Stormwater Management Report
Property of Mehak Realty, LLC
64-66 Willimantic Road
Chaplin, Connecticut

October 18, 2021

Prepared for:

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1.0 INTRODUCTION

Mehak Realty, LLC is proposing to develop the 2.96 acre site at 64-66 Willimantic Road (Route 6) in Chaplin, Connecticut. The site is located on the western side of Willimantic Road (Route 6) as shown on Figure 1 – Site Location Map. There is an area of inland wetlands on the western side of the site. The wetlands flow to a pipe on the neighboring property and goes to the Natchaug River.

The site is located in FEMA Flood Hazard Zone C (area of minimal flooding) per the Flood Insurance Rate map (FIRM) Town of Chaplin, Connecticut, Windham County, Panel 11 of 20, Community Number 0901790011A effective January 6, 1982. See Figure 2 – FIRMette.

The topography on the site generally forms from the western edge of the existing driveway and flows either to Willimantic Road, western to the onsite wetlands or southerly. Per the Natural Resources Conservation Service (NRCS) Web Soil Survey, soils within the development area are generally classified as soils Merrimac fine sandy loam (Hydrologic Soil Group A) and Hinckley loamy sand (Hydrologic Soil Group A).

The site currently has a vacant house with driveway to Willimantic Road, barn and several dilapidated buildings. Proposed work includes demolition of existing buildings, construction of a new 4,960 SF convenience store, gas pump canopy, diesel pump canopy and associated site work.

2.0 PURPOSE OF REPORT

The purpose of this report is to analyze and quantify the stormwater runoff conditions for the pre-development and post-development conditions and design a stormwater management system to manage the increased stormwater peak discharges.

This report presents the basis of the hydrologic and hydraulic analysis and design for the new stormwater management system in accordance with the Connecticut Department of Transportation (CTDOT) Drainage Manual (Drainage Manual) and the 2004 Connecticut Stormwater Quality Manual (SQM) to the greatest extent practical.

Figure 1 – Site Location Map

MAP REFERENCE:

SECTION OF THE USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP FOR SPRING HILL, CT. MAP VERSION DATE 2021.

1000 0 1000 2000 3000

APPROXIMATE SCALE IN FEET

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DRAINAGE REPORT
FIGURE 1
USGS SITE LOCATION MAP

CONVENIENCE STORE & FUELING STATION
64-66 WILLIMANTIC ROAD, CHAPLIN, CT

MEHAK REALTY LLC

SCALE
1" = 2000'±

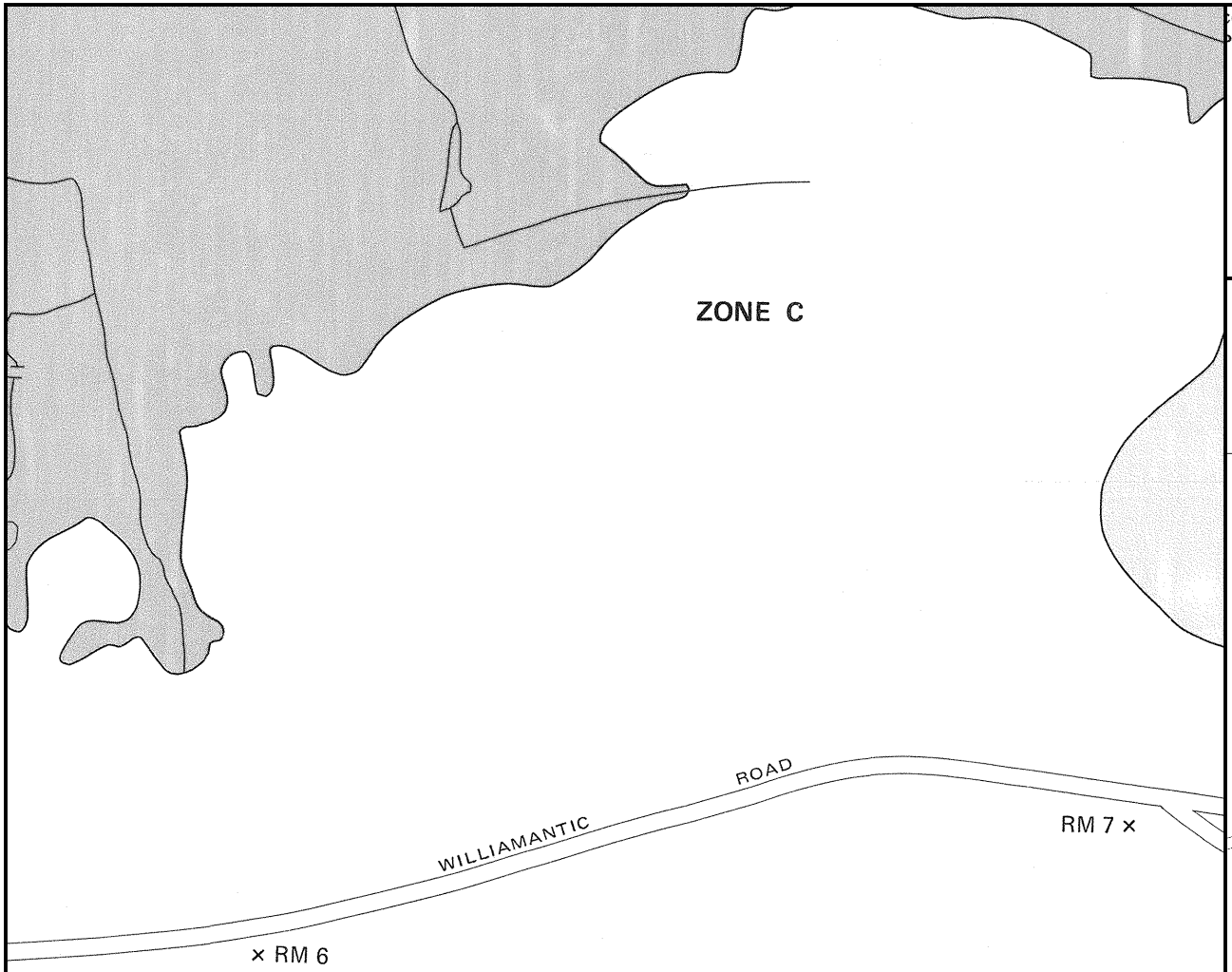
COMM. NO.
07BC1.05

DATE
09/09/2021

1

V:\CT\CHAPLIN\WILLIAMANTIC RD-64-66\CONVENIENCE STORE-GAS STATION\DWGS\NON PLANSET DWG\USGS SITE LOC.DWG Tab: SITE LOC MAP Saved: 9/9/2021 9:39 AM Plotted: 9/9/2021 9:41 AM

Figure 2 – FIRMette



ontact your insurance agent, or call the National Flood Insurance rogram at (800) 638-6620.

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
CHAPLIN,
CONNECTICUT
WINDHAM COUNTY

PANEL 11 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
090179 0011 A

EFFECTIVE DATE:
JANUARY 6, 1982

federal emergency management agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://msc.fema.gov.

3.0 ANALYSIS PARAMETERS

Three design points were selected as the analysis points (see Figure 3 – Pre-Development Watershed Map and Figure 4 – Post-Development Watershed Map):

- Design Point #1 is located on the property line along Willimantic Road.
- Design Point #2 is located on the southern property line.
- Design Point #3 is located on the edge of the onsite wetlands.

4.0 BASIS OF DESIGN

The basis of the drainage design is as follows:

1. Maintain overall drainage patterns.
2. Capture, store and infiltrate the runoff volume from the developed areas for the 2 year, 10 year, 25 year and 100 year, 24 hour events.
3. Attenuate post development peak discharge rates for the 2 year, 10 year, 25 year and 100 year, 24 hour events.
4. Stormwater treatment systems are designed to meet, to the greatest extend practical, the water quality goals per the SQM.
5. Building roof drainage systems are designed to convey runoff from a 100 year storm event.

5.0 STORMWATER MANAGEMENT

5.1 Existing Conditions

The site is mostly undeveloped grass, brush woodland with some a vacant house, barn, small buildings and a driveway to Willimantic Road. Existing runoff is directed to three drainage areas.

- Drainage Area DA1 - Approximately 0.14 acres of grass, driveway, part of the house roof, and woods. This drainage area sheetflows to Willimantic Road.
- Drainage Area DA2 – Approximately 1.64 acres of barn, grass and woods. This drainage area sheetflows to the southern property line.
- Drainage Area DA3 – Approximately 0.60 acres of grass, woods and buildings. This drainage area sheetflows to the limit of onsite wetlands.

Figure 3 – Pre-Development Watershed Map

Figure 4 – Post-Development Watershed Map

Figure 5 – STORMWATER SUMMARY

PEAK RATE OF RUNOFF (CFS) SUMMARY

STORM FREQUENCY	DRAINAGE AREA DA1 - WILLIMANTIC ROAD			DRAINAGE AREA DA2 - SOUTHERN PROPERTY LINE		
	EXISTING	PROPOSED	CHANGE	EXISTING	PROPOSED	CHANGE
2 YEAR	0.11	0.00	-0.11	0.00	0.00	0.00
10 YEAR	0.29	0.19	-0.10	0.06	0.02	-0.02
25 YEAR	0.43	0.33	-0.10	0.27	0.09	-0.18
100 YEAR	0.65	0.62	-0.03	0.88	0.36	-0.52

STORM FREQUENCY	DRAINAGE AREA DA3 - ONSITE WETLANDS		
	EXISTING	PROPOSED	CHANGE
2 YEAR	0.00	0.00	0.00
10 YEAR	0.01	0.01	0.00
25 YEAR	0.04	0.03	-0.01
100 YEAR	0.20	0.17	-0.03

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DRAINAGE REPORT
FIGURE 5 - STORMWATER SUMMARY

NEW CONVENIENCE STORE AND FUELING STATION
64-66 WILLIMANTIC ROAD, CHAPLIN, CT
PREPARED FOR:
MEHAK REALTY LLC

SCALE
N.T.S.

COMM. NO.
07BC1.05

DATE
09-08-2021

5

V:\CT\CHAPLIN\WILLIAMANTIC RD-64-66\CONVENIENCE STORE-GAS STATION\DWGS\NON PLANSET DWG\DRAINAGE REPORT FIGURES\DRAINAGE REPORT FIGURES.DWG Tab: FIGURE 6 Saved: 9/8/2021 1:48 PM Plotted: 9/8/20

5.2 Proposed Conditions

Developed DA1

Developed Drainage Area DA1A is approximately 0.11 acres of grass, pavement, and woods that sheetflows to Willimantic Road.

Developed Drainage Area DA1B is approximately 0.89 acres including the new building, new canopies, a portion of the new paved area and landscaped areas. The roof drains from the new building and new canopies will be piped to the new StormTech SC-740 infiltration system. The paved area in this drainage area sheetflows towards Willimantic Road and is collected in catch basins and trench drains then piped to the infiltration system.

The infiltration system in DA1B is designed to remove fine sediment and pollutants and attenuate peak flows for the 2 year, 10 year, 25 year and 100 year storm events. Per the SQM, the infiltration system is based on permeability tests and soil testing performed onsite. The infiltration system uses an infiltration rate of 5 inches/hour, which is less than the range of 36.5 inches/hour to 67 inches/hour (permeability results of TH DD, EE and FF). The bottom elevation of the infiltration system is designed to maintain a minimum of 3 feet from any seasonally high water table per the SQM. An outlet control structure is provided that is connected to an existing catch basin in Willimantic Road.

Pretreatment is provided with the isolator rows in the infiltration system. The isolator row is designed to capture the "first flush" or Water Quality Volume (See Water Quality Calculations in the Technical Appendix). Other pretreatment best management practices include deep sump catch basins.

Developed DA2

Developed Drainage Area DA2 is approximately 0.47 acres of grass and landscaped area that sheetflows to the southern property line.

Developed DA3

Developed Drainage Area DA3A is approximately 0.41 acres of the rest of the new paved area. The runoff from the paved area will be collected in catch basins and piped to a new infiltration system.

The infiltration system in DA3A is designed to remove fine sediment and pollutants and attenuate peak flows for the 2 year, 10 year, 25 year and 100 year storm events. Per the SQM, the infiltration system is based on permeability tests and soil testing performed onsite. The infiltration system uses an infiltration rate of 5 inches/hour, which is less than the range of 14 inches/hour to 50.5 inches/hour (permeability results of TH CC and HH). The bottom elevation of the infiltration system is designed to maintain a minimum of 3 feet from any seasonally high water table per the SQM. An outlet control structure is provided that will outlet to a level spreader then overland flow to the existing onsite wetlands.

Pretreatment is provided with the isolator rows in the infiltration system. The isolator row is designed to capture the "first flush" or Water Quality Volume (See Water Quality Calculations in the Technical Appendix). Other pretreatment best management practices include deep sump catch basins.

Developed Drainage Area 3B is approximately 0.56 acres of grass, landscaped areas and woods that sheetflow to the existing onsite wetlands.

6.0 SOURCE CONTROL AND POLLUTION PREVENTION MAINTENANCE AND OPERATION

Source control and pollution prevention practices for this project are intended to eliminate the generation of pollutants at their source, reduce the types and concentration of pollutants in stormwater runoff and to assure that the BMPs continue to function to remove oil and grease and TSS. The site property managers will be responsible for maintaining the stormwater management system and the goal of this section is to inform managers about system operations.

The following maintenance and operation measures are recommended for source control.

Parking Lots

Parking lots will be swept, at a minimum, in the spring to remove winter accumulations of road sand.

Landscaping

Normal landscaping maintenance shall consist of pruning, mulching, planting, mowing lawns, raking leaves, etc. Use of fertilizers and pesticides will be controlled and limited to minimal amounts necessary for healthy landscape maintenance.

Trees will be fertilized no more than once in the spring with an organic fertilizer. Shrubs and lawn will be fertilized with an organic slow-release fertilizer each spring. Liming of lawn areas to control pH will also be done in the spring if soil testing indicates that it is necessary.

Pesticides will only be used as a control method when a problem has been clearly identified and other natural control methods are not successful. All pesticide applications shall be by licensed applicators, where necessary.

Trash Collection

Trash receptacles service the facility and a dumpster exists on-site. The pickup of trash will occur on a regular basis and all trash will be disposed of legally off-site.

Outdoor Storage

There will be no outdoor storage of hazardous chemicals, fertilizer, pesticides, or herbicides anywhere on site.

Snow Removal & Storage

Snow shall be shoveled and plowed from sidewalk and parking areas as soon as practical during and after winter storms and deposited in snow storage areas on the site or removed.

Catch Basins and Manholes

A Connecticut-Licensed hauler shall pump the sumps of onsite catch basins and manholes, and shall dispose of the sand legally.

For the first three years each catch basin and manhole shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum “Vactor” type of maintenance equipment. After the first three years the inspection schedule may be adjusted to meet actual operating conditions however, one inspection shall always be conducted in April.

Stormtech SC-740 Isolator row

The isolator row shall be cleaned at the end of construction once the contributing areas are fully stabilized. For the first year of operation following construction, the chamber rows shall be inspected once every 6 months.

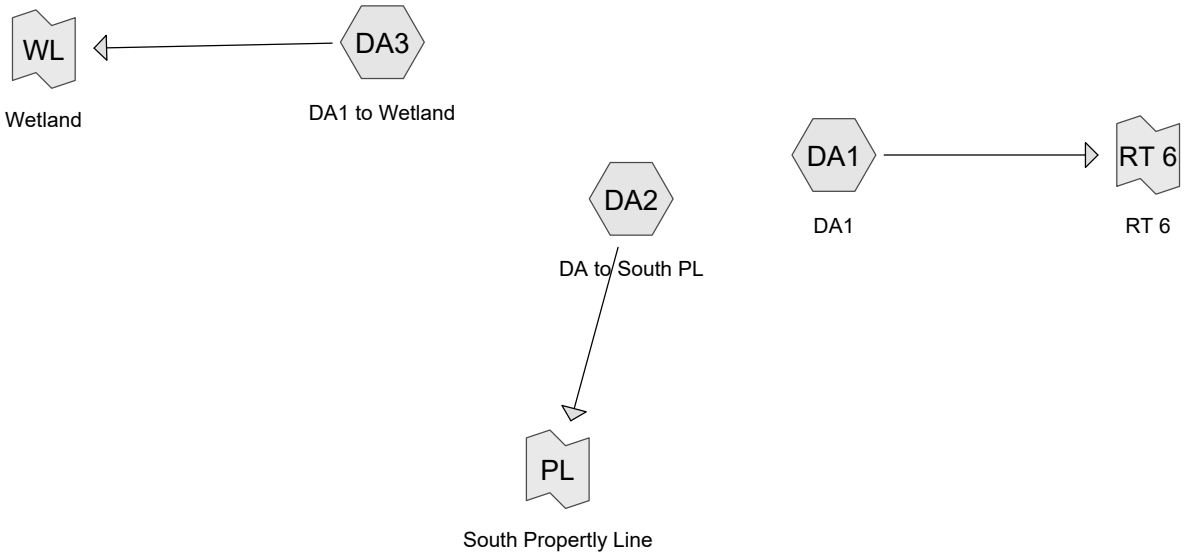
After the first year of operation, the chambers shall be inspected a minimum of once per year. If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of the sediment. When the average depth of accumulation exceeds 3", a clean-out should be performed and properly disposed off-site. Clean-out should be accomplished using a jetvac process.

A detailed maintenance logbook shall be kept onsite for the units by the property owner/manager. Information is to include, but not be limited to, the date of inspection, record of sediment depth, general observations, and date of cleaning performed.

7.0 CONCLUSION

The new site improvements are consistent with the Town of Chaplin Zoning Regulations, Connecticut Department of Transportation (CTDOT) Drainage Manual (Drainage Manual) and the 2004 Connecticut Stormwater Quality Manual (SQM) to the greatest extent practical. The new stormwater management improvements have been designed to attenuate the post-development peak discharge rates for the 2-year, 10-year, 25-year and 100-year, 24-hour storm events at each of the Design Points.

Appendix A: PRE-CONSTRUCTION HYDROCAD REPORT



Subcat Reach Pond Link

Routing Diagram for MEHAK EX REV2 SRM

Prepared by Loureiro Engineering Associates, Inc., Printed 9/8/2021

HydroCAD® 10.10-5a s/n 06006 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YEAR	Type III 24-hr		Default	24.00	1	3.37	2
2	10-YEAR	Type III 24-hr		Default	24.00	1	5.05	2
3	25-YEAR	Type III 24-hr		Default	24.00	1	6.10	2
4	100-YEAR	Type III 24-hr		Default	24.00	1	7.72	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.816	39	>75% Grass cover, Good, HSG A (DA1, DA2, DA3)
0.042	98	Paved roads w/curbs & sewers, HSG A (DA1)
0.009	83	Paved roads w/open ditches, 50% imp, HSG A (DA2)
0.085	98	Unconnected roofs, HSG A (DA1, DA2, DA3)
0.428	30	Woods, Good, HSG A (DA1, DA2, DA3)

Summary for Subcatchment DA1: DA1

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
421	30	Woods, Good, HSG A
1,830	98	Paved roads w/curbs & sewers, HSG A
2,870	39	>75% Grass cover, Good, HSG A
1,058	98	Unconnected roofs, HSG A
6,179	66	Weighted Average
3,291		53.26% Pervious Area
2,888		46.74% Impervious Area
1,058		36.63% Unconnected

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.00 cfs @ 23.96 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Adj	Description
1,873	98		Unconnected roofs, HSG A
380	83		Paved roads w/open ditches, 50% imp, HSG A
6,414	30		Woods, Good, HSG A
62,874	39		>75% Grass cover, Good, HSG A
71,541	40	39	Weighted Average, UI Adjusted
69,478			97.12% Pervious Area
2,063			2.88% Impervious Area
1,873			90.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0400	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.8	202	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.0	302	Total			

Summary for Subcatchment DA3: DA1 to Wetland

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Adj	Description
758	98		Unconnected roofs, HSG A
13,345	39		>75% Grass cover, Good, HSG A
11,827	30		Woods, Good, HSG A
25,930	37	36	Weighted Average, UI Adjusted
25,172			97.08% Pervious Area
758			2.92% Impervious Area
758			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0350	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.7	146	0.0170	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.8	246	Total			

Summary for Link PL: South Propertly Line

Inflow Area = 1.642 ac, 2.88% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 23.96 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 23.96 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.142 ac, 46.74% Impervious, Inflow Depth = 0.73" for 2-YEAR event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Primary = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.595 ac, 2.92% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1: DA1

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 0.021 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
421	30	Woods, Good, HSG A
1,830	98	Paved roads w/curbs & sewers, HSG A
2,870	39	>75% Grass cover, Good, HSG A
1,058	98	Unconnected roofs, HSG A
6,179	66	Weighted Average
3,291		53.26% Pervious Area
2,888		46.74% Impervious Area
1,058		36.63% Unconnected

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.06 cfs @ 12.69 hrs, Volume= 0.029 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Adj	Description
1,873	98		Unconnected roofs, HSG A
380	83		Paved roads w/open ditches, 50% imp, HSG A
6,414	30		Woods, Good, HSG A
62,874	39		>75% Grass cover, Good, HSG A
71,541	40	39	Weighted Average, UI Adjusted
69,478			97.12% Pervious Area
2,063			2.88% Impervious Area
1,873			90.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0400	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.8	202	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.0	302	Total			

Summary for Subcatchment DA3: DA1 to Wetland

Runoff = 0.01 cfs @ 14.98 hrs, Volume= 0.006 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Adj	Description
758	98		Unconnected roofs, HSG A
13,345	39		>75% Grass cover, Good, HSG A
11,827	30		Woods, Good, HSG A
25,930	37	36	Weighted Average, UI Adjusted
25,172			97.08% Pervious Area
758			2.92% Impervious Area
758			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0350	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.7	146	0.0170	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.8	246	Total			

Summary for Link PL: South Propertly Line

Inflow Area = 1.642 ac, 2.88% Impervious, Inflow Depth = 0.21" for 10-YEAR event
Inflow = 0.06 cfs @ 12.69 hrs, Volume= 0.029 af
Primary = 0.06 cfs @ 12.69 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.142 ac, 46.74% Impervious, Inflow Depth = 1.76" for 10-YEAR event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 0.021 af
Primary = 0.29 cfs @ 12.08 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.595 ac, 2.92% Impervious, Inflow Depth = 0.12" for 10-YEAR event
Inflow = 0.01 cfs @ 14.98 hrs, Volume= 0.006 af
Primary = 0.01 cfs @ 14.98 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1: DA1

Runoff = 0.43 cfs @ 12.08 hrs, Volume= 0.030 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
421	30	Woods, Good, HSG A
1,830	98	Paved roads w/curbs & sewers, HSG A
2,870	39	>75% Grass cover, Good, HSG A
1,058	98	Unconnected roofs, HSG A
6,179	66	Weighted Average
3,291		53.26% Pervious Area
2,888		46.74% Impervious Area
1,058		36.63% Unconnected

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.27 cfs @ 12.52 hrs, Volume= 0.065 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Adj	Description
1,873	98		Unconnected roofs, HSG A
380	83		Paved roads w/open ditches, 50% imp, HSG A
6,414	30		Woods, Good, HSG A
62,874	39		>75% Grass cover, Good, HSG A
71,541	40	39	Weighted Average, UI Adjusted
69,478			97.12% Pervious Area
2,063			2.88% Impervious Area
1,873			90.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0400	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.8	202	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.0	302	Total			

Summary for Subcatchment DA3: DA1 to Wetland

Runoff = 0.04 cfs @ 12.63 hrs, Volume= 0.016 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Adj	Description
758	98		Unconnected roofs, HSG A
13,345	39		>75% Grass cover, Good, HSG A
11,827	30		Woods, Good, HSG A
25,930	37	36	Weighted Average, UI Adjusted
25,172			97.08% Pervious Area
758			2.92% Impervious Area
758			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0350	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.7	146	0.0170	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.8	246	Total			

Summary for Link PL: South Propertly Line

Inflow Area = 1.642 ac, 2.88% Impervious, Inflow Depth = 0.47" for 25-YEAR event
Inflow = 0.27 cfs @ 12.52 hrs, Volume= 0.065 af
Primary = 0.27 cfs @ 12.52 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.142 ac, 46.74% Impervious, Inflow Depth = 2.51" for 25-YEAR event
Inflow = 0.43 cfs @ 12.08 hrs, Volume= 0.030 af
Primary = 0.43 cfs @ 12.08 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.595 ac, 2.92% Impervious, Inflow Depth = 0.32" for 25-YEAR event
Inflow = 0.04 cfs @ 12.63 hrs, Volume= 0.016 af
Primary = 0.04 cfs @ 12.63 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1: DA1

Runoff = 0.65 cfs @ 12.08 hrs, Volume= 0.045 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
421	30	Woods, Good, HSG A
1,830	98	Paved roads w/curbs & sewers, HSG A
2,870	39	>75% Grass cover, Good, HSG A
1,058	98	Unconnected roofs, HSG A
6,179	66	Weighted Average
3,291		53.26% Pervious Area
2,888		46.74% Impervious Area
1,058		36.63% Unconnected

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.88 cfs @ 12.39 hrs, Volume= 0.143 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Adj	Description
1,873	98		Unconnected roofs, HSG A
380	83		Paved roads w/open ditches, 50% imp, HSG A
6,414	30		Woods, Good, HSG A
62,874	39		>75% Grass cover, Good, HSG A
71,541	40	39	Weighted Average, UI Adjusted
69,478			97.12% Pervious Area
2,063			2.88% Impervious Area
1,873			90.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0400	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.8	202	0.0300	1.21		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.0	302	Total			

Summary for Subcatchment DA3: DA1 to Wetland

Runoff = 0.20 cfs @ 12.48 hrs, Volume= 0.039 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Adj	Description
758	98		Unconnected roofs, HSG A
13,345	39		>75% Grass cover, Good, HSG A
11,827	30		Woods, Good, HSG A
25,930	37	36	Weighted Average, UI Adjusted
25,172			97.08% Pervious Area
758			2.92% Impervious Area
758			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0350	0.10		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
2.7	146	0.0170	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
19.8	246	Total			

Summary for Link PL: South Propertly Line

Inflow Area = 1.642 ac, 2.88% Impervious, Inflow Depth = 1.04" for 100-YEAR event
Inflow = 0.88 cfs @ 12.39 hrs, Volume= 0.143 af
Primary = 0.88 cfs @ 12.39 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.142 ac, 46.74% Impervious, Inflow Depth = 3.78" for 100-YEAR event
Inflow = 0.65 cfs @ 12.08 hrs, Volume= 0.045 af
Primary = 0.65 cfs @ 12.08 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

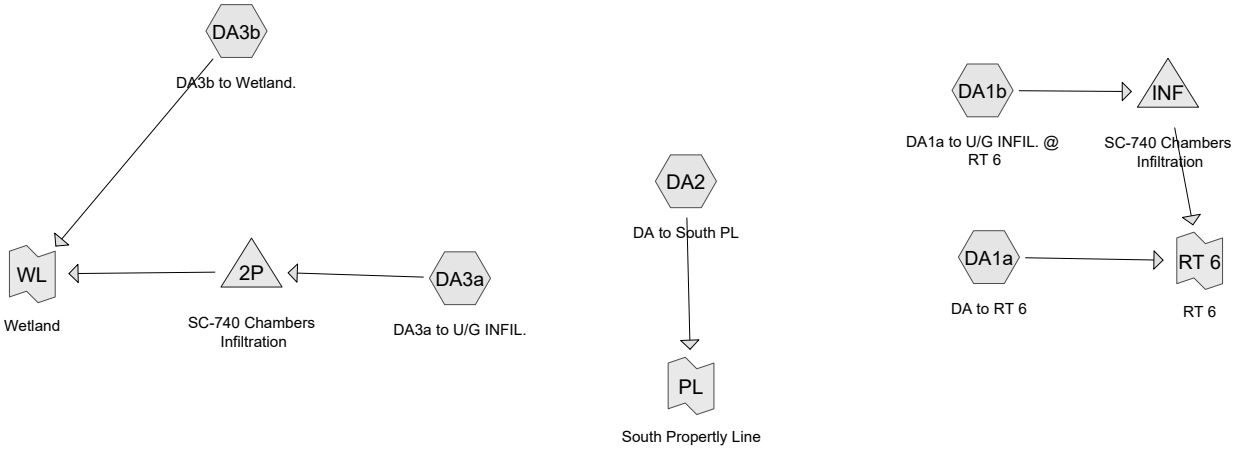
Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.595 ac, 2.92% Impervious, Inflow Depth = 0.79" for 100-YEAR event
Inflow = 0.20 cfs @ 12.48 hrs, Volume= 0.039 af
Primary = 0.20 cfs @ 12.48 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Appendix B: POST-CONSTRUCTION HYDROCAD REPORT



Subcat Reach Pond Link

Routing Diagram for MEHAK PR REV5 SRM

Prepared by Loureiro Engineering Associates, Inc., Printed 9/8/2021

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YEAR	Type III 24-hr		Default	24.00	1	3.37	2
2	10-YEAR	Type III 24-hr		Default	24.00	1	5.05	2
3	25-YEAR	Type III 24-hr		Default	24.00	1	6.10	2
4	100-YEAR	Type III 24-hr		Default	24.00	1	7.72	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.013	39	>75% Grass cover, Good, HSG A (DA1a, DA1b, DA2, DA3a, DA3b)
0.396	98	Paved parking, HSG A (DA1a, DA3a)
0.609	98	Paved roads w/curbs & sewers, HSG A (DA1b)
0.195	98	Roofs, HSG A (DA1b)
0.211	30	Woods, Good, HSG A (DA1a, DA3b)

Summary for Subcatchment DA1a: DA to RT 6

Runoff = 0.00 cfs @ 15.57 hrs, Volume= 0.000 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
3,809	39	>75% Grass cover, Good, HSG A
429	30	Woods, Good, HSG A
400	98	Paved parking, HSG A
4,638	43	Weighted Average
4,238		91.38% Pervious Area
400		8.62% Impervious Area

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

Summary for Subcatchment DA1b: DA1a to U/G INFIL. @ RT 6

Runoff = 2.64 cfs @ 12.07 hrs, Volume= 0.186 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
8,514	98	Roofs, HSG A
26,531	98	Paved roads w/curbs & sewers, HSG A
3,686	39	>75% Grass cover, Good, HSG A
38,731	92	Weighted Average
3,686		9.52% Pervious Area
35,045		90.48% Impervious Area

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.00 cfs @ 23.75 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
20,269	39	>75% Grass cover, Good, HSG A
20,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3a: DA3a to U/G INFIL.

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 0.095 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
16,870	98	Paved parking, HSG A
771	39	>75% Grass cover, Good, HSG A
17,641	95	Weighted Average
771		4.37% Pervious Area
16,870		95.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3b: DA3b to Wetland.

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.37"

Area (sf)	CN	Description
15,578	39	>75% Grass cover, Good, HSG A
8,765	30	Woods, Good, HSG A
24,343	36	Weighted Average
24,343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	100	0.0170	0.07		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
24.0	830	0.0068	0.58		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
46.8	930	Total			

Summary for Pond 2P: SC-740 Chambers Infiltration

Inflow Area = 0.405 ac, 95.63% Impervious, Inflow Depth = 2.81" for 2-YEAR event
Inflow = 1.30 cfs @ 12.07 hrs, Volume= 0.095 af
Outflow = 0.33 cfs @ 11.87 hrs, Volume= 0.095 af, Atten= 74%, Lag= 0.0 min
Discarded = 0.33 cfs @ 11.87 hrs, Volume= 0.095 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 289.63' @ 12.43 hrs Surf.Area= 2,885 sf Storage= 888 cf

Plug-Flow detention time= 17.3 min calculated for 0.095 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (795.7 - 778.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	289.00'	2,606 cf	**30.00'W x 96.18'L x 3.50'H Field A** 10,099 cf Overall - 3,583 cf Embedded = 6,515 cf x 40.0% Voids
#2A	289.50'	3,583 cf	**ADS_StormTech SC-740 +Cap** x 78 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 78 Chambers in 6 Rows
#3	295.00'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		6,277 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	289.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 289.00' / 288.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	290.60'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	291.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	289.00'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.33 cfs @ 11.87 hrs HW=289.13' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=289.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond INF: SC-740 Chambers Infiltration

Inflow Area = 0.889 ac, 90.48% Impervious, Inflow Depth = 2.51" for 2-YEAR event
Inflow = 2.64 cfs @ 12.07 hrs, Volume= 0.186 af
Outflow = 0.55 cfs @ 11.83 hrs, Volume= 0.186 af, Atten= 79%, Lag= 0.0 min
Discarded = 0.55 cfs @ 11.83 hrs, Volume= 0.186 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 286.29' @ 12.49 hrs Surf.Area= 4,783 sf Storage= 2,064 cf

Plug-Flow detention time= 24.1 min calculated for 0.186 af (100% of inflow)
Center-of-Mass det. time= 24.1 min (819.1 - 795.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	285.50'	4,491 cf	**191.50'W x 24.98'L x 3.50'H Field A** 16,741 cf Overall - 5,513 cf Embedded = 11,228 cf x 40.0% Voids
#2A	286.00'	5,513 cf	**ADS_StormTech SC-740 +Cap** x 120 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 40 Rows
#3	291.50'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		10,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	286.00'	**12.0" Round Culvert** L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.00' / 285.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	286.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	287.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	285.50'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.55 cfs @ 11.83 hrs HW=285.63' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.55 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=285.50' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PL: South Propertly Line

Inflow Area = 0.465 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 23.75 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 23.75 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.996 ac, 81.73% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 15.57 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 15.57 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.964 ac, 40.18% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1a: DA to RT 6

Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
3,809	39	>75% Grass cover, Good, HSG A
429	30	Woods, Good, HSG A
400	98	Paved parking, HSG A
4,638	43	Weighted Average
4,238		91.38% Pervious Area
400		8.62% Impervious Area

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

Summary for Subcatchment DA1b: DA1a to U/G INFIL. @ RT 6

Runoff = 4.24 cfs @ 12.07 hrs, Volume= 0.307 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
8,514	98	Roofs, HSG A
26,531	98	Paved roads w/curbs & sewers, HSG A
3,686	39	>75% Grass cover, Good, HSG A
38,731	92	Weighted Average
3,686		9.52% Pervious Area
35,045		90.48% Impervious Area

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.02 cfs @ 12.45 hrs, Volume= 0.008 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
20,269	39	>75% Grass cover, Good, HSG A
20,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3a: DA3a to U/G INFIL.

Runoff = 2.02 cfs @ 12.07 hrs, Volume= 0.151 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
16,870	98	Paved parking, HSG A
771	39	>75% Grass cover, Good, HSG A
17,641	95	Weighted Average
771		4.37% Pervious Area
16,870		95.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3b: DA3b to Wetland.

Runoff = 0.01 cfs @ 15.44 hrs, Volume= 0.005 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.05"

Area (sf)	CN	Description
15,578	39	>75% Grass cover, Good, HSG A
8,765	30	Woods, Good, HSG A
24,343	36	Weighted Average
24,343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	100	0.0170	0.07		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
24.0	830	0.0068	0.58		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
46.8	930	Total			

Summary for Pond 2P: SC-740 Chambers Infiltration

Inflow Area = 0.405 ac, 95.63% Impervious, Inflow Depth = 4.47" for 10-YEAR event
Inflow = 2.02 cfs @ 12.07 hrs, Volume= 0.151 af
Outflow = 0.33 cfs @ 11.74 hrs, Volume= 0.151 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.33 cfs @ 11.74 hrs, Volume= 0.151 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 290.03' @ 12.53 hrs Surf.Area= 2,885 sf Storage= 1,825 cf

Plug-Flow detention time= 34.1 min calculated for 0.151 af (100% of inflow)
Center-of-Mass det. time= 34.1 min (801.1 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	289.00'	2,606 cf	**30.00'W x 96.18'L x 3.50'H Field A** 10,099 cf Overall - 3,583 cf Embedded = 6,515 cf x 40.0% Voids
#2A	289.50'	3,583 cf	**ADS_StormTech SC-740 +Cap** x 78 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 78 Chambers in 6 Rows
#3	295.00'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		6,277 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	289.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 289.00' / 288.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	290.60'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	291.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	289.00'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.33 cfs @ 11.74 hrs HW=289.14' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=289.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond INF: SC-740 Chambers Infiltration

Inflow Area = 0.889 ac, 90.48% Impervious, Inflow Depth = 4.14" for 10-YEAR event
Inflow = 4.24 cfs @ 12.07 hrs, Volume= 0.307 af
Outflow = 0.73 cfs @ 12.52 hrs, Volume= 0.307 af, Atten= 83%, Lag= 27.0 min
Discarded = 0.55 cfs @ 11.68 hrs, Volume= 0.295 af
Primary = 0.17 cfs @ 12.52 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 286.84' @ 12.52 hrs Surf.Area= 4,783 sf Storage= 4,090 cf

Plug-Flow detention time= 45.0 min calculated for 0.307 af (100% of inflow)
Center-of-Mass det. time= 45.0 min (826.4 - 781.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	285.50'	4,491 cf	**191.50'W x 24.98'L x 3.50'H Field A** 16,741 cf Overall - 5,513 cf Embedded = 11,228 cf x 40.0% Voids
#2A	286.00'	5,513 cf	**ADS_StormTech SC-740 +Cap** x 120 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 40 Rows
#3	291.50'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		10,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	286.00'	**12.0" Round Culvert** L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.00' / 285.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	286.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	287.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	285.50'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.55 cfs @ 11.68 hrs HW=285.63' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.55 cfs)

Primary OutFlow Max=0.17 cfs @ 12.52 hrs HW=286.84' (Free Discharge)
└**1=Culvert** (Passes 0.17 cfs of 2.20 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 2.00 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PL: South Propertly Line

Inflow Area = 0.465 ac, 0.00% Impervious, Inflow Depth = 0.21" for 10-YEAR event
Inflow = 0.02 cfs @ 12.45 hrs, Volume= 0.008 af
Primary = 0.02 cfs @ 12.45 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.996 ac, 81.73% Impervious, Inflow Depth = 0.18" for 10-YEAR event
Inflow = 0.19 cfs @ 12.50 hrs, Volume= 0.015 af
Primary = 0.19 cfs @ 12.50 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.964 ac, 40.18% Impervious, Inflow Depth = 0.07" for 10-YEAR event
Inflow = 0.01 cfs @ 15.44 hrs, Volume= 0.005 af
Primary = 0.01 cfs @ 15.44 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1a: DA to RT 6

Runoff = 0.05 cfs @ 12.12 hrs, Volume= 0.006 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
3,809	39	>75% Grass cover, Good, HSG A
429	30	Woods, Good, HSG A
400	98	Paved parking, HSG A
4,638	43	Weighted Average
4,238		91.38% Pervious Area
400		8.62% Impervious Area

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

Summary for Subcatchment DA1b: DA1a to U/G INFIL. @ RT 6

Runoff = 5.23 cfs @ 12.07 hrs, Volume= 0.383 af, Depth= 5.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
8,514	98	Roofs, HSG A
26,531	98	Paved roads w/curbs & sewers, HSG A
3,686	39	>75% Grass cover, Good, HSG A
38,731	92	Weighted Average
3,686		9.52% Pervious Area
35,045		90.48% Impervious Area

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
20,269	39	>75% Grass cover, Good, HSG A
20,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3a: DA3a to U/G INFIL.

Runoff = 2.46 cfs @ 12.07 hrs, Volume= 0.186 af, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
16,870	98	Paved parking, HSG A
771	39	>75% Grass cover, Good, HSG A
17,641	95	Weighted Average
771		4.37% Pervious Area
16,870		95.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3b: DA3b to Wetland.

Runoff = 0.03 cfs @ 13.16 hrs, Volume= 0.015 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
15,578	39	>75% Grass cover, Good, HSG A
8,765	30	Woods, Good, HSG A
24,343	36	Weighted Average
24,343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	100	0.0170	0.07		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
24.0	830	0.0068	0.58		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
46.8	930	Total			

Summary for Pond 2P: SC-740 Chambers Infiltration

Inflow Area = 0.405 ac, 95.63% Impervious, Inflow Depth = 5.51" for 25-YEAR event
Inflow = 2.46 cfs @ 12.07 hrs, Volume= 0.186 af
Outflow = 0.33 cfs @ 11.68 hrs, Volume= 0.186 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.33 cfs @ 11.68 hrs, Volume= 0.186 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 290.30' @ 12.57 hrs Surf.Area= 2,885 sf Storage= 2,450 cf

Plug-Flow detention time= 47.2 min calculated for 0.186 af (100% of inflow)
Center-of-Mass det. time= 47.2 min (809.5 - 762.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	289.00'	2,606 cf	**30.00'W x 96.18'L x 3.50'H Field A** 10,099 cf Overall - 3,583 cf Embedded = 6,515 cf x 40.0% Voids
#2A	289.50'	3,583 cf	**ADS_StormTech SC-740 +Cap** x 78 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 78 Chambers in 6 Rows
#3	295.00'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		6,277 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	289.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 289.00' / 288.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	290.60'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	291.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	289.00'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.33 cfs @ 11.68 hrs HW=289.13' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=289.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond INF: SC-740 Chambers Infiltration

Inflow Area = 0.889 ac, 90.48% Impervious, Inflow Depth = 5.17" for 25-YEAR event
Inflow = 5.23 cfs @ 12.07 hrs, Volume= 0.383 af
Outflow = 0.85 cfs @ 12.53 hrs, Volume= 0.383 af, Atten= 84%, Lag= 27.5 min
Discarded = 0.55 cfs @ 11.61 hrs, Volume= 0.349 af
Primary = 0.30 cfs @ 12.53 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 287.18' @ 12.53 hrs Surf.Area= 4,783 sf Storage= 5,294 cf

Plug-Flow detention time= 52.0 min calculated for 0.383 af (100% of inflow)
Center-of-Mass det. time= 52.0 min (827.8 - 775.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	285.50'	4,491 cf	**191.50'W x 24.98'L x 3.50'H Field A** 16,741 cf Overall - 5,513 cf Embedded = 11,228 cf x 40.0% Voids
#2A	286.00'	5,513 cf	**ADS_StormTech SC-740 +Cap** x 120 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 40 Rows
#3	291.50'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		10,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	286.00'	**12.0" Round Culvert** L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.00' / 285.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	286.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	287.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	285.50'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.55 cfs @ 11.61 hrs HW=285.63' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.55 cfs)

Primary OutFlow Max=0.30 cfs @ 12.53 hrs HW=287.18' (Free Discharge)
└**1=Culvert** (Passes 0.30 cfs of 3.12 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 3.45 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PL: South Propertly Line

Inflow Area = 0.465 ac, 0.00% Impervious, Inflow Depth = 0.47" for 25-YEAR event
Inflow = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af
Primary = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.996 ac, 81.73% Impervious, Inflow Depth = 0.49" for 25-YEAR event
Inflow = 0.33 cfs @ 12.47 hrs, Volume= 0.041 af
Primary = 0.33 cfs @ 12.47 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.964 ac, 40.18% Impervious, Inflow Depth = 0.18" for 25-YEAR event
Inflow = 0.03 cfs @ 13.16 hrs, Volume= 0.015 af
Primary = 0.03 cfs @ 13.16 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Subcatchment DA1a: DA to RT 6

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
3,809	39	>75% Grass cover, Good, HSG A
429	30	Woods, Good, HSG A
400	98	Paved parking, HSG A
4,638	43	Weighted Average
4,238		91.38% Pervious Area
400		8.62% Impervious Area

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

Summary for Subcatchment DA1b: DA1a to U/G INFIL. @ RT 6

Runoff = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
8,514	98	Roofs, HSG A
26,531	98	Paved roads w/curbs & sewers, HSG A
3,686	39	>75% Grass cover, Good, HSG A
38,731	92	Weighted Average
3,686		9.52% Pervious Area
35,045		90.48% Impervious Area

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

Summary for Subcatchment DA2: DA to South PL

Runoff = 0.36 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
20,269	39	>75% Grass cover, Good, HSG A
20,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3a: DA3a to U/G INFIL.

Runoff = 3.14 cfs @ 12.07 hrs, Volume= 0.240 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
16,870	98	Paved parking, HSG A
771	39	>75% Grass cover, Good, HSG A
17,641	95	Weighted Average
771		4.37% Pervious Area
16,870		95.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, SHEET FLOW**

Summary for Subcatchment DA3b: DA3b to Wetland.

Runoff = 0.13 cfs @ 12.85 hrs, Volume= 0.037 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=7.72"

Area (sf)	CN	Description
15,578	39	>75% Grass cover, Good, HSG A
8,765	30	Woods, Good, HSG A
24,343	36	Weighted Average
24,343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	100	0.0170	0.07		**Sheet Flow, Sheet Flow** Grass: Bermuda n= 0.410 P2= 3.37"
24.0	830	0.0068	0.58		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
46.8	930	Total			

Summary for Pond 2P: SC-740 Chambers Infiltration

Inflow Area = 0.405 ac, 95.63% Impervious, Inflow Depth = 7.12" for 100-YEAR event
Inflow = 3.14 cfs @ 12.07 hrs, Volume= 0.240 af
Outflow = 0.38 cfs @ 12.60 hrs, Volume= 0.240 af, Atten= 88%, Lag= 32.0 min
Discarded = 0.33 cfs @ 11.59 hrs, Volume= 0.238 af
Primary = 0.05 cfs @ 12.60 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 290.74' @ 12.60 hrs Surf.Area= 2,885 sf Storage= 3,422 cf

Plug-Flow detention time= 67.9 min calculated for 0.240 af (100% of inflow)
Center-of-Mass det. time= 67.9 min (824.8 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	289.00'	2,606 cf	**30.00'W x 96.18'L x 3.50'H Field A** 10,099 cf Overall - 3,583 cf Embedded = 6,515 cf x 40.0% Voids
#2A	289.50'	3,583 cf	**ADS_StormTech SC-740 +Cap** x 78 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 78 Chambers in 6 Rows
#3	295.00'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		6,277 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	289.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 289.00' / 288.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	290.60'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	291.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	289.00'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.33 cfs @ 11.59 hrs HW=289.13' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.05 cfs @ 12.60 hrs HW=290.74' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 4.22 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.29 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond INF: SC-740 Chambers Infiltration

Inflow Area = 0.889 ac, 90.48% Impervious, Inflow Depth = 6.77" for 100-YEAR event
Inflow = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af
Outflow = 1.13 cfs @ 12.52 hrs, Volume= 0.501 af, Atten= 83%, Lag= 27.2 min
Discarded = 0.55 cfs @ 11.37 hrs, Volume= 0.423 af
Primary = 0.58 cfs @ 12.52 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs
Peak Elev= 287.78' @ 12.52 hrs Surf.Area= 4,783 sf Storage= 7,257 cf

Plug-Flow detention time= 62.1 min calculated for 0.501 af (100% of inflow)
Center-of-Mass det. time= 62.1 min (831.2 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	285.50'	4,491 cf	**191.50'W x 24.98'L x 3.50'H Field A** 16,741 cf Overall - 5,513 cf Embedded = 11,228 cf x 40.0% Voids
#2A	286.00'	5,513 cf	**ADS_StormTech SC-740 +Cap** x 120 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 40 Rows
#3	291.50'	88 cf	**4.00'D x 7.00'H Vertical Cone/Cylinder**
		10,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	286.00'	**12.0" Round Culvert** L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.00' / 285.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	286.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	287.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.6' Crest Height
#4	Discarded	285.50'	**5.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.55 cfs @ 11.37 hrs HW=285.63' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.55 cfs)

Primary OutFlow Max=0.53 cfs @ 12.52 hrs HW=287.78' (Free Discharge)
└**1=Culvert** (Passes 0.53 cfs of 4.29 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 5.09 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.08 cfs @ 0.61 fps)

Summary for Link PL: South Propertly Line

Inflow Area = 0.465 ac, 0.00% Impervious, Inflow Depth = 1.04" for 100-YEAR event
Inflow = 0.36 cfs @ 12.11 hrs, Volume= 0.040 af
Primary = 0.36 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link RT 6: RT 6

Inflow Area = 0.996 ac, 81.73% Impervious, Inflow Depth = 1.09" for 100-YEAR event
Inflow = 0.62 cfs @ 12.52 hrs, Volume= 0.090 af
Primary = 0.62 cfs @ 12.52 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Summary for Link WL: Wetland

Inflow Area = 0.964 ac, 40.18% Impervious, Inflow Depth = 0.49" for 100-YEAR event
Inflow = 0.17 cfs @ 12.84 hrs, Volume= 0.039 af
Primary = 0.17 cfs @ 12.84 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.01 hrs

Appendix C: WATER QUALITY VOLUME AND WATER QUALITY FLOW CALCULATIONS

WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA1A - NORTH TRENCH DRAIN

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.18 ac	A = Area draining to the practice
0.14 ac	A_I = Impervious area draining to the practice
0.78 decimal	I = Percent impervious area draining to the practice, in decimal form
0.75 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.14 ac-in	WQV = 1" x R_V x A
490 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.75 inches	Q = Water Quality Depth. Q=WQV/A
98 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.3 inches	S = potential maximum retention. S = (1000/CN) - 10
0.051 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 $cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.138 cfs	WQF = qu x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 3 units = 0.45 CFS

Contributing WQF = 0.138 CFS

Treated flow rate is greater than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA1A - ROOF & CB

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.23 ac	A = Area draining to the practice
0.23 ac	A_I = Impervious area draining to the practice
1.00 decimal	I = Percent impervious area draining to the practice, in decimal form
0.95 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.22 ac-in	WQV = 1" x R_V x A
793 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.95 inches	Q = Water Quality Depth. Q=WQV/A
100 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.0 inches	S = potential maximum retention. S = (1000/CN) - 10
0.009 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 $cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.224 cfs	WQF = qu x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 3 units = 0.45 CFS

Contributing WQF = 0.22 CFS

Treated flow rate is greater than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA1A - SOUTH TRENCH DRAIN

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.37 ac	A = Area draining to the practice
0.37 ac	A_I = Impervious area draining to the practice
1.00 decimal	I = Percent impervious area draining to the practice, in decimal form
0.95 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.35 ac-in	WQV = 1" x R_V x A
1,276 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.95 inches	Q = Water Quality Depth. Q=WQV/A
100 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.0 inches	S = potential maximum retention. S = (1000/CN) - 10
0.009 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 $cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.360 cfs	WQF = qu x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 3 units = 0.45 CFS

Contributing WQF = 0.36 CFS

Treated flow rate is greater than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA1A - NORTH CB

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.11 ac	A = Area draining to the practice
0.06 ac	A_I = Impervious area draining to the practice
0.55 decimal	I = Percent impervious area draining to the practice, in decimal form
0.54 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.06 ac-in	WQV = 1" x R_V x A
216 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.54 inches	Q = Water Quality Depth. Q=WQV/A
95 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.6 inches	S = potential maximum retention. S = (1000/CN) - 10
0.113 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 $cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.061 cfs	WQF = qu x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 3 units = 0.45 CFS

Contributing WQF = 0.061 CFS

Treated flow rate is greather than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA3A - NORTH CB

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.31 ac	A = Area draining to the practice
0.31 ac	A_I = Impervious area draining to the practice
1.00 decimal	I = Percent impervious area draining to the practice, in decimal form
0.95 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.29 ac-in	WQV = 1" x R_V x A
1,069 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.95 inches	Q = Water Quality Depth. Q=WQV/A
100 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.0 inches	S = potential maximum retention. S = (1000/CN) - 10
0.009 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 cfs/mi^2/in	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.301 cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 10 units = 1.50 CFS

Contributing WQF = 0.301 CFS

Treated flow rate is greather than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA DA3A - SOUTH CB

Project:	**NEW CONVENIENCE STORE AND FUELING STATION**	**Calculated By**	**Date**
Comm. No.:	**07BC1.05**	SRM	9/8/2021
Client:	**MEHAK REALTY LLC**	**Checked By**	**Date**
Location:	**64-66 WILLIMANTIC ROAD, CHAPLIN, CT**		

Water Quality Volume (WQV)

0.09 ac	A = Area draining to the practice
0.09 ac	A_I = Impervious area draining to the practice
1.00 decimal	I = Percent impervious area draining to the practice, in decimal form
0.95 unitless	R_V = Runoff coefficient = 0.05 + (0.9 x I)
0.09 ac-in	WQV = 1" x R_V x A
310 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.95 inches	Q = Water Quality Depth. Q=WQV/A
100 unitless	CN = unit peak discharge curve number. $CN=1000/(10+5P+10Q-10*[Q^2+1.25*Q*P]^{0.5})$
0.0 inches	S = potential maximum retention. S = (1000/CN) - 10
0.009 inches	Ia = initial abstraction. Ia=0.2S
5.0 minutes	T_c = Time of Concentration
655.0 $cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.088 cfs	WQF = qu x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer Notes:

Pre-treatment Sizing:

Stormtech SC-740 Isolator Rows:

Treated flow rate = 0.15 CFS per unit times 6 units = 0.90 CFS

Contributing WQF = 0.0.088 CFS

Treated flow rate is greather than Water Quality Flow

qu obtained from exhibit 4-III for NRCS type III rainfall distribution

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Appendix D: STORMWATER MAINTENANCE PROGRAM AND CHECKLIST

64-66 Willimantic Road, Chaplin

Stormwater Management System Maintenance Program

There shall be periodic maintenance of the stormwater systems on the property after installation. In order to ensure effective performance of the system, the following stormwater maintenance program has been established. The property owner will be responsible for implementation of this program. A log and schedule of all inspections, cleanings, and repairs shall be maintained by the property owner. All maintenance documents shall be transferred to any future owners upon sale or transfer of the property.

A. Catch basins/manholes

Catch basins are designed with sumps for the purpose of collecting coarse sediment. All catch basins should be inspected two times per year, specifically during times for high levels of maintenance around the site. Sediment should be removed when it extends to within 6 inches of the outlet pipe invert or not less than once per year. Cleanout should be facilitated via vacuum truck or other means that accomplish sediment removal. The sediment shall be disposed of in an approved off-site location in accordance with town and state requirements.

B. Asphalt

Asphalt areas should be swept annually. Ideal sweeping timeframe is in the spring after winter sanding or salting for deicing. Deicing chemicals should be kept to a minimum during the winter months.

C. Subsurface detention systems

Underground detention systems shall be inspected through the surface openings quarterly and sediment/debris shall be removed as needed to ensure proper functioning of structures and inlets/outlets. Areas of disturbance that may be as a result of cleaning shall be seeded and planted in accordance with the original planting plan. Associated structures shall be maintained yearly, or more frequently, as required, by the condition of the site and system. Waste material will be properly disposed of off-site.

D. Lawn and vegetated areas

Vegetated cover shall be maintained on all earth surfaces to minimize soil erosion. Fertilizer use should be minimized and applied using careful application processes.

E. Level spreader

Level spreader shall be inspected quarterly and sediment/debris shall be removed as needed to ensure proper functioning. Concrete sill should be inspected to ensure structural integrity and any signs of failure.

64-66 Willimantic Road, Chaplin

Stormwater Management System Maintenance Checklist

Inspection Date: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
Drainage Structures			
Sedimentation Accumulation			
Large Floating Debris			
Inlet/Outlet			
Structure walls			
Riser			
Frame and Cover			
Subsurface Detention/Retention System			
Settling Over System			
Sedimentation Accumulation			
Large Floating Debris			
Inspection Structure Integrity			
Inspection Structure Frame and Cover			
Surrounding Lawn and Vegetated Areas			
Signs of Erosion			
Ponding/Settling			
Overgrowth			

Additional Comments: _____

_____

_____