388 Main Street East

Functional Site Servicing and Stormwater Management Report

Project Location:
388 Main Street East, Milton, ON

Prepared for:
Mikmada Homes Inc.
Burlington, ON

Prepared by:
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520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

February 25, 2025

MTE File No.: 56022-100

Engineers, Scientists, Surveyors.

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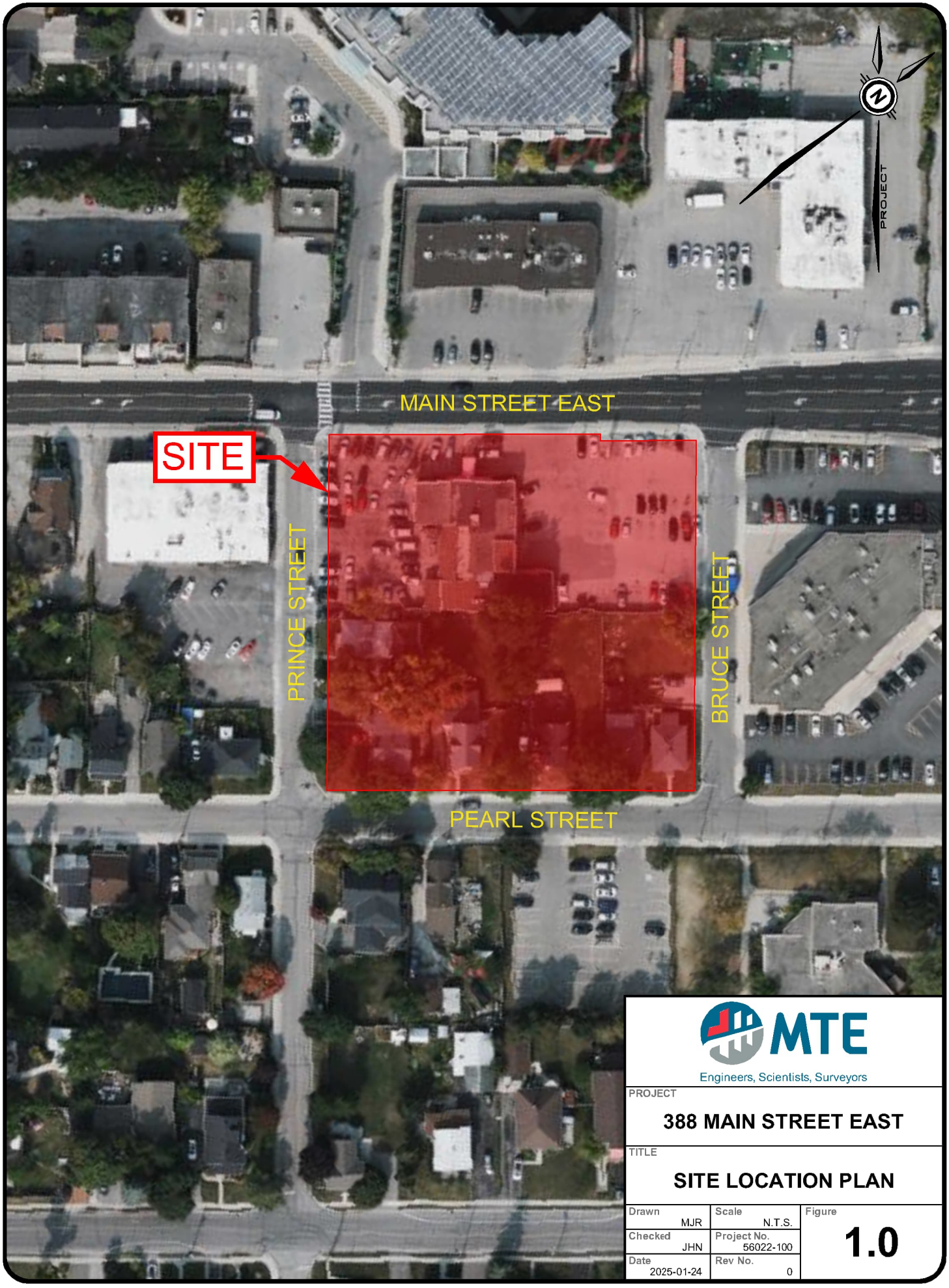
1.0 INTRODUCTION

1.1 Overview

MTE Consultants Inc. was retained by Mikmada Homes Inc. to complete the site grading, servicing, and stormwater management design for the proposed development located at 388 Main Street East, 17 Prince Street, and 389-409 Pearl Street in the Town of Milton (see Figure 1.0 for Location Plan). This report will outline a functional servicing and stormwater management strategy for the proposed development.

The site is located on a 0.659ha parcel of land. The site is bounded by Main Street East to the north, Bruce Street to the east, Pearl Street to the south, and Prince Street to the west. The property is currently occupied by an existing commercial building and associated parking lot, as well as six existing residential dwellings with associated driveways and landscaped areas. The proponent plans to construct two residential towers atop of a 6-storey podium with three levels of underground parking. There will be several commercial units on the ground floor of the podium, along with a driveway entrance's connecting to Pearl Street and Bruce Street. New municipal concrete sidewalks will be installed as part of the development within the Prince Street and Bruce Street right-of-ways.

The functional servicing described in this report will provide additional detailed information on the proposed servicing scheme for the site. Please refer to the site plan and the enclosed MTE drawings for additional information.



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PROJECT
388 MAIN STREET EAST

TITLE
SITE LOCATION PLAN

Drawn: MJR	Scale: N.T.S.	Figure: **1.0**
Checked: JHN	Project No.: 56022-100	
Date: 2025-01-24	Rev No.: 0	

2.0 STORMWATER MANAGEMENT

The following sections will describe the proposed stormwater management (SWM) plan for the proposed development.

2.1 Stormwater Management Criteria

The Stormwater management criteria was established following the review of the Town of Milton and Halton Region pre-consultation notes.

2.1.1 Quantity Control

As per the Town of Milton requirements and pre-consultation notes, attenuation of the 100-year post-development peak flow is to be controlled to the 5-year pre-development peak flow rate via on-site storage and flow controls.

2.1.2 Quality Control

Water quality treatment is required for most impacted surface runoff prior to discharging to the receiving system as per the Town of Milton requirements. Water quality treatment is proposed to be provided via an OGS unit on site before entering the municipal storm sewer along Main Street East.

2.2 Existing Conditions

Under existing conditions, the subject site is currently occupied by an existing commercial building and associated parking lot, as well as six existing residential dwellings with associated driveways and landscaped areas. The subject site sites at the top end of two storm drainage systems. There is an existing 375mm diameter storm sewer flowing westerly and an existing 450mm diameter storm sewer flowing easterly within the Main Street East right-of-way. There is also an existing 300mm diameter storm sewer flowing southerly within the Bruce Street right-of-way which connects to the existing 1200mm diameter storm sewer flowing westerly within the Pearl Street right-of-way. There are no known existing stormwater management quantity or quality controls on-site. The catchment for establishing the allowable flow rate has been defined by one catchment area with an existing imperviousness of 71.0%. See Table 2.1 and Figure 2.0.

Table 2.1 – Existing Conditions Catchment Area

#	Catchment	Area (ha)	% Impervious	Pervious CN	Impervious CN	Slope (%)	Flow Length (m)
101	Existing Site	0.659	72	75	90	3.0	25.0

The existing conditions were assessed using MIDUSS modelling 5-year design storm with Rainfall Intensity Equation Coefficients as per Table 4.3 in the Town of Milton Engineering and Parks Standards Manual Part 4 Grading and Stormwater Management (Sep 2024). Table 2.2 below summarizes the pre-development runoff rates for the 5-year storm event.

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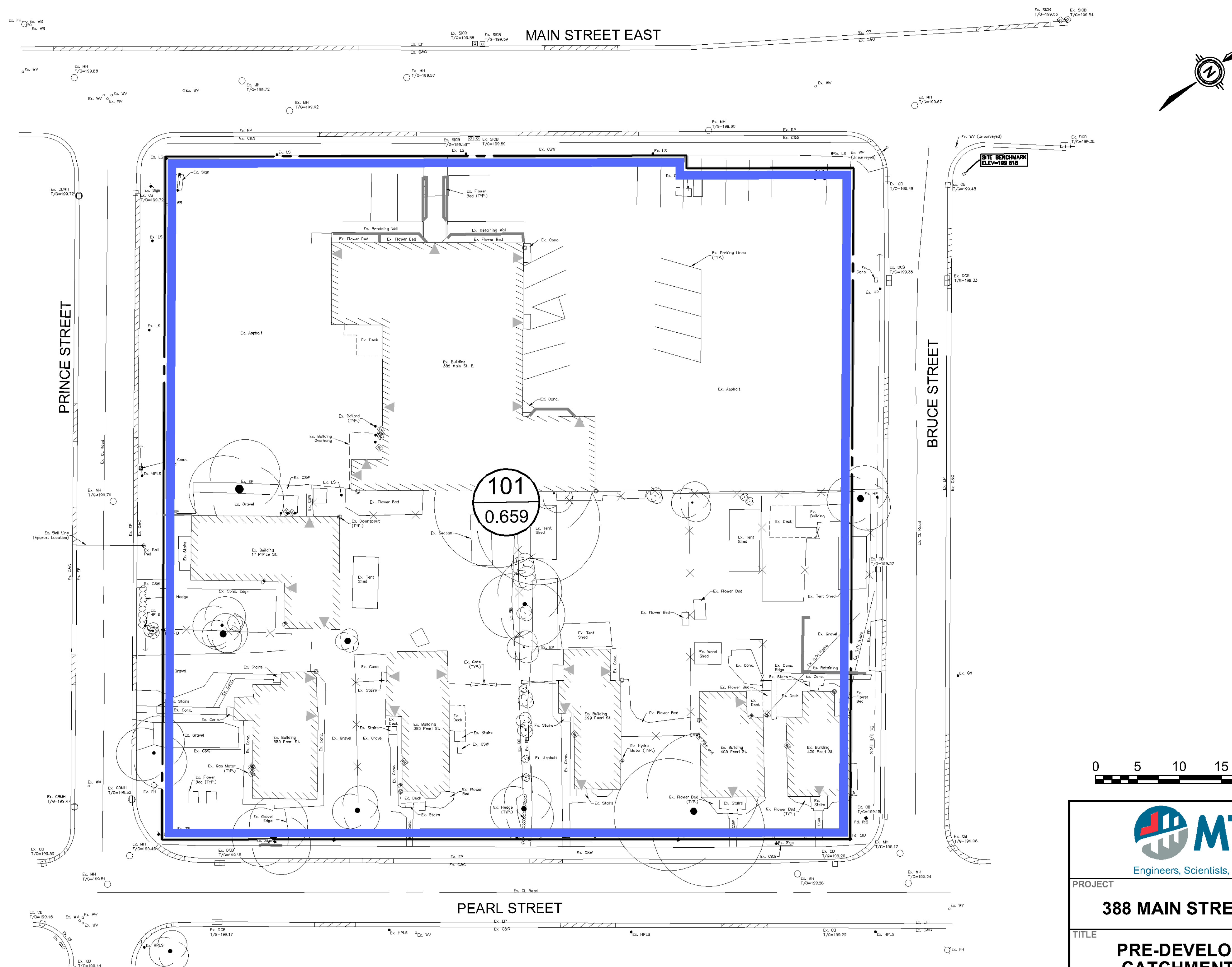
LEGEND

SITE BOUNDARY

CATCHMENT 101

101 / 0.659 — SUB-CATCHMENT NUMBER / AREA (ha.)



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PROJECT
388 MAIN STREET EAST

TITLE
PRE-DEVELOPMENT CATCHMENT AREA

Drawn	Scale	Figure
MJR	1:500	2.0
Checked: JHN	Project No.: 56022-100	
Date: 2025-01-24	Rev No.: 0	

Plot Date: January 24, 2025 – 3:18 PM

Table 2.2 – Allowable Site Discharge

Catchment	Area (ha)	Allowable Peak Discharge Rate (5-Year Storm Pre-development)[A] (m^3/s)
101	0.659	0.148
Total	**0.659**	**0.146**

[A] Discharge rate taken from MIDUSS Output (see Appendix A).

2.3 Proposed Conditions

The development proposes construction of an 18-storey tower and 8-storey podium along Main Street and Prince Street and 6-storey along Prince Street and Bruce Street with ground floor commercial. All parking is proposed to be underground with access from Pearl Street. Surface and underground parking will be included for the building. Associated walkways and landscaped areas are proposed along the perimeter of the site.

2.3.1 Water Quantity Control

Stormwater runoff from the site will be collected by a series of roof drains and area drains. These drains will connect to the internal plumbing of the building and therefore will be detailed by the mechanical consultant. The storm sewer outlet for the development will convey flows to the existing 375mm diameter combined sewer located on Main Street East.

Table 2.3 provides a brief description of each catchment area as well as the size and impervious cover associated with each. Figure 3.0 provides an illustration of the post-development catchment areas. Appendix A contains detailed information pertaining to the stormwater management model.

Table 2.3 – Post-Development Catchment Areas

#	Catchment	Area (ha)	% Impervious	Pervious CN	Impervious CN	Slope (%)	Flow Length (m)
201	Building Area	0.325	100	75	98	1.5	10.0
202	Controlled Areas to AD2	0.040	74	75	98	2.0	20.0
203	Controlled Areas to AD3	0.080	88	75	98	2.0	20.0
204	Uncontrolled Area	0.214	67	75	98	2.0	7.0

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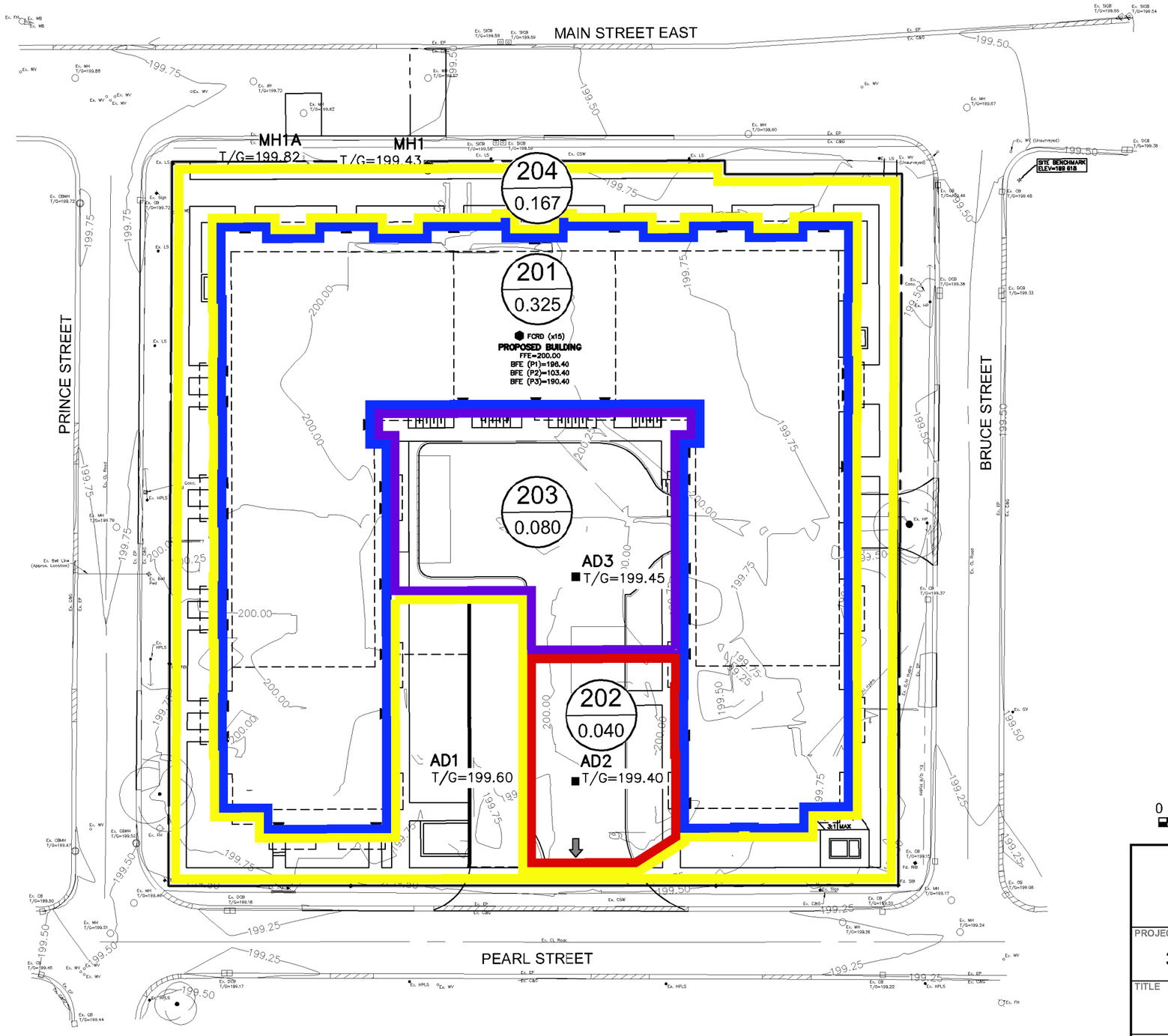
Plot Date: January 24, 2025 - 3:21 PM

LEGEND

- SITE BOUNDARY
- CATCHMENT 201
- CATCHMENT 202
- CATCHMENT 203
- CATCHMENT 204

201 / 0.325 — SUB-CATCHMENT NUMBER / AREA (ha.)



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PROJECT
388 MAIN STREET EAST

TITLE
POST-DEVELOPMENT CATCHMENT AREAS

Drawn: MJR	Scale: 1:500	Figure: **3.0**
Checked: JHN	Project No.: 56022-100	
Date: 2025-01-24	Rev No.: 0	

Stormwater management controls in the form of flow control roof drains (FCRD) and casting orifices proposed at the area drains located within the internal driveway will be implemented to attenuate post-development discharge rate to the allowable release rate for the site. Due to grading constraints, the exterior perimeter landscaped areas and walkways will drain uncontrolled to the abutting ROWs via overland sheet flow. These areas are primarily landscaped and concrete walkways and thus do not generate significant runoff.

In order to achieve the stormwater management requirements for the site, runoff generated from the controlled areas will be conveyed to area drains AD2 and AD3, wherein the flow will be controlled with the installation of two casting orifices 70mm at AD2 and 160mm at AD3. Storage volume for the orifice will be provided within the internal driveway areas. The maximum depth of ponding permitted within the parking area by grading is 10mm.

In addition, 15 flow-control roof drains, single notch with a rating of 22.5L/min/25mm, are proposed to be installed on the roof of the proposed podium and towers. This will help to further reduce the post-development runoff from the site. Volume for the FCRDs are provided on the building rooftop with the maximum ponding depth of 15mm. The flow equations for the orifice are included in Appendix A.

Tables 2.4, 2.5 and 2.6 summarize the stage-storage-discharge characteristics for building rooftop ponding (Catchment 201), surface ponding at AD2 (Catchment 202), and surface ponding at AD3 (Catchment 203) respectively. Refer to Appendix A for MIDUSS modelling results.

Table 2.4 – Stage-Storage Discharge Calculations for Building Rooftop Ponding (Catchment 201)

Depth (m)	Storage Volume (m^3) [A]	Discharge, Q (m^3/s)[B]	Comments
0.00	0.0	0.00000	Building Roof
0.05	2.7	0.01013	0.050m (2 inches) ponding on upper roof
0.10	33.6	0.02362	0.100m (4 inches) ponding on upper roof
0.15	97.9	0.03375	0.150m (6 inches) ponding on upper roof

Table 2.5 – Stage-Storage-Discharge Calculations for Surface Ponding at AD2 (Catchment 202)

Depth (m)	Storage Volume (m^3) [A]	Discharge, Q (m^3/s)[B]	Comments
199.25	0.0	0.00000	70mm Casting Orifice
199.40	0.0	0.00417	Contour
199.45	1.0	0.00481	Contour
199.50	6.7	0.00538	Contour

Table 2.6 - Stage-Storage-Discharge Calculations for Surface Ponding at AD3 (Catchment 203)

Depth (m)	Storage Volume (m^3) [A]	Discharge, Q (m^3/s)[B]	Comments
199.25	0.0	0.00000	160mm Casting Orifice
199.40	0.0	0.02174	Contour
199.45	0.6	0.02510	Contour
199.50	3.4	0.02806	Contour

With the addition of the 70mm and 160mm diameter casting orifice plates, the post-development runoff from the controlled driveway portion of the site for the 100-year storm events is controlled to 0.038m^3/s and 0.064m^3/s, respectively. The following table 2.7 summarizes the flows generated by the whole site.

Table 2.7 – Summary of Flows

Modelling Condition	5-Year Storm Event (m3/s)
Allowable Rate	0.146
Post-Development	0.144

For the 100-year storm event, the maximum ponding elevation is 149.49. This represents 9cm of ponding depth within the parking area, with no overflow.

2.3.2 Water Quality Control

A Stormceptor Model EFO4 will be installed at the downstream end of the stormwater management system prior to connecting into the existing 375mm diameter combined sewer within the Main Street North ROW to provide water quality control. The chosen unit is expected to provide Normal Level water quality control. The Stormceptor will require regular annual maintenance to ensure it is operating properly.

The following parameters were used to size the oil/grit separator:

- Upstream Catchment Area = 0.120ha (Catchments 202 + 203)
- % Impervious = 89.2%
- Particle Distribution = CA ETV

The analysis indicates that a Stormceptor EFO8 will provide 70% TSS Removal and treat over 90% of the average annual runoff, which meets the requirements for a “Normal” (Level 2 or 70% TSS removal) level of water quality protection. Stormceptor sizing output information is included in Appendix B.

Stormwater runoff generated from the remainder of the site perimeter (Catchment 204) will flow overland uncontrolled to the abutting right-of-way. Since these areas are comprised of walkways and landscaped areas, stormwater runoff is generally considered to be clean and therefore no water quality controls will be provided for these areas.

2.3.3 Private Storm Service Connection

A proposed 300mm diameter private storm sewer service at a slope of 1% will outlet into the proposed OGS and then to the existing 375mm diameter combined sewer on Main Street East. The proposed 300mm diameter sewer has a full flow capacity of approximately 96.7L/s which is greater than the 100-year controlled peak discharge of 57L/s from all controlled areas. Therefore, the proposed storm lateral will have sufficient capacity to convey the proposed 100-year controlled peak flow from the site. Please refer to Drawing C2.1 for further site servicing details.

2.4 Sediment and Erosion Control

Sediment and erosion control measures will be implemented on site during construction and will conform to the Erosion & Sediment Control Guideline for Urban Construction and City of Milton Standards.

Sediment and erosion control measures will include:

- Installation of silt control fencing at strategic locations around the perimeter of the site where feasible.
- Preventing silt or sediment laden water from entering inlets (catchbasins / catchbasin-manholes) by wrapping their tops with filter fabric or installing silt sacks.
- Construction of a mud mat at the exit from the site to Pearl Street to mitigate the transportation of sediments to the surrounding roads.
- Maintaining sediment and erosion control structures in good repair (including periodic cleaning as required) until such time that the Engineer or Town of Milton approves their removal. Erosion control measures to be inspected daily and after any rainfall event.

3.0 SANITARY SEWER SERVICING

3.1 Existing Conditions

There is an existing 200mm diameter sanitary sewer flowing east at approximately 0.6% within the Main Street East right-of-way. This existing sewer has a full flow capacity of approximately 25.4L/s, which will be utilized to service the site.

There is also an existing 200mm diameter sanitary sewer flowing south at approximately 3.3% within the Prince Street right-of-way which connects to an existing manhole located within the Prince Street and Pearl Street intersection. From this manhole, an existing 200mm diameter sanitary sewer flows easterly within the Pearl Street right-of-way.

3.2 Sanitary Demands

The anticipated sanitary discharge from the proposed development was estimated using Regional Municipality of Halton Water and Wastewater Linear Design Manual, as well as the Ontario Building Code Sewage Design Flows based on the proposed building usage.

Table 3.1 provides an estimate of the building population and the number of units in the residential portion of building.

Table 3.1 – Population Estimate

Unit Types	Total Number of Units	People per Unit	Population (People) [B]
Commercial Units			
Commercial	6 (Total 815m^2)	90 persons/ha [A]	8
Residential Units			
1-Bedroom Units	570	1.7 [C]	969
		Total Estimated Population	**977**

[A] Population density-based Table 3-2 of Regional Municipality of Halton Water and Wastewater Linear Design Manual (v5, October 2019)
[B] Population calculated as (Total # of Units) X (Persons per Unit)
[C] Assumed 1.7 people per residential unit.

To determine sanitary discharge rates from these uses, the commercial floor area was used along with the 2012 Ontario Building Code (OBC) flow rates for a Shopping Centre (excluding food and laundry) to be conservative. Region of Halton guidelines were used to calculate discharge rates from the residential units. The sanitary sewer discharge rates from the development and detailed calculations are summarized in Table 3.2 and Appendix C.

Table 3.2 – Sanitary Sewer Discharge from Site

Land Use	Population (people)	Average Flow (L/s)	Peak Flow (L/s)
Residential Units	969 [A]	3.084 [B]	15.421 [C]
Commercial Space	8 [A]	0.047 [D]	0.236 [C]
		Total Peak Sanitary Demand for Site	15.657 [F]
Total Peak Sanitary Demand for Site (with infiltration allowance)			**15.845 [G]**

[A] Population Estimate: see Table 3.1
[B] Average flow based on 275 L/ca/day per Section 2.4 in Regional Municipality of Halton Water and Wastewater Linear Design Manual (v5, October 2019).
Avg Flow = 275*969/(24*60*60) = 3.084L/s
[C] Peak flow = Average Flow*PF, where Babbit Peaking Factor (PF) = 5÷(P^0.2) = 5÷(977÷1000)^0.2 = 5.02 (max 5.0).
[D] Commercial average flow = (5L/m^2/day)*(815 m^2 floor space)/(24*60*60) = 0.047L/s
[F] Total Peak flow = Peak flow from Residential + Commercial
[G] Total Peak flow with infiltration = Total Peak flow + Infiltration Allowance = 15.657 + 0.188 = 15.845L/s where infiltration is based on 0.286L/s/ha.
Area reflects site area (0.659ha), I = 0.286*0.659 = 0.188L/s

3.3 Proposed Sanitary Servicing Plan and Capacity Analysis

As calculated in Table 3.2, the total hourly peak sanitary discharge from the site is 15.845L/s.

The proposed building will be serviced by a 200mm diameter sanitary service at 1.0% slope (full flow capacity = 32.8L/s) that will connect to the Main Street East sanitary sewer. The calculated sanitary discharge rate of 15.845L/s (per Table 3.2) is less than the capacity of the Main Street East sanitary sewer (25.4L/s) and represents 62.4% of the total sewer capacity. Therefore, it is

not expected at the proposed development will adversely impact the existing combined sewer system.

4.0 DOMESTIC AND FIRE WATER SUPPLY SERVICING

4.1 Existing Conditions

The existing municipal water distribution system around the site consists of a 300mm diameter watermain within the Main Street East right-of-way, a 150mm diameter watermain within the Prince Street right-of-way, and a 150mm reduced to 100mm diameter watermain within the Pearl Street right-of-way. There are three existing municipal hydrants located at the the south, east and west corners of the Site.

4.2 Domestic Water Demands

The expected domestic water demands for the proposed development were estimated using Region of Halton design criteria. Table 4.1 summarizes the domestic water demand requirements for the Average Day, Maximum Day and Peak Hour demand scenarios and detailed calculations are provided in Appendix D. It should be noted that average day peak factor is 1.0, the max day peak factor is 2.25 and the peak hour factor is 4.0 in accordance with Region of Halton standards.

Table 4.1 – Domestic Water Demands

Residential Demands		
Population:	969 people (see Table 3.1)	
Average Day Demand:	275L/c/d x 969 people =	3.084L/s
Maximum Day Demand:	2.25 x 3.084L/s =	6.939L/s
Peak Hour Demand:	4.0 x 3.084L/s =	12.336L/s
Commercial Demands		
Population:	8 people (see Table 3.1)	
Average Day Demand:	275L/c/d x 8 people=	0.025L/s
Maximum Day Demand:	2.25 x 0.025L/s =	0.056L/s
Peak Hour Demand:	4.0 x 0.025L/s =	0.010L/s

4.3 Fire Flow Demands

A hydrant flow test will need to be completed when weather permits to determine if the fire flow demands for the building will be satisfied as per the methodology outlined in Water Supply for Public Fire Protection (Fire Underwriters Survey (FUS), 1999).

4.4 Proposed Water Servicing Plan and Analysis

Water servicing for the site will include the installation of a 200mm diameter water service off the existing 300mm diameter watermain on Main Street East to service the proposed building. The service will be split at property line into a 150mm diameter domestic service and 200mm diameter fire service.

It is expected that the existing municipal fire hydrants located at the south, east and west corners of the Site will be sufficient to provide fire protection for the building. The fire department connection of the building will likely be proposed to be within 45m of these existing fire hydrants. The pressures and flows at the hydrant must be sufficient for firefighting conditions as established by the Ontario Building Code (2012). The minimum residual pressure under firefighting conditions is 140kPa (20.3psi) per OBC 2012 A-3.2.5.7 3(b).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information provided herein, it is concluded that the development can be constructed to meet the requirements of the Town of Milton. Therefore, it is recommended that:

i. The 100-year post-development flow rate be attenuated to the 5-year pre-development flow rate through the installation of casting orifices and roof storage complete with flow control drains.

ii. Erosion and sediment controls be installed as described in Section 2.4 of this report.

iii. Sanitary servicing for the development be installed as described in Section 3.3 of this report.

iv. On-site storm sewers connect to existing storm sewers on Main Street East described in Section 2.3.

v. Water servicing for the development be installed as described in Section 4.4 of this report to meet OBC and the Region of Halton minimum water supply requirements.

vi. The site grading works described in this report and as shown on Drawings C2.1 be accepted.

We trust the information enclosed herein is satisfactory. Should you have any questions please do not hesitate to contact our office.

All of which is respectfully submitted,

MTE Consultants Inc.

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Appendix A

MIDUSS Output

CALCULATIONS

Orifice Equation (MIDUSS NET)

$$Q = C_c \, p/4 \, D5 \, \text{sqrt}(2g(H-2/3D))$$

where

C_c	coefficient of contraction
H	head relative to the invert of the orifice
D	orifice diameter
g	gravitational acceleration

Pre-Development

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"        0.100   Pervious Ia/S coefficient"
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Post-Development

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```

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"             Runoff coefficient     0.000      0.891      0.891      "
"             Maximum flow           0.000      0.180      0.180      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.180     0.180     0.000     0.000"
" 54          POND DESIGN"
"         0.180   Current peak flow    c.m/sec"
"         0.090   Target outflow    c.m/sec"
"         217.9   Hydrograph volume    c.m"
"           11.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.150   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                 0.01500   0.00338   0.09795"
"                 0.03000   0.00675    0.7836"
"                 0.04500   0.01013     2.645"
"                 0.06000   0.01350     6.269"
"                 0.07500   0.01688    12.244"
"                 0.09000   0.02025    21.158"
"                  0.1050   0.02362    33.598"
"                  0.1200   0.02700    50.152"
"                  0.1350   0.03038    71.408"
"                  0.1500   0.03375    97.954"
"            1.   ROOFTOP"
"                 Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                   hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                     0.325       0.244     160.000      22.500      37.800"
"             Using 15 roofdrains on roofstorage area of 2438. square metre"
"             Peak outflow                   0.033    c.m/sec"
"             Maximum level                  0.148    metre"
"             Maximum storage               93.608    c.m"
"             Centroidal lag                 1.956   hours"
"                  0.180     0.180     0.033     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Total Area"
"             Maximum flow                   0.033    c.m/sec"
"             Hydrograph volume            217.931    c.m"
"                     0.180     0.180     0.033     0.033"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.180     0.000     0.033     0.033"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   Area to AD2"
"       74.000   % Impervious"
"        0.040   Total Area"
"       20.000   Flow length"
"        2.000   Overland Slope"
"        0.010   Pervious Area"
"       20.000   Pervious length"
"        2.000   Pervious slope"
"        0.030   Impervious Area"
```

```
"       20.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.389   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.908   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.017     0.000     0.033     0.033 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.010      0.030      0.040      hectare"
"             Time of concentration  9.773      1.242      2.357      minutes"
"             Time to Centroid       111.485    88.107     91.163     minutes"
"             Rainfall depth         75.218     75.218     75.218     mm"
"             Rainfall volume        7.82       22.26      30.09      c.m"
"             Rainfall losses        45.979     6.911      17.069     mm"
"             Runoff depth           29.239     68.308     58.150     mm"
"             Runoff volume          3.04       20.22      23.26      c.m"
"             Runoff coefficient     0.389      0.908      0.773      "
"             Maximum flow           0.001      0.016      0.017      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.017     0.017     0.033     0.033"
" 54          POND DESIGN"
"        0.017   Current peak flow    c.m/sec"
"        0.010   Target outflow    c.m/sec"
"         23.3   Hydrograph volume    c.m"
"           4.   Number of stages"
"      199.250   Minimum water level    metre"
"      199.500   Maximum water level    metre"
"      199.250   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                199.250     0.000     0.000"
"                199.400   0.00417  1.00E-07"
"                199.450   0.00481     1.000"
"                199.500   0.00538     6.700"
"           1.   HOR. ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                199.250     0.630    0.0700     1.000"
"             Peak outflow                  0.005    c.m/sec"
"             Maximum level               199.492    metre"
"             Maximum storage               5.841    c.m"
"             Centroidal lag                1.651   hours"
"                  0.017     0.017     0.005     0.033 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Total Area"
"             Maximum flow                  0.038    c.m/sec"
"             Hydrograph volume           240.725    c.m"
"                     0.017     0.017     0.005     0.038"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
```

```
"                    0.017     0.000     0.005     0.038"
" 33          CATCHMENT 203"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           203   Area to AD3"
"        88.000   % Impervious"
"         0.080   Total Area"
"        20.000   Flow length"
"         2.000   Overland Slope"
"         0.010   Pervious Area"
"        20.000   Pervious length"
"         2.000   Pervious slope"
"         0.070   Impervious Area"
"        20.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        75.000   Pervious SCS Curve No."
"         0.389   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.467   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.908   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                    0.039     0.000     0.005     0.038 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.010      0.070      0.080      hectare"
"             Time of concentration  9.773      1.242      1.713      minutes"
"             Time to Centroid       111.485    88.107     89.396     minutes"
"             Rainfall depth         75.218     75.218     75.218     mm"
"             Rainfall volume        7.22       52.95      60.17      c.m"
"             Rainfall losses        45.979     6.911      11.599     mm"
"             Runoff depth           29.239     68.308     63.620     mm"
"             Runoff volume          2.81       48.09      50.90      c.m"
"             Runoff coefficient     0.389      0.908      0.846      "
"             Maximum flow           0.001      0.038      0.039      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.039     0.039     0.005     0.038"
" 54          POND DESIGN"
"         0.039   Current peak flow    c.m/sec"
"         0.009   Target outflow    c.m/sec"
"          50.9   Hydrograph volume    c.m"
"             4.   Number of stages"
"       199.250   Minimum water level    metre"
"       199.500   Maximum water level    metre"
"       199.250   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 199.250     0.000     0.000"
"                 199.400   0.02174  1.00E-07"
"                 199.450   0.02510    0.6000"
"                 199.500   0.02806     3.400"
"             1.   HOR. ORIFICES"
"                  Orifice   Orifice   Orifice Number of"
"                   invert coefficie  diameter  orifices"
"                 199.250     0.630    0.1600     1.000"
```

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"             Peak outflow                  0.027    c.m/sec"
"             Maximum level               199.488    metre"
"             Maximum storage               2.749    c.m"
"             Centroidal lag                1.500   hours"
"                  0.039     0.039     0.027     0.038 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Total Area"
"             Maximum flow                  0.064    c.m/sec"
"             Hydrograph volume           292.042    c.m"
"                     0.039     0.039     0.027     0.064"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.039     0.000     0.027     0.064"
" 33          CATCHMENT 204"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          204   Uncontrolled Area"
"       66.500   % Impervious"
"        0.214   Total Area"
"        8.000   Flow length"
"        4.000   Overland Slope"
"        0.072   Pervious Area"
"        8.000   Pervious length"
"        4.000   Pervious slope"
"        0.142   Impervious Area"
"        8.000   Impervious length"
"        4.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.389   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.859   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.087     0.000     0.027     0.064 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           0.072      0.142      0.214      hectare"
"             Time of concentration  4.581      0.582      1.324      minutes"
"             Time to Centroid       104.363    87.621     90.727     minutes"
"             Rainfall depth         75.218     75.218     75.218     mm"
"             Rainfall volume        53.92      107.04     160.97     c.m"
"             Rainfall losses        45.986     10.573     22.436     mm"
"             Runoff depth           29.232     64.646     52.782     mm"
"             Runoff volume          20.96      92.00      112.95     c.m"
"             Runoff coefficient     0.389      0.859      0.702      "
"             Maximum flow           0.013      0.079      0.087      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.087     0.087     0.027     0.064"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.087     0.087     0.087     0.064"
" 40          HYDROGRAPH   Combine    1"
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```
"            6   Combine "
"            1   Node #"
"                Total Area"
"             Maximum flow                  0.144    c.m/sec"
"             Hydrograph volume           404.995    c.m"
"                     0.087     0.087     0.087     0.144"
" 38          START/RE-START TOTALS 204"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.659    hectare"
"             Total Impervious area                     0.567    hectare"
"             Total % impervious                       86.086"
" 38          START/RE-START TOTALS 204"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.659    hectare"
"             Total Impervious area                     0.567    hectare"
"             Total % impervious                       86.086"
" 19          EXIT"
```

Appendix B

Stormceptor Sizing Output

Stormceptor®

Rinker MATERIALS™

Stormceptor® EF Sizing Report

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

02/25/2025

Province:	Ontario
City:	Town of Milton
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20

Project Name:	388 Main St E
Project Number:	56022-100
Designer Name:	Jolie Nguyen
Designer Company:	MTE Consultants
Designer Email:	jnguyen@mte85.com
Designer Phone:	519-743-6500
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	388 Main St E
Drainage Area (ha):	0.12
% Imperviousness:	89.20

Runoff Coefficient 'c': 0.83

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	70.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	3.12
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	100
Estimated Average Annual Sediment Load (kg/yr):	46
Estimated Average Annual Sediment Volume (L/yr):	37

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	67
EFO5	68
EFO6	69
EFO8	70
EFO10	70
EFO12	70

Recommended Stormceptor EFO Model: EFO8

Estimated Net Annual Sediment (TSS) Load Reduction (%): 70

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 waterwavs.

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	8.5	8.5	0.14	8.0	2.0	70	6.0	6.0
1.00	20.6	29.1	0.28	17.0	4.0	70	14.5	20.5
2.00	16.8	45.9	0.56	33.0	7.0	70	11.8	32.3
3.00	10.8	56.7	0.84	50.0	11.0	70	7.6	39.9
4.00	8.5	65.2	1.11	67.0	14.0	70	5.9	45.9
5.00	6.4	71.6	1.39	84.0	18.0	70	4.5	50.4
6.00	5.5	77.0	1.67	100.0	21.0	70	3.8	54.2
7.00	3.9	81.0	1.95	117.0	25.0	70	2.8	57.0
8.00	2.9	83.9	2.23	134.0	28.0	70	2.0	59.0
9.00	2.7	86.5	2.51	150.0	32.0	70	1.9	60.9
10.00	2.2	88.7	2.79	167.0	36.0	70	1.5	62.5
11.00	1.0	89.7	3.06	184.0	39.0	70	0.7	63.1
12.00	1.7	91.3	3.34	201.0	43.0	70	1.2	64.3
13.00	1.4	92.8	3.62	217.0	46.0	70	1.0	65.3
14.00	1.0	93.7	3.90	234.0	50.0	69	0.7	66.0
15.00	0.3	94.0	4.18	251.0	53.0	69	0.2	66.2
16.00	0.8	94.8	4.46	267.0	57.0	69	0.5	66.7
17.00	0.8	95.7	4.74	284.0	60.0	67	0.6	67.3
18.00	0.2	95.8	5.02	301.0	64.0	67	0.1	67.4
19.00	1.5	97.3	5.29	318.0	68.0	67	1.0	68.4
20.00	0.2	97.5	5.57	334.0	71.0	66	0.1	68.5
21.00	0.6	98.2	5.85	351.0	75.0	66	0.4	68.9
22.00	0.0	98.2	6.13	368.0	78.0	66	0.0	68.9
23.00	0.2	98.4	6.41	384.0	82.0	64	0.1	69.1
24.00	0.2	98.6	6.69	401.0	85.0	64	0.2	69.2
25.00	0.2	98.9	6.97	418.0	89.0	64	0.2	69.4
30.00	1.1	100.0	8.36	502.0	107.0	62	0.7	70.1
35.00	0.0	100.0	9.75	585.0	124.0	61	0.0	70.1
40.00	0.0	100.0	11.14	669.0	142.0	59	0.0	70.1
45.00	0.0	100.0	12.54	752.0	160.0	57	0.0	70.1
Estimated Net Annual Sediment (TSS) Load Reduction =								**70 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

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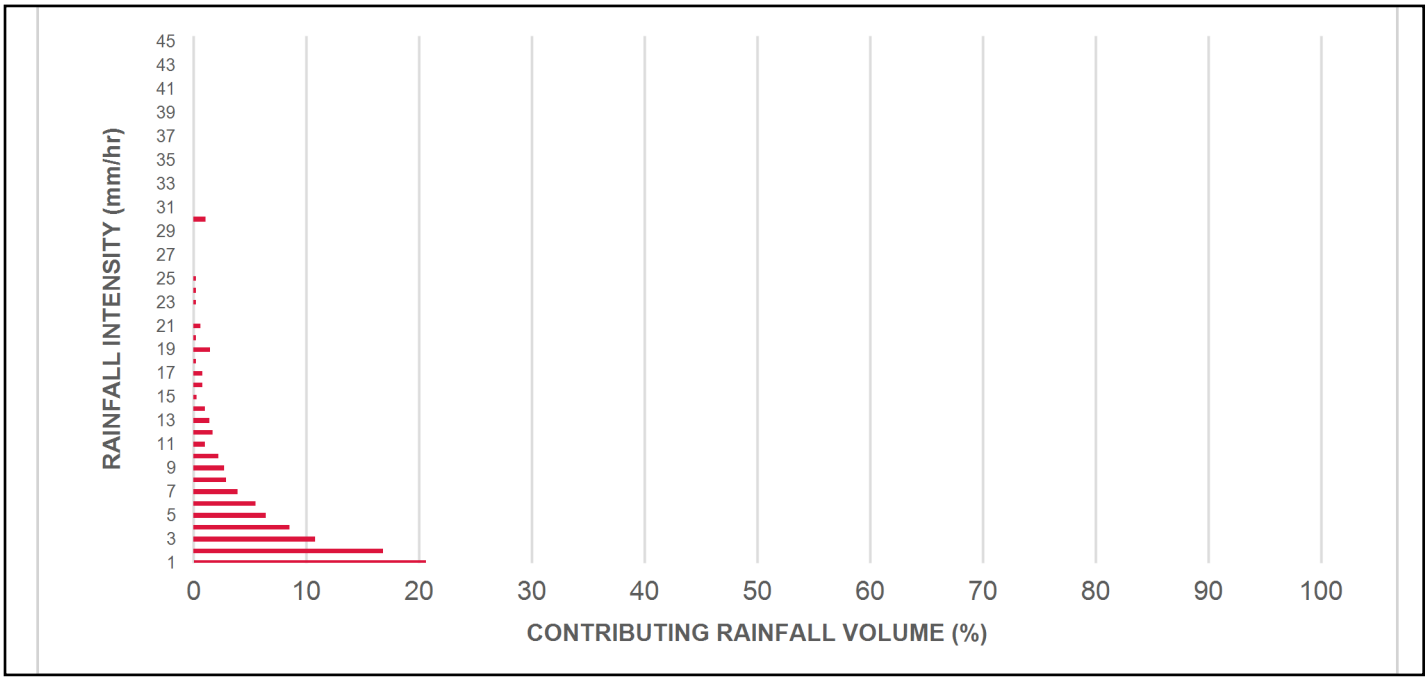
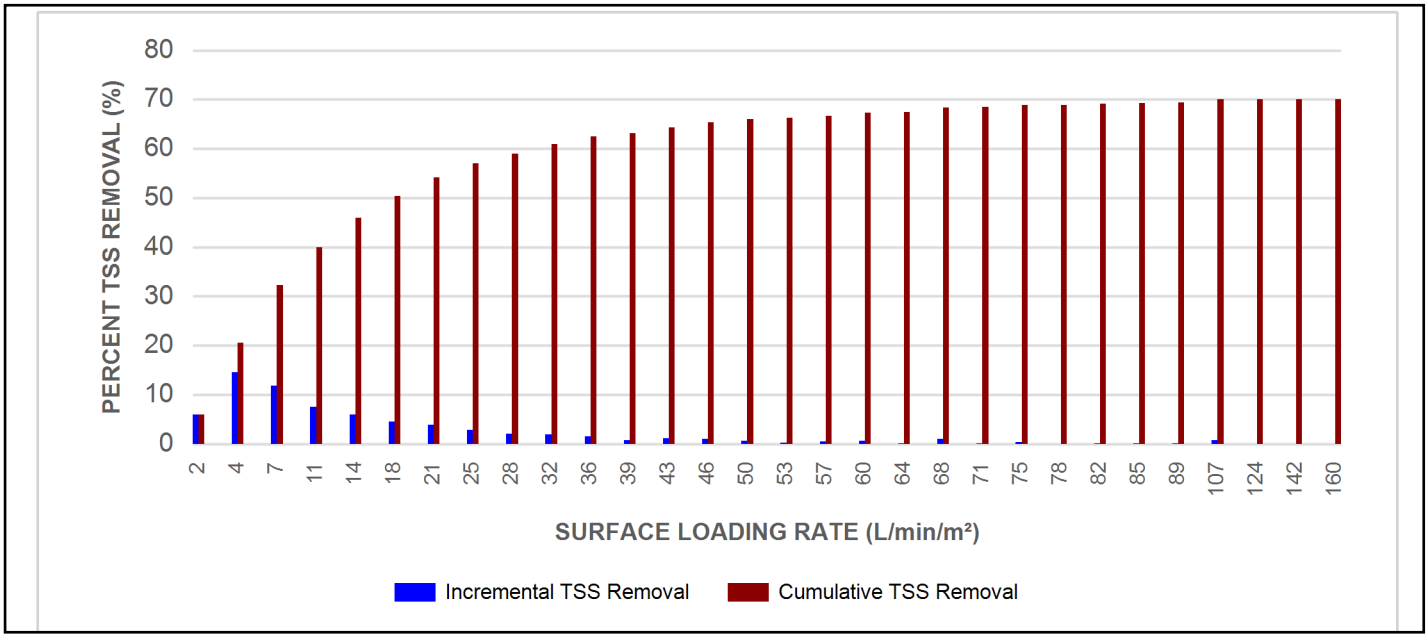
RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



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
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
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

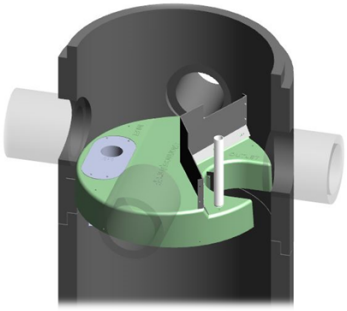
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

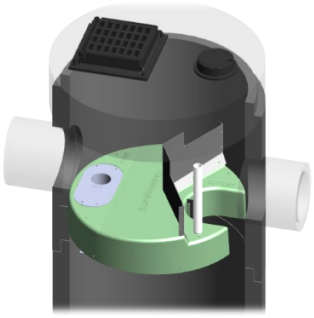
DESIGN FLEXIBILITY

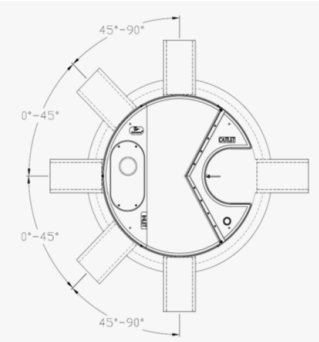
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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







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
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
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

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 TREAMENT 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
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 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 C

Sanitary Sewer Demand

388 Main Street E

Milton, ON
Project No: 56022-100
Date: February 4, 2025
By: JHN

Sanitary Demand Calculations

Excelligent Milton LTC	Population [1]	Commercial Area (m^2) [2-1]	Average Daily Sanitary Flow Rate[2] (L/s)	Peak Sanitary Flow Rate (L/s)	Total Peak Sanitary Demand for Site Including Infiltration (L/s)
Residential Units	969		3.084	15.421	
Commercial	8	815	0.047	0.236	
Totals	**977**		**3.131**	**15.657**	**15.845**

Sanitary Demand		
Per Unit [2]	275	L/d/capita
	0.0032	L/s/capita
Per Floor Space	5	L/m^2/day
	0.0001	L/s/capita
Peak Factor 'M' [3]	5.0	

Infiltration Allowance[4]		
Allowable Infiltration Rate	0.286	L/s/hectare
Site Area	0.659	hectare
Infiltration Allowance	0.188474	L/s

Notes

Note 1: Population based on Site Plan for Resident Unit Count. Refer to Excelligent Milton LTC Site Plan

Note 2: Average flow based on 275 L/ca/day per Section 2.4 in Regional Municipality of Halton Water and Wastewater Linear Design Manual (v5, October 2019).

Note 2-1: Sanitary demand for Commercial - the commercial floor area was used as per the 2012 Ontario Building Code (OBC) flow rates for a Shopping Centre to be conservative

Note 3: Peak Factor calculated using the Babbit Formula M = 5/P^0.2, where P is the population in thousands (Max = 5.0)

Note 4: Infiltration Allowance based on Regional Municipality of Halton Water and Wastewater Linear Design Manual (Section 3.2.4 - Infiltration Allowance)

Appendix D

Domestic Water Demands

388 Main St E

Milton, ON

Project No: 56022-100

Date: Feburary 05, 2025

By: JHN

Peaking Factors[1]:	
Avg. Day	1.0
Max. Day	2.25
Peak Hour	4.0

Demand Calculations

Design Population		Demand (L/s)	Final Demand: Avg Day Demand Q_{avg} (L/s)	Final Demand: Max Day Demand [5] $Q_{max.day}$ (L/s)	Final Demand: Peak Hour Demand [6] Q_{peak} (L/s)
Residential Units [2]	969	3.084	3.084	6.939	12.336
Commercial	8	0.025	0.025	0.056	0.100
Totals	**977**	**3.109**	**3.109**	**6.995**	**12.436**

Water Demand	
Average Daily Demands: [3] Residential	275 L/d/person 0.0032 L/s/person
Average Daily Demands: [4] Commercial	275 L/d/person 0.0032 L/s/person

Note 1: Peaking factors from Table 2-2 from Regional Municipality of Halton Water and Wastewater Linear Design Manual

Note 2: Population based on assumed population density of 1.7ppu

Note 3: Average flow based on 275 L/ca/day per Section 2.4 in Regional Municipality of Halton Water and Wastewater Linear Design Manual (v5, October 2019).

Note 4: Unitary Flow Rate for average daily demand from Regional Municipality of Halton Water and Wastewater Linear Design Manual (Section 2.4.2)

Note 5: Maximum day demand calculated by dividing peak hour demand by peak hour factor and multiplying by max day factor

Note 6: Peak hour demand calculated by multiplying average daily demand by peak hour factor