SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Project Address – 1592 Tenth Line Road, Orleans On

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

By Blanchard Letendre Engineering Ltd.
Date – November 20, 2020
Our File Reference: 20-261

First Submission
November 19, 2020

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APPENDIX TABLE

1.0 INTRODUCTION

Blanchard Letendre Engineering Ltd. (BLEL) was retained by Bridor Developments. to complete their site servicing and stormwater management for the new proposed site located at 1592 Tenth Line in Orleans. 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 ADSI Arpentage Dutrisac Surveying Inc. 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 at 1592 Tenth Line in Orleans, Ontario. As per the aerial picture in figure 1, the existing site (0.149ha) consist of a existing house with a paved entrance to Tenth Line and some green space area. The existing building will be demolished prior to construction. The land will be developed with a new apartment building with a new underground parking garage.

Figure 1- Existing site at 1592 Tenth Line, Orleans, Ontario

3.0 STORM WATER MANAGEMENT

3.1 Existing Site Condition

The existing site currently has and existing residential home with an access driveway off Tenth Line. The existing property has a split drainage where half the property drains towards Tenth Line and the other portion towards Phoenix Crescent. The property is bounded by residential homes and a commercial development east of Tenth Line. 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 residential apartment building which will combine a total of thirty (30) residential units with a connecting underground parking garage. The site will be modified by adding a total of 626 square meter building, asphalt area and amities. 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 and proposed underground parking garage. The property has a split drainage where a portion drains east towards Tenth Line whereas the west portion drains west towards Phoenix Crescent. The affected area stormwater management will outlet to City storm sewer on Phoenix Crescent and the overland flow route was designed to convey the storm runoff towards the city right away.

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 the existing city storm sewer on Phoenix Crescent. 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 undersized 200mm diameter storm pipe which will act as an orifice and limit the flow outletting to City storm sewer on Phoenix. By throttling the flow, stormwater retention will be completed with the use of underground pipe 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 5-year storm and a 10-minute time of concentration for the affected area. From the 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 0.50 was used as per the city of Ottawa design Guidelines, see Appendix 'A' – Pre-Development Drainage Area table.

Using the Rational Method and considering the tributary areas of the affected area by the proposed (see Appendix 'A'), the pre-development allowable release rate for the site was evaluated at **21.52 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 =	0.50
I =	104.2 mm/hr
Tc =	10 min
Total =	0.149 ha
Allowable Release Rate=	**21.52 L/s**

3.4 Proposed Stormwater Quantity Control

The proposed stormwater management for the site will be achieve primarily through the use of underground chambers storage. As most of the site will be covered with the underground parking area that will connect both buildings, a portion of the stormwater will be in the underground parking and the balance will be around the building foundation footprint. The grading of the site has been designed to direct the stormwater towards the series of catchbasins connected to the underground stormwater sewers before outleting west into the 300mm diameter storm city sewer on Phoenix Crescent. The proposed underground stormwater sewers and cathcbasins are shown on the attached drawings in Appendix 'E'.

The proposed site affected area has been graded to outlet overland onto Tenth Line and Phoenix Crescent. As the site has a split drainage and that the front and rear of the property are facing city right of ways, 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 nearest city right of way and will be captured through a series of catchbasins.

The stormwater generated from site affected area will be discharged to the existing storm sewer on Phoenix Crescent and be controlled using an undersized pipe which will throttle the flow direct to the municipal sewer. The proposed 200mm diameter pipe will release a total of **18.05 L/s** with a maximum head of 2.31m (HWL = 88.08) during the 100 year event. As the flow will be restricted, 31.92m^3 of stormwater storage will be required for this area. This storage will be provided with underground stormwater chamber. The underground chamber, model MC-3500 chambers designed by ADS Pipe were designed to hold up to 37.10 m^3 with a HWL of 87.40.

Part of the frontage and rear of the property will be left uncontrolled due to the proximity of the city right away. These areas (WS-05 and WS-06) will therefore drain uncontrolled towards the respective city right away and be captured by the road catchbasins. These uncontrolled areas will generate a total flow of **3.47L/s** under the 100 year event conditions. Therefore with the outlet

restriction and the provided stormwater storage, the post-development will meet the pre-development flow to the city main storm sewer on Phoenix Crescent.

3.4.1 Roof Drainage

The proposed roofs are flat roof with roof drains. Drain and scuppers will be installed to drain the water into the storm pipes located in the underground garage.

3.4.1 Underground Parking Garage

The proposed underground parking will be drain using a series of catchbasin that will be connected to the sanitary pipe of the building. The flow that will be generated from the underground parking will consist of the ramps area hard surface and the snow/water accumulation on the cars.

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 EF04 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 an existing 135mm diameter service that is connected to the existing sanitary main on Tenth Line. The existing connection will be abandoned whereas the new connection will be completed off Phoenix Crescent that will service the new building.

4.2 Existing Site Conditions

The new apartment building, will discharge to the city via a new 150mm diameter sanitary service. The service will be located on the west side of the buildings and will discharge to the existing 250mm diameter city sewer running along Phoenix Crescent. The proposed 150mm diameter service will be installed at a minimum of 1.00% slope directly to the city sewer. A monitoring manhole is proposed for the new connections which will be installed at the property line. Refer to drawing C300 – Site Servicing Plan for the proposed sanitary service.

Based on the City of Ottawa Sanitary Design Guidelines, the sanitary peak loads were evaluated at **1.40 L/s.** As per the City specific design parameters, the sanitary flow was evaluated based on

the residential unit counts, new building footprint and the total site area. 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 19mm diameter home service which services the existing house and is connected to the existing 254mm diameter watermain on Tenth Line. The existing connection will be abandoned whereas the new connection will be completed off Phoenix Crescent which will service the new building. There is currently one (1) city fire hydrant on the west side of Tenth Line and two (2) fire hydrants on the west side of Phoenix that are all 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 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 **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:

		UNITS
Average Water Demand =	**10.21**	L/min
Maximum Daily =	**25.52**	L/min
Maximum Hourly =	**56.15**	L/min
Total Domestic Flow =	**0.94**	**L/s**
Total Fire Flow =	**136.67**	**L/s**

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

5.3 Proposed Fire Demand

As the residential apartment buildings will not have a fire suppression sprinkler system, the new service was sized to supply the daily water demand. Based on the Ontario building code

calculations, the water flow was evaluated at **136.67L/s**. Refer to Appendix 'C' for the fire flow calculation sheet.

The proposed buildings will be serviced with a new 50mm water service which will connect to the existing 250mm diameter watermain on Phoenix Crescent. The new services will be installed at the west side of the new buildings and be placed in the same trench as the sanitary service.

5.4 Water Capacity Comments

The boundary conditions and HGL for hydraulic analysis for 1592 Tenth Line were obtained from the city, see attached copy in Appendix 'E'. From the boundary conditions, there is a maximum HGL of 130.2 m for the water main elevation at 87.69 m and a maximum pressure estimate of 60.4 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 of the site will be maintained to its pre-development rate of **21.52 L/s** thought undersizing the outlet to the sewer main on Phoenix Crescent. Stormwater quantity control will be achieved with 37.1m^3 underground pipes/structures. The stormwater quality control will be met through the use of a stormwater treatment unit.

7.2 Sanitary Service

The current site will be services with a new 150mm sanitary connection onto Phoenix Crescent. The estimated sanitary flow of **1.40 L/s** will be directed to the existing 250mm sanitary sewer along Phoenix Crescent.

7.3 Water Service

Currently the existing building on site is serviced with an existing 19mm diameter water service that will be replaced with a new 50mm diameter water service to be connected to the existing 252mm diameter main on Phoenix Crescent. The existing connection will be replaced with a new 50mm water service. The water demand for the building was evaluated at **0.94 L/s** and the fire

flow demand **136.67L/s.** Sprinkler system is not proposed for the site. There is also one (3) fire located around the property within 90m from every entrance doors.

8.0 LIMITATION

This report was prepared for **Bridor Developement.**, and is only applicable for the property at 1592 Tenth Line, 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.
Civil Engineer

Benjamin Falconer, E.I.T.

APPENDIX "A"
Stormwater Management Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-363	**Date:**	November 19, 2020
Project:	New Residential Development	**Designed:**	Benjamin Falconer
Project Address:	1592 Tenth Line Road - Orleans	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C300

PRE-DEVELOPMENT DRAINAGE AREA

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.30	C = 0.80	C = 0.90		
E-01	0.092	0.000	0.056	0.149	0.53
TOTAL	0.092	0.000	0.056	0.149	0.53

POST-DEVELOPMENT DRAINAGE AREA

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.20	C = 0.80	C = 0.90		
WS-01 - ROOF	0.000	0.000	0.049	0.049	0.90
WS-02 - ROOF	0.000	0.000	0.033	0.033	0.90
WS-03	0.002	0.000	0.040	0.042	0.86
WS-04	0.000	0.000	0.010	0.010	0.90
WS-05	0.008	0.000	0.000	0.008	0.20
WS-06	0.004	0.000	0.004	0.007	0.56
TOTAL	0.002	0.000	0.135	0.149	0.84

RUNOFF COEFFICIENT (C)

Grass	0.20
Gravel	0.80
Asphalt / rooftop	0.90

BLANCHARD LETENDRE
ENGINEERING

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Checked: Guillaume Brunet
Drawing Reference: C300

STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION			AREA (ha)			FLOW					STORM SEWER DATA							
WATERSHED / STREET	From MH	To MH	C = 0.20	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-03	MH06	MH05	0.002	0.000	0.040	0.10	0.10	10.00	104.19	10.56	200	PVC	0.25%	16.5	16.4	0.52	0.53	**0.64**
WS-02	MH05	MH04	0.000	0.000	0.049	0.12	0.22	10.53	101.49	22.73	250	PVC	0.25%	15.6	29.7	0.61	0.43	**0.76**
WS-01	MH04	MH03	0.000	0.000	0.033	0.08	0.31	10.96	99.40	30.47	200	PVC	0.25%	4.6	16.4	0.52	0.15	**1.86**
	MH03	MH02	0.000	0.000	0.000	0.00	0.31	10.96	99.40	30.47	200	PVC	0.38%	42.2	20.2	0.64	1.09	**1.51**
	MH02	MH01	0.000	0.000	0.000	0.00	0.31	11.10	98.71	30.26	200	PVC	0.38%	20.8	20.2	0.64	0.54	**1.50**
	MH01	CITY	0.000	0.000	0.000	0.00	0.31	12.05	94.49	28.96	200	PVC	0.30%	8.5	18.0	0.57	0.25	**1.61**

DESIGN PARAMETERS NOTES

Runoff Coefficient (C)	
Grass	0.2
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

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STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION		MANHOLE INFORMATION							AVAILABLE STORAGE						
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)	Pipe Storage 5 Year (m^3)	Pipe Storage 100 year (m^3)	Upstream CB/MH Size (m)	Water Depth 5 year (m)	Water Depth 100 year (m)	CB/MH Storage 5 year (m^3)	CB/MH Storage 100 year (m^3)
MH06	MH05	85.74	85.70	88.90	88.90	2.96	3.00	2.96	0.52	0.52	0.60	2.34	2.34	0.84	0.84
MH05	MH04	85.67	85.63	88.90	88.08	2.98	2.20	2.98	0.77	0.77	0.60	2.41	2.41	0.87	0.87
MH04	MH03	85.57	85.55	88.08	88.08	2.31	2.33	2.31	-	-	-	-	-	-	-
MH03	MH02	85.49	85.33	88.08	88.00	2.39	2.47	2.39	-	-	-	-	-	-	-
MH02	MH01	85.27	85.20	88.00	88.05	2.53	2.65	2.53	-	-	-	-	-	-	-
MH01	CITY	85.18	85.15	88.05	87.80	2.87	-	2.87	-	-	-	-	-	-	-
									1.28	**1.28**				**1.71**	**1.71**

HWL (5 Year)		88.08
HWL (100 Year)		88.08
TOTAL STORAGE - 5 YEAR		3.00
TOTAL STORAGE - 100 YEAR		3.00

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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	0.149	ha	R=	0.53
	Total Uncontrolled =	**0.149**	ha	**∑R=**	**0.53**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

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

C =	0.50	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines
I =	104.2	mm/hr
Tc =	10	min
Total =	0.149	ha
Allowable Release Rate=	**21.52**	**L/s**

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
Controlled	WS-01	0.049	ha	R=	0.90	1.00
	WS-02	0.033	ha	R=	0.90	1.00
	WS-03	0.042	ha	R=	0.86	1.00
	WS-04	0.010	ha	R=	0.90	1.00
	Total Contolled =	**0.134**	**ha**	**∑R=**	**0.89**	**1.00**
Un-controlled	WS-05	0.008	ha	R=	0.20	0.25
	WS-06	0.007	ha	R=	0.56	0.70
	Total Un-Controlled =	**0.015**	**ha**	**∑R=**	**0.37**	**0.34**

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

		REQUIRED STORAGE				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	104.2	34.44	9.83	18.05	1.62	19.67
15	83.6	27.62	8.61	18.05	1.30	19.35
20	70.3	23.22	6.20	18.05	1.09	19.14
25	60.9	20.13	3.11	18.05	0.95	19.00
30	53.9	17.83	0.00	18.05	0.84	18.89
35	48.5	16.04	0.00	18.05	0.75	18.81
40	44.2	14.60	0.00	18.05	0.69	18.74
50	37.7	12.45	0.00	18.05	0.59	18.64
60	32.9	10.89	0.00	18.05	0.51	18.56
80	26.6	8.78	0.00	18.05	0.41	18.47
90	24.3	8.03	0.00	18.05	0.38	18.43

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**9.83 m^3**	
Pipe Storage =	0.00 m^3	refer to Storm Sewer Design Sheet
CB/MH Storage =	0.00 m^3	refer to Storm Sewer Design Sheet
Underground Chambers =	37.10 m^3	
Total Available Storage =	**37.10 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	0.149	ha	R=	0.53
	Total Uncontrolled =	**0.149**	ha	$\sum$**R=**	**0.53**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

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

C =	0.50	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines
I =	104.2	mm/hr
Tc =	10	min
Total =	0.149	ha
Allowable Release Rate=	**21.52**	**L/s**

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
Controlled	WS-01	0.049	ha	R=	0.90	1.00
	WS-02	0.033	ha	R=	0.90	1.00
	WS-03	0.042	ha	R=	0.86	1.00
	WS-04	0.010	ha	R=	0.90	1.00
	Total Contolled =	**0.134**	**ha**	$\sum$**R=**	**0.89**	**1.00**
Un-controlled	WS-05	0.008	ha	R=	0.20	0.25
	WS-06	0.007	ha	R=	0.56	0.70
	Total Un-Controlled =	**0.015**	**ha**	$\sum$**R=**	**0.37**	**0.47**

$$\mathbf{I_{100} = 1735.688 / (Td + 6.014)^{0.820}}$$

		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	66.47	29.05	18.05	3.47	21.52
15	142.9	53.19	31.62	18.05	2.78	20.83
20	120.0	44.65	31.92	18.05	2.33	20.38
25	103.8	38.66	30.90	18.05	2.02	20.07
30	91.9	34.20	29.06	18.05	1.78	19.84
35	82.6	30.74	26.64	18.05	1.60	19.66
40	75.1	27.97	23.81	18.05	1.46	19.51
50	64.0	23.81	17.26	18.05	1.24	19.30
60	55.9	20.81	9.91	18.05	1.09	19.14
70	49.8	18.53	2.02	18.05	0.97	19.02
90	41.1	15.30	0.00	18.05	0.80	18.85
100	*37.9*	14.11	0.00	18.05	0.74	18.79
110	35.2	13.10	0.00	18.05	0.68	18.74
120	32.9	12.24	0.00	18.05	0.64	18.69

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**31.92 m^3**	
Pipe Storage =	1.28 m^3	refer to Storm Sewer Design Sheet
CB/MH Storage =	1.71 m^3	refer to Storm Sewer Design Sheet
Underground Chambers =	37.10 m^3	
Total Available Storage =	**40.10 m^3**	

APPENDIX "B"
Sanitary Design

BLANCHARD LETENDRE
ENGINEERING

File No. 20-363
Project: New Residential Development
Project Address: 1592 Tenth Line Road - Orleans
Client: Bridor Development

Date: November 19, 2020
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Drawing Reference: C300

SANITARY DESIGN SHEET
SEWER DESIGN

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE						MANHOLE	
STREET	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE 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	MH01	0.149	42.0	0.15	42.0	4.0	0.68	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.68	0.149	0.149	0.04	1.40	16.2	150	PVC	1.00%	15.23	0.86	85.87	85.71
	MH01	CITY	0.000	42.0	0.00	0.0	0.0	0.00	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.000	0.149	0.04	1.40	10.8	150	PVC	1.00%	15.23	0.86	85.71	85.60

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	Appartment	Total
Bachelor =	1.4	0	0
1 Bedroom =	1.4	30	42
2 Bedroom =	2.1	0	0
3 Bedroom =	3.1	0	0

APPENDIX "C"
Watermain Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-363	**Date:**	November 19- 2020
Project:	New Residential Development	**Designed:**	Guillaume Brunet
Project Address:	1592 Tenth Line Road - Orleans	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	

WATER CONSUMPTION CALCULATION

Total Building Floor Area =	**688**	m^2	
Site Total Area =	**0.214**	ha	
Total Population =	42	ea.	
Average Demand Per People =	350	L/c/d	
Average Water Demand =	**14700.00**	L/d	0.17
Maximum Daily Peak Factor =	2.5	* As per City of Ottawa	
Maximum Daily =	**36750.00**	L/d	0.43
Maximum Hourly Peak Factor =	2.2	* As per City of Ottawa	
Maximum Hourly =	**80850.00**	L/d	0.94
Total Domestic Flow =	**0.94**	**L/s**	
Total Fire Flow =	**136.67**	**L/s**	

	Unit Counts	WSFU	Total
Unrinal Flush Tank	30	2	60
Sinks	60	1	60
Bathub	30	4	120
Diswasher	30	1.5	45
Washing Machine	30	2	60
Total			345

Appartments:	Person Per Unit	Appartment	Total
Bachelor =	1.4	0	0
1 Bedroom =	1.4	30	42
2 Bedroom =	2.1	0	0
3 Bedroom =	3.1	0	0
Total			42

BLANCHARD LETENDRE
ENGINEERING

File No.	20-363	**Date:**	November 19- 2020
Project:	New Residential Development	**Designed:**	Guillaume Brunet
Project Address:	1592 Tenth Line Road - Orleans	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	

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	10	unit	
	Townhouse - no. of units	0				
	Building - no. of units per floor	10				
	Number of floors excluding the basement	3		3	floor	
	Floor space per unit	varies	626	626	sq.m.	
Required fire flow	**Fire Flow = 220 x C x Area^0.5**				L/min	**7,627**
					L/s	127
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	**6,483**
	Rapid burning	0.25			L/s	108
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	**5,835**
	Fully supervised system	-0.10	True	-0.1	L/s	97
Exposure distance between units	North side	20.1 to 30m	0.1			
	East side	Over 45m	0			
	South side	3.1 to 10m	0.2		L/min	**8,169**
	West side	20.1 to 30m	0.1	0.4	L/s	136
			Minimum required fire flow rate (rounded to nearest 100)		L/min	**8,200**
			Minimum required fire flow rate		L/s	**136.67**
			Required duration of fire flow		min	**30**

APPENDIX "D"
Underground Chambers & Stormwater Treatment Unit

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	HAIDER NASRULLAH 647-850-9417 HAIDER.NASRULLAH@ADS-PIPE.COM
ADS SALES REP:	MICHAEL REID 613-882-4186 MICHAEL.REID@ADS-PIPE.COM
PROJECT NO:	S209349
ADS SITE COORDINATOR:	MATTHEW BEGHIN 519-710-3687 MATTHEW.BEGHIN@ADS-PIPE.COM

ADVANCED DRAINAGE SYSTEMS, INC.

SiteASSIST™ by StormTech

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1592 TENTH LINE ROAD

ORLEANS, ON.

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
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 F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
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 75 mm (3").
   - 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 500 LBS/IN/IN. 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 MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 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. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm)..
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. 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 MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 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 CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING 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

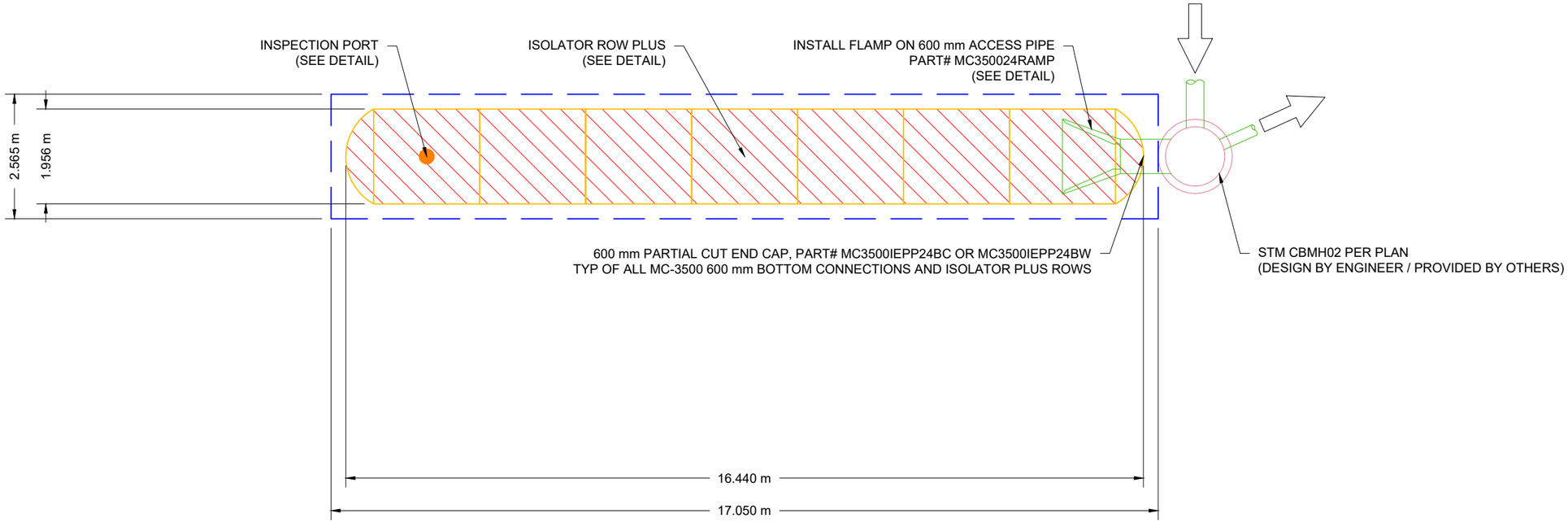
7	STORMTECH MC-3500 CHAMBERS
2	STORMTECH MC-3500 END CAPS
305	STONE ABOVE (mm)
229	STONE BELOW (mm)
40	% STONE VOID
37.1	**INSTALLED SYSTEM VOLUME (m^3) ABOVE ELEVATION 86.00 (PERIMETER STONE INCLUDED)**
43.7	SYSTEM AREA (m^2)
39.2	SYSTEM PERIMETER (m)

PROPOSED ELEVATIONS

89.529	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):
87.701	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):
87.548	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):
87.548	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):
87.548	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT):
87.396	TOP OF STONE:
87.091	TOP OF MC-3500 CHAMBER:
86.000	600 mm ISOLATOR ROW PLUS INVERT:
85.948	BOTTOM OF MC-3500 CHAMBER:
85.719	BOTTOM OF STONE:

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL 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.



1592 TENTH LINE ROAD
ORLEANS, ON.

DATE: 11/04/20 | DRAWN: RCT | CHECKED: NPB | PROJECT #: S209349

DATE	DRWN	CHKD	DESCRIPTION

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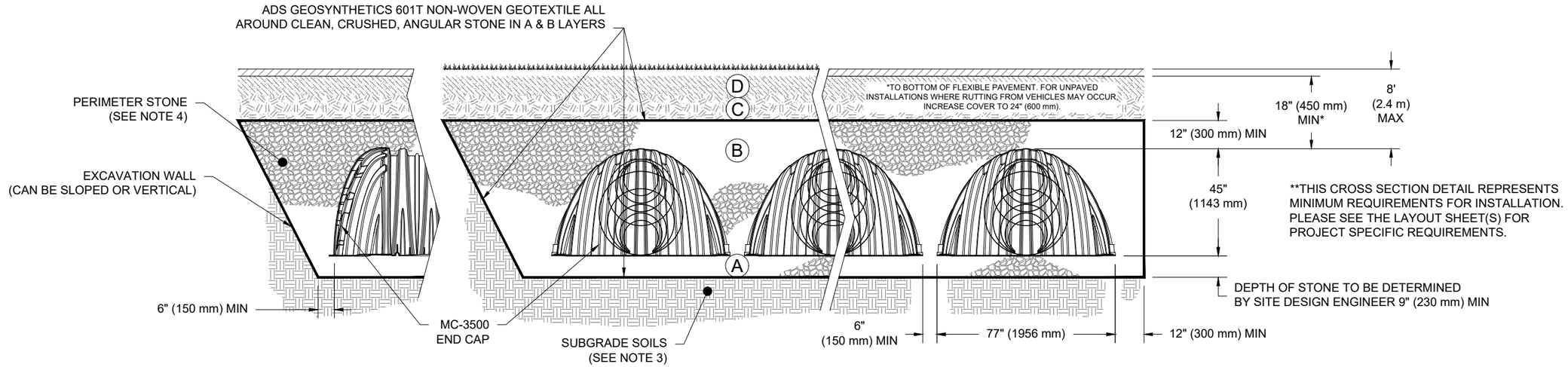
ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

SCALE = 1 : 100

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 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 24" (600 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 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
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, 4	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, 4	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 9" (230 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 F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 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 3".
   - 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 500 LBS/IN/IN. 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.

1592 TENTH LINE ROAD
ORLEANS, ON.

DATE: 11/04/20 | DRAWN: RCT | CHECKED: NPB | PROJECT #: S209349

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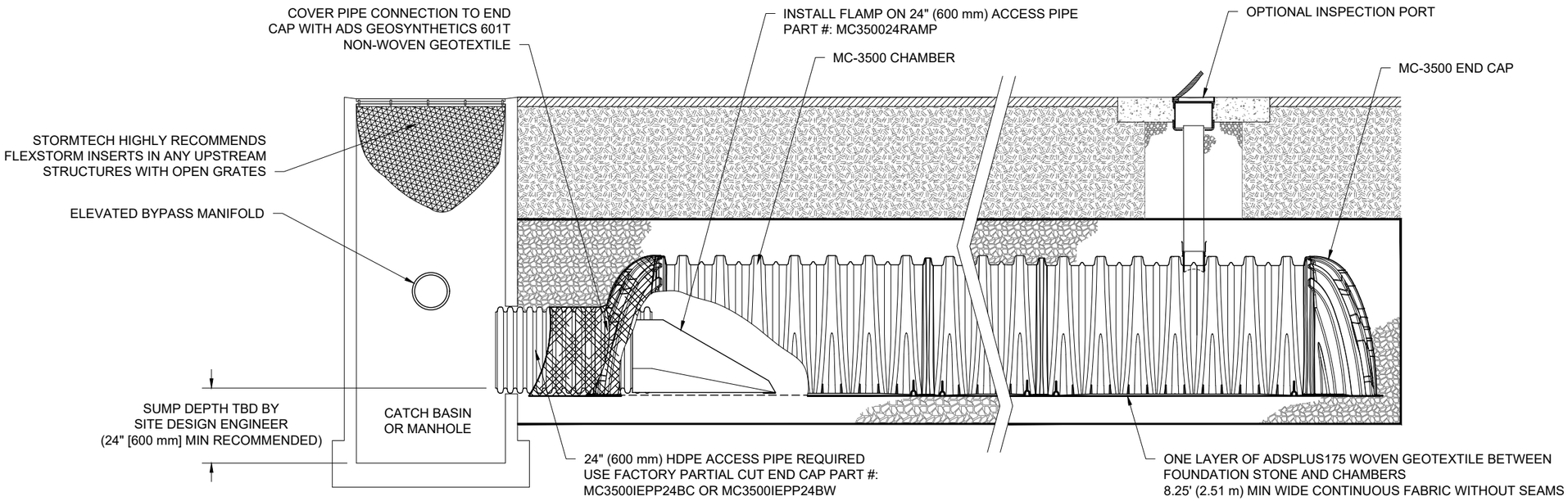


MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

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

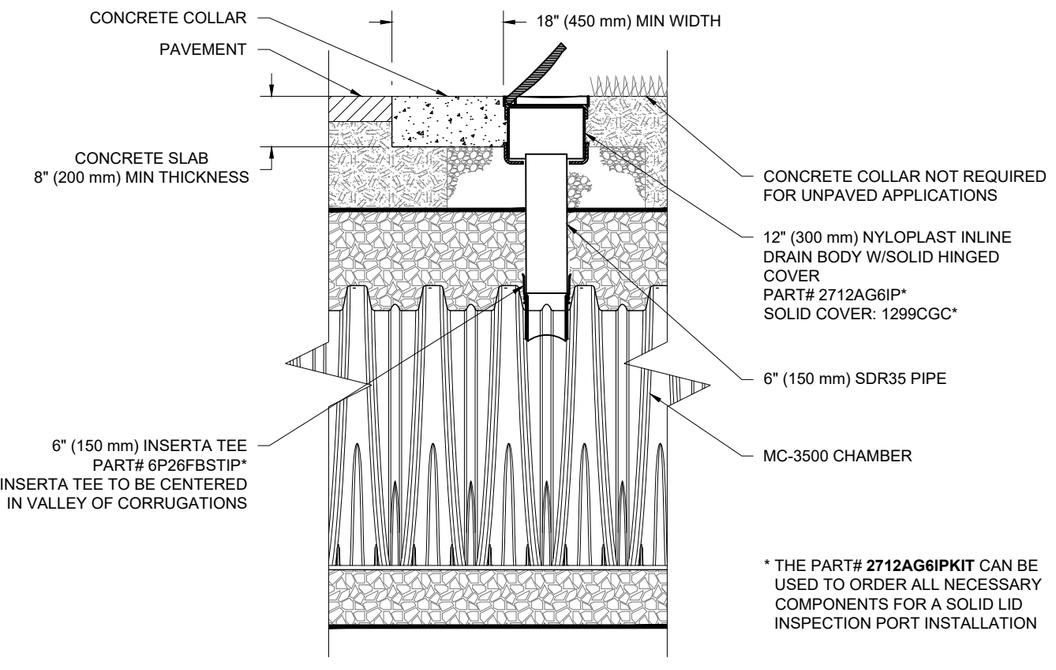
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

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.



MC-3500 6" (150 mm) INSPECTION PORT DETAIL
NTS

1592 TENTH LINE ROAD
ORLEANS, ON.

DATE: 11/04/20 | DRAWN: RCT | CHECKED: NPB
PROJECT #: S209349

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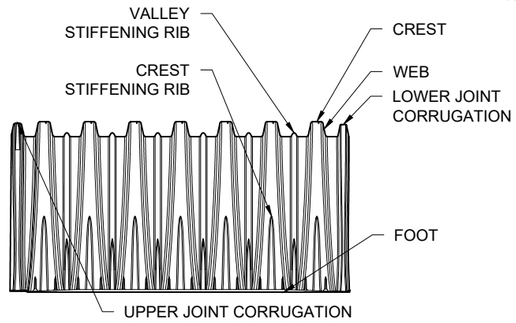
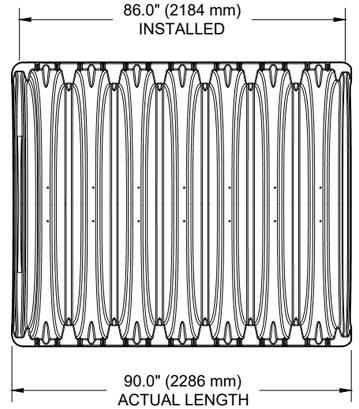
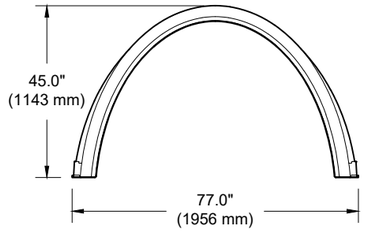
ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

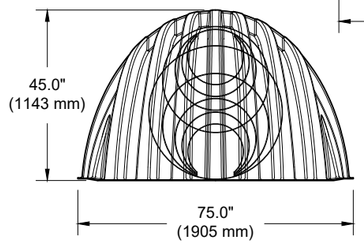
MC-3500 TECHNICAL SPECIFICATION

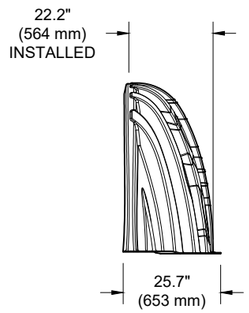
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

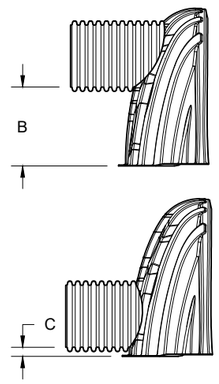
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

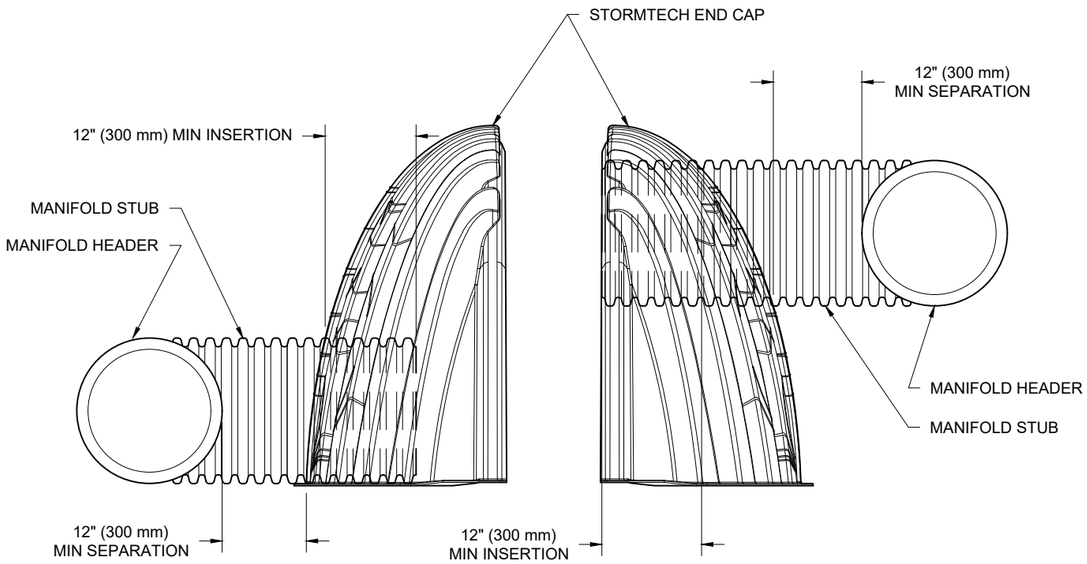
NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

1592 TENTH LINE ROAD
ORLEANS, ON.

DATE: 11/04/20 | DRAWN: RCT | CHECKED: NPB | PROJECT #: S209349

DATE	DRWN	CHKD	DESCRIPTION

StormTech
Detention • Retention • Water Quality
520 CROMWELL AVENUE | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

ELEV. = 87.63

PROP. STM CBMH01
TREATMENT UNITS STORMCEPTOR EF-04 OR
EQUIVALENT, SEE C500
T/G = 88.08
N INV.=85.50
S INV. = 85.80

PROP. STM 4.5m - 200mm Ø PVC
DR-35 @0.38%

FOUNDATION INVERT
INV. = 85.90

PROP. STM 3.8m - 300mm Ø PVC
DR-35 @0.38%

PROP. STM CBMH02
T/G = 88.08
N INV.= 85.82
S INV. = 86.00
W INV. = 86.00

CONNECTION FROM
UNDERGROUND PARKING TO
STORM SEWER

PROPOSED
RESIDENTIAL
BUILDING BLOCK 'A'
12 UNITS

USF =

PROP.STORM STORAGE
UNDERGROUND CHAMBERS
VOLUME = 35 m³
TOTAL RELEASE RATE = 20.12 L/s

TENTH LINE ROAD

Project: **1592 Tenth Line Road**

Chamber Model -	MC-3500		
Units -	**Metric**	Click Here for Imperial	
Number of Chambers -	7		
Number of End Caps -	2		
Voids in the stone (porosity) -	40	%	
Base of Stone Elevation -	85.72	m	☑ Include Perimeter Stone in Calculations
Amount of Stone Above Chambers -	305	mm	
Amount of Stone Below Chambers -	229	mm	
Amount of Stone Between Chambers -	152	mm	
	43.7	sq.meters	Min. Area - 35.246 sq.meters

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
1676	0.00	0.00	0.00	0.00	0.444	0.44	42.87	87.40
1651	0.00	0.00	0.00	0.00	0.444	0.44	42.43	87.37
1626	0.00	0.00	0.00	0.00	0.444	0.44	41.99	87.34
1600	0.00	0.00	0.00	0.00	0.444	0.44	41.54	87.32
1575	0.00	0.00	0.00	0.00	0.444	0.44	41.10	87.29
1549	0.00	0.00	0.00	0.00	0.444	0.44	40.65	87.27
1524	0.00	0.00	0.00	0.00	0.444	0.44	40.21	87.24
1499	0.00	0.00	0.00	0.00	0.444	0.44	39.77	87.22
1473	0.00	0.00	0.00	0.00	0.444	0.44	39.32	87.19
1448	0.00	0.00	0.00	0.00	0.444	0.44	38.88	87.17
1422	0.00	0.00	0.00	0.00	0.444	0.44	38.44	87.14
1397	0.00	0.00	0.00	0.00	0.444	0.44	37.99	87.12
1372	0.00	0.00	0.01	0.00	0.439	0.45	37.55	87.09
1346	0.01	0.00	0.04	0.00	0.428	0.47	37.10	87.07
1321	0.01	0.00	0.06	0.00	0.420	0.48	36.63	87.04
1295	0.01	0.00	0.08	0.00	0.411	0.49	36.15	87.01
1270	0.02	0.00	0.14	0.00	0.388	0.53	35.66	86.99
1245	0.03	0.00	0.20	0.00	0.360	0.57	35.13	86.96
1219	0.04	0.00	0.25	0.01	0.342	0.60	34.56	86.94
1194	0.04	0.00	0.28	0.01	0.328	0.62	33.96	86.91
1168	0.04	0.00	0.31	0.01	0.316	0.64	33.35	86.89
1143	0.05	0.00	0.34	0.01	0.305	0.65	32.71	86.86
1118	0.05	0.01	0.36	0.01	0.295	0.67	32.06	86.84
1092	0.05	0.01	0.38	0.01	0.286	0.68	31.39	86.81
1067	0.06	0.01	0.40	0.01	0.277	0.69	30.71	86.79
1041	0.06	0.01	0.42	0.01	0.269	0.71	30.02	86.76
1016	0.06	0.01	0.44	0.01	0.262	0.72	29.31	86.74
991	0.07	0.01	0.46	0.02	0.255	0.73	28.59	86.71
965	0.07	0.01	0.47	0.02	0.248	0.74	27.87	86.68
940	0.07	0.01	0.49	0.02	0.242	0.75	27.13	86.66
914	0.07	0.01	0.50	0.02	0.236	0.75	26.38	86.63
889	0.07	0.01	0.51	0.02	0.231	0.76	25.63	86.61
864	0.08	0.01	0.53	0.02	0.226	0.77	24.86	86.58
838	0.08	0.01	0.54	0.02	0.221	0.78	24.09	86.56
813	0.08	0.01	0.55	0.02	0.216	0.79	23.32	86.53
787	0.08	0.01	0.56	0.02	0.211	0.79	22.53	86.51
762	0.08	0.01	0.57	0.02	0.207	0.80	21.74	86.48
737	0.08	0.01	0.58	0.02	0.203	0.80	20.94	86.46
711	0.08	0.01	0.59	0.02	0.199	0.81	20.13	86.43
686	0.09	0.01	0.60	0.02	0.195	0.82	19.32	86.40
660	0.09	0.01	0.61	0.02	0.192	0.82	18.51	86.38
635	0.09	0.01	0.61	0.02	0.188	0.83	17.68	86.35
610	0.09	0.01	0.62	0.03	0.185	0.83	16.86	86.33
584	0.09	0.01	0.63	0.03	0.182	0.84	16.03	86.30
559	0.09	0.01	0.63	0.03	0.179	0.84	15.19	86.28
533	0.09	0.01	0.64	0.03	0.177	0.84	14.35	86.25
508	0.09	0.01	0.65	0.03	0.174	0.85	13.51	86.23
483	0.09	0.01	0.65	0.03	0.172	0.85	12.66	86.20
457	0.09	0.01	0.66	0.03	0.169	0.86	11.81	86.18
432	0.09	0.01	0.66	0.03	0.167	0.86	10.95	86.15
406	0.10	0.01	0.67	0.03	0.165	0.86	10.09	86.13
381	0.10	0.01	0.67	0.03	0.163	0.87	9.23	86.10
356	0.10	0.02	0.68	0.03	0.161	0.87	8.36	86.07
330	0.10	0.02	0.68	0.03	0.159	0.87	7.50	86.05
305	0.10	0.02	0.69	0.03	0.157	0.87	6.62	86.02
279	0.10	0.02	0.69	0.03	0.155	0.88	5.75	86.00
254	0.10	0.02	0.69	0.03	0.152	0.88	4.87	85.97
229	0.00	0.00	0.00	0.00	0.444	0.44	3.99	85.95
203	0.00	0.00	0.00	0.00	0.444	0.44	3.55	85.92
178	0.00	0.00	0.00	0.00	0.444	0.44	3.11	85.90
152	0.00	0.00	0.00	0.00	0.444	0.44	2.66	85.87
127	0.00	0.00	0.00	0.00	0.444	0.44	2.22	85.85
102	0.00	0.00	0.00	0.00	0.444	0.44	1.78	85.82
76	0.00	0.00	0.00	0.00	0.444	0.44	1.33	85.80
51	0.00	0.00	0.00	0.00	0.444	0.44	0.89	85.77
25	0.00	0.00	0.00	0.00	0.444	0.44	0.44	85.74

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

11/17/2020

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

Project Name:	Tenth Line
Project Number:	20-363
Designer Name:	GUILLAUME BRUNET
Designer Company:	BL ENGINEERING
Designer Email:	guillaume@blengineering.ca
Designer Phone:	613-693-0700
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	1592 Tenth Line
Drainage Area (ha):	0.15
Runoff Coefficient 'c':	0.84
Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	4.55
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	18.05
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 (%)
EF4	88
EF6	91
EF8	92
EF10	93
EF12	93

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 88

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

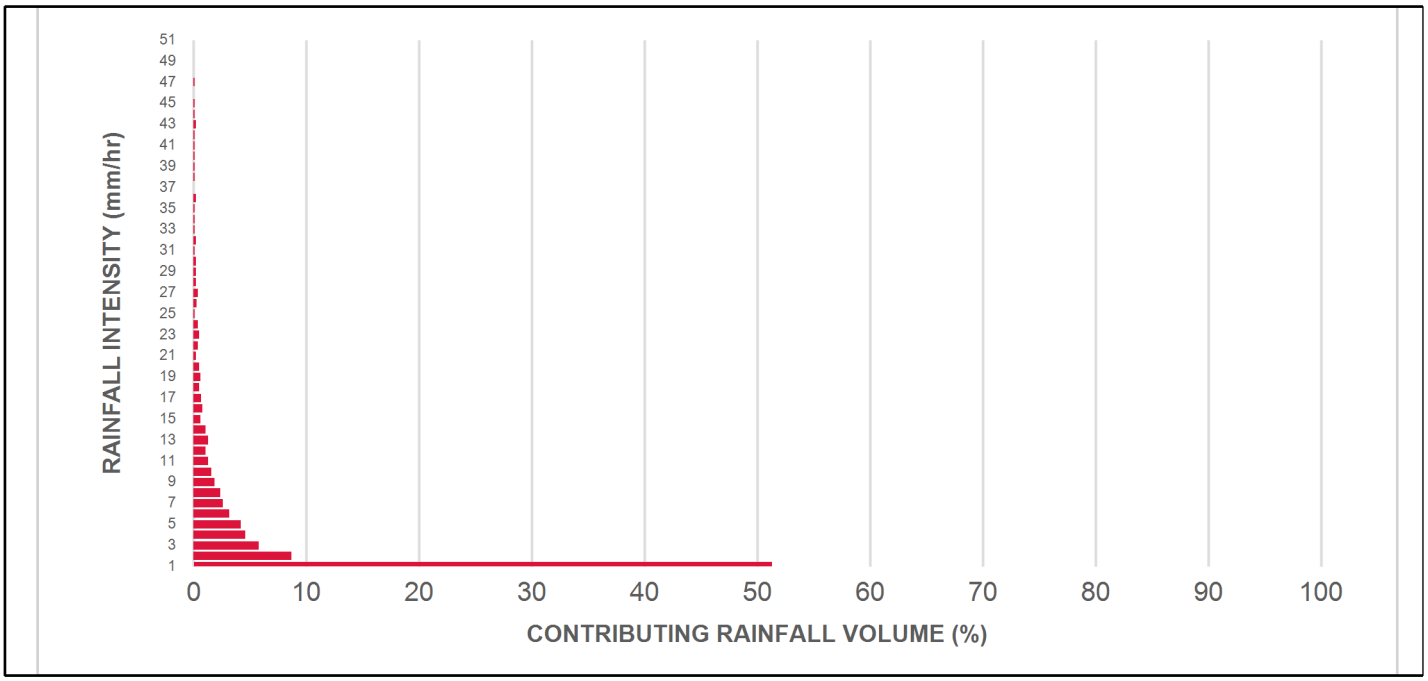
Upstream Flow Controlled Results

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 (%)
1	51.3	51.3	0.35	21.0	18.0	93	47.7	47.7
2	8.7	60.0	0.70	42.0	35.0	93	8.1	55.8
3	5.8	65.8	1.05	63.0	53.0	92	5.3	61.1
4	4.6	70.4	1.40	84.0	70.0	90	4.1	65.3
5	4.2	74.6	1.75	105.0	88.0	89	3.7	69.0
6	3.2	77.8	2.10	126.0	105.0	87	2.8	71.8
7	2.6	80.4	2.45	147.0	123.0	85	2.2	74.0
8	2.4	82.8	2.80	168.0	140.0	83	2.0	76.0
9	1.9	84.7	3.15	189.0	158.0	81	1.5	77.5
10	1.6	86.3	3.50	210.0	175.0	79	1.3	78.8
11	1.3	87.6	3.85	231.0	193.0	77	1.0	79.8
12	1.1	88.7	4.20	252.0	210.0	75	0.8	80.6
13	1.3	90.0	4.55	273.0	228.0	74	1.0	81.6
14	1.1	91.1	4.90	294.0	245.0	72	0.8	82.4
15	0.6	91.7	5.25	315.0	263.0	71	0.4	82.8
16	0.8	92.5	5.60	336.0	280.0	69	0.6	83.4
17	0.7	93.2	5.95	357.0	298.0	68	0.5	83.8
18	0.5	93.7	6.31	378.0	315.0	66	0.3	84.2
19	0.6	94.3	6.66	399.0	333.0	64	0.4	84.5
20	0.5	94.8	7.01	420.0	350.0	63	0.3	84.9
21	0.2	95.0	7.36	441.0	368.0	62	0.1	85.0
22	0.4	95.4	7.71	462.0	385.0	60	0.2	85.2
23	0.5	95.9	8.06	483.0	403.0	58	0.3	85.5
24	0.4	96.3	8.41	504.0	420.0	58	0.2	85.7
25	0.1	96.4	8.76	525.0	438.0	58	0.1	85.8

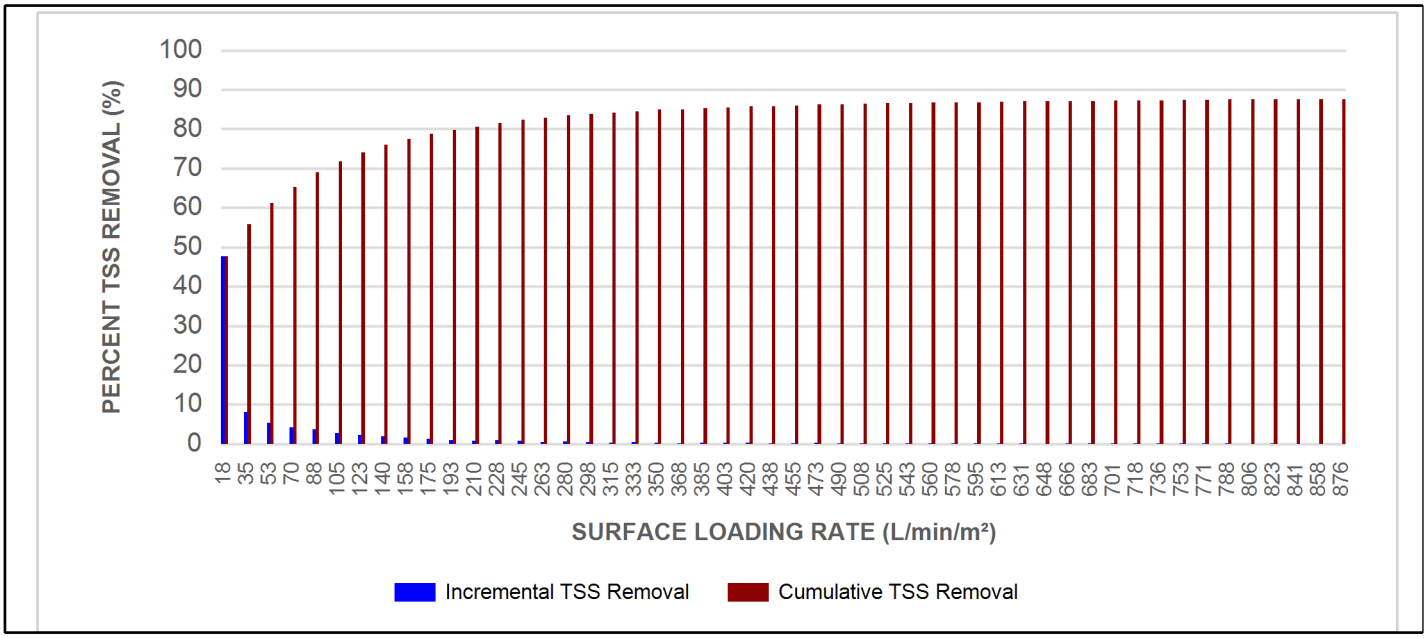
Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	96.7	9.11	546.0	455.0	58	0.2	86.0
27	0.4	97.1	9.46	567.0	473.0	57	0.2	86.2
28	0.2	97.3	9.81	588.0	490.0	57	0.1	86.3
29	0.2	97.5	10.16	609.0	508.0	57	0.1	86.4
30	0.2	97.7	10.51	631.0	525.0	57	0.1	86.5
31	0.1	97.8	10.86	652.0	543.0	57	0.1	86.6
32	0.2	98.0	11.21	673.0	560.0	56	0.1	86.7
33	0.1	98.1	11.56	694.0	578.0	56	0.1	86.8
34	0.1	98.2	11.91	715.0	595.0	56	0.1	86.8
35	0.1	98.3	12.26	736.0	613.0	56	0.1	86.9
36	0.2	98.5	12.61	757.0	631.0	56	0.1	87.0
37	1.5	100.0	12.96	778.0	648.0	56	0.8	87.8
38	0.1	100.1	13.31	799.0	666.0	56	0.1	87.9
39	0.1	100.2	13.66	820.0	683.0	56	0.1	87.9
40	0.1	100.3	14.01	841.0	701.0	56	0.1	88.0
41	0.1	100.4	14.36	862.0	718.0	55	0.1	88.0
42	0.1	100.5	14.71	883.0	736.0	55	0.1	88.1
43	0.2	100.7	15.06	904.0	753.0	55	0.1	88.2
44	0.1	100.8	15.41	925.0	771.0	55	0.1	88.3
45	0.1	100.9	15.76	946.0	788.0	55	0.1	88.3
46	-0.9	100.0	16.11	967.0	806.0	55	N/A	87.8
47	0.1	100.1	16.46	988.0	823.0	55	0.1	87.9
48	-0.1	100.0	16.81	1009.0	841.0	55	N/A	87.8
49	0.0	100.0	17.16	1030.0	858.0	55	0.0	87.8
50	0.0	100.0	17.51	1051.0	876.0	55	0.0	87.8
Estimated Net Annual Sediment (TSS) Load Reduction =								**88 %**

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

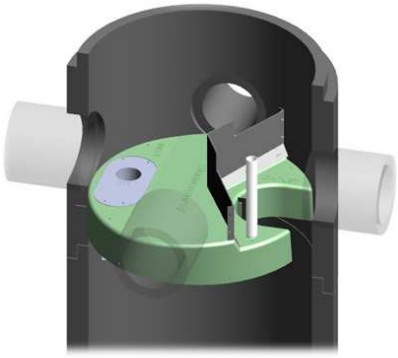
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

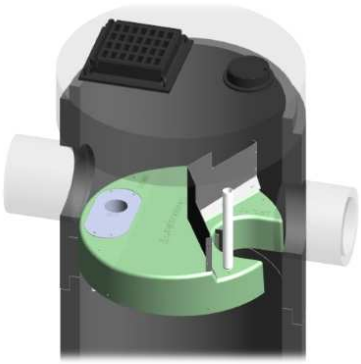
DESIGN FLEXIBILITY

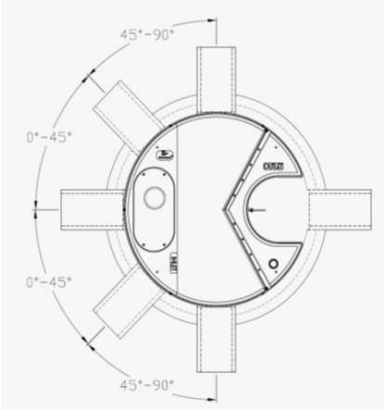
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

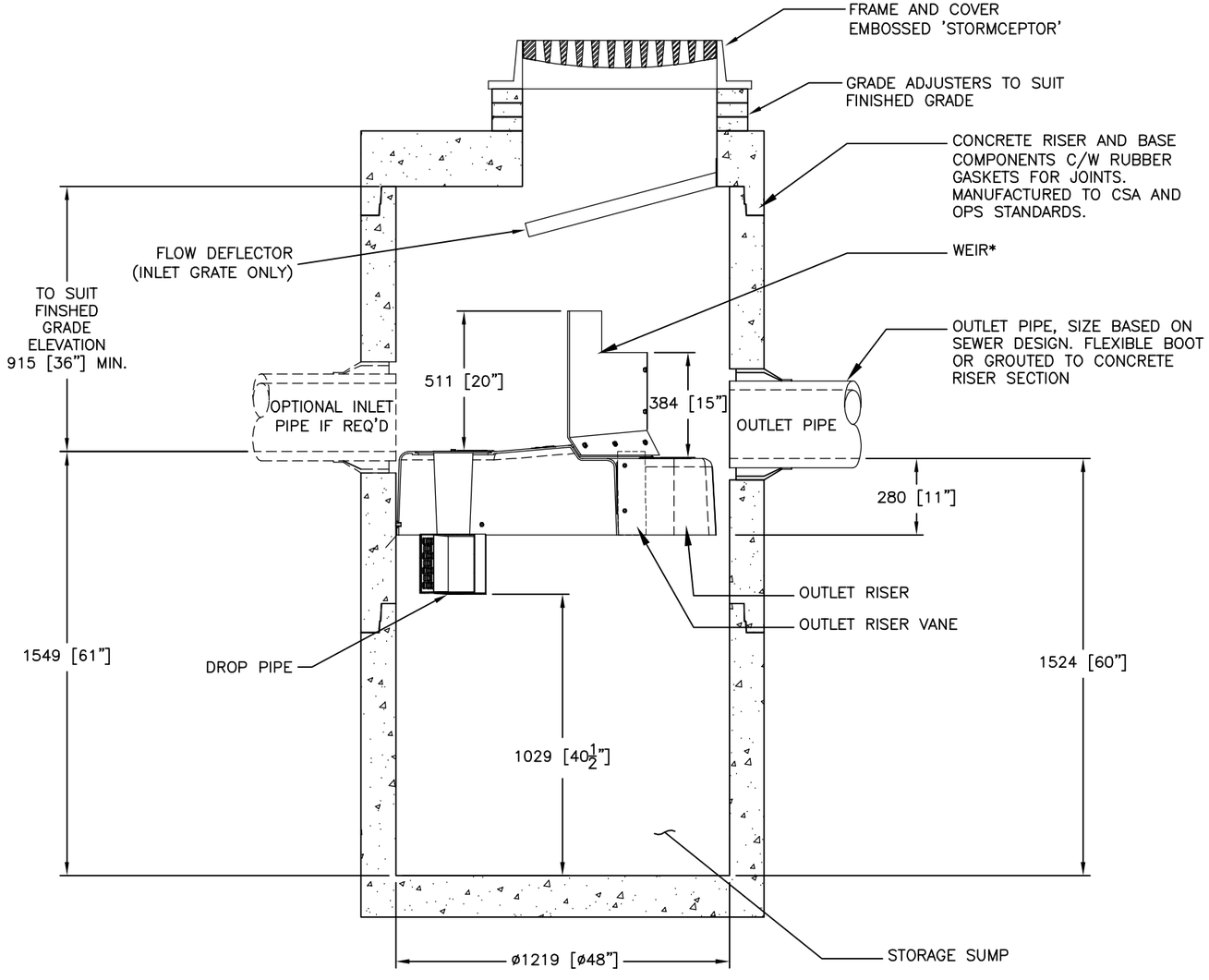
3.2 SIZING METHODOLOGY

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.

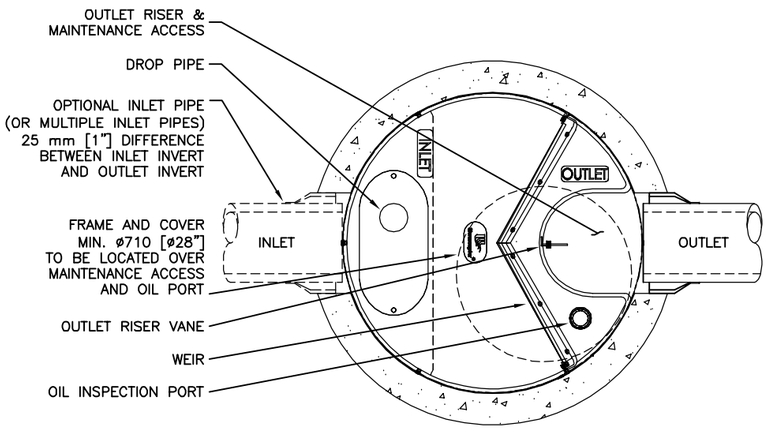
3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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.**

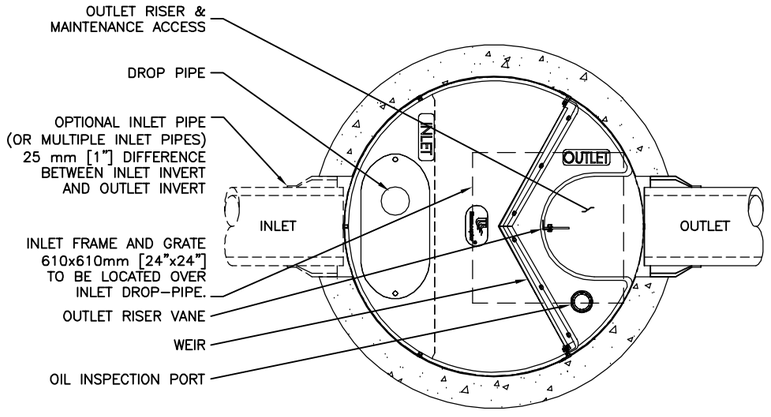
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

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

GENERAL NOTES:

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

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

INSTALLATION NOTES

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

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

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

* PER ENGINEER OF RECORD

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

Stormceptor® EF

SCALE = NTS

imbrium®
7007 RIDGE ROAD, SUITE 350, HANOVER, MD 21076
USA: 888-279-9828 CA: 800-386-4801 INTL: +1-416-960-9900

DATE: 5/26/2017

DESIGNED:	DRAWN:
JSK	JSK
CHECKED:	APPROVED:
BSF	SP
PROJECT No.:	SEQUENCE No.:
EF4	*

SHEET: 1 OF 1

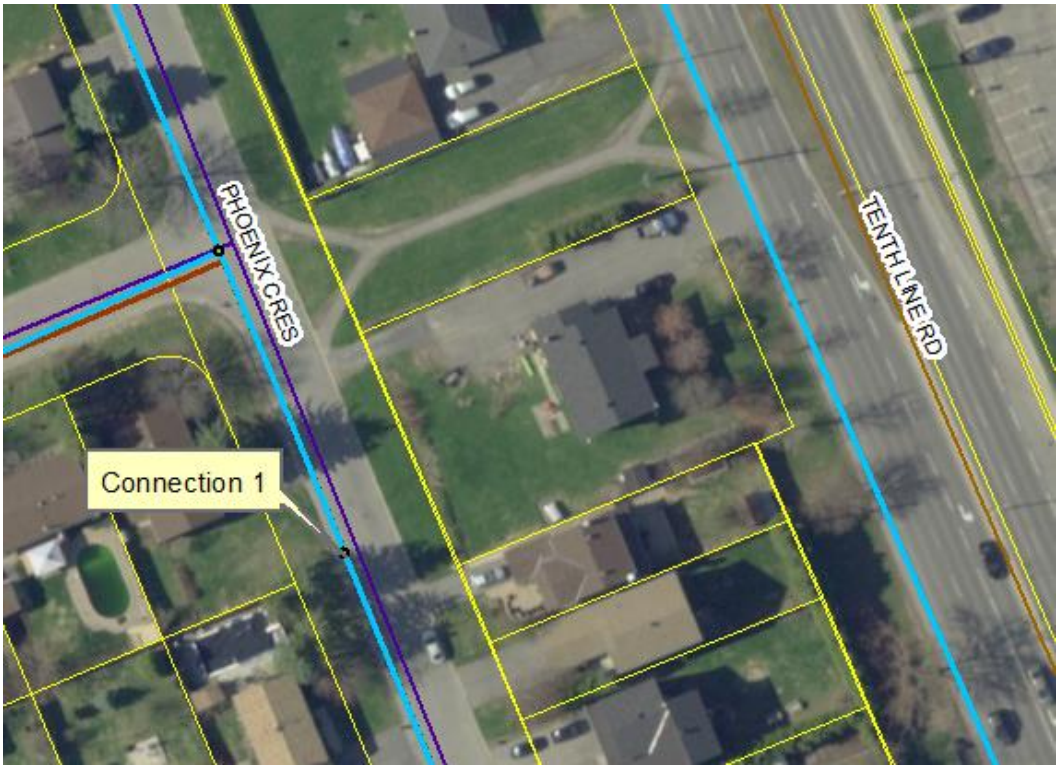
APPENDIX “E”
Boundary Conditions

Boundary Conditions
1592 Tenth Line

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	10	0.17
Maximum Daily Demand	26	0.43
Peak Hour	56	0.94
Fire Flow Demand #1	8,200	136.67

Location



Results

Connection 1 – Phoenix Cres.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	60.4
Peak Hour	125.7	54.1
Max Day plus Fire 1	115.9	40.2

[1] Ground Elevation = 87.69 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:

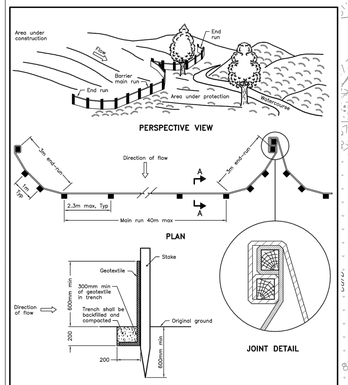
2.1. WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
2.2. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
2.3. PROTECT DISTURBED AREAS FROM RUNOFF.
2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT 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:

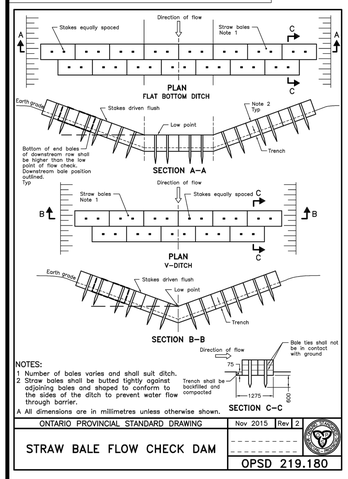
3.1. PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREA.
3.2. REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.
3.3. INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED EASEMENT
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- +50.00 PROPOSED ELEVATION
- +50.00HP PROPOSED HIGH POINT ELEVATION
- +50.00SW PROPOSED SWALE ELEVATION
- +50.00EX MATCH INTO EXISTING ELEVATION
- - 70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED 100mmØ PERFORATED SUBDRAIN
- 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
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- 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
- PROPOSED WATER METER
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2
LIGHT–DUTY SILT FENCE BARRIER
OPSD 219.110



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2
STRAW BALE FLOW CHECK DAM
OPSD 219.180

PROPOSED SILT FENCE AS PER OPSD 219.110

PROPOSED RESIDENTIAL BUILDING BLOCK 'B'
18 UNITS
USF = 85.95
FFE = 89.30

PROPOSED RESIDENTIAL BUILDING BLOCK 'A'
12 UNITS
USF = 85.95
FFE = 89.30

SITE BENCHMARK
CONCRETE PIN
ELEV. = 87.63

TENTH LINE ROAD

PLAN BY J.G. PAYETTE, O.L.S. DATED JANUARY 24TH, 1990

TRANSFER N' RR95153

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191038
11/11/2020
PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 11 / 2020

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

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

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
1592 TENTH LINE RD,
ORLEANS, ON

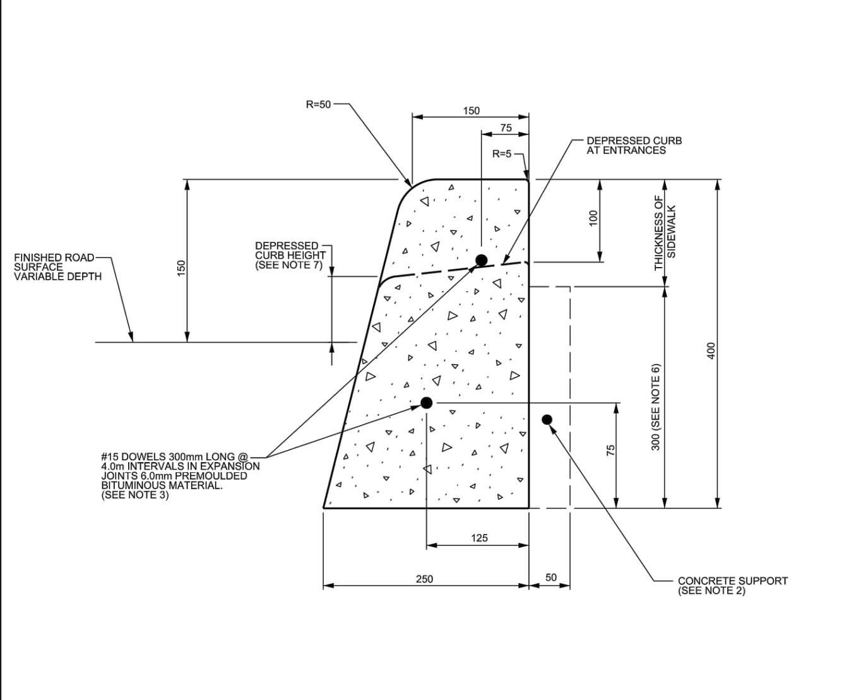
DRAWING:
SEDIMENT & EROSION CONTROL PLAN

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	11-2020
SCALE:	1:250
PROJECT NUMBER:	20-363

PAGE: C100

LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED EASEMENT
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00SW PROPOSED SWALE ELEVATION
- ×50.00EX MATCH INTO EXISTING ELEVATION
- × 70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED 100mmØ PERFORATED SUBDRAIN
- 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
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — 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
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD

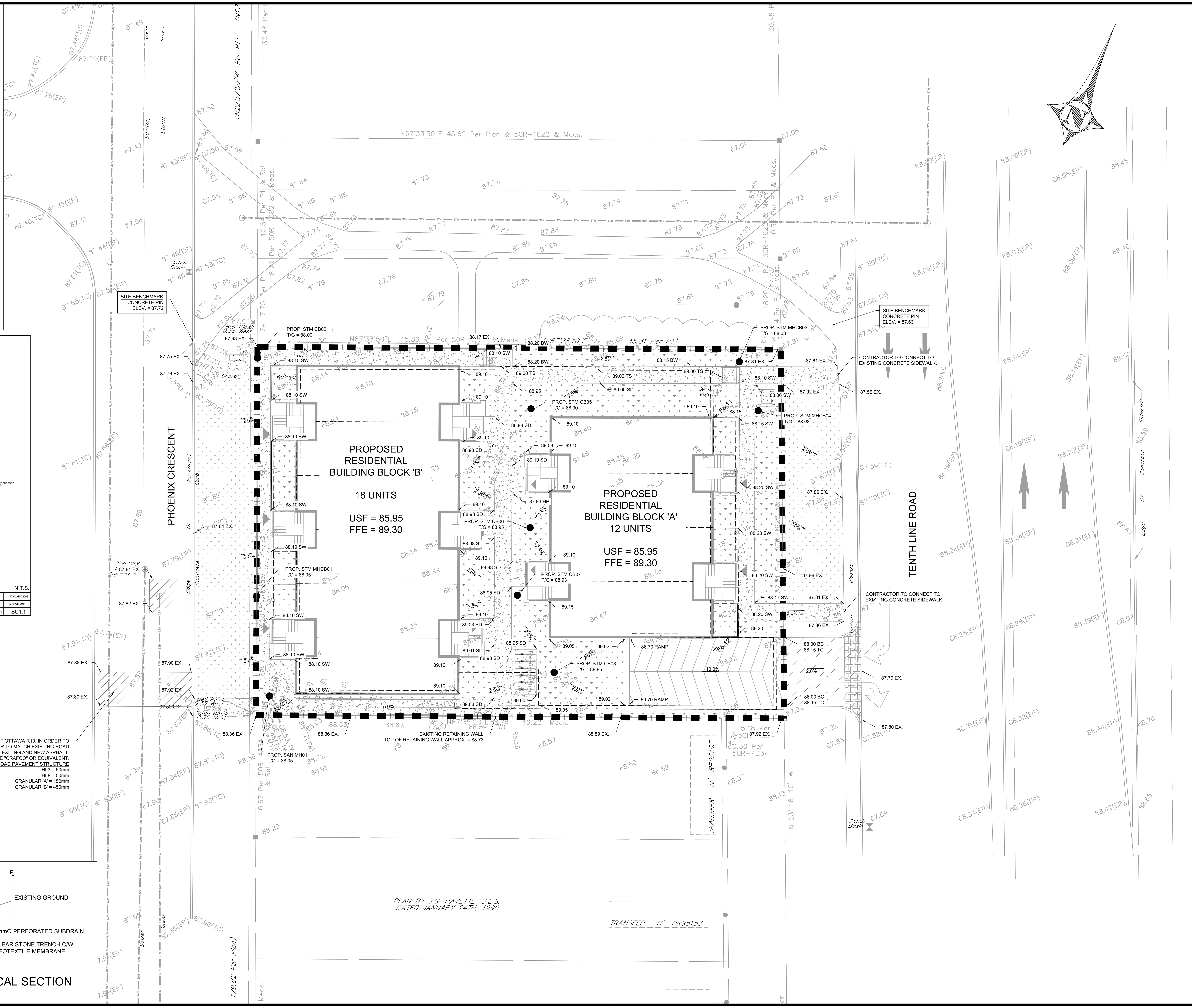


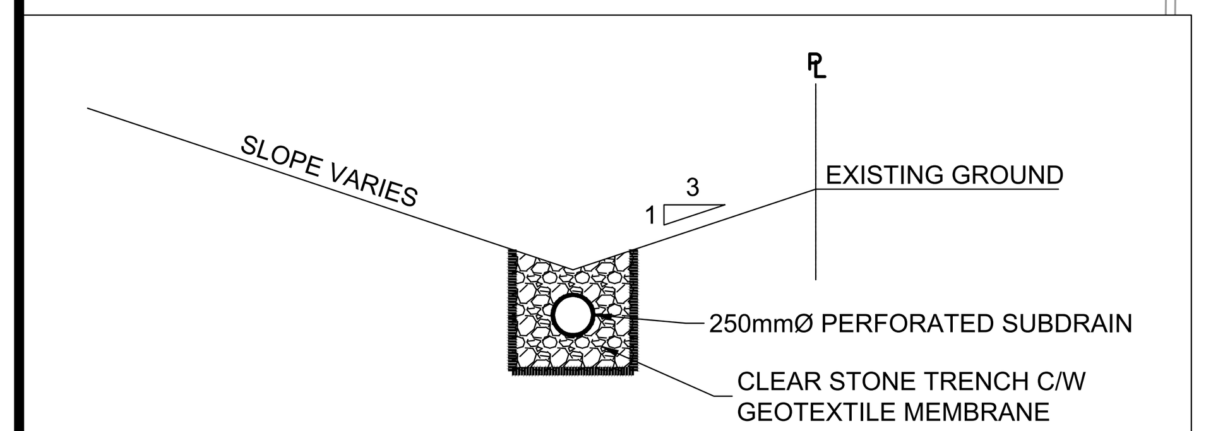
CONCRETE BARRIER CURB

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 2m SPACING.
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 25mm.

N.T.S.

Ottawa	CONCRETE BARRIER CURB FOR GRANULAR BASE PAVEMENT (MODIFIED OPSD-600.110)	DATE:	JANUARY 2003
		REV. DATE:	MARCH 2014
		DWG. No.:	SC1.1





SWALE & SUBDRAIN - TYPICAL SECTION

(N.T.S.)

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER G. L. BRUNET 100191036 19/11/2020 PROVINCE OF ONTARIO

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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
1592 TENTH LINE RD,
ORLEANS, ON

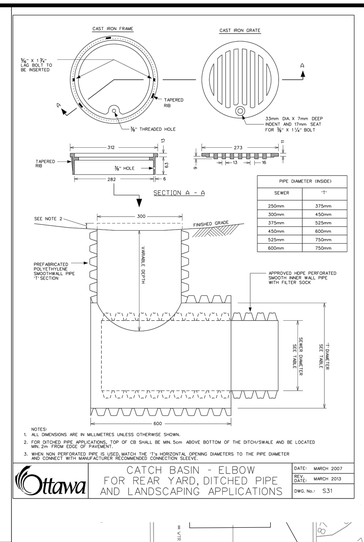
DRAWING:
SITE GRADING PLAN

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	11-2020
SCALE:	1:200
PROJECT NUMBER:	20-363

PAGE: C200

LEGEND:

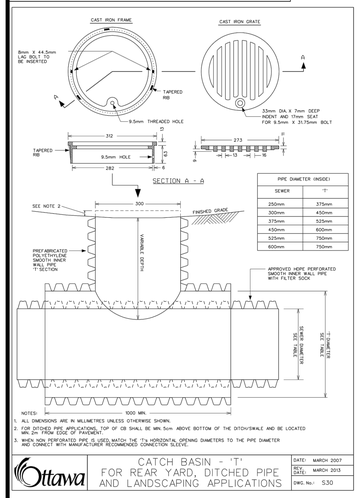
- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED EASEMENT
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00SW PROPOSED SWALE ELEVATION
- ×50.00EX MATCH INTO EXISTING ELEVATION
- 70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM STM STM PROPOSED STORM SEWER
- SAN SAN SAN PROPOSED SANITARY SEWER
- WTR WTR WTR PROPOSED WATERMAIN
- SAN SAN SAN EXISTING SANITARY SEWER
- WTR WTR WTR EXISTING WATERMAIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX — WATERSHED NAME
- C=XX — RUNOFF COEFFICIENT
- A=XX — 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
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD



PIPE DIAMETER (INSIDE)	
SEWER	T
250mm	375mm
300mm	450mm
375mm	525mm
450mm	600mm
525mm	750mm
600mm	750mm

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. FOR DITCHED PIPE APPLICATIONS, TOP OF CB SHALL BE MIN. 5cm ABOVE BOTTOM OF THE DITCH/SWALE AND BE LOCATED MIN. 2m FROM EDGE OF PAVEMENT.
3. WHEN NON PERFORATED PIPE IS USED, MATCH THE 7½ HORIZONTAL OPENING DIAMETERS TO THE PIPE DIAMETER AND CONNECT WITH MANUFACTURER RECOMMENDED CONNECTION SLEEVE.

Ottawa | CATCH BASIN - ELBOW FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS | DATE: MARCH 2007 | REV. DATE: MARCH 2013 | DWG. No.: S.31



PIPE DIAMETER (INSIDE)	
SEWER	T
250mm	375mm
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NOTES:
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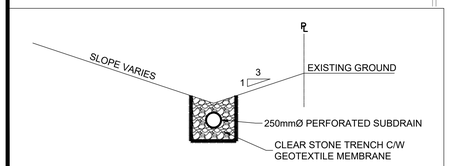
Ottawa | CATCH BASIN - 'T' FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS | DATE: MARCH 2007 | REV. DATE: MARCH 2013 | DWG. No.: S.30



SWALE & SUBDRAIN - TYPICAL SECTION
(N.T.S.)

NOTES:
FOR AUXILIARY, SERVICES AND ISOLATION VALVES.
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. FOR 200 AND 250mm VALVES, ADD BEDDING BELOW THE CONCRETE BLOCKS AS REQUIRED TO RAISE BELL HIGH ENOUGH TO PREVENT CONTACT WITH THE VALVE BONNET.

Ottawa | VALVE BOX ASSEMBLY | DATE: MAY 2001 | REV. DATE: MARCH 2016 | DWG. No.: W24

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191038
19 / 11 / 2020
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BLANCHARD LETENDRE ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, (613) 693-0700 K0A 1W1 blengineering.ca

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

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
1592 TENTH LINE RD,
ORLEANS, ON

DRAWING:
SITE SERVICING PLAN

PAPER FORMAT:	24x36
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LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
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- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- +50.00 — PROPOSED ELEVATION
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- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED GRAVEL AREA
- PROPOSED RIP RAP AS PER OPSD 810.010
- PROPOSED WATER METER
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER — G. L. BRUNET — 100191036 — 19 / 11 / 2020 — PROVINCE OF ONTARIO

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1592 TENTH LINE RD,
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LEGEND:

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- WTR PROPOSED WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- PROPOSED CATCHBASIN/MANHOLE/CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX (CONTROLLED / UNCONTROLLED) 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
- PROPOSED WATER METER
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD

SITE BENCHMARK
CONCRETE PIN
ELEV. = 87.72

SITE BENCHMARK
CONCRETE PIN
ELEV. = 87.63

PROPOSED RESIDENTIAL BUILDING BLOCK 'B'

18 UNITS

USF = 85.95
FFE = 89.30

PROPOSED RESIDENTIAL BUILDING BLOCK 'A'
12 UNITS

USF = 85.95
FFE = 89.30

PROP. STM CB02 T/G = 88.00
PROP. STM MHCB03 T/G = 88.08
PROP. STM CB05 T/G = 88.90
PROP. STM MHCB04 T/G = 88.08
PROP. STM CB06 T/G = 88.95
PROP. STM MHCB01 T/G = 88.05
PROP. STM CB07 T/G = 88.93
PROP. STM CB08 T/G = 88.85

WS-01 CONTROLLED 0.050 0.90
WS-02 CONTROLLED 0.033 0.90
WS-03 CONTROLLED 0.042 0.86
WS-04 CONTROLLED 0.010 0.90
WS-05 UNCONTROLLED 0.008 0.20
WS-06 UNCONTROLLED 0.007 0.56

PHOENIX CRESCENT

TENTH LINE ROAD

PLAN BY J.G. PAYETTE, O.L.S.
DATED JANUARY 24TH, 1990

TRANSFER N° RR95153

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
19 / 11 / 2020
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996-B ST. AUGUSTIN RD.
EMBRUN, ON

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
1592 TENTH LINE RD,
ORLEANS, ON

DRAWING:
POST DEVELOPMENT STORAGE AREA

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DATE:	11-2020
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PROJECT NUMBER:	20-363

PAGE: C401

PROJECT INFORMATION

ENGINEERED PRODUCT MANAGER:	HAIDER NASRULLAH 647-850-9417 HAIDER.NASRULLAH@ADS-PIPE.COM
ADS SALES REP:	MICHAEL REID 613-882-4186 MICHAEL.REID@ADS-PIPE.COM
PROJECT NO:	S209349
ADS SITE COORDINATOR:	MATTHEW BEGHIN 519-710-3687 MATTHEW.BEGHIN@ADS-PIPE.COM

ADVANCED DRAINAGE SYSTEMS, INC.

SiteASSIST FOR STORMTECH INSTRUCTIONS, DOWNLOAD THE INSTALLATION APP

1592 TENTH LINE ROAD

ORLEANS, ON.

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
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 F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
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 75 mm (3").
   - 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 500 LBS/IN/IN. 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 MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 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. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. 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 MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

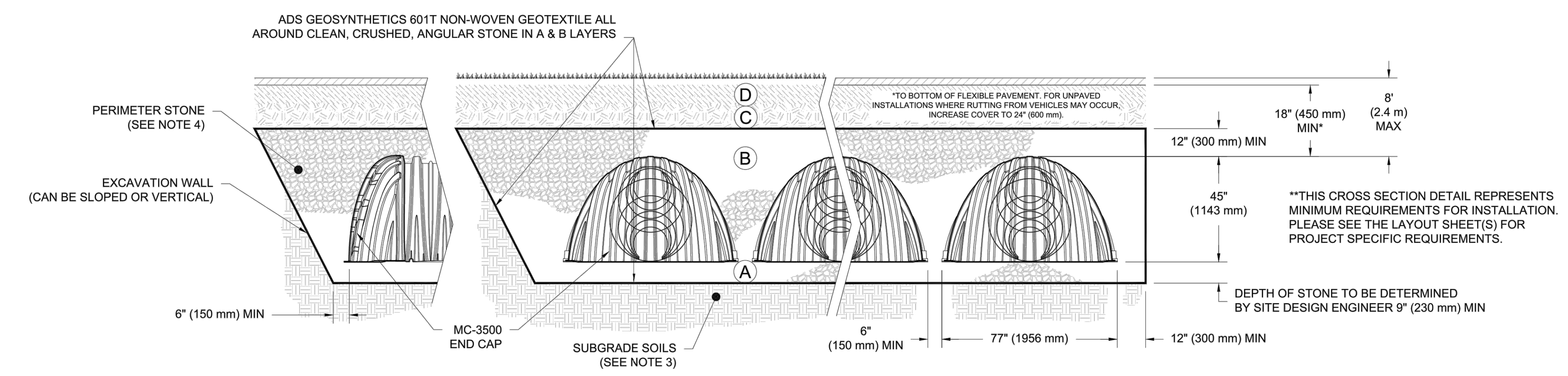
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

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

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 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 24" (600 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 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
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, 4	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, 4	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 9" (230 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.



ADS GEOSYNTHETICS 601T NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED, ANGULAR STONE IN A & B LAYERS
PERIMETER STONE (SEE NOTE 4)
EXCAVATION WALL (CAN BE SLOPED OR VERTICAL)
D
C
B
A
*TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).
18" (450 mm) MIN*
8' (2.4 m) MAX
12" (300 mm) MIN
45" (1143 mm)
**THIS CROSS SECTION DETAIL REPRESENTS MINIMUM REQUIREMENTS FOR INSTALLATION. PLEASE SEE THE LAYOUT SHEET(S) FOR PROJECT SPECIFIC REQUIREMENTS.
DEPTH OF STONE TO BE DETERMINED BY SITE DESIGN ENGINEER 9" (230 mm) MIN
6" (150 mm) MIN
MC-3500 END CAP
SUBGRADE SOILS (SEE NOTE 3)
6" (150 mm) MIN
77" (1956 mm)
12" (300 mm) MIN

NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 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 3".
   - 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 500 LBS/IN/IN. 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.

1592 TENTH LINE ROAD, ORLEANS, ON. — StormTech — 4640 TRUEMAN BLVD HILLIARD, OH 43026 — SHEET 3 OF 5

PROPOSED LAYOUT

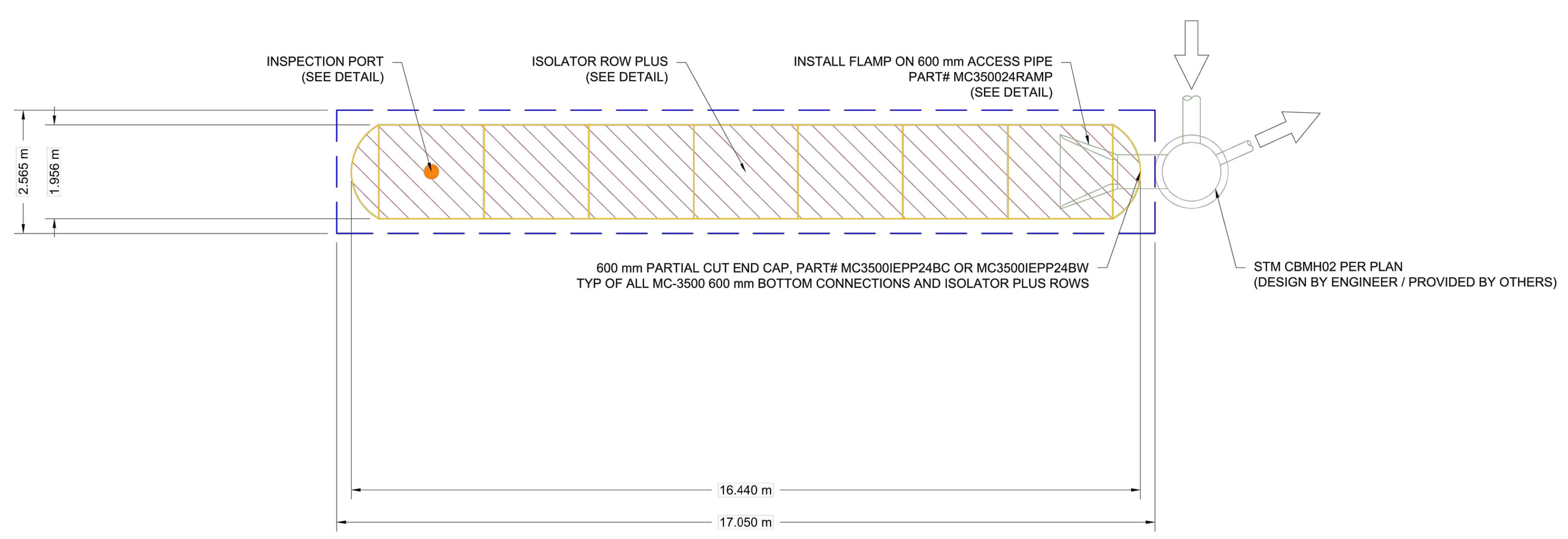
7	STORMTECH MC-3500 CHAMBERS
2	STORMTECH MC-3500 END CAPS
305	STONE ABOVE (mm)
229	STONE BELOW (mm)
40	% STONE VOID
37.1	**INSTALLED SYSTEM VOLUME (m³) ABOVE ELEVATION 86.00 (PERIMETER STONE INCLUDED)**
43.7	SYSTEM AREA (m²)
39.2	SYSTEM PERIMETER (m)

PROPOSED ELEVATIONS

89.529	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):
87.701	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):
87.548	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):
87.548	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):
87.548	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT):
87.396	TOP OF STONE:
87.091	TOP OF MC-3500 CHAMBER:
86.000	600 mm ISOLATOR ROW PLUS INVERT:
85.948	BOTTOM OF MC-3500 CHAMBER:
85.719	BOTTOM OF STONE:

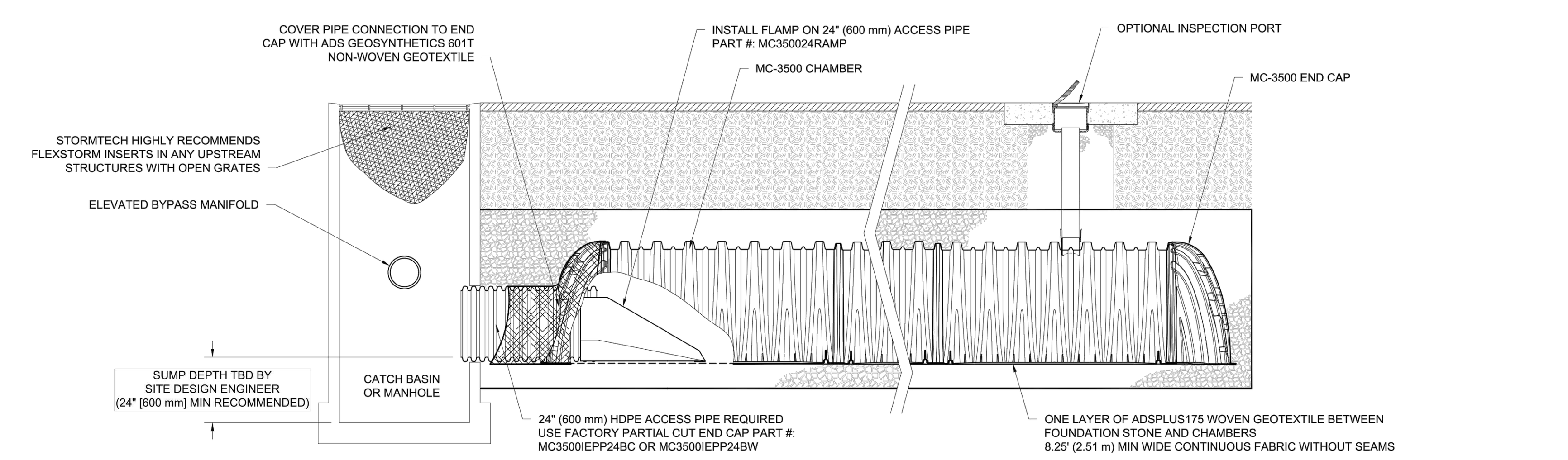
NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL 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.



INSPECTION PORT (SEE DETAIL)
ISOLATOR ROW PLUS (SEE DETAIL)
INSTALL FLAMP ON 600 mm ACCESS PIPE PART# MC350024RAMP (SEE DETAIL)
600 mm PARTIAL CUT END CAP, PART# MC3500IEPP24BC OR MC3500IEPP24BW TYP OF ALL MC-3500 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS
STM CBMH02 PER PLAN (DESIGN BY ENGINEER / PROVIDED BY OTHERS)
16.440 m
17.050 m

1592 TENTH LINE ROAD, ORLEANS, ON. — StormTech — 4640 TRUEMAN BLVD HILLIARD, OH 43026 — SCALE = 1 : 100 — SHEET 2 OF 5



COVER PIPE CONNECTION TO END CAP WITH ADS GEOSYNTHETICS 601T NON-WOVEN GEOTEXTILE
INSTALL FLAMP ON 24" (600 mm) ACCESS PIPE PART #: MC350024RAMP
MC-3500 CHAMBER
OPTIONAL INSPECTION PORT
MC-3500 END CAP
STORMTECH HIGHLY RECOMMENDS FLEXSTORM INSERTS IN ANY UPSTREAM STRUCTURES WITH OPEN GRATES
ELEVATED BYPASS MANIFOLD
SUMP DEPTH TBD BY SITE DESIGN ENGINEER (24" [600 mm] MIN RECOMMENDED)
CATCH BASIN OR MANHOLE
24" (600 mm) HDPE ACCESS PIPE REQUIRED USE FACTORY PARTIAL CUT END CAP PART #: MC3500IEPP24BC OR MC3500IEPP24BW
ONE LAYER OF ADSPLUS175 WOVEN GEOTEXTILE BETWEEN FOUNDATION STONE AND CHAMBERS 8.25' (2.51 m) MIN WIDE CONTINUOUS FABRIC WITHOUT SEAMS

MC-3500 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.

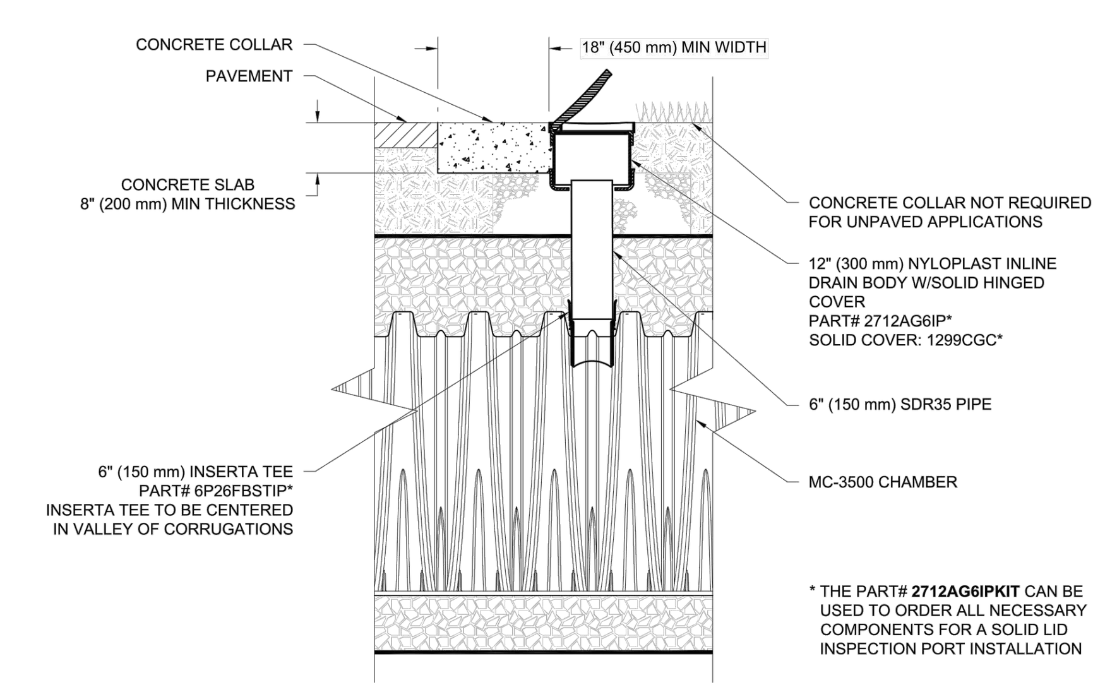
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

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.



CONCRETE COLLAR
PAVEMENT
18" (450 mm) MIN WIDTH
CONCRETE SLAB 8" (200 mm) MIN THICKNESS
CONCRETE COLLAR NOT REQUIRED FOR UNPAVED APPLICATIONS
12" (300 mm) NYLOPLAST INLINE DRAIN BODY W/SOLID HINGED COVER PART# 2712AG6IP* SOLID COVER: 1299CGC*
6" (150 mm) SDR35 PIPE
6" (150 mm) INSERTA TEE PART# 6P26FBSTIP* INSERTA TEE TO BE CENTERED IN VALLEY OF CORRUGATIONS
MC-3500 CHAMBER
* THE PART# 2712AG6IPKIT CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

MC-3500 6" (150 mm) INSPECTION PORT DETAIL

NTS

1592 TENTH LINE ROAD, ORLEANS, ON. — StormTech — 4640 TRUEMAN BLVD HILLIARD, OH 43026 — SHEET 4 OF 5

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER — G. L. BRUNET — 100191036 — 19/11/2020 — PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
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#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 11 / 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
1592 TENTH LINE RD,
ORLEANS, ON

DRAWING:
DETAILS - 1

PAPER FORMAT:	24x36
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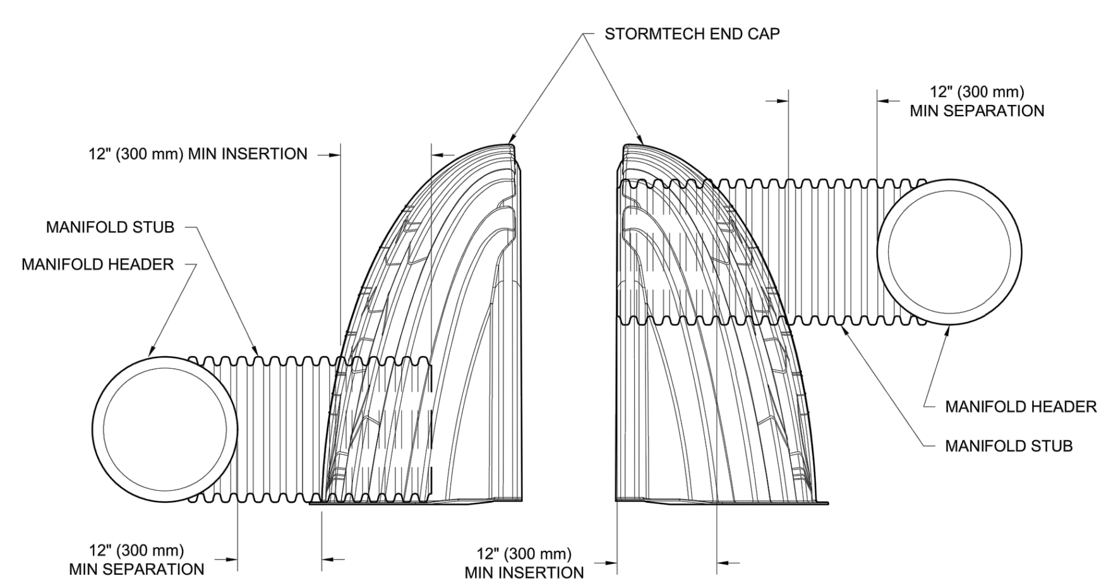
SCALE:	
PROJECT NUMBER:	20-363

PAGE: C500

MC-SERIES END CAP INSERTION DETAIL

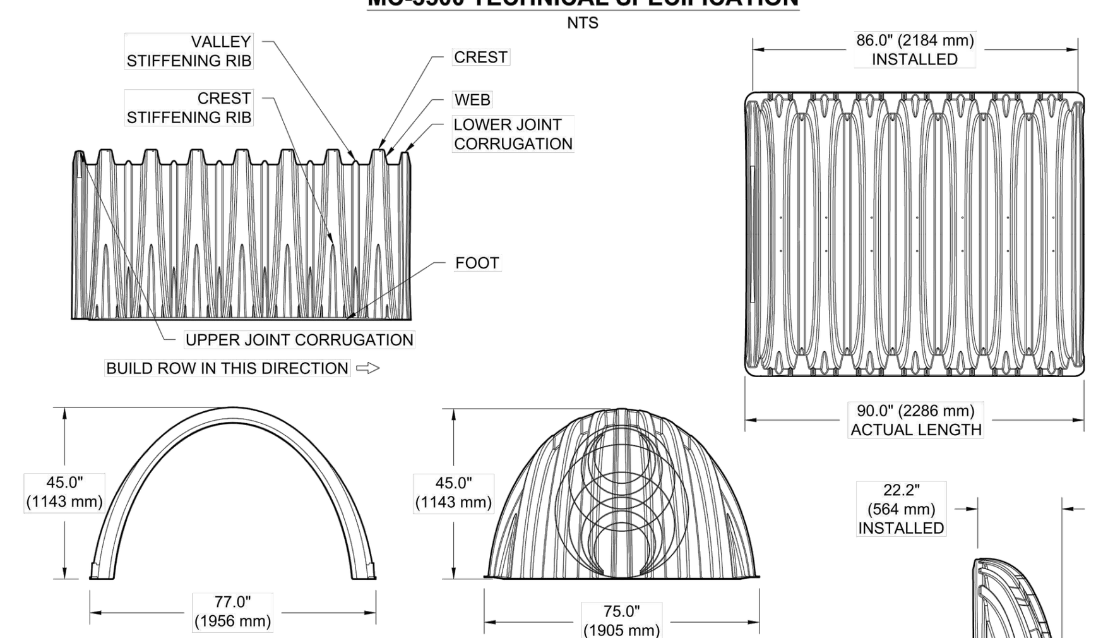
NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-3500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

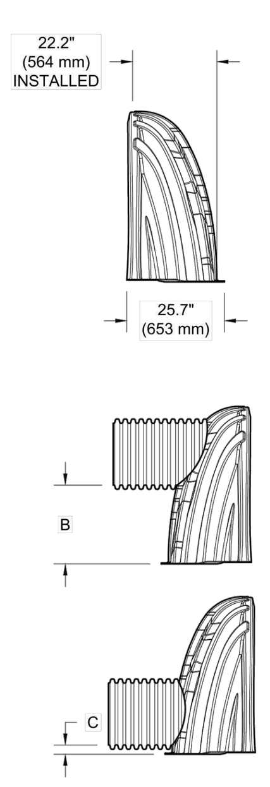
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



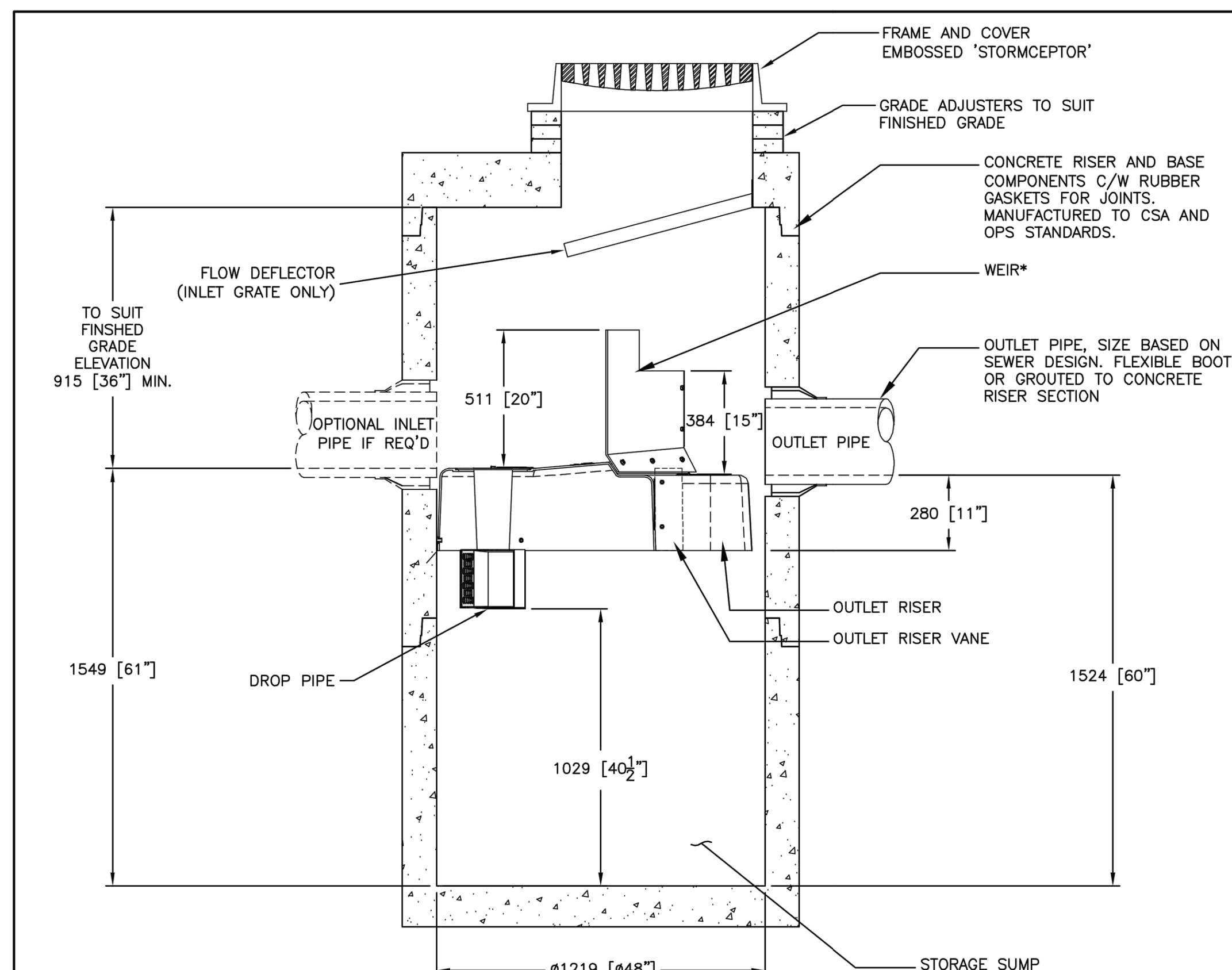
CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

1592 TENTH LINE ROAD
ORLEANS, ON.
DATE: 11/04/20 DRAWN: RCT
PROJECT #: S295249 CHECKED: NPB

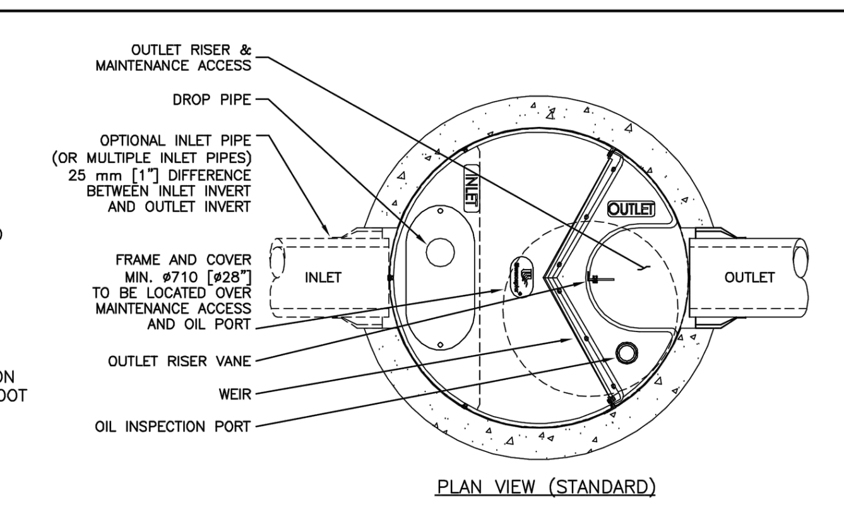
StormTech® Detention • Retention • Water Quality

ADS® ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

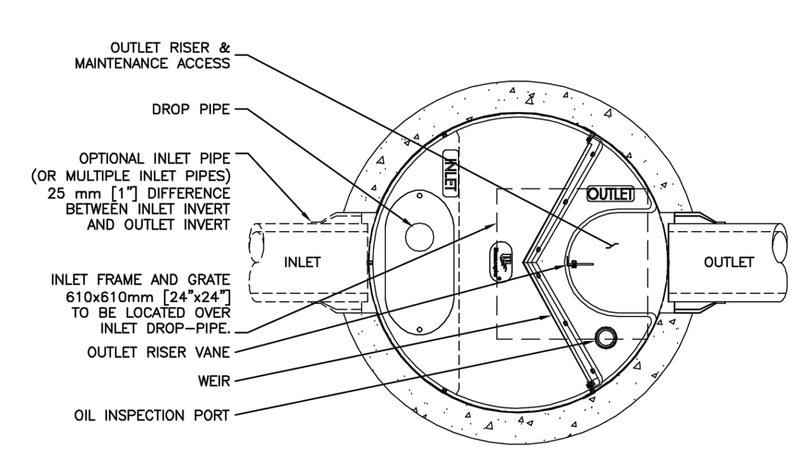
SHEET 5 OF 5


FRAME AND COVER EMBOSSED 'STORMCEPTOR'
GRADE ADJUSTERS TO SUIT FINISHED GRADE
CONCRETE RISER AND BASE COMPONENTS C/W RUBBER GASKETS FOR JOINTS. MANUFACTURED TO CSA AND OPS STANDARDS.
WEIR*
OUTLET PIPE, SIZE BASED ON SEWER DESIGN. FLEXIBLE BOOT OR GROUTED TO CONCRETE RISER SECTION
FLOW DEFLECTOR (INLET GRATE ONLY)
TO SUIT FINISHED GRADE ELEVATION 915 [36"] MIN.
OPTIONAL INLET PIPE IF REQ'D
511 [20"]
384 [15"]
OUTLET PIPE
280 [11"]
OUTLET RISER
OUTLET RISER VANE
1549 [61"]
DROP PIPE
1524 [60"]
1029 [40½"]
ø1219 [ø48"]
STORAGE SUMP

SECTION VIEW


OUTLET RISER & MAINTENANCE ACCESS
DROP PIPE
OPTIONAL INLET PIPE (OR MULTIPLE INLET PIPES) 25 mm [1"] DIFFERENCE BETWEEN INLET INVERT AND OUTLET INVERT
FRAME AND COVER MIN. ø710 [ø28"] TO BE LOCATED OVER MAINTENANCE ACCESS AND OIL PORT
OUTLET RISER VANE
WEIR
OIL INSPECTION PORT
INLET
OUTLET

PLAN VIEW (STANDARD)


OUTLET RISER & MAINTENANCE ACCESS
DROP PIPE
OPTIONAL INLET PIPE (OR MULTIPLE INLET PIPES) 25 mm [1"] DIFFERENCE BETWEEN INLET INVERT AND OUTLET INVERT
INLET FRAME AND GRATE 610x610mm [24"x24"] TO BE LOCATED OVER INLET DROP–PIPE.
OUTLET RISER VANE
WEIR
OIL INSPECTION PORT
INLET
OUTLET

PLAN VIEW (INLET TOP)

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

GENERAL NOTES:

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

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

INSTALLATION NOTES

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

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

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

* PER ENGINEER OF RECORD

Stormceptor® EF
SCALE = NTS

imbrium®
7037 RIDGE ROAD, SUITE 350, HANOVER, MD 21076

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

ENGINEERING STAMP

NO.	REVISION	DATE (DD/MM/YYYY)
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#6		
#5		
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#3		
#2		
#1	ISSUED FOR SPA	19 / 11 / 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
1592 TENTH LINE RD,
ORLEANS, ON

DRAWING:
DETAILS - 1

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