DRAINAGE REPORT

Dine-In Market & Boutique Hotel 63 Wheeler Avenue SBL 201-9-3 Village of Warwick, Orange County, NY

Prepared for:

John Contreras 12 Black Walnut Drive Warwick, NY 10990

JOB # 220115

NOVEMBER 2023



MJS ENGINEERING

MJS Engineering & Land Surveying, PC 261 Greenwich Avenue Goshen NY 10924 845-291-8650

Note: It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

Drainage Report

Table of Contents:

Cover	.1
Table of Contents	.2
Summary of Drainage Impacts	.3
Background	.3
Hydrology	.3
Storm Drainage Conveyance Systems	.3
Erosion & Sediment Control & Stormwater Management	.3
References	.4
Appendices:	

Appendix A - Underground Infiltration System Calculations

Summary of Drainage Impacts:

The Western Addition LLC site has been designed to mitigate the impact of the development. A catch basin in the parking lot will convey water to a rain garden located SW of the building. The roof drains will be directed to an underground infiltration system located NE of the building. Analysis shows the flow will be adequately handled by the drainage infrastructure and will not negatively impact downstream properties and/or drainage systems.

Background:

The existing site does not feature a drainage system. The N side of the site drains NE towards McEwen Street. The S side of the site drains S towards West Street.

Hydrology:

For the roof, the hydrologic analysis method used is the Water Quality Volume (WQv) from the NYS Stormwater Management Design Manual (NYSSMDM). The design storm is the 90th Percentile Rainfall, from Figure 4.1 of the NYSSMDM. The WQv was calculated for the roof area, which drains to the underground infiltration system located NE of the building. This system was designed to infiltrate the Runoff Reduction Volume (RRv) from the roof area into the underlying soils. During large storm events, the system will overflow to the surface, NE of the underground infiltration system.

For the parking lot, the SW side of the lot is tributary to a catch basin. The catch basin flows to a rain garden, located SW of the building. The rain garden will infiltrate the stormwater into the underlying soils.

Storm Drainage Conveyance Systems:

A storm drainage system for the proposed parking lot will consist of 1 inlet structure on the SE side of the parking area. This will be piped to the rain garden with 12" diameter HDPE. A HDPE end section will be installed at the outlet into the rain garden.

The roof drains will flow to the underground infiltration system. The underground infiltration system will consist of ADS SC-740 Stormtech Chambers. The underground infiltration system will be installed off-line, with overflow directed NE of the system.

Erosion & Sediment Control & Stormwater Management:

The project will follow the Erosion & Sediment Control provided in New York State Standards for Erosion and Sediment Control. Refer to the Erosion & Sediment Control Plan.

References:

New York State Department of Environmental Conservation (NYSDEC), (January 2015), New York State Stormwater Management Design Manual, Albany, NY

New York State Dept. of Environmental Conservation, (November 2016), Standards and Specifications for Erosion and Sediment Control, Albany, NY

Record Plans: C-1 Site Plan C-2 Notes C-3 Existing Conditions & Demolition Plan C-4 Grading & Drainage Plan C-5 Details 8 SC-740 Standard Details

APPENDIX A

UNDERGROUND INFILTRATION SYSTEM CALCULATIONS

220115.01 **MJS ENGINEERING** SHEET NO. & LAND SURVEYING P.C. BBC DATE 10/25/23 261 Greenwich Avenue CALCULATED BY GOSHEN, NY 10924-2028 (845) 291-8650 CHECKED BY (845) 291-8657 FAX WESTERN ADDITION I.C.C. UNDER GROUND INFILTRATION SIZE UNDER GROUND INFICTRY TOATO 1 - 75 K (p) INFIL TRATE WQ, (90TH RELCENTICE STORM) P=1.4" FROM NYSDEC STORMUMTER MANUAL WQV = 1.4 × (0.05+0.009(100) × 0.114 AC = 550CF ROOF ALEA = 4,9595F = 0.114AC USE STORM TECH SC-740 CHAMBERS 550 CF = 7,4 CHAMBERS = USE 8 CHAMBERS 74.9 CF/EA

StormTech[®] SC-740 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

Nominal Chamber Specifications (not to scale)



Size (L x W x H) 90.7" (2304 mm) 85.4" x 51" x 30" ACTUAL LENGTH 2,170 mm x 1,295 mm x 762 mm 24" (600 mm) DIAMETER MAX. **Chamber Storage** 45.9 ft³ (1.30 m³) 29.3" (744 mm) Min. Installed Storage* 74.9 ft³ (2.12 m³) 12.2" (310 mm) 45.9" (1166 mm) Weight 85.4" (2169 mm) 74.0 lbs (33.6 kg) **INSTALLED LENGTH** Shipping 30.0" (762 mm) 30 chambers/pallet 60 end caps/pallet 51 0' 12 pallets/truck (1295 mm) *Assumes 6" (150 mm) stone above. below and between chambers and 40% stone porosity. EMBEDMENT STONE SHALL BE A CLEAN, CRUSHED AND ANGULAR STONE WITH AN AASHTO M43 DESIGNATION BETWEEN #3 AND #57 GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES, COMPACT IN 6" (150 mm) MAX LIFTS TO 95% PROCTOR DENSITY. SEE THE TABLE OF ACCEPTABLE FILL MATERIALS. CHAMBERS SHALL MEET THE REQUIREMENTS FOR ASTM F2418 POLYPROPLENE (PP) CHAMBERS OR ASTM F2922 POLYETHYLENE (PE) CHAMBERS CHAMBERS SHALL BE BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". ADS GEOSYTHETICS 601T NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED ANGULAR EMBEDMENT STONE PAVEMENT LAYER (DESIGNED BY SITE DESIGN ENGINEER (2.4 m) MAX (450 m 6" (150 m PERIMETER STONE 30" (760 mm) EXCAVATION WALI (CAN BE SLOPEI OR VERTICAL DEPTH OF STONE TO BE DETERMINED BY SITE DESIGN ENGINEER 6" (150 mm) MIN SC-740 END CA 12" (300 mm) MIN SITE DESIGN ENGINEER IS RESPONSIBLE FOR THE ENSURING THE REQUIRED BEARING 51" (1295 mm) 12" (300 mm) TYP (150 mm) MIN CAPACITY OF SUBGRADE SOILS *MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR. INCREASE COVER TO 24" (600 mm)



StormTech SC-740 Specifications

Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (150 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)		Total System Cumulative Storage ft³ (m³)
42 (1067)	45	5.90 (1.300)	74.90 (2.121)
41 (1041)	45	5.90 (1.300)	73.77 (2.089)
40 (1016)	45	5.90 (1.300)	72.64 (2.057)
39 (991)	Stone 45	5.90 (1.300)	71.52 (2.025)
38 (965)	45	5.90 (1.300)	70.39 (1.993)
37 (940)	45	5.90 (1.300)	69.26 (1.961)
36 (914)	45	5.90 (1.300)	68.14 (1.929)
35 (889)	45	5.85 (1.298)	66.98 (1.897)
34 (864)	4	5.69 (1.294)	65.75 (1.862)
33 (838)	4	5.41 (1.286)	64.46 (1.825)
32 (813)	44	4.81 (1.269)	62.97 (1.783)
31 (787)	44	4.01 (1.246)	61.36 (1.737)
30 (762)	43	3.06 (1.219)	59.66 (1.689)
29 (737)	4	1.98 (1.189)	57.89 (1.639)
28 (711)	4	0.80 (1.155)	56.05 (1.587)
27 (686)	3	9.54 (1.120)	54.17 (1.534)
26 (660)	3	8.18 (1.081)	52.23 (1.479)
25 (635)	30	5.74 (1.040)	50.23 (1.422)
24 (610)	35	5.22 (0.977)	48.19 (1.365)
23 (584)	33	3.64 (0.953)	46.11 (1.306)
22 (559)	31	1.99 (0.906)	44.00 (1.246)
21 (533)	30).29 (0.858)	1.85 (1.185)
20 (508)	28	8.54 (0.808)	39.67 (1.123)
19 (483)	20	6.74 (0.757)	37.47 (1.061)
18 (457)	24	4.89 (0.705)	35.23 (0.997)
17 (432)	23	3.00 (0.651)	32.96 (0.939)
16 (406)	21	1.06 (0.596)	30.68 (0.869)
15 (381)	19	9.09 (0.541)	28.36 (0.803)
14 (356)	17	7.08 (0.484)	26.03 (0.737)
13 (330)	15	5.04 (0.426)	23.68 (0.670)
12 (305)	12	2.97 (0.367)	21.31 (0.608)
11 (279)	10).87 (0.309)	18.92 (0.535)
10 (254)	8	3.74 (0.247)	16.51 (0.468)
9 (229)	(5.58 (0.186)	14.09 (0.399)
8 (203)		4.41 (0.125)	11.66 (0.330)
7 (178)	2	2.21 (0.063)	9.21 (0.264)
6 (152)	1	0 (0)	6.76 (0.191)
5 (127)		0 (0)	5.63 (0.160)
4 (102)	Stone	0 (0)	4.51 (0.128)
3 (76)		0 (0)	3.38 (0.096)
2 (51)		0 (0)	2.25 (0.064)
1 (25)	V	0(0)	1.13 (0.032)

Note: Add 1.13 ft³ (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

Working on a project?

Visit us at adspipe.com/stormtech and utilize the Design Tool



ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com The ADS logo and the Green Stripe are registered trademarks of Advanced Drainage Systems, Inc. StormTech® is a registered trademark of StormTech, Inc. © 2022 Advanced Drainage Systems, Inc. 12/22 CS

Storage Volume Per Chamber ft³ (m³)

	Bare Chamber Storage ft ³ (m ³)	Chamber and Stone Foundation Depth in. (mm)			
		6 (150)	12 (300)	18 (450)	

 SC-740 Chamber
 45.9 (1.3)
 74.9 (2.1)
 81.7 (2.3)
 88.4 (2.5)

 Note:
 Assumes 6" (150 mm) stone above chambers, 6" (150 mm) row spacing and 40% stone porosity.
 150 mm) row

Amount of Stone Per Chamber

English Tons (vds3)	Stone Foundation Depth			
	6″	12″	16″	
SC-740	3.8 (2.8)	4.6 (3.3)	5.5 (3.9)	
Metric Kilograms (m³)	150 mm	300 mm	450 mm	
SC-740	3,450 (2.1)	4,170 (2.5)	4,490 (3.0)	

Note: Assumes 6" (150 mm) of stone above and between chambers.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	6 (150)	12 (300)	18 (450)	
SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)	

Note: Assumes 6" (150 mm) of row separation and 18" (450 mm) of cover. The volume of excavation will vary as depth of cover increases.

