nexTrans Consulting

A Division of NextEng Consulting Group Inc.

Transportation Planning

Traffic Impact Assessment

Parking Assessment

Site Access Design & Review

Site Servicing and Grading

Stormwater Management

Municipal Road Design

Functional Servicing and Storm Water Management Report

Proposed 10 Units Townhouse Development

86 Thomas Street
Mississauga, Ontario

August 16 2020
Project No:NT-19-013

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Appendices

1.0 INTRODUCTION

This Functional Servicing & Stormwater Management Report has been prepared in support of the Rezoning (ZBA) and Site Plan Control Application (SPCA) for the proposed 10 units stacked townhouses development at 86 Thomas Street, in Mississauga, Peel Region.

The purpose of this report is to identify and document how the proposed development will be serviced by the City's existing municipal infrastructure (i.e. water, storm and sanitary) and the measures to be used to provide appropriate stormwater management.

2.0 SITE LOCATION & EXISTING CONDITIONS

The subject site is approximately 0.1643 hectares in area and is located at the northwest corner of Thomas Street and Hillside Drive, as shown in **Figure 1 after the report**.

The subject site is bounded by:

- Townhouse development on 80 Thomas St. to the north and east (Dunpar Development).
- Existing residential property to the west.
- Thomas Street to the south.

3.0 PROPOSED DEVELOPMENT

The proposed development consists of 10 units townhouses, as shown in the Site Plan contained in **Appendix A**.

4.0 MUNICIPAL SERVICING

4.1 WATER

4.1.1 Design Criteria

Type of Construction	Residential
Average Day Consumption	280 L/person/day
PPU	2.7 person per unit
Maximum Day Factor	2.0
Peak Hour Factor	3.0

Region of Peel, Watermain Design Criteria, Revised June 2010

4.1.2 Existing

As shown in the City's 'As-Built' drawings (contained in **Appendix B**), there is an existing 300 mm dia. watermain located on the northside of Thomas Street that runs along the southern frontage of the subject site.

There are 2 fire hydrants on Thomas Street. One is located in front of 80 Thomas Street, approximately 53m northeast of the subject site, and the other located in front of 96 Thomas Street, approximately 45m southwest of the subject site.

ONYX.SPRINKLER Installations Inc. performed the flow test for the development at 80 Thomas Street on November 10th 2020. Since the subject site is adjacent to 80 Thomas St. development, the flow test will be used for this project, details can be found in Appendix C.

4.1.3 Proposed Water Demand

Based on the calculation in **Appendix C**, water demand and pressure as below in Table 1:

Table 1 Water Demand & Pressure

	Water Demand	Required Pressure, kPa	Provided Pressure, kPa
Average Daily Demand, l/s	0.09	275 - 690	550
Maximum Daily Demand. l/s	0.18	275 - 690	550
Peak Hourly Demand, l/s	0.26	275 - 690	550

According to our calculations, a minimum fire suppression flow of 146 l/s at 140 kPa will be required, refer to detailed calculations in **Appendix C**. ONYX flow tests show that the existing water system has 391 l/s at 140 kPa (20 psi). Based on the flow test and Table 1, there is enough pressure and flow in the existing water system to support the subject development.

4.1.4 Proposed Water Servicing

An internal 150mm dia. watermain will be proposed to service the site with 25mm PVC water connections for each unit, which will connect to the existing 300 mm watermain on Thomas Street.

At this time no additional Fire Hydrants are being proposed since there are 2 existing hydrants within 75m which provides sufficient coverage for the proposed site.

4.2 SANITARY

4.2.1 Design Criteria

Type of Construction	Residential
PPU	2.7 people per unit
Peak sanitary flow factor	Harmon Formula
Average Daily Flow	302.8 L/capita/day
Peak Extraneous Flow	0.2 L/s/ha 0.028 l/s/m of sewer

Region of Peel, Sanitary Sewer Design Criteria, Modified March 2017 REV 0.9

4.2.2 Existing Conditions

As shown in City's 'As-Built' drawings (contained in **Appendix B**), there are two (2) existing sanitary sewers along Thomas Street. One located in the middle of Thomas Street with size of 375mm dia. at slope of 0.6%, named as EX. N. SAN in drawings. The other located in the south of Thomas Street with size of 300mm dia.

4.2.3 Proposed Sanitary Flow

During the site development, the proposed sanitary flow will be 1.85 l/s, for detailed calculation see **Appendix D**. The proposed development will add 1.4% of the existing sanitary sewer capacity, which can be considered negligible.

4.2.4 Proposed Sanitary Servicing

An internal 250mm dia. sanitary sewer will drain southernly and connect into the existing 375mm dia. sanitary sewer system on Thomas Street.

5.0 GRADING, DRAINAGE & STORMWATER MANAGEMENT

5.1.1 Stormwater Design Criteria

The most current version of the following guidelines, policies and standards will apply to the design of storm drainage facilities in the City of Mississauga:

- MOECC (i.e., Stormwater Management Planning and Design Manual, March 2003)
- Wet Weather Flow Management Guidelines, WWFMG, November 2006
- Low Impact Development Stormwater Management Planning and Design Guide (TRCA, 2011)
- Development Requirements Manual, Section 2 – Design Requirements, City of Mississauga, Effective September 2016

5.1.2 Stormwater Quality Control

Under the Wet Weather Flow Management Guidelines, the site is required to provide a long-term removal of 80% of total suspended solids (TSS) on an average annual basis.

5.1.3 Storm Water Quantity Control

Provide post to pre control for 2-, 5-, 10-, 25-, 50- & 100-year storm event.

5.1.4 Erosion Control

As indicated in WWFMG, 'For small infill/redevelopment sites < 2 ha, erosion control in the form of stormwater detention is normally not required, provided the on-site minimum runoff retention from a small design rainfall event (typically 5mm) is achieved under the Water Balance Criteria.'

5.2 EXISTING CONDITIONS

5.2.1 Existing Drainage pattern

The overland flow on site generally drains southernly uncontrolled to Thomas street and finally collected by the existing storm sewer system on Thomas Street.

5.2.2 Existing Stormwater Service

There is an existing 1200mm dia. C.P. storm sewer located on Thomas Street, runs along the southern frontage of the subject site with a slope of 1.66%, see in **Appendix B**.

5.2.3 Pre-Development Target Flow

The pre-development target flow is summarized in Table 2 below, and drainage areas can be found on Drawing DAP.

Table 2 – Pre-Development Target Peak Flow

On Site, Pre-development Catchment Area: A=0.1643 ha		
Return Period	"C"	Target Peak Flow
1:2	0.25	6.8 L/s
1:5	0.25	9.2 L/s
1:10	0.25	11.3 L/s
1:25	0.28	14.3 L/s
1:50	0.30	17.4 L/s
1:100	0.31	20.1 L/s

5.3 STORMWATER QUANTITY CONTROL

The majority of stormwater from the site will be collected via catchbasins, manholes, and area drains. All of the area drains and the associated piping will be detailed by the building mechanical consultant under a separate application. A small area on the south and east of the property will drain to Thomas Street as uncontrolled flow.

The following table identifies the input post development parameters and the corresponding detailed calculations can be found in **Appendix E**.

Table 3 – Post-Development Quantity Control Analysis

Return Period (1)	Target Flow (L/s) (2)	Uncontrolled Flow to Thomas Street (L/s) (3)	Controlled Flow before Quantity Control (L/s) (4)	Controlled Flow after Quantity Control (L/s) (5)	Required Storage (m^3) (6)
1:2	6.8	1.1	20.1	5.6	12.5
1:5	9.2	1.4	27.0	7.7	16.5
1:10	11.3	1.7	33.3	9.5	20.3
1:25	14.3	2.2	42.0	11.9	25.8
1:50	17.4	2.7	51.2	14.35	31.6
1:100	20.1	3.1	59.0	16.8	36.2

Total stormwater storage will be provided by an underground GreenStorm System (40.0m^3) and underground pipes and MHs. The maximum outflow from the site will be controlled via an 75mm orifice tube located in upstream of STM Control MH, see Drawing of SS.

The uncontrolled flow will drain to ROW of Thomas Street and will be collected by the storm sewer system (CBs) along north side of Thomas Street.

5.4 DOWNSTREAM STORM SEWER IMPACT ANALYSIS

Refer to the report of "Storm Sewer Downstream Capacity Analysis", the proposed development was over controlled and will not be affecting the existing downstream storm sewer system capacity.

5.5 STORMWATER QUALITY CONTROL

Under the Wet Weather Flow Management Guidelines, the site is proposed to provide a long-term removal of 80% of total suspended solids (TSS) on an average annual basis.

To address this requirement, NexTrans is proposing to provide:

- A Stormceptor EFO4 at the downstream STM MH 103.
- Enhanced landscaping features to treat runoff from the property.

Table 4 below quantitively demonstrates how criteria targets are being addressed.

Table 4 – TSS Removal

Surface	Site Area (ha)	Fraction of Site Area	Proposed TSS Removal	TSS Removal Overall
Controlled Area				
Impervious	0.1275	78%	91%	71%

Landscape (300mm absorbent soil)	0.0242	15%	95%	14%
Uncontrolled Area				
Landscape (300mm absorbent soil)	0.0077	4%	85%	3%
Impervious	0.0049	3%	0	0
Total	0.1643			**88%**

5.6 WATER BALANCE

The water balance criteria require that 5 mm of rainfall be diverted from the storm sewer system through infiltration, evapotranspiration, or rainwater reuse. A total of 8.2 m^3 of water is to be retained on site (1643 m^2 x 5 mm).

The proposed GreenStorm system will retain 17.2 m^3 volume of harvested rain water to be infiltrated on site, details of the proposed GreenStorm system can be found in the shop drawing in **Appendix D**.

6.0 SUMMARY

Table 5 – STM Plan Summary

	Criteria	Proposed	Met the Criteria?
Water Balance	5mm	5mm	yes
STM Quantity Control	Retain to pre-development	Minor System: internal pipe Major System: future road	yes
STM Quality Control	80% of TSS removal	80% min.	yes

This Functional Servicing and Stormwater Management Report has outlined the requirements for servicing the proposed development. Reference to Table 5, these preliminary studies and general results indicate that the subject development can be serviced by existing municipal services (storm, sanitary and water) and the existing infrastructure is adequate to support the proposed development.

Report Prepared By:

Report Reviewed By:

Wendy Li
P.Eng.

Ghansham Ramnath
P.Eng.

NEXTRANS (CONSULTING ENGINEERS)

DATE: FEB 13, 2019
PROJECT NO. NT-19-013
DRAWING NO. FIGURE 1

PROJECT NAME:
86 THOMAS STREET
CITY OF MISSISSAUGA

DRAWING TITLE:
LOCATION PLAN

nexTrans CONSULTING ENGINEERS
Suite 201, 520 Industrial Parkway South
Aurora ON L4G 6W8
Tel: 905-503-2563
Web: www.nextrans.ca

APPENDIX A – SITE PLAN

SITE STATISTICS

ZONING REGULATIONS - From Table 4.14.1 - RM9 and RM10 Permitted Uses and Zone Regulations				
ZONE RM-10 (BACK TO BACK AND STACKED TOWNHOUSES)				REXTON DEVELOPMENT
1.	**ZONE REGULATIONS**		**REQUIRED**	**PROPOSED**
2.		MAXIMUM DWELLING HEIGHT		
3.	5.1	Measured to the mean height level of a flat roof on top of a sloped roof.	15.0 m. 3 Storeys.	9.86 m. 3 Storeys.
4. 5.	6.0	MINIMUM FRONT YARD	7.50 m.	 3.80 m (South)
7. 8.	7.0	MINIMUM EXTERIOR SIDE YARD	4.5 m.	N/A N/A
9. 10.	8.0	MINIMUM INTERIOR SIDE YARD	4.5 m.	8.78 m (West) 1.23 m (East)
11.	12.2	MINIMUM PARKING SPACES		
12.		2.0 spaces per 4-4 bedroom unit = 8 parking spaces. 1.5 spaces per 6-2 bedroom unit = 9 spaces.	17 spaces	18 spaces
13.	12.3	MINIMUM VISITOR PARKING SPACES		
14.		0.25 spaces per 10 units = 2.5 spaces.	2.5 spaces	3 spaces (Includes 1 H/C space)
15.	13.0	PARKING AREAS SETBACKS		
16.		Minimum setback between a parking space and an interior side lot line and/or rear lot line.	3.0 metres	1.63 metres
17.	15.0	MINIMUM AMENITY AREA AND LANDSCAPE AREA		
18.	15.1	MINIMUM LANDSCAPE AREA	40 % of lot area.	30.59 % (502.68 m²)
19.	15.2	MINIMUM REQUIRED LANDSCAPED SOFT AREA	50 % of landscaped area	61.68 % (310.04 m²)
20.	15.3	MINIMUM LANDSCAPED BUFFER ABUTTING ANY SIDE AND REAR LOT LINE	3.0 metres	1.23 m East yard. 1.28 m West yard.
21.	15.4	MINIMUM CONTIGUOUS AMENITY AREA	82.17 m² (5 % of the lot area)	82.17 m² outdoor.
22.	15.7	MINIMUM CONTIGUOUS PRIVATE OUTDOOR SPACE PER UNIT	6.0 m²	7.53 m²

LEGAL DESCRIPTION
PART OF Lot 4
Concession 5, West of Hurontario Street
City of Mississauga
Regional Municipality of Peel

SITE STATISTICS

ZONING:
RM10 (Back to back & stacked townhouse)

LOT AREA 1,643.35 m² (17,689 Ft²) (0.406 ac)

BUILDING COVERAGE:
PERMITTED: N/A
PROPOSED: 877.76 m² (9,448.13 Ft²) 53.41%

DWELLING UNIT WIDTH:
MINIMUM PERMITTED: 4.5 m
PROPOSED: 5.73 m

LOT FRONTAGE:
REQUIRED (MIN.): 38.0 m
PROPOSED: 39.04 m

BUILDING G.F.A.:

FIRST FLOOR AREA	283.18 m² (3,048.12 Ft²)
SECOND FLOOR AREA	877.76 m² (9,448.13 Ft²)
THIRD FLOOR AREA	877.76 m² (9,448.13 Ft²)
TOTAL GROSS AREA	**2,038.70 m²** (21,944.38 Ft²)

SETBACKS	REQUIRED	PROVIDED
Front Yard (South)	4.5 m	3.80 m
Rear Yard (North)	7.5 m	3.54 m
Interior Side Yard (East)	2.5 m	1.23 m
Interior Side Yard (West)	2.5 m	8.78 m
PARKING SETBACKS:		
East (to a Residential Zone)	4.5 m	1.63 m

BUILDING HEIGHT: MAXIMUM PERMITTED 15.0 m 3 Storeys
PROVIDED: 9.86 m 3 Storeys

PARKING:
REQUIRED:
2.0 spaces per 4-4 bedroom unit = 8 parking spaces
1.5 spaces per 6-2 bedroom unit = 9 spaces.
0.25 visitor spaces per 10 units = 2.5 spaces
Total: 20 spaces
PROVIDED: 21 spaces
Includes 3 visitor spaces:
1-V, 20-V and 21-V (H/C space)

LANDSCAPE AREA
MINIMUM REQUIRED 40 %
PROPOSED 30.59 % (502.68 m²)

SNOW STORAGE
REQUIRED MIN.: 32.87 m² (2.00 % of Lot Area)
PROVIDED: 32.87 m² (2.00% of Lot Area)

General Note:

i. I hereby certify that this drawing confirms in all respects to the site development plans Architect or Engineer's Signature (if applicable) and Professional seal

ii. The City of Mississauga requires that all working drawings submitted to the Building Division as part of an application for the issuance of a building permit shall be certified by the architect or engineer as being in conformity with the site development plan as approved by the City of Mississauga.

iii. All exterior lighting will be directed onto the site and will not infringe upon the adjacent properties.

iv. All rooftop mechanical units shall be screened from view by the applicant.

v. Parking spaces reserved for people with disabilities must be identified by a sign, installed at the applicant's expense, in accordance with the By-law Requirements and Building Code Requirements.

vi. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

vii. Grades will be met with a 33% maximum slope at the property lines and within the site.

viii. All damaged areas are to be reinstated with topsoil and sod prior to the release of securities.

ix. Signage shown on the site development plans is for information purposes only. All signs will be subject to the provisions of Sign by-law 0054-2002, as amended, and a separate sign application will be required through the Building Division.

x. Any fencing adjacent to municipal lands is to be located 15 cm (6.0 in.) inside the property line.

xi. Only "shielded" lighting fixtures are permitted for all development, except for detached and semi-detached dwellings within 60 m (196.8 ft.) of a residentially zoned property and must confirm to the Engineer Certified Lighting Plan.

xii. The Engineer Certified Lighting Plan must be signed by the consulting Engineer.

xiii. The Owner covenants and agrees to construct and install "shielded" lighting fixtures on the subject lands, in conformity with the Site Plan and Engineer Certified Lighting Plan to the satisfaction of the City of Mississauga.

xiv. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

xv. Where planting is to be located in landscaped areas on top of an underground parking structure, it is the responsibility of the applicant to arrange the coordination of the design of the underground parking structure with the Landscape Architect and the Consulting Engineering. Underground parking structures with landscaping area to be capable of supporting the following loads:

- 15 cm of drainage gravel plus 40 cm topsoil for sod
- 15 cm of drainage gravel plus 60 cm topsoil for shrubs
- 15 cm of drainage gravel plus 90 cm for trees

Or

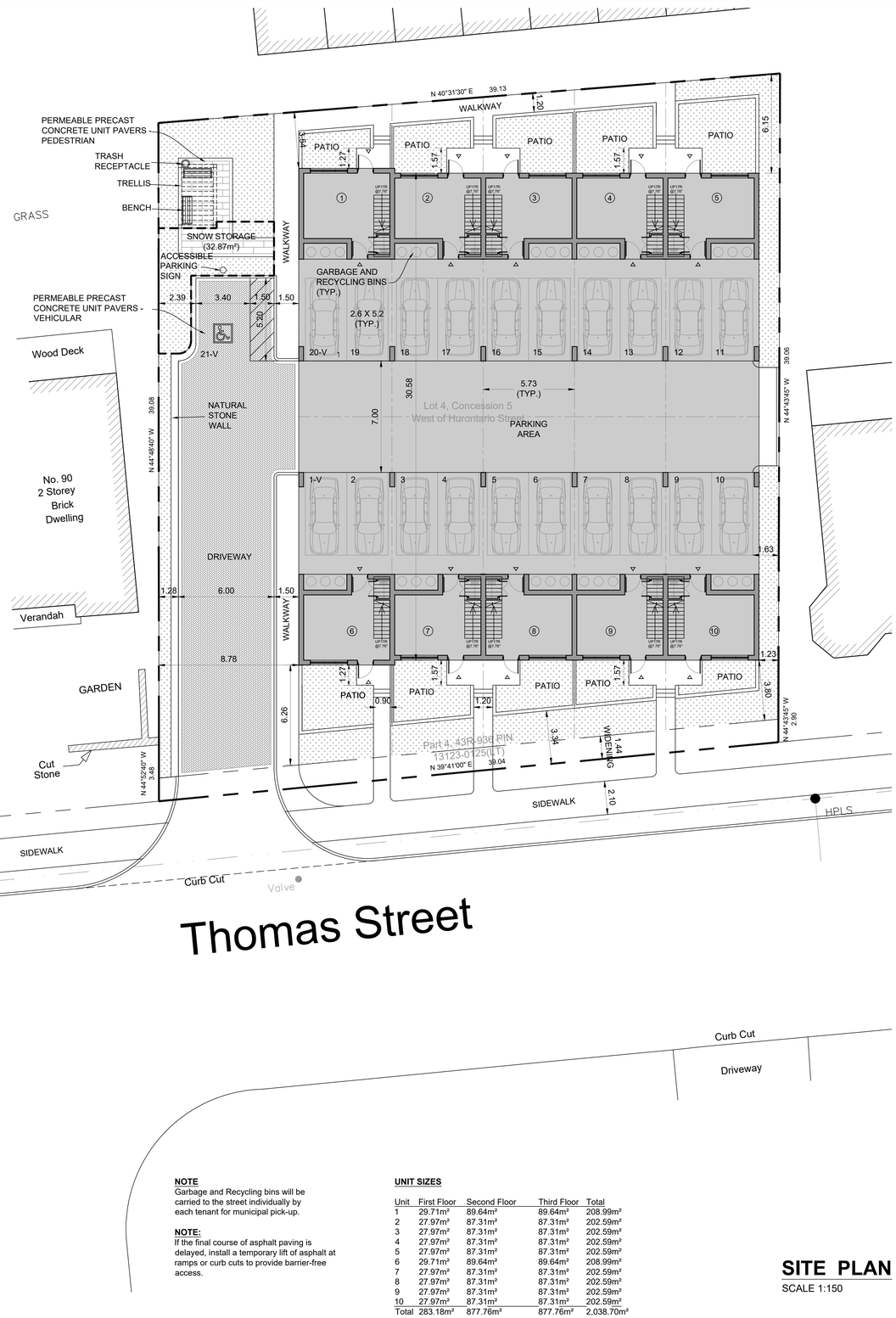
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 40 cm topsoil for sod
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 60 cm topsoil for shrubs
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 90 cm topsoil for trees

* Terradrain 900 or approved equal

xvi. The structural design of any retaining wall over 0.6 m in height or any retaining wall located on a property line is to be shown on the Site Grading plan for this project and is to be approved by the Consulting Engineer for the project.

xvii. Continuous 15 cm high barrier type poured concrete curbing will be provided between all asphalt and landscaped areas throughout the site.

xviii. All utility companies will be notified for locates prior to the installation of the hoarding that lies within the site and within the limited of the City boulevard area.



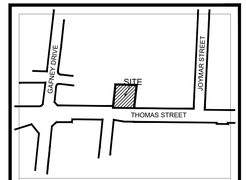
NOTE
Garbage and Recycling bins will be carried to the street individually by each tenant for municipal pick-up.

NOTE:
If the final course of asphalt paving is delayed, install a temporary lift of asphalt at ramps or curb cuts to provide barrier-free access.

UNIT SIZES

Unit	First Floor	Second Floor	Third Floor	Total
1	29.71m²	89.64m²	89.64m²	208.99m²
2	27.97m²	87.31m²	87.31m²	202.59m²
3	27.97m²	87.31m²	87.31m²	202.59m²
4	27.97m²	87.31m²	87.31m²	202.59m²
5	27.97m²	87.31m²	87.31m²	202.59m²
6	29.71m²	89.64m²	89.64m²	208.99m²
7	27.97m²	87.31m²	87.31m²	202.59m²
8	27.97m²	87.31m²	87.31m²	202.59m²
9	27.97m²	87.31m²	87.31m²	202.59m²
10	27.97m²	87.31m²	87.31m²	202.59m²
Total	283.18m²	877.76m²	877.76m²	2,038.70m²

SITE PLAN
SCALE 1:150



KEY PLAN
N.T.S.

SITE PLAN APPLICATION NUMBER: OZ 20 11

NO.	DATE	REVISION/ISSUED FOR	BY
2	JUN 03 2020	SITE PLAN APPROVAL	
1	MAR 21 2019	PRE-APPLICATION CONSULTATION	

PROJECT NAME
PROPOSED RESIDENTIAL DEVELOPMENT
86 THOMAS ST.
MISSISSAUGA, ON

CONSTRUCTION NORTH

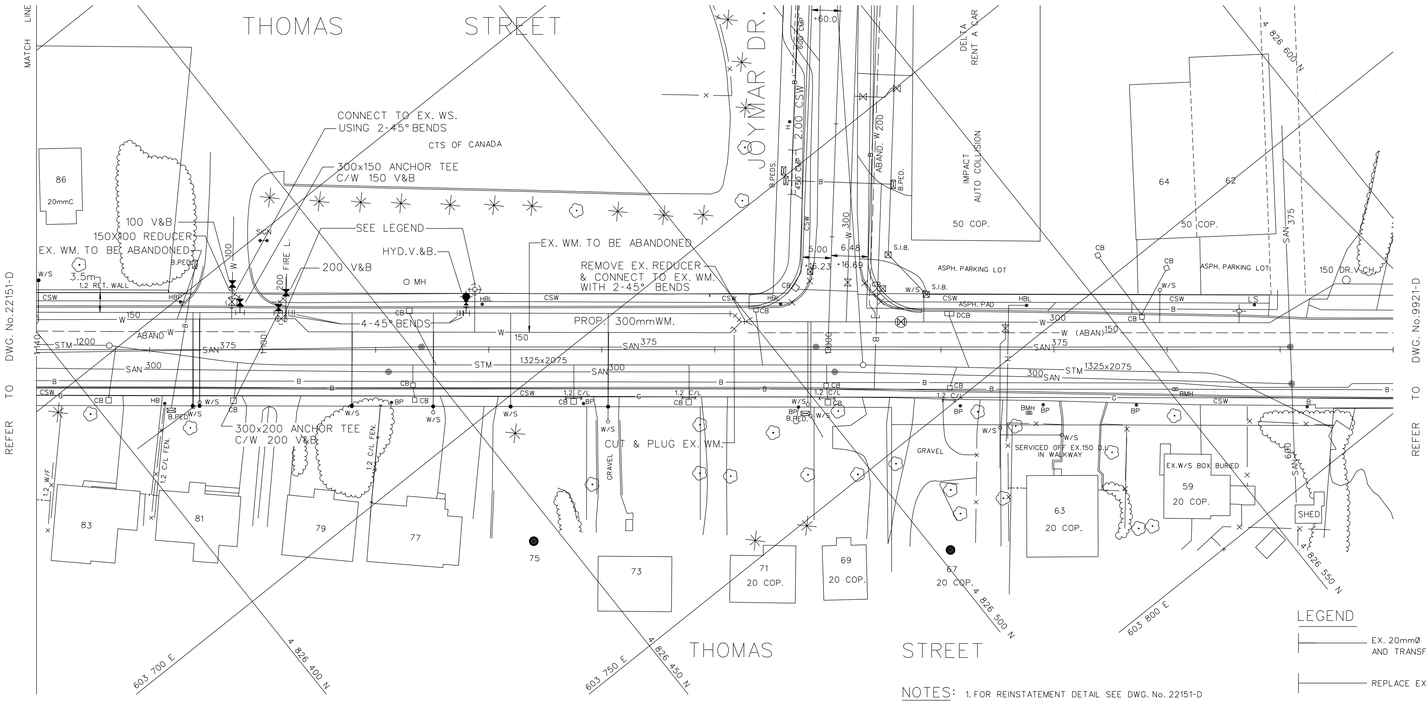
WES SURDYKA architect inc
3645 KEELE STREET, 2nd FLOOR, STE 108
TORONTO ONTARIO M3J 1M8
TEL (416) 630-2254 FAX (416) 630-5741
E-mail: surdykaarchitect@bellnet.ca

DRAWING TITLE
SITE PLAN

DRAWN BY	
PLOTTED	MAR. 18, 2021
SCALE	AS SHOWN
START DATE	MAR 2019
PROJECT NO.	18-12

DRAWING NO.
A1.0
OF

APPENDIX B – AS-BUILT DRAWINGS



NOTES: 1. FOR REINSTATEMENT DETAIL SEE DWG. No. 22151-D

2. FOR TRENCH BEDDING DETAIL SEE DWG. No. 22570-D

LEGEND

EX. 20mmØ & LARGER COPPER W/S TO BE CUT AND TRANSFERED OR EXTENDED TO THE NEW WM.

REPLACE EX. W/S WITH 20mmØ COPPER

(4) & (5) EX. HYD. V. & B. TO BE REMOVED AND HYD. TO BE RETURNED TO REGION YARD IN MISSISSAUGA. VALVES TO BE DISPOSED OF OFF SITE.

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARK & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.
OCT. 1997	AS CONSTRUCTED	J.P.

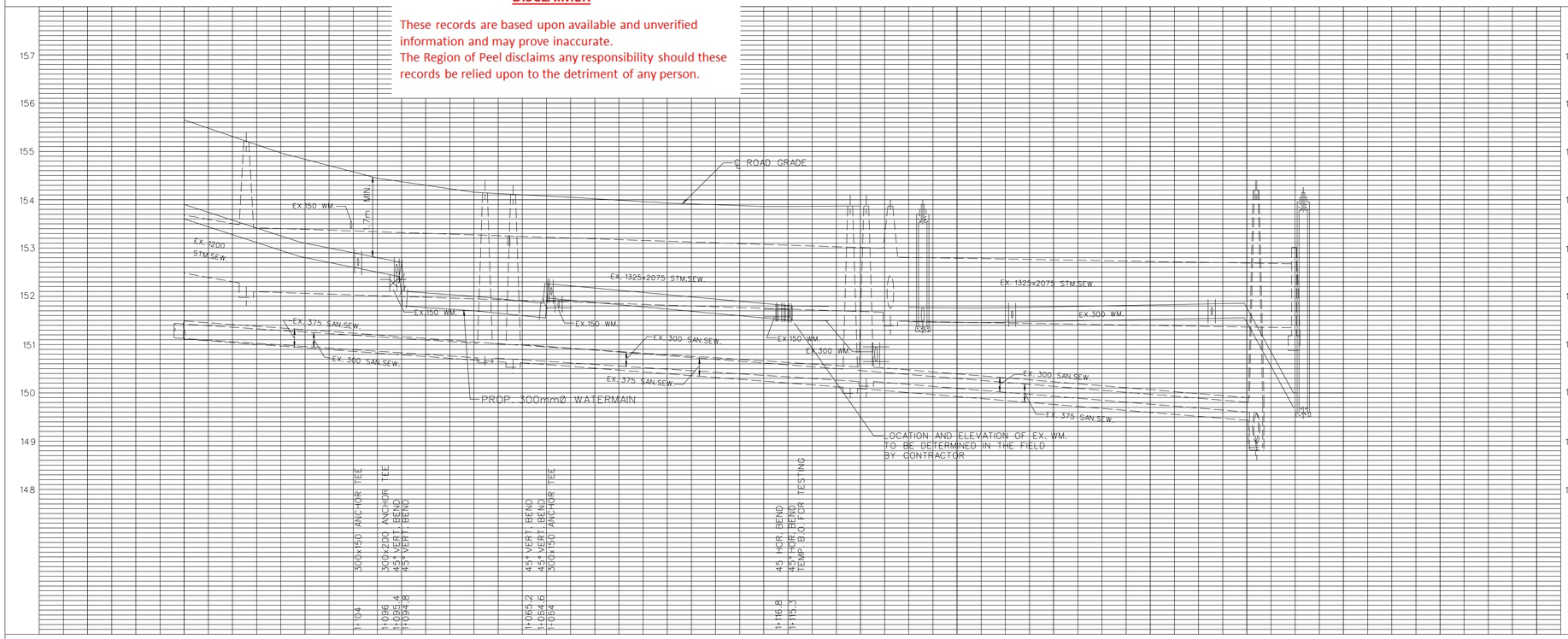
KEY PLAN
N.T.S.

GENERAL NOTES:

1. ALL COPPER (LESS THEN 20mm),GALVANIZED & LEAD WATER SERVICES ARE TO BE REPLACED WITH 20mm TYPE 'K' COPPER FROM THE NEW WATERMAIN TO THE STREET LINE COMPLETE WITH A NEW SERVICE BOX AT STREET LINE.
   ALL W/S'S MUST HAVE A MIN. OF 1.7m COVER ON CURB & GUTTER ROADS AND A MIN. OF 2.1m COVER ON UNIMPROVED ROADS.
   IF W/S CONFLICTS WITH SEWERS AND/OR EXISTING WATERMAIN W/S HAS TO BE INSTALLED UNDER SEWER AND/OR WATERMAIN WITH A MIN. OF 300mm CLEARANCE.
   REMOVE & DISPOSE OF EXISTING WATER SERVICE BOXES.
2. PLUG THE ENDS OF THE ABANDONED WATERMAIN WITH CONCRETE.
3. 50mm TEMP. BLOW-OFF AND/OR RISER PIPE FOR SWABBING OF THE WATERMAIN IS/ARE TO BE LOCATED IN THE BOULEVARD.
4. INSTALL W/S BY BORING UNDER PAVEMENT, TREES AND SHRUBS.
5. LOCATION OF EXISTING W/S IS APPROXIMATE ONLY AND IS TO BE STAKED OUT IN THE FIELD.
6. INSTALL TEMP. PLUG & B.O. AT END OF EACH PIPE FOR TEST.
7. NEW HYDRANT OFFSET TO BE 3.5m FROM STREET LINE UNLESS OTHERWISE SHOWN.
8. EXISTING HYDRANT AND VALVE TO BE REMOVED AND RETURNED TO REGION YARD AT 3515 WOLFDALE ROAD, MISSISSAUGA.
9. ALL EXISTING VALVE BOXES TO BE REMOVED AND DISPOSED OF OFF SITE.

DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



General Notes

- — — All Driveways ASPHALT Unless Otherwise Noted.
- — — All Service Locations Are Approximate And Must Be Located Accurately In The Field
- Denotes Building - Not Located
- Denotes Building Located

B.M. No. Elev.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by | Approved by

Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
HYDRO ELECTRIC COMM. TOWN OF CALEDON
CABLE TELEVISION

10m 0 10m 20m 30m HORIZONTAL SCALE
1m 0 1m 2m 3m VERTICAL SCALE

Region of Peel
Public Works

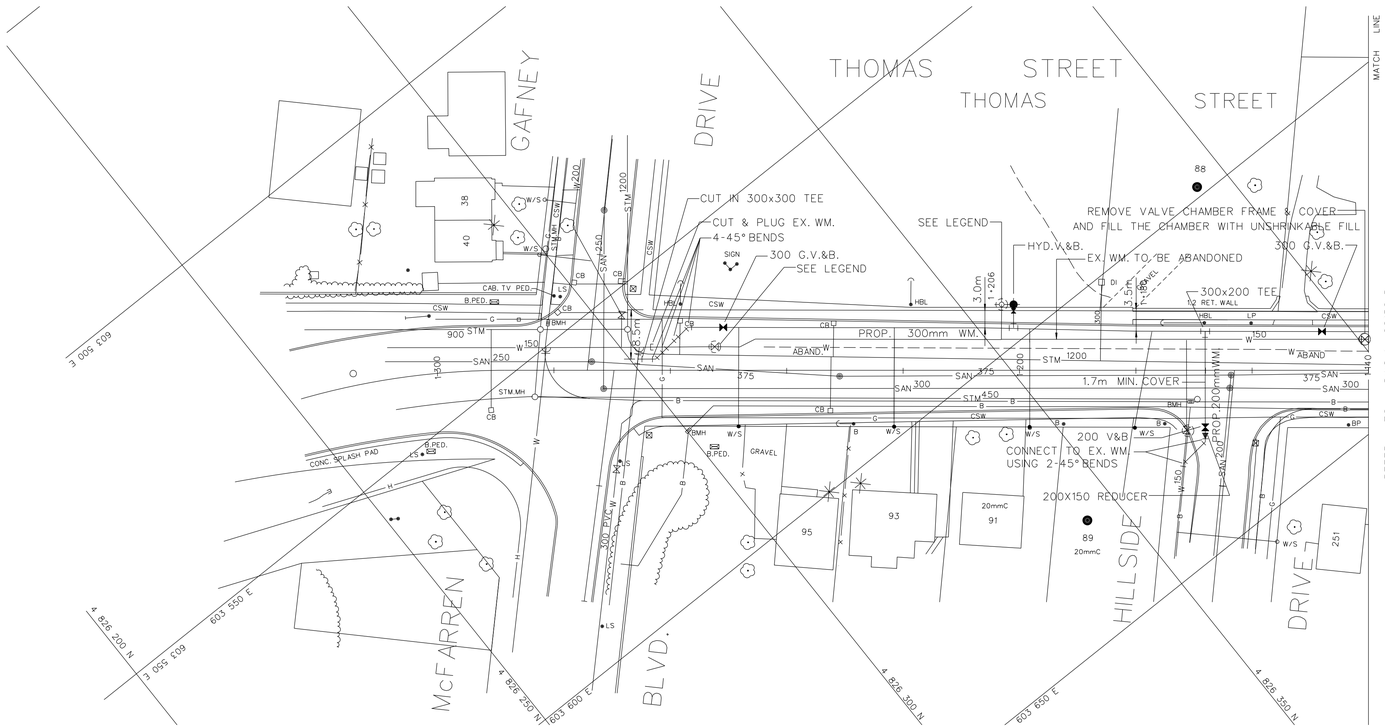
THOMAS STREET

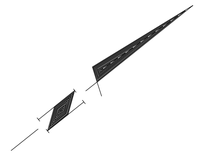
(FROM JOYMAR DR. TO GAFNEY DR.)

PROP. 300mmØ WATERMAIN

Sta. 1+000 **To Sta.** 1+140

Lots	Area Z-39 N	Project No. 96-1440	
Checked by	Drawn by YC/JP	Plan No. 22150-D	
Date AUG. 03, 1995	Sheet 1 of 2		





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SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
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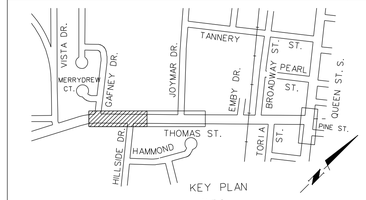
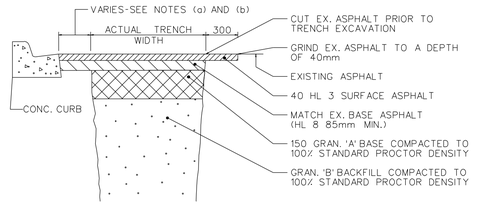
TRANSIT			ONT. HYDRO		
PARK & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.
OCT. 1997	AS CONSTRUCTED	J.P.

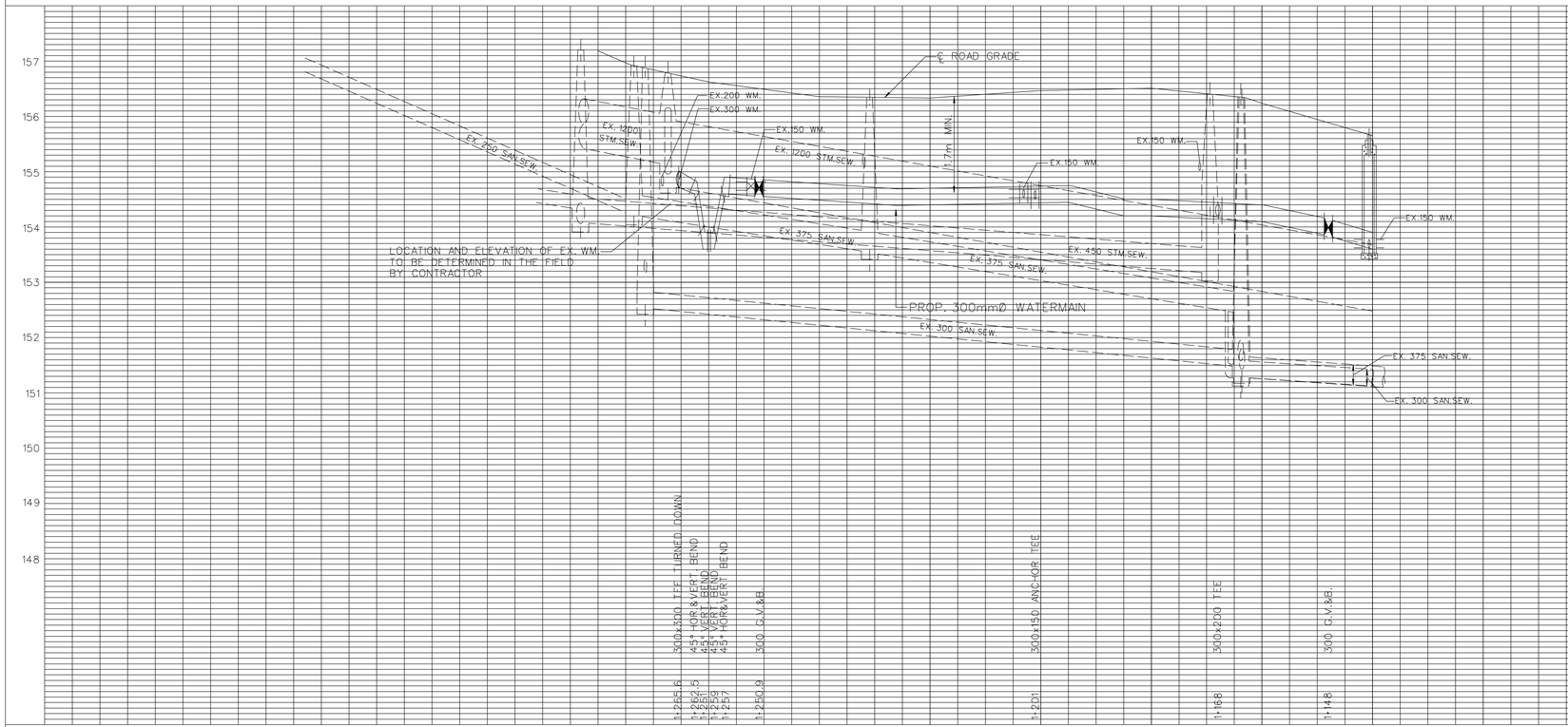


NOTES:
1. FOR GENERAL NOTES AND LEGEND SEE DWG. No.22150-D
2. FOR TRENCH BEDDING DETAIL SEE DWG. No.22570-D
3. REMOVE AND DISPOSE OF ABANDONED WATERMAIN IF IT CONFLICTS WITH PROPOSED WATERMAIN



NOTES: (a). 300mmx40mm GRIND WIDE WHERE DISTANCE FROM EDGE OF TRENCH TO CURB EXCEEDS 1.0m
(b). FULL WIDTH TO CURB WHERE DISTANCE LESS THEN 1.0m

REINSTATEMENT DETAIL
(THOMAS ST. AND QUEEN ST.)
N.T.S.



General Notes
- All Driveways ASPHALT Unless Otherwise Noted.
- All Service Locations Are Approximate And Must Be Located Accurately In The Field
- Denotes Building - Not Located
- Denotes Building Located

B.M. No. Elev.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only. To Be Verified In Field By Contractor.

Designed by ____ Chkd. ____ Approved by

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
HYDRO ELECTRIC COMM. TOWN OF CALEDON
CABLE TELEVISION

10m 0 10m 20m 30m HORIZONTAL SCALE
1m 0 1m 2m 3m VERTICAL SCALE

Region of Peel
Public Works

THOMAS STREET
(FROM JOYMAR DR. TO GAFNEY DR.)

PROP. 300mmØ WATERMAIN

Sta. 1+140 **To Sta.** 1+300

Lots | Area Z-39 N | Project No. 96-1440
Checked by | Drawn by Y.C. | Plan No. 22151-D
Date AUG. 03, 1995 | Sheet 2 of 2

APPENDIX C – WATER DATA

DOMESTICE WATER CALCULATION - New Building

86 Thomas Street		
Mississauga, ON		
March 15, 2020		
File No.: NT-19-013		
Nextrans Engineering		
Prepared by: W.L.		
Checked by: G.R.	**Type of Housing**	**Residential**

Unit Quantity Determination

1. Type of Construction	Residential	
2. PPU	2.7	
3. Number of Units	10	
4. Maximum Day Factor	2.00	
5. Peak Hour Factor	3.00	
6. Average Daily Demand	280	L/person/day

Water Usage Determination

1. Average Daily Demand	0.09	L/s
2. Maximum Daily Demand	0.18	L/s
3. Peak Hourly Demand	0.26	L/s

FIRE WATER DEMAND CALCULATION (FUS 1999)

86 Thomas Street		
Mississauga, ON		
June 20, 2020		
File No.: NT-19-013		
Nextrans Engineering		
Checked by: G.R.	**Type of Housing**	**Townhouse**
Prepared by: W.L.	**ID**	New Building

Design Parameters

1 C - Type of Construction		ordinary construction	1.0
2. Total Floor Area (from site plan)		584	m^2
3. Fire Hazard Factor		Combustible	0%
4. Automatice Sprinkler Protection		no	0%
5. Fully Supervised System		no	0%
6. Exposure Factor			0.65
	East Side	3.1 to 10m	0.2
	West Side	3.1 to 10m	0.2
	South Side	30.1 to 45m	0.05
	North Side	3.1 to 10m	0.2

Fire Water Determination

1. $F=220*C*A^{0.5}$	5,316.7	l/min
2. Adjusted by Fire Hazard Factor	5,316.7	l/min
3. Adjusted by Automatic Sprinkler System	0.0	l/min
4. Adjusted by Supervised System	0.0	l/min
5. Adjusted by Exposure Factor	3,455.8	l/min
Fire Water Demand	**8,772.5**	l/min
	146	L/s

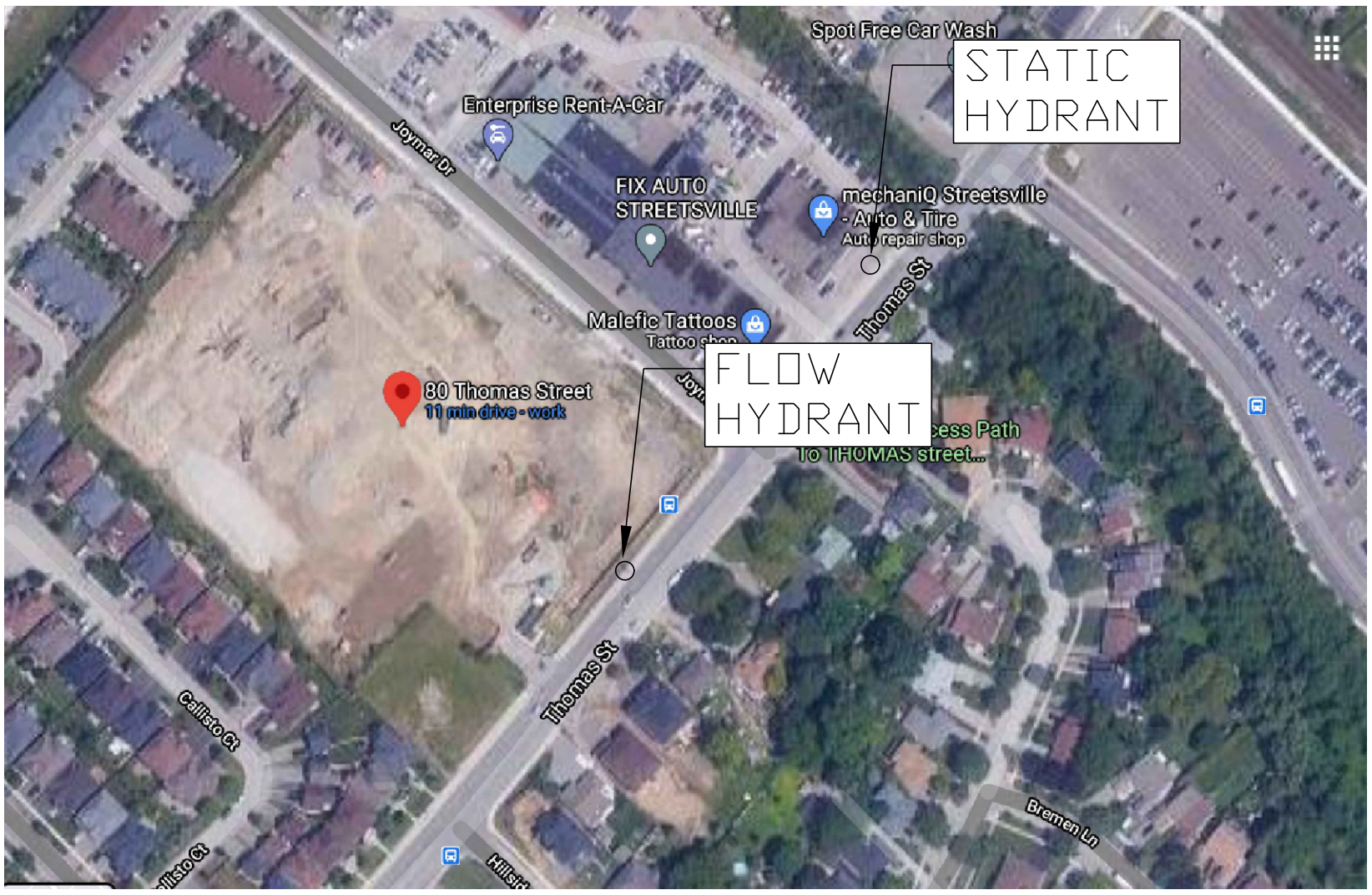
A min. flow of 146 l/s must be available at the nearest hydrant with a minimum pressure of 14o kPa.

FIRE HYDRANT FLOW TEST REPORT

ONYX SPRINKLER INSTALLATIONS INC.

400 MATHESON BLVD W,
MISSISSAUGA, ON
L5R 1B8
TEL. 416-674-5633
FAX. 416-674-9623

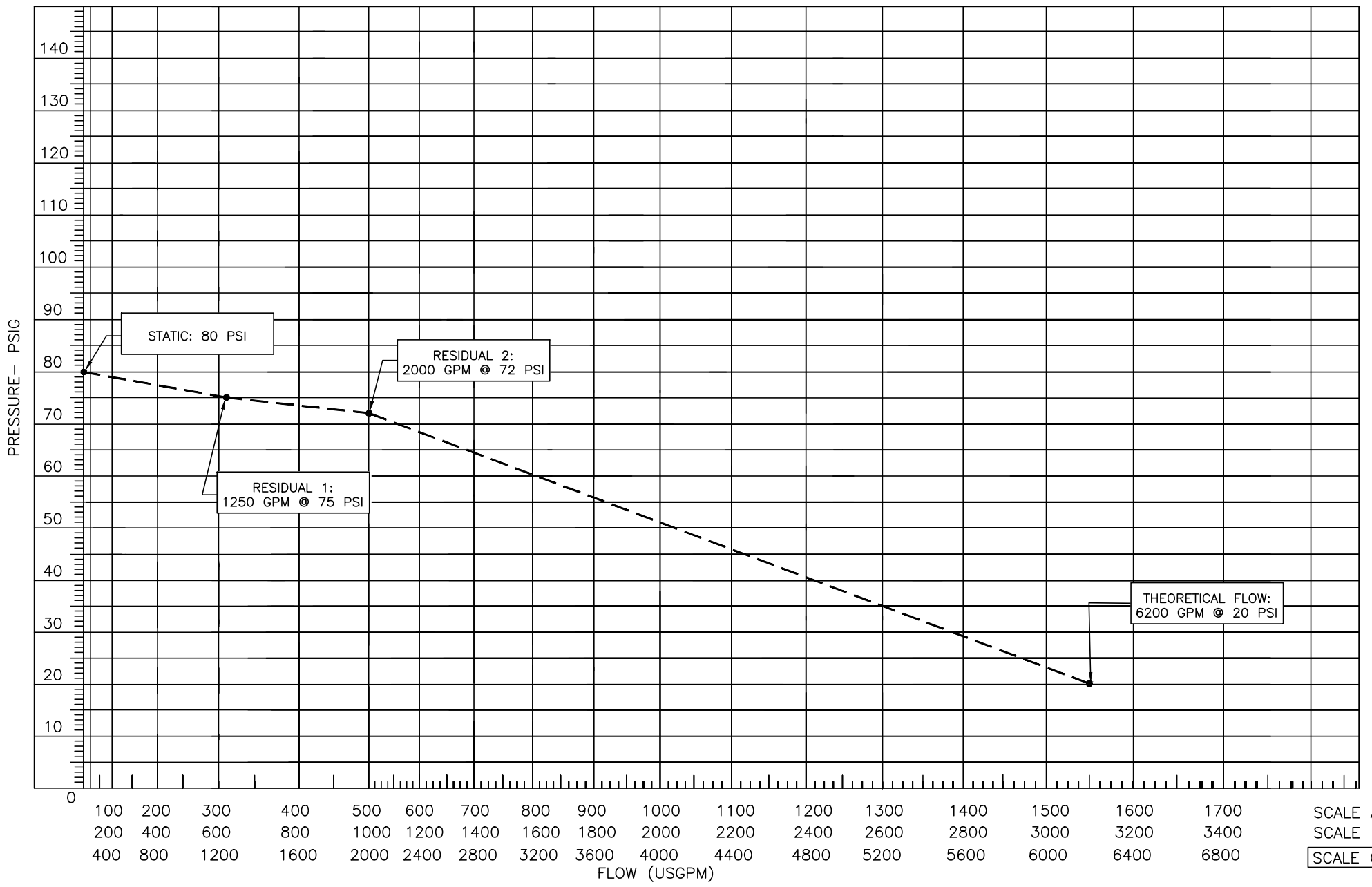
LOCATION:	80 THOMAS, MISSISSAUGA, ON
TEST DATE:	11/10/2020
TIME:	08:00 AM
CONDUCTED BY:	ONYX SPRINKLER INSTALLATIONS INC.
WITNESSED BY:	JAKUB
W/O NO.:	20201103-116
SPF NO.:	SPF3155



LOCATION MAP

FLOW TEST RESULT DATA

TEST NO.	PRESSURE (PSI)	FLOW (USGPM)	# OF PORTS	PRESSURE (BAR)	FLOW (L/MIN)
1	80	0	0	5.52	0.0
2	75	1250	1	5.17	4731.8
3	72	2000	2	4.96	7570.8
*4	20	6200	*		



APPENDIX D – SANITARY DATA

nexTrans ENGINEERING

Proposed Sanitary Drainage Design Sheet

Street Name	Up Stream	Down Stream	Increment			Cumulative		FLOW									PIPE							
	MH	MH	Units	PPU	Areas, ha	P	Areas, ha	KH	Pop/Flow	A Gross	Infilt. Flow	Infilt. 1	Len. sewer	Infilt. Flow	Infilt. 2	Q Total	L	Act. Size	Nom. Size	Grade	Nom. Cap.	Vel.	Act. Vel.	% Pipe
									l/s	ha	L/s.ha	l/s	m	L/s.m	l/s	l/s	m	mm	mm	%	l/s	m/s	m/s	Full
New Development			10	2.7	0.1643	27	0.1643	4.36	0.41	0.1643	0.20	0.03	50.00	0.028	1.40	1.85	50.00	250	250	1.00	59.5	1.21	0.55	3.1
Sewer to Thomas Street						27	0.1643									1.85		375	375	0.60	135.8	1.23	0.43	1.4

A = area in ha
PPU = persons per unit
P = population
KH = $1+14/\{4+(P/1000)^{1/2}\}$
Qaverage=302.8 L/capita/day

86 Thomas Street
11 Units Townhouse
Sanitary Sewer Design

Design:	W.L.	Job No.	NT-19-013		
Check:	G.R.	Date	Mar. 2020	Sheet	1 of 1

APPENDIX E – STORMWATER DATA

nexTrans ENGINEERING

Drainage Area

86 Thomas St.
File No. NT-19-013
Date: March 2021

Pre-Development			C	
Total area	0.1643	ha	0.25	Drain to Thimas St.

Post-Development			C	
post-area:				
A1 - Controlled	**0.1517**	ha	**0.80**	Drain to Stm. Sewer
Lanscape	0.0242	ha	0.25	
Permeable Unit Paver	0	ha	0.85	
Hard Surface	0.1275	ha	0.90	
A2 - Uncontrolled	**0.0098**	ha	**0.58**	Drain to Thomas St.
Landscape	0.0049	ha	0.25	
Hard Surface	0.0049	ha	0.90	
A3- Uncontrolled, swale catchment	**0.0028**	ha	**0.25**	Drain to Thomas St.
Landscape	0.0028	ha	0.25	
Hard Surface	0	ha	0.90	

A2+A3	0.0126	0.5028

nexTrans ENGINEERING

Rational Method

Pre-Development Flow Calculation

86 Thomas Street
File No. NT-19-013
Date:March 2020

Time of Concentration Calculation

Area Number	Area (ha)	C	Tc (min.)
Site	0.1643	0.25	15.0

Rational Method Calculation

Event 2 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 610.00 b= 4.6
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.25	0.04	15.0	59.9	0.007	6.83	Total 6.83

Event 5 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 820.00 b= 4.6
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.25	0.04	15	80.5	0.009	9.19	Total 9.19

Event 10 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 1010.00 b= 4.6
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.25	0.041	15	99.2	0.0113	11.31	Total 11.31

Event 25 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 1160.00 b= 4.6
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.28	0.045	15	113.9	0.0143	14.29	Total 14.29

Event 50 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 1300.00 b= 4.7
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.30	0.049	15	127.1	0.0174	17.41	Total 17.41

Event 100 yr
IDF Data Set City of Mississauga, Development Requirement Manual, September 2016
a = 1450.00 b= 4.9
c = -0.7800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)	
Site	0.1643	0.31	0.051	15	140.7	0.0201	20.07	Total 20.07

Modified Rational Method - Two Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

	Uncontrolled A2+A3			Controlled A1					
Drainage Areas				Drainage Areas					
Area =	**0.0126**	ha		Area =	**0.1517**	ha			
"C" =	**0.50**			"C" =	**0.80**		Allowable Rel. Rate =	6.83	L/s
AC1=	**0.01**			AC2=	**0.12**				
							Max. Orifice Allowed =	5.78	L/s
Tc =	**15.0**	min		Tc =	**15.0**	min	Actual Orifice Release Rate M =	5.56	L/s
Time Increment =	**1.0**	min		Time Increment =	**1.0**	min			
							Max. Storage Required =	**12.5**	m^3

2-Year Return Frequency

a=	610.00
c=	-0.7800
I =	$A*(T+4.6)^c$

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall**	**Storm**	**Runoff**	**Storm**	**Runoff**	**Storm**	**Total Runoff**	**Total**
	Intensity	**Runoff (Uncon. Post)**	**Volume (Uncon. Post)**	**Runoff (Con. Post)**	**Volume (Con. Post)**	**Actual Runoff**	**Volume**	**Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	59.9	0.0011	0.95	0.0201	18.09	0.0066	6.0	12.1
16.0	57.6	0.0010	0.97	0.0193	18.56	0.0066	6.3	12.2
17.0	55.5	0.0010	1.00	0.0186	19.00	0.0065	6.7	12.3
18.0	53.6	0.0009	1.02	0.0180	19.42	0.0065	7.0	12.4
19.0	51.8	0.0009	1.04	0.0174	19.82	0.0065	7.4	12.4
20.0	50.2	0.0009	1.06	0.0168	20.20	0.0064	7.7	12.5
21.0	48.6	0.0009	1.08	0.0163	20.56	0.0064	8.1	12.5
22.0	47.2	0.0008	1.10	0.0158	20.91	0.0064	8.4	12.5
23.0	45.9	0.0008	1.11	0.0154	21.24	0.0064	8.8	12.5
24.0	44.6	0.0008	1.13	0.0150	21.55	0.0063	9.1	12.4
25.0	43.4	0.0008	1.15	0.0146	21.86	0.0063	9.5	12.4
26.0	42.3	0.0007	1.16	0.0142	22.15	0.0063	9.8	12.3
27.0	41.3	0.0007	1.18	0.0138	22.43	0.0063	10.2	12.2
28.0	40.3	0.0007	1.19	0.0135	22.70	0.0063	10.5	12.2
29.0	39.3	0.0007	1.20	0.0132	22.97	0.0063	10.9	12.1
30.0	38.4	0.0007	1.22	0.0129	23.22	0.0062	11.2	12.0
31.0	37.6	0.0007	1.23	0.0126	23.47	0.0062	11.6	11.9
32.0	36.8	0.0006	1.24	0.0123	23.71	0.0062	11.9	11.8
33.0	36.0	0.0006	1.26	0.0121	23.94	0.0062	12.3	11.7
34.0	35.3	0.0006	1.27	0.0118	24.16	0.0062	12.6	11.6
35.0	34.6	0.0006	1.28	0.0116	24.38	0.0062	13.0	11.4
36.0	33.9	0.0006	1.29	0.0114	24.60	0.0062	13.3	11.3
37.0	33.3	0.0006	1.30	0.0112	24.81	0.0061	13.6	11.2
38.0	32.7	0.0006	1.31	0.0110	25.01	0.0061	14.0	11.0
39.0	32.1	0.0006	1.32	0.0108	25.21	0.0061	14.3	10.9
40.0	31.5	0.0006	1.33	0.0106	25.40	0.0061	14.7	10.7
41.0	31.0	0.0005	1.34	0.0104	25.59	0.0061	15.0	10.6
42.0	30.5	0.0005	1.35	0.0102	25.77	0.0061	15.4	10.4
43.0	30.0	0.0005	1.36	0.0101	25.95	0.0061	15.7	10.3
44.0	29.5	0.0005	1.37	0.0099	26.13	0.0061	16.0	10.1
45.0	29.0	0.0005	1.38	0.0097	26.30	0.0061	16.4	9.9
46.0	28.6	0.0005	1.39	0.0096	26.47	0.0061	16.7	9.7
47.0	28.1	0.0005	1.40	0.0094	26.64	0.0061	17.1	9.6
48.0	27.7	0.0005	1.41	0.0093	26.80	0.0060	17.4	9.4
49.0	27.3	0.0005	1.41	0.0092	26.96	0.0060	17.8	9.2
50.0	26.9	0.0005	1.42	0.0090	27.11	0.0060	18.1	9.0
51.0	26.6	0.0005	1.43	0.0089	27.27	0.0060	18.4	8.8
52.0	26.2	0.0005	1.44	0.0088	27.42	0.0060	18.8	8.6
53.0	25.8	0.0005	1.45	0.0087	27.57	0.0060	19.1	8.4
54.0	25.5	0.0004	1.45	0.0086	27.71	0.0060	19.5	8.2
55.0	25.2	0.0004	1.46	0.0084	27.86	0.0060	19.8	8.1
56.0	24.8	0.0004	1.47	0.0083	28.00	0.0060	20.1	7.9
57.0	24.5	0.0004	1.48	0.0082	28.14	0.0060	20.5	7.6
58.0	24.2	0.0004	1.48	0.0081	28.27	0.0060	20.8	7.4
59.0	23.9	0.0004	1.49	0.0080	28.41	0.0060	21.2	7.2
60.0	23.6	0.0004	1.50	0.0079	28.54	0.0060	21.5	7.0
61.0	23.3	0.0004	1.50	0.0078	28.67	0.0060	21.8	6.8
62.0	23.1	0.0004	1.51	0.0077	28.80	0.0060	22.2	6.6
63.0	22.8	0.0004	1.52	0.0077	28.92	0.0060	22.5	6.4
64.0	22.5	0.0004	1.52	0.0076	29.05	0.0060	22.9	6.2
65.0	22.3	0.0004	1.53	0.0075	29.17	0.0060	23.2	6.0
90.0	17.5	0.0003	1.67	0.0059	31.79	0.0062	33.5	0.0
120.0	14.2	0.0002	1.79	0.0047	34.19	0.0050	36.0	0.0
150.0	12.0	0.0002	1.89	0.0040	36.12	0.0042	38.0	0.0
180.0	10.4	0.0002	1.98	0.0035	37.74	0.0037	39.7	0.0
210.0	9.3	0.0002	2.05	0.0031	39.16	0.0033	41.2	0.0
240.0	8.4	0.0001	2.12	0.0028	40.41	0.0030	42.5	0.0

Modified Rational Method - Five Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

	Uncontrolled A2+A3			Controlled A1		
Drainage Areas						
Area =	**0.0126**	ha	Area =	**0.1517**	ha	
"C" =	**0.50**		"C" =	**0.80**		
AC1=	**0.01**		AC2=	**0.12**		
Tc =	**15.0**	min	Tc =	**15.0**	min	
Time Increment =	**1.0**	min	Time Increment =	**1.0**	min	

Allowable Rel. Rate =	9.19	L/s
Max. Orifice Allowed =	7.77	L/s
Actual Orifice Release Rate M =	7.70	L/s
Total Actual Flow=	9.11	L/s
Max. Storage Required =	**16.5**	m^3

5-Year Return Frequency	
a=	820.00
c=	-0.7800
I =	A*(T+4.6)^c

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall**	**Storm**	**Runoff**	**Storm**	**Runoff**	**Storm**	**Total Runoff**	**Total**
	Intensity	**Runoff (Uncon. Post)**	**Volume (Uncon. Post)**	**Runoff (Con. Post)**	**Volume (Con. Post)**	**Actual Runoff**	**Volume**	**Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	80.5	0.0014	1.28	0.0270	24.31	0.0091	8.2	16.1
16.0	77.4	0.0014	1.31	0.0260	24.95	0.0091	8.7	16.3
17.0	74.6	0.0013	1.34	0.0250	25.54	0.0090	9.2	16.4
18.0	72.0	0.0013	1.37	0.0242	26.11	0.0090	9.7	16.4
19.0	69.7	0.0012	1.40	0.0234	26.64	0.0089	10.2	16.5
20.0	67.4	0.0012	1.42	0.0226	27.15	0.0089	10.7	16.5
21.0	65.4	0.0012	1.45	0.0219	27.64	0.0088	11.1	16.5
22.0	63.4	0.0011	1.47	0.0213	28.10	0.0088	11.6	16.5
23.0	61.6	0.0011	1.50	0.0207	28.55	0.0088	12.1	16.4
24.0	60.0	0.0011	1.52	0.0201	28.97	0.0088	12.6	16.4
25.0	58.4	0.0010	1.54	0.0196	29.38	0.0087	13.1	16.3
26.0	56.9	0.0010	1.56	0.0191	29.77	0.0087	13.6	16.2
27.0	55.5	0.0010	1.58	0.0186	30.15	0.0087	14.0	16.1
28.0	54.1	0.0010	1.60	0.0182	30.52	0.0086	14.5	16.0
29.0	52.9	0.0009	1.62	0.0177	30.87	0.0086	15.0	15.9
30.0	51.7	0.0009	1.64	0.0173	31.22	0.0086	15.5	15.7
31.0	50.5	0.0009	1.65	0.0170	31.55	0.0086	16.0	15.6
32.0	49.5	0.0009	1.67	0.0166	31.87	0.0086	16.4	15.4
33.0	48.4	0.0009	1.69	0.0163	32.18	0.0085	16.9	15.3
34.0	47.5	0.0008	1.70	0.0159	32.48	0.0085	17.4	15.1
35.0	46.5	0.0008	1.72	0.0156	32.78	0.0085	17.9	14.9
36.0	45.6	0.0008	1.73	0.0153	33.07	0.0085	18.4	14.7
37.0	44.8	0.0008	1.75	0.0150	33.35	0.0085	18.8	14.5
38.0	43.9	0.0008	1.76	0.0147	33.62	0.0085	19.3	14.3
39.0	43.2	0.0008	1.78	0.0145	33.88	0.0085	19.8	14.1
40.0	42.4	0.0007	1.79	0.0142	34.14	0.0084	20.3	13.9
41.0	41.7	0.0007	1.80	0.0140	34.40	0.0084	20.7	13.7
42.0	41.0	0.0007	1.82	0.0137	34.64	0.0084	21.2	13.4
43.0	40.3	0.0007	1.83	0.0135	34.89	0.0084	21.7	13.2
44.0	39.6	0.0007	1.84	0.0133	35.12	0.0084	22.2	13.0
45.0	39.0	0.0007	1.85	0.0131	35.36	0.0084	22.6	12.7
46.0	38.4	0.0007	1.87	0.0129	35.58	0.0084	23.1	12.5
47.0	37.8	0.0007	1.88	0.0127	35.81	0.0084	23.6	12.2
48.0	37.3	0.0007	1.89	0.0125	36.02	0.0084	24.1	12.0
49.0	36.7	0.0006	1.90	0.0123	36.24	0.0083	24.5	11.7
50.0	36.2	0.0006	1.91	0.0121	36.45	0.0083	25.0	11.5
51.0	35.7	0.0006	1.92	0.0120	36.66	0.0083	25.5	11.2
52.0	35.2	0.0006	1.93	0.0118	36.86	0.0083	25.9	10.9
53.0	34.7	0.0006	1.94	0.0117	37.06	0.0083	26.4	10.6
54.0	34.3	0.0006	1.95	0.0115	37.25	0.0083	26.9	10.4
55.0	33.8	0.0006	1.96	0.0113	37.45	0.0083	27.4	10.1
56.0	33.4	0.0006	1.97	0.0112	37.63	0.0083	27.8	9.8
57.0	33.0	0.0006	1.98	0.0111	37.82	0.0083	28.3	9.5
58.0	32.5	0.0006	1.99	0.0109	38.00	0.0083	28.8	9.2
59.0	32.1	0.0006	2.00	0.0108	38.18	0.0083	29.2	8.9
60.0	31.8	0.0006	2.01	0.0107	38.36	0.0083	29.7	8.6
61.0	31.4	0.0006	2.02	0.0105	38.54	0.0082	30.2	8.4
62.0	31.0	0.0005	2.03	0.0104	38.71	0.0082	30.7	8.1
63.0	30.7	0.0005	2.04	0.0103	38.88	0.0082	31.1	7.8
64.0	30.3	0.0005	2.05	0.0102	39.05	0.0082	31.6	7.4
65.0	30.0	0.0005	2.06	0.0101	39.21	0.0082	32.1	7.1
90.0	23.6	0.0004	2.24	0.0079	42.73	0.0083	45.0	0.0
120.0	19.0	0.0003	2.41	0.0064	45.96	0.0067	48.4	0.0
150.0	16.1	0.0003	2.55	0.0054	48.56	0.0057	51.1	0.0
180.0	14.0	0.0002	2.66	0.0047	50.74	0.0049	53.4	0.0
210.0	12.4	0.0002	2.76	0.0042	52.64	0.0044	55.4	0.0
240.0	11.2	0.0002	2.85	0.0038	54.32	0.0040	57.2	0.0

Modified Rational Method - Ten Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

Uncontrolled A2+A3			Controlled A1		
Drainage Areas			Drainage Areas		
Area =	**0.0126**	ha	Area =	**0.1517**	ha
"C" =	**0.50**		"C" =	**0.80**	
AC1=	**0.01**		AC2=	**0.12**	
Tc =	**15.0**	min	Tc =	**15.0**	min
Time Increment =	**1.0**	min	Time Increment =	**1.0**	min

Allowable Rel. Rate =	11.31	L/s
Max. Orifice Allowed =	9.56	L/s
Actual Orifice Release Rate M =	9.49	L/s
Total Actual Flow=	11.24	L/s
Max. Storage Required =	**20.3**	m^3

10-Year Return Frequency	
a=	1010.00
c=	-0.7800
I =	$A*(T+4.6)^c$

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall Intensity**	**Storm Runoff (Uncon. Post)**	**Runoff Volume (Uncon. Post)**	**Storm Runoff (Con. Post)**	**Runoff Volume (Con. Post)**	**Storm Actual Runoff**	**Total Runoff Volume**	**Total Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	99.2	0.0017	1.57	0.0333	29.95	0.0112	10.1	19.8
16.0	95.4	0.0017	1.61	0.0320	30.73	0.0112	10.7	20.0
17.0	91.9	0.0016	1.65	0.0308	31.46	0.0111	11.3	20.1
18.0	88.7	0.0016	1.69	0.0298	32.16	0.0111	11.9	20.2
19.0	85.8	0.0015	1.72	0.0288	32.82	0.0110	12.5	20.3
20.0	83.1	0.0015	1.75	0.0279	33.45	0.0110	13.1	20.3
21.0	80.5	0.0014	1.79	0.0270	34.04	0.0109	13.7	20.3
22.0	78.1	0.0014	1.82	0.0262	34.61	0.0109	14.3	20.3
23.0	75.9	0.0013	1.84	0.0255	35.16	0.0108	14.9	20.2
24.0	73.9	0.0013	1.87	0.0248	35.68	0.0108	15.5	20.1
25.0	71.9	0.0013	1.90	0.0241	36.19	0.0108	16.1	20.1
26.0	70.1	0.0012	1.92	0.0235	36.67	0.0107	16.7	19.9
27.0	68.3	0.0012	1.95	0.0229	37.14	0.0107	17.3	19.8
28.0	66.7	0.0012	1.97	0.0224	37.59	0.0107	17.9	19.7
29.0	65.1	0.0011	1.99	0.0219	38.03	0.0106	18.5	19.5
30.0	63.7	0.0011	2.02	0.0214	38.45	0.0106	19.1	19.3
31.0	62.3	0.0011	2.04	0.0209	38.86	0.0106	19.7	19.2
32.0	60.9	0.0011	2.06	0.0204	39.25	0.0106	20.3	19.0
33.0	59.7	0.0010	2.08	0.0200	39.64	0.0105	20.9	18.8
34.0	58.4	0.0010	2.10	0.0196	40.01	0.0105	21.5	18.5
35.0	57.3	0.0010	2.12	0.0192	40.37	0.0105	22.1	18.3
36.0	56.2	0.0010	2.14	0.0189	40.73	0.0105	22.6	18.1
37.0	55.1	0.0010	2.15	0.0185	41.07	0.0105	23.2	17.8
38.0	54.1	0.0010	2.17	0.0182	41.41	0.0104	23.8	17.6
39.0	53.2	0.0009	2.19	0.0178	41.74	0.0104	24.4	17.3
40.0	52.2	0.0009	2.21	0.0175	42.05	0.0104	25.0	17.1
41.0	51.3	0.0009	2.22	0.0172	42.37	0.0104	25.6	16.8
42.0	50.5	0.0009	2.24	0.0169	42.67	0.0104	26.2	16.5
43.0	49.6	0.0009	2.25	0.0167	42.97	0.0104	26.7	16.2
44.0	48.8	0.0009	2.27	0.0164	43.26	0.0104	27.3	15.9
45.0	48.1	0.0008	2.28	0.0161	43.55	0.0103	27.9	15.6
46.0	47.3	0.0008	2.30	0.0159	43.83	0.0103	28.5	15.3
47.0	46.6	0.0008	2.31	0.0156	44.10	0.0103	29.1	15.0
48.0	45.9	0.0008	2.33	0.0154	44.37	0.0103	29.7	14.7
49.0	45.2	0.0008	2.34	0.0152	44.64	0.0103	30.3	14.4
50.0	44.6	0.0008	2.35	0.0150	44.89	0.0103	30.8	14.1
51.0	44.0	0.0008	2.37	0.0148	45.15	0.0103	31.4	13.7
52.0	43.4	0.0008	2.38	0.0146	45.40	0.0103	32.0	13.4
53.0	42.8	0.0008	2.39	0.0144	45.64	0.0102	32.6	13.1
54.0	42.2	0.0007	2.41	0.0142	45.88	0.0102	33.2	12.7
55.0	41.7	0.0007	2.42	0.0140	46.12	0.0102	33.7	12.4
56.0	41.1	0.0007	2.43	0.0138	46.35	0.0102	34.3	12.0
57.0	40.6	0.0007	2.44	0.0136	46.58	0.0102	34.9	11.7
58.0	40.1	0.0007	2.45	0.0135	46.81	0.0102	35.5	11.3
59.0	39.6	0.0007	2.47	0.0133	47.03	0.0102	36.1	11.0
60.0	39.1	0.0007	2.48	0.0131	47.25	0.0102	36.7	10.6
61.0	38.6	0.0007	2.49	0.0130	47.47	0.0102	37.2	10.2
62.0	38.2	0.0007	2.50	0.0128	47.68	0.0102	37.8	9.9
63.0	37.8	0.0007	2.51	0.0127	47.89	0.0102	38.4	9.5
64.0	37.3	0.0007	2.52	0.0125	48.09	0.0101	39.0	9.1
65.0	36.9	0.0006	2.53	0.0124	48.30	0.0101	39.6	8.7
90.0	29.0	0.0005	2.76	0.0097	52.64	0.0103	55.4	0.0
120.0	23.4	0.0004	2.97	0.0079	56.61	0.0083	59.6	0.0
150.0	19.8	0.0003	3.14	0.0066	59.81	0.0070	62.9	0.0
180.0	17.2	0.0003	3.28	0.0058	62.50	0.0061	65.8	0.0
210.0	15.3	0.0003	3.40	0.0051	64.83	0.0054	68.2	0.0
240.0	13.8	0.0002	3.51	0.0046	66.90	0.0049	70.4	0.0

Modified Rational Method - Twenty-Five Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

Uncontrolled A2+A3			Controlled A1		
Drainage Areas			Drainage Areas		
Area =	**0.0126**	ha	Area =	**0.1517**	ha
"C" =	**0.55**		"C" =	**0.88**	
AC1=	**0.01**		AC2=	**0.13**	
Tc =	**15.0**	min	Tc =	**15.0**	min
Time Increment =	**1.0**	min	Time Increment =	**1.0**	min

Allowable Rel. Rate =	14.29	L/s
Max. Orifice Allowed =	12.09	L/s
Actual Orifice Release Rate M =	11.90	L/s
Total actual flow=	14.10	L/s
Max. Storage Required =	**25.8**	m^3

25-Year Return Frequency	
a=	1160.00
c=	-0.7800
I =	$A*(T+4.6)^c$

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall**	**Storm**	**Runoff**	**Storm**	**Runoff**	**Storm**	**Total Runoff**	**Total**
	Intensity	**Runoff (Uncon. Post)**	**Volume (Uncon. Post)**	**Runoff (Con. Post)**	**Volume (Con. Post)**	**Actual Runoff**	**Volume**	**Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	113.9	0.0022	1.98	0.0420	37.84	0.0141	12.7	25.1
16.0	109.6	0.0021	2.04	0.0404	38.82	0.0140	13.5	25.4
17.0	105.6	0.0020	2.08	0.0390	39.75	0.0139	14.2	25.5
18.0	101.9	0.0020	2.13	0.0376	40.63	0.0139	15.0	25.6
19.0	98.5	0.0019	2.17	0.0364	41.46	0.0138	15.7	25.7
20.0	95.4	0.0018	2.22	0.0352	42.25	0.0137	16.5	25.8
21.0	92.5	0.0018	2.26	0.0341	43.01	0.0137	17.2	25.8
22.0	89.8	0.0017	2.29	0.0331	43.73	0.0136	18.0	25.7
23.0	87.2	0.0017	2.33	0.0322	44.42	0.0136	18.8	25.7
24.0	84.8	0.0016	2.36	0.0313	45.08	0.0135	19.5	25.6
25.0	82.6	0.0016	2.40	0.0305	45.72	0.0135	20.2	25.5
26.0	80.5	0.0016	2.43	0.0297	46.33	0.0135	21.0	25.3
27.0	78.5	0.0015	2.46	0.0290	46.92	0.0134	21.7	25.2
28.0	76.6	0.0015	2.49	0.0283	47.49	0.0134	22.5	25.0
29.0	74.8	0.0014	2.52	0.0276	48.04	0.0133	23.2	24.8
30.0	73.1	0.0014	2.55	0.0270	48.57	0.0133	24.0	24.6
31.0	71.5	0.0014	2.57	0.0264	49.09	0.0133	24.7	24.4
32.0	70.0	0.0014	2.60	0.0258	49.59	0.0133	25.4	24.1
33.0	68.5	0.0013	2.63	0.0253	50.08	0.0132	26.2	23.9
34.0	67.1	0.0013	2.65	0.0248	50.55	0.0132	26.9	23.6
35.0	65.8	0.0013	2.67	0.0243	51.01	0.0132	27.7	23.3
36.0	64.5	0.0012	2.70	0.0238	51.45	0.0131	28.4	23.1
37.0	63.3	0.0012	2.72	0.0234	51.89	0.0131	29.1	22.7
38.0	62.2	0.0012	2.74	0.0229	52.31	0.0131	29.9	22.4
39.0	61.0	0.0012	2.77	0.0225	52.73	0.0131	30.6	22.1
40.0	60.0	0.0012	2.79	0.0221	53.13	0.0131	31.3	21.8
41.0	58.9	0.0011	2.81	0.0218	53.53	0.0130	32.1	21.4
42.0	58.0	0.0011	2.83	0.0214	53.91	0.0130	32.8	21.1
43.0	57.0	0.0011	2.85	0.0210	54.29	0.0130	33.5	20.7
44.0	56.1	0.0011	2.87	0.0207	54.66	0.0130	34.3	20.4
45.0	55.2	0.0011	2.89	0.0204	55.02	0.0130	35.0	20.0
46.0	54.4	0.0011	2.90	0.0201	55.37	0.0130	35.7	19.6
47.0	53.5	0.0010	2.92	0.0198	55.72	0.0129	36.5	19.2
48.0	52.7	0.0010	2.94	0.0195	56.06	0.0129	37.2	18.8
49.0	52.0	0.0010	2.96	0.0192	56.39	0.0129	37.9	18.4
50.0	51.2	0.0010	2.97	0.0189	56.72	0.0129	38.7	18.0
51.0	50.5	0.0010	2.99	0.0186	57.04	0.0129	39.4	17.6
52.0	49.8	0.0010	3.01	0.0184	57.36	0.0129	40.1	17.2
53.0	49.1	0.0010	3.02	0.0181	57.67	0.0129	40.9	16.8
54.0	48.5	0.0009	3.04	0.0179	57.97	0.0128	41.6	16.4
55.0	47.8	0.0009	3.06	0.0177	58.27	0.0128	42.3	15.9
56.0	47.2	0.0009	3.07	0.0174	58.56	0.0128	43.1	15.5
57.0	46.6	0.0009	3.09	0.0172	58.85	0.0128	43.8	15.1
58.0	46.0	0.0009	3.10	0.0170	59.14	0.0128	44.5	14.6
59.0	45.5	0.0009	3.12	0.0168	59.42	0.0128	45.2	14.2
60.0	44.9	0.0009	3.13	0.0166	59.69	0.0128	46.0	13.7
61.0	44.4	0.0009	3.14	0.0164	59.97	0.0128	46.7	13.3
62.0	43.9	0.0008	3.16	0.0162	60.23	0.0127	47.4	12.8
63.0	43.4	0.0008	3.17	0.0160	60.50	0.0127	48.2	12.3
64.0	42.9	0.0008	3.19	0.0158	60.76	0.0127	48.9	11.9
65.0	42.4	0.0008	3.20	0.0156	61.02	0.0127	49.6	11.4
90.0	33.4	0.0006	3.49	0.0123	66.50	0.0130	70.0	0.0
120.0	26.9	0.0005	3.75	0.0099	71.52	0.0105	75.3	0.0
150.0	22.7	0.0004	3.96	0.0084	75.56	0.0088	79.5	0.0
180.0	19.8	0.0004	4.14	0.0073	78.95	0.0077	83.1	0.0
210.0	17.6	0.0003	4.30	0.0065	81.91	0.0068	86.2	0.0
240.0	15.9	0.0003	4.43	0.0059	84.52	0.0062	89.0	0.0

Modified Rational Method - Fifty Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

	Uncontrolled A2+A3			Controlled A1		
Drainage Areas						
Area =	**0.0126**	ha	Area =	**0.1517**	ha	
"C" =	**0.60**		"C" =	**0.96**		
AC1=	**0.01**		AC2=	**0.14**		
Tc =	**15.0**	min	Tc =	**15.0**	min	
Time Increment =	**1.0**	min	Time Increment =	**1.0**	min	

Allowable Rel. Rate =	17.41	L/s
Max. Orifice Allowed =	14.73	L/s
Actual Orifice Release Rate M =	14.35	L/s
Total actual flow=	17.04	L/s
Max. Storage Required =	**31.6**	m^3

50-Year Return Frequency	
a=	1300.00
c=	-0.7800
I =	A*(T+4.7)^c

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall**	**Storm**	**Runoff**	**Storm**	**Runoff**	**Storm**	**Total Runoff**	**Total**
	Intensity	**Runoff (Uncon. Post)**	**Volume (Uncon. Post)**	**Runoff (Con. Post)**	**Volume (Con. Post)**	**Actual Runoff**	**Volume**	**Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	127.1	0.0027	2.42	0.0512	46.07	0.0170	15.3	30.7
16.0	122.3	0.0026	2.48	0.0493	47.28	0.0169	16.3	31.0
17.0	117.9	0.0025	2.54	0.0475	48.42	0.0168	17.2	31.2
18.0	113.8	0.0024	2.60	0.0458	49.50	0.0168	18.1	31.4
19.0	110.1	0.0023	2.65	0.0443	50.52	0.0167	19.0	31.5
20.0	106.6	0.0023	2.70	0.0429	51.50	0.0166	19.9	31.6
21.0	103.3	0.0022	2.75	0.0416	52.42	0.0165	20.8	31.6
22.0	100.3	0.0021	2.80	0.0404	53.31	0.0165	21.7	31.6
23.0	97.5	0.0021	2.84	0.0392	54.15	0.0164	22.6	31.5
24.0	94.8	0.0020	2.88	0.0382	54.97	0.0164	23.5	31.4
25.0	92.3	0.0019	2.92	0.0372	55.75	0.0163	24.5	31.3
26.0	89.9	0.0019	2.96	0.0362	56.50	0.0163	25.4	31.1
27.0	87.7	0.0019	3.00	0.0353	57.22	0.0162	26.3	31.0
28.0	85.6	0.0018	3.04	0.0345	57.92	0.0162	27.1	30.8
29.0	83.6	0.0018	3.07	0.0337	58.60	0.0161	28.0	30.6
30.0	81.7	0.0017	3.11	0.0329	59.25	0.0161	28.9	30.3
31.0	80.0	0.0017	3.14	0.0322	59.89	0.0160	29.8	30.0
32.0	78.3	0.0017	3.17	0.0315	60.50	0.0160	30.7	29.8
33.0	76.6	0.0016	3.20	0.0309	61.10	0.0160	31.6	29.5
34.0	75.1	0.0016	3.23	0.0302	61.67	0.0159	32.5	29.2
35.0	73.6	0.0016	3.26	0.0296	62.24	0.0159	33.4	28.8
36.0	72.2	0.0015	3.29	0.0291	62.79	0.0159	34.3	28.5
37.0	70.8	0.0015	3.32	0.0285	63.32	0.0158	35.2	28.1
38.0	69.5	0.0015	3.35	0.0280	63.84	0.0158	36.1	27.8
39.0	68.3	0.0014	3.37	0.0275	64.35	0.0158	37.0	27.4
40.0	67.1	0.0014	3.40	0.0270	64.84	0.0158	37.8	27.0
41.0	65.9	0.0014	3.43	0.0266	65.33	0.0157	38.7	26.6
42.0	64.8	0.0014	3.45	0.0261	65.80	0.0157	39.6	26.2
43.0	63.8	0.0013	3.47	0.0257	66.26	0.0157	40.5	25.8
44.0	62.8	0.0013	3.50	0.0253	66.71	0.0157	41.4	25.3
45.0	61.8	0.0013	3.52	0.0249	67.16	0.0157	42.3	24.9
46.0	60.8	0.0013	3.54	0.0245	67.59	0.0156	43.2	24.4
47.0	59.9	0.0013	3.57	0.0241	68.02	0.0156	44.0	24.0
48.0	59.0	0.0012	3.59	0.0238	68.43	0.0156	44.9	23.5
49.0	58.2	0.0012	3.61	0.0234	68.84	0.0156	45.8	23.0
50.0	57.3	0.0012	3.63	0.0231	69.24	0.0156	46.7	22.6
51.0	56.5	0.0012	3.65	0.0228	69.64	0.0155	47.6	22.1
52.0	55.7	0.0012	3.67	0.0224	70.02	0.0155	48.5	21.6
53.0	55.0	0.0012	3.69	0.0221	70.40	0.0155	49.3	21.1
54.0	54.3	0.0011	3.71	0.0218	70.78	0.0155	50.2	20.6
55.0	53.5	0.0011	3.73	0.0216	71.14	0.0155	51.1	20.1
56.0	52.9	0.0011	3.75	0.0213	71.51	0.0155	52.0	19.5
57.0	52.2	0.0011	3.77	0.0210	71.86	0.0155	52.9	19.0
58.0	51.5	0.0011	3.79	0.0208	72.21	0.0154	53.7	18.5
59.0	50.9	0.0011	3.80	0.0205	72.55	0.0154	54.6	17.9
60.0	50.3	0.0011	3.82	0.0202	72.89	0.0154	55.5	17.4
61.0	49.7	0.0010	3.84	0.0200	73.23	0.0154	56.4	16.9
62.0	49.1	0.0010	3.86	0.0198	73.56	0.0154	57.2	16.3
63.0	48.5	0.0010	3.87	0.0195	73.88	0.0154	58.1	15.8
64.0	48.0	0.0010	3.89	0.0193	74.20	0.0154	59.0	15.2
65.0	47.4	0.0010	3.91	0.0191	74.51	0.0154	59.9	14.6
90.0	37.4	0.0008	4.26	0.0150	81.23	0.0158	85.5	0.0
120.0	30.1	0.0006	4.58	0.0121	87.39	0.0128	92.0	0.0
150.0	25.5	0.0005	4.84	0.0103	92.33	0.0108	97.2	0.0
180.0	22.2	0.0005	5.06	0.0089	96.49	0.0094	101.5	0.0
210.0	19.7	0.0004	5.25	0.0079	100.10	0.0084	105.3	0.0
240.0	17.8	0.0004	5.42	0.0072	103.30	0.0076	108.7	0.0

Modified Rational Method - One Hundred Year Storm

Site Flow and Storage Summary

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

nexTrans ENGINEERING

	Uncontrolled A2+A3			Controlled A1		
Drainage Areas						
Area =	**0.0126**	ha	Area =	**0.1517**	ha	
"C" =	**0.63**		"C" =	**1.00**		
AC1=	**0.01**		AC2=	**0.15**		
Tc =	**15.0**	min	Tc =	**15.0**	min	
Time Increment =	**1.0**	min	Time Increment =	**1.0**	min	

Allowable Rel. Rate =	20.07	L/s
Max. Orifice Allowed =	16.98	L/s
Actual Orifice Release Rate M =	16.83	L/s
Total actual flow=	19.92	L/s
Max. Storage Required =	**36.2**	m^3

100-Year Return Frequency	
a=	1450.00
c=	-0.7800
I =	A*(T+4.9)^c

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time	**Rainfall**	**Storm Runoff (Uncon. Post)**	**Runoff Volume (Uncon. Post)**	**Storm Runoff (Con. Post)**	**Runoff Volume (Con. Post)**	**Storm Actual Runoff**	**Total Runoff Volume**	**Total Volume Required**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3/s)**	**(m^3)**	**(m^3)**
(1)	**(2)**	**(3) = [(2)*AC1] / 360**	**(4) = (1)*(3)*60**	**(5) = [(2)*AC2] / 360**	**(6) = (1)*(5)*60**		**(8) =(7)*10*60**	**(9) =(6)-(8)**
15.0	140.7	0.0031	2.79	0.0590	53.11	0.0199	17.9	35.2
16.0	135.4	0.0030	2.86	0.0568	54.53	0.0198	19.0	35.5
17.0	130.6	0.0029	2.93	0.0548	55.86	0.0197	20.1	35.8
18.0	126.1	0.0028	3.00	0.0529	57.12	0.0196	21.2	35.9
19.0	122.0	0.0027	3.06	0.0512	58.32	0.0195	22.2	36.1
20.0	118.1	0.0026	3.12	0.0495	59.45	0.0194	23.3	36.1
21.0	114.5	0.0025	3.17	0.0480	60.54	0.0193	24.4	36.2
22.0	111.2	0.0024	3.23	0.0466	61.58	0.0193	25.4	36.1
23.0	108.1	0.0024	3.28	0.0453	62.57	0.0192	26.5	36.1
24.0	105.2	0.0023	3.33	0.0441	63.52	0.0191	27.6	36.0
25.0	102.4	0.0023	3.38	0.0430	64.43	0.0191	28.6	35.8
26.0	99.8	0.0022	3.43	0.0419	65.31	0.0190	29.7	35.6
27.0	97.4	0.0021	3.47	0.0408	66.16	0.0190	30.7	35.4
28.0	95.1	0.0021	3.51	0.0399	66.98	0.0189	31.8	35.2
29.0	92.9	0.0020	3.55	0.0389	67.77	0.0189	32.8	34.9
30.0	90.8	0.0020	3.59	0.0381	68.53	0.0188	33.9	34.6
31.0	88.8	0.0020	3.63	0.0372	69.28	0.0188	34.9	34.3
32.0	86.9	0.0019	3.67	0.0365	69.99	0.0187	36.0	34.0
33.0	85.1	0.0019	3.71	0.0357	70.69	0.0187	37.0	33.7
34.0	83.4	0.0018	3.74	0.0350	71.37	0.0187	38.1	33.3
35.0	81.8	0.0018	3.78	0.0343	72.03	0.0186	39.1	32.9
36.0	80.2	0.0018	3.81	0.0336	72.67	0.0186	40.2	32.5
37.0	78.7	0.0017	3.84	0.0330	73.29	0.0186	41.2	32.1
38.0	77.3	0.0017	3.88	0.0324	73.90	0.0185	42.2	31.7
39.0	75.9	0.0017	3.91	0.0318	74.50	0.0185	43.3	31.2
40.0	74.6	0.0016	3.94	0.0313	75.08	0.0185	44.3	30.7
41.0	73.3	0.0016	3.97	0.0307	75.64	0.0184	45.4	30.3
42.0	72.1	0.0016	4.00	0.0302	76.20	0.0184	46.4	29.8
43.0	70.9	0.0016	4.02	0.0297	76.74	0.0184	47.4	29.3
44.0	69.8	0.0015	4.05	0.0293	77.27	0.0184	48.5	28.8
45.0	68.7	0.0015	4.08	0.0288	77.78	0.0183	49.5	28.3
46.0	67.6	0.0015	4.11	0.0284	78.29	0.0183	50.6	27.7
47.0	66.6	0.0015	4.13	0.0279	78.79	0.0183	51.6	27.2
48.0	65.6	0.0014	4.16	0.0275	79.28	0.0183	52.6	26.6
49.0	64.7	0.0014	4.18	0.0271	79.75	0.0183	53.7	26.1
50.0	63.8	0.0014	4.21	0.0267	80.22	0.0182	54.7	25.5
51.0	62.9	0.0014	4.23	0.0264	80.68	0.0182	55.7	25.0
52.0	62.0	0.0014	4.25	0.0260	81.14	0.0182	56.8	24.4
53.0	61.2	0.0013	4.28	0.0257	81.58	0.0182	57.8	23.8
54.0	60.4	0.0013	4.30	0.0253	82.02	0.0182	58.8	23.2
55.0	59.6	0.0013	4.32	0.0250	82.44	0.0181	59.9	22.6
56.0	58.8	0.0013	4.35	0.0247	82.87	0.0181	60.9	22.0
57.0	58.1	0.0013	4.37	0.0244	83.28	0.0181	61.9	21.4
58.0	57.3	0.0013	4.39	0.0240	83.69	0.0181	63.0	20.7
59.0	56.6	0.0012	4.41	0.0238	84.09	0.0181	64.0	20.1
60.0	56.0	0.0012	4.43	0.0235	84.49	0.0181	65.0	19.5
61.0	55.3	0.0012	4.45	0.0232	84.88	0.0180	66.0	18.8
62.0	54.6	0.0012	4.47	0.0229	85.26	0.0180	67.1	18.2
63.0	54.0	0.0012	4.49	0.0227	85.64	0.0180	68.1	17.5
64.0	53.4	0.0012	4.51	0.0224	86.01	0.0180	69.1	16.9
65.0	52.8	0.0012	4.53	0.0221	86.38	0.0180	70.2	16.2
90.0	41.6	0.0009	4.94	0.0174	94.23	0.0184	99.2	0.0
120.0	33.6	0.0007	5.32	0.0141	101.40	0.0148	106.7	0.0
150.0	28.4	0.0006	5.62	0.0119	107.16	0.0125	112.8	0.0
180.0	24.7	0.0005	5.87	0.0104	112.01	0.0109	117.9	0.0
210.0	22.0	0.0005	6.09	0.0092	116.22	0.0097	122.3	0.0
240.0	19.9	0.0004	6.29	0.0083	119.95	0.0088	126.2	0.0

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Area Drain Orifice Calculation
Stormwater Storage

86 Thomas Street, Mississauga
File No.: NT-19-013
Date: March 2021

Orifice Equation

Orifice Tube = 0.82
Orifice Tube Elevation =153.41

Storm Event	Orifice Coefficient	Head at Centroid (m)	Head Surface Ponding (m)	Total Head (m)	Diameter of Orifice (mm)	Maximum Area of Orifice (m^2)	Release Rate (L/s)
2 year	0.82	0.12	0.00	0.12	75.0	0.004	5.56
5 year	0.82	0.23	0.00	0.23	75.0	0.004	7.70
10 year	0.82	0.35	0.00	0.35	75.0	0.004	9.49
25 year	0.82	0.55	0.00	0.55	75.0	0.004	11.90
50 year	0.82	0.80	0.00	0.80	75.0	0.004	14.35
100 year	0.82	1.10	0.00	1.10	75.0	0.004	16.83

nexTrans ENGINEERING

Provided Storage

86 Thomas St.
File No. NT-19-013
Date: July 2021

100 year
Orifice Invert 153.41

Dia	Length	Volume
0.3	62.7	2.21
0.25	23.5	0.58

Head from Centroid 1.10

	Invert	Depth	Volume
STM MH 101	154.5	0.147	0.17
STM MH 102	154.3	0.347	0.39
STM CBMH101	153.61	1.037	1.17
CB 101	154.56	0.087	0.03
DCB 101	153.86	0.787	0.57
DCB 102	153.52	1.127	0.81

Required	36.2
Total Provided	44.56
Underground Pipe + MHs	4.56
Tank Provided	40

LID - INFILTRATION FACILITY CALCULATION

86 Thomas Street		
Mississauga, ON		
August 9, 2021	$D = \frac{PT}{1000}$	
File # NT-19-013		
Nextrans Engineering		
Prepared by: W.L.		
Checked by: G.R.	**Type of Development**	**Residential**

Unit Quantity Determination

1. Volume within GreenStorm	8.2	m^3
2. Percolation Rate *	7.5	mm/hr
3. Depth of Infiltration Bed	320.0	mm

Infiltration Facility Determination

1. Time to Infiltrate	42.7	hrs

* Percolation Rate from test on 80 Thomas St provided by Soils Engineers Ltd.

Stormceptor® EF Sizing Report

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION
STORMCEPTOR®

Date: 8/26/2019

Green cells require user input
Grey cells indicate optional user input
Blue cells indicate sizing results

Project Name:	80 Thomas St.
Project Number:	

User Contact Information		EOR Contact Information	
Name:	Brandon O'Leary	Name:	Wendy Li, P.Eng
Company:	Forterra	Company:	NexTrans Consulting Engineers
Email / Phone:	Brandon.Oleary@forterrapbp.com / 905-630-0359	Email / Phone:	wendyl@nextrans.ca

Drainage Area (ha):	0.164
% Imperviousness:	84
Runoff Coefficient 'c':	0.8
Particle Size Distribution:	FINE
Target TSS Removal (%):	80

Province:	Ontario	
City:	Mississauga	
Nearest Rainfall Station:	TORONTO CENTRAL	
NCDC Rainfall Station ID:	ON100	Years of Rainfall Data: 18

Require Hydrocarbon Spill Capture?	Yes
Upstream Flow Control?	No
Required Water Quality Runoff Volume Capture (%):	90
Estimated Water Quality Flow Rate (L/s):	2.1
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	91
EFO6	92
EFO8	93
EFO10	93
EFO12	93

Recommended Stormceptor EFO Model: EFO4
Estimated Net Annual Sediment (TSS) Load Reduction (%): 91
Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►Stormceptor® EF and Stormceptor® EFO are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

PERFORMANCE

►Stormceptor® EF and EFO remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

►The Canadian ETV PSD shown in the table below, or particle fractions within this PSD, were used for this sizing. This is the identical PSD that is referenced in the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

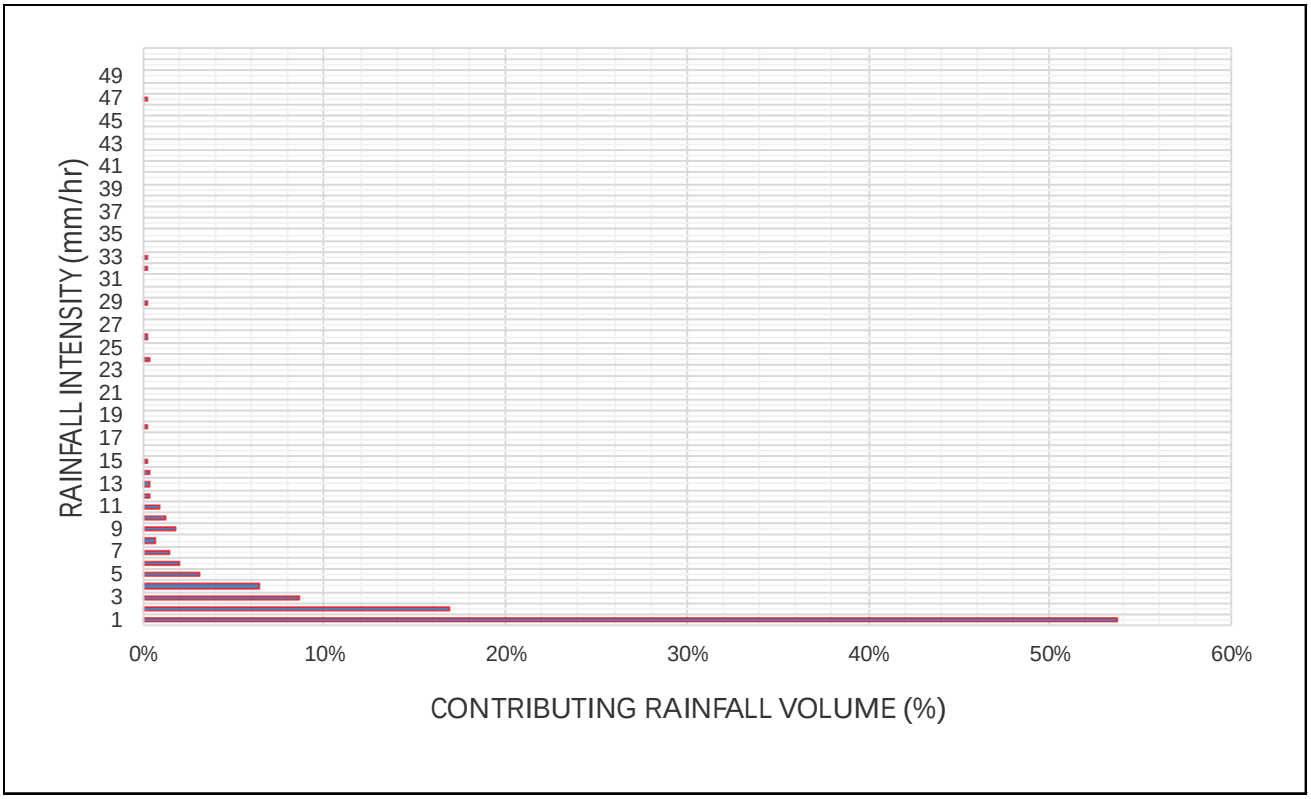
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

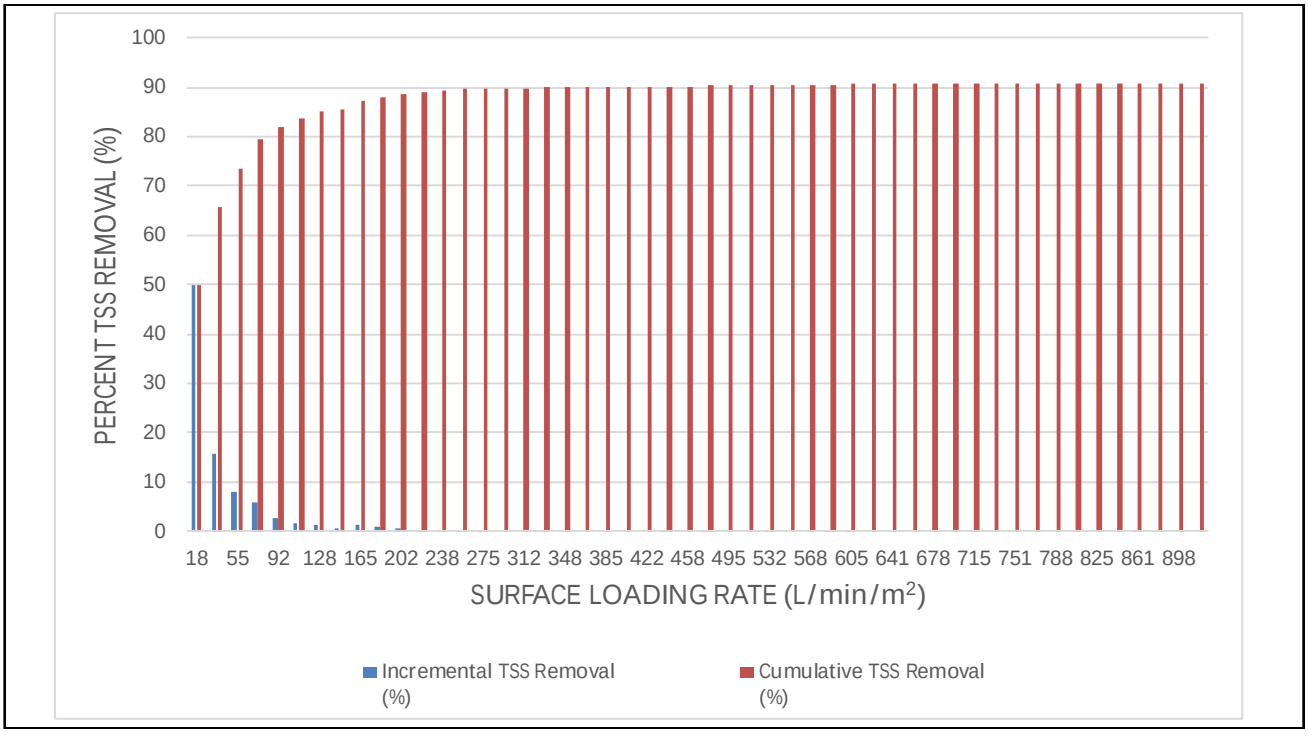
Rainfall Intensity (mm/hr)	Percent Rainfall Volume	Cumulative Rainfall Volume	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m^2)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1.0	53.7%	53.7%	0.37	22.0	18.3	93	49.9	49.9
2.0	16.9%	70.6%	0.73	44.0	36.7	93	15.7	65.7
3.0	8.6%	79.2%	1.10	66.0	55.0	92	7.9	73.6
4.0	6.4%	85.6%	1.47	88.0	73.3	90	5.8	79.3
5.0	3.1%	88.7%	1.83	110.0	91.6	88	2.7	82.1
6.0	2.0%	90.7%	2.20	132.0	110.0	86	1.7	83.8
7.0	1.5%	92.2%	2.57	154.0	128.3	85	1.3	85.0
8.0	0.7%	92.9%	2.93	175.9	146.6	83	0.6	85.6
9.0	1.8%	94.7%	3.30	197.9	165.0	80	1.4	87.1
10.0	1.3%	96.0%	3.67	219.9	183.3	78	1.0	88.1
11.0	0.9%	96.9%	4.03	241.9	201.6	76	0.7	88.8
12.0	0.4%	97.3%	4.40	263.9	219.9	74	0.3	89.1
13.0	0.4%	97.7%	4.77	285.9	238.3	73	0.3	89.4
14.0	0.4%	98.1%	5.13	307.9	256.6	72	0.3	89.6
15.0	0.2%	98.3%	5.50	329.9	274.9	70	0.1	89.8
16.0	0.0%	98.3%	5.86	351.9	293.2	68	0.0	89.8
17.0	0.0%	98.3%	6.23	373.9	311.6	66	0.0	89.8
18.0	0.2%	98.5%	6.60	395.9	329.9	64	0.1	89.9
19.0	0.0%	98.5%	6.96	417.9	348.2	63	0.0	89.9
20.0	0.0%	98.5%	7.33	439.9	366.6	62	0.0	89.9
21.0	0.0%	98.5%	7.70	461.9	384.9	60	0.0	89.9
22.0	0.0%	98.5%	8.06	483.9	403.2	58	0.0	89.9
23.0	0.0%	98.5%	8.43	505.9	421.5	57	0.0	89.9
24.0	0.4%	98.9%	8.80	527.8	439.9	57	0.2	90.1
25.0	0.0%	98.9%	9.16	549.8	458.2	57	0.0	90.1
26.0	0.2%	99.1%	9.53	571.8	476.5	56	0.1	90.2
27.0	0.0%	99.1%	9.90	593.8	494.9	55	0.0	90.2
28.0	0.0%	99.1%	10.26	615.8	513.2	55	0.0	90.2
29.0	0.2%	99.3%	10.63	637.8	531.5	54	0.1	90.4
30.0	0.0%	99.3%	11.00	659.8	549.8	54	0.0	90.4
31.0	0.0%	99.3%	11.36	681.8	568.2	53	0.0	90.4
32.0	0.2%	99.5%	11.73	703.8	586.5	53	0.1	90.5
33.0	0.2%	99.7%	12.10	725.8	604.8	52	0.1	90.6
34.0	0.0%	99.7%	12.46	747.8	623.2	52	0.0	90.6
35.0	0.0%	99.7%	12.83	769.8	641.5	52	0.0	90.6
36.0	0.0%	99.7%	13.20	791.8	659.8	52	0.0	90.6
37.0	0.0%	99.7%	13.56	813.8	678.1	52	0.0	90.6
38.0	0.0%	99.7%	13.93	835.8	696.5	52	0.0	90.6
39.0	0.0%	99.7%	14.30	857.7	714.8	51	0.0	90.6
40.0	0.0%	99.7%	14.66	879.7	733.1	51	0.0	90.6
41.0	0.0%	99.7%	15.03	901.7	751.4	51	0.0	90.6
42.0	0.0%	99.7%	15.40	923.7	769.8	51	0.0	90.6
43.0	0.0%	99.7%	15.76	945.7	788.1	51	0.0	90.6
44.0	0.0%	99.7%	16.13	967.7	806.4	51	0.0	90.6
45.0	0.0%	99.7%	16.50	989.7	824.8	51	0.0	90.6
46.0	0.0%	99.7%	16.86	1011.7	843.1	51	0.0	90.6
47.0	0.2%	99.9%	17.23	1033.7	861.4	51	0.1	90.7
48.0	0.0%	99.9%	17.59	1055.7	879.7	51	0.0	90.7
49.0	0.0%	99.9%	17.96	1077.7	898.1	51	0.0	90.7
50.0	0.0%	99.9%	18.33	1099.7	916.4	50	0.0	90.7
Estimated Net Annual Sediment (TSS) Load Reduction =								**91%**

Stormceptor® EF Sizing Report

RAINFALL DATA FROM THE TORONTO CENTRAL RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Table 1.1
Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Minimum Angle Inlet / Outlet Pipes	Maximum Inlet Pipe Diameter		Maximum Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90º	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90º	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90º	1,219	48	1,219	48	1,700	60
EF10 / EFO10	3.0	10	90º	1,828	72	1,828	72	2,830	100
EF12 / EFO12	3.6	12	90º	1,828	72	1,828	72	2,830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

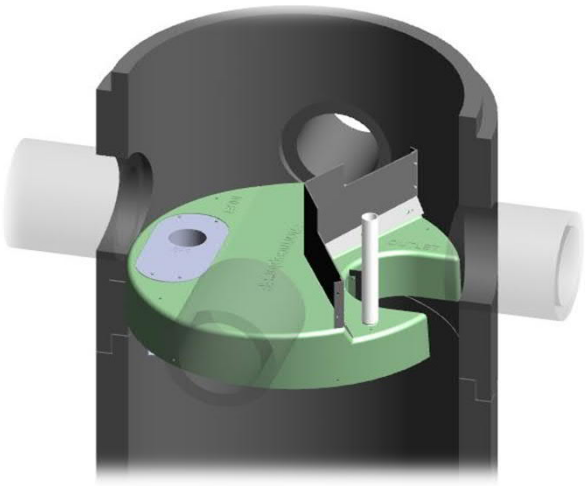
►Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators , and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

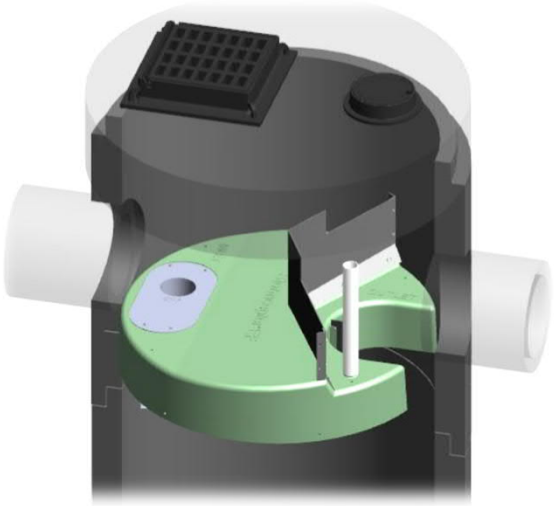
DESIGN FLEXIBILITY

►Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

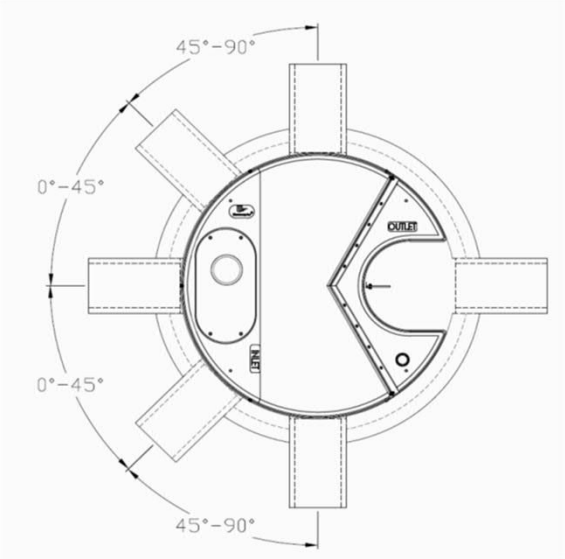
OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor® EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators . Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.





Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP – Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0^o – 45^o: The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45^o – 90^o: The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS
The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Table 1.2
Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	197	52	203	8	1,190	42	1,904	5,250
EF6 / EFO6	1.8	6	1.93	6.3	348	92	305	12	3,470	123	5,552	15,375
EF8 / EFO8	2.4	8	2.59	8.5	545	144	610	24	8,780	310	14,048	38,750
EF10 / EFO10	3.0	10	3.25	10.7	874	231	610	24	17,790	628	28,464	78,500
EF12 / EFO12	3.6	12	3.89	12.8	1,219	322	610	24	31,220	1,103	49,952	137,875
						* Increased sump depth may be added to increase sediment storage capacity						
						** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)						

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS
For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION
For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

86 THOMAS STREET,MISSISSAUGA

DRAWING INDEX

PROJECT INFORMATION			
SITE CONTACT	PHIL ALLEN	416-286-5990	PHILALLEN@STORMCON.CA
ENGINEER / TECHNICAL SPECIALIST	PARTH PUSHKARNA	647-278-7339	PARTHP@STORMCON.CA
SALES REP:	GREG DZIEWIECKI	437-231-6080	GREGD@STORMCON.CA
	PARTH PUSHKARNA	647-278-7339	PARTHP@STORMCON.CA
PROJECT NO:	21-114.00		

COMMENTS:	REVISION	DATE	COMMENT	BY

GENERAL NOTES

1. COORDINATE WITH MANUFACTURER'S REPRESENTATIVE/DISTRIBUTOR FOR PRE-CONSTRUCTION MEETING AND SITE INSPECTION DURING INSTALLATION.
2. ENGINEERING DRAWINGS SUPERSEDE ALL PROVIDED DOCUMENTATION. REFER TO SITE ENGINEERS FOR ADDITIONAL INSTRUCTIONS.
3. COORDINATE GREENSTORM INSTALLATION ACTIVITIES WITH OTHER SITE ACTIVITIES
4. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE
5. THE SUB-GRADE AND SIDE BACKFILL TO BE COMPACTED TO 95% SPD OR AS DIRECTED BY THE QUALIFIED ENGINEER.
6. CONFIRM GEOTECHNICAL SOIL EVALUATION BY A QUALIFIED ENGINEER TO DETERMINE SUITABILITY OF STRUCTURAL INSTALLATION
7. CONFIRM FOR BURIED UNDERGROUND UTILITIES INCLUDING GAS, ELECTRICAL, PIPELINES OR CONDUITS
8. WHEN INSTALLED IN CONFORMANCE TO THE INSTALLATION GUIDELINES, GREENSTORM-ST CAN HANDLE STANDARD CL-625 TRUCK LOADING. FOR NON-STANDARD LOADS CONTACT MANUFACTURER'S REPRESENTATIVE/DISTRIBUTOR
9. PROTECT THE INSTALLATION AGAINST DAMAGE WITH CONSTRUCTION TAPE, FENCING OR OTHER MEANS TILL THE CONSTRUCTION IS COMPLETE.
10. ENSURE THAT CONSTRUCTION FOLLOWS APPLICABLE FEDERAL, PROVINCIAL, LOCAL, MUNICIPAL AND LOCAL LAWS, ORDNANCES, REGULATIONS AND SAFETY REQUIREMENTS.
11. VEHICULAR LOADING IS PROHIBITED UNTIL BACKFILLED AS PER MANUFACTURER'S INSTALLATION GUIDELINES. THE USE OF EQUIPMENT OVER GREENSTORM CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
    - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE CONSTRUCTION GUIDE.
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE CONSTRUCTION GUIDE.
    - FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

CHECK - REQUIRED MATERIALS AND EQUIPMENT

10. ALL GREENSTORM CHAMBERS AND ACCESSORIES AS SPECIFIED IN THE ENGINEER'S PLANS INCLUDING NON-WOVEN GEOTEXTILE, CONNECTORS, QUADS, SIDEWALLSADAPTER, RISER AND LINER WHERE APPLICABLE.
11. RECIPROCATING SAW OR ROUTER
12. TRANSIT OR LASER LEVEL MEASURING DEVICE
13. COMPACTION EQUIPMENT WITH MAXIMUM GROSS VEHICLE WEIGHT OF 12,000 LBS (5,440 KGS).
14. ACCEPTABLE FILL MATERIAL AS SHOWN IN INSTALLATION INSTRUCTIONS.
15. QUANTITIES FOR GEOSYNTHETIC ARE APPROXIMATE AND MAY VARY BASED ON OVERLAP, WASTAGE.
16. CHECK GREENSTORM CHAMBERS FOR DAMAGE PRIOR TO INSTALLATION. DO NOT USE DAMAGED CHAMBERS, CONTACT YOUR SUPPLIER IMMEDIATELY TO REPORT DAMAGE OR PACKING-LIST DISCREPANCIES.

NOTES FOR BIDDING AND INSTALLATIONS

1. CONTRACTORS ARE EXPECTED TO COMPREHEND AND USE THE MOST CURRENT INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING A SYSTEM INSTALLATION. FOR THE MOST CURRENT INSTRUCTIONS, CONTACT STORMCON AT (647) 463-9803 OR VISIT WWW.STORMCON.CA.
2. CONTACT STORMCON AT LEAST TWO WEEKS PRIOR TO SYSTEM INSTALLATION TO ARRANGE FOR A PRE-CONSTRUCTION MEETING.
3. USE GREENSTORM INSTALLATION INSTRUCTIONS AS A GUIDELINE ONLY FOR MINIMUM/MAXIMUM REQUIREMENTS. ACTUAL DESIGN MAY VARY. REFER TO APPROVED CONSTRUCTION DRAWINGS FOR JOB-SPECIFIC DETAILS. ENGINEERING DRAWINGS SUPERSEDE ALL PROVIDED DOCUMENTATION.
4. THE FOUNDATION STONE SHALL BE LEVEL AND COMPACTED PRIOR TO CHAMBER INSTALLATION.
5. ANY DISCREPANCIES WITH THE SYSTEM SUB-GRADE SOIL'S BEARING CAPACITY MUST BE REPORTED TO THE GEOTECHNICAL ENGINEER.
6. CONTRACTOR TO REFER TO GREENSTORM INSTALLATION INSTRUCTIONS CONCERNING VEHICULAR TRAFFIC. RESPONSIBILITY FOR PREVENTING VEHICLES THAT EXCEED REQUIREMENTS SPECIFIED FROM TRAVELING ACROSS OR PARKING OVER THE CHAMBER SYSTEM LIES SOLELY WITH THE CONTRACTOR THROUGHOUT THE ENTIRE SITE CONSTRUCTION PROCESS. THE PLACEMENT OF WARNING TAPE, TEMPORARY FENCING, AND/OR APPROPRIATELY LOCATED SIGNS IS HIGHLY RECOMMENDED.
7. TRAFFIC OF INSTALLATION EQUIPMENT OR OTHER VEHICULAR TRAFFIC OVER TOP OF THE GREENSTORM STORMWATER SYSTEM IS STRICTLY RESTRICTED AND PROHIBITED UNTIL SATISFACTORY COVER AND COMPACTION IS ACHIEVED ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
8. EROSION AND SEDIMENT-CONTROL MEASURES MUST MEET LOCAL CODES AND THE DESIGN ENGINEER'S SPECIFICATIONS THROUGHOUT THE ENTIRE SITE CONSTRUCTION PROCESS.
9. GREENSTORM SYSTEMS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH STORMCON'S MINIMUM REQUIREMENTS. FAILURE TO DO SO WILL VOID THE LIMITED WARRANTY.

STORMCON

10 CEDAR AVE
THORNHILL ON
L3T 3W1

SALES@STORMCON.CA
www.STORMCON.CA

NOTE: THESE SHOP DRAWINGS MAY CONTAIN COMPONENTS INCLUDING BUT NOT LIMITED TO MANHOLES, CATCH BASINS, STORM PIPES AND FITTINGS, MANIFOLDS, CASTINGS AND OTHER NECESSARY APPURTENANCES THAT MAY NOT BE SUPPLIED BY STORMCON. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR SUPPLIER TO CONFIRM THE MATERIALS PROVIDED.

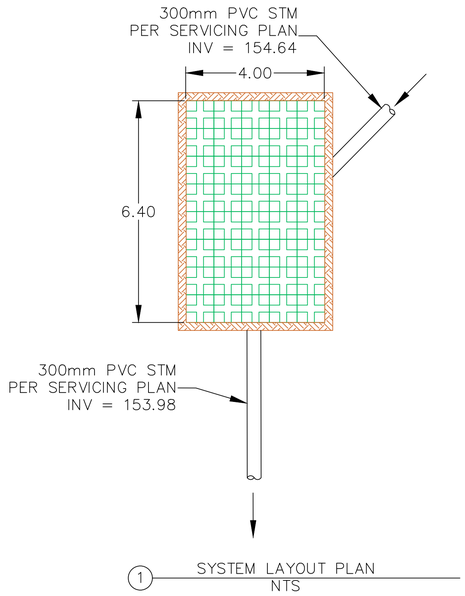
PROPOSED SYSTEM ELEVATIONS

(TO BE APPROVED BY ENGINEER)
***ENGINEER TO CONFIRM MINIMUM AND MAXIMUM BURIAL REQUIREMENTS ARE MET**

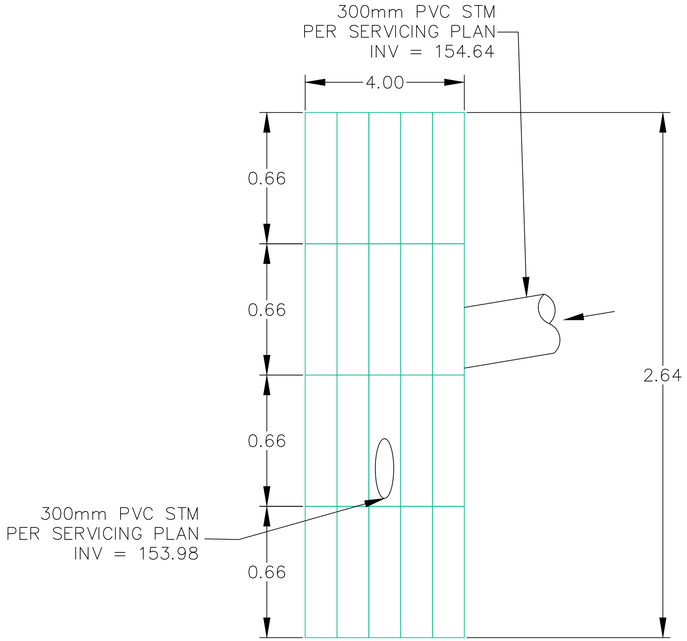
159.28	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):
156.72	MINIMUM ALLOWABLE GRADE
155.92	GREENSTORM STORAGE TOP ELEVATION LEVEL 4
155.26	GREENSTORM STORAGE TOP ELEVATION LEVEL 3
154.60	GREENSTORM STORAGE TOP ELEVATION LEVEL 2
153.94	GREENSTORM STORAGE TOP ELEVATION LEVEL 1
153.28	GREENSTORM STORAGE BOTTOM ELEVATION
153.18	BOTTOM OF EXCAVATION

GREENSTORM STORMWATER MANAGEMENT SYSTEM

TOTAL STORAGE PROVIDED: 64.88m^3
ACTIVE STORAGE ABOVE INVERT 153.98: 47.68m^3
DEAD STORAGE BELOW INVERT 153.98: 17.20m^3
STORAGE VOID RATIO: 0.96
SYSTEM AREA: 25.60 m^2
DEPTH OF EMBEDMENT STONE: 0.00m
DEPTH OF BEDDING STONE: 0.00 m
STONE PERIMETER: 0.00 m



1 SYSTEM LAYOUT PLAN
NTS



BOTTOM OF GREENSTORM 153.28
GREENSTORM TANK VOLUME = 64.88 m3

2 4 LAYER –SYSTEM LAYOUT PROFILE
NTS

NOTE:*ALL EXTERNAL SYSTEM STRUCTURES, INLET/OUTLET PIPES, AND PROPOSED ELEVATIONS MUST BE DESIGNED AND APPROVED BY PROJECT ENGINEER OF RECORD. PROJECT ENGINEER OF RECORD MUST ENSURE CHAMBER BURIAL REQUIREMENTS ARE MET.

MATERIALS LIST SUPPLIED BY STORMCON (SYSTEM MATERIALS LIST - SEE COVER SHEET FOR COMBINED PROJECT MATERIALS LIST)		
GREENSTORM-ST 80x80x66 cm	160	BLOCKS
GREENSTORM-ST 80x80x33 cm (HALF BLOCK)	0	BLOCKS
MULTI LAYER-CONNECTOR	320	PIECES
SINGLE LAYER-CONNECTOR	0	PIECES
SIDEWALL GRID	104	PIECES
ADAPTER	0	PIECES
3 LAYER QUADRO-CONTROL	0	PIECES
EXTENSION PIPE (6m LENGTH)	0	METER
CAST IRON COVER	0	PIECES
4 OZ NON-WOVEN GEOTEXTILE	140	SQ. METERS
8 OZ NON-WOVEN GEOTEXTILE	0	SQ. METERS
30MIL PVC IMPERMEABLE LINER	0	SQ. METERS
GREENSTORM TREATMENT ROW	0	METER
50MM SUBDRAIN	0	METER

GREENSTORM LEGEND

GREENSTORM ST BLOCK

4 OZ NON-WOVEN GEOTEXTILE

STORMCON
10 CEDAR AVE
THORNHILL ON
L3T 3W1
SALES@STORMCON.CA
www.STORMCON.CA

86 THOMAS STREET, MISSISSAUGA

SYSTEM LAYOUT SHEET STORAGE TANK

GREENSTORM STORMWATER CHAMBER

PROJECT NO:	21-114.00	DATE:	08/10/2021
DESIGNED BY:	VS	CHECKED BY:	VS
SCALE:	N.T.S.	SHEET NO:	2 OF 5

Project Name	86 Thomas St R3					
Location	Mississauga, ON					
Date	Tuesday, August 10, 2021					
Chamber Model	**GreenStorm-ST**					
Number of Layers	4.0		Top Stone	0.00	m	
Height of Chambers	2.64	m	Bottom Stone	0.00	m	
Chamber Length	6.40		Perimeter Stone	0.00	m	
Chamber Width	4.00		Stone Qty	0.00	m^3	
Storage Void Ratio	0.96		Stone Void Ratio	40.00%		
System Perimeter	20.80					
System Area	25.60	m^2	Liner	No		
System Base Elevation	153.28	m				

Height of System		GreenStorm Volume		Stone Volume		Cumulative Storage Volume		Elevation		
mm	in	m^3	ft^3	m^3	ft^3	m^3	ft^3	m	ft	
2640	103.94	0.98	34.72	0.00	0.00	64.88	2,291.24	155.92	511.55	Top of GreenStorm
2600	102.36	0.61	21.70	0.00	0.00	63.90	2,256.52	155.88	511.42	
2575	101.38	0.61	21.70	0.00	0.00	63.28	2,234.83	155.86	511.34	
2550	100.39	0.61	21.70	0.00	0.00	62.67	2,213.13	155.83	511.25	
2525	99.41	0.61	21.70	0.00	0.00	62.05	2,191.43	155.81	511.17	
2500	98.43	0.61	21.70	0.00	0.00	61.44	2,169.73	155.78	511.09	
2475	97.44	0.61	21.70	0.00	0.00	60.83	2,148.04	155.76	511.01	
2450	96.46	0.61	21.70	0.00	0.00	60.21	2,126.34	155.73	510.93	
2425	95.47	0.61	21.70	0.00	0.00	59.60	2,104.64	155.71	510.84	
2400	94.49	0.61	21.70	0.00	0.00	58.98	2,082.94	155.68	510.76	
2375	93.50	0.61	21.70	0.00	0.00	58.37	2,061.25	155.66	510.68	
2350	92.52	0.61	21.70	0.00	0.00	57.75	2,039.55	155.63	510.60	
2325	91.54	0.61	21.70	0.00	0.00	57.14	2,017.85	155.61	510.52	
2300	90.55	0.61	21.70	0.00	0.00	56.52	1,996.15	155.58	510.43	
2275	89.57	0.61	21.70	0.00	0.00	55.91	1,974.46	155.56	510.35	
2250	88.58	0.61	21.70	0.00	0.00	55.30	1,952.76	155.53	510.27	
2225	87.60	0.61	21.70	0.00	0.00	54.68	1,931.06	155.51	510.19	
2200	86.61	0.61	21.70	0.00	0.00	54.07	1,909.37	155.48	510.10	
2175	85.63	0.61	21.70	0.00	0.00	53.45	1,887.67	155.46	510.02	
2150	84.65	0.61	21.70	0.00	0.00	52.84	1,865.97	155.43	509.94	
2125	83.66	0.61	21.70	0.00	0.00	52.22	1,844.27	155.41	509.86	
2100	82.68	0.61	21.70	0.00	0.00	51.61	1,822.58	155.38	509.78	
2075	81.69	0.61	21.70	0.00	0.00	51.00	1,800.88	155.36	509.69	
2050	80.71	0.61	21.70	0.00	0.00	50.38	1,779.18	155.33	509.61	
2025	79.72	0.61	21.70	0.00	0.00	49.77	1,757.48	155.31	509.53	
2000	78.74	0.61	21.70	0.00	0.00	49.15	1,735.79	155.28	509.45	
1975	77.76	0.61	21.70	0.00	0.00	48.54	1,714.09	155.26	509.37	
1950	76.77	0.61	21.70	0.00	0.00	47.92	1,692.39	155.23	509.28	
1925	75.79	0.61	21.70	0.00	0.00	47.31	1,670.69	155.21	509.20	
1900	74.80	0.61	21.70	0.00	0.00	46.69	1,649.00	155.18	509.12	
1875	73.82	0.61	21.70	0.00	0.00	46.08	1,627.30	155.16	509.04	
1850	72.83	0.61	21.70	0.00	0.00	45.47	1,605.60	155.13	508.96	
1825	71.85	0.61	21.70	0.00	0.00	44.85	1,583.91	155.11	508.87	
1800	70.87	0.61	21.70	0.00	0.00	44.24	1,562.21	155.08	508.79	
1775	69.88	0.61	21.70	0.00	0.00	43.62	1,540.51	155.06	508.71	
1750	68.90	0.61	21.70	0.00	0.00	43.01	1,518.81	155.03	508.63	
1725	67.91	0.61	21.70	0.00	0.00	42.39	1,497.12	155.01	508.55	
1700	66.93	0.61	21.70	0.00	0.00	41.78	1,475.42	154.98	508.46	
1675	65.94	0.61	21.70	0.00	0.00	41.16	1,453.72	154.96	508.38	
1650	64.96	0.61	21.70	0.00	0.00	40.55	1,432.02	154.93	508.30	
1625	63.98	0.61	21.70	0.00	0.00	39.94	1,410.33	154.91	508.22	
1600	62.99	0.61	21.70	0.00	0.00	39.32	1,388.63	154.88	508.14	
1575	62.01	0.61	21.70	0.00	0.00	38.71	1,366.93	154.86	508.05	
1550	61.02	0.61	21.70	0.00	0.00	38.09	1,345.23	154.83	507.97	
1525	60.04	0.61	21.70	0.00	0.00	37.48	1,323.54	154.81	507.89	
1500	59.06	0.61	21.70	0.00	0.00	36.86	1,301.84	154.78	507.81	
1475	58.07	0.61	21.70	0.00	0.00	36.25	1,280.14	154.76	507.73	
1450	57.09	0.61	21.70	0.00	0.00	35.64	1,258.45	154.73	507.64	
1425	56.10	0.61	21.70	0.00	0.00	35.02	1,236.75	154.71	507.56	

Height of System		GreenStorm Volume		Stone Volume		Cumulative Storage Volume		Elevation		
mm	in	m^3	ft^3	m^3	ft^3	m^3	ft^3	m	ft	
1400	55.12	0.61	21.70	0.00	0.00	34.41	1,215.05	154.68	507.48	
1375	54.13	0.61	21.70	0.00	0.00	33.79	1,193.35	154.66	507.40	
1350	53.15	0.61	21.70	0.00	0.00	33.18	1,171.66	154.63	507.32	
1325	52.17	0.61	21.70	0.00	0.00	32.56	1,149.96	154.61	507.23	
1300	51.18	0.61	21.70	0.00	0.00	31.95	1,128.26	154.58	507.15	
1275	50.20	0.61	21.70	0.00	0.00	31.33	1,106.56	154.56	507.07	
1250	49.21	0.61	21.70	0.00	0.00	30.72	1,084.87	154.53	506.99	
1225	48.23	0.61	21.70	0.00	0.00	30.11	1,063.17	154.51	506.91	
1200	47.24	0.61	21.70	0.00	0.00	29.49	1,041.47	154.48	506.82	
1175	46.26	0.61	21.70	0.00	0.00	28.88	1,019.77	154.46	506.74	
1150	45.28	0.61	21.70	0.00	0.00	28.26	998.08	154.43	506.66	
1125	44.29	0.61	21.70	0.00	0.00	27.65	976.38	154.41	506.58	
1100	43.31	0.61	21.70	0.00	0.00	27.03	954.68	154.38	506.50	
1075	42.32	0.61	21.70	0.00	0.00	26.42	932.99	154.36	506.41	
1050	41.34	0.61	21.70	0.00	0.00	25.80	911.29	154.33	506.33	
1025	40.35	0.61	21.70	0.00	0.00	25.19	889.59	154.31	506.25	
1000	39.37	0.61	21.70	0.00	0.00	24.58	867.89	154.28	506.17	
975	38.39	0.61	21.70	0.00	0.00	23.96	846.20	154.26	506.09	
950	37.40	0.61	21.70	0.00	0.00	23.35	824.50	154.23	506.00	
925	36.42	0.61	21.70	0.00	0.00	22.73	802.80	154.21	505.92	
900	35.43	0.61	21.70	0.00	0.00	22.12	781.10	154.18	505.84	
875	34.45	0.61	21.70	0.00	0.00	21.50	759.41	154.16	505.76	
850	33.46	0.61	21.70	0.00	0.00	20.89	737.71	154.13	505.68	
825	32.48	0.61	21.70	0.00	0.00	20.28	716.01	154.11	505.59	
800	31.50	0.61	21.70	0.00	0.00	19.66	694.31	154.08	505.51	
775	30.51	0.61	21.70	0.00	0.00	19.05	672.62	154.06	505.43	
750	29.53	0.61	21.70	0.00	0.00	18.43	650.92	154.03	505.35	
725	28.54	0.61	21.70	0.00	0.00	17.82	629.22	154.01	505.27	
700	27.56	0.61	21.70	0.00	0.00	17.20	607.53	153.98	505.18	
675	26.57	0.61	21.70	0.00	0.00	16.59	585.83	153.96	505.10	
650	25.59	0.61	21.70	0.00	0.00	15.97	564.13	153.93	505.02	
625	24.61	0.61	21.70	0.00	0.00	15.36	542.43	153.91	504.94	
600	23.62	0.61	21.70	0.00	0.00	14.75	520.74	153.88	504.86	
575	22.64	0.61	21.70	0.00	0.00	14.13	499.04	153.86	504.77	
550	21.65	0.61	21.70	0.00	0.00	13.52	477.34	153.83	504.69	
525	20.67	0.61	21.70	0.00	0.00	12.90	455.64	153.81	504.61	
500	19.69	0.61	21.70	0.00	0.00	12.29	433.95	153.78	504.53	
475	18.70	0.61	21.70	0.00	0.00	11.67	412.25	153.76	504.45	
450	17.72	0.61	21.70	0.00	0.00	11.06	390.55	153.73	504.36	
425	16.73	0.61	21.70	0.00	0.00	10.44	368.85	153.71	504.28	
400	15.75	0.61	21.70	0.00	0.00	9.83	347.16	153.68	504.20	
375	14.76	0.61	21.70	0.00	0.00	9.22	325.46	153.66	504.12	
350	13.78	0.61	21.70	0.00	0.00	8.60	303.76	153.63	504.04	
325	12.80	0.61	21.70	0.00	0.00	7.99	282.07	153.61	503.95	
300	11.81	0.61	21.70	0.00	0.00	7.37	260.37	153.58	503.87	
275	10.83	0.61	21.70	0.00	0.00	6.76	238.67	153.56	503.79	
250	9.84	0.61	21.70	0.00	0.00	6.14	216.97	153.53	503.71	
225	8.86	0.61	21.70	0.00	0.00	5.53	195.28	153.51	503.63	
200	7.87	0.61	21.70	0.00	0.00	4.92	173.58	153.48	503.54	
175	6.89	0.61	21.70	0.00	0.00	4.30	151.88	153.46	503.46	
150	5.91	0.61	21.70	0.00	0.00	3.69	130.18	153.43	503.38	
125	4.92	0.61	21.70	0.00	0.00	3.07	108.49	153.41	503.30	
100	3.94	0.61	21.70	0.00	0.00	2.46	86.79	153.38	503.22	
75	2.95	0.61	21.70	0.00	0.00	1.84	65.09	153.36	503.13	
50	1.97	0.61	21.70	0.00	0.00	1.23	43.39	153.33	503.05	
25	0.98	0.61	21.70	0.00	0.00	0.61	21.70	153.31	502.97	
0	0.00	0.00	0.00	0.26	9.04	0.00	0.00	153.28	502.89	System Bottom

4.0-LAYER GREENSTORM CALCULATION SHEET (SYSTEM STAGE-STORAGE TABLE)

STORMCON
10 CEDAR AVE
THORNHILL ON
L3T 3W1

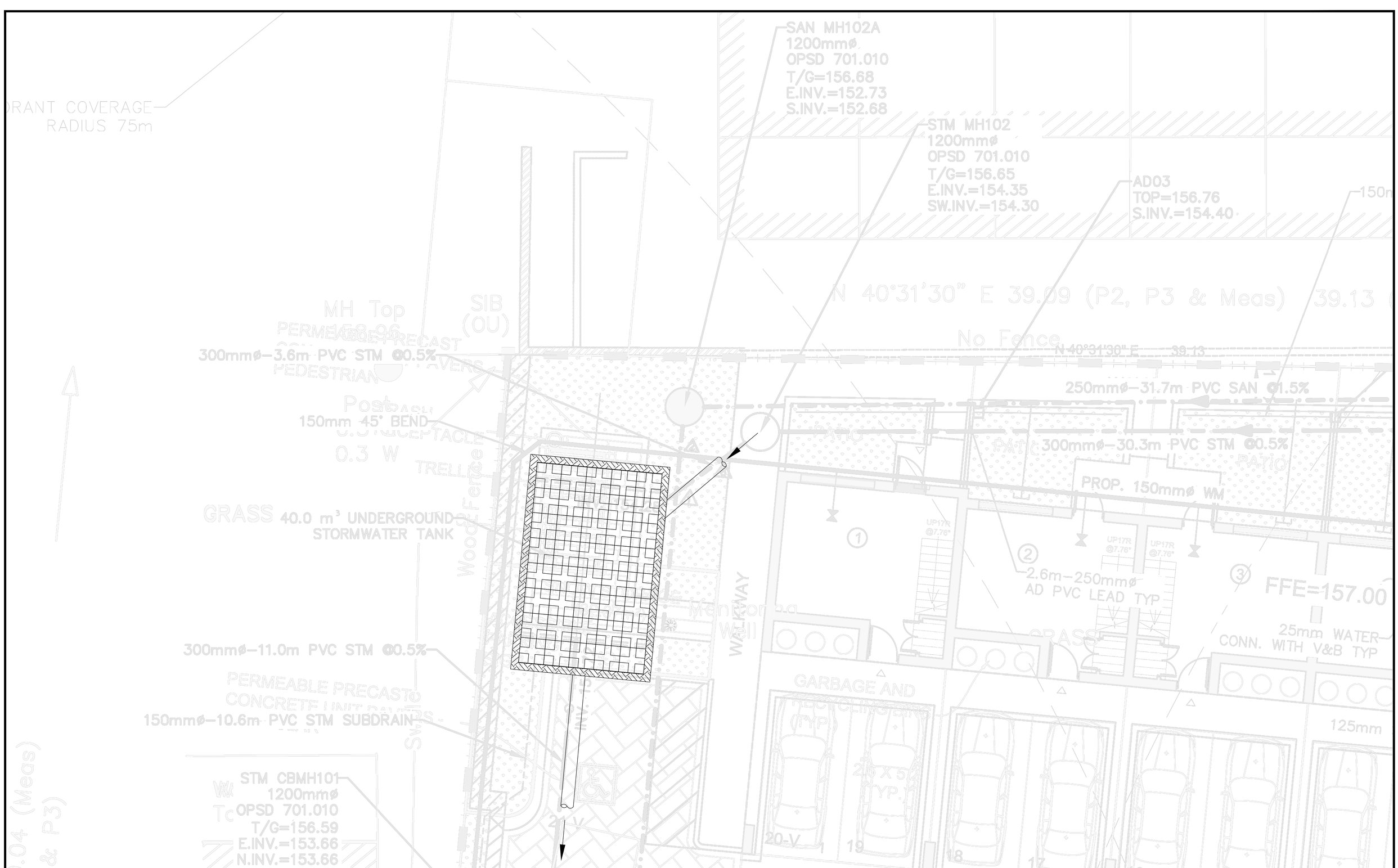
SALES@STORMCON.CA
www.STORMCON.CA

86 THOMAS STREET, MISSISSAUGA

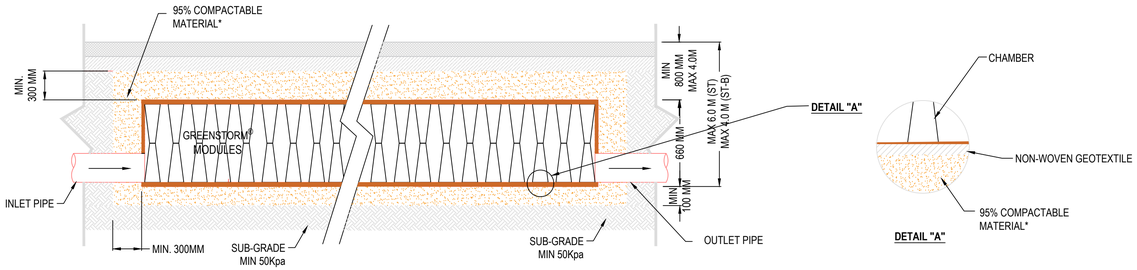
SYSTEM CALCULATION SHEET

GREENSTORM STORMWATER CHAMBER

PROJECT NO:	21-114.00	DATE:	08/10/2021
DESIGNED BY:	VS	CHECKED BY:	VS
SCALE:	N.T.S.	SHEET NO:	3 OF 5



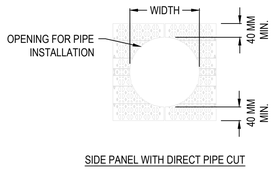
STORMCON	10 CEDAR AVE THORNHILL ON L3T 3W1	SALES@STORMCON.CA www.STORMCON.CA	THIS DRAWING WAS PREPARED TO SUPPORT THE PROJECT ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE ULTIMATE RESPONSIBILITY OF THE PROJECT ENGINEER OF RECORD TO ENSURE THAT THE GREENSTORM SYSTEM'S DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IT IS THE CONTRACTOR OF RECORD'S RESPONSIBILITY TO ENSURE THAT THE STORMCON PRODUCTS ARE DESIGNED IN ACCORDANCE WITH STORMCONS MINIMUM REQUIREMENTS. STORMCON DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS.	86 THOMAS STREET, MISSISSAUGA SYSTEM OVERLAY SHEET	GREENSTORM STORMWATER CHAMBER	
				PROJECT NO: 21-114.00	DATE: 08/10/2021
				DESIGNED BY: VS	CHECKED BY: VS
				SCALE: N.T.S.	SHEET NO: 4 OF 5



*COMPACTABLE MATERIAL LIST	LEGEND
• SAND	4 OZ NON-WOVEN GEOTEXTILE

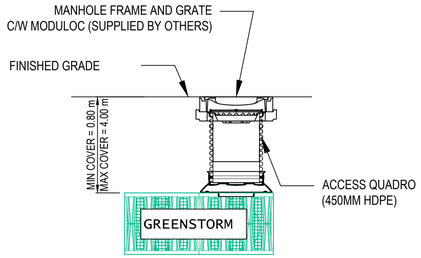
TYPICAL ONE LAYER GREENSTORM CROSS SECTION

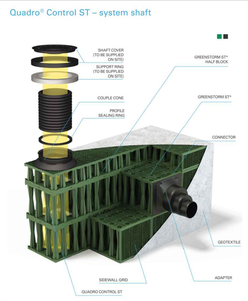
FULL CONNECTION OPTIONS
Dia 100mm, 150 mm, 200 mm, 250 mm, 300 mm AND 375 mm



SIDE PANEL WITH DIRECT PIPE CUT

STANDARD SIDE PANEL WITH DIRECT PIPE CUT

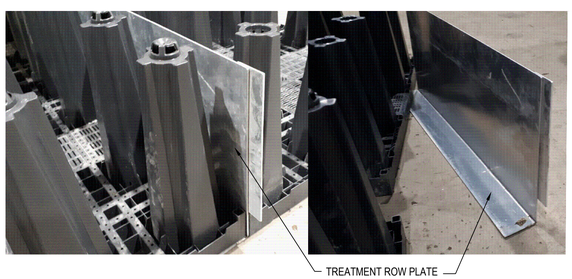




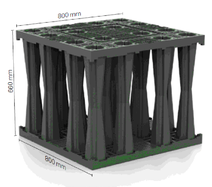
GREENSTORM ACCESS QUADRO DETAIL(WHERE APPLICABLE)

ADAPTER PANEL WITH DIA 450 AND 525

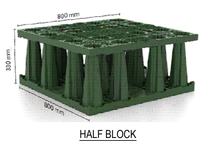
STANDARD ADAPTER PANEL WITH DIA 450 AND 525



STANDARD TREATMENT ROW DETAIL(WHERE APPLICABLE)



FULL BLOCK



HALF BLOCK

STANDARD GREENSTORM BLOCK DETAIL

STORMCON
10 CEDAR AVE
THORNHILL ON
L3T 3W1
SALES@STORMCON.CA
www.STORMCON.CA

DETAILS

GREENSTORM STORMWATER CHAMBER

PROJECT NO:	21-114.00	DATE:	08/10/2021
DESIGNED BY:	VS	CHECKED BY:	VS
SCALE:	N.T.S.	SHEET NO:	5 OF 5