



**2524 CAWTHRA ROAD, MISSISSAUGA, ON.  
PROPOSED FIRE STATION 124**

**Functional Servicing and Stormwater  
Management Report**

Prepared for:

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Prepared by:



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## 1. Introduction

This report has been prepared in support of a proposed building permit application for a property located at 2524 Cawthra Road, Mississauga, Ontario.

The objective of this report is to provide details on the required site grading and drainage and stormwater management features as required to accommodate the proposed site redevelopment.

## 2. Existing Conditions

The property encompasses an area in the order of 0.592 ha located southwest of Cawthra Road facing Needham Lane.

The legal description of property is a part of lot 11 Concession1, South of Dundas Street, City of Mississauga (Part 1- Plan 43R-40440- PIN 13345-0060(LT)).

The proposed development site is vacant land now and all the existing features including one residential house and granular parking lot on the subject land have been demolished. The site is serviced by sanitary and water from Needham Lane which are not in use currently.

A major portion of the development site is currently draining from northeast to southwest to the neighbor's property via sheet flows.

The site location and existing topography are indicated in Figures No. 1 & 2 respectively.

### 2.1. Existing Servicing

Information on the existing municipal servicing in the vicinity of the proposed site development was obtained from historical records provided by Region of Peel and the survey plans done by Nanfara & ng Surveyors Inc. Based on the available information sources, the existing municipal services relevant to the current proposal include the following:

Within the Needham Lane right of way, from southwest to northeast,

- 375mm Storm Sewer,
- 250mm Sanitary Sewer,
- Bell Canada Conduit,
- Gas Main,
- 200mm Watermain



Existing servicing in the vicinity of the site, as provided by Region's records and the survey plans, is included in CV-3 Servicing Plan.

### **3. Proposed Site Development**

The Proposed Development will include design and construction of one-storey fire station building with a total gross floor area of 1041.88m<sup>2</sup> to be located at 2524 Cawthra Road, Mississauga, Ontario. The proposed fire station will include driveways, parking lot, landscape area, and two vehicular entrances off Needham Lane.

### **4. Proposed Grading**

Based on the current site plan, several constraints are associated with the overall grading design: matching existing grades along the limit of the site property line.

Additional constraints include providing sufficient cover over the proposed storm sewers which will convey storm drainage to the municipal storm sewer network.

Proposed grading within the hardscaped area of the site will be in the range of 1%-5% and will be designed to direct surface drainage to proposed storm structures to ensure site draining is routed through the private storm system towards the ultimate site outlet. Most of the drainage runoff from the site will be self-contained and collected by the proposed internal storm system.

Proposed site grading is indicated on the Site Grading Plan, Drawing CV-2.

### **5. Private Servicing Design**

#### **5.1. Minor Storm Servicing**

The minor storm sewer network is designed to convey the flows from the site based on a 10-year storm event, without surcharging, in accordance with the City of Mississauga requirements.

The proposed storm servicing will be composed of a series of sewers, catchbasins, catchbasin manholes, and manholes that will capture and convey stormwater to the municipal storm sewer system, via a new storm sewer service connection. The controlled flow from the control manhole will be conveyed to the existing 375mm municipal storm sewer located within Needham Lane right of way to the northeast of the property.

The minor system is designed based on the Rational Method using a time of concentration of 15 minutes and the City of Mississauga's IDF curve with a 10-year return period. The storm sewer design sheet has been included in Appendix B. The existing and proposed drainage areas can be found in Figure 3 and Figure 5 respectively.

Proposed storm servicing for the subject development is indicated on the Site Servicing Plan, Drawing CV-3.

## **5.2. Major Storm Servicing**

In the event of a major storm or the storm system becoming blocked, the proposed grading will be designed to ensure emergency overland flow is directed to Needham Lane Right of Way.

The emergency overland flow of the development will be directed through the driveways to Needham Lane Right of way at an elevation of 117.80 which is 0.35m below the proposed finished floor elevation.

The proposed overland flow route is indicated in the CV-2 Grading Plan.

## **5.3. Water Servicing**

Water servicing as required for a domestic supply and fire protection for the building is proposed to be provided with a new 150mm watermain connection from the existing 200mm watermain located in Needham Lane right of way as indicated on the Site Servicing Plan, Drawing CV-3. Calculations for water demand are provided in Appendix C.

The existing water service connection is proposed to be decommissioned in accordance with Region of Peel requirements.

A preliminary calculation for the required fire flow to protect the new construction is included in Appendix C based on the criteria provided by the Fire Underwriters Survey (FUS). The analysis indicates that a flow of 4028.75 l/min is required at a residual pressure of 140 kPa to provide fire protection for the new construction.

The flow and pressure test for the hydrant located at Needham Lane is not yet done and will be provided during detail design stage.

## **5.4. Sanitary Servicing**

Sanitary servicing as required for the proposed one-storey fire station building is to be provided by a new 150mm service connecting to the existing 250mm sanitary sewer located in Needham Lane right of way as indicated on the Site Servicing Plan, Drawing CV-3. The existing sanitary servicing connection will be disconnected at main as per Region standards. Calculations for sanitary flow projections are provided in Appendix D.

# **6. Proposed Stormwater Management**

## **6.1 Proposed Rate Controls**

The site is within the Cawthra Creek sub-watershed where it is required to control stormwater flow from 100 year post development flows to 2 year pre development levels. However, the design is to achieve the site also wants to achieve level 1 stormwater management per the City of Mississauga's Corporate Green Building Standard, Which is to achieve an 85% reduction of the 100-year post-development flow to pre-development conditions of the site. Given this, the calculated allowable release rate is 0.0225 cms.

Rate controls have been provided with the installation of a 78 mm diameter orifice plate, installed on the upstream side of the proposed MH 11. The orifice plate will achieve an 85% reduction of the 100-year post-development flow to pre-development conditions of the site

On-site storage has been provided as required, including 86.0 m<sup>3</sup> of underground storage within the proposed storm system, and 163.3 m<sup>3</sup> of surface storage, for a total site storage of 249.3 m<sup>3</sup> which exceeds the calculated required storage during the 2 year to 100 year storm events.

Additional stormwater controls are proposed with the installation of flow control roof drains installed within flat roof areas of the proposed building. The controlled flow from the building roof, based on a maximum ponding depth of 100 mm (which is the depth of ponding before overflowing through roof scuppers at the roof edge), has been included as the post development flow from the roof with calculated drain down time of 3.06 hours, in the appended stormwater calculations.

Detailed SWM Calculations for the proposed development are included in Appendix A.

## **6.2 Proposed Quality Control**

MGM has been informed by City Staff that the required quality control for this site is 80% TSS removal (enhanced protection) in accordance with MECP guidelines. Treatment of stormwater runoff from the site will be provided by a HydroDome HD 6 unit with ETV certification located near the southeast corner of the property as indicated in Drawing CV-3. The proposed treatment unit will be designed to achieve 80% TSS removal on an annual loading basis with capturing 99% annual runoff prior to discharging stormwater runoff to the existing 375 mm storm sewer on Needham Lane. The OGS Unit design information is provided in Appendix E.

## **6.3 Proposed Runoff Volume Reduction**

The corporate green building standard requires the first 15mm of runoff shall be retained on-site and managed by way of infiltration, evapotranspiration, re-use, or filtration.

As indicated in the water balance calculation included in Appendix A, the proposed site features will provide an estimated 15.2 mm of runoff retention over the site area.

The proposed development layout includes a 81 m<sup>3</sup> ACO Stormbrixx Chambers with the stone base layer, which will collect rainwater from the roof.

Detailed calculations have been included in Appendix A. ACO Stormbrixx Chamber design is indicated in Appendix F.

#### 6.4 Summary of the Stormwater Management

Storm Event	Peak Rate Controls		Site Storage	
	Required	Provided	Required	Provided
	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	( m <sup>3</sup> )	( m <sup>3</sup> )
Water balance			88.8	89.8
2 Year	0.0225	0.0193	37.7	86.0
5 Year	0.0225	0.0209	56.7	86.0
10 Year	0.0225	0.0211	76.3	86.0
25 Year	0.0225	0.0215	106.1	129.6
50 Year	0.0225	0.0218	130.2	171.6
100 Year	0.0225	0.0223	153.3	249.3

#### 7. Erosion and Sediment Control During Construction

All erosion and sediment controls required during construction are to be in accordance with the Greater Golden Horseshoe Area Conservation Authorities ESC Guideline entitled Erosion and Sediment Control Guidelines for Urban Construction.

The following principles should be adhered to for all development within the subject lands (*Ref. Erosion and Sediment Control Guidelines for Urban Construction*):

- Adopt a multi-barrier approach to provide erosion and sediment control through erosion controls first,
- Retain existing ground cover and stabilize exposed soils with vegetation where possible,
- Limit the duration of soil exposure and phase construction where possible,
- Limit the size of disturbed areas by minimizing nonessential clearing and grading,
- Minimize slope length and gradient of disturbed areas,
- Maintain overland sheet flow and avoid concentrated flows,

- Store/stockpile soil away (e.g. greater than 30m) from watercourses, drainage features and top of steep slopes,
- Ensure contractors and all involved in the ESC practices are trained in ESC Plan, implementation, inspections, maintenance, and repairs,
- Adjust ESC Plan at construction site to adapt to site features,
- Assess all ESC practices before and after all rainfall and significant snowmelt events, and
- Maintain record of inspection on site.

### **7.1. Control Measures**

- Install all silt fences prior to any other activities on site,
- Any dewatering of the site should incorporate sediment and debris screens at the inlet of the pumping system and sediment settling facilities at discharge points, to prevent sediment discharges to the municipal drainage system.
- Construct temporary construction access including mud mat at construction access points,
- Construct cut-off swales as shown on the Sediment and Erosion Control Plan,
- Install sediment socks as indicated on the Erosion and Sediment Control Plan,
- Contractor to use haulage roads to minimize disturbances to existing vegetated areas,
- During the servicing construction, limit open trench lengths to minimize erosion potential,
- During work stoppages or inclement weather, plug ends of open sewers to prevent downstream sedimentation,
- Provide catchbasin sediment protection on all catchbasins for the duration of construction,
- Provide dust control during dry periods as directed by the site engineer,
- Sweep external streets as directed by the engineer,
- Following base course asphalt, catchbasins to be rewrapped with geotextile, and

- Periodic street cleaning and catchbasin cleanout to be performed as required.

## 7.2. Inspection and Maintenance

The following is a minimum inspection schedule that should be adhered to for the full length of the construction period. (*Ref. Erosion and Sediment Control Guidelines for Urban Construction*)

- All erosion and siltation measures are to be inspected on a weekly basis by the Consultant's resident inspector.
- All erosion and siltation measures are to be inspected after every rainfall event by the Consultant's resident inspector.
- All erosion and siltation measures are to be inspected after significant snowfall events by the Consultant's resident inspector.
- All erosion and siltation measures are to be inspected daily during extended rain or snowmelt periods by the Consultant's resident inspector.
- Maintain record of inspection on site.

During inactive construction periods, where the site is left alone for 30 days or longer, monthly inspections should be conducted.

## 8. Conclusions

Based on the information contained in this report, current site development requirements, and record information provided by the City of Mississauga and Region of Peel.

- Site grading can be completed as required to convey minor storm flows to site drainage features, to convey major storm flows to the adjacent right of way to provide safe vehicular and pedestrian access, and to match with existing elevations on abutting lands.
- Stormwater has achieved an 85% reduction of the 100-year post-development flow to pre-development conditions of the site.
- Stormwater quality control is achieved by the proposed HydroDome HD 6 unit which provides 80% TSS removal with capturing 99% of the annual runoff.
- The proposed minor system has been designed to convey the 10-year flow, without surcharging, which is consistent with the current City of Mississauga standards.

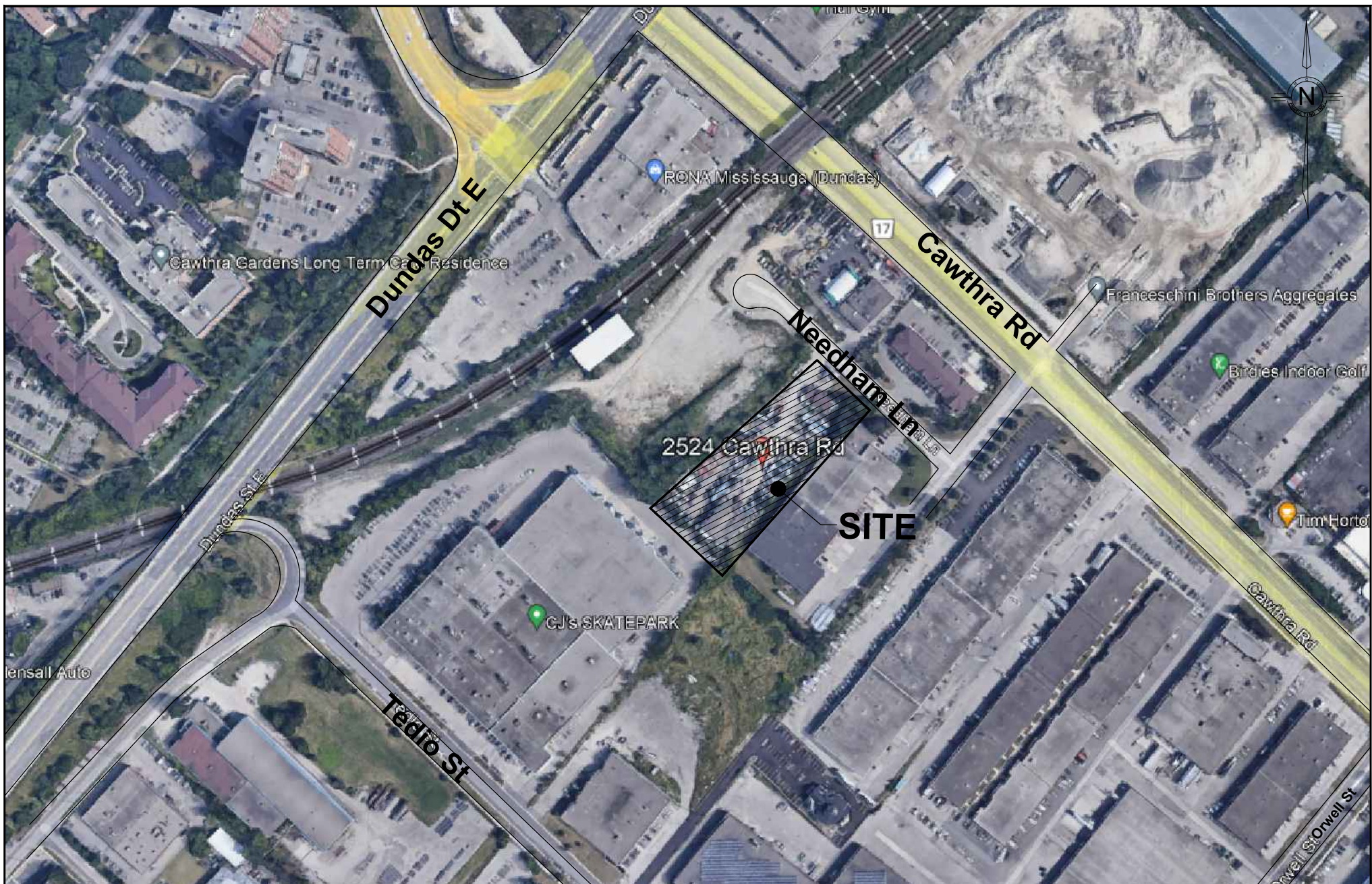
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- Water balance objectives can be achieved through evapotranspiration, infiltration to landscape areas, and on-site water re-use which retains a depth of 15.2mm water over the entire site area.
  - A 150mm watermain is proposed to adequately provide fire protection and domestic service. The available flow in the nearby hydrants will be confirmed during detail design stage.
  - A 150 mm sanitary sewer is proposed to adequately service wastewater from the building.
  - Sediment and erosion controls as indicated in the Sediment and Erosion Control Plan are to be implemented before construction and maintained until the site is stabilized.

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2524 Cawthra Road, Mississauga, ON.

## SITE LOCATION

# MGM

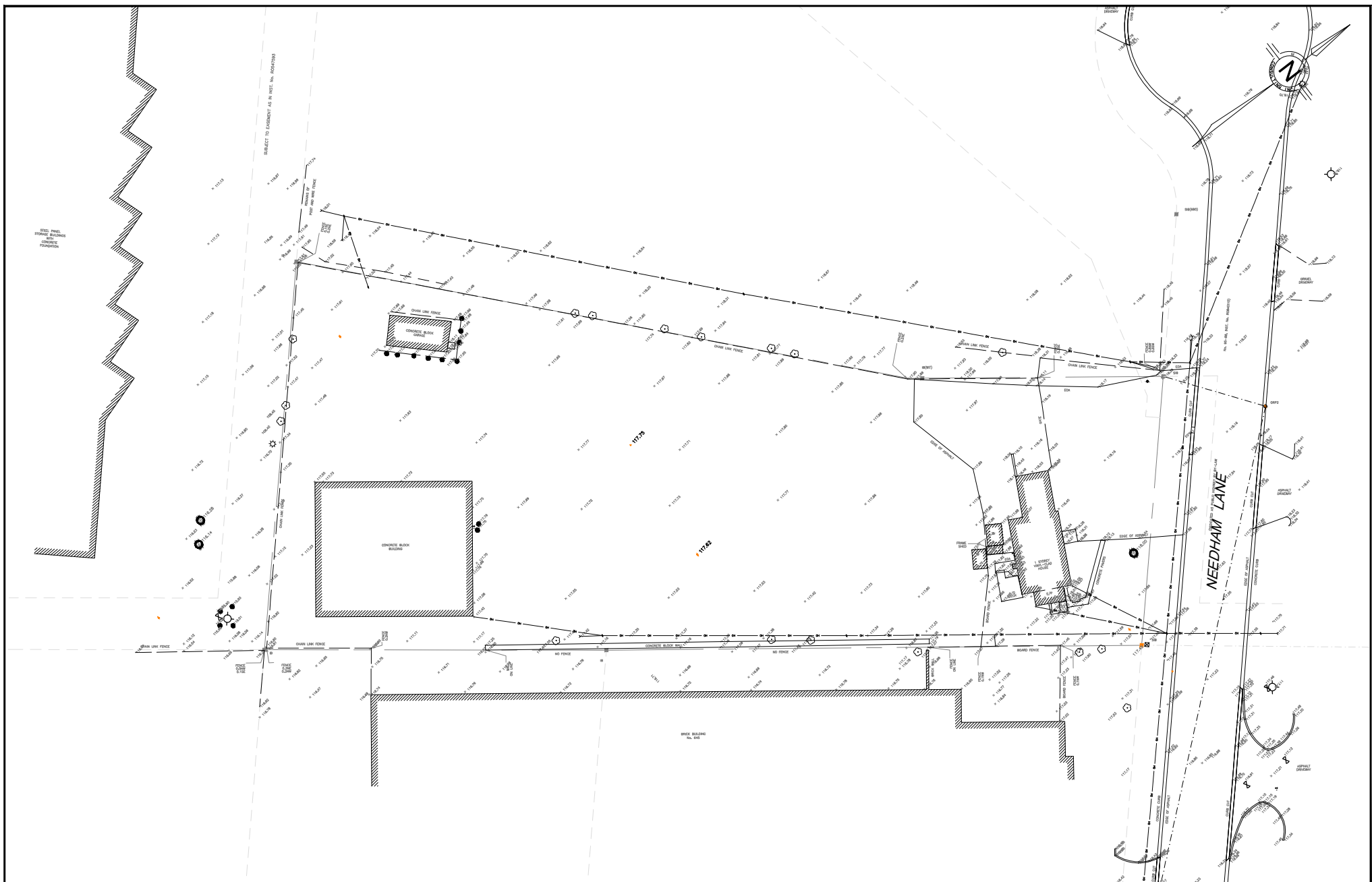
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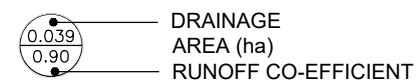
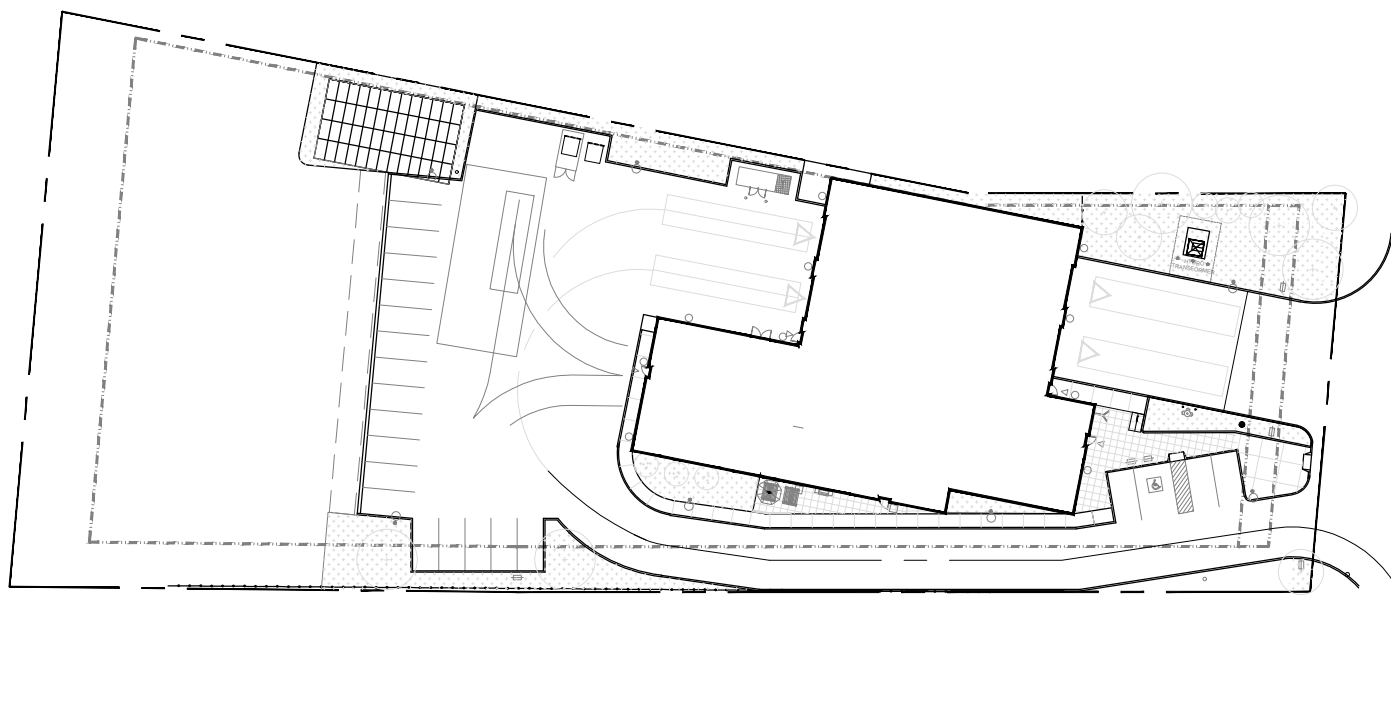
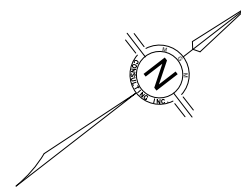
FIGURE 1

DATE: MAR 2024  
SCALE: NTS  
DWG#2024-001-C3









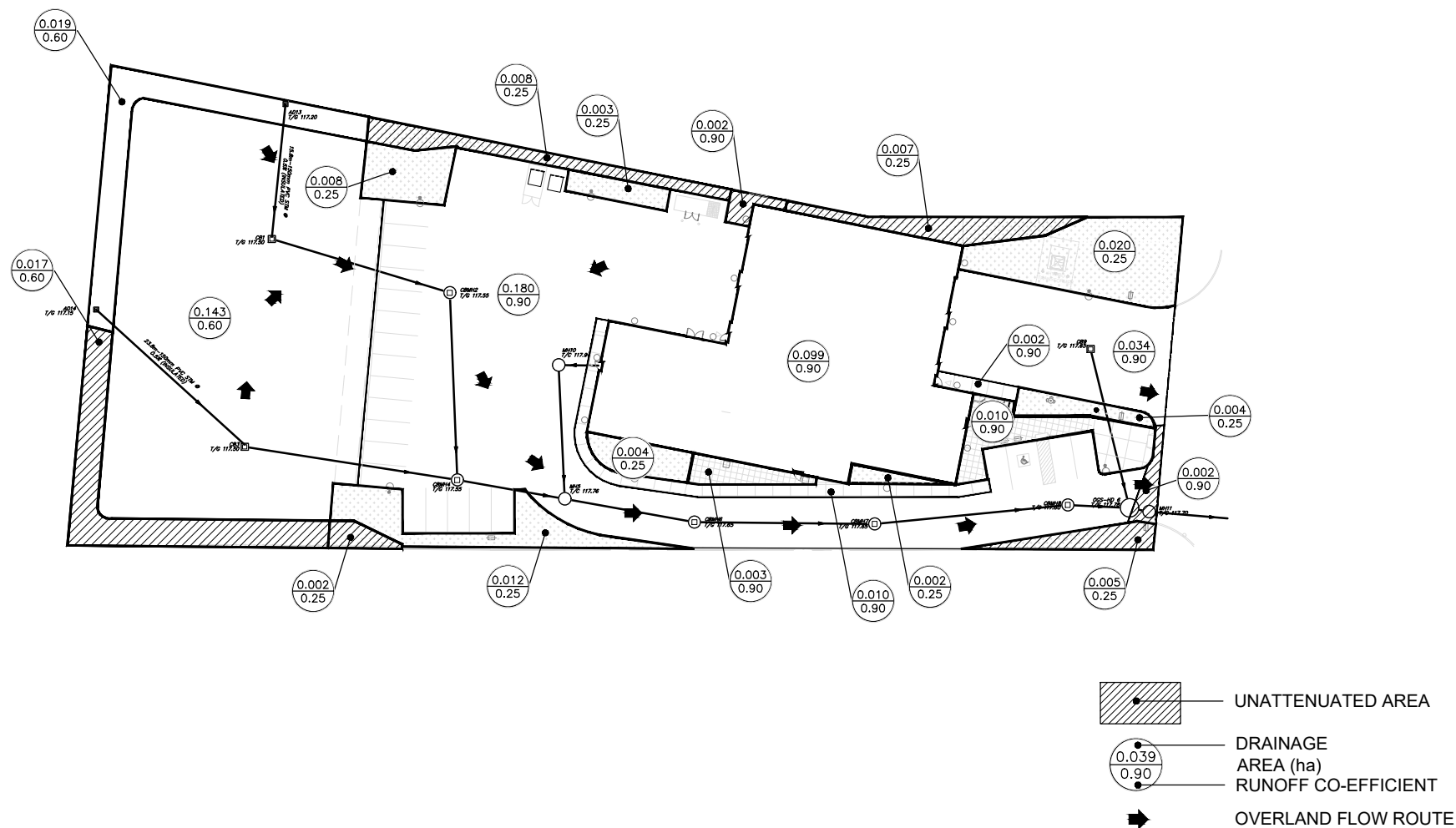
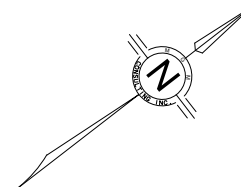
2524 Cawthra Road, Mississauga, ON.

## PROPOSED DEVELOPMENT

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FIGURE 4

DATE: MAR 2024  
SCALE: 1:750  
DWG#2024-001-C3



2524 Cawthra Road, Mississauga, ON.

# POST-DEVELOPMENT STORM DRAINAGE AREAS

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FIGURE 5

DATE: SEP 2024  
SCALE: 1:750  
DWG#2024-001-C3

**APPENDIX A**

**STORMWATER MANAGEMENT CALCULATIONS**

**Fire Station 124**  
**Stormwater Management Calculations**

**1.0 DRAINAGE CHARACTERISTICS**

**1.1 Existing Drainage Areas (see Figure No.3)**

		"c"	Area (ha)
<u>Attenuated Areas</u>			
Grassed/Landscaped	addition	0.25	0.030
Paved/Concrete		0.90	0.067
Gravel		0.60	0.433
Building Roof		0.90	0.062
<b>Total Area</b>			<b>0.592</b>
<b>Weighted Average "c"</b>			<b>0.65</b>

**1.2 Proposed Drainage Areas Draining West (see Figure No. 5):**

		"c"	"c <sub>25</sub> "	"c <sub>50</sub> "	"c <sub>100</sub> "	Area (ha)
<u>Attenuated Areas</u>						
Landscaped		0.25	0.28	0.30	0.31	0.053
Paved/Concrete		0.90	0.99	1.00	1.00	0.239
Stones		0.60	0.66	0.72	0.75	0.000
Gravel		0.60	0.66	0.72	0.75	0.162
Green Roof		0.25	0.28	0.30	0.31	0.000
Controlled Roof		0.90	0.99	1.00	1.00	0.099
<b>Sub-Total Area</b>						<b>0.553</b>
<b>Weighted Average "c"</b>						<b>0.86</b>
<u>Un-attenuated Areas</u>						
Landscaped		0.25	0.28	0.30	0.31	0.018
Paved/Concrete		0.90	0.99	1.00	1.00	0.004
Stones		0.60	0.66	0.72	0.75	0.000
Gravel		0.60	0.66	0.72	0.75	0.017
Green Roof		0.25	0.28	0.30	0.31	0.000
Conventional Roof		0.90	0.99	1.00	1.00	0.000
<b>Sub-Total Area</b>						<b>0.039</b>
<b>Weighted Average "c"</b>						<b>0.57</b>
<b>Total Area</b>						<b>0.592</b>
<b>Weighted Average "c"</b>						<b>0.666</b>

**2.0 Allowable Post Development Flows**

The subject site is within the Cawthra Creek watershed, where post-development flows from the 100 year storm event must be controlled to the 2 year storm pre-development levels.

In addition, the site also wants to achieve level 1 stormwater management per the City of Mississauga's Corporate Green Building Standard. Which is to achieve 85% reduction of the 100-year post-development flow to pre-development conditions of the site.

Based on Tc = 15 minutes  
Flow "Q" -  $cIA/360$ , where c = 0.65

Storm event	Intensity mm/hr	Existing Flow m <sup>3</sup> /s	85% reduction m <sup>3</sup> /s	15% allowable m <sup>3</sup> /s
2 year	59.9	<b>0.0638</b>		
100 year	140.7	0.1498	0.1274	<b>0.0225</b>

\* Rainfall intensities are as provided by the City of Mississauga.

The post development allowable flow= **0.0225 m<sup>3</sup>/s**

### 3.0 Rooftop Controlled Flow and Storage Calculations

Flow from new roof areas is to be controlled with the installation of Zurn " Control-Flo" roof drains.

Total Roof Area =	0.099	ha
Total No. of Hoppers=	2	each
1 weir per Hopper	1	each
Weir Rating=	0.015	l/sec/mm
Max ponding depth =	100	mm.
Peak Flow from roof =	0.0030	m <sup>3</sup> /s
Storage provided =	33.0	cu.m
Drain down time =	3.06	hours

### 4.0 On-Site Storage Required

#### 4.1 2 Year Storage Calculation

Rainfall Duration		2 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	59.9	0.0030	0.0542	0.0030	0.0171	36.0
20	1200	50.2	0.0030	0.0454	0.0026	0.0171	37.5
<b>25</b>	<b>1500</b>	<b>43.4</b>	<b>0.0030</b>	<b>0.0393</b>	<b>0.0022</b>	<b>0.0171</b>	<b>37.7</b>
30	1800	38.4	0.0030	0.0348	0.0020	0.0171	37.2
35	2100	34.6	0.0030	0.0313	0.0018	0.0171	36.1
40	2400	31.5	0.0030	0.0285	0.0016	0.0171	34.6
45	2700	29.0	0.0030	0.0263	0.0015	0.0171	32.8

The peak flow during a 2 year storm event (attenuated flow + unattenuated flow) = **0.0193 cms**

#### 4.2 5 Year Storage Calculation

Rainfall Duration		5 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	80.5	0.0030	0.0728	0.0041	0.0182	51.8
20	1200	67.4	0.0030	0.0610	0.0034	0.0182	54.9
25	1500	58.4	0.0030	0.0528	0.0030	0.0182	56.3
<b>30</b>	<b>1800</b>	<b>51.7</b>	<b>0.0030</b>	<b>0.0467</b>	<b>0.0026</b>	<b>0.0182</b>	<b>56.7</b>
35	2100	46.5	0.0030	0.0421	0.0024	0.0182	56.3
40	2400	42.4	0.0030	0.0383	0.0022	0.0182	55.5
45	2700	39.0	0.0030	0.0353	0.0020	0.0182	54.1

The peak flow during a 5 year storm event (attenuated flow + unattenuated flow) = **0.0209 cms**

#### 4.3 10 Year Storage Calculation

Rainfall Duration		10 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	99.2	0.0030	0.0897	0.0050	0.0185	66.8
20	1200	83.1	0.0030	0.0751	0.0042	0.0185	71.6
25	1500	71.9	0.0030	0.0650	0.0037	0.0185	74.3
30	1800	63.7	0.0030	0.0576	0.0032	0.0185	75.8
35	2100	57.3	0.0030	0.0518	0.0029	0.0185	76.3
<b>40</b>	<b>2400</b>	<b>52.2</b>	<b>0.0030</b>	<b>0.0472</b>	<b>0.0027</b>	<b>0.0185</b>	<b>76.2</b>
45	2700	48.1	0.0030	0.0435	0.0024	0.0185	75.6
50	3000	44.6	0.0030	0.0403	0.0023	0.0185	74.6
55	3300	41.7	0.0030	0.0377	0.0021	0.0185	73.2

The peak flow during a 10 year storm event (attenuated flow + unattenuated flow) = **0.0211 cms**

#### 4.4 25 Year Storage Calculation

Rainfall Duration		25 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	113.9	0.0030	0.1133	0.0064	0.0186	87.9
20	1200	95.4	0.0030	0.0949	0.0053	0.0186	95.1
25	1500	82.6	0.0030	0.0821	0.0046	0.0186	99.8
30	1800	73.1	0.0030	0.0727	0.0041	0.0186	102.8
35	2100	65.8	0.0030	0.0655	0.0037	0.0186	104.7
40	2400	60.0	0.0030	0.0597	0.0034	0.0186	105.7
45	2700	55.2	0.0030	0.0549	0.0031	0.0186	106.1
<b>50</b>	<b>3000</b>	<b>51.2</b>	<b>0.0030</b>	<b>0.0510</b>	<b>0.0029</b>	<b>0.0186</b>	<b>106.0</b>
55	3300	47.8	0.0030	0.0476	0.0027	0.0186	105.5
60	3600	44.9	0.0030	0.0447	0.0025	0.0186	104.7
65	3900	42.4	0.0030	0.0422	0.0024	0.0186	103.6

The peak flow during a 25 year storm event (attenuated flow + unattenuated flow) =

**0.0215 cms**

#### 4.5 50 Year Storage Calculation

Rainfall Duration		50 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	127.1	0.0030	0.1312	0.0076	0.0188	103.9
20	1200	106.6	0.0030	0.1100	0.0064	0.0188	113.0
25	1500	92.3	0.0030	0.0953	0.0055	0.0188	119.2
30	1800	81.7	0.0030	0.0844	0.0049	0.0188	123.4
35	2100	73.6	0.0030	0.0760	0.0044	0.0188	126.4
40	2400	67.1	0.0030	0.0692	0.0040	0.0188	128.3
45	2700	61.8	0.0030	0.0638	0.0037	0.0188	129.5
50	3000	57.3	0.0030	0.0592	0.0034	0.0188	130.1
55	3300	53.5	0.0030	0.0553	0.0032	0.0188	130.2
<b>60</b>	<b>3600</b>	<b>50.3</b>	<b>0.0030</b>	<b>0.0519</b>	<b>0.0030</b>	<b>0.0188</b>	<b>130.0</b>
65	3900	47.4	0.0030	0.0490	0.0029	0.0188	129.4
70	4200	45.0	0.0030	0.0464	0.0027	0.0188	128.5

The peak flow during a 50 year storm event (attenuated flow + unattenuated flow) =

**0.0218 cms**

#### 4.6 100 Year Storage Calculation

Rainfall Duration		100 Year Rainfall Intensity (I)	Controlled Roof Flow	Attenuated Flow From Site	Un-attenuated Flow From Site	Controlled Flow From Site*	Aprox. Detention Volumes
min.	s	mm/h	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup>
15	900	140.7	0.0030	0.1474	0.0087	0.0190	118.2
20	1200	118.1	0.0030	0.1237	0.0073	0.0190	129.2
25	1500	102.4	0.0030	0.1073	0.0064	0.0190	136.9
30	1800	90.8	0.0030	0.0951	0.0056	0.0190	142.3
35	2100	81.8	0.0030	0.0856	0.0051	0.0190	146.2
40	2400	74.6	0.0030	0.0781	0.0046	0.0190	149.0
45	2700	68.7	0.0030	0.0719	0.0043	0.0190	151.0
50	3000	63.8	0.0030	0.0668	0.0040	0.0190	152.3
55	3300	59.6	0.0030	0.0624	0.0037	0.0190	153.0
60	3600	56.0	0.0030	0.0586	0.0035	0.0190	153.3
<b>65</b>	<b>3900</b>	<b>52.8</b>	<b>0.0030</b>	<b>0.0553</b>	<b>0.0033</b>	<b>0.0190</b>	<b>153.2</b>
70	4200	50.0	0.0030	0.0524	0.0031	0.0190	152.8
75	4500	47.6	0.0030	0.0498	0.0030	0.0190	152.1

The peak flow during a 100 year storm event (attenuated flow + unattenuated flow) =

**0.0223 cms**



## 5.0 Orifice Calculation

A 78mm orifice plate is proposed on the upstream side of MH11 to control post development flows:

Orifice Equation:  $Q = CA \cdot (2gh)^{1/2}$

Orifice diameter = 78 mm

A = cross sectional area of orifice = 0.00478 m<sup>2</sup>

g = gravitational acceleration 9.81 m/sec<sup>2</sup>

c = entrance loss coefficient 0.62

Orif. tube invert elev = 115.66 m.

Orif. tube centreline elev = 115.70 m.

## 6.0 Controlled Flow Calculations

### 6.1 Two Year Controlled Flow Calculations

2 Year Ponding Elev.	117.40	m
head = "h" =	1.701	m
Controlled Flow "Q" =	0.0171	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0193</b>	cms

### 6.2 Five Year Controlled Flow Calculations

5 Year Ponding Elev.	117.63	m
head = "h" =	1.931	m
Controlled Flow "Q" =	0.0182	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0209</b>	cms

### 6.3 Ten Year Controlled Flow Calculations

10 Year Ponding Elev.	117.68	m
head = "h" =	1.981	m
Controlled Flow "Q" =	0.0185	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0211</b>	cms

### 6.4 Twenty Five Year Controlled Flow Calculations

25 Year Ponding Elev.	117.71	m
head = "h" =	2.011	m
Controlled Flow "Q" =	0.0186	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0215</b>	cms

### 6.5 Fifty Year Controlled Flow Calculations

50 Year Ponding Elev.	117.75	m
head = "h" =	2.051	m
Controlled Flow "Q" =	0.0188	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0218</b>	cms

### 6.6 One Hundred Year Controlled Flow Calculations

100 Year Ponding Elev.	117.80	m
head = "h" =	2.101	m
Controlled Flow "Q" =	0.0190	cms
Total Flow (Including Un-attenuated Flow)	<b>0.0223</b>	cms

## **7.0 On-Site Storage Provided**

### **7.1 Storm Sewer Storage**

The maximum detention volume available within the storm sewer pipes is as follows:

From	To	Length (m)	Size (mm)	Volume ( m <sup>3</sup> )
CB1	CBMH2	22.1	250	1.1
CBMH2	CBMH4	22.3	300	1.6
CB3	CBMH4	25.6	250	1.3
CBMH4	MH5	12.9	375	1.4
MH5	CBMH6	15.6	600	4.4
CBMH6	CBMH7	21.4	600	6.1
CBMH7	CBMH8	23.1	600	6.5
CBMH8	OGS	7.3	600	2.1
CB9	OGS	19.4	250	1.0
MH 10	MH 5	15.9	300	1.1
<b>Total</b>				<b>26.5</b>

### **7.2 Storm Structure Storage**

Structure	Size (mm)	Depth (m)	Volume (cu.m)
CB 1	600	0.90	0.3
CBMH 2	1200	1.20	1.4
CB 3	600	1.00	0.4
CBMH 4	1200	1.34	1.5
MH 5	1200	1.85	2.1
CBMH 6	1200	1.61	1.8
CBMH 7	1200	1.75	2.0
CBMH 8	1200	1.85	2.1
CB9	600	1.73	0.6
MH 10.	1200	1.79	2.0
<b>Total</b>			<b>14.2</b>

### **7.3 Storm Structure Storage for Water Detention**

#### **7.3.1 ACO StormBrixx (HD) for Water Detention Storage-Tank 1**

Length of StormBrixx=	10.8 m
Width of StormBrixx=	4.2 m
Area of StormBrixx=	45.4 sq.m
Depth=	0.61 m
Total Gross Volume=	27.7 cu.m.
TotalNet Volume=	<b>26.3 cu.m.</b>

#### **7.3.2 ACO StormBrixx (HD) for Water Detention Storage-Tank 2**

Length of StormBrixx=	7.8 m
Width of StormBrixx=	4.2 m
Area of StormBrixx=	20.0 sq.m
Depth=	0.61 m
Total Gross Volume=	20 cu.m.
TotalNet Volume=	<b>19.0 cu.m.</b>

Total underground storage provided = **86.0 m<sup>3</sup>**

### 7.3 Surface Storage Calculations

#### 7.3.1 - 25 Year Surface Storage

25 Year Ponding Elevation 117.71 m

Structure	Grate Elev. (m)	Depth (m)	Area ( m <sup>2</sup> )	Volume ( m <sup>3</sup> )
CB1	117.55	0.16	206.78	11.0
CBMH2	117.55	0.16	218.18	11.6
CB3	117.55	0.16	132.39	7.1
CBMH4	117.55	0.16	195.85	10.4
CBMH6	117.65	0.06	24.29	0.5
CBMH7	117.65	0.06	16.17	0.3
CBMH8	117.60	0.11	61.89	2.3
CB9	117.65	0.06	17.53	0.4
Total 25 Year Surface Storage				<b>43.6 m<sup>3</sup></b>

#### 7.3.2 - 50 Year Surface Storage

50 Year Ponding Elevation 117.75 m

Structure	Grate Elev. (m)	Depth (m)	Area ( m <sup>2</sup> )	Volume ( m <sup>3</sup> )
CB1	117.55	0.20	323.09	21.5
CBMH2	117.55	0.20	313.42	20.9
CB3	117.55	0.20	206.87	13.8
CBMH4	117.55	0.20	284.07	18.9
CBMH6	117.65	0.10	67.46	2.2
CBMH7	117.65	0.10	44.91	1.5
CBMH8	117.60	0.15	101.42	5.1
CB9	117.65	0.10	48.7	1.6
Total 50 Year Surface Storage				<b>85.6 m<sup>3</sup></b>

#### 7.3.3 - 100 Year Surface Storage

100 Year Ponding Elevation 117.80 m

Structure	Grate Elev. (m)	Depth (m)	Area ( m <sup>2</sup> )	Volume ( m <sup>3</sup> )
CB1	117.55	0.25	500	41.7
CBMH2	117.55	0.25	436.43	36.4
CB3	117.55	0.25	323.23	26.9
CBMH4	117.55	0.25	385.24	32.1
CBMH6	117.65	0.15	121.96	6.1
CBMH7	117.65	0.15	82.11	4.1
CBMH8	117.60	0.20	177.28	11.8
CB9	117.65	0.15	84.55	4.2
Total 100 Year Surface Storage				<b>163.3 m<sup>3</sup></b>

### 8.0 Water Balance Calculations

The corporate green building standard requires the first 15mm of runoff shall be retained on-site and managed by way of infiltration, evapotranspiration, water harvesting or re-use on site.

Total required volume to be retained on site per total site area = 88.8 cu.m

Description	Area (m <sup>2</sup> )	Initial Abstraction(mm)	Volume (m <sup>3</sup> )
Impervious Surfaces	5210	1.0	5.2
Landscape Area	710	5.0	3.6
Cistern/ Infiltration Pit			81.0
Total	5920		89.8 cu.m

Pro-rated depth over the site area = 15.2 mm

### 9.0 StormBrixx Storage Sizing for Water Retention

Length of StormBrixx= 13.2 m  
Width of StormBrixx= 9.6 m  
Area of StormBrixx= 126.7 sq.m  
Depth= 0.61 m  
Total Gross Volume= 77.2 cu.m.  
TotalNet Volume= 73.4 cu.m.

Depth of stone base= 150 mm  
Void Space 40%  
Volume in the stone= 7.6 cu.m.

Total Available Storage= 81.0 cu.m.

### 10.0 Infiltration Time Calculation

Infiltration rate = 12.00 mm/hr (Assumed most least rate, to be confirmed by Geotechnical)

The estimated time to infiltrate water is as follows:

Depth of pit = 760 mm  
Time to infiltrate = 63.33 hrs

### 11.0 Stormwater Management Summary

Storm Event	Peak Rate Controls		Site Storage	
	Required	Provided	Required	Provided
	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	( m <sup>3</sup> )	( m <sup>3</sup> )
Water balance			88.8	89.8
2 Year	0.0225	0.0193	37.7	86.0
5 Year	0.0225	0.0209	56.7	86.0
10 Year	0.0225	0.0211	76.3	86.0
25 Year	0.0225	0.0215	106.1	129.6
50 Year	0.0225	0.0218	130.2	171.6
100 Year	0.0225	0.0223	153.3	249.3

**APPENDIX B**  
**STORM SEWER DESIGN SHEET**

**MGM CONSULTING Inc.**  
**STORM SEWER DESIGN SHEET**

**Fire Station 124, 2524 Cawthra Rd, Mississauga, ON.**

**By: CS**  
**Date: Septemebr, 2024**

Location				Areas		A * C			Rainfall		Flow	Sewer Design						Pipe Capacity % full
Manhole from	Invert m.	Manhole to	Invert m.	Area ha	Cumulative Area ha	Weighted Coefficient C	Incremental A * C	Cumulative A * C	Time min	Intensity I10 mm/hr.	Q cms	Pipe Size mm.	Slope %	Max. Flow Q max cms	Max Velocity V max m./sec.	Length m.	Time in Section min.	
AD 13		CB 1		0.009	0.009	0.60	0.005	0.005	15.0	99.2	0.001	150	0.50	0.011	0.61	15.8	0.43	14
CB 1		CBMH 2		0.073	0.082	0.59	0.043	0.048	15.4	97.5	0.013	250	1.00	0.060	1.21	22.1	0.30	22
CBMH 2		CBMH 4		0.088	0.170	0.88	0.077	0.125	15.7	96.4	0.034	300	0.50	0.068	0.97	22.3	0.38	49
AD 14		CB 3		0.010	0.010	0.60	0.006	0.006	15.0	99.2	0.002	150	0.50	0.011	0.61	23.8	0.65	15
CB 3		CBMH 4		0.075	0.085	0.59	0.044	0.044	15.6	96.7	0.012	250	1.00	0.060	1.21	25.6	0.35	20
CBMH 4		MH 5		0.063	0.318	0.79	0.050	0.219	16.1	95.0	0.058	375	0.50	0.124	1.12	12.9	0.19	47
BLD. Roof		MH 10		0.099	0.099	0.90	Controlled roof flow				0.0030	250	2.00	0.084	1.72	2.8	0.03	4
MH 10		MH 5			0.099						0.0030	300	1.90	0.134	1.89	15.9	0.14	2
MH 5		CBMH 6			0.318			0.219	16.3	94.3	0.060	600	0.50	0.435	1.54	15.6	0.17	14
CBMH 6		CBMH 7		0.031	0.349	0.77	0.024	0.243	16.5	93.7	0.066	600	0.50	0.435	1.54	21.4	0.23	15
CBMH 7		CBMH 8		0.019	0.368	0.83	0.016	0.259	16.7	92.9	0.070	600	0.50	0.435	1.54	23.1	0.25	16
CBMH 8		OGS		0.030	0.398	0.90	0.027	0.286	17.0	92.1	0.076	600	0.50	0.435	1.54	7.3	0.08	18
CB 9		OGS		0.065	0.065	0.64	0.042	0.042	15.0	99.2	0.011	250	1.00	0.060	1.21	19.4	0.27	19
OGS		MH 11			0.463			0.328	17.0	91.8	0.087	600	1.00	0.615	2.17	2.0	0.02	14
MH 11		EX-SEWER		Flow to be controlled by a 78mm orifice plate installed at upstream side of MH11							0.0190	250	1.00	0.060	1.21	9.5	0.13	32

n = 0.013  
Note: Calculated as per City's 10yr storm IDF curve.

**APPENDIX C**

**FIREFLOW AND WATER**

**DEMAND CALCULATIONS**



# FIRE FLOW REQUIREMENT

Proposed Fire Station Building,  
2524 Cawthra Rd, Mississauga, Ontario

Project # 2024-001  
DATE: Feb 2024

## Design Note

Total Effective Area for a building classified with a construction coefficient below 1.0 and if any vertical openings in the building(ex. Interconnected floor spaces, atria, elevators, escalators, etc)are unprotected, consider the largest floor area plus two largest adjoining floor areas plus 50% of all the floors immediately above them up to a maximum of eight. (Ref: Fire Underwriters Survey-Water Supply for Public Fire Protection,2020)

Effective Area

1041.9 m<sup>2</sup>

## Base Flow Calculation

A= Effective area

1,042 m<sup>2</sup>

C= Ordinary

1

F= Required fire flow

7,101 L/min.

Flow Rounded up to nearest 1,000

7,000 L/min

## Flow 'F' Adjustments

			Credits (L/min)	Charges (L/min)	Flow Adjusted (L/min)
<b>Occupancy Adjustment</b> %					
Non-combustible	-25%		-1750		5,250
<b>Sprinkler Adjustments</b>					
Sprinklered as per NFPA 13	Yes		-2,100		
Standard Water Supply	Yes		-700		
Fully supervised watersupply	No				2,450
<b>Exposure Adjustments</b>					
Exposure	Sep. (m)	Charge			
North	>30	0%			
East	>31	0%			
South	13	15%			
West	>33	0%			
Total Exposure Charge		15%		1050	3,500

Total Required Flow (Flow Rounded up to nearest 1,000) L/min =

4000

L/min

or

67

L/s

\*GFA was taken from the Site Statics provided by thw Hossack & Associates Architects.



**Water Demand Calculations**  
**Proposed Fire Station 124,**  
**2524 Cawthra Rd, Mississauga, ON.**

Project # 2024-001

DATE: Feb 2024

**Water Connection**

Connection Point

Existing 200mm dia. Watermain located in  
Needham Lane

Population to be Served

Industrial

Commercial(50 persons/ha)

Residential

0.0

30.0

0.0

Total Population

30.00

**Hydrant flow test**

Hydrant flow test location

N/A

Pressure (kPa)

Flow (in L/s)

Time

Minimum water pressure

Maximum water pressure

***Refer to Fire Hydrant Flow Test Results***

**Water Demands**

No.		Commercial (L/s)	Industrial (L/s)	Residential (L/s)	Total (L/s)
1	Average day flow <sup>1</sup>	0.0000	0.1042	0.0000	0.1042
2	Maximum day flow <sup>2</sup>	0.0000	0.1458	0.0000	0.1458
3	Peak hour flow <sup>3</sup>	0.0000	0.3125	0.0000	0.3125
4	Fire flow <sup>4</sup>				67

**Analysis**

5 Maximum day plus fire flow

**67.15 L/s**

or

**4028.75 L/min**

or

**1064.28 usgpm**

Note:

1. Water demand for Industrial, Commercial and Institutional: 300 L/cap.day

2. Max Day Factor for ICI: 1.4

3. Peak Hour Factor for ICI: 3.0

(Ref: Public Works Design, Specifications and Procedures Manual-Region of Peel)

**APPENDIX D**

**SANITARY SEWER DESIGN SHEET**



THE REGIONAL MUNICIPALITY OF PEEL  
SANITARY SEWER DESIGN SHEET

Project No. 2024-001  
Subdivision Fire Station 124  
Date: 22-Mar-24  
Des. By: CS Chk. By: MLS

Street	Tributary Area Hectare				Population Tributary				Average Increment**	Average Total	Peaking	Max.	Infiltration***	Max. Flow	SEWER					PIPE			REMARKS
	Increment			Total	Increment			Total*							mm.	%	Q	V m/S		Type	n	Class	
	Res. ha	Comm. ha	Ind. ha		Res.	Comm.	Ind.		Full Flow	Act. Flow													
Commercial		0.59		0.59		30		30	0.099	0.099	4.355	0.431	0.118	0.549	150	2.00	21.546	1.22		PVC	0.013	SDR35	

\*Total Population is calculated based an equivalent population of 50 persons per hectare as per Sanitary Sewer Design Criteria, Region of Peel  
\*\*Domestic sewage flow is 285 L/cap/day  
\*\*\*Infiltration unit rate is 0.0002 m3/sec/ha

**APPENDIX E**

**OGS UNIT SIZE MODELING**



## **Hydroworks Sizing Summary**

**Fire Station 124**

**Mississauga, Ontario**

**03-14-2024**

### **Recommended Size: HydroDome HD 6**

A HydroDome HD 6 is recommended to provide 80 % annual TSS removal based on a drainage area of .541 (ha) with an imperviousness of 92 % and Toronto Central, Ontario rainfall for the ETV/NJDEP particle size distribution.

The recommended HydroDome HD 6 treats 99 % of the annual runoff and provides 80 % annual TSS removal for the Toronto Central rainfall records and ETV/NJDEP particle size distribution.

The HydroDome has a siphon which creates a discontinuity in headloss. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .06 (m<sup>3</sup>/s) for the given 250 (mm) pipe diameter at 1% slope. The headloss was calculated to be 240 (mm) above the crown of the 250 (mm) outlet pipe.

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at [support@hydroworks.com](mailto:support@hydroworks.com).

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroDome .

## TSS Removal Sizing Summary

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

Site Parameters

Area (ha) .541

Imperviousness (%) 92

Units

☐ U.S.

☒ Metric

Rainfall Station

Toronto Central Ontario

1982 To 1999 Rainfall Timestep = 15 min.

Project Title

Fire Station 124

Mississauga, Ontario

ETV Lab Testing Results ☐ Post Treatment Recharge

Outlet Pipe

Diam. (mm) 250 Peak Design Flow (m3/s)

Slope (%) 1

HydroDome Annual Sizing Results

Model #	Qlow (m3/s)	Qtot (m3/s)	Flow Capture (%)	TSS Removal (%)
Unavailable	.059	.059	99 %	64 %
HD 4	.059	.059	99 %	71 %
HD 5	.059	.059	99 %	76 %
HD 6	.059	.059	99 %	80 %
Unavailable	.059	.059	99 %	84 %
HD 8	.059	.059	99 %	86 %
HD 10	.059	.059	99 %	91 %
HD 12	.059	.059	99 %	94 %

Particle Size Distribution

Size (um)	%	SG
1	5	2.65
4	5	2.65
6	5	2.65
7	5	2.65
18	15	2.65
45	10	2.65
70	5	2.65
90	10	2.65
125	15	2.65
200	15	2.65

Note: Results vary significantly based on particle size distribution

Simulate

## TSS Particle Size Distribution

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

TSS Particle Size Distribution

Size (um)	%	SG
1	5	2.65
4	5	2.65
6	5	2.65
7	5	2.65
18	15	2.65
45	10	2.65
70	5	2.65
90	10	2.65
125	15	2.65
200	15	2.65
400	5	2.65
850	5	2.65
*		

Notes:

1. To change data just click a cell and type in the new value(s)
2. To add a row just go to the bottom of the table and start typing.
3. To delete a row, select the row by clicking on the first pointer column, then press delete
4. To sort the table click on one of the column headings

TSS Distributions

☒ ETV Canada / NJDEP

☐ Standard HDS Design

☐ Alden Laboratory

☐ OK110

☐ Toronto

☐ Ontario Fine

☐ Calgary Forebay

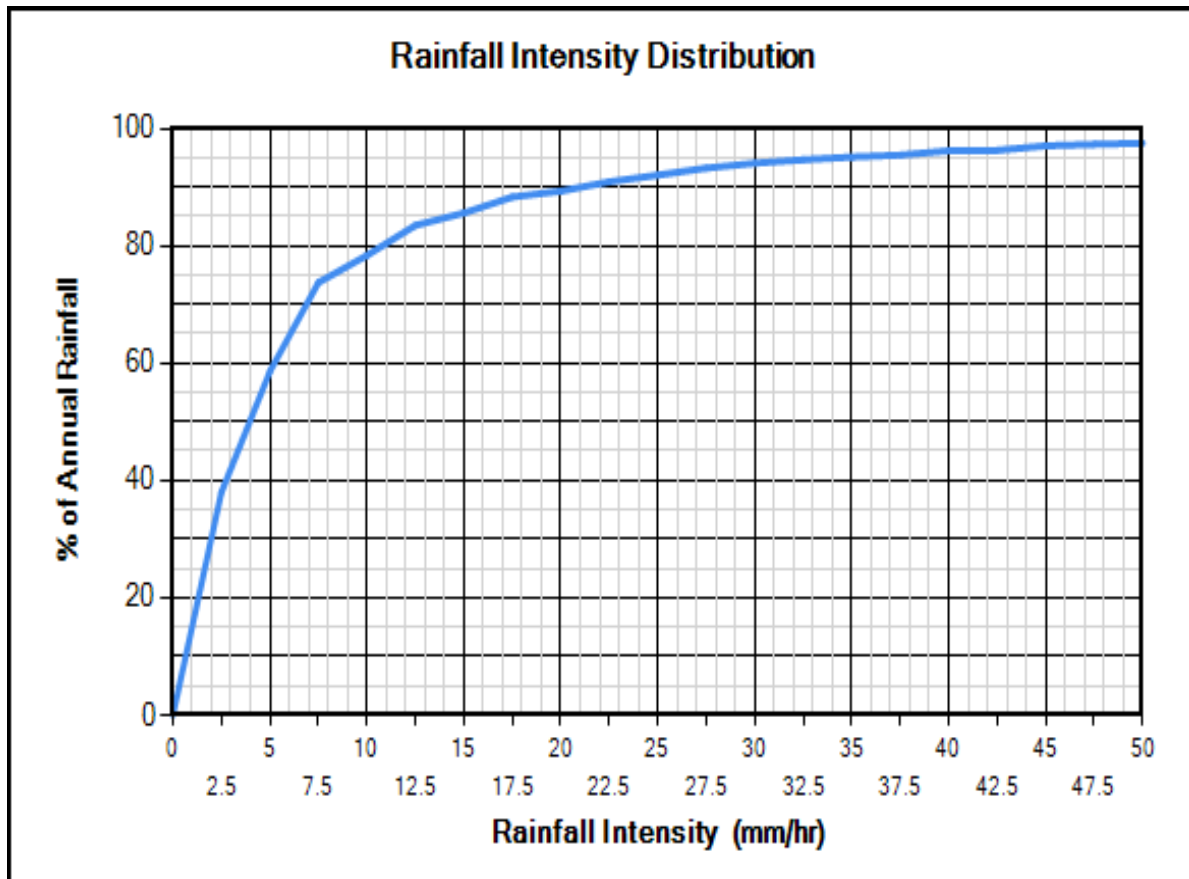
☐ Kitchener

☐ User Defined

Clear

You must select a particle size distribution for TSS to simulate TSS removal

Water Temp (C) 20



## Site Physical Characteristics

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

**Catchment Parameters**

Width (m)  Imperv. Mannings n  Maintenance Frequency (months)

Perv Mannings n

Slope (%)  Imp. Depress. Storage (mm)

Perv. Depress. Storage (mm)

**Daily Evaporation (mm/day)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	2.54	2.54	3.81	3.81	3.81	2.54	2.54	0	0

**Infiltration**

Max. Infiltration Rate (mm/hr)

Min. Infiltration Rate (mm/hr)

Infiltration Decay Rate (1/s)

Infiltration Regen. Rate (1/s)

**Catch Basins**

# of Catch basins

**Controlled Roof Runoff**

Roof Runoff (m3/s)

Resets all parameters excluding input catchment width.

## Dimensions And Capacities

Hydroworks Siphon Separator Sizing Program - HydroDome

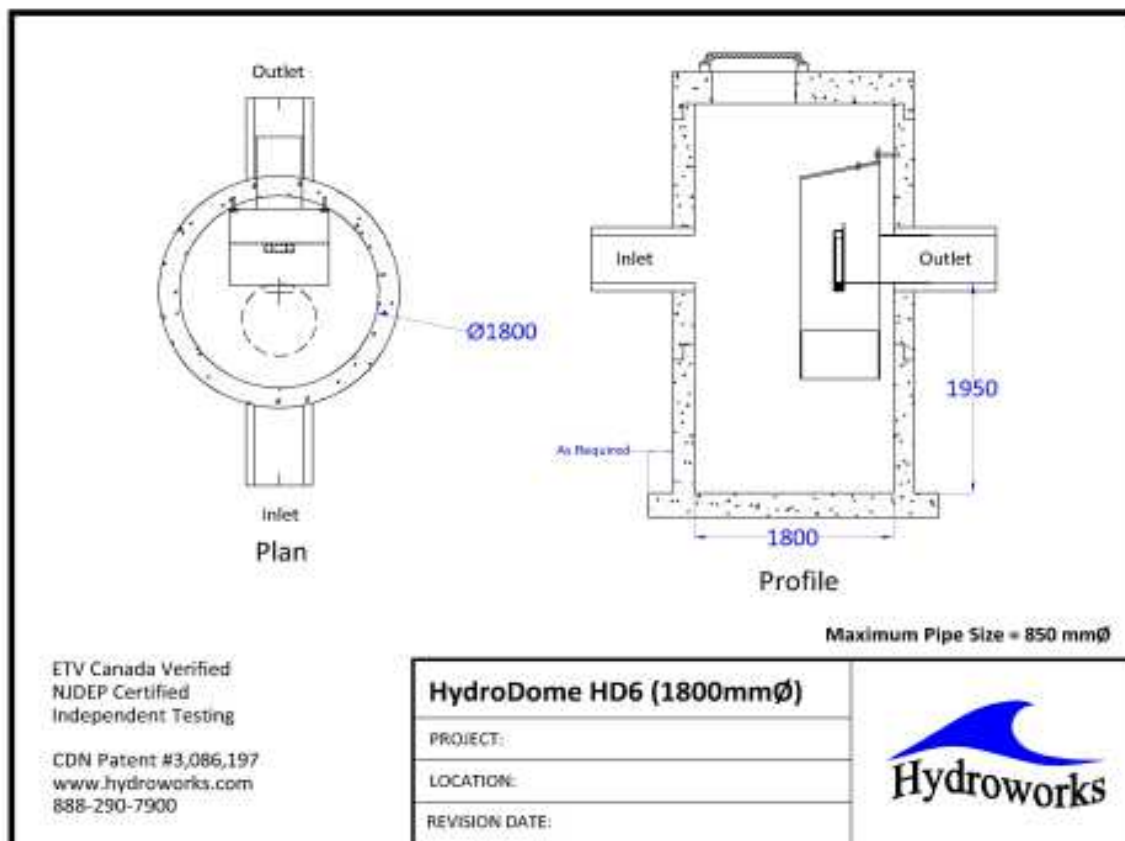
File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

Dimensions and Capacities					
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HD 3	0.91	1.22	123	0.5	0.8
HD 4	1.22	1.37	266	0.9	1.6
HD 5	1.52	1.68	483	1.7	3.1
HD 6	1.83	1.98	803	2.9	5.2
HD 7	2.13	2.29	1226	4.6	8.2
HD 8	2.44	2.59	1863	6.8	12.1
HD 10	3.05	3.2	3617	13	23.3
HD 12	3.66	3.81	6224	22.2	40

Depth = Depth from outlet invert to inside bottom of tank

## Generic HD 6 CAD Drawing





## TSS Buildup And Washoff

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

**TSS Buildup**

☐ Power Linear  
☒ Exponential

**TSS Washoff**

☒ Power-Exponential  
☐ Rating Curve (no upper limit)

**Street Sweeping**

Efficiency (%) 30  
 Start Month May  
 Stop Month Sep  
 Frequency (days) 30  
 Available Fraction .3

**Soil Erosion**

☐ Add Erosion to TSS

Reset to Default Values

**TSS Buildup Parameters**

Limit (kg/ha) 28.02  
 Coeff (kg/ha) 67.25  
 Exponent .5

**TSS Washoff Parameters**

Coefficient .0855  
 Exponent 1.1

**TSS Buildup**

☒ Based on Area  
☐ Based on Curb Length

## Upstream Quantity Storage

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

**Quantity Control Storage**

	Storage (m3)	Discharge (m3/s)
▶	0	0
•		

**Notes:**

1. To change data just click a cell and type in the new value (s)
2. To add a row just go to the bottom of the table and start typing.
3. To delete a row, select the row by clicking on the first pointer column, then press delete
4. To sort the table click on one of the column headings

Clear

## Other Parameters

Hydroworks Siphon Separator Sizing Program - HydroDome

File Product Units CAD Video Help

General Dimensions Rainfall Site TSS PSD TSS Loading Quantity Storage By-Pass Custom CAD Video Other

Scaling Law

- ☐ Peclet Scaling based on diameter x depth
- ☒ Peclet Scaling based on surface area (diameter x diameter)

TSS Removal Extrapolation

- ☒ Extrapolate TSS Removal for flows lower than tested
- ☐ No TSS Removal extrapolation for flows lower than tested
- ☐ No TSS Removal extrapolation for lower flows or inter-event periods

Lab Testing

- ☐ Use NJDEP Lab Testing Results
- ☒ Use ETV Canada Lab Testing Results

HydroDome Design

- ☒ High Flow Weir
- ☐ Flow Control (parking lot storage)  
Must add Quantity Storage Table

HD Hydraulics

HD Model HD 6

- ☐ Custom Insert Size

TSS Removal Results

☒ Required TSS Removal

☐ Choose Model #

TSS Removal Required

TSS Removal (%) 80.0 Enter required TSS Removal (%)

## Flagged Issues

If there is underground detention storage upstream of the HydroDome please contact Hydroworks to ensure it has been modeled correctly.

Hydroworks Sizing Program - Version 5.8

Copyright Hydroworks, LLC, 2023

1-800-290-7900

[www.hydroworks.com](http://www.hydroworks.com)

**APPENDIX F**

**ACO StormBrixx Design**

## Online Project Configuration

### Project Details

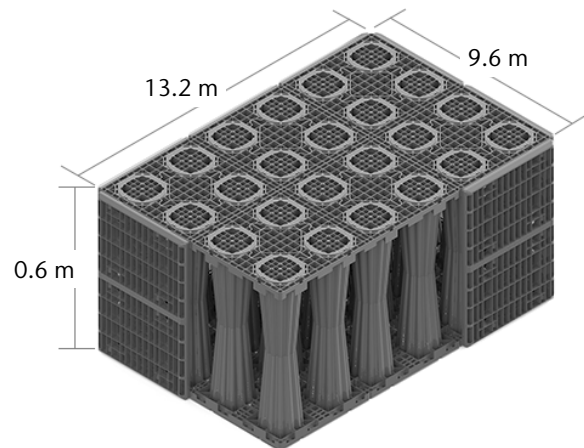
Description : 124 Fire Station  
Date : 04-08-2024  
City : Mississauga  
State : ON  
Zip Code : L5A2X3  
Country : CANADA

### Customer Details

Contact : Dewindi Udara  
Email : dudara@mgm.on.ca

## Tank Configuration

Tank Function	Infiltration
Product	Heavy Duty (HD)
Number of Layers	1.0
Total Net Volume (m <sup>3</sup> )	73.4 m <sup>3</sup>
Total Gross Volume (m <sup>3</sup> )	77.2 m <sup>3</sup>
Length of Tank (m)	13.2 m
Width of Tank (m)	9.6 m
Depth of Tank (m)	0.6 m

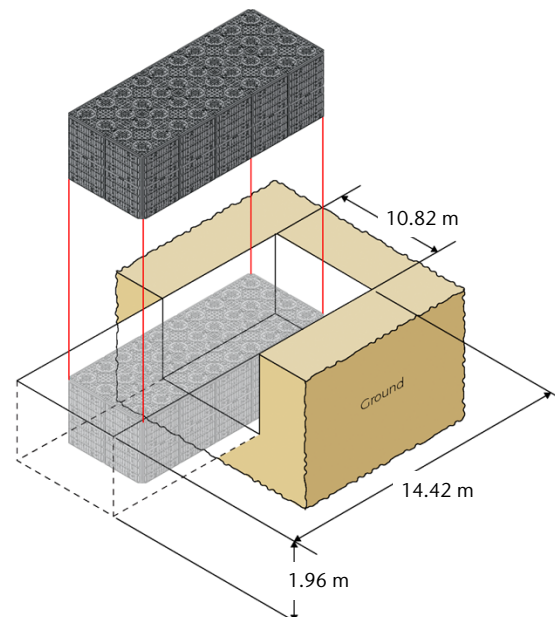


## Cavity & Excavation Details

Length of Cavity (m)	14.4 m
Width of Cavity (m)	10.8 m
Depth of Cavity (m)	2.0 m
Volume of Material to be Excavated (m <sup>3</sup> )	306.1 m <sup>3</sup>
*Membrane Quantity (m <sup>2</sup> )	323.4 m <sup>2</sup>
Cover Dimension (m)	1.2 m
**Backfill Material (m <sup>3</sup> )	228.8 m <sup>3</sup>

\* Calculation includes a 15% overlap





\*\* Pavement not accounted for







\* Diagram shows cavity size rounded to nearest foot

# Project Configuration Inlets, Outlets, and Access




## Inlets

		Qty
	<b>Inlets</b>	<b>1</b>
	Remote Access Unit	0
	Side Panels	1
	Horizontal Pipe Connector	0

## Outlets

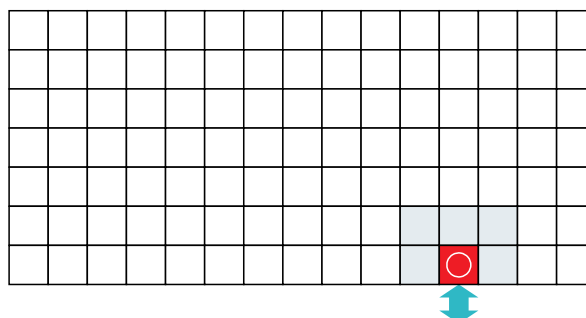
		Qty
	<b>Outlets</b>	<b>1</b>
	Remote Access Unit	1
	Side Panels	0
	Horizontal Pipe Connector	0

## Access

		Qty
	<b>Access Points</b>	<b>0</b>
	Remote Access Unit	0
	Remote Access Plate	0

### Grid Note

The grids below do not represent accurate dimensions or proportions they just give a general guide to both inlet / outlet and access placement on your StormBrixx scheme.



### Inlet/Outlet Grid Key



Inlet/Outlet Pipe



Inlet/Outlet using Remote Access Unit

### Access Grid Key












Remote Access Unit with maintenance access



Remote Access Plate with maintenance access

# Bill of Materials



Pt No.		Description	Qty	Price Each (\$)	Extended Price (\$)	Weight Each (lbs)	Extended Weight (lbs)
314061		HD Half-Module	352			22.40	7,884.8
314062		HD Side Panel	76			3.79	288.0
140213		Stormbrixx Universal top cover	352			1.79	630.1
314023		HD Layer Connectors	176			0.03	5.3
27034		HD Remote Access Unit	1			70.50	70.5
314038		Extension Shaft	5			4.84	24.2
314053		Remote Access Vented Cover - Ductile Iron	1			83.60	83.6
27018		Vertical Inspection Point Connector	1			5.52	5.5
314044		Inspection Point Cover - Ductile Iron	1			34.54	34.5
<b>Totals</b>				<b>Price</b>		<b>Weight</b>	<b>9,026.6</b>

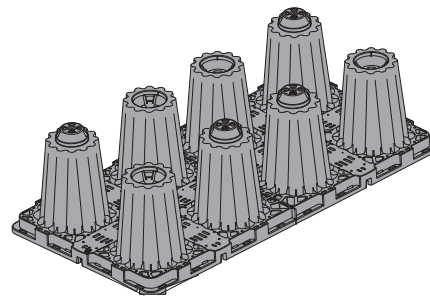
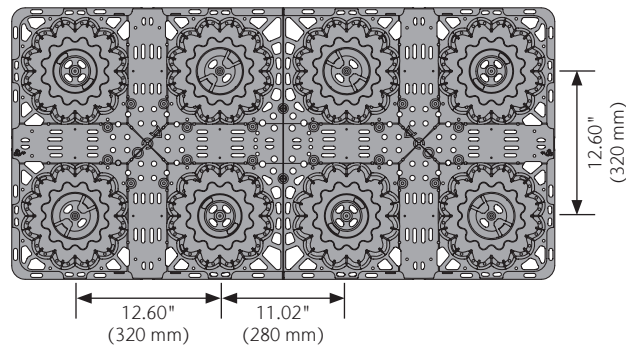
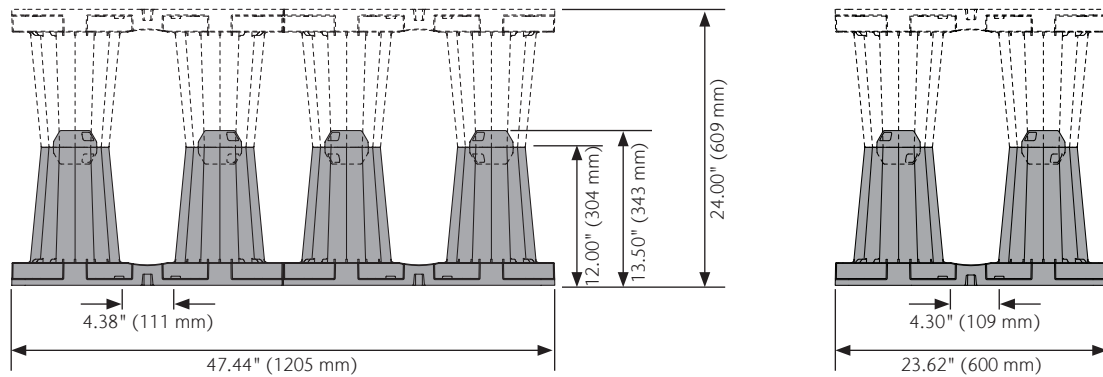
## Notes:

1) These prices are the manufacturer's suggested retail price (MSRP). Please contact your local dealer or ACO Customer Service for more information.

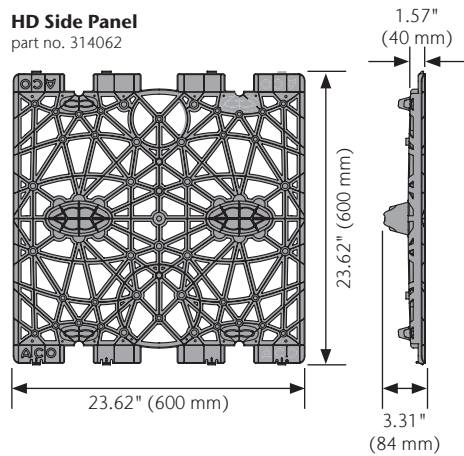
2) You should have received an email with your output results from: [no-reply@acosbconfigurator.com](mailto:no-reply@acosbconfigurator.com) If you do not receive the confirmation within a few minutes, please check your spam folder.

# Stormwater Detention/Infiltration/Retention System

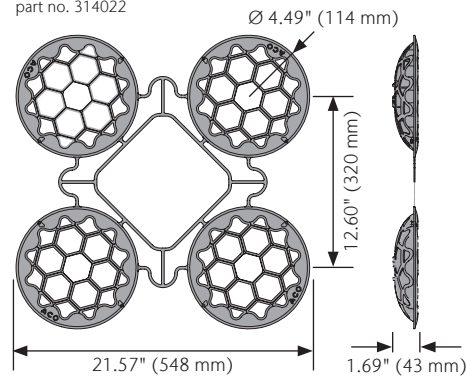
**HD Half-Module**  
part no. 314061



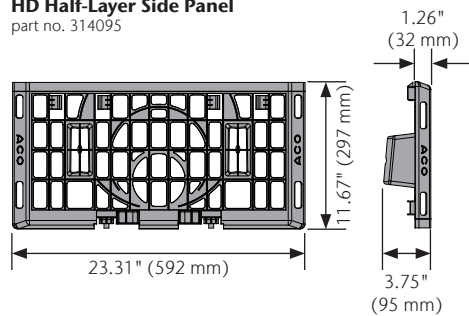
**HD Side Panel**  
part no. 314062



**HD Top Cover**  
part no. 314022



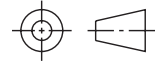
**HD Half-Layer Side Panel**  
part no. 314095



ACO Specification Information

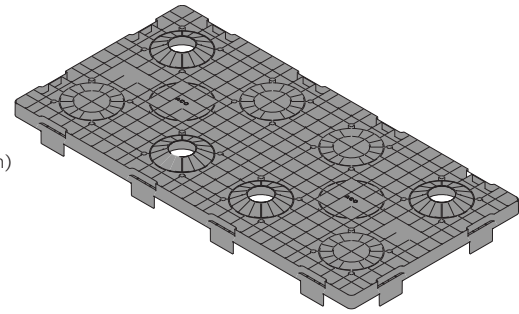
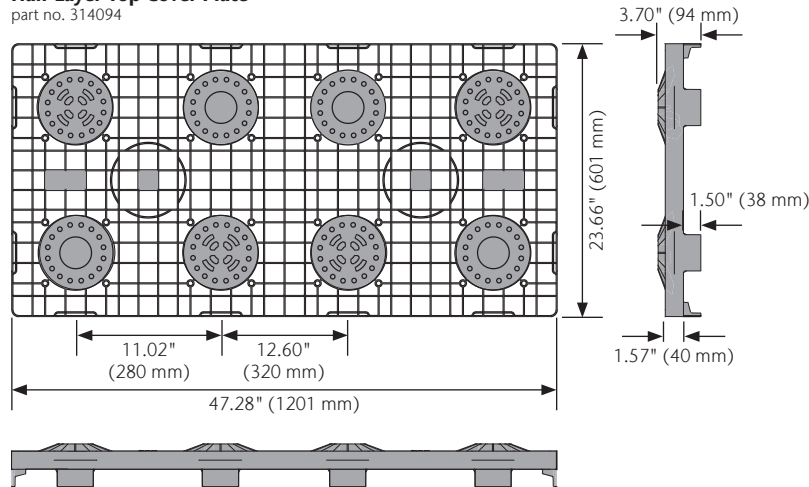


# Stormwater Detention/Infiltration/Retention System



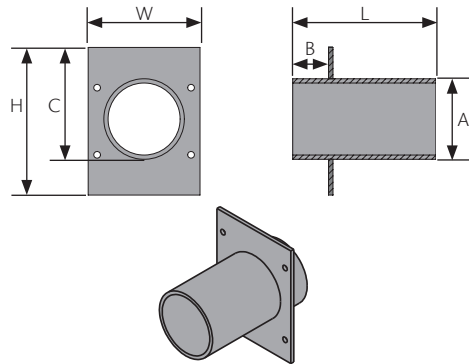
## Half-Layer Top Cover Plate

part no. 314094



## Horizontal Pipe Connector

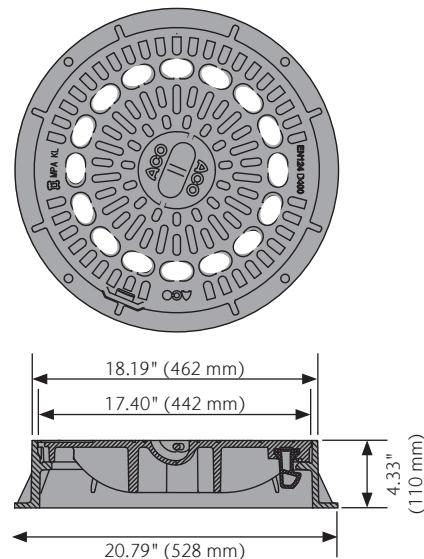
part no. see chart



Part No.	A in (mm)	B in (mm)	C in (mm)	H in (mm)	W in (mm)	L in (mm)
93139	SDR 35 - 4"	2.00 (51)	6.25 (158)	8.25 (209)	6.70 (170)	8.00 (203)
93145	SCH 40 - 4"	2.00 (51)	7.47 (189)	8.29 (210)	6.70 (170)	8.00 (203)
93140	SDR 35 - 6"	2.00 (51)	8.95 (227)	9.93 (252)	10.22 (259)	8.00 (203)
93146	SCH 40 - 6"	2.00 (51)	9.11 (231)	9.93 (252)	10.22 (259)	8.00 (203)
93141	SDR 35 - 8"	2.00 (51)	10.46 (265)	11.39 (289)	11.64 (295)	8.00 (203)
93147	SCH 40 - 8"	2.00 (51)	10.57 (268)	11.39 (289)	11.64 (295)	8.00 (203)
93142	SDR 35 - 12"	2.00 (51)	13.48 (342)	14.30 (363)	16.66 (423)	8.00 (203)
93144	SCH 35 - 15"	2.00 (51)	18.61 (471)	19.25 (489)	19.25 (489)	8.00 (203)

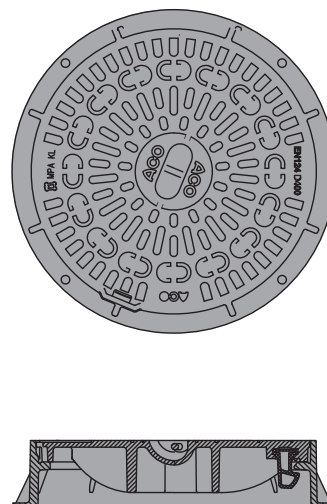
## Remote Access Cover (Vented)

part no. 314053



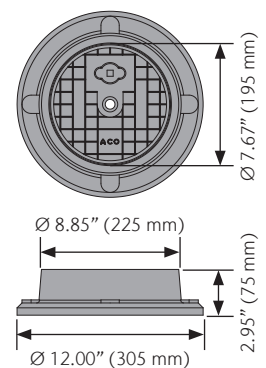
## Remote Access Cover (Non-Vented)

part no. 314043



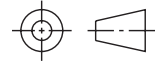
## Inspection Point Cover

part no. 314044

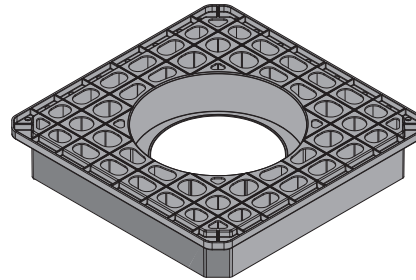
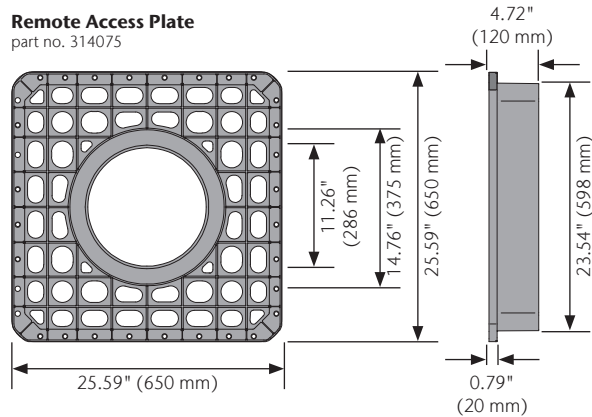




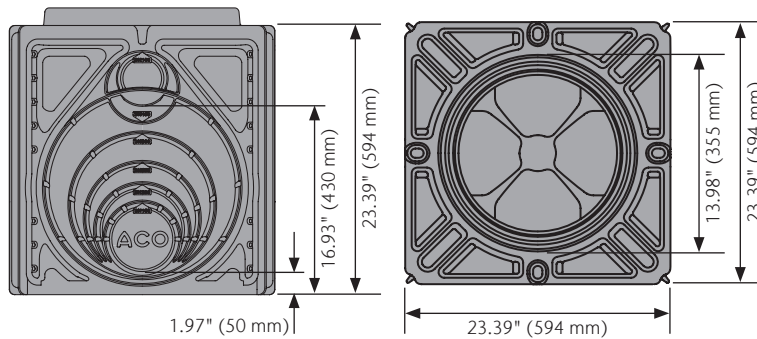
# Stormwater Detention/Infiltration/Retention System



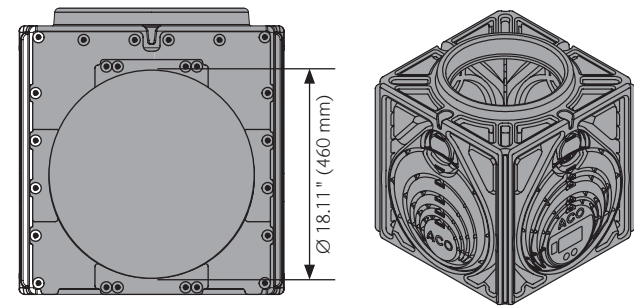
**Remote Access Plate**  
part no. 314075



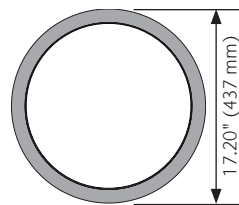
**HD Remote Access Unit**  
part no. 27034



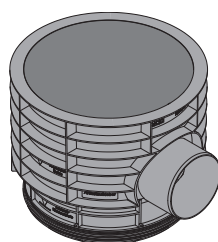
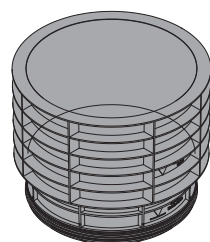
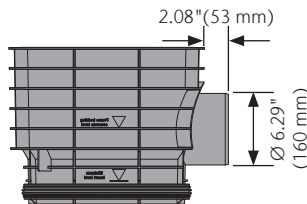
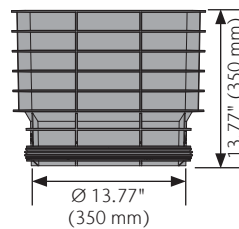
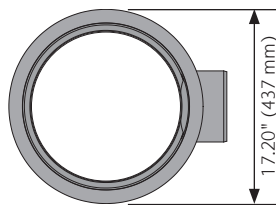
**HD Remote Access Unit with Adapter Plate**  
part no. 138140



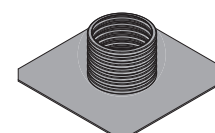
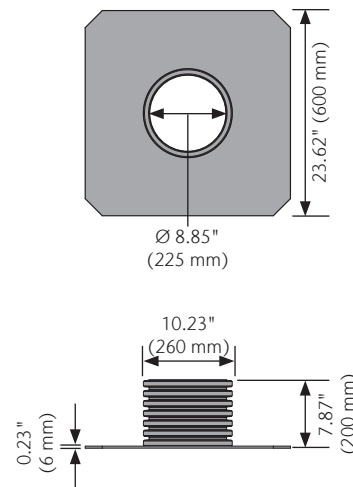
**Extension Shaft**  
part no. 314038



**Extension Shaft with Pipe Socket**  
part no. 314039

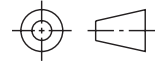


**Vertical Inspection Point Connector**  
part no. 27018



ACO Specification Information

## Stormwater Detention/Infiltration/Retention System



ACO StormBrixx HD Parts Table	Part No.	Length in (mm)	Width in (mm)	Depth in (mm)	Weight lbs (kg)
HD Half-Module	314061	47.44 (1205)	23.70 (602)	13.50 (343)	22.40 (10.20)
HD Side Panel	314062	23.62 (600)	23.62 (600)	2.17 (55)	3.79 (1.72)
HD Top Cover	314022	21.57 (548)	21.57 (548)	1.70 (43)	1.79 (0.81)
HD Half-Layer Side Panel	314095	23.31 (592)	11.67 (297)	1.26 (32)	1.98 (0.90)
Half-Layer Top Cover Plate	314094	47.25 (1200)	23.63 (600)	3.70 (94)	7.70 (3.50)
HD Layer Connector	314023	3.94 (100)	1.58 (40)	1.82 (46)	0.03 (0.02)
Remote Access Plate	314075	25.59 (650)	25.59 (650)	4.72 (120)	10.78 (4.90)
HD Remote Access Unit	27034	23.39 (594)	23.39 (594)	24.02 (610)	70.50 (31.98)
HD Remote Access Unit with Adapter Plate	138140	24.41 (620)	23.39 (594)	24.02 (610)	71.00 (32.21)
Remote Access Cover- Ductile Iron (Load Class D400)	314043	-	Ø 20.79 (528)	4.34 (110)	86.46 (39.30)
Remote Access Vented Cover Ductile Iron (Load Class D400)	314053	-	Ø 20.79 (528)	4.34 (110)	83.60 (38.00)
Inspection Point Cover - Ductile Iron (Load Class D400)	314044	-	Ø 8.85 (225)	2.95 (75)	34.54 (15.70)
Extension Shaft	314038	-	Ø 17.21 (437)	13.78 (350)	4.84 (2.60)
Extension Shaft with Pipe Socket	314039	-	Ø 17.21(437)	13.78 (350)	6.16 (2.80)
Vertical Inspection Point Connector	27018	-	Ø 8.85* (225)	7.87 (200)	5.52 (2.50)
Horizontal Pipe Connectors					
SDR 35 - 4"	93139		4.00* (102)		1.9 (0.87)
SCH 40 - 4"	93145		4.00* (102)		1.9 (0.87)
SDR 35 - 6"	93140		6.00* (152)		3.2 (1.49)
SCH 40 - 6"	93146	8.00 (203)	6.00* (152)	-	3.20 (1.49)
SDR 35 - 8"	93141		8.00* (203)		5.52 (2.50)
SCH 40 - 8"	93147		8.00* (203)		5.52 (2.50)
SDR 35 - 12"	93142		12.00* (305)		5.52 (2.50)
SDR 35 - 15"	93144		15.00* (381)		5.52 (2.50)

\*Internal width

## Specifications

## General

The StormBrixx stormwater Detention\*/Infiltration\*/Retention\* system shall be ACO Stormbrixx HD as supplied by ACO, Inc.

ACO StormBrixx HD meets AASHTO H-25 and HS-25 loading conditions.

## Materials

The half-module shall be manufactured from polypropylene and have minimum properties as follows:

Tensile impact strength:

152 ft-lb/in<sup>2</sup> (319 kJ/m<sup>2</sup>)

Tensile strength, ultimate:

3,480 psi (23,994 kpa)

Water absorption: 0.01%

Frost proof, salt proof and fuels and oils resistant

The stormwater tank shall provide an average 95% open area<sup>1</sup>, holding up to 14.73<sup>1</sup> ft<sup>3</sup> (0.42 m<sup>3</sup>) per module (2 half-modules assembled) and offer full access to all areas and levels for maintenance.

## Geomembranes/Geotextiles

The StormBrixx stormwater system shall be wrapped in appropriate permeable geotextile or impermeable geomembrane\* (supplied by others) as indicated by project design engineer.

## Accessories

The StormBrixx stormwater system shall be used in conjunction with remote access unit or plate\*\*/extension shaft\*\*/inspection point connector\*\*.

## Installation

The StormBrixx stormwater system shall be installed in strict accordance with the manufacturer's installation instructions and recommendations.

\*Choose one

\*\*Choose none, one or more

<sup>1</sup>Configuration and use of side/top panels will marginally impact these figures

## ACO, Inc.

West Sales Office  
825 W. Beechcraft Street  
Casa Grande, AZ 85122  
Tel: (520) 421-9988  
Toll-Free: (888) 490-9552  
Fax: (520) 421-9899

Northeast Sales Office  
9470 Pinecone Drive  
Mentor, OH 44060  
Tel: (440) 639-7230  
Toll-Free: (800) 543-4764  
Fax: (440) 639-7235

Southeast Sales Office  
4211 Pleasant Road  
Fort Mill, SC 29708  
Toll-Free: (800) 543-4764  
Fax: (803) 802-1063

info@acousa.com  
www.acousa.com

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All reasonable care has been taken in compiling the information in this document. All recommendations and suggestions on the use of ACO products are made without guarantee since the conditions of use are beyond the control of the company. It is the customer's responsibility to ensure that each product is fit for its intended purpose and that the actual conditions of use are suitable. ACO, Inc. reserves the right to change products and specifications without notice.

ACO. creating  
the future of drainage



## Online Project Configuration

### Project Details

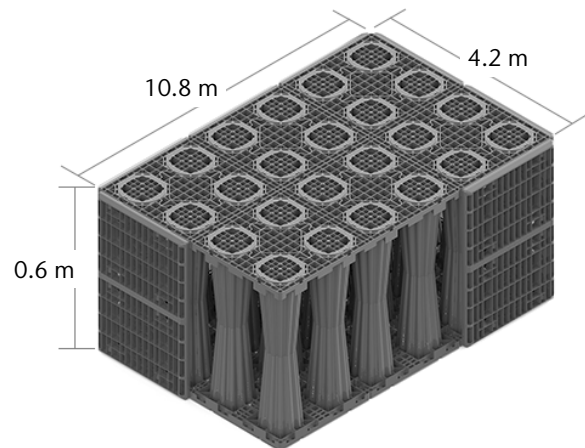
Description : 124 Fire Station-detention-1  
 Date : 04-10-2024  
 City : Mississauga  
 State : ON  
 Zip Code : M6K 1H2  
 Country : CANADA

### Customer Details

Contact : Dewindi Udara  
 Email : dudara@mgm.on.ca

## Tank Configuration

Tank Function	Detention/Retention
Product	Heavy Duty (HD)
Number of Layers	1.0
Total Net Volume (m <sup>3</sup> )	26.3 m <sup>3</sup>
Total Gross Volume (m <sup>3</sup> )	27.7 m <sup>3</sup>
Length of Tank (m)	10.8 m
Width of Tank (m)	4.2 m
Depth of Tank (m)	0.6 m

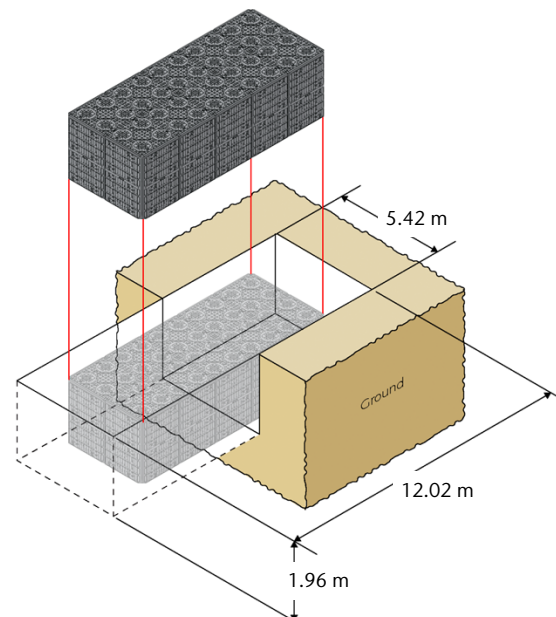


## Cavity & Excavation Details

Length of Cavity (m)	12.0 m
Width of Cavity (m)	5.4 m
Depth of Cavity (m)	2.0 m
Volume of Material to be Excavated (m <sup>3</sup> )	127.8 m <sup>3</sup>
*Membrane Quantity (m <sup>2</sup> )	125.4 m <sup>2</sup>
Cover Dimension (m)	1.2 m
**Backfill Material (m <sup>3</sup> )	100.1 m <sup>3</sup>

\* Calculation includes a 15% overlap





\*\* Pavement not accounted for







\* Diagram shows cavity size rounded to nearest foot

# Project Configuration Inlets, Outlets, and Access




## Inlets

		Qty
	<b>Inlets</b>	<b>1</b>
	Remote Access Unit	0
	Side Panels	1
	Horizontal Pipe Connector	0

## Outlets

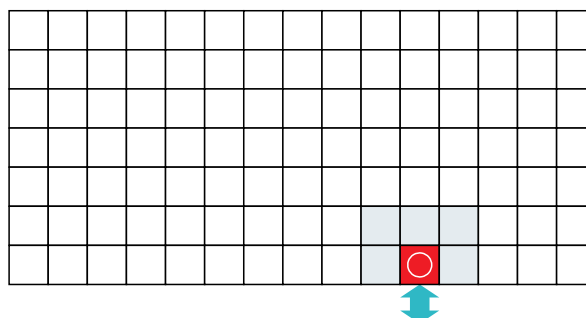
		Qty
	<b>Outlets</b>	<b>1</b>
	Remote Access Unit	1
	Side Panels	0
	Horizontal Pipe Connector	0

## Access

		Qty
	<b>Access Points</b>	<b>0</b>
	Remote Access Unit	0
	Remote Access Plate	0

### Grid Note

The grids below do not represent accurate dimensions or proportions they just give a general guide to both inlet / outlet and access placement on your StormBrixx scheme.



### Inlet/Outlet Grid Key



Inlet/Outlet Pipe



Inlet/Outlet using Remote Access Unit

### Access Grid Key










Remote Access Unit with maintenance access



Remote Access Plate with maintenance access

## Bill of Materials



Pt No.		Description	Qty	Price Each (\$)	Extended Price (\$)	Weight Each (lbs)	Extended Weight (lbs)
314061		HD Half-Module	126			22.40	2,822.4
314062		HD Side Panel	50			3.79	189.5
140213		Stormbrixx Universal top cover	126			1.79	225.5
314023		HD Layer Connectors	63			0.03	1.9
27034		HD Remote Access Unit	1			70.50	70.5
314038		Extension Shaft	5			4.84	24.2
314053		Remote Access Vented Cover - Ductile Iron	1			83.60	83.6
<b>Totals</b>				<b>Price</b>		<b>Weight</b>	<b>3,417.6</b>

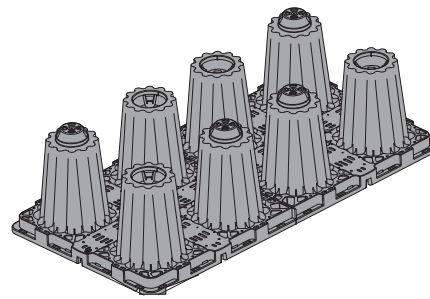
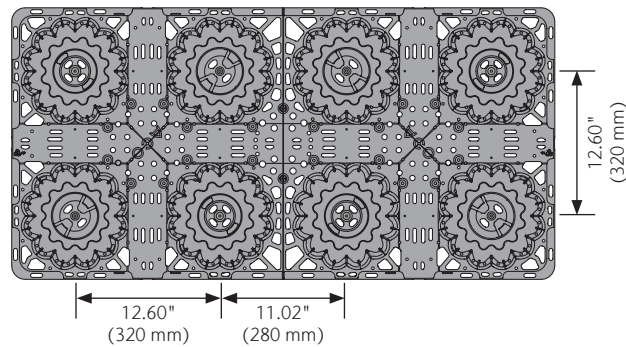
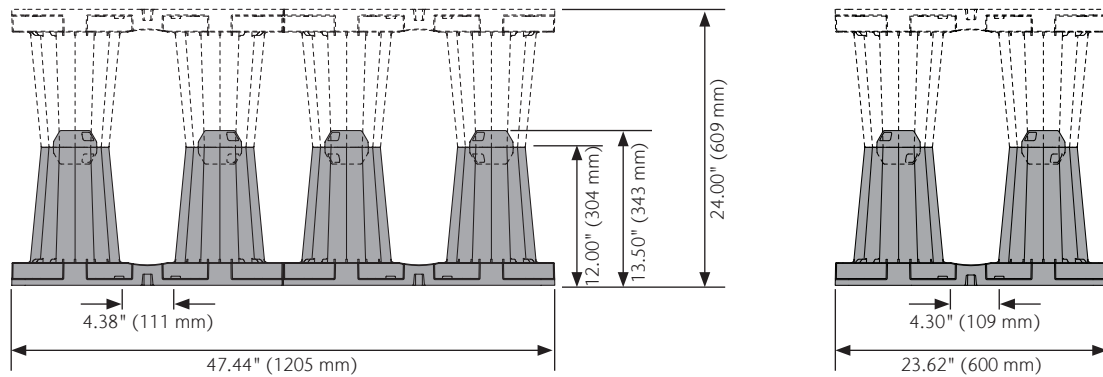
### Notes:

1) These prices are the manufacturer's suggested retail price (MSRP). Please contact your local dealer or ACO Customer Service for more information.

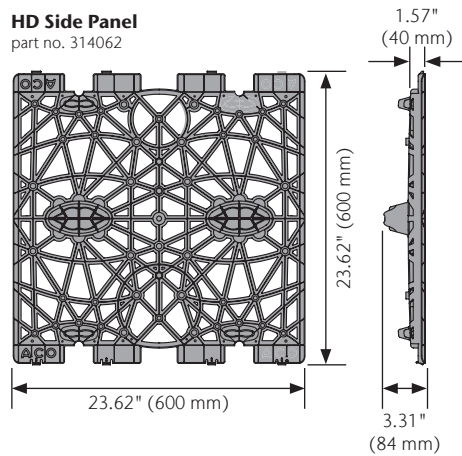
2) You should have received an email with your output results from: [no-reply@acosbconfigurator.com](mailto:no-reply@acosbconfigurator.com) If you do not receive the confirmation within a few minutes, please check your spam folder.

# Stormwater Detention/Infiltration/Retention System

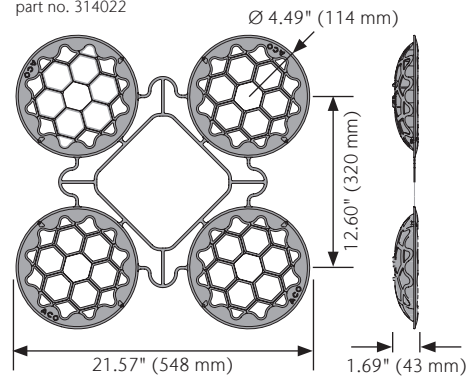
**HD Half-Module**  
part no. 314061



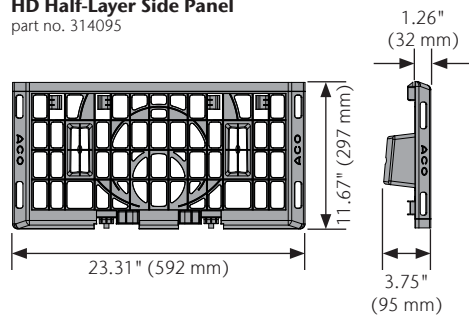
**HD Side Panel**  
part no. 314062



**HD Top Cover**  
part no. 314022



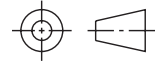
**HD Half-Layer Side Panel**  
part no. 314095



ACO Specification Information

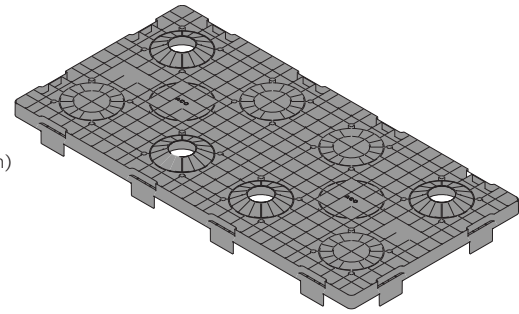
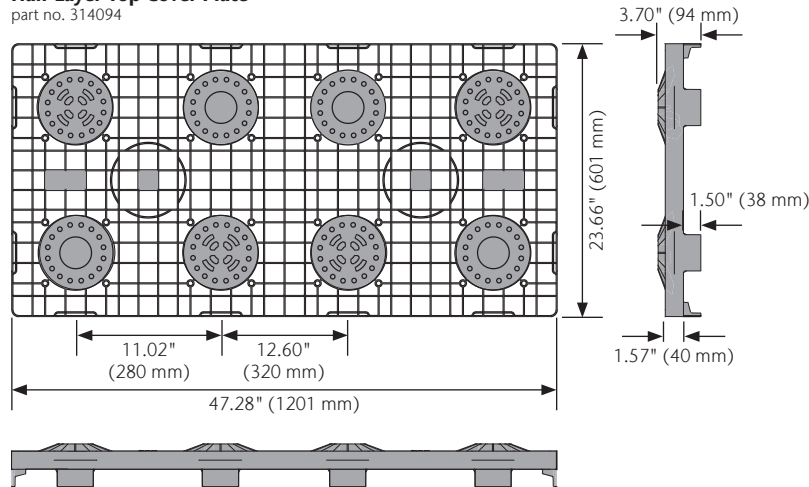


# Stormwater Detention/Infiltration/Retention System



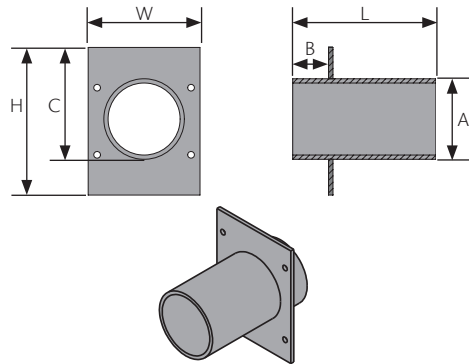
## Half-Layer Top Cover Plate

part no. 314094



## Horizontal Pipe Connector

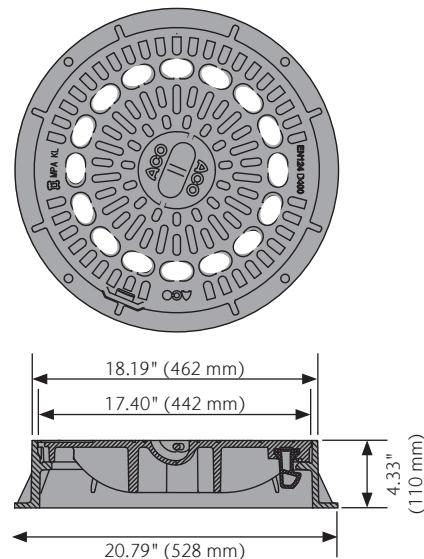
part no. see chart



Part No.	A in (mm)	B in (mm)	C in (mm)	H in (mm)	W in (mm)	L in (mm)
93139	SDR 35 - 4"	2.00 (51)	6.25 (158)	8.25 (209)	6.70 (170)	8.00 (203)
93145	SCH 40 - 4"	2.00 (51)	7.47 (189)	8.29 (210)	6.70 (170)	8.00 (203)
93140	SDR 35 - 6"	2.00 (51)	8.95 (227)	9.93 (252)	10.22 (259)	8.00 (203)
93146	SCH 40 - 6"	2.00 (51)	9.11 (231)	9.93 (252)	10.22 (259)	8.00 (203)
93141	SDR 35 - 8"	2.00 (51)	10.46 (265)	11.39 (289)	11.64 (295)	8.00 (203)
93147	SCH 40 - 8"	2.00 (51)	10.57 (268)	11.39 (289)	11.64 (295)	8.00 (203)
93142	SDR 35 - 12"	2.00 (51)	13.48 (342)	14.30 (363)	16.66 (423)	8.00 (203)
93144	SCH 35 - 15"	2.00 (51)	18.61 (471)	19.25 (489)	19.25 (489)	8.00 (203)

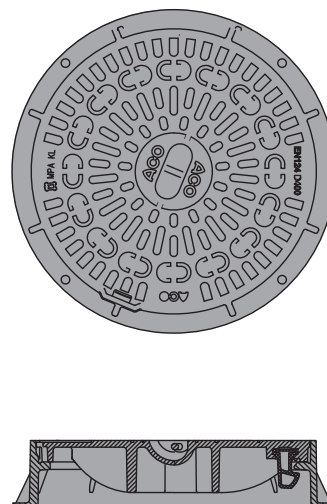
## Remote Access Cover (Vented)

part no. 314053



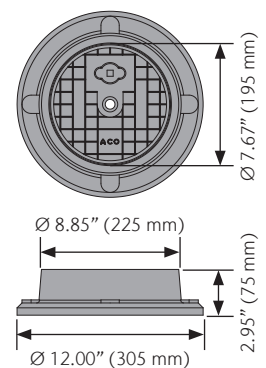
## Remote Access Cover (Non-Vented)

part no. 314043



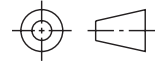
## Inspection Point Cover

part no. 314044

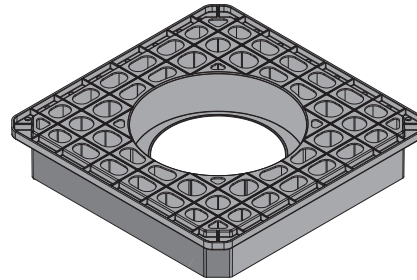
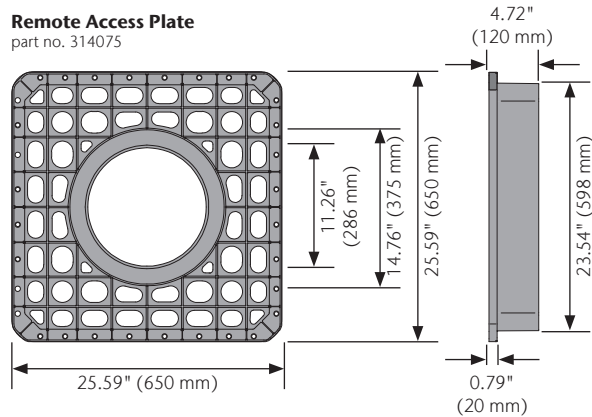


ACO Specification Information

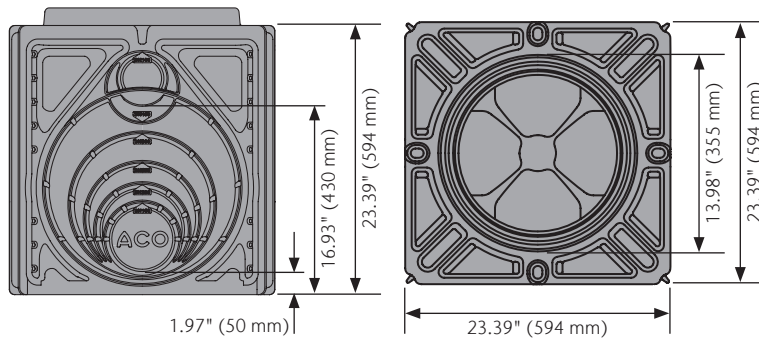
# Stormwater Detention/Infiltration/Retention System



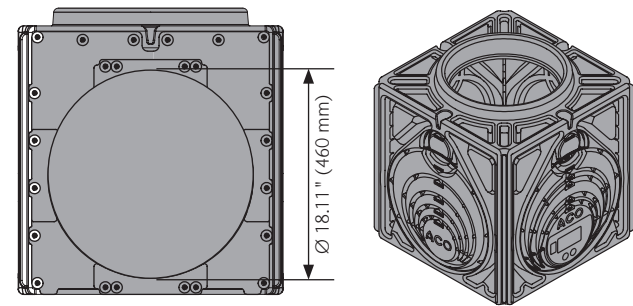
**Remote Access Plate**  
part no. 314075



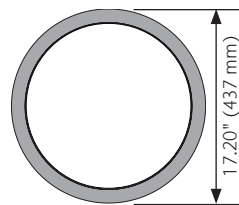
**HD Remote Access Unit**  
part no. 27034



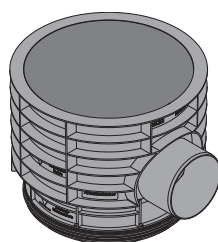
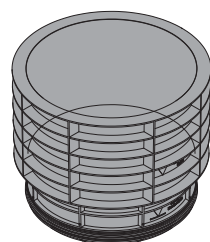
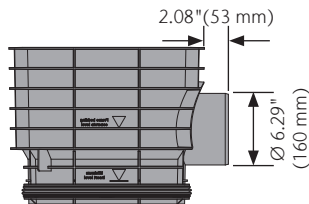
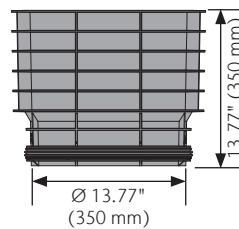
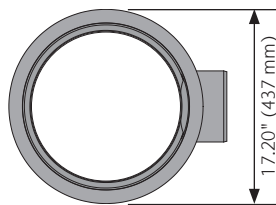
**HD Remote Access Unit with Adapter Plate**  
part no. 138140



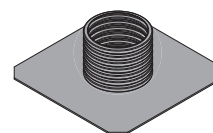
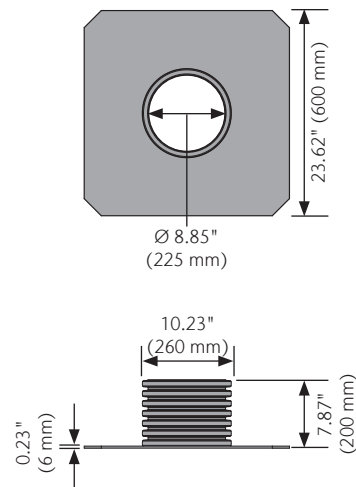
**Extension Shaft**  
part no. 314038



**Extension Shaft with Pipe Socket**  
part no. 314039



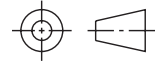
**Vertical Inspection Point Connector**  
part no. 27018



ACO Specification Information



## Stormwater Detention/Infiltration/Retention System



ACO StormBrixx HD Parts Table	Part No.	Length in (mm)	Width in (mm)	Depth in (mm)	Weight lbs (kg)
HD Half-Module	314061	47.44 (1205)	23.70 (602)	13.50 (343)	22.40 (10.20)
HD Side Panel	314062	23.62 (600)	23.62 (600)	2.17 (55)	3.79 (1.72)
HD Top Cover	314022	21.57 (548)	21.57 (548)	1.70 (43)	1.79 (0.81)
HD Half-Layer Side Panel	314095	23.31 (592)	11.67 (297)	1.26 (32)	1.98 (0.90)
Half-Layer Top Cover Plate	314094	47.25 (1200)	23.63 (600)	3.70 (94)	7.70 (3.50)
HD Layer Connector	314023	3.94 (100)	1.58 (40)	1.82 (46)	0.03 (0.02)
Remote Access Plate	314075	25.59 (650)	25.59 (650)	4.72 (120)	10.78 (4.90)
HD Remote Access Unit	27034	23.39 (594)	23.39 (594)	24.02 (610)	70.50 (31.98)
HD Remote Access Unit with Adapter Plate	138140	24.41 (620)	23.39 (594)	24.02 (610)	71.00 (32.21)
Remote Access Cover- Ductile Iron (Load Class D400)	314043	-	Ø 20.79 (528)	4.34 (110)	86.46 (39.30)
Remote Access Vented Cover Ductile Iron (Load Class D400)	314053	-	Ø 20.79 (528)	4.34 (110)	83.60 (38.00)
Inspection Point Cover - Ductile Iron (Load Class D400)	314044	-	Ø 8.85 (225)	2.95 (75)	34.54 (15.70)
Extension Shaft	314038	-	Ø 17.21 (437)	13.78 (350)	4.84 (2.60)
Extension Shaft with Pipe Socket	314039	-	Ø 17.21(437)	13.78 (350)	6.16 (2.80)
Vertical Inspection Point Connector	27018	-	Ø 8.85* (225)	7.87 (200)	5.52 (2.50)
Horizontal Pipe Connectors					
SDR 35 - 4"	93139		4.00* (102)		1.9 (0.87)
SCH 40 - 4"	93145		4.00* (102)		1.9 (0.87)
SDR 35 - 6"	93140		6.00* (152)		3.2 (1.49)
SCH 40 - 6"	93146	8.00 (203)	6.00* (152)	-	3.20 (1.49)
SDR 35 - 8"	93141		8.00* (203)		5.52 (2.50)
SCH 40 - 8"	93147		8.00* (203)		5.52 (2.50)
SDR 35 - 12"	93142		12.00* (305)		5.52 (2.50)
SDR 35 - 15"	93144		15.00* (381)		5.52 (2.50)

\*Internal width

## Specifications

## General

The StormBrixx stormwater Detention\*/Infiltration\*/Retention\* system shall be ACO Stormbrixx HD as supplied by ACO, Inc.

ACO StormBrixx HD meets AASHTO H-25 and HS-25 loading conditions.

## Materials

The half-module shall be manufactured from polypropylene and have minimum properties as follows:

Tensile impact strength:

152 ft-lb/in<sup>2</sup> (319 kJ/m<sup>2</sup>)

Tensile strength, ultimate:

3,480 psi (23,994 kpa)

Water absorption: 0.01%

Frost proof, salt proof and fuels and oils resistant

The stormwater tank shall provide an average 95% open area<sup>1</sup>, holding up to 14.73<sup>1</sup> ft<sup>3</sup> (0.42 m<sup>3</sup>) per module (2 half-modules assembled) and offer full access to all areas and levels for maintenance.

## Geomembranes/Geotextiles

The StormBrixx stormwater system shall be wrapped in appropriate permeable geotextile or impermeable geomembrane\* (supplied by others) as indicated by project design engineer.

## Accessories

The StormBrixx stormwater system shall be used in conjunction with remote access unit or plate\*\*/extension shaft\*\*/inspection point connector\*\*.

## Installation

The StormBrixx stormwater system shall be installed in strict accordance with the manufacturer's installation instructions and recommendations.

\*Choose one

\*\*Choose none, one or more

<sup>1</sup>Configuration and use of side/top panels will marginally impact these figures

## ACO, Inc.

West Sales Office  
825 W. Beechcraft Street  
Casa Grande, AZ 85122  
Tel: (520) 421-9988  
Toll-Free: (888) 490-9552  
Fax: (520) 421-9899

Northeast Sales Office  
9470 Pinecone Drive  
Mentor, OH 44060  
Tel: (440) 639-7230  
Toll-Free: (800) 543-4764  
Fax: (440) 639-7235

Southeast Sales Office  
4211 Pleasant Road  
Fort Mill, SC 29708  
Toll-Free: (800) 543-4764  
Fax: (803) 802-1063

info@acousa.com  
www.acousa.com

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All reasonable care has been taken in compiling the information in this document. All recommendations and suggestions on the use of ACO products are made without guarantee since the conditions of use are beyond the control of the company. It is the customer's responsibility to ensure that each product is fit for its intended purpose and that the actual conditions of use are suitable. ACO, Inc. reserves the right to change products and specifications without notice.

ACO. creating  
the future of drainage



## Online Project Configuration

### Project Details

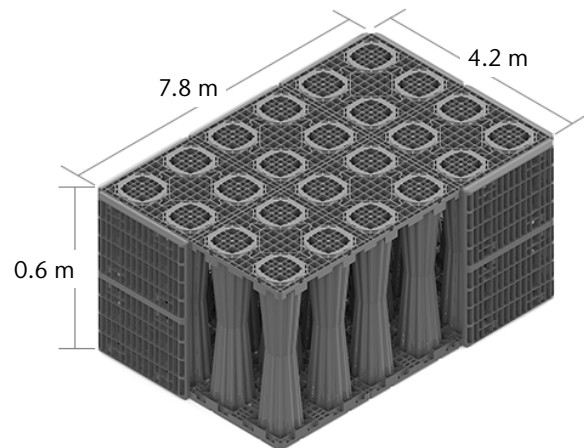
Description : 124 Fire Station-detention-2  
 Date : 04-10-2024  
 City : Mississauga  
 State : ON  
 Zip Code : M6K 1H2  
 Country : CANADA

### Customer Details

Contact : Dewindi Udara  
 Email : dudara@mgm.on.ca

## Tank Configuration

Tank Function	Detention/Retention
Product	Heavy Duty (HD)
Number of Layers	1.0
Total Net Volume (m <sup>3</sup> )	19.0 m <sup>3</sup>
Total Gross Volume (m <sup>3</sup> )	20.0 m <sup>3</sup>
Length of Tank (m)	7.8 m
Width of Tank (m)	4.2 m
Depth of Tank (m)	0.6 m

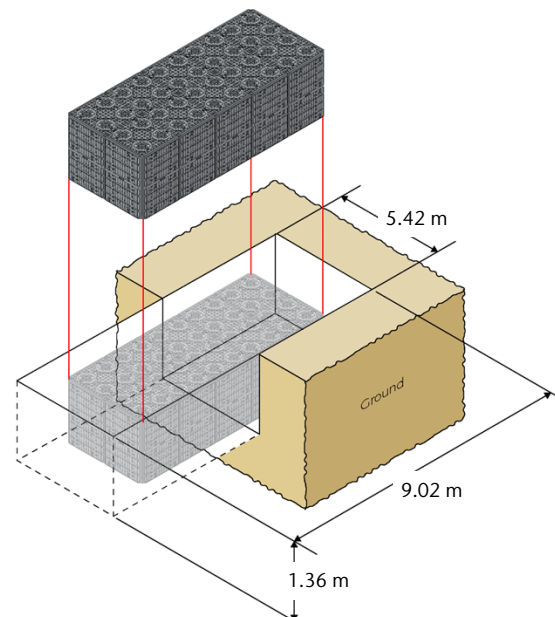


## Cavity & Excavation Details

Length of Cavity (m)	9.0 m
Width of Cavity (m)	5.4 m
Depth of Cavity (m)	1.4 m
Volume of Material to be Excavated (m <sup>3</sup> )	66.6 m <sup>3</sup>
*Membrane Quantity (m <sup>2</sup> )	92.2 m <sup>2</sup>
Cover Dimension (m)	0.6 m
**Backfill Material (m <sup>3</sup> )	46.6 m <sup>3</sup>

\* Calculation includes a 15% overlap





\*\* Pavement not accounted for







\* Diagram shows cavity size rounded to nearest foot

# Project Configuration Inlets, Outlets, and Access




## Inlets

		Qty
	<b>Inlets</b>	<b>1</b>
	Remote Access Unit	0
	Side Panels	1
	Horizontal Pipe Connector	0

## Outlets

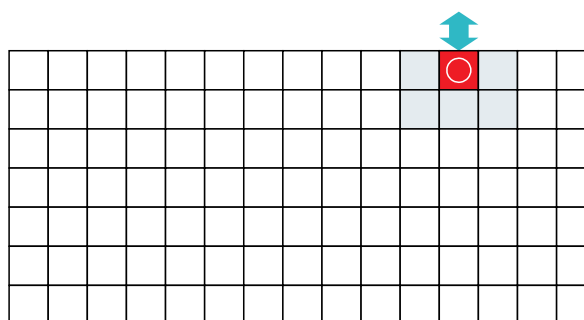
		Qty
	<b>Outlets</b>	<b>1</b>
	Remote Access Unit	1
	Side Panels	0
	Horizontal Pipe Connector	0

## Access

		Qty
	<b>Access Points</b>	<b>0</b>
	Remote Access Unit	0
	Remote Access Plate	0

### Grid Note

The grids below do not represent accurate dimensions or proportions they just give a general guide to both inlet / outlet and access placement on your StormBrixx scheme.



### Inlet/Outlet Grid Key



Inlet/Outlet Pipe



Inlet/Outlet using Remote Access Unit

### Access Grid Key










Remote Access Unit with maintenance access



Remote Access Plate with maintenance access

# Bill of Materials



Pt No.		Description	Qty	Price Each (\$)	Extended Price (\$)	Weight Each (lbs)	Extended Weight (lbs)
314061		HD Half-Module	91			22.40	2,038.4
314062		HD Side Panel	40			3.79	151.6
140213		Stormbrixx Universal top cover	91			1.79	162.9
314023		HD Layer Connectors	46			0.03	1.4
27034		HD Remote Access Unit	1			70.50	70.5
314038		Extension Shaft	3			4.84	14.5
314053		Remote Access Vented Cover - Ductile Iron	1			83.60	83.6
<b>Totals</b>				<b>Price</b>		<b>Weight</b>	<b>2,522.9</b>

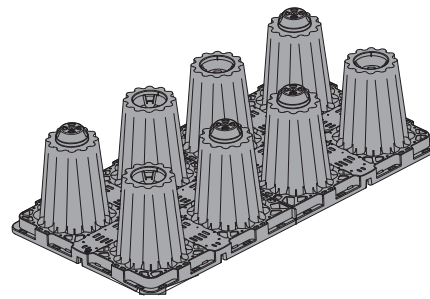
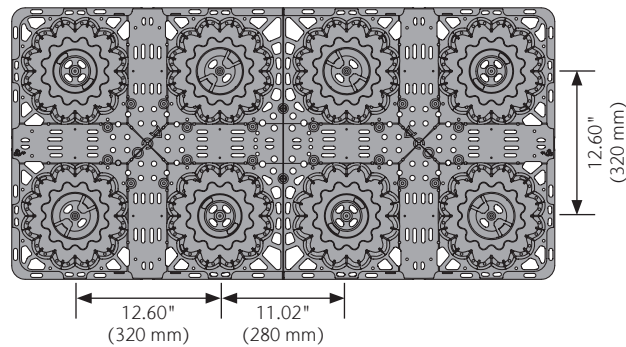
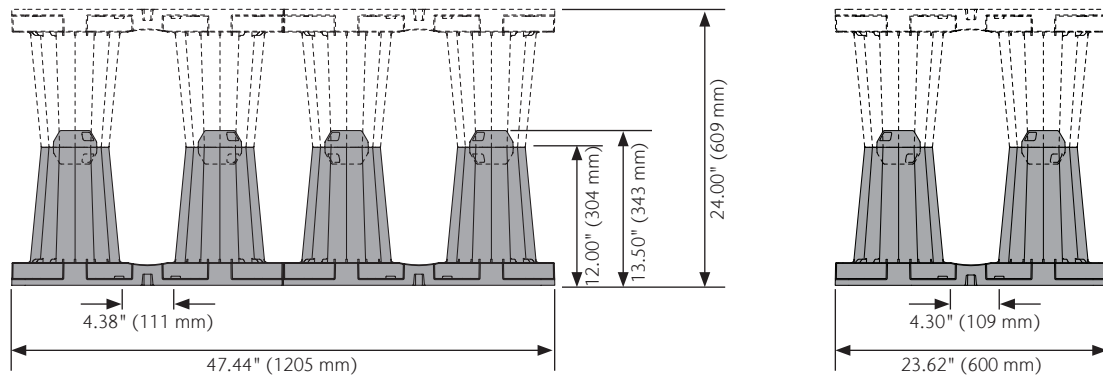
## Notes:

1) These prices are the manufacturer's suggested retail price (MSRP). Please contact your local dealer or ACO Customer Service for more information.

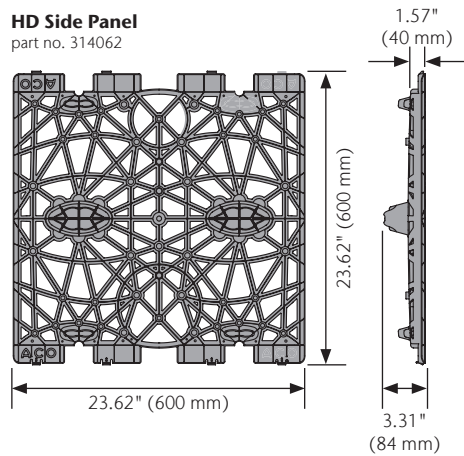
2) You should have received an email with your output results from: [no-reply@acosbconfigurator.com](mailto:no-reply@acosbconfigurator.com) If you do not receive the confirmation within a few minutes, please check your spam folder.

# Stormwater Detention/Infiltration/Retention System

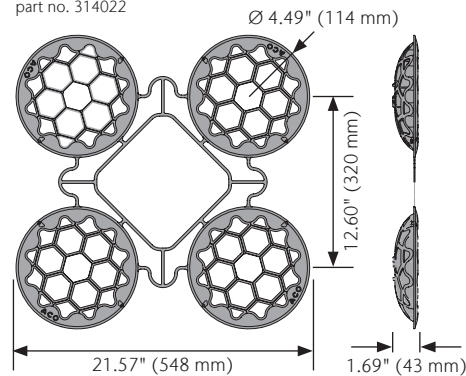
**HD Half-Module**  
part no. 314061



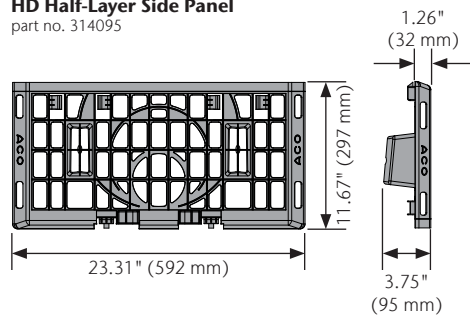
**HD Side Panel**  
part no. 314062



**HD Top Cover**  
part no. 314022

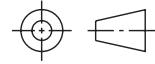


**HD Half-Layer Side Panel**  
part no. 314095



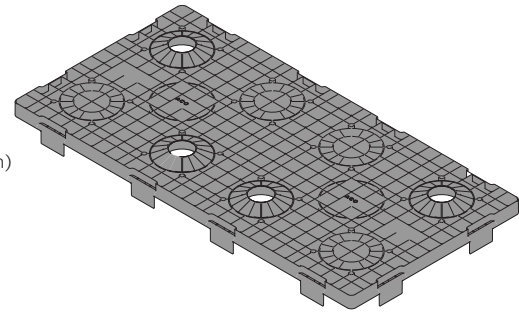
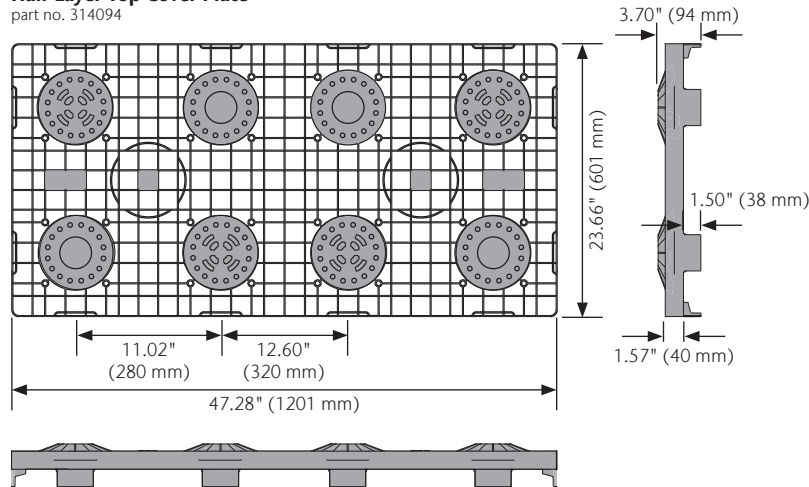
ACO Specification Information

# Stormwater Detention/Infiltration/Retention System



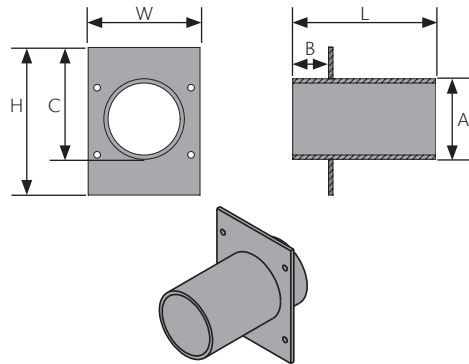
## Half-Layer Top Cover Plate

part no. 314094



## Horizontal Pipe Connector

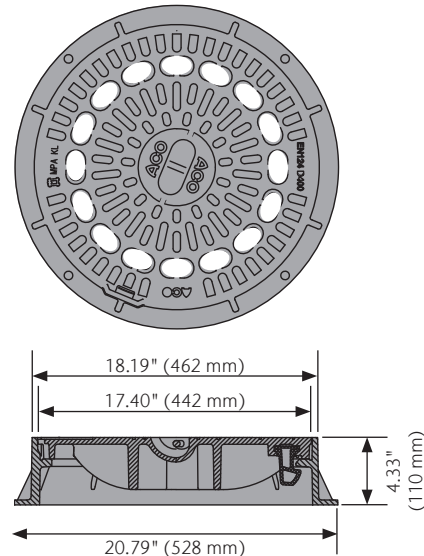
part no. see chart



Part No.	A in (mm)	B in (mm)	C in (mm)	H in (mm)	W in (mm)	L in (mm)
93139	SDR 35 - 4"	2.00 (51)	6.25 (158)	8.25 (209)	6.70 (170)	8.00 (203)
93145	SCH 40 - 4"	2.00 (51)	7.47 (189)	8.29 (210)	6.70 (170)	8.00 (203)
93140	SDR 35 - 6"	2.00 (51)	8.95 (227)	9.93 (252)	10.22 (259)	8.00 (203)
93146	SCH 40 - 6"	2.00 (51)	9.11 (231)	9.93 (252)	10.22 (259)	8.00 (203)
93141	SDR 35 - 8"	2.00 (51)	10.46 (265)	11.39 (289)	11.64 (295)	8.00 (203)
93147	SCH 40 - 8"	2.00 (51)	10.57 (268)	11.39 (289)	11.64 (295)	8.00 (203)
93142	SDR 35 - 12"	2.00 (51)	13.48 (342)	14.30 (363)	16.66 (423)	8.00 (203)
93144	SCH 35 - 15"	2.00 (51)	18.61 (471)	19.25 (489)	19.25 (489)	8.00 (203)

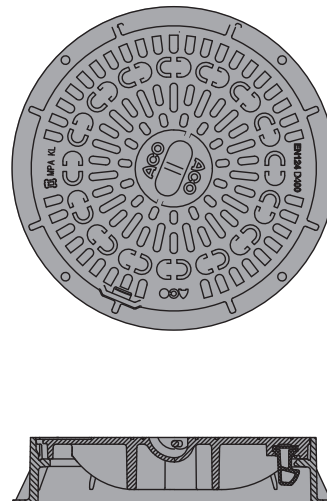
## Remote Access Cover (Vented)

part no. 314053



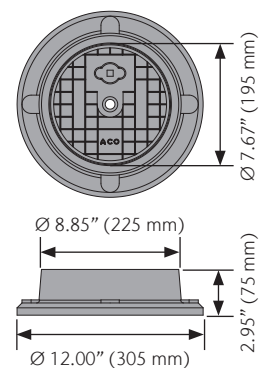
## Remote Access Cover (Non-Vented)

part no. 314043



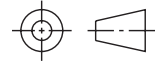
## Inspection Point Cover

part no. 314044

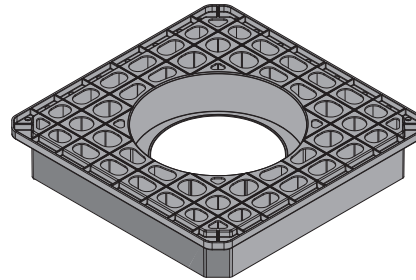
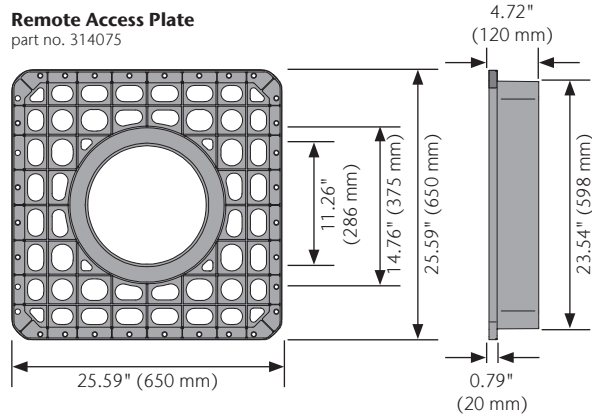




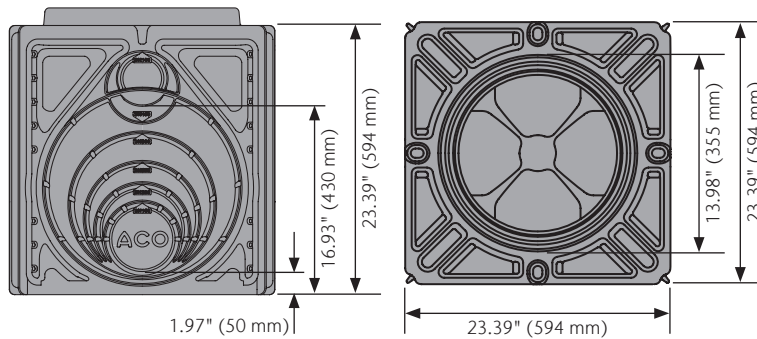
# Stormwater Detention/Infiltration/Retention System



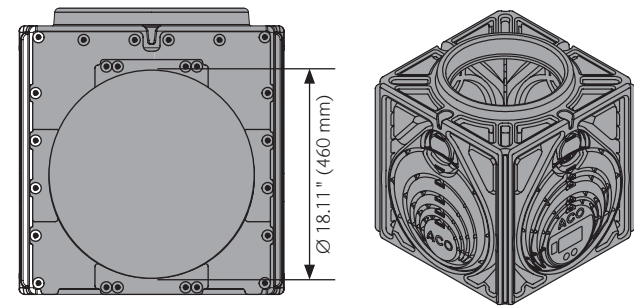
**Remote Access Plate**  
part no. 314075



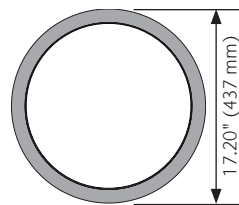
**HD Remote Access Unit**  
part no. 27034



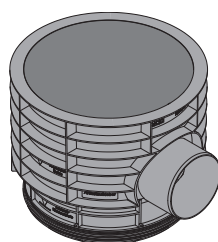
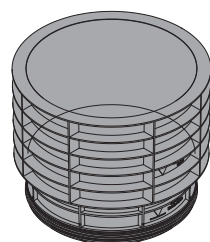
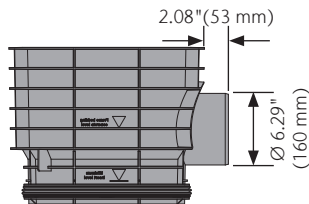
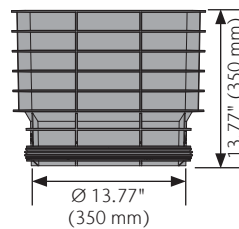
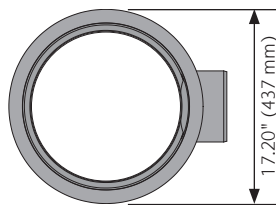
**HD Remote Access Unit with Adapter Plate**  
part no. 138140



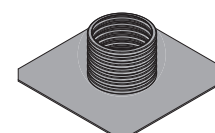
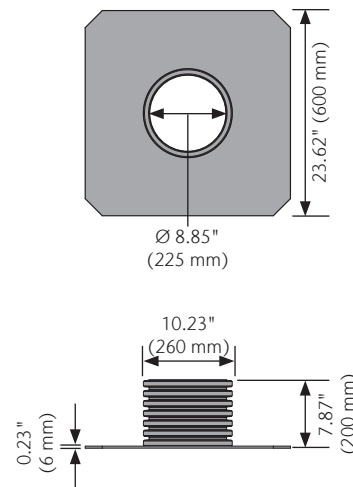
**Extension Shaft**  
part no. 314038



**Extension Shaft with Pipe Socket**  
part no. 314039

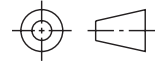


**Vertical Inspection Point Connector**  
part no. 27018



ACO Specification Information

## Stormwater Detention/Infiltration/Retention System



ACO StormBrixx HD Parts Table	Part No.	Length in (mm)	Width in (mm)	Depth in (mm)	Weight lbs (kg)
HD Half-Module	314061	47.44 (1205)	23.70 (602)	13.50 (343)	22.40 (10.20)
HD Side Panel	314062	23.62 (600)	23.62 (600)	2.17 (55)	3.79 (1.72)
HD Top Cover	314022	21.57 (548)	21.57 (548)	1.70 (43)	1.79 (0.81)
HD Half-Layer Side Panel	314095	23.31 (592)	11.67 (297)	1.26 (32)	1.98 (0.90)
Half-Layer Top Cover Plate	314094	47.25 (1200)	23.63 (600)	3.70 (94)	7.70 (3.50)
HD Layer Connector	314023	3.94 (100)	1.58 (40)	1.82 (46)	0.03 (0.02)
Remote Access Plate	314075	25.59 (650)	25.59 (650)	4.72 (120)	10.78 (4.90)
HD Remote Access Unit	27034	23.39 (594)	23.39 (594)	24.02 (610)	70.50 (31.98)
HD Remote Access Unit with Adapter Plate	138140	24.41 (620)	23.39 (594)	24.02 (610)	71.00 (32.21)
Remote Access Cover- Ductile Iron (Load Class D400)	314043	-	Ø 20.79 (528)	4.34 (110)	86.46 (39.30)
Remote Access Vented Cover Ductile Iron (Load Class D400)	314053	-	Ø 20.79 (528)	4.34 (110)	83.60 (38.00)
Inspection Point Cover - Ductile Iron (Load Class D400)	314044	-	Ø 8.85 (225)	2.95 (75)	34.54 (15.70)
Extension Shaft	314038	-	Ø 17.21 (437)	13.78 (350)	4.84 (2.60)
Extension Shaft with Pipe Socket	314039	-	Ø 17.21(437)	13.78 (350)	6.16 (2.80)
Vertical Inspection Point Connector	27018	-	Ø 8.85* (225)	7.87 (200)	5.52 (2.50)
Horizontal Pipe Connectors					
SDR 35 - 4"	93139		4.00* (102)		1.9 (0.87)
SCH 40 - 4"	93145		4.00* (102)		1.9 (0.87)
SDR 35 - 6"	93140		6.00* (152)		3.2 (1.49)
SCH 40 - 6"	93146	8.00 (203)	6.00* (152)	-	3.20 (1.49)
SDR 35 - 8"	93141		8.00* (203)		5.52 (2.50)
SCH 40 - 8"	93147		8.00* (203)		5.52 (2.50)
SDR 35 - 12"	93142		12.00* (305)		5.52 (2.50)
SDR 35 - 15"	93144		15.00* (381)		5.52 (2.50)

\*Internal width

## Specifications

## General

The StormBrixx stormwater Detention\*/Infiltration\*/Retention\* system shall be ACO Stormbrixx HD as supplied by ACO, Inc.

ACO StormBrixx HD meets AASHTO H-25 and HS-25 loading conditions.

## Materials

The half-module shall be manufactured from polypropylene and have minimum properties as follows:

Tensile impact strength:

152 ft-lb/in<sup>2</sup> (319 kJ/m<sup>2</sup>)

Tensile strength, ultimate:

3,480 psi (23,994 kpa)

Water absorption: 0.01%

Frost proof, salt proof and fuels and oils resistant

The stormwater tank shall provide an average 95% open area<sup>1</sup>, holding up to 14.73<sup>1</sup> ft<sup>3</sup> (0.42 m<sup>3</sup>) per module (2 half-modules assembled) and offer full access to all areas and levels for maintenance.

## Geomembranes/Geotextiles

The StormBrixx stormwater system shall be wrapped in appropriate permeable geotextile or impermeable geomembrane\* (supplied by others) as indicated by project design engineer.

## Accessories

The StormBrixx stormwater system shall be used in conjunction with remote access unit or plate\*\*/extension shaft\*\*/inspection point connector\*\*.

## Installation

The StormBrixx stormwater system shall be installed in strict accordance with the manufacturer's installation instructions and recommendations.

\*Choose one

\*\*Choose none, one or more

<sup>1</sup>Configuration and use of side/top panels will marginally impact these figures

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