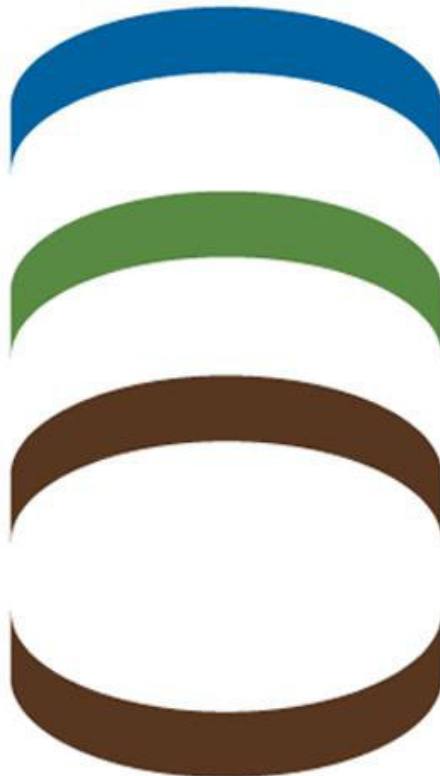


## STORMWATER MANAGEMENT DESIGN BRIEF

Property located at 1195 Newmarket Street, Ottawa

N/Réf.: 14166



**Hui Chen Peng., P. Eng.**

*Consultant - 1001130984*



**Pascal Fhima, Eng., P. Eng.**

*President and CEO*

**AUGUST 2021**

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## 1.0 INTRODUCTION

The proposed warehouse and site alteration development is located at 1195 Newmarket Street, City of Ottawa, Ontario (see Figure 1). The subject 2,602 hectares development is in East Industrial of Ottawa, and bounded by Newmarket street to the south, a drainage swale to the west and a railway corridor to the north. There are Municipal sanitary and water services on Newmarket Street. The site drains to the swale that flows north.

This report provides overview of servicing and stormwater management plan required for the proposed development.



***Figure 1 - Site Location and Surface Water Drainage***



## 2.0 STORMWATER MANAGEMENT

The subject site is situated in the watershed of Cyrville Drain which joins Ottawa River East. The Rideau Valley Conservation Authority (RVCA) requires water quality and post-to-pre flow control. As the drainage swale within the property will not be altered, therefore the SWM plan focuses on the 2,494 ha development area.

The Rational Method is used to calculate the peak flows responding to design storms. The IDF parameters of design storms and calculation sheets are included in Appendix A.

### 2.1 PRE-DEVELOPMENT CONDITIONS

The land use of the pre-development site consists of a warehouse building, asphalt parking area, a storage shed at the north, gravel pavement area for storage and a swale at the east boundary.

The site sheet flows from north and south to the middle low area to the east swale. The swale flows northwest to the culvert under the railway track to the north.

The site weighted runoff coefficient is tabulated in Table 1. The peak flow rates in comparison with the post- development flows are shown in Table 3.

**Table 1: Pre-development Land Use Breakdown and Runoff Coefficient**

Drainage	Surface	Area (ha)	Runoff Coefficient	Imp
To Swale	Building	0.246	0.9	100%
	Asphalt	0.271	0.9	100%
	Storage shed	0.057	0.9	100%
	Gravel	1.828	0.7	77%
	Grassed	0.09	0.25	0%
<b>Development Area</b>		<b>2.492</b>	<b>0.73</b>	<b>80%</b>
Swale in property		0.110		
Entire Site		2.602		



## 2.2 POST-DEVELOPMENT CONDITIONS

The proposed development consists of a warehouse building, paved parking areas and driveway and vegetative landscape areas. The swale segment within the property will remain unchanged.

Refer to Figure 3, the development is divided into three drainage catchments based on flow outlets. Table 2 shows the land use and the overall runoff coefficient of the proposed development. The comparison of the site runoff coefficient and peak flow rates between the pre- and post-development conditions is summarized in Table 3. The stormwater peak flows of post-development site will be about 17% greater than the existing condition. Therefore, peak flow attenuation is required.

**Table 2: Post-development Land Use and Drainage Plan**

Catchment	Outlet	Surface	Area (ha)	Runoff Coefficient	Imp
A1	Swale	Warehouse Rooftop	1.073	0.9	100%
A2	Storm sewer and OGS	Asphalt Surface	1.224	0.9	100%
A3	Ditch	Soft Landscaped	0.195	0.32	5%
<b>Total</b>			<b>2.492</b>	<b>0.85</b>	<b>93%</b>

**Table 3: Comparison of Peak Flows between Pre- and Post-Development**

Storm Return Period (Year)	Intensity (mm/hr)	Pre-Development		Post-Development		Peak Flow Increase (L/s)
		Runoff Coefficient	Peak Flow (L/s)	Runoff Coefficient	Peak Flow (L/s)	
2	76.8	0.73	388.4	0.85	454.7	66.3
5	104.2	0.73	526.9	0.85	616.9	89.9
100	178.6	0.91	1125.7	1.00	1237.0	111.3

Note: \*- runoff coefficient increase factor 1.25 applied to the 100-year storm



## 2.3 STORMWATER MANAGEMENT (SWM) PLAN

---

The stormwater runoff from landscaped areas (catchment A3) will sheet flow into the existing roadside ditch. Roof top (catchment A1) stormwater discharge will be restricted prior to discharge to the west side swale. A storm sewer system will be installed to capture runoff from paved area (catchment A2) and outlet to the swale. The catchment delineation is shown in Figure 2.

### 2.3.1 Water Quality Control

The existing site has no water quality measure. The RVCA requires the site provides water quality treatment prior to discharge from the site. As the receiving swale contains no fish habitat and is a green infrastructure, it is considered as part of water quality treatment train for the development. The site pavement area is the main sediment load spot. Stormwater from rooftop and landscaped area is essentially uncontaminated and through ditch and swale, therefore water quality treatment is considered not necessary.

Runoff from pavement (catchment Area 2) will be captured and flow through an oil-grit separator, which is sized to provide 90% annual runoff treatment and 87% TSS removal prior to discharge to the swale. The sizing brief of OGS – Stormceptor EF06 is included in Appendix B. The OGS is to be installed at the crossing point of the sewer lines. The Owner should conduct the necessary inspection and maintenance as included in the product manual to ensure the OGS long term operational effectiveness.

### 2.3.2 Water Quantity Control

As shown in Table 3, the increase of peak flow is 66~111 L/s in comparison with the pre-development condition. The rooftop flow will be restricted via roof drains to match the site pre-development flow rates. The 2-year and 100-year rooftop peak flow rates is 206 L/s and 533 L/s, respectively. To match the site existing flows, the allowed release rate is 140 L/s and 421 L/s. A calculation based on the Modified Rational Method concludes that a 190 m<sup>3</sup> rooftop ponding storage is required to control the 100-year rooftop flow to 266 L/s, and a 78 m<sup>3</sup> storage to control the 2-year flow to 100 L/s. The controlled peak flow is way lower than the allowed release rate.



The 1.073 ha flat building rooftop can provide sufficient water detention storage. With a 0.025m water ponding on the rooftop, the available storage is 250m<sup>3</sup>. Therefore, the rooftop flow control will satisfy the water quantity control target (see Table 4). The site total flow will be lower than the existing.

**Table 4: Post- development Flow with SWM Plan**

Storm Return Period (Year)	Peak Flow Rate (L/s)				Flow Change
	Existing (target)	Post-Development			
	Site Total	Uncontrolled Area 2 & 3	Controlled Area 1	Site Total	
2	388.4	248.5	100	348.5	-10%
5	526.9	337.2	140	477.2	-9%
100	1125.7	646.3	266	912.3	-19%

The proposed SWM plan can meet water quality and quantity requirements. Stormwater calculation details are included in Appendix A.

## 3.0 OTHER PROPOSED WORK

### 3.1 GRADING

The objective of grading design is to direct the stormwater runoff into the storm sewers and achieve the minimum and maximum slopes in the grading of the asphalt surfaces. This will ensure the surface not only drains as per the design, but is not too steep. The grading of the site also ensures that the storm water flow will mostly drain through the onsite drainage system for storm water quality control.

### 3.2 DRAINAGE

The proposed storm sewer is sized to capture stormwater runoff from a 5-year storm. The drainage system requires 129.5 meters Ø300mm, 234.6 meters Ø375mm and 51.0 meters Ø450mm of solid main storm sewer, four (4) precast catch basin, two (2) precast catch basin maintenance hole, one (1) oil/grit separator (See Figure 3).



### 3.3 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

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The proposed construction of the warehouse is located at 1195 Newmarket Street, Ottawa, ON. The site sheet flow drains into the municipal ditch at the West side of the site. An erosion and sediment control (ECA) plan during the construction has been prepared to prevent sediment migration to the existing conveyance system.

- The construction activities will be within the property boundary, and the proposed accesses to Newmarket Street will be paved 10-meter length, 9.5-meter width and 0.3-meter depth clear stone as mud-mat at construction entrance.
- Install silt fence along the outer boundary of the property to ensure that sediment will not be migrated to the adjacent properties.
- Place clear stone to cover the proposed catchbasins and maintenance holes and use woven geotextile to wrap grant.
- Clean sediment and remove debris at sediment control areas prior to completion of daily work, if there are any near the property due to the construction.
- All erosion and sediment control devices should be inspected minimum weekly and after every rainfall, maintained and cleaned as required.
- Stabilize all disturbed or grassed areas to minimize the opportunity for erosion.

All the above noted measures /devices must be installed prior to the commencement of excavation and maintained throughout the construction process, until all the landscaping is completed.

The developer and/or his contractor shall be responsible for any costs incurred during the remediation of problem areas to the satisfaction of the RVCA.



**APPENDICES**

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## APPENDIX I

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- ❖ Peak Flow Rates Calculation-Rational Method



Peak Flow Rates Calculation--Rational Method

Based on Rational Method, peak flow rates are calculated:

$$Q = 2.78CIA$$

Where: Q=Peak Flow Rate in L/s  
 C=Runoff Coefficient  
 I=Rainfall Intensity in mm/hr  
 A=Drainage Area in ha

City of Ottawa

**I**ntensity-Duration-Frequency (IDF)

$$I=A/(T+B)^C$$

where: I=Rainfall Intensity in mm/hr  
 T=Time of Concentration in hours--use inlet time of 10 min  
 A, B,C=Rainfall parameters

Return Period (Years)	A	B	C
2	732.951	6.199	0.810
5	998.071	6.053	0.814
100	1735.688	6.014	0.820

Peak Flow Rates under Existing Condition

A= 2.492 ha

Return Period (Years)	Intensity (mm/hr)	Runoff Coefficient	Peak Flow (L/s)
2	76.8	0.73	388.4
5	104.2	0.73	526.9
100	178.6	0.91	1125.7

Peak Flow Rates under Post-development Conditions

A= 2.492 ha

Return Period (Years)	Intensity (mm/hr)	Runoff Coefficient	Peak Flow (L/s)
2	76.8	0.85	454.7
5	104.2	0.85	616.9
100	178.6	1.00	1237.0

Peak Flow Increase (L/s)
66.3
89.9
111.3

A= 1.073 ha

ROOF

Return Period (Years)	Intensity (mm/hr)	Runoff Coefficient	Peak Flow (L/s)
2	76.8	0.9	206.2
5	104.2	0.9	279.7
100	178.6	1.0	532.6

Flow Control Target (L/s)
139.9
189.8
421.3

A= 1.224 ha

PAVED

Return Period (Years)	Intensity (mm/hr)	Runoff Coefficient	Peak Flow (L/s)
2	76.8	0.9	235.2
5	104.2	0.9	319.1
100	178.6	1.0	607.6

A= 0.195 ha

GRASS

Return Period (Years)	Intensity (mm/hr)	Runoff Coefficient	Peak Flow (L/s)
2	76.8	0.32	13.3
5	104.2	0.32	18.1
100	178.6	0.40	38.7

Note: Runoff coefficient increase factor 1.25 is applied; the maximum is 1.0.

## APPENDIX III

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- ❖ Modified Rational Method – 100-5-2-year Storage Requirement



APPENDIX A-2

Project 1195 Newmarket Street, City of Ottawa

Modified Rational Method - 100-year Storage Requirement

		Area	1.0730	ha	
		Runoff Coefficient	1.00	(* runoff coefficient x1.25 applied )	
		Allowable Discharge Rate	421.3	l/s	
		Release Rate	266.0	l/s	(way lower than the allowed )
Rainfall Duration (min.)	Rainfall Intensity (mm/hr)	Peak Flow Rate (L/s)	Runoff Volume (m <sup>3</sup> )	Volume Discharged (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	243	723.97	217.19	119.70	97.49
10	179	532.63	319.58	159.60	159.98
15	143	426.24	383.62	199.50	184.12
20	120	357.80	429.37	239.40	189.97
25	104	309.77	464.65	279.30	185.35
30	92	274.04	493.27	319.20	174.07
35	83	246.33	517.29	359.10	158.19
40	75	224.15	537.97	399.00	138.97
45	69	205.97	556.13	438.90	117.23
50	64	190.77	572.31	478.80	93.51
55	60	177.85	586.92	518.70	68.22
60	56	166.73	600.23	558.60	41.63
65	53	157.04	612.46	598.50	13.96
70	50	148.52	623.78	638.40	-14.62

Maximum Storage Required: 189.97 m<sup>3</sup>

APPENDIX A-3

Project 1195 Newmarket Street, City of Ottawa

Modified Rational Method - 5-year Storage Requirement

		Area	1.0730	ha		
		Runoff Coefficient	0.90			
		Allowable Discharge Rate	189.8	l/s		
		Release Rate	140.0	l/s	(way lower than the allowed )	
Rainfall Duration (min.)	Rainfall Intensity (mm/hr)	Peak Flow Rate (L/s)	Runoff Volume (m <sup>3</sup> )	Volume Discharged (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )	
5	141	379.01	113.70	63.00	50.70	
10	104	279.72	167.83	84.00	83.83	
15	84	224.32	201.89	105.00	96.89	
20	70	188.60	226.32	126.00	100.32	
25	61	163.48	245.23	147.00	98.23	
30	54	144.78	260.60	168.00	92.60	
35	49	130.25	273.53	189.00	84.53	
40	44	118.62	284.69	210.00	74.69	
45	41	109.07	294.50	231.00	63.50	
50	38	101.09	303.26	252.00	51.26	
55	35	94.29	311.17	273.00	38.17	
60	33	88.44	318.39	294.00	24.39	
65	31	83.34	325.03	315.00	10.03	
70	29	78.85	331.18	336.00	-4.82	
75	28	74.87	336.92	357.00	-20.08	

Maximum Storage Required: 100.32 m<sup>3</sup>

APPENDIX A-4

Project 1195 Newmarket Street, City of Ottawa

Modified Rational Method -2-year Storage Requirement

		Area	1.0730	ha		
		Runoff Coefficient	0.90			
		Allowable Discharge Rate	139.9	l/s		
		Release Rate	100.0	l/s	(way lower than the allowed )	
Rainfall Duration (min.)	Rainfall Intensity (mm/hr)	Peak Flow Rate (L/s)	Runoff Volume (m <sup>3</sup> )	Volume Discharged (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )	
5	104	278.05	83.42	45.00	38.42	
10	77	206.19	123.72	60.00	63.72	
15	62	165.82	149.24	75.00	74.24	
20	52	139.69	167.62	90.00	77.62	
25	45	121.26	181.89	105.00	76.89	
30	40	107.50	193.50	120.00	73.50	
35	36	96.81	203.29	135.00	68.29	
40	33	88.23	211.75	150.00	61.75	
45	30	81.18	219.19	165.00	54.19	
50	28	75.28	225.84	180.00	45.84	
55	26	70.26	231.85	195.00	36.85	
60	25	65.93	237.34	210.00	27.34	
65	23	62.15	242.39	225.00	17.39	
70	22	58.83	247.08	240.00	7.08	
75	21	55.88	251.44	255.00	-3.56	

Maximum Storage Required: 77.62 m<sup>3</sup>

## APPENDIX IV

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- ❖ Warehouse Development Stormceptor Sizing





**STORMCEPTOR<sup>®</sup>**  
**ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION**

07/16/2021

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP
NCDC Rainfall Station Id:	6000
Years of Rainfall Data:	37

Project Name:	Warehouse Development
Project Number:	
Designer Name:	
Designer Company:	
Designer Email:	
Designer Phone:	
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	
------------	--

Drainage Area (ha):	1.224
Runoff Coefficient 'c':	0.90

Particle Size Distribution:	OK-110
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	39.81
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Net Annual Sediment (TSS) Load Reduction Sizing Summary	
Stormceptor Model	TSS Removal Provided (%)
EFO4	76
<b>EFO6</b>	<b>87</b>
EFO8	93
EFO10	96
EFO12	98

**Recommended Stormceptor EFO Model: EFO6**  
**Estimated Net Annual Sediment (TSS) Load Reduction (%): 87**  
**Water Quality Runoff Volume Capture (%): > 90**

## Stormceptor® EF Sizing Report

### 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<sup>®</sup> EF Sizing Report

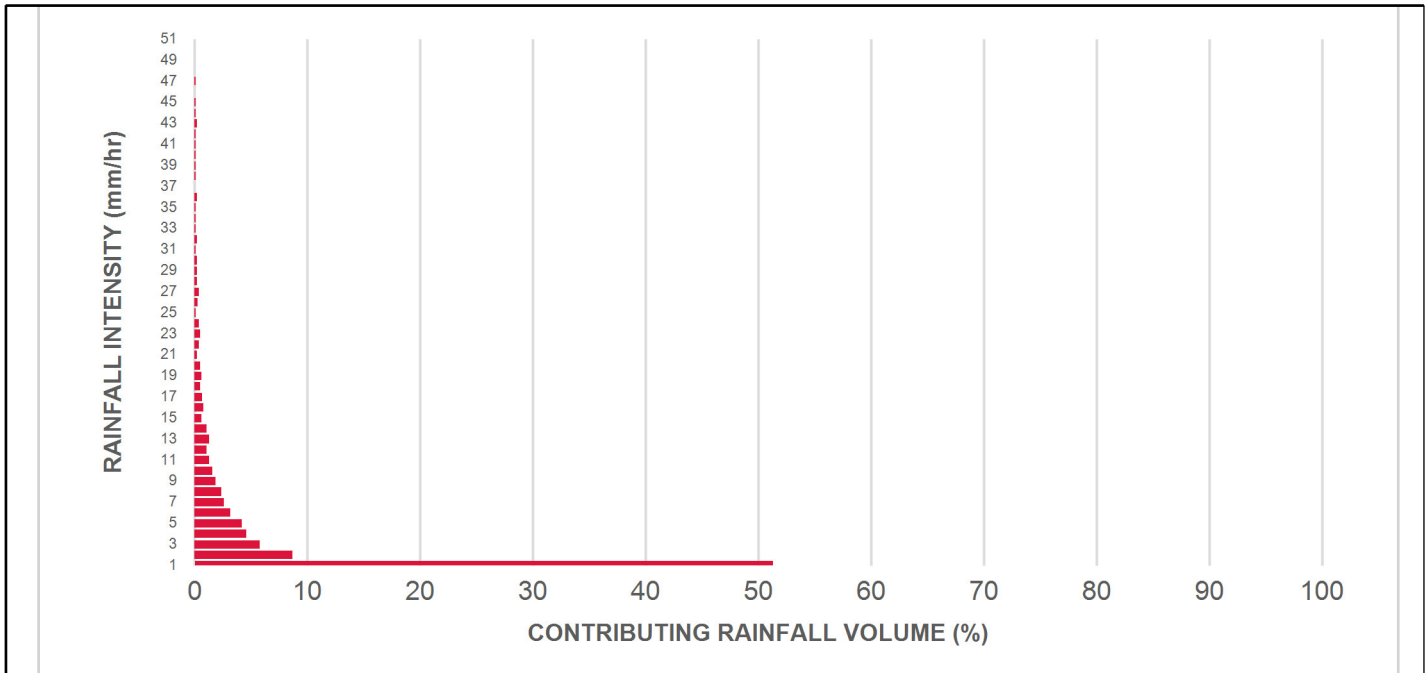
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m <sup>2</sup> )	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	51.3	51.3	3.06	184.0	70.0	100	51.3	51.3
2	8.7	60.0	6.12	367.0	140.0	100	8.7	60.0
3	5.8	65.8	9.19	551.0	210.0	98	5.7	65.7
4	4.6	70.4	12.25	735.0	279.0	94	4.3	70.0
5	4.2	74.6	15.31	919.0	349.0	90	3.8	73.8
6	3.2	77.8	18.37	1102.0	419.0	84	2.7	76.5
7	2.6	80.4	21.44	1286.0	489.0	74	1.9	78.4
8	2.4	82.8	24.50	1470.0	559.0	66	1.6	80.0
9	1.9	84.7	27.56	1654.0	629.0	59	1.1	81.1
10	1.6	86.3	30.62	1837.0	699.0	57	0.9	82.0
11	1.3	87.6	33.69	2021.0	769.0	55	0.7	82.7
12	1.1	88.7	36.75	2205.0	838.0	54	0.6	83.3
13	1.3	90.0	39.81	2389.0	908.0	52	0.7	84.0
14	1.1	91.1	42.87	2572.0	978.0	51	0.6	84.6
15	0.6	91.7	45.94	2756.0	1048.0	48	0.3	84.9
16	0.8	92.5	49.00	2940.0	1118.0	45	0.4	85.2
17	0.7	93.2	52.06	3124.0	1188.0	41	0.3	85.5
18	0.5	93.7	55.12	3307.0	1258.0	38	0.2	85.7
19	0.6	94.3	58.19	3491.0	1327.0	35	0.2	85.9
20	0.5	94.8	61.25	3675.0	1397.0	31	0.2	86.1
21	0.2	95.0	64.31	3859.0	1467.0	30	0.1	86.1
22	0.4	95.4	67.37	4042.0	1537.0	28	0.1	86.2
23	0.5	95.9	70.44	4226.0	1607.0	27	0.1	86.4
24	0.4	96.3	73.50	4410.0	1677.0	26	0.1	86.5
25	0.1	96.4	76.56	4594.0	1747.0	25	0.0	86.5

## Stormceptor<sup>®</sup>EF Sizing Report

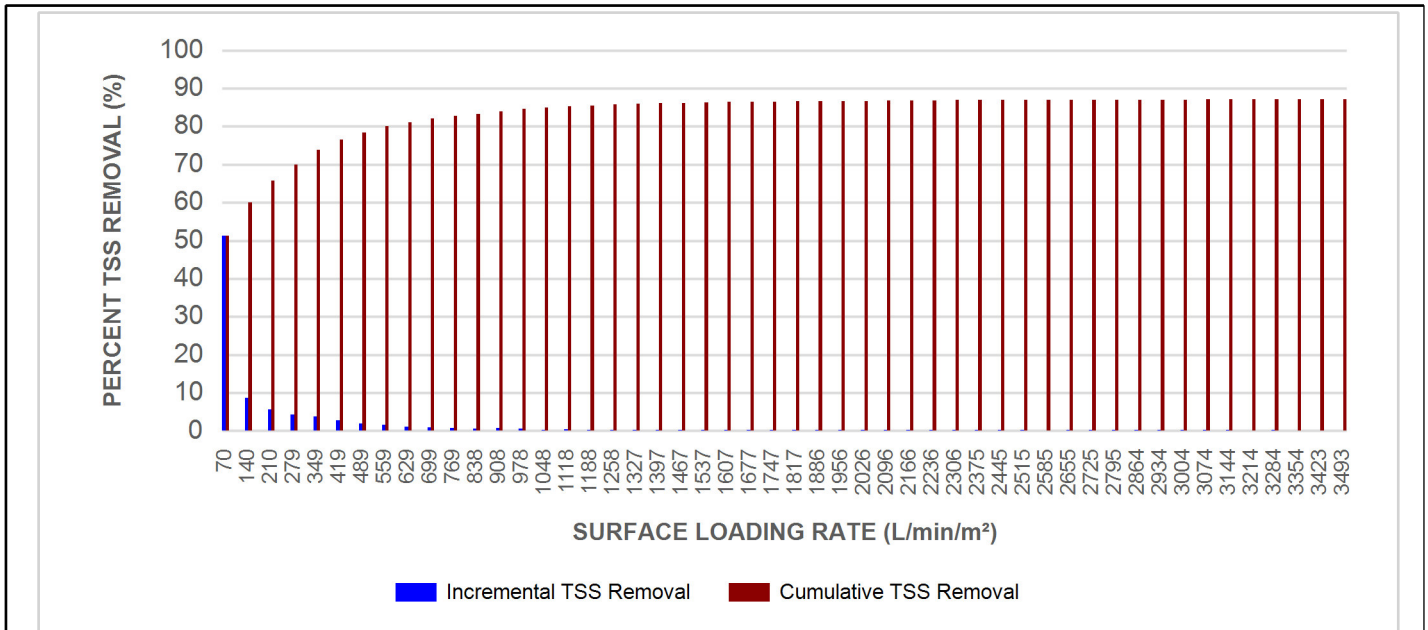
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m <sup>2</sup> )	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	96.7	79.62	4777.0	1817.0	24	0.1	86.6
27	0.4	97.1	82.69	4961.0	1886.0	23	0.1	86.7
28	0.2	97.3	85.75	5145.0	1956.0	22	0.0	86.7
29	0.2	97.5	88.81	5329.0	2026.0	21	0.0	86.7
30	0.2	97.7	91.87	5512.0	2096.0	21	0.0	86.8
31	0.1	97.8	94.94	5696.0	2166.0	20	0.0	86.8
32	0.2	98.0	98.00	5880.0	2236.0	19	0.0	86.8
33	0.1	98.1	101.06	6064.0	2306.0	19	0.0	86.9
34	0.1	98.2	104.12	6247.0	2375.0	18	0.0	86.9
35	0.1	98.3	107.19	6431.0	2445.0	18	0.0	86.9
36	0.2	98.5	110.25	6615.0	2515.0	17	0.0	86.9
37	0.0	98.5	113.31	6799.0	2585.0	17	0.0	86.9
38	0.1	98.6	116.37	6982.0	2655.0	17	0.0	87.0
39	0.1	98.7	119.44	7166.0	2725.0	16	0.0	87.0
40	0.1	98.8	122.50	7350.0	2795.0	16	0.0	87.0
41	0.1	98.9	125.56	7534.0	2864.0	16	0.0	87.0
42	0.1	99.0	128.62	7717.0	2934.0	15	0.0	87.0
43	0.2	99.2	131.69	7901.0	3004.0	14	0.0	87.0
44	0.1	99.3	134.75	8085.0	3074.0	14	0.0	87.1
45	0.1	99.4	137.81	8269.0	3144.0	14	0.0	87.1
46	0.0	99.4	140.87	8452.0	3214.0	14	0.0	87.1
47	0.1	99.5	143.94	8636.0	3284.0	14	0.0	87.1
48	0.0	99.5	147.00	8820.0	3354.0	13	0.0	87.1
49	0.0	99.5	150.06	9004.0	3423.0	13	0.0	87.1
50	0.0	99.5	153.12	9187.0	3493.0	13	0.0	87.1
<b>Estimated Net Annual Sediment (TSS) Load Reduction =</b>								<b>87 %</b>

**Stormceptor<sup>®</sup> EF Sizing Report**

**RAINFALL DATA FROM OTTAWA MACDONALD-CARTIER INT'L AP RAINFALL STATION**



**INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR<sup>®</sup> MODEL**



## Stormceptor® EF Sizing Report

### 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

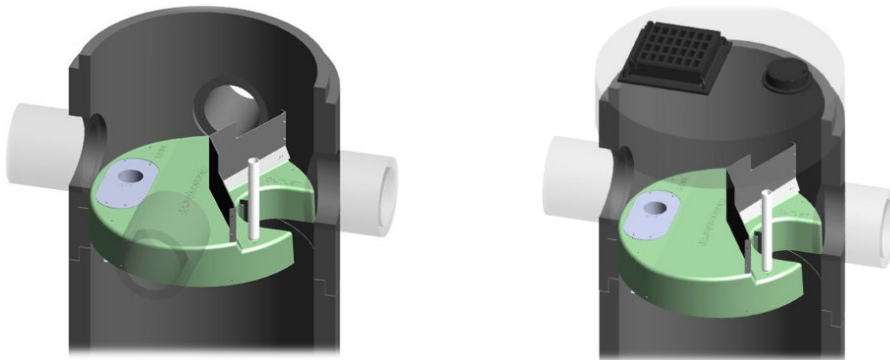
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

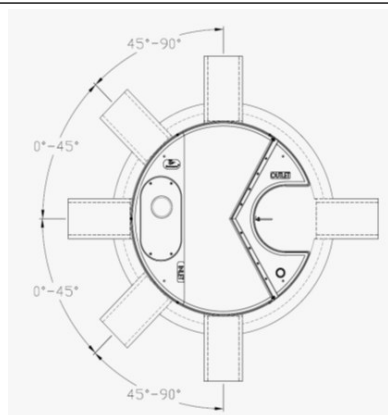
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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



## 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 <sup>3</sup> )	(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<sup>3</sup>)

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.imbrium.com/stormwater-treatment-solutions/stormceptor-ef>

### STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbrium.com/stormwater-treatment-solutions/stormceptor-ef>

## Stormceptor<sup>®</sup> EF Sizing Report

### 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 <sup>3</sup> sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m <sup>3</sup> sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m <sup>3</sup> sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m <sup>3</sup> sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m <sup>3</sup> 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



## Stormceptor<sup>®</sup>EF Sizing Report

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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. 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<sup>2</sup>.

### 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.

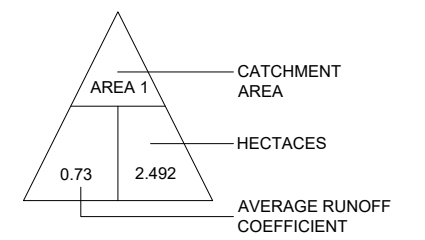
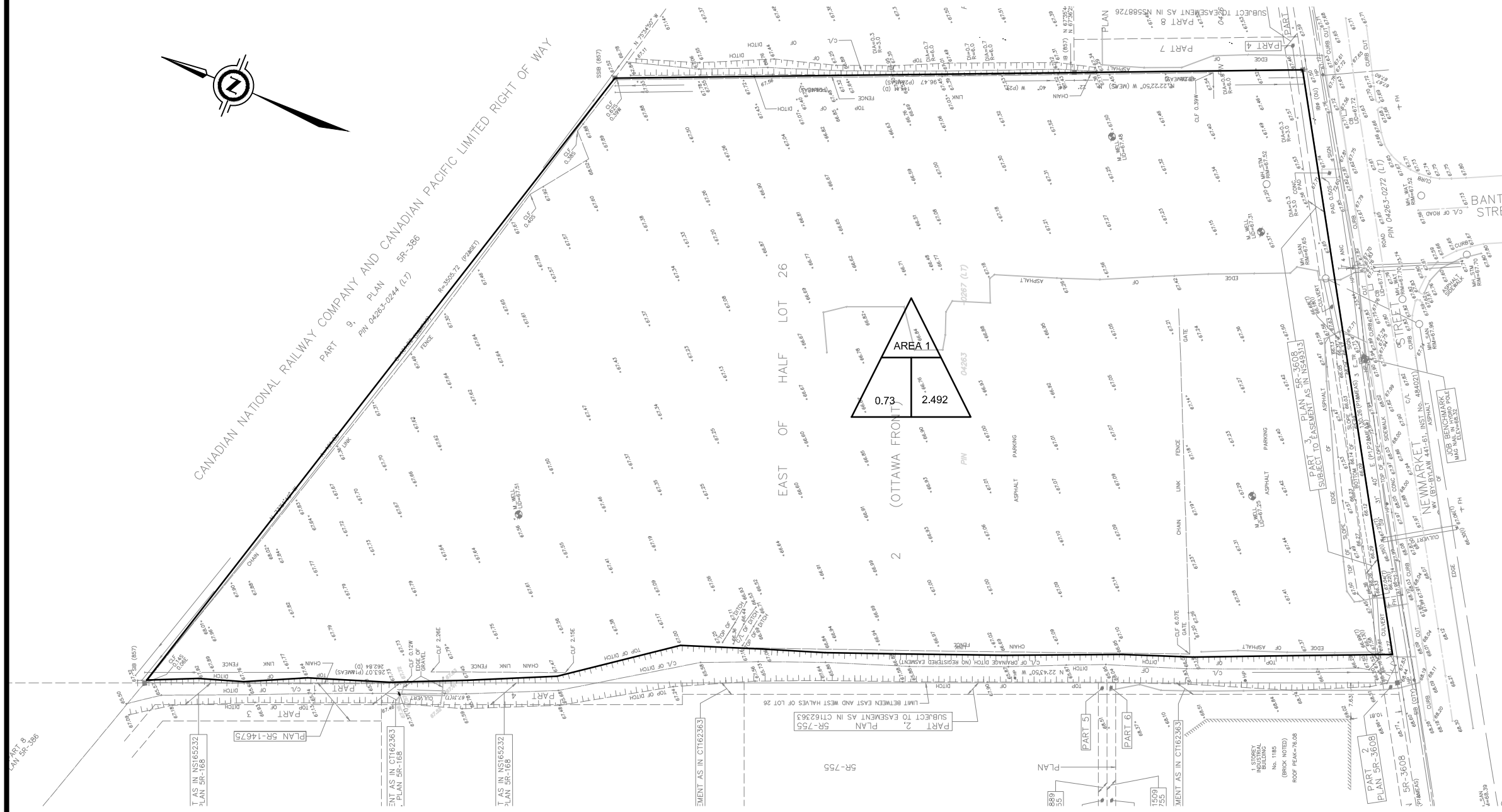
3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m<sup>2</sup> to 2600 L/min/m<sup>2</sup>) 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 V

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- ❖ Pre-development Catchment Area Plan





**Not For Construction**

<b>A</b>			
<b>NO.</b>	<b>ISSUE / REVISION</b>	<b>BY</b>	<b>DATE</b>

The contractor shall check and verify all dimensions and report all errors and omissions to the Engineer before proceeding with the work. This drawing is the property of the Engineer and must be returned on completion of the work. Do not scale drawings.

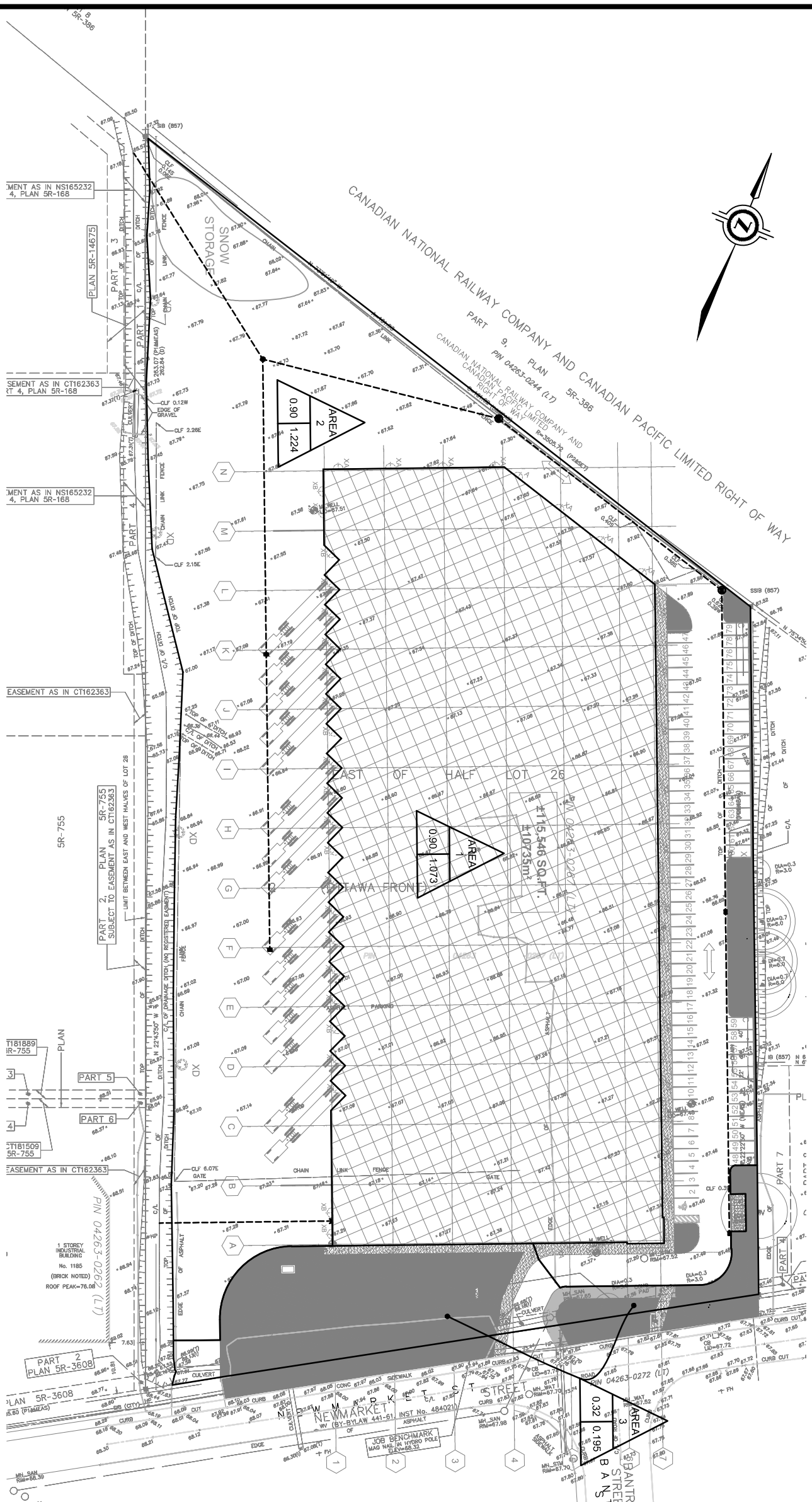
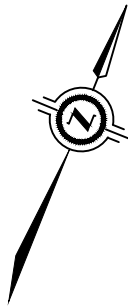
PROJECT:  
18630\_1195 NEWMARKET STREET  
1195 NEWMARKET STREET, OTTAWA ONTARIO

DRAWING: PRE-DEVELOPMENT  
CATCHMENT AREA PLAN

**GROUPE ORTAM INC.**  
1200, rue de Louvain Ouest  
Montréal (Québec) H4N 1G5  
Tél: (514) 982-0990,  
[www.ortamgroupe.com](http://www.ortamgroupe.com)

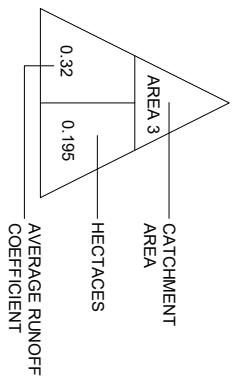
DRAWN BY :	CHECKED BY :
SCALE: AS SHOWN	DATE:
PROJECT NO: <b>14166</b>	DRAWING NO: <b>14166</b>

**PRE-DEVELOPMENT CATCHMENT AREA PLAN**  
1:500



**POST DEVELOPMENT CATCHMENTS AREA PLAN**

1:300



**Not For Construction**

NO.	ISSUE / REVISION	BY	DATE
A			

The contractor shall check and verify all dimensions and report all errors and omissions to the Engineer before proceeding with the work. This drawing is the property of the Engineer and must be returned on completion of the work. Do not scale drawings.

PROJECT:  
18630\_1195 NEWMARKET STREET  
1195 NEWMARKET STREET, OTTAWA ONTARIO

DRAWING:  
POST DEVELOPMENT  
CATCHMENTS AREA PLAN

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SCALE: AS SHOWN	DATE:
PROJECT NO: <b>14166</b>	DRAWING NO: <b>14166</b>