Site Servicing and Stormwater Management Report

Project Address – 3817 – 3843 Innes Road, Ottawa

Owner/Client:	**Bridor Development**
Address:	**996-B St-Augustin Rd, Embrun ON**
City file Number:	

By Blanchard Letendre Engineering Ltd.
Date – May 3, 2022
Our File Reference: 20-184

Submission
April 5, 2021

Previous Submission
December 17, 2020

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APPENDIX TABLE

1.0 INTRODUCTION

Blanchard Letendre Engineering Ltd. (BLEL) was retained by Bridor Development. to complete their site servicing and stormwater management for the new proposed site located at 3817 – 3843 Innes Road in Ottawa. This report summarized proposed site servicing and stormwater management and should be read in conjunction with the engineering drawings prepare by BLEL. This report and site servicing plan have been prepared based on the site plan proposed by P-Square Concepts and the site survey completed by Annis O'Sullivan Vollebekk. The information contained herein is based on the provided drawings and if there is any discrepancy with the survey or site plan, BLEL should be informed in order to verify the information and complete the changes if required.

2.0 SITE PLAN

The proposed site is to be located in Orleans, Ontario. As per the aerial picture in figure 1, the existing site consist of and green space area with four (4) existing building that will be demolished prior to construction. The property located at 3817- 3843 Innes Road, consist of approximately 0.661ha of undeveloped land. The land will be developed with two (2) new residential apartments building and be severed into two separate properties with one (1) shared entrance.

Figure 1- Existing site at 3817 – 3843 Innes Road, Orleans, Ontario

3.0 STORM WATER MANAGEMENT

3.1 Existing Site Condition

The existing site currently has no stormwater management nor storm service connection. The site currently drains uncontrolled towards Innes road where the stormwater generated from the site is captured by the road site catchbasin. The existing property naturally grades towards Innes road away from the residential development on the north and west portion of the property. There is an existing gras station at the east side of the property that is developed at a lower elevation than the existing property. Refer to BL Engineering drawing C400 for the pre-development drainage area and existing grading showing the current drainage of the site.

3.2 Proposed Storm Water Management

The development of the site will consist of adding two (2) new residential apartment buildings. The site will be modified by adding a total of 2436 square meter of building (Block A = 1218m^2; Block B = 1218m^2) asphalt parking and driving and amities areas. As the runoff coefficient will increase due to addition of hard surfaces, post-development stormwater quantity and quality will be implemented.

The site stormwater management has been prepared in correlation with the existing site grading. To minimize the fill and site work required, the stormwater management has been developed to follow the existing site grading. As the property naturally drains towards Innes Road, the proposed stormwater management will outlet to City storm sewer on Innes Road. The overland flow route has also been designed to convey the storm runoff towards Innes road.

The stormwater generated by the new hard surfaces will be directed to a series of catchbasins which will capture and covey the water runoff to existing the surrounding ditches. The catchment areas have been delineated as per the proposed grading plan. Refer to Appendix ‘A’, for the catchment area and runoff coefficient. In order to respect the 5 year pre-development allowable release rate, the outlets will be controlled by inlet control device which will limit the flow outletting to City storm sewer on Innes road. By throttling the flow, stormwater retention will be completed with the use of overland ponding and underground storage which was designed to hold the 100 year storm event. Refer to Appendix ‘A’ for the stormwater flow and storage calculations.

3.3 Proposed Storm Water Management

The pre-development flow of the 5-year storm was calculated using a 5-year storm and a 10-minute time of concentration for the affected area. The pre-development flow of the 100-year storm was calculated using a 100-year storm and a 10-minute time of concentration for the affected area. From intensity duration curves established for the Ottawa area, the intensity was evaluated at of 104.2 mm/hr for the 5yr predevelopment flow and 178.6mm/hr for the 100-year predevelopment flow. A run-off coefficient of 0.45 was used as per the evaluated, see Appendix 'A' – Pre-Development Drainage Area table.

Using the Rational Method and considering the tributary areas of the proposed (see Appendix 'A'), the pre-development allowable release rate for the site was evaluated at **86.16 L/s**. See also the Storm Sewer Design Sheet in Appendix 'A'.

Allowable Release Rate (Q) =	**2.78CIA (L/s)**
I_5 =	**$998.071 / (Tc + 6.053)^{0.814}$**
C =	0.45
I =	104.2 mm/hr
Tc =	10 min
Total =	0.661 ha
Allowable Release Rate=	**86.16 L/s**

3.4 Proposed Stormwater Quantity Control

The proposed stormwater management for the site will be achieve primarily through the use of underground pipe storage and overland surface ponding. The grading of the site has been designed to direct the stormwater towards the series of catchbasins connected to the underground stormwater chambers before outleting south into the 1350mm diameter storm city sewer. The proposed underground stormwater chambers and cathcbasins are shown on the attached drawings in Appendix 'E'.

The proposed site has been graded to outlet overland onto Innes Road on the south side of the property. As the site naturally grades from the north side to the south side, the grades have been adjusted to suit this profile, to minimize the grade raise of the site. All catchment areas were designed to directed the stormwater overland to the south-east corner and to will be conveyed captured through a series of parking catchbasins and landscaping drains with subdrains.

The stormwater generated from site will be discharged to the existing storm sewer on Innes road and be controlled using an undersized pipe which will throttle the flow direct to the municipal sewer. The proposed inlet control device will release a total of **20.05 L/s** with a maximum head of 2.93m (HWL = 92.10) during the 100 year event. As the flow will be restricted, 223.81m^3 of stormwater storage will be required for this area. This storage will be provided with underground stormwater chambers and surface ponding. The underground storage has been designed to hold and convey the stormwater water to the sewer on Innes road. The underground chambers will prove 160.0 m^3 whereas the remaining will be stored on the parking and driving areas. An additional 65.82m^3 of storage was designed overland which combined with the underground chambers (163.3 m^3 + 68.82m^3 = 229.12 m^3) can hold more than the minimum required storage. Refer to the underground chambers in Appendix 'D'.

The two (2) underground parking ramp will be drained with separate catchbasin that will capture and to the underground garage drainage. These areas have been designated uncontrolled.

3.4.1 Roof Drainage

The proposed roofs are flat roof with roof drains. Drain and scuppers will be installed to drain the water onto the pavement area.

3.4.2 Underground Chambers

The underground storage chambers have been designed to hold and convey the stormwater generated from the site. The underground chambers have been designed to hold most of the stormwater under the proposed parking/ driving area. The chambers, which have been designed as isolator rows, were designed to also provide some filtration which is favorable for the final site TSS. A total of 163.30 m^3 will be provided by the underground chambers. The chambers will be connected to the proposed manhole catchbasin which will facilitates the maintenance of the chambers. The maintenance of the chambers is to be in accordance with the manufacture. Refer to Appendix “D” for Stormwater Storage Chambers.

3.5 Proposed Stormwater Quality Control

A water quality control requirement of 80% TSS removal was set by the City of Ottawa. In order to meet the requirements, a storm treatment unit will be installed and the downstream end of the system. Using the Stormceptor sizing software, the EF06 was selected. The software generated report has been attached (See Appendix "D").

4.0 SANITARY SEWER DESIGN

4.1 Existing Site Conditions

The existing site is currently being service by a three separate service which services the existing three parcels and are connected to the existing 250mm diameter sanitary on Innes Road. The existing connection will be removed and reinstated with three new connection that will service the new buildings.

4.2 Existing Site Conditions

The new residential apartment building, which proposes 55 units for Block A and 55 units for Block B will discharge to the city via one new 200mm diameter sanitary services. The service will be located on the south face of the buildings Block A and will discharge to the existing 250mm diameter city sewer running along Innes road. The proposed 200mm diameter service will be installed at a minimum of 1.00% slope directly to the city sewer. A monitoring manhole (SAN-MH-A) is proposed for the new connection to city. Refer to drawing C300 – Site Servicing Plan for the existing and proposed sanitary service.

Based on the City of Ottawa Sanitary Design Guidelines, the sanitary peak loads were evaluated as follow; Block A: **1.57 L/s** and Block B: **1.57L/s.** As per the City specific design parameters, the sanitary flow was evaluated based on the new building footprint and the total site area for each individual building. Refer to Appendix 'B' for the sanitary sewer design calculation and design parameters set by the City of Ottawa.

5.0 WATER CONNECTION DESIGN

5.1 Existing Site Conditions

The existing site is currently being service by a three separate 19mm diameter water service which services the existing three parcels and are connected to the existing 403mm diameter watermain on Innes Road. The existing connection will be removed and reinstated with a new connection that will service the new buildings. There is currently two (2) city fire hydrant at the front of the property. The two (2) hydrants are located on the south side of Innes Road both within the 90m radius from the building main entrance. Refer to drawing C300 – Site Servicing Plan for the existing and proposed water services and city existing infrastructure.

5.2 Proposed Domestic Water Service

The two new residential apartment buildings water services were sized based on the City of Ottawa Design Guidelines and the AWWA Standards. Based on the number of fixtures proposed and on the average water demand for residential developments the daily water consumption was evaluated for the proposed building. As per the city guidelines, the average water demand per person of is **350L/c/d** was applied to the population of the new building. The daily and hourly peak factor of **2.5** and **2.2** respectively were applied to the water demand as stated in the City of Ottawa guideline. By using the average demand and peaking factors, the daily water demand for the new buildings were evaluated as follow:

	BLOCK A	BLOCK B	UNITS
Average Water Demand =	**31850.00**	**31850.00**	L/d
Maximum Daily =	**79625.00**	**79625.00**	L/d
Maximum Hourly =	**175175.00**	**175175.00**	L/d
Total Domestic Flow =	**2.03**	**2.03**	**L/s**
Total Fire Flow =	**203.33**	**203.33**	**L/s**

Refer to Appendix 'C' for the water flow calculation sheet.

5.3 Proposed Fire Demand

The new property will be serviced by a new fire hydrant located in front of Block B. Since the fire hydrants are located on the south side of Innes Road, the 45 meters of unobstructed path of travel is not possible hence the new fire hydrant will be installed. The fire hydrant will be installed in the city right of way and have a separate connection to the city 405mm diameter watermain.

The new residentials buildings Block A and Block B will not have a sprinkler system as it is not required in the building code. Hence the new services were sized to supply only the domestic water. Therefore the buildings Block A and Block B will be serviced with two (2) new 75mm water service which will connect to the existing 405mm diameter watermain on Innes Road. The new service will be installed at the south elevation of the new buildings and be placed in the same trench as the other services.

5.4 Water Capacity Comments

The boundary conditions and HGL for hydraulic analysis for 3817 Innes was obtained from the city. See attached copy in Appendix ‘E’. From the boundary conditions, the minimum HGL was evaluated at 130.3 m for the water main elevation at 91.6m and a maximum pressure estimate of 55.1 psi.

6.0 EROSION AND SEDIMENT CONTROL

During the construction, sediment and erosion protect will be implemented around the property to prevent any sediments from leaching off site. The construction and maintenance of the sediment controls must comply with the Ontario Provision Standard Specification OPSS 577. Refer to drawing C100 – Erosion and Sediment Control for the perimeter fence proposed.

7.0 CONCLUSION AND LIMITATION OF REPORT

7.1 Stormwater Management

The stormwater management proposed for the site will maintain the site to its pre-development release rate conditions and meet the requirements from the City of Ottawa. The post development release rate will be maintained to its pre-development rate of **86.16 L/s** thought an **orifice plate of 103mm**, the outlet to the sewer main on Innes Road. Stormwater quantity control will be achieved with 160.00m^3 underground chamber and 65.82 m^3 overland. The stormwater quality control will be met through the use of a stormwater treatment unit and isolator rows in the underground chambers.

7.2 Sanitary Service

The current site will be services with three new 200mm sanitary connection onto Innes Road. The estimated sanitary flow of; Block A: **1.57 L/s** and Block B: **1.57L/s,** for the new connections will be directed to the existing sanitary sewer along Innes Road.

7.3 Water Service

Currently the existing buildings on site are serviced with an existing 19mm diameter water service that will be replaced with a new 10mm diameter water service to be connected to the existing 406mm diameter main on Innes Road. The existing connections will all be replaced with new water services. The water demand for the building was evaluated at: Block A: **2.03 L/s** and Block B: **2.03L/s** and the fire flow demand at Block A: **203.33 L/s** and Block B: **203.33 L/s.** There will also be a new fire hydrant installed on the property at the front of Block B in the city right of way.

8.0 LIMITATION

This report was prepared for **Bridor Developement.**, and is only applicable for the property at 3817 – 3843 Innes Road, Ottawa.

Any changes to the existing site may require a review by Blanchard Letendre engineering Ltd. to ensure all information is consistent with the proposed design.

Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely Yours,

Guillaume Brunet, P. Eng.

APPENDIX "A"
Stormwater Management Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-184	**Date:**	May 3, 2022
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	3817-3843 - Innes Road	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION			AREA (ha)			FLOW					STORM SEWER DATA							
WATERSHED / STREET	From MH	To MH	C = 0.30	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (l/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-06	LCB10	LCB09	0.045	0.000	0.014	0.06	0.06	10.00	104.19	6.13	200	PVC	0.25%	25.0	16.40	0.52	0.80	**0.37**
	LCB09	LCB08	0.000	0.000	0.000	0.00	0.06	10.80	100.16	5.89	200	PVC	0.25%	26.2	16.40	0.52	0.84	**0.36**
	LCB08	LCB07	0.000	0.000	0.000	0.00	0.06	11.63	96.28	5.66	200	PVC	0.25%	25.5	16.40	0.52	0.81	**0.35**
	LCB07	LCB06	0.000	0.000	0.000	0.00	0.06	12.45	92.82	5.46	200	PVC	0.25%	17.0	16.40	0.52	0.54	**0.33**
	LCB06	CBMH03	0.000	0.000	0.000	0.00	0.06	12.99	90.66	5.33	250	PVC	0.25%	13.1	29.73	0.61	0.36	**0.18**
WS-07	LCB15	LCB14	0.045	0.000	0.014	0.06	0.06	10.00	104.19	6.13	200	PVC	0.25%	19.2	16.40	0.52	0.61	**0.37**
	LCB14	LCB13	0.000	0.000	0.000	0.00	0.06	10.61	101.06	5.94	200	PVC	0.25%	16.5	16.40	0.52	0.53	**0.36**
	LCB13	LCB12	0.000	0.000	0.000	0.00	0.06	11.14	98.53	5.79	200	PVC	0.25%	11.5	16.40	0.52	0.37	**0.35**
	LCB12	LCB11	0.000	0.000	0.000	0.00	0.06	11.51	96.85	5.69	200	PVC	0.25%	40.0	16.4	0.52	1.28	**0.35**
	LCB11	CBMH03	0.000	0.000	0.000	0.00	0.06	12.78	91.47	5.38	250	PVC	0.25%	16.0	29.7	0.61	0.44	**0.18**
WS-01	CBMH05	CBMH04	0.086	0.000	0.168	0.47	0.47	10.00	104.19	48.86	375	PVC	0.40%	15.7	110.9	1.00	0.26	**0.44**
WS-02+ WS-03	CBMH04	CBMH03A	0.000	0.000	0.243	0.61	1.08	10.26	102.84	110.85	375	PVC	0.40%	19.2	110.9	1.00	0.32	**1.00**
	CBMH03A	CBMH03	0.000	0.000	0.145	0.36	1.44	10.58	101.23	145.82	375	PVC	0.40%	2.6	110.9	1.00	0.04	**1.31**
	CBMH03	TREATMENT	0.000	0.000	0.000	0.00	1.20	13.35	89.29	106.74	300	PVC	0.40%	28.5	61.16	0.87	0.55	**1.75**
	TREATMENT	CBMH01	0.000	0.000	0.000	0.00	1.20	13.90	87.28	104.35	300	PVC	0.40%	4.5	61.16	0.87	0.09	**1.71**
	CBMH01	CITY	0.000	0.000	0.000	0.00	1.20	13.99	86.98	103.98	300	PVC	1.00%	13.2	96.7	1.37	0.16	**1.08**

DESIGN PARAMETERS NOTES

Runoff Coefficient (C)

Grass	0.30
Gravel	0.80
Asphalt / rooftop	0.90

Q = 2.78 AIC, where
Q = Peak flow in Litres per second (L/s)
A = Area in hectares (ha)
I = Rainfall Intensity (mm/hr)
C = Runoff Coefficient

Ottawa Macdonald-Cartier International Airport IDF curve
$I_5 = 998.071 / (T_c + 6.053)^{0.814}$
Min. velocity = 0.76 m/s
Manning's "n" = 0.013

BLANCHARD LETENDRE
ENGINEERING

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STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION		MANHOLE INFORMATION						
From MH	To MH	Up Invert (m)	Down Invert (m)	T/G Up Stream (m)	T/G Down Stream	Up Depth obv (m)	Down Depth obv (m)	Up Depth inv (m)
LCB10	LCB09	90.38	90.32	91.80	91.70	1.22	1.18	1.22
LCB09	LCB08	90.26	90.19	91.70	91.30	1.24	0.91	1.24
LCB08	LCB07	90.13	90.07	91.30	91.75	0.97	1.48	0.97
LCB07	LCB06	90.01	89.97	91.75	91.95	1.54	1.73	1.54
LCB06	CBMH03	89.77	89.73	91.95	91.80	1.93	1.87	1.98
LCB15	LCB14	90.62	90.57	92.20	92.10	1.38	1.33	1.38
LCB14	LCB13	90.51	90.47	92.10	92.10	1.39	1.43	1.39
LCB13	LCB12	90.41	90.38	92.10	92.00	1.49	1.42	1.49
LCB12	LCB11	90.32	90.22	92.00	92.20	1.48	1.73	1.48
LCB11	CBMH03	89.72	89.68	92.20	91.80	2.23	1.74	2.28
CBMH05	CBMH04	89.61	89.55	91.80	91.80	1.81	1.87	1.81
CBMH04	CBMH03A	89.49	89.41	91.80	91.80	1.93	2.09	1.93
CBMH03A	CBMH03	89.35	89.34	91.80	91.80	2.07	2.16	2.07
CBMH03	TREATMENT	89.28	89.17	91.80	92.25	2.22	2.78	2.14
TREATMENT	CBMH01	89.11	89.09	92.25	92.30	2.84	2.91	2.84
CBMH01	CITY	89.03	88.90	92.30	91.77	2.97	2.57	2.97

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PRE-DEVELOPMENT DRAINAGE AREA (AFFECTED AREA)

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.3	C = 0.80	C = 0.90		
E-01	0.501	0.000	0.160	0.661	0.45
TOTAL	0.501	0.000	0.160	0.661	0.45

POST-DEVELOPMENT DRAINAGE AREA

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.30	C = 0.80	C = 0.90		
WS-01	0.086	0.000	0.168	0.254	0.70
WS-02 - Roof	0.000	0.000	0.122	0.122	0.90
WS-03 - Roof	0.000	0.000	0.122	0.122	0.90
WS-04 - Ramp	0.000	0.000	0.023	0.023	0.90
WS-05 - Ramp	0.000	0.000	0.023	0.023	0.90
WS-06	0.045	0.000	0.014	0.059	0.44
WS-07	0.045	0.000	0.014	0.059	0.44
TOTAL	0.176	0.000	0.485	0.661	0.74

RUNOFF COEFFICIENT (C)

Grass	0.30
Gravel	0.80
Asphalt / rooftop	0.90

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STORM WATER MANAGEMENT DESIGN SHEET
5 YEAR STORM EVENT

PRE-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$
Un-Controlled	EWS-01	0.661	ha	R=	0.45
	Total Uncontrolled =	**0.661**	**ha**	**∑R=**	**0.45**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

$I_5 = 998.071 / (Tc + 6.053)^{0.814}$

C =	0.45	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines	
I =	104.2	mm/hr	
Tc =	10	min	
Total =	0.661	ha	
Allowable Release Rate=	**86.16**	L/s	
Allowable Release Rate=	**43.08**	L/s	50% of flow as per City of Ottawa

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
Controlled	WS-01	0.254	ha	R=	0.70	0.87
	WS-02 - Roof	0.122	ha	R=	0.90	1.00
	WS-03 - Roof	0.122	ha	R=	0.90	1.00
	WS-06	0.059	ha	R=	0.44	0.55
	WS-07	0.059	ha	R=	0.44	0.55
	Total Contolled =	**0.615**	**ha**	**∑R=**	**0.73**	**0.86**
Un-controlled	WS-04 - Ramp	0.023	ha	R=	0.90	1.00
	WS-05 - Ramp	0.023	ha	R=	0.90	1.00
	Total Un-Controlled =	**0.046**	**ha**	**∑R=**	**0.90**	**1.00**

$I_5 = 998.071 / (Tc + 6.053)^{0.814}$

		REQUIRED STORAGE				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	104.2	129.66	65.77	20.05	6.05	26.09
15	83.6	103.98	75.54	20.05	4.85	24.90
20	70.3	87.42	80.85	20.05	4.08	24.12
25	60.9	75.78	83.60	20.05	3.53	23.58
30	53.9	67.11	84.71	20.05	3.13	23.18
35	48.5	60.38	84.69	20.05	2.82	22.86
40	44.2	54.98	83.85	20.05	2.56	22.61
45	40.6	50.56	82.38	20.05	2.36	22.40
50	37.7	46.86	80.43	20.05	2.19	22.23
60	32.9	41.00	75.42	20.05	1.91	21.96
70	29.4	36.55	69.32	20.05	1.70	21.75
80	26.6	33.05	62.44	20.05	1.54	21.59
90	24.3	30.22	54.96	20.05	1.41	21.46
500	6.3	7.81	0.00	20.05	0.36	20.41
720	4.7	5.83	0.00	20.05	0.27	20.32
1440	2.7	3.32	0.00	20.05	0.16	20.20

Storage Volume = (Controlled Runoff - Controlled RR)/1000 * (Time*60s)

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**84.71 m^3**
Surface Ponding =	65.52 m^3
Underground Chambers =	163.30 m^3
Total Available Storage =	**228.82 m^3**

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STORM WATER MANAGEMENT DESIGN SHEET
100 YEAR STORM EVENT

PRE-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$
Un-Controlled	EWS-01	0.661	ha	R=	0.45
	Total Uncontrolled =	**0.661**	**ha**	**∑R=**	**0.45**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

$I_5 = 998.071 / (Tc + 6.053)^{0.814}$

C =	0.45	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines	
I =	104.2	mm/hr	
Tc =	10	min	
Total =	0.661	ha	
Allowable Release Rate=	**86.16**	L/s	
Allowable Release Rate=	**43.08**	L/s	50% of flow as per City of Ottawa

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
	WS-01	0.254	ha	R=	0.70	0.87
	WS-02 - Roof	0.122	ha	R=	0.90	1.00
	WS-03 - Roof	0.122	ha	R=	0.90	1.00
	WS-06	0.059	ha	R=	0.44	0.55
	WS-07	0.059	ha	R=	0.44	0.55
	Total Contolled =	**0.615**	**ha**	**∑R=**	**0.73**	**0.86**
Un-controlled	WS-04 - Ramp	0.023	ha	R=	0.90	1.00
	WS-05 - Ramp	0.023	ha	R=	0.90	1.00
	Total Un-Controlled =	**0.046**	**ha**	**∑R=**	**0.90**	**1.00**

$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$

		REQUIRED STORAGE				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	178.6	262.65	145.56	20.05	23.03	43.08
15	142.9	210.19	171.13	20.05	18.43	38.48
20	120.0	176.44	187.67	20.05	7.74	27.78
25	103.8	152.75	199.06	20.05	6.70	26.74
30	91.9	135.13	207.15	20.05	5.93	25.97
35	82.6	121.47	212.98	20.05	5.33	25.37
40	75.1	110.53	217.17	20.05	4.85	24.89
45	69.1	101.57	220.11	20.05	4.45	24.50
50	64.0	94.07	222.08	20.05	4.12	24.17
60	55.9	82.22	223.81	20.05	3.60	23.65
90	41.1	60.47	218.29	20.05	2.65	22.70
120	32.9	48.39	204.05	20.05	2.12	22.17
360	13.7	20.18	2.96	20.05	0.88	20.93
500	*10.5*	15.48	0.00	20.05	0.68	20.73
720	7.8	11.51	0.00	20.05	0.50	20.55

Storage Volume = (Controlled Runoff - Controlled RR)/1000 * (Time*60s)

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**223.81 m^3**
Surface Ponding =	65.52 m^3
Underground Chambers =	163.30 m^3
Total Available Storage =	**228.82 m^3**

Inlet Control Device Parameters

Product	**Orifice Plate**	at CB01	
HWL =	92.00	m (highest HWL)	
Grate Level =	92.00	m	from inv.
Invert Level =	89.30	m	
Outlet Pipe Dia. =	300	mm	
Max. Flow =	20.05	L/s	
ICD Centerline =	89.45		
HWL Head =	2.55	m (from centerlin	from centerline
C=	0.86		
Orifice Area =	0.008	m2	
Orifice Diameter =	**103**	mm (min. 75mm)	

APPENDIX "B"
Sanitary Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-184	**Date:**	May 3, 2022
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	3817-3843 - Innes Road	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

SANITARY DESIGN SHEET
SEWER DESIGN

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE						MANHOLE	
					CUMMULATIVE																							
STREET	FROM MH	TO MH	AREA (Ha)	POP.	AREA (Ha)	POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	MATERAIL	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	UP INVERT (m)	DOWN INVERT (m)
SITE	PROP. BLDG B	TRUNK	0.331	91.0	0.33	91.0	4.0	1.47	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.33	0.33	0.09	1.57	25.3	200	PVC	1.00%	32.80	1.04	86.90	86.65
SITE	PROP. BLDG A	TRUNK	0.331	91.0	0.66	182.0	4.0	2.95	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.33	0.66	0.19	3.13	25.3	200	PVC	1.00%	32.80	1.04	87.18	86.93

DESIGN PARAMETERS NOTES

Average Daily Flow =	350	L/p/day
Commercial and Institutional Flow =	50000	L/ha/da
Industrial Flow =	35000.00	L/ha/da
Maximum Resedential Peak Flow =	4	
Commection and Intitutional Peak Factor =	1.5	

Industrial Peak Factor =	7	as per Appendix 4-B
Extraneous Flow =	0.28	L/s/ha
Minimum Velocity =	0.76	m/s
Mannings n =	0.013	

Appartments:	Person Per Unit	Building B	Building A
Bachelor =	1.4	0	0
1 Bedroom =	1.4	35	35
2 Bedroom =	2.1	20	20
3 Bedroom =	3.1	0	0

APPENDIX "C"
Watermain Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-184	**Date:**	May 3, 2022
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	3817-3843 - Innes Road	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

WATER CONSUMPTION CALCULATION

	BLOCK A	BLOCK B	
Total Building Floor Area =	**892.05**	**557.05**	m^2
Site Total Area =	**0.24**	**0.24**	ha
Total Population =	91.00	91.00	ea.
Average Demand Per People =	350	350	L/c/d
Average Water Demand =	**31850.00**	**31850.00**	L/d
Maximum Daily Peak Factor =	2.5	2.5	* As per City of Ottawa
Maximum Daily Residential =	**79625.00**	**79625.00**	L/d
Maximum Hourly Peak Factor =	2.2	2.2	* As per City of Ottawa
Maximum Hourly Residentiall =	**175175.00**	**175175.00**	L/d
Total Domestic Flow =	**2.03**	**2.03**	**L/s**
Total Fire Flow =	**203.33**	**203.33**	**L/s**

Appartments:	Person Per Unit	Building A	Building B
Bachelor =	1.4	0	0
1 Bedroom =	1.4	35	35
2 Bedroom =	2.1	20	20
3 Bedroom =	3.1	0	0
		91.00	**91.00**

BLOCK A	1 Bedroom	2 Bedroom	Unit Counts	WSFU	Total
Unrinal Flush Tank	1	2	75	2	150
Sinks	2	2	110	1	110
Bathub	1	2	75	4	300
Diswasher	1	1	55	1.5	82.5
Washing Machine	1	1	55	2	110
Total					**752.5**

BLOCK B	1 Bedroom	2 Bedroom	Unit Counts	WSFU	Total
Unrinal Flush Tank	1	2	75	2	150
Sinks	2	2	110	1	110
Bathub	1	2	75	4	300
Diswasher	1	1	55	1.5	82.5
Washing Machine	1	1	55	2	110
Total					**752.5**

BLANCHARD LETENDRE
ENGINEERING

File No.	20-184	**Date:**	May 3, 2021
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	3817-3843 - Innes Road	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

BLOCK B

Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	0.8		
	Ordinary Construction	1.0				
	Non-combustible construction	0.8				
	Fire resistive construction <2 hrs	0.7				
	Fire resistive construction >2 hrs	0.6				
Type of housing	Single family dwelling	0	Building - no. of units per floor	15	unit	
	Townhouse - no. of units	0				
	Building - no. of units per floor	2				
	Number of floors excluding the basement			4	floor	
	Floor space per unit	1	1,218	1,218	sq.m.	
Required fire flow	**Fire Flow = 220 x C x Area^0.5**				L/min	**12,285**
					L/s	205
Occupancy hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15		
	Limited combustible	-0.15				
	Combustible	0				
	Free burning	0.15			L/min	**10,442**
	Rapid burning	0.25			L/s	174
Sprinkler reduction	Sprinklers (NFPA13)	-0.30	False	0		
	Water supply is standard for both the system and fire department hose lines	-0.10	False	0	L/min	**9,398**
	Fully supervised system	-0.10	True	-0.1	L/s	157
Exposure distance between units	North side	Over 45m	0			
	East side	10.1 to 20m	0.15			
	South side	Over 45m	0		L/min	**12,217**
	West side	10.1 to 20m	0.15	0.3	L/s	204
Minimum required fire flow rate (rounded to nearest 100)					L/min	**12,200**
Minimum required fire flow rate					L/s	**203**
Required duration of fire flow					min	**30**

BLANCHARD LETENDRE
ENGINEERING

File No.	20-184	**Date:**	May 3, 2022
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	3817-3843 - Innes Road	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

BLOCK A

Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	0.8		
	Ordinary Construction	1.0				
	Non-combustible construction	0.8				
	Fire resistive construction <2 hrs	0.7				
	Fire resistive construction >2 hrs	0.6				
Type of housing	Single family dwelling	0	Building - no. of units per floor	15	unit	
	Townhouse - no. of units	0				
	Building - no. of units per floor	2				
	Number of floors excluding the basement			4	floor	
	Floor space per unit	1	1,218	1,218	sq.m.	
Required fire flow	**Fire Flow = 220 x C x Area^$^{0.5}$**				L/min	**12,285**
					L/s	205
Occupancy hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15		
	Limited combustible	-0.15				
	Combustible	0				
	Free burning	0.15			L/min	**10,442**
	Rapid burning	0.25			L/s	174
Sprinkler reduction	Sprinklers (NFPA13)	-0.30	False	0		
	Water supply is standard for both the system and fire department hose lines	-0.10	False	0	L/min	**9,398**
	Fully supervised system	-0.10	True	-0.1	L/s	157
Exposure distance between units	North side	Over 45m	0			
	East side	10.1 to 20m	0.15			
	South side	Over 45m	0		L/min	**12,217**
	West side	10.1 to 20m	0.15	0.3	L/s	204
Minimum required fire flow rate (rounded to nearest 100)					L/min	**12,200**
Minimum required fire flow rate					L/s	**203**
Required duration of fire flow					min	**30**

APPENDIX "D"
Underground Chambers & Stormwater Treatment Unit

Stormceptor®   FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

09/25/2020

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP
NCDC Rainfall Station Id:	6000
Years of Rainfall Data:	37
Site Name:	Innes Road
Drainage Area (ha):	0.72
Runoff Coefficient 'c':	0.80
Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	20.82
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	93.85
Site Sediment Transport Rate (kg/ha/yr):	480.00
Estimated Average Annual Sediment Load (kg/yr):	276.48

Project Name:	Innes Road
Project Number:	20-184
Designer Name:	GUILLAUME BRUNET
Designer Company:	BL ENGINEERING
Designer Email:	guillaume@blengineering.ca
Designer Phone:	613-693-0700
EOR Name:	GUILLAUME BRUNET
EOR Company:	BL ENGINEERING
EOR Email:	guillaume@blengineering.ca
EOR Phone:	613-693-0700

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	74
EFO6	83
EFO8	87
EFO10	89
EFO12	90

Recommended Stormceptor EFO Model:	**EFO6**
Estimated Net Annual Sediment (TSS) Load Reduction (%):	**83**
Water Quality Runoff Volume Capture (%):	**> 90**

imbrium

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

PARTICLE SIZE DISTRIBUTION (PSD)

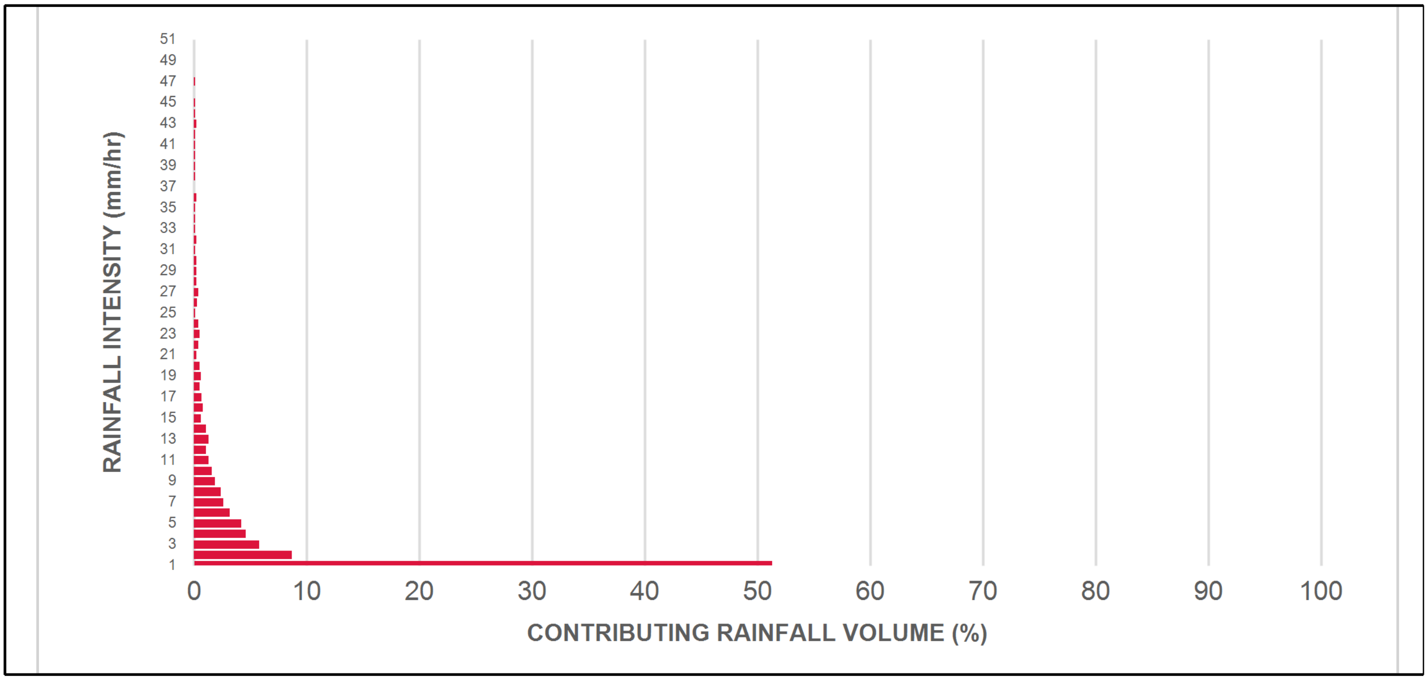
►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a 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

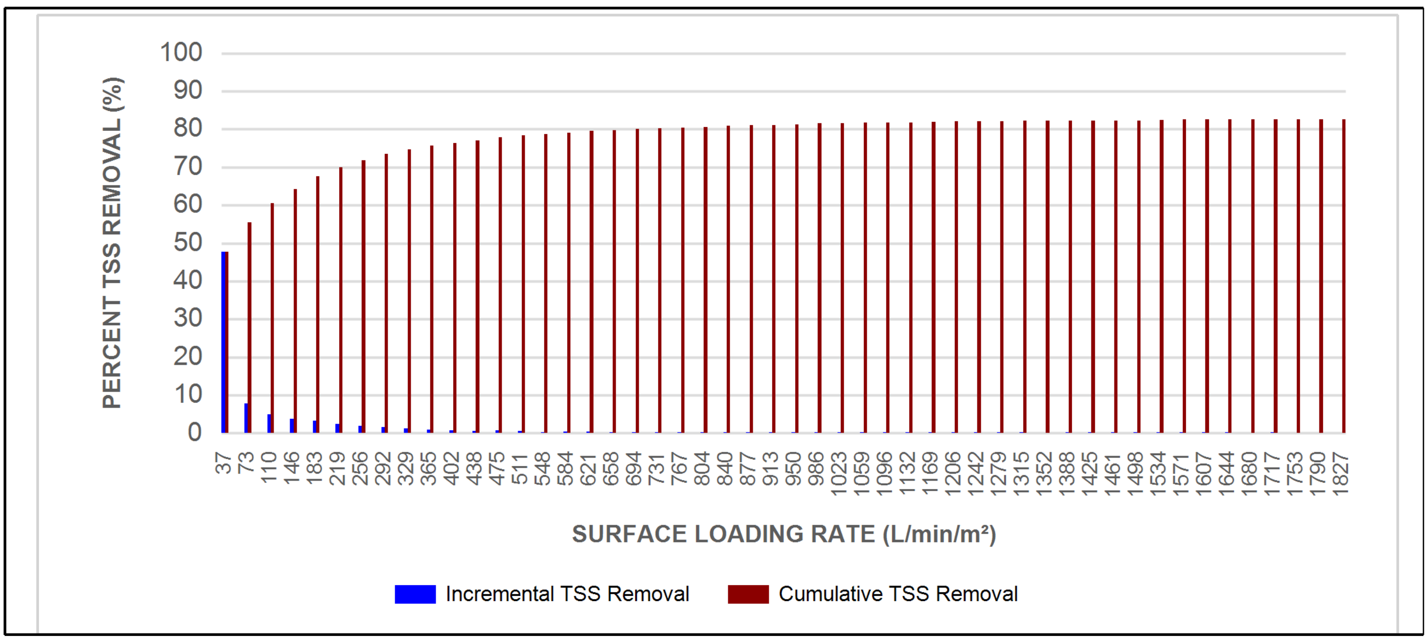
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	51.3	51.3	1.60	96.0	37.0	93	47.7	47.7
2	8.7	60.0	3.20	192.0	73.0	90	7.8	55.5
3	5.8	65.8	4.80	288.0	110.0	86	5.0	60.5
4	4.6	70.4	6.41	384.0	146.0	83	3.8	64.3
5	4.2	74.6	8.01	480.0	183.0	78	3.3	67.6
6	3.2	77.8	9.61	576.0	219.0	74	2.4	70.0
7	2.6	80.4	11.21	673.0	256.0	72	1.9	71.8
8	2.4	82.8	12.81	769.0	292.0	68	1.6	73.5
9	1.9	84.7	14.41	865.0	329.0	65	1.2	74.7
10	1.6	86.3	16.01	961.0	365.0	62	1.0	75.7
11	1.3	87.6	17.61	1057.0	402.0	58	0.8	76.4
12	1.1	88.7	19.22	1153.0	438.0	57	0.6	77.1
13	1.3	90.0	20.82	1249.0	475.0	56	0.7	77.8
14	1.1	91.1	22.42	1345.0	511.0	55	0.6	78.4
15	0.6	91.7	24.02	1441.0	548.0	54	0.3	78.7
16	0.8	92.5	25.62	1537.0	584.0	53	0.4	79.1
17	0.7	93.2	27.22	1633.0	621.0	52	0.4	79.5
18	0.5	93.7	28.82	1729.0	658.0	52	0.3	79.8
19	0.6	94.3	30.42	1825.0	694.0	52	0.3	80.1
20	0.5	94.8	32.03	1922.0	731.0	51	0.3	80.3
21	0.2	95.0	33.63	2018.0	767.0	51	0.1	80.4
22	0.4	95.4	35.23	2114.0	804.0	51	0.2	80.6
23	0.5	95.9	36.83	2210.0	840.0	51	0.3	80.9
24	0.4	96.3	38.43	2306.0	877.0	51	0.2	81.1
25	0.1	96.4	40.03	2402.0	913.0	50	0.1	81.1

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 (%)
26	0.3	96.7	41.63	2498.0	950.0	50	0.2	81.3
27	0.4	97.1	43.23	2594.0	986.0	50	0.2	81.5
28	0.2	97.3	44.84	2690.0	1023.0	50	0.1	81.6
29	0.2	97.5	46.44	2786.0	1059.0	49	0.1	81.7
30	0.2	97.7	48.04	2882.0	1096.0	49	0.1	81.8
31	0.1	97.8	49.64	2978.0	1132.0	49	0.0	81.8
32	0.2	98.0	51.24	3074.0	1169.0	48	0.1	81.9
33	0.1	98.1	52.84	3171.0	1206.0	48	0.0	82.0
34	0.1	98.2	54.44	3267.0	1242.0	48	0.0	82.0
35	0.1	98.3	56.04	3363.0	1279.0	47	0.0	82.1
36	0.2	98.5	57.65	3459.0	1315.0	47	0.1	82.2
37	0.0	98.5	59.25	3555.0	1352.0	47	0.0	82.2
38	0.1	98.6	60.85	3651.0	1388.0	46	0.0	82.2
39	0.1	98.7	62.45	3747.0	1425.0	45	0.0	82.3
40	0.1	98.8	64.05	3843.0	1461.0	44	0.0	82.3
41	0.1	98.9	65.65	3939.0	1498.0	43	0.0	82.3
42	0.1	99.0	67.25	4035.0	1534.0	42	0.0	82.4
43	0.2	99.2	68.86	4131.0	1571.0	41	0.1	82.5
44	0.1	99.3	70.46	4227.0	1607.0	40	0.0	82.5
45	0.1	99.4	72.06	4323.0	1644.0	39	0.0	82.5
46	0.0	99.4	73.66	4420.0	1680.0	38	0.0	82.5
47	0.1	99.5	75.26	4516.0	1717.0	38	0.0	82.6
48	0.0	99.5	76.86	4612.0	1753.0	37	0.0	82.6
49	0.0	99.5	78.46	4708.0	1790.0	36	0.0	82.6
50	0.0	99.5	80.06	4804.0	1827.0	35	0.0	82.6
Estimated Net Annual Sediment (TSS) Load Reduction =								**83 %**

RAINFALL DATA FROM OTTAWA MACDONALD-CARTIER INT'L 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
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

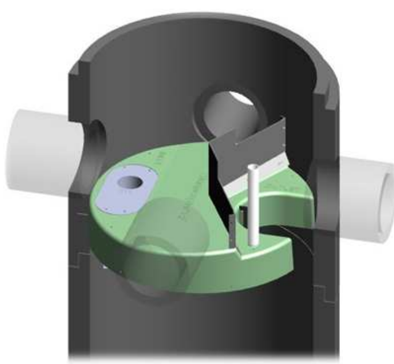
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

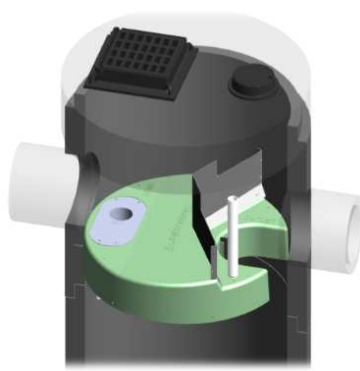
DESIGN FLEXIBILITY

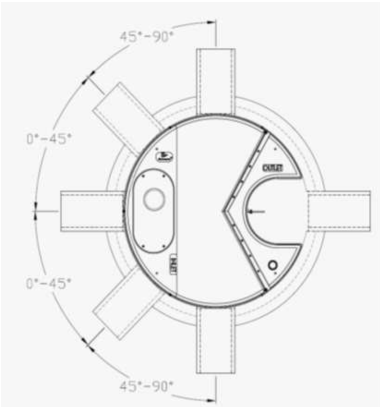
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend 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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

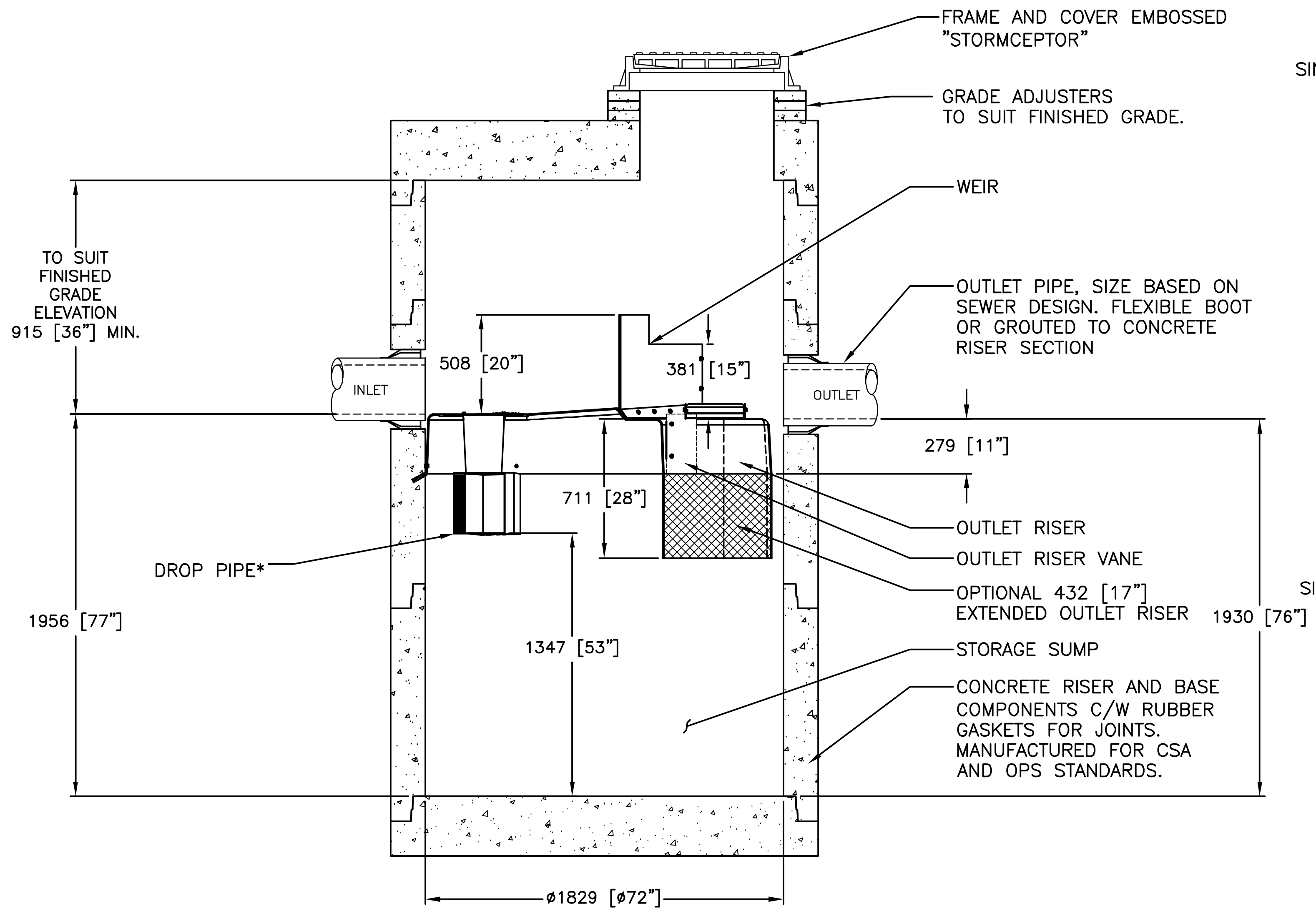
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

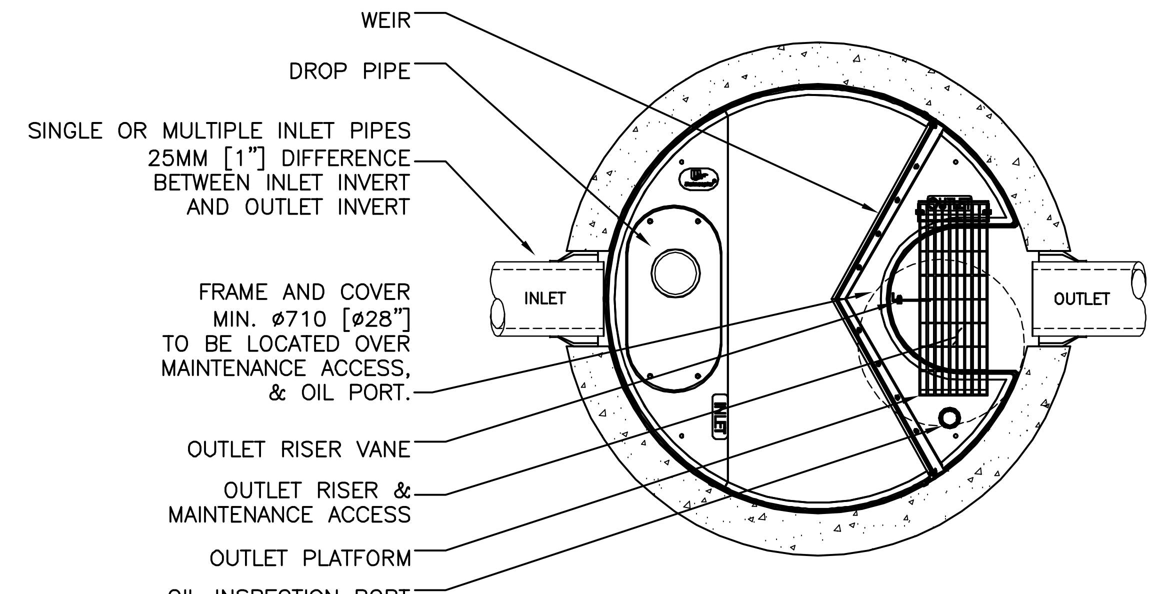
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 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/m2 to 2600 L/min/m2) 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.

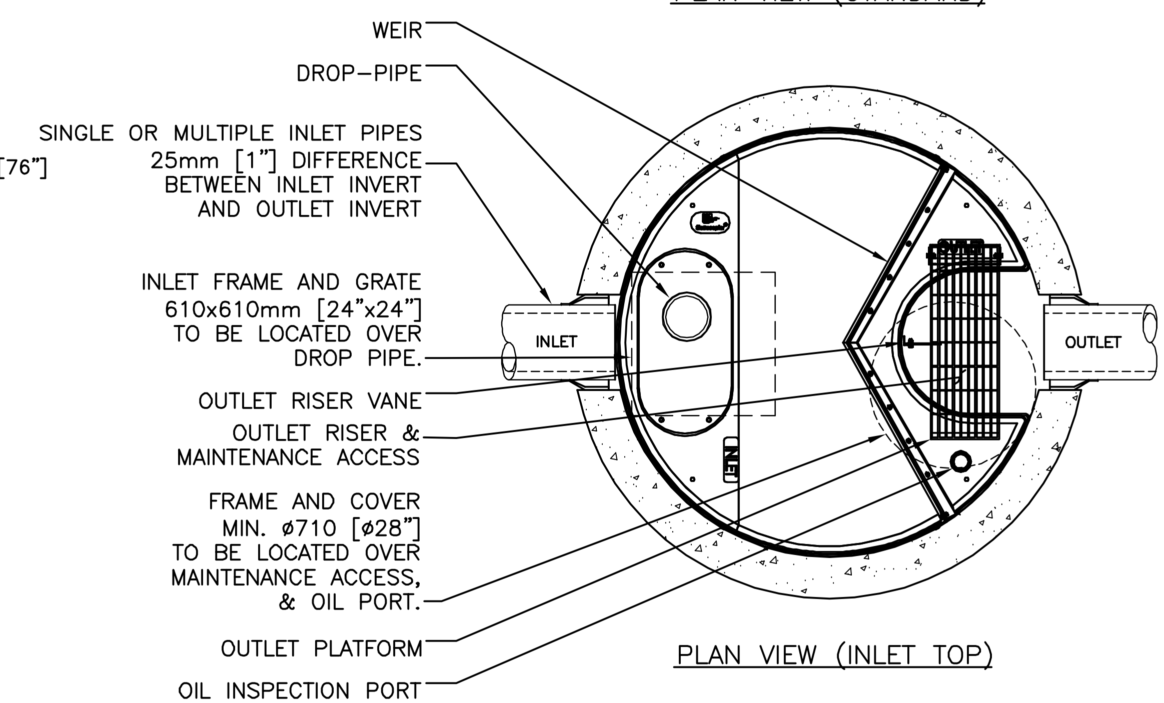
DRAWING NOT TO BE USED FOR CONSTRUCTION



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.

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.

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).

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

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If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Imbrium immediately for re-evaluation of the design. Imbrium accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

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

THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING PATENTS

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

APPENDIX "E"
Boundary Conditions

Boundary Conditions
3817-3843 Innes Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	769	12.82
Maximum Daily Demand	1,154	19.23
Peak Hour	1,385	23.08
Fire Flow Demand #1	5,600	93.33

Location

Results

Connection 1 – Innes Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	55.1
Peak Hour	127.1	50.5
Max Day plus Fire 1	129.3	53.7

[1] Ground Elevation = 91.6 m

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

APPENDIX "F"
Engineering Drawings

EROSION AND SEDIMENT CONTROL MEASURES:

** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES **

1. PRIOR TO START OF CONSTRUCTION:

1.1. PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF ANY SOIL, AND CONSTRUCTION:

1.1.1. INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).

1.1.2. INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCH BASINS AND MANHOLES.

1.1.3. INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASIN STRUCTURES.

1.1.4. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

2.1. WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.

2.2. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.

2.3. PROTECT DISTURBED AREAS FROM RUNOFF.

2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILIATED WITHIN 30 DAYS.

2.5. INSPECT SILT FENCE, FILTER CLOTHS, AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY

2.6. PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.

2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.

2.8. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (30 DAYS).

2.9. CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).

2.10. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.

2.11. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS. "TO PREVENT UNNECESSARY SEDIMENT DISCHARGE, THE CONTRACTOR IS PERMITTED TO PLACE ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES IN A TIMELY MANNER, IF REQUIRED. THE CONTRACTOR TO ADVISE CONSULTANT ONCE INSTALLED FOR INSPECTION."

2.12. CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC, AT THE END OF EACH WORK DAY.

2.13. PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG. 4m WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHER-RUN LIMESTONE). MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.

2.14. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.

2.15. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.

2.16. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

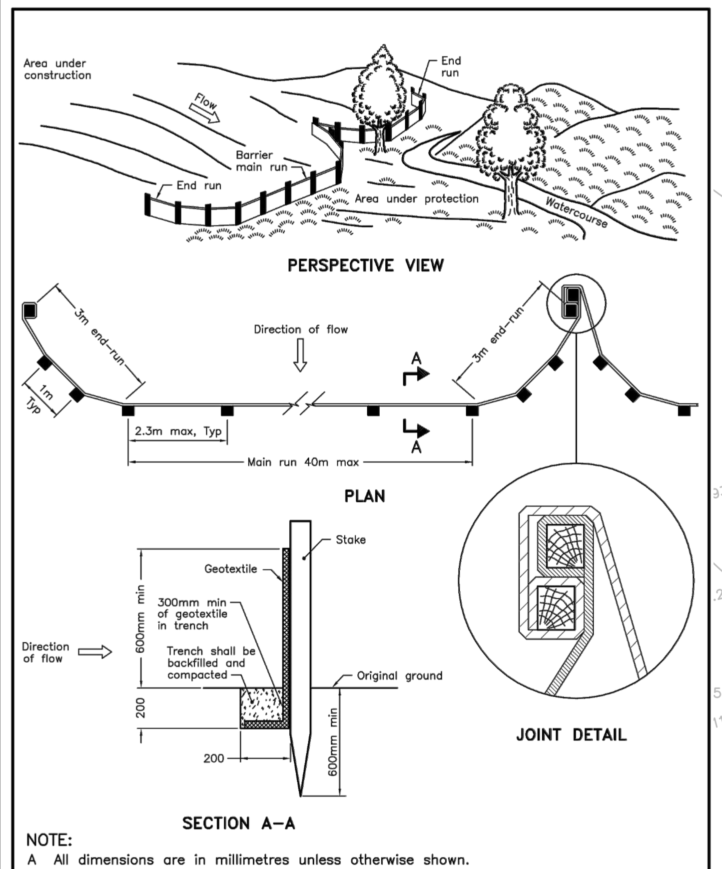
3.1. PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREA.

3.2. REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.

3.3. INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

LEGEND:

EXISTING PROPERTY LINE TO REMAIN
PROPOSED DOOR ENTRANCE/EXIT
×50.00 PROPOSED ELEVATION
×50.00HP PROPOSED HIGH POINT ELEVATION
×50.00SD PROPOSED SIDEWALK ELEVATION
×50.00SW PROPOSED SWALE ELEVATION
×50.00EX MATCH INTO EXISTING ELEVATION
×50.00 EXISTING ELEVATION
PROPOSED OVERLAND MAJOR FLOW ROUTE
PROPOSED SILT FENCE AS PER OPSD 219.110
SUB PROPOSED 250mmØ PERFORATED SUBDRAIN
>S PROPOSED SWALE
STM PROPOSED STORM SEWER
SAN PROPOSED SANITARY SEWER
WTR PROPOSED WATERMAIN
SAN EXISTING SANITARY SEWER
WTR EXISTING WATERMAIN
PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
PROPOSED CURB STOP
PROPOSED PIPE INSULATION AS PER W22
PROPOSED 100 YEAR HIGH WATER LEVEL
STORM WATERSHED EXTENT
WS-XX CONTROLLED AREA RUNOFF
WATERSHED NAME
RUNOFF COEFFICIENT
AREA IN HECTARES
PROPOSSED GRASS AREA
PROPOSED CONCRETE FEATURES/SLAB
PROPOSED HEAVY DUTY ASPHALT
PROPOSED LIGHT DUTY ASPHALT
PROPOSED GRAVEL AREA
PROPOSED RIP RAP AS PER OPSD 810.010
M PROPOSED WATER METER
SC PROPOSED SIEMIESE CONNECTION
PROPOSED GROWING FIELD

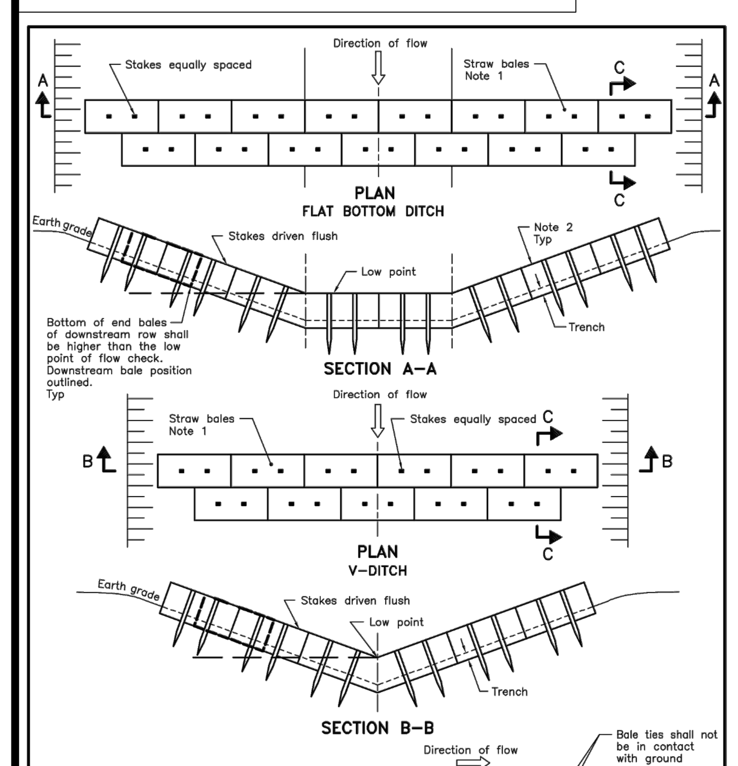


NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

LIGHT–DUTY SILT FENCE BARRIER

OPSD 219.110

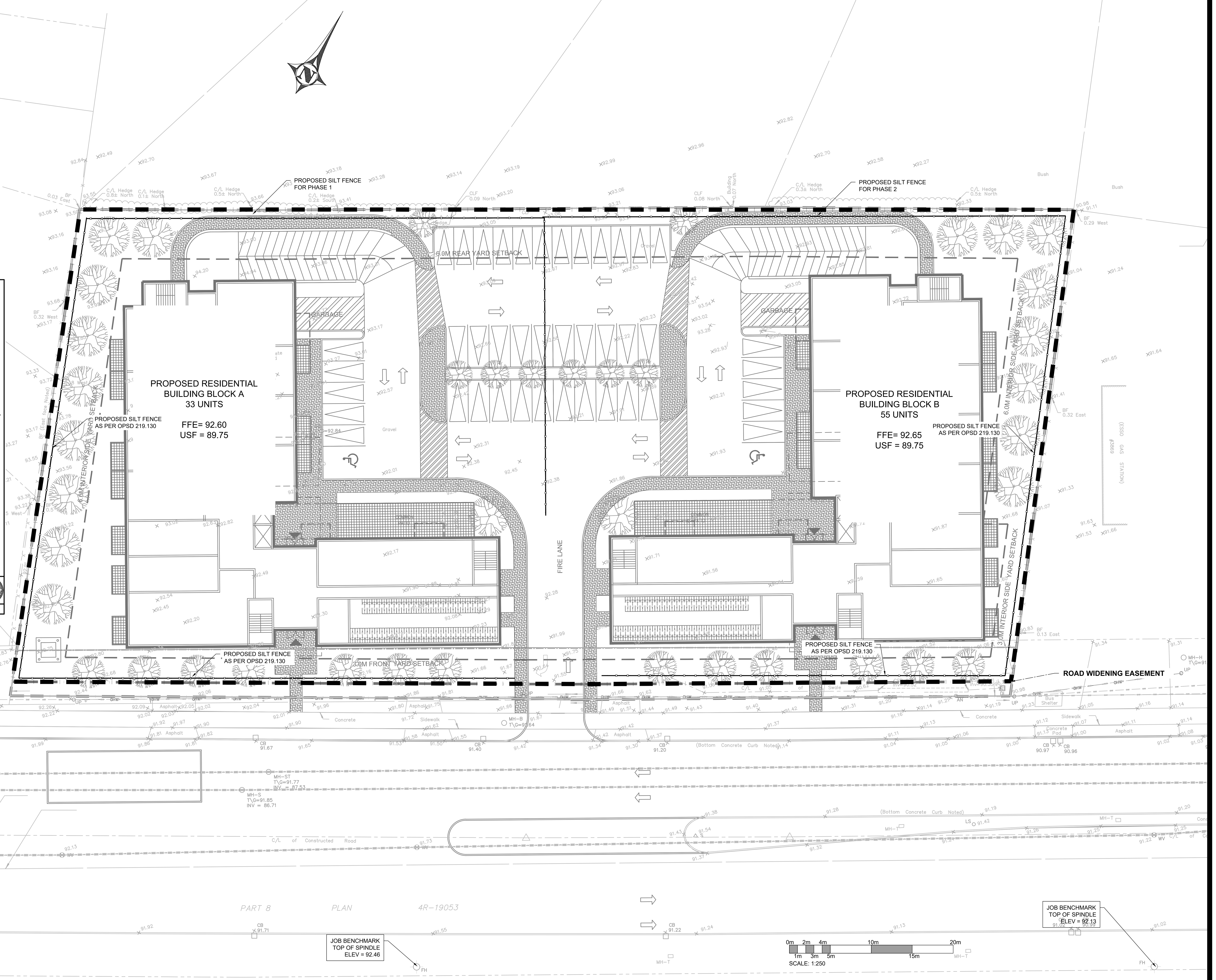


NOTES:
1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

STRAW BALE FLOW CHECK DAM

OPSD 219.180



ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
03/05/2022
PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4	ISSUED FOR CITY COMMENTS	03 / 05 / 2022
#3	ISSUED FOR CITY COMMENTS	05 / 04 / 2021
#2	ISSUED FOR CITY COMMENTS	17 / 12 / 2020
#1	ISSUED FOR SPA	14 / 10 / 2020

BLANCHARD LETENDRE
ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, K0A 1W1
(613) 693-0700 blengineering.ca

CLIENT:

OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

DRAWING:

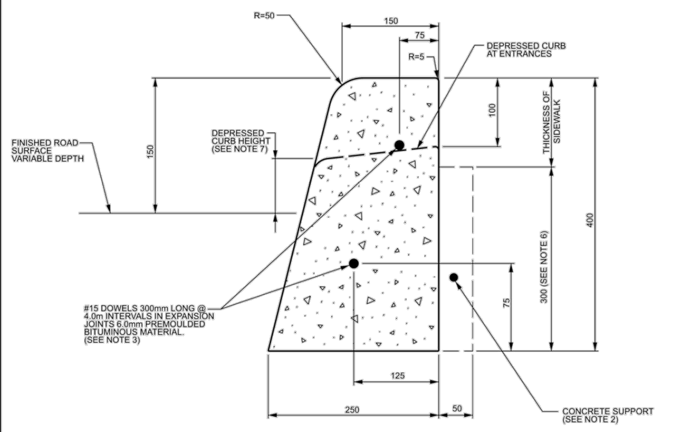
SEDIMENT & EROSION CONTROL PLAN

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	04-2022
SCALE:	1:250
PROJECT NUMBER:	20-184

PAGE: C100

DRAWING NUMBER : 18285

D07-12-20-0164

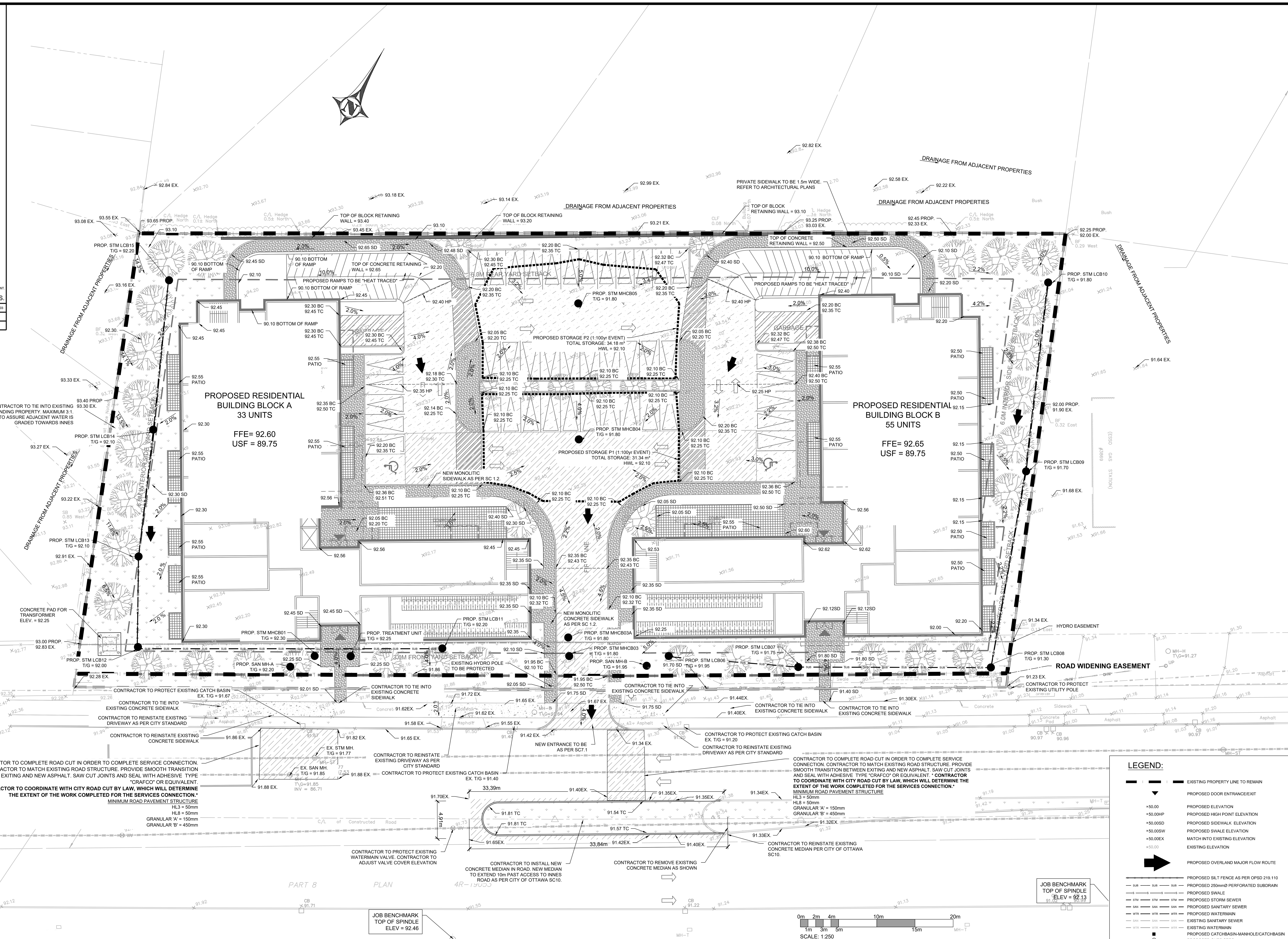


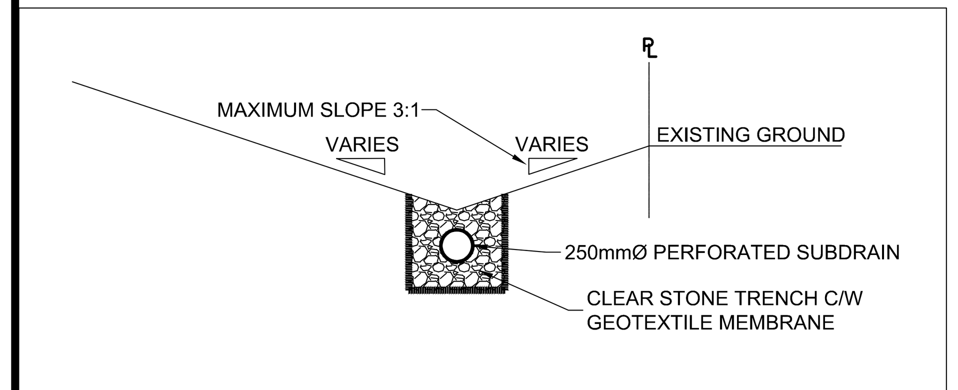
CONCRETE BARRIER CURB

NOTES:
1. THE FULL CURB DEPTH SHALL BE CARRIED THROUGH THE DEPRESSED ACCESS CROSSING.
2. A CONCRETE SUPPORT IS REQUIRED WHEN BUILT ADJACENT TO THE SIDEWALK.
3. IF AN EXTRUSION CURBING MACHINE IS USED, THE EXPANSION BITUMINOUS MATERIAL AND THE #15 DOWELS ARE TO BE PLACED AT THE END OF THE EXTRUSION.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
5. DUMMY JOINTS SHALL BE 25mm DEEP, FRONT, BACK AND TOP OF SECTION AT 4m SPACING OR MATCH JOINTING WHERE SIDEWALK IS ADJACENT.
6. FOR DEPRESSED CURB AT ENTRANCES USE 250.
7. DEPRESSED CURB HEIGHT - FOR PEDESTRIAN CURB RAMPS 0 TO 6 mm AND FOR PRIVATE ENTRANCES 0 TO 13mm.

N.T.S.

Ottawa	CONCRETE BARRIER CURB FOR GRANULAR BASE PAVEMENT (MODIFIED OPSD-600.110)	DATE:	JANUARY 2003
		REV. DATE:	MARCH 2021
		DWG. No.:	SC1.1





SWALE & SUBDRAIN - TYPICAL SECTION

(N.T.S.)

PONDING TABLE

100 year storm HWL = 92.10

PONDING AREA	VOLUME (m3)	DEPTH (mm)
P1	31.34	300
P2	34.18	300

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) LIGHT DUTY	THICKNESS (mm) HEAVY DUTY
SURFACE	HL.3 A/C (PG 58-28)	50	40
BINDER	HL.8 A/C (PG 58-28)	--	50
BASECOURSE	GRANULAR "A"	150	150
SUBBASE	GRANULAR "B" TYPE II	300	400

LEGEND:

EXISTING PROPERTY LINE TO REMAIN
PROPOSED DOOR ENTRANCE/EXIT
×50.00 PROPOSED ELEVATION
×50.00HP PROPOSED HIGH POINT ELEVATION
×50.00SD PROPOSED SIDEWALK ELEVATION
×50.00SW PROPOSED SWALE ELEVATION
×50.00EX MATCH INTO EXISTING ELEVATION
×50.00 EXISTING ELEVATION
PROPOSED OVERLAND MAJOR FLOW ROUTE
PROPOSED SILT FENCE AS PER OPSD 219.110
SUB PROPOSED 250mmØ PERFORATED SUBDRAIN
>S PROPOSED SWALE
STM PROPOSED STORM SEWER
SAN PROPOSED SANITARY SEWER
WTR PROPOSED WATERMAIN
SAN EXISTING SANITARY SEWER
WTR EXISTING WATERMAIN
PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
PROPOSED CURB STOP
PROPOSED PIPE INSULATION AS PER W22
PROPOSED 100 YEAR HIGH WATER LEVEL
STORM WATERSHED EXTENT
WS-XX CONTROLLED AREA RUNOFF
WATERSHED NAME
RUNOFF COEFFICIENT
AREA IN HECTARES
PROPOSSED GRASS AREA
PROPOSSED CONCRETE FEATURES/SLAB
PROPOSSED HEAVY DUTY ASPHALT
PROPOSSED LIGHT DUTY ASPHALT
PROPOSSED GRAVEL AREA
PROPOSSED RIP RAP AS PER OPSD 810.010
M PROPOSSED WATER METER
SC PROPOSSED SIEMESE CONNECTION
PROPOSSED GROWING FIELD

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BLANCHARD LETENDRE ENGINEERING

CLIENT:
OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

DRAWING:
SITE GRADING PLAN

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PAGE: C200

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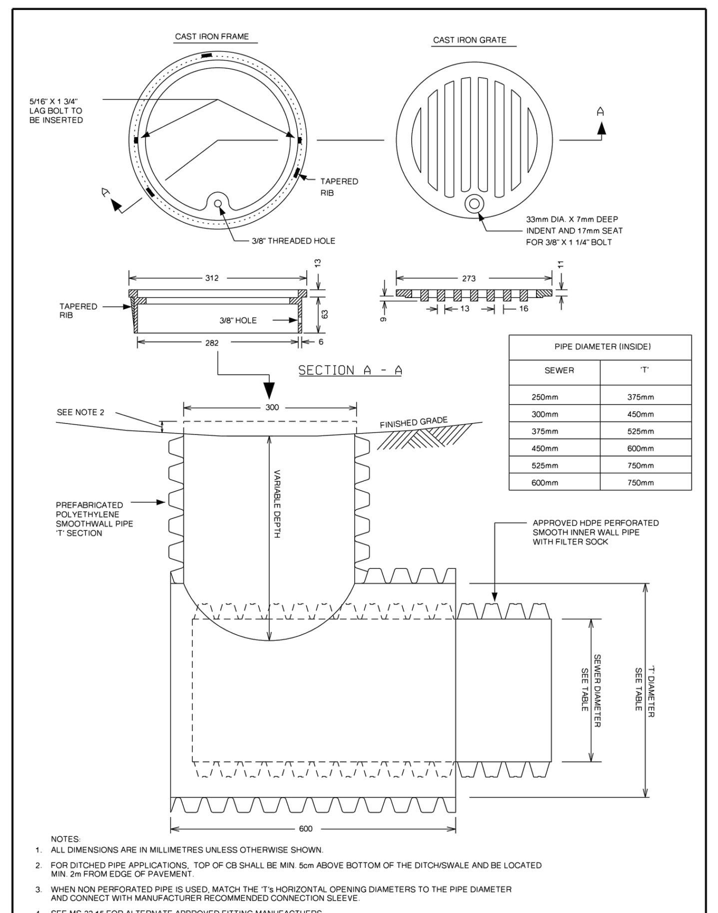
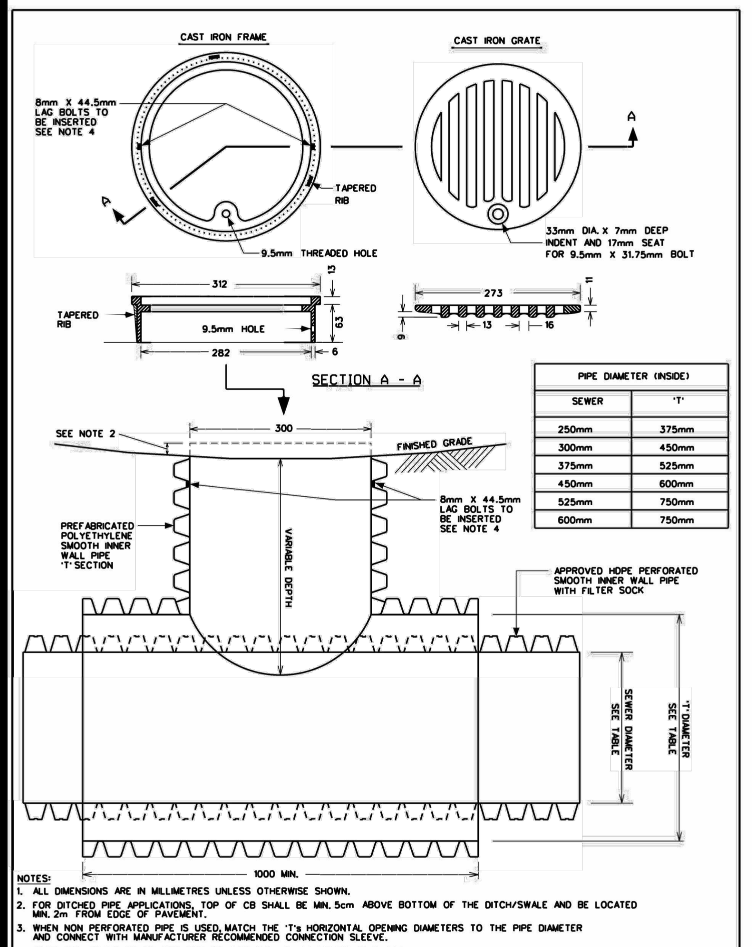
LEGEND:

	EXISTING PROPERTY LINE TO REMAIN
	PROPOSED DOOR ENTRANCE/EXIT
×50.00	PROPOSED ELEVATION
×50.00HP	PROPOSED HIGH POINT ELEVATION
×50.00SD	PROPOSED SIDEWALK ELEVATION
×50.00SW	PROPOSED SWALE ELEVATION
×50.00EX	MATCH INTO EXISTING ELEVATION
×50.00	EXISTING ELEVATION
	PROPOSED OVERLAND MAJOR FLOW ROUTE
	PROPOSED SILT FENCE AS PER OPSD 219.110
SUB	PROPOSED 250mmØ PERFORATED SUBDRAIN
	PROPOSED SWALE
STM	PROPOSED STORM SEWER
SAN	PROPOSED SANITARY SEWER
WTR	PROPOSED WATERMAIN
SAN	EXISTING SANITARY SEWER
WTR	EXISTING WATERMAIN
	PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
	PROPOSED CURB STOP
	PROPOSED PIPE INSULATION AS PER W22
	PROPOSED 100 YEAR HIGH WATER LEVEL
	STORM WATERSHED EXTENT
WS-XX	WATERSHED NAME
RUNOFF	RUNOFF COEFFICIENT
AREA	AREA IN HECTARES
	PROPOSED GRASS AREA
	PROPOSED CONCRETE FEATURES/SLAB
	PROPOSED HEAVY DUTY ASPHALT
	PROPOSED LIGHT DUTY ASPHALT
	PROPOSED GRAVEL AREA
	PROPOSED RIP RAP AS PER OPSD 810.010
M	PROPOSED WATER METER
S	PROPOSED SIEMESE CONNECTION
	PROPOSED GROWING FIELD



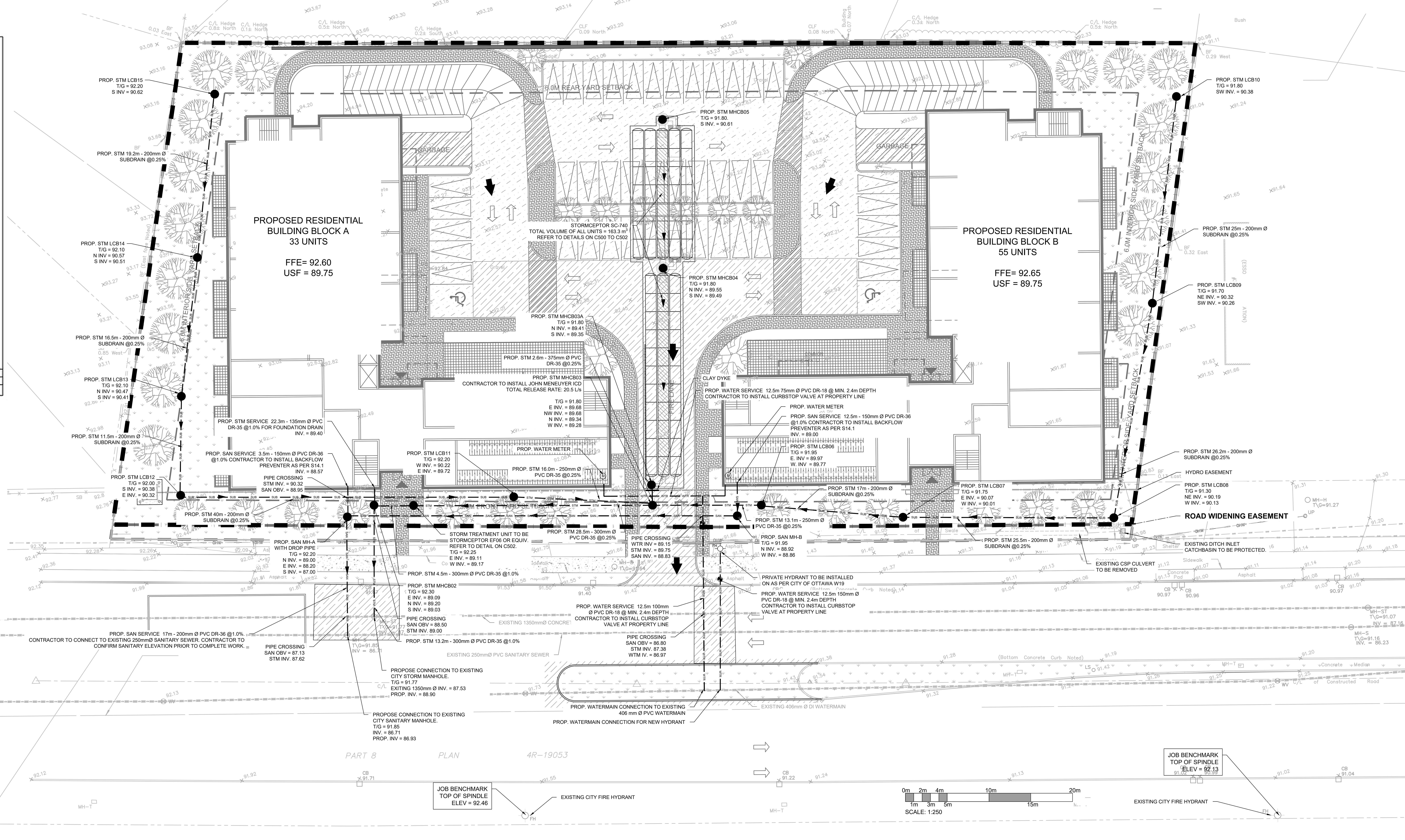
CATCH BASIN - ELBOW
FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS
DATE: MARCH 2007
REV. DATE: MARCH 2019
DWG No. S31

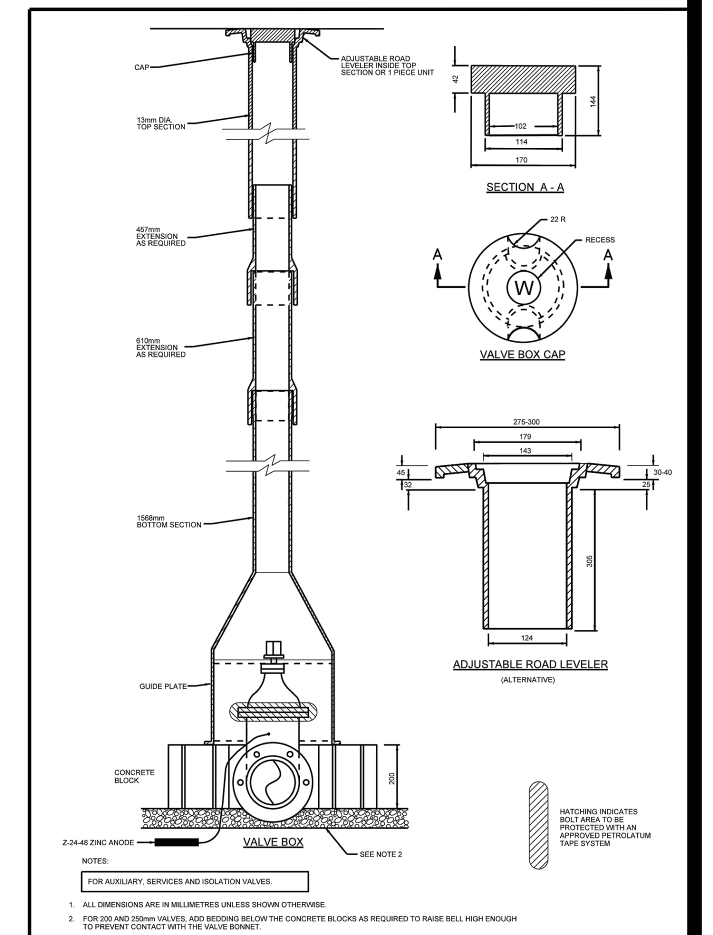


CATCH BASIN - 'T'
FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS
DATE: MARCH 2007
REV. DATE: MARCH 2021
DWG. No. S30

MANHOLE TABLE

STORM		
MH Number	Size	Cover
MH01	1200mm	S23
MHCB02	1200mm	S28.1
MHCB03	1200mm	S28.1
MHCB03A	1200mm	S28.1
MHCB04	1200mm	S28.1
MHCB05	1200mm	S28.1
LCB06 TO LCB15	S30 AND S31	
SANITARY		
MH Number	Size	Cover
MHA	1200mm	S24
MHB	1200mm	S24





VALVE BOX ASSEMBLY
DWG. No. W24

ENGINEERING STAMP

G. L. BRUNET
100191036
03/05/2022
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

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BLANCHARD LETENDRE ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, K0A 1W0
(613) 693-0700 blengineering.ca

CLIENT:
OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

DRAWING:
SITE SERVICING PLAN

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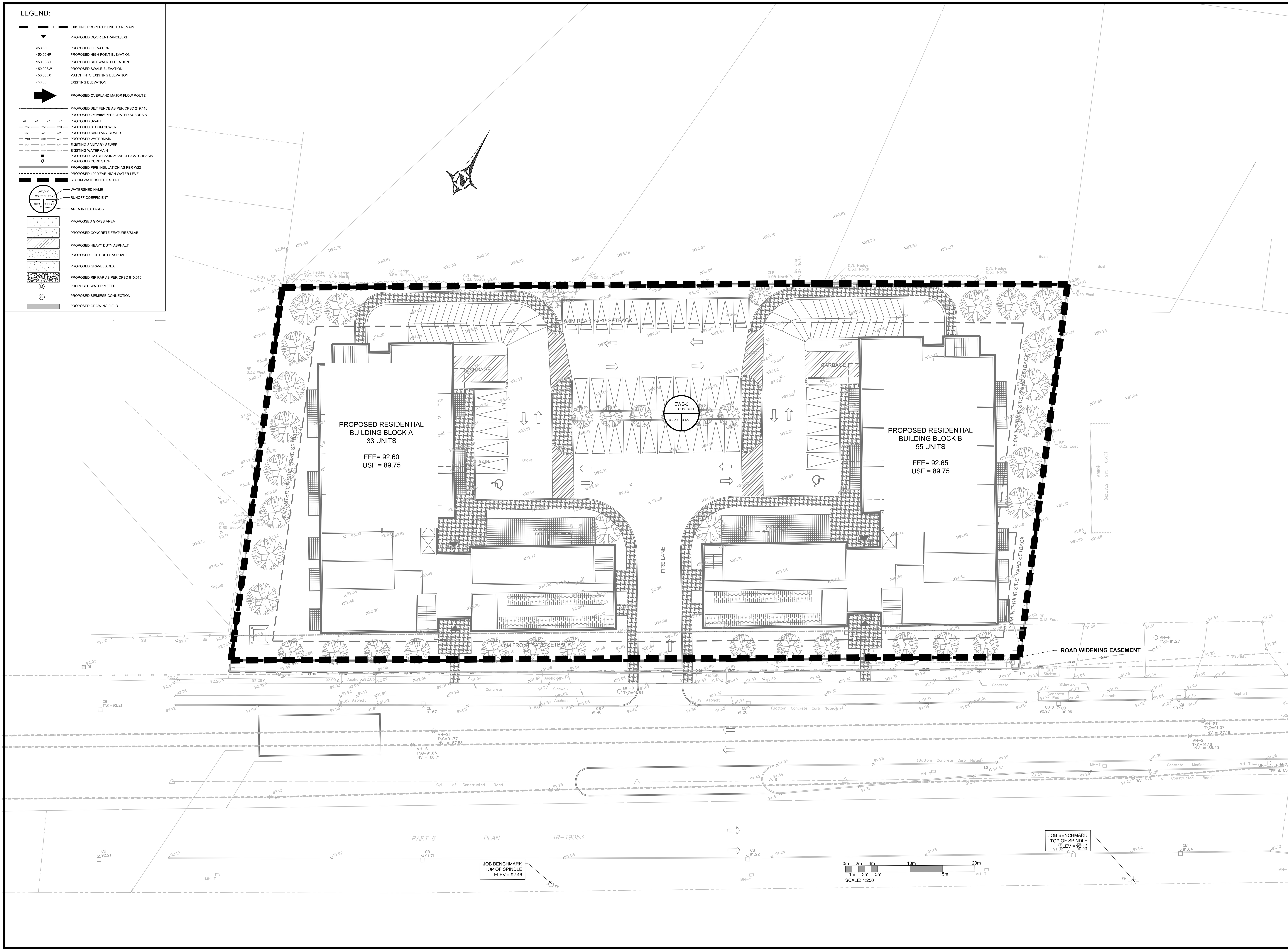

ENGINEERING STAMP

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G. L. BRUNET
100191036
03/05/2022
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CLIENT:

OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

DRAWING:

PRE DEVELOPMENT DRAINAGE AREA

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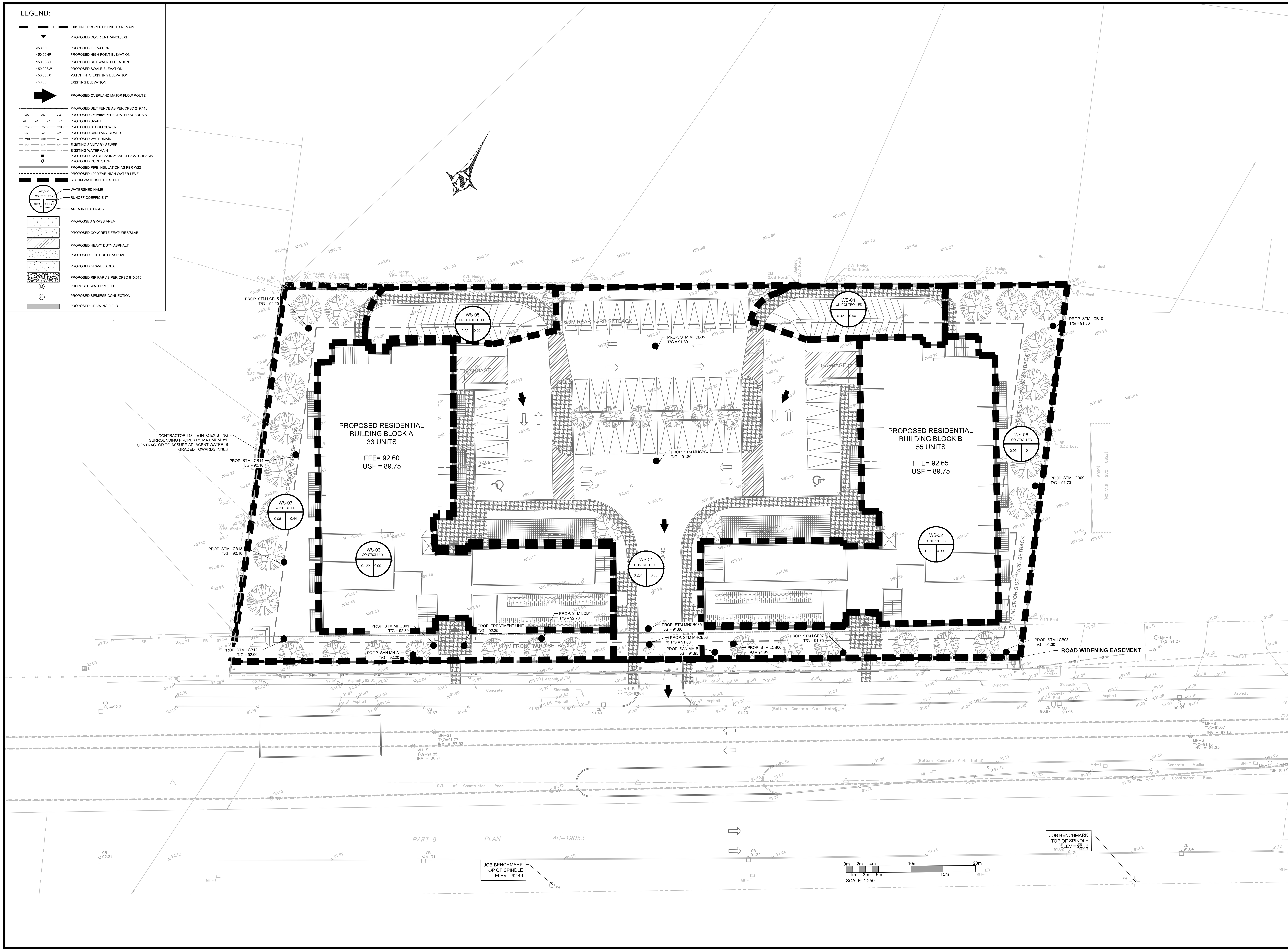

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
03/05/2022
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(613) 693-0700 blengineering.ca

CLIENT:
OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

DRAWING:
POST DEVELOPMENT DRAINAGE AREA

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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

3817 INNES ROAD
OTTAWA, CANADA

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
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, TESTED 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 AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. 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.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/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 - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 20-50 mm (3/4-2").
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-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 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/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/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.

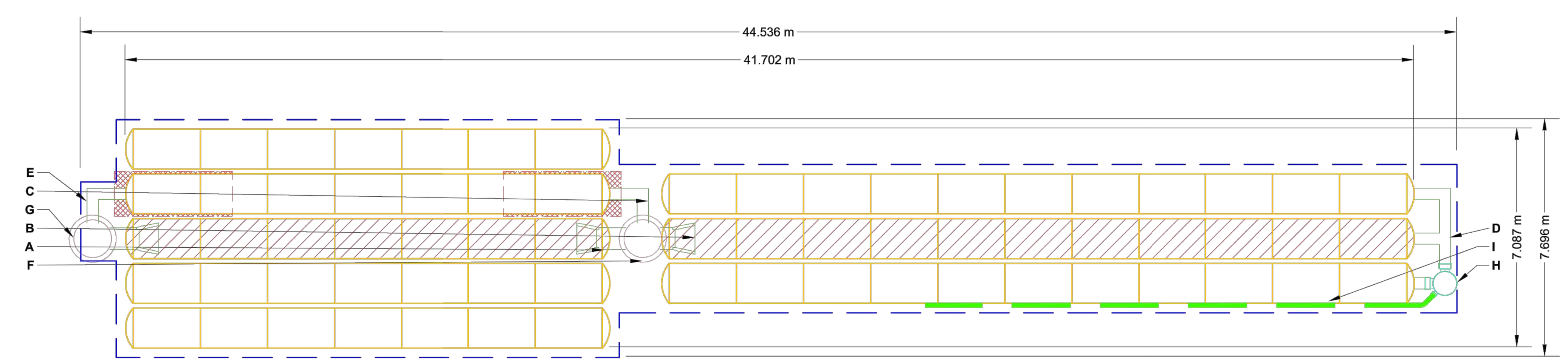
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT	
68	STORMTECH SC-740 CHAMBERS
16	STORMTECH SC-740 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	STONE VOID
163.3	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
258.4	SYSTEM AREA (m^2)
104.5	SYSTEM PERIMETER (m)

PROPOSED ELEVATIONS	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	93.198
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	91.369
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	91.217
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	91.217
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	91.217
TOP OF STONE:	90.912
TOP OF SC-740 CHAMBER:	90.759
300 mm x 300 mm TOP MANIFOLD INVERT:	90.315
300 mm x 300 mm TOP MANIFOLD INVERT:	90.315
300 mm x 300 mm BOTTOM MANIFOLD INVERT:	90.028
300 mm BOTTOM CONNECTION INVERT:	90.028
600 mm ISOLATOR ROW PLUS INVERT:	90.000
600 mm ISOLATOR ROW PLUS INVERT:	90.000
BOTTOM OF SC-740 CHAMBER:	89.997
UNDERDRAIN INVERT:	89.845
BOTTOM OF STONE:	89.845

*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#: SC740ECEZ / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	3 mm	
FLAMP	B	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: SC74024RAMP (TYP 3 PLACES)		
MANIFOLD	C	300 mm x 300 mm TOP MANIFOLD, ADS N-12	318 mm	
MANIFOLD	D	300 mm x 300 mm BOTTOM MANIFOLD, ADS N-12	30 mm	
MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	318 mm	
CONCRETE STRUCTURE	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		65 L/s IN
CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		65 L/s IN
NYLOPLAST (OUTLET)	H	750 mm DIAMETER (DESIGN BY ENGINEER)		113 L/s OUT
UNDERDRAIN	I	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS (SEE DETAIL/TYP 2 PLACES)

PLACE MINIMUM 3.810 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- 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.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

3817 INNES ROAD
OTTAWA, CANADA
DATE: | DRAWN: HN
PROJECT #: | CHECKED: N/A

DATE | DRW | CHK | DESCRIPTION

StormTech®
Chamber System
888-892-2694 | WWW.STORMTECH.COM

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

SCALE = 1 : 150

SHEET
2 OF 6

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
03/05/2022
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3817 - 3843 INNES RD,
ORLEANS, ON

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DETAILS - 1

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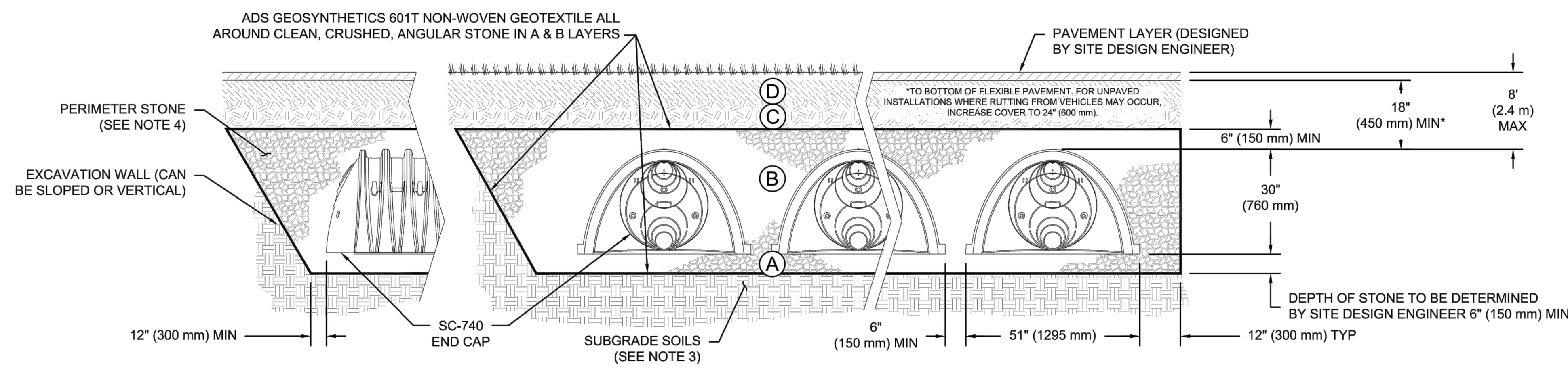
ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

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 18" (450 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	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	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.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 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.
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 SHALL BE GREATER THAN OR EQUAL TO 550 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 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

3817 INNES ROAD
OTTAWA, CANADA

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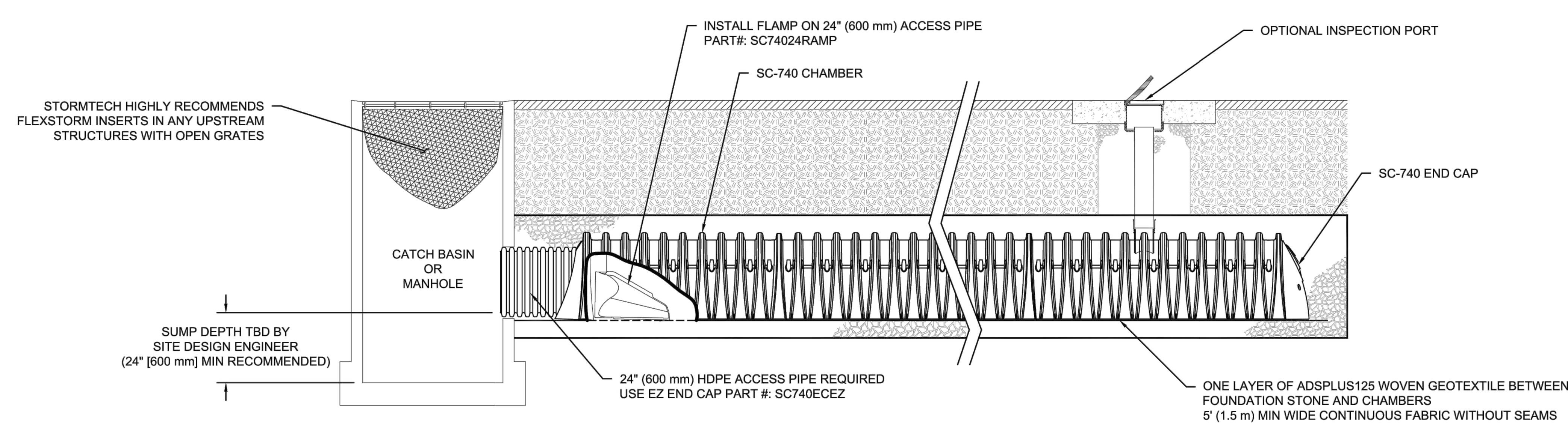

SC-740 ISOLATOR ROW PLUS DETAIL
NTS

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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ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
03/05/2022
PROVINCE OF ONTARIO

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#3	ISSUED FOR CITY COMMENTS	05 / 04 / 2021
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#1	ISSUED FOR SPA	14 / 10 / 2020

BLANCHARD LETENDRE
ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, K0A 1W1
(613) 693-0700 blengineering.ca

CLIENT:

OLIGO DEVELOPMENT
996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
3817 - 3843 INNES RD,
ORLEANS, ON

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DETAILS - 2

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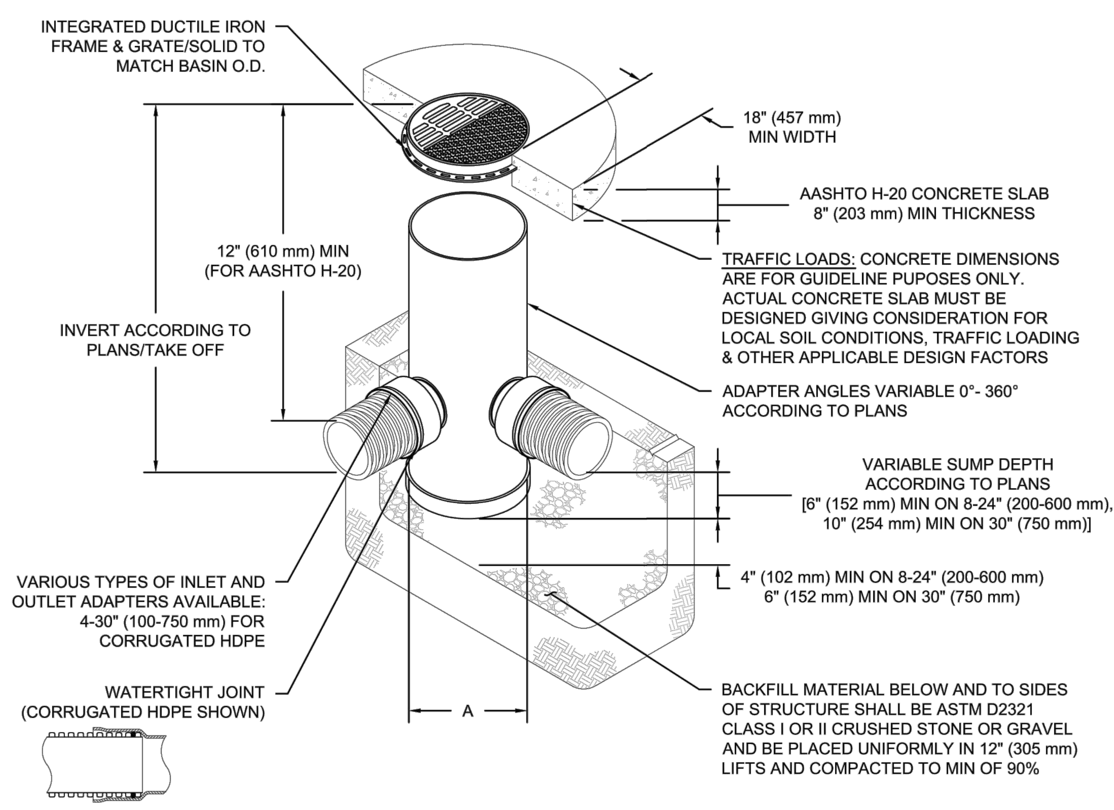
NYLOPLAST DRAIN BASIN

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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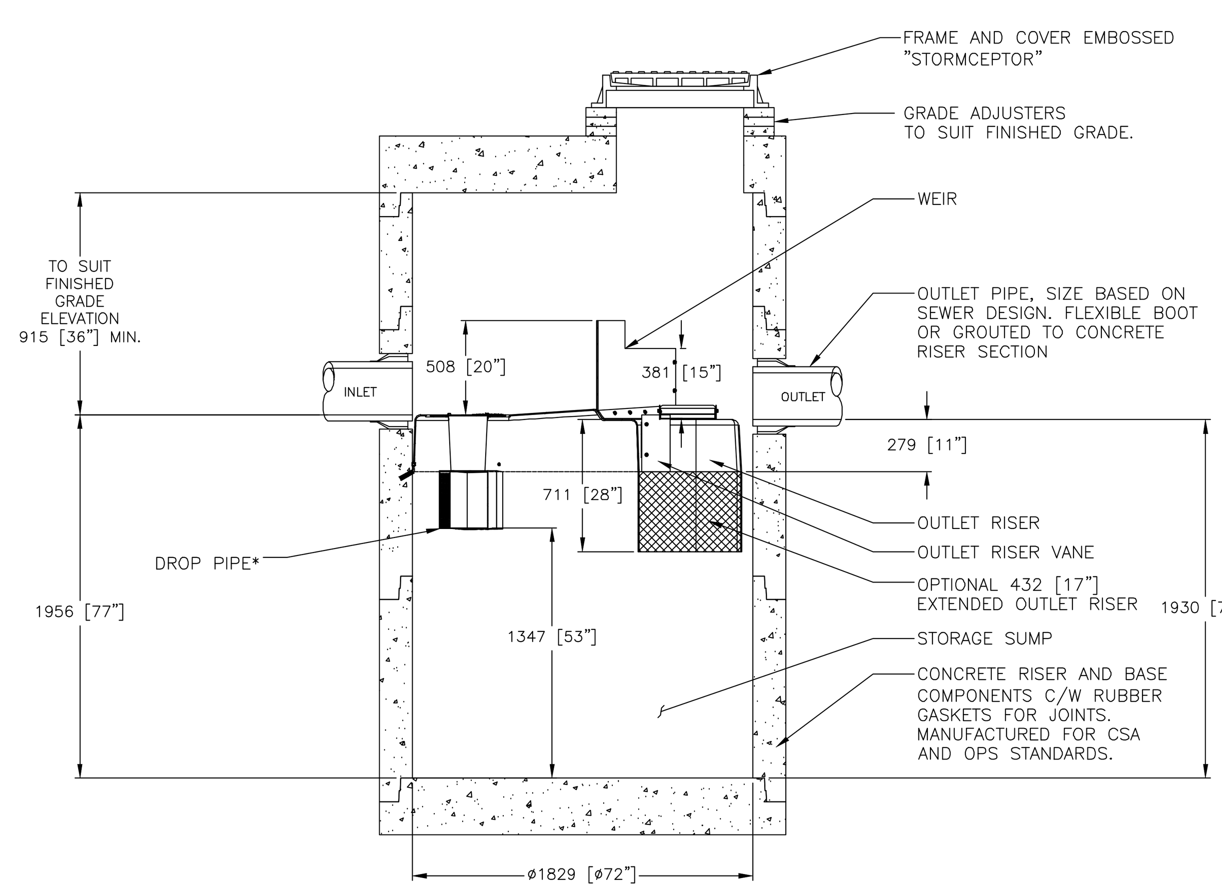
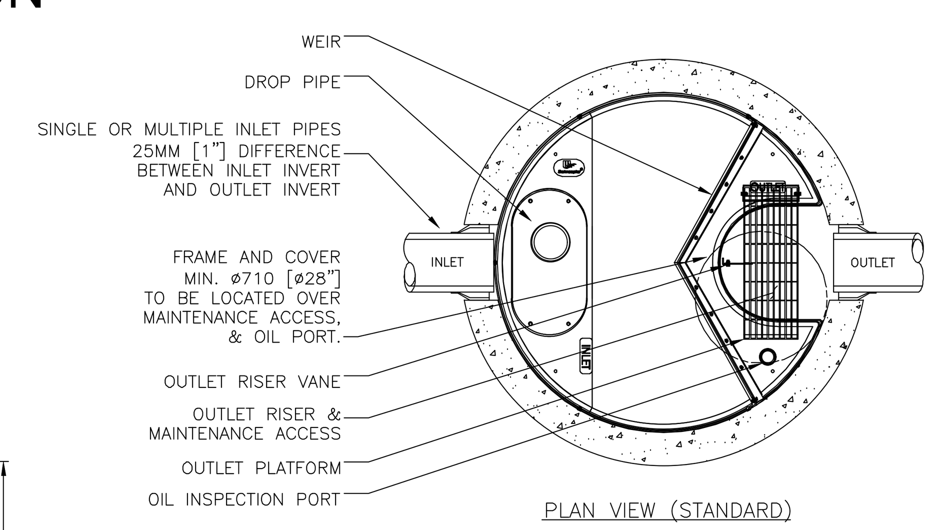
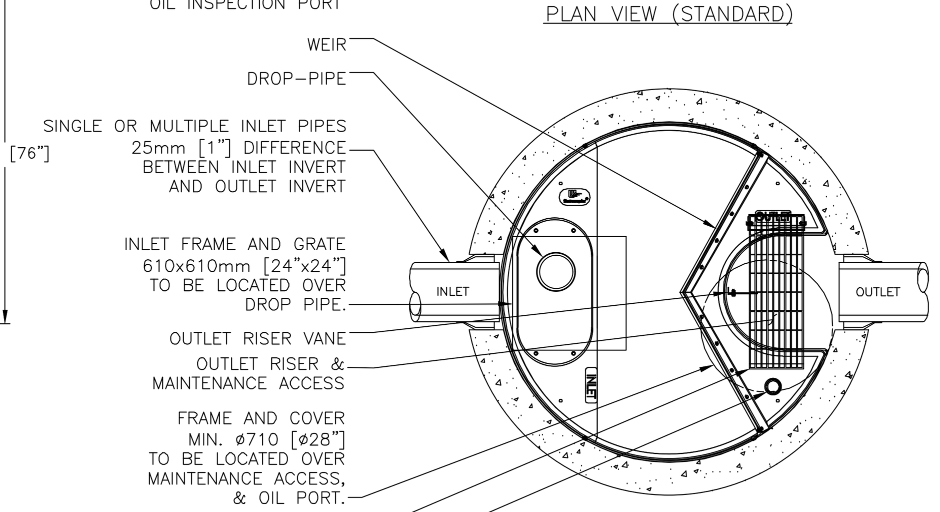
DRAWING NOT TO BE USED FOR CONSTRUCTION



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/m2 (27.9 gpm/ft2) FOR STORMCEPTOR EF6 AND 535 L/min/m2 (13.1 gpm/ft2) 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

REVISION	DATE	MARK
OUTLET PLATFORM	1/5/18	
INITIAL RELEASE	10/13/17	

SCALE = NTS

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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.: *
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