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CIVIL & TRAFFIC ENGINEERS / LAND SURVEYORS / PLANNERS / LANDSCAPE ARCHITECTS

Serving Connecticut, Massachusetts, & Rhode Island

Stormwater Management Statement
Prime Wellness Retail Establishment
45, 59, & 73 John Fitch Blvd.
South Windsor, CT
March 7, 2022

Introduction

Prime Wellness, is proposing a 20-space parking expansion to the existing parking lot currently serving the commercial buildings at 59 and 73 John Fitch Blvd. The parking expansion is proposed on the 45 John Fitch Blvd property. The properties are referenced on the Town of South Windsor Tax Assessors map as GIS # 47700045, 47700059, and 47700073 for 45, 59, & 73 John Fitch Blvd. respectively. The proposed development will include the construction of the 20 space parking lot and associated site improvements to include, but not limited to, landscaping, lighting, and stormwater management BMP's.

The combined tract is $3.77\pm$ acres, $0.30\pm$ acres of which is proposed to be disturbed during construction. For more information, please refer to the plans entitled "Prime Wellness Hybrid Retail Establishment Parking ~ Site Plan of Development ~ 45, 59, & 73 John Fitch Boulevard ~ South Windsor ~ CT ~ Facility Also Known as 75 John Fitch Boulevard" prepared by Design Professionals, Inc., and dated March 7th, 2022, as amended.

Discussion

No runoff from the proposed parking area will enter the stormwater management system for the existing parking lot or John Fitch Boulevard. A $2,557\pm$ cft Stormtech underground infiltration system is proposed to retain, infiltrate, and treat runoff from the new parking area for all storms up to and including the 100-yr, 24-hr storm event. HydroCAD computer modeling software was used to model the storm condition. The Natural Resources Conservation Service's TR-55 Manual was followed in predicting peak rates of runoff and volumes. Rainfall data from NOAA Atlas 14 Point Frequency Estimates was used to generate the 100-yr storm condition for the site. NOAA Atlas 14 rainfall data is included in **Attachment B** for reference.

The design of the infiltration basin considered data from previous soil testing conducted by DPI at neighboring 95 John Fitch Boulevard. Deep test pit data from the testing indicated that high water is expected to be approximately 62"-89" below the surface. Percolation testing also demonstrated that the soil there achieved an infiltration rate greater than 1 min / inch (60 inches / hour). Review of web soil survey data indicated that soils in the area of the proposed underground infiltration system were similar to those at 95 John Fitch Boulevard. With this DPI based design assumptions for the underground infiltration system on this data.

The basin design considered a infiltration rate of 5 inches / hour (maximum recommended rate without field measured soil data), and minimum separation distance of 36" to the high-water elevation as recommended in the CT 2004 Water Quality Manual. The average depth to high water was assumed at $75.5'\pm$ (6.29') below the surface. Considering 75.5" to high water and the

recommended 36" separation distance; the underground chamber system design took credit for infiltration only where the bottom of chamber elevation would be no more than 39.5" (3.29') below the existing surface. With this, only portions of the basin below existing ground elevation 49.00 was considered capable of infiltration (bottom of stone elevation: $45.70 + 3.29 = 48.99$). The final basin design proposes 140 Stormtech SC-160LP chambers, 24 of which will be located within the existing elevation 49 contour. These 24 chambers were the only chambers modeled considering infiltration, the remaining were added solely for retention volume. Please see **Attachments A and D** for HydroCAD model results and the drainage area map for the site respectively.

Water Quality

Both proposed catchbasins will have 2' sumps and trap hoods for preliminary stormwater treatment. The proposed Stormtech underground infiltration system will also include two Isolator rows to further address water quality for the new pavement surface. The isolator rows were sized based on the determined water quality flow rate as recommended in the CT 2004 Water Quality Manual and manufacturer's specifications for treated flow rate per chamber. The two isolation rows will have two chambers each (4 total isolation chambers). See **Attachment C** for water quality flow calcs and Stormtech Isolator row manufacture's specifications.

Conclusion

The proposed stormwater management system upgrades as discussed herein and shown on the referenced plans is appropriate for the proposed development on the subject site and should not pose any detrimental impacts to the environment.

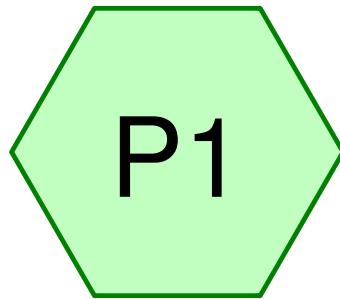
Please contact us with any questions.

Sincerely,
DESIGN PROFESSIONALS, INC.

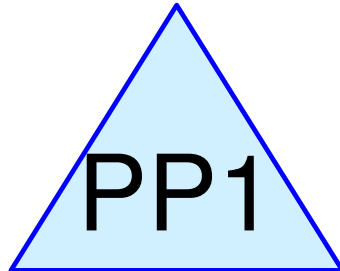


Daniel H. Jameson, P.E.
Project Manager

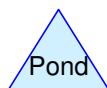
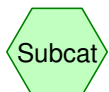
Attachment A
HydroCAD 100-yr summary



Parking Area



Infiltration Basin



Routing Diagram for 3364.H - HydroCAD

Prepared by Design Professionals, Inc. , Printed 3/7/2022
HydroCAD® 10.00-25 s/n 09320 © 2019 HydroCAD Software Solutions LLC

3364.H - HydroCAD

Prepared by Design Professionals, Inc.

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Proposed Conditions

Type III 24-hr 100-yr 24 hr Rainfall=7.75"

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Summary for Subcatchment P1: Parking Area

Runoff = 1.56 cfs @ 12.08 hrs, Volume= 0.126 af, Depth= 7.27"

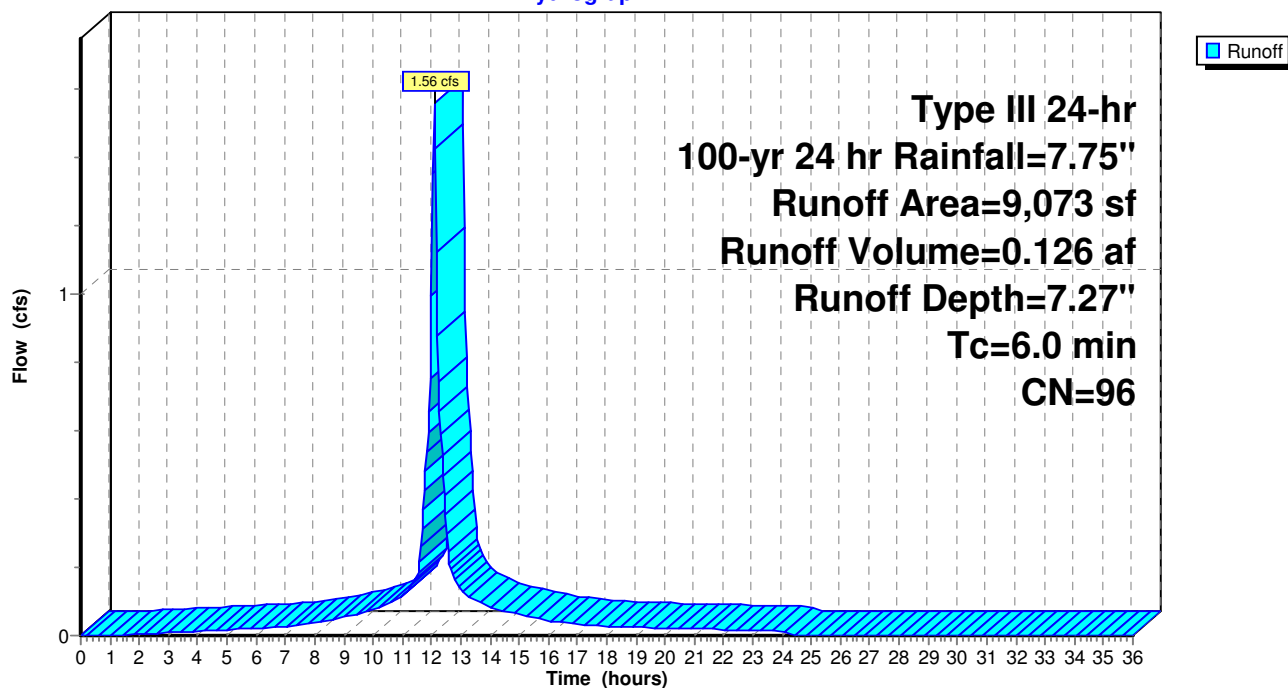
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-yr 24 hr Rainfall=7.75"

Area (sf)	CN	Description
97	80	>75% Grass cover, Good, HSG D
428	61	>75% Grass cover, Good, HSG B
* 8,548	98	IMPERVIOUS
9,073	96	Weighted Average
525		5.79% Pervious Area
8,548		94.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment P1: Parking Area

Hydrograph



3364.H - HydroCAD

Prepared by Design Professionals, Inc.

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Proposed Conditions

Type III 24-hr 100-yr 24 hr Rainfall=7.75"

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Summary for Pond PP1: Infiltration Basin

Inflow Area = 0.208 ac, 94.21% Impervious, Inflow Depth = 7.27" for 100-yr 24 hr event
 Inflow = 1.56 cfs @ 12.08 hrs, Volume= 0.126 af
 Outflow = 0.10 cfs @ 13.57 hrs, Volume= 0.126 af, Atten= 94%, Lag= 89.2 min
 Discarded = 0.10 cfs @ 13.57 hrs, Volume= 0.126 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
 Peak Elev= 47.57' @ 13.57 hrs Surf.Area= 571 sf Storage= 2,431 cf

Plug-Flow detention time= 222.8 min calculated for 0.126 af (100% of inflow)
 Center-of-Mass det. time= 222.7 min (975.6 - 753.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.70'	290 cf	18.67'W x 23.83'L x 2.00'H Field A 890 cf Overall - 164 cf Embedded = 725 cf x 40.0% Voids
#2A	46.20'	164 cf	ADS_StormTech SC-160LP +Cap x 24 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 8 Rows
#3B	45.70'	90 cf	4.08'W x 30.95'L x 2.00'H Field B 253 cf Overall - 27 cf Embedded = 225 cf x 40.0% Voids
#4B	46.20'	27 cf	ADS_StormTech SC-160LP +Cap x 4 Inside #3 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap
#5C	45.70'	1,219 cf	18.67'W x 102.15'L x 2.00'H Field C -Impervious 3,813 cf Overall - 766 cf Embedded = 3,048 cf x 40.0% Voids
#6C	46.20'	766 cf	ADS_StormTech SC-160LP +Cap x 112 Inside #5 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 112 Chambers in 8 Rows
2,557 cf			Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.70'	5.000 in/hr Exfiltration over Wetted area

Discarded OutFlow Max=0.10 cfs @ 13.57 hrs HW=47.57' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.10 cfs)

3364.H - HydroCAD

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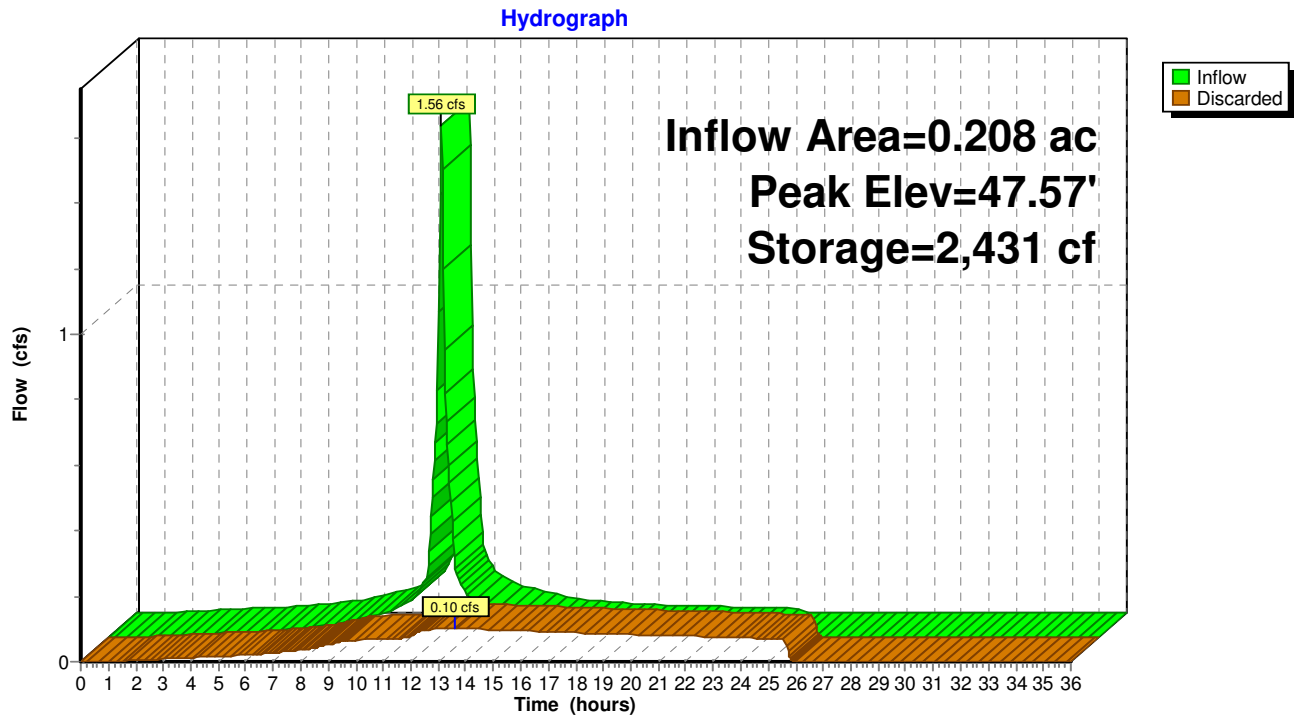
Proposed Conditions

Type III 24-hr 100-yr 24 hr Rainfall=7.75"

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Pond PP1: Infiltration Basin



Attachment B
NOAA Atlas 14 Rainfall Data



NOAA Atlas 14, Volume 10, Version 3
Location name: South Windsor, Connecticut, USA*
Latitude: 41.8019°, Longitude: -72.6202°
Elevation: 54.7 ft**

* source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.334 (0.262-0.426)	0.406 (0.318-0.518)	0.523 (0.408-0.669)	0.620 (0.481-0.798)	0.753 (0.565-1.02)	0.854 (0.628-1.18)	0.959 (0.684-1.38)	1.08 (0.727-1.58)	1.25 (0.809-1.90)	1.39 (0.877-2.16)
10-min	0.474 (0.371-0.604)	0.575 (0.450-0.733)	0.740 (0.578-0.949)	0.878 (0.681-1.13)	1.07 (0.800-1.44)	1.21 (0.889-1.67)	1.36 (0.968-1.95)	1.53 (1.03-2.24)	1.77 (1.15-2.69)	1.96 (1.24-3.06)
15-min	0.557 (0.437-0.710)	0.677 (0.530-0.863)	0.872 (0.681-1.12)	1.03 (0.801-1.33)	1.25 (0.941-1.69)	1.42 (1.05-1.96)	1.60 (1.14-2.29)	1.80 (1.21-2.64)	2.08 (1.35-3.17)	2.31 (1.46-3.60)
30-min	0.747 (0.585-0.951)	0.908 (0.711-1.16)	1.17 (0.915-1.50)	1.39 (1.08-1.79)	1.70 (1.27-2.29)	1.92 (1.41-2.65)	2.16 (1.54-3.10)	2.43 (1.64-3.57)	2.81 (1.82-4.29)	3.13 (1.98-4.87)
60-min	0.936 (0.733-1.19)	1.14 (0.893-1.45)	1.48 (1.15-1.89)	1.75 (1.36-2.26)	2.13 (1.60-2.88)	2.42 (1.78-3.34)	2.72 (1.94-3.91)	3.06 (2.07-4.50)	3.55 (2.30-5.40)	3.94 (2.49-6.14)
2-hr	1.22 (0.958-1.54)	1.47 (1.16-1.87)	1.89 (1.49-2.41)	2.24 (1.75-2.87)	2.72 (2.06-3.66)	3.08 (2.28-4.24)	3.46 (2.49-4.97)	3.91 (2.65-5.71)	4.58 (2.98-6.94)	5.14 (3.26-7.96)
3-hr	1.40 (1.11-1.77)	1.70 (1.34-2.14)	2.18 (1.71-2.76)	2.58 (2.02-3.29)	3.13 (2.37-4.19)	3.53 (2.63-4.86)	3.97 (2.88-5.70)	4.50 (3.05-6.55)	5.30 (3.45-8.01)	5.99 (3.81-9.22)
6-hr	1.75 (1.39-2.19)	2.12 (1.69-2.67)	2.74 (2.17-3.45)	3.25 (2.56-4.11)	3.94 (3.01-5.27)	4.46 (3.34-6.11)	5.02 (3.66-7.19)	5.71 (3.89-8.27)	6.78 (4.43-10.2)	7.69 (4.91-11.8)
12-hr	2.12 (1.70-2.65)	2.60 (2.08-3.25)	3.39 (2.70-4.24)	4.04 (3.20-5.08)	4.93 (3.79-6.55)	5.59 (4.21-7.61)	6.31 (4.63-8.99)	7.20 (4.92-10.4)	8.59 (5.63-12.8)	9.79 (6.26-14.9)
24-hr	2.47 (1.99-3.06)	3.08 (2.48-3.81)	4.06 (3.26-5.06)	4.88 (3.89-6.11)	6.01 (4.65-7.95)	6.83 (5.19-9.29)	7.75 (5.74-11.0)	8.91 (6.10-12.7)	10.8 (7.07-15.9)	12.4 (7.95-18.7)
2-day	2.80 (2.27-3.44)	3.53 (2.86-4.35)	4.74 (3.82-5.86)	5.74 (4.60-7.14)	7.12 (5.55-9.40)	8.11 (6.21-11.0)	9.24 (6.93-13.2)	10.7 (7.37-15.3)	13.2 (8.70-19.4)	15.4 (9.91-23.1)
3-day	3.04 (2.48-3.73)	3.86 (3.13-4.73)	5.18 (4.19-6.38)	6.28 (5.05-7.78)	7.79 (6.10-10.3)	8.89 (6.83-12.0)	10.1 (7.63-14.5)	11.8 (8.12-16.7)	14.6 (9.61-21.4)	17.0 (11.0-25.5)
4-day	3.26 (2.66-3.99)	4.12 (3.36-5.05)	5.53 (4.49-6.80)	6.70 (5.40-8.28)	8.31 (6.52-10.9)	9.47 (7.30-12.8)	10.8 (8.15-15.4)	12.6 (8.66-17.8)	15.5 (10.3-22.7)	18.2 (11.7-27.1)
7-day	3.85 (3.16-4.68)	4.81 (3.94-5.86)	6.39 (5.21-7.81)	7.69 (6.23-9.46)	9.49 (7.47-12.4)	10.8 (8.34-14.5)	12.3 (9.26-17.3)	14.2 (9.83-20.0)	17.4 (11.5-25.3)	20.3 (13.1-30.0)
10-day	4.45 (3.66-5.40)	5.47 (4.49-6.64)	7.13 (5.83-8.68)	8.50 (6.91-10.4)	10.4 (8.20-13.5)	11.8 (9.11-15.7)	13.3 (10.0-18.6)	15.3 (10.6-21.4)	18.6 (12.3-26.9)	21.4 (13.9-31.7)
20-day	6.41 (5.30-7.72)	7.48 (6.18-9.02)	9.23 (7.60-11.2)	10.7 (8.74-13.0)	12.7 (10.0-16.2)	14.2 (10.9-18.6)	15.8 (11.8-21.6)	17.7 (12.4-24.6)	20.7 (13.8-29.8)	23.3 (15.1-34.1)
30-day	8.09 (6.72-9.72)	9.19 (7.62-11.0)	11.0 (9.08-13.3)	12.5 (10.2-15.1)	14.5 (11.5-18.4)	16.1 (12.4-20.8)	17.7 (13.2-23.8)	19.5 (13.7-26.9)	22.2 (14.9-31.7)	24.4 (15.9-35.7)
45-day	10.2 (8.52-12.2)	11.4 (9.45-13.6)	13.2 (11.0-15.9)	14.8 (12.2-17.8)	16.9 (13.4-21.2)	18.5 (14.3-23.7)	20.1 (14.9-26.7)	21.8 (15.4-30.0)	24.1 (16.2-34.3)	25.9 (16.9-37.7)
60-day	12.0 (10.0-14.3)	13.2 (11.0-15.8)	15.1 (12.6-18.1)	16.7 (13.8-20.1)	18.9 (15.0-23.6)	20.6 (15.9-26.3)	22.3 (16.5-29.3)	23.9 (16.9-32.7)	25.9 (17.5-36.7)	27.3 (17.9-39.7)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

Attachment C
WQF &
Stormtech Iso row Specs

Prime Wellness Retail Establishment - DPI No.3364.H

March 07, 2022

Water Quality Flow Calculations

Per 2004 Connecticut Stormwater Quality Manual

Per Appendix B page B-3:

Water Quality Flow (WQF) = (qu)(A)(Q), where:

qu = unit peak discharge (cfs/mi²/inch) per Exhibit 4-III

A = drainage area (mi²)

Q = runoff depth (in watershed inches)

= [Water Quality Volume (WQV) (in acre-feet)] x [12 inches/foot] / drainage area (acres)

ISOLATION CHAMBER DESIGN (CB1 & CB2)

To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:

Time of Concentration (Tc):

6 mins = 0.10 hours

Initial Abstraction (Ia) in inches / Design Precipitation (P) in inches:

Initial abstraction (Ia) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

CN = 96

Ia = 0.083 inches

Design Precipitation (P) = 1" for water quality storms per Appendix B

Ia/P = 0.083

Unit Peak Discharge qu = 650 cfs/mi²/inch

Drainage Area A = 9,073 sf = 0.21 acres = 0.00033 mi²

**Excludes proposed roof area*

Runoff Depth Q = WQV (acre-feet) x 12 / drainage area (acres)

Water Quality Volume (WQV) = (1")(R)(A)/12, where:

R = volumetric runoff coefficient

= 0.05 + 0.009(I), where I = percent impervious cover = 94.21%

R = 0.05 + 0.009(I)

R = 0.05 + 0.009(94.21)

R = 0.898

A = drainage area in acres = 0.21 acres

WQV = (1")(R)(A)/12

WQV = (1")(0.898)(0.21 acres) / 12 in/ft

WQV = 0.0157 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area

Q = (0.0157 acre-feet x 12 in/ft) / 0.21 acres

Q = 0.897 in

WQF = qu x A x Q

WQF = 650 cfs/mi²/inch x 0.00033 mi² x 0.897 in

WQF = **0.192 cfs required**

Proposed

The **two** proposed isolation chamber systems with **2 ~ SC-160LP** Stormtech Chambers each (@ **0.055 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **0.192 cfs** water quality flow. The current design plan will provide **0.22 cfs** of WQF (**4 total chambers**). See isolator row sizing chart included in the appendix.



STORMTECH ISOLATOR ROW SIZING CHART

	SC-160LP	SC-310	SC-740	DC-780	MC-3500	MC-4500
Chamber Area (Sq.Ft.)	11.4	20	27.8	27.8	43.2	30.1
Treated Flow Rate per chamber (CFS)	0.055	0.11	0.15	0.15	0.24	0.17

NOTE: Testing of the Isolator Row verified by NJCAT. It has shown to have a TSS removal efficiency of 84% for SIL-CO-SIL 250. MASTEP verification of up to 83% TSS of the OK-110.

NJCAT verified Treated Flow Rate (GPM / Sq.Ft.) 2.5



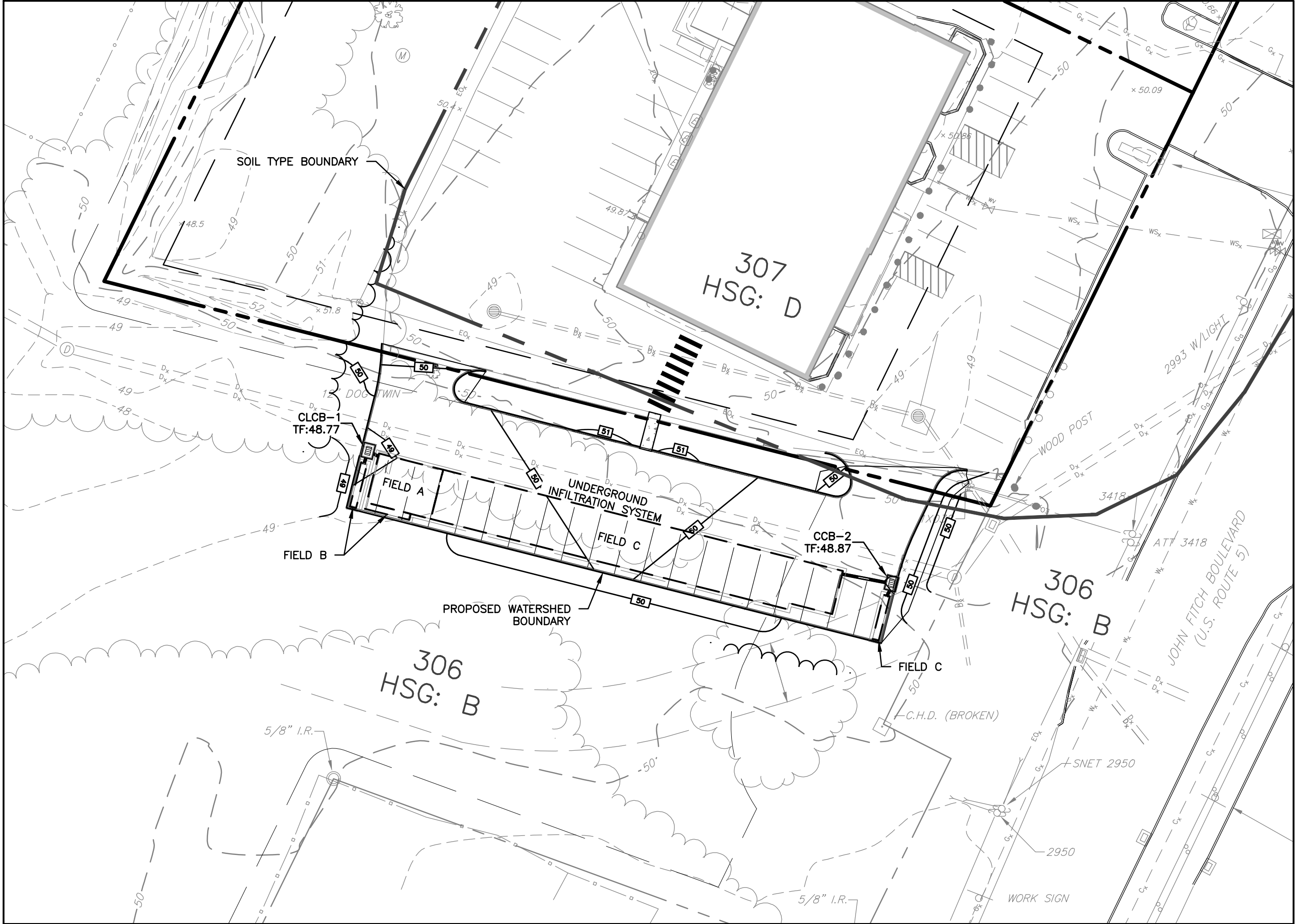
For more information contact ADS at
 800-821-6710 or visit www.ads-pipe.com

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Attachment D Drainage Area Map

File: C:\jos\336\33641\Engineering\Stormwater\33641\1 Site Plan-Drainage.dwg Layout: 11 X 17 TB Plotted: 3/7/2022 8:49 AM Last Saved: 3/4/2022 5:38 PM Last Saved By: Daniel Janeson



SCALE: 0 15' 30' 60'



DRAWING		DRAINAGE AREA MAP		
C-DA1				
NO.	DATE	REVISIONS		BY

PRIME WELLNESS RETAIL ESTABLISHMENT
45, 59, & 73 JOHN FITCH BLVD.
FACILITY ALSO KNOWN AS 75 JOHN FITCH BLVD.
SOUTH WINDSOR, CONNECTICUT

PROJECT NO:	3364.H
DATE:	03/07/22
DESIGN BY:	DHJ
DRAWN BY:	DHJ

design professionals
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