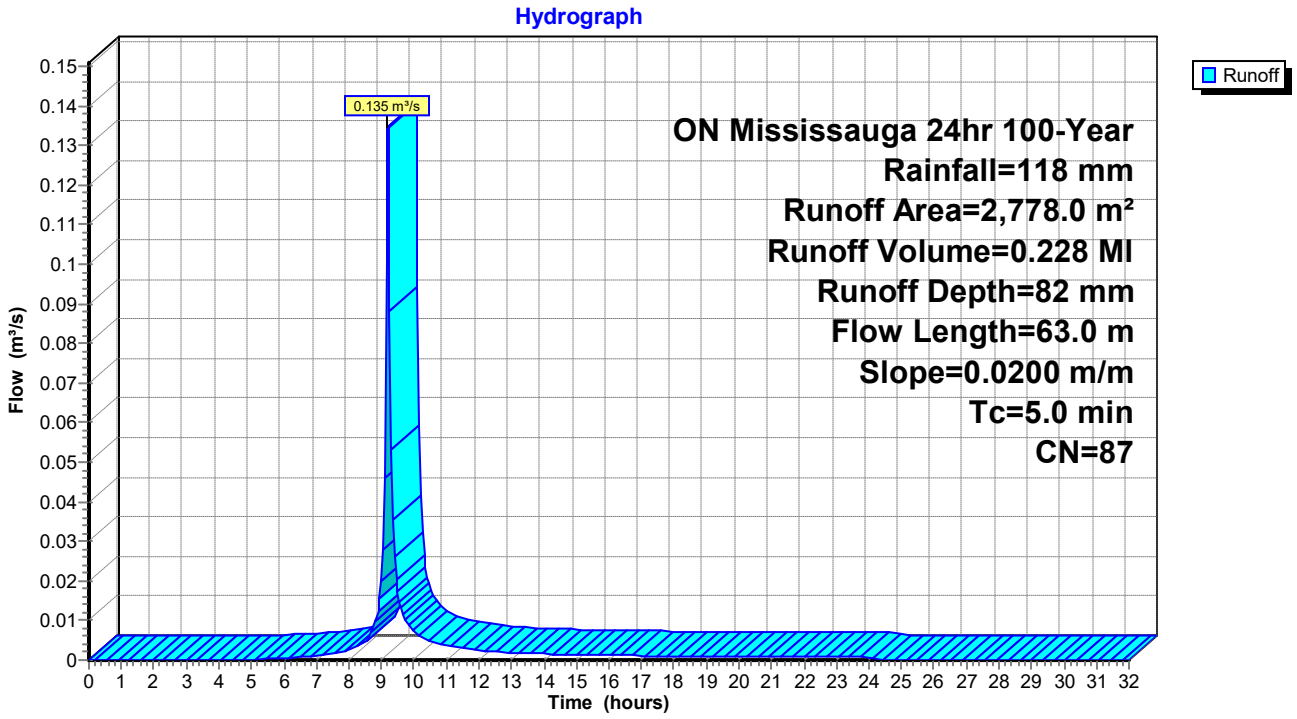
Runoff = 0.135 m³/s @ 9.20 hrs, Volume= 0.228 Ml, Depth= 82 mm
Routed to Pond 8P : Storage Tank B

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
1,957.0	98	Paved roads w/curbs & sewers, HSG B
821.0	61	>75% Grass cover, Good, HSG B
2,778.0	87	Weighted Average
821.0		29.55% Pervious Area
1,957.0		70.45% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0	63.0	0.0200	0.21		**Lag/CN Method,**

Subcatchment 5S: Area C



Summary for Subcatchment 6S: Area D

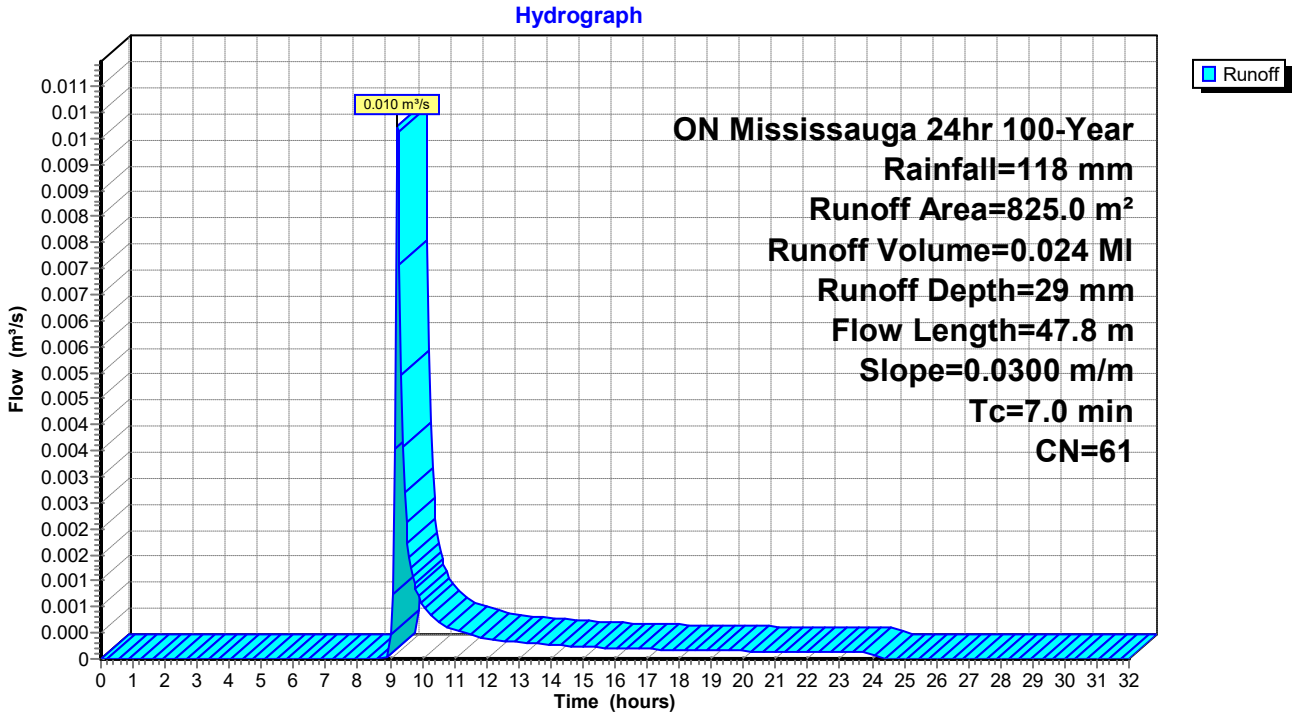
Runoff = 0.010 m³/s @ 9.24 hrs, Volume= 0.024 Ml, Depth= 29 mm
Routed to Link 10L : Sheridan Creek

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
825.0	61	>75% Grass cover, Good, HSG B
825.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
7.0	47.8	0.0300	0.11		**Lag/CN Method,**

Subcatchment 6S: Area D



Summary for Pond 7P: Storage Tank A

Inflow Area = 0.0707 ha, 62.66% Impervious, Inflow Depth = 75 mm for 100-Year event
Inflow = 0.035 m³/s @ 9.16 hrs, Volume= 0.053 Ml
Outflow = 0.019 m³/s @ 9.24 hrs, Volume= 0.053 Ml, Atten= 45%, Lag= 4.4 min
Discarded = 0.000 m³/s @ 9.24 hrs, Volume= 0.001 Ml
Primary = 0.019 m³/s @ 9.24 hrs, Volume= 0.052 Ml
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= 93.740 m @ 9.24 hrs Surf.Area= 14.4 m² Storage= 7.7 m³

Plug-Flow detention time= 16.3 min calculated for 0.053 Ml (99% of inflow)
Center-of-Mass det. time= 12.2 min (677.6 - 665.4)

Volume	Invert	Avail.Storage	Storage Description
#1	93.180 m	8.2 m³	**Custom Stage Data (Conic)** Listed below (Recalc) 8.6 m³ Overall x 95.0% Voids

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)	Wet.Area (sq-meters)
93.180	14.4	0.0	0.0	14.4
93.780	14.4	8.6	8.6	22.5

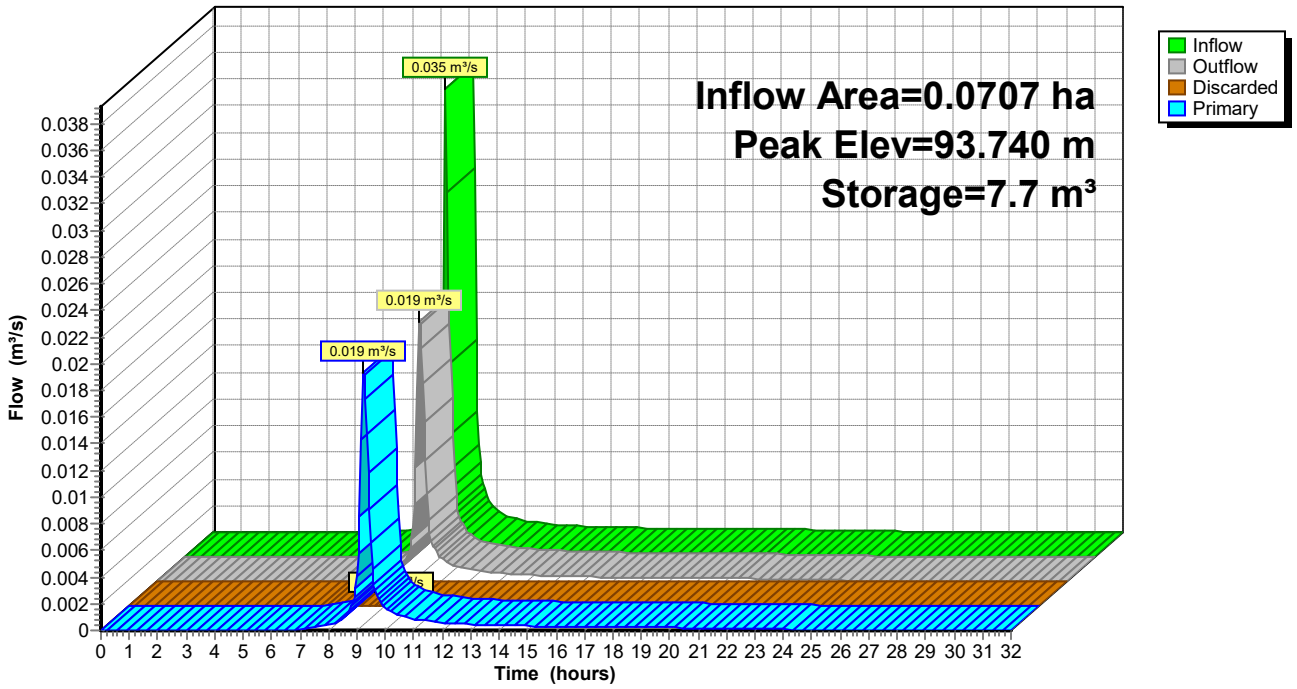
Device	Routing	Invert	Outlet Devices
#1	Discarded	93.180 m	**60.00 mm/hr Exfiltration over Wetted area from 93.180 m - 94.060 m** Conductivity to Groundwater Elevation = 91.900 m Excluded Wetted area = 14.4 m²
#2	Primary	93.210 m	**100 mm Vert. Orifice/Grate** C= 0.800 Limited to weir flow at low heads

Discarded OutFlow Max=0.000 m³/s @ 9.24 hrs HW=93.729 m (Free Discharge)
↑—**1=Exfiltration** (Controls 0.000 m³/s)

Primary OutFlow Max=0.019 m³/s @ 9.24 hrs HW=93.728 m TW=0.000 m (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 0.019 m³/s @ 2.43 m/s)

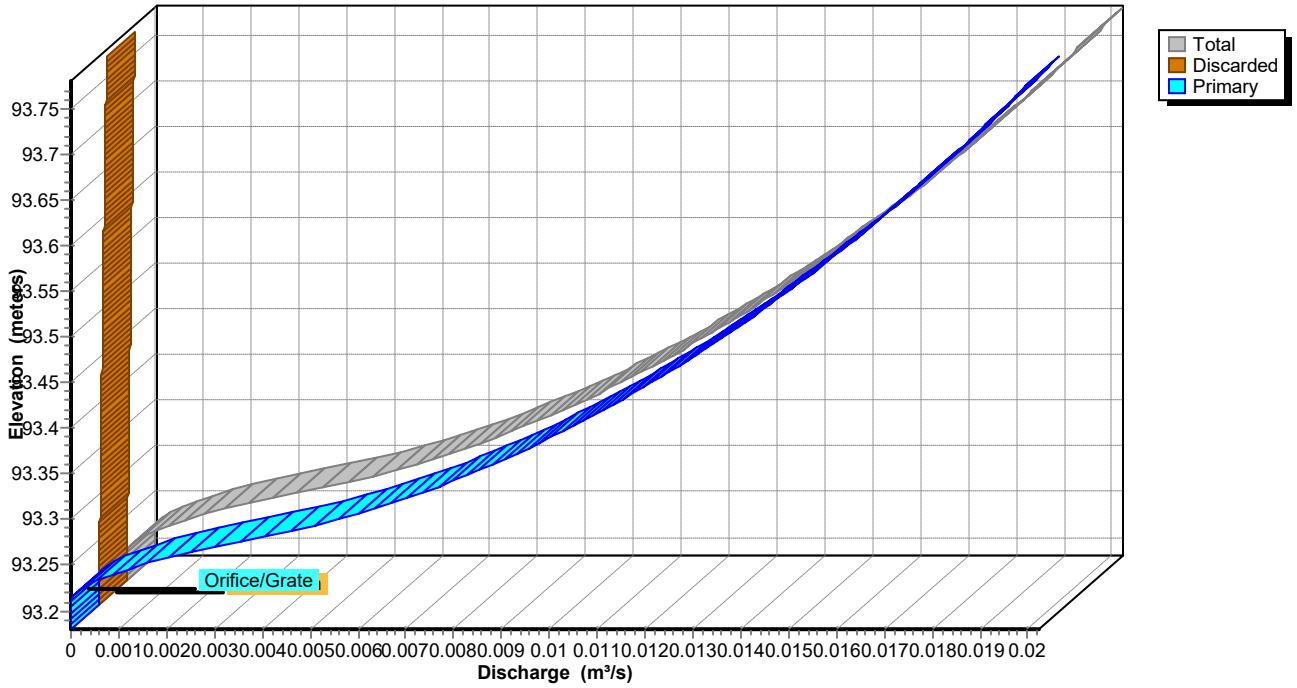
Pond 7P: Storage Tank A

Hydrograph

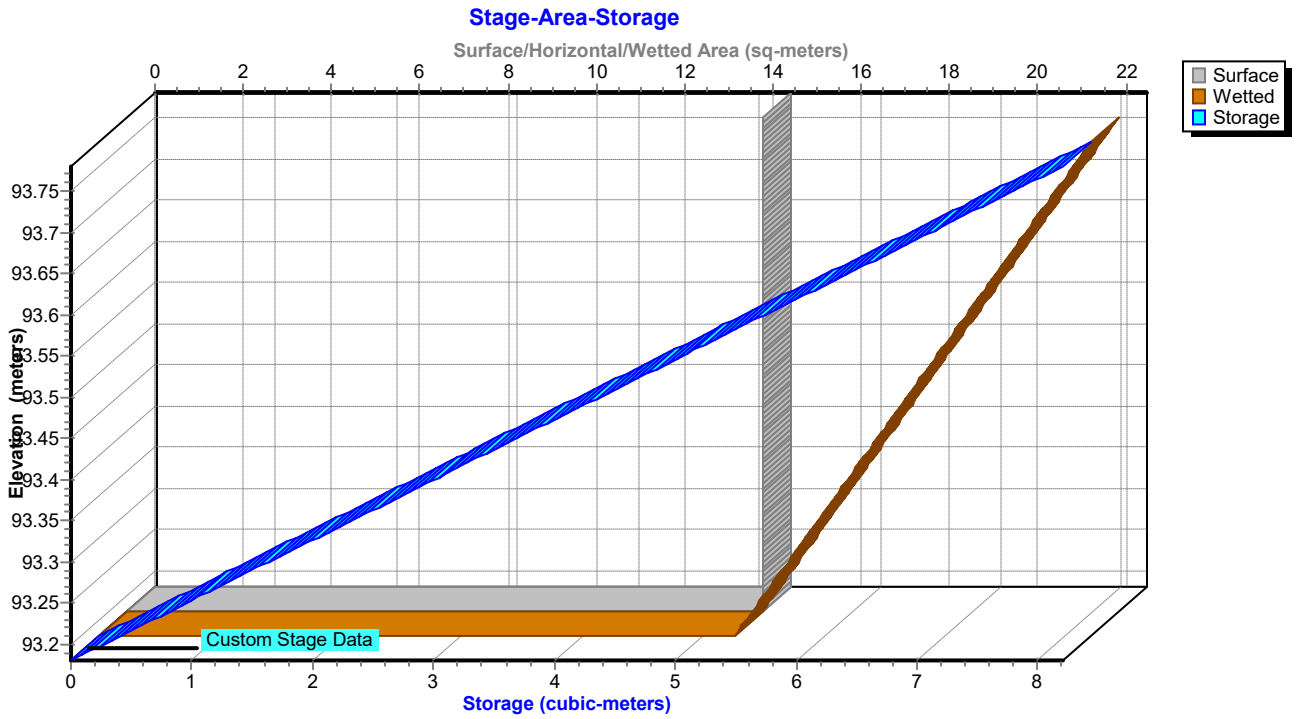


Pond 7P: Storage Tank A

Stage-Discharge



Pond 7P: Storage Tank A



Summary for Pond 8P: Storage Tank B

Inflow Area = 0.2778 ha, 70.45% Impervious, Inflow Depth = 82 mm for 100-Year event
Inflow = 0.135 m³/s @ 9.20 hrs, Volume= 0.228 Ml
Outflow = 0.023 m³/s @ 9.43 hrs, Volume= 0.213 Ml, Atten= 83%, Lag= 13.8 min
Discarded = 0.001 m³/s @ 9.43 hrs, Volume= 0.017 Ml
Primary = 0.022 m³/s @ 9.43 hrs, Volume= 0.196 Ml
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= 94.709 m @ 9.43 hrs Surf.Area= 69.1 m² Storage= 95.8 m³

Plug-Flow detention time= 113.6 min calculated for 0.213 Ml (93% of inflow)
Center-of-Mass det. time= 70.4 min (728.6 - 658.1)

Volume	Invert	Avail.Storage	Storage Description
#1	93.250 m	98.5 m³	**Custom Stage Data (Conic)** Listed below (Recalc) 103.7 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	69.1	0.0	0.0	69.1
94.750	69.1	103.7	103.7	113.3

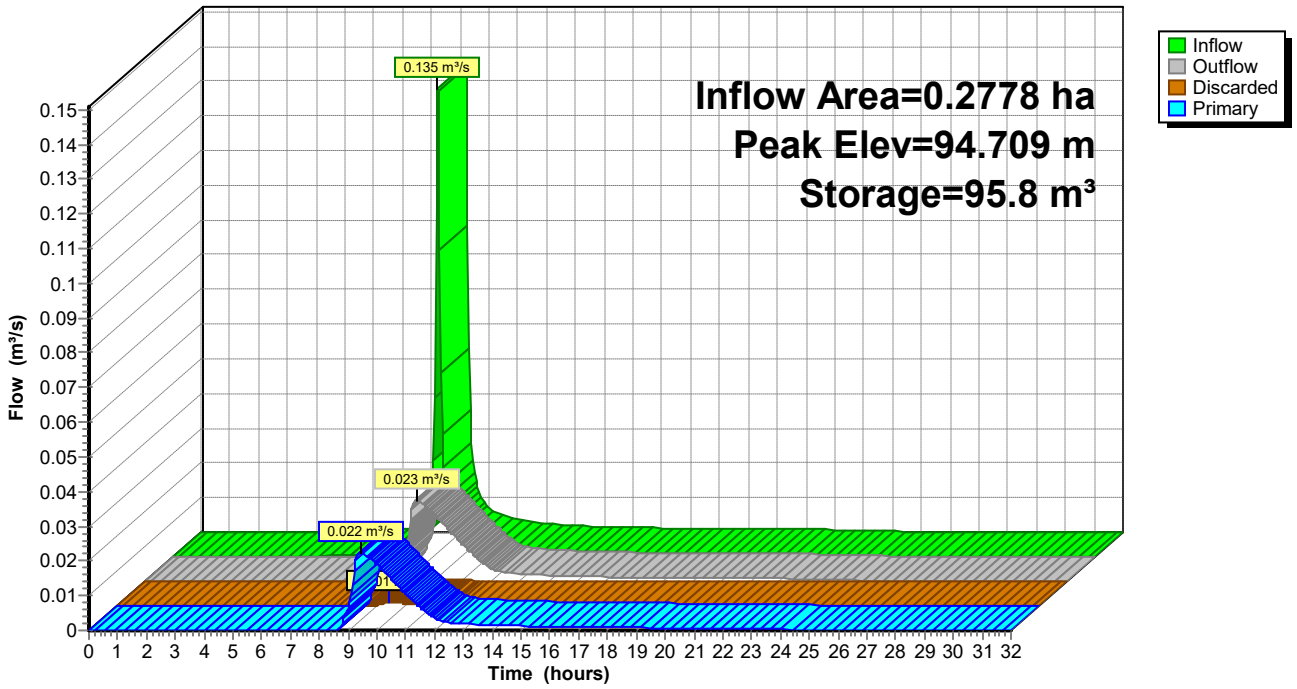
Device	Routing	Invert	Outlet Devices
#1	Primary	93.520 m	**100 mm Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	93.250 m	**60.00 mm/hr Exfiltration over Wetted area from 93.250 m - 94.950 m** Conductivity to Groundwater Elevation = 91.700 m Excluded Wetted area = 69.1 m²

Discarded OutFlow Max=0.001 m³/s @ 9.43 hrs HW=94.708 m (Free Discharge)
↑—**2=Exfiltration** (Controls 0.001 m³/s)

Primary OutFlow Max=0.022 m³/s @ 9.43 hrs HW=94.708 m TW=0.000 m (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.022 m³/s @ 2.83 m/s)

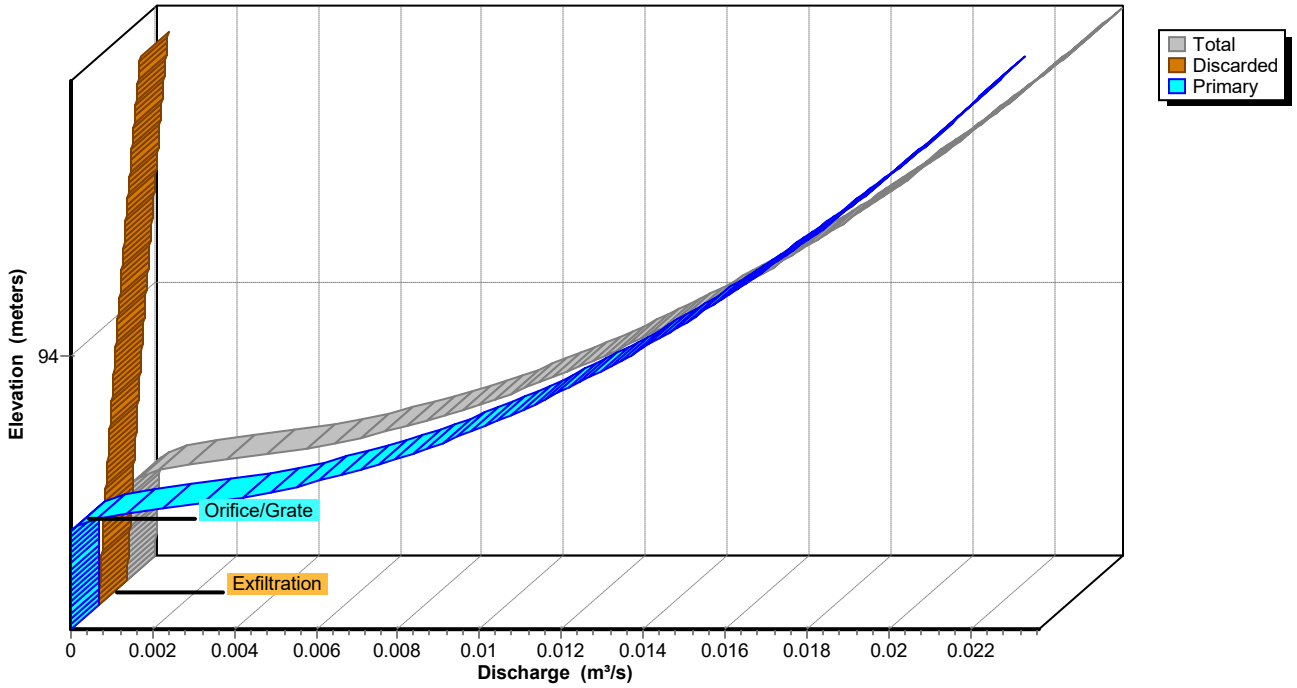
Pond 8P: Storage Tank B

Hydrograph

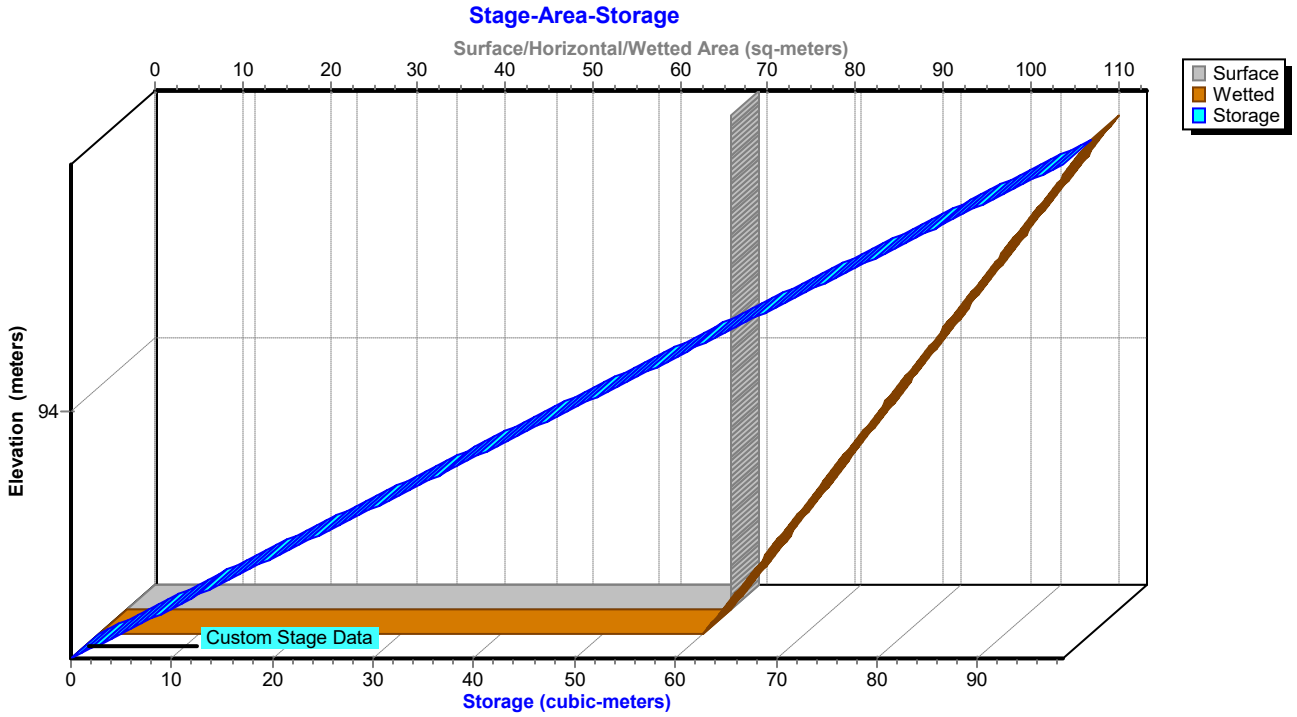


Pond 8P: Storage Tank B

Stage-Discharge



Pond 8P: Storage Tank B

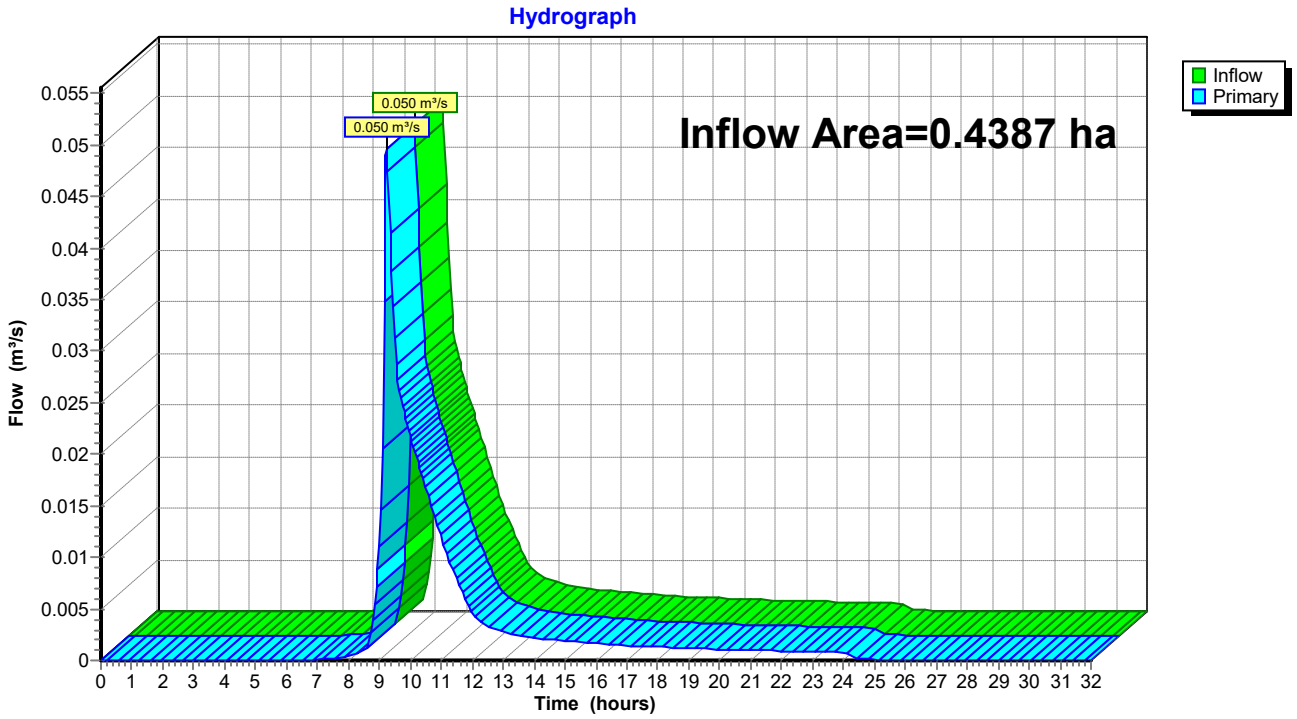


Summary for Link 9L: To Valley

Inflow Area = 0.4387 ha, 54.71% Impervious, Inflow Depth = 62 mm for 100-Year event
Inflow = 0.050 m³/s @ 9.23 hrs, Volume= 0.274 Ml
Primary = 0.050 m³/s @ 9.23 hrs, Volume= 0.274 Ml, Atten= 0%, Lag= 0.0 min

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

Link 9L: To Valley

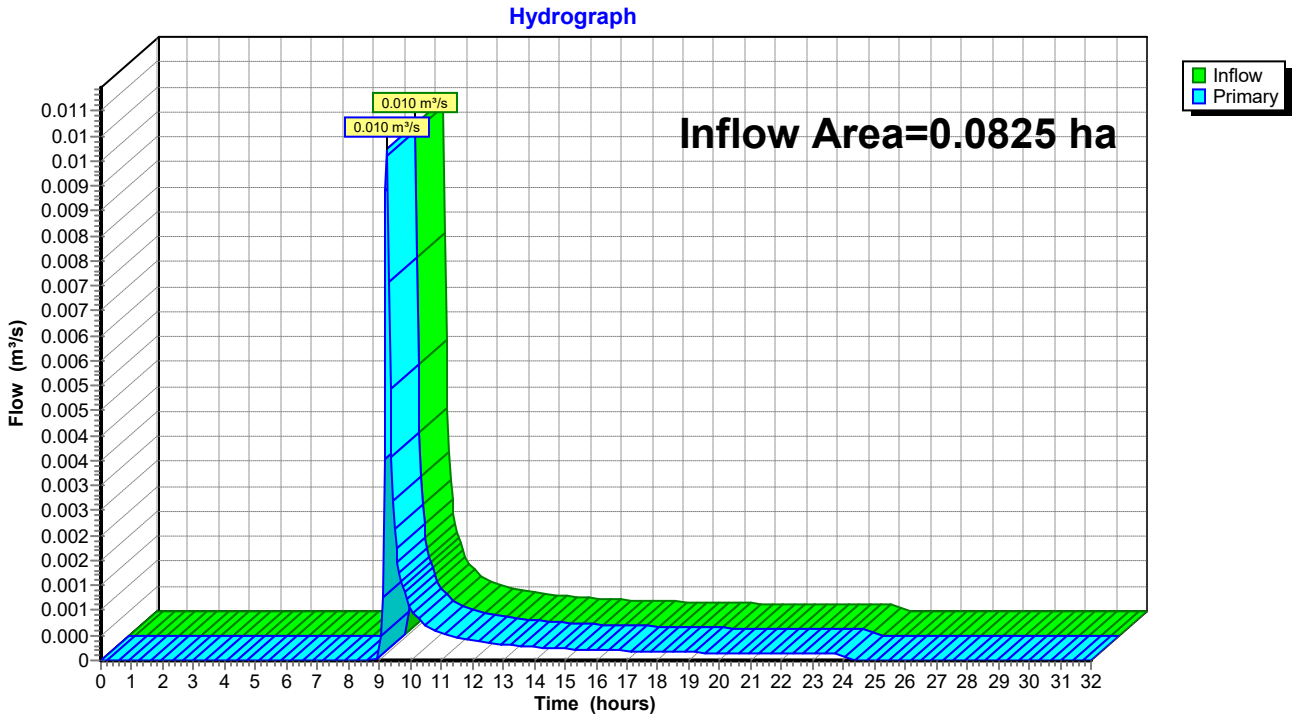


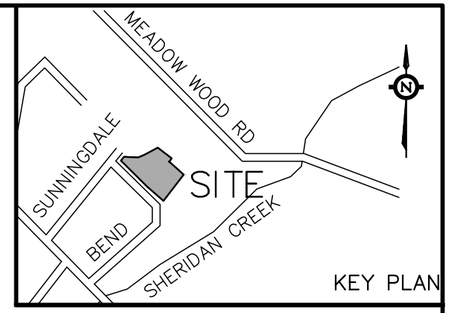
Summary for Link 10L: Sheridan Creek

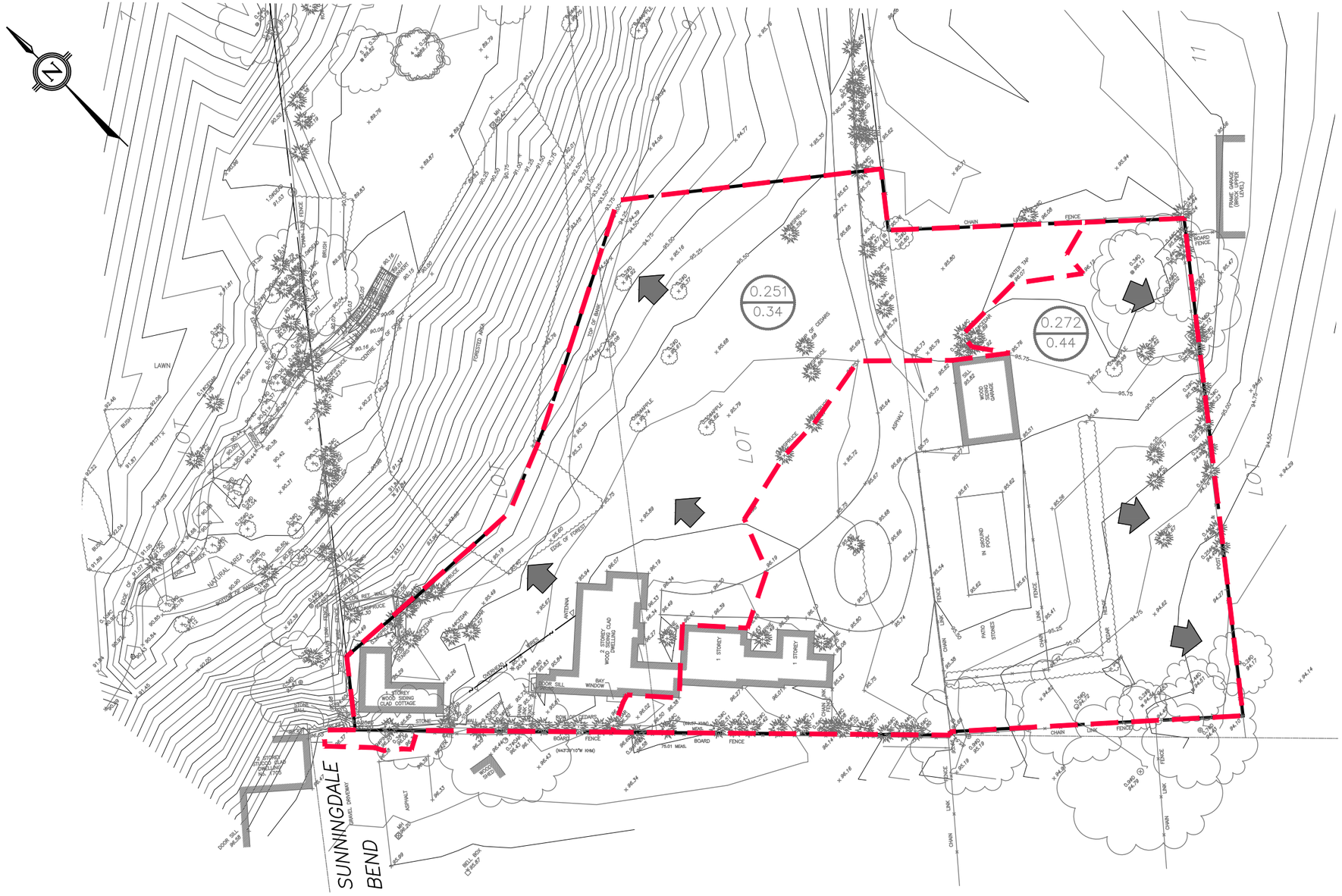
Inflow Area = 0.0825 ha, 0.00% Impervious, Inflow Depth = 29 mm for 100-Year event
Inflow = 0.010 m³/s @ 9.24 hrs, Volume= 0.024 Ml
Primary = 0.010 m³/s @ 9.24 hrs, Volume= 0.024 Ml, Atten= 0%, Lag= 0.0 min

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

Link 10L: Sheridan Creek







LEGEND

EXISTING DRAINAGE AREA

EXISTING DRAINAGE DIRECTION

4.90 / 0.7 — STORM AREA IN HECTARES / STORM RUN–OFF COEFFICIENT

PROJECT TITLE
RESIDENTIAL DEVELOPMENT
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE
PRE–DEVELOPMENT DRAINAGE PLAN

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	SP	SCALE	1:500	DRAWING No.
DRAWN BY	ZG	DATE	Feb 07, 2023	Figure 2

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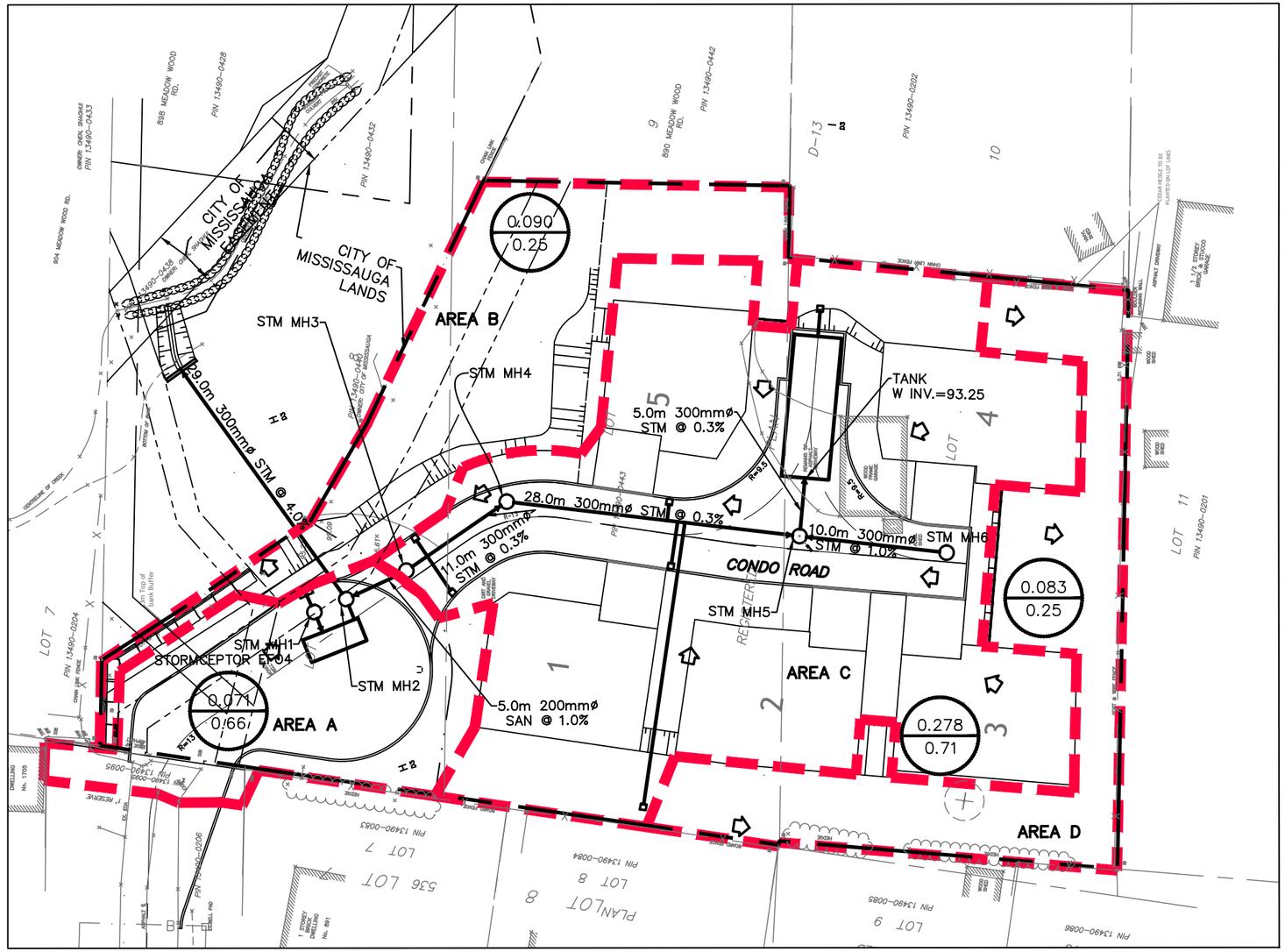

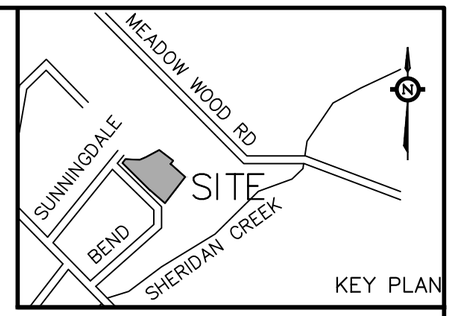

LEGEND

- PROPOSED DRAINAGE AREA
- PROPOSED DRAINAGE DIRECTION
- 0.083 / 0.25 — STORM AREA IN HECTARES / STORM RUN–OFF COEFFICIENT

PROJECT TITLE
RESIDENTIAL DEVELOPMENT
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE
POST–DEVELOPMENT AREA PLAN

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

DESIGN BY	SP	SCALE	1:500	DRAWING No.
DRAWN BY	ZG	DATE	Feb 07, 2023	Figure 3

FILENAME: P:\1407 Welton\Drawings\DWG\1407GS.dwg
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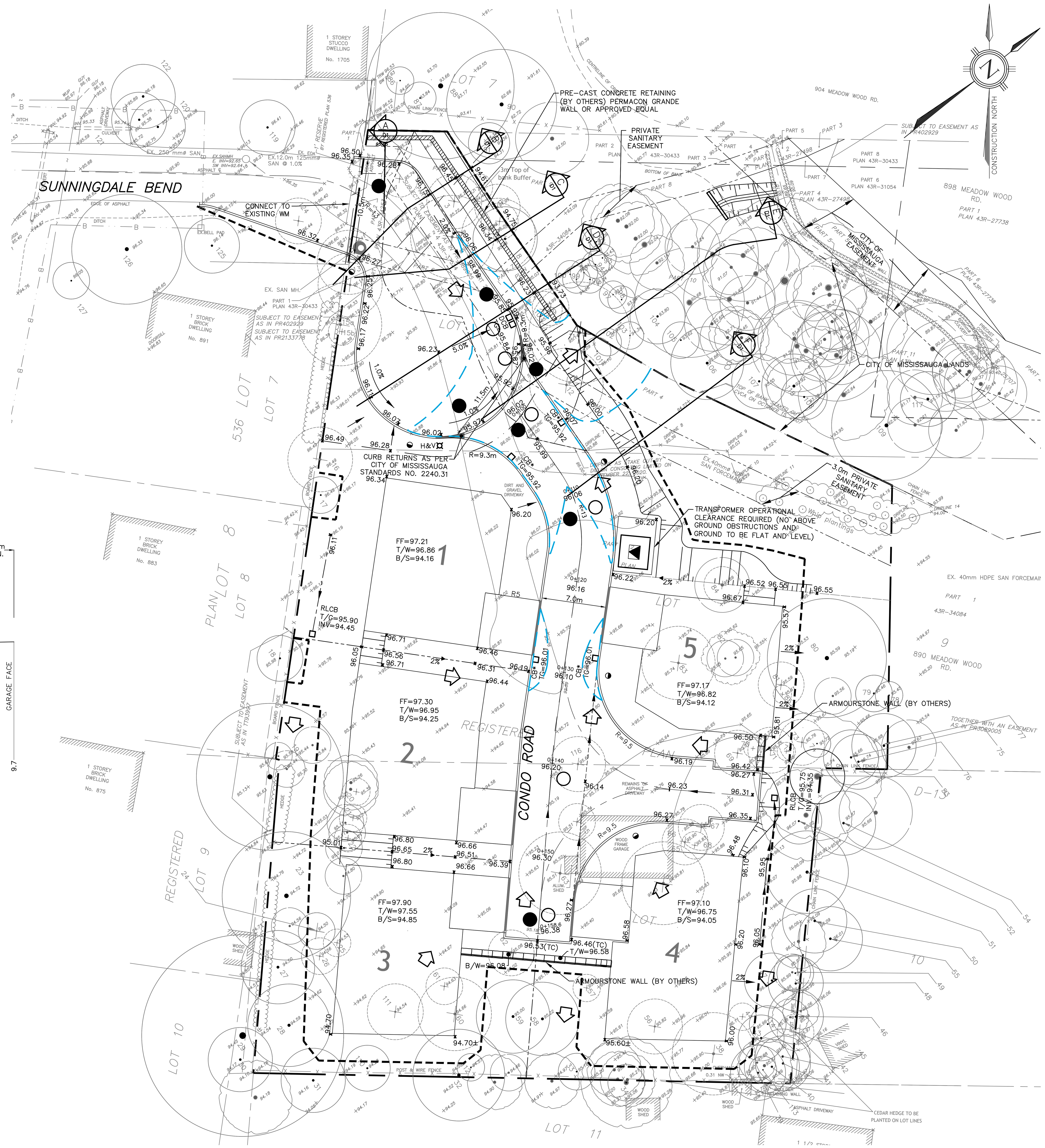
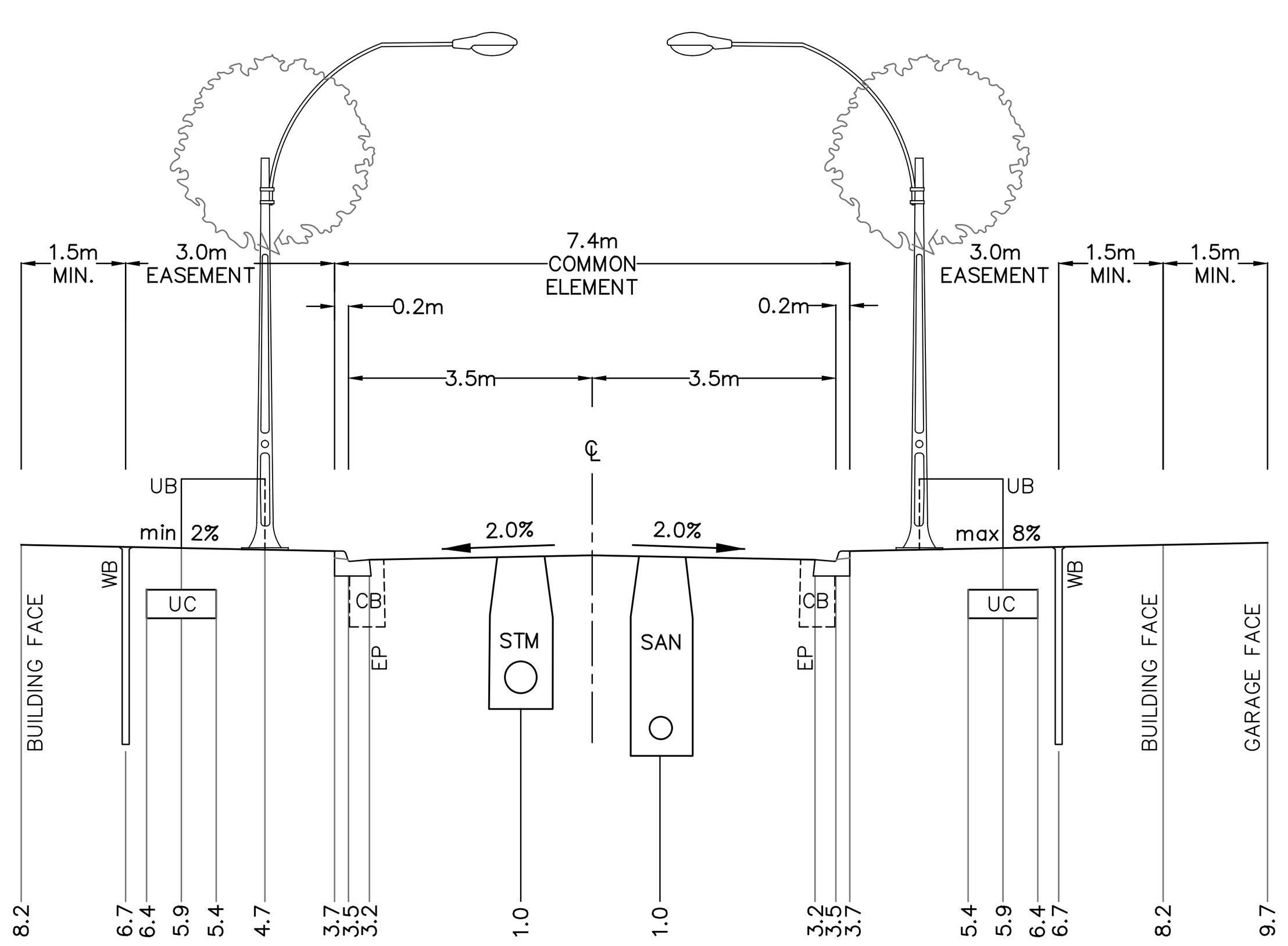
APPENDIX 'E'

Grading Plan (G1)

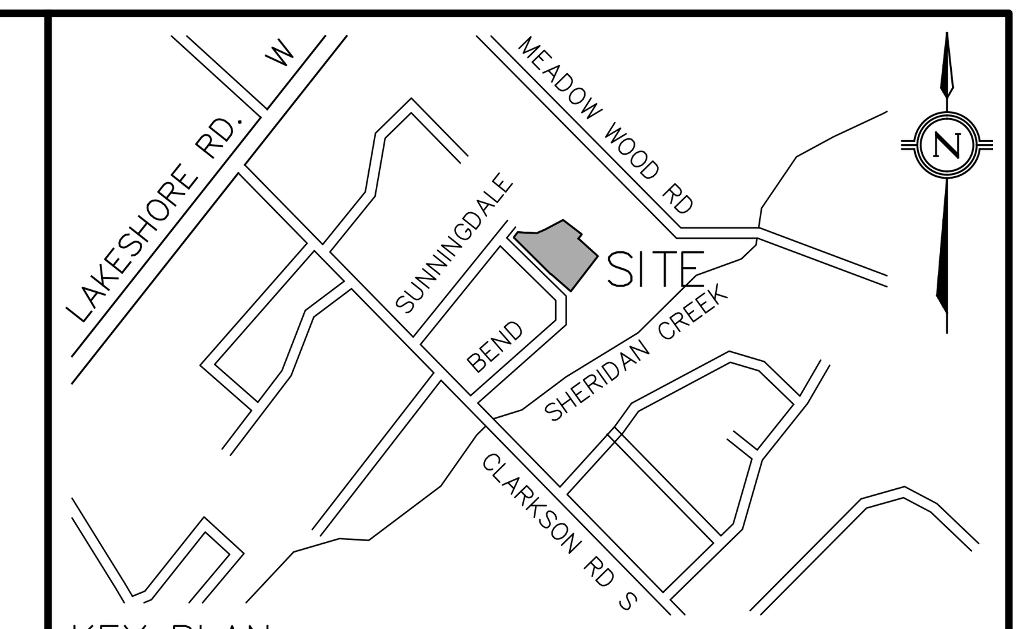
Servicing Plan (S1)

Cross-section (D1, D2)





TYPICAL ROAD SECTION G–G
1:100



KEY PLAN

LEGEND

- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- PROPOSED PLUG
- 90.01 EXISTING ELEVATION
- 000.00 PROPOSED FINISHED ELEVATION
- PROPOSED DRAINAGE DIRECTION
- PROPOSED SWALE DRAINAGE DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- CB* CATCH BASIN WITH CB SHIELD
- PROPOSED SLOPE
- 104 TREE NUMBER
- TREE TO BE REMOVED
- TREE TO REMAIN
- TREE HOARDING
- 100-YEAR FLOODLINE (96.05 m)
- STREET LIGHT POST
- TRANSFORMER

NO.	DATE	BY/DRAWN	REVISIONS
2	23/02/07	AJP/JN	RE-ISSUED FOR RE-ZONING
1	21/06/09	SP/ZG	ISSUED

CAD FILE: 1407GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Jun 15, 2023

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

LICENSED PROFESSIONAL ENGINEER J. T. NELSON 100199359 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
RESIDENTIAL DEVELOPMENT

LOCATION
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE
GRADING PLAN

SCALE	1:250	DESIGN BY	AJP	PROJECT No.	1407
DRAWN BY	ZG	CHECKED BY	JN	PLAN No.	G1
DATE	2023/06/15	SHEET	1 OF 1		

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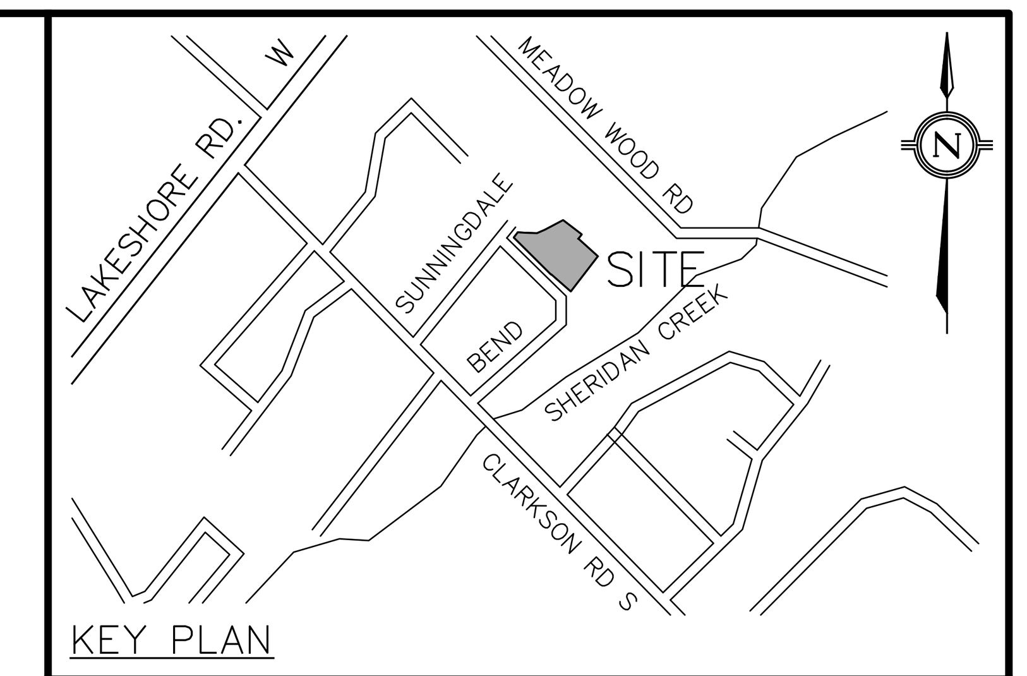
PLOTDATE: Jun 15, 2023 – 2:42pm



LEGEND

- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE & BOX
- PROPOSED 300mm x 100mm REDUCER
- PROPOSED PLUG
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPERTY BOUNDARY
- PROPOSED STORM CONNECTION
- PROPOSED SAN CONNECTION
- PROPOSED WATERMAIN CONNECTION
- OVERLAND FLOW
- CB* CATCH BASIN WITH CB SHIELD
- SP SUMP PUMP REQUIRED
- 104 TREE NUMBER
- TREE TO BE REMOVED
- TREE TO REMAIN
- TREE HOARDING
- STREET LIGHT POST
- TRANSFORMER

NO.	DATE	BY/DRAWN	REVISIONS
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: Jun 15, 2023

BENCHMARK

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LICENSED PROFESSIONAL ENGINEER J. T. NELSON 100199359 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
RESIDENTIAL DEVELOPMENT

LOCATION
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE
SERVICING PLAN

SCALE	1:250	DESIGN BY	SP	PROJECT No.	1407
DRAWN BY	AJP	CHECKED BY	JN	PLAN No.	S1
DATE	2023/06/15	SHEET	1 OF 1		

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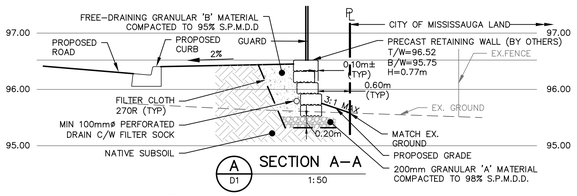
PLOTDATE: Jun 15, 2023 - 2:42pm



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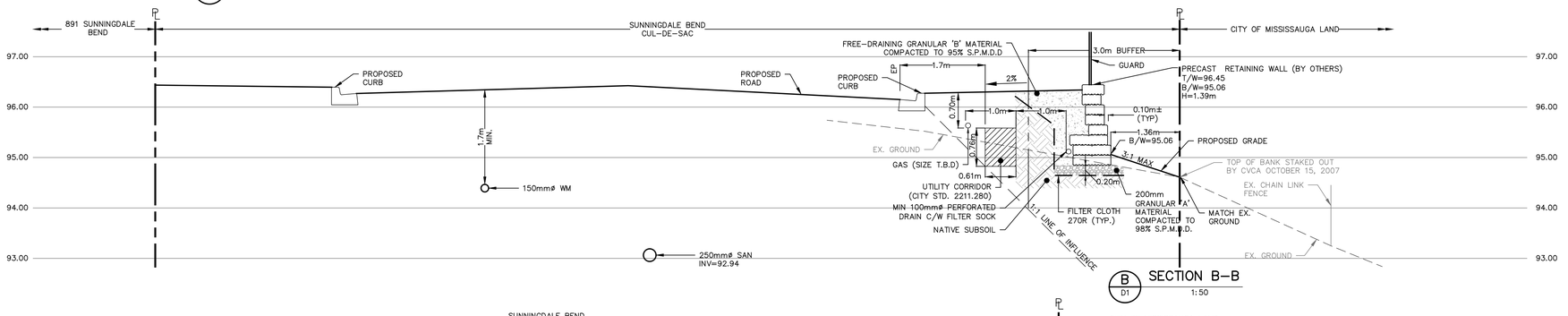

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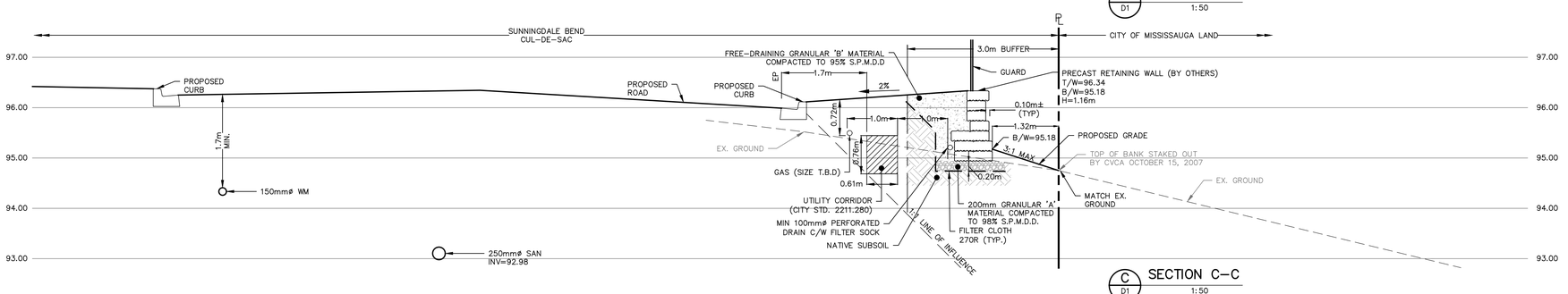

C D1 SECTION C–C
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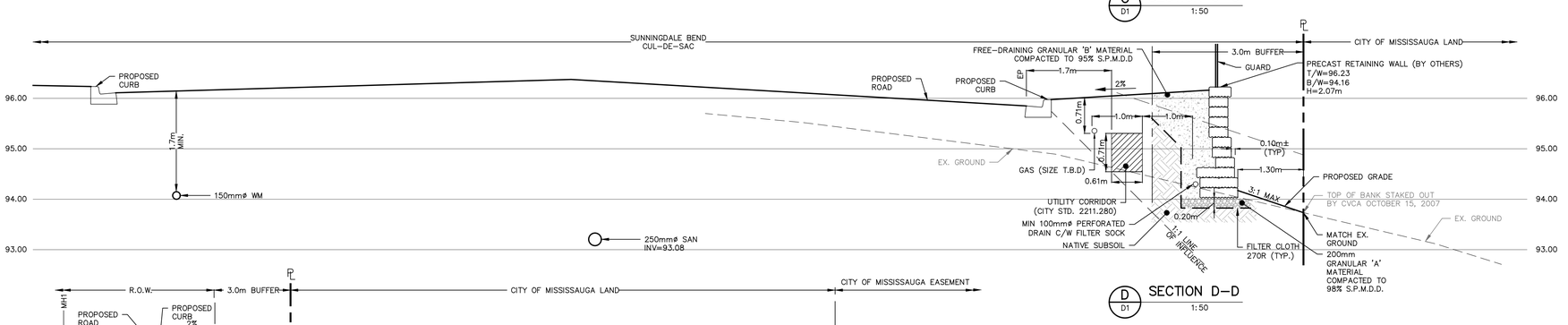

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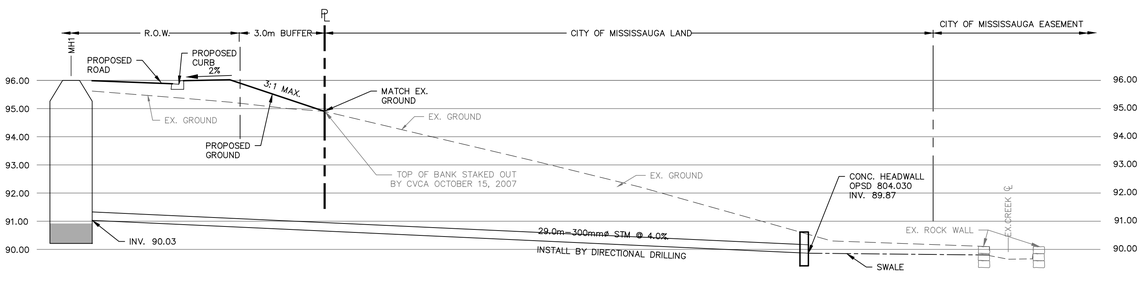

E D1 SECTION E–E
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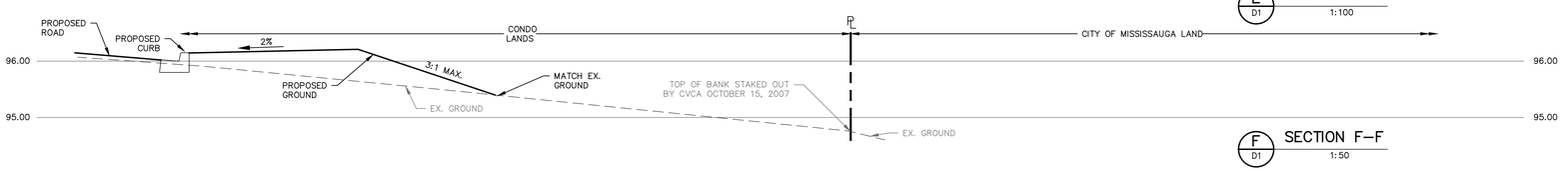
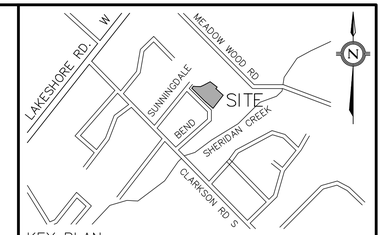


F D1 SECTION F–F
1:50



KEY PLAN

LEGEND

NO.	DATE	BY/DRAWN	REVISIONS
2	23/02/07	AJP/JN	ISSUED FOR RE-ZONING
1	22/08/19	JN/ZI	ISSUED FOR DISCUSSION

CAD FILE: 1407GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Jun 15, 2023

BENCHMARK

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NOTE

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LICENSED PROFESSIONAL ENGINEER J. T. WELSON 100198389 June PROVINCE OF ONTARIO

DESIGNED BY

APPROVED BY

TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE

RESIDENTIAL DEVELOPMENT

LOCATION

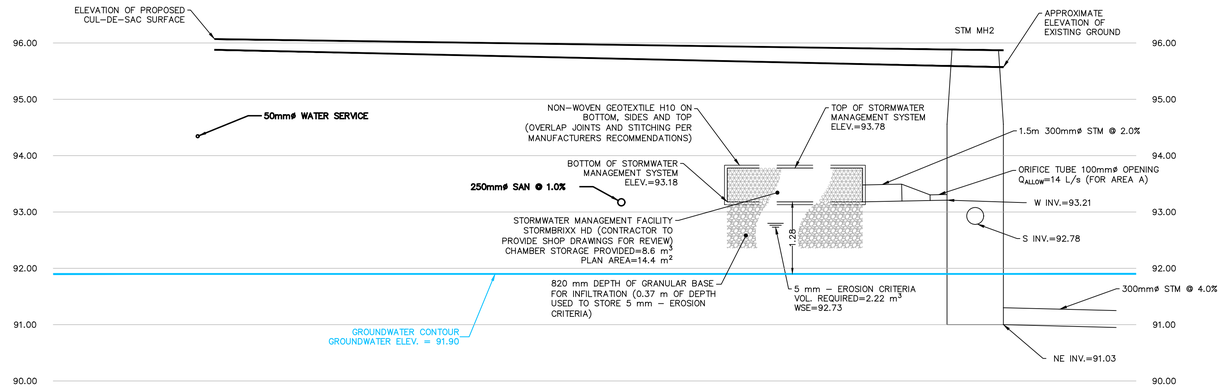
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE

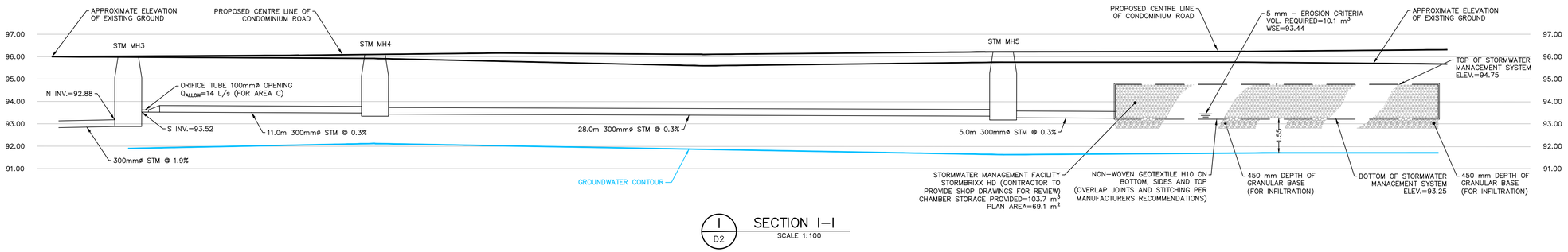
SECTIONS

SCALE	1:50	DESIGN BY	SP
DRAWN BY	ZI	CHECKED BY	JN
DATE	2023/06/15	SHEET	1 OF 1
PROJECT No.	1407	PLAN No.	D1

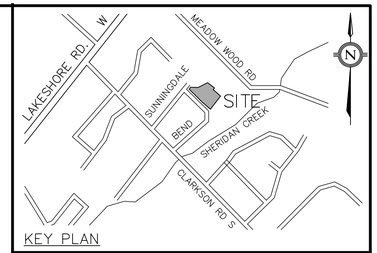
FILENAME: P:\1407 Welton\Drawings\DWG\1407GS.dwg
PLOTDATE: Jun 15, 2023 - 2:45pm



H / D2 SECTION H-H
SCALE 1:50



I / D2 SECTION I-I
SCALE 1:100



KEY PLAN

NO.	DATE	BY/DRAWN	REVISIONS
1	23/01/04	AJP/JN	ISSUED FOR RE-ZONING

CAD FILE: 1407GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Jun 15, 2023

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

LICENSED PROFESSIONAL ENGINEER J. T. NELSON 100193369 PROVINCE OF ONTARIO 2023

DESIGNED BY | APPROVED BY

CONSULTANT
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
RESIDENTIAL DEVELOPMENT

LOCATION
1667 SUNNINGDALE BEND
MISSISSAUGA ON

DRAWING TITLE
ACO STORMBRIXX
CROSS-SECTIONS

SCALE AS SHOWN	DESIGN BY AJP	PROJECT No. 1407	
DRAWN BY AJP	CHECKED BY JN	PLAN No. D2	
DATE 2023/06/15	SHEET 1 OF 1		

FILENAME: P:\1407 Wetten\Drawings\DWG\1407GS.dwg
PLOTDATE: Jun 15, 2023 - 2:44pm