TRAFALGAR ENGINEERING

FUNCTIONAL SERVICING REPORT

Water, Sanitary, and Stormwater Management

PROPOSED 3-STOREY MULTI-RESIDENTIAL DEVELOPMENT

2169 & 2175 GHENT AVENUE
CITY OF BURLINGTON

OUR FILE: 1839

PREPARED FOR RYAN SMALL

September 2024

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REVISION HISTORY

DATE	REVISION	SUBMISSION
2024-09-27	1	Issued for OPA/ZBA

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1.0 INTRODUCTION

1.1 Scope of Functional Servicing Report

This report has been prepared in support of the Rezoning By-law Amendment and Official Plan Amendment applications of a multi-residential development located at 2169 and 2175 Ghent Avenue in the City of Burlington. This report discusses how the proposed development of the property can be serviced for water, wastewater, and stormwater. This report may be updated and refined as the project moves through the ZBA/OPA approval process to support the Site Plan Application and Building Permit stages. A copy of the Site Plan is included in Appendix 'A' for reference.

For the purpose of this report, north is defined as running perpendicular to Ghent Avenue.

1.2 Existing Condition

The subject lands are approximately 1754 m^2 and are comprised of 2169 and 215 Ghent Avenue. Each lot contains a single family, two-storey residential dwelling fronting onto Ghent Avenue. The west lot, 2169 Ghent, features an asphalt driveway while the east lot, 2175 Ghent Avenue, features a gravel driveway. Low density residential exists to the north and east of the subject lands, while medium density residential exists to the west and south. The sidewalk adjacent to the property is curb facing, with no boulevard.

1.3 Proposed Condition

The site plan proposes two, three-storey, six-unit residential buildings with an associated parking lot fronting Ghent Avenue. The proposed development features a courtyard between the two buildings which is where each buildings primary access is located. Each building has a secondary access at their rear. There is a garbage enclosure and bicycle parking adjacent the parking lot. There is an outdoor amenity area at the rear of the property behind the second building.

2.0 MUNICIPAL WATER AND WASTEWATER

The location of existing services was determined through the review of record drawings provided by the City of Burlington, Region of Halton, and a topographic survey completed by MacKay, MacKay & Peters Ltd.

All proposed services must be in accordance with the Ontario Building code, City of Burlington, and Region of Halton standards and requirements. Proposed servicing can be found on the Servicing drawing, S1, included in Appendix 'E'. Existing and proposed servicing is discussed in further detail in the following sections.

2.1 Water

Development of the subject site will require adequately sized water services that comply with the Ontario Building Code (OBC) and Region of Halton Standards.

Plans obtained from the Region of Halton and the City of Burlington indicate there is an existing 250 mm ø watermain that runs along Ghent Avenue. Both the existing residential houses are serviced off this watermain.

Per the Region of Halton standards for townhouses, maisonettes (6 storey apartment or less), the equivalent population is estimated using a population density of 135 persons/ha. Based on that population density the development would have an equivalent population of 24 persons. The estimated water demand is determined with 24 persons and 275 L/cap/day. See Appendix 'B' for supporting calculations.

The fire flow was estimated for demand purposes only using the Fire Underwriters Survey methodology. Fire flows should be confirmed at the building permit stage by the sprinkler consultant.

Table 1: Estimated Water Demands (L/min)

Average Daily Demand	5
Minimum Hourly Demand	5
Maximum Hourly Demand	18
Maximum Daily Demand	10
Estimated Fire Demand (FUS 1999)	6000
Maximum Daily Plus Fire Demand	6010

A fire flow test was undertaken to confirm adequate firefighting flows. This test was conducted using the fire hydrants at 2161 Ghent Avenue and 2189 Ghent Avenue. The results of the flow test are included in Appendix 'B' and summarized as follows:

Table 2: Fire Hydrant Flow Test Summary (psig)

Static Pressure	60
Flow 1, 1138 usgpm (72 L/s)	56
Flow 2, 1776 usgpm (112 L/s)	54
Theoretical Flow 3946 usgpm (555 L/s)	20
Estimated Max. Daily Plus Fire Service Pressure	53

The proposed development is not proposed to be sprinklered and thus will not have a fire service and will instead be protected by the fire hydrant located at 2189 Ghent Avenue. The subject lands fall entirely within a 90 m radius of this hydrant.

2.2 Wastewater

Record drawings indicate there is a 250 mm ø sanitary sewer running east to west within Ghent Avenue in front of the subject lands. This sewer originates at a manhole approximately 5 m east of the eastern property line of the subject lands and connects to the trunk sewer on Brant Street. Both the existing residential dwellings are serviced of this sewer. We are not aware of any capacity concerns on the Brant Street trunk sanitary sewer at this time.

2.2.1 Estimated Flows

Using the Region of Halton design criteria for single family homes of 55 persons/ha, the estimated existing sanitary flow is determined with 10 persons and 275 L/cap.day (See Appendix 'C' for supporting Calculations).

Table 3: Estimated Existing Wastewater Flow (L/s)

Average Daily Dry Weather Flow	0.03
Modified Harmon Peaking Factor	4.42
Infiltration Allowance (0.286L/s-ha)	0.05
Peak Daily Flow	0.19

Using the Region of Halton design criteria for townhouses and maisonettes (6 storey apartments or less) of 135 persons/ha, the estimated proposed sanitary flow is determined with 24 persons and 275 L/cap.day (See Appendix 'C' for supporting Calculations).

Table 4: Estimated Proposed Wastewater Flow (L/s)

Average Daily Dry Weather Flow	0.08
Modified Harmon Peaking Factor	4.37
Infiltration Allowance (0.26L/s-ha)	0.05
Peak Daily Flow	0.38

2.2.2 Service Lateral Connection

The proposed development will decommission and abandon the existing sanitary service laterals servicing the existing single family homes. A new 200 mm ø PVC sanitary lateral will connect to the existing 250 mm ø sanitary sewer on Ghent Avenue, complete with a property line inspection manhole. Internal to the site the buildings will be serviced by a 200 mm ø building sewer that runs from the property line manhole to the courtyard between the buildings, where the building connections will be located.

3.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

3.1 Existing Storm Drainage

The existing site slopes generally from north to south at an average slope of approximately 2.0%. As mentioned, the site is currently occupied by two single family residences and associated driveways, all of which will be removed as part of the development. Through analysis of the topographic survey, there is no meaningful external drainage through the site under existing conditions. Existing drainage sheet flows south uncontrolled to Ghent Avenue, where it is intercepted by a municipal catchbasin adjacent the site connected to an existing 375 mm ø storm sewer in Ghent Avenue. This sewer flows west approximately 200 m before out letting to Rambo Creek. A small portion of the site flows west onto the neighbouring property, where it follows the same drainage pattern described above.

The subject lands are approximately 30% impervious with a weighted SCS curve number of CN = 81, calculated by taking the impervious area as CN = 98 (Paved parking) and the pervious area as CN = 74 (>75% Grass cover, HSG C). Refer to the HydroCAD results and Pre-Development Strom Drainage Area Plan in Appendix 'D' for supporting calculations.

3.2 Proposed Storm Drainage

The proposed site will have an overall increase in impervious area with 71% of the site impervious. The site will slope generally from north to south matching the pre-development conditions. A 150 mm ø storm lateral connection is proposed to the 375 mm ø storm sewer on Ghent Avenue, complete with property line inspection manhole. A small area of the subject lands will flow uncontrolled while the majority will be captured and directed to a stormwater management system underneath the parking lot. Stormwater management requirements are discussed further in Section 3.3 below.

3.3 Stormwater Management

3.3.1 Stormwater Quantity Control (Peak Flow Control)

The City of Burlington generally requires developments to manage their drainage to lesser of the pre-development levels for each event up to the 100-year storm, or the receiving system's capacity. In this case, to prevent the increased possibility of surcharging downstream systems, we propose to control runoff from all events under post-development conditions, to the 5-year pre-development rate. This is consistent with developments of this type.

To address the stormwater management requirements for the subject lands, the site is desigfned with a buried stormwater management system and outflows are controlled by way of an orifice plate. The stormwater management system will be comprised of Cultec Contractor 100HD modules and will be located underneath the parking lot on the east of the site.

The Cultec system will collect drainage from the roof areas, paved parking lot, and a majority of the landscaped areas. The controlled areas have a weighted SCS curve number of CN = 92, calculated by taking the impervious areas as CN = 98 (Paved parking) and the pervious area as CN = 74 (>75% Grass cover, HSG C). The uncontrolled area of the site, has a weighted SCS curve number of CN = 77, calculated using the same methodology as above. Refer to the HydroCAD results and Post-Development Storm Drainage Plan (F2) in Appendix 'D' for more details.

The Cultec system will be constructed such that there is sufficient volume to infiltrate the first 5 mm of rainfall across the site, this results in 8.8 m^3 of required storage. A conservative infiltration rate of 12 mm/hr was assumed and will be confirmed at the site plan stage. Water budget is discussed further in Section 3.3.2 below, however the storage required for infiltration will be considered dead storage and will not contribute to the storage volumes required for quantity control.

Using the SCS Runoff Method and the City of Burlington IDF data, pre- and post-development peak flows for the subject lands are estimated and summarized in Table 5 below:

Table 5: Stormwater Flows

Return	Pre-Dev Total (L/s)	Post-Dev Uncontrolled (L/s)	Post-Dev Orifice Flow (L/s)	Storage Required (m^3)
5-yr	16.8	1.3	8.1	22.3
10-yr	22.2	1.8	9.2	27.3
25-yr	29.6	2.6	10.4	33.9
50-yr	35.1	3.1	11.3	38.9
100-yr	40.7	3.7	12.6	43.6

To control the post-development total flow rate to the pre-development 5-year flow rate of 16.8 L/s, approximately 43.6 m^3 of storage is required for quantity control. Combined with the dead storage for infiltration, a total of 52.4 m^3 of storage is required. The proposed Cultec Contractor 100HD system will be approximately 37.34 m x 4.58 m providing approximately 57.8 m^3 of storage. In order to limit the post-development controlled peak flow rate, a 100 mm diameter orifice plate will be installed on the upstream side of the property line storm control manhole. The combined post-development controlled and uncontrolled peak flow rates will not exceed the pre-development 5-year peak flow rate.

3.3.2 Water Budget

As per City of Burlington Guidelines, it is recommended to infiltrate or re-use the first 5 mm of rainfall, this results in 8.8 m^3 of water to be infiltrated. A conservative infiltration rate of 12 mm/hr was assumed, this will be confirmed at the site plan stage. The storage required will be provided in the bottom of the Cultec stormwater management system, 129 mm of clear stone is provided below the outlet pipe, resulting in 8.8 m^3 of storage.

3.3.3 Stormwater Quality Control

Catch basins in the parking area are to be fitted with CB Shields. This provides (conservatively) 50% removal of long term TSS. The CB Shields combined with a downstream Stormceptor EF4 providing 60% removal of long term TSS to form a treatment train approach. Refer to the OGS sizing report in Appendix 'D' for more details.

This design is based on information obtained from the NJDEP Stormwater BMP Manual wherein it provides a simplified equation for the TSS removal rate for two BMP's in a series:

$$R = A + B - [(A \times B) / 100]$$
$$= 50\% + 60\% - [(50\% \times 60\%) / 100]$$
$$= 110\% - 30\%$$
$$= 80\%$$

Where:
R = Total TSS Removal Rate
A = TSS Removal Rate of the First or Upstream BMP
B = TSS Removal Rate of the Second or Downstream BMP

The treatment train provides 80% long term TSS removal, meeting the requirements of MECP Enhanced treatment.

4.0 SUMMARY

The information presented in this Functional Servicing Report demonstrates that the proposed development can be serviced by the existing infrastructure for water, wastewater, and stormwater and can meet the City of Burlington stormwater management criteria. The following is a summary of the report findings:

- The site's domestic water service connection will be connected to the existing 250 mm ø watermain on Ghent Avenue.
- The site's sanitary system will be connected to the existing 250 mm ø sanitary sewer on Ghent Avenue using a 200 mm ø sanitary lateral.
- 100-year post-development peak discharge is to be controlled to the 5-year pre-development peak rate. Runoff is stored within a Cultec stormwater storage system below the parking lot, and released through a 100 mm diameter orifice plate to a max rate of 12.6 L/s to the storm sewer on Ghent Avenue.
- The stormwater storage system provides the required storage of 52.4 m^3 with a total volume of 57.8 m^3.
- 8.8 m^3 of storage has been provided beneath the outlet from the stormwater management system to infiltrate the first 5 mm of rainfall.
- MECP enhanced treatment and 80% long term TSS removal is achieved through CB Shields on the catchbasins and a Stormceptor EF4 OGS in a treatment train approach.

Based on the above, we support the proposed development for OPA/ZBA from a civil engineering perspective.

Should you have any questions, do not hesitate to contact the undersigned.

PREPARED BY TRAFALGAR ENGINEERING LTD.



M. Wallace, EIT
Intermediate Designer

N. Sylvester, P.Eng.
Principal

Appendix 'A'

Topographic Survey (Tarasick McMillan Kubicki Ltd)

Site Plan (Hicks Design Studio)

SURVEYOR'S REAL PROPERTY REPORT
PART 1 - PLAN OF SURVEY SHOWING TOPOGRAPHY OF PART OF
LOT 5
REGISTERED PLAN 125
IN THE
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

SCALE 1 : 200

0 5 10 20 metres

THE INTENDED PLOT SIZE OF THIS PLAN IS 580mm IN WIDTH BY 470mm IN HEIGHT WHEN PLOTTED AT A SCALE OF 1:200 (INCLUDING 15mm BEYOND EACH BORDER)

MacKAY, MacKAY & PETERS LIMITED - ONTARIO LAND SURVEYORS

© 2023

KNOWN AS MUNICIPAL No. 2169 & 2175 GHENT AVENUE

PART 2 - REPORT SUMMARY (TO BE READ IN CONJUNCTION WITH PART 1)

LAND REGISTRY OFFICE TITLE INFORMATION ON SUBJECT PROPERTY INCLUDING BOUNDARIES, EASEMENTS AND RIGHT OF WAYS – MAY 19, 2023

REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY:
– NONE

ADDITIONAL REMARKS:
– REFER TO PART 1 OF SURVEY FOR THE LOCATION OF BUILDINGS, STRUCTURES, FENCES & UTILITIES

MacKAY, MacKAY & PETERS LIMITED grants BRANT LEIGHLAND DEVELOPMENTS INC., ("The Client"), their solicitor and other related parties permission to use "Original Copies" of the Surveyor's Real Property Report in transactions involving "The Client"

METRIC *DISTANCES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048*

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-56848

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR IN ACCORDANCE WITH REGULATION 1026, SECTION 29(3)

LEGEND

■	DENOTES A SURVEY MONUMENT FOUND
□	DENOTES A SURVEY MONUMENT PLANTED
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
P1	DENOTES REGISTERED PLAN 125
P2	DENOTES PLAN 20R–3223
P3	DENOTES PLAN 20R–2428
D1	DENOTES INST. No. 155492
D2	DENOTES INST. No. 167318
D3	DENOTES INST. No. 156109
D4	DENOTES INST. No. 176710
D5	DENOTES INST. No. 821382
C1	DENOTES CALCULATED FROM D1 & D3
PIN	DENOTES PROPERTY IDENTIFICATION NUMBER
(OU)	DENOTES ORIGIN UNKNOWN
DS	DENOTES DOOR SILL
BF	DENOTES BOARD FENCE
CLF	DENOTES CHAIN LINK FENCE
℄	DENOTES CENTRELINE
SAN–MH	DENOTES SANITARY MANHOLE
STM–MH	DENOTES STORM MANHOLE
CB	DENOTES CATCH BASIN
WVC	DENOTES WATER VALVE CHAMBER
EG	DENOTES EDGE OF GRAVEL
EA	DENOTES EDGE OF ASPHALT
TL	DENOTES TREE LINE
WHP	DENOTES WOOD HYDRO POLE
ULS	DENOTES UTILITY LIGHT STANDARD
OHW	DENOTES OVERHEAD WIRE
N.T.S.	DENOTES NOT TO SCALE

DENOTES DECIDUOUS TREE SCALED TO CANOPY TRUNK SIZE SHOWN IN METRES

DENOTES CONIFEROUS TREE SCALED TO CANOPY TRUNK SIZE SHOWN IN METRES

ALL BUILDING TIES ARE TO FOUNDATION AND ARE PERPENDICULAR TO PROPERTY LINES UNLESS OTHERWISE NOTED

BENCHMARK NOTE

CITY OF BURLINGTON BENCHMARK No. 1044
ELEVATION = 91.800 METRES (CGVD28:78 ADJUSTMENT)

CULVERT OVER RAMBO CREEK ON GHENT AVENUE 140 METRES SOUTH WEST OF PEARSON STREET AND 465 METRES NORTHEAST OF BRANT STREET. PLAQUE IS LOCATED ON THE NORTH SIDE OF GHENT AVENUE AND EAST SIDE OF RAMBO CREEK SET ON WEST FACE OF CONCRETE CULVERT WING WALL

BEARING REFERENCE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE NORTHEASTERLY LIMIT OF GHENT AVENUE AS SHOWN ON REGISTERED PLAN 125 HAVING A BEARING OF N45°49'00"E

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 11th DAY OF JULY, 2023.

JULY 14, 2023
DATE

ROY C. MAYO
ONTARIO LAND SURVEYOR
FOR MACKAY, MACKAY & PETERS LIMITED

E:\(20) Halton\Registered Plans\RP0125\LOT 5\23-111\23-111.dwg

MMP
MacKay, MacKay & Peters Limited
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DRAWN BY:	G.S.
PARTY CHIEF:	C.M.
CHECKED BY:	
PROJECT No.:	23–111



Site Plan
1 : 100

ZONING TABLE:

Standard **RM3**	Required	Proposed
Lot Area (min.)	0.4 ha	0.17 ha (1754.31 m²)
Total Units	---	Two 6 - Unit Apartment (5 two-bedrooms units, 7 one-bedroom units)
Lot Width	30m	39.75m
Front Yard Setback	7.50m	**4.50m**
Rear Yard Setback	9m	10.17m
Side Yard Setback	4.50m	**2.00m** & 19.70m
Yard Abutting R2 Zone	12m	**10.17m** & 19.70m
Building Height (max.)	3 Storeys	3 Storeys
Landscaped area	4.5m Abutting Street	4.5m
Landscaped Buffer	6m Abutting R2 Zone	**2.00m to 4.18m**
Garbage Storage Side Setback (min.)	15m Abutting Residential Zonea	**12.45m**
Garbage Storage Front Setback (min.)	4.5m (as proposed to be amended)	4.72m
Parking	16 spaces total (1.25 spaces / 2-bed unit 1 space / 1-bed unit Visitor parking: 0.25/unit)	16 spaces
Density	25 units / ha (min.) 50 units / ha (max.)	**70 / ha**
Amenity	425 sm (25 sm / bedroom)	**355.27 sm**
Privacy Area	10sm / Unit	**57.60 sm**

Area Schedule (Gross Building)		
Name	Level	Area
A-COMMON AREA	GRND FLOOR PLAN	34.36 m²
A-COMMON AREA	2ND FLOOR PLAN	23.61 m²
A-COMMON AREA	THIRD FLOOR PLAN	23.61 m²
A-SUITE #1 - 1 BED	GRND FLOOR PLAN	67.62 m²
A-SUITE #2 - 1 BED	GRND FLOOR PLAN	78.36 m²
A-SUITE #3 - 1 BED	2ND FLOOR PLAN	78.36 m²
A-SUITE #4 - 1 BED	2ND FLOOR PLAN	78.36 m²
A-SUITE #5 - 1 BED	THIRD FLOOR PLAN	78.36 m²
A-SUITE #6 - 1 BED	THIRD FLOOR PLAN	78.36 m²
B-COMMON AREA	GRND FLOOR PLAN	38.99 m²
B-COMMON AREA	2ND FLOOR PLAN	28.24 m²
B-COMMON AREA	THIRD FLOOR PLAN	28.24 m²
B-SUITE #1 - 1 BED	GRND FLOOR PLAN	82.98 m²
B-SUITE #2 - 2 BED	GRND FLOOR PLAN	93.73 m²
B-SUITE #3 - 2 BED	2ND FLOOR PLAN	93.73 m²
B-SUITE #4 - 2 BED	2ND FLOOR PLAN	93.73 m²
B-SUITE #5 - 2 BED	THIRD FLOOR PLAN	93.73 m²
B-SUITE #6 - 2 BED	THIRD FLOOR PLAN	93.73 m²

No.	Description	Date
3	Consultants Coordination	2024.09.18
2	Design Development	2024.08.14
1	Preliminary Design	2024.08.19

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

DO NOT SCALE DRAWINGS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED.

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NORTH

PROJECT
MULTI RESIDENTIAL DEVELOPMENT

2169 & 2175 GHENT AVE,
BURLINGTON, ON

DRAWING TITLE
SITE PLAN

SCALE	PROJECT NO.
As indicated	23-1731

DRAWN BY	APPROVED	Y.M.DATE
JK	CP	24.03.19

DRAWING NO.
A102

2024-09-18 2:15:02 PM

Appendix 'B'

Estimated Water Demand

Estimated Demand Pressure

Fire Flow Test Results

TRAFALGAR ENGINEERING LTD.

ESTIMATED WATER DEMAND

Project: 1839 Ghent Avenue
Desc: Multi Unit Residential ZBA/OPA

Project No.: 1839
Prepared By: MW
Checked By: NAS

	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)
3-Storey Multi-unit Residential	0.1754	135.0	24	275	4.5	1.00	4.00	2.25	4.5	18.1	10.2
*Per Cap. Demand based on O.B.C. Table 8.2.1.3.B. -- 5 L/1.0m^2 Stores											
TOTAL	**0**		**24**		**5**				**5**	**18**	**10**

Average Daily Demand: **5 (L/min)**
Minimum Hourly Demand: **5 (L/min)**
Maximum Hourly Demand: **18 (L/min)**
Maximum Daily Demand: **10 (L/min)**
Max. Daily Plus Fire: **6010 (L/min)**

Fire Flow
Using Fire Underwriters Survey Methodology:

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: Non-Combustible Coefficient: 0.80 Total Floor Area: 647.1 (m^2)

F = 4000 (L/min)

Adequately Protected Vertical Openings: No

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: Combustible Factor: 0%

F = 4000 (L/min)

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

NFPA 13 Sprinkler:	No	Reduction:	0%
Standard Water Supply:	No	Reduction:	0%
Fully Supervised:	No	Reduction:	0%

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

4. Adjust the value in No. 2 for exposure

	Separation (m)	Charge
North	34	5%
East	22	10%
South	5.2	20%
West	8	20%
	Total Charge:	**55%**
	Exposure Charge:	**2200 (L/min)**

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

F = 6000 (L/min)

TRAFALGAR ENGINEERING LTD.

ESTIMATED DEMAND PRESSURE (AT MAIN)

Project: 1839 Ghent Avenue
Desc: Multi Unit Residential ZBA/OPA

Project No.: 1839
Prepared By: MW
Checked By: NAS

Hydrant Residual Flow (Refer to Attached Flow Test Results)

Coefficient	$C=$	0.9	
Port Diameter	$D=$	2.5	(inch)
Pitot Pressure	$P_{pit}=$	46	(psig)
Residual Flow	$Q_R=$	1138	(us gpm)
Residual Flow	$Q_R=$	4307	(L/min)

Hydrant Theoretical Flow (Refer to Attached Flow Test Results)

Static Pressure	$P_{stat}=$	60	(psig)
Residual Pressure	$P_{res}=$	56	(psig)
Theoretical Pressure	$P_{theo}=$	20	(psig)
Theoretical Flow	$Q_T=$	3946	(us gpm)
Theoretical Flow	$Q_T=$	14936	(L/min)

Max. Demand Pressure

Maximum Demand	$Q_D=$	6009	(L/min)
Maximum Demand	$Q_D=$	1588	(us gpm)
Calculated Pressure	$P=$	53	(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.

SUTHERLAND CONTRACTING LTD.

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November 8th, 2023

Fire Flow Testing Report

Trafalgar Engineering - Ghent Avenue
Burlington, Ontario

Flow Hydrant #1		
Watermain Size	250mm PVC	
Location	Fire Hydrant H9421 - Ghent Ave	
Time	**Make/Model of Hydrant**	**Sec Valve Location**
1:45	AVK 2780	2m South
Static Pressure (psi)	**Pitot 1 Port Open (psi)**	**Pitot 2 Ports Open (psi)**
60	44	32

Residual Hydrant #1		
Watermain Size	150mm PVC	
Location	Fire Hydrant H9418 Pearson Street	
Time	**Make/Model of Hydrant**	**Sec Valve Location**
1:45	McAvity M67	2m West
Static Pressure (psi)	**Residual Pressure 1 Port Open (psi)**	**Residual Pressure 2 Ports Open (psi)**
60	55	53

Fire Flow Calculation #1			
Pitot 1 Port Open (psi)	**Field Flow (GPM)**	**Residual Pressure (psi)**	**TFF 1 Port Open at 20 psi (GPM)**
44	**1,113**	55	**3,421**
Pitot 2 Port Open (psi)	**Field Flow (GPM)**	**Residual Pressure (psi)**	**TFF 2 Ports Open at 20 psi (GPM)**
32	**1,898**	53	**4,865**

TFF = Theoretical Fire Flow GPM = US Gallons

Flow Hydrant #2		
Watermain Size	150mm PVC	
Location	Fire Hydrant H9418 Pearson Street	
Time	**Make/Model of Hydrant**	**Sec Valve Location**
2:05	McAvity M67	2m West
Static Pressure (psi)	**Pitot 1 Port Open (psi)**	**Pitot 2 Ports Open (psi)**
60	46	28

Residual Hydrant #2		
Watermain Size	250mm PVC	
Location	Fire Hydrant H9421 - Ghent Ave	
Time	**Make/Model of Hydrant**	**Sec Valve Location**
2:05	AVK 2780	2m South
Static Pressure (psi)	**Residual Pressure 1 Port (psi)**	**Residual Pressure 2 Ports (psi)**
60	56	54

Fire Flow Calculation #2			
Pitot 1 Port Open (psi)	**Field Flow (GPM)**	**Residual Pressure (psi)**	**TFF 1 Port Open at 20 psi (GPM)**
46	**1,138**	56	**3,946**
Pitot 2 Port Open (psi)	**Field Flow (GPM)**	**Residual Pressure (psi)**	**TFF 2 Ports Open at 20 psi (GPM)**
28	**1,776**	54	**4,971**

Date Report Completed:	November 13th, 2023
Site Address:	Ghent Avenue, Burlington
Contractor:	Trafalgar Engineering
Region/Municpality:	Region of Halton

This flow test report is representative of the static water pressure and flow rates only at the time the tests were completed. Results may vary during peak usage hours.



Fire Hydrant H9421 - Ghent Ave



Fire Hydrant H9418 - Pearson Street

Appendix 'C'

Estimated Existing Sanitary Flow

Estimated Proposed Sanitary Flow

TRAFALGAR ENGINEERING LTD.

ESTIMATED SANITARY FLOW

Project: 2169 & 2175 Ghent Avenue
Desc: Multi Unit Residential ZBA/OPA

Project No.: 1839
Prepared By: MW
Checked By: NAS

Residential

Land Use / Occupancy Type	Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
Single family homes	0.175	55.0	10	275	0.03
TOTAL	**0**		**10**		**0.03**

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:	4.42	
ICI Peaking Factor:	4.50	
Include ICI Peaking?	No	
Tributary Area:	0.18	(ha)
Infiltration Allowance:	0.29	(L/s ha)
Foundation Drain Allowance:	0.00	(L/s ha)
Residential Average Flow:	0.08	(L/s)
ICI Average Flow:	0.00	(L/s)
Groundwater Discharge:	0.00	(L/s)
Total Average Flow:	**0.08**	**(L/s)**
Residential Peak Flow:	0.19	(L/s)
ICI Peak Flow:	0.00	(L/s)
Groundwater Discharge:	0.00	(L/s)
Total Peak Flow:	**0.19**	**(L/s)**

TRAFALGAR ENGINEERING LTD.

ESTIMATED SANITARY FLOW

Project: 2169 & 2175 Ghent Avenue
Desc: Multi Unit Residential ZBA/OPA

Project No.: 1839
Prepared By: MW
Checked By: NAS

Residential

Land Use / Occupancy Type	Area (ha)	Population Density (pers/ha)	Eq. Population (cap.)	Per Cap. Demand (L/cap. Day)	Average Daily Dry Weather Flow (L/s)
3-Storey Multi-unit Residential	0.175	135.0	24	275	0.08
TOTAL	**0**		**24**		**0.08**

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:	4.37	
ICI Peaking Factor:	4.50	
Include ICI Peaking?	No	
Tributary Area:	0.18	(ha)
Infiltration Allowance:	0.29	(L/s ha)
Foundation Drain Allowance:	0.00	(L/s ha)
Residential Average Flow:	0.13	(L/s)
ICI Average Flow:	0.00	(L/s)
Groundwater Discharge:	0.00	(L/s)
Total Average Flow:	**0.13**	**(L/s)**
Residential Peak Flow:	0.38	(L/s)
ICI Peak Flow:	0.00	(L/s)
Groundwater Discharge:	0.00	(L/s)
Total Peak Flow:	**0.38**	**(L/s)**

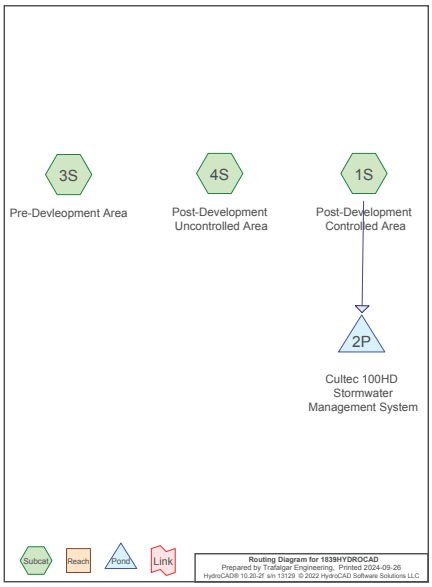
Appendix 'D'

HydroCAD Summaries and Results

Pre-Development Drainage Plan (F1)

Post Development Drainage Plan (F2)

Stormceptor EFO4 OGS Sizing Report



Project Notes

Copied 6 events from ON Burlington 4hr storm
Copied 6 events from ON Burlington 24hr storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (mm)	AMC
1	5-Year	ON Burlington 24hr	5-Year	Default	24.00	1	64	2
2	10-Year	ON Burlington 24hr	10-Year	Default	24.00	1	74	2
3	25-Year	ON Burlington 24hr	25-Year	Default	24.00	1	87	2
4	50-Year	ON Burlington 24hr	50-Year	Default	24.00	1	96	2
5	100-Year	ON Burlington 24hr	100-Year	Default	24.00	1	105	2

Area Listing (all nodes)

Area (sq-meters)	CN	Description (subcatchment-numbers)
1,749.0	74	>75% Grass cover, Good, HSG C (1S, 3S, 4S)
1,759.0	98	Paved parking, HSG A (1S, 3S, 4S)
3,508.0	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-meters)	Soil Group	Subcatchment Numbers
1,759.0	HSG A	1S, 3S, 4S
0.0	HSG B	
1,749.0	HSG C	1S, 3S, 4S
0.0	HSG D	
0.0	Other	
3,508.0		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-meters)	HSG-B (sq-meters)	HSG-C (sq-meters)	HSG-D (sq-meters)	Other (sq-meters)	Total (sq-meters)	Ground Cover
0.0	0.0	1,749.0	0.0	0.0	1,749.0	>75% Grass cover, Good
1,759.0	0.0	0.0	0.0	0.0	1,759.0	Paved parking
1,759.0	**0.0**	**1,749.0**	**0.0**	**0.0**	**3,508.0**	**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=1,566.0 m² 77.01% Impervious Runoff Depth=44 mm
Tc=10.0 min CN=92 Runoff=0.0286 m³/s 68.3 m³

Subcatchment 3S: Pre-Devleopment Runoff Area=1,754.0 m² 30.16% Impervious Runoff Depth=24 mm
Tc=10.0 min CN=81 Runoff=0.0168 m³/s 42.8 m³

Subcatchment 4S: Post-Development Runoff Area=188.0 m² 12.77% Impervious Runoff Depth=19 mm
Tc=10.0 min CN=77 Runoff=0.0013 m³/s 3.6 m³

Pond 2P: Cultec 100HD Stormwater Peak Elev=92.150 m Storage=22.3 m³ Inflow=0.0286 m³/s 68.3 m³
Outflow=0.0081 m³/s 68.2 m³

Total Runoff Area = 3,508.0 m² Runoff Volume = 114.7 m³ Average Runoff Depth = 33 mm
49.86% Pervious = 1,749.0 m² 50.14% Impervious = 1,759.0 m²

Summary for Subcatchment 1S: Post-Development Controlled Area

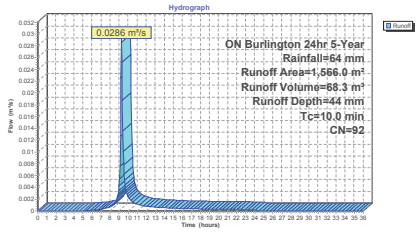
Runoff = 0.0286 m³/s @ 9.26 hrs, Volume= 68.3 m³, Depth= 44 mm
Routed to Pond 2P : Cultec 100HD Stormwater Management System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 5-Year Rainfall=64 mm

Area (m²)	CN	Description
1,206.0	98	Paved parking, HSG A
360.0	74	>75% Grass cover, Good, HSG C
1,566.0	92	Weighted Average
360.0		22.99% Pervious Area
1,206.0		77.01% Impervious Area

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

Subcatchment 1S: Post-Development Controlled Area



Summary for Subcatchment 3S: Pre-Devleopment Area

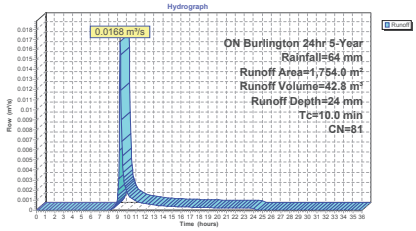
Runoff = 0.0168 m³/s @ 9.27 hrs, Volume= 42.8 m³, Depth= 24 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 5-Year Rainfall=64 mm

Area (m²)	CN	Description
529.0	98	Paved parking, HSG A
1,225.0	74	>75% Grass cover, Good, HSG C
1,754.0	81	Weighted Average
1,225.0		69.84% Pervious Area
529.0		30.16% Impervious Area

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

Subcatchment 3S: Pre-Devleopment Area



Summary for Subcatchment 4S: Post-Development Uncontrolled Area

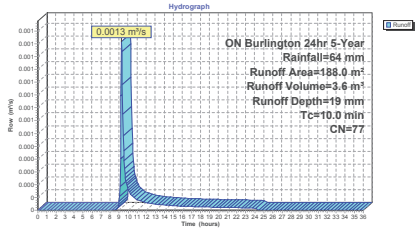
Runoff = 0.0013 m³/s @ 9.27 hrs, Volume= 3.6 m³, Depth= 19 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 5-Year Rainfall=64 mm

Area (m²)	CN	Description
24.0	98	Paved parking, HSG A
164.0	74	>75% Grass cover, Good, HSG C
188.0	77	Weighted Average
164.0		87.23% Pervious Area
24.0		12.77% Impervious Area

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

Subcatchment 4S: Post-Development Uncontrolled Area



Summary for Pond 2P: Cultec 100HD Stormwater Management System

Inflow Area = 1,566.0 m², 77.01% Impervious, Inflow Depth = 44 mm for 5-Year event
Inflow = 0.0286 m³/s @ 9.26 hrs, Volume= 68.3 m³
Outflow = 0.0081 m³/s @ 9.50 hrs, Volume= 68.2 m³, Atten= 72%, Lag= 14.4 min
Primary = 0.0081 m³/s @ 9.50 hrs, Volume= 68.2 m³

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 92.150 m @ 9.50 hrs Surf.Area= 170.7 m² Storage= 22.3 m³

Plug-Flow detention time= 52.2 min calculated for 68.1 m³ (100% of inflow)
Center-of-Mass det. time= 52.2 min (723.7 - 671.6)

Volume	Invert	Avail.Storage	Storage Description
#1	91.950 m	49.0 m³	**Custom Stage Data** Listed below -Impervious
#2	91.820 m	0.0 m³	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			105.8 m³ Overall x 0.0% Voids
		49.0 m³	Total Available Storage

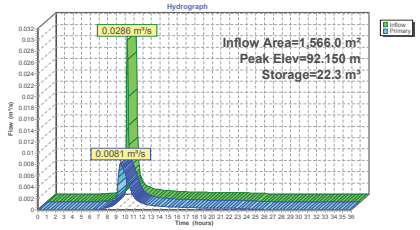
Elevation (meters)	Cum.Store (cubic-meters)
91.950	0.0
91.973	1.6
92.290	38.6
92.442	49.0

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)
91.820	170.7	0.0	0.0
92.440	170.7	105.8	105.8

Device	Routing	Invert	Outlet Devices
#1	Primary	91.950 m	**100 mm Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.0081 m³/s @ 9.50 hrs HW=92.150 m (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 0.0081 m³/s @ 1.03 m/s)

Pond 2P: Cultec 100HD Stormwater Management System



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=1,566.0 m² 77.01% Impervious Runoff Depth=53 mm
Tc=10.0 min CN=92 Runoff=0.0344 m³/s 82.7 m³

Subcatchment 3S: Pre-Devleopment Runoff Area=1,754.0 m² 30.16% Impervious Runoff Depth=32 mm
Tc=10.0 min CN=81 Runoff=0.0222 m³/s 55.5 m³

Subcatchment 4S: Post-Development Runoff Area=188.0 m² 12.77% Impervious Runoff Depth=26 mm
Tc=10.0 min CN=77 Runoff=0.0018 m³/s 4.8 m³

Pond 2P: Cultec 100HD Stormwater Peak Elev=92.193 m Storage=27.3 m³ Inflow=0.0344 m³/s 82.7 m³
Outflow=0.0092 m³/s 82.6 m³

Total Runoff Area = 3,508.0 m² Runoff Volume = 143.1 m³ Average Runoff Depth = 41 mm
49.86% Pervious = 1,749.0 m² 50.14% Impervious = 1,759.0 m²

Summary for Subcatchment 1S: Post-Development Controlled Area

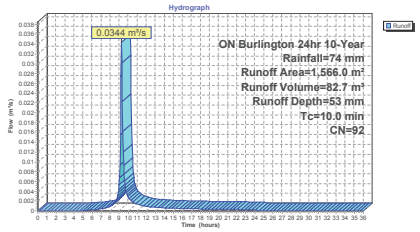
Runoff = 0.0344 m³/s @ 9.26 hrs, Volume= 82.7 m³, Depth= 53 mm
Routed to Pond 2P : Cultec 100HD Stormwater Management System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 10-Year Rainfall=74 mm

Area (m²)	CN	Description
1,206.0	98	Paved parking, HSG A
360.0	74	>75% Grass cover, Good, HSG C
1,566.0	92	Weighted Average
360.0		22.99% Pervious Area
1,206.0		77.01% Impervious Area

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

Subcatchment 1S: Post-Development Controlled Area



Summary for Subcatchment 3S: Pre-Devleopment Area

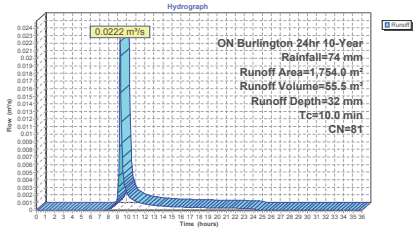
Runoff = 0.0222 m³/s @ 9.26 hrs, Volume= 55.5 m³, Depth= 32 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 10-Year Rainfall=74 mm

Area (m²)	CN	Description
529.0	98	Paved parking, HSG A
1,225.0	74	>75% Grass cover, Good, HSG C
1,754.0	81	Weighted Average
1,225.0		69.84% Pervious Area
529.0		30.16% Impervious Area

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

Subcatchment 3S: Pre-Devleopment Area



Summary for Subcatchment 4S: Post-Development Uncontrolled Area

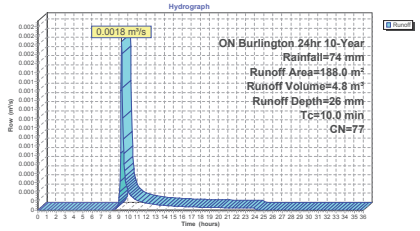
Runoff = 0.0018 m³/s @ 9.27 hrs, Volume= 4.8 m³, Depth= 26 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 10-Year Rainfall=74 mm

Area (m²)	CN	Description
24.0	98	Paved parking, HSG A
164.0	74	>75% Grass cover, Good, HSG C
188.0	77	Weighted Average
164.0		87.23% Pervious Area
24.0		12.77% Impervious Area

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

Subcatchment 4S: Post-Development Uncontrolled Area



Summary for Pond 2P: Cultec 100HD Stormwater Management System

Inflow Area = 1,566.0 m², 77.01% Impervious, Inflow Depth = 53 mm for 10-Year event
Inflow = 0.0344 m³/s @ 9.26 hrs, Volume= 82.7 m³
Outflow = 0.0092 m³/s @ 9.51 hrs, Volume= 82.6 m³, Atten= 73%, Lag= 15.0 min
Primary = 0.0092 m³/s @ 9.51 hrs, Volume= 82.6 m³

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 92.193 m @ 9.51 hrs Surf.Area= 170.7 m² Storage= 27.3 m³

Plug-Flow detention time= 52.4 min calculated for 82.6 m³ (100% of inflow)
Center-of-Mass det. time= 51.7 min (718.2 - 666.5)

Volume	Invert	Avail.Storage	Storage Description
#1	91.950 m	49.0 m³	**Custom Stage Data** Listed below -Impervious
#2	91.820 m	0.0 m³	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			105.8 m³ Overall x 0.0% Voids
		49.0 m³	Total Available Storage

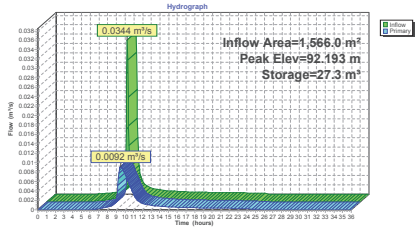
Elevation (meters)	Cum.Store (cubic-meters)
91.950	0.0
91.973	1.6
92.290	38.6
92.442	49.0

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)
91.820	170.7	0.0	0.0
92.440	170.7	105.8	105.8

Device	Routing	Invert	Outlet Devices
#1	Primary	91.950 m	**100 mm Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.0092 m³/s @ 9.51 hrs HW=92.193 m (Free Discharge)
↑—1=Orifice/Grate (Orifice Controls 0.0092 m³/s @ 1.17 m/s)

Pond 2P: Cultec 100HD Stormwater Management System



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=1,566.0 m² 77.01% Impervious Runoff Depth=65 mm
Tc=10.0 min CN=92 Runoff=0.0417 m³/s 101.3 m³

Subcatchment 3S: Pre-Devleopment Runoff Area=1,754.0 m² 30.16% Impervious Runoff Depth=41 mm
Tc=10.0 min CN=81 Runoff=0.0296 m³/s 72.7 m³

Subcatchment 4S: Post-Development Runoff Area=188.0 m² 12.77% Impervious Runoff Depth=35 mm
Tc=10.0 min CN=77 Runoff=0.0026 m³/s 6.5 m³

Pond 2P: Cultec 100HD Stormwater Peak Elev=92.250 m Storage=33.9 m³ Inflow=0.0417 m³/s 101.3 m³
Outflow=0.0104 m³/s 101.2 m³

Total Runoff Area = 3,508.0 m² Runoff Volume = 180.5 m³ Average Runoff Depth = 51 mm
49.86% Pervious = 1,749.0 m² 50.14% Impervious = 1,759.0 m²

Summary for Subcatchment 1S: Post-Development Controlled Area

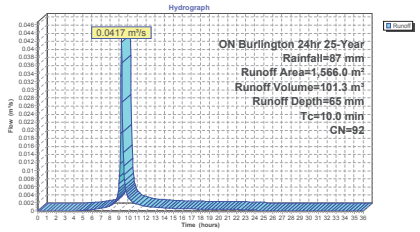
Runoff = 0.0417 m³/s @ 9.26 hrs, Volume= 101.3 m³, Depth= 65 mm
Routed to Pond 2P : Cultec 100HD Stormwater Management System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 25-Year Rainfall=87 mm

Area (m²)	CN	Description
1,206.0	98	Paved parking, HSG A
360.0	74	>75% Grass cover, Good, HSG C
1,566.0	92	Weighted Average
360.0		22.99% Pervious Area
1,206.0		77.01% Impervious Area

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

Subcatchment 1S: Post-Development Controlled Area



Summary for Subcatchment 3S: Pre-Devleopment Area

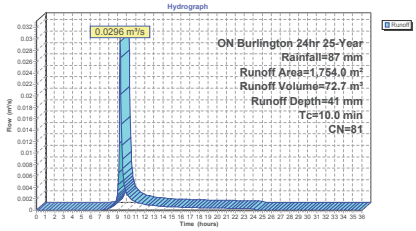
Runoff = 0.0296 m³/s @ 9.26 hrs, Volume= 72.7 m³, Depth= 41 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 25-Year Rainfall=87 mm

Area (m²)	CN	Description
529.0	98	Paved parking, HSG A
1,225.0	74	>75% Grass cover, Good, HSG C
1,754.0	81	Weighted Average
1,225.0		69.84% Pervious Area
529.0		30.16% Impervious Area

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

Subcatchment 3S: Pre-Devleopment Area



Summary for Subcatchment 4S: Post-Development Uncontrolled Area

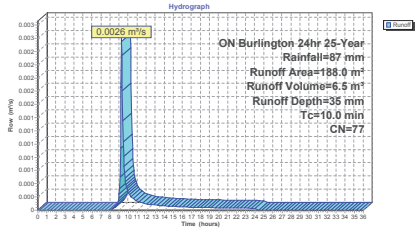
Runoff = 0.0026 m³/s @ 9.26 hrs, Volume= 6.5 m³, Depth= 35 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 25-Year Rainfall=87 mm

Area (m²)	CN	Description
24.0	98	Paved parking, HSG A
164.0	74	>75% Grass cover, Good, HSG C
188.0	77	Weighted Average
164.0		87.23% Pervious Area
24.0		12.77% Impervious Area

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

Subcatchment 4S: Post-Development Uncontrolled Area



Summary for Pond 2P: Cultec 100HD Stormwater Management System

Inflow Area = 1,566.0 m², 77.01% Impervious, Inflow Depth = 65 mm for 25-Year event
Inflow = 0.0417 m³/s @ 9.26 hrs, Volume= 101.3 m³
Outflow = 0.0104 m³/s @ 9.52 hrs, Volume= 101.2 m³, Atten= 75%, Lag= 15.7 min
Primary = 0.0104 m³/s @ 9.52 hrs, Volume= 101.2 m³

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 92.250 m @ 9.52 hrs Surf.Area= 170.7 m² Storage= 33.9 m³

Plug-Flow detention time= 52.4 min calculated for 101.2 m³ (100% of inflow)
Center-of-Mass det. time= 51.8 min (713.0 - 661.2)

Volume	Invert	Avail.Storage	Storage Description
#1	91.950 m	49.0 m³	**Custom Stage Data**Listed below -Impervious
#2	91.820 m	0.0 m³	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			105.8 m³ Overall x 0.0% Voids
		49.0 m³	Total Available Storage

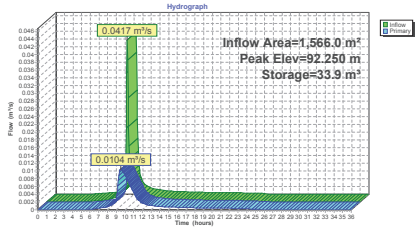
Elevation (meters)	Cum.Store (cubic-meters)
91.950	0.0
91.973	1.6
92.290	38.6
92.442	49.0

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)
91.820	170.7	0.0	0.0
92.440	170.7	105.8	105.8

Device	Routing	Invert	Outlet Devices
#1	Primary	91.950 m	**100 mm Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.0104 m³/s @ 9.52 hrs HW=92.249 m (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 0.0104 m³/s @ 1.33 m/s)

Pond 2P: Cultec 100HD Stormwater Management System



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=1,566.0 m² 77.01% Impervious Runoff Depth=74 mm
Tc=10.0 min CN=92 Runoff=0.0471 m³/s 115.3 m³

Subcatchment 3S: Pre-Devleopment Runoff Area=1,754.0 m² 30.16% Impervious Runoff Depth=49 mm
Tc=10.0 min CN=81 Runoff=0.0351 m³/s 86.1 m³

Subcatchment 4S: Post-Development Runoff Area=188.0 m² 12.77% Impervious Runoff Depth=42 mm
Tc=10.0 min CN=77 Runoff=0.0031 m³/s 7.8 m³

Pond 2P: Cultec 100HD Stormwater Peak Elev=92.294 m Storage=38.9 m³ Inflow=0.0471 m³/s 115.3 m³
Outflow=0.0113 m³/s 115.2 m³

Total Runoff Area = 3,508.0 m² Runoff Volume = 209.2 m³ Average Runoff Depth = 60 mm
49.86% Pervious = 1,749.0 m² 50.14% Impervious = 1,759.0 m²

Summary for Subcatchment 1S: Post-Development Controlled Area

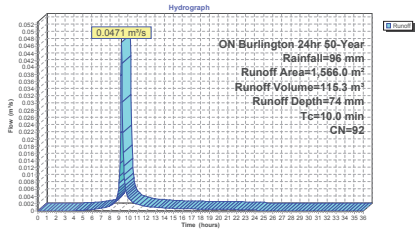
Runoff = 0.0471 m³/s @ 9.26 hrs, Volume= 115.3 m³, Depth= 74 mm
Routed to Pond 2P : Cultec 100HD Stormwater Management System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 50-Year Rainfall=96 mm

Area (m²)	CN	Description
1,206.0	98	Paved parking, HSG A
360.0	74	>75% Grass cover, Good, HSG C
1,566.0	92	Weighted Average
360.0		22.99% Pervious Area
1,206.0		77.01% Impervious Area

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

Subcatchment 1S: Post-Development Controlled Area



Summary for Subcatchment 3S: Pre-Devleopment Area

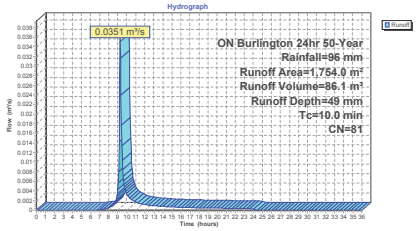
Runoff = 0.0351 m³/s @ 9.26 hrs, Volume= 86.1 m³, Depth= 49 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 50-Year Rainfall=96 mm

Area (m²)	CN	Description
529.0	98	Paved parking, HSG A
1,225.0	74	>75% Grass cover, Good, HSG C
1,754.0	81	Weighted Average
1,225.0		69.84% Pervious Area
529.0		30.16% Impervious Area

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

Subcatchment 3S: Pre-Devleopment Area



Summary for Subcatchment 4S: Post-Development Uncontrolled Area

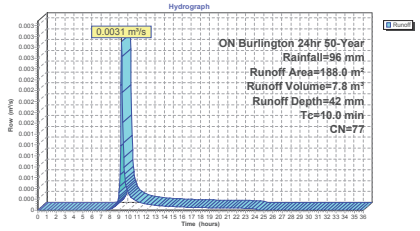
Runoff = 0.0031 m³/s @ 9.26 hrs, Volume= 7.8 m³, Depth= 42 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 50-Year Rainfall=96 mm

Area (m²)	CN	Description
24.0	98	Paved parking, HSG A
164.0	74	>75% Grass cover, Good, HSG C
188.0	77	Weighted Average
164.0		87.23% Pervious Area
24.0		12.77% Impervious Area

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

Subcatchment 4S: Post-Development Uncontrolled Area



Summary for Pond 2P: Cultec 100HD Stormwater Management System

Inflow Area = 1,566.0 m², 77.01% Impervious, Inflow Depth = 74 mm for 50-Year event
Inflow = 0.0471 m³/s @ 9.26 hrs, Volume= 115.3 m³
Outflow = 0.0113 m³/s @ 9.52 hrs, Volume= 115.2 m³, Atten= 76%, Lag= 16.1 min
Primary = 0.0113 m³/s @ 9.52 hrs, Volume= 115.2 m³

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 92.294 m @ 9.52 hrs Surf.Area= 170.7 m² Storage= 38.9 m³

Plug-Flow detention time= 52.8 min calculated for 115.2 m³ (100% of inflow)
Center-of-Mass det. time= 52.2 min (710.2 - 658.0)

Volume	Invert	Avail.Storage	Storage Description
#1	91.950 m	49.0 m³	**Custom Stage Data**Listed below -Impervious
#2	91.820 m	0.0 m³	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			105.8 m³ Overall x 0.0% Voids
		49.0 m³	Total Available Storage

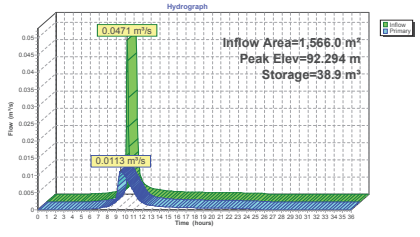
Elevation (meters)	Cum.Store (cubic-meters)
91.950	0.0
91.973	1.6
92.290	38.6
92.442	49.0

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)
91.820	170.7	0.0	0.0
92.440	170.7	105.8	105.8

Device	Routing	Invert	Outlet Devices
#1	Primary	91.950 m	**100 mm Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.0113 m³/s @ 9.52 hrs HW=92.293 m (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 0.0113 m³/s @ 1.44 m/s)

Pond 2P: Cultec 100HD Stormwater Management System



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=1,566.0 m² 77.01% Impervious Runoff Depth=82 mm
Tc=10.0 min CN=92 Runoff=0.0524 m³/s 128.8 m³

Subcatchment 3S: Pre-Devleopment Runoff Area=1,754.0 m² 30.16% Impervious Runoff Depth=57 mm
Tc=10.0 min CN=81 Runoff=0.0407 m³/s 99.2 m³

Subcatchment 4S: Post-Development Runoff Area=188.0 m² 12.77% Impervious Runoff Depth=48 mm
Tc=10.0 min CN=77 Runoff=0.0037 m³/s 9.1 m³

Pond 2P: Cultec 100HD Stormwater Peak Elev=92.363 m Storage=43.6 m³ Inflow=0.0524 m³/s 128.8 m³
Outflow=0.0126 m³/s 128.7 m³

Total Runoff Area = 3,508.0 m² Runoff Volume = 237.0 m³ Average Runoff Depth = 68 mm
49.86% Pervious = 1,749.0 m² 50.14% Impervious = 1,759.0 m²

Summary for Subcatchment 1S: Post-Development Controlled Area

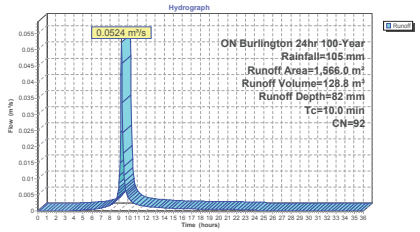
Runoff = 0.0524 m³/s @ 9.26 hrs, Volume= 128.8 m³, Depth= 82 mm
Routed to Pond 2P : Cultec 100HD Stormwater Management System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 100-Year Rainfall=105 mm

Area (m²)	CN	Description
1,206.0	98	Paved parking, HSG A
360.0	74	>75% Grass cover, Good, HSG C
1,566.0	92	Weighted Average
360.0		22.99% Pervious Area
1,206.0		77.01% Impervious Area

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

Subcatchment 1S: Post-Development Controlled Area



Summary for Subcatchment 3S: Pre-Devleopment Area

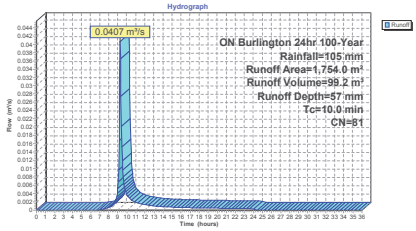
Runoff = 0.0407 m³/s @ 9.26 hrs, Volume= 99.2 m³, Depth= 57 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 100-Year Rainfall=105 mm

Area (m²)	CN	Description
529.0	98	Paved parking, HSG A
1,225.0	74	>75% Grass cover, Good, HSG C
1,754.0	81	Weighted Average
1,225.0		69.84% Pervious Area
529.0		30.16% Impervious Area

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

Subcatchment 3S: Pre-Devleopment Area



Summary for Subcatchment 4S: Post-Development Uncontrolled Area

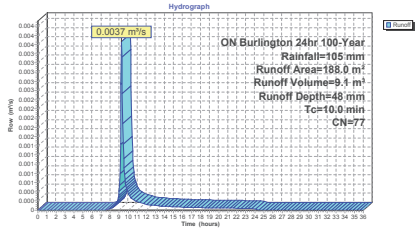
Runoff = 0.0037 m³/s @ 9.26 hrs, Volume= 9.1 m³, Depth= 48 mm

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
ON Burlington 24hr 100-Year Rainfall=105 mm

Area (m²)	CN	Description
24.0	98	Paved parking, HSG A
164.0	74	>75% Grass cover, Good, HSG C
188.0	77	Weighted Average
164.0		87.23% Pervious Area
24.0		12.77% Impervious Area

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

Subcatchment 4S: Post-Development Uncontrolled Area



Summary for Pond 2P: Cultec 100HD Stormwater Management System

Inflow Area = 1,566.0 m², 77.01% Impervious, Inflow Depth = 82 mm for 100-Year event
Inflow = 0.0524 m³/s @ 9.26 hrs, Volume= 128.8 m³
Outflow = 0.0126 m³/s @ 9.52 hrs, Volume= 128.7 m³, Atten= 76%, Lag= 16.1 min
Primary = 0.0126 m³/s @ 9.52 hrs, Volume= 128.7 m³

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 92.363 m @ 9.52 hrs Surf.Area= 170.7 m² Storage= 43.6 m³

Plug-Flow detention time= 53.0 min calculated for 128.7 m³ (100% of inflow)
Center-of-Mass det. time= 52.5 min (707.6 - 655.1)

Volume	Invert	Avail.Storage	Storage Description
#1	91.950 m	49.0 m³	**Custom Stage Data** Listed below -Impervious
#2	91.820 m	0.0 m³	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			105.8 m³ Overall x 0.0% Voids
		49.0 m³	Total Available Storage

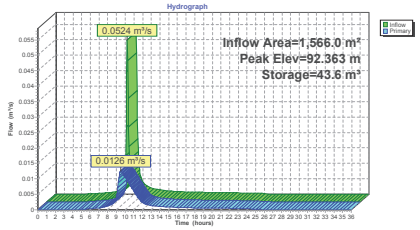
Elevation (meters)	Cum.Store (cubic-meters)
91.950	0.0
91.973	1.6
92.290	38.6
92.442	49.0

Elevation (meters)	Surf.Area (sq-meters)	Inc.Store (cubic-meters)	Cum.Store (cubic-meters)
91.820	170.7	0.0	0.0
92.440	170.7	105.8	105.8

Device	Routing	Invert	Outlet Devices
#1	Primary	91.950 m	**100 mm Vert. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.0126 m³/s @ 9.52 hrs HW=92.362 m (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 0.0126 m³/s @ 1.60 m/s)

Pond 2P: Cultec 100HD Stormwater Management System



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PLOTDATE: Sep 27, 2024 - 2:15pm

LEGEND

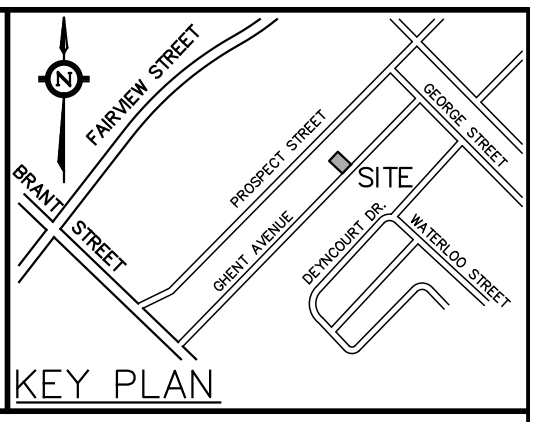
CATCHMENT AREA (m^2)
SCS CURVE NUMBER

DRAINAGE AREA BOUNDARY

PROPERTY LINE

OVERLAND FLOW DIRECTION

IMPERVIOUS AREA



KEY PLAN



PROJECT TITLE

PROPOSED RESIDENTIAL TOWNHOUSE
2169 & 2175 GHENT AVENUE
BURLINGTON, ONTARIO

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

DRAWING TITLE
PRE DEVELOPMENT STORM DRAINAGE PLAN

DESIGN BY MW	SCALE 1:250	DRAWING No. FIG. 1
DRAWN BY GL	DATE 2024-09-20	

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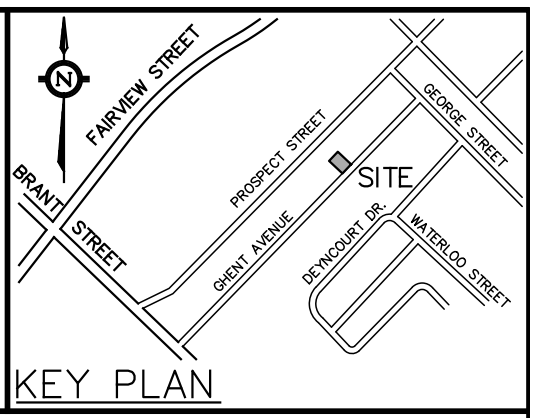
CATCHMENT AREA (ha)
SCS CURVE NUMBER

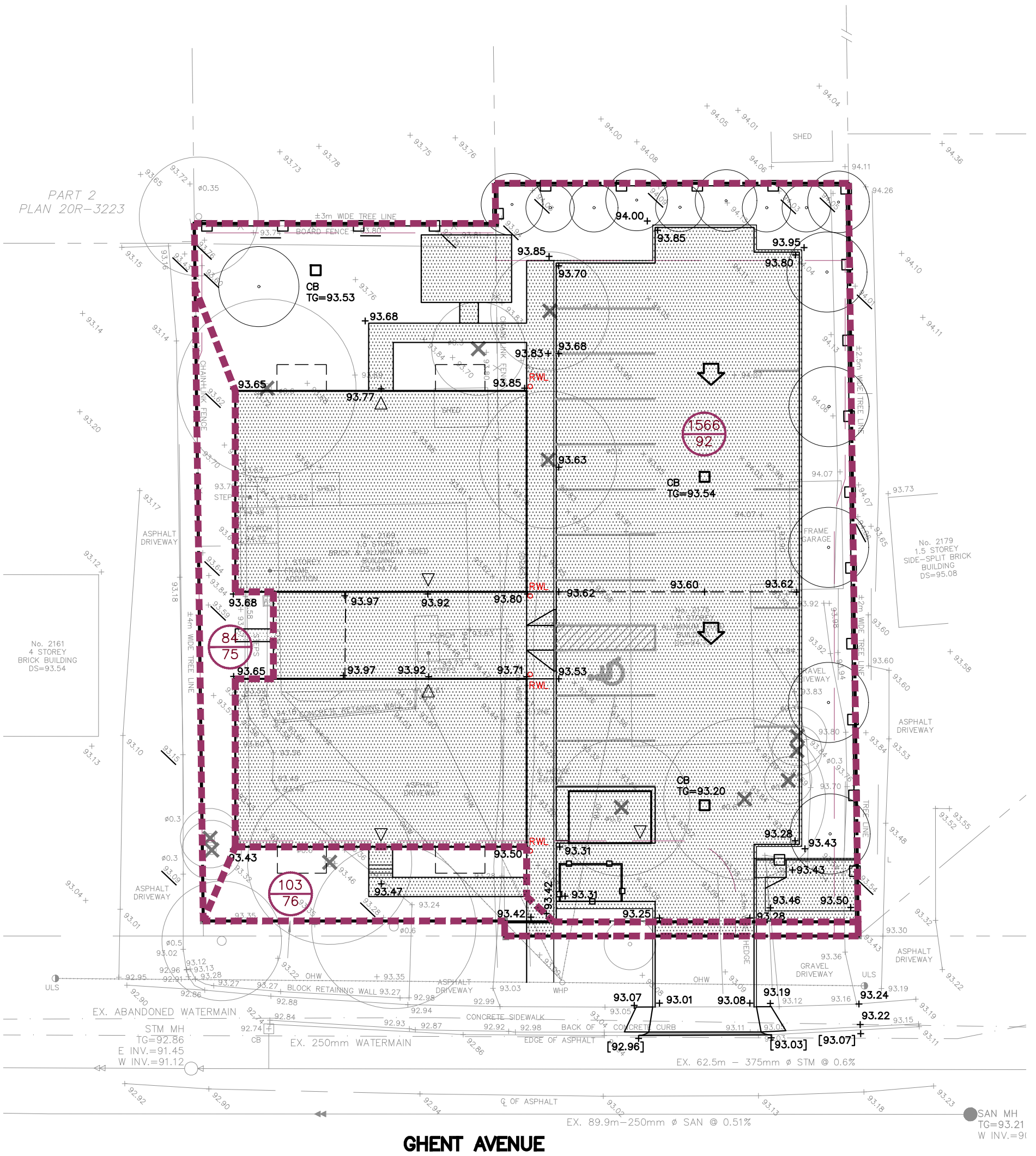
DRAINAGE AREA BOUNDARY

PROPERTY LINE

OVERLAND FLOW DIRECTION

IMPERVIOUS AREA





PROJECT TITLE

PROPOSED RESIDENTIAL TOWNHOUSE
2169 & 2175 GHENT AVENUE
BURLINGTON, ONTARIO

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

DRAWING TITLE

POST DEVELOPMENT STORM DRAINAGE PLAN

DESIGN BY MW	SCALE 1:250	DRAWING No. FIG. 2
DRAWN BY GL	DATE 2024-09-20	

Stormceptor®

Rinker MATERIALS® A QUIKRETE® COMPANY

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/12/2024

Province:	Ontario
City:	Burlington
Nearest Rainfall Station:	HAMILTON RBG CS
Climate Station Id:	6153301
Years of Rainfall Data:	20

Site Name:	2169 Ghent Ave.

Drainage Area (ha):	0.1557
Runoff Coefficient 'c':	0.90

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0
Required Water Quality Runoff Volume Capture (%):	90.0

Estimated Water Quality Flow Rate (L/s):	4.51
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	137
Estimated Average Annual Sediment Volume (L/yr):	111

Project Name:	2169 Ghent Ave.
Project Number:	1839
Designer Name:	Brandon O'Leary
Designer Company:	Rinker Pipe
Designer Email:	brandon.oleary@RinkerPipe.com
Designer Phone:	905-630-0359
EOR Name:	Malcolm Wallace
EOR Company:	Trafalgar Engineering Ltd.
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	64
EFO6	68
EFO8	70
EFO10	70
EFO12	70

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 64

Water Quality Runoff Volume Capture (%): > 90

imbrium

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 was used, or in part, 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.

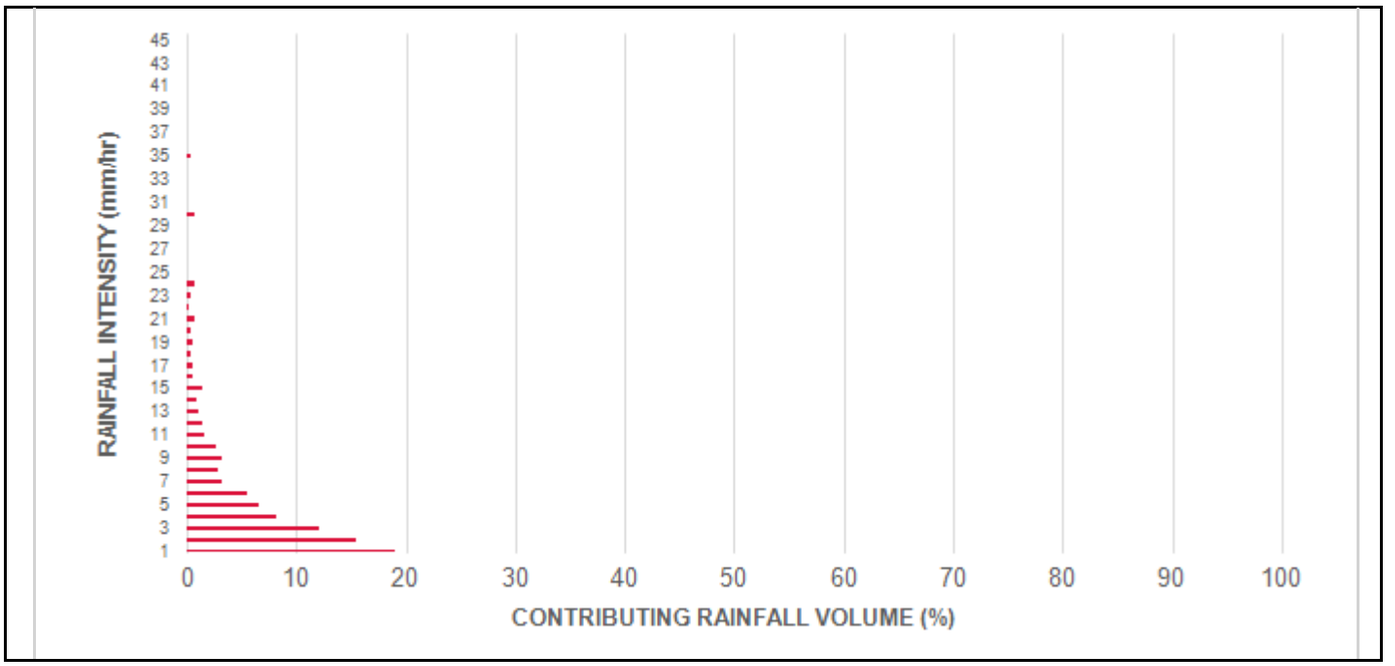
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

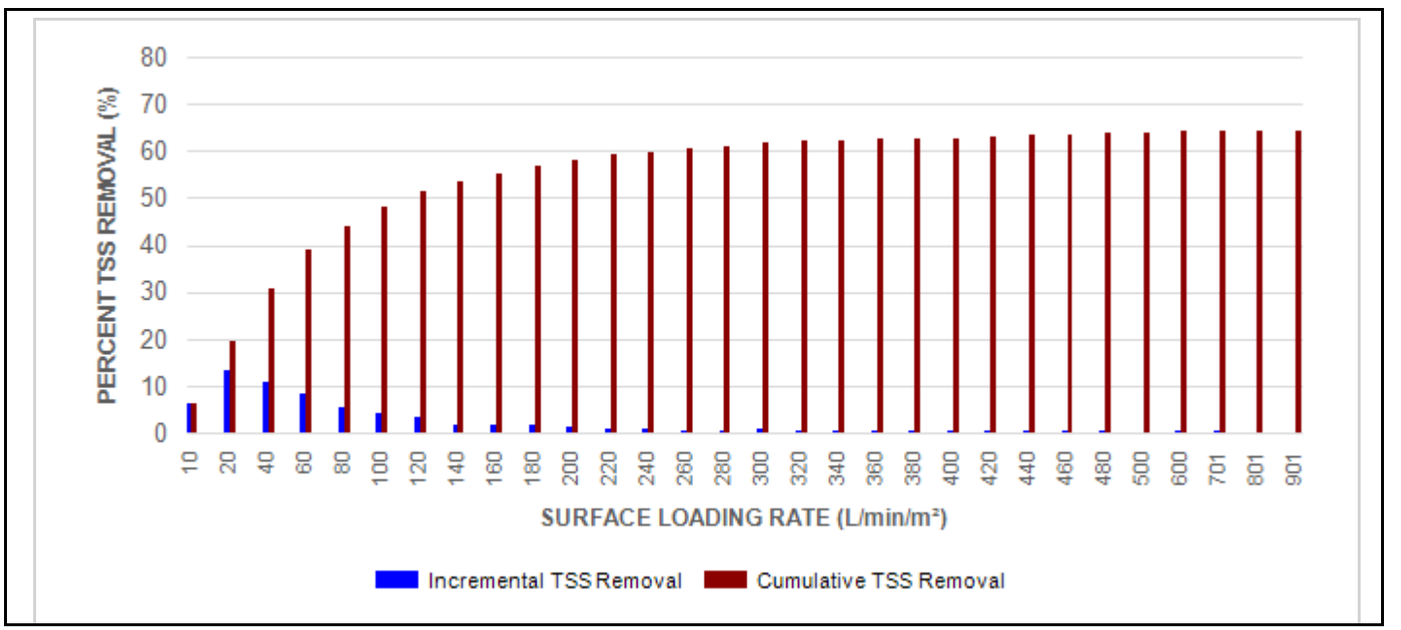
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	9.1	9.1	0.20	12.0	10.0	70	6.4	6.4
1.00	19.0	28.0	0.40	24.0	20.0	70	13.4	19.7
2.00	15.5	43.5	0.80	48.0	40.0	70	10.9	30.7
3.00	12.1	55.6	1.20	72.0	60.0	67	8.1	38.8
4.00	8.2	63.8	1.60	96.0	80.0	64	5.2	44.0
5.00	6.5	70.4	2.00	120.0	100.0	62	4.1	48.1
6.00	5.5	75.9	2.40	144.0	120.0	61	3.3	51.4
7.00	3.2	79.0	2.80	168.0	140.0	59	1.9	53.3
8.00	2.9	81.9	3.20	192.0	160.0	57	1.7	55.0
9.00	3.2	85.2	3.60	216.0	180.0	56	1.8	56.8
10.00	2.7	87.9	4.00	240.0	200.0	54	1.5	58.2
11.00	1.7	89.6	4.40	264.0	220.0	53	0.9	59.2
12.00	1.5	91.1	4.80	288.0	240.0	53	0.8	59.9
13.00	1.1	92.2	5.20	312.0	260.0	52	0.6	60.5
14.00	0.9	93.1	5.60	336.0	280.0	52	0.5	61.0
15.00	1.4	94.5	6.00	360.0	300.0	51	0.7	61.7
16.00	0.6	95.1	6.41	384.0	320.0	50	0.3	62.0
17.00	0.5	95.6	6.81	408.0	340.0	50	0.2	62.2
18.00	0.3	95.9	7.21	432.0	360.0	49	0.2	62.4
19.00	0.5	96.4	7.61	456.0	380.0	49	0.3	62.7
20.00	0.4	96.8	8.01	480.0	400.0	48	0.2	62.8
21.00	0.8	97.6	8.41	504.0	420.0	47	0.4	63.2
22.00	0.2	97.8	8.81	528.0	440.0	47	0.1	63.3
23.00	0.4	98.2	9.21	552.0	460.0	46	0.2	63.5
24.00	0.7	98.9	9.61	576.0	480.0	46	0.3	63.8
25.00	0.0	98.9	10.01	600.0	500.0	45	0.0	63.8
30.00	0.7	99.7	12.01	721.0	600.0	42	0.3	64.1
35.00	0.3	100.0	14.01	841.0	701.0	42	0.1	64.3
40.00	0.0	100.0	16.01	961.0	801.0	41	0.0	64.3
45.00	0.0	100.0	18.01	1081.0	901.0	41	0.0	64.3
Estimated Net Annual Sediment (TSS) Load Reduction =								**64 %**

Climate Station ID: 6153301 *Years of Rainfall Data*: 20

RAINFALL DATA FROM HAMILTON RBG CS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



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Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

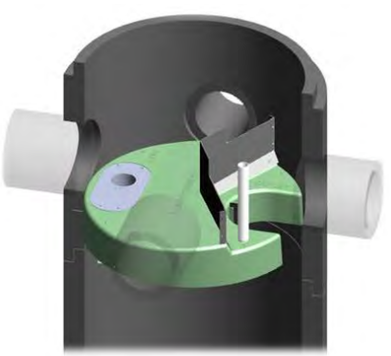
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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.

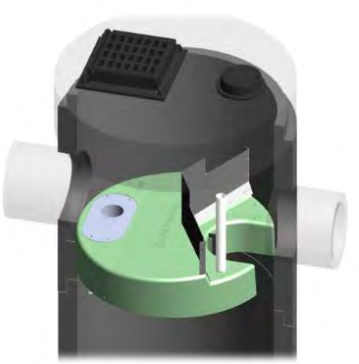
DESIGN FLEXIBILITY

►**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

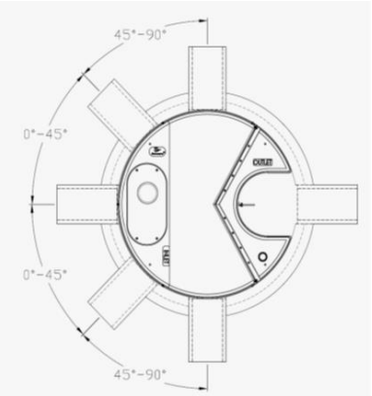
►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV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





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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° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : 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.

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	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*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

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Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in

accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

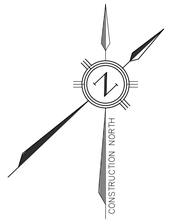
Appendix 'E'

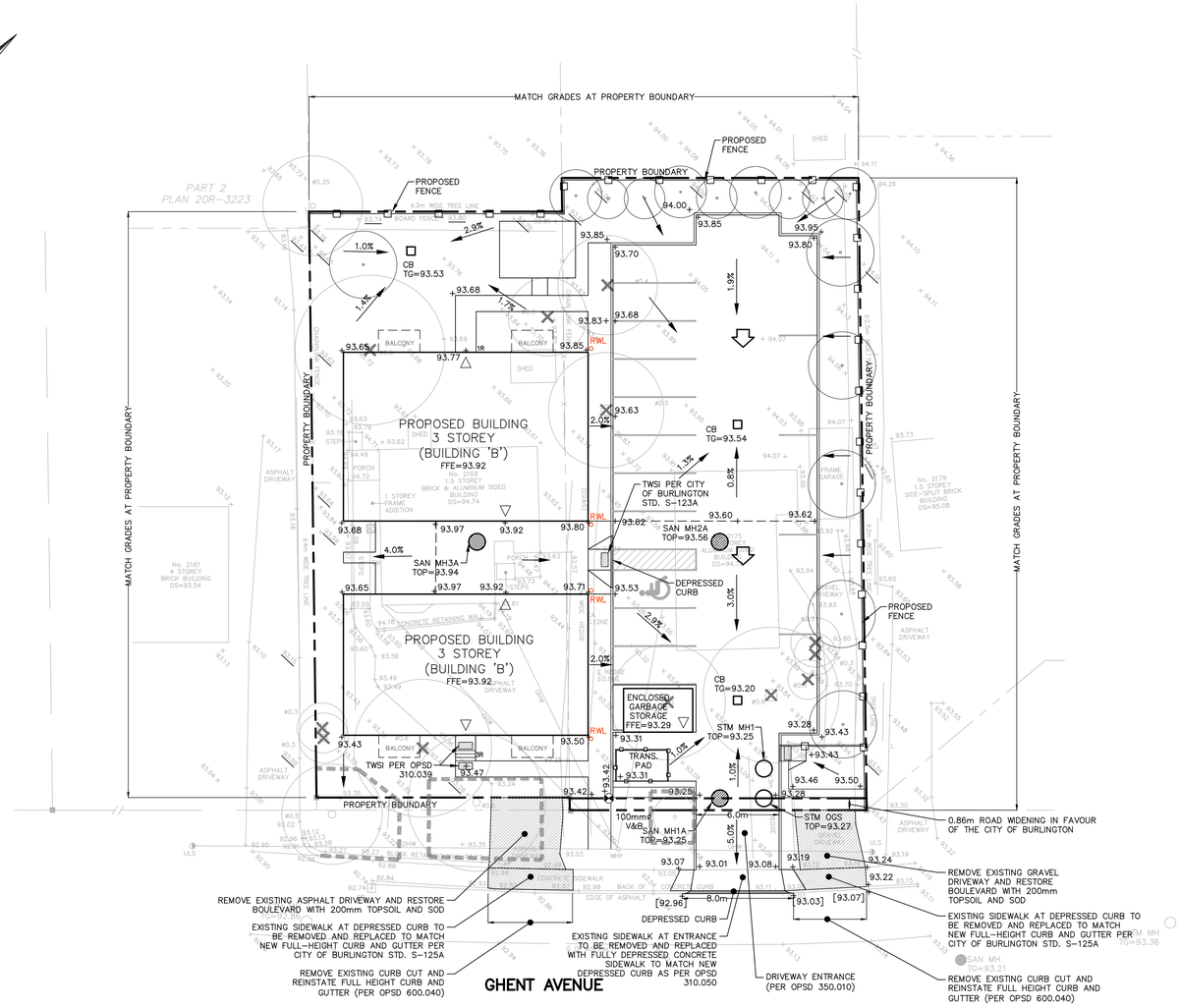
Grading Plan (G1)

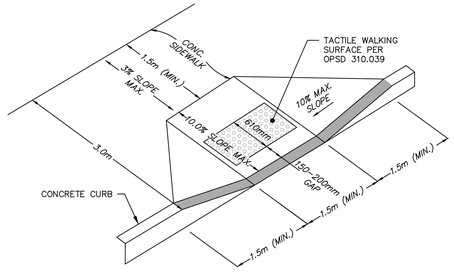
Servicing Plan (S1)

Erosion and Sediment Control Plan (E1)

Construction and Mobility Management Plan (CMMP1)







BARRIER-FREE CURB RAMP
N.T.S.

GENERAL NOTES

1. ALL THE CONSTRUCTON WORK FOR THIS PROJECT SHALL COMPLY WITH THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF BURLINGTON AND THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
2. ALL SURFACE DRAINAGE SHALL BE COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. DRAINAGE OF ABUTTING PROPERTIES SHALL NOT BE ADVERSELY AFFECTED.
3. PROPOSED ELEVATIONS ALONG SITE PROPERTY LINES MUST MATCH EXISTING ELEVATIONS.
4. A SILT FENCE MUST BE PLACED AROUND THE PERIMETER OF THE SITE.
5. AT ALL ENTRANCES TO THE SITE, THE ROAD CURB AND SIDEWALK WILL BE CONTINUOUS THROUGH THE DRIVEWAY. THE DRIVEWAY GRADE WILL BE COMPATIBLE WITH THE EXISTING SIDEWALK AND A CURB DEPRESSION WILL BE PROVIDED FOR AT EACH ENTRANCE.
6. SIDEWALK TO BE REMOVED AND REPLACED AS PER CITY STD. S-121.
7. THE PORTION OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD MUST BE PAVED WITH 40mm HL3 AND 50mm HL8. BASE TO BE 150mm GRANULAR "A" (OR 130mm OF 20mm CRUSHER RUN LIMESTONE) AND 300mm GRANULAR "B" (OR 225mm OF 50mm CRUSHER RUN LIMESTONE) COMPACTED TO 100% STANDARD PROCTOR DENSITY.
8. A UTILITY CLEARANCE RADIUS OF 1.2 METRES BETWEEN THE PROPOSED DRIVEWAY ENTRANCE CURB RETURN AND ALL ABOVE GROUND UTILITIES MUST BE MAINTAINED.
9. ROAD OCCUPANCY / ACCESS PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
10. THE SERVICE CONNECTION TRENCH WITHIN THE TRAVELED PORTION OF THE ROAD ALLOWANCE SHALL BE BACKFILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROAD OCCUPANCY / ACCESS PERMIT APPLICATION.
11. WITHIN THE CITY'S RIGHT-OF-WAY, STORM SEWERS AND STORM SEWER CONNECTIONS MUST BE CONCRETE, OR APPROVED EQUAL, WITH TYPE "B" BEDDING THROUGHOUT. THE STRENGTH OF THE CONCRETE PIPE MUST BE AS PER CITY STANDARD AND OF MINIMUM 65-D FOR REINFORCED PIPE.
12. THE MINIMUM CATCHBASIN LEAD DIAMETER ALLOWED IS 250mm.
13. ALL CATCHBASIN MANHOLES AND MANHOLES WITH INLET CONTROL DEVICES MUST HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.

GRADING NOTES

1. ALONG ADJOINING PROPERTIES GRADE TO MEET EXISTING OR PROPOSED ELEVATIONS WITH SODDED SLOPES (MIN. 3H TO 1V) AND/OR RETAINING WALLS AS SPECIFIED.
2. UNLESS OTHERWISE NOTED, THE GROUND BETWEEN PROPOSED ELEVATIONS ON SIDE LOTS SHALL BE GRADED AS A STRAIGHT LINE.
3. ALL FILL PLACED ON LOTS SHALL BE COMPACTED TO A MINIMUM 95% SPD (UNLESS OTHERWISE RECOMMENDED BY THE GEOTECHNICAL ENGINEER). ALL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm LIFTS.
4. IF APPLICABLE FOR DELINEATION OF TREE PROTECTION ZONES, BUFFERS, REMOVALS AND PROTECTION SCHEMATICS, ETC., REFER TO TREE PROTECTION PLAN (BY LANDSCAPE ARCHITECT).
5. LOT GRADING SHALL CONFORM STRICTLY WITH THIS PLAN. ANY CHANGES, UNLESS APPROVED PRIOR TO CONSTRUCTION BY THE CITY, SHALL RESULT IN NON ACCEPTANCE BY THE CITY.

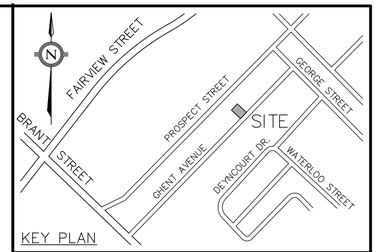
ADDITIONAL NOTES

1. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK, WHETHER SHOWN ON THE PLAN OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COST ARISING FROM SUCH INSPECTION.

TREE PROTECTION LEGEND

(REFER TO ARBORIST REPORT PREPARED BY AMY CHOI CONSULTING AND LANDSCAPE PLAN PREPARED BY LANDSCAPE FLORDIA)

- EXISTING TREE TO BE REMOVED
- TREE PROTECTION FENCE
- EXISTING TREE
- PROPOSED TREE



KEY PLAN

LEGEND

- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED CATCHBASIN
- PROPERTY BOUNDARY
- 100.00 EXISTING ELEVATION
- 100.00 EXISTING ELEVATION TO REMAIN
- +101.32 PROPOSED FINISHED ELEVATION
- +[99.74] INTERPOLATED EXISTING ELEVATION TO REMAIN
- 0.8% PROPOSED DRAINAGE DIRECTION
- PROPOSED SWALE DRAINAGE DIRECTION
- PROPOSED SLOPE
- OVERLAND FLOW
- RWL DOWNSPOUT TO BURIED RAINWATER LEADER
- PROPOSED FENCE (REFER TO LANDSCAPE DRAWINGS)
- TREE HOARDING

NO.	YY/MM/DD	BY/DRAWN	REVISIONS
0	24/09/27	MW/GL	ISSUED FOR OPA/ZBA

CAD FILE: 1839GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Sep 27, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78) AND DERIVED FROM THE CITY OF BURLINGTON BENCHMARK NO. 1044.

BENCHMARK

CULVERT OVER RAMBO CREEK ON GHENT AVENUE 140 METRES SOUTH WEST OF PEARSON STREET AND 465 METRES NORTHEAST OF BRANT STREET. PLAQUE IS LOCATED PM THE NORTH SIDE OF GHENT AVENUE AND EAST SIDE OF RAMBO CREEK SET ON WEST FACE OF CONCRETE CULVERT WING WALL.
ELEVATION = 91.8000 METRES

TOPOGRAPHIC SURVEY INFORMATION IN THIS DRAWING IS FROM PLAN 23-111 BY MACKAY, MACKAY & PETERS LIMITED, JULY 11, 2023.

SCALE 1:200 (0 2 4 6 8 10)

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
SEPT 27 2024
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

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

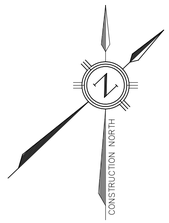
PROJECT TITLE
MULTI RESIDENTIAL DEVELOPMENT

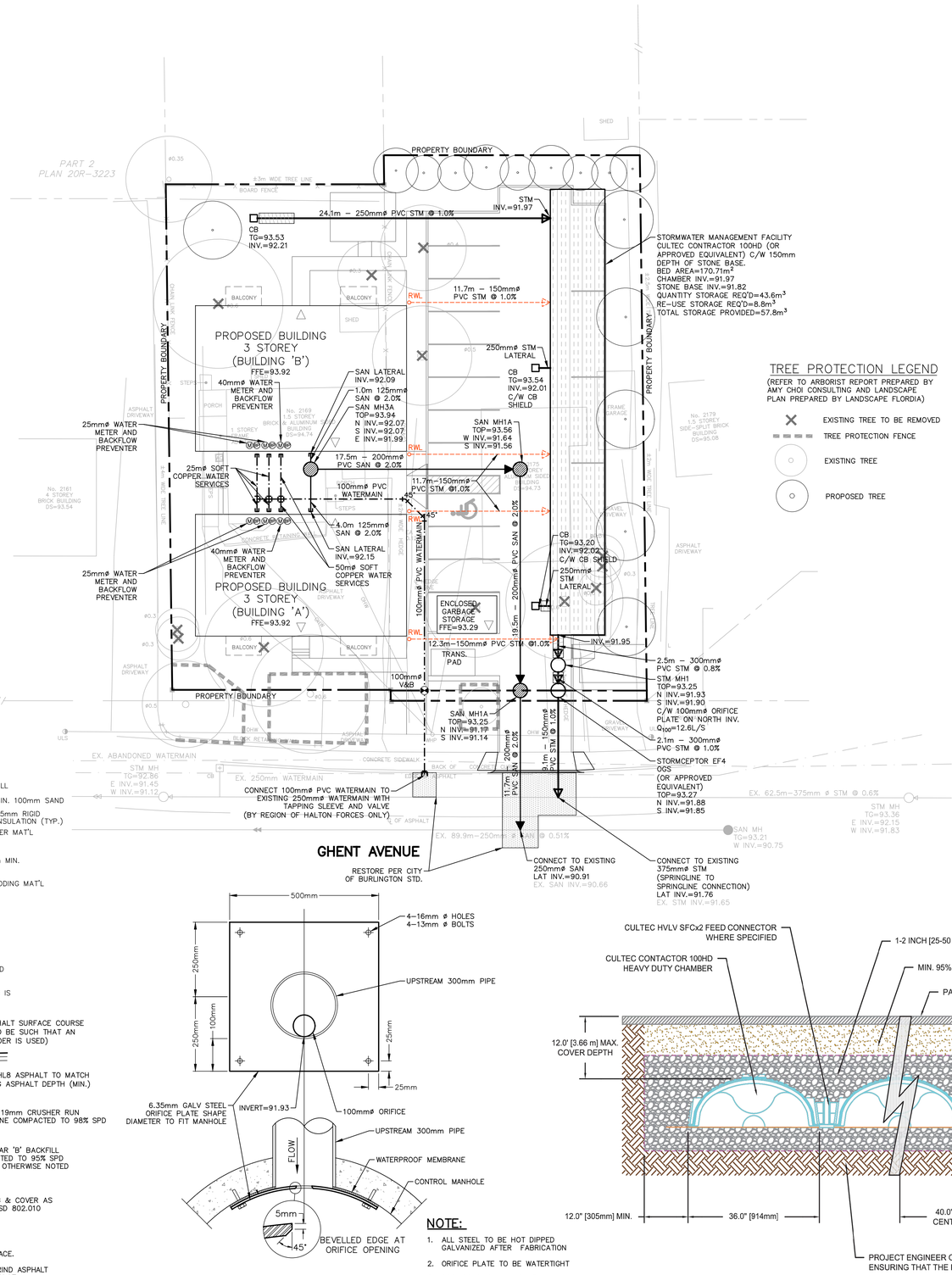
LOCATION
2169 & 2175 GHENT AVE
BURLINGTON, ONTARIO

DRAWING TITLE
GRADING PLAN

SCALE 1:200	DESIGN BY MW	PROJECT No. 1839	
DRAWN BY GL	CHECKED BY NS	PLAN No. G1	
DATE 24/08/01	SHEET 1 OF 1		

FILENAME: P:\1839 2169 Ghent Avenue\04-CAD\03-Site Plan\1839GS.dwg
PLOTDATE: Sep 27, 2024 - 2:50pm

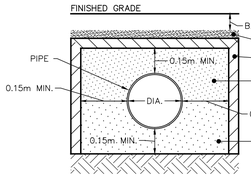




TREE PROTECTION LEGEND

(REFER TO ARBORIST REPORT PREPARED BY AMY CHOI CONSULTING AND LANDSCAPE PLAN PREPARED BY LANDSCAPE FLORDIA)

- EXISTING TREE TO BE REMOVED
- TREE PROTECTION FENCE
- EXISTING TREE
- PROPOSED TREE

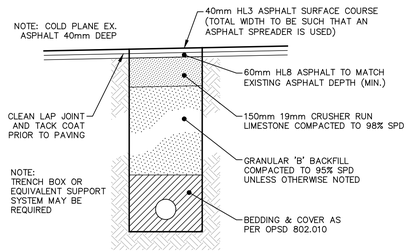


PIPE INSULATION DETAIL

N.T.S.

NOTE:

1. DETAIL TO BE READ IN CONJUNCTION WITH OPSD 1109.030
2. INSULATION REQUIRED WHERE DEPTH OF COVER IS <1.2m (SEWER) or <1.7m (WATER)



NOTE:

1. PLACE HL8 ASPHALT TO MATCH EX SURFACE.
2. IN FOLLOWING CONSTRUCTION SEASON GRIND ASPHALT 40mm DEEP AND PLACE 40mm HL3 ASPHALT

TYPICAL TRENCH RESTORATION

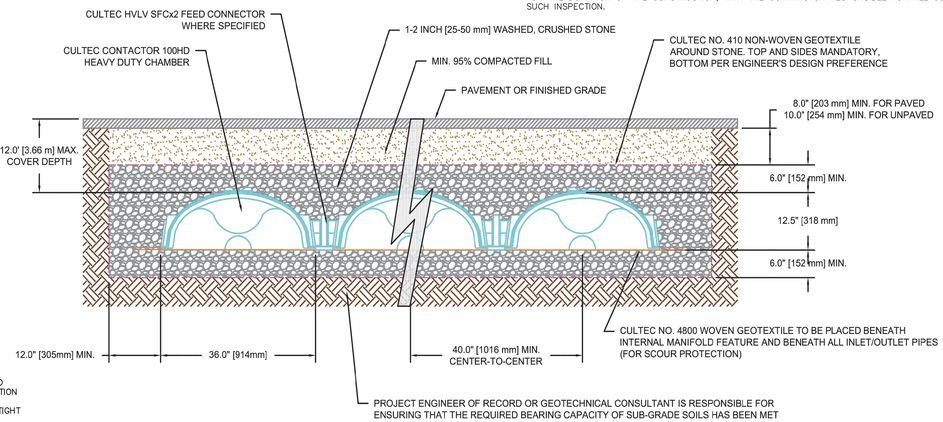
N.T.S.

NOTE:

1. ALL STEEL TO BE HOT DIPPED GALVANIZED AFTER FABRICATION
2. ORIFICE PLATE TO BE WATERTIGHT
3. PROVIDE 0.60m SUMP AT CONTROL MANHOLE

CONTROL ORIFICE DETAIL

N.T.S.



CULTEC CONTRACTOR 100HD TYPICAL SECTION

N.T.S.

GENERAL NOTES

1. ALL THE CONSTRUCTON WORK FOR THIS PROJECT SHALL COMPLY WITH THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF BURLINGTON AND THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
2. ALL SURFACE DRAINAGE SHALL BE COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. DRAINAGE OF ABUTTING PROPERTIES SHALL NOT BE ADVERSELY AFFECTED.
3. PROPOSED ELEVATIONS ALONG SITE PROPERTY LINES MUST MATCH EXISTING ELEVATIONS.
4. A SILT FENCE MUST BE PLACED AROUND THE PERIMETER OF THE SITE.
5. AT ALL ENTRANCES TO THE SITE, THE ROAD CURB AND SIDEWALK WILL BE CONTINUOUS THROUGH THE DRIVEWAY. THE DRIVEWAY GRADE WILL BE COMPATIBLE WITH THE EXISTING SIDEWALK AND A CURB DEPRESSION WILL BE PROVIDED FOR AT EACH ENTRANCE.
6. SIDEWALK TO BE REMOVED AND REPLACED AS PER CITY STD. S-121.
7. THE PORTION OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD MUST BE PAVED WITH 40mm HL3 AND 50mm HL8. BASE TO BE 150mm GRANULAR 'A' (OR 130mm OF 20mm CRUSHER RUN LIMESTONE) AND 300mm GRANULAR "B" (OR 225mm OF 50mm CRUSHER RUN LIMESTONE) COMPACTED TO 100% STANDARD PROCTOR DENSITY.
8. A UTILITY CLEARANCE RADIUS OF 1.2 METRES BETWEEN THE PROPOSED DRIVEWAY ENTRANCE CURB RETURN AND ALL ABOVE GROUND UTILITIES MUST BE MAINTAINED.
9. ROAD OCCUPANCY / ACCESS PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
10. THE SERVICE CONNECTION TRENCH WITHIN THE TRAVELED PORTION OF THE ROAD ALLOWANCE SHALL BE BACKFILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROAD OCCUPANCY / ACCESS PERMIT APPLICATION.
11. WITHIN THE CITY'S RIGHT-OF-WAY, STORM SEWERS AND STORM SEWER CONNECTIONS MUST BE CONCRETE, OR APPROVED EQUAL, WITH TYPE 'B' BEDDING THROUGHOUT. THE STRENGTH OF THE CONCRETE PIPE MUST BE AS PER CITY STANDARD AND OF MINIMUM 65-D FOR REINFORCED PIPE.
12. THE MINIMUM CATCHBASIN LEAD DIAMETER ALLOWED IS 250mm.
13. ALL CATCHBASIN MANHOLES AND MANHOLES WITH INLET CONTROL DEVICES MUST HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.

STORM SEWERS

1. SEWER BEDDING AS PER OPSD 802.010 OR 802.013 FOR FLEXIBLE PIPES AND OPSD 802.030 OR 802.013 FOR RIGID PIPES, CLASS 'B' BEDDING OR APPROVED BY CITY ENGINEER.
2. ALL MANHOLES AND CATCH BASINS SHALL BE:
   A. OPSD 701.010 (1200mmø)
3. MANHOLE AND CATCH BASIN (LANDSCAPE) COVER/ GRATING SHALL BE AS FOLLOWS:
   A. OPSD 401.010, TYPE 'A' – CLOSED COVER FOR MANHOLE AND STAMPED "DANGER–STORM"
   B. CITY STD. S-176 – BEEHIVE CATCH BASIN FRAME AND COVER FOR CB ON LANDSCAPE AREAS
4. ALL MANHOLES TO BE BENCHED THROUGHOUT TO THE SPRING LINE.
5. SURROUND ALL MANHOLES AND CATCHBASINS WITH A MINIMUM OF 1.0 METRE GRANULAR 'A' OR APPROVED EQUAL BY THE CITY ENGINEER COMPACTED TO 100% S.P.D.

WATERMAINS

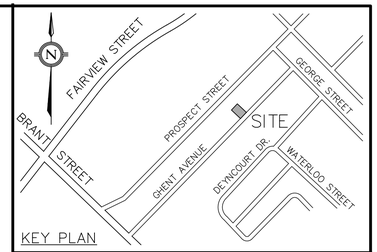
1. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT REGION OF HALTON WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAIN AND / OR WATER SERVICE MATERIALS 100mm (4") AND LARGER MUST BE AWWA C-900-75 POLYVINYL CHLORIDE (PVC) DR18 INSTALLED WITH A 12 GAUGE TWH SOLID COPPER LIGHT COLOURED PLASTIC COATED TRACER WIRE BROUGHT TO THE SURFACE AT EACH VALVE BOX. SIZE 50mm (2") AND SMALLER COPPER TYPE "K" SOFT COPPER TUBING.
3. WATERMAINS AND / OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4") FROM THEMSELVES AND ALL OTHER UTILITIES.
4. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO THE PARKING LOT OR DOWN THE DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100mm (4") DIAMETER MINIMUM ON A HYDRANT.
5. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
6. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
7. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.30m (12") OVER / 0.50m (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
8. ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
9. ALL LIVE TAPPING AND OPERATION OF REGION OF WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENCE DIVISION.

SANITARY SEWERS

1. ALL SANITARY SEWERS SHALL BE SDR-28 PVC PIPE.
2. ALL BEDDING FOR SANITARY SEWERS SHALL BE IN ACCORDANCE WITH REGION OF HALTON STD. DWG. WITH GRANULAR COVER MATERIAL HAVING STONE SIZE NO GREATER THAN 25mm COMPACTED TO 95% SPMDD.
3. ALL MANHOLES SHALL BE IN ACCORDANCE WITH OPSD 701.010, OPSD 401.010 TYPE-A CLOSED COVER AND STAMPED "DANGER-SANITARY" AND BENCHING THROUGHOUT TO THE CROWN OF ALL PIPES ON A VERTICAL PROJECTION FROM SPRING LINE.

ADDITIONAL NOTES

1. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK. WHETHER SHOWN ON THE PLAN OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COST ARISING FROM SUCH INSPECTION.



KEY PLAN

LEGEND

- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED BACKFLOW PREVENTER
- PROPOSED WATER METER
- PROPOSED CATCHBASIN
- PROPOSED STORM SEWER
- PROPOSED BURIED RAINWATER LEADER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPERTY BOUNDARY
- PIPE INSULATION
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE

NO.	YY/MM/DD	BY/DRAWN	REVISIONS
0	24/09/27	MW/GL	ISSUED FOR OPA/ZBA

CAD FILE: 1839GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Sep 27, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78) AND DERIVED FROM THE CITY OF BURLINGTON BENCHMARK NO. 1044.

BENCHMARK

CULVERT OVER RAMBO CREEK ON GHENT AVENUE 140 METRES SOUTH WEST OF PEARSON STREET AND 465 METRES NORTHEAST OF BRANT STREET. PLAQUE IS LOCATED PM THE NORTH SIDE OF GHENT AVENUE AND EAST SIDE OF RAMBO CREEK SET ON WEST FACE OF CONCRETE CULVERT WING WALL.
ELEVATION = 91.8000 METRES

TOPOGRAPHIC SURVEY INFORMATION IN THIS DRAWING IS FROM PLAN 23-111 BY MACKAY, MACKAY & PETERS LIMITED, JULY 11, 2023.

SCALE 1:200 (0, 2, 4, 6, 8, 10)

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
SEPT 27 2024
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

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

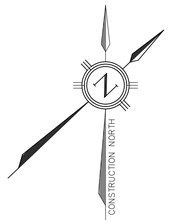
PROJECT TITLE
MULTI RESIDENTIAL DEVELOPMENT

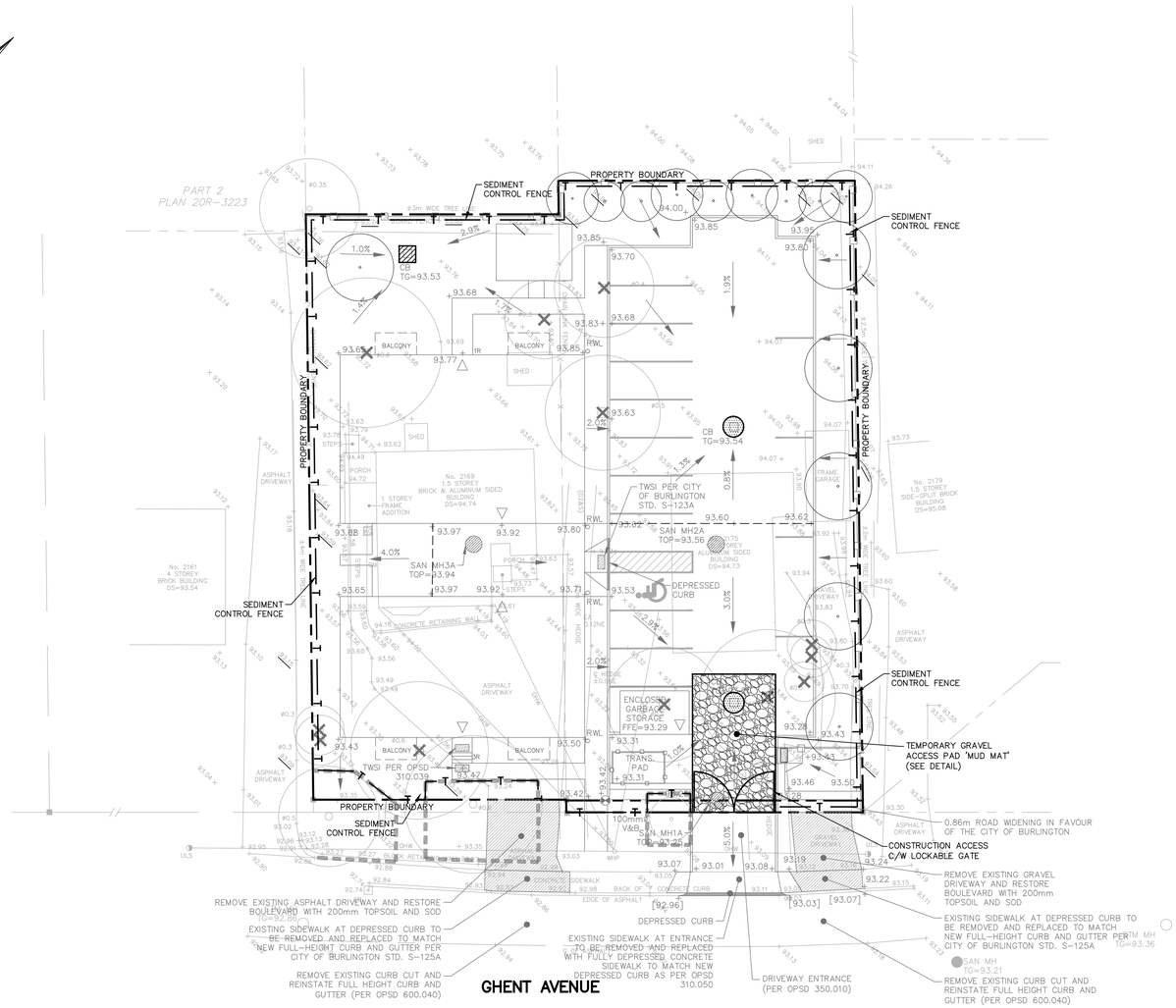
LOCATION
2169 & 2175 GHENT AVE
BURLINGTON, ONTARIO

DRAWING TITLE
SERVICING PLAN

SCALE	1:200	DESIGN BY	MW
DRAWN BY	GL	CHECKED BY	NS
DATE	24/08/01	SHEET	1 OF 1
PROJECT No.	1839		
PLAN No.	S1		

FILENAME: P:\1839 2169 Ghent Avenue\04-CAD\03-Site Plan\1839GS.dwg
PLOTDATE: Sep 27, 2024 - 2:20pm





GENERAL NOTES

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3. PROPOSED ELEVATIONS ALONG SITE PROPERTY LINES MUST MATCH EXISTING ELEVATIONS.
4. A SILT FENCE MUST BE PLACED AROUND THE PERIMETER OF THE SITE.
5. AT ALL ENTRANCES TO THE SITE, THE ROAD CURB AND SIDEWALK WILL BE CONTINUOUS THROUGH THE DRIVEWAY. THE DRIVEWAY GRADE WILL BE COMPATIBLE WITH THE EXISTING SIDEWALK AND A CURB DEPRESSION WILL BE PROVIDED FOR AT EACH ENTRANCE.
6. SIDEWALK TO BE REMOVED AND REPLACED AS PER CITY STD. S-121.
7. THE PORTION OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD MUST BE PAVED WITH 40mm HL3 AND 50mm HL8. BASE TO BE 150mm GRANULAR "A" (OR 130mm OF 20mm CRUSHER RUN LIMESTONE) AND 300mm GRANULAR "B" (OR 225mm OF 50mm CRUSHER RUN LIMESTONE) COMPACTED TO 100% STANDARD PROCTOR DENSITY.
8. A UTILITY CLEARANCE RADIUS OF 1.2 METRES BETWEEN THE PROPOSED DRIVEWAY ENTRANCE CURB RETURN AND ALL ABOVE GROUND UTILITIES MUST BE MAINTAINED.
9. ROAD OCCUPANCY / ACCESS PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
10. THE SERVICE CONNECTION TRENCH WITHIN THE TRAVELED PORTION OF THE ROAD ALLOWANCE SHALL BE BACKFILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROAD OCCUPANCY / ACCESS PERMIT APPLICATION.
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12. THE MINIMUM CATCHBASIN LEAD DIAMETER ALLOWED IS 250mm.
13. ALL CATCHBASIN MANHOLES AND MANHOLES WITH INLET CONTROL DEVICES MUST HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.

ADDITIONAL NOTES

1. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK, WHETHER SHOWN ON THE PLAN OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COST ARISING FROM SUCH INSPECTION.

EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT MEASURES/DEVICES SHALL INSTALLED PRIOR TO ANY SITE DISTURBANCE/CONSTRUCTION
2. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED, REPAIRED/MAINTAINED WEEKLY AND FOLLOWING ALL SIGNIFICANT RAINFALLS.
3. THE MEASURES AS PROPOSED MAY BE MODIFIED AT THE DISCRETION OF THE ENGINEER TO SUIT THE PROPOSED CONSTRUCTION PROGRAMS. THE GENERAL INTENT OF THE PROPOSED EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES.
4. DECOMMISSIONING OF ALL EROSION CONTROL MEASURES SHALL OCCUR ONLY ONCE VEGETATIVE COVER IS ESTABLISHED.
5. DESIGNATED ENTRANCE FOR ALL CONSTRUCTION TRAFFIC TO BE INSTALLED WITH MUD CONTROL DEVICE AS PER MUD MAT DETAIL. MUD CONTROL DEVICES TO BE INSTALLED PRIOR TO START OF CONSTRUCTION AND ARE TO BE MAINTAINED IN GOOD WORKING ORDER UNTIL GRADING WORKS ARE COMPLETED. MUD MAT MAY BE DELETED WITH THE APPROVAL OF THE MUNICIPALITY.
6. ANY DISTURBED AREA NOT SCHEDULED FOR FURTHER CONSTRUCTION WITHIN 30 DAYS SHALL BE PROVIDED WITH A TEMPORARY SEED.
7. INSTALL CATCHBASIN SEDIMENT CONTROL ON EXISTING CATCHBASINS PRIOR TO START OF CONSTRUCTION.
8. INSTALL CATCHBASIN SEDIMENT CONTROL ON NEW CATCHBASINS AT TIME OF INSTALLATION.
9. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED BY THE BUILDER/DEVELOPER:

A) WEEKLY

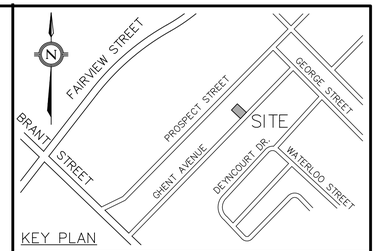
B) BEFORE AND AFTER ANY PREDICTED RAINFALL EVENT

C) FOLLOWING AN UNPREDICTED RAINFALL EVENT

D) DAILY, DURING EXTENDED DURATION RAINFALL EVENTS

E) AFTER SIGNIFICANT SNOW MELT EVENTS

10. WHERE A SITE REQUIRES DEWATERING AND WHERE THE EXPELLED WATER CAN BE FREELY RELEASED TO A SUITABLE RECEIVER, THE EXPELLED WATER SHALL BE TREATED TO CAPTURE SUSPENDED PARTICLES GREATER THAN 40 MICRON IN SIZE. THE CAPTURED SEDIMENT SHALL BE DISPOSED OF PROPERLY PER MOECC GUIDELINES. THE CLEAN EXPELLED WATER SHALL BE FREELY RELEASED TO A SUITABLE RECEIVER THAT DOES NOT CREATE DOWNSTREAM ISSUES INCLUDING BUT NOT LIMITED TO EROSION, FLOODING – NUISANCE OR OTHERWISE, INTERFERENCE ISSUES, ETC.
11. EXISTING STORM SEWER AND DRAINAGE DITCHES ADJACENT TO THE WORKS SHALL BE PROTECTED AT ALL TIMES FROM THE ENTRY OF SEDIMENT/SILT THAT MAY MIGRATE FROM THE SITE. FOR STORM SEWERS: ALL INLETS (REAR LOT CATCHBASINS, ROAD CATCHBASINS, PIPE INLETS, ETC.) MUST BE SECURED/FITTED WITH SILTATION CONTROL MEASURES. FOR DRAINAGE DITCHES: THE INSTALLATION OF ROCK CHECK DAMS, SILTATION FENCE, SEDIMENT CONTAINMENT DEVICES MUST BE INSTALLED TO TRAP AND CONTAIN SEDIMENT. THESE SILTATION CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED PER ITEMS B AND C ABOVE.
12. IN THE EVENT OF A SPILL (RELEASE OF DELETERIOUS MATERIAL) ON OR EMANATING FROM THE SITE, THE OWNER OR OWNERS AGENT SHALL IMMEDIATELY NOTIFY ALL APPLICABLE AGENCIES INCLUDING BUT NOT LIMITED TO MOECC, LOCAL AND REGIONAL AUTHORITIES AND FOLLOW ANY PRESCRIBED CLEAN UP PROCEDURE. THE OWNER OR OWNERS AGENT WILL ADDITIONALLY IMMEDIATELY NOTIFY THE MUNICIPALITY.



KEY PLAN

LEGEND

- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPERTY BOUNDARY
- + 101.32 EXISTING ELEVATION
- + 101.32 EXISTING ELEVATION TO REMAIN
- +101.32 PROPOSED FINISHED ELEVATION
- +[99.74] INTERPOLATED EXISTING ELEVATION
- 2.0% PROPOSED DRAINAGE DIRECTION
- PROPOSED SWALE DRAINAGE DIRECTION
- PROPOSED SLOPE
- OVERLAND FLOW

NO.	YY/MM/DD	BY/DRAWN	REVISIONS
0	24/09/27	MW/GL	ISSUED FOR OPA/ZBA

CAD FILE: 1839GS.dwg | PLOT SCALE: 1:1 | PLOT DATE: Sep 27, 2024

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78) AND DERIVED FROM THE CITY OF BURLINGTON BENCHMARK NO. 1044.

BENCHMARK

CULVERT OVER RAMBO CREEK ON GHENT AVENUE 140 METRES SOUTH WEST OF PEARSON STREET AND 465 METRES NORTHEAST OF BRANT STREET. PLAQUE IS LOCATED PM THE NORTH SIDE OF GHENT AVENUE AND EAST SIDE OF RAMBO CREEK SET ON WEST FACE OF CONCRETE CULVERT WING WALL.
ELEVATION = 91.8000 METRES

TOPOGRAPHIC SURVEY INFORMATION IN THIS DRAWING IS FROM PLAN 23-111 BY MACKAY, MACKAY & PETERS LIMITED, JULY 11, 2023.

SCALE 1:200 (0 2 4 6 8 10)

LICENSED PROFESSIONAL ENGINEER N. A. SYLVESTER 100199487 SEPT 27 2024 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

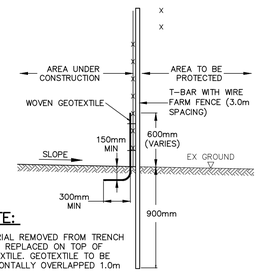
CONSULTANT
TRAFALGAR ENGINEERING
#1-481 MORDEN ROAD, OAKVILLE, ON, L6K 3W6
www.trafalgareng.com

PROJECT TITLE
MULTI RESIDENTIAL DEVELOPMENT

LOCATION
2169 & 2175 GHENT AVE
BURLINGTON, ONTARIO

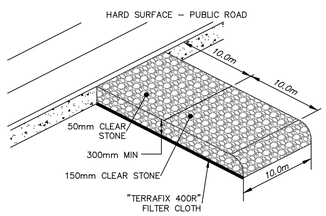
DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

SCALE	1:200	DESIGN BY	MW
DRAWN BY	GL	CHECKED BY	NS
DATE	24/08/01	SHEET	1 OF 1
PROJECT No.	1839		
PLAN No.	E1		



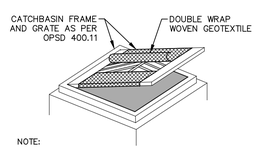
NOTE:
MATERIAL REMOVED FROM TRENCH TO BE REPLACED ON TOP OF GEOTEXTILE. GEOTEXTILE TO BE HORIZONTALLY OVERLAPPED 1.0m

SEDIMENT CONTROL FENCE
N.T.S.



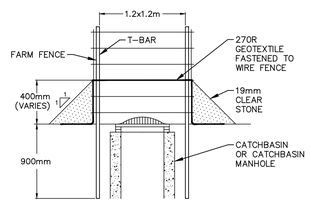
NOTE: LOCATION TO BE DETERMINED IN THE FIELD

GRAVEL ACCESS PAD (MUD MAT)
N.T.S.



NOTE:
1. TO BE USED UNDER APPROPRIATE DRAINAGE CIRCUMSTANCES, BETWEEN APRIL AND DECEMBER
2. WOVEN GEOTEXTILE TO HAVE EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm
3. WOVEN GEOTEXTILE TO BE REPLACED PERIODICALLY WHEN ACCUMULATED SEDIMENTS INTERFERES WITH DRAINAGE.

CATCHBASIN SEDIMENT CONTROL IN PAVED AREAS
N.T.S.



CATCHBASIN SEDIMENT CONTROL OFF ROAD AREAS
N.T.S.

SEDIMENT CONTROL LEGEND

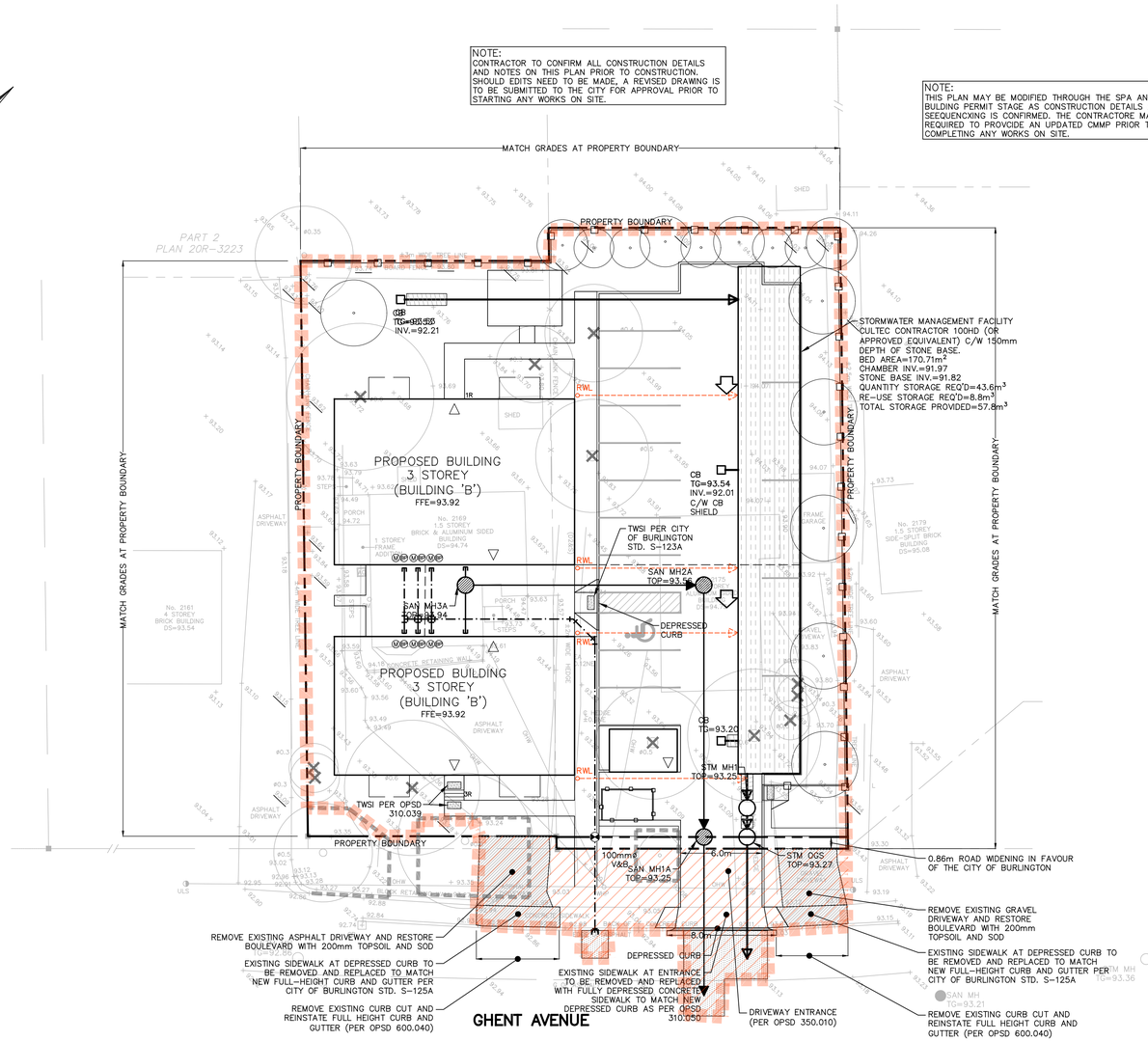
- SEDIMENT CONTROL CB IN PAVED AREAS
- SEDIMENT CONTROL CB IN LANDSCAPED AREA
- SEDIMENT CONTROL FENCE
- SOLID CONSTRUCTION BARRIER
- MUD MAT
- FIBRE ROLL
- TREE HOARDING (SEE LANDSCAPE DRAWING)
- 37 TREE NUMBER (SEE LANDSCAPE DRAWING)

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PLOTDATE: Sep 27, 2024 - 2:39pm

CONSTRUCTION NORTH

NOTE:
CONTRACTOR TO CONFIRM ALL CONSTRUCTION DETAILS AND NOTES ON THIS PLAN PRIOR TO CONSTRUCTION. SHOULD EDITS NEED TO BE MADE, A REVISED DRAWING IS TO BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO STARTING ANY WORKS ON SITE.

NOTE:
THIS PLAN MAY BE MODIFIED THROUGH THE SPA AND BUILDING PERMIT STAGE AS CONSTRUCTION DETAILS AND SEEQUENCXING IS CONFIRMED. THE CONTRACTORE MAY BE REQUIRED TO PROVCIDE AN UPDATED CMMP PRIOR TO COMPLETING ANY WORKS ON SITE.

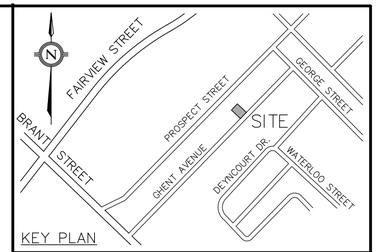


GENERAL NOTES

1. ALL THE CONSTRUCTON WORK FOR THIS PROJECT SHALL COMPLY WITH THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF BURLINGTON AND THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
2. A SILT FENCE MUST BE PLACED AROUND THE PERIMETER OF THE SITE.
3. AT ALL ENTRANCES TO THE SITE, THE ROAD CURB AND SIDEWALK WILL BE CONTINUOUS THROUGH THE DRIVEWAY. THE DRIVEWAY GRADE WILL BE COMPATIBLE WITH THE EXISTING SIDEWALK AND A CURB DEPRESSION WILL BE PROVIDED FOR AT EACH ENTRANCE.
4. SIDEWALK TO BE REMOVED AND REPLACED AS PER CITY STD. S-121.
5. THE PORTION OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD MUST BE PAVED WITH 40mm HL3 AND 50mm HL8. BASE TO BE 150mm GRANULAR "A" (OR 130mm OF 20mm CRUSHER RUN LIMESTONE) AND 300mm GRANULAR "B" (OR 225mm OF 50mm CRUSHER RUN LIMESTONE) COMPACTED TO 100% STANDARD PROCTOR DENSITY.
6. A UTILITY CLEARANCE RADIUS OF 1.2 METRES BETWEEN THE PROPOSED DRIVEWAY ENTRANCE CURB RETURN AND ALL ABOVE GROUND UTILITIES MUST BE MAINTAINED.
7. ROAD OCCUPANCY / ACCESS PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
8. THE SERVICE CONNECTION TRENCH WITHIN THE TRAVELED PORTION OF THE ROAD ALLOWANCE SHALL BE BACKFILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROAD OCCUPANCY / ACCESS PERMIT APPLICATION.
9. WITHIN THE CITY'S RIGHT-OF-WAY, STORM SEWERS AND STORM SEWER CONNECTIONS MUST BE CONCRETE, OR APPROVED EQUAL, WITH TYPE "B" BEDDING THROUGHOUT. THE STRENGTH OF THE CONCRETE PIPE MUST BE AS PER CITY STANDARD AND OF MINIMUM 65-D FOR REINFORCED PIPE.
10. ALL CATCHBASIN MANHOLES AND MANHOLES WITH INLET CONTROL DEVICES MUST HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.
11. ALL REMOVALS PER OPSS.MUNI 510. CURB AND GUTTER REMOVAL OPSS.MUNI.07.03.03 AMENDED AS PER CITY OF BURLINGTON STANDARD SPECIFICATIONS B.4

ADDITIONAL NOTES

1. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK, WHETHER SHOWN ON THE PLAN OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COST ARISING FROM SUCH INSPECTION.



KEY PLAN

LEGEND

- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED CATCHBASIN
- PROPOSED DOUBLE CATCHBASIN
- PROPERTY BOUNDARY
- OVERLAND FLOW
- PROPOSED LIMIT OF CONSTRUCTION
- PROPOSED TEMPORARY ENCROACHMENT ON CITY'S ROW

NO.	YY/MM/DD	BY/DRAWN	REVISIONS
0	24/09/27	MW/GL	ISSUED FOR OPA/ZBA

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ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78) AND DERIVED FROM THE CITY OF BURLINGTON BENCHMARK NO. 1044.

BENCHMARK

CULVERT OVER RAMBO CREEK ON GHENT AVENUE 140 METRES SOUTH WEST OF PEARSON STREET AND 465 METRES NORTHEAST OF BRANT STREET. PLAQUE IS LOCATED PM THE NORTH SIDE OF GHENT AVENUE AND EAST SIDE OF RAMBO CREEK SET ON WEST FACE OF CONCRETE CULVERT WING WALL.
ELEVATION = 91.8000 METRES

TOPOGRAPHIC SURVEY INFORMATION IN THIS DRAWING IS FROM PLAN 23-111 BY MACKAY, MACKAY & PETERS LIMITED, JULY 11, 2023.

SCALE 1:200 0 2 4 6 8 10

LICENSED PROFESSIONAL ENGINEER
N. A. SYLVESTER
100199487
SEPT 27 2024
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

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

PROJECT TITLE
MULTI RESIDENTIAL DEVELOPMENT

LOCATION
2169 & 2175 GHENT AVE
BURLINGTON, ONTARIO

DRAWING TITLE
CONSTRUCTION & MOBILITY MANAGEMENT PLAN

SCALE	1:200	DESIGN BY	MW	PROJECT No.	1839
DRAWN BY	GL	CHECKED BY	NS	PLAN No.	CMMP1
DATE	24/08/01	SHEET	1 OF 1		

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