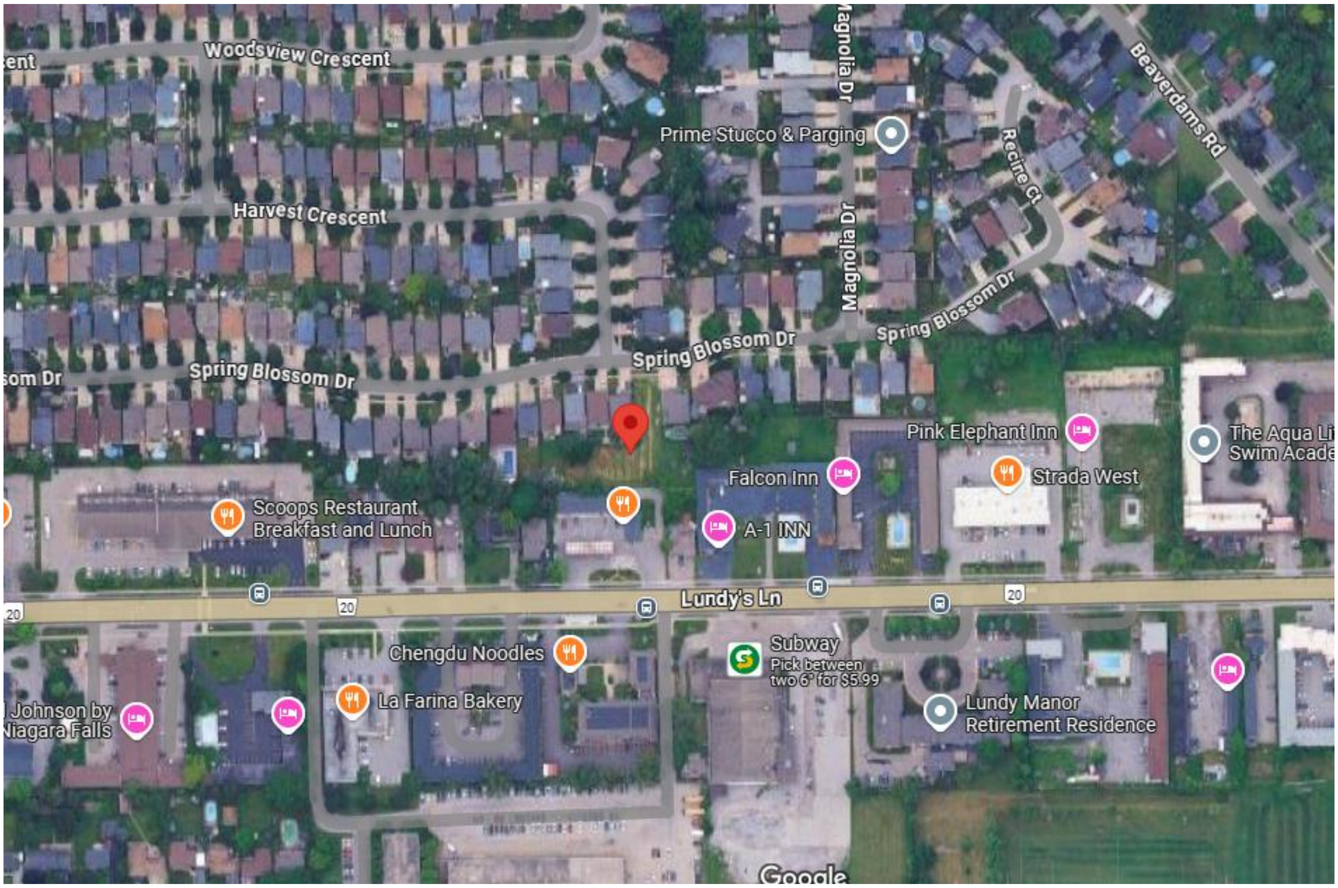
STORMWATER MANAGEMENT REPORT



Project Location:

7956 Spring Blossom Drive
Niagara Falls
Ontario

Prepared for:

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Prepared by:
AM Engineering

July 2025
File: 25037

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APPENDICES

FIGURES

1 INTRODUCTION

AM Engineering was retained to complete a Stormwater Management Report in support of proposed development on lands located at 7956 Spring Blossom Drive, Niagara Falls. The subject site is approximately 0.1815 Hectares and is currently vacant and covered by grass and some trees near the south west property line. It is bounded by Spring Blossom Drive to the north and residential properties on all other sides. (Refer to Figure 1).

The proposed development is for seven Townhouses as well as required parking to serve the development.

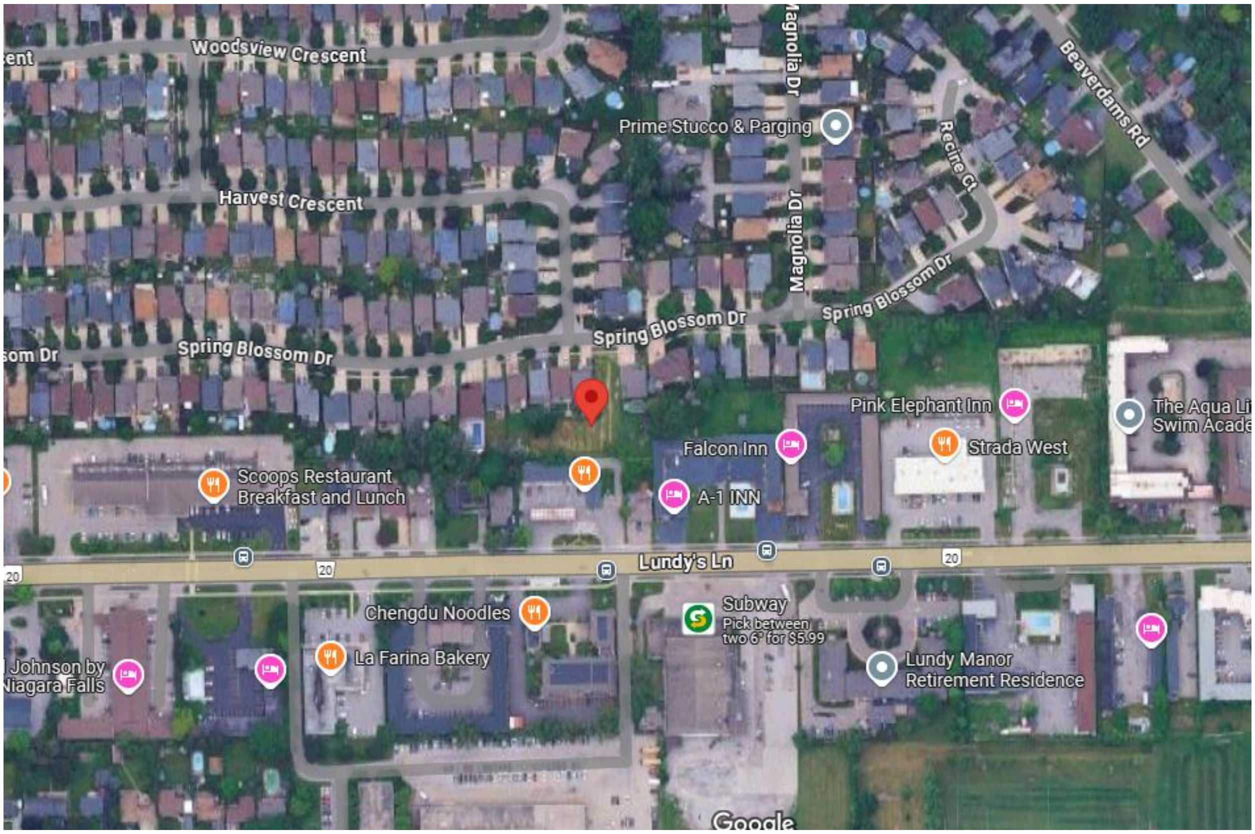


Figure 1 - Location Plan

2 EXISTING CONDITIONS

The topographical survey for the subject site indicates that the site slopes northerly towards Spring Blossom Drive. The site currently is undeveloped and is covered by natural vegetation.

Based on available information, there are no quality and/or quantity control features installed on this property

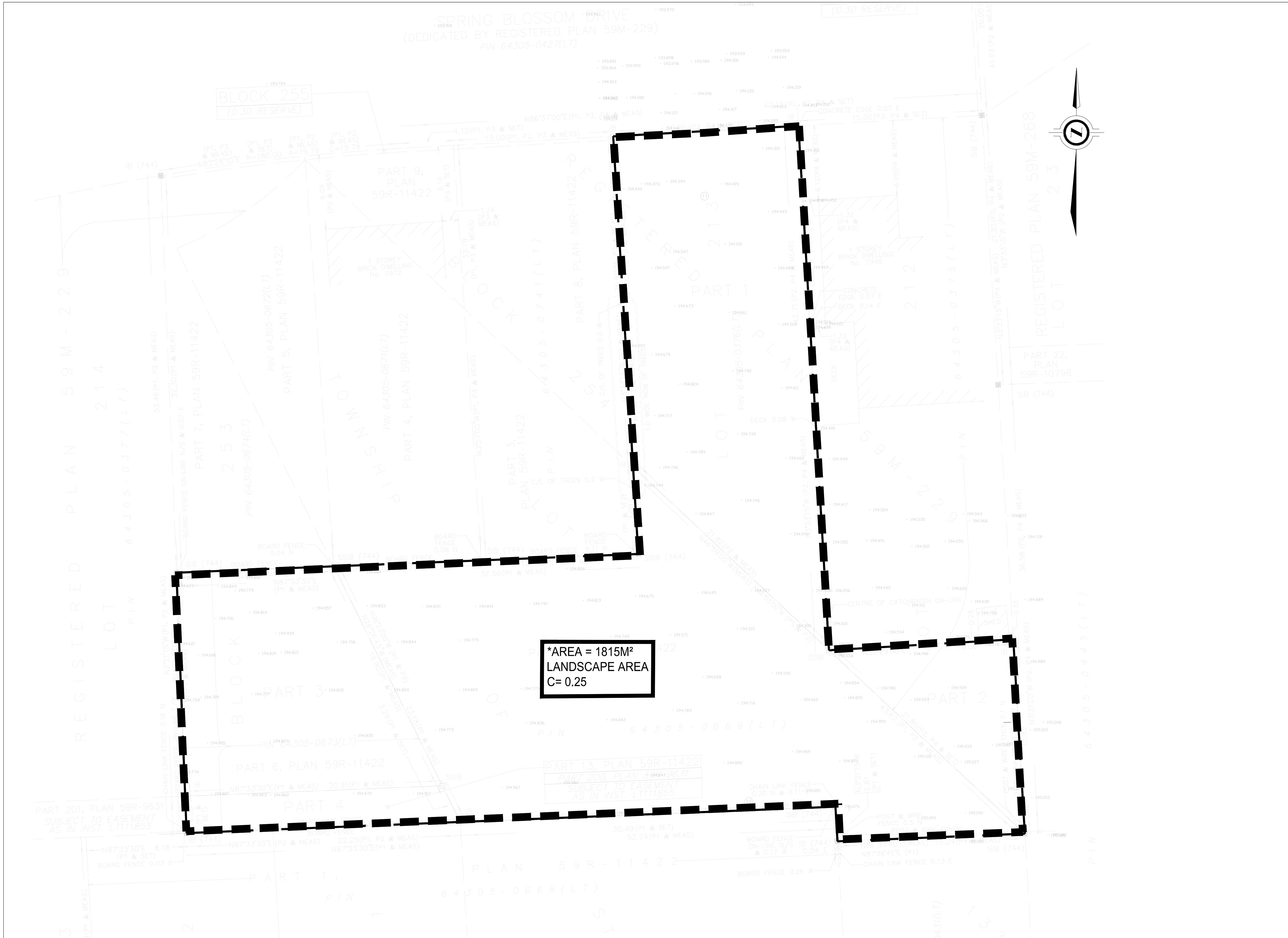
The pre-development site statistics are as follows (See Fig 2):

Pre-Development

Roof Area (existing houses)	0 m^2	c=0.90	ac=	0.0
Asphalt Areas (existing driveways)	0 m^2	c=0.90	ac=	0.0
Landscaped Areas	1815 m^2	c=0.25	ac=	453.75
Total	1815 m^2		ac=	453.75

Composite runoff coefficient, C = 453.75 / 1815 = **0.25**

Figure 2 – Pre-Development Drainage Area Plan



LEGEND:

— - —	PROPERTY LINE
X 252.55	EXISTING ELEVATION
- - - -	SWM AREA

ENGINEER SEAL

Contractor must verify all dimensions on the Project Site and report any discrepancies before proceeding with the Work.

This drawing is a part of the Contract Documents and is to be read in conjunction with all other Contract Documents.

REV.	DESCRIPTION	DATE
03		
02		
01		

PROJECT: 7956 SPRING BLOSSOM DRIVE, NIAGARA FALLS

CONSULTANT: AM ENGINGEERING

4145 North Service Road,
Burlington, ON L7L 6A3
amengineering.ca

DWG TITLE: SWM PRE

SHEET:	SCALE: 1:300
DRAWN: SK	DATE: 2025-07-18

3 PROPOSED CONDITIONS

The proposed development is for seven Townhouses. The site will be serviced with asphalt paved driveway and parking areas. The development will result in increased impervious area thereby resulting to increased runoff.

Accordingly, and to ensure no adverse effects occurs to neighboring properties, it is proposed to implement stormwater management measures to limit runoff from this property to pre-development peak flow levels or less.

In this regard it is proposed to control runoff from this site by use of the proposed underground storage.

The post-development site statistics are as follows **(See Fig 3)**:

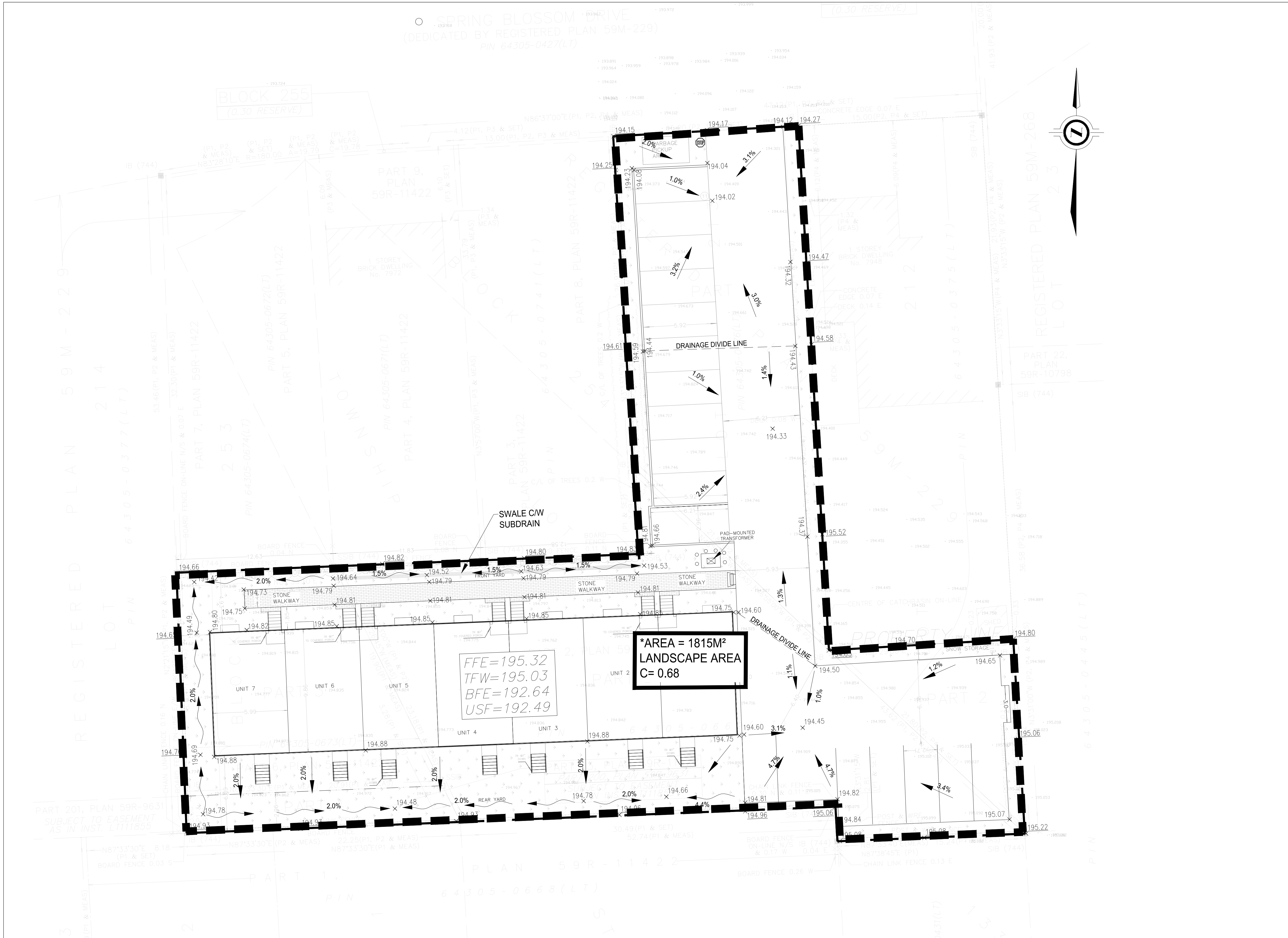
Post-Development

Roof Area	434 m^2	c=0.90	ac=	390.60
Asphalt/Conc Areas	772 m^2	c=0.90	ac=	694.80
Pervious Areas	609 m^2	c=0.25	ac=	152.25
Total	1815 m^2		ac=	1237.65

Composite runoff coefficient, C = 1237.65 / 1815 = **0.68**

Due to the increase in imperviousness of the site and hence the runoff volume, quantity control will be provided for the 2 to 100-year storm events; post to pre-development levels as detailed in the following section.

Figure 2 – Post-Development Drainage Area Plan



LEGEND:

- PROPERTY LINE
- 252.55 EXISTING ELEVATION
- SWM AREA
- 100.00 ELEVATION TO REMAIN
- 100.00 PROPOSED GROUND ELEVATION
- OVERLAND FLOW
- SWALE

ENGINEER SEAL

Contractor must verify all dimensions on the Project Site and report any discrepancies before proceeding with the Work.

This drawing is a part of the Contract Documents and is to be read in conjunction with all other Contract Documents.

REV.	DESCRIPTION	DATE
03		
02		
01		

PROJECT: 7956 SPRING BLOSSOM DRIVE, NIAGARA FALLS

CONSULTANT: AM ENGINGEERING

4145 North Service Road,
Burlington, ON L7L 6A3
amengineering.ca

DWG TITLE: SWM PRE

SHEET:	SCALE: 1:300
DRAWN: SK	DATE: 2025-07-18

3.1 Quantity Control

Quantity control is proposed to be provided by the use of underground storage facilities proposed to be located under the parking area. A storage volume of 31.8m^3 has been determined to be adequate to attenuation of the 2–100-year post-development pick flows to the 2-year pre-development design flows. The total storage volume provided in the underground chambers is 34.85m^3. An orifice plate will be installed on the downstream side of STMH1 to provide the required attenuation. Pre and post-development peak runoff and storage requirements calculation are included in Appendix B.

Orifice Calculation

The proposed underground storage will outlet to the pipe system on Spring Blossom Drive. The outflow will be restricted to the 2-year sewer pre-development flows (8 L/s). Peak flow calculations for pre-development scenario are included in Appendix "B".

Orifice is sized as follows:

Orifice #1

Max Storage Elevation (m)	=	193.54m
Orifice Invert (m)	=	192.70m
∆H (head)	=	0.84m

Q = 8 l/s

$$\text{Area Orifice} = \frac{Q}{c\sqrt{2g(\Delta h)}} = \frac{8 / 1000}{0.63\sqrt{(2 \times 9.81 \times 0.84)}} = 0.0031 \text{ sq. m.}$$

$$\text{Diameter Orifice} = (4 \times 0.0031/\pi)^{0.5} = 0.063\text{m} = 63 \text{ mm}$$

A 63 mm diameter orifice plate will be installed on the downstream of STMH1 as shown in Figure 3.

3.2 Quality Control

Level 1 (Enhanced) treatment level as per the MOEE SWMM Practices Planning and Design Manual 2003 is proposed. To provide the enhanced treatment criteria on the basis of total suspended solids control, a water quality interceptor such as a Stormceptor EF4 (or approved equivalent) is proposed. The water quality interceptor unit identified above is sized based upon a continuous hydrologic model to intercept pollutant washoff, as derived from accepted theory (USEPA). Sizing calculations indicate that TSS removal provided is 60%. Sizing calculations and details of the stormceptor are included in Appendix C.

3.3 Erosion and Sediment Control

Prior to any grading or servicing works taking place on-site, sediment and erosion control measures must be in place to prevent the transport of sediments off the site and into the secondary drains or adjacent properties. The location and design of sediment control will include:

- Installation of siltation control fencing
- Proposed and/or existing catchbasins or inlets within the work area are to be protected from silt by wrapping their tops with filter fabric or providing a sediment trap around the structure
- Proposed swales are to be sodded after they have been shaped in order to prevent scouring and/or down-cutting of the swale invert.

The erosion control measures shall be maintained in good repair during the entire construction period until all construction is complete or until determined they are no longer required.

4 SUMMARY

The main findings of the functional servicing report for the proposed development are:

1. The proposed development storm water servicing requirements can be adequately addressed through the storm sewers and overland flow routes for conveyance, underground storage facility for quantity control and an OGS for quality control.
2. Overall site grading will provide for “major” overland flow conveyance towards the Spring Blossom Drive, provide adequate cover over services and generally match existing road and boundary grades with appropriate slopes.

AM Engineering

Gurbir Mundi, P.Eng.

APPENDIX A

STORMWATER CALCULATIONS

PEAK FLOWS

PROJECT : 7956 Spring Blossom Drive, Niagara Falls
DATE : 2025-07-07

Pre-Development Runoff Calculation

Total Drainage Area	0.1815

Land Type	Area, A (ha)	C	A x C
Landscape	0.1815	0.250	0.0454
Asphalt	0.0000	0.900	0.0000
Conc S/W	0.0000	0.900	0.0000
Gravel	0.0000	0.700	0.0000
Building	0.0000	0.900	0.0000
	0.1815		*0.0454*

Design Runnoff Coefficient 0.250

Factored Runoff Cofficent :

YEAR	Factor	Modified Runoff Factor
2	1.000	0.250
5	1.000	0.250
10	1.000	0.250
25	1.100	0.275
50	1.200	0.300
100	1.250	0.313
250	1.250	0.313

Using Modified Rational Method

Q = C * i * A / 360 cms

C = Runoff Coefficient
i = Rainfall intensity (mm/hr)
A = Watershed area (ha)

[i=A/(t_c+B)^C]		
A	B	C
521.97	5.28	0.7590
719.50	6.34	0.7687
870.09	6.81	0.7738
1020.69	7.29	0.7790
1142.00	7.50	0.7800
1264.57	7.72	0.7814

Time of concentration		10.000	0.167 hrs

YEAR	Modified Runoff Factor	Rainfall mm/hr	Flow	
			m3/sec	L / Sec
2	0.250	65.902	0.008	8
5	0.250	84.024	0.011	11
10	0.250	97.999	0.012	12
25	0.275	110.829	0.015	15
50	0.300	122.489	0.019	19
100	0.313	133.781	0.021	21

PROJECT : 7956 Spring Blossom Drive, Niagara Falls
DATE : 2025-07-07

Post-Development Runoff Calculation (Before Control)

Total Drainage Area		.1815 Ha

Site Statics

Land Type	Area, A (ha)	C	A x C
Landscape	0.0609	0.25	0.02
Pave	0.0772	0.90	0.07
Conc S/W	0.0000	0.90	0.00
Perm. Paving	0.0000	0.70	0.00
Building	0.0434	0.90	0.04
Total	0.1815		0.124

Post Development weighted Runoff Coefficent 0.68

Factored Runoff Cofficent :

YEAR	Factor	Modified Runoff Factor
2	1.00	0.682
5	1.00	0.682
10	1.00	0.682
25	1.10	0.750
50	1.20	0.818
100	1.25	0.852
250	1.25	0.852

Using Modified Rational Method

Q = C * i * A / 360 cms

C = Runoff Coefficient
i = Rainfall intensity (mm/hr)
A = Watershed area (ha)

[i=A/(t^B)]		
A	B	C
521.97	5.28	0.7590
719.50	6.34	0.7687
870.09	6.81	0.7738
1020.69	7.29	0.7790
1142.00	7.50	0.7800
1264.57	7.72	0.7814

Time of concentration		10	min	0.16666667	hrs

Flow :

YEAR	Modified Runoff Factor	Rainfall mm/hr	Flow	
			m3/sec	L / Sec
2	0.682	65.90	0.023	23
5	0.682	84.02	0.029	29
10	0.682	98.00	0.034	34
25	0.750	110.83	0.042	42
50	0.818	122.49	0.051	51
100	0.852	133.78	0.057	57

STORAGE

SWM STORAGE VOLUME CALCULATION - 2YR STORM EVENT

JOB NUMBER:	
CLIENT:	XXXXX
LOCATION:	7956 Spring Blossom Drive
IDF STATION:	Niagara Falls

SITE INFORMATION

Subcatchment Area:

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate (Post- Pre) =	8.00
	0.00
Allowable Release from Other Areas=	8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:

Q=CiA/360

2 YEAR EVENT		
A	521.97	i=A/(t+B)^C
B	5.28	
C	0.7590	

TIME	i	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
	100YR									
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	129.4	0.000	0.044	0.0	2.7	0.0	0.5	0.0	2.2	
2	115.7	0.000	0.040	0.0	4.8	0.0	1.0	0.0	3.8	
3	104.9	0.000	0.036	0.0	6.5	0.0	1.4	0.0	5.1	
4	96.2	0.000	0.033	0.0	7.9	0.0	1.9	0.0	6.0	
5	89.0	0.000	0.031	0.0	9.2	0.0	2.4	0.0	6.8	
6	83.0	0.000	0.029	0.0	10.3	0.0	2.9	0.0	7.4	
7	77.8	0.000	0.027	0.0	11.2	0.0	3.4	0.0	7.9	
8	73.3	0.000	0.025	0.0	12.1	0.0	3.8	0.0	8.3	
9	69.4	0.000	0.024	0.0	12.9	0.0	4.3	0.0	8.6	
10	65.9	0.000	0.023	0.0	13.6	0.0	4.8	0.0	8.8	
11	62.8	0.000	0.022	0.0	14.3	0.0	5.3	0.0	9.0	
12	60.0	0.000	0.021	0.0	14.9	0.0	5.8	0.0	9.1	
13	57.5	0.000	0.020	0.0	15.4	0.0	6.2	0.0	9.2	
14	55.2	0.000	0.019	0.0	16.0	0.0	6.7	0.0	9.2	
15	53.2	0.000	0.018	0.0	16.4	0.0	7.2	0.0	9.2	
16	51.3	0.000	0.018	0.0	16.9	0.0	7.7	0.0	9.2	
17	49.5	0.000	0.017	0.0	17.4	0.0	8.2	0.0	9.2	
18	47.9	0.000	0.016	0.0	17.8	0.0	8.6	0.0	9.1	9.2
19	46.4	0.000	0.016	0.0	18.2	0.0	9.1	0.0	9.1	
20	45.0	0.000	0.015	0.0	18.6	0.0	9.6	0.0	9.0	
21	43.7	0.000	0.015	0.0	18.9	0.0	10.1	0.0	8.8	
22	42.4	0.000	0.015	0.0	19.3	0.0	10.6	0.0	8.7	
23	41.3	0.000	0.014	0.0	19.6	0.0	11.0	0.0	8.6	
24	40.2	0.000	0.014	0.0	19.9	0.0	11.5	0.0	8.4	
25	39.2	0.000	0.013	0.0	20.2	0.0	12.0	0.0	8.2	
26	38.3	0.000	0.013	0.0	20.5	0.0	12.5	0.0	8.0	
27	37.4	0.000	0.013	0.0	20.8	0.0	13.0	0.0	7.8	
28	36.5	0.000	0.013	0.0	21.1	0.0	13.4	0.0	7.6	
29	35.7	0.000	0.012	0.0	21.3	0.0	13.9	0.0	7.4	
30	34.9	0.000	0.012	0.0	21.6	0.0	14.4	0.0	7.2	
31	34.2	0.000	0.012	0.0	21.9	0.0	14.9	0.0	7.0	
32	33.5	0.000	0.012	0.0	22.1	0.0	15.4	0.0	6.7	
33	32.8	0.000	0.011	0.0	22.3	0.0	15.8	0.0	6.5	
34	32.2	0.000	0.011	0.0	22.6	0.0	16.3	0.0	6.3	
35	31.6	0.000	0.011	0.0	22.8	0.0	16.8	0.0	6.0	
36	31.0	0.000	0.011	0.0	23.0	0.0	17.3	0.0	5.7	

SWM STORAGE VOLUME CALCULATION - 5YR STORM EVENT

JOB NUMBER:
CLIENT: XXXXX
LOCATION: 7956 Spring Blossom Drive
IDF STATION: Niagara Falls

SITE INFORMATION

Subcatchment Area: 0

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate= 8.00
Release Rate from Roof=
Allowable Release from Other Areas= 8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:
Q=CiA/360

5 YEAR EVENT	
A	719.50
B	6.34
C	0.7687

i=A/(t+B)^C

TIME	i	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
	100YR									
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	155.4	0.000	0.053	0.0	3.2	0.0	0.5	0.0	2.7	
2	140.9	0.000	0.048	0.0	5.8	0.0	1.0	0.0	4.9	
3	129.2	0.000	0.044	0.0	8.0	0.0	1.4	0.0	6.6	
4	119.4	0.000	0.041	0.0	9.9	0.0	1.9	0.0	7.9	
5	111.3	0.000	0.038	0.0	11.5	0.0	2.4	0.0	9.1	
6	104.3	0.000	0.036	0.0	12.9	0.0	2.9	0.0	10.0	
7	98.2	0.000	0.034	0.0	14.2	0.0	3.4	0.0	10.8	
8	92.9	0.000	0.032	0.0	15.3	0.0	3.8	0.0	11.5	
9	88.2	0.000	0.030	0.0	16.4	0.0	4.3	0.0	12.1	
10	84.0	0.000	0.029	0.0	17.3	0.0	4.8	0.0	12.5	
11	80.3	0.000	0.028	0.0	18.2	0.0	5.3	0.0	12.9	
12	76.9	0.000	0.026	0.0	19.0	0.0	5.8	0.0	13.3	
13	73.8	0.000	0.025	0.0	19.8	0.0	6.2	0.0	13.6	
14	71.0	0.000	0.024	0.0	20.5	0.0	6.7	0.0	13.8	
15	68.4	0.000	0.024	0.0	21.2	0.0	7.2	0.0	14.0	
16	66.1	0.000	0.023	0.0	21.8	0.0	7.7	0.0	14.1	
17	63.9	0.000	0.022	0.0	22.4	0.0	8.2	0.0	14.2	
18	61.9	0.000	0.021	0.0	23.0	0.0	8.6	0.0	14.3	14.4
19	60.0	0.000	0.021	0.0	23.5	0.0	9.1	0.0	14.4	
20	58.2	0.000	0.020	0.0	24.0	0.0	9.6	0.0	14.4	
21	56.6	0.000	0.019	0.0	24.5	0.0	10.1	0.0	14.4	
22	55.0	0.000	0.019	0.0	25.0	0.0	10.6	0.0	14.4	
23	53.6	0.000	0.018	0.0	25.4	0.0	11.0	0.0	14.4	
24	52.2	0.000	0.018	0.0	25.9	0.0	11.5	0.0	14.3	
25	50.9	0.000	0.018	0.0	26.3	0.0	12.0	0.0	14.3	
26	49.7	0.000	0.017	0.0	26.7	0.0	12.5	0.0	14.2	
27	48.6	0.000	0.017	0.0	27.0	0.0	13.0	0.0	14.1	
28	47.5	0.000	0.016	0.0	27.4	0.0	13.4	0.0	14.0	
29	46.4	0.000	0.016	0.0	27.8	0.0	13.9	0.0	13.9	
30	45.5	0.000	0.016	0.0	28.1	0.0	14.4	0.0	13.7	
31	44.5	0.000	0.015	0.0	28.5	0.0	14.9	0.0	13.6	
32	43.6	0.000	0.015	0.0	28.8	0.0	15.4	0.0	13.4	
33	42.8	0.000	0.015	0.0	29.1	0.0	15.8	0.0	13.3	
34	41.9	0.000	0.014	0.0	29.4	0.0	16.3	0.0	13.1	
35	41.2	0.000	0.014	0.0	29.7	0.0	16.8	0.0	12.9	
36	40.4	0.000	0.014	0.0	30.0	0.0	17.3	0.0	12.7	

SWM STORAGE VOLUME CALCULATION - 10YR STORM EVENT

JOB NUMBER:	
CLIENT:	XXXXX
LOCATION:	7956 Spring Blossom Drive
IDF STATION:	Niagara Falls

SITE INFORMATION

Subcatchment Area: 0

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate=	8.00
Release Rate from Roof=	
Allowable Release from Other Areas=	8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:

Q=CiA/360

10 YEAR EVENT		
A	870.1	i=A/(t+B)^C
B	6.810	
C	0.7738	

TIME	i	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
	100YR									
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	177.3	0.000	0.061	0.0	3.7	0.0	0.5	0.0	3.2	
2	161.6	0.000	0.056	0.0	6.7	0.0	1.0	0.0	5.7	
3	148.7	0.000	0.051	0.0	9.2	0.0	1.4	0.0	7.8	
4	137.9	0.000	0.047	0.0	11.4	0.0	1.9	0.0	9.5	
5	128.8	0.000	0.044	0.0	13.3	0.0	2.4	0.0	10.9	
6	120.9	0.000	0.042	0.0	15.0	0.0	2.9	0.0	12.1	
7	114.1	0.000	0.039	0.0	16.5	0.0	3.4	0.0	13.1	
8	108.1	0.000	0.037	0.0	17.8	0.0	3.8	0.0	14.0	
9	102.8	0.000	0.035	0.0	19.1	0.0	4.3	0.0	14.8	
10	98.0	0.000	0.034	0.0	20.2	0.0	4.8	0.0	15.4	
11	93.7	0.000	0.032	0.0	21.3	0.0	5.3	0.0	16.0	
12	89.8	0.000	0.031	0.0	22.2	0.0	5.8	0.0	16.5	
13	86.3	0.000	0.030	0.0	23.1	0.0	6.2	0.0	16.9	
14	83.1	0.000	0.029	0.0	24.0	0.0	6.7	0.0	17.3	
15	80.1	0.000	0.028	0.0	24.8	0.0	7.2	0.0	17.6	
16	77.4	0.000	0.027	0.0	25.5	0.0	7.7	0.0	17.9	
17	74.9	0.000	0.026	0.0	26.2	0.0	8.2	0.0	18.1	
18	72.5	0.000	0.025	0.0	26.9	0.0	8.6	0.0	18.3	18.9
19	70.3	0.000	0.024	0.0	27.6	0.0	9.1	0.0	18.4	
20	68.3	0.000	0.023	0.0	28.2	0.0	9.6	0.0	18.6	
21	66.4	0.000	0.023	0.0	28.8	0.0	10.1	0.0	18.7	
22	64.6	0.000	0.022	0.0	29.3	0.0	10.6	0.0	18.8	
23	62.9	0.000	0.022	0.0	29.8	0.0	11.0	0.0	18.8	
24	61.3	0.000	0.021	0.0	30.4	0.0	11.5	0.0	18.8	
25	59.8	0.000	0.021	0.0	30.9	0.0	12.0	0.0	18.9	
26	58.4	0.000	0.020	0.0	31.3	0.0	12.5	0.0	18.8	
27	57.1	0.000	0.020	0.0	31.8	0.0	13.0	0.0	18.8	
28	55.8	0.000	0.019	0.0	32.2	0.0	13.4	0.0	18.8	
29	54.6	0.000	0.019	0.0	32.7	0.0	13.9	0.0	18.7	
30	53.4	0.000	0.018	0.0	33.1	0.0	14.4	0.0	18.7	
31	52.3	0.000	0.018	0.0	33.5	0.0	14.9	0.0	18.6	
32	51.3	0.000	0.018	0.0	33.9	0.0	15.4	0.0	18.5	
33	50.3	0.000	0.017	0.0	34.2	0.0	15.8	0.0	18.4	
34	49.3	0.000	0.017	0.0	34.6	0.0	16.3	0.0	18.3	
35	48.4	0.000	0.017	0.0	35.0	0.0	16.8	0.0	18.2	
36	47.5	0.000	0.016	0.0	35.3	0.0	17.3	0.0	18.0	

SWM STORAGE VOLUME CALCULATION - 25YR STORM EVENT

JOB NUMBER:	
CLIENT:	XXXXX
LOCATION:	7956 Spring Blossom Drive
IDF STATION:	Niagara Falls

SITE INFORMATION

Subcatchment Area: 0

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate=	8.00
Release Rate from Roof=	
Allowable Release from Other Areas=	8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:

Q=CiA/360

25 YEAR EVENT		
A	1020.7	i=A/(t+B)^C
B	7.290	
C	0.7790	

TIME	i	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		2YEAR ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
	100YR									
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	196.5	0.000	0.068	0.0	4.1	0.0	0.5	0.0	3.6	
2	179.8	0.000	0.062	0.0	7.4	0.0	1.0	0.0	6.5	
3	166.0	0.000	0.057	0.0	10.3	0.0	1.4	0.0	8.8	
4	154.5	0.000	0.053	0.0	12.7	0.0	1.9	0.0	10.8	
5	144.6	0.000	0.050	0.0	14.9	0.0	2.4	0.0	12.5	
6	136.0	0.000	0.047	0.0	16.8	0.0	2.9	0.0	14.0	
7	128.6	0.000	0.044	0.0	18.6	0.0	3.4	0.0	15.2	
8	122.0	0.000	0.042	0.0	20.1	0.0	3.8	0.0	16.3	
9	116.1	0.000	0.040	0.0	21.6	0.0	4.3	0.0	17.2	
10	110.8	0.000	0.038	0.0	22.9	0.0	4.8	0.0	18.1	
11	106.1	0.000	0.036	0.0	24.1	0.0	5.3	0.0	18.8	
12	101.8	0.000	0.035	0.0	25.2	0.0	5.8	0.0	19.4	
13	97.8	0.000	0.034	0.0	26.2	0.0	6.2	0.0	20.0	
14	94.2	0.000	0.032	0.0	27.2	0.0	6.7	0.0	20.5	
15	90.9	0.000	0.031	0.0	28.1	0.0	7.2	0.0	20.9	
16	87.9	0.000	0.030	0.0	29.0	0.0	7.7	0.0	21.3	
17	85.0	0.000	0.029	0.0	29.8	0.0	8.2	0.0	21.7	
18	82.4	0.000	0.028	0.0	30.6	0.0	8.6	0.0	22.0	23.3
19	80.0	0.000	0.027	0.0	31.3	0.0	9.1	0.0	22.2	
20	77.7	0.000	0.027	0.0	32.0	0.0	9.6	0.0	22.4	
21	75.5	0.000	0.026	0.0	32.7	0.0	10.1	0.0	22.6	
22	73.5	0.000	0.025	0.0	33.4	0.0	10.6	0.0	22.8	
23	71.6	0.000	0.025	0.0	34.0	0.0	11.0	0.0	22.9	
24	69.8	0.000	0.024	0.0	34.6	0.0	11.5	0.0	23.0	
25	68.1	0.000	0.023	0.0	35.1	0.0	12.0	0.0	23.1	
26	66.5	0.000	0.023	0.0	35.7	0.0	12.5	0.0	23.2	
27	65.0	0.000	0.022	0.0	36.2	0.0	13.0	0.0	23.2	
28	63.6	0.000	0.022	0.0	36.7	0.0	13.4	0.0	23.3	
29	62.2	0.000	0.021	0.0	37.2	0.0	13.9	0.0	23.3	
30	60.9	0.000	0.021	0.0	37.7	0.0	14.4	0.0	23.3	
31	59.7	0.000	0.021	0.0	38.1	0.0	14.9	0.0	23.3	
32	58.5	0.000	0.020	0.0	38.6	0.0	15.4	0.0	23.2	
33	57.3	0.000	0.020	0.0	39.0	0.0	15.8	0.0	23.2	
34	56.3	0.000	0.019	0.0	39.5	0.0	16.3	0.0	23.1	
35	55.2	0.000	0.019	0.0	39.9	0.0	16.8	0.0	23.1	
36	54.2	0.000	0.019	0.0	40.3	0.0	17.3	0.0	23.0	

SWM STORAGE VOLUME CALCULATION - 50YR STORM EVENT

JOB NUMBER:	
CLIENT:	XXXXX
LOCATION:	7956 Spring Blossom Drive
IDF STATION:	Niagara Falls

SITE INFORMATION

Subcatchment Area: 0

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate=	8.00
Release Rate from Roof=	0.00
Allowable Release from Other Areas=	8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:

Q=CiA/360

50 YEAR EVENT		
A	1142.00	i=A/(t+B)^C
B	7.50	
C	0.7800	

TIME	i 100YR	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	215.1	0.000	0.074	0.0	4.4	0.0	0.5	0.0	4.0	
2	197.3	0.000	0.068	0.0	8.1	0.0	1.0	0.0	7.2	
3	182.4	0.000	0.063	0.0	11.3	0.0	1.4	0.0	9.9	
4	170.0	0.000	0.058	0.0	14.0	0.0	1.9	0.0	12.1	
5	159.2	0.000	0.055	0.0	16.4	0.0	2.4	0.0	14.0	
6	150.0	0.000	0.052	0.0	18.6	0.0	2.9	0.0	15.7	
7	141.8	0.000	0.049	0.0	20.5	0.0	3.4	0.0	17.1	
8	134.7	0.000	0.046	0.0	22.2	0.0	3.8	0.0	18.4	
9	128.2	0.000	0.044	0.0	23.8	0.0	4.3	0.0	19.5	
10	122.5	0.000	0.042	0.0	25.3	0.0	4.8	0.0	20.5	
11	117.3	0.000	0.040	0.0	26.6	0.0	5.3	0.0	21.3	
12	112.6	0.000	0.039	0.0	27.9	0.0	5.8	0.0	22.1	
13	108.3	0.000	0.037	0.0	29.0	0.0	6.2	0.0	22.8	
14	104.3	0.000	0.036	0.0	30.1	0.0	6.7	0.0	23.4	
15	100.7	0.000	0.035	0.0	31.2	0.0	7.2	0.0	24.0	
16	97.3	0.000	0.033	0.0	32.1	0.0	7.7	0.0	24.4	
17	94.2	0.000	0.032	0.0	33.0	0.0	8.2	0.0	24.9	
18	91.3	0.000	0.031	0.0	33.9	0.0	8.6	0.0	25.3	
19	88.6	0.000	0.030	0.0	34.7	0.0	9.1	0.0	25.6	
20	86.1	0.000	0.030	0.0	35.5	0.0	9.6	0.0	25.9	
21	83.7	0.000	0.029	0.0	36.3	0.0	10.1	0.0	26.2	
22	81.5	0.000	0.028	0.0	37.0	0.0	10.6	0.0	26.4	
23	79.4	0.000	0.027	0.0	37.7	0.0	11.0	0.0	26.6	
24	77.4	0.000	0.027	0.0	38.3	0.0	11.5	0.0	26.8	
25	75.6	0.000	0.026	0.0	39.0	0.0	12.0	0.0	27.0	
26	73.8	0.000	0.025	0.0	39.6	0.0	12.5	0.0	27.1	
27	72.1	0.000	0.025	0.0	40.2	0.0	13.0	0.0	27.2	
28	70.5	0.000	0.024	0.0	40.7	0.0	13.4	0.0	27.3	27.5
29	69.0	0.000	0.024	0.0	41.3	0.0	13.9	0.0	27.4	
30	67.6	0.000	0.023	0.0	41.8	0.0	14.4	0.0	27.4	
31	66.2	0.000	0.023	0.0	42.3	0.0	14.9	0.0	27.5	
32	64.9	0.000	0.022	0.0	42.8	0.0	15.4	0.0	27.5	
33	63.7	0.000	0.022	0.0	43.3	0.0	15.8	0.0	27.5	
34	62.5	0.000	0.021	0.0	43.8	0.0	16.3	0.0	27.5	
35	61.3	0.000	0.021	0.0	44.3	0.0	16.8	0.0	27.5	
36	60.2	0.000	0.021	0.0	44.7	0.0	17.3	0.0	27.4	

SWM STORAGE VOLUME CALCULATION - 50YR STORM EVENT

JOB NUMBER:
CLIENT: XXXXX
LOCATION: 7956 Spring Blossom Drive
IDF STATION: Niagara Falls

SITE INFORMATION

Subcatchment Area: 0

	AREA (m2)	RUNOFF COEFFICIENT
Roof Area (Controlled)	0	0.9
Paved Area (Hard Surface)	1206	0.9
Landscaped Area	609	0.25
Overall Area	1815	0.68
Paved + Landscaped	1815	0.68

Allowable Release Rate from Site (L/s):

Total Allowable Release Rate= 8.00
Release Rate from Roof= 0.00
Allowable Release from Other Areas= 8.00

STORAGE VOLUME CALCULATION

Modified Rational Method used to determine storage volume:

Q=CiA/360

100 YEAR EVENT		
A	1264.6	i=A*(T^B)
B	7.7	
C	0.7814	

TIME	i 100YR	INFLOW (m3/sec)		ACCUMULATED RUNOFF VOLUME (m3)		ALLOWABLE RELEASE VOL. (m3)		REQ'D STORAGE (m3)		
(MIN.)	(mm/hr)	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	ROOF	SURFACE	TOTAL
1	232.8	0.000	0.080	0.0	4.8	0.0	0.5	0.0	4.3	
2	213.9	0.000	0.074	0.0	8.8	0.0	1.0	0.0	7.9	
3	198.1	0.000	0.068	0.0	12.3	0.0	1.4	0.0	10.8	
4	184.8	0.000	0.064	0.0	15.2	0.0	1.9	0.0	13.3	
5	173.3	0.000	0.060	0.0	17.9	0.0	2.4	0.0	15.5	
6	163.4	0.000	0.056	0.0	20.2	0.0	2.9	0.0	17.3	
7	154.6	0.000	0.053	0.0	22.3	0.0	3.4	0.0	19.0	
8	146.9	0.000	0.051	0.0	24.2	0.0	3.8	0.0	20.4	
9	140.0	0.000	0.048	0.0	26.0	0.0	4.3	0.0	21.7	
10	133.8	0.000	0.046	0.0	27.6	0.0	4.8	0.0	22.8	
11	128.2	0.000	0.044	0.0	29.1	0.0	5.3	0.0	23.8	
12	123.1	0.000	0.042	0.0	30.5	0.0	5.8	0.0	24.7	
13	118.4	0.000	0.041	0.0	31.7	0.0	6.2	0.0	25.5	
14	114.1	0.000	0.039	0.0	33.0	0.0	6.7	0.0	26.2	
15	110.2	0.000	0.038	0.0	34.1	0.0	7.2	0.0	26.9	
16	106.5	0.000	0.037	0.0	35.2	0.0	7.7	0.0	27.5	
17	103.1	0.000	0.035	0.0	36.2	0.0	8.2	0.0	28.0	
18	100.0	0.000	0.034	0.0	37.1	0.0	8.6	0.0	28.5	
19	97.1	0.000	0.033	0.0	38.0	0.0	9.1	0.0	28.9	
20	94.3	0.000	0.032	0.0	38.9	0.0	9.6	0.0	29.3	
21	91.7	0.000	0.032	0.0	39.7	0.0	10.1	0.0	29.7	
22	89.3	0.000	0.031	0.0	40.5	0.0	10.6	0.0	30.0	
23	87.0	0.000	0.030	0.0	41.3	0.0	11.0	0.0	30.3	
24	84.9	0.000	0.029	0.0	42.0	0.0	11.5	0.0	30.5	
25	82.8	0.000	0.028	0.0	42.7	0.0	12.0	0.0	30.7	
26	80.9	0.000	0.028	0.0	43.4	0.0	12.5	0.0	30.9	
27	79.1	0.000	0.027	0.0	44.0	0.0	13.0	0.0	31.1	
28	77.4	0.000	0.027	0.0	44.7	0.0	13.4	0.0	31.2	31.8
29	75.7	0.000	0.026	0.0	45.3	0.0	13.9	0.0	31.4	
30	74.1	0.000	0.025	0.0	45.9	0.0	14.4	0.0	31.5	
31	72.6	0.000	0.025	0.0	46.4	0.0	14.9	0.0	31.6	
32	71.2	0.000	0.024	0.0	47.0	0.0	15.4	0.0	31.6	
33	69.8	0.000	0.024	0.0	47.5	0.0	15.8	0.0	31.7	
34	68.5	0.000	0.024	0.0	48.1	0.0	16.3	0.0	31.7	
35	67.3	0.000	0.023	0.0	48.6	0.0	16.8	0.0	31.8	
36	66.1	0.000	0.023	0.0	49.1	0.0	17.3	0.0	31.8	

User Inputs

Chamber Model:	SC-800
Outlet Control Structure:	Yes
Project Name:	7956 Spring Blossom
Engineer:	George Karugu
Project Location:	Ontario
Measurement Type:	Metric
Required Storage Volume:	31.11 cubic meters.
Stone Porosity:	40%
Stone Foundation Depth:	153 mm.
Stone Above Chambers:	153 mm.
Design Constraint Dimensions:	(6.51 m. x 15.00 m.)

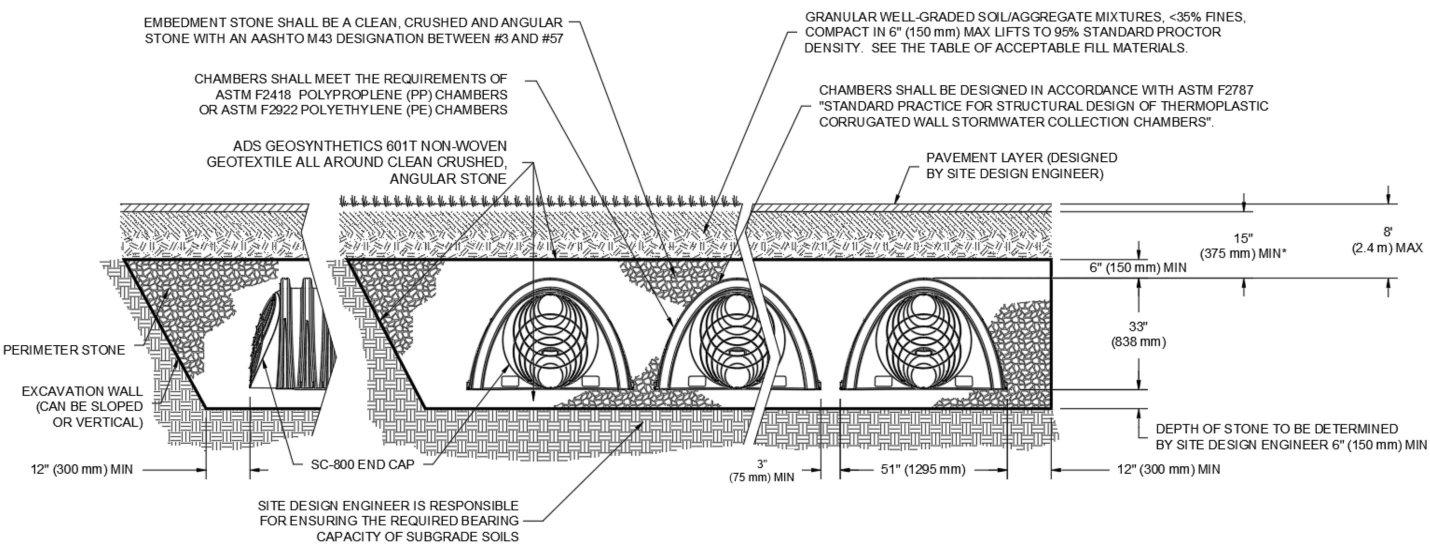
Results

System Volume and Bed Size

Installed Storage Volume:	34.85 cubic meters.
Storage Volume Per Chamber:	1.44 cubic meters.
Number Of Chambers Required:	12
Number Of End Caps Required:	4
Chamber Rows:	2
Maximum Length:	15.36 m.
Maximum Width:	3.46 m.
Approx. Bed Size Required:	53.13 square meters.
Average Cover Over Chambers:	N/A .

System Components

Amount Of Stone Required:	44 cubic meters
Volume Of Excavation (Not Including Fill):	61 cubic meters
Total Non-woven Geotextile Required:	180 square meters
Woven Geotextile Required (excluding Isolator Row):	9 square meters
Woven Geotextile Required (Isolator Row):	25 square meters
Total Woven Geotextile Required:	34 square meters
Impervious Liner Required:	0 square meters



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

7956 SPRING BLOSSOM

NIAGARA FALLS, ON, CANADA

SC-800 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-800.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 50 mm (2").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-800 SYSTEM

1. STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 75 mm (3") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

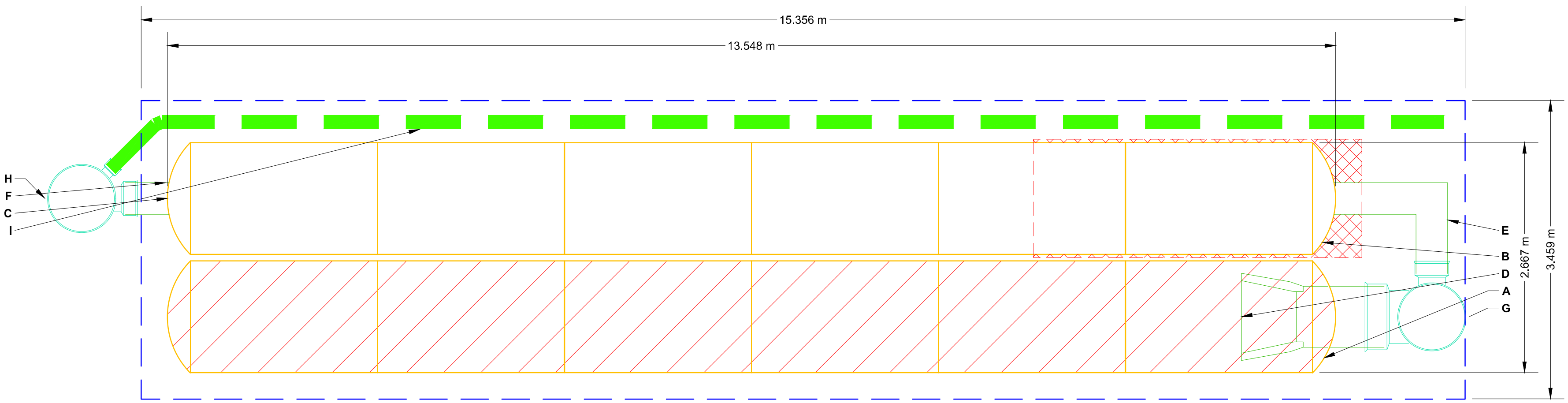
CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT	
12	STORMTECH SC-800 CHAMBERS
4	STORMTECH SC-800 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	STONE VOID
34.8	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
53.1	SYSTEM AREA (m^2)
37.6	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.429
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.524
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.372
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.372
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.372
TOP OF STONE:	1.143
TOP OF SC-800 CHAMBER:	0.991
300 mm x 300 mm TOP MANIFOLD INVERT:	0.518
600 mm ISOLATOR ROW PLUS INVERT:	0.211
300 mm BOTTOM CONNECTION INVERT:	0.193
BOTTOM OF SC-800 CHAMBER:	0.152
UNDERDRAIN INVERT:	0.000
BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	600 mm BOTTOM PREFABRICATED EZ END CAP, PART#: SC800ECEZ / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	58 mm	
PRE-CORED END CAP	B	300 mm TOP PRE-CORED END CAP, PART#: SC800EPE12TPC / TYP OF ALL 300 mm TOP CONNECTIONS	366 mm	
PRE-CORED END CAP	C	300 mm BOTTOM PRE-CORED END CAP, PART#: SC800EPE12BPC / TYP OF ALL 300 mm BOTTOM CONNECTIONS	41 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: SC80024RAMP		
MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	366 mm	
PIPE CONNECTION	F	300 mm BOTTOM CONNECTION	41 mm	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	750 mm DIAMETER (610 mm SUMP MIN)		65 L/s IN
NYLOPLAST (OUTLET)	H	750 mm DIAMETER (DESIGN BY ENGINEER)		57 L/s OUT
UNDERDRAIN	I	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

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StormTech®
Chamber System

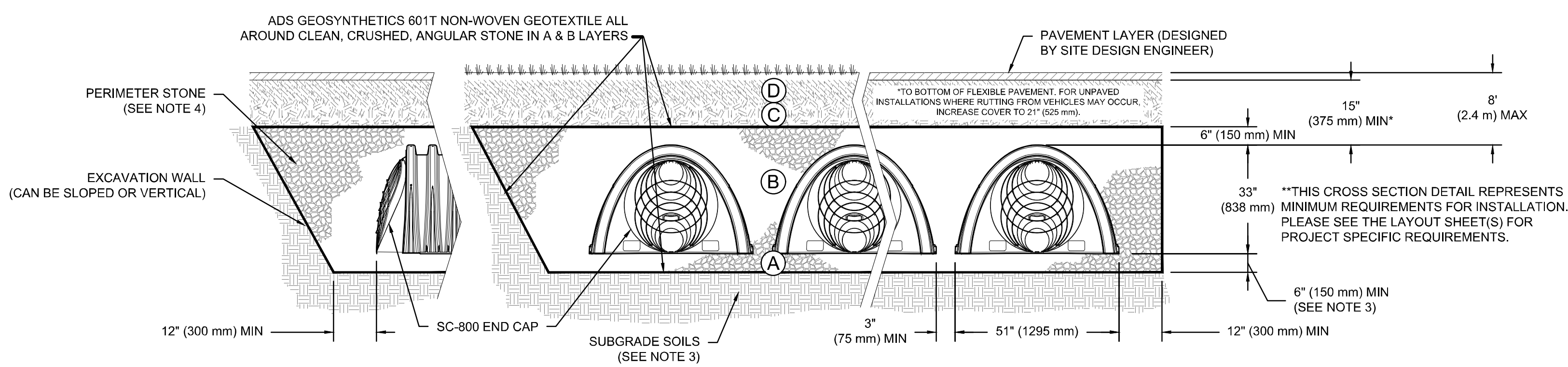
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 50

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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Chamber System

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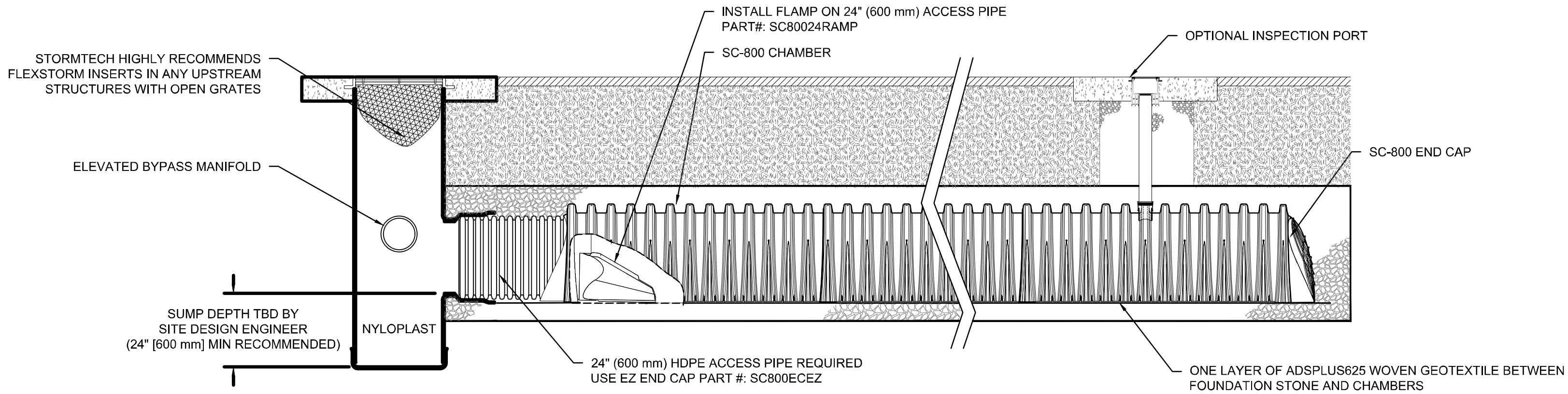

SC-800 ISOLATOR ROW PLUS DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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UNDERDRAIN DETAIL

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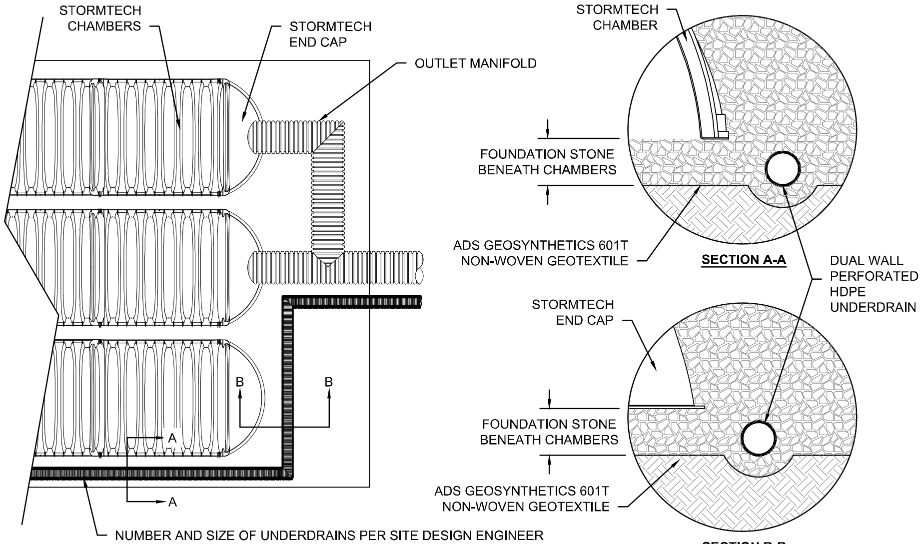
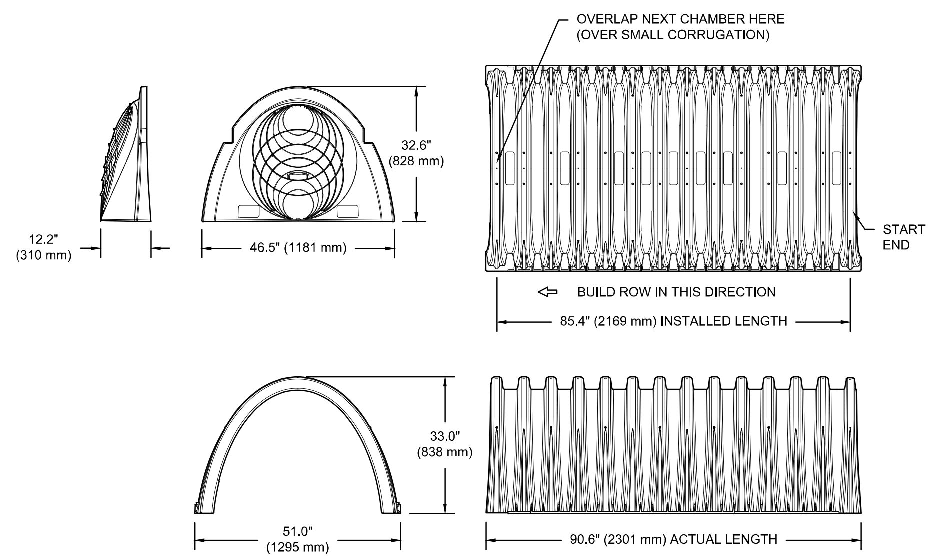


NUMBER AND SIZE OF UNDERDRAINS PER SITE DESIGN ENGINEER
4" (100 mm) TYP FOR SC-310 & SC-160LP SYSTEMS
6" (150 mm) TYP FOR SC-800, DC-780, MC-3500, MC-4500 & MC-7200 SYSTEMS

SC-800 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	78.4 CUBIC FEET	(2.22 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

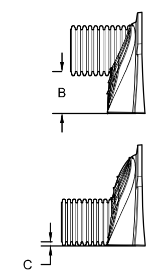
NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	14.7 CUBIC FEET	(0.42 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (150 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS, 3" (75 mm) BETWEEN CHAMBERS
**ASSUMES 6" (150 mm) STONE ABOVE AND BELOW END CAPS, 3" (150 mm) BETWEEN ROWS, 12" (300 mm) BEYOND END CAPS

PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	



NOTE: ALL DIMENSIONS ARE NOMINAL

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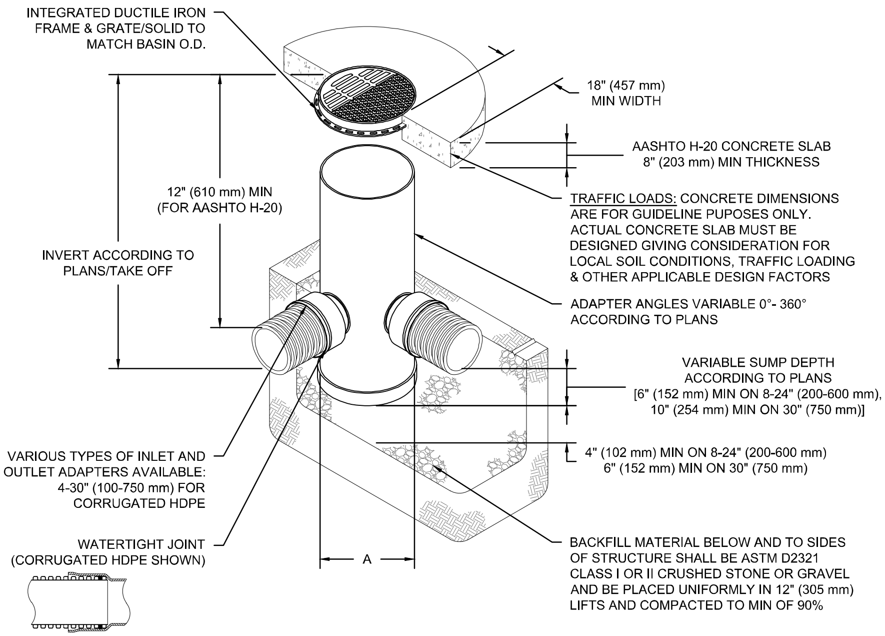
NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

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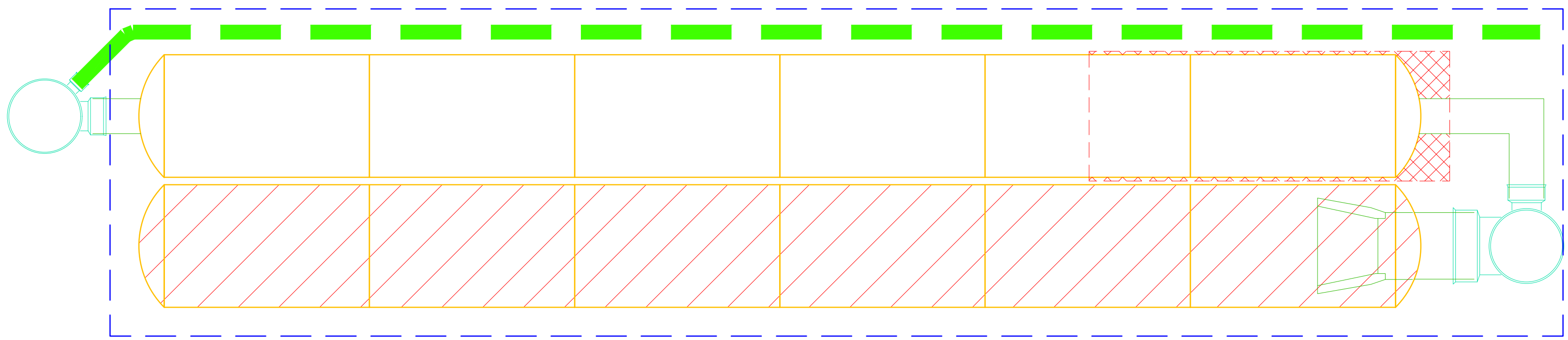
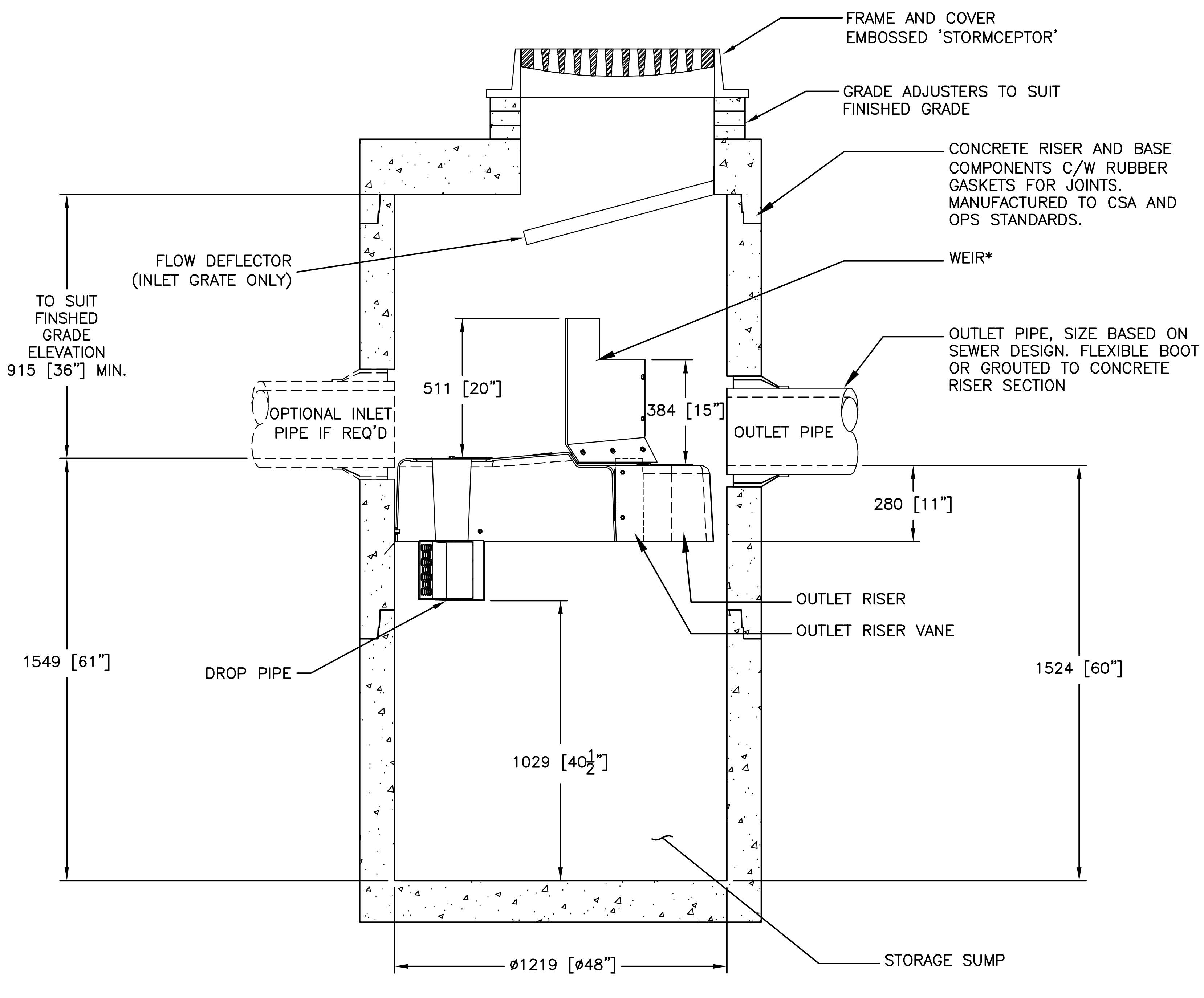
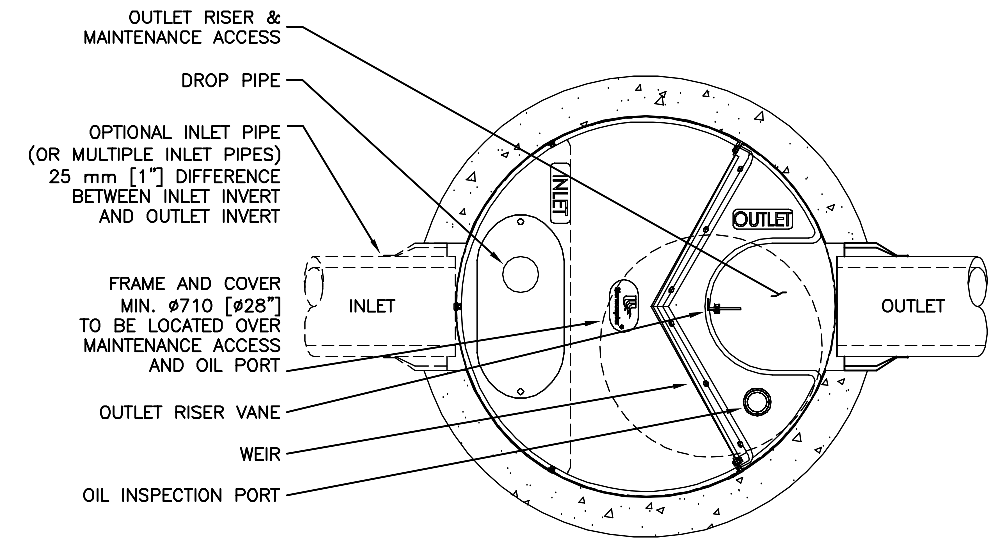


APPENDIX B

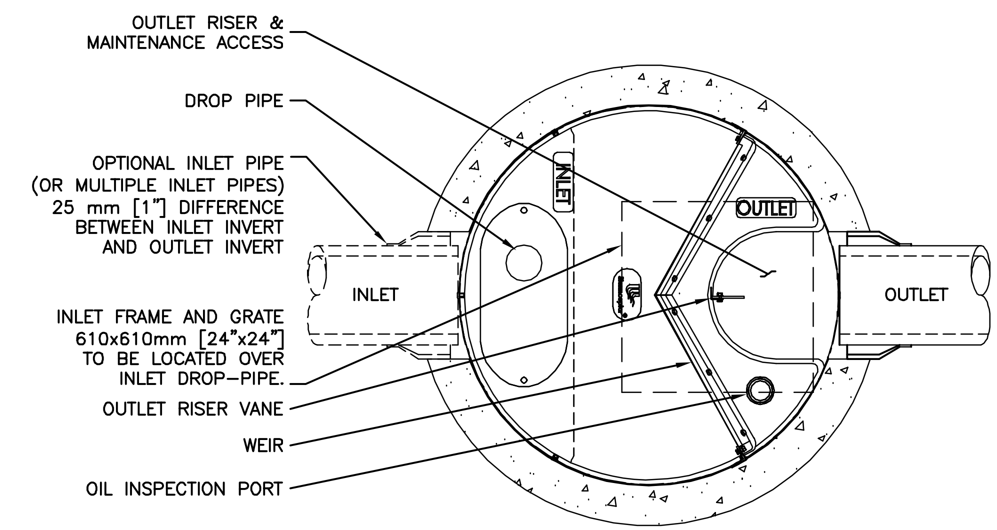
OGS CALCULATIONS



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF4				
STRUCTURE ID					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

MARK	DATE	REVISION DESCRIPTION	BY
0	5/26/17	INITIAL RELEASE	JSK
1	6/8/18	UPDATES	JSK
####	####	####	####
####	####	####	####
####	####	####	####

Stormceptor® EF

SCALE = NTS

imbrium

DATE: 5/26/2017
DESIGNED: JSK
DRAWN: JSK
CHECKED: BSF
APPROVED: SP
PROJECT No.: EF4
SEQUENCE No.: *
SHEET: 1 OF 1

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

07/08/2025

Province:	Ontario
City:	Niagara Falls
Nearest Rainfall Station:	ST CATHARINES AP
Climate Station Id:	6137287
Years of Rainfall Data:	33

Site Name:	7956 Spring Blossom Drive

Drainage Area (ha):	0.17
Runoff Coefficient 'c':	0.70

Project Name:	7956 Spring Blossom Drive
Project Number:	25037
Designer Name:	George Karugu
Designer Company:	Consulting
Designer Email:	gkarugu@karugu.com
Designer Phone:	226-927-7103
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	3.70
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	8.00
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	102
Estimated Average Annual Sediment Volume (L/yr):	83

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	66
EF5	68
EF6	69
EF8	70
EF10	70
EF12	70

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 66

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below 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.

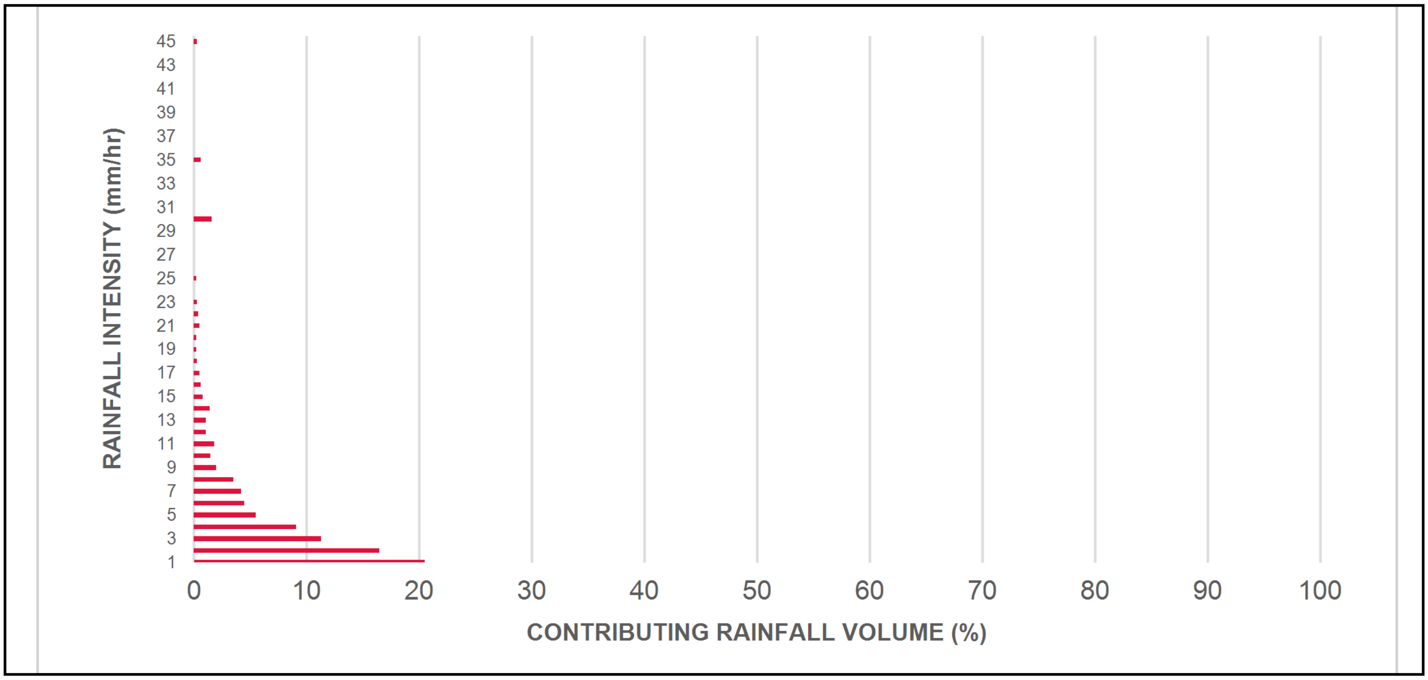
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

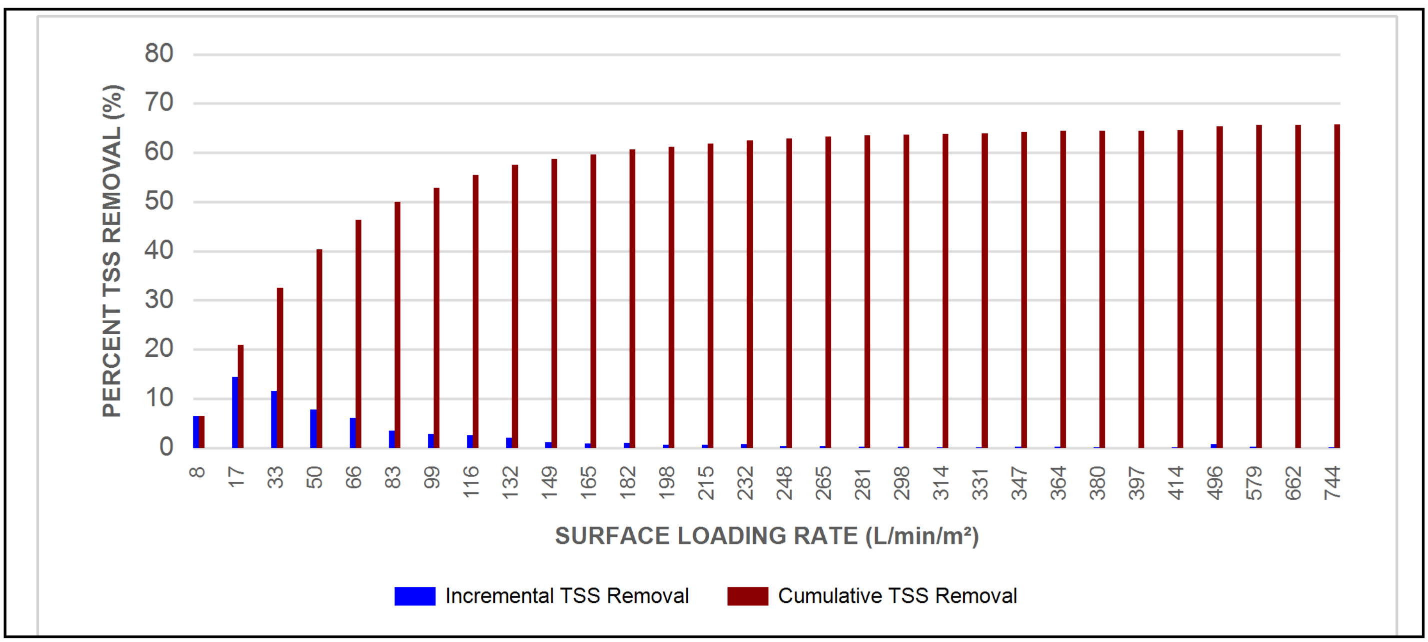
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	9.2	9.2	0.17	10.0	8.0	70	6.5	6.5
1.00	20.5	29.7	0.33	20.0	17.0	70	14.4	20.9
2.00	16.5	46.2	0.66	40.0	33.0	70	11.6	32.5
3.00	11.3	57.5	0.99	60.0	50.0	69	7.8	40.3
4.00	9.1	66.7	1.32	79.0	66.0	67	6.1	46.4
5.00	5.5	72.2	1.65	99.0	83.0	64	3.5	50.0
6.00	4.5	76.7	1.98	119.0	99.0	62	2.8	52.8
7.00	4.2	80.9	2.32	139.0	116.0	62	2.6	55.4
8.00	3.5	84.4	2.65	159.0	132.0	60	2.1	57.5
9.00	2.0	86.5	2.98	179.0	149.0	59	1.2	58.7
10.00	1.5	88.0	3.31	198.0	165.0	57	0.8	59.6
11.00	1.8	89.8	3.64	218.0	182.0	56	1.0	60.6
12.00	1.1	90.9	3.97	238.0	198.0	55	0.6	61.2
13.00	1.1	92.0	4.30	258.0	215.0	54	0.6	61.8
14.00	1.4	93.4	4.63	278.0	232.0	53	0.8	62.5
15.00	0.8	94.2	4.96	298.0	248.0	53	0.4	62.9
16.00	0.6	94.8	5.29	318.0	265.0	52	0.3	63.3
17.00	0.5	95.3	5.62	337.0	281.0	52	0.3	63.5
18.00	0.3	95.6	5.95	357.0	298.0	51	0.2	63.7
19.00	0.2	95.9	6.29	377.0	314.0	51	0.1	63.8
20.00	0.2	96.1	6.62	397.0	331.0	50	0.1	63.9
21.00	0.5	96.6	6.95	417.0	347.0	50	0.3	64.2
22.00	0.4	97.0	7.28	437.0	364.0	49	0.2	64.4
23.00	0.3	97.3	7.61	457.0	380.0	49	0.1	64.5
24.00	2.7	100.0	7.94	476.0	397.0	48	1.3	65.8
25.00	0.0	100.0	8.00	480.0	400.0	48	0.0	65.8
30.00	0.0	100.0	8.00	480.0	400.0	48	0.0	65.8
35.00	0.0	100.0	8.00	480.0	400.0	48	0.0	65.8
40.00	0.0	100.0	8.00	480.0	400.0	48	0.0	65.8
45.00	0.0	100.0	8.00	480.0	400.0	48	0.0	65.8
Estimated Net Annual Sediment (TSS) Load Reduction =								**66 %**

Climate Station ID: 6137287 *Years of Rainfall Data*: 33

RAINFALL DATA FROM ST CATHARINES 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

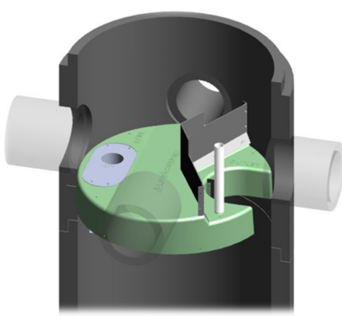
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

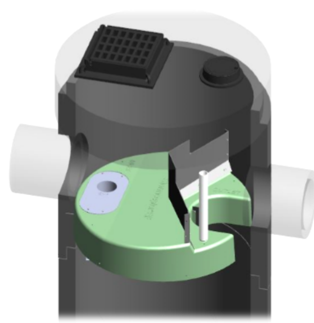
DESIGN FLEXIBILITY

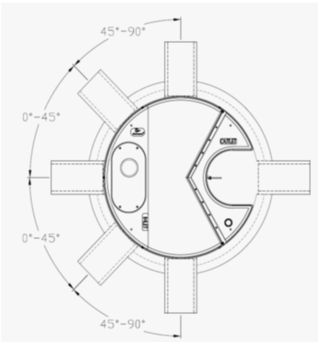
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

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

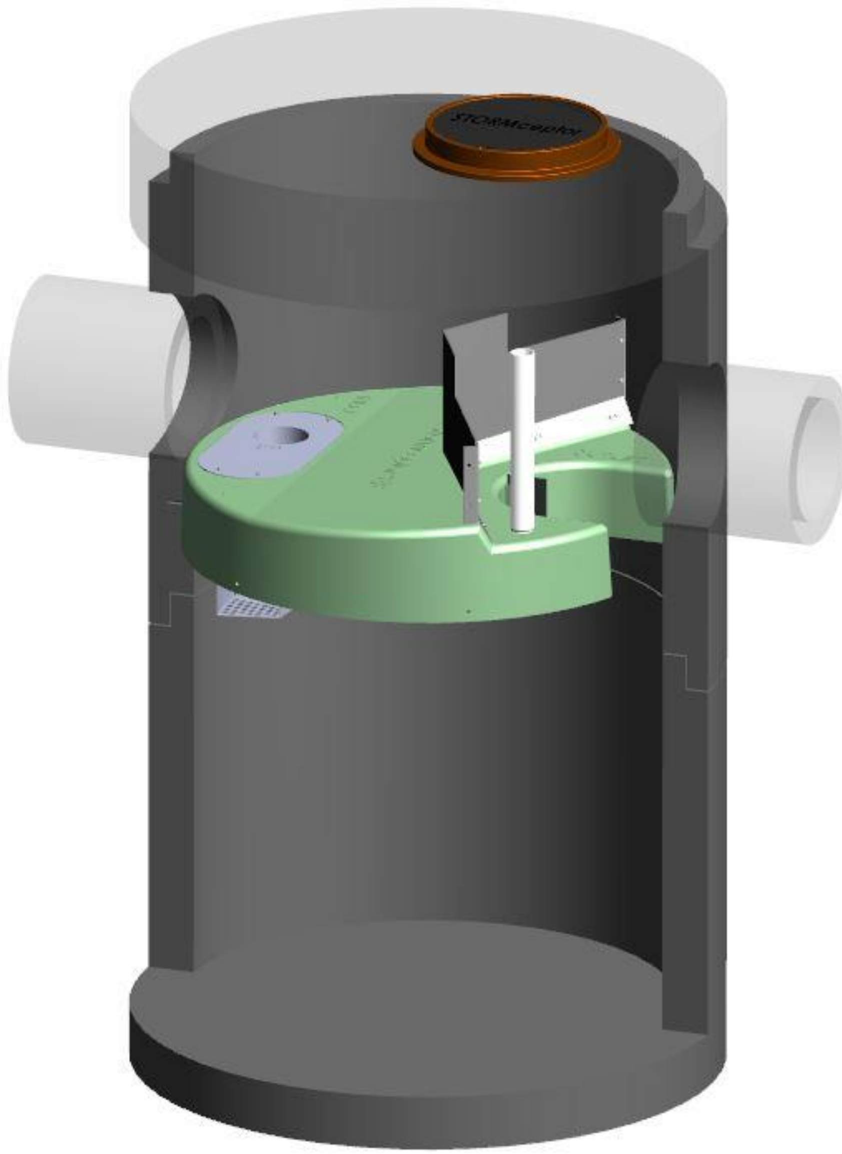
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

APPENDIX C

OGS MAINTENANCE MANUAL

Stormceptor® EF

Owner’s Manual



Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,180,305
Canadian Patent No. 2,327,768
Canadian Patent No. 2,694,159
Canadian Patent No. 2,697,287
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216
U.S. Patent No. 7,666,303
Australia Patent No. 693.164
Australia Patent No. 729,096
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900
Japanese Patent No. 5,997,750
Japanese Patent No. 5,555,160
Korean Patent No. 0519212
Korean Patent No. 1451593
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583
South African Patent No. 2010/00682
South African Patent No. 2010/01796
Patent pending

Table of Contents:

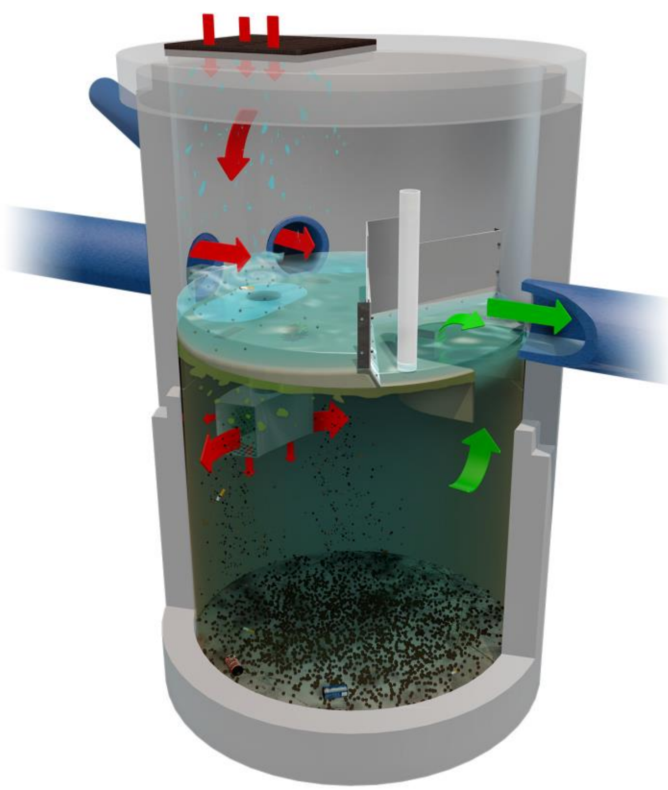
OVERVIEW

Stormceptor® EF is a continuation and evolution of the most globally recognized oil grit separator (OGS) stormwater treatment technology - ***Stormceptor®***. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at flow rates higher than the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention platform ensures sediment is retained during all rainfall events.

Stormceptor EF offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe, multiple inlet pipes, and/or from the surface through an inlet grate. Stormceptor EF can also serve as a junction structure, accommodate a 90-degree inlet to outlet bend angle, and be modified to ensure performance in submerged conditions. With its scour prevention and internal bypass, Stormceptor EF can be installed online, eliminating the need for costly additional bypass structures.

OPERATION

- Stormwater enters the Stormceptor upper chamber through the inlet pipe(s) or a surface inlet grate. A specially designed insert reduces the influent velocity by creating a pond upstream of the insert's weir. Sediment particles immediately begin to settle. Swirling flow sweeps water, sediment, and floatables across the sloped surface of the insert to the inlet opening of the drop pipe, where a strong vortex draws water, sediment, oil, and debris down the drop pipe cone.
- Influent exits the cone into the drop pipe duct. The duct has two large rectangular outlet openings as well as perforations in the backside and floor of the duct. Influent is diffused through these various opening in multiple directions and at low velocity into the lower chamber.
- Free oils and other floatables rise up within the channel surrounding the central riser pipe and are trapped beneath the insert, while sediment settles to the sump. Pollutants are retained for later removal during maintenance cleaning.
- Treated effluent enters the outlet riser, moves upward, and discharges to the top side of the insert downstream of the weir, where it flows out the outlet pipe.
- During intense storm events with very high influent flow rates, the pond height on the upstream side of the weir may exceed the height of the weir, and the excess flow passes over the top of the weir to the downstream side of the insert, and exits through the outlet pipe. This internal bypass feature allows for in-line installation, avoiding the cost of additional bypass structures. During bypass, the pond separates sediment from all incoming flows, while full treatment in the lower chamber continues at the maximum flow rate.
- Stormceptor EF's patent-pending enhanced flow and scour prevention technology ensures pollutants are captured and retained, allowing excess flows to bypass during infrequent, high intensity storms.



COMPONENTS

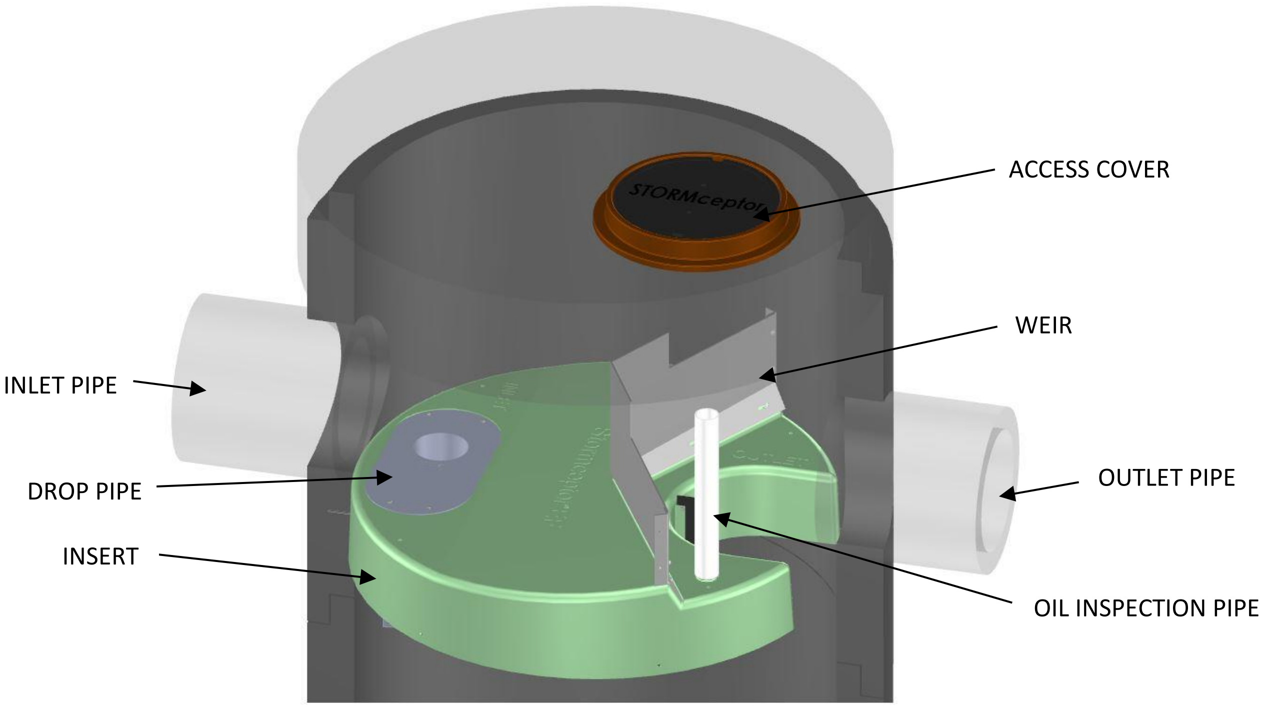


Figure 1

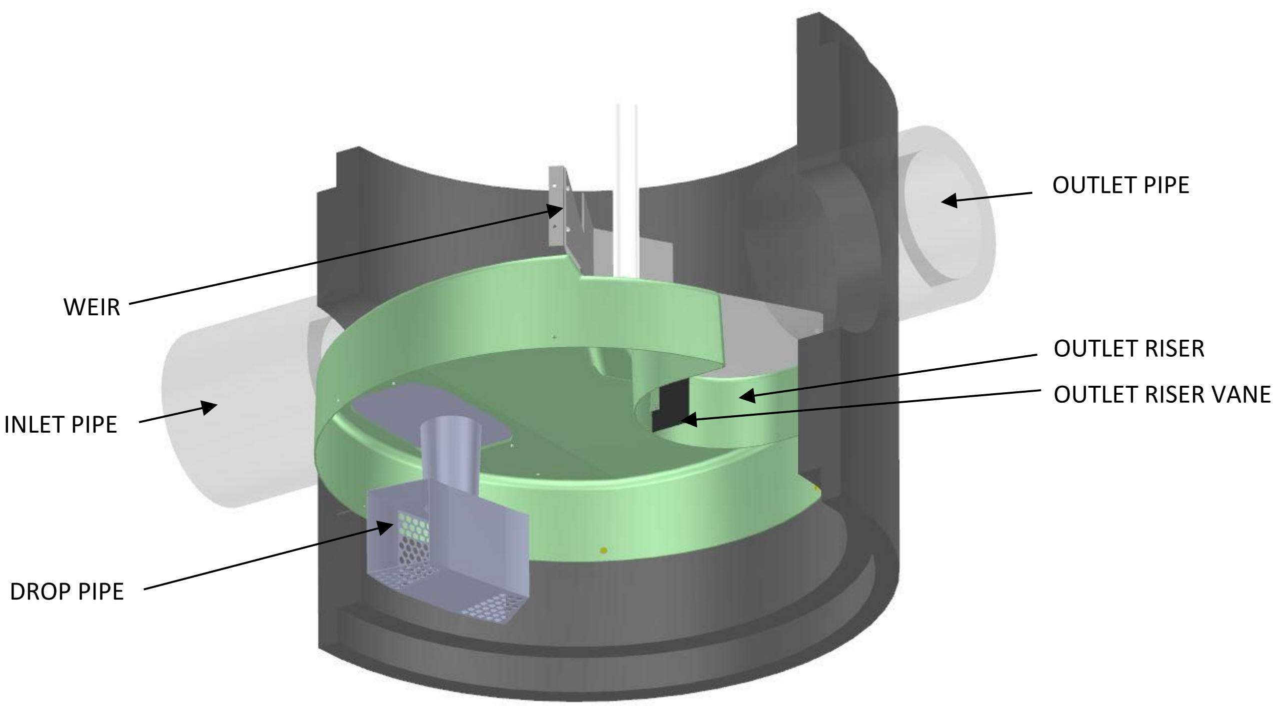


Figure 2

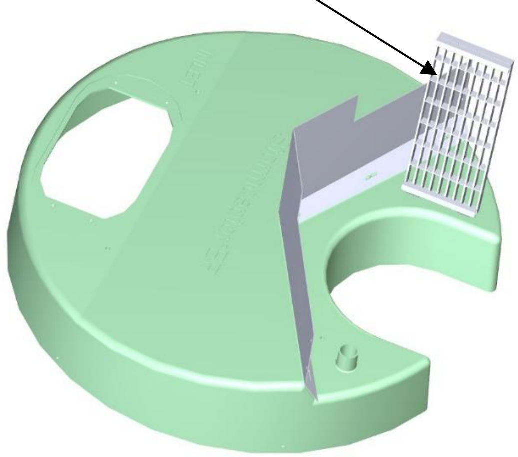


Figure 3A

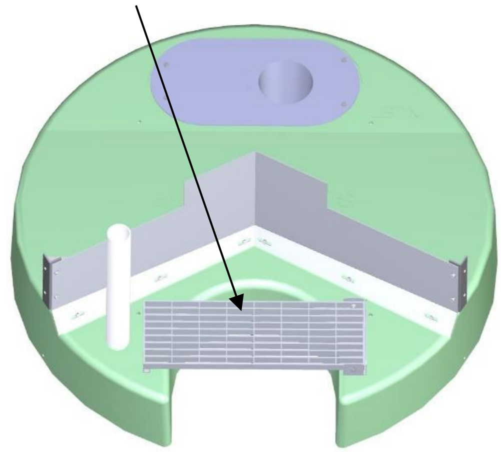


Figure 3B

- **Insert** – separates vessel into upper and lower chambers, and provides double-wall containment of hydrocarbons
- **Weir** – creates stormwater ponding and driving head on top side of insert
- **Drop pipe** – conveys stormwater and pollutants into the lower chamber
- **Outlet riser** – conveys treated stormwater from the lower chamber to the outlet pipe, and provides primary inspection and maintenance access into the lower chamber
- **Outlet riser vane** – prevents formation of a vortex in the outlet riser during high flow rate conditions
- **Outlet platform (optional)** – safety platform in the event of manned entry into the unit
- **Oil inspection pipe** – primary access for measuring oil depth

PRODUCT DETAILS

METRIC DIMENSIONS AND CAPACITIES

Table 1

Stormceptor Model	Inside Diameter (m)	Minimum Surface to Outlet Invert Depth (mm)	Depth Below Outlet Pipe Invert (mm)	Wet Volume (L)	Sediment Capacity [1] (m^3)	Hydrocarbon Storage Capacity [2] (L)	Maximum Flow Rate into Lower Chamber [3] (L/s)	Peak Conveyance Flow Rate [4] (L/s)
EF4 / EFO4	**1.22**	**1219/914**	**1524**	**1780**	**1.19**	**265**	**22.1 / 10.4**	**425**
EF5/EFO5	**1.52**	**1219**	**1626**	**3150**	**1.95**	**420**	**34.6 / 16.2**	**708**
EF6 / EFO6	**1.83**	**1219**	**1930**	**5070**	**3.47**	**610**	**49.6 / 23.4**	**990**
EF8 / EFO8	**2.44**	**1219**	**2591**	**12090**	**8.78**	**1070**	**88.3 / 41.6**	**1700**
EF10 / EFO10	**3.05**	**1219**	**3251**	**23700**	**17.79**	**1670**	**138 / 65**	**2830**
EF12 / EFO12	**3.66**	**1219**	**3886**	**40800**	**31.22**	**2475**	**198.7 / 93.7**	**2830**

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe duct. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 1135 L/min/m^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 535 L/min/m^2.

[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 1.5 m/s.

U.S. DIMENSIONS AND CAPACITIES

Table 2

Stormceptor Model	Inside Diameter (ft)	Minimum Surface to Outlet Invert Depth (in)	Depth Below Outlet Pipe Invert (in)	Wet Volume (gal)	Sediment Capacity [1] (ft^3)	Hydrocarbon Storage Capacity [2] (gal)	Maximum Flow Rate into Lower Chamber [3] (cfs)	Peak Conveyance Flow Rate [4] (cfs)
EF4 / EFO4	**4**	**48 / 36**	**60**	**471**	**42**	**70**	**0.78 / 0.37**	**15**
EF5 / EFO5	**5**	**48**	**64**	**833**	**75**	**111**	**1.22 / 0.57**	**25**
EF6 / EFO6	**6**	**48**	**76**	**1339**	**123**	**160**	**1.75 / 0.83**	**35**
EF8 / EFO8	**8**	**48**	**102**	**3194**	**310**	**280**	**3.12 / 1.47**	**60**
EF10 / EFO10	**10**	**48**	**128**	**6261**	**628**	**440**	**4.87 / 2.30**	**100**
EF12 / EFO12	**12**	**48**	**153**	**10779**	**1103**	**655**	**7.02 / 3.31**	**100**

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe duct. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 27.9 gpm/ft^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 13.1 gpm/ft^2.

[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 5 fps.

IDENTIFICATION

Each Stormceptor EF/EFO unit is easily identifiable by the trade name ***Stormceptor***® embossed on the access cover at grade as shown in **Figure 3**. The tradename ***Stormceptor***® is also embossed on the top of the insert upstream of the weir as shown in **Figure 3**.

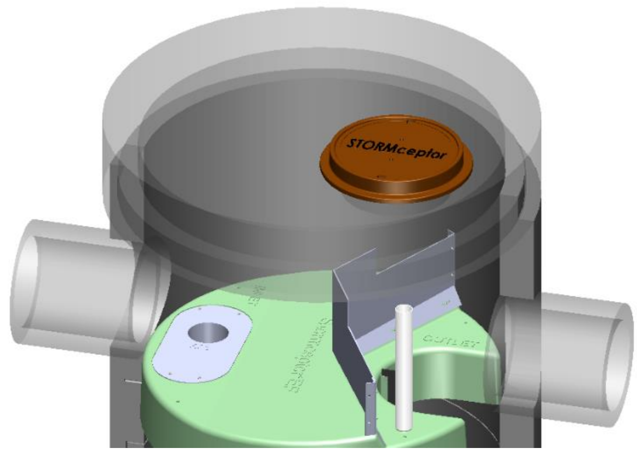


Figure 4

The specific Stormceptor EF/EFO model number is identified on the top of the aluminum Drop Pipe as shown in **Figure 4**. The unit serial number is identified on the top of the insert upstream of the weir as shown in **Figure 4**.

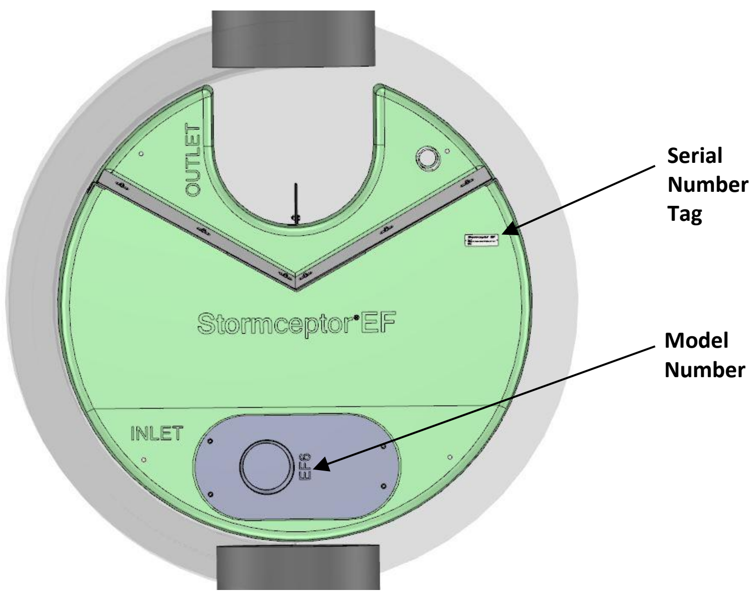


Figure 5

INSPECTION AND MAINTENANCE

It is very important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued of natural waterways.

Quick Reference

- Typical inspection and maintenance is performed from grade
- Remove manhole **cover(s)** or **inlet grate** to access insert and lower chamber
  NOTE: EF4/EFO4 & EF5/EFO5 require the removal of a **flow deflector** beneath inlet grate
- Use Sludge Judge® or similar sediment probe to check sediment depth through the **outlet riser**
- Oil dipstick can be inserted through the **oil inspection pipe**
- Visually inspect the **insert** for debris, remove debris if present
- Visually inspect the **drop pipe** opening for blockage, remove blockage if present
- Visually inspect **insert** and **weir** for damage, schedule repair if needed
- Insert vacuum hose and jetting wand through the outlet riser and extract sediment and floatables
- Replace flow deflector (EF4/EFO4 & EF5/EFO5), inlet grate, and cover(s)
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess pollutant accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

What equipment is typically required for inspection?

- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

When is maintenance cleaning needed?

- If the post-construction inspection indicates presence of construction sediment of a depth greater than a few inches, maintenance is recommended at that time.
- For optimum performance and normal operation the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, see **Table 3**.
- Maintain immediately after an oil, fuel, or other chemical spill.

Table 3

Recommended Sediment Depths for Maintenance Service*	
MODEL	Sediment Depth (in/mm)
EF4 / EFO4	8 / 203
EF5 / EFO5	12 /305
EF6 / EFO6	12 /305
EF8 / EFO8	24 / 610
EF10 / EFO10	24 / 610
EF12 / EFO12	24 / 610

* Based on a minimum distance of 41 inches (1,041 mm) from bottom of outlet riser to top of sediment bed

The frequency of inspection and maintenance may need to be adjusted based on site conditions to ensure the unit is operating and performing as intended. Maintenance costs will vary based on the size of the unit, site conditions, local requirements, disposal costs, and transportation distance.

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required (adhere to all OSHA / CCOSH standards)

What conditions can compromise Stormceptor performance?

- Presence of construction sediment and debris in the unit prior to activation
- Excessive sediment depth beyond the recommended maintenance depth
- Oil spill in excess of the oil storage capacity
- Clogging or restriction of the drop pipe inlet opening with debris
- Downstream blockage that results in a backwater condition

Maintenance Procedures

- Maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is maintained from grade through a standard surface manhole access cover or inlet grate.
- In the case of submerged or tailwater conditions, extra measures are likely required, such as plugging the inlet and outlet pipes prior to conducting maintenance.
- Inspection and maintenance of upstream catch basins and other stormwater conveyance structures is also recommended to extend the time between future maintenance cycles.

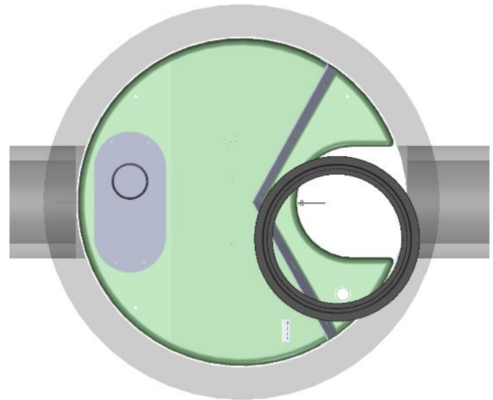


Figure 6

- Sediment depth inspections are performed through the **Outlet Riser** and oil presence can be determined through the **Oil Inspection Pipe**.
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.

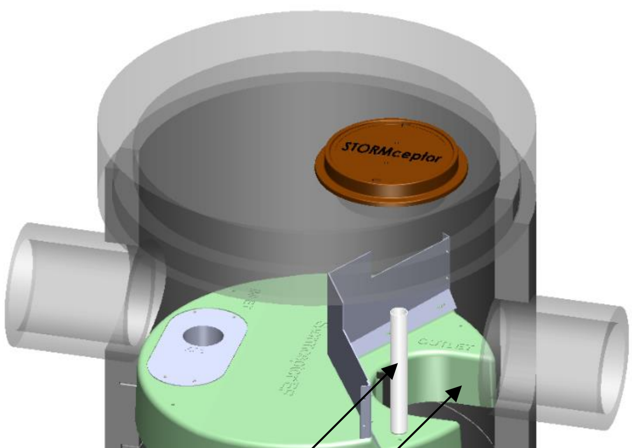


Figure 7

Figure 8

- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

- When maintenance is required, a standard vacuum truck is used to remove the pollutants from the lower chamber of the unit through the **Outlet Riser**.

Figure 9

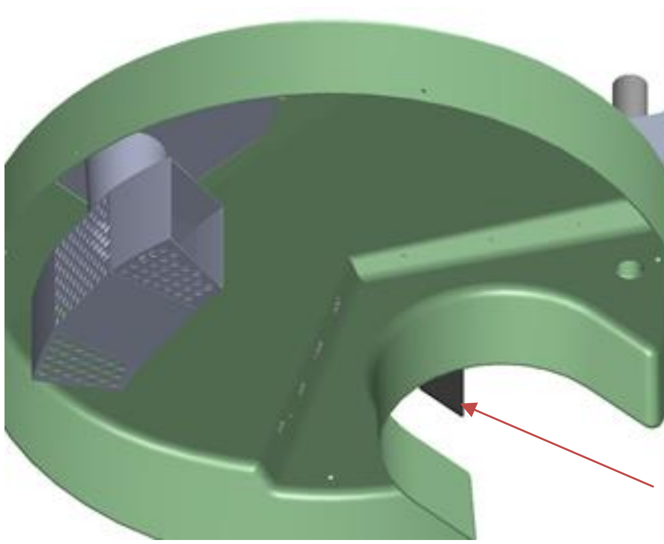


Figure 10

NOTE: The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference.

Removable Flow Deflector

- Top grated inlets for the Stormceptor EF4/EFO4 & EF5/EFO5 models require a removable flow deflector staged underneath a 24-inch x 24-inch (600 mm x 600 mm) square inlet grate to direct flow towards the inlet side of the insert, and avoid flow and pollutants from entering the outlet side of the insert from grade. The EF6/EFO6 and larger models do not require the flow deflector.

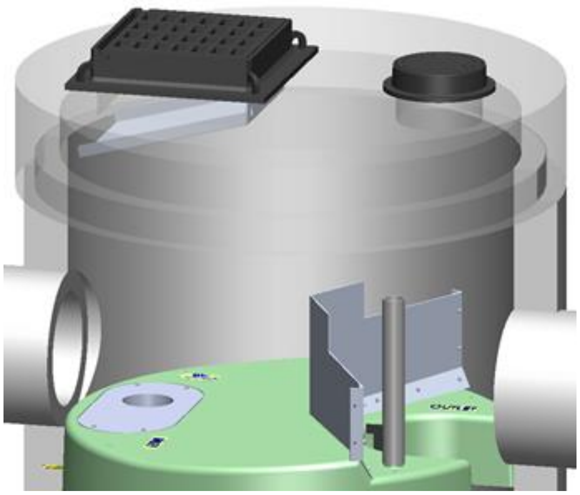
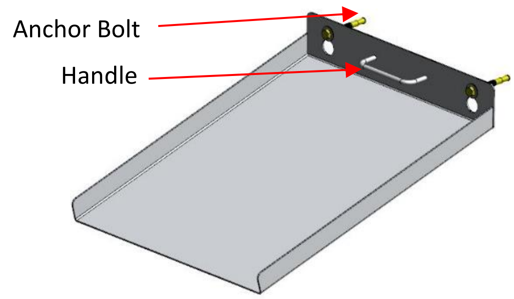


Figure 11

How to Remove:

1. Loosen anchor bolts
2. Pull up and out using the handle



Removable Flow Deflector

Hydrocarbon Spills

Stormceptor is often installed on high pollutant load hotspot sites with vehicular traffic where hydrocarbon spill potential exists. Should a spill occur, or presence of oil be identified within a Stormceptor EF/EFO, it should be cleaned immediately by a licensed liquid waste hauler.

Disposal

Maintenance providers are to follow all federal, state/ provincial, and local requirements for disposal of material.

Oil Sheens

When oil is present in stormwater runoff, a sheen may be noticeable at the Stormceptor outlet. An oil rainbow or sheen can be noticeable at very low oil concentrations (< 10 mg/L). Despite the appearance of a sheen, Stormceptor EF/EFO may still be functioning as intended.

Oil Level Alarm

To mitigate spill liability with 24/7 detection, an electronic monitoring system can be employed to trigger a visual and audible alarm when a pre-set level of oil is captured within the lower chamber or when an oil spill occurs. The oil level alarm is available as an optional feature to include with Stormceptor EF/EFO as shown in **Figure 11**. For additional details about the Oil Level Alarm please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

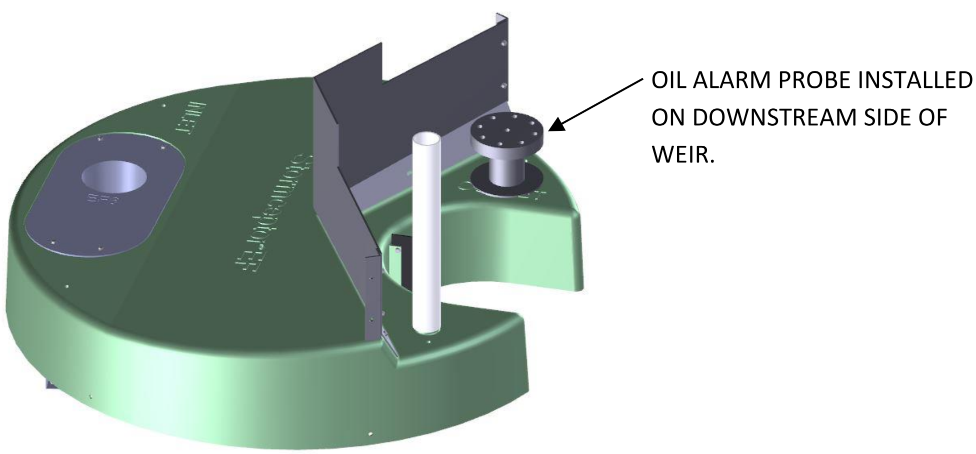


Figure 12

Replacement Parts

Stormceptor has no moving parts to wear out. Therefore inspection and maintenance activities are generally focused on pollutant removal. Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. However, if replacement parts are necessary, they may be purchased by contacting your local Stormceptor representative.

Stormceptor Inspection and Maintenance Log

Stormceptor Model No: ________________________

Serial Number: ________________________

Installation Date: ________________________

Location Description of Unit: ________________________

Recommended Sediment Maintenance Depth: ________________________

DATE	SEDIMENT DEPTH (inch or mm)	OIL DEPTH (inch or mm)	SERVICE REQUIRED (Yes / No)	MAINTENANCE PERFORMED	MAINTENANCE PROVIDER	COMMENTS

Other Comments:

Contact Information

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Imbrium representative or by visiting our website at www.imbriumsystems.com.

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