Stantec Consulting Ltd.
600-171 Queens Avenue
London ON N6A 5J7

July 13, 2022

Project/File: 161414081

File Reviewer
City of London
300 Dufferin Avenue
LONDON ON N6B 1Z2

Dear File Reviewer,

Reference: 376-390 Hewitt Street & 748 King Street ZBA SWM Brief

This letter is written in support of the proposed development at 376-390 Hewitt Street & 748 King Street and its ZBA application. The intent of the letter is to identify the stormwater management (SWM) requirements for the site and propose a strategy to mitigate the developments impact.

EXISTING CONDITIONS

The site currently is a paved parking area but was previously seven (7) single family lots with a total area of 0.23 ha. The area is accounted for in the storm area drainage plan (City Reference Drawing 24516) at a runoff coefficient of 0.9 and is serviced by a 300mm storm sewer on Hewitt Street.

PROPOSED CONDITIONS

The site is proposed to be a parking lot with 59 spaces, as per the attached site plan. The site has been assumed as 100% impervious with a runoff coefficient of 0.9 to be conservative.

SWM STRATEGY

The site is accounted for in the receiving sewer's design and as such, requires no quantity controls to be put in place. As the site has over 29 parking spots, the City's Design Standards and Requirement Manual (DSRM) requires that the site be provided with quality treatment. As the site is located within the Central Thames Subwatershed, that quality treatment is required to remove 70% of total suspended solids (TSS) from the site's runoff.

To achieve this it is proposed that an oil-grit separator (OGS) unit be used to treat the site runoff. An OGS unit has been sized to show that this is achievable and a Stormceptor™ EF4 unit will achieve a 92% TSS removal rate for the site. The sizing report has been provided with this brief.

Reference: **376-390 Hewitt Street & 748 King Street SWM Brief**

CLOSURE

The above SWM strategy outlines the measures needed to mitigate the proposed development. No quantity controls are required, and the necessary quality control can be achieved by an OGS unit. Should there be any questions or comments on the contents of this brief please feel free to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

Digitally signed by Adam Kristoferson
Date: 2022.07.14 09:51:12 -04'00'

Adam Kristoferson P. Eng.
Water Resources Engineer
Phone: (519) 675-6669
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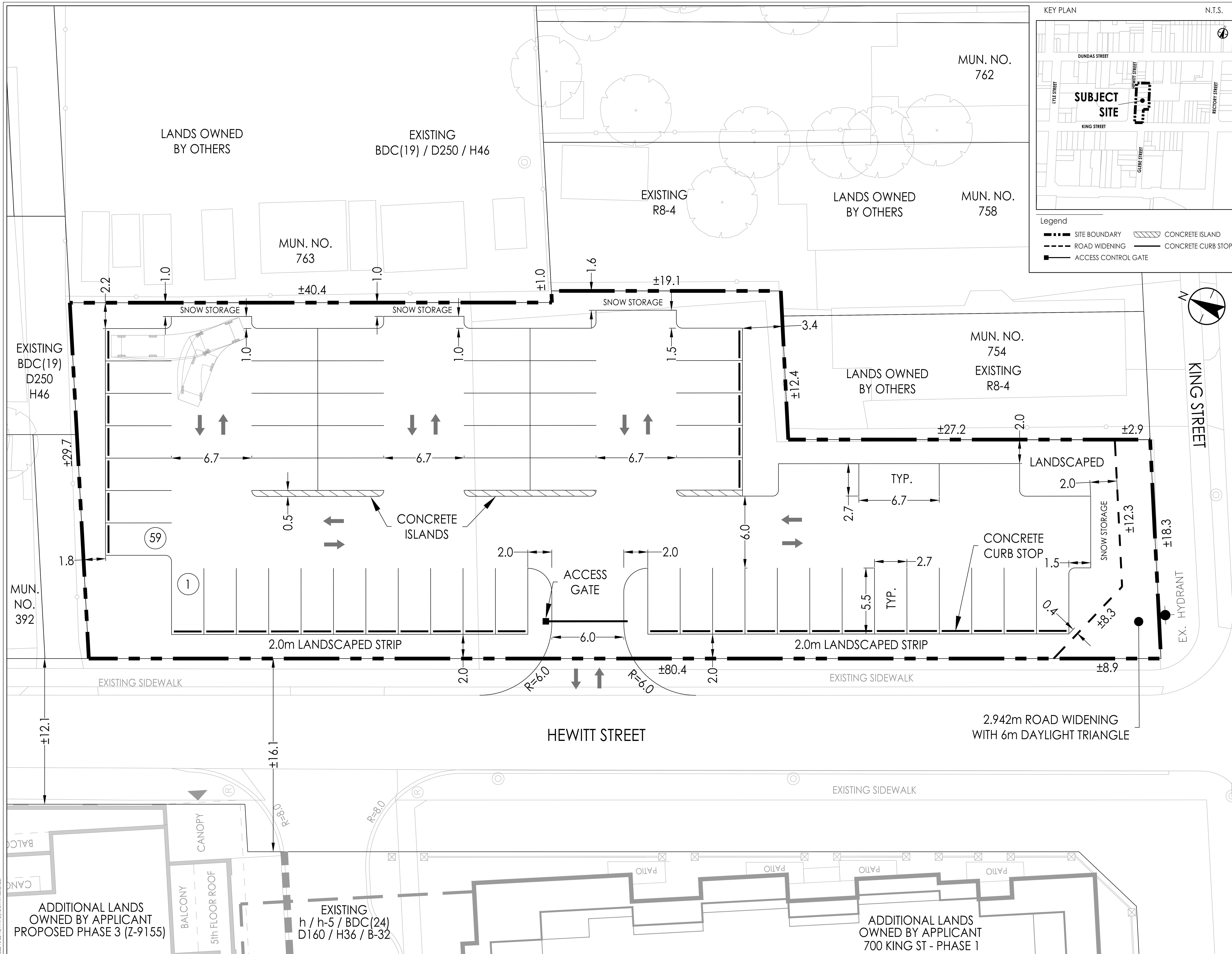
Attachment: Site Plan
Stormceptor Sizing Report



Stantec
600-171 Queens Avenue
London ON N6A 5J7
Tel. 519-645-2007
www.stantec.com

Liability Note

The Contractor shall verify and be responsible for all dimensions.
DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Design Data

Existing Zone:	BDC(2) & R8-4	
Proposed Zone:	T(__) & Maintain Existing	
Proposed Use:	Temporary surface parking lot	
Site Area - Total (m²)	±2,325 m²	
Road Widening (m²)	±71.7 m² (Included in Area Above)	
Lot Frontage - Hewitt Street	±80.4m	
Regulation - T(__) Zone	Requirement	Provided
Parking Setback - ROW (min)*	3.0 m	2.0 m*
Parking Setback - Internal Limits (min)*	1.5 m	1.0 m*
Parking Setback - Daylight Triangle (min)*	3.0 m	0.4 m*
Drive Isle Width (min)*	6.7 m	6.0 m*
Drive Isle Hammerhead Depth (min)*	1.5 m	1.0 m*
Landscaped Islands - Internal (min)*	3.0 m	0.5 m Concrete*
Landscaped Islands - Entrance (min)*	3.0 m	2.0 m*
Parking Spaces - Total	n/a	59 Spaces
Landscape Open Space (min)	n/a	21%

All data marked with a * to be included as special provisions within the T(__) Zone

Notes

1. THIS IS A COMPILED PLAN AND SHOULD NOT BE CONSIDERED A PLAN OF SURVEY.
2. ONTARIO BASE MAPPING USED FOR AREAS AND DIMENSIONS, LEGAL PLAN REQUIRED FOR PRECISE CALCULATIONS.

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
1. ZONING BY-LAW AMENDMENT	AB	BB	22.08.17

File Name: 161413817_r-db	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	AB	BB	AB	21.06.01

Permit-Seal

Client/Project

EAST VILLAGE HOLDINGS LTD.

376, 378, 380, 382, 386, 390 Hewitt Street
and 748 King Street
London, ON Canada

Title

Site Plan

Project No. 161414081

Scale HORZ - 1 : 150 (1.5 0 3m)

Drawing No. 1

Sheet 1 of 1

Revision 0

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

07/13/2022

Province:	Ontario
City:	London
Nearest Rainfall Station:	LONDON CS
Climate Station Id:	6144478
Years of Rainfall Data:	20

Site Name:	Parking Lot

Drainage Area (ha):	0.23
Runoff Coefficient 'c':	0.90

Particle Size Distribution:	Fine
Target TSS Removal (%):	70.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	7.56
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	King and Hewitt
Project Number:	161414081
Designer Name:	Adam Kristoferson
Designer Company:	Stantec Consulting
Designer Email:	adam.kristoferson@stantec.com
Designer Phone:	519-675-6669
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	92
EF6	97
EF8	99
EF10	100
EF12	100

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 92

Water Quality Runoff Volume Capture (%): > 90

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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 (%)
0.5	9.0	9.0	0.29	17.0	14.0	100	9.0	9.0
1	18.9	27.8	0.58	35.0	29.0	100	18.9	27.8
2	15.3	43.2	1.15	69.0	58.0	100	15.3	43.2
3	10.8	53.9	1.73	104.0	86.0	98	10.6	53.8
4	7.8	61.7	2.30	138.0	115.0	95	7.4	61.1
5	5.8	67.5	2.88	173.0	144.0	91	5.3	66.4
6	4.5	72.0	3.45	207.0	173.0	87	3.9	70.3
7	3.6	75.6	4.03	242.0	201.0	83	3.0	73.3
8	3.5	79.1	4.60	276.0	230.0	82	2.9	76.1
9	3.3	82.4	5.18	311.0	259.0	81	2.6	78.8
10	2.6	85.0	5.75	345.0	288.0	79	2.1	80.8
11	1.7	86.7	6.33	380.0	317.0	78	1.3	82.2
12	1.7	88.4	6.91	414.0	345.0	77	1.3	83.5
13	1.5	89.8	7.48	449.0	374.0	75	1.1	84.6
14	1.2	91.0	8.06	483.0	403.0	74	0.9	85.4
15	1.3	92.3	8.63	518.0	432.0	73	0.9	86.4
16	0.8	93.0	9.21	552.0	460.0	73	0.6	86.9
17	0.8	93.8	9.78	587.0	489.0	72	0.6	87.5
18	1.2	95.0	10.36	621.0	518.0	72	0.8	88.3
19	0.7	95.7	10.93	656.0	547.0	72	0.5	88.8
20	0.9	96.6	11.51	691.0	575.0	71	0.7	89.5
21	0.2	96.8	12.08	725.0	604.0	71	0.1	89.6
22	0.0	96.8	12.66	760.0	633.0	71	0.0	89.6
23	0.4	97.2	13.24	794.0	662.0	70	0.3	89.9
24	0.4	97.7	13.81	829.0	691.0	70	0.3	90.3
25	0.0	97.7	14.39	863.0	719.0	70	0.0	90.3
30	1.3	99.0	17.26	1036.0	863.0	69	0.9	91.1
35	0.6	99.6	20.14	1208.0	1007.0	68	0.4	91.6
40	0.4	100.0	23.02	1381.0	1151.0	71	0.3	91.8
45	0.0	100.0	25.90	1554.0	1295.0	73	0.0	91.8
Estimated Net Annual Sediment (TSS) Load Reduction =								**92 %**

Climate Station ID: 6144478 *Years of Rainfall Data*: 20

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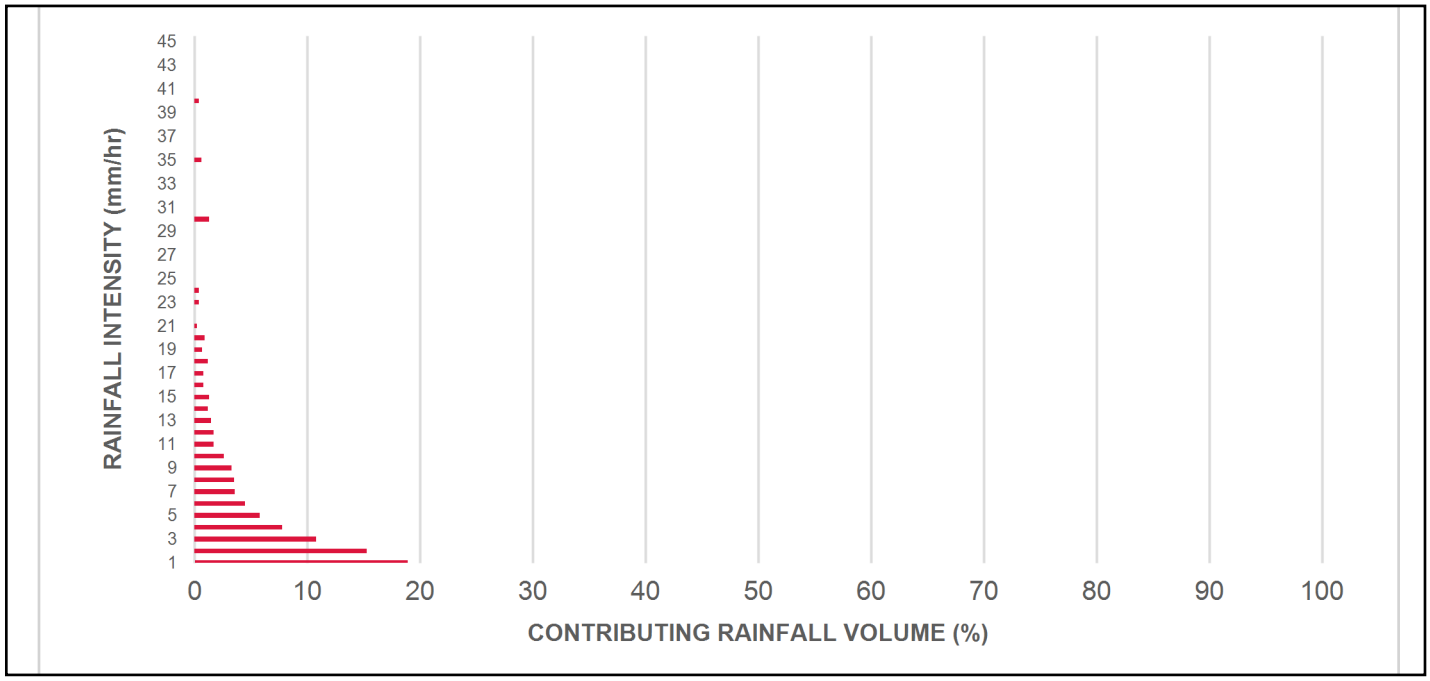
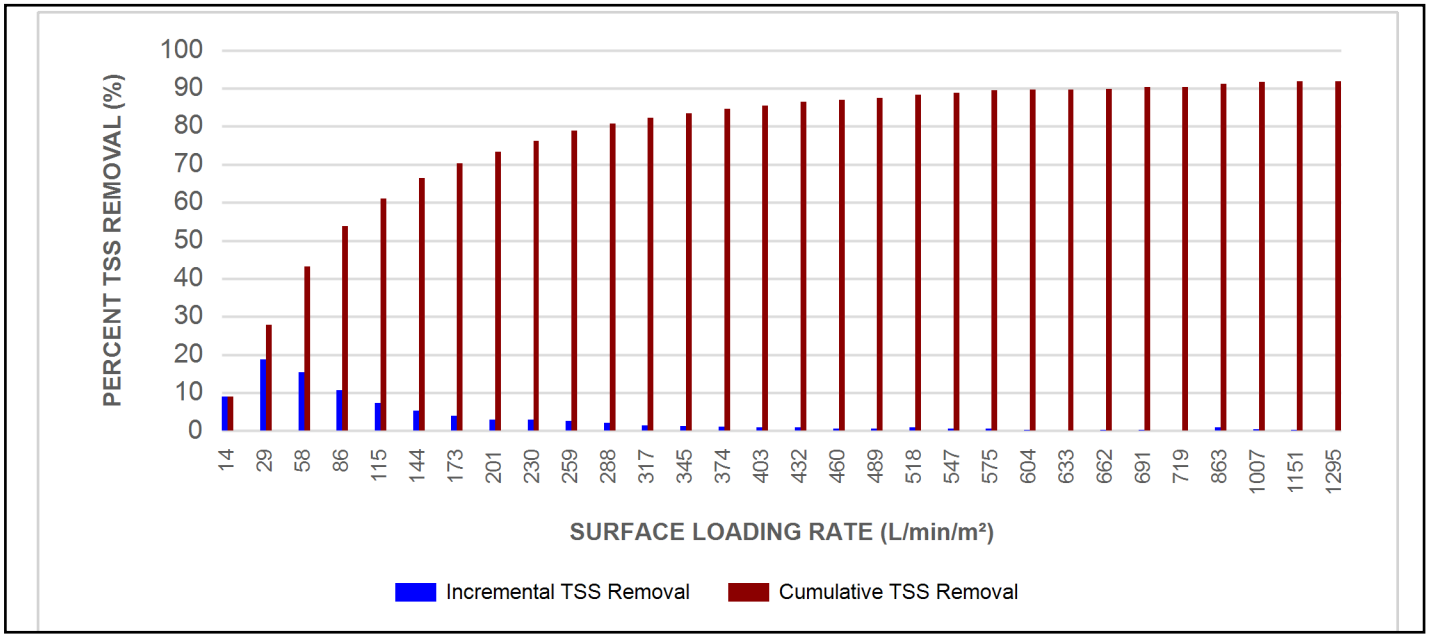
RAINFALL DATA FROM LONDON CS RAINFALL STATION



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
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

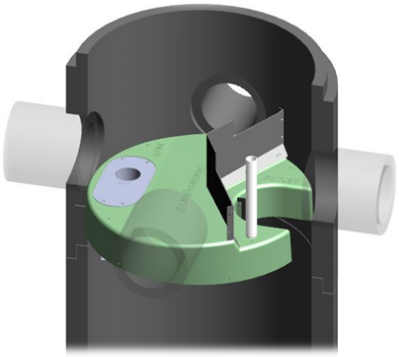
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

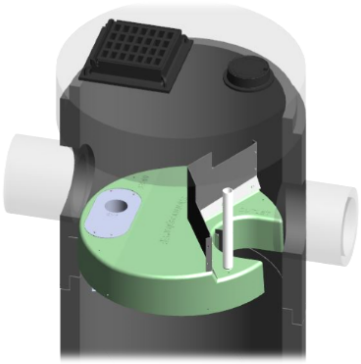
DESIGN FLEXIBILITY

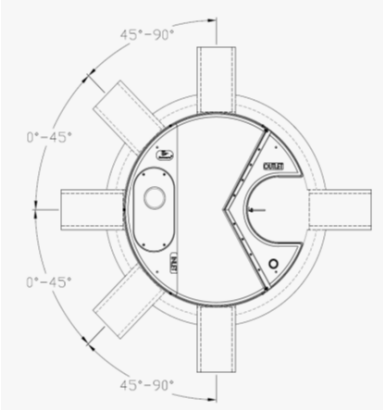
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

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.