THE CITY OF WINDSOR
ONTARIO, CANADA

Office of the Commissioner of Infrastructure Services

Stormwater Management Submission Requirements
Rational Method

For sites under 2 hectares, the following information must be included in the stormwater management submission from the Engineering Consultant on behalf of the Developer and shall be completed in accordance with the **Windsor/Essex Region Stormwater Standards Manual**, including any addendums issued thereafter. Additionally, the submission shall adhere to the City of Windsor's **Standard Specifications** & **Engineering Best Practices**. **Stormwater management review fees** will be collected with the SWM plan submission for review by the City.

Please Note: This checklist **does not apply** to the following circumstances and the Stormwater Management Submission Requirements - **Modeling Method** must be referenced for further information.

1. Site area is greater than 2 ha
2. Time of concentration exceeds two times the appropriate maximum inlet time per graph 3.2.2.6 within the Windsor/Essex Region Stormwater Standards Manual
3. Modeling Method has been used

Total Site Area:	**1992 m^2**	**Total Number of Drainage Areas**	**1**

DRAINAGE AREA
Sites with multiple drainage areas must include Appendix A

EXISTING			PROPOSED		
Area	Area (m^2)	Runoff Coefficient (C - Value)	Area	Area (m^2)	Runoff Coefficient (C - Value)
Grassed	0	0.2	Grassed	535	0.2
Gravel		0.7	Gravel		0.7
Paved	0	0.95	Paved	1457	0.95
Rooftop		0.95	Rooftop		0.95
Total	**1992**	**0.60**	**Total**	**1992**	**0.75**

Soil Type:	D	Time of Concentration (T):	14.5 min
Orifice Type:		Orifice Diameter (if applicable):	89 mm

*Pre-development runoff (Q_{pre})	30 L/Sec	Post-development runoff (Q_{post})	30 L/Sec
5-year required storage	9.1 m^3	100-year required storage	36.8 m^3

Check all boxes to confirm information has been provided within the submission:

STORMWATER MANAGEMENT REPORT

1. Storage design chart, indicating:		
☑ Time	☑ Intensity	
☑ Maximum Required Storage	☑ Maximum Provided Storage	
☑ Maximum Controlled Peak Outflow (Q_{peak})		
2. Intensity values indicating:		
☑ IDF values	☑ Formula & breakdown of calculations	
3. Storage volume calculations:		
☑ Peak storage	☑ Individual calculations for each storage structure (pipes, catchbasins, etc.)	
4. Site is located within the ERCA regulated area	☐ Yes (contact ERCA)	☑ No
5. *Combined sewer, roadside ditch or municipal drain outlet	☐ Yes (restrict to 2 year predevelopment flow)	☑ No
Please Note: Sanitary flows must be taken into consideration when determining the allowable release rate for any development that outlets to a municipal combined sewer		

STORMWATER MANAGEMENT REPORT - CONTINUED	
☑ 5 year storage calculations ☑ The first 32mm are stored exclusively underground ☑ Surface ponding does not exceed maximum depth of 300mm	
☑ 100 year storage calculations ☑ Surface ponding does not exceed maximum depth of 300mm	
Flow restriction calculations complete with:	
☑ Calculation formula	☑ Orifice Specifications
Please Note: Minimum orifice plate size - 76mm x 76mm (3” x 3”) or 100mm dia. (4” dia.)	

DRAWINGS
SITE SERVICING
☑ Drainage/catchment areas (size, elevations, etc.)
☑ All proposed and existing connections to municipal sewers and watermains. o All redundant connections to be abandoned as per Best Practice BP1.3.3 o Wye connections to combined sewers as per Best Practice BP1.1.1 o Windsor Utilities Commission (WUC) approval is required for any water works
☑ Sanitary sampling manhole (non residential only) o In accordance with Best Practice BP1.1.2
☑ Existing and new pipe information, including the diameter, slope, material & intended use (storm, sanitary, water, etc.)
☑ Any quantity and/or quality control measures identified with the model number
☑ Location, elevation and description of all catchbasins, manholes, underground storage units and any other structures, labelled existing or new
☑ Dimensions of all driveways at the property line and curb line o Straight flares, with no raised curbs in the ROW as per AS-204 o If the subject site fronts a rural cross section, AS-203 may be acceptable o Ditch fills and culverts in accordance with AS-209A and Best Practice BP3.3.3
☑ Poles, pedestals and other vertical obstructions within the right-of-way (if applicable)
☐ Any removals within the right-of-way, including encroachments, sidewalks/leadwalks and redundant driveway approaches
☑ Property lines, including any required land conveyances
LOT GRADING
☐ Existing and proposed elevations, drainage areas, surface ponding, with maximum depths (5 & 100 year ponding elevations)
☐ All catchbasins, manholes, underground storage units and any other structures, labelled existing or new

ADDITIONAL INFORMATION

HADDAD MORGAN & ASSOCIATES LTD
CONSULTING ENGINEERS

Stormwater Management Study Report

Development at 619 Cabana Road W.

Windsor, Ontario

May 8, 2025

William Tape, Ph.D., P.E., P.Eng.

SUBMITTED TO:

The City of Windsor

The principal objective of this report is to provide the stormwater management for three (3) identical multi-unit residential developments being developed through subdivision at the current address 619 Cabana Road West. This shall include the stormwater storage requirement, in accordance with the storm water management guidelines set out in Windsor/Essex Region Stormwater Management Standards Manual.

Available Infrastructure

In coordination with the City of Windsor's available infrastructure the storm flow will convey to the existing (new) storm sewer located on Cabana Road West which has been assessed for a run-off coefficient from adjacent lands of 0.6 per e-mail correspondence with Mr. Robert Perissinotti, P.Eng. on May 29, 2024. As per the discussions with the Development department at the City of Windsor, the three residential developments will use a single stormwater service outlet based on a reciprocal service agreement.

Pre-Develops Conditions

The pre-developed condition was assessed at a C of 0.6 assuming all flow was routed over land from the rear of the yard to the edge of curb.

STORM

Proposed Development

The proposed project includes three identical residential buildings and a new parking lot with access from Cabana. In the developed condition, the surface condition, per site, breakdown will be as follows:

Building Area	461.1 square metres
Paved/Hardscape Area	995.4 square metres
Landscaped Area	535.1 square metres

The introduction of the new on-site storm network would change the overland flow distance, in addition to accounting for the flow on paved infrastructure and thus this was accounted for in the calculations associated with the design of the onsite network as defined in the attached drawings. The release rate applied for the site is based on the following study and discussions with the City of Windsor.

The net rate stated above was used as the basis for determining the storage requirement.

The proposed system includes the following components:

- New storm sewer system under the proposed pavement;
- Underground storage units;
- Outlet control;

- Surface storage, as required, within parking areas where permitted by the standard.

Minor System
The minor storm event for this site is the 5- year event with restrict given in accordance with the same. A depiction of the proposed onsite storm sewer infrastructure can be found in the design drawings. The necessary storm water storage associated with the 5-year storm shall be accommodated by means of underground structures (pipes, manholes, catch basins, and storage units). The minor system hydraulic grade line (HGL) shall be below ground elevations (i.e., **no surface storage**), as per the standards manual.

Major System
This design was developed using the standard for major system design with a 100-year return period. The necessary storm water storage associated with the 100-year storm event shall be accommodated by means of underground structures (pipes, manholes, catch basins, storage units) with reserve available on the surface but not required by calculation.

Runoff Control
Based on the establishing of the 5-year and 100-year event flood storage levels and an anticipated elevation of the outlet, it was found that an equivalent of an 89 mm diameter opening is required. To control the outlet flow rate under gravity condition an IPEX LMF device is proposed.

Storage Requirements
Storage has been assessed against a free jet release condition with these calculations offered in the attached appendices. Based on the results of this analysis it was found that a storage volume of 9.1CM was needed for the minor event and 36.8CM was required for the major event.

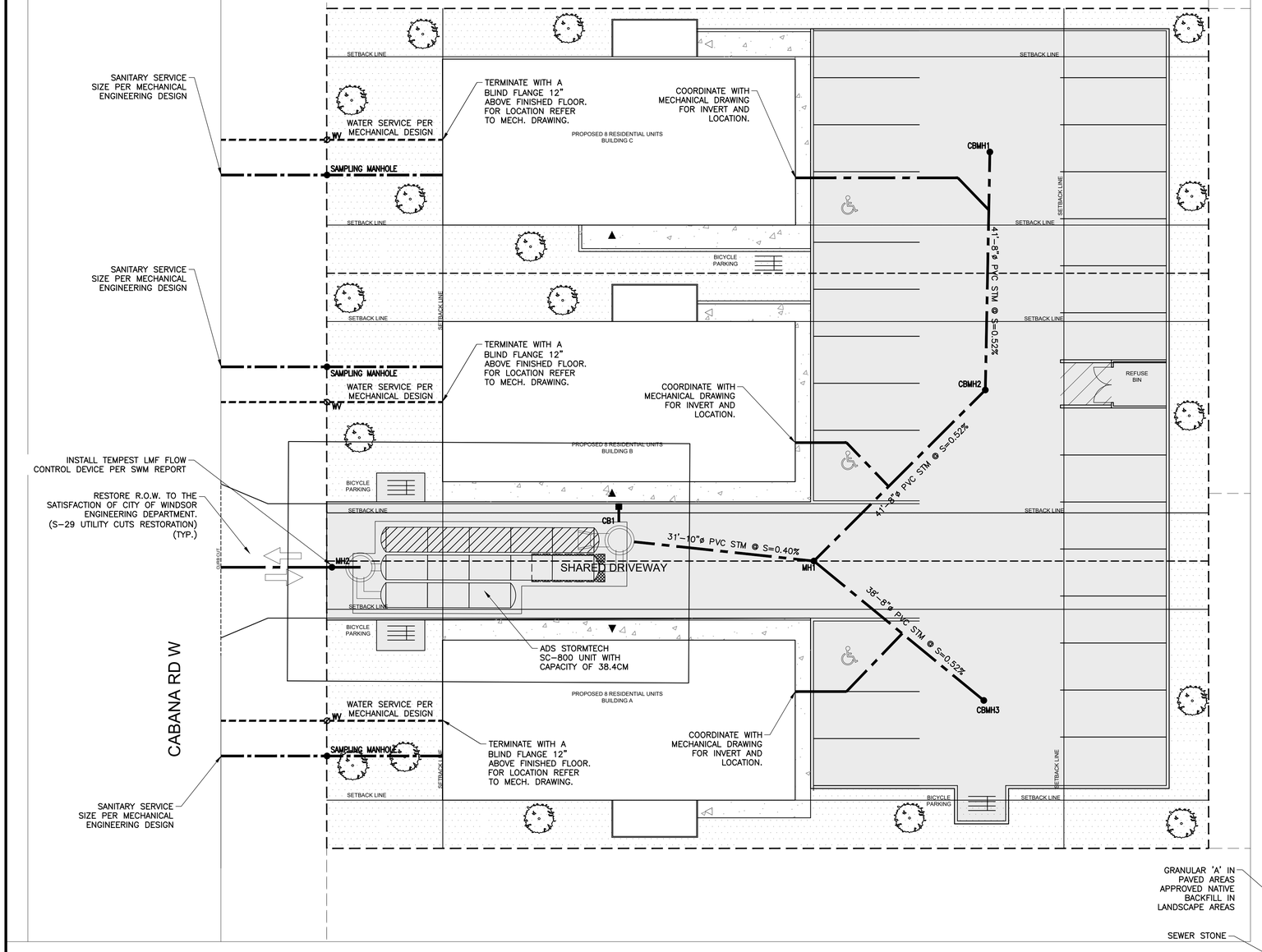
Please refer to page 5 of the calculation packages attached for definition of the storage measures and associated volumes.

Free Board
Given the above 100-year flood levels all openings to the building shall be set to an elevation of not less than 0.3m above this point the lowest building elevation during the final grading design.

Closing
Should you have any questions or comments regarding this report, please feel free to contact our office.

Appendix A

Drawings

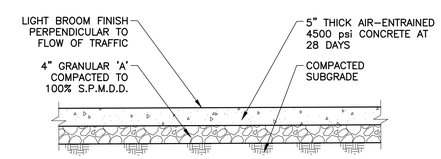


NOTE: SITE GRADING TO BE PROVIDED AT LATER STAGE.

ALL MEASUREMENTS SHOWN ON THIS DRAWING ARE IMPERIAL UNLESS MENTIONED OTHERWISE.

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:

1. ARCHITECTURAL SITE PLAN
2. MECHANICAL SITE PLAN

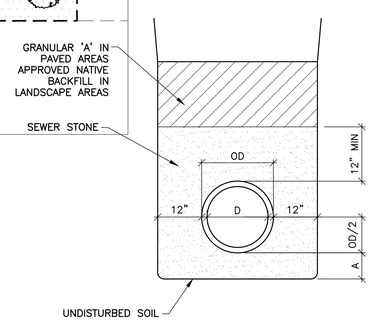


NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 5'-0" MAXIMUM INTERVALS.
2. EXPANSION JOINTS SHALL BE PREMOULDED FILLER, SPACED AT A MAXIMUM OF 50'-0" O.C. AND SHALL BE PROVIDED WHERE THE WALK ABUTS STRUCTURES, BEGINNING AND END OF RADII AND WHERE WALK ABUTS EXISTING CONCRETE.

CONCRETE SIDEWALK

NOT TO SCALE

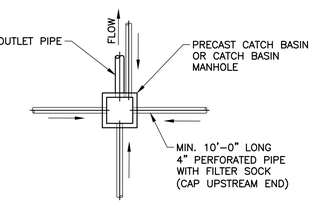


NOTES: O.D. IS NOT TO INCLUDE BELL.
A = D/4 BUT NOT LESS THAN 6"

ALTERNATIVE BEDDING MATERIAL MAY BE USED, SUBJECT TO THE APPROVAL OF THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.

CLASS 'B' BEDDING DETAIL

NOT TO SCALE



SUBDRAINS AT CATCHBASIN DETAIL

NOT TO SCALE

GENERAL NOTES:

1. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND FIELD CONDITIONS. IN THE EVENT DIMENSIONS OR FIELD CONDITIONS VARY FROM DESIGN DRAWINGS, THE ENGINEER SHALL BE NOTIFIED.
2. THE LOCATION OF UTILITIES AS SHOWN ON THIS DRAWING ARE NOT CERTIFIED AS TO LOCATION. THE ONUS LIES UPON THE TENDERER (AND AFTER ACCEPTANCE OF TENDER, UPON THE CONTRACTOR) TO ASCERTAIN AT HIS OWN EXPENSE THE EXACT LOCATION OF EACH UTILITY. NO EXTRA OR CLAIM FOR COMPENSATION WILL BE ALLOWED IF IT IS DISCOVERED THAT ANY UTILITY IS ACTUALLY LOCATED ON THE SITE AND IS IN CONFLICT WITH THE PROPOSED WORKS.
3. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES FOR LOCATES AND TO REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED TO THESE UTILITIES OR TO OTHER THIRD PARTIES ARISING OUT OF ANY ACT OR NEGLECT BY THE CONTRACTOR, OR ANYONE ACTING UNDER HIS AUTHORITY, DURING THE COURSE OF WORK. THE CONTRACTOR AGREES TO INDEMNIFY HADDAD, MORGAN AND ASSOCIATES LTD. AGAINST THE CONTRACTOR'S ACTIONS.
4. ALL SIGNS, BARRICADES, FENCES AND LIGHTS SHALL BE MAINTAINED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR AND HIS WORKERS SHALL UNDERTAKE ALL WORK ON THIS PROJECT IN COMPLIANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS", ONT. REG. 213/91 AS AMENDED.
6. ALL WORK SHALL CONFORM TO THE CITY OF WINDSOR SPECIFICATIONS AND/OR REQUIREMENTS.
7. ALL DIMENSIONS SHOWN ON THE PLAN ARE TO FACE OF CURB OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. ALL ELEVATIONS INDICATED ARE AT EDGE OF PAVEMENT.
8. THE LIMIT FOR EXCAVATION AND GRANULAR BASE INSTALLATION SHALL BE 6" BEYOND EDGE OF PAVEMENTS OR BACK OF CURB.
9. SUBGRADE SHALL BE SHAPED TO THE SPECIFIED GRADE AND CROSS SECTION AND HEAVILY PROOF-ROLLED TO DETERMINE THE PRESENCE OF ANY SOFT SPOTS IN THE PRESENCE OF A GEOTECHNICAL ENGINEER.
10. ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM SITE.
11. GRANULAR BASE SHALL BE GRANULAR 'A' MATERIAL CONFORMING TO OPSS 1010, MECHANICALLY COMPACTED TO 100% S.P.M.D.D. BASE THICKNESS SHALL BE MINIMUM 12".
12. STORM DRAINS SHALL BE PVC PIPE DR35 CERTIFIED TO CSA B182.2. TRENCHES UNDER PAVEMENTS, SIDEWALKS AND 5' BEHIND CURBS TO BE BACKFILLED WITH GRANULAR 'A' CONFORMING TO OPSS 1010 MECHANICALLY COMPACTED TO 100% S.P.M.D.D. UNDER GRASSED AREA BACKFILL WITH NATIVE MATERIAL COMPACTED TO 90% S.P.M.D.D. STORM DRAINS SHALL BE INSTALLED IN ACCORDANCE WITH OPSS 410.
13. BENCHING IS NOT REQUIRED IN STORM MANHOLES. PROVIDE A MINIMUM OF 12" AND A MAXIMUM OF 18" DEEP SUMP.
14. CATCH BASINS SHALL BE INSTALLED IN ACCORDANCE WITH OPSS 407 AT THE LOCATIONS AS INDICATED. CATCH BASIN FRAME AND COVER SHALL CONFORM TO OPSD 400.020. CATCH BASINS TO HAVE 24" SUMPS. INSTALL 6" ø 'T' TRAP CLEAN-OUTS. INSTALL FILTER CLOTH UNDER GRATES DURING CONSTRUCTION.
15. SUBDRAINS AND TILE DRAINS SHALL BE 4" ø BIG 'O' WRAPPED WITH FILTER FABRIC SOCK BACKFILLED WITH 3/4" CLEAR STONE. SLOPE 4" ø BIG 'O' @ 0.2%. BIG 'O' SUBDRAINS SHALL BE INSTALLED UNDER CURBS AND CONNECTED TO THE NEAREST CATCHBASIN.
16. CONCRETE FOR BARRIER CURBS, SIDEWALKS AND DRIVEWAYS SHALL HAVE A COMPRESSIVE STRENGTH OF 32 MPa AT 28 DAYS WITH 6% TO 8% AIR ENTRAINMENT.
17. THE CONTRACTOR SHALL SUPPLY, PLACE AND COMPACT HOT-MIX, HOT-LAID ASPHALTIC CONCRETE IN ACCORDANCE WITH OPSS 310 "HOT MIX ASPHALT".
18. SURFACE COURSE ASPHALT SHALL BE HL3 AND BASE COURSE ASPHALT SHALL BE HL4. ASPHALTIC MIXTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH THE REQUIREMENTS OF OPSS 1150.
19. PAVEMENT MARKINGS SHALL BE PLACED ON A CLEAN SURFACE. TRAFFIC PAINT SHALL BE WATER BASED LATEX TRAFFIC PAINT YELLOW IN COLOUR.
20. ALL EXISTING GRASS AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED WITH A MINIMUM OF 4" TOPSOIL, GRASS SEED AND HYDRO MULCH.
21. PROVIDE ALL CONCRETE PAVED SURFACES, SIDEWALKS, AND DRIVES WITH CRYSTAL-LOK BY IMCO.

SEDIMENT CONTROL MEASURES:

1. THE CONTRACTOR SHALL PROTECT ALL EXPOSED SURFACES AND CONTROL ALL RUNOFF DURING CONSTRUCTION.
2. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION AND MUST REMAIN IN PLACE UNTIL RESTORATION IS COMPLETE.
3. THE CONTRACTOR SHALL MAINTAIN EROSION CONTROL MEASURES DURING CONSTRUCTION.
4. ALL COLLECTED SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED LOCATION.
5. AREA DISTURBED DURING CONSTRUCTION SHALL BE KEPT TO A MINIMUM.
6. ALL DE-WATERING SHALL BE DISPOSED OF IN AN APPROVED SEDIMENTATION BASIN.
7. THE CONTRACTOR SHALL PROTECT ALL CATCHBASINS, MANHOLES AND PIPE ENDS FROM SEDIMENT INTRUSION WITH FILTER CLOTH OR OTHER APPROVED METHOD.
8. ALL SUMPS SHALL BE KEPT CLEAN DURING CONSTRUCTION.
9. THE CONTRACTOR SHALL PREVENT WIND-BLOWN DUST.
10. STRAW BALES ARE TO BE USED DURING CONSTRUCTION, AS REQUIRED.

THE FOLLOWING CITY OF WINDSOR STANDARD DRAWINGS SHALL APPLY TO THIS CONTRACT:

CURB AND GUTTER FOR ASPHALT PAVEMENT	AS-208
FLAT CATCH BASIN FRAME AND GRATE	AS-301
MANHOLE FRAME AND COVER TYPE II	AS-304A
DETAIL OF TYPICAL MANHOLE STEP	AS-305
STANDARD GOSS GULLY TRAP	AS-307
600mmX600mm PRECAST CONCRETE CATCH BASIN (WITH GOSS GULLY TRAP)	AS-309
PRIVATE DRAIN DETAIL (SINGLE)	AS-313
PRE-CAST MAINTENANCE HOLE 1200mm DIAMETER	AS-314A
CLEANOUT AT PROPERTY LINE	AS-325
RESIDENTIAL CONCRETE SIDEWALK	AS-401
SUB DRAIN AT CATCH BASIN	AS-515
TRUNCATED DOME TACTILE SURFACE INDICATORS	AS-549
2' x 2' PRE-CAST CONCRETE CATCHBASIN WITH T-Y TRAP AND CLEANOUT	BD-02

HADDAD MORGAN & ASSOCIATES LTD
CONSULTING ENGINEERS
24 Shepherd St. E. Windsor, ON N8X 2J8
(519) 973-1177 hma@haddadmorgan.com

DATE	ISSUED FOR
MAY 8, 2025	SWM REPORT
JUNE 3, 2024	SWM REPORT

PROJECT :
619 CABANA ROAD WEST DEVELOPMENT
SITE SERVICES
Windsor Ontario

DWG. TITLE :
SITE SERVICING AND GENERAL NOTES

DATE	: JUNE 2024
SCALE	: AS SHOWN
DESIGNED BY	: WT
DRAWN BY	: MT
CHECKEDBY	: WT
APPROVED BY	: WT
PROJECTNO.	:

DWG. NO.
C1

Appendix B

SWM Calculations

HADDAD MORGAN & ASSOCIATES LTD
CONSULTING ENGINEERS

This project has been analyzed in accordance with the requirements set out in the latest edition of the Windsor-Essex Region Stormwater Management Report for catchments 2Ha or smaller

Project Description:	Cabana Road Development - 3 Identical Lots		
Project No.:			
Date of Analysis	May-25	Revision	1
Design for Minor Event	5	Design for Major Event	100

Property Information (SM units)

Description	Existing	New	Table 3.2.2.7 C
Total Catchment Size	1991.6	1991.6	
Building Area	0	461.1	0.95
Paved Area	0	995.4	0.95
Gravel Area	0	0	0.70
Landscape - Clay	0.0	535.1	0.20
Landscape - Sand			0.15
Residential Single Family	1991.6		0.60
Resid. Single - Lots <500SM			0.70
Residential - semi det.			0.70
Residential - Town/Row			0.80
Industrial Commerical			0.90

	AC	
Description	Existing	New
Building Area	-	438.05
Paved Area	-	945.63
Gravel Area	-	-
Landscape - Clay	-	107.02
Landscape - Sand	-	-
esidential Single Family	1,194.96	-
id. Single - Lots <500SM	-	-
Residential - semi det.	-	-
esidential - Town/Row	-	-
ndustrial Commerical	-	-
Sumation	1,194.96	1,490.70

Soil Designation (A-D)	D	
% Impervious Override	0	%

Storm Event - Section 3.2 **(Pre-Developed)**

Storm Event	a	b	c
2	854	7	0.818
5	1259	8.8	0.838
10		9.5	0.845
25		10.2	0.852
50	2114	10.6	0.858
100	2375	11	0.861

$$I = \frac{a}{(T+b)^c}$$

Minor Storm	
a	1259
b	8.8
c	0.838
Major Storm	
a	2375
b	11
c	0.861

Time of Concentration - 3.7.3

Time of Concentration = t (sheet) +t (shallow) + t (concentrated)

t sheet (t1) $= \frac{6.92L^{0.6}n^{0.6}}{I^{0.4}S^{0.3}}$

Length of Shallow flow	45.73	m
Mannings	Grass - shore praire	
Average Slope	1	%
Shallow Concentrated Flow (User Input) t2	0	min
Concentrated time (pipe flow) (User Input) t3	0	min

***USER NOTE - macro will not run to solve t1 if t1 below reads 0.0 - input higher value*

Mannings n - Values Per Table 3.7.4.1

Value	Description
0.013	Smooth asphalt/concrete
0.06	Cultived soil - resid. Cover <20%
0.17	Cultived soil - resid. Cover >20%
0.13	Range (natural)
0.15	Grass - shore praire
0.24	grass - dense
0.4	woods - light underbrush
0.8	woods - dense underbrush
0	User Input

Minor Storm Event		
Calculated n value	0.15	
t2+t3	0	min
t1 (sheet)	14.45	min
t total	14.45	min
Intensity	90.15	mm/hr

Major Storm Event		
Calculated n value	0.15	
t2+t3	0	min
t1 (sheet)	11.39	min
t total	11.39	min
Intensity	163.39	mm/hr

Page 3 ***Pre-Development Runoff and Flow Control Analysis***

Soil Classification D

	AC		
Description	Existing	New	
Property Total Area CM	1,991.60	1,991.60	
Building Area	-	438.05	
Paved Area	-	945.63	
Gravel Area	-	-	
Landscape - Clay	-	107.02	
Landscape - Sand	-	-	*
Residential Single Family	1,194.96	-	*
Resid. Single - Lots <500SM	-	-	*
Residential - semi det.	-	-	*
Residential - Town/Row	-	-	*
Industrial Commerical	-	-	*
Sumation AC	1,194.96	1,490.70	

** User Note: % Impervious taken as 100% for noted items - if different use overide on Pg.1*

% Impervious	73.1	%	C equiv by AC	0.748	
Storage depth 3.3.2	96.1	mm	C 100 year	0.890	

Runoff Pre-Development

Intensity (minor)	90.15	mm/hr
Intensity (major)	163.39	mm/hr

Rational Method - PreDevelopment

Q_{minor}	0.030	CMS	Q Reduction	0	CMS **
Q_{major}	0.054	CMS	** per approval authority		

Surface Elevation :	Minor Event	100.00	m
	Major Event	100.15	m

Outlet Info:	Invert at outlet	97.00	m		
	Orifice Diameter	89.00	mm	Max. Dia.	89.8 mm
	Orifice coefficient	0.62			
	Tailwater elev.	0	m		

Head Condition Differential	Minor	2.956	m	
	Major	3.106	m	

Discharge Rate Through Orifice	Minor	0.0294	CMS	***OK***
	Major	0.0301	CMS	***OK***

Page 4 ***Storage Requirements***

Zero Release condition

Storage Depth 96.13 mm

Zero Release Storage	191.5 CM

$C_{100year}$ 0.890 C_{minor} 0.748

Release Rates CMS Minor 0.029 Major 0.030

23-209/18-141 CMS CMS

	Minor Event				Major			
Time	Intensity (mm/hr)	Total Input CM	Total Release CM	Storage CM	Intensity (mm/hr)	Total Input CM	Total Release CM	Storage CM
5	139.6	17.34	8.81	8.5	218.2	32.24	9.03	23.21
10	107.7	26.76	17.62	9.1	172.7	51.02	18.06	32.95
15	88.4	32.94	26.43	6.5	143.7	63.67	27.10	36.58
20	75.3	37.44	35.25	2.2	123.5	72.97	36.13	36.84
25	65.9	40.92	44.06	- 3.1	108.6	80.19	45.16	35.03
30	58.7	43.75	52.87	- 9.1	97.1	86.04	54.19	31.84
35	53.0	46.11	61.68	- 15.6	87.9	90.91	63.23	27.68
40	48.4	48.13	70.49	- 22.4	80.4	95.06	72.26	22.80
45	44.6	49.90	79.30	- 29.4	74.2	98.67	81.29	17.38
50	41.4	51.46	88.11	- 36.7	68.9	101.85	90.32	11.53
55	38.7	52.87	96.93	- 44.1	64.4	104.69	99.36	5.33
60	36.3	54.14	105.74	- 51.6	60.5	107.25	108.39	-1.14
65	34.2	55.30	114.55	- 59.2	57.1	109.57	117.42	-7.85
70	32.4	56.37	123.36	- 67.0	54.0	111.70	126.45	-14.75
75	30.8	57.36	132.17	- 74.8	51.3	113.66	135.48	-21.82
80	29.3	58.29	140.98	- 82.7	48.9	115.48	144.52	-29.03
85	28.0	59.15	149.79	- 90.6	46.7	117.18	153.55	-36.37
90	26.8	59.97	158.61	- 98.6	44.7	118.76	162.58	-43.82
95	25.7	60.73	167.42	- 106.7	42.8	120.25	171.61	-51.36
100	24.7	61.46	176.23	- 114.8	41.2	121.66	180.65	-58.99
105	23.8	62.14	185.04	- 122.9	39.6	122.99	189.68	-66.69
110	23.0	62.80	193.85	- 131.1	38.2	124.25	198.71	-74.47
115	22.2	63.43	202.66	- 139.2	36.9	125.44	207.74	-82.30
120	21.5	64.02	211.48	- 147.5	35.7	126.58	216.78	-90.19
125	20.8	64.60	220.29	- 155.7	34.6	127.67	225.81	-98.13
130	20.2	65.15	229.10	- 164.0	33.5	128.72	234.84	-106.12
135	19.6	65.67	237.91	- 172.2	32.5	129.72	243.87	-114.16
140	19.0	66.18	246.72	- 180.5	31.6	130.68	252.90	-122.23
145	18.5	66.67	255.53	- 188.9	30.7	131.60	261.94	-130.34
150	18.0	67.15	264.34	- 197.2	29.9	132.49	270.97	-138.48
155	17.6	67.61	273.16	- 205.5	29.1	133.35	280.00	-146.65
160	17.1	68.05	281.97	- 213.9	28.4	134.18	289.03	-154.86
165	16.7	68.48	290.78	- 222.3	27.7	134.98	298.07	-163.09
				9.1				36.8

Page 5 - Storage Distribution

Alternate Zero Release Solution **191.5** **CM**

Minor Event	**9.1**	**CM - REQUIRED**	
8" pipe	37 m		1.16
10" pipe	9 m		0.44
Manhole x 2	1200 Diameter		2.71
Underground Storage - ADS Stormtech - SC310			38.40
		total	42.71

Major Event	**36.8**	**CM - REQUIRED**	
8" pipe	37 m		1.16
10" pipe	9 m		0.44
Manhole x 2	1200 Diameter		2.71
Underground Storage - ADS Stormtech - SC310			38.40
			42.7

Appendix C

ADS Underground Storage System

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

619 CABANA ROAD WEST

WINDSOR, ON, CANADA

SC-800 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-800.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 50 mm (2").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. 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.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-800 SYSTEM

1. STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

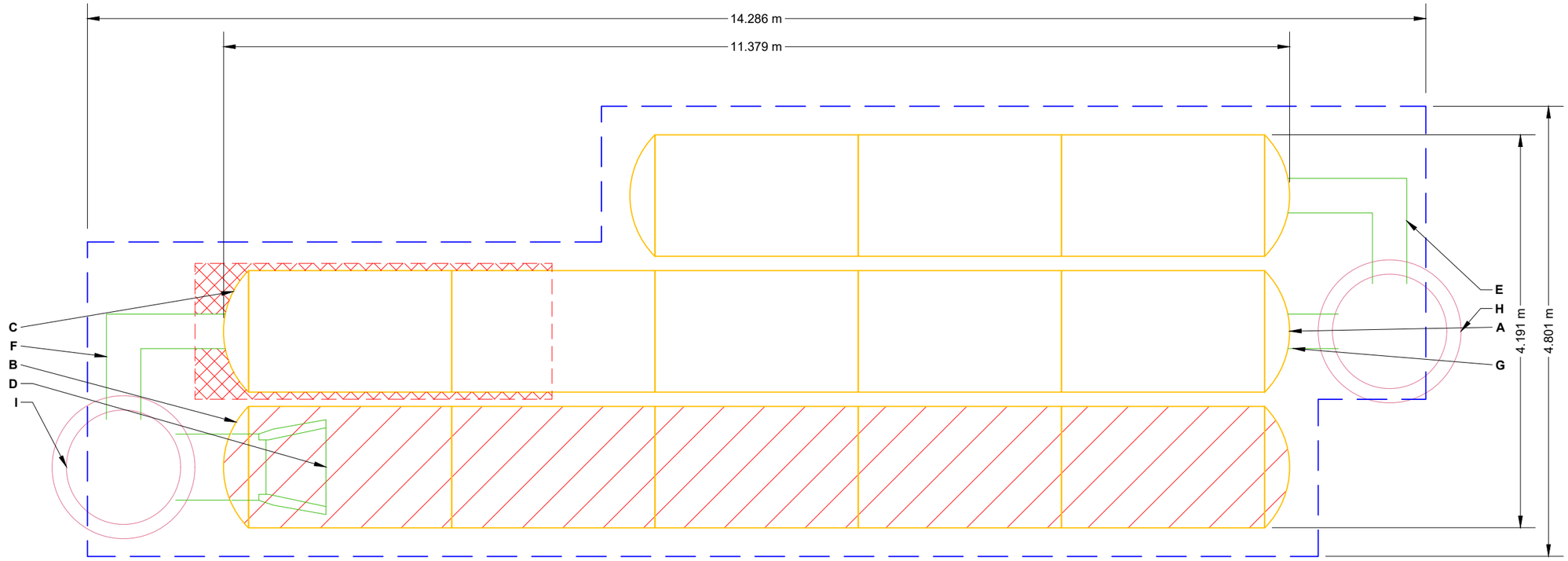
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS	
13	STORMTECH SC-800 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.429
6	STORMTECH SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.524
152	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.372
152	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.372
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.372
38.4	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	1.143
		TOP OF SC-800 CHAMBER:	0.991
		300 mm x 300 mm TOP MANIFOLD INVERT:	0.518
		600 mm ISOLATOR ROW PLUS INVERT:	0.211
58.7	SYSTEM AREA (m^2)	300 mm x 300 mm BOTTOM MANIFOLD INVERT:	0.193
38.2	SYSTEM PERIMETER (m)	300 mm BOTTOM CONNECTION INVERT:	0.193
		BOTTOM OF SC-800 CHAMBER:	0.152
		BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PRE-CORED END CAP	A	300 mm BOTTOM PRE-CORED END CAP, PART#: SC800EPE12BPC / TYP OF ALL 300 mm BOTTOM CONNECTIONS	41 mm	
PRE-CORED END CAP	B	600 mm BOTTOM PRE-CORED END CAP, PART#: SC800EPE24BPC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	58 mm	
PRE-CORED END CAP	C	300 mm TOP PRE-CORED END CAP, PART#: SC800EPE12TPC / TYP OF ALL 300 mm TOP CONNECTIONS	366 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: SC74024RAMP		
MANIFOLD	E	300 mm x 300 mm BOTTOM MANIFOLD, ADS N-12	41 mm	
MANIFOLD	F	300 mm x 300 mm TOP MANIFOLD, ADS N-12	366 mm	
PIPE CONNECTION	G	300 mm BOTTOM CONNECTION	41 mm	
CONCRETE STRUCTURE	H	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		113 L/s OUT
CONCRETE STRUCTURE	I	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		33 L/s IN



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

619 CABANA ROAD WEST
WINDSOR, ON, CANADA
DATE: 05/08/2025 | DRAWN: SB | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

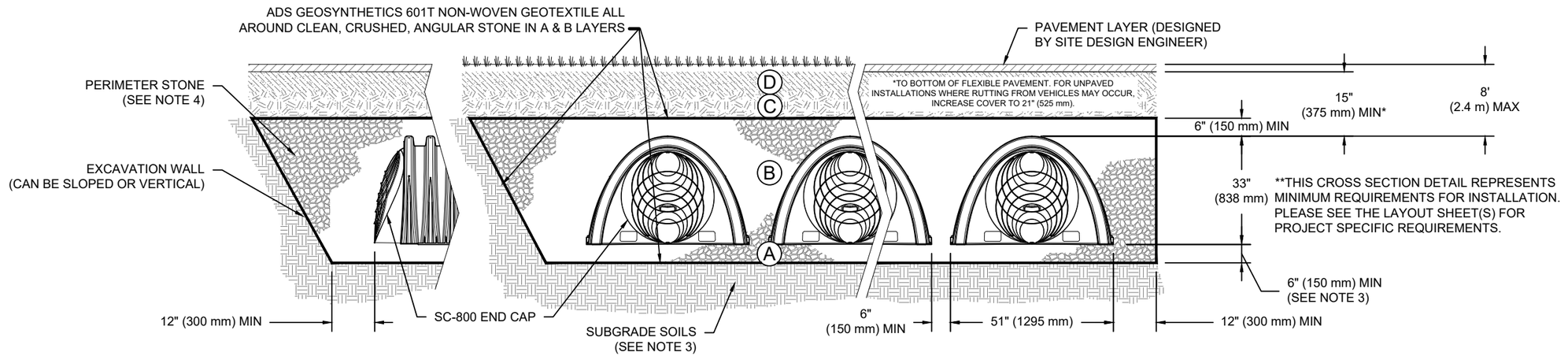
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 50

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

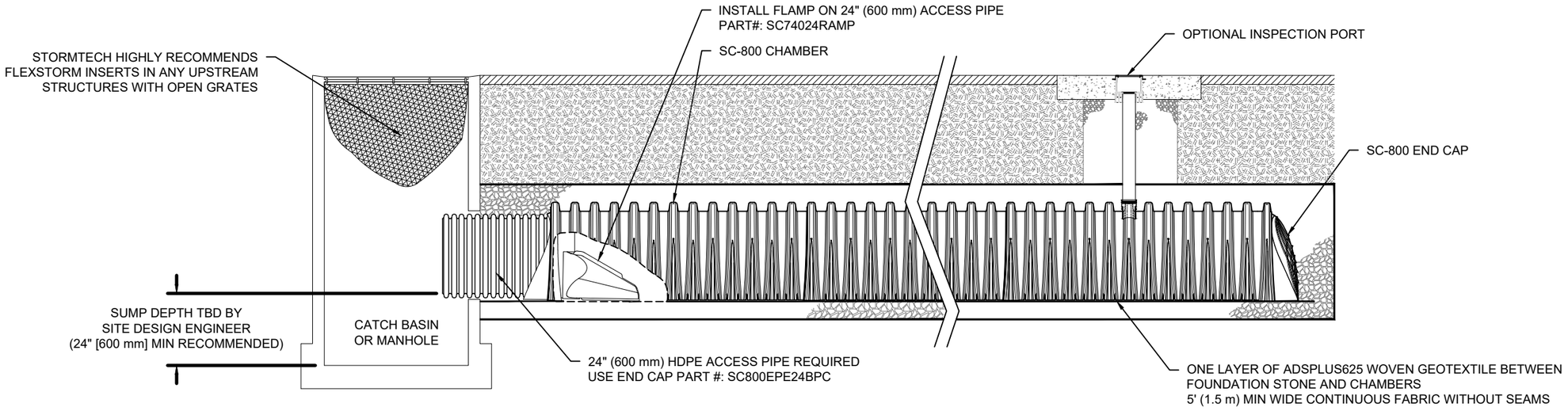
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

619 CABANA ROAD WEST
WINDSOR, ON, CANADA
DATE: 05/08/2025 | DRAWN: SB | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech® Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

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



SC-800 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

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

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

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

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

NOTES

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

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

619 CABANA ROAD WEST
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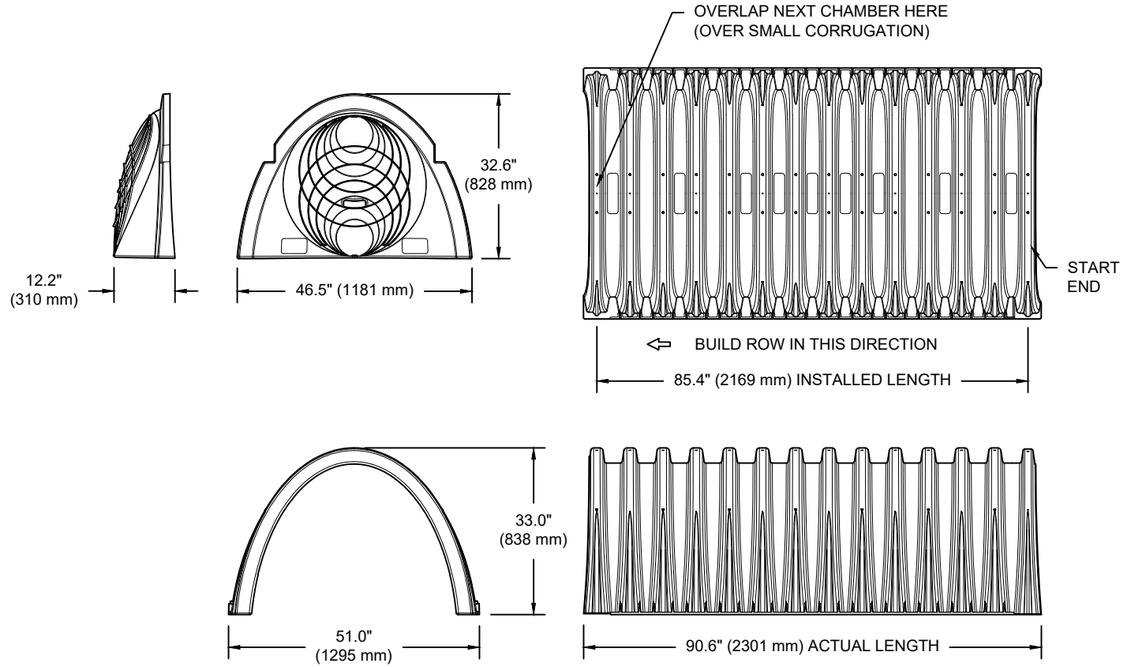
StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

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

SC-800 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	81.0 CUBIC FEET	(2.29 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

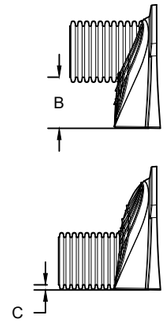
NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5"	(1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET	(0.09 m³)
MINIMUM INSTALLED STORAGE**	15.4 CUBIC FEET	(0.43 m³)
WEIGHT	15.7 lbs.	(7.1 kg)

* ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS
**ASSUMES 6" (152 mm) STONE ABOVE AND BELOW END CAPS, 6" (152 mm) BETWEEN ROWS, 12" (305 mm) BEYOND END CAPS

PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "BPC"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "TPC"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	



NOTE: ALL DIMENSIONS ARE NOMINAL

619 CABANA ROAD WEST
WINDSOR, ON, CANADA
DATE: 05/08/2025 | DRAWN: SB | CHECKED: N/A
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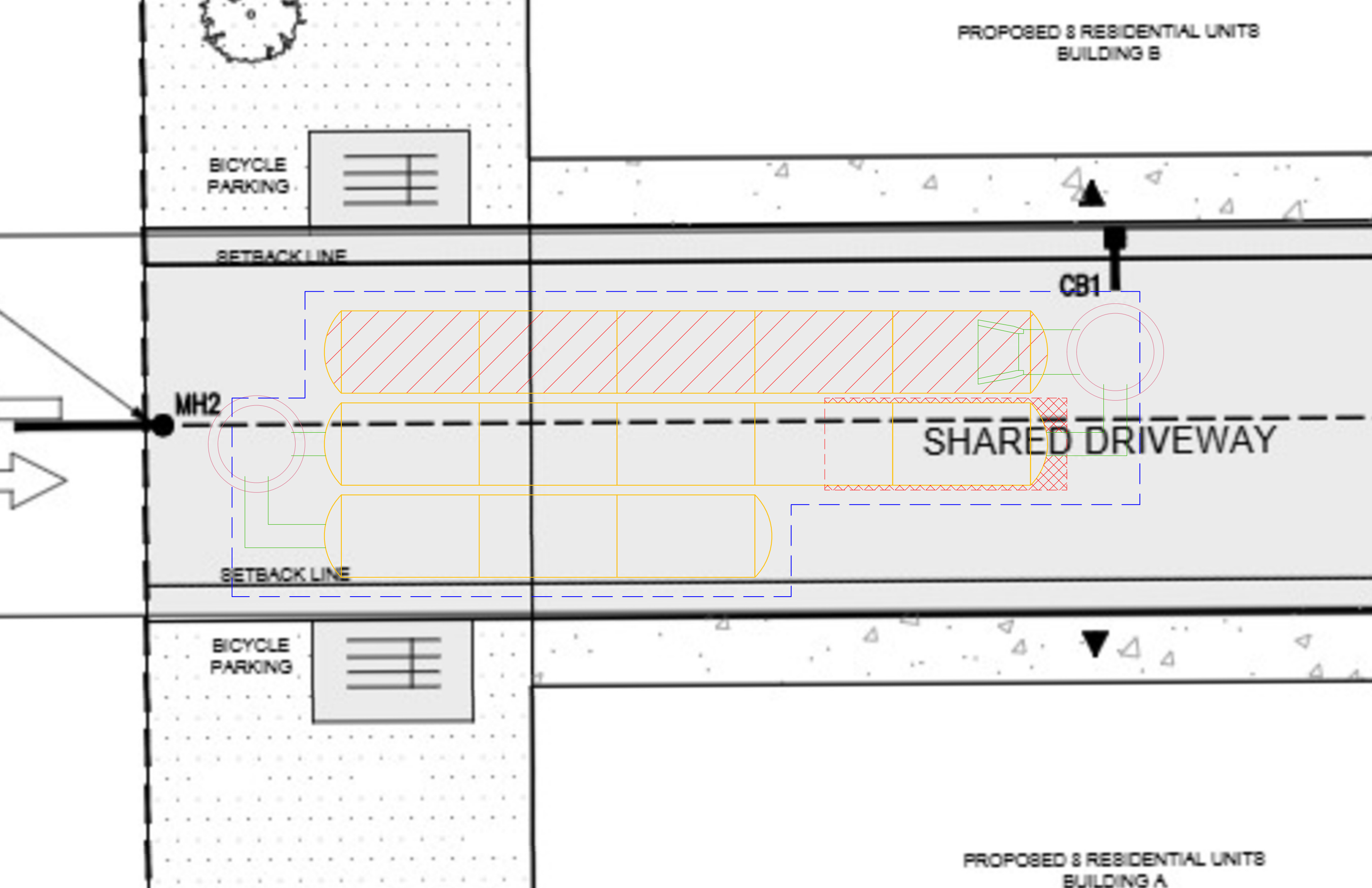
ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SHEET
5 OF 5


PROPOSED 8 RESIDENTIAL UNITS
BUILDING B
BICYCLE PARKING
SETBACK LINE
CB1
MH2
SHARED DRIVEWAY
SETBACK LINE
BICYCLE PARKING
PROPOSED 8 RESIDENTIAL UNITS
BUILDING A

May 8, 2025

ADS Isolator Row PLUS Sizing

Project Name:	619 Cabana Road West		
Consulting Engineer:	Haddad Morgan & Associates		
Location:	Windsor, ON		
Sizing Completed By:	Steve Buckley	**Email:**	steve.buckley@adspipe.com

Stormtech Details	
Chamber Model	SC-800
No. Chamber in Isolator Row PLUS:	5
Isolator Row PLUS TSS Removal:	72.7%
Volume Treated by Isolator Row Plus:	89.5%

Notes: Refer to Stormtech drawings for full IR+ configuration.

Site Details	
Site Area (ha):	0.2
Rational C:	0.75
Particle Size Distribution:	ETV
Rainfall Station:	Windsor, ONT

Net Annual Removal Efficiency Summary

Rainfall Intensity	Fraction of Rainfall	Removal Efficiency IR PLUS	IR+ % Volume Treated
mm/hr	%	%	%
3.00	13.2%	81.2%	13.2%
4.00	9.6%	81.2%	9.6%
5.00	7.5%	81.2%	7.5%
6.00	6.0%	81.2%	6.0%
7.00	4.8%	81.2%	4.8%
8.00	4.1%	81.2%	4.1%
9.00	3.6%	81.2%	3.6%
10.00	3.2%	81.2%	3.2%
11.00	2.8%	81.2%	2.8%
12.00	2.5%	81.2%	2.5%
15.00	6.6%	81.2%	6.6%
20.00	8.3%	81.2%	8.3%
25.00	5.8%	73.6%	5.3%
30.00	4.6%	61.3%	3.5%
35.00	3.8%	52.6%	2.5%
40.00	2.9%	46.0%	1.6%
45.00	2.4%	40.9%	1.2%
50.00	1.8%	36.8%	0.8%
65.00	6.6%	28.3%	2.3%
	Total Net Annual Removal Efficiency		**72.7%**
	Total Runoff Volume Treated		**89.5%**

Notes:

Isolator Row PLUS removal efficiency based on verified ETV test report. For dimensions and configuration of Isolator Row PLUS, please see Stormtech drawing package.

(1) Based on Windsor/Essex Region Stormwater Manual 2018, Table 3.4.1.5

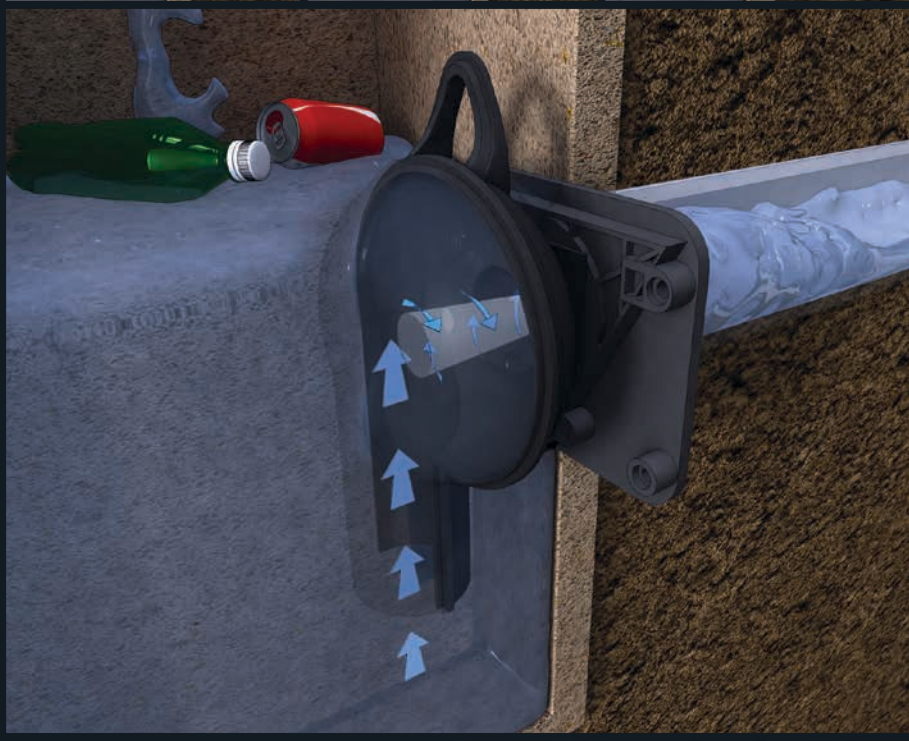
(2) Canada ETV PSD & Test Protocols - ISO14034 Certifed

(3)

Appendix D

Inlet Control Device

THE NEXT GENERATION IN STORM SEWER INLET CONTROLS



TEMPEST™
INLET CONTROL DEVICES

STORM WATER FLOW CONTROL

THE COST-EFFECTIVE SOLUTION TO YOUR STORM WATER SURCHARGE PROBLEMS

- Conserves sewer system capacity
- System accommodates low to high flows
- Integrated odour and floatable control
- Fast and easy to install and maintain

IPEX
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We build tough products for tough environments®

TEMPEST™
INLET CONTROL DEVICES

THE NEXT GENERATION IN STORM SEWER INLET CONTROLS

✓ Reduces Sewer Overflows & Basement Backups

Tempest is a family of cost-effective inlet control devices that work together across a series of catch basins to limit the amount of storm water runoff that can enter a combined sewer system during a storm event. Basement backups and sewer overflows are avoided because storm water surcharges are controlled at the sewer inlet and are allowed to remain in catch basins or temporarily above ground.

✓ Integrated Odour & Floatable Control

In addition to flow control, Tempest systems can also alleviate sewer system odour emissions as well as prevent floating debris from entering the sewer system.

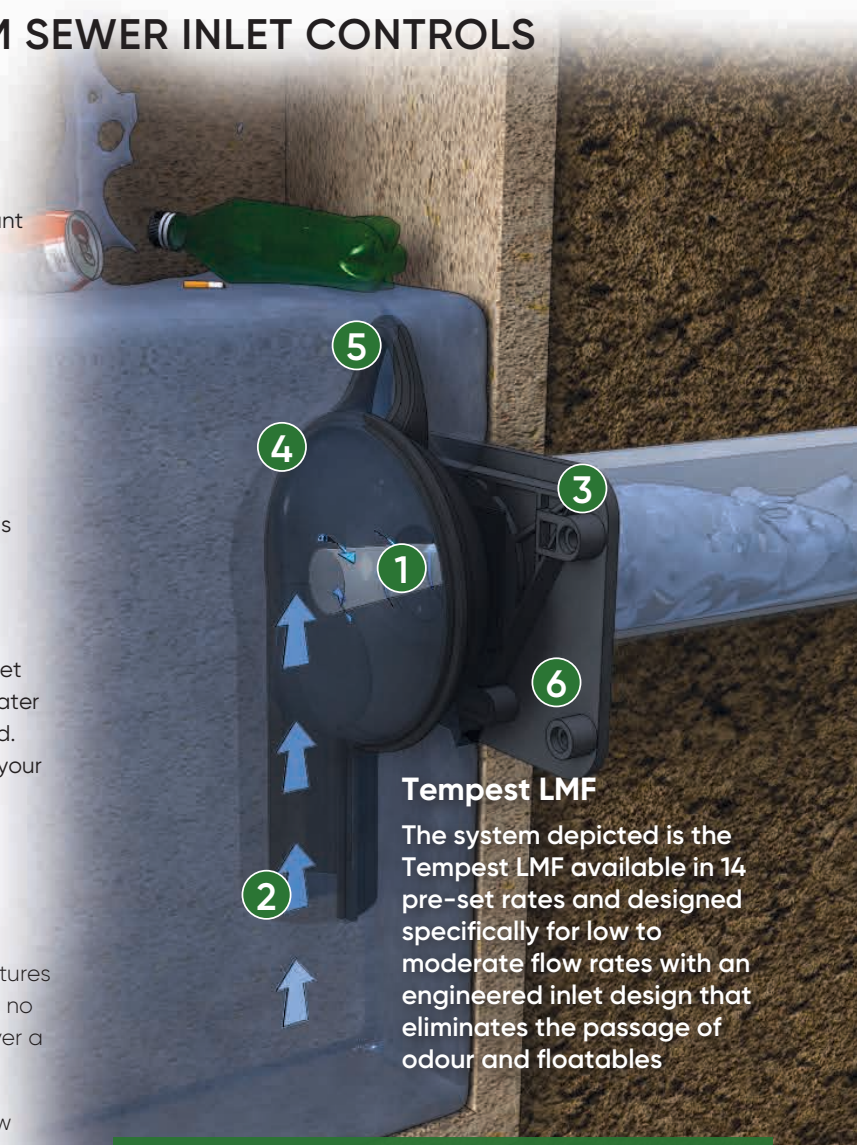
✓ Wide Range of Models & Pre-set Flow Rates

Available in a wide range of patent pending models and pre-set flow rates, Tempest systems can accommodate most storm water flow control requirements from 32 GPM to 270 GPM and beyond. Application specific solutions can also be engineered to meet your unique needs in both wet and dry catch basin environments.

✓ Easy to Install & Maintain

Constructed from durable PVC, Tempest units are corrosion free and built to last. The Tempest's light weight design accommodates both square and round catch basins and features a universal back plate and interchangeable components with no moving parts that makes the units quick and easy to install over a catch basin outlet pipe.

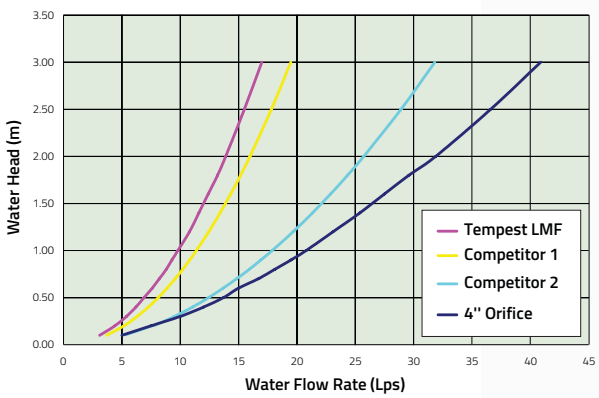
These devices also include a quick release mechanism to allow easy access for service without the need to drain the installation.



Tempest LMF

The system depicted is the Tempest LMF available in 14 pre-set rates and designed specifically for low to moderate flow rates with an engineered inlet design that eliminates the passage of odour and floatables

Tempest Inlet Control Devices restrict flow to a narrower range than traditional methods regardless of head



FEATURES & BENEFITS

1. Restricts flow to a narrow range regardless of head
2. Unit design prevents the passage of floatables and odours
3. Neoprene gasket for air-tight seal*
4. Virtually maintenance free and corrosion free durable PVC construction
5. Features a quick release mechanism that's accessed with reach bar. Unit can then be simply lifted out for easy maintenance*
6. Universal back plates available for both square and round catch basins*

* Excluding Tempest HF Sump

THE TEMPEST FAMILY OF SYSTEMS

TEMPEST LMF

Restricts:
- ✓ Flow
- ✓ Odours
- ✓ Floatables

LOW to MODERATE FLOW RATES
32 GPM (2 L/s) – 270 GPM (17 L/s)
14 pre-set flow rates

The Tempest LMF system features a vortex inlet design that allows a low flow rate to be set and eliminates the passage of odours and floatables and allows for debris and sediment to collect in the structure.

TEMPEST MHF

Restricts:
- ✓ Flow

MEDIUM TO HIGH FLOW RATES
143 GPM (9L/s) or greater
Specified pre-set flow rates

The Tempest MHF is a standard orifice plate or plug device designed to allow a specified flow volume through the outlet pipe at a specified head.

TEMPEST HF & HF SUMP

Restricts:
- ✓ Flow
- ✓ Odours
- ✓ Floatables

HIGH FLOW RATES
240 GPM (15 L/s) or greater
5 pre-set flow rates

The standard Tempest HF system allows a near constant discharge rate to be set and eliminates the passage of odours and floatables and allows for debris and sediment to collect in the structure.

The Tempest HF SUMP system is designed for catch basins & manholes in which there is no sump or the outlet pipe is too low to install standard Tempest device.

UNIVERSAL BACK PLATES

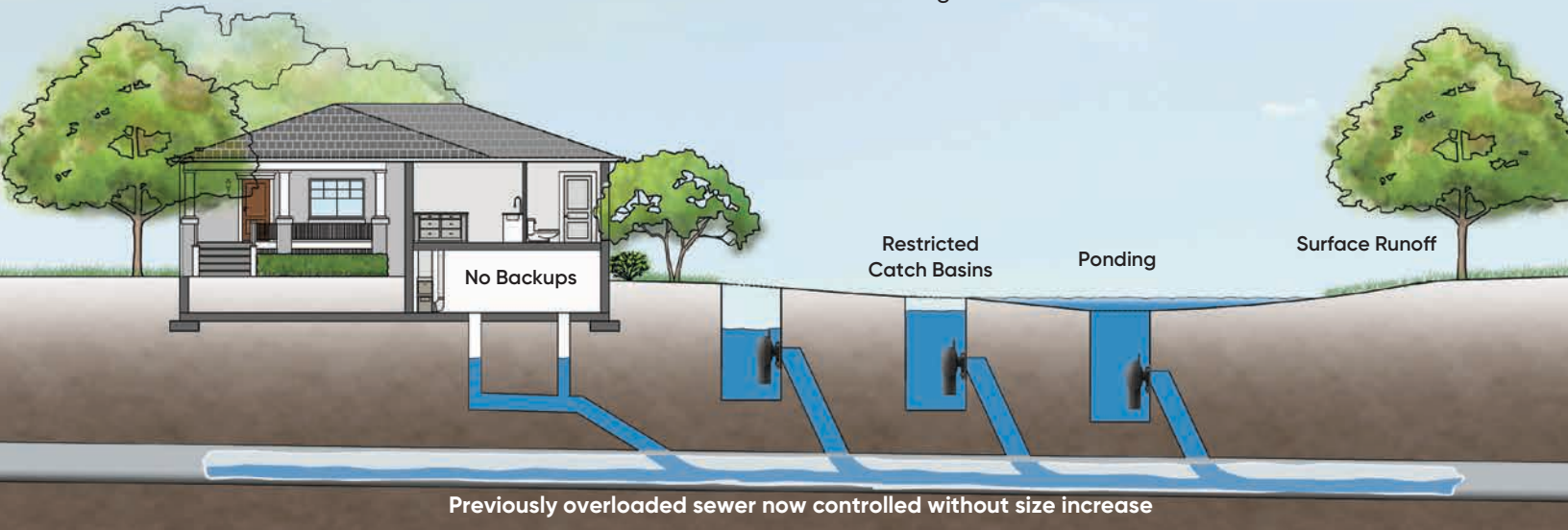
Available for BOTH square and round catch basins.*

For square catch basins

For round catch basins

SOLUTION: TEMPEST INLET CONTROL SYSTEMS

- Provides control by restricting flow into the sewer system
- Provides temporary ponding in catch basins, parking lots & roadways
- Helps preserve sewer capacity, slows down the inlet flow
- Reduces residential flooding and flash flooding
- Water surcharge is controlled and directed as per engineer design
- Can accommodate outlet pipes 6" and larger



Previously overloaded sewer now controlled without size increase

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- PVC, CPVC, PP, PVDF, PE, ABS, and PEX pipe and fittings
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

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