

LRL Associates Ltd.  
Storm Watershed Summary



**LRL File No.** 210216-04  
**Project:** Stacked Townhouses  
**Location:** 6001/6005 RENAUD  
**Date:** April 23rd, 2024  
**Designed:** K. Herold  
**Drawing Reference:** C701/C702

**Pre-Development Catchments**

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (m <sup>2</sup> )	Total Area (ha)	Combined C
EWS-01	1096.3	0.0	240.6	1336.9	0.134	0.33
EWS-02	1176.7	0.0	400.8	1577.5	0.158	0.38
<b>TOTAL</b>	<b>2273.0</b>	<b>0.0</b>	<b>641.4</b>	<b>2914.4</b>	<b>0.291</b>	<b>0.35</b>

**Post-Development Catchments**

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (m <sup>2</sup> )	Total Area (ha)	Combined C
WS-01 (UNCONTROLLED)	275.6	0.0	154.8	430.4	0.043	0.45
WS-02 (UNCONTROLLED)	54.5	0.0	96.9	151.4	0.015	0.65
WS-03 (CONTROLLED)	549.0	0.0	1783.6	2332.6	0.233	0.74
<b>TOTAL</b>	<b>879.1</b>	<b>0.0</b>	<b>2035.3</b>	<b>2914.4</b>	<b>0.291</b>	<b>0.66</b>



LRJ File No. 210216-04  
 Project: Stated Township  
 Location: 60016005 REV/LD  
 Date: April 23rd, 2024  
 Designer: K. Herold  
 Drawn By: CA01, CG01

Stormwater Management  
 100-Year Design Storm

Runoff Equation

$Q = 2.76C(A/L)^{0.6}$   
 $C =$  Runoff coefficient  
 $L =$  Rational runoff length (m)  $= A / (T_t + C)$   
 $A =$  Area (ha)  
 $T_t =$  Time of concentration (min)

Pre-development Stormwater Management

EWS-01 Total Area = 0.134 ha  
 EWS-02 Total Area = 0.198 ha  
 Total Area = 0.291 ha

EWS-01 Allowable Release Rate = 11.39 L/s  
 EWS-02 Allowable Release Rate = 13.43 L/s  
 Total Allowable Release Rate = 24.77 L/s

\*Per pre-allocated release rate of 6SL/ha as per EJC Master Servicing Study (Stantec 2005)

Post-development Stormwater Management

	Total Site Area =	0.291	ha	10%	19%	11%	19%
<b>Controlled</b>	TOTAL CONTROLLED =	0.233	ha	78%	0.74	0.89	0.92
	WS-01-02	0.233	ha				
<b>Un-controlled</b>	WS-01-02	0.058	ha	19%	0.50	0.63	0.63
	TOTAL UN-CONTROLLED =	0.058	ha				

Post-development Stormwater Management (Uncontrolled Catchment WS-01)

100 Year Storm Event:

$I_{100} = 1735.688 / (T_d + 6.014)^{0.6}$       $a = 1735.688$       $b = 0.820$       $C = 6.014$

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
0	0	0.00	0.00	0.00
5	13.15	13.15	0.00	13.15

Post-development Stormwater Management (WS-02)

100 Year Storm Event:

$I_{100} = 1735.688 / (T_d + 6.014)^{0.6}$       $a = 1735.688$       $b = 0.820$       $C = 6.014$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m³)	Release Rate Constant (L/s)		
5	78.8	104.42	0.82	0.00	0.00	0.82
15	142.9	56.16	70.69	6.62	0.00	6.62
20	120.0	31.25	77.84	6.62	0.00	6.62
25	103.6	18.93	80.01	6.62	0.00	6.62
30	91.9	14.75	81.64	6.62	0.00	6.62
35	81.9	11.60	82.93	6.62	0.00	6.62
40	74.0	8.82	84.09	6.62	0.00	6.62
45	67.9	6.33	85.09	6.62	0.00	6.62
50	63.2	4.58	85.94	6.62	0.00	6.62
55	59.1	3.30	86.58	6.62	0.00	6.62
60	55.6	2.39	87.05	6.62	0.00	6.62
75	43.1	1.00	90.00	6.62	0.00	6.62
100	29.5	0.17	95.33	6.62	0.00	6.62
120	22.9	0.00	97.49	6.62	0.00	6.62
140	18.2	0.00	99.33	6.62	0.00	6.62
160	14.6	0.00	100.87	6.62	0.00	6.62
180	11.9	0.00	102.16	6.62	0.00	6.62
200	9.6	0.00	103.25	6.62	0.00	6.62

Post-development Stormwater Management (WS-02)

Stormwater Storage Calculations (1/2 release rate for u/g storage & variable design head)

100 Year Storm Event:

$I_{100} = 1735.688 / (T_d + 6.014)^{0.6}$       $a = 1735.688$       $b = 0.820$       $C = 6.014$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m³)	Release Rate Constant (L/s)		
5	78.8	104.42	0.82	0.00	0.00	0.82
10	114.3	127.75	74.63	3.31	0.00	3.31
15	142.9	56.16	74.07	3.31	0.00	3.31
20	120.0	31.49	81.81	3.31	0.00	3.31
25	103.6	18.93	87.87	3.31	0.00	3.31
30	91.9	14.75	89.59	3.31	0.00	3.31
40	74.0	8.78	93.54	3.31	0.00	3.31
50	63.2	5.50	95.82	3.31	0.00	3.31
60	55.6	3.31	96.91	3.31	0.00	3.31
75	43.1	1.00	101.04	3.31	0.00	3.31
90	34.0	0.17	104.43	3.31	0.00	3.31
105	28.2	0.00	106.19	3.31	0.00	3.31
120	22.9	0.00	107.42	3.31	0.00	3.31
140	18.2	0.00	108.16	3.31	0.00	3.31
160	14.6	0.00	108.55	3.31	0.00	3.31
180	11.9	0.00	108.70	3.31	0.00	3.31
200	9.6	0.00	108.79	3.31	0.00	3.31

Total Storage Required = 118.35 m³  
 Available Storage = 129.51 m³     refer to LRF Plan C601

Summary of release Rates and Storage Volumes

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m³)	Total Available Storage (m³)
WS-01	0.058	13.15	0	0
WS-02	0.233	14.63	118.35	129.51
TOTAL	0.291	14.77	118.35	129.51

Post-development Stormwater Management (WS-02)

Stormwater Storage Calculations (1/2 release rate for u/g storage & variable design head)

2 Year Storm Event:

$I_{100} = 732.851 / (T_d + 6.199)^{0.6}$       $a = 732.851$       $b = 0.81$       $C = 6.199$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m³)	Release Rate Constant (L/s)		
5	78.8	45.77	25.48	3.31	0.00	3.31
10	114.3	29.24	25.48	3.31	0.00	3.31
20	120.0	31.01	33.24	3.31	0.00	3.31
30	103.6	26.32	35.41	3.31	0.00	3.31
40	91.9	21.95	37.06	3.31	0.00	3.31
50	81.9	19.59	38.06	3.31	0.00	3.31
60	74.0	17.71	40.21	3.31	0.00	3.31
75	63.2	14.54	42.27	3.31	0.00	3.31
90	55.6	11.45	44.28	3.31	0.00	3.31
105	48.1	8.81	45.51	3.31	0.00	3.31
120	41.9	6.62	46.72	3.31	0.00	3.31
140	34.0	4.50	48.05	3.31	0.00	3.31
160	27.9	2.70	48.91	3.31	0.00	3.31
180	22.9	1.42	49.89	3.31	0.00	3.31
200	18.2	0.33	50.65	3.31	0.00	3.31

Total Storage Required = 48.92 m³  
 Underground Available Storage = 112.53 m³     refer to LRF Plan C601  
 \*Underground chambers have more than sufficient volume to accommodate all storage requirements for the 2-year storm event, no overland ponding is occur in the 2-year storm event.

LRL Associates Ltd.  
Storm Design Sheet



**LRL File No.** 210216-04  
**Project:** 36 Stacked Towns  
**Location:** 6001/6005 RENAUD  
**Date:** April 23rd, 2024  
**Designed:** K. Herold  
**Drawing Reference:** C401

**Storm Design Parameters**

Rational Method  $Q = 2.78CIA$

Q = Peak flow in litres per second (L/s)  
A = Drainage area in hectares (ha)  
C = Runoff coefficient  
I = Rainfall intensity (mm/hr)

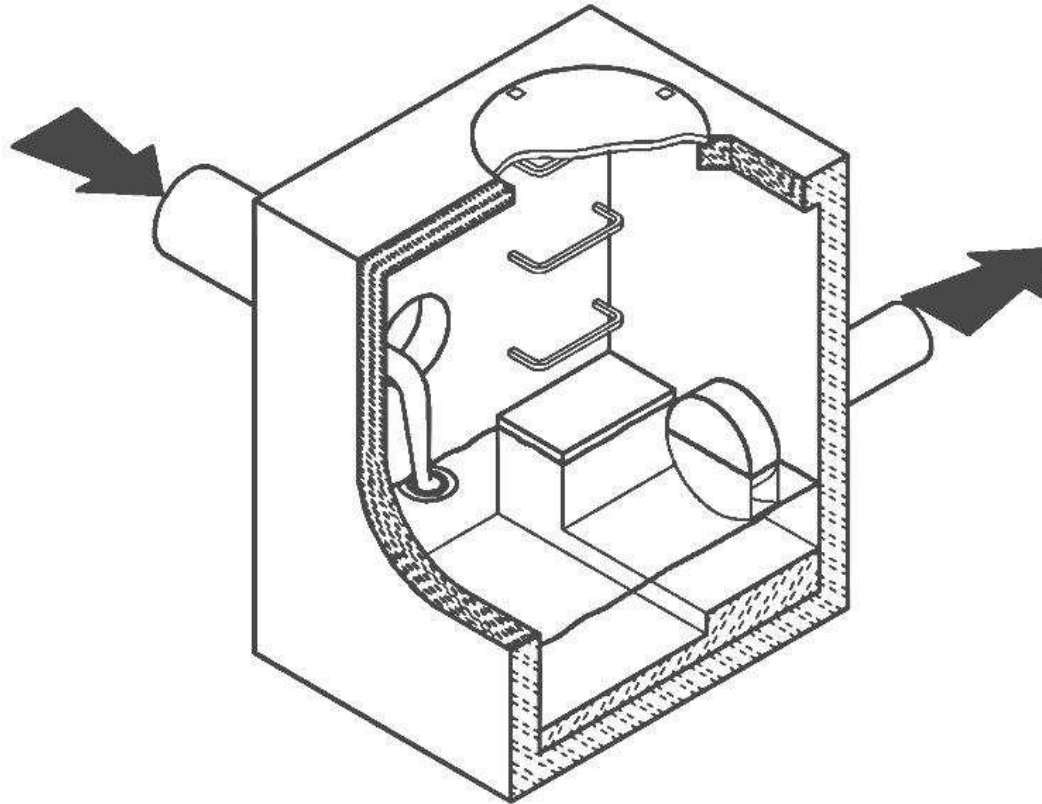
Runoff Coefficient (C)  
Grass 0.20  
Gravel 0.80  
Asphalt / rooftop 0.90

Ottawa Macdonald-Cartier International Airport IDF curve  
equation (5 year event, intensity in mm/hr)  
 $I = 998.071 / (T_c + 6.053)^{0.814}$   
Min. velocity = 0.80 m/s  
Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW						STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled 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 <sub>FULL</sub> )
WS-02	CB06	CBMH05	0.011	0.000	0.003	0.014	0.01	10.00	104.2	1.42		300	PVC	0.50%	16.5	68.4	0.97	0.28	0.02
	CBMH05	CBMH04	0.017	0.000	0.081	0.212	0.23	10.28	102.7	23.19		300	PVC	0.50%	35.5	68.4	0.97	0.61	0.34
	CBMH04	MH03	0.015	0.000	0.079	0.206	0.43	10.90	99.7	43.04		300	PVC	0.50%	17.8	68.4	0.97	0.31	0.63
	MH03	CBMH02	0.012	0.000	0.016	0.047	0.48	11.20	98.2	47.00		300	PVC	0.50%	9.2	68.4	0.97	0.16	0.69
	CBMH02	MH01	0.000	0.000	0.000	0.000	0.48	11.36	97.5	46.65		300	PVC	0.50%	13.3	68.4	0.97	0.23	0.68
	MH01	SEWER	0.000	0.000	0.000	0.000	0.48	11.59	96.5	46.16	6.62	300	PVC	5.50%	21.5	226.8	3.21	0.11	0.20



**HYDROVEX® VHV / SVHV**  
**Vertical Vortex Flow Regulator**



**JOHN MEUNIER**

# HYDROVEX® VHV / SVHV VERTICAL VORTEX FLOW REGULATOR

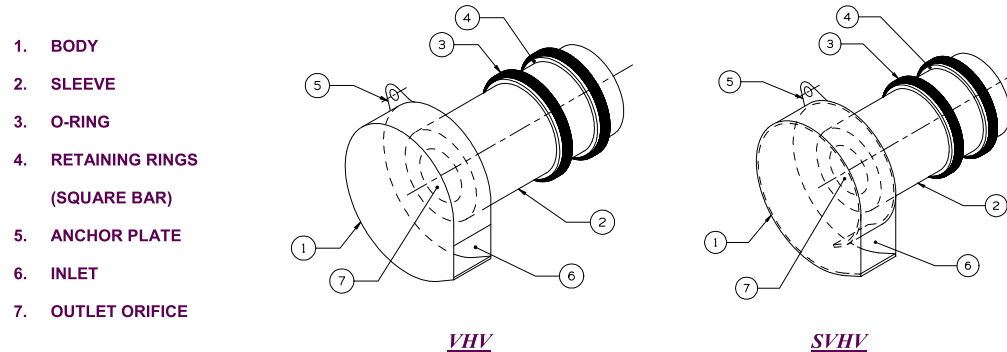
## APPLICATIONS

One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators (**refer to Figure 1**) are manufactured entirely of stainless steel, and consist of a hollow body (1) (in which flow control takes place) and an outlet orifice (7). Two rubber "O" rings (3) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (4) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.



**FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTEX FLOW REGULATORS**

## ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.

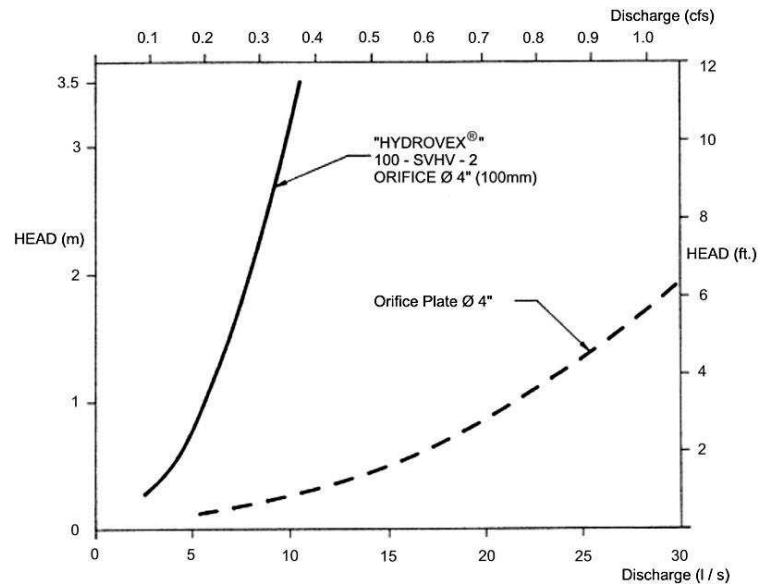


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

## SELECTION

Selection of a VHV or SVHV regulator can be easily made using the selection charts found at the back of this brochure (see Figure 3). These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

### Example:

- ✓ Maximum design head      2m (6,56 ft.)
- ✓ Maximum discharge        6 L/s (0.2 cfs)
- ✓ Using Figure 3 - VHV      model required is a 75 VHV-1

## INSTALLATION REQUIREMENTS

All HYDROVEX® VHV / SVHV flow regulators can be installed in circular or square manholes. Figure 4 gives the various minimum dimensions required for a given regulator. *It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.*

## SPECIFICATIONS

In order to specify a **HYDROVEX**<sup>®</sup> regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) \*
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

\* *Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the **HYDROVEX**<sup>®</sup> flow regulator is to be installed.*

**PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:**

- *project design flow rate*
- *pressure head*
- *chamber's outlet pipe diameter and type*



*Typical VHV model in factory*

**OPTIONS**



*VHV-1-O (standard model with odour control inlet)*



*FV-SVHV (mounted on sliding plate)*



*FV-VHV-O (mounted on sliding plate with odour control inlet)*



*VHV with Gooseneck assembly in existing chamber without minimum release at the bottom*



*VHV with air vent for minimal slopes*





# VHV Vertical Vortex Flow Regulator

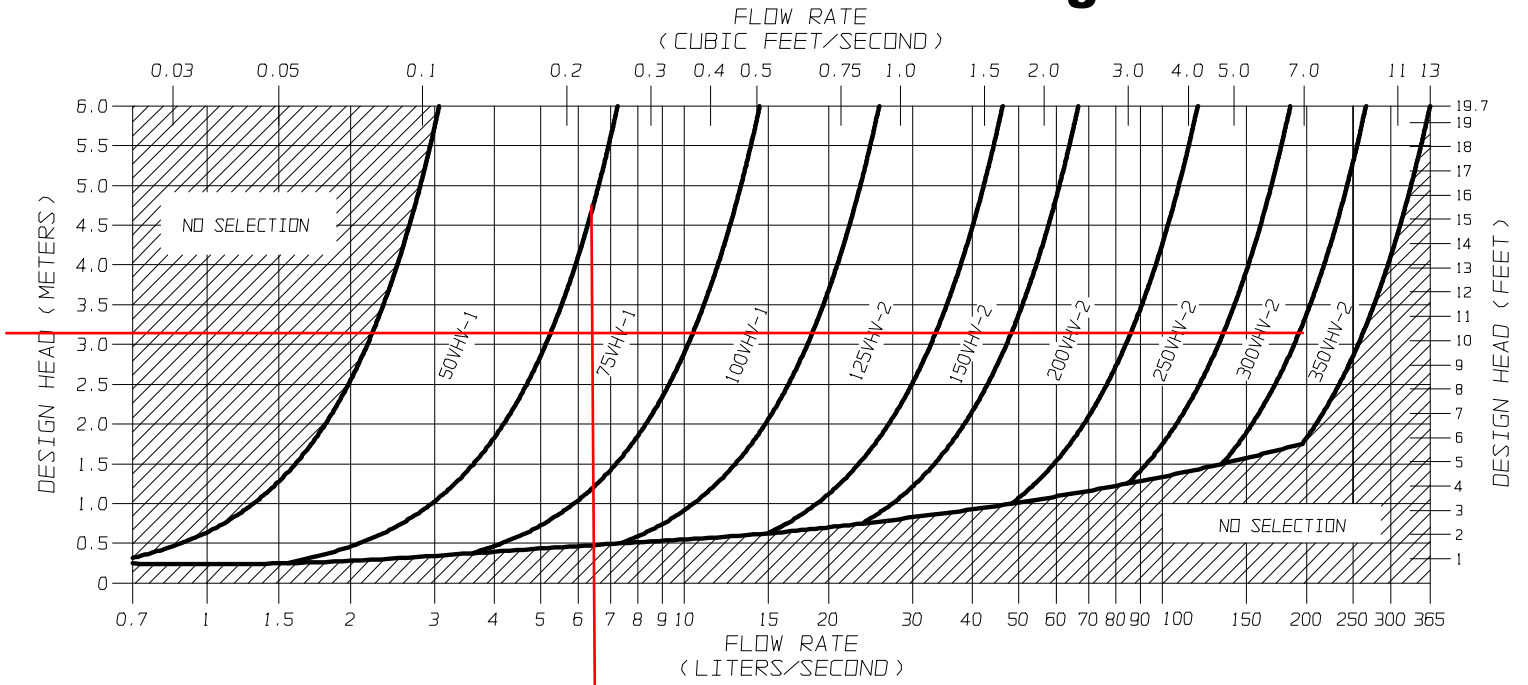


FIGURE 3 - VHV

**JOHN MEUNIER**



# SVHV Vertical Vortex Flow Regulator

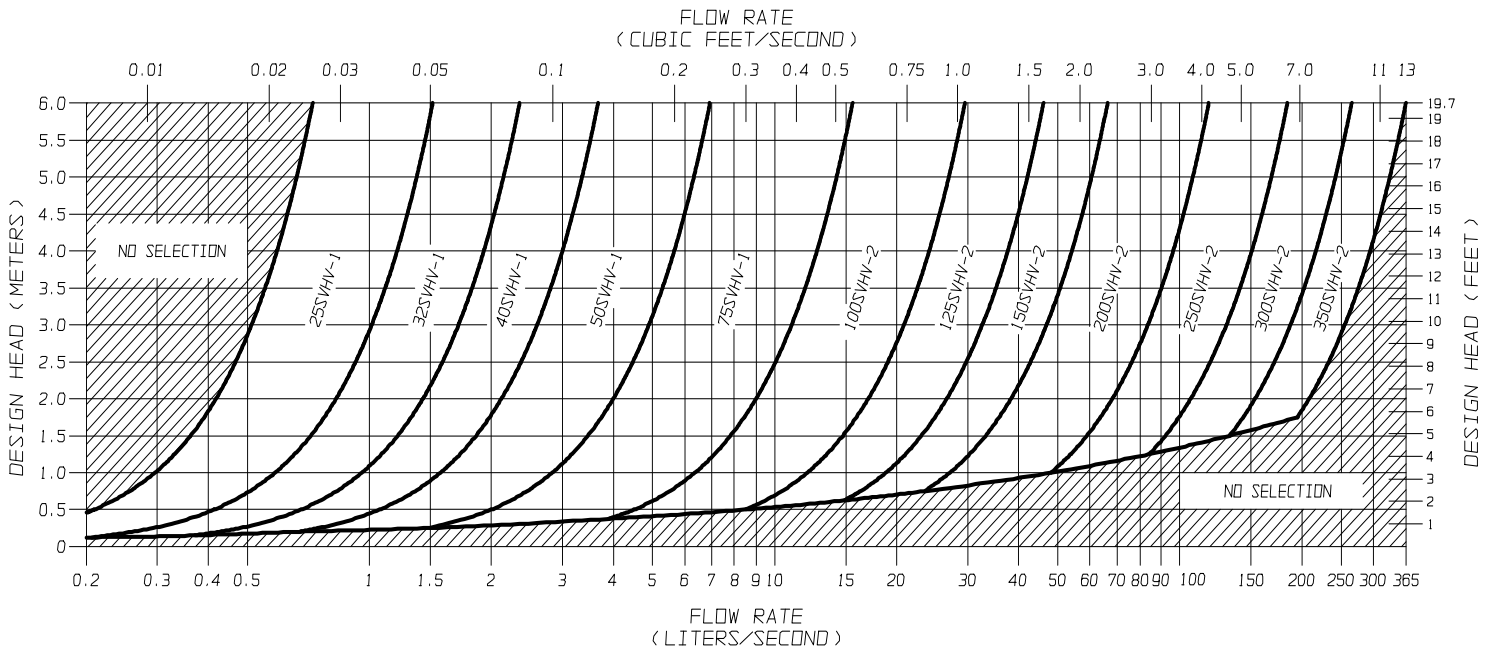
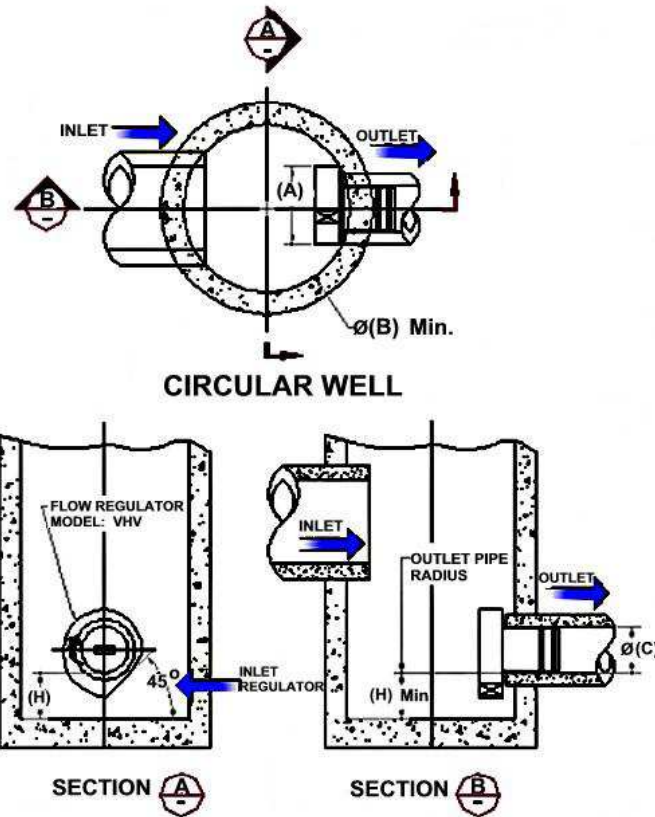


FIGURE 3 - SVHV

**JOHN MEUNIER**

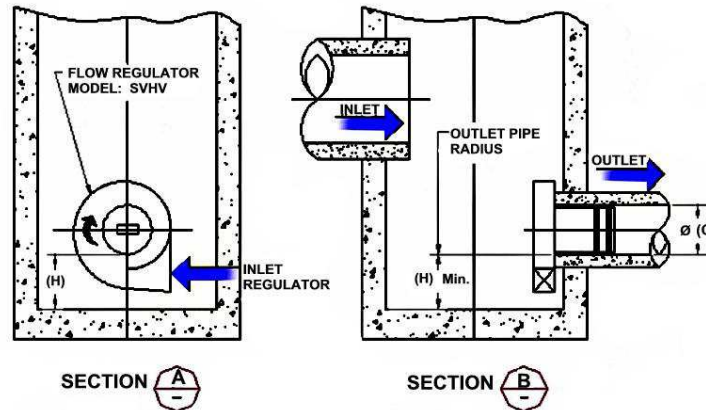
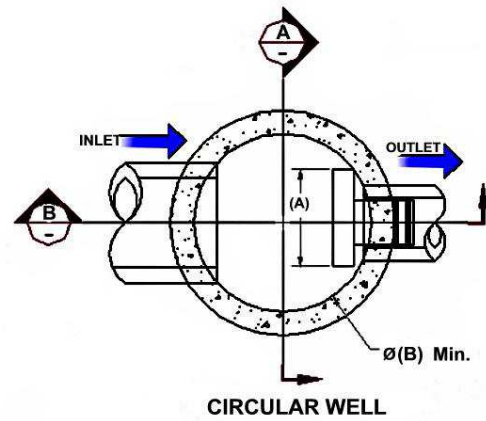
**FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE**  
**FIGURE 4 (MODEL VHV)**

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	A (in.)	B (mm)	B (in.)	C (mm)	C (in.)	H (mm)	H (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



**FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE  
FIGURE 4 (MODEL SVHV)**

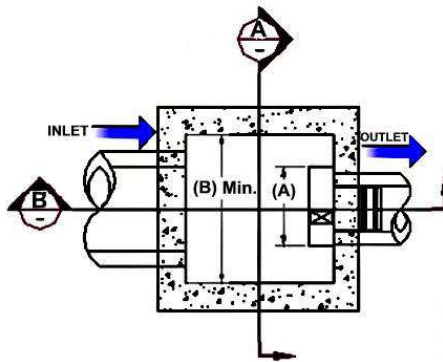
Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	A (in.)	B (mm)	B (in.)	C (mm)	C (in.)	H (mm)	H (in.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	900	36	150	6	275	11
100 SVHV-2	275	11	900	36	150	6	250	10
125 SVHV-2	350	14	900	36	150	6	300	12
150 SVHV-2	425	17	1200	48	150	6	350	14
200 SVHV-2	575	23	1600	64	200	8	450	18
250 SVHV-2	700	28	1800	72	250	10	550	22
300 SVHV-2	850	34	2400	96	250	10	650	26
350 SVHV-2	1000	40	2400	96	250	10	700	28



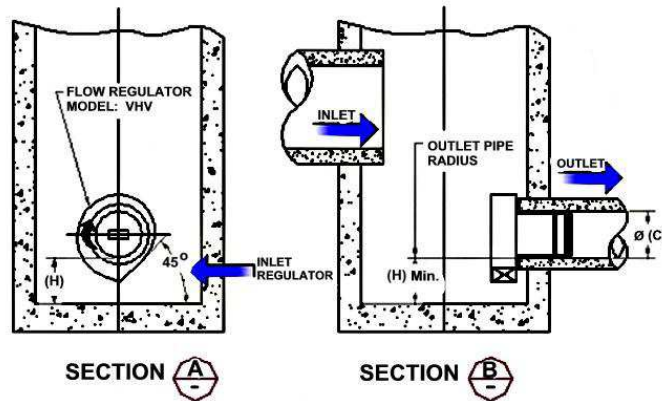
**FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE**  
**FIGURE 4 (MODEL VHV)**

Model Number	Regulator Diameter		Minimum Chamber Width		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	A (in.)	B (mm)	B (in.)	C (mm)	C (in.)	H (mm)	H (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	600	24	150	6	200	8
125VHV-2	275	11	600	24	150	6	200	8
150VHV-2	350	14	600	24	150	6	225	9
200VHV-2	450	18	900	36	200	8	300	12
250VHV-2	575	23	900	36	250	10	350	14
300VHV-2	675	27	1200	48	250	10	400	16
350VHV-2	800	32	1200	48	300	12	500	20

**NOTE:** *In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.*



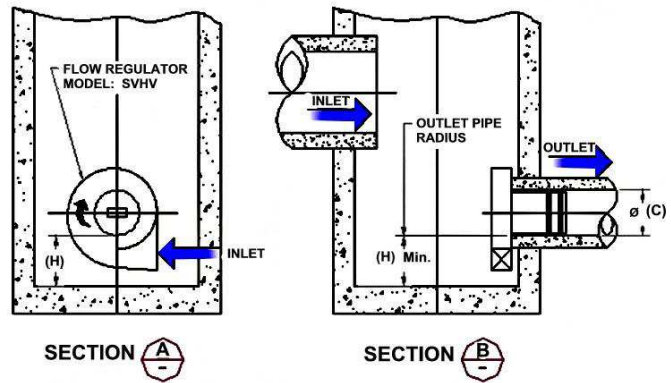
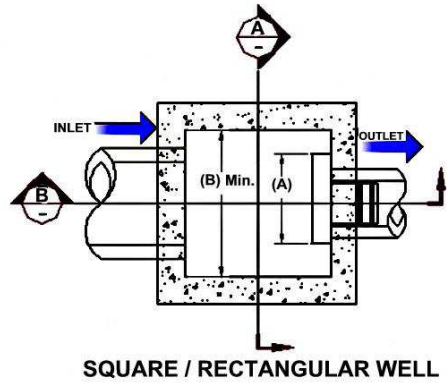
**SQUARE / RECTANGULAR WELL**



**FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE  
FIGURE 4 (MODEL SVHV)**

Model Number	Regulator Diameter		Minimum Chamber Width		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	A (in.)	B (mm)	B (in.)	C (mm)	C (in.)	H (mm)	H (in.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	600	24	150	6	275	11
100 SVHV-2	275	11	600	24	150	6	250	10
125 SVHV-2	350	14	600	24	150	6	300	12
150 SVHV-2	425	17	600	24	150	6	350	14
200 SVHV-2	575	23	900	36	200	8	450	18
250 SVHV-2	700	28	900	36	250	10	550	22
300 SVHV-2	850	34	1200	48	250	10	650	26
350 SVHV-2	1000	40	1200	48	250	10	700	28

**NOTE:** *In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.*



## INSTALLATION

The installation of a **HYDROVEX**<sup>®</sup> regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

## MAINTENANCE

**HYDROVEX**<sup>®</sup> regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

## GUARANTY

The **HYDROVEX**<sup>®</sup> line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

### John Meunier Inc.

ISO 9001 : 2008

#### Head Office

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Revised: 2011-05-03

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



# 210216 - 6001-6005 RENAUD

## OTTAWA, ON, CANADA

### MC-3500 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-3500.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- 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.
- 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.
- 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 450 LBS/FT%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- 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.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

- STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- 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

- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER Tired LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

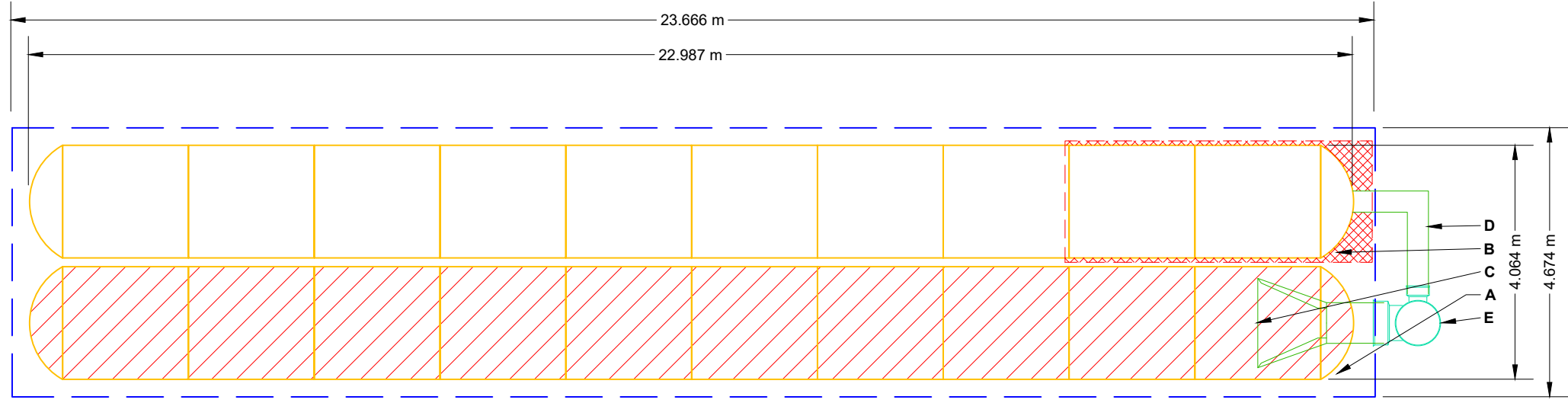
**USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.**

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



PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:	
20	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.810
4	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.981
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.829
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.829
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.829
112.5	INSTALLED SYSTEM VOLUME (m <sup>3</sup> ) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	1.676
		TOP OF MC-3500 CHAMBER:	1.372
		300 mm x 300 mm TOP MANIFOLD INVERT:	0.898
		600 mm ISOLATOR ROW PLUS INVERT:	0.281
110.6	SYSTEM AREA (m <sup>2</sup> )	BOTTOM OF MC-3500 CHAMBER:	0.229
56.7	SYSTEM PERIMETER (m)	BOTTOM OF STONE:	0.000

				*INVERT ABOVE BASE OF CHAMBER	
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW	
PREFABRICATED END CAP	A	600 mm BOTTOM CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm		
PREFABRICATED END CAP	B	300 mm TOP CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	670 mm		
FLAMP	C	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP			
MANIFOLD	D	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm		
NYLOPLAST (INLET W/ ISO PLUS ROW)	E	750 mm DIAMETER (610 mm SUMP MIN)			70 L/s IN



- ISOLATOR ROW PLUS (SEE DETAIL)
- PLACE MINIMUM 5.334 m OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

**NOTES**

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

210216 - 6001-6005 RENAUD

OTTAWA, ON, CANADA

DATE: \_\_\_\_\_

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2 OF 6

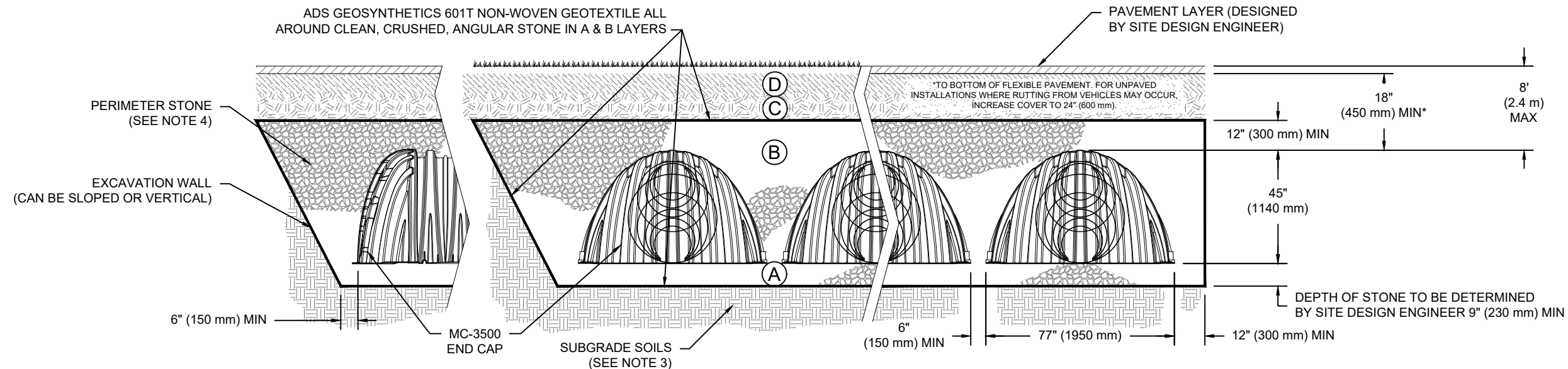
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## ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> 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	<b>INITIAL FILL:</b> 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 <sup>1</sup> A-1, A-2-4, A-3  OR  AASHTO M43 <sup>1</sup> 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	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>1</sup> 3, 4	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>1</sup> 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

**PLEASE NOTE:**

- 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".
- 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.
- 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.
- 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:**

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- 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.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- 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 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT<sup>2</sup>%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

210216 - 6001-6005 RENAUD

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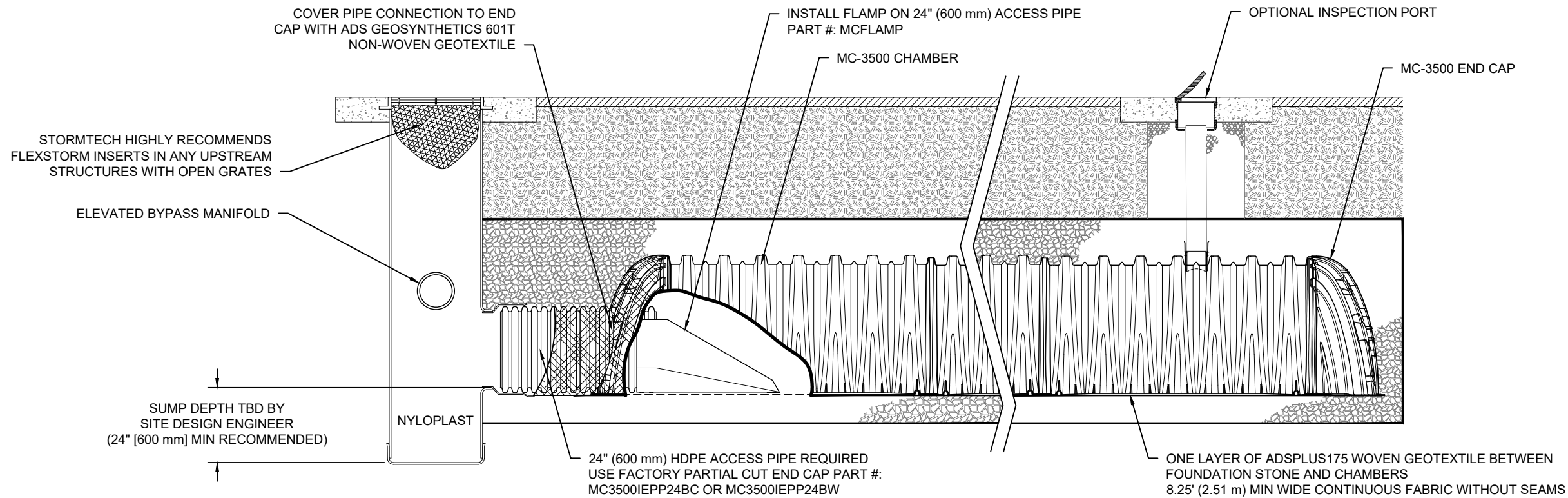
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**MC-3500 ISOLATOR ROW PLUS DETAIL**

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**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.

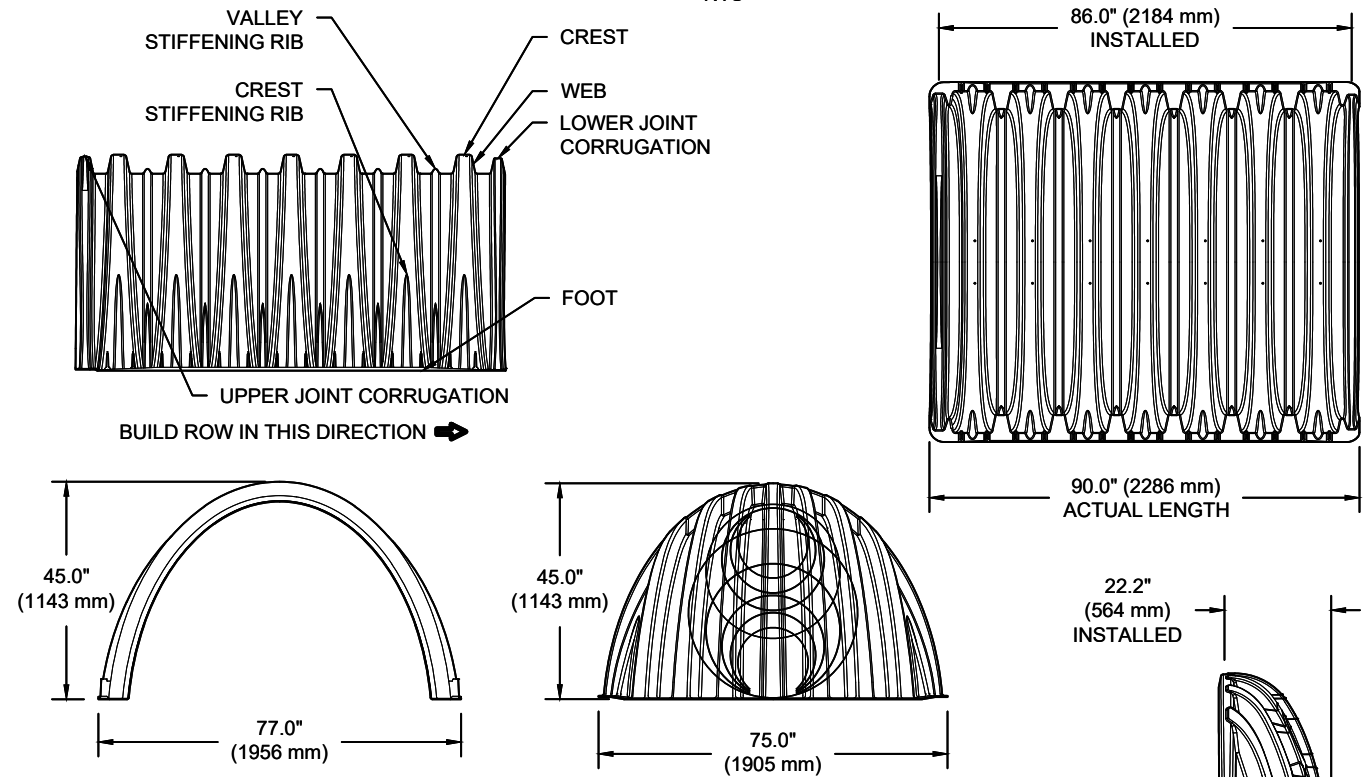
**NOTES**

- 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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SHEET		
4 OF 6		

# MC-3500 TECHNICAL SPECIFICATION

NTS



### NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m <sup>3</sup> )
WEIGHT	134 lbs.	(60.8 kg)

### NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m <sup>3</sup> )
WEIGHT	49 lbs.	(22.2 kg)

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

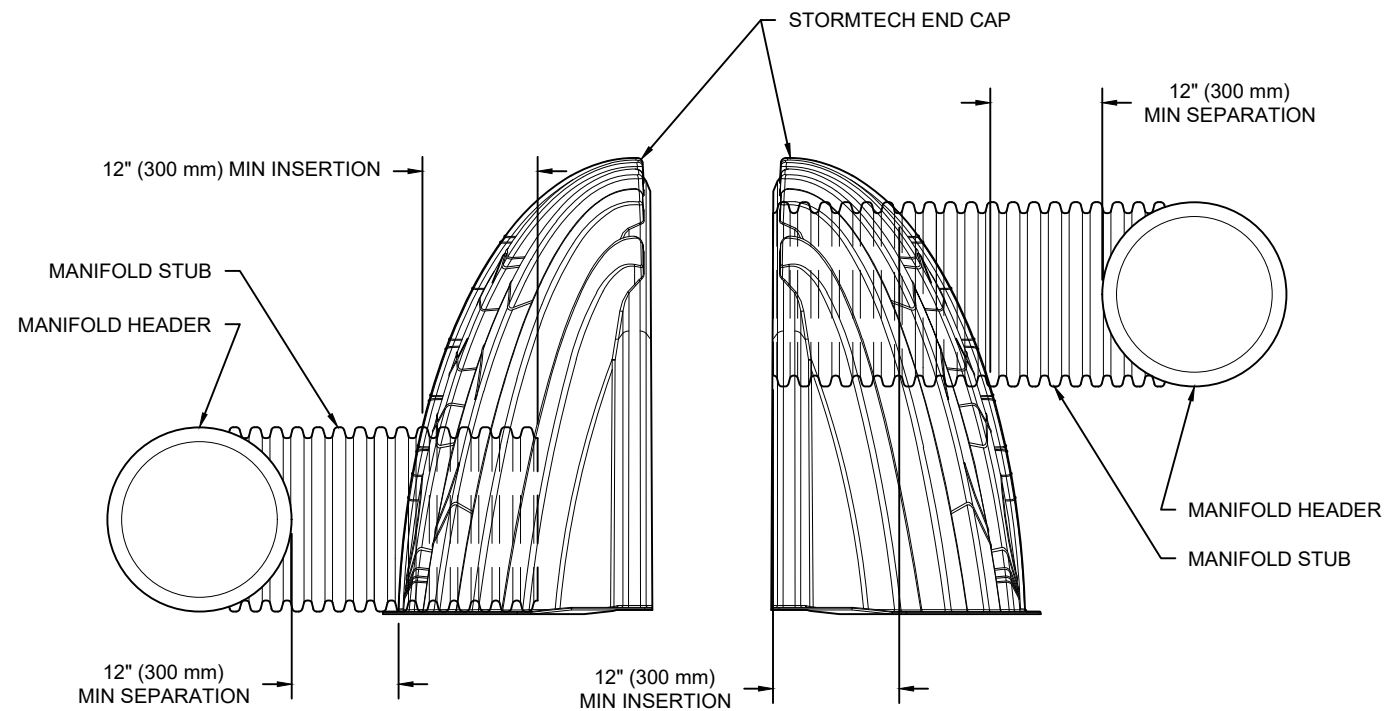
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
 STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
 END CAPS WITH A WELDED CROWN PLATE END WITH "C"  
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

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

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

# MC-SERIES END CAP INSERTION DETAIL

NTS



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

NOTE: ALL DIMENSIONS ARE NOMINAL

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Chamber System

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



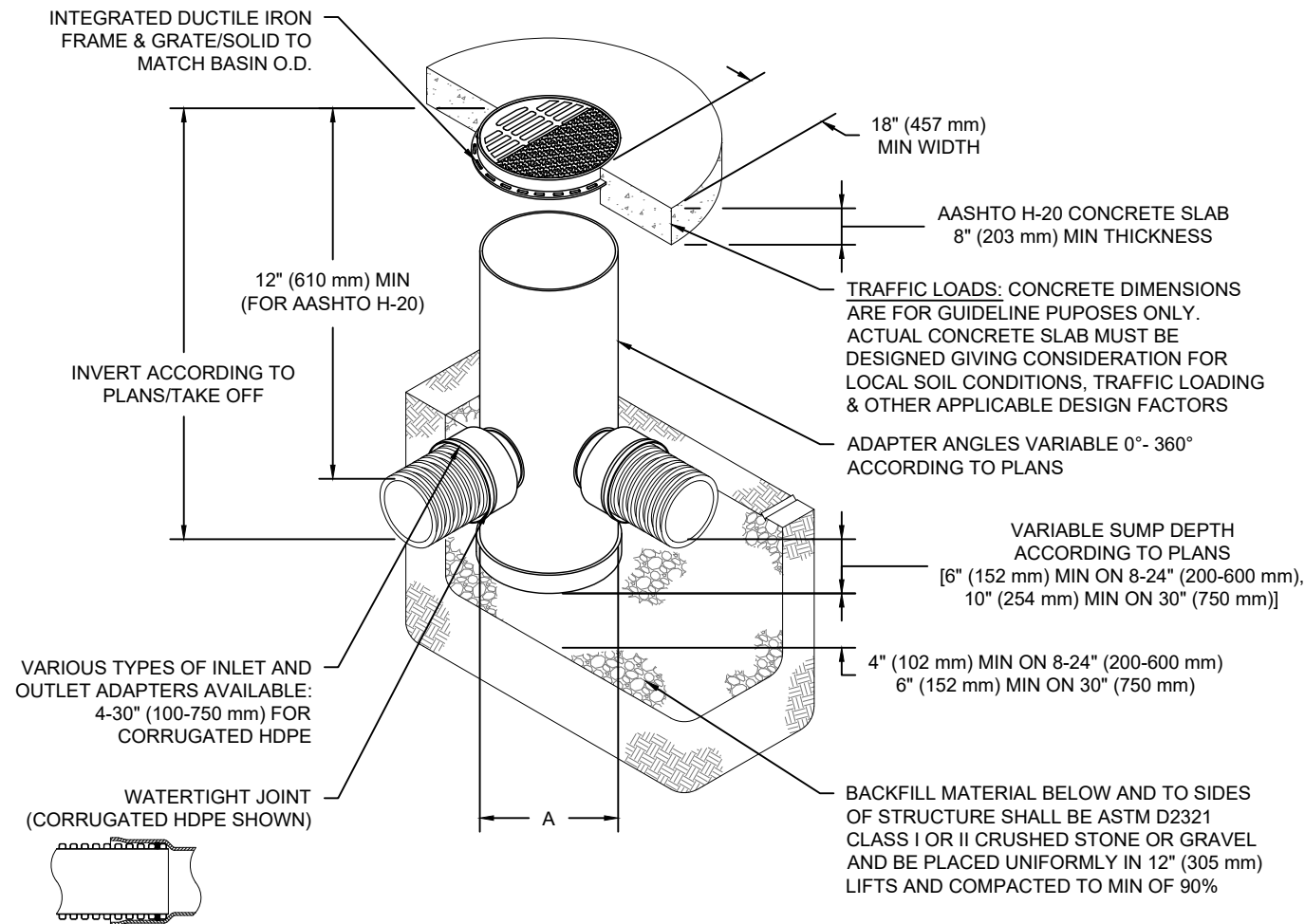
SHEET

5 OF 6

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

# NYLOPLAST DRAIN BASIN

NTS



## NOTES

- 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: [WWW.NYLOPLAST-US.COM](http://WWW.NYLOPLAST-US.COM)
- TO ORDER CALL: 800-821-6710

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

210216 - 6001-6005 RENAUD

OTTAWA, ON, CANADA

DATE:

PROJECT #:

DESCRIPTION

CHK

DRW

DATE

**Nyloplast**<sup>®</sup>

770-932-2443 | [WWW.NYLOPLAST-US.COM](http://WWW.NYLOPLAST-US.COM)

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



SHEET

6 OF 6

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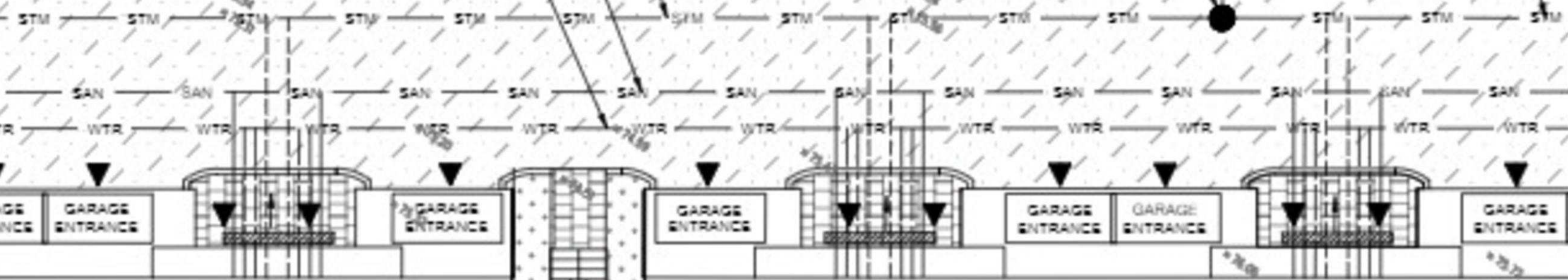
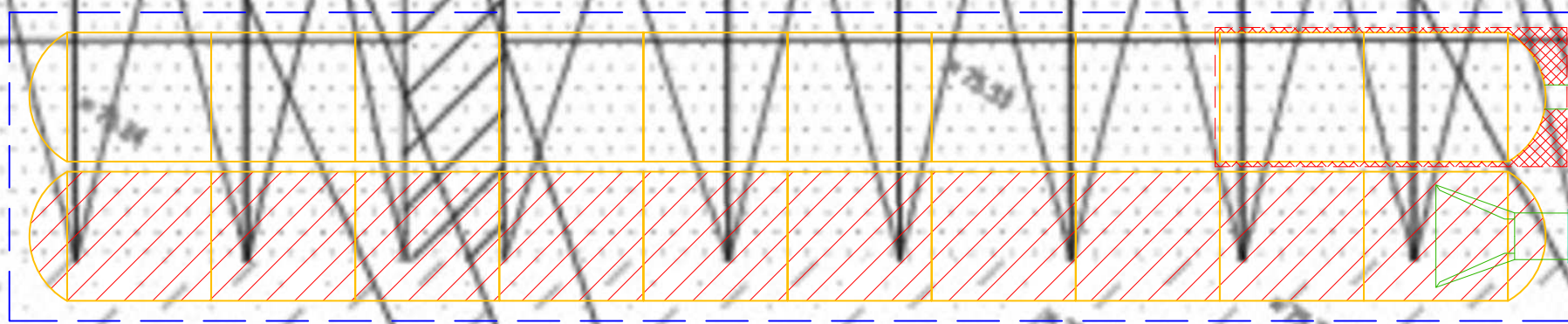
PROP. 69.6m - 150mmØ PVC-DR28 SAN SERVICE @ 1.50% SLOPE

PROP. NYLOPLAST FD-4HC  
T/G = 74.53  
SE INV = 71.84  
(OR APPROVED EQUIVALENT)

PROP. STM CBMH04  
COVER AS PER S28.1  
T/G = 74.45  
NE INV = 71.77  
SW INV = 71.80  
NW INV = 71.77

PROPOSED PROPERTY LINE

PROP. 121.5m - 150mmØ WATERMAIN TO BE BURIED MIN. 2.4m BELOW GRADE



7.75  
74.90  
72.93  
73.13

GROUND F.F.E. = 77.75  
BASEMENT F.F.E. = 74.90  
NORTH U.S.F. = 72.93  
SOUTH U.S.F. = 73.13

# FlexStorm Catch-It™

## Inlet Filters

---

FlexStorm Catch-It inlet filters are the temporary and reusable solution for storm sewer inlet protection. They comply with ASTM D8057 and are the preferred choice for storm water runoff control. FlexStorm Catch-It inlet filters are configured to fit any drainage structure, are equipped with a high-efficiency filter bag and allow builders to keep their job sites SWPPP compliant during construction.

### Applications

- Residential developments
- Commercial developments
- Roadway construction

### Features

- Configured to fit any storm drainage structure
- Geotextile bag is easily replaced
- Bypass feature allows streets to drain if bag is full
- Installs quickly, easy maintenance

### Benefits

- Prevents hazardous road conditions by eliminating ponding at curb inlets
- Prevents pollution of rivers, lakes and ponds
- Reduces job site flooding
- Significantly reduces clean-up costs



# FlexStorm Catch-It Inlet Filters Specification

## Material and Performance

The filter is comprised of a corrosion resistant steel frame and a replaceable geotextile filter bag attached to the frame with a stainless steel locking band. The filter bag hangs suspended below the grate that shall allow full water flow into the drainage structure if the bag is completely filled with sediment. The standard woven "FX" filter bags are rated for 200 gpm/sqft with a removal efficiency of 82% when filtering a USDA Sandy Loam sediment load. The filters are certified to meet ASTM D8057.

## Installation

1. Remove the grate from the inlet.
2. Clean debris from the ledges of the inlet.
3. Place the inlet filter onto the load bearing ledges of the structure.
4. Replace the grate and confirm it is not elevated more than 1/8" (3 mm).

## Frequency of Inspections

Inspection should occur every three months and following rain events greater than 1/2" (13 mm). Sites with greater runoff conditions may need to be inspected more frequently.

## Maintenance Guidelines

1. Empty the filter bag manually or by industrial vacuum taking care not to damage the geotextile bag when more than half filled or during scheduled inspection period.
2. Remove compacted silt from sediment bag and flush with medium spray.
3. Inspect and replace bag if torn or punctured.

## Filter Bag Replacement

1. Remove the bag by loosening or cutting off clamping band.
2. Take the new, correctly sized sediment bag and secure hose clamping band to the frame channel as previously removed.
3. Ensure bag is secure and there is no slack around perimeter.

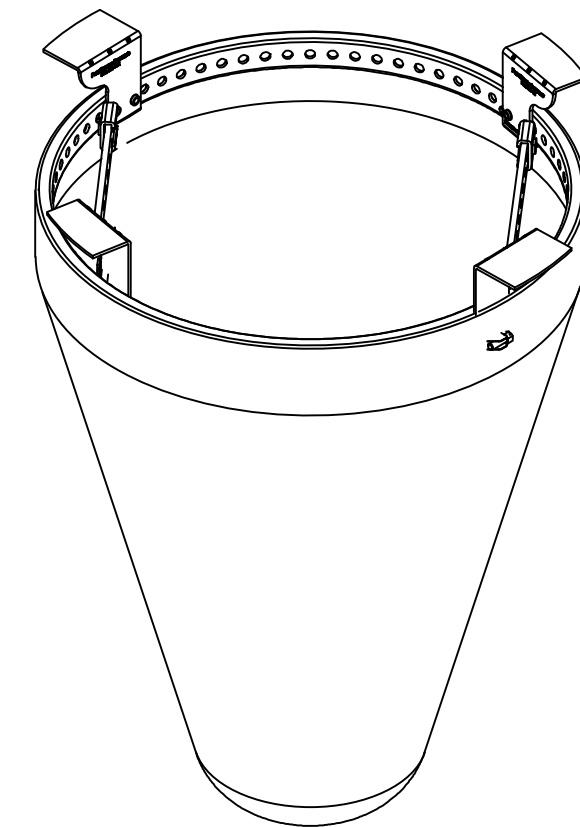
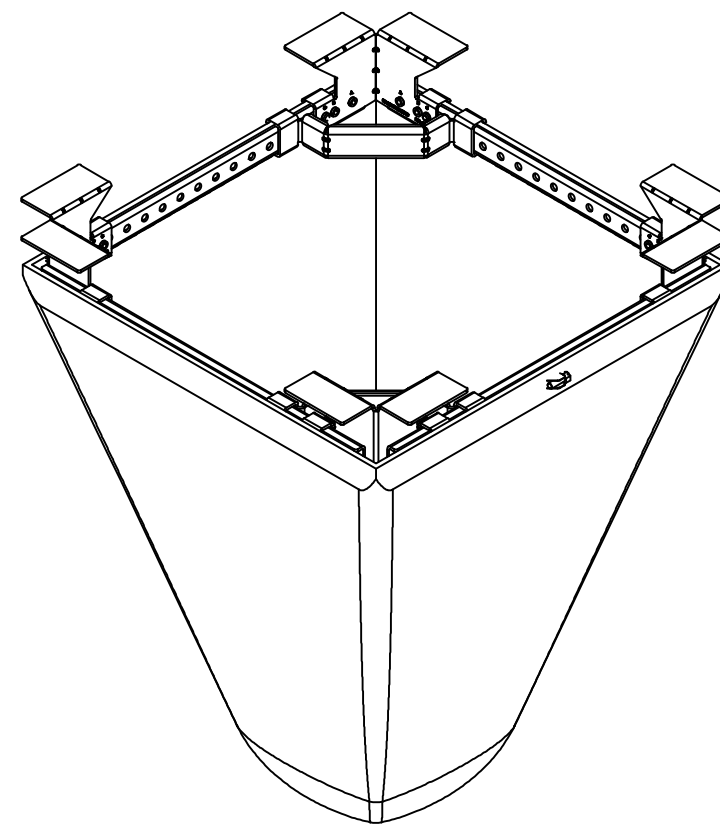
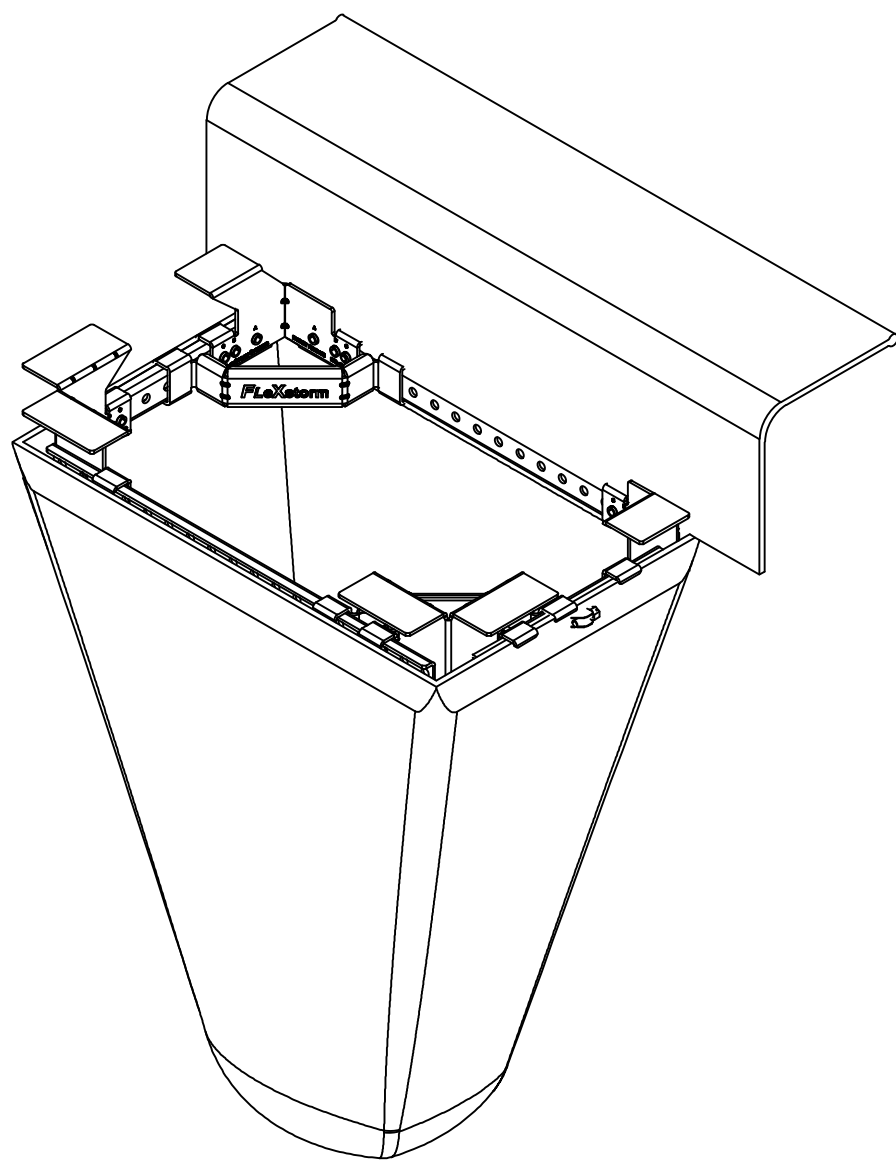
## Build America, Buy America (BABA)

ADS FlexStorm Catch-It Inlet Filter is manufactured for temporary use during construction and therefore is not subject to the requirements of the Build America, Buy America (BABA) Act.





# ADS FLEXSTORM CATCH-IT INLET FILTERS



SQUARE/RECTANGULAR CURB INLET FILTER		
Clear Opening Size	Style P/N	Minimum Bypass Flow Rate (CFS)
Small: Up to 64" Perimeter	62SCBFX	2.4
Medium: 65" - 96" Perimeter	62MCBFX	3.5
Large: 97" - 120" Perimeter	62LCBFX	5.0
Extra-Large: 121" or Greater Perimeter	62XLCBFX	7.2

SQUARE/RECTANGULAR INLET FILTER		
Clear Opening Size	Style P/N	Minimum Bypass Flow Rate (CFS)
Small: Up to 64" Perimeter	62SSQFX	2.4
Medium: 65" - 96" Perimeter	62MSQFX	3.5
Large: 97" - 120" Perimeter	62LSQFX	5.0
Extra-Large: 121" or Greater Perimeter	62XLSQFX	7.2

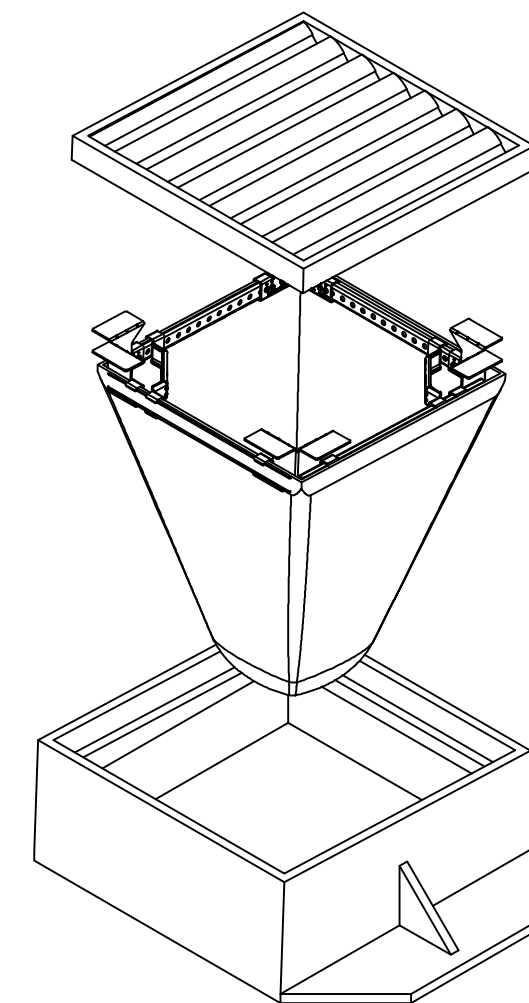
ROUND INLET FILTER		
Clear Opening Size	Style P/N	Minimum Bypass Flow Rate (CFS)
Small: 10" - 16" Dia.	62SRDFX	1.6
Medium: 17" - 24" Dia.	62MRDFX	2.7
Large: 25" - 36" Dia.	62LRDFX	3.8

SPECIFICATIONS BY NOMINAL SIZE RANGE (MIN. VALUES)			
Nominal Bag Size	Solids Storage (CuFt)	Flow Rate (CFS)*	TSS Removal Rate
Small	1.6	1.2	82%; Large scale 3rd party testing per ASTM D 7351
Medium	2.1	1.7	using 7% concentration
Large	3.8	2.7	USDA Sandy Loam
Extra Large	4.2	3.6	

\*Filter bag at 50% max solids storage capacity

## INSTALLATION INSTRUCTIONS:

1. REMOVE GRATE
2. CLEAN GRATE LEDGE
3. SET INLET FILTER ON LOAD BEARING LEDGE OF STRUCTURE
4. REPLACE GRATE



## NOTES:

1. ALL FRAMING IS CONSTRUCTED OF G90 GALVANIZED STEEL.
2. TOTAL BYPASS CAPACITY WILL VARY WITH EACH SIZE DRAINAGE STRUCTURE. ADS DESIGNS FRAMING BYPASS TO MEET OR EXCEED THE DESIGN FLOW OF THE PARTICULAR DRAINAGE STRUCTURE.
3. UPON ORDERING, CONFIRMATION OF THE INLET SPECIFICATION, PRECAST/FOUNDRY CASTING MAKE AND MODEL, OR DETAILED DIMENSIONAL FORMS MUST BE PROVIDED TO CONFIGURE AND ASSEMBLE AN INLET FILTER.
4. ALL FILTERS MEET ASTM D8057 SPECIFICATIONS.
5. FOR WRITTEN SPECIFICATIONS AND MAINTENANCE GUIDELINES VISIT [WWW.ADPIPE.COM](http://WWW.ADPIPE.COM).








ALL PRODUCTS MANUFACTURED  
BY ADVANCED DRAINAGE SYSTEMS  
[WWW.ADPIPE.COM](http://WWW.ADPIPE.COM)  
PH. 1-800-821-6710



SIZE	DATE	DWG NO	REV
C	02/06/2023	ADS FLEXSTORM CATCH-IT	A
SCALE	N/A	SHEET 1 OF 1	



**SUBJECT SITE**

-  FUTURE ROADS
-  AREAS WHERE FLOW IS DIVERTED TO ADJACENT SUB-WATERSHED
-  DRY POND WHICH REQUIRES EXCAVATION
-  DRY POND USING NATURAL DEPRESSIONS / RAVINES
-  STORMWATER FLOW ROUTE
-  POND TRIBUTARY AREA
-  SUB-WATERSHED BOUNDARY

PLAN IS TAKEN FROM THE CITY OF GLOUCESTER, EAST URBAN COMMUNITY, MASTER DRAINAGE PLAN BY GORE & STORRIE LIMITED, DATED SEPT. 1991.

### RECOMMENDED SWM POND LOCATIONS EAST URBAN COMMUNITY City of Ottawa

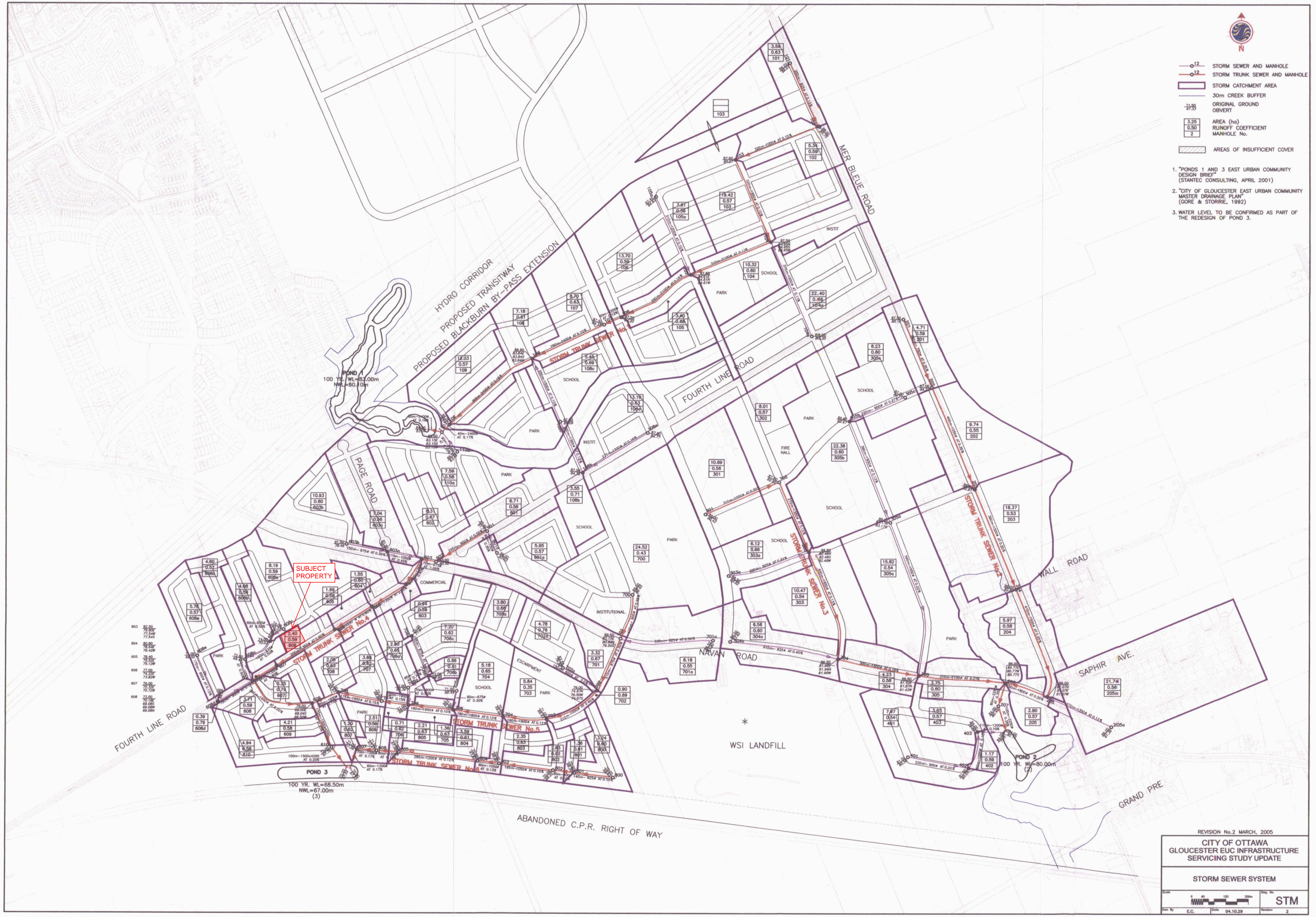


Figure 6



- STORM SEWER AND MANHOLE
- STORM TRUNK SEWER AND MANHOLE
- STORM CATCHMENT AREA
- 30m CREEK BUFFER
- ORIGINAL GROUND OBVERT
- AREA (ha)  
RUNOFF COEFFICIENT  
MANHOLE No.
- AREAS OF INSUFFICIENT COVER

1. "PONDS 1 AND 3 EAST URBAN COMMUNITY DESIGN BRIEF" (STANTEC CONSULTING, APRIL 2001)
2. "CITY OF GLOUCESTER EAST URBAN COMMUNITY MASTER DRAINAGE PLAN" (GORE & STORRIE, 1992)
3. WATER LEVEL TO BE CONFIRMED AS PART OF THE REDESIGN OF POND 3.



REVISION No.2 MARCH, 2005

**CITY OF OTTAWA**  
GLOUCESTER EUC INFRASTRUCTURE  
SERVICING STUDY UPDATE

**STORM SEWER SYSTEM**

Scale: 1:1000

Drawn By: E.C. Date: 04.10.29 Revision: 2

STM



## **APPENDIX B**

### **DESIGN CALCULATIONS**

- Storm Sewer Design Sheet (5-Year)
- Sanitary Sewer Design Sheet



**STORM SEWER DESIGN SHEET**

5 Year Storm

**CAIVAN RENUAD INC.**

CITY OF OTTAWA

**PROJECT DETAILS**

Project No: 20-647-O

Date: 20-Dec-02

Designed by: R.B.

Checked by: T.R.

**DESIGN CRITERIA**

Min. Diameter =	300	mm	Rainfall Intensity =	$\frac{A}{(T_c+B)^c}$
Mannings 'n' =	0.013		A =	998.071
Starting Tc =	10	min	B =	6.053
Factor of Safety =	15	%	c =	0.814

**NOMINAL PIPE SIZE USED**

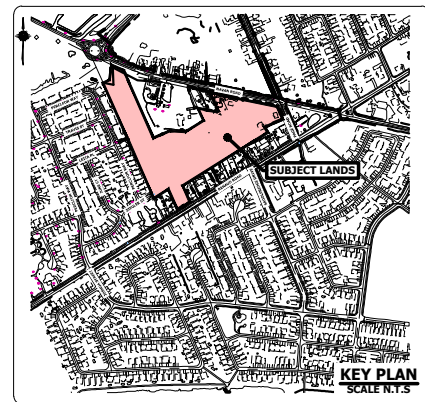
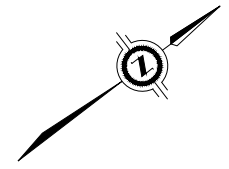
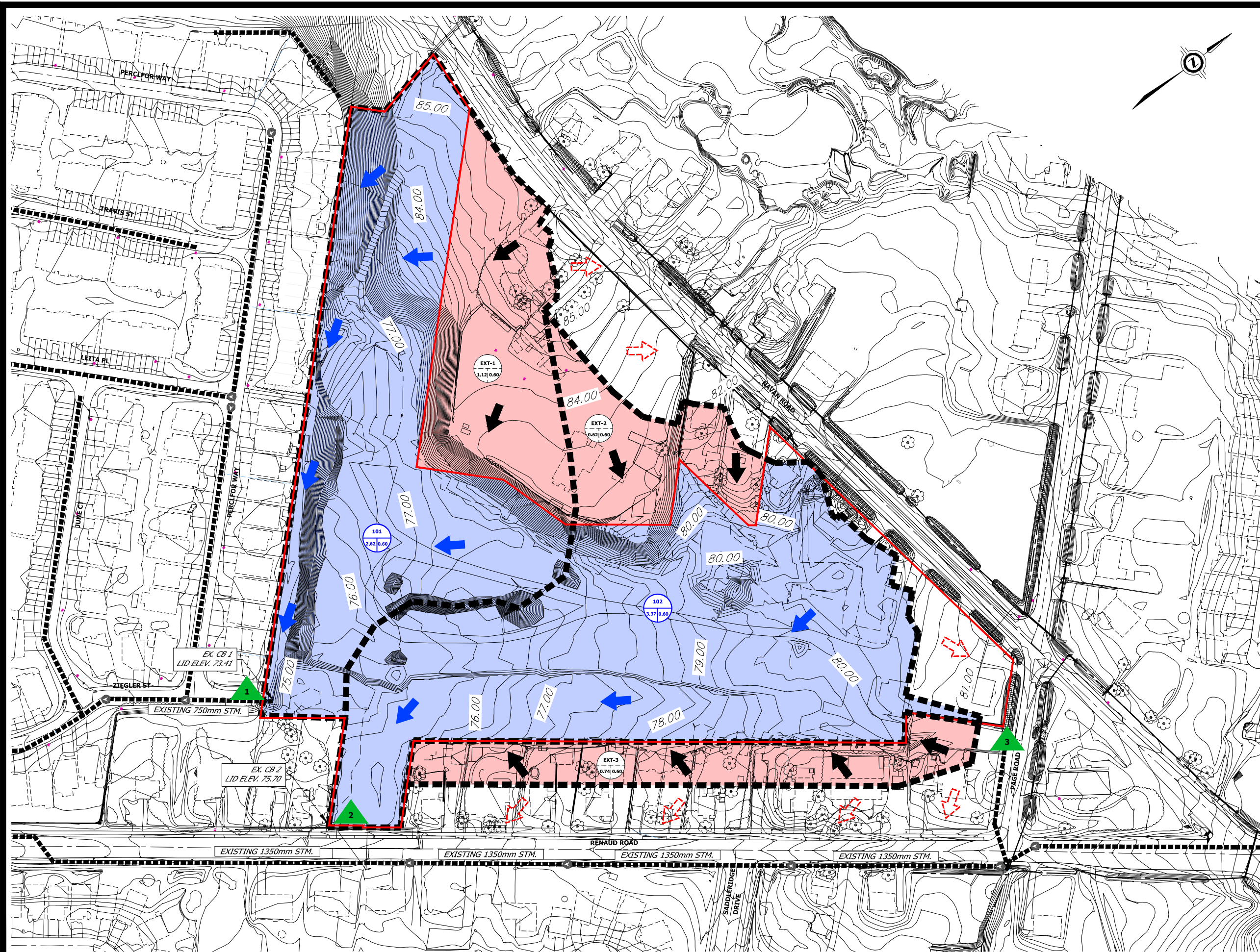
STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
<b>STREET C</b>																				
ST. C	MH 1	MH 2	0.60	0.76	0.46	0.46	104.2	0.132			0.132	54.0	1.00	375	0.175	1.59	10.00	0.57	10.57	75%
EXTERNAL DRAINAGE 2	DICB 1	MH 2	0.73	0.74	0.54	0.54	104.2	0.156			0.156	32.0	0.50	450	0.202	1.27	10.00	0.42	10.42	78%
ST. C	MH 2	MH 3				1.00	101.3	0.280			0.280	62.0	1.00	525	0.430	1.99	10.57	0.52	11.09	65%
<b>STREET D</b>																				
ST. D	MH 3	MH 4	0.13	0.72	0.09	1.09	98.8	0.299			0.299	59.0	1.00	525	0.430	1.99	11.09	0.49	11.58	70%
<b>STREET A</b>																				
ST. A	MH 5	MH 6	0.31	0.77	0.24	0.24	104.2	0.069			0.069	104.0	1.00	300	0.097	1.37	10.00	1.27	11.27	71%
EXTERNAL DRAINAGE 3		CTR MH 1	0.20	0.65	0.13	0.13														
CONDO BLOCK	CTR MH 1	MH 6	0.90	0.80	0.72	0.85	104.2	0.246			0.246	9.0	1.00	450	0.285	1.79	10.00	0.08	10.08	86%
<b>STREET A</b>																				
EXTERNAL DRAINAGE 4		MH 6	0.23	0.65	0.15	0.15														
ST. A	MH 6	MH 7	0.61	0.78	0.48	1.71	97.9	0.466			0.466	93.0	1.00	600	0.614	2.17	11.27	0.71	11.98	76%
EXTERNAL DRAINAGE 5		MH 7	0.31	0.65	0.20	0.20														
ST. A	MH 7	MH 4	0.37	0.76	0.28	2.20	94.8	0.578			0.578	61.0	1.00	675	0.841	2.35	11.98	0.43	12.41	69%
ST. A	MH 4	MH 8	0.24	0.76	0.18	3.47	93.0	0.896			0.896	59.0	1.00	750	1.113	2.52	12.41	0.39	12.80	80%
ST. A	MH 8	MH 9				3.47	91.4	0.881			0.881	22.0	1.00	750	1.113	2.52	12.80	0.15	12.95	79%

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 3760 14th Avenue, Suite 301 Markham, Ontario L3R 3T7  
 TEL: 905.946.9461 FAX: 905.946.9595  
[www.urbantech.com](http://www.urbantech.com)



STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
<b>STREET E</b>																				
ST. E	MH 9	MH 10	0.27	0.71	0.19	3.66	90.8	0.924			0.924	90.0	1.00	750	1.113	2.52	12.95	0.60	13.54	83%
<b>STREET C</b>																				
ST. C	MH 11	MH 12	0.32	0.72	0.23	0.23	104.2	0.067			0.067	39.0	1.00	300	0.097	1.37	10.00	0.48	10.48	69%
ST. C	MH 12	MH 13				0.23	101.7	0.065			0.065	14.0	1.00	300	0.097	1.37	10.48	0.17	10.65	67%
ST. C	MH 13	MH 14	0.56	0.76	0.43	0.66	100.9	0.184			0.184	73.0	1.00	450	0.285	1.79	10.65	0.68	11.32	64%
<b>STREET A</b>																				
ST. A	MH 14	MH 15				0.66	97.7	0.178			0.178	20.0	1.00	450	0.285	1.79	11.32	0.19	11.51	62%
ST. A	MH 15	MH 16				0.66	96.8	0.176			0.176	42.0	1.00	450	0.285	1.79	11.51	0.39	11.90	62%
<b>STREET B</b>																				
ST. B	MH 18	MH 19	0.53	0.74	0.39	0.39	104.2	0.114			0.114	67.0	1.00	375	0.175	1.59	10.00	0.70	10.70	65%
ST. B	MH 19	MH 20	0.72	0.74	0.53	0.93	100.6	0.259			0.259	93.0	1.00	525	0.430	1.99	10.70	0.78	11.48	60%
ST. B	MH 20	MH 21				0.93	97.0	0.249			0.249	21.0	1.00	525	0.430	1.99	11.48	0.18	11.66	58%
EXTERNAL DRAINAGE 1	DICB 1	MH 21	1.09	0.70	0.76	0.76	104.2	0.221			0.221	31.0	0.50	525	0.304	1.40	10.00	0.37	10.37	73%
ST. B	MH 21	MH 22	0.35	0.74	0.26	1.95	96.2	0.520			0.520	60.0	1.00	600	0.614	2.17	11.66	0.46	12.12	85%
ST. B	MH 22	MH 16	0.50	0.74	0.37	2.32	94.2	0.606			0.606	69.0	1.00	675	0.841	2.35	12.12	0.49	12.61	72%
ST. B	MH 16	MH 23				2.97	92.2	0.761			0.761	10.0	1.00	750	1.113	2.52	12.61	0.07	12.68	68%
<b>STREET A</b>																				
ELBOW BLOCK	MH 23	EXDICB300				2.97	91.9	0.759			0.759	26.0	1.00	750	1.113	2.52	12.68	0.17	12.85	68%
<b>ZIEGLER ST.</b>																				

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



**LEGEND**

- SUBJECT PROPERTY
- EXISTING CONTOUR
- INTERNAL DRAINAGE AREA ID
- INTERNAL DRAINAGE AREA (ha)
- RUNOFF COEFFICIENT
- EXTERNAL DRAINAGE AREA ID
- EXTERNAL DRAINAGE AREA (ha)
- RUNOFF COEFFICIENT
- ▲ DRAINAGE OUTLET & ID
- EXISTING DRAINAGE BOUNDARY
- EXISTING INTERNAL DRAINAGE AREA
- EXISTING EXTERNAL DRAINAGE AREA FLOWING TOWARDS SITE
- ➔ EXISTING INTERNAL FLOW DIRECTION
- ➔ EXISTING EXTERNAL FLOW DIRECTION
- ➔ EXISTING FLOW DIRECTION FLOWING AWAY FROM SITE
- EXISTING STORM SEWER AND FLOW DIRECTION

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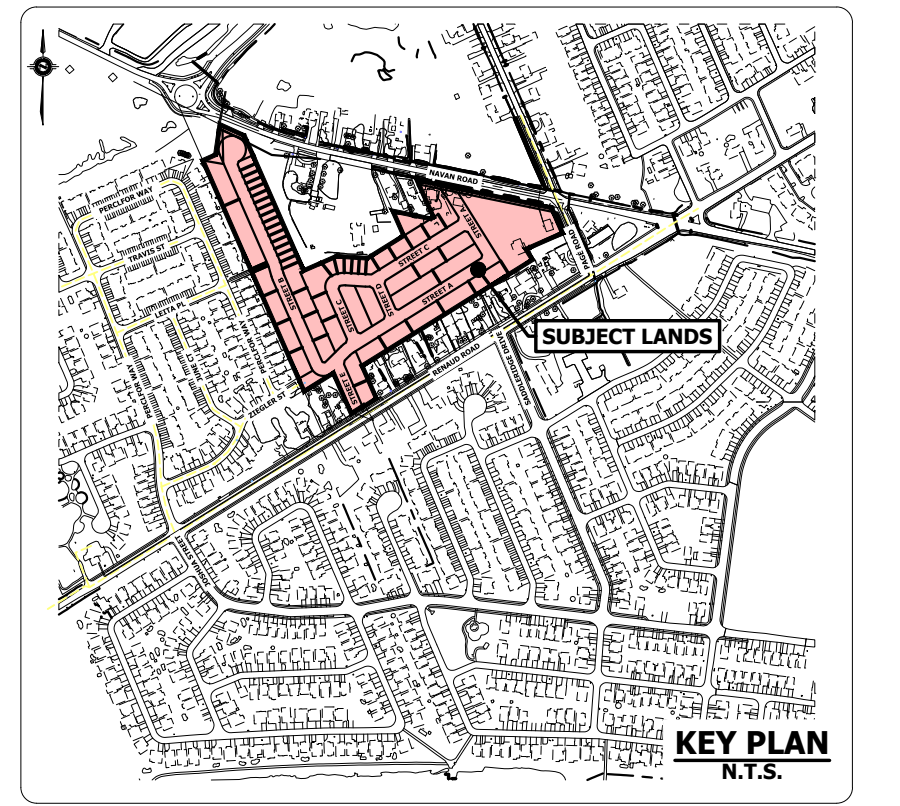
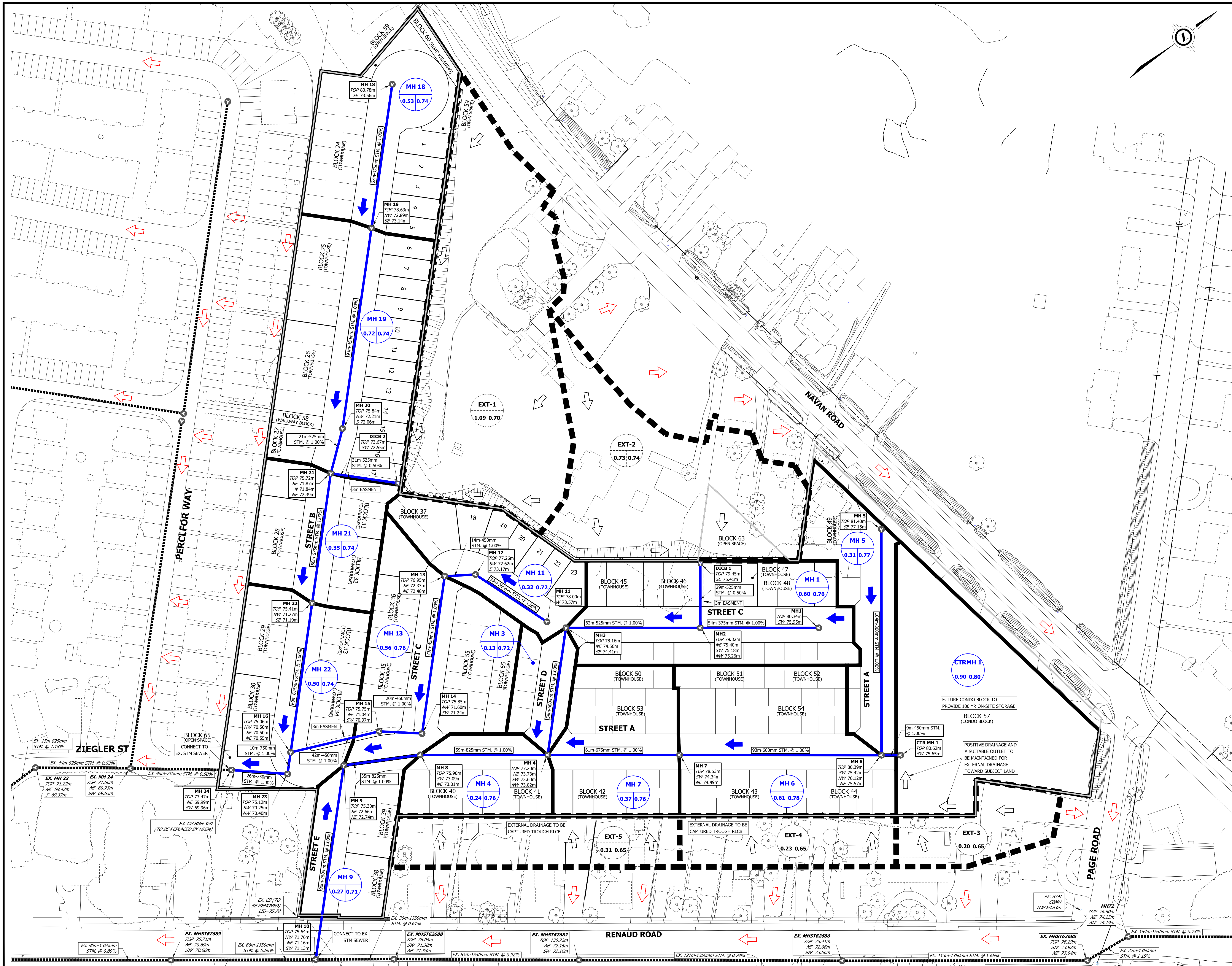
**Caivan Renaud Inc.**  
 CITY OF OTTAWA

PRE-DEVELOPMENT  
 DRAINAGE PLAN

PROJECT No.	DATE	SCALE	FIGURE No.
20-647-O	DEC 2020	1:2000	3

File: T:\Projects\20-647-O\_Caivan - Brazeau East\Reports\Functional Servicing Report\Drawings & Figures\20-647-O-STM-2\_Existing Storm Drainage Plan.dwg - Revised by <RBAGHER> - Tue, Aug 11, 2020 - 9:43am





- LEGEND:**
- PROPERTY LIMIT
  - PROPOSED DRAINAGE AREA
  - EXTERNAL DRAINAGE AREA
  - PROPOSED STORM SEWER AND DIRECTION
  - EXISTING STORM SEWER AND DIRECTION
  - INTERNAL OVERLAND FLOW
  - EXTERNAL OVERLAND FLOW TOWARDS SUBJECT LANDS
  - EXTERNAL OVERLAND FLOW AWAY FROM SUBJECT LANDS
  - MH 21 0.35 0.74 ASSIGNED MINOR SYSTEM OUTLET
  - MH 21 0.35 0.74 AREA-WEIGHTED RUNOFF COEFFICIENT
  - MH 21 0.35 0.74 CATCHMENT AREA (ha)
  - EXT-4 0.23 0.65 EXTERNAL DRAINAGE AREA ID
  - EXT-4 0.23 0.65 AREA-WEIGHTED RUNOFF COEFFICIENT
  - EXT-4 0.23 0.65 CATCHMENT AREA (ha)

**CAIVAN RENUAD INC.**

**CITY OF OTTAWA**

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A Division of Leighton-Zec Ltd.  
3750 14th Avenue, Suite 301,  
Markham, ON, L3R 3T7  
TEL 905.946.9461 • urbantech.com

**POST DEVELOPMENT STORM DRAINAGE PLAN**

PROJECT No.: 20-647-O      FIGURE No.:  
DATE: DECEMBER, 2020  
SCALE: 1:750      4