SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Project Address – 2308 - 2396 Cleroux Cres., Orleans, Ontario

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

By Blanchard Letendre Engineering Ltd.
Date – March 18, 2021
Our File Reference: 20-305

First Submission
March 19, 2021

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APPENDIX TABLE

1.0 INTRODUCTION

Blanchard Letendre Engineering Ltd. (BLEL) was retained by Bridor Development. to complete their site servicing and stormwater management for the new proposed site located at 2308 – 2396 Cleroux Crescent in Ottawa. This report summarized proposed site servicing and stormwater management and should be read in conjunction with the engineering drawings prepare by BLEL.

This report and site servicing plan have been prepared based on the site plan proposed by P-Square Concepts and the site survey completed by Annis O'Sullivan Vollebekk. The information contained herein is based on the provided drawings and if there is any discrepancy with the survey or site plan, BLEL should be informed in order to verify the information and complete the changes if required.

2.0 SITE PLAN

The proposed site is to be located in Orleans, Ontario. As per the aerial picture in figure 1, the existing site consist of and green space area with two (2) existing houses with garage that will be demolished prior to construction. The property located at 2308 – 2396 Cleroux Cres., consist of approximately 0.ha of undeveloped land. The land will be developed with two (2) new residential apartments building with underground parking with shared entrance and parking.

Figure 1- Existing site at 2308 - 2396 Cleroux Cres. Orleans, Ontario

3.0 STORM WATER MANAGEMENT

3.1 Existing Site Condition

The existing site currently has no stormwater management nor storm service connection. The site currently drains uncontrolled towards the surrounding roads, Cleroux Crescent and Orient Park as where the stormwater generated from the site is captured by the road site catchbasin. The south-west corner of the property drains uncontrolled towards the neighbouring backyards. An existing city catchbasin is installed in the corner with captures and conveys the stormwater towards the existing storm stub in the south easement. The existing property naturally grades south towards the existing neighbourhood backyard. There is an existing subdivision adjacent to property on the west and south portions. 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 constructing two (2) new residential three (3) storeys The site will be modified by adding two (2) new 1016 square meter building, asphalt parking and driving and amities areas. As the runoff coefficient will increase due to addition of hard surfaces, post-development stormwater quantity and quality will be implemented.

The site stormwater management has been prepared in correlation with the existing site grading. To minimize the fill and site work required, the stormwater management has been developed to follow the existing site grading. As the property naturally drains south towards the neighbour's backyard, the proposed site work has been prepared to limit the work at the south-west corner while maintaining the stormwater outlet to City storm sewer in the easement at the south end of the property. The overland flow route has also been designed to convey the storm runoff towards Oriental Park. By limiting the work at the south-west corner, where the biggest elevation drops occurs, the use of retaining walls near the neighbour's backyard won't be as intrusive.

The stormwater generated by the new hard surfaces will be directed to a series of catchbasins which will capture and covey the water runoff to existing the 300mm diameter storm sewer stub located in the easement at the south end portion of the property between 2492 and 2490 Orient Park Dr. 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 outlet will be controlled by the undersized 300mm diameter storm pipe which will act as an orifice and limit the flow outletting to City storm sewer in the easement. By throttling the flow, stormwater retention will be completed with the use of underground storage which was designed to hold the 100 year storm event. Refer to Appendix 'A' for the stormwater flow and storage calculations.

3.3 Proposed Storm Water Management

The pre-development flow of the 5-year storm was calculated using a 5-year storm and a 10-minute time of concentration for the affected area. The pre-development flow of the 100-year storm was calculated using a 100-year storm and a 10-minute time of concentration for the affected area. From intensity duration curves established for the Ottawa area, the intensity was evaluated at of 104.2 mm/hr for the 5yr predevelopment flow and 178.6mm/hr for the 100-year predevelopment flow. A run-off coefficient of 0.42 was used as per the evaluated, see Appendix 'A' – Pre-Development Drainage Area table.

Using the Rational Method and considering the tributary areas of the proposed (see Appendix 'A'), the pre-development allowable release rate for the site was evaluated at **102.08 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 =	0.42
I =	104.2 mm/hr
Tc =	10 min
Total =	0.839 ha
Allowable Release Rate=	**102.08 L/s**

As the site will outlet to the existing storm sewer stub located in the easement between 2492 and 2490 Orient Park Dr., the existing 300mm diameter sewer stub previously installed only has a full flow capacity of 96.70 L/s. Therefore, the site total release rate has been designed to meet the maximum flow of **96.70 L/s** of the existing 300mm diameter storm stub.

3.4 Proposed Stormwater Quantity Control

The proposed stormwater management for the site will be achieve primarily through the use of underground pipe storage. The grading of the site has been designed to direct the stormwater towards the series of catchbasins connected to the underground stormwater chambers before outleting south into the 300mm diameter storm city stubs that ultimately connect to the 375mm sewer on Orient Park Dr. The proposed underground stormwater chambers and cathcbasins are shown on the attached drawings in Appendix 'E'.

The proposed site has been graded to outlet overland onto Oriental Park Dr. on the south-east side of the property. As the site naturally grades from the north side to the south side, the grades have been adjusted to suit this profile and minimize the grade raise of the site. All catchment areas were designed to directed the stormwater overland to a series of cathcbasins, landscaping drains and subdrains which will capture and convey the stormwater to Oriental Park Dr.

The stormwater generated from site will be discharged to the existing storm sewer stub on Orient Park Dr. and be controlled using the undersized pipe which will throttle the flow direct to the municipal sewer. The existing 300mm diameter storm pipe will release a total of **96.70 L/s** with a maximum head of 3.865m (HWL = 79.865) during the 100 year event. As the flow will be restricted, 132.41m^3 of stormwater storage will be required for this area. This storage will be provided with underground stormwater chambers as the property natural slopes does not promote overland storage. The underground storage has been designed to hold and convey the stormwater water to the sewer the easement on Oriental Park. The underground chambers will prove 137 m^3 which will hold more than the minimum required storage. Refer to the underground chambers in Appendix 'D'.

The two (2) underground parking ramp will be drained with separate catchbasin that will capture and convey the storm water generated from the ramps to the underground chambers. Backflow preventers will be installed in the receiving catchbasins (CB09 and CB11) to prevent stormwater from ponding in the ramps area. Storage has been provided in each area to store the 100 year event when the underground chambers will fill during storm events greater than the 5 year.

3.4.1 Roof Drainage

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

3.4.2 Underground Chambers

The underground storage chambers have been designed to hold and convey the stormwater generated from the site. The underground chambers have been designed to hold most of the stormwater under the proposed parking/ driving area. The chambers, which have been designed as isolator rows, were designed to also provide some filtration which is favorable for the final site TSS. A total of 137 m^3 will be provide by the underground chambers. The chambers will be connected to the proposed manhole catchbasin which will facilitates the maintenance of the chambers. The maintenance of the chambers is to be in accordance with the manufacture. Refer to Appendix "D" for Stormwater Storage Chambers.

3.5 Proposed Stormwater Quality Control

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

4.0 SANITARY SEWER DESIGN

4.1 Existing Site Conditions

The existing site is currently being service by a two separate residential service connected to the the houses on the two parcels which are connected to the existing 250mm diameter sanitary on Cleroux Crescent. The existing connection will be abandoned at the property line as the new connections will be completed at the north end portion of the property where and existing sanitary stub was previously installed in the city right away between 2492 and 2490 Orient Park Dr.

4.2 Existing Site Conditions

The two new residential apartment building, which proposes 40 units each will discharge to the city main sewer stub on Orient Park Dr. via two new 150mm diameter sanitary services connected to the 200mm diameter sewer proposed between the two new buildings. The service will be discharged into the new sewer before being conveyed north to the existing 250mm diameter sanitary stub in the city easement between 2492 and 2490 Orient Park Dr. The proposed 150mm diameter service will be installed at a minimum of 1.00% slope directly to the new private sewer. A monitoring manhole is proposed at the sanitary stub which will also be a drop structure considering the change in elevation on the property. Refer to drawing C300 – Site Servicing Plan for the existing and proposed sanitary service.

Based on the City of Ottawa Sanitary Design Guidelines, the sanitary peak loads were evaluated as follow; Block A: **1.15 L/s** and Block B: **1.12L/s** for a total of **2.27 L/s** which is below the allowable flow of 7.0L/s as per the City of Ottawa property boundaries. As per the City specific design parameters, the sanitary flow was evaluated based on the new building footprint and the total site area for each individual building. Refer to Appendix 'B' for the sanitary sewer design calculation and design parameters set by the City of Ottawa.

5.0 WATER CONNECTION DESIGN

5.1 Existing Site Conditions

The existing site is currently being service by a two separate 19mm diameter water service which services the existing two houses on the parcels and are connected to the existing 305mm diameter watermain on Cleroux Crescent. The existing connection will be removed and where two new connection will be installed to service the two new buildings. There is currently two (2) city fire hydrant, one (1) at the south façade of the property and the other at the north-west. The hydrants on south is located on the north side of Cleroux Crescent and the other is located on the north side

of Orient Park Dr, both within the 90m radius from the building 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:

	BLOCK A	BLOCK B	UNITS
Average Water Demand =	22050.00	22540.00	L/d
Maximum Daily =	55125.00	56350.50	L/d
Maximum Hourly =	121275.00	123970.50	L/d
Total Domestic Flow =	**1.40**	**1.43**	**L/s**
Total Fire Flow =	**166.67**	**161.67**	**L/s**

Refer to Appendix ‘C’ for the water flow calculation sheet.

The proposed buildings will be serviced with a new 100mm water service that will be connected to the existing 305mm watermain on Cleroux Crescent. The two new building will then be connected to the new 100mm service via separate 50mm diameter water service. Each service will connect into the proposed mechanical room of the buildings. As per the City standard, two water service will be teed off the existing watermain on Cleroux with an isolation valve in between to allow maintenance on the city watermain without interrupting the water for the site.

5.3 Proposed Fire Demand

As the new residentials buildings will not have a sprinkler system, the new services were sized to supply only the domestic flow. Based on the Ontario building code calculations, the water flow was evaluated at **166.67L/s** for Block A and **161.67L/s** for Block B. Refer to Appendix ‘C’ for the fire flow calculation sheet. As there is two existing water hydrants located within the 90m radius from the building main entrances, there will be no new private hydrant installed on the property.

5.4 Water Capacity Comments

The boundary conditions and HGL for hydraulic analysis for 2396 Cleroux Crescent was obtained from the city. See attached copy in Appendix 'E'. From the boundary conditions, the minimum HGL was evaluated at 131.0 m for the water main elevation at 83.2m and a maximum pressure estimate of 67.8 psi.

6.0 EROSION AND SEDIMENT CONTROL

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

7.0 CONCLUSION AND LIMITATION OF REPORT

7.1 Stormwater Management

The stormwater management proposed for the site will maintain the site to its pre-development release rate conditions and meet the requirements from the City of Ottawa. The post development release rate will be maintained to its pre-development rate of **96.70 L/s** thought undersizing the outlet to the sewer main in the easement on Oriental Park. Stormwater quantity control will be achieved with 137.00m^3 underground chamber. The stormwater quality control will be met through the use of a stormwater treatment unit downstream of the storm sewers proposed for the site.

7.2 Sanitary Service

The current site will be services with a new 200mm sanitary connection to the sanitary sewer located in the easement south of the property. The estimated sanitary flow of; Block A: **1.15 L/s,** and Block B: **1.12L/s,** for the new connections will be directed to the existing sanitary sewer along the easement on Oriental Park.

7.3 Water Service

Currently the existing buildings on site are serviced with an existing 19mm diameter water service that will be replaced with a 100mm diameter water services to connected to the existing 305mm diameter main on Cleroux Crescent. The existing connections will be removed. The water demand for the building was evaluated at: Block A: **1.40 L/s,** Block B: **1.43L/s** and the fire flow demand at Block A: **166.67 L/s,** Block B: **161.67 L/s.** Sprinkler system are not proposed for the site. There are two (2) 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 2308- 2396 Cleroux Crescent, 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.

Benjamin Falconer, E.I.T.

APPENDIX "A"
Stormwater Management Design

BLANCHARD LETENDRE
ENGINEERING

File No. 20-305
Project: Proposed Apartment Buildings
Project Address: 2396 Cleroux Crescent, Ottawa
Client: Bridor Development

Date: 19/03/2021
Designed: Guillaume Brunet
Checked: Guillaume Brunet
Drawing Reference: C200 & C300

STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION			AREA (ha)			FLOW					STORM SEWER DATA							
WATERSHED / STREET	From MH	To MH	C = 0.30	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (l/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-06	LCB10	MHCB08	0.041	0.000	0.000	0.02	0.02	10.00	104.19	2.38	250	PVC	0.40%	15.8	37.6	0.77	0.34	**0.06**
WS-07	MHCB09	MHCB08	0.000	0.000	0.005	0.01	0.01	10.34	102.41	1.15	250	PVC	0.25%	12.5	29.73	0.61	0.34	**0.04**
	MHCB08	MHCB02	0.000	0.000	0.000	0.00	0.03	10.69	100.70	3.43	250	PVC	1.00%	22.0	59.47	1.21	0.30	**0.06**
WS-08	CB11	MHCB04	0.000	0.000	0.013	0.03	0.03	10.00	104.19	3.26	250	PVC	0.40%	23.5	37.6	0.77	0.51	**0.09**
	LCB13	MHCB06	0.000	0.000	0.000	0.00	0.00	10.00	104.19	0.00	250	PVC	0.40%	18.0	37.6	0.77	0.39	**0.00**
	LCB12	LCB07	0.000	0.000	0.000	0.00	0.00	10.00	104.19	0.00	250	PVC	0.25%	31.0	29.73	0.61	0.85	**0.00**
WS-01	LCB07	MHCB06	0.074	0.000	0.011	0.07	0.07	10.85	99.89	6.83	250	PVC	0.40%	15.5	37.61	0.77	0.34	**0.18**
	MHCB06	MHCB05	0.000	0.000	0.000	0.00	0.07	11.19	98.30	6.72	250	PVC	1.00%	19.3	59.47	1.21	0.27	**0.11**
WS-02 + WS-10	MHCB05	MHCB04	0.033	0.000	0.172	0.45	0.52	11.46	97.09	50.18	250	PVC	1.00%	16.3	59.5	1.21	0.22	**0.84**
WS-03 + WS-09	MHCB04	MHCB03	0.021	0.000	0.162	0.42	0.96	11.68	96.08	92.61	450	PVC	0.25%	17.3	142.6	0.90	0.32	**0.65**
WS-04	MHCB03	MHCB02	0.015	0.000	0.054	0.14	1.11	12.00	94.69	104.90	450	PVC	0.25%	19.0	142.55	0.90	0.35	**0.74**
	MHCB02	MHCB01	0.000	0.000	0.000	0.00	1.11	12.35	93.21	103.25	450	PVC	1.00%	7.6	285.11	1.79	0.07	**0.36**
WS-05	LCB14	MHCB01	0.220	0.000	0.020	0.17	1.31	12.43	92.92	122.11	250	PVC	1.00%	9.2	59.47	1.21	0.13	**2.05**
	MHCB01	STORMCEPTOR	0.000	0.000	0.000	0.00	1.31	12.55	92.40	121.44	300	PVC	1.00%	3.2	96.70	1.37	0.04	**1.26**
	STORMCEPTOR	CITY	0.000	0.000	0.000	0.00	1.31	12.59	92.24	121.23	300	PVC	1.00%	16.1	96.7	1.37	0.20	**1.25**

DESIGN PARAMETERS NOTES

Runoff Coefficient (C)	
Grass	0.30
Gravel	0.80
Asphalt / rooftop	0.90

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

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

BLANCHARD LETENDRE
ENGINEERING

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STORM WATER MANAGEMENT DESIGN SHEET

SEWER DESIGN

LOCATION		MANHOLE INFORMATION						
From MH	To MH	Up Invert (m)	Down Invert (m)	T/G Up Stream (m)	T/G Down Stream	Up Depth obv (m)	Down Depth obv (m)	Up Depth inv (m)
LCB10	MHCB08	78.52	78.45	81.80	80.30	3.03	1.60	3.03
MHCB09	MHCB08	78.36	78.33	79.70	80.30	1.09	1.72	1.34
MHCB08	MHCB02	78.27	78.05	80.30	80.71	1.78	2.41	1.78
CB11	MHCB04	78.70	78.61	79.90	81.90	0.95	3.04	1.20
LCB13	MHCB06	80.37	80.29	82.50	82.75	1.88	2.21	2.13
LCB12	LCB07	81.63	81.56	82.42	82.60	0.54	0.79	0.79
LCB07	MHCB06	80.36	80.29	82.60	82.75	1.99	2.21	1.99
MHCB06	MHCB05	80.09	79.90	82.75	82.20	2.41	2.05	2.41
MHCB05	MHCB04	79.60	79.41	82.20	81.90	2.35	2.24	2.35
MHCB04	MHCB03	78.45	78.40	81.90	81.30	3.00	2.45	3.20
MHCB03	MHCB02	78.34	78.30	81.30	80.71	2.51	1.96	2.51
MHCB02	MHCB01	76.08	76.00	80.71	78.20	4.18	1.75	4.18
LCB14	MHCB01	75.74	75.65	76.65	78.20	0.66	2.30	0.91
MHCB01	STORMCEPTOR	74.91	74.88	78.20	78.00	2.99	2.82	3.29
STORMCEPTOR	CITY	74.82	74.73	78.00	77.40	2.88	2.37	2.88

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PRE-DEVELOPMENT DRAINAGE AREA (AFFECTED AREA)

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.3	C = 0.80	C = 0.90		
E-01	0.671	0.000	0.168	0.839	0.42
TOTAL	0.671	0.000	0.168	0.839	0.42

POST-DEVELOPMENT DRAINAGE AREA

Catchment Area	Runoff Coefficient			Total Area (ha)	Combined C
	C = 0.30	C = 0.80	C = 0.90		
WS-01	0.074	0.000	0.011	0.085	0.38
WS-02	0.033	0.000	0.070	0.103	0.71
WS-03	0.021	0.000	0.060	0.081	0.74
WS-04	0.015	0.000	0.054	0.069	0.77
WS-05	0.220	0.000	0.020	0.240	0.35
WS-06	0.041	0.000	0.000	0.041	0.30
WS-07- Ramp	0.000	0.000	0.005	0.005	0.90
WS-08 - Ramp	0.000	0.000	0.013	0.013	0.90
WS-09 - Roof	0.000	0.000	0.102	0.102	0.90
WS-10 - Roof	0.000	0.000	0.102	0.102	0.90
TOTAL	0.404	0.000	0.436	0.839	0.61

RUNOFF COEFFICIENT (C)

Grass	0.30
Gravel	0.80
Asphalt / rooftop	0.90

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STORM WATER MANAGEMENT DESIGN SHEET
5 YEAR STORM EVENT

PRE-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$
Un-Controlled	EWS-01	0.839	ha	R=	0.42
	Total Uncontrolled =	**0.839**	**ha**	**∑R=**	**0.42**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

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

C =	0.42	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines
I =	104.2	mm/hr
Tc =	10	min
Total =	0.839	ha
Allowable Release Rate=	**102.08**	**L/s**
Allowable Release Rate=	**96.70**	**L/s**

* As per City 300mm Diameter Stub installed at 1.00%

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
Controlled	WS-01	0.085	ha	R=	0.38	0.47
	WS-02	0.103	ha	R=	0.71	0.89
	WS-03	0.081	ha	R=	0.74	0.93
	WS-04	0.069	ha	R=	0.77	0.96
	WS-05	0.240	ha	R=	0.35	0.44
	WS-06	0.041	ha	R=	0.30	0.38
	WS-07- Ramp	0.005	ha	R=	0.90	1.00
	WS-08 - Ramp	0.013	ha	R=	0.90	1.00
	WS-09 - Roof	0.102	ha	R=	0.90	1.00
	WS-10 - Roof	0.102	ha	R=	0.90	1.00
	Total Contolled =	**0.839**	**ha**	**∑R=**	**0.61**	**0.73**

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

* WS-09 will not be accounted for as it will remain unaffected

		REQUIRED STORAGE				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	104.2	148.62	31.15	96.70	0.00	96.70
15	83.6	119.19	20.24	96.70	0.00	96.70
20	70.3	100.21	4.21	96.70	0.00	96.70
25	60.9	86.86	0.00	96.70	0.00	96.70
30	53.9	76.92	0.00	96.70	0.00	96.70
35	48.5	69.20	0.00	96.70	0.00	96.70
40	44.2	63.02	0.00	96.70	0.00	96.70
45	40.6	57.95	0.00	96.70	0.00	96.70
50	37.7	53.71	0.00	96.70	0.00	96.70
60	32.9	46.99	0.00	96.70	0.00	96.70
70	29.4	41.90	0.00	96.70	0.00	96.70
80	26.6	37.89	0.00	96.70	0.00	96.70
90	24.3	34.64	0.00	96.70	0.00	96.70
500	6.3	8.96	0.00	96.70	0.00	96.70
720	4.7	6.68	0.00	96.70	0.00	96.70
1440	2.7	3.81	0.00	96.70	0.00	96.70

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

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**31.15 m^3**
Surface Storage =	137.00 m^3
Total Available Storage =	**137.00 m^3**

BLANCHARD LETENDRE
ENGINEERING

File No.	20-305	**Date:**	19/03/2021
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	2396 Cleroux Crescent, Ottawa	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

STORM WATER MANAGEMENT DESIGN SHEET
100 YEAR STORM EVENT

PRE-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$
Un-Controlled	EWS-01	0.839	ha	R=	0.42
	Total Uncontrolled =	**0.839**	**ha**	**∑R=**	**0.42**

PRE-DEVELOPMENT ALLOWABLE RELEASE RATE

Q = 2.78CIA (L/s)

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

C =	0.45	up to a maximum of 0.5 as per City of Ottawa Sewer Design Guidelines
I =	104.2	mm/hr
Tc =	10	min
Total =	0.839	ha
Allowable Release Rate=	**109.37**	**L/s**
Allowable Release Rate=	**96.70**	**L/s** * As per City 300mm Diameter Stub installed at 1.00%

POST-DEVELOPMENT STORMATER MANAGEMENT

Runoff	Catchment Area	Area			$\sum R_5$	$\sum R_{100}$
	WS-01	0.085	ha	R=	0.38	0.47
	WS-02	0.103	ha	R=	0.71	0.89
	WS-03	0.081	ha	R=	0.74	0.93
	WS-04	0.069	ha	R=	0.77	0.96
	WS-05	0.240	ha	R=	0.35	0.44
	WS-06	0.041	ha	R=	0.30	0.38
	WS-07- Ramp	0.005	ha	R=	0.90	1.00
	WS-08 - Ramp	0.013	ha	R=	0.90	1.00
	WS-09 - Roof	0.102	ha	R=	0.90	1.00
	WS-10 - Roof	0.102	ha	R=	0.90	1.00
	Total Contolled =	**0.839**	**ha**	**∑R=**	**0.53**	**0.73**

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

		REQUIRED STORAGE				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	178.6	304.67	124.78	96.70	0.00	96.70
15	142.9	243.82	132.41	96.70	0.00	96.70
20	120.0	204.67	129.56	96.70	0.00	96.70
25	103.8	177.19	120.74	96.70	0.00	96.70
30	91.9	156.75	108.10	96.70	0.00	96.70
35	82.6	140.90	92.83	96.70	0.00	96.70
40	75.1	128.22	75.65	96.70	0.00	96.70
45	69.1	117.82	57.02	96.70	0.00	96.70
50	64.0	109.12	37.27	96.70	0.00	96.70
60	55.9	95.37	0.00	96.70	0.00	96.70
90	41.1	70.15	0.00	96.70	0.00	96.70
120	32.9	56.13	0.00	96.70	0.00	96.70
360	13.7	23.41	0.00	96.70	0.00	96.70
500	*10.5*	17.95	0.00	96.70	0.00	96.70
720	7.8	13.35	0.00	96.70	0.00	96.70

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

STORMATER STORAGE REQUIREMENTS

Total Storage Required =	**132.41 m^3**
Dry PondStorage =	137.00 m^3
Total Available Storage =	**137.00 m^3**

APPENDIX "B"
Sanitary Design

BLANCHARD LETENDRE
ENGINEERING

File No. 20-305
Project: Proposed Apartment Buildings
Project Address: 2396 Cleroux Crescent, Ottawa
Client: Bridor Development

Date: 19/03/2021
Designed: Guillaume Brunet
Checked: Guillaume Brunet
Drawing Reference: C200 & C300

SANITARY DESIGN SHEET
SEWER DESIGN

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE						MANHOLE	
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 A	SAN MH02	0.450	63.0	0.45	63.0	4.0	1.02	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.45	0.45	0.13	1.15	8.4	150	PVC	2.00%	21.54	1.22	78.67	78.50
SITE	PROP. BLDG B	SAN MH02	0.389	62.3	0.39	62.3	4.0	1.01	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.39	0.39	0.11	1.12	17.4	150	PVC	2.00%	21.54	1.22	78.85	78.50
	SAN MH02	SAN MH01	0.000	0.0	0.84	125.3	4.0	2.03	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.00	0.84	0.23	2.27	65.3	200	PVC	1.20%	35.93	1.14	76.38	75.60

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	Building A	Building B
Bachelor =	1.4		
1 Bedroom =	1.4	30	28
2 Bedroom =	2.1	10	12
3 Bedroom =	3.1		

APPENDIX "C"
Watermain Design

BLANCHARD LETENDRE
ENGINEERING

File No.	20-305	**Date:**	19/03/2021
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	2396 Cleroux Crescent, Ottawa	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

WATER CONSUMPTION CALCULATION

	BLOCK A	BLOCK B	
Total Building Floor Area =	**1016**	**1016**	m^2
Site Total Area =	**0.4195**	**0.4195**	ha
Total Population =	63.00	64.40	ea.
Average Demand Per People =	350	350	L/c/d
Average Water Demand =	**22050.00**	**22540.00**	L/d
Maximum Daily Peak Factor =	2.5	2.5	* As per City of Ottawa
Maximum Daily Residential =	**55125.00**	**56350.00**	L/d
Maximum Hourly Peak Factor =	2.2	2.2	* As per City of Ottawa
Maximum Hourly Residential =	**121275.00**	**123970.00**	L/d
Total Domestic Flow =	**1.40**	**1.43**	**L/s**
Total Fire Flow =	**166.67**	**161.67**	**L/s**

Appartments:	Person Per Unit	Building A	Building B
Bachelor =	1.4	0	0
1 Bedroom =	1.4	30	28
2 Bedroom =	2.1	10	12
3 Bedroom =	3.1	0	0
		63.00	**64.40**

BLOCK A	1 Bedroom	2 Bedroom	Unit Counts	WSFU	Total
Unrinal Flush Tank	1	1	40	2	80
Sinks	2	2	80	1	80
Bathub	1	1	40	4	160
Diswasher	1	1	40	1.5	60
Washing Machine	1	1	40	2	80
Total					**460**

BLOCK B	1 Bedroom	2 Bedroom	Unit Counts	WSFU	Total
Unrinal Flush Tank	1	1	40	2	80
Sinks	2	2	80	1	80
Bathub	1	1	40	4	160
Diswasher	1	1	40	1.5	60
Washing Machine	1	1	40	2	80
Total					**460**

BLANCHARD LETENDRE
ENGINEERING

File No.	20-305	**Date:**	18/02/2021
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	2396 Cleroux Crescent, Ottawa	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

BLOCK A

Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	0.8		
	Ordinary Construction	1.0				
	Non-combustible construction	0.8				
	Fire resistive construction <2 hrs	0.7				
	Fire resistive construction >2 hrs	0.6				
Type of housing	Single family dwelling	0	Building - no. of units per floor	14	unit	
	Townhouse - no. of units	0				
	Building - no. of units per floor	0				
	Number of floors excluding the basement			3	floor	
	Floor space per unit	1	1,016	1,016	sq.m.	
Required fire flow	**Fire Flow = 220 x C x Area^0.5**				L/min	**9,717**
					L/s	162
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	**8,259**
	Rapid burning	0.25			L/s	138
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	**7,433**
	Fully supervised system	-0.10	True	-0.1	L/s	124
Exposure distance between units	North side	Over 45m	0			
	East side	20.1 to 30m	0.1			
	South side	20.1 to 30m	0.1		L/min	**10,035**
	West side	10.1 to 20m	0.15	0.35	L/s	167
			Minimum required fire flow rate (rounded to nearest 100)		L/min	**10,000**
			Minimum required fire flow rate		L/s	**167**
			Required duration of fire flow		min	**30**

BLANCHARD LETENDRE
ENGINEERING

File No.	20-305	**Date:**	19/03/2021
Project:	Proposed Apartment Buildings	**Designed:**	Guillaume Brunet
Project Address:	2396 Cleroux Crescent, Ottawa	**Checked:**	Guillaume Brunet
Client:	Bridor Development	**Drawing Reference:**	C200 & C300

BLOCK B

Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	0.8		
	Ordinary Construction	1.0				
	Non-combustible construction	0.8				
	Fire resistive construction <2 hrs	0.7				
	Fire resistive construction >2 hrs	0.6				
Type of housing	Single family dwelling	0	Building - no. of units per floor	14	unit	
	Townhouse - no. of units	0				
	Building - no. of units per floor	0				
	Number of floors excluding the basement			3	floor	
	Floor space per unit	1	1,016	1,016	sq.m.	
Required fire flow	**Fire Flow = 220 x C x Area^0.5**				L/min	**9,717**
					L/s	162
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	**8,259**
	Rapid burning	0.25			L/s	138
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	**7,433**
	Fully supervised system	-0.10	True	-0.1	L/s	124
Exposure distance between units	North side	Over 45m	0			
	East side	20.1 to 30m	0.1			
	South side	20.1 to 30m	0.1		L/min	**9,663**
	West side	20.1 to 30m	0.1	0.3	L/s	161
			Minimum required fire flow rate (rounded to nearest 100)		L/min	**9,700**
			Minimum required fire flow rate		L/s	**162**
			Required duration of fire flow		min	**30**

APPENDIX "D"
Underground Chambers & Stormwater Treatment Unit

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

SiteASSIST™ by StormTech

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2396 CLEROUX CRES

OTTAWA, ONTARIO

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500.
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 60x101.
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-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 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 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 - 230 mm (9") 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 SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. 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-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 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

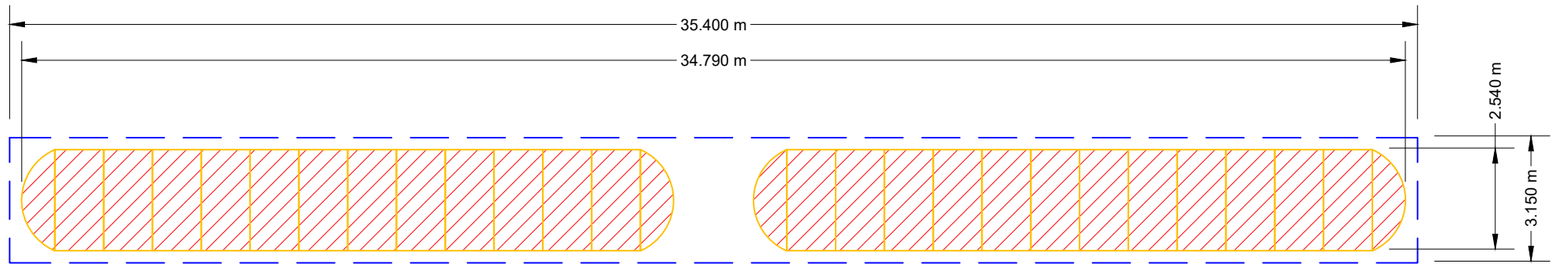
24	STORMTECH MC-4500 CHAMBERS
4	STORMTECH MC-4500 END CAPS
305	STONE ABOVE (mm)
229	STONE BELOW (mm)
40	STONE VOID
0.0	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
111.5	SYSTEM AREA (m^2)
77.1	SYSTEM PERIMETER (m)

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	81.636
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	80.265
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	80.112
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	80.112
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	80.112
TOP OF STONE:	79.807
TOP OF MC-4500 CHAMBER:	79.503
BOTTOM OF MC-4500 CHAMBER:	77.979
BOTTOM OF STONE:	77.750

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW



ISOLATOR ROW PLUS
(SEE DETAIL/TYP 2 PLACES)

NO WOVEN GEOTEXTILE

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

2396 CLEROUX CRES
OTTAWA, ONTARIO

DRAWN: HN
CHECKED: N/A
DATE: 12/7/2020
PROJECT #:

REV	DRW	CHK	DESCRIPTION

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

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

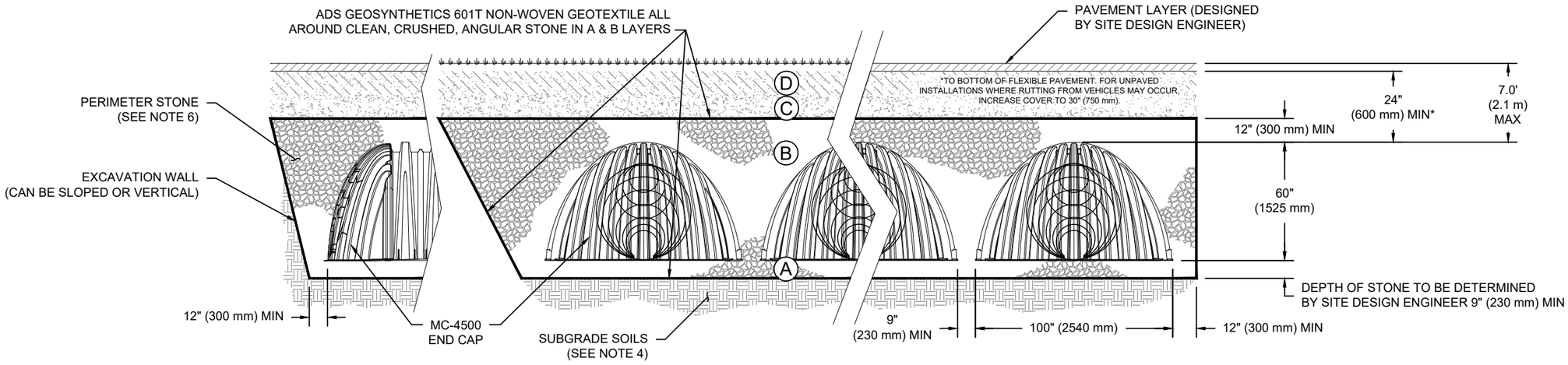
SCALE = 1 : 150

SHEET
2 OF 5

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 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 60x101
2. MC-4500 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.

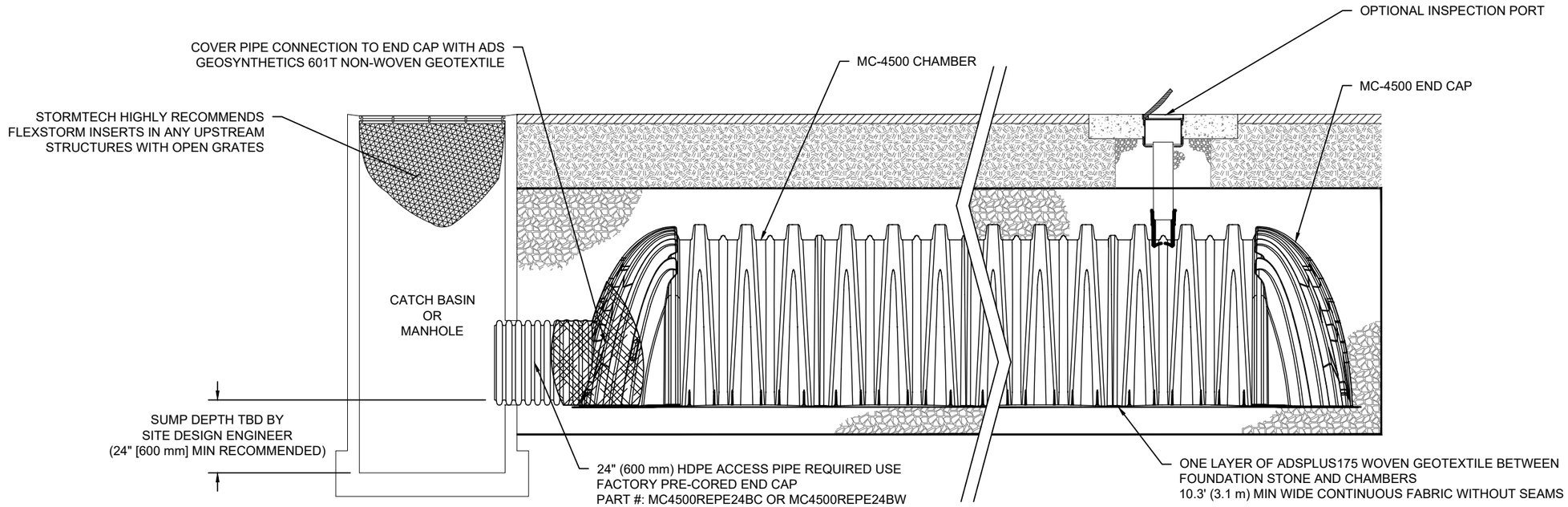
2396 CLEROUX CRES
OTTAWA, ONTARIO

DATE: 12/7/2020 | DRAWN: HN | CHECKED: N/A | PROJECT #:

REV	DRW	CHK	DESCRIPTION

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

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



MC-4500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

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

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

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

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

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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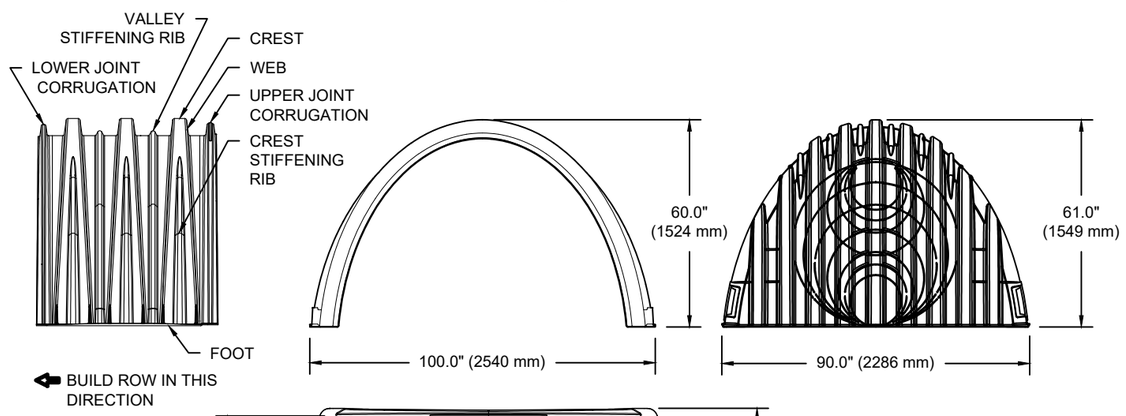
MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT (NOMINAL)	125.0 lbs.	(56.7 kg)

NOMINAL END CAP SPECIFICATIONS

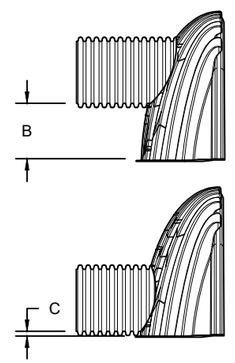
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 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"

PART #	STUB	B	C
MC4500IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500IEPP06B		---	0.86" (22 mm)
MC4500IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC4500IEPP08B		---	1.01" (26 mm)
MC4500IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC4500IEPP10B		---	1.33" (34 mm)
MC4500IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC4500IEPP12B		---	1.55" (39 mm)
MC4500IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500IEPP15B		---	1.70" (43 mm)
MC4500IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500IEPP18TW			
MC4500IEPP18B		---	1.97" (50 mm)
MC4500IEPP18BW			
MC4500IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24TW			
MC4500IEPP24B		---	2.26" (57 mm)
MC4500IEPP24BW			
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

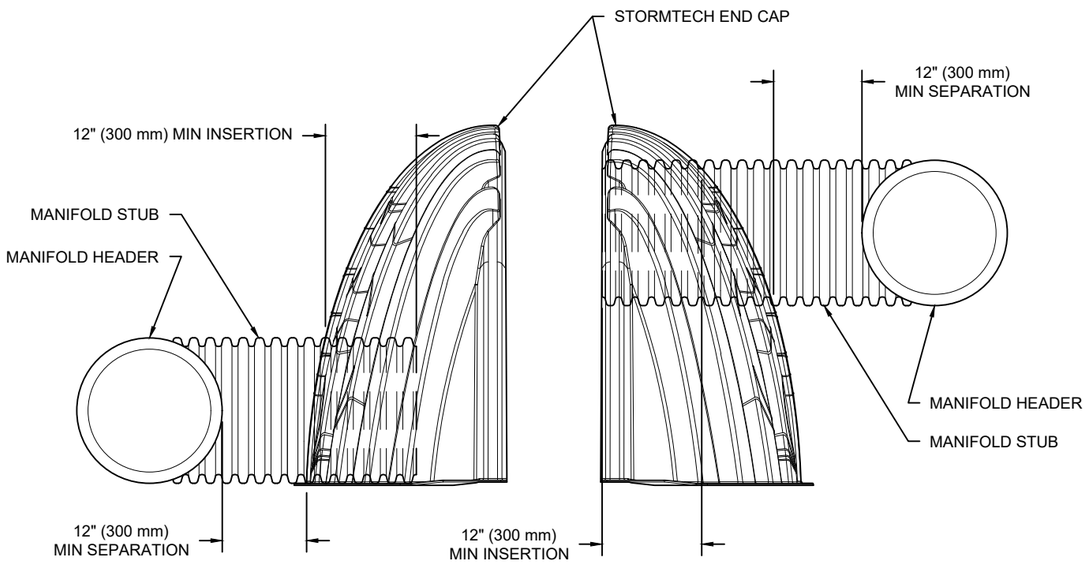
NOTE: ALL DIMENSIONS ARE NOMINAL



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-4500 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.

2396 CLEROUX CRES
OTTAWA, ONTARIO

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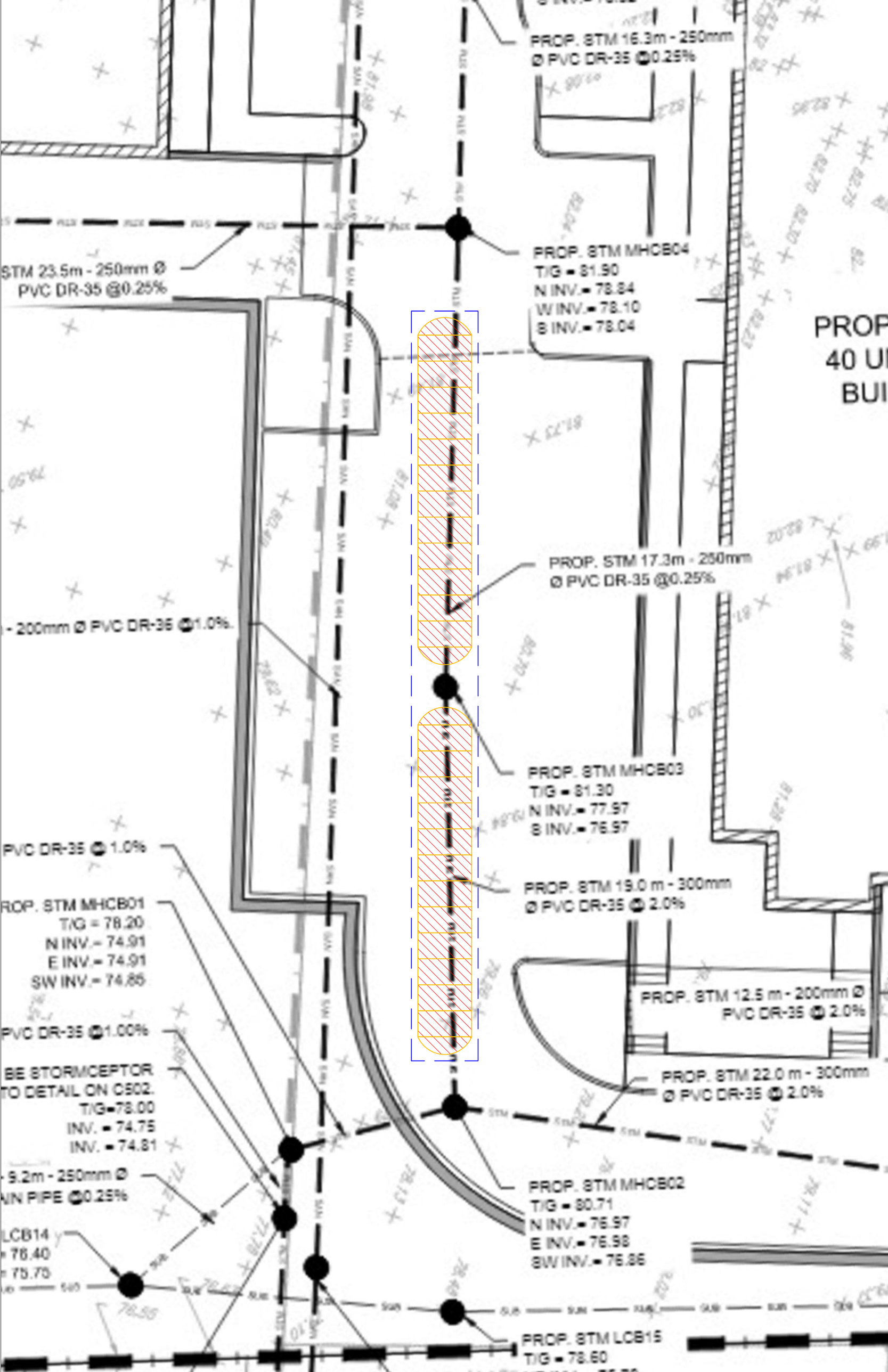
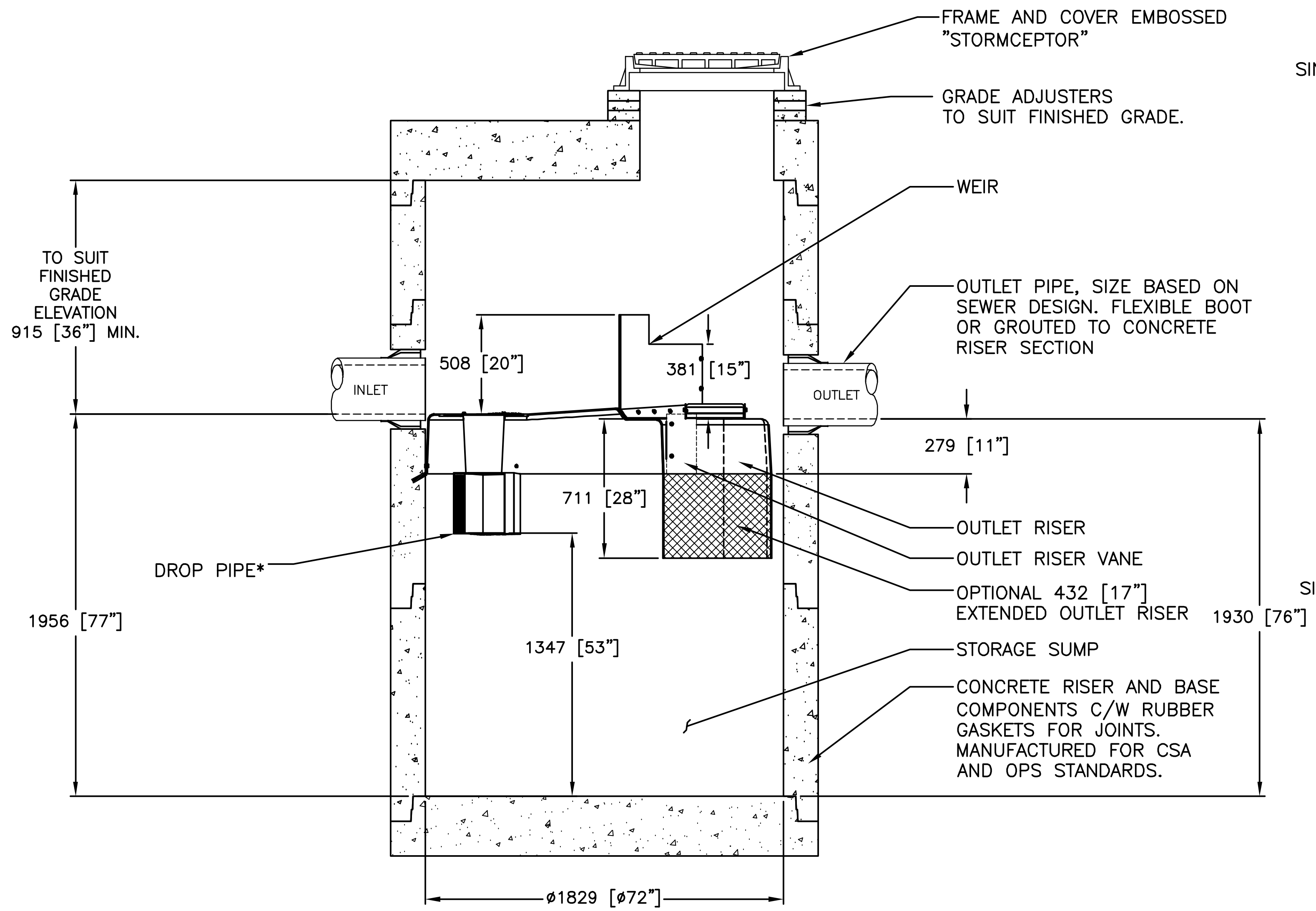
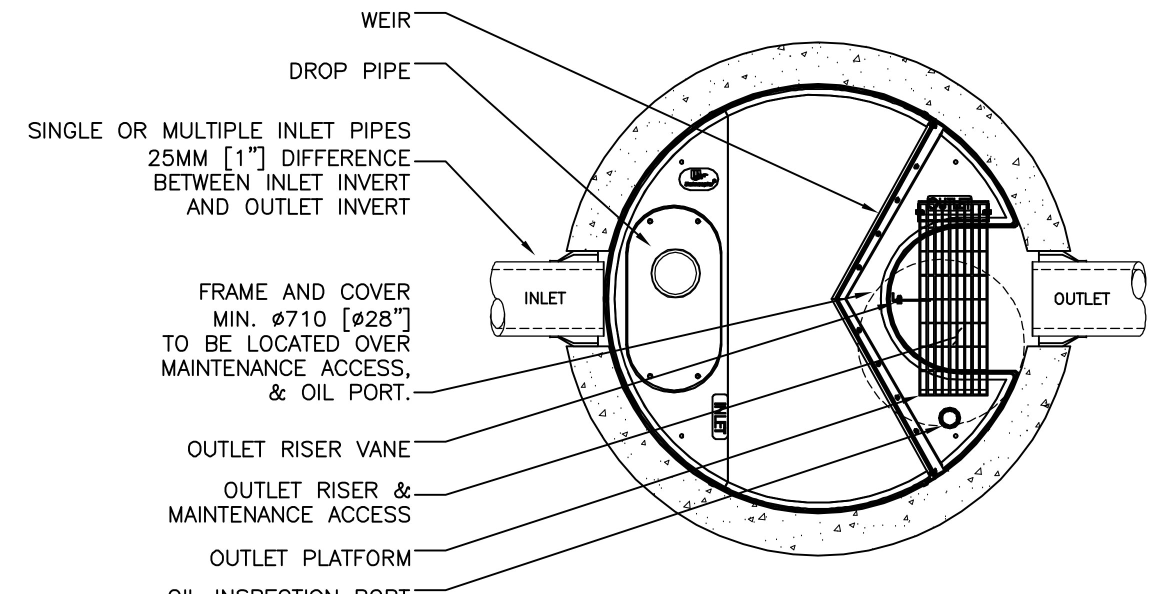

PROP. STM 16.3m - 250mm
Ø PVC DR-35 @0.25%
PROP. STM MHCB04
T/G = 81.90
N INV.= 78.84
W INV.= 78.10
S INV.= 78.04
STM 23.5m - 250mm Ø
PVC DR-35 @0.25%
PROP. STM 17.3m - 250mm
Ø PVC DR-35 @0.25%
- 200mm Ø PVC DR-35 @1.0%
PROP. STM MHCB03
T/G = 81.30
N INV.= 77.97
S INV.= 76.97
PVC DR-35 @ 1.0%
PROP. STM 19.0 m - 300mm
Ø PVC DR-35 @ 2.0%
ROP. STM MHCB01
T/G = 78.20
N INV.= 74.91
E INV.= 74.91
SW INV.= 74.85
PROP. STM 12.5 m - 200mm Ø
PVC DR-35 @ 2.0%
PVC DR-35 @1.00%
BE STORMCEPTOR
TO DETAIL ON C502.
T/G=78.00
INV. = 74.75
INV. = 74.81
PROP. STM 22.0 m - 300mm
Ø PVC DR-35 @ 2.0%
9.2m - 250mm Ø
AIN PIPE @0.25%
PROP. STM MHCB02
T/G = 80.71
N INV.= 76.97
E INV.= 76.98
SW INV.= 76.86
LCB14
= 76.40
= 75.75
PROP. STM LCB15
T/G = 78.60

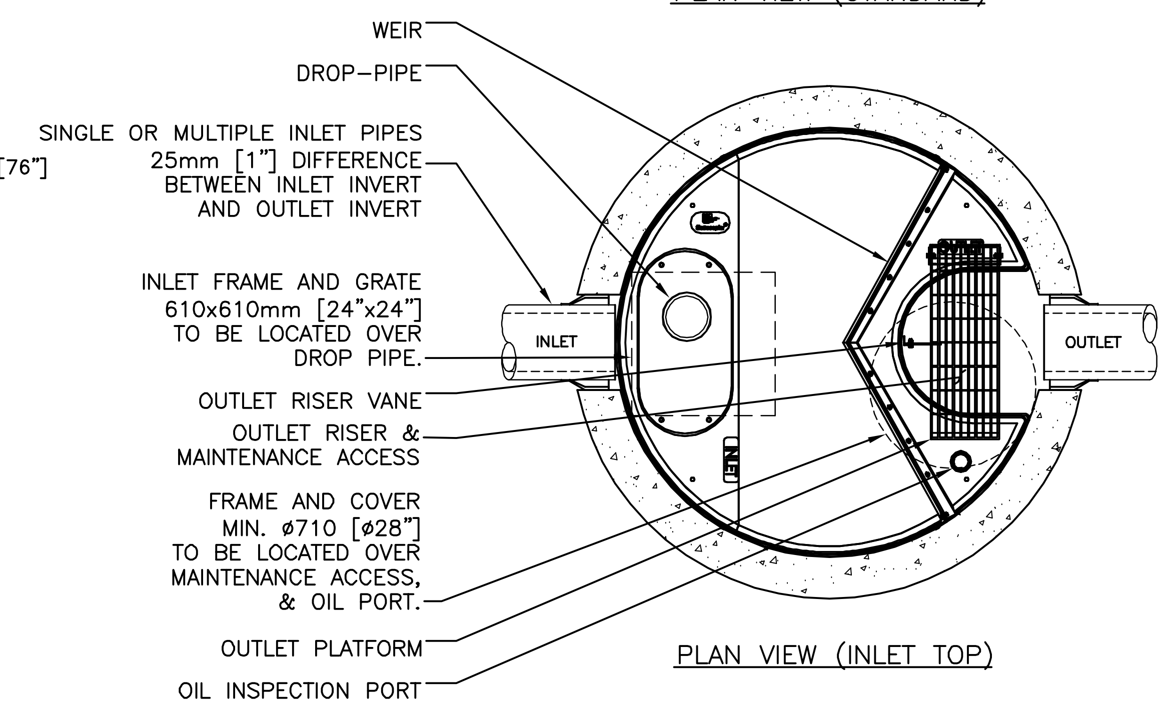
DRAWING NOT TO BE USED FOR CONSTRUCTION



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF6 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

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

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

INSTALLATION NOTES

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

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO6				
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

MARK	DATE	REVISION DESCRIPTION	BY
####	####	####	####
####	####	####	####
####	####	####	####
1	6/8/18	OUTLET PLATFORM	JSK
0	05/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

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

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

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/17/2021

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP
NCDC Rainfall Station Id:	6000
Years of Rainfall Data:	37
Site Name:	
Drainage Area (ha):	0.84
Runoff Coefficient 'c':	0.61
Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	18.52
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	Cleroux Street
Project Number:	20-305
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:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	76
EFO6	84
EFO8	87
EFO10	89
EFO12	91

Recommended Stormceptor EFO Model: EFO6

Estimated Net Annual Sediment (TSS) Load Reduction (%): 84

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

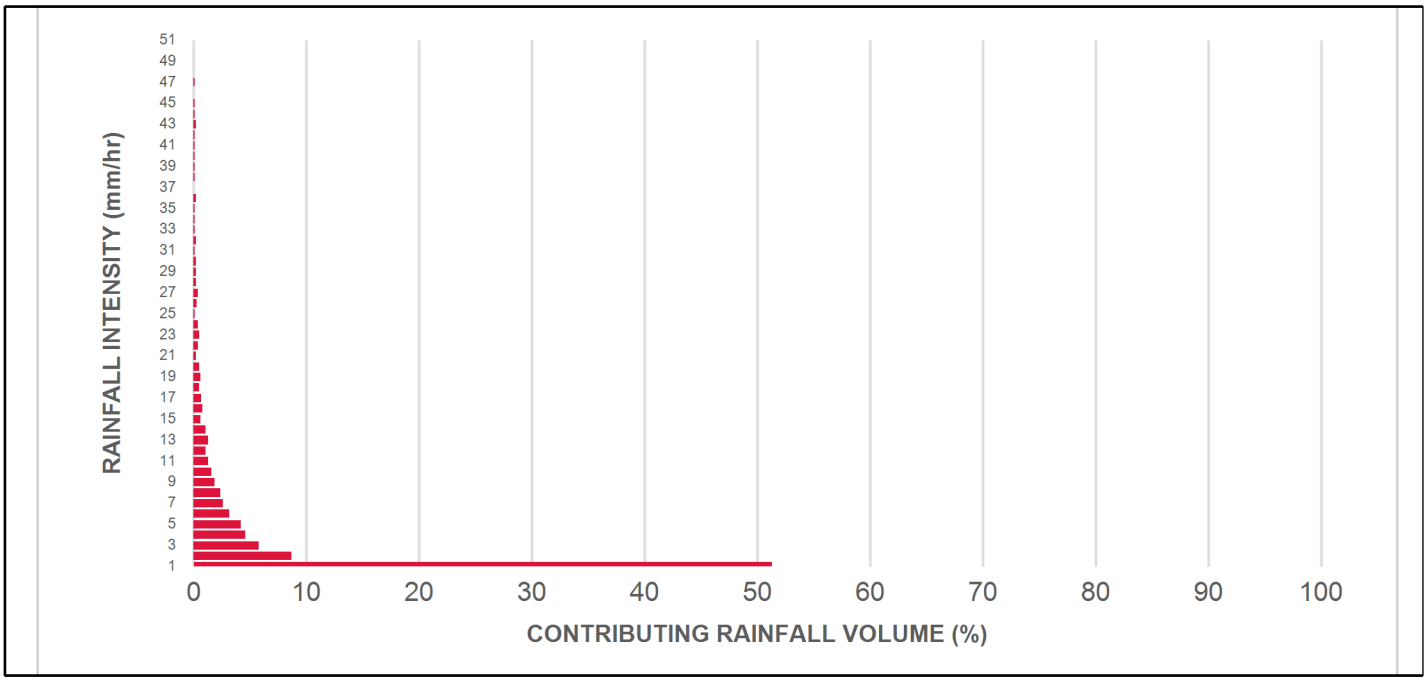
Stormceptor® EF Sizing Report

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 (%)
1	51.3	51.3	1.42	85.0	32.0	93	47.7	47.7
2	8.7	60.0	2.85	171.0	65.0	91	7.9	55.6
3	5.8	65.8	4.27	256.0	97.0	88	5.1	60.7
4	4.6	70.4	5.70	342.0	130.0	84	3.8	64.6
5	4.2	74.6	7.12	427.0	162.0	80	3.4	67.9
6	3.2	77.8	8.55	513.0	195.0	77	2.5	70.4
7	2.6	80.4	9.97	598.0	227.0	74	1.9	72.3
8	2.4	82.8	11.40	684.0	260.0	71	1.7	74.0
9	1.9	84.7	12.82	769.0	292.0	68	1.3	75.3
10	1.6	86.3	14.24	855.0	325.0	65	1.0	76.4
11	1.3	87.6	15.67	940.0	357.0	63	0.8	77.2
12	1.1	88.7	17.09	1026.0	390.0	59	0.6	77.8
13	1.3	90.0	18.52	1111.0	422.0	57	0.7	78.6
14	1.1	91.1	19.94	1197.0	455.0	57	0.6	79.2
15	0.6	91.7	21.37	1282.0	487.0	56	0.3	79.5
16	0.8	92.5	22.79	1367.0	520.0	54	0.4	80.0
17	0.7	93.2	24.22	1453.0	552.0	54	0.4	80.3
18	0.5	93.7	25.64	1538.0	585.0	53	0.3	80.6
19	0.6	94.3	27.06	1624.0	617.0	52	0.3	80.9
20	0.5	94.8	28.49	1709.0	650.0	52	0.3	81.2
21	0.2	95.0	29.91	1795.0	682.0	52	0.1	81.3
22	0.4	95.4	31.34	1880.0	715.0	51	0.2	81.5
23	0.5	95.9	32.76	1966.0	747.0	51	0.3	81.7
24	0.4	96.3	34.19	2051.0	780.0	51	0.2	81.9
25	0.1	96.4	35.61	2137.0	812.0	51	0.1	82.0

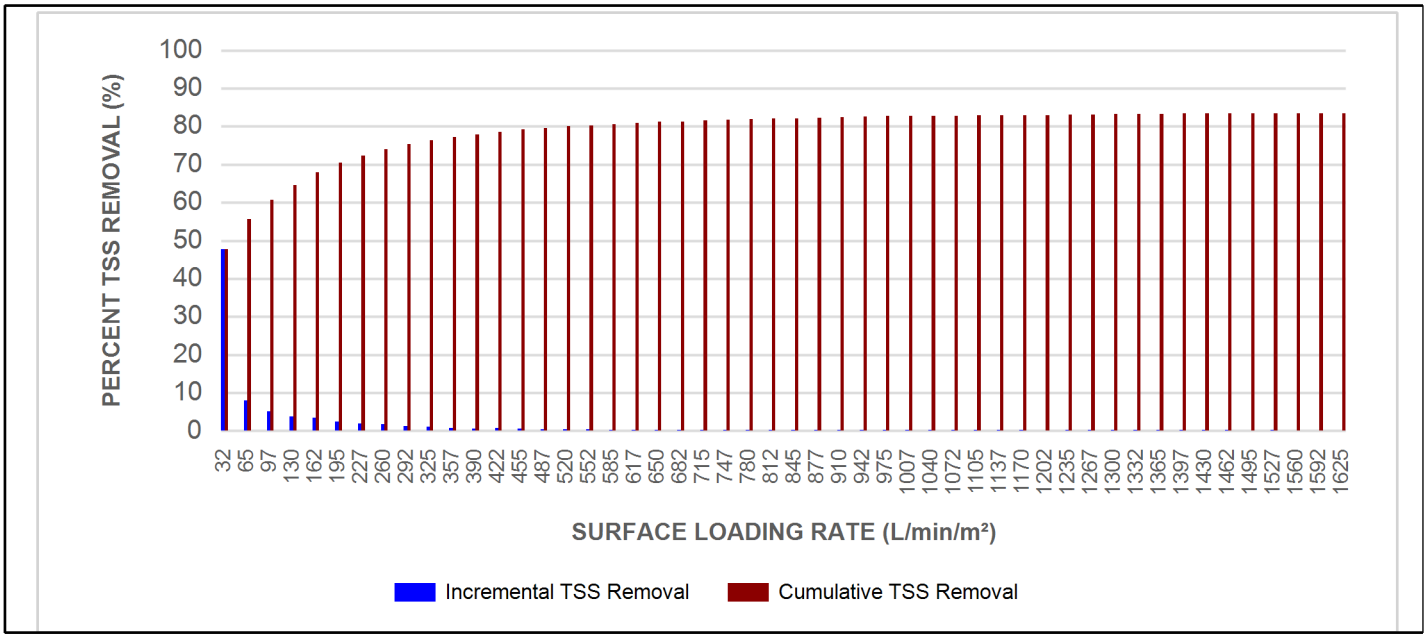
Stormceptor® EF Sizing Report

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	37.04	2222.0	845.0	51	0.2	82.1
27	0.4	97.1	38.46	2308.0	877.0	51	0.2	82.3
28	0.2	97.3	39.89	2393.0	910.0	50	0.1	82.4
29	0.2	97.5	41.31	2479.0	942.0	50	0.1	82.5
30	0.2	97.7	42.73	2564.0	975.0	50	0.1	82.7
31	0.1	97.8	44.16	2650.0	1007.0	50	0.1	82.7
32	0.2	98.0	45.58	2735.0	1040.0	50	0.1	82.8
33	0.1	98.1	47.01	2820.0	1072.0	49	0.0	82.8
34	0.1	98.2	48.43	2906.0	1105.0	49	0.0	82.9
35	0.1	98.3	49.86	2991.0	1137.0	49	0.0	82.9
36	0.2	98.5	51.28	3077.0	1170.0	48	0.1	83.0
37	0.0	98.5	52.71	3162.0	1202.0	48	0.0	83.0
38	0.1	98.6	54.13	3248.0	1235.0	48	0.0	83.1
39	0.1	98.7	55.55	3333.0	1267.0	47	0.0	83.1
40	0.1	98.8	56.98	3419.0	1300.0	47	0.0	83.2
41	0.1	98.9	58.40	3504.0	1332.0	47	0.0	83.2
42	0.1	99.0	59.83	3590.0	1365.0	46	0.0	83.3
43	0.2	99.2	61.25	3675.0	1397.0	46	0.1	83.4
44	0.1	99.3	62.68	3761.0	1430.0	45	0.0	83.4
45	0.1	99.4	64.10	3846.0	1462.0	44	0.0	83.5
46	0.0	99.4	65.53	3932.0	1495.0	43	0.0	83.5
47	0.1	99.5	66.95	4017.0	1527.0	42	0.0	83.5
48	0.0	99.5	68.37	4102.0	1560.0	41	0.0	83.5
49	0.0	99.5	69.80	4188.0	1592.0	41	0.0	83.5
50	0.0	99.5	71.22	4273.0	1625.0	40	0.0	83.5
Estimated Net Annual Sediment (TSS) Load Reduction =								**84 %**

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

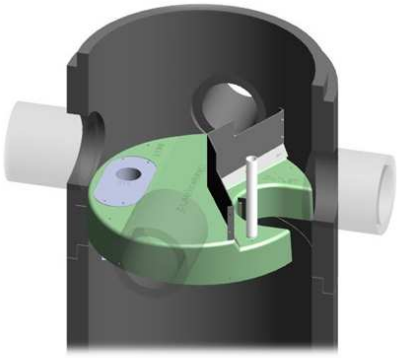
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

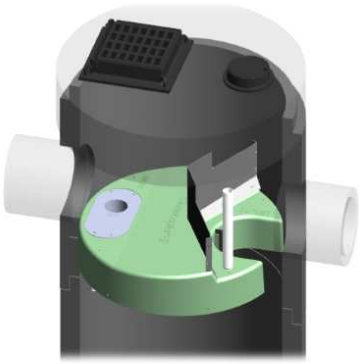
DESIGN FLEXIBILITY

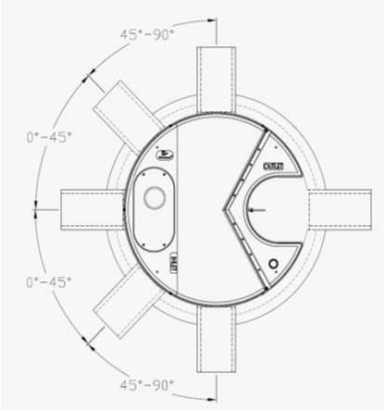
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

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

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m2 to 2600 L/min/m2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

APPENDIX "E"
Boundary Conditions

Boundary Conditions
2396 Cleroux Street

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	31	0.51
Maximum Daily Demand	76	1.27
Peak Hour	167	2.79
Fire Flow Demand #1	10,000	166.67

Location

Results

Connection 1 – Cleroux St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.0	67.8
Peak Hour	127.0	62.2
Max Day plus Fire 1	123.1	56.6

Ground Elevation = 83.2 m

Connection 2 – Orient Park Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.0	70.2
Peak Hour	127.0	64.6
Max Day plus Fire 1	120.1	54.8

Ground Elevation = 81.6 m

Disclaimer

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

APPENDIX “F”
Engineering Drawings

EROSION AND SEDIMENT CONTROL MEASURES:

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

1. PRIOR TO START OF CONSTRUCTION:

1.1. PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF ANY SOIL, AND CONSTRUCTION:
- 1.1.1. INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- 1.1.2. INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCH BASINS AND MANHOLES.
- 1.1.3. INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASIN STRUCTURES.
- 1.1.4. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

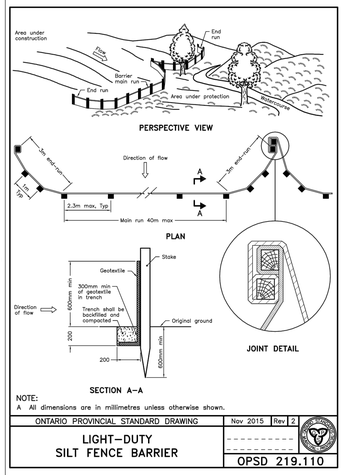
2.1. WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
2.2. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
2.3. PROTECT DISTURBED AREAS FROM RUNOFF.
2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILIATED WITHIN 30 DAYS.
2.5. INSPECT SILT FENCE, FILTER CLOTHS, AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY
2.6. PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
2.8. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (30 DAYS).
2.9. CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).
2.10. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
2.11. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS. "TO PREVENT UNNECESSARY SEDIMENT DISCHARGE, THE CONTRACTOR IS PERMITTED TO PLACE ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES IN A TIMELY MANNER, IF REQUIRED. THE CONTRACTOR TO ADVISE CONSULTANT ONCE INSTALLED FOR INSPECTION."
2.12. CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC, AT THE END OF EACH WORK DAY.
2.13. PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG. 4m WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHER-RUN LIMESTONE). MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.
2.14. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
2.15. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
2.16. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

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

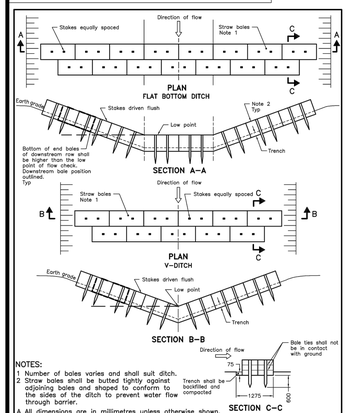
LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED 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) / (UNCONTROLLED) — 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



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

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



NOTES:
1. Number of bales varies and shall suit ditch.
2. Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.

A All dimensions are in millimetres unless otherwise shown.

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

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
19/03/2021
PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 03 / 2021

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
2396 CLEROUX CRES,
OTTAWA, ON

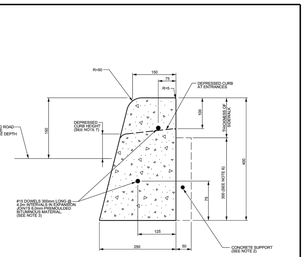
DRAWING:
SEDIMENT & EROSION CONTROL PLAN

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	03-2021
SCALE:	1:300
PROJECT NUMBER:	20-305

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
- 75.19 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
- 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 (CONTROL LOC.) / AREA, RUNOFF — WATERSHED NAME / RUNOFF COEFFICIENT / AREA IN HECTARES
- PROPOSSED GRASS AREA
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED GRAVEL AREA
- PROPOSED RIP RAP AS PER OPSD 810.010
- M PROPOSED WATER METER
- PROPOSED ACCESS GATE
- PROPOSED GROWING FIELD

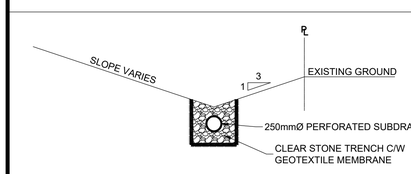


CONCRETE BARRIER CURB

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 EXTRUSION 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 20mm.

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



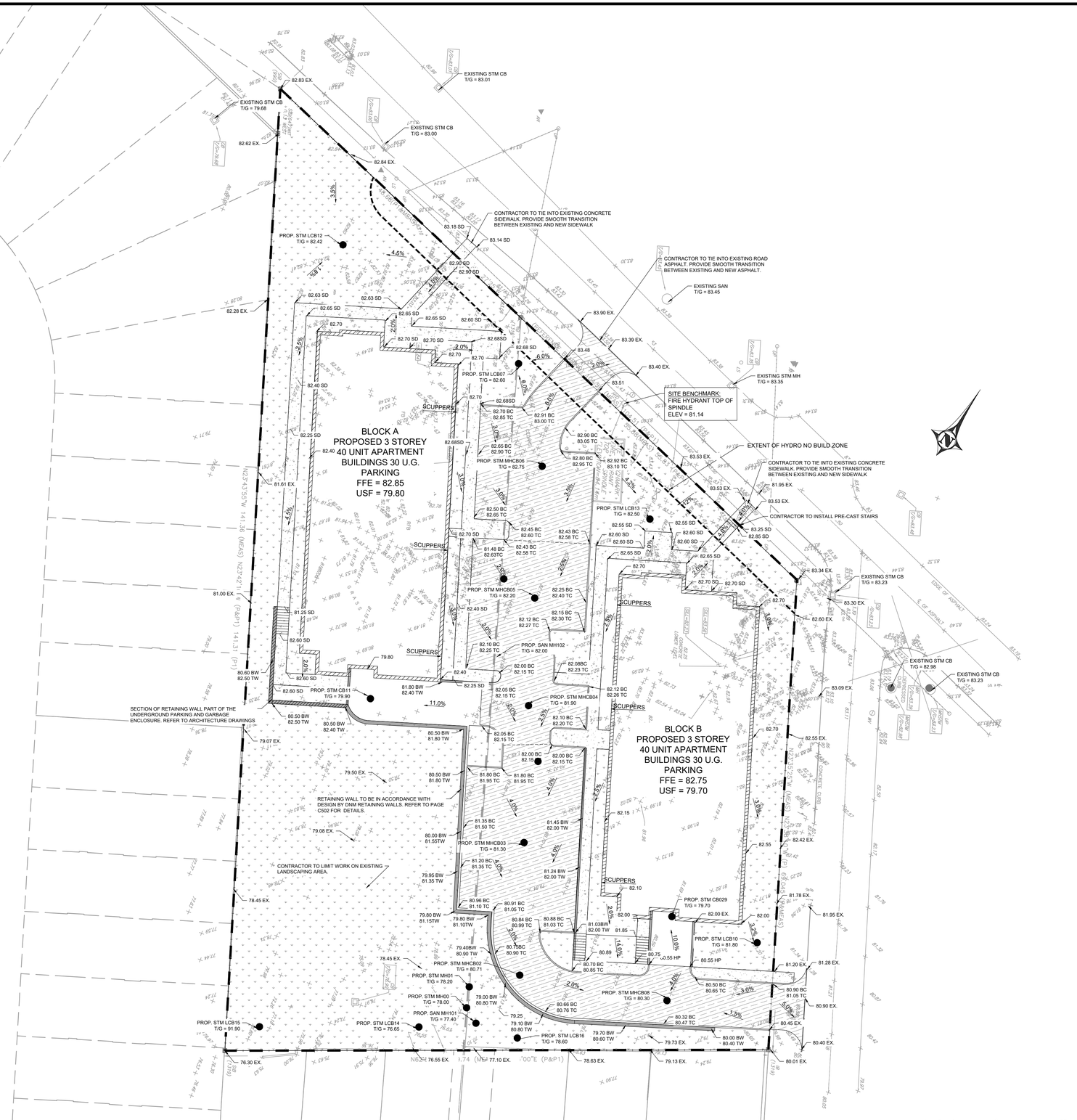
SWALE & SUBDRAIN - TYPICAL SECTION

(N.T.S.)

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL3 A/C (PG 58-28)	50	40
BINDER	HL8 A/C (PG 58-28)	--	50
BASECOURSE	GRANULAR "A"	150	150
SUBBASE	GRANULAR "B" TYPE II	350	450

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.



ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER — G. L. BRUNET — 100191036 — 19/03/2021 — PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
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BLANCHARD LETENDRE ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, K0A 1W1
(6 1 3) 6 9 3 - 0 7 0 0
blengineering.ca

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

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
2396 CLEROUX CRES,
OTTAWA, ON

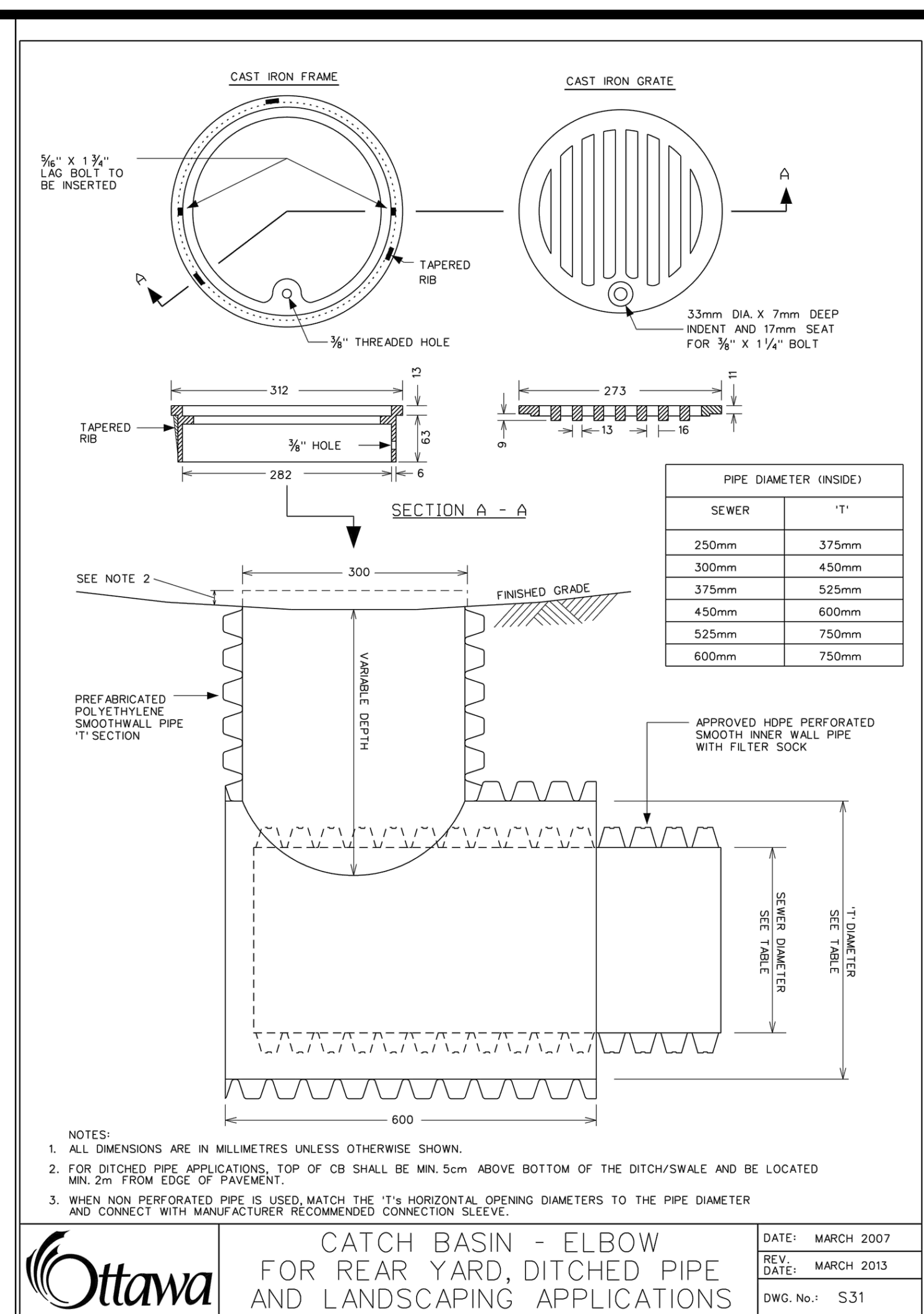
DRAWING:
SITE GRADING PLAN

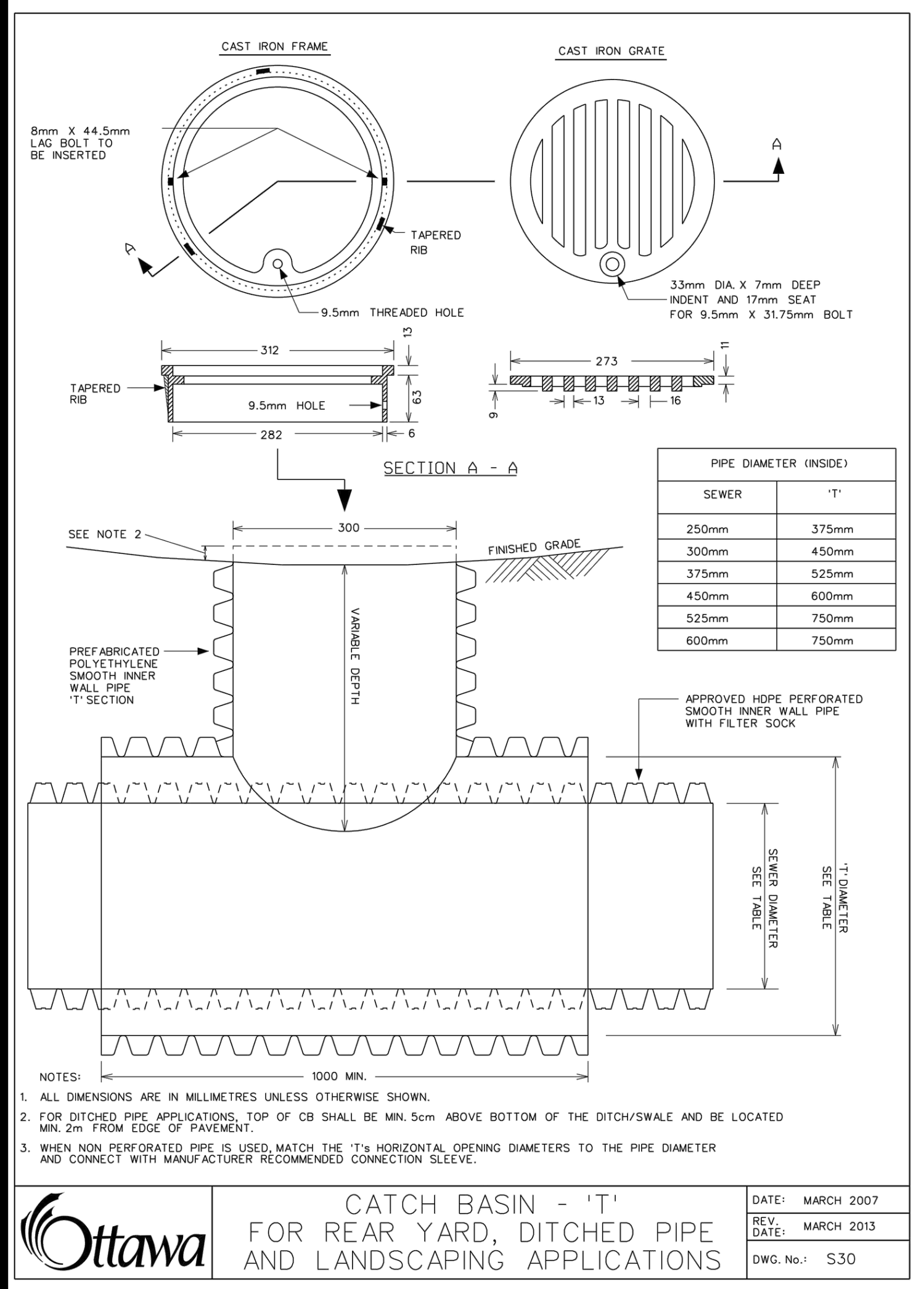
PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	03-2021
SCALE:	1:300
PROJECT NUMBER:	20-305

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
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- 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
- 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



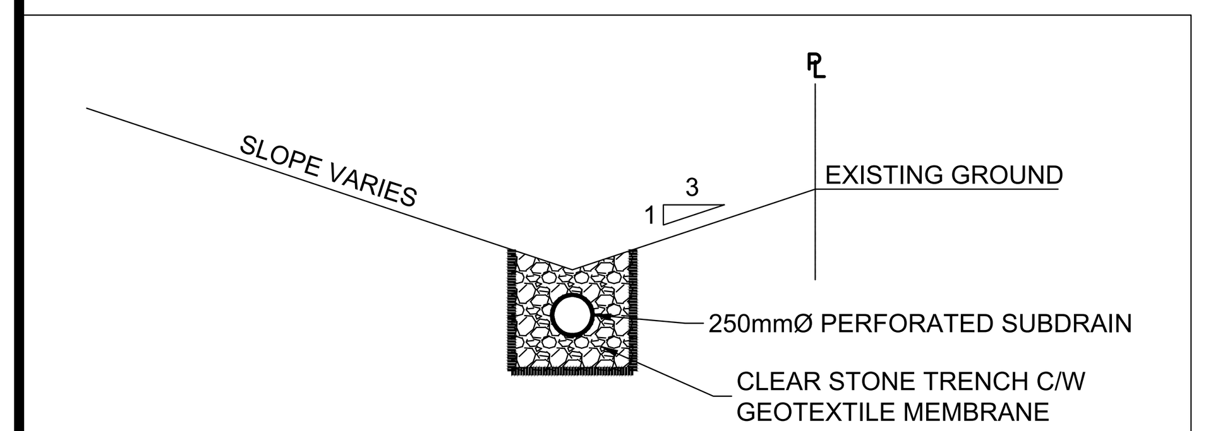


MANHOLE TABLE

STORM		
MH Number	Size (diameter)	Cover
MH00	Treatment Unit - 1800mm	S23 / OPSD 404.010
MH01	1200mm	S23 / OPSD 404.010
MHCB02	1200mm	S19 / OPSD 404.010
MHCB03	1200mm	S19 / OPSD 404.010
MHCB04	1200mm	S19 / OPSD 404.010
MHCB05	1200mm	S19 / OPSD 404.010
MHCB06	1200mm	S19 / OPSD 404.010
MHCB08	1200mm	S19 / OPSD 404.010
CB09	600mm	S19 / OPSD 404.010
CB11	600mm	S19 / OPSD 404.010
LCB07,10, 13, 14, 15, 16	S30 AND S31	

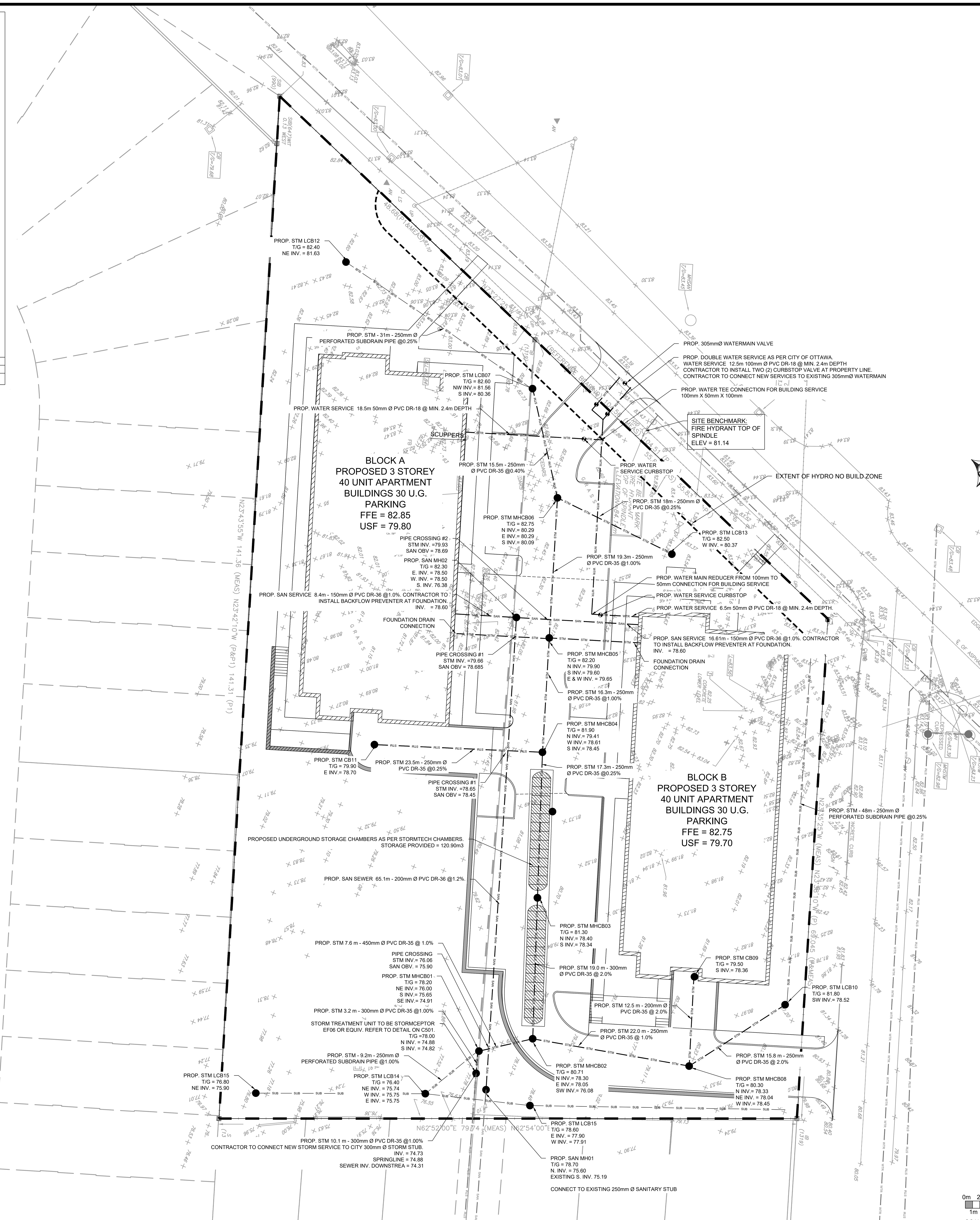
MANHOLE TABLE

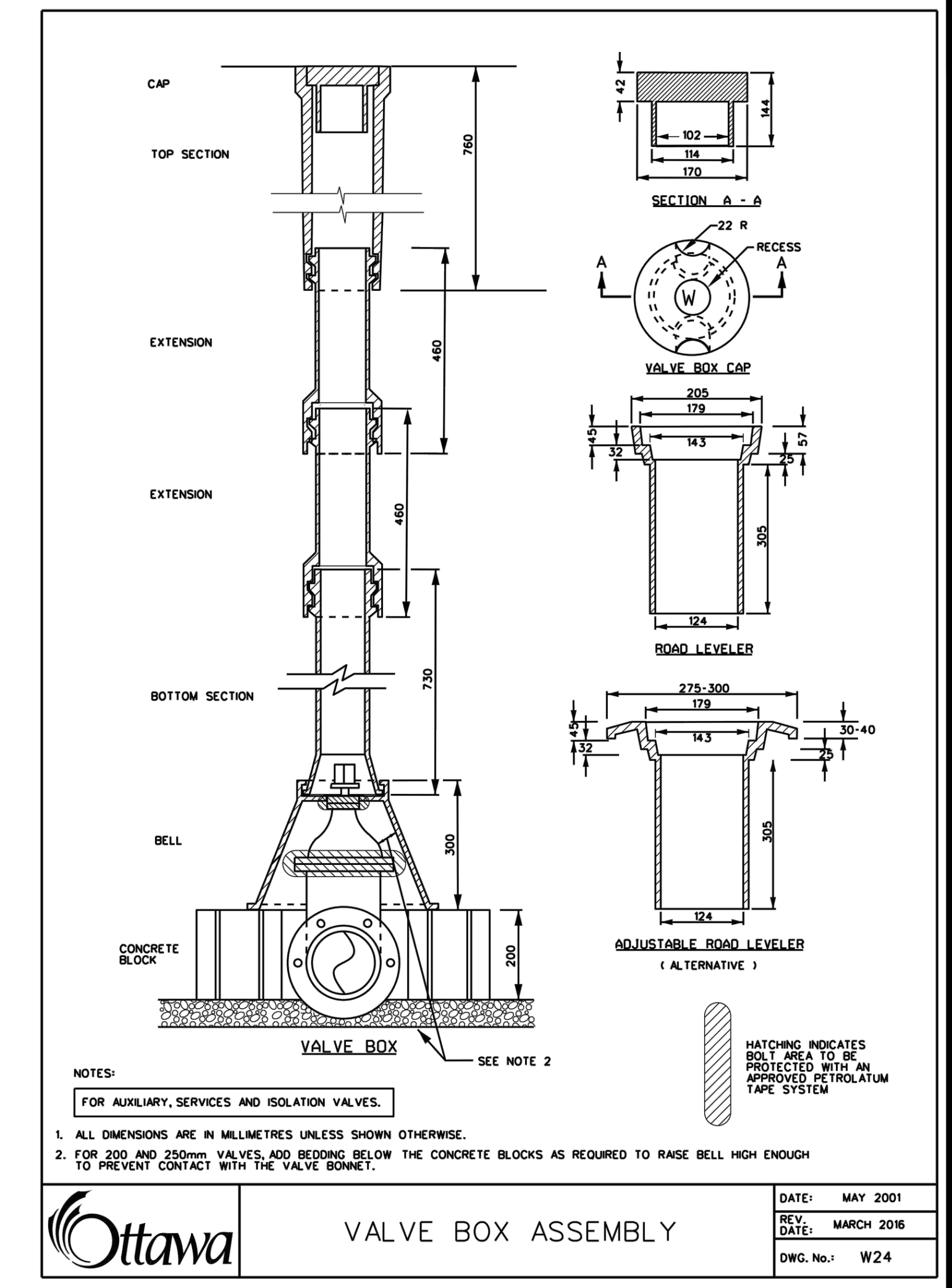
SANITARY		
MH Number	Size (diameter)	Cover
MH101	1200mm	S23 / OPSD 404.010
MH102	1200mm	S23 / OPSD 404.010



SWALE & SUBDRAIN - TYPICAL SECTION

(N.T.S.)





ENGINEERING STAMP

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BLANCHARD LETENDRE ENGINEERING

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

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
2396 CLEROUX CRES,
OTTAWA, ON

DRAWING:

SITE SERVICING PLAN

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- PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM PROPOSED STORM SEWER
- SAN PROPOSED SANITARY SEWER
- WTR PROPOSED WATERMAIN
- SAN EXISTING SANITARY SEWER
- WTR EXISTING WATERMAIN
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- PROPOSED CURB STOP
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- STORM WATERSHED EXTENT
- WS-XX (EXISTING / NEW) — WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES
- PROPOSSED GRASS AREA
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
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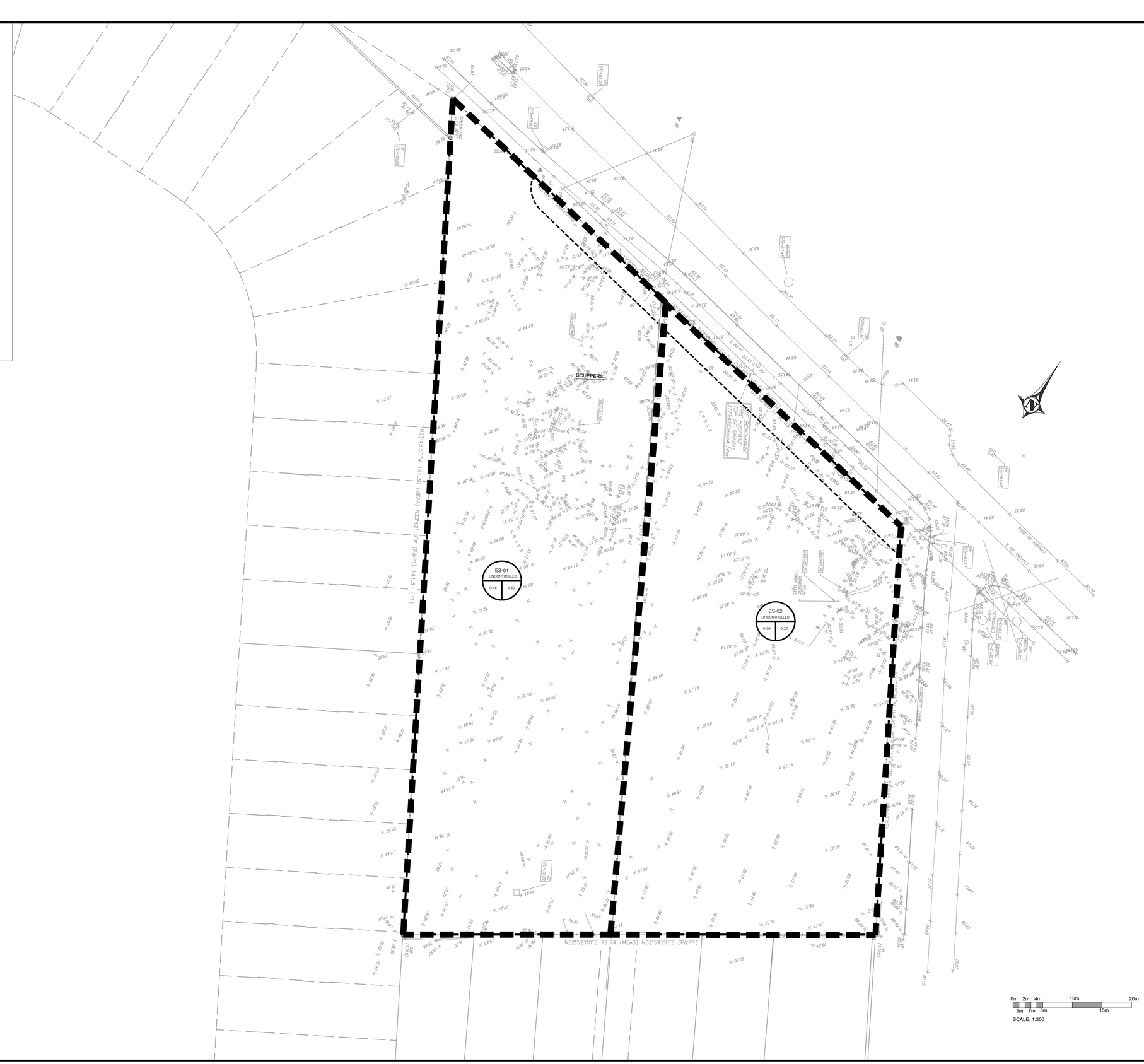

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- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX (CONTROL) (AREA) (RUNOFF) — WATERSHED NAME / RUNOFF COEFFICIENT / AREA IN HECTARES
- PROPOSSED GRASS AREA
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED GRAVEL AREA
- PROPOSED RIP RAP AS PER OPSD 810.010
- PROPOSED WATER METER
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- PROPOSED GROWING FIELD

EXISTING STM CB T/G = 79.68
EXISTING STM CB T/G = 83.01
EXISTING STM CB T/G = 83.00
PROP. STM LCB12 T/G = 82.42
WS-01 CONTROLLED 0.085 0.38
CLEROUX CRESCENT
EXISTING SAN T/G = 83.45
DEPRESSED SIDEWALK
PROP. STM LCB07 T/G = 82.60
EXISTING STM MH T/G = 83.35
SITE BENCHMARK: FIRE HYDRANT TOP OF SPINDLE ELEV = 81.14
HYDRO NO BUILD ZONE
BLOCK A PROPOSED 3 STOREY 40 UNIT APARTMENT BUILDINGS 30 U.G. PARKING FFE = 82.85 USF = 79.80
PROP. STM MHCB06 T/G = 82.75
WS-02 CONTROLLED 0.103 0.71
PROP. STM LCB13 T/G = 82.50
WS-10 CONTROLLED 0.102 0.90
WS-06 CONTROLLED 0.041 0.30
EXISTING STM CB T/G = 83.23
PROP. STM MHCB05 T/G = 82.20
GARBAGE ROOM AND BICYCLE PARKING ENCLOSURE STRUCTURE
PROP. SAN MH102 T/G = 82.00
EXISTING STM CB T/G = 82.98
EXISTING STM CB T/G = 83.23
PROP. STM CB11 T/G = 79.90
WS-08 CONTROLLED 0.013 0.50
WS-03 CONTROLLED 0.081 0.74
PROP. STM MHCB04 T/G = 81.90
WS-09 CONTROLLED 0.102 0.90
BLOCK B PROPOSED 3 STOREY 40 UNIT APARTMENT BUILDINGS 30 U.G. PARKING FFE = 82.75 USF = 79.70
SECONDARY ENTRANCE
3.0M INTERIOR SIDE YARD SETBACK
EXISTING VEGETATION TO REMAIN
20 SURFACE PARKING
ORIENT PARK DR.
PROP. STM MHCB03 T/G = 81.30
WS-05 CONTROLLED 0.240 0.35
WS-04 CONTROLLED 0.069 0.77
PROP. STM CB029 T/G = 79.70
PROP. STM LCB10 T/G = 81.80
WS-07 CONTROLLED 0.005 0.90
PROP. STM MHCB02 T/G = 80.71
PROP. STM MH01 T/G = 78.20
PROP. STM MH00 T/G = 78.00
PROP. SAN MH101 T/G = 77.40
PROP. STM MHCB08 T/G = 80.30
20M REAR YARD SETBACK
PROP. STM LCB15 T/G = 91.90
PROP. STM LCB14 T/G = 76.65
PROP. STM LCB16 T/G = 78.60
9.02
N62°52'00"E 79.74 (MEAS) N62°54'00"E (P&P1)
N27°45'50"W 14.35 (MEAS) N27°42'10"W (P&P1) 14.13

0m 2m 4m 10m 20m
1m 7m 5m 15m
SCALE: 1:300

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EMBRUN, ON

PROJECT:
NEW RESIDENTIAL DEVELOPMENT
2396 CLEROUX CRES,
OTTAWA, ON

DRAWING:
POST DEVELOPMENT STORAGE AREA

PAPER FORMAT:	24x36
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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

ADS Canada

2396 CLEROUX CRES
OTTAWA, ONTARIO

SiteASSIST by StormTech
FOR STORMTECH INSTRUCTIONS, DOWNLOAD THE INSTALLATION APP

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500.
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 60x101.
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 PAIRED (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-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 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 EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONE/SHOOTER 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 - 230 mm (9") 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 SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. 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-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 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.

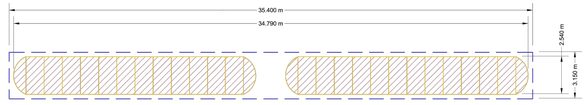
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

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

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
24	STORMTECH MC-4500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)	81.630
4	STORMTECH MC-4500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)	80.200
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)	80.110
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	80.110
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	80.110
0.0	INSTALLED SYSTEM VOLUME (m³) (PERIMETER STONE INCLUDED) (EXCAVATION ASSUMED) (BASE & STONE INCLUDED)	TOP OF STONE:	79.807
		TOP OF MC-4500 CHAMBER:	79.503
		BOTTOM OF MC-4500 CHAMBER:	77.930
		BOTTOM OF STONE:	77.750
111.5	SYSTEM AREA (m²)		
77.1	SYSTEM PERIMETER (m)		

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW



ISOLATOR ROW PLUS (SEE DETAIL/TYP 2 PLACES)
NO WOVEN GEOTEXTILE
BED LIMITS

NOTES
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE IN-SITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

2396 CLEROUX CRES — OTTAWA, ONTARIO — DATE: 12/7/2020 — PROJECT #: — DRAWN: HN — CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

StormTech — 4640 TRUEMAN BLVD, HILLIARD, OH 43026, 1-800-733-7473 — 50 CHUNNEL AVENUE - ROCKHILL, CT 06067, 860-529-8188 - 888-892-2694 - WWW.STORMTECH.COM

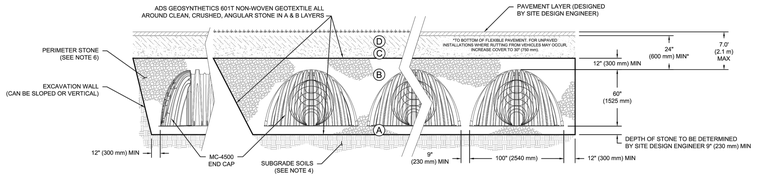
ADS Canada — SCALE = 1 : 150

SHEET 2 OF 5

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 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 60x101
2. MC-4500 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.

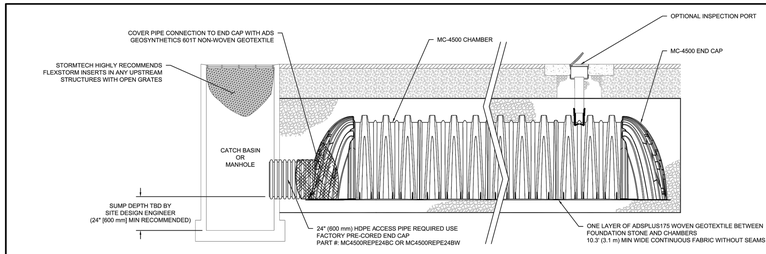
2396 CLEROUX CRES — OTTAWA, ONTARIO — DATE: 12/7/2020 — PROJECT #: — DRAWN: HN — CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

StormTech — 4640 TRUEMAN BLVD, HILLIARD, OH 43026, 1-800-733-7473 — 50 CHUNNEL AVENUE - ROCKHILL, CT 06067, 860-529-8188 - 888-892-2694 - WWW.STORMTECH.COM

ADS Canada

SHEET 3 OF 5



MC-4500 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.

2396 CLEROUX CRES — OTTAWA, ONTARIO — DATE: 12/7/2020 — PROJECT #: — DRAWN: HN — CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

StormTech — 4640 TRUEMAN BLVD, HILLIARD, OH 43026, 1-800-733-7473 — 50 CHUNNEL AVENUE - ROCKHILL, CT 06067, 860-529-8188 - 888-892-2694 - WWW.STORMTECH.COM

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SHEET 4 OF 5

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER — G. L. BRUNET — 100191036 — 19/03/2021 — PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 03 / 2021

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
2396 CLEROUX CRES,
OTTAWA, ON

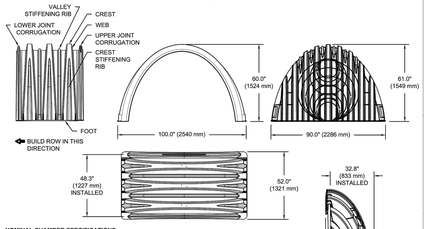
DRAWING:
DETAILS - 1

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	03-2021
SCALE:	
PROJECT NUMBER:	20-305

PAGE: C500

MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT (NOMINAL)	125.0 lbs.	(56.7 kg)

NOMINAL END CAP SPECIFICATIONS

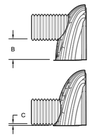
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 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"

PART #	STUB	B	C
MC4500EPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500EPP06B		---	0.86" (22 mm)
MC4500EPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC4500EPP08B		---	1.01" (26 mm)
MC4500EPP10T	10" (250 mm)	38.37" (975 mm)	---
MC4500EPP10B		---	1.33" (34 mm)
MC4500EPP12T	12" (300 mm)	35.69" (907 mm)	---
MC4500EPP12B		---	1.55" (39 mm)
MC4500EPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500EPP15B		---	1.70" (43 mm)
MC4500EPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500EPP18B		---	1.97" (50 mm)
MC4500EPP18BW			
MC4500EPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500EPP24TW		---	2.26" (57 mm)
MC4500EPP24B			
MC4500EPP24BW			
MC4500EPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500EPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500EPP42BW	42" (1050 mm)	---	3.55" (90 mm)

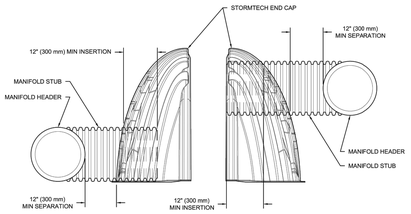
NOTE: ALL DIMENSIONS ARE NOMINAL



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-4500 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.

2396 CLEROUX CRES
OTTAWA, ONTARIO
DATE: 12/7/2020
PROJECT #:
DRAWN: HN
CHECKED: N/A

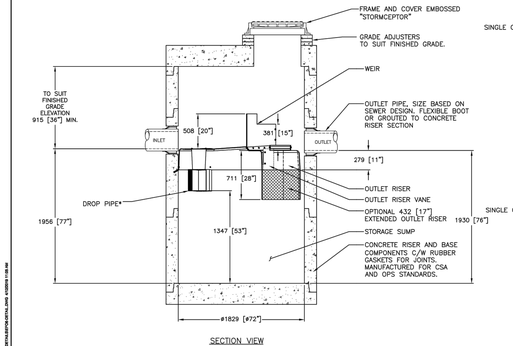
REV	DRW'T	CHK.	DESCRIPTION

Stormtech
SC-740/MC-4500/MC-3500 CHAMBERS
STORMTECH PRODUCTS LTD. (1997)
905-639-8518 1-800-561-3948 WWW.STORMTECH.COM

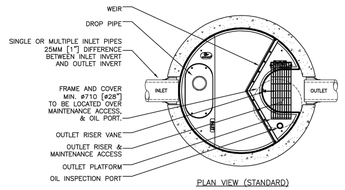
4663 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SHEET
5 OF 5

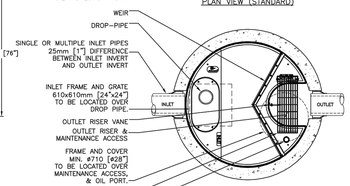
DRAWING NOT TO BE USED FOR CONSTRUCTION



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m² (27.9 gpm/ft²) FOR STORMCEPTOR EF4 AND 535 L/min/m² (13.1 gpm/ft²) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

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

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

INSTALLATION NOTES

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

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO6	
STRUCTURE ID		*
HYDROCARBON STORAGE REQ'D (L)		*
WATER QUALITY FLOW RATE (L/s)		*
PEAK FLOW RATE (L/s)		*
RETURN PERIOD OF PEAK FLOW (yrs)		*
DRAINAGE AREA (HA)		*
DRAINAGE AREA IMPERVIOUSNESS (%)		*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

REV	DESCRIPTION	BY	APP'D
0000			
0000			
0000			
0000	OUTLET PLATFORM	JSK	BSF
0000	INITIAL RELEASE	JSK	BSF

SCALE = N/TS

imbriumrr
1-800-461-9166 FAX 1-888-296-7962
2 THORNHILL DRIVE, UNIT 5 DARTMOUTH, NOVA SCOTIA B3B 1S2

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

ENGINEERING STAMP

LICENSED PROFESSIONAL ENGINEER
G. L. BRUNET
100191036
19/03/2021
PROVINCE OF ONTARIO

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 03 / 2021

BLANCHARD LETENDRE
ENGINEERING
767, Notre Dame, Local 42, Embrun, Ontario, K0A 1W
(6 1 3) 6 9 3 - 0 7 0 0
blengineering.ca

CLIENT:

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

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
2396 CLEROUX CRES,
OTTAWA, ON

DRAWING:

DETAILS - 1

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
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DATE:	03-2021
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PROJECT NUMBER:	20-305

PAGE:
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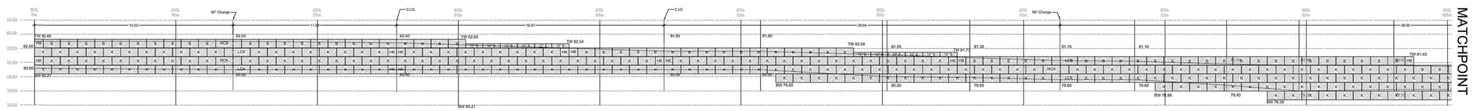

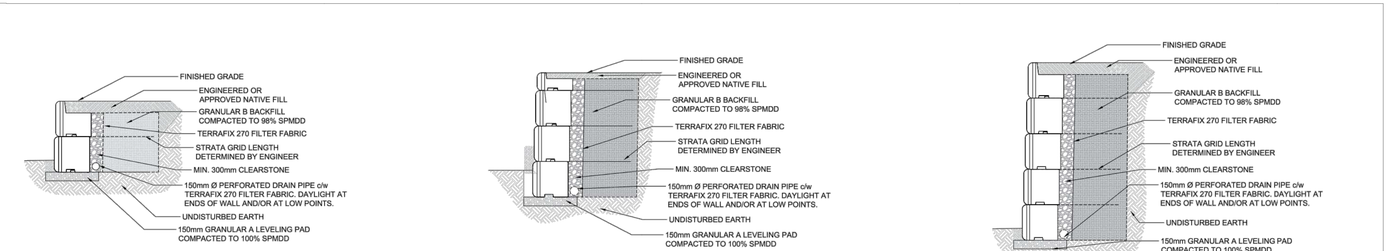

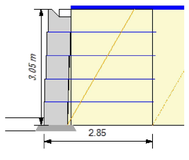

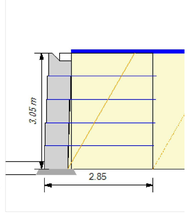

DNM Stone Terra^{TM} PRELIMINARY BLOCK COUNT		
12" BENCH	12" B	12
FULL BENCH	B	83
HALF BENCH	HB	4
LEFT BENCH	LCB	1
RIGHT BENCH	RCB	1
12" KEYED	12" K	0
FULL KEYED	K	254
HALF KEYED	HK	9
LEFT KEYED	LCK	3
RIGHT KEYED	RCK	2
	SG350 - 5 ROLLS	

GENERAL NOTES:

1. THE FOLLOWING NOTES SHALL GOVERN UNLESS NOTED OTHERWISE ON THE DRAWINGS.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL PROJECT DRAWINGS AND CONTRACT DOCUMENTS.
3. PRIOR TO COMMENCING WORK THE CONTRACTOR WILL VERIFY ALL MEASUREMENTS AND CONDITIONS ON SITE AND REPORT TO THE ENGINEER ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS THAT MAY AFFECT THE PROPER COMPLETION OF WORK.
4. SEE FIELD CONSTRUCTION MANUAL FOR INSTALLATION DETAILS.
5. DRAWINGS ARE METRIC AND NOT TO BE SCALED.
6. OUTSIDE CURVES WILL REQUIRE BACKS OF BLOCKS TO BE TRIMMED.
7. CONTRACTORS CONSTRUCTION LOADS MUST NOT EXCEED THE ABOVE DESIGN LOADS. DESIGN LOADS MAY ONLY BE APPLIED AFTER THE WALL HAS BEEN INSTALLED AND APPROVED.

SOIL AND BACKFILL:

1. SPECIFIED SOIL BEARING CAPACITY MUST BE VERIFIED BY A GEOTECHNICAL ENGINEER PRIOR TO COMMENCING CONSTRUCTION OF THE FOUNDATION. CONDITIONS FOUND TO BE UNSATISFACTORY IN BEARING CAPACITY MUST BE REPORTED TO THE PROJECT GEOTECHNICAL ENGINEER.
2. FOUNDATIONS MUST BEAR ON SUITABLE MATERIAL.
3. BACKFILL TO BE INSTALLED AND COMPACTED IN LIFTS NOT GREATER THAN 200mm WHERE HEAVY EQUIPMENT IS USED AND 150mm WHERE HAND OPERATED EQUIPMENT IS USED. HAND OPERATED EQUIPMENT MUST BE USED WHEN WITHIN 1m OF THE WALL.

NO.	DATE	DESCRIPTION
R0	2021-01-28	ISSUED FOR APPROVALS

REVISION/ISSUED:

THIS DRAWING IS ON LOAN ONLY, NOT TO BE COPIED OR DUPLICATED IN ANY WAY WITHOUT THE WRITTEN CONSENT.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL APPROVED. ALL WORK IS TO BE DONE IN ACCORDANCE WITH CURRENT OBC, OHSA AND ALL AUTHORITIES HAVING JURISDICTION.

DO NOT SCALE THE DRAWINGS. ALL DIMENSIONS, DRAWINGS AND DOCUMENTS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING ANY WORK. ANY DISCREPANCY MUST BE COMMUNICATED TO THE ENGINEER.

THE CLIENT EXPRESSLY AGREES THAT EMPLOYEES, STAMPING ENGINEERS AND PRINCIPALS SHALL HAVE NO PERSONAL LIABILITY TO THE CLIENT IN RESPECT OF A CLAIM, WHETHER IN CONTRACT, TORT AND/OR ANY OTHER CAUSE OF ACTION IN LAW. ACCORDINGLY, THE CLIENT EXPRESSLY AGREES THAT IT WILL BRING NO PROCEEDINGS AND TAKE NO ACTION IN ANY COURT OF LAW AGAINST EMPLOYEES, STAMPING ENGINEERS OR PRINCIPALS IN THEIR PERSONAL CAPACITY.

THE INFORMATION ON THIS DRAWING SHALL NOT BE USED FOR ANY OTHER PROJECT OR WORKS. THE INFORMATION ON THESE DRAWINGS APPLIES SOLELY TO THIS PROJECT. RETAINING WALL ENGINEER WILL TAKE NO RESPONSIBILITY FOR ANY CHANGES TO OR DEVIATIONS FROM THIS DRAWINGS UNLESS APPROVED IN WRITING.

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DNM
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4795 19TH SIDEROAD
KING, ON L7B 0E4
Phone: (905)-864-9808
Fax: (905)-864-9818

PROJECT:
OLIGO DEVELOPMENTS

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

DRAWING DESCRIPTION:
ELEVATION, CROSS SECTIONS,
& LAYOUT

REFERENCE FILE:
BASED ON INFORMATION FOUND ON:
GRADING PLAN/20-035-C200/DRAWN BY:
BF+GB/DATE:02-2021

DRAWN BY: DS
CHECKED BY:

DATE STARTED: 2021-02-26

PROJECT NO. EST12897

SHEET NO. 1

DNM Systems Ltd
Retaining Walls

REA Analysis

Project: Olgin Development
Location: Ottawa
Designer: ds
Date: 2021-02-26
Section: Section 1
Design Method: CAN_CSA_S6
Design Unit: StoneTerra

SOIL PARAMETERS	φ	coh	γ
Reinforced Soil:	30 deg	0.00 kNpsm	18.85 kNpcm
Retained Soil:	30 deg	0.00 kNpsm	18.85 kNpcm
Foundation Soil:	30.00 deg	0.00 kNpsm	18.85 kNpcm

Leveling Pad: Crushed Stone

GEOMETRY

Design Height:	3.05 m	Live Load:	2.40 kNpsm
Wall Batter/Tilt:	2.4/ 0.00 deg	Live Load Offset:	0.00 m
Embedment:	0.20 m	Live Load Width:	6.00 m
Leveling Pad Depth:	0.15 m	Dead Load:	0.00 kNpsm
Slope Angle:	0.0 deg	Dead Load Offset:	0.0 m
Slope Length:	0.0 m	Dead Load Width:	0.00 m
Slope Toe Offset:	0.0 m	Leveling Pad Width:	0.91 m

DNM Systems Ltd
Retaining Walls

RESULTS

CDR Sliding:	1.54 (fnd)	CDR Bearing:	3.61
Eccentricity (e/L):	0.13	Bearing:	83.09; srvc 71.37
FoS Connection:	1.68		

ID	Height	Length	Geogrid.	Tr (Ta*Rf)	% Cvrg	EP (Pa)	LL (Pql)	DL (Pqd)	TMax	CDR Str	Tallow Cn	CDR Pk	CDR PO/	CDR Sldg	Grid
4	2.44	2.85	SG350	32.04	100	3.30	1.25	0.00	4.54	7.05	11.31	2.49	1.74/[3.30]	93.20	0.93
3	1.83	2.85	SG350	32.04	100	5.85	0.83	0.00	6.68	4.80	15.62	2.34	2.64/[5.85]	29.74	1.26
2	1.22	2.85	SG350	32.04	100	8.77	0.83	0.00	9.59	3.34	19.93	2.08	3.33/[8.77]	14.87	1.59
1	.61	2.85	SG350	32.04	100	11.68	0.83	0.00	12.51	2.56	21.06	1.68	2.74/[11.68]	9.07 [1.54]	1.91

Column Descriptions:

Ta: allowable geogrid strength
Rc %: percent coverage for geosynthetics
EP (Pa) internal active earth pressure
LL (Pql) earth pressure due to live load surcharge
DL (Pqd) earth pressure due to dead load surcharge
Tmax maximum earth pressure on geosynthetic layer
FSstr factor of safety on geogrid strength (Ta/Tmax)
Ta cn allowable tension on the connection
FS Pkcn, factor of safety on the connection (Ta cn/Tmax)
FS PO, factor of safety on pullout (Ta pullout/(Tmax - LL)
Grid Embedment, depth of embedment beyond the theoretical failure plane.

ENGINEERING STAMP

G. L. BRUNET
100191036
19/03/2021

NO.	REVISION	DATE (DD/MM/YYYY)
#8		
#7		
#6		
#5		
#4		
#3		
#2		
#1	ISSUED FOR SPA	19 / 03 / 2021

BLANCHARD LETENDRE
ENGINEERING
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blengineering.ca

CLIENT:

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

PROJECT:

NEW RESIDENTIAL DEVELOPMENT
2396 CLEROUX CRES,
OTTAWA, ON

DRAWING:

DETAILS - 1

PAPER FORMAT:	24x36
DRAWN BY:	BF + GB
CHECKED BY:	GB
DATE:	03-2021
SCALE:	
PROJECT NUMBER:	20-305

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C502