J+B ENGINEERING INC.
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STORMWATER MANAGEMENT REPORT

FOR PROPERTY OF PETRO-CANADA LOCATED AT

8605 PROMENADE CAMPEAU DRIVE, OTTAWA, ON

Prepared For
SUNCOR ENERGY PRODUCTS PARTNERSHIP

Prepared By
J and B Engineering Inc.
25 Centurion Drive, Suite 201
Markham, Ontario
L3R 5N8

Revised Aug 05, 2022

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1. INTRODUCTION

1.1 Study Area

The subject property is located at the south-east corner of Campeau Drive & Palladium Drive, Ottawa ON. The civic address for this property is 8605 Campeau Drive, Ottawa and is shown in Figure 1-1.

The existing study area is an undeveloped site with an approximate area of 0.907 ha. The area is proposed to be developed as a commercial area with a single storey commercial building, pump islands and associated canopy, underground storage tanks and a car wash. The development will be split into two phases. Phase 1 will encompass majority of the proposed development that includes the building, pump islands, underground storage tanks and parking areas. Phase 2 will be located in the northern portion of the site and includes construction of a car wash, associated drive aisle and parking areas.

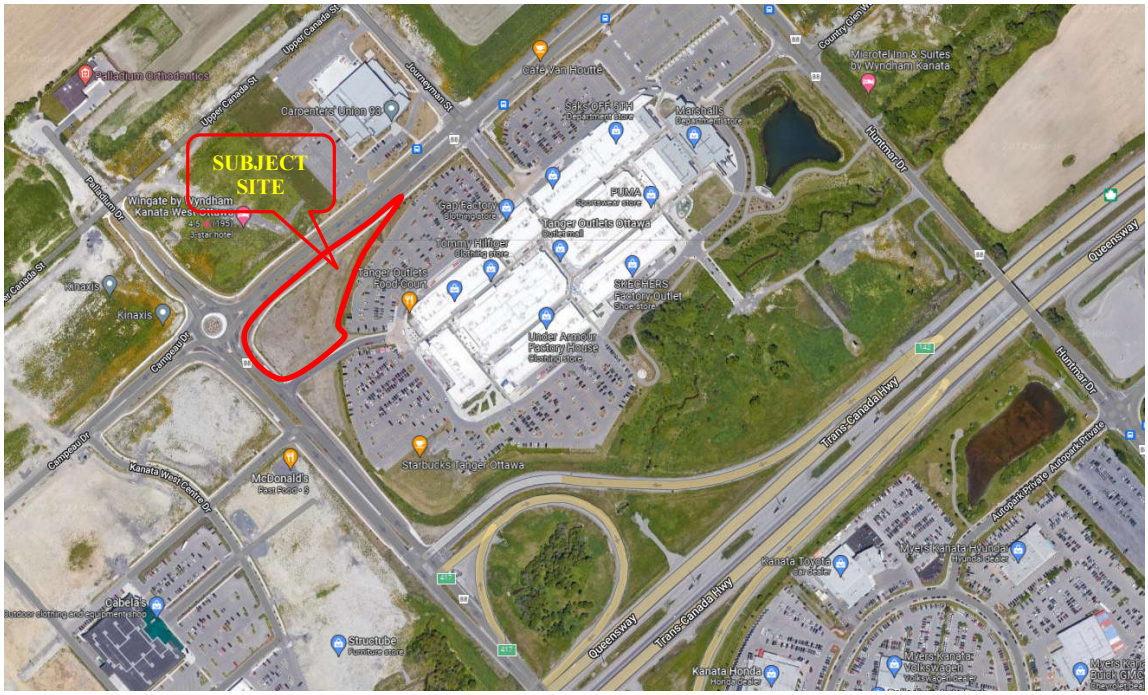


Figure 1-1: Study Area

1.2 Background

This study addresses the Stormwater Management (SWM) requirements for the proposed facility and provides details for stormwater quantity and quality controls to ensure that the proposed development will not have any adverse effects on the existing drainage system.

According to the Design Brief - Kanata West Business Park (KWBP) – Phase 5, 425 Huntmar Drive, prepared by IBI dated September 2019, the subject property is part of the overall development, and this parcel is designed to discharge to Pond 6 East located to the east of the Tanger Mall Outlet. KWBP – Phase 5 Design Brief also establishes the minor system capture rates and on-site storage requirements for KWBP (Refer to section 4.3.2, Section 4.4.1.2 and Table 4.2 and Appendix C of KWBP – Phase 5 Design Brief).

1.3 Objectives of Drainage and Stormwater Management Study

The objectives of the SWM study are to develop a strategy that will:

- Identify potential stormwater runoff (quality and quantity) impacts to the receiving watercourses from the proposed development area.
- Address concerns from the review agencies including the City of Ottawa, Mississippi Valley Conservation Authority (MVCA) and the Ministry of Environment (MOE) for the preparation of a Stormwater Management study for quantity & quality purposes.
- Provide an appropriate site drainage system for safe operational use.

2. SITE DRAINAGE CONDITIONS

General Stormwater Management guidelines and information was obtained from the City of Ottawa Design Criteria and Standard Drawings and the Design Brief - Kanata West Business Park (KWBP) – Phase 5, 425 Huntmar Drive, prepared by IBI.

2.1 Existing Drainage Conditions

The subject property is an undeveloped parcel of green land that is approximately **0.907 ha** with no storm infrastructure in place. Based on existing topography, the site drains in the southeast direction into an existing conveyance swale and eventually flows towards the Tanger Mall Outlet parking lot.

According to the Design Brief - Kanata West Business Park (KWBP) – Phase 5, 425 Huntmar Drive report prepared by IBI, the subject property is part of the overall development and is identified with Area ID 135A (Table 4.2). This parcel is designed such that the runoff is discharged to Pond 6 East (Figure 1 of KWBP – Phase 5 Design Brief) located to the east of the Tanger Mall Outlet and will provide both quantity and quality treatment control Plan.

2.2 Allowable Release Rate

The allowable release rate for the site, as per Table 4.2 of Design Brief - KWBP – Phase 5, September 2019, the subject site (Area #135 A) has a contribution area of 1.12 ha with an established allowable release rate of 257 l/s and storage requirement of 111m^3.

However, the runoff coefficient and the area for the subject site differs from the KWBP Phase 5 Design Brief, detailed calculations have been carried out using the “Modified Rational Method” to

establish the 5yr allowable release rate using a conservative runoff coefficient of **C=0.2** for the site as follows:

$$Q = 0.00278\ C\ I\ A \quad \leftarrow Equation\ (1)$$
$$Where\ Q := Maximum\ Runoff\ Rate\ (m^3/sec)$$
$$C := Runoff\ Coefficient$$
$$I := Rainfall\ Intensity\ (mm/hr)\ \ (5-year\ storm\ event)$$
$$A := Drainage\ Area\ (ha)$$

Q_{target}= 0.00278 * 0.2 * 104.19 * 0.907
Q_{target}= 0.0525 m^3/sec → Target Release Rate

2.3 Proposed Drainage Conditions

The post-development hydrologic conditions for the entire site (Phase 1 and 2) were established utilizing the City of Ottawa's 2-Year to 100-Year IDF curve (Appendix A). A conservative surface run-off coefficient of 0.90 was used for impervious surfaces (i.e. Roof drainage, driveways and parking area) and 0.20 was used for landscaped areas (Refer to Pre/Post Drainage Plan P-303 in Appendix B).

The study area is delineated into two sub-catchments, identified as sub-catchment 1 and 2, for stormwater management purposes and are described below.

Sub-catchment-1 (Controlled)

The controlled sub-catchement-1 consist of the majority of the site area (0.842 ha). The stormwater runoff from sub-catchment-1 will be captured by various drainage structures located around the proposed development. The flow will be treated by an OWS and controlled by an orifice tube installed at the outlet of CB.MH#01 prior to discharging onto 1350mm existing storm network on Campeau Dr. (Refer to Servicing Plan P-301 in Appendix C). This is consistent with the calculations and figure provided in the Appendix C of KWBP – Phase 5 Design Brief. The existing and proposed runoff coefficients for sub-catchment-1 are shown in Table 2-1 below:

Surface Composition		Impervious	Pervious	Combined
Existing Condition	(m^2)	0.00	8415.11	8415.11
	(ha)	0.000	0.842	0.842
Runoff Coefficient		0.90	0.20	0.20

Surface Composition		Impervious	Pervious	Combined
Proposed Condition	(m^2)	5255.14	3159.98	8415.11
	(ha)	0.526	0.316	0.842
Runoff Coefficient		0.90	0.20	0.64

Table 2-1: Existing and proposed runoff coefficients for Sub-catchment-1

For estimating flows using the Rational Method for storms greater than the 10-year return storm, runoff coefficients are increased 10%, 20% and 25% for the 25-year, 50-year and 100-year storms

respectively to account for additional runoff due to soil saturation and the reduced accuracy associated with larger storms. (Refer to Table 2-2 below)

St. Event	Existing	Proposed
2-Year	0.20	0.64
5-Year	0.20	0.64
10-Year	0.20	0.64
25-Year	0.20	0.70
50-Year	0.20	0.76
100-Year	0.20	0.80

Table 2-2: Adjusted runoff coefficients for 2-100-yr events (Sub-catchments-1)

Sub-catchment-2 (Uncontrolled)

The uncontrolled sub-catchment -2 (0.065 ha) represents a small strip of landscape area along the east and north property limits. This area will flow controlled towards the Tanger outlet parking lot and Campeau Dr. ROW respectively following the existing drainage pattern due to grading constraints. The existing and proposed runoff coefficients for the uncontrolled sub-catchment-2 are shown below in Table 2-3.

Surface Composition		Impervious	Pervious	Combined
Existing Condition	(m^2)	0.00	650.53	650.53
	(ha)	0.000	0.065	0.065
Runoff Coefficient		0.90	0.20	0.20

Surface Composition		Impervious	Pervious	Combined
Proposed Condition	(m^2)	0.00	650.53	650.53
	(ha)	0.000	0.065	0.065
Runoff Coefficient		0.90	0.20	0.20

Table 2-3: Existing and proposed runoff coefficients for Sub-catchment-2

3. PROPOSED STORMWATER MANAGEMENT PLAN

The drainage pattern is expected to change due to increase in impervious surfaces for the proposed development. In order to satisfy the City and MVCA requirements, quantity controls have been provided to ensure post development peak run-off is controlled to pre-development levels for the 5 – 100-year storm events.

Onsite storage and flow control is provided using an orifice tube restrictor located at the outlet for controlled sub-catchments 1 prior to entering the Stormceptor to limit the release rates to the target rates.

Considering this is a relatively small area the "Modified Rational Method" was used to generate the surface runoff for each storm event as follows:

Sub-catchment 1 (Controlled)

The results of peak flow rates (m^3) generated by the "Modified Rational Method" for existing and proposed conditions for the sub-catchment-1 is shown in Table 3-1.

Storm Event	Rainfall Intensity (mm/hr)				<Equation 1> Flow Rate (m^3/sec)		
	a	b	c	I	Existing	Proposed	Excess Flow
2-Year	732.951	0.810	6.199	76.81	0.0359	0.1145	0.0785
5-Year	998.071	0.814	6.053	104.19	0.0487	0.1553	0.1066
10-Year	1174.184	0.816	6.014	122.14	0.0571	0.1821	0.1249
25-Year	1402.884	0.819	6.018	144.69	0.0677	0.2372	0.1695
50-Year	1569.580	0.820	6.014	161.47	0.0755	0.2888	0.2133
100-Year	1735.688	0.820	6.014	178.56	0.0835	0.3327	0.2491

Table 3-1: Peak Flows 2 - 100 Year Events (Sub-Catchment-1)

As per Table 3-1, the allowable release rate for sub-catchment-1 is based on the 5-year storm event which has a flow rate of 0.0487 m^3/s. However, this rate will be reduced to a target flow rate of **0.0444m^3/s** to compensate for the uncontrolled flow from sub-catchment 2. The target release rate will be achieved using an orifice tube restrictor at the outlet of CB.MH#01 and an on-site dry pond with a max. ponding elevation set at 102.70.

Sizing of the orifice is given by the formula.

$$Q = C\,A\,\sqrt{2\,g\,h} \quad \leftarrow Equation\ (2)$$

$$Where\ Q := Flow\ Rate\ Through\ Orifice\ (m^3/sec) = Q_{Allowable}$$

$$C := Contraction\ Coefficient = 0.80\ (For\ Orifice\ Pipe)$$

$$A := Area\ of\ Orifice\ Pipe\ (m^2)$$

$$g := Acceleration\ Due\ To\ Gravity\ (m/sec^2) = 9.81\ (m/sec^2)$$

$$h := Pressure\ Head\ To\ Be\ Dissipated\ (m)$$

By trial-and-error calculations, a 100mm orifice pipe is required to control the flow to the Target release rate.

$$Q = \frac{(0.80)\pi\left(\frac{0.100}{2}\right)^2}{\sqrt{2 * 9.81 * \left(102.70 - 100.10 - \left(\frac{0.100}{2}\right)\right)}}$$

$$Q = 0.0444\ m^3/\sec \leq 0.0444\ \ m^3/\ sec\ (target\ release\ rate)$$

Based on the calculated orifice release rate of Q= 0.0444m^3/s, the required storage for the 100-year storm event is calculated using the "Modified Rational Method" and is shown below in Table 3-2.

Stm Event	Td	Id	Qpost	Qorifce	Excess Flow	Volume(cum)
	5	243	0.4522	0.0444	0.408	122.326
	7	212	0.3944	0.0444	0.350	146.970
	10	179	0.3327	0.0444	0.288	172.945
	15	143	0.2662	0.0444	0.222	199.613
	20	120	0.2235	0.0444	0.179	214.853
100 Year	25	104	0.1935	0.0444	0.149	223.562
	30	92	0.1712	0.0444	0.127	228.101
	35	83	0.1539	0.0444	0.109	229.771
	40	75	0.1400	0.0444	0.096	229.357
	45	69	0.1287	0.0444	0.084	227.366
	50	64	0.1192	0.0444	0.075	224.143
	55	60	0.1111	0.0444	0.067	219.932
	60	56	0.1041	0.0444	0.060	214.913
	65	53	0.0981	0.0444	0.054	209.221
	70	50	0.0928	0.0444	0.048	202.959
				Max Volume Required	cum	**229.77**

Table 3-2: Required Storage Volume for 100yr storm event (Sub-catchment 1)

Therefore, the 100mm orifice tube at the outlet of CB.MH#01 will generate an on-site required storage of 229.77 m^3. The storage is met by a combination of underground piping, storm drainage structures (CB's and MH's) and a proposed dry pond at the northeast corner of the subject property. The generated storage is illustrated in Table 3-3 below.

Structure	Diameter (mm)	Area (m^2)	Maximum. Water	Invert	Volume (m^3)
CB#1	600x600	0.36	102.70	100.41	0.82
CB#2	600x600	0.36	102.65	100.40	0.81
CB#3	600x600	0.36	102.70	101.36	0.48
CB#4	600x600	0.36	102.70	101.37	0.48
CB/MH#1	1200.00	1.13	102.15	100.10	2.32
CB/MH#2	1200.00	1.13	102.70	100.25	2.77
CB/MH#3	1200.00	1.13	102.70	100.66	2.31
CB/MH#4	1200.00	1.13	102.70	101.06	1.85
CB/MH#5	1200.00	1.13	102.70	101.32	1.56
STM/MH#2	1200.00	1.13	103.55	101.13	2.74
				Sum	**16.14**

U/G Conduit	Diameter (m)	Area (m^2)	Length (m)	Volume (m^3)
1	250	0.05	150.5	7.39
1	375	0.11	53	5.85
			Sum	**13.24**

Storage Volume For 100-Year Event (m^3)	
Catch Basins & Manholes	16.14
Underground Conduits	13.24
Dry Pond	254.45
Total Provided	**283.84**

Table 3-3: Summary of Actual Storage Provided for Sub-catchment 1

The total storage provided on site for stormwater runoff is 283.84 m^3 which is more than the required volume of 229.77 m^3 calculated in Table 3-2 above.

Sub-catchment 2 (Uncontrolled)

The results of peak flow rates (m^3) generated by the "Modified Rational Method" for existing and proposed conditions for the South sub-catchment is shown Table 3-4.

Storm Event	Rainfall Intensity (mm/hr)				<Equation 1> Flow Rate (m^3/sec)		
	a	b	c	I	Existing	Proposed	Excess Flow
2-Year	732.951	0.810	6.199	76.81	0.0028	0.0028	0.0000
5-Year	998.071	0.814	6.053	104.19	0.0038	0.0038	0.0000
10-Year	1174.184	0.816	6.014	122.14	0.0044	0.0044	0.0000
25-Year	1402.884	0.819	6.018	144.69	0.0052	0.0058	0.0005
50-Year	1569.580	0.820	6.014	161.47	0.0058	0.0070	0.0012
100-Year	1735.688	0.820	6.014	178.56	0.0065	0.0081	0.0016

Table 3-4: Peak flows 2 – 100 Year Events (Sub-Catchment-2)

As per the table above, the release rate for Sub-catchment 2 is based on the 100-year storm event, which has a flow rate of Q=0.0052 m^3/s.

3.1 SWM Summary

The overall release rate for the site is the sum of the controlled flow rate from the Sub-catchment 1+ the uncontrolled flow from the Sub-catchment 2. See below for overall release rate.

Overall release rate for the site = Sub-catchment 1 + Sub-catchment 2

Q = 0.0444 + 0.0081

Q= 0.0514 m^3/s

Therefore, the overall release rate is 0.0525m^3/s which is equal to allowable release rate of 0.0525m^3/s as per calculations shown in section 2.2.

The controlled flow from the site will discharge onto the city 1300mm storm sewer via existing MH 108 along Campeau Dr. and is consistent with the calculations and figures of KWBP – Phase 5 Design Brief.

3.2 Infiltration

Section 4.3.5 of the Design Brief - KWBP – Phase 5, September 2019 indicates that each block will be required to provide infiltration galleries fed by rooftop drains. As such, a 6.5m x 3.0m x 1.5m infiltration gallery is proposed to direct the rooftop drainage towards the infiltration gallery to promote ground water recharge.

Based on the Geotech report prepared by Terrapex dated January 24, 2020, the groundwater depth at the vicinity of the proposed infiltration gallery is approx. 3.5m. Therefore, the proposed infiltration gallery will not interfere with the groundwater table. Table below shows the infiltration volume of the infiltration gallery.

Description	Dimension	Porosity	Volume (m^3)
Infiltration Galler	6.5mx3.0mx1.5m	0.4	11.7

Table 3-5: Infiltration Gallery Volume

3.3 Quality Control

A treatment train approach has been adopted for this site by incorporating the following treatment methods:

- Installation of the Stormceptor EFO6 at the outlet of the storm system prior to discharge into the existing City storm network on Campeau Dr. The EFO6 has ETV verification and has a TSS removal rate of 89% based on the sizing report in the Appendix D. When the uncontrolled areas are factored in the calculations (i.e 0.025 ha at 0% TSS removal), an overall TSS removal of 84.6% is anticipated.
- Upstream of EFO6 is a proposed grass swale, infiltration gallery and a dry pond which provides additional on-site quality control.

4. EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

The erosion potential of the study area was assessed using methods described in the "*MTO Drainage Management Manual*" of temporary erosion and sediment control measures suitable for construction sites close to highways.

During Site construction, various temporary measures will be implemented to prevent the discharge of sediment laden Stormwater from the Site. These measures include silt fencing, catchbasin silt-sacks and mud-mats, etc. as shown on DWG P-302 - Erosion Control Plan.

In addition to the above, the following "good housekeeping" measures are recommended:

- All exposed soil shall be stabilized as soon as possible with a seed and mulch application as directed by the Engineer.
- No construction activity or machinery shall intrude beyond the silt/snow fence or limit of construction area. All construction vehicles shall leave the site at designated locations as shown on the plans.
- Stockpiles of soil shall be set back from any watercourse and stabilized against erosion as soon as possible. A set back of at least 15m from any top-of-bank, watercourse or pond is required.
- Cleaning and repairs of mud-mats and any other temporary sediment control measures shall be completed as deemed necessary through regular inspection.
- Sediment/slit shall be removed from the sediment control devices after storm events and deposited in areas as approved by the engineer.
- All re-graded areas within the development which are not occupied by buildings, roadways, sidewalks, or driveways shall be top-soiled and sodded/seeded immediately after completion of final grading operations as directed by the engineer.

5. SUMMARY AND CONCLUSION

In summary, required conditions of the City of Ottawa have been satisfied as follows:

- The Stormwater flow from the Site is controlled to pre-development conditions.
- The proposed SWM facilities provide ENHANCED level of protection as specified by the Ministry of the Environment, Conservation and Parks (MECP)
- The proposed SWM techniques meet both quantity and quality requirements.
- The Sediment and Erosion Control Plan demonstrates how erosion and sedimentation will be minimized during construction

This SWM Report satisfies all requirements for stormwater quantity, sedimentation, and erosion control.

Binay Rajbhandari, P.Eng
Tel (416) 229-2636
b.rajbhandari@jandb-inc.com

Appendix

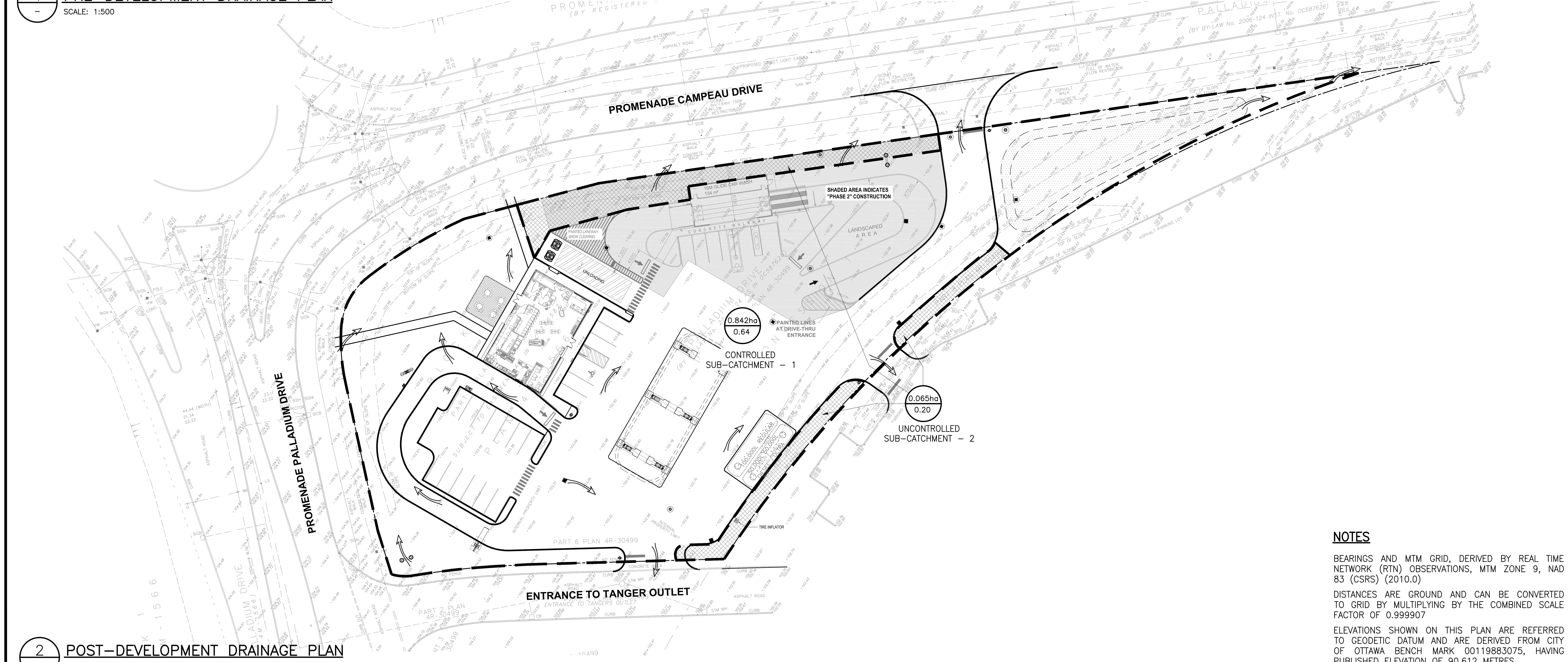
APPENDIX A: IDF CURVE

Ottawa IDF curve

Storm	IDF Curve Equation
2-Year	$I = 732.951 / (Tc + 6.199)^{0.810}$
5-Year	$I = 998.071 / (Tc + 6.053)^{0.814}$
10-Year	$I = 1174.184 / (Tc + 6.014)^{0.816}$
25-Year	$I = 1402.884 / (Tc + 6.018)^{0.819}$
50-Year	$I = 1569.580 / (Tc + 6.014)^{0.820}$
100-Year	$I = 1735.688 / (Tc + 6.014)^{0.820}$

APPENDIX B: PRE-POST DRAINAGE PLAN

1 PRE-DEVELOPMENT DRAINAGE PLAN
SCALE: 1:500



2 POST-DEVELOPMENT DRAINAGE PLAN
SCALE: 1:500

NOTES

BEARINGS AND MTM GRID, DERIVED BY REAL TIME NETWORK (RTN) OBSERVATIONS, MTM ZONE 9, NAD 83 (CSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999907

ELEVATIONS SHOWN ON THIS PLAN ARE REFERRED TO GEODETIC DATUM AND ARE DERIVED FROM CITY OF OTTAWA BENCH MARK 00119883075, HAVING PUBLISHED ELEVATION OF 90.612 METRES

PLAN OF SURVEY
PART 1 - PLAN OF SURVEY OF
PART OF BLOCK 6
PLAN 4M-1566
AND
PART OF LOT 3
CONCESSION 1
GEOGRAPHIC TOWNSHIP OF HUNTLEY
CITY OF OTTAWA

KEY PLAN
NTS

GENERAL NOTES

1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. DO NOT SCALE DRAWINGS.
3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGN ENGINEER AS APPLICABLE.
4. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
5. DESIGN AND CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE PROVINCIAL AND LOCAL BUILDING CODES LATEST EDITION.
6. ALL WORKS AND MATERIALS USED SHALL COMPLY AS REQUIRED BY THE BUILDING CODE LATEST EDITION.
7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS & SPECIFICATIONS.
8. EVERYTHING IS TO BE CONSIDERED NEW UNLESS SPECIFIED EXISTING OTHERWISE.

LEGEND

EXISTING ELEVATION
EXISTING CATCHBASIN
EXISTING MANHOLE
NEW CATCHBASIN
NEW C.B./M.H.
NEW MANHOLE
PROPERTY LINE
R.L. RIDGE LINE
0.110ha 0.25 DRAINAGE AREA (ha) RUNOFF COEFFICIENT
OVERLAND FLOW
CATCHMENT BOUNDARY
UNCONTROLLED AREA
SURFACE PONDING AREA
PHASE 2

REVISION TABLE

REV.	DESCRIPTION	DRAWN	APP'D.
		DATE	

ISSUE TABLE

TO	FOR	DATE
SUNCOR	FOR REVIEW	08 JUL 22
CITY	ISSUED FOR SPA	28 JUL 22

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.. CONTRACTOR TO CHECK/VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK. ALL DISCREPANCIES TO BE REPORTED TO THE PROJECT DESIGNER. DO NOT SCALE DRAWINGS.

SEAL:
LICENSED PROFESSIONAL ENGINEER
B. RAJBHANDARI SHRESTHA
100528915
Jul. 29 2022
PROVINCE OF ONTARIO

CONSULTANT:
J+B
J + B ENGINEERING INC.

PETRO-CANADA
A Suncor Energy Business

DRAWING TITLE:
PRE-POST DRAINAGE PLAN

PROJECT:
PROMENADE PALLADIUM DRIVE
@ PROMENADE CAMPEAU DRIVE
OTTAWA, ON

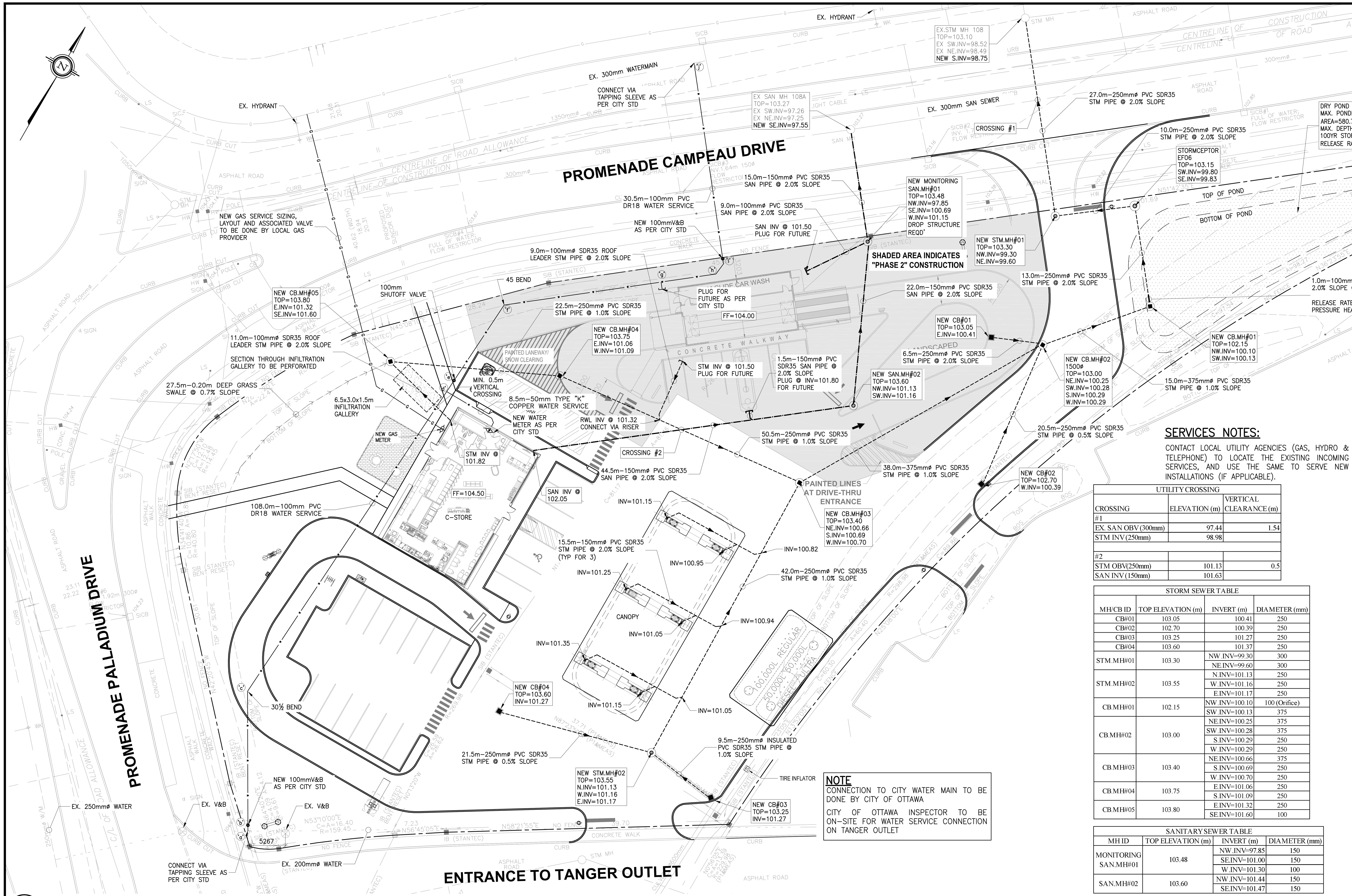
DRAWN BY:	BR	CAD INFO.: SHEET SIZE D (559 x 864)
DRAWING SCALE:	1:300	PETRO-CANADA CAD FILE No.
DATE DRAWN:	2022-07-01	CONSULTANT CAD FILE No. 200258-P303
CHECKED BY:	JS	PLOT SCALE 1:1
APPROVED BY:	JK	PLOT DATE
		PLOT CONFIGURATION

STD No./OUTLET No.
10565
P303

D07-12-21-0155

#18629

APPENDIX C: SITE SERVICING PLAN



NOTE

CONNECTION TO CITY WATER MAIN TO BE DONE BY CITY OF OTTAWA

CITY OF OTTAWA INSPECTOR TO BE ON-SITE FOR WATER SERVICE CONNECTION ON TANGER OUTLET

1 P-301 **SERVICING PLAN**
SCALE: 1:300

SERVICES NOTES:

CONTACT LOCAL UTILITY AGENCIES (GAS, HYDRO & TELEPHONE) TO LOCATE THE EXISTING INCOMING SERVICES, AND USE THE SAME TO SERVE NEW INSTALLATIONS (IF APPLICABLE).

UTILITY CROSSING		
CROSSING	ELEVATION (m)	VERTICAL CLEARANCE (m)
#1		
EX. SAN OBV (300mm)	97.44	1.54
STM INV (250mm)	98.98	
#2		
STM OBV(250mm)	101.13	0.5
SAN INV (150mm)	101.63	

STORM SEWER TABLE			
MH/CB ID	TOP ELEVATION (m)	INVERT (m)	DIAMETER (mm)
CB#01	103.05	100.41	250
CB#02	102.70	100.39	250
CB#03	103.25	101.27	250
CB#04	103.60	101.37	250
STM.MH#01	103.30	NW.INV=99.30	300
		NE.INV=99.60	300
STM.MH#02	103.55	N.INV=101.13	250
		W.INV=101.16	250
		E.INV=101.17	250
CB.MH#01	102.15	NW.INV=100.10	100 (Orifice)
		SW.INV=100.13	375
CB.MH#02	103.00	NE.INV=100.25	375
		SW.INV=100.28	375
		S.INV=100.29	250
		W.INV=100.29	250
CB.MH#03	103.40	NE.INV=100.66	375
		S.INV=100.69	250
		W.INV=100.70	250
CB.MH#04	103.75	E.INV=101.06	250
		S.INV=101.09	250
CB.MH#05	103.80	E.INV=101.32	250
		SE.INV=101.60	100

SANITARY SEWER TABLE			
MH ID	TOP ELEVATION (m)	INVERT (m)	DIAMETER (mm)
MONITORING SAN.MH#01	103.48	NW.INV=97.85	150
		SE.INV=101.00	150
		W.INV=101.30	100
SAN.MH#02	103.60	NW.INV=101.44	150
		SE.INV=101.47	150

WATER SERVICE TABLE		
ID	DESCRIPTION	TOP OF PIPE (m)
'a'	CONNECTION TO EX 200mm WATERMAIN	102.30 (To be site verified)
'b'	100mm VALVE AND BOX	102.30
'c'	30 1/2 BEND	101.80
'd'	100x50mm TEE CONNECTION	101.70
'e'	100mm SHUTOFF VALVE	101.65
'f'	45 BEND	101.00
'g'	PLUG FOR FUTURE	101.10
'h'	45 BEND	101.10
'i'	100mm VALVE AND BOX	101.10
'j'	CONNECTION TO EX 200mm WATERMAIN	101.10 (To be site verified)

NOTES

BEARINGS AND MTM GRID, DERIVED BY REAL TIME NETWORK (RTN) OBSERVATIONS, MTM ZONE 9, NAD 83 (CSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999907

ELEVATIONS SHOWN ON THIS PLAN ARE REFERRED TO GEODETIC DATUM AND ARE DERIVED FROM CITY OF OTTAWA BENCH MARK 00119883075, HAVING PUBLISHED ELEVATION OF 90.612 METRES

SPECIFICATIONS FOR C.B'S AND M.H.'S

STORM:

1. DROP STRUCTURE IF REQUIRED AS CITY SPECIFICATION AND PER OPSD 1003.010.
2. 600x600 PRECAST CB AS PER OPSD 705.010 c/w FRAME AND GRATE AS PER S19. GOSS TRAP AND SUBDRAINS AS PER CITY STANDARD.
3. 1200⌀ PRECAST MH AS PER OPSD 701.010 c/w FRAME AS PER S25 AND COVER AS PER S24.1 AND S28.1.
4. BENCHING AS PER OPSD 701.021.
5. BEDDING AS PER CITY STD S6.
6. ADJUSTMENT UNITS AND CAPS AS PER OPSD 704.01.
7. SEWER COVER-GRANULAR 'A' CONFORMING TO OPSD 802.03.
8. PIPE-PVC SDR35 UNLESS NOTED OTHERWISE.
9. CB CONNECTIONS AS PER OPSD 708.03
10. ALL CB TO HAVE 3.0m -150mm⌀ PERFORATED SUBDRAIN IN ALL 4 DIRECTIONS AS PER TOWN STANDARDS.
11. ALL EX. STORM AND SANITARY ABANDONED SHOWN ON THE PLAN OR ENCOUNTERED DURING CONSTRUCTION ARE TO BE EXCAVATED AT THE STREET LINE AND SEALED TO CITY STD.
12. WHEN THE DEPTH OF THE COVER OVER THE PROP. SANITARY OR STORM SEWERS IS LESS THAN 2.0m, SEWER LINES ARE TO BE INSULATED AS PER CITY STD. THE INSULATION TO BE STYROFOAM BRAND H.I. TYPE IV OR EQUAL.

WATERMAINS:

1. ALL NEW WATERMAIN CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY STANDARDS.
2. WATERMAIN AND/OR WATER SERVICES TO HAVE A MINIMUM OF 1.0m HORIZONTAL SEPARATION FROM OTHER UTILITIES AS PER CITY STANDARDS.
3. WHERE WATERMAIN AND/OR WATER SERVICES CROSSES UNDER SANITARY OR STORM SEWER A MINIMUM CLEARANCE OF 0.5m SHALL BE PROVIDED.
4. BEDDING MATERIAL TO BE INSTALLED AS PER CITY STANDARDS.
5. WATER SERVICE TO HAVE MIN. 2.4m COVER. WHERE THE MINIMUM COVER IS NOT POSSIBLE INSULATE AS PER CITY OF OTTAWA STANDARD W22 AND W23
6. ALL TEES, PLUGS AND BENDS TO HAVE CONCRETE THRUST BLOCKS AS PER CITY STD
7. CONTRACTOR TO PROVIDE PRESSURE TEST RESULTS OF NEW WATERMAIN AND FIRE MAIN.
8. WATERMAIN TO BE INSTALLED WITH TRACER WIRE.

SANITARY

1. 1200⌀ PRECAST M.H'S AS PER OPSD 701.01 c/w FRAME AS PER S25 AND COVER AS PER S24.
2. DROP STRUCTURE IF REQUIRED AS CITY SPECIFICATION AND PER OPSD 1003.010.
3. BEDDING AS AS PER CITY STD S6.
4. BENCHING AS PER OPSD 701.021.
5. SANITARY PIPES TO BE PVC SDR35.
6. ALL SANITARY SEWERS TO BE TESTED IN ACCORDANCE WITH THE REQUIREMENT OF OBC 7.3.6

NOTE

EXISTING INFORMATION REGARDING UTILITIES ALONG PALLADIUM DR. AND CAMPEAU DR. TO BE SITE VERIFIED

INFORMATION REGARDING EXISTING STORM, SANITARY AND WATER EXTRACTED FROM PROJECT 14289 DWG #103, DATED 2020-05-27 AND DWG #107, DATED 2018-09-14 BY IBI GROUP

PLAN OF SURVEY
PART 1 - PLAN OF SURVEY OF
PART OF BLOCK 6
PLAN 4M-1566
AND
PART OF LOT 3
CONCESSION 1
GEOGRAPHIC TOWNSHIP OF HUNTLEY
CITY OF OTTAWA

KEY PLAN
NTS

GENERAL NOTES

1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. DO NOT SCALE DRAWINGS.
3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGN ENGINEER AS APPLICABLE.
4. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
5. DESIGN AND CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE PROVINCIAL AND LOCAL BUILDING CODES LATEST EDITION.
6. ALL WORKS AND MATERIALS USED SHALL COMPLY AS REQUIRED BY THE BUILDING CODE LATEST EDITION.
7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS & SPECIFICATIONS.
8. EVERYTHING IS TO BE CONSIDERED NEW UNLESS SPECIFIED EXISTING OTHERWISE.

LEGEND

- EXISTING ELEVATION
- EXISTING CATCHBASIN
- EXISTING C.B./M.H.
- EXISTING MANHOLE
- NEW CATCHBASIN
- NEW C.B./M.H.
- NEW MANHOLE
- EXISTING STORM LINE
- EXISTING SANITARY LINE
- PROPERTY LINE
- SETBACK LINE
- NEW SANITARY LINE
- NEW STORM LINE
- NEW WATER LINE
- PHASE 2
- PIPE INSULATION

REVISION TABLE			
REV.	DESCRIPTION	DRAWN / DATE	APP'D.
0	REVISED AS PER CLIENT COMMENTS	RP / 11 FEB 21	JS
1	REVISED AS PER SITE PLAN AND CITY COMMENTS	BR / 15 JUL 22	JS
2	WATER SERVICE REVISED	BR / 05 AUG 22	JS

ISSUE TABLE		
TO	FOR	DATE
SUNCOR	75% REVIEW	11 NOV 20
SUNCOR	PRICING	04 DEC 20
CITY	ISSUED FOR SPA	18 DEC 20
SUNCOR	FOR REVIEW	08 JUL 22
CITY	RE-ISSUED FOR SPA	05 AUG 22

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.. CONTRACTOR TO CHECK/VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK. ALL DESCREPANCIES TO BE REPORTED TO THE PROJECT DESIGNER. DO NOT SCALE DRAWINGS.

SEAL:

CONSULTANT:
J + B ENGINEERING INC.

PETRO-CANADA
A Suncor Energy Business

DRAWING TITLE:
SERVICING PLAN

PROJECT:
PROMENADE PALLADIUM DRIVE
@ PROMENADE CAMPEAU DRIVE
OTTAWA, ON

DRAWN BY:	RP	CAD INFO.: SHEET SIZE	D (559 x 864)
DRAWING SCALE:	1:300	PETRO-CANADA CAD FILE No.	
DATE DRAWN:	2020-10-14	CONSULTANT CAD FILE No.	200258-P301
CHECKED BY:	BR	PLOT SCALE	1:1
APPROVED BY:	JS	PLOT DATE	
		PLOT CONFIGURATION	

STD No./OUTLET No. 10565
P301

D07-12-21-0155

#18629

APPENDIX D: STORMCEPTOR SIZING REPORT

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

07/07/2022

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	Promenade Campeau Dr.

Drainage Area (ha):	0.91
% Imperviousness:	70.00

Runoff Coefficient 'c': 0.72

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Project Name:	Kanata
Project Number:	200258
Designer Name:	Binay Rajbhandari
Designer Company:	J+B Engineering
Designer Email:	b.rajbhandari@jandb-inc.com
Designer Phone:	416-229-2636
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	21.15
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	46.20
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	79
EFO6	89
EFO8	94
EFO10	97
EFO12	99

Recommended Stormceptor EFO Model: EFO6

Estimated Net Annual Sediment (TSS) Load Reduction (%): 89

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 waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

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

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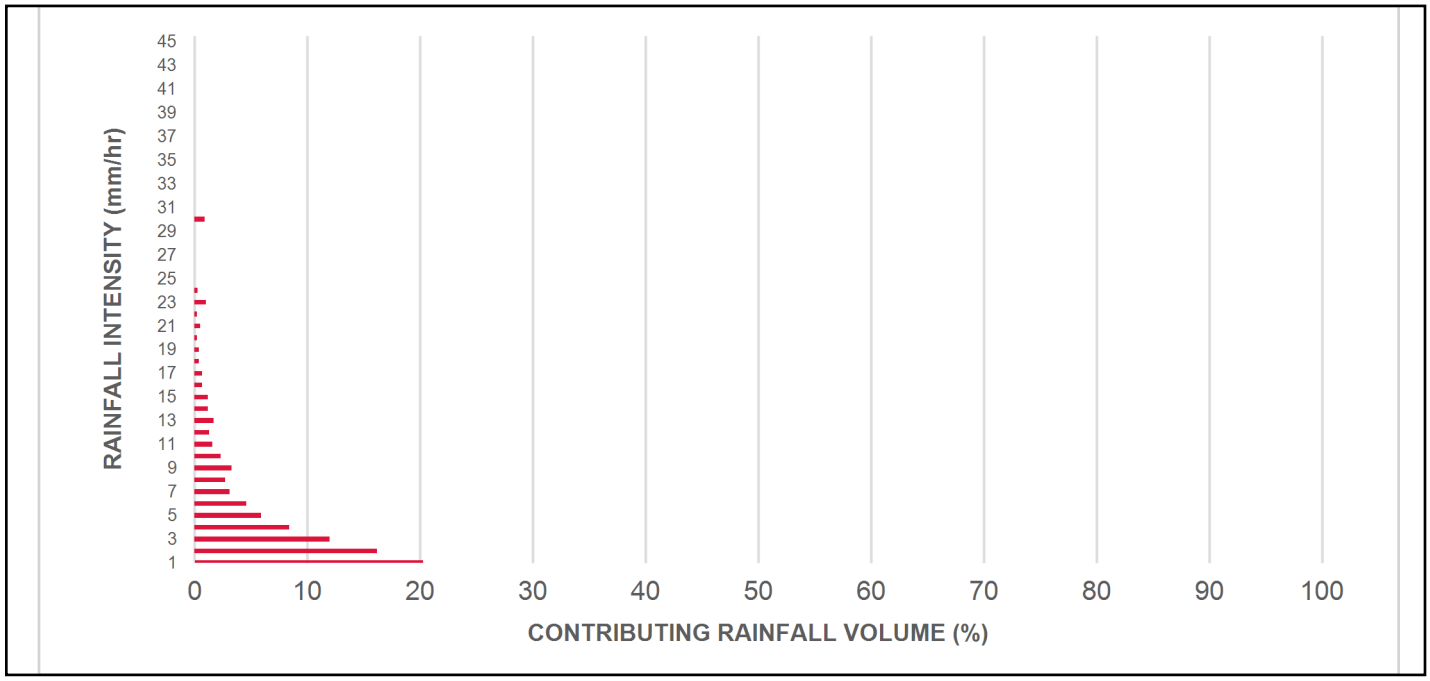
Upstream Flow Controlled Results

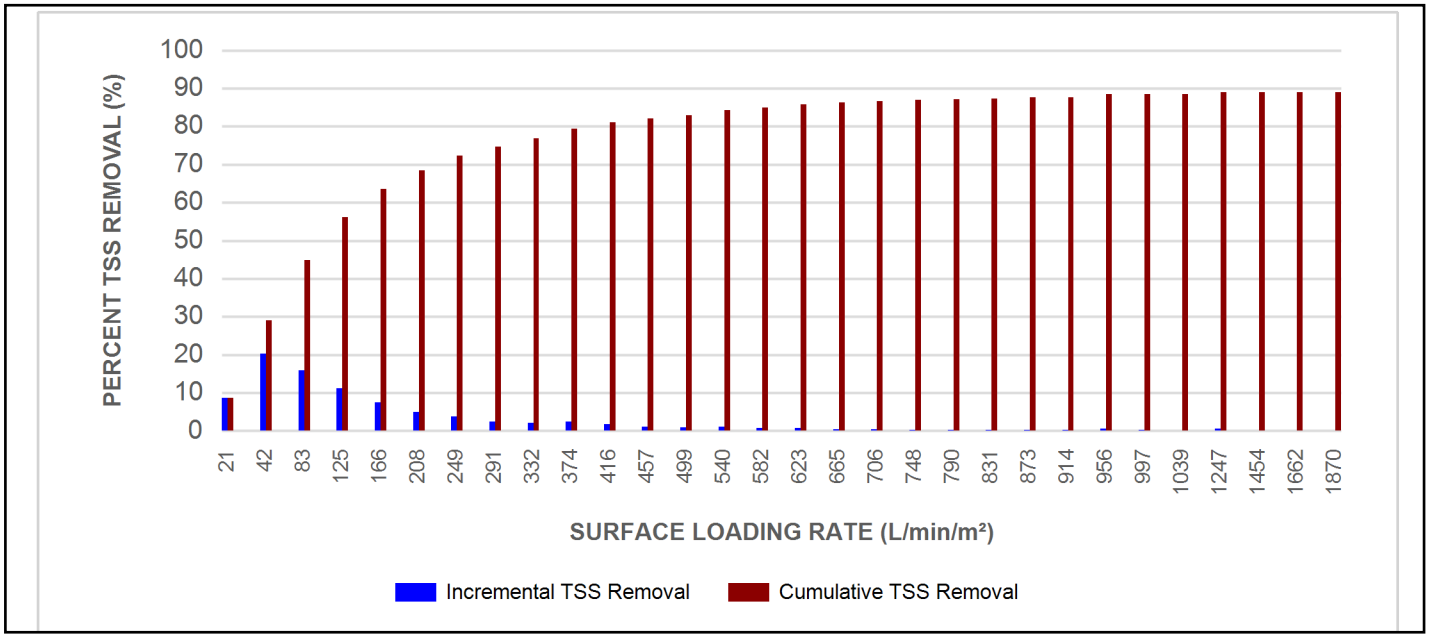
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.5	8.6	8.6	0.91	55.0	21.0	100	8.6	8.6
1	20.3	29.0	1.82	109.0	42.0	100	20.3	29.0
2	16.2	45.2	3.64	219.0	83.0	98	16.0	44.9
3	12.0	57.2	5.46	328.0	125.0	93	11.2	56.1
4	8.4	65.6	7.29	437.0	166.0	88	7.4	63.6
5	5.9	71.6	9.11	546.0	208.0	83	4.9	68.5
6	4.6	76.2	10.93	656.0	249.0	81	3.7	72.3
7	3.1	79.3	12.75	765.0	291.0	79	2.4	74.7
8	2.7	82.0	14.57	874.0	332.0	77	2.1	76.8
9	3.3	85.3	16.39	984.0	374.0	75	2.5	79.3
10	2.3	87.6	18.21	1093.0	416.0	73	1.7	81.0
11	1.6	89.2	20.04	1202.0	457.0	72	1.1	82.1
12	1.3	90.5	21.86	1311.0	499.0	70	0.9	83.0
13	1.7	92.2	23.68	1421.0	540.0	67	1.2	84.2
14	1.2	93.5	25.50	1530.0	582.0	66	0.8	85.0
15	1.2	94.6	27.32	1639.0	623.0	64	0.7	85.7
16	0.7	95.3	29.14	1749.0	665.0	64	0.4	86.2
17	0.7	96.1	30.96	1858.0	706.0	64	0.5	86.6
18	0.4	96.5	32.79	1967.0	748.0	64	0.3	86.9
19	0.4	96.9	34.61	2076.0	790.0	63	0.3	87.2
20	0.2	97.1	36.43	2186.0	831.0	63	0.1	87.3
21	0.5	97.5	38.25	2295.0	873.0	63	0.3	87.6
22	0.2	97.8	40.07	2404.0	914.0	62	0.2	87.7
23	1.0	98.8	41.89	2514.0	956.0	62	0.6	88.4
24	0.3	99.1	43.71	2623.0	997.0	62	0.2	88.5
25	0.9	100.0	45.54	2732.0	1039.0	61	0.6	89.1
30	0.0	100.0	46.00	2760.0	1049.0	60	0.0	89.1
35	0.0	100.0	46.00	2760.0	1049.0	60	0.0	89.1
40	0.0	100.0	46.00	2760.0	1049.0	60	0.0	89.1
45	0.0	100.0	46.00	2760.0	1049.0	60	0.0	89.1
Estimated Net Annual Sediment (TSS) Load Reduction =								**89 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



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Maximum Pipe Diameter / Peak Conveyance

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

SCOUR PREVENTION AND ONLINE CONFIGURATION

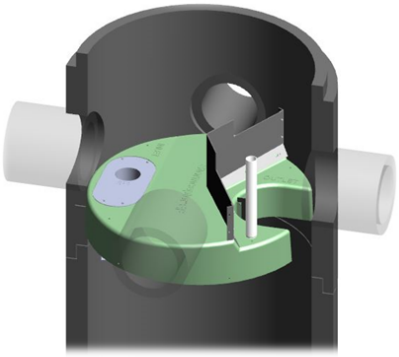
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

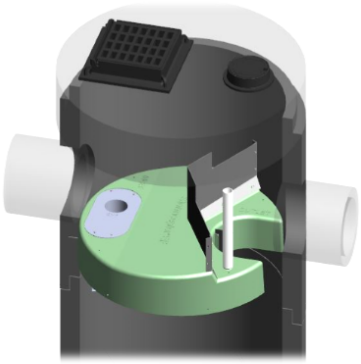
DESIGN FLEXIBILITY

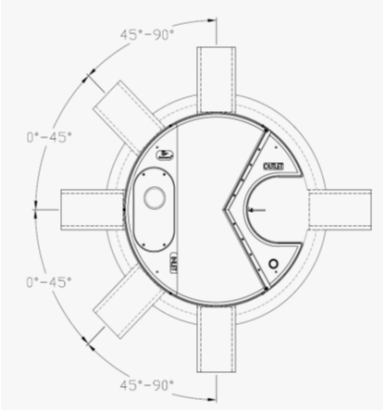
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

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







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.

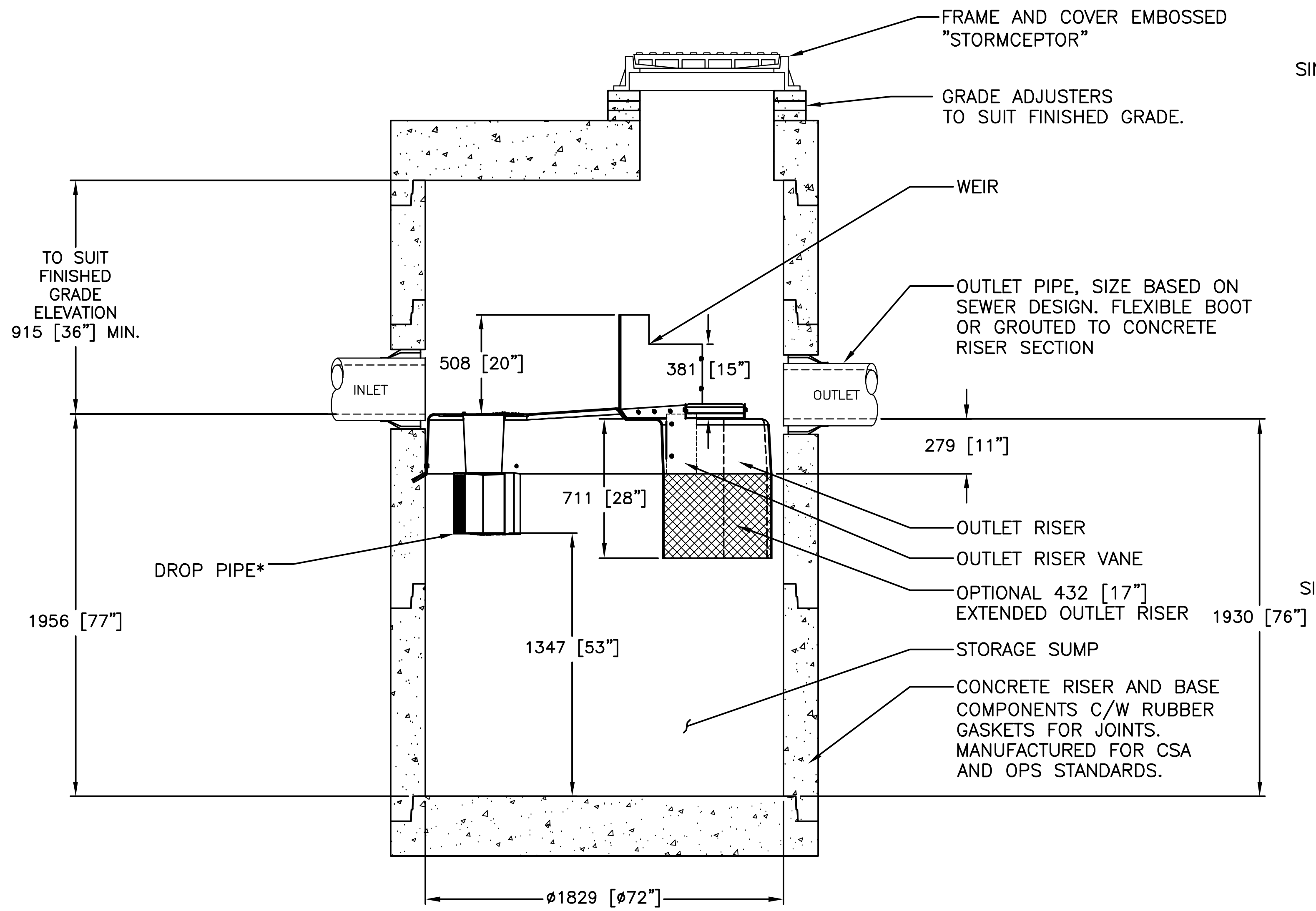
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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

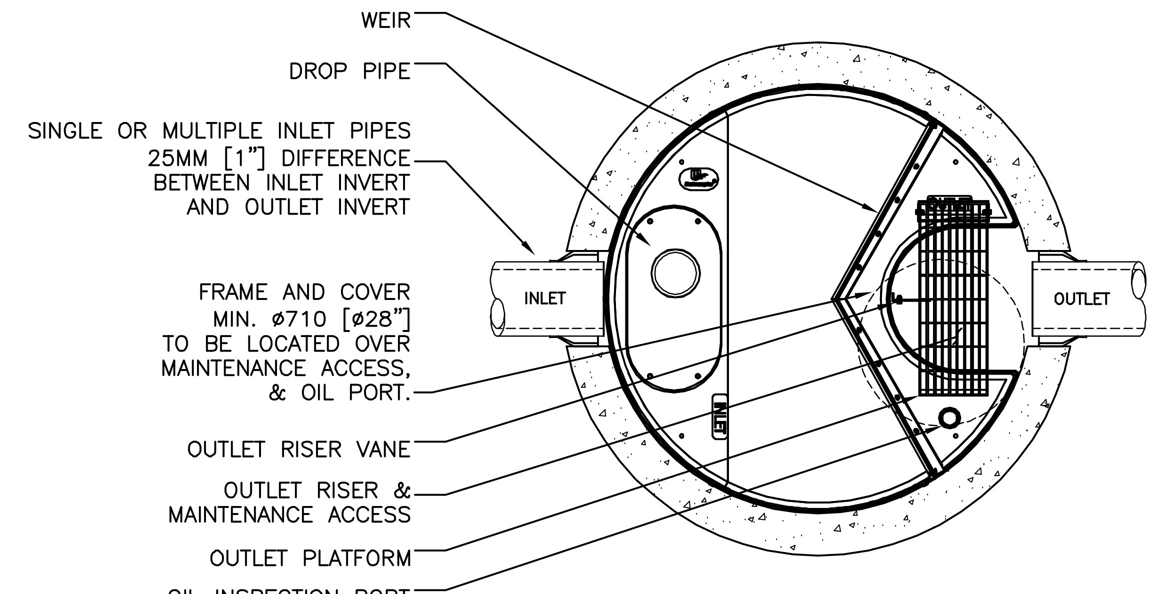
assess whether light liquids captured after a spill are effectively retained at high flow rates.

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

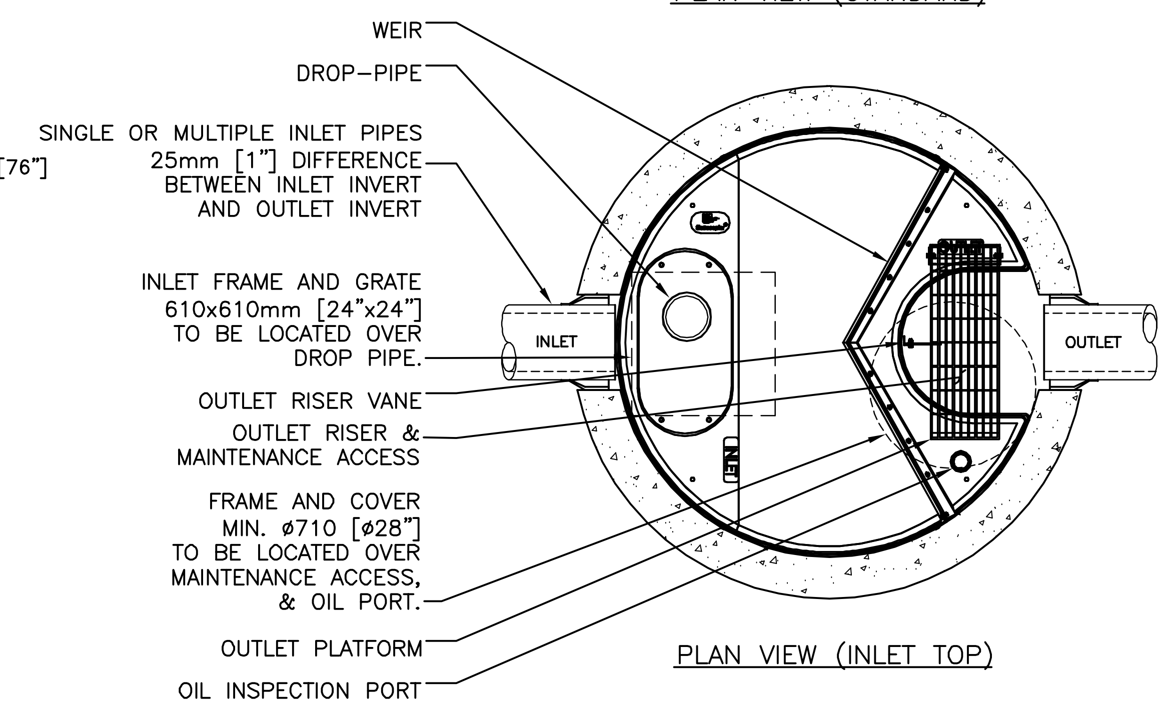
DRAWING NOT TO BE USED FOR CONSTRUCTION



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

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 EF6 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

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.

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).

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	EFO6				
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
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	05/26/17	INITIAL RELEASE	JSK
1	6/8/18	OUTLET PLATFORM	JSK
####	####	####	####
####	####	####	####
####	####	####	####

Stormceptor® EF

SCALE = NTS

imbrium®
407 FAIRVIEW DRIVE, WHITBY, ON L1N 3A9
TF 800-565-4801 CA 416-960-9900 INTL +1-416-960-9900

DATE: 10/13/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EFO6	SEQUENCE No.: *
SHEET: 1 OF 1	

I:\IMBRIUM\PRODUCTS\STORMCEPTOR\STORMCEPTOR EF\40 DRAWINGS & DETAILS\STANDARD DETAILS\EFO STANDARD DETAILS\EFO6-DETAIL.DWG 4/12/2019 11:05 AM