1211 Western Avenue

City of Albany, NY 12203

PREPARED FOR

GSX Ventures
7 Old Solomon's Island Road
Annapolis, MD 21401

PREPARED BY

100 Great Oaks Boulevard
Suite 118
Albany, NY 12203
518.389.3600

February 4, 2018

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Appendices

1

Introduction

SWPPP Report Description

The Stormwater Pollution Prevention Plan was prepared for the 1211 Western Avenue Residential use project in accordance with the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002) and the NYSDEC Stormwater Management Design Manual. The General Permit authorizes stormwater discharge to surface waters of the state for construction projects involving soil disturbance of one or more acres. The design parameters outlined herein and on the project site plans describe the measures necessary to control runoff and pollutants from the site during and after construction.

This SWPPP document provides the following information (where applicable), as required by the SPDES Permit:

- Site Description
- Development Description
- Drainage Characteristics
- Soil Characteristics
- Rare and Endangered Species Data
- Construction Phasing Information
- Pollution Prevention Practices
- Erosion and Sedimentation Control BMPs
- Grading, Drainage and Erosion Control Plans
- SPDES Permit and Fact Sheet
- Notice of Intent (NOI) Form
- MS4 Acceptance Form
- Notice of Termination (NOT) Form
- Inspection Forms, Monitoring and Reporting Requirements
- Contractor Certification Form

Existing Site Description

The overall property consists of a single parcel totaling 0.92 acres located at 1211 Western Avenue in the City of Albany, Albany County, New York. The overall property is identified by Tax Map number 64.22-1-10.

The project coordinates obtained from the NYSDEC Environmental Resource Mapper are:

Longitude and Latitude: E -73.821 N 42.676

The property is currently developed with an existing commercial office and parking. The general area surrounding the property is a mix of residential, institutional and commercial businesses.

Proposed Project Description

The project currently proposes to construct a single building containing a 136 unit multi-family residential building with a parking garage on the lower levels. The apartment building is a combination of 6 stories and 3 stories with a footprint of 28,489 S.F.. Approximately 154 new parking stalls will be constructed.

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Existing Site Conditions

Existing Watershed Descriptions

The proposed project encompasses the lands of 1211 Western Avenue in the City of Albany, Albany County, New York. The project site total is 0.92 acres, while the drainage area is ±1.1 acres. The site is bounded by Western Avenue on the south, with a commercial building to the west, a parking lot to the east and north with some residential properties to the northwest. The site consists of a commercial office building with associated parking lot.

Public water and sanitary sewer are available on site.

Sensitive Resource Areas

The project site is not within a sensitive resource area.

Surface Waters and Wetlands

This site does not contain ACOE wetlands, so no impacts are proposed as a result of this project.

Rare, Threatened or Endangered Species

Based on the database search of the NYS Natural Heritage Program (NYSNHP), no Rare, Threatened or Endangered Species are believed to utilize the project site.

Flood Plain

Based on the historic Flood Insurance Rate Map (FIRM), map number 36001C0187D, effective March 16, 2015, the site is within an area of minimal flood hazard.

Historical Places

The construction of the project will not have an effect on cultural resources or properties listed on the State or National Registers of Historic Places.

SEQR

The project is going through the SEQR review as part of the site plan approval process with the City of Albany.

Soils

According to the NRCS Web Soil Survey for Albany County, the soils found on the project site are generally loamy, moderately well-draining soils. A summary of the soils found on the site follows in Table 1:

Table 1 NRCS Soil Data

Soil Symbol	Description	Hydrologic Soil Group	Drainage Class
Us	Urban Land-Udipsamments	-	Well Drained
Ur	Urban Land	-	-
EnA	Elnora fine sand	A/D	Well Drained

Source: NRCS Web Soil Survey

Rainfall Data

The rainfall amounts for the 24-hour rainfall event were obtained from the NYSDEC Stormwater Manual and are summarized below:

- WQ 90% rainfall = 1.15 in.
- 1-year rainfall = 2.2 in.
- 2-year rainfall = 2.7 in.
- 10-year rainfall = 4.0 in.
- 100-year rainfall = 6.6 in.

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Post Development Conditions

Proposed Site Development

The SWPPP has been developed to ensure water quality and quantity is maintained during the construction and operation of all of the proposed project's components. This project falls under the guidelines of the "Reconstruction" criteria set forth in the NYSDEC SWMDM. A description of the site components is provided below:

Building Pad Site

A level area will be graded around the proposed building pad areas to construct the foundations. Once foundations and general layout are complete, the remainder of the disturbed area will be graded to tie into the existing ground using sloped lawns and pavement. A grading plan for the site is included in the Site Plan Submission set.

Access and Parking

The access to the project site will be via a private drive from Western Avenue. Parking will be provided by interior garages under the proposed building and accessed off of the main entry drive.

Construction Staging Area

A temporary staging area for the construction of the project will be provided on site. The area will be used for storage of equipment, materials and contractor parking.

Spoil Area

The potential spoil area for the project is identified on the construction drawings. This area will be used for wasting excess cut material and temporary stockpiling of material during earthwork operations.

Project Impacts

The property developed and occupied by the applicant is operated as a residential multi-family project. This project is classified as reconstruction. The following is a summary of the impacts associated with the construction of the proposed project:

Table 2 Impact Summary

Existing Impervious Area (Ac.)	Limit of Tree Clearing (Ac.)	Area of Disturbance (Ac.)	Proposed Impervious Area (Ac.)
0.811	0.116	1.1	1.0

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Stormwater Management Assessment

General Permit Requirements

A stormwater management assessment of the project has been conducted pursuant to the 2015 NYS DEC Stormwater Management Design Manual and the NYSDEC General Permit No. GP-0-15-002. A Stormwater Pollution Prevention Plan (SWPPP) has been prepared based on the project involving the disturbance of more than one (1) acre of land as part of the large common plan of development.

Stormwater Management Design Objectives

The following design objectives were the basis of the Stormwater Management System for the proposed project:

- Provide temporary and permanent erosion control measures
- Develop an adequate drainage system to convey stormwater runoff and prevent flooding on and off site.
- Provide for the water quality treatment of the stormwater runoff and control flows to the pre-development 10 and 100-year rates, based on the NYSDEC Stormwater Management Design Manual.

The following section outlines the steps taken in the development of the proposed stormwater management system with regard to Runoff Reduction values for the added impervious areas:

Step1 – Evaluation of Green Infrastructure Planning

As part of the stormwater management design planning process, the following practices were evaluated:

Conservation of Natural Areas:

The added development is kept as close to the existing commercially developed areas as possible thereby reducing impacts to Natural Areas.

Sheetflow to Riparian Buffers and Filter Strips

Sheetflow is not used as there is not enough sheet flow length to meet the criteria.

Vegetated Swales

The developed site does not have sufficient room for vegetated swales.

Tree Planting/Tree Pits

New landscaping will complement the existing environment. No credit has been applied for proposed tree planting.

Disconnection of Rooftop Runoff

Rooftop disconnect was not considered for this project, as the buildings are located within large paved areas.

Stream Daylighting

Stream daylighting is not available for the proposed project.

Rain Gardens/BioRetention

Bioretention is not proposed to obtain RRv.

Green Roofs

Green roofs are not utilized for this project, however a blue roof is.

Stormwater Planter

The stormwater planter practice is not proposed for this project.

Rain Barrels and Cisterns

Rain barrels and cisterns were not considered for this project, due to the commercial nature of the use.

Porous Pavement

Porous pavement is utilized in this project.

Infiltration System

Porous pavement is used with a Rainstore Chamber system beneath for storage while storm events infiltrate.

Step 2 – Water Quality Treatment

The project has been evaluated with regard to water quality and water quantity control. Based on the existing site characteristics, runoff leaves the site under the existing conditions. This project falls under the guidelines for Redevelopment.

The **Initial** water quality treatment volume is calculated below, based on the equation **WQv=[(P) (Rv) (A)] / 12**

- Site Area (Ac.) = 1.306
- Impervious Area (Ac.) = 0.995
- Percent Impervious = 76.2%
- Rv = 0.74
- Rainfall (in) = 1.15
- **WQv (ac-ft) = 0.092**

The Target Water Quality Volume is as follows;
WQv Target= (N) (WQv)+(0.25)(R)(WQv)

WQv=0.092
N= 0.184 ac
R= 0.811 ac.
WQv Target=0.036 ac.-ft.

The calculations in the appendix provide a breakdown of the treatment requirements.

Step 3 – Runoff Reduction by Applying Green Infrastructure Techniques and SMPs with RRv Capacity

As a redevelopment project this project does not require RRv, however green infrastructure practices are used that do provide RRv and WQv. The project provides 0.061 ac-ft of WQv (and RRv) through the use of a Blue Roof system and porous pavement with infiltration, and is detailed in the WQv Calculations provided in the Appendix.

Step 4 – Apply SMP to Address Remaining Water Quality Volume

The Water Quality Volume & RRv for the project site are managed through the use of a Blue Roof and a porous pavement system.

Step 5 – Apply Volume and Peak Rate Control Practices to Meet Requirements

The volume and rate control is addressed in a Blue Roof system and drywells. This analysis was performed using HydroCAD version 10.0 utilizing the Dynamic Storage Indicator calculation method. The resulting data is presented in the following tables, and the calculations are included in Appendix D of this report.

Existing Analysis

The existing site was divided into two watersheds with a single analysis point. Based on the existing cover conditions, the topography of the site, and the large amount of impervious area and poor infiltration rate, there is currently runoff which leaves the site during all storm events. The proposed design was developed to match the existing runoff pattern from the site.

The Existing Conditions Drainage Area figures and associated HydroCAD calculations are included in Appendix D.

Proposed Conditions Analysis

The proposed site was divided into 7 watersheds with a single analysis point. The treated watershed is the Blue Roof areas and the west side of the site that drains to the porous pavement system. Treated subcatchments are designated as 1B & 1D in the HydroCAD model and have a combined WQv of 0.036 ac.-ft.. Other portions of the roof (courtyards) are not treated and are discharged directly to the roof leaders. The runoff rates are summarized in the table below.

The Proposed Conditions Drainage Area figures and associated HydroCAD calculations are also included in Appendix D.

PRE AND POST CONSTRUCTION RUNOFF RATES (CFS)

	Design Point	WQv	1-yr	10-yr	100-yr
EXISTING	AP-1	0.15	0.76	2.34	11.65
PROPOSED	AP-1	0.07	0.56	1.93	4.10
DIFFERENCE		-0.08	-0.20	-0.41	-7.55

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Erosion and Sediment Control

Erosion and Sediment Control Practices

During construction, the following procedures and practices will be followed:

- Cleared brush, debris, and soils will be stockpiled up slope from erosion and sediment controls.
- Equipment cleaning, maintenance, and repair will be conducted in designated areas protected by berms or other acceptable means.
- The contractor will ensure that the project site is litter free at the close of each working day. The contractor will dispose of construction debris as decided upon with the owner and in accordance with all applicable regulations.
- Portable sanitary facilities will be made available to construction personnel, if permanent facilities are unavailable, and will be serviced regularly.
- The contractor will provide the owner with a description of controls to manage waste, reduce pollutants (including storage practices), spill prevention, and response to spills.
- Any construction chemicals will be disposed of in accordance with applicable regulations and will not be disposed of into the stormwater system.
- The vehicle washout and concrete washout area designated on the plans should be cleaned whenever sediment is deposited.
- The construction drive will be maintained immediately if any sediment is dropped, spilled or washed on the drive.

Temporary Erosion Control Practices

During construction the contractor is required to install and maintain temporary erosion and sediment control measures to prevent sediment and debris from washing into the drainage systems and/or leaving the site. At such time that all the restoration of the construction area is completed and the areas of disturbance are permanently

stabilized, the contractor will then be permitted to remove the temporary erosion and sediment control devices.

The temporary erosion and sediment control devices will be installed prior to the start of any disturbance of the existing ground surface and will remain in place until all disturbed areas are properly stabilized. In addition to the temporary erosion and sediment control devices indicated on the Erosion and Sediment Control Details plan, the contractor shall be responsible to install any additional measures that may be needed. These additional erosion preventative measures will be installed in accordance with the "New York State Standards and Specifications for Erosion and Sediment Control" (Bluebook), latest edition. Weekly SWPPP inspections will be the responsibility of the owner as per the NYSDEC General permit GP-0-15-005.

Stabilization Practices (Vegetative Measures)

Stabilization practices to be used on this site include mulching and temporary seeding. Stabilization practices will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. The project has been designed to preserve existing vegetation where possible.

Mulching

Straw mulching will be employed on all inactive and disturbed areas that will remain un-stabilized for more than fourteen (14) days. Mulch materials will be spread uniformly by hand or machine at a rate of approximately 100 pounds per 1,000 square feet. Mulch will be spread such that at least 75 percent of the ground surface is covered. Mulching may be used with temporary or permanent seeding, or with slope stabilization techniques. Hydro mulch may also be used for temporary soil stabilization

Erosion Control Slope Blankets

Upon completion of final grading, any areas not covered by pavement, other forms of stabilization or landscaping and which are on slopes of 4:1 and greater will be protected with erosion control slope blankets and seeded with an erosion control seed mix. The blanket will be installed from the top of the slope, with the upper edge of the blanket secured in a trench. Blankets shall be unrolled down the slope or swale in the direction of the water flow. Edges of blanket shall be stapled with approximately four inches of overlap where two or more strip widths are required. The end of an upper blanket shall overlap the end of a lower blanket by at least six inches and both

ends shall be stapled in place. The blankets will be staked and/or stapled into place as per manufacturer's recommendations.

Temporary Seeding

A temporary vegetative cover will be established on areas of exposed soils (including stockpiles) that remain inactive and un-stabilized for a period of more than fourteen (14) days for slopes. The seeded surfaces will be covered with a layer of straw mulch or hydro mulch as described above.

Structural Practices

Structural erosion and sedimentation controls are to be used throughout the project site during construction. They include the following:

Silt Fence Barriers

Prior to any ground disturbance, the silt fence is to be put in place at the down gradient limit of work in accordance with the Erosion and Sediment Control Plans and Details. When necessary, additional check dams and silt fence barriers will be installed immediately down gradient of erosion-prone areas, such as the base of steep exposed slopes and around the base of stockpiles, throughout the construction phase of the project. The barriers will be entrenched into the substrate to prevent underflow.

The erosion control barriers will be inspected weekly and after every storm event. Any sediment that collects behind the barriers will be removed and will be either reused at the site or disposed of at a suitable offsite location. Any damaged sections of silt fence or straw bales will be repaired or replaced.

Stabilized Construction Exits

Stone anti-tracking pads will be installed at each access point to the work area to prevent the off-site transport of sediment by construction vehicles. The stabilized construction exits will be at least fifty feet long and will consist of a 4-inch thick layer of crushed stone (1.5 to 2.5 inches in diameter). The stone will be placed over a layer of non-woven filter fabric. The anti-tracking pads will remain in place until a binder coat of pavement has been established in areas to be paved.

Dewatering Haybale Basins and Filter Bags

Dewatering for this project should be performed as per the Geotechnical Report and will require approval from the City of Albany and possibly NYSDEC. The Owner/Operator, under the supervision of a Licensed Engineer/ Landscape Architect, will be responsible to implement all the necessary procedures of discharging the pumped water in compliance with the dewatering permit.

Where dewatering operations require the installation of temporary dewatering wells with a total capacity of 45 gallons per minute or more, and/or require discharge off-site, the contractor will be responsible for obtaining the necessary NYSDEC permits.

Additional Erosion Control Measures

The following controls will be implemented as directed by the Licensed Engineer/Landscape Architect, CPESC or NYSDEC Certified Inspector.

Resource Protection

- Evaluate, mark and protect important trees and associated rooting zones, wetlands, on-site septic systems absorption fields, etc.
- Temporary construction fencing will be placed around trees to remain and will be at a minimum at the drip line of the longest branch.
- Protect existing vegetated areas by fencing off, especially in perimeter areas.

Stabilized Construction Exit

- Establish a temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway.
- Stabilize bare areas (entrances, construction routes, equipment parking areas) immediately as work takes place. Top these areas with gravel or maintain vegetative cover.
- Provide wash down facilities where necessary.
- Remove sediment tracked onto public streets on a daily basis.

Perimeter Sediment Controls

- Silt fence material and installation must comply with the NYSDEC standard drawings and specifications. They shall also comply with the Erosion and Sedimentation Control Plan.

- Silt fencing and straw bale barriers will be entrenched to eliminate sediment underflow.
- Silt fences will be installed based on appropriate spacing intervals. This interval will decrease as the slope increases. Silt fence should be placed on or parallel to contours where there is no concentration of water flowing to the silt fence and where erosion occurs in the form of sheet erosion. On sloped areas, the area below the final silt fence shall be undisturbed ground.
- Principal sediment basins, if utilized, will be installed after the construction site is assessed.
- Additional sediment traps and barriers will be installed as needed during grading.
- Erosion control blankets will be stapled and/or staked into place on slopes 5:1 or greater after disturbing area.
- The erosion control barriers will be inspected and maintained routinely throughout the duration of the project.

Runoff Control

- Install runoff control after sediment traps are installed and before land grading starts.
- Control the runoff in each small drainage area before flow reaches runoff from entire site.
- Divert offsite or clean runoff from disturbed areas.
- Convey surface flows from highly erodible soil and steep slopes to more suitable stable areas.
- Redirect runoff from existing or proposed cut and fill slopes to reduce water velocity without causing erosion.
- Design final site drainage to prevent erosion, concentrated flows to adjacent properties, uncontrolled overflow and ponding.

Construction Sequence

This project is planned to be constructed in one phase.

The site improvements will need to proceed in an organized manner so that the site remains stabilized during construction.

Although the final sequence of construction and means and methods of construction will be determined by the contractor and owner, the anticipated sequencing of construction events will be:

1. Hold pre-construction meeting with engineer, inspector, and city.

2. Install silt fence/wattles, stabilized construction entrances, temporary diversions, and temporary sediment traps.
3. Contractor to demolish existing structures, clear and grub the site, and perform rough grading including installing additional erosion control measures if required.
4. Stockpile erosion sediment control material in case of large storm events during construction. Materials shall include at a minimum: mulch, stone, silt fence and erosion control fabric.
5. Install drainage system beginning at the downstream area, provide temporary diversion of stormwater in temporary swales and sediment basins.
6. Install utilities, storm sewer structures, and piping. Protect structures from sedimentation using approved methods. Install outlet protection and check dams.
7. Temporary seed disturbed areas.
8. Install electrical and communication components, process piping and conduits.
9. Excavate and install foundations, providing approved concrete wash-out areas as required.
10. Install base course of access drive.
11. Install equipment, mechanical and electrical expansion.
12. Construct building. Maintain clean site by managing construction debris.
13. Fine grade site and stabilize vegetated areas.
14. Install permanent stormwater control facilities.
15. Remove silt from temporary storage areas, structures, sumps, and pipes.
16. Exercise winter shutdown procedures, if applicable. Sequencing may vary.
17. Pave asphalt areas.
18. Remove temporary sediment control measures, de-compact as required, reseed and mulch disturbed areas.
19. Obtain substantially stable verification from SWPPP inspector.
20. Remove silt fence and inlet protection upon site stabilization.
21. File notice of termination.

The utilities and drive will be sequenced in a manner that will facilitate the construction of the building with as little impact on the neighboring lands as possible and may require construction easements and/or permanent easements.

If site disturbance discontinues and building construction continues into the winter months then winter shut down procedures; including but not limited to site stabilization, monthly inspections, installation of temporary check dams and overflow piping are required.

At no time shall disturbance be greater than 5 acres. Refer to the Erosion & Sediment Control Plan in the Construction Documents.

Inspections

The site contractor shall have a qualified professional conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the Stormwater Management Report and required by the local law have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days. **SWPPP Inspections shall be submitted to the Stormwater Program Manager at the Department of Water & Water Supply within 24 hours after inspection is completed.** The owner/operator shall have a qualified inspector conduct site inspections according to Part 4.C of the New York State Department of Environmantal Conservation SPDES General Permit GP-0-15-002 (permit included in Appendix B of this report).

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Construction Housekeeping Practices

During construction, the following procedures and practices will be followed:

- Cleared brush, debris, and soils will be stockpiled up slope from erosion and sediment controls.
- Equipment cleaning, maintenance, and repair will be conducted in designated areas protected by berms or other acceptable means.
- The contractor will ensure that the project site is litter free at the close of each working day. The contractor will dispose of construction debris as decided upon with the owner and in accordance with all applicable regulations.
- Portable sanitary facilities will be made available to construction personnel, if permanent facilities are unavailable, and will be serviced regularly.
- The contractor will provide the owner with a description of controls to manage waste, reduce pollutants (including storage practices), spill prevention, and response to spills.
- Any construction chemicals will be disposed of in accordance with applicable regulations and will not be disposed of into the stormwater system.
- The vehicle washout area designated on the plans should be cleaned whenever sediment is deposited.
- The construction drive will be maintained immediately if any sediment is dropped, spilled or washed on the drive.

Appendix A

NOI Form, MS4 Acceptance Form, NOT Form

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.18

(Submission #: 38Y-APEG-6SCX, version 1)

PRINTED ON 2/5/2019

Summary

Submission #:	38Y-APEG-6SCX	**Date Submitted:**	Not Submitted
Form:	NOI for coverage under Stormwater General Permit for Construction Activity	**Status:**	Draft
Applicant:	Patrick Mitchell	**Active Steps:**	Form Submitted
Reference #:			
Description:	NOI for coverage under Stormwater General Permit for Construction Activity		

Notes
There are currently no Submission Notes.

Details

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)
GSX Ventures

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Grant

Owner/Operator Contact Person First Name
Jon

Owner/Operator Mailing Address
7 Old Solomons Island Road

City
Annapolis

State
MD

Zip
21401

Phone
4102300003

Email
jgrant@grantarchitects.com

Federal Tax ID
NONE PROVIDED

Project Location

Project/Site Name
1211 Western Avenue

Street Address (Not P.O. Box)
12 11 Western Avenue

Side of Street
North

City/Town/Village (THAT ISSUES BUILDING PERMIT)
City of Albany

State
NY

Zip
12203

County
ALBANY

DEC Region
4

Name of Nearest Cross Street
University Place

Distance to Nearest Cross Street (Feet)
150

Project In Relation to Cross Street
East

Tax Map Numbers Section-Block-Parcel
64.22-1

Tax Map Numbers
10

1. Coordinates

Provide the Geographic Coordinates for the project site. The two methods are: - Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates. - The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.

Navigate to your location and click on the map to get the X,Y coordinates
42.676198224254264,-73.82134284666978

Project Details

2. What is the nature of this project?
Redevelopment with increase in impervious area

3. Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Landuse
Commercial

Post-Development Future Land Use
Multifamily Residential

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.
NONE PROVIDED

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. *** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)
1.1

Total Area to be Disturbed (acres)
1.1

Existing Impervious Area to be Disturbed (acres)
.6

Future Impervious Area Within Disturbed Area (acres)
.9

5. Do you plan to disturb more than 5 acres of soil at any one time?
No

6. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.

A (%)
0

B (%)
0

C (%)
0

D (%)
100

7. Is this a phased project?
No

8. Enter the planned start and end dates of the disturbance activities.

Start Date
03/17/2019

End Date
3/08/2020

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
Krumkill Creek

9a. Type of waterbody identified in question 9?
Stream/Creek Off Site

Other Waterbody Type Off Site Description
NONE PROVIDED

9b. If "wetland" was selected in 9A, how was the wetland identified?
Regulatory Map

10. Has the surface waterbody(ies in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002?
Yes

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002?
No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?
No

If No, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey?
No

If Yes, what is the acreage to be disturbed?
NONE PROVIDED

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?
No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?

Yes

16. What is the name of the municipality/entity that owns the separate storm sewer system?
City of Albany

17. Does any runoff from the site enter a sewer classified as a Combined Sewer?
Yes

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?
No

19. Is this property owned by a state authority, state agency, federal government or local government?
No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)
No

Required SWPPP Components

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?
Yes

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)?
Yes

If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?
Yes

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Certified Professional in Erosion and Sediment Control (CPESC)

SWPPP Preparer
VHB Engineering, Surveying, Landscape Architecture & Geology, Inc.

Contact Name (Last, Space, First)
Mitchell, ,Patrick

Mailing Address
100 Great Oaks blvd, Suite 118

City
Albany

State
NY

Zip
12203

Phone
518-389-3628

Email

pmitchell@vhb.com

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form: 1) Click on the link below to download a blank certification form 2) The certified SWPPP preparer should sign this form 3) Scan the signed form 4) Upload the scanned document

Download SWPPP Preparer Certification Form

Please upload the SWPPP Preparer Certification - Attachment

SWPPP Preparers Cert - signed-reduced.pdf

Comment: NONE PROVIDED

Erosion & Sediment Control Criteria

25. Has a construction sequence schedule for the planned management practices been prepared?

Yes

26. Select all of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

Dust Control
Silt Fence
Stabilized Construction Entrance
Storm Drain Inlet Protection

Biotechnical

None

Vegetative Measures

Mulching
Seeding

Permanent Structural

Land Grading

Other

NONE PROVIDED

Post-Construction Criteria

* IMPORTANT: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

Preservation of Undisturbed Area
Locating Development in Less Sensitive Areas

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)

0.036

29. Post-construction SMP Identification

Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28). Identify the SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice. Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)

0.061

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28)?

Yes

If Yes, go to question 36. If No, go to question 32.

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)

NONE PROVIDED

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

If Yes, go to question 33.

Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP. If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs

Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30). Also, provide the total impervious area that contributes runoff to each practice selected. NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)

NONE PROVIDED

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

NONE PROVIDED

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?

If Yes, go to question 36. If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv required and provided or select waiver (#36a), if applicable.

CPv Required (acre-feet)

.003

CPv Provided (acre-feet)

.003

36a. The need to provide channel protection has been waived because:

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (#37a), if applicable.

Overbank Flood Control Criteria (Qp)

Pre-Development (CFS)
2.34

Post-Development (CFS)
2.08

Total Extreme Flood Control Criteria (Qf)

Pre-Development (CFS)
11.65

Post-Development (CFS)
4.37

37a. The need to meet the Qp and Qf criteria has been waived because:

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?
Yes

If Yes, Identify the entity responsible for the long term Operation and Maintenance
Owner

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.
This is a redevelopment project that utilizes a Blue Roof Green Roof system to achieve 100% of the WQv .

Post-Construction SMP Identification

Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs

Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)
0

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)
0

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
0

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
0

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)
0

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)
0

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)
0

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)
0

Total Contributing Impervious Acres for Vegetated Swale (RR-5)
0

Total Contributing Impervious Acres for Rain Garden (RR-6)
0

Total Contributing Impervious Acres for Stormwater Planter (RR-7)
0

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)
0

Total Contributing Impervious Acres for Porous Pavement (RR-9)
0

Total Contributing Impervious Acres for Green Roof (RR-10)
.633

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)
0

Total Contributing Impervious Acres for Infiltration Basin (I-2)
0

Total Contributing Impervious Acres for Dry Well (I-3)
.13

Total Contributing Impervious Acres for Underground Infiltration System (I-4)
0

Total Contributing Impervious Acres for Bioretention (F-5)
0

Total Contributing Impervious Acres for Dry Swale (O-1)
0

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)
0

Total Contributing Impervious Acres for Wet Pond (P-2)

0

Total Contributing Impervious Acres for Wet Extended Detention (P-3)
0

Total Contributing Impervious Acres for Multiple Pond System (P-4)
0

Total Contributing Impervious Acres for Pocket Pond (P-5)
0

Total Contributing Impervious Acres for Surface Sand Filter (F-1)
0

Total Contributing Impervious Acres for Underground Sand Filter (F-2)
0

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)
0

Total Contributing Impervious Acres for Organic Filter (F-4)
0

Total Contributing Impervious Acres for Shallow Wetland (W-1)
0

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)
0

Total Contributing Impervious Acres for Pond/Wetland System (W-3)
0

Total Contributing Impervious Acres for Pocket Wetland (W-4)
0

Total Contributing Impervious Acres for Wet Swale (O-2)
0

Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Total Contributing Impervious Area for Hydrodynamic
0

Total Contributing Impervious Area for Wet Vault
0

Total Contributing Impervious Area for Media Filter
0

"Other" Alternative SMP?
0

Total Contributing Impervious Area for "Other"
0

Provide the name and manufaturer of the alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

Manufacturer of Alternative SMP

NONE PROVIDED

Name of Alternative SMP
NONE PROVIDED

Other Permits

40. Identify other DEC permits, existing and new, that are required for this project/facility.
None

If SPDES Multi-Sector GP, then give permit ID
NONE PROVIDED

If Other, then identify
NONE PROVIDED

41. Does this project require a US Army Corps of Engineers Wetland Permit?
No

If "Yes," then indicate Size of Impact, in acres, to the nearest tenth
NONE PROVIDED

42. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.
NONE PROVIDED

MS4 SWPPP Acceptance

43. Is this project subject to the requirements of a regulated, traditional land use control MS4?
Yes - Please attach the MS4 Acceptance form below

If No, skip question 44

44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?
No

MS4 SWPPP Acceptance Form Download

Download form from the link below. Complete, sign, and upload.

MS4 SWPPP Acceptance Form

MS4 Acceptance Form Upload - Attachment
SWPPP Acceptance Form_signed.pdf
Comment: NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download

Download the certification form by clicking the link below. Complete, sign, scan, and upload the form.

Owner/Operator Certification Form (PDF, 45KB)

Upload Owner/Operator Certification Form * - Attachment
SWPPP Owner Certification_signed.pdf
Comment: NONE PROVIDED

Attachments

Date	Attachment Name	Context

Status History

Date	User	Processing Status
None		

Processing Steps

Step Name	Assigned To/Completed By	Date Completed
Form Submitted	Patrick Mitchell	
Deemed Complete	Toni Cioffi	

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges
From Construction Activity (GP-0-15-002)

Project Site Information

Project/Site Name

1211 Western Avenue

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

GSX Ventures

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Patrick	A	Mitchell
First name	MI	Last Name

Signature

Date

Revised: April 2015

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-15-002)

Project/Site Name: 1211 Western Avenue

eNOI Submission Number: 38Y-APEG-6SCX

eNOI Submitted by: ☐ **Owner/Operator** ☑ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name M.I. Last Name

_____

Signature

_____

Date

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name: GSX Ventures

2. Street Address: 7 Old Solomons Island Road

3. City/State/Zip: Annapolis, MD 21401

4. Contact Person: Jon Grant | 4a.Telephone: 410-230-0003

4b. Contact Person E-Mail: jgrant@gsxventures.com

II. Project Site Information

5. Project/Site Name: 1211 Western Avenue

6. Street Address: 1211 Western Avenue

7. City/Zip: Albany, NY 12203

8. County: Albany

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:	
Title/Position:	
Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	GSX Ventures
2. Contact Person:	Jon Grant
3. Street Address:	7 Old Solomon's Island Road
4. City/State/Zip:	Annapolis, MD 21401
II. Project Site Information	
5. Project/Site Name:	1211 Western Avenue
6. Street Address:	1211 Western Avenue
7. City/State/Zip:	Albany, NY 12203
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	
9. Title/Position:	
10. Date Final SWPPP Reviewed and Accepted:	
IV. Regulated MS4 Information	
11. Name of MS4:	
12. MS4 SPDES Permit Identification Number: NYR20A	
13. Contact Person:	
14. Street Address:	
15. City/State/Zip:	
16. Telephone Number:	

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

Appendix B

Grading, Drainage and Erosion Control Plans

UNDER SEPARATE COVER

Appendix C

NYSDEC SPDES General Permit

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP-0-15-002

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2015 Expiration Date: January 28, 2020

Modification Date:
July 14, 2015 – Correction of typographical error in definition of "New Development", Appendix A

November 23, 2016 – Updated to require the use of the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. The use of this standard will be required as of February 1, 2017.

John J. Ferguson
Chief Permit Administrator

Authorized Signature 11-14-16 Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES
FROM CONSTRUCTION ACTIVITIES

Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the Stormwater Pollution Prevention Plan ("SWPPP") the reason(s) for the deviation or alternative design and provide information

which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

   (ii) Control stormwater *discharge*s to *minimize* channel and streambank erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted; and

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from dewatering activities, including *discharge*s

from dewatering of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharge*s.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion

at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. ***Sizing Criteria* for *New Development***

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv

that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or

(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or

(2) A downstream analysis reveals that overbank control is not required.

b. ***Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed**

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or

standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

c. ***Sizing Criteria* for *Redevelopment Activity***

(Part I.C.2.c.i)

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or
(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or
(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or
(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) Overbank Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(Part I.C.2.c.iv)

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

d. ***Sizing Criteria*** **for Combination of** ***Redevelopment Activity*** **and** ***New Development***

Construction projects that include both *New Development* and *Redevelopment Activity* shall provide post-construction stormwater management controls that meet the *sizing criteria* calculated as an aggregate of the *Sizing Criteria* in Part I.C.2.a. or b. of this permit for the *New Development* portion of the project and Part I.C.2.c of this permit for *Redevelopment Activity* portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or

if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater *discharges* may be authorized by this permit: *discharge*s from firefighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated *groundwater* or spring water; uncontaminated *discharge*s from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who *discharge* as noted in this paragraph, and with the exception of flows from firefighting activities, these *discharges* must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

(Part I.F)

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an endangered or threatened species unless the *owner or operator* has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.C.2 of this permit.

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb one or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture (“USDA”) Soil Survey for the County where the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb two or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the USDA Soil Survey for the County where the disturbance will occur.

(Part I.F.8)

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.C.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the construction site within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:
      (i) No Affect
      (ii) No Adverse Affect

(Part I.F.8.c.iii)

(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. OBTAINING PERMIT COVERAGE

A.Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the Department in order to be authorized to *discharge* under this permit. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address.

NOTICE OF INTENT
NYS DEC, Bureau of Water Permits
625 Broadway, 4th Floor
Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI.

   The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the address in Part II.A.1.

(Part II.A.2)

The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4*.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

   c. the final SWPPP has been prepared, and

   d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above

(Part II.B.3)

will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

(ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

(iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. The Department may suspend or deny an *owner's or operator's* coverage

(Part II.B.4)

under this permit if the Department determines that the SWPPP does not meet the permit requirements. In accordance with statute, regulation, and the terms and conditions of this permit, the Department may deny coverage under this permit and require submittal of an application for an individual SPDES permit based on a review of the NOI or other information pursuant to Part II.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.B. of this permit.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-15-002), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, and all documentation necessary to demonstrate eligibility with this permit at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

   a. The *owner or operator* shall

have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the *regulated, traditional land use control MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice

(Part II.D)

D. Permit Coverage for Discharges Authorized Under GP-0-10-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-10-001), an *owner or operator* of *a construction activity* with coverage under GP-0-10-001, as of the effective date of GP-0-15-002, shall be authorized to *discharge* in accordance with GP-0-15-002, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-15-002.

E. Change of *Owner or Operator*

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

(Part III)

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

   a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

   b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the *discharge* of *pollutants*; and

   c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the

(Part III.A.5)

SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.C.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   > "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

   In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the

trained contractor responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project;

   b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

   c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

   d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other

activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design

and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

   b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

   c. A Stormwater Modeling and Analysis Report that includes:

      (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

      (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

      (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

      (iv) Summary table, with supporting calculations, which demonstrates

that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

(v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

(vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

(Part IV)

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

(Part IV.C)

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

   d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and

the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall

be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of *discharge* from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of *discharge* from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

(Part IV.C.4.i)

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.C.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

(Part V.A.2)

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

   b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

   c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E. of this permit.

   d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

(Part V.A.5)

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

   a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

   b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

   c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

   d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

(Part VII)

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

(Part VII.E)

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      (i) a president, secretary, treasurer, or vice-president of the

corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named

individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any *discharge*r authorized by a general permit to apply for an individual SPDES permit, it shall notify the *discharge*r in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to

discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a construction site which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

(Part VII.N)

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “*Construction Activity(ies)*” also.

***Construction Activity*(ies) -** means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied

on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State
or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters,

ditches, man-made
channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*

(ii) Designed or used for collecting or conveying stormwater;

(iii) Which is not a *combined sewer*; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York..

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), Overbank Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area with a Soil Slope Phase that is identified as an E or F, or

the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture (“USDA”) Soil Survey for the County where the disturbance will occur.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part

621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other agricultural building, silo, stock yard or pen.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Bike paths and trails
- Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River **-** Figure 1
- Onondaga Lake Watershed **-** Figure 2
- Greenwood Lake Watershed **-**Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

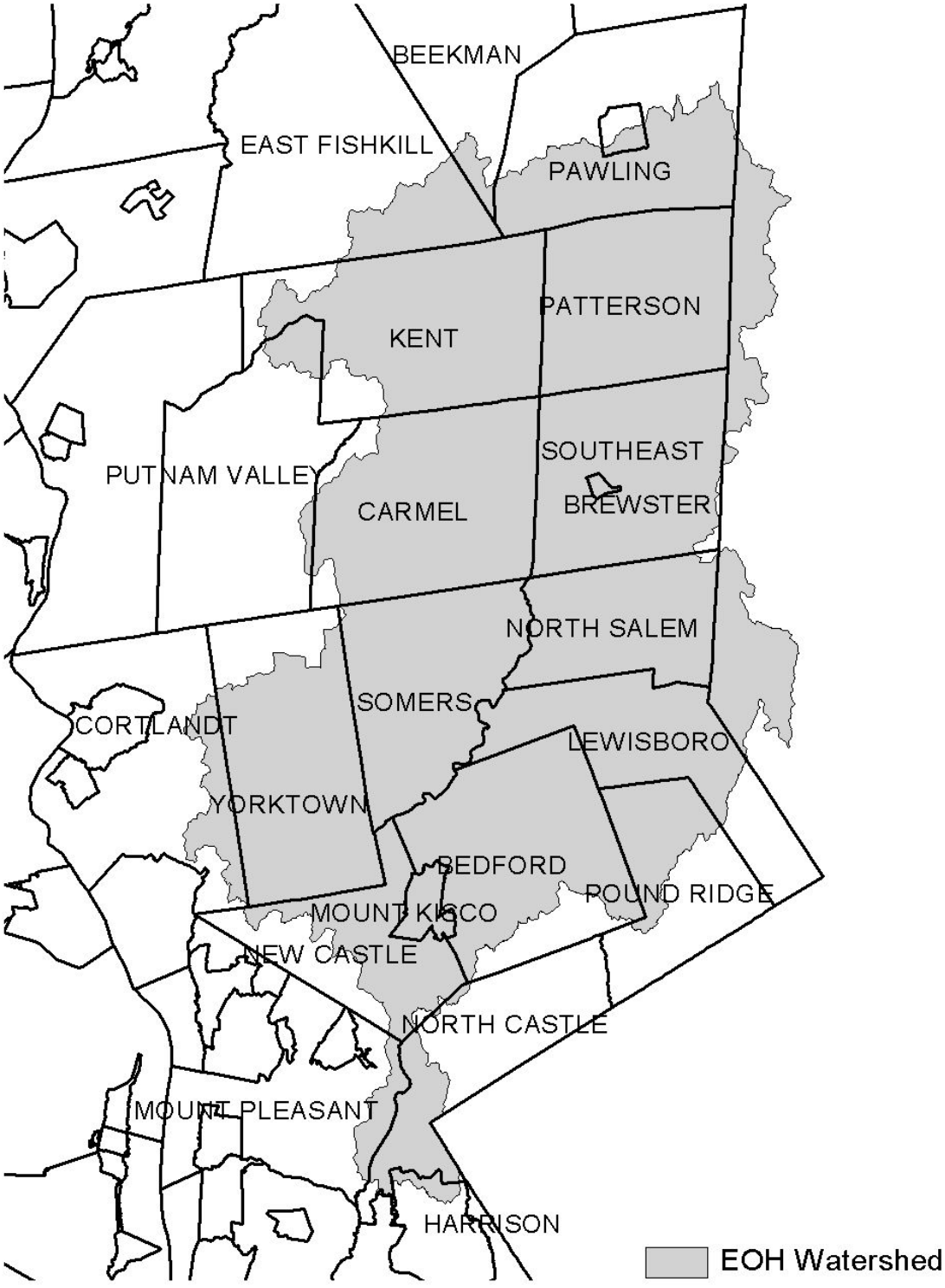


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

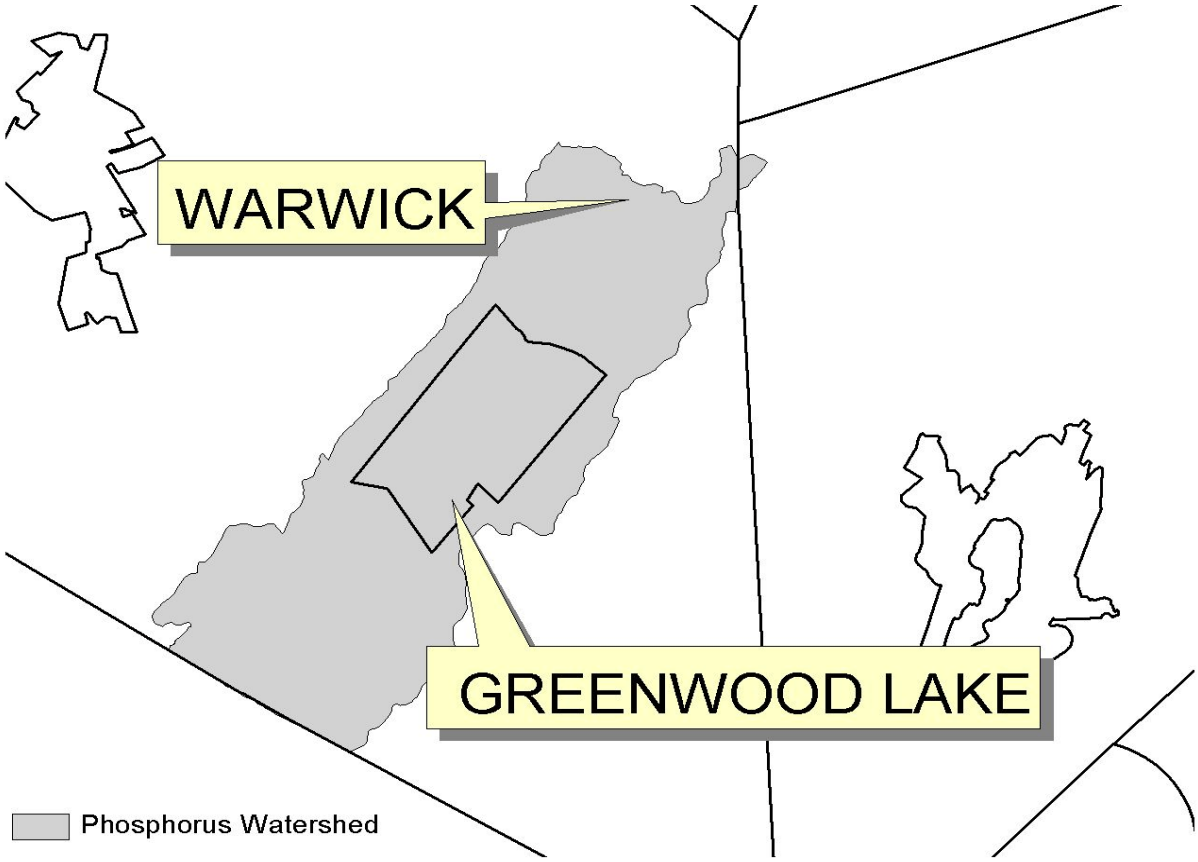


Figure 4 - Oscawana Lake Watershed

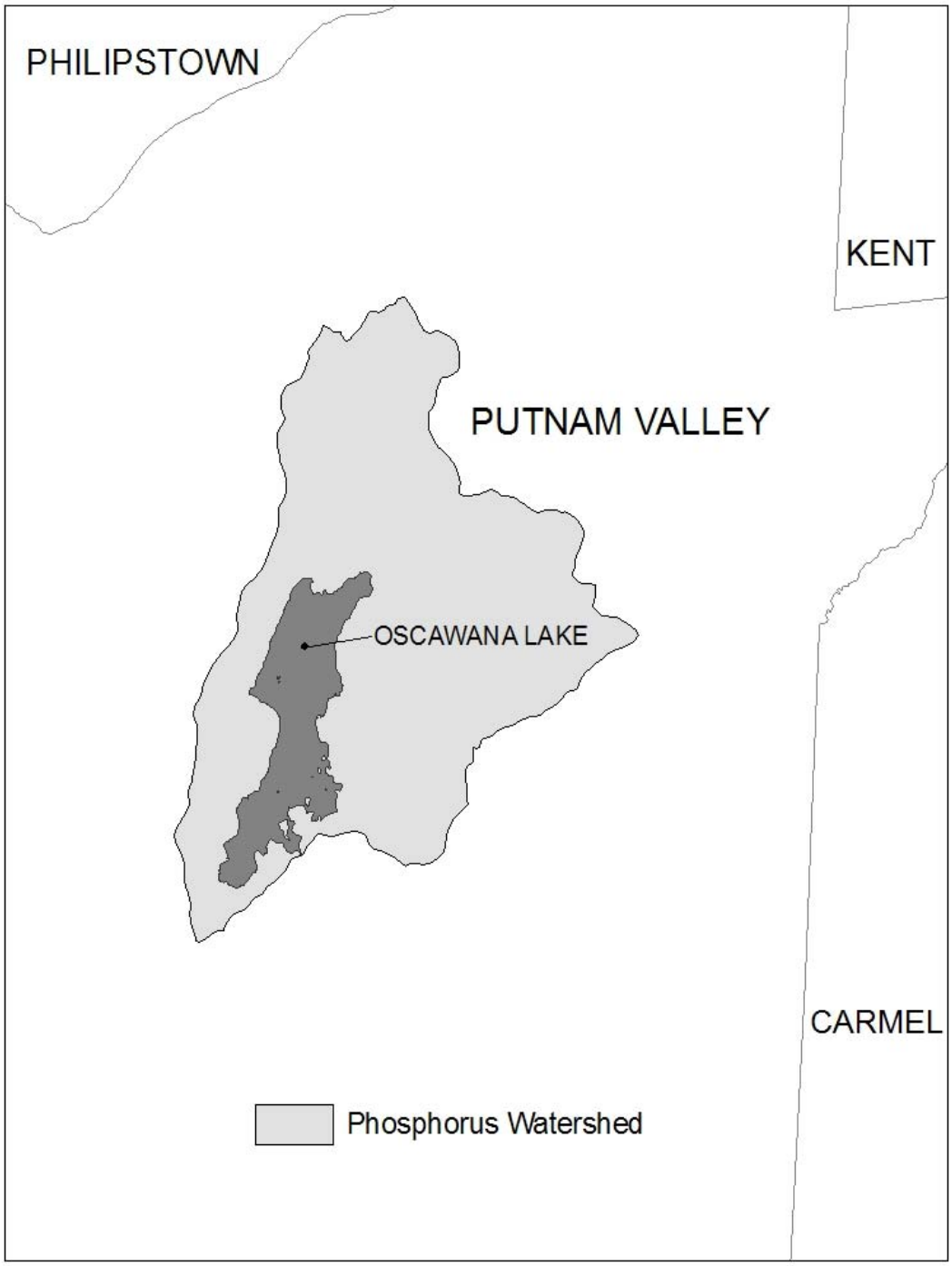
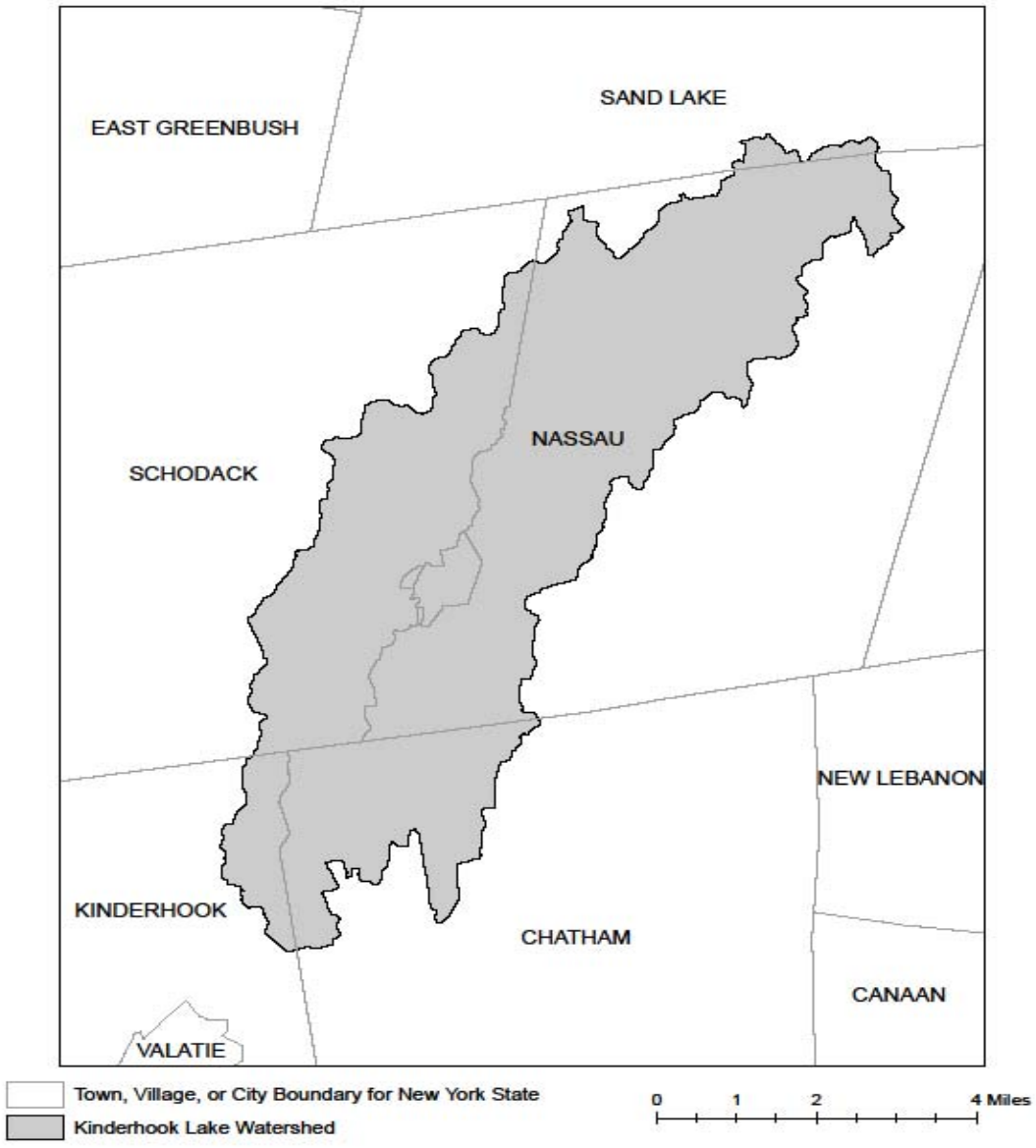


Figure 5: Kinderhook Lake Watershed



APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River **-** See Figure 1 in Appendix C

APPENDIX E

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond	Greene	Sleepy Hollow Lake
Albany	Basic Creek Reservoir	Herkimer	Steele Creek tribs
Allegheny	Amity Lake, Saunders Pond	Kings	Hendrix Creek
Bronx	Van Cortlandt Lake	Lewis	Mill Creek/South Branch and tribs
Broome	Whitney Point Lake/Reservoir	Livingston	Conesus Lake
Broome	Fly Pond, Deer Lake	Livingston	Jaycox Creek and tribs
Broome	Minor Tribs to Lower Susquehanna (north)	Livingston	Mill Creek and minor tribs
		Livingston	Bradner Creek and tribs
Cattaraugus	Allegheny River/Reservoir	Livingston	Christie Creek and tribs
Cattaraugus	Case Lake	Monroe	Lake Ontario Shoreline, Western
Cattaraugus	Linlyco/Club Pond	Monroe	Mill Creek/Blue Pond Outlet and tribs
Cayuga	Duck Lake	Monroe	Rochester Embayment - East
Chautauqua	Chautauqua Lake, North	Monroe	Rochester Embayment - West
Chautauqua	Chautauqua Lake, South	Monroe	Unnamed Trib to Honeoye Creek
Chautauqua	Bear Lake	Monroe	Genesee River, Lower, Main Stem
Chautauqua	Chadakoin River and tribs	Monroe	Genesee River, Middle, Main Stem
Chautauqua	Lower Cassadaga Lake	Monroe	Black Creek, Lower, and minor tribs
Chautauqua	Middle Cassadaga Lake	Monroe	Buck Pond
Chautauqua	Findley Lake	Monroe	Long Pond
Clinton	Great Chazy River, Lower, Main Stem	Monroe	Cranberry Pond
Columbia	Kinderhook Lake	Monroe	Mill Creek and tribs
Columbia	Robinson Pond	Monroe	Shipbuilders Creek and tribs
Dutchess	Hillside Lake	Monroe	Minor tribs to Irondequoit Bay
Dutchess	Wappinger Lakes	Monroe	Thomas Creek/White Brook and tribs
Dutchess	Fall Kill and tribs	Nassau	Glen Cove Creek, Lower, and tribs
Erie	Green Lake	Nassau	LI Tribs (fresh) to East Bay
Erie	Scajaquada Creek, Lower, and tribs	Nassau	East Meadow Brook, Upper, and tribs
Erie	Scajaquada Creek, Middle, and tribs	Nassau	Hempstead Bay
Erie	Scajaquada Creek, Upper, and tribs	Nassau	Hempstead Lake
Erie	Rush Creek and tribs	Nassau	Grant Park Pond
Erie	Ellicott Creek, Lower, and tribs	Nassau	Beaver Lake
Erie	Beeman Creek and tribs	Nassau	Camaans Pond
Erie	Murder Creek, Lower, and tribs	Nassau	Halls Pond
Erie	South Branch Smoke Cr, Lower, and tribs	Nassau	LI Tidal Tribs to Hempstead Bay
		Nassau	Massapequa Creek and tribs
Erie	Little Sister Creek, Lower, and tribs	Nassau	Reynolds Channel, east
Essex	Lake George (primary county: Warren)	Nassau	Reynolds Channel, west
Genesee	Black Creek, Upper, and minor tribs	Nassau	Silver Lake, Lofts Pond
Genesee	Tonawanda Creek, Middle, Main Stem	Nassau	Woodmere Channel
Genesee	Oak Orchard Creek, Upper, and tribs	Niagara	Hyde Park Lake
Genesee	Bowen Brook and tribs	Niagara	Lake Ontario Shoreline, Western
Genesee	Bigelow Creek and tribs	Niagara	Bergholtz Creek and tribs
Genesee	Black Creek, Middle, and minor tribs	Oneida	Ballou, Nail Creeks
Genesee	LeRoy Reservoir	Onondaga	Ley Creek and tribs
Greene	Schoharie Reservoir	Onondaga	Onondaga Creek, Lower and tribs

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Onondaga	Onondaga Creek, Middle and tribs	Suffolk	Great South Bay, West
Onondaga	Onondaga Creek, Upp, and minor tribs	Suffolk	Mill and Seven Ponds
Onondaga	Harbor Brook, Lower, and tribs	Suffolk	Moriches Bay, East
Onondaga	Ninemile Creek, Lower, and tribs	Suffolk	Moriches Bay, West
Onondaga	Minor tribs to Onondaga Lake	Suffolk	Quantuck Bay
Onondaga	Onondaga Creek, Lower, and tribs	Suffolk	Shinnecock Bay (and Inlet)
Ontario	Honeoye Lake	Sullivan	Bodine, Montgomery Lakes
Ontario	Hemlock Lake Outlet and minor tribs	Sullivan	Davies Lake
Ontario	Great Brook and minor tribs	Sullivan	Pleasure Lake
Orange	Monhagen Brook and tribs	Sullivan	Swan Lake
Orange	Orange Lake	Tompkins	Cayuga Lake, Southern End
Orleans	Lake Ontario Shoreline, Western	Tompkins	Owasco Inlet, Upper, and tribs
Oswego	Pleasant Lake	Ulster	Ashokan Reservoir
Oswego	Lake Neatahwanta	Ulster	Esopus Creek, Upper, and minor tribs
Putnam	Oscawana Lake		
Putnam	Palmer Lake	Ulster	Esopus Creek, Lower, Main Stem
Putnam	Lake Carmel	Ulster	Esopus Creek, Middle, and minor tribs
Queens	Jamaica Bay, Eastern, and tribs (Queens)		
Queens	Bergen Basin	Warren	Lake George
Queens	Shellbank Basin	Warren	Tribs to L.George, Village of L George
Rensselaer	Nassau Lake		
Rensselaer	Snyders Lake	Warren	Huddle/Finkle Brooks and tribs
Richmond	Grasmere, Arbutus and Wolfes Lakes	Warren	Indian Brook and tribs
Rockland	Congers Lake, Swartout Lake	Warren	Hague Brook and tribs
Rockland	Rockland Lake	Washington	Tribs to L.George, East Shr Lk George
Saratoga	Ballston Lake		
Saratoga	Round Lake	Washington	Cossayuna Lake
Saratoga	Dwaas Kill and tribs	Washington	Wood Cr/Champlain Canal, minor tribs
Saratoga	Tribs to Lake Lonely		
Saratoga	Lake Lonely	Wayne	Port Bay
Schenectady	Collins Lake	Wayne	Marbletown Creek and tribs
Schenectady	Duane Lake	Westchester	Lake Katonah
Schenectady	Mariaville Lake	Westchester	Lake Mohegan
Schoharie	Engleville Pond	Westchester	Lake Shenorock
Schoharie	Summit Lake	Westchester	Reservoir No.1 (Lake Isle)
Schuyler	Cayuta Lake	Westchester	Saw Mill River, Middle, and tribs
St. Lawrence	Fish Creek and minor tribs	Westchester	Silver Lake
St. Lawrence	Black Lake Outlet/Black Lake	Westchester	Teatown Lake
Steuben	Lake Salubria	Westchester	Truesdale Lake
Steuben	Smith Pond	Westchester	Wallace Pond
Suffolk	Millers Pond	Westchester	Peach Lake
Suffolk	Mattituck (Marratooka) Pond	Westchester	Mamaroneck River, Lower
Suffolk	Tidal tribs to West Moriches Bay	Westchester	Mamaroneck River, Upp, and tribs
Suffolk	Canaan Lake	Westchester	Sheldrake River and tribs
Suffolk	Lake Ronkonkoma	Westchester	Blind Brook, Lower
Suffolk	Beaverdam Creek and tribs	Westchester	Blind Brook, Upper, and tribs
Suffolk	Big/Little Fresh Ponds	Westchester	Lake Lincolndale
Suffolk	Fresh Pond	Westchester	Lake Meahaugh
Suffolk	Great South Bay, East	Wyoming	Java Lake
Suffolk	Great South Bay, Middle	Wyoming	Silver Lake

Note: The list above identifies those waters from the final New York State "2014 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated January 2015, that are impaired by silt, sediment or nutrients.

APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix D

Stormwater Calculations

JOB 1211 Western Ave
SHEET NO. 1 OF 1
CALCULATED BY DATE 10/12/2018
CHECKED BY DATE
SCALE Water Quality Volume

Initial Water Quality Volume

WQv = [(P)(Rv)(A)]/12

Where:
Rv = 0.05 + 0.009(I)
I = impervious cover in percent
P = 90% rainfall (see Figure 4.1)
A = site area in acres

Target Water Quality Volume for Redevelopment Projects

WQv(target) = (N) (WQv) + (0.25)(R)(WQv)

Where:
N = New Impervious Area/Total Impervious Area
R = Replaced Impervious Area/Total Impervious Area

Location	Site Area (ac)	New Impervious Area (ac)	Replaced Impervious Area (ac)	% Impervious	Rv	Rainfall (P) (inches)	Initial WQv (ac-ft)	Target WQv (ac-ft)	cf
1A	0.317	0.166	0.000	52.4%	0.52	1.15	0.016	0.016	689.836
1B	0.264	0.000	0.264	100.0%	0.95	1.15	**0.024**	0.006	261.741
1C	0.310	0.000	0.310	100.0%	0.95	1.15	0.028	0.007	307.348
1D	0.130	0.000	0.130	100.0%	0.95	1.15	**0.012**	0.003	128.888
1E	0.092	0.000	0.059	64.1%	0.63	1.15	0.006	0.001	60.2172
1F	0.064	0.000	0.030	46.9%	0.47	1.15	0.003	0.001	31.5175
1G	0.070	0.018	0.018	51.4%	0.51	1.15	0.003	0.002	93.6653
	1.247	0.184	0.811	79.8%	0.77	1.15	0.092	0.036	1573.21

WQv (1B+1D) provided= **0.036**

WQv required= 0.036

vhb.com

Engineering, Surveying &
Landscape Architecture, PC
100 Great Oaks Boulevard
Suite 118
Albany, NY 12203
518.389.3600

0 10 20 40 Feet

1211 Western Avenue

1211 Western Avenue
Albany, New York 12203

No.	Revision	Date	Appvd.
4	P.B Submission	9/17/2018	MBT
3	Revised Building	5/1/2018	MBT
2	Revised Building	3/6/2018	MBT
1	Revised Building	12/28/2017	MBT

Designed by: AWK
Checked by: MBT

Issued for: Site Plan Review
Date: November 1, 2017

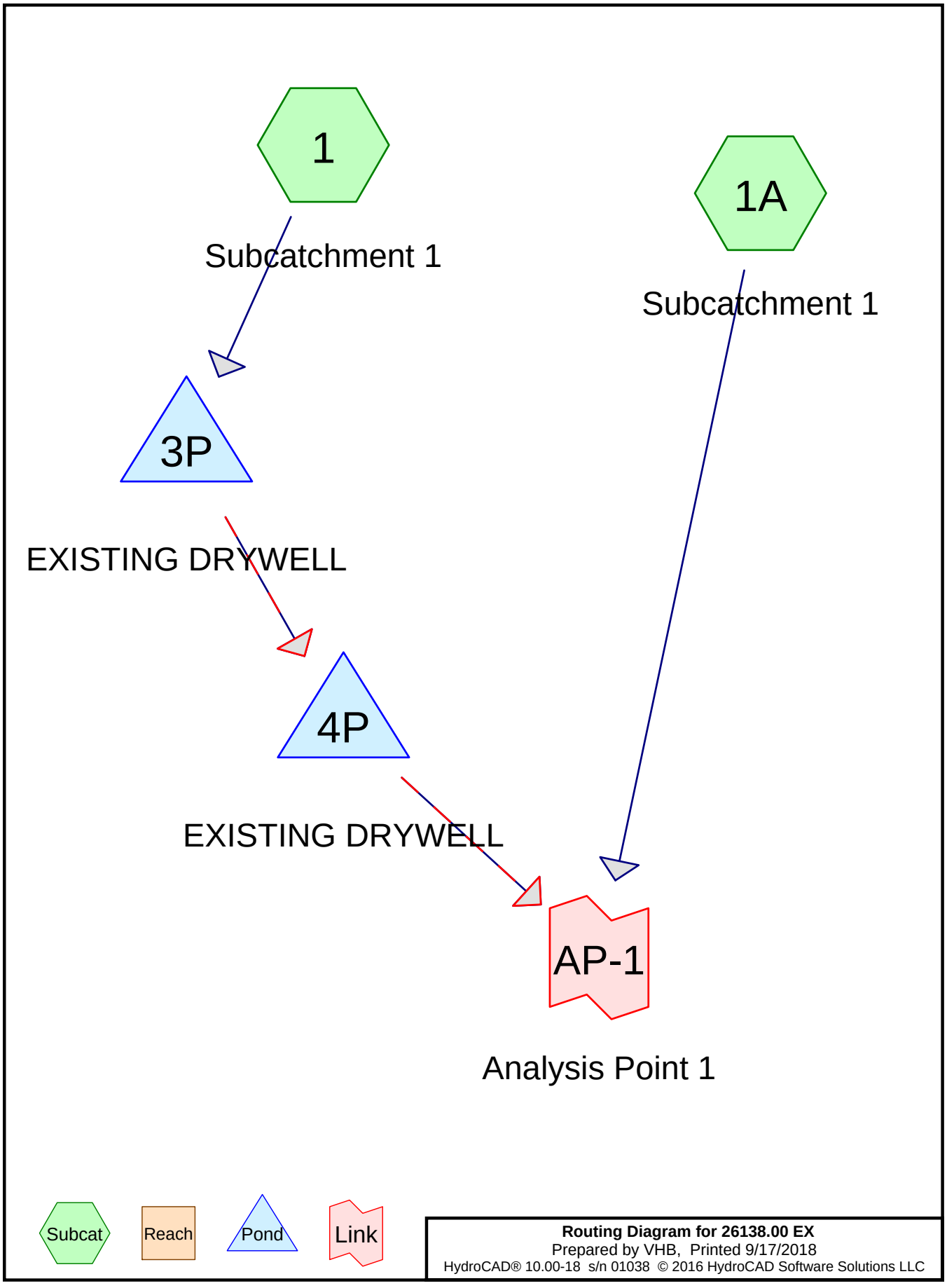
Not Approved for Construction

Drawing Title
Layout and Materials Plan

Drawing Number
ECD

Sheet 1 of 1

Project Number
26138.00



Routing Diagram for 26138.00 EX
Prepared by VHB, Printed 9/17/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.274	39	>75% Grass cover, Good, HSG A (1)
0.811	98	Paved parking, HSG A (1, 1A)
0.095	30	Woods, Good, HSG A (1)
1.180	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.180	HSG A	1, 1A
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.180		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.274	0.000	0.000	0.000	0.000	0.274	>75% Grass cover, Good	1
0.811	0.000	0.000	0.000	0.000	0.811	Paved parking	1, 1A
0.095	0.000	0.000	0.000	0.000	0.095	Woods, Good	1
1.180	**0.000**	**0.000**	**0.000**	**0.000**	**1.180**	**TOTAL AREA**	

Time span=1.00-48.00 hrs, dt=0.01 hrs, 4701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=1.088 ac 66.08% Impervious Runoff Depth=0.56"
Flow Length=128' Tc=5.0 min CN=77 Runoff=1.10 cfs 0.051 af

Subcatchment 1A: Subcatchment 1 Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=1.97"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=98 Runoff=0.29 cfs 0.015 af

Pond 3P: EXISTING DRYWELL Peak Elev=197.63' Storage=500 cf Inflow=1.10 cfs 0.051 af
Discarded=0.01 cfs 0.013 af Primary=0.78 cfs 0.036 af Secondary=0.00 cfs 0.000 af Outflow=0.79 cfs 0.050 af

Pond 4P: EXISTING DRYWELL Peak Elev=196.96' Storage=164 cf Inflow=0.78 cfs 0.036 af
Discarded=0.00 cfs 0.005 af Primary=0.66 cfs 0.031 af Secondary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.036 af

Link AP-1: Analysis Point 1 Inflow=0.76 cfs 0.046 af
Primary=0.76 cfs 0.046 af

Total Runoff Area = 1.180 ac Runoff Volume = 0.066 af Average Runoff Depth = 0.67"
31.27% Pervious = 0.369 ac 68.73% Impervious = 0.811 ac

Summary for Subcatchment 1: Subcatchment 1

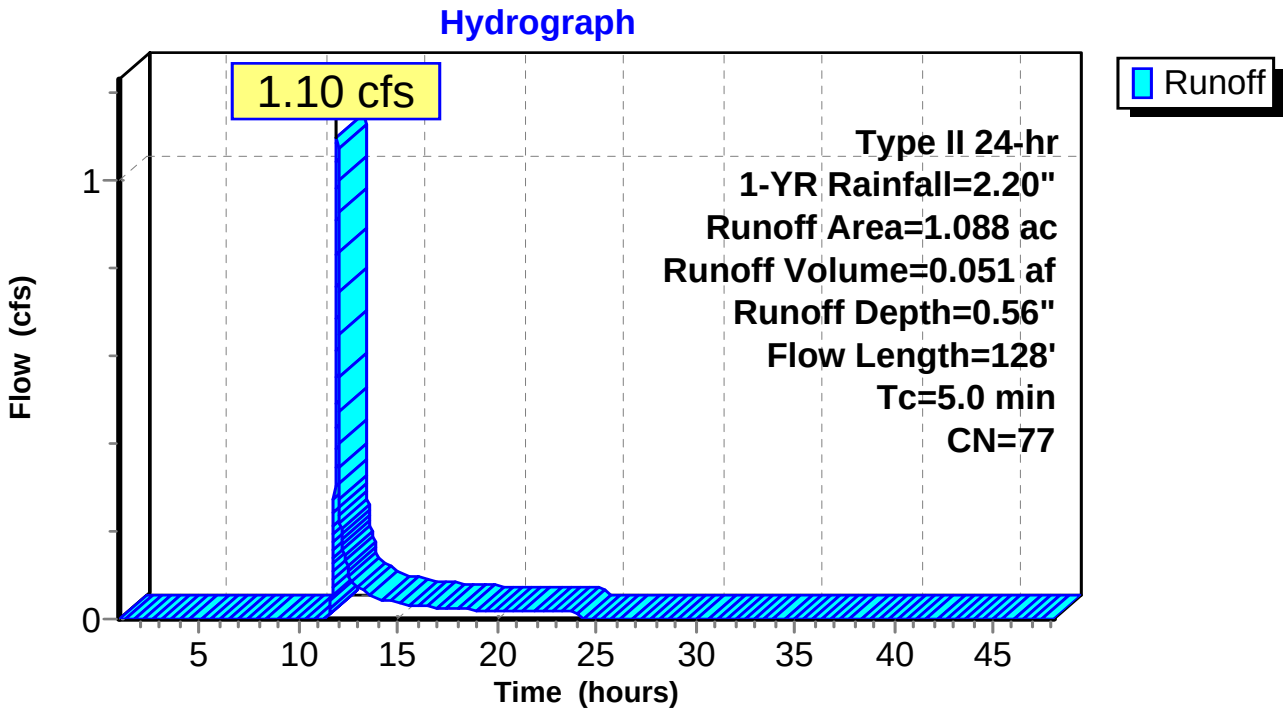
Runoff = 1.10 cfs @ 11.97 hrs, Volume= 0.051 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.095	30	Woods, Good, HSG A
0.719	98	Paved parking, HSG A
0.274	39	>75% Grass cover, Good, HSG A
1.088	77	Weighted Average
0.369		33.92% Pervious Area
0.719		66.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0260	1.42		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
0.1	28	0.0360	3.85		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
1.3	128	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 1A: Subcatchment 1

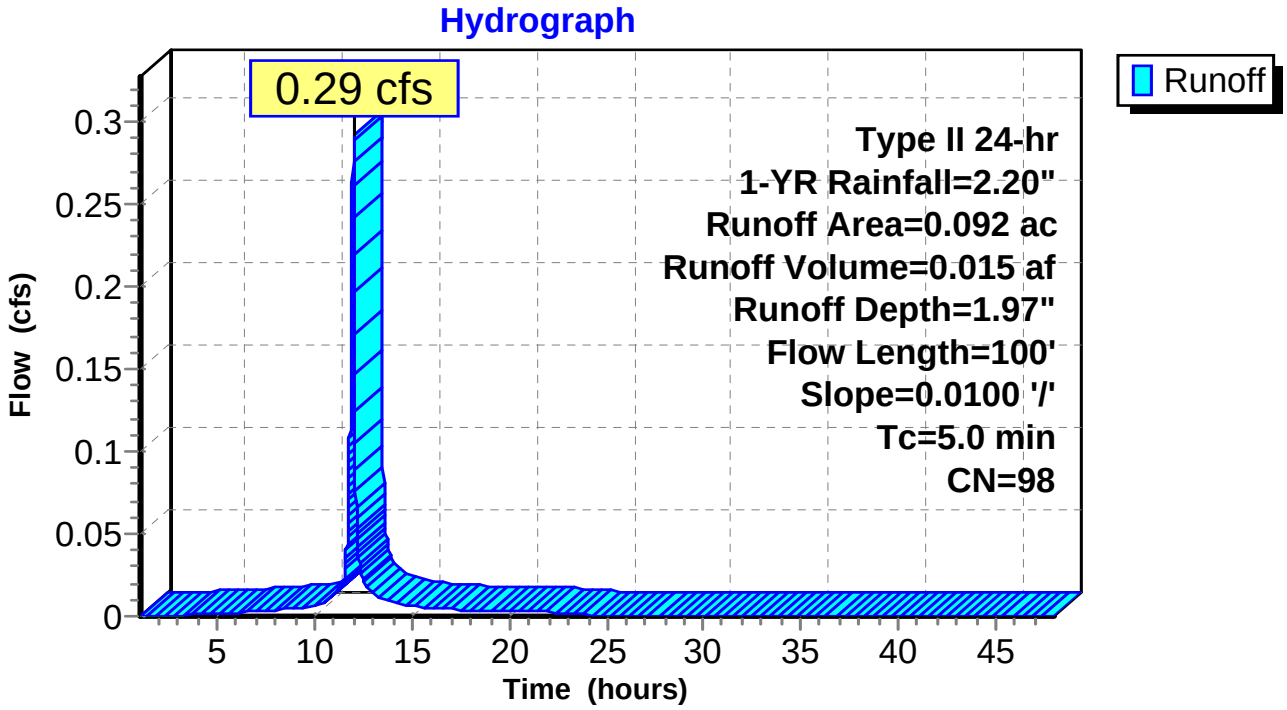
Runoff = 0.29 cfs @ 11.96 hrs, Volume= 0.015 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.092	98	Paved parking, HSG A
0.092		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.97		**Sheet Flow, ROOF** Smooth surfaces n= 0.011 P2= 2.75"
1.7	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1A: Subcatchment 1



Summary for Pond 3P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 0.56" for 1-YR event
Inflow = 1.10 cfs @ 11.97 hrs, Volume= 0.051 af
Outflow = 0.79 cfs @ 12.03 hrs, Volume= 0.050 af, Atten= 28%, Lag= 3.3 min
Discarded = 0.01 cfs @ 12.03 hrs, Volume= 0.013 af
Primary = 0.78 cfs @ 12.03 hrs, Volume= 0.036 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 197.63' @ 12.03 hrs Surf.Area= 637 sf Storage= 500 cf

Plug-Flow detention time= 212.2 min calculated for 0.050 af (98% of inflow)
Center-of-Mass det. time= 200.3 min (1,073.0 - 872.7)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	1,309 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** x 2 3,506 cf Overall - 233 cf Embedded = 3,273 cf x 40.0% Voids
#2	195.10'	226 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** x 2 Inside #1 233 cf Overall - 0.5" Wall Thickness = 226 cf
		1,536 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	197.08'	**8.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 197.08' / 196.47' S= 0.0094 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.37'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

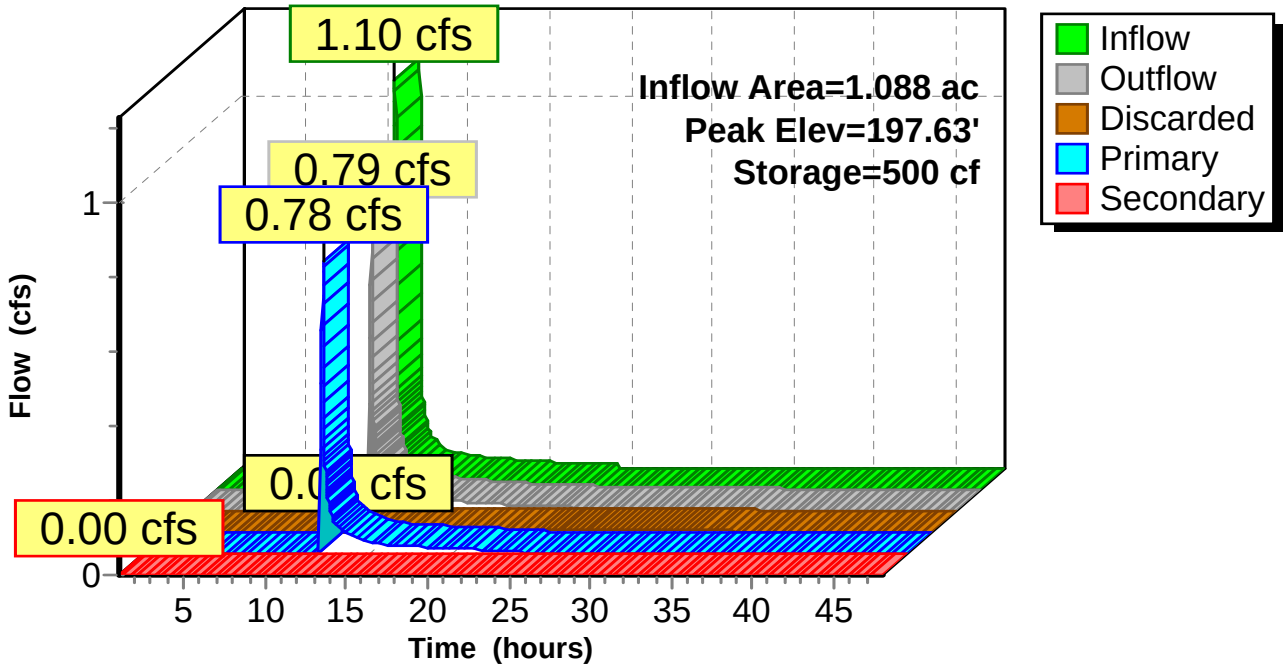
Discarded OutFlow Max=0.01 cfs @ 12.03 hrs HW=197.63' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.78 cfs @ 12.03 hrs HW=197.63' (Free Discharge)
2=Culvert (Inlet Controls 0.78 cfs @ 2.53 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
3=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: EXISTING DRYWELL

Hydrograph



Summary for Pond 4P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 0.40" for 1-YR event
Inflow = 0.78 cfs @ 12.03 hrs, Volume= 0.036 af
Outflow = 0.66 cfs @ 12.06 hrs, Volume= 0.036 af, Atten= 16%, Lag= 2.3 min
Discarded = 0.00 cfs @ 12.06 hrs, Volume= 0.005 af
Primary = 0.66 cfs @ 12.06 hrs, Volume= 0.031 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 196.96' @ 12.06 hrs Surf.Area= 239 sf Storage= 164 cf

Plug-Flow detention time= 96.2 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 94.2 min (975.7 - 881.5)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	655 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** 1,753 cf Overall - 116 cf Embedded = 1,637 cf x 40.0% Voids
#2	195.10'	113 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** Inside #1 116 cf Overall - 0.5" Wall Thickness = 113 cf
		768 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	196.47'	**8.0" Round Culvert** L= 55.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 196.47' / 195.00' S= 0.0267 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.07'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

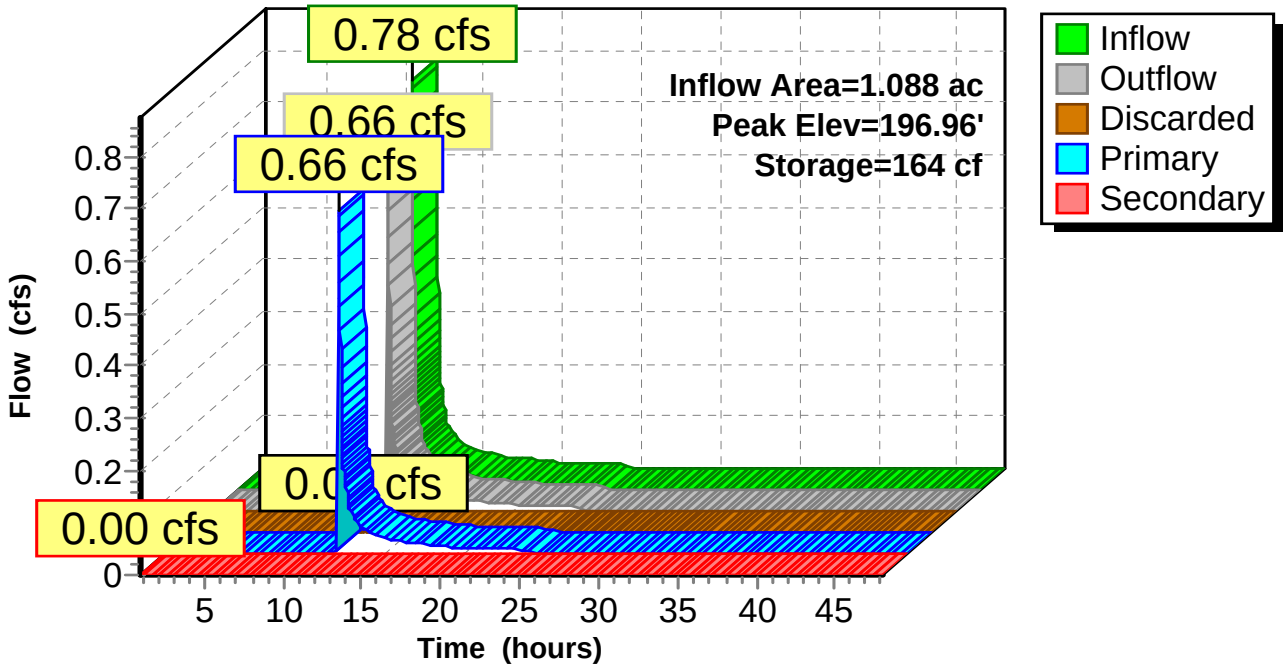
Discarded OutFlow Max=0.00 cfs @ 12.06 hrs HW=196.96' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.65 cfs @ 12.06 hrs HW=196.96' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.65 cfs @ 2.38 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
↑**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: EXISTING DRYWELL

Hydrograph



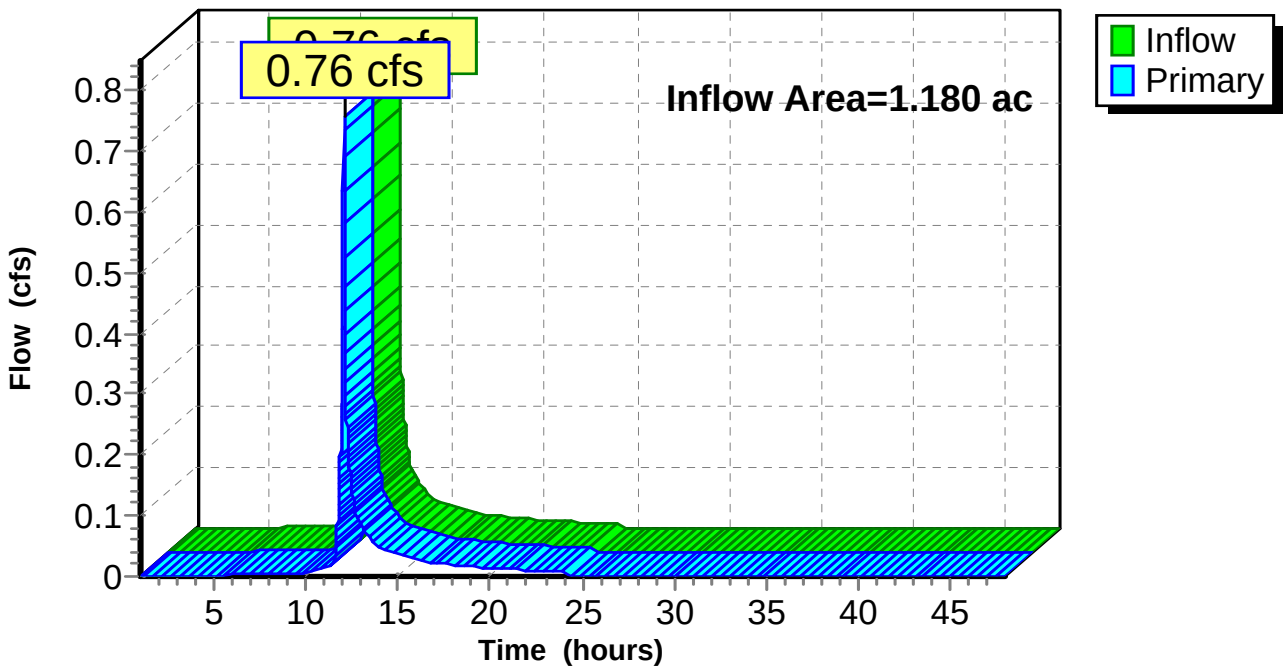
Summary for Link AP-1: Analysis Point 1

Inflow Area = 1.180 ac, 68.73% Impervious, Inflow Depth = 0.47" for 1-YR event
Inflow = 0.76 cfs @ 12.06 hrs, Volume= 0.046 af
Primary = 0.76 cfs @ 12.06 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point 1

Hydrograph



Time span=1.00-48.00 hrs, dt=0.01 hrs, 4701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=1.088 ac 66.08% Impervious Runoff Depth=1.81"
Flow Length=128' Tc=5.0 min CN=77 Runoff=3.67 cfs 0.164 af

Subcatchment 1A: Subcatchment 1 Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=3.77"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=98 Runoff=0.54 cfs 0.029 af

Pond 3P: EXISTING DRYWELL Peak Elev=199.69' Storage=1,316 cf Inflow=3.67 cfs 0.164 af
Discarded=0.01 cfs 0.014 af Primary=2.24 cfs 0.149 af Secondary=0.00 cfs 0.000 af Outflow=2.25 cfs 0.163 af

Pond 4P: EXISTING DRYWELL Peak Elev=198.37' Storage=370 cf Inflow=2.24 cfs 0.149 af
Discarded=0.00 cfs 0.005 af Primary=2.10 cfs 0.144 af Secondary=0.00 cfs 0.000 af Outflow=2.11 cfs 0.149 af

Link AP-1: Analysis Point 1 Inflow=2.34 cfs 0.173 af
Primary=2.34 cfs 0.173 af

Total Runoff Area = 1.180 ac Runoff Volume = 0.193 af Average Runoff Depth = 1.96"
31.27% Pervious = 0.369 ac 68.73% Impervious = 0.811 ac

Summary for Subcatchment 1: Subcatchment 1

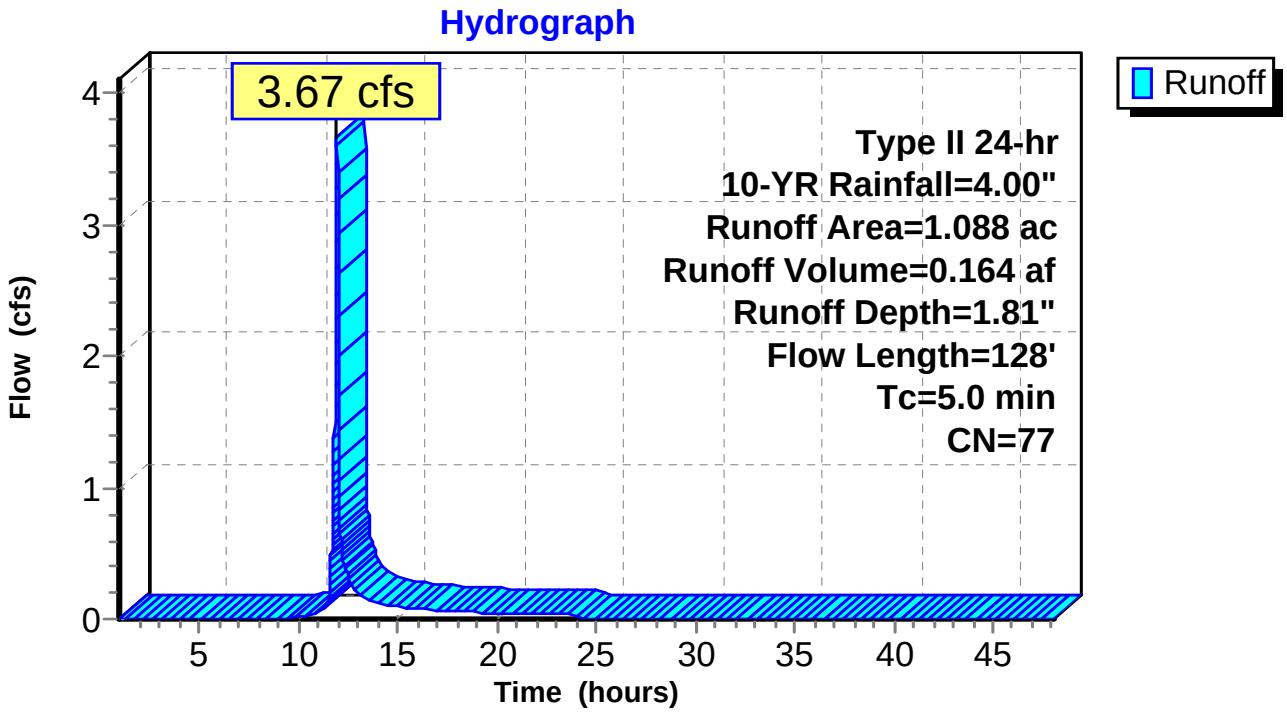
Runoff = 3.67 cfs @ 11.96 hrs, Volume= 0.164 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.095	30	Woods, Good, HSG A
0.719	98	Paved parking, HSG A
0.274	39	>75% Grass cover, Good, HSG A
1.088	77	Weighted Average
0.369		33.92% Pervious Area
0.719		66.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0260	1.42		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
0.1	28	0.0360	3.85		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
1.3	128	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 1A: Subcatchment 1

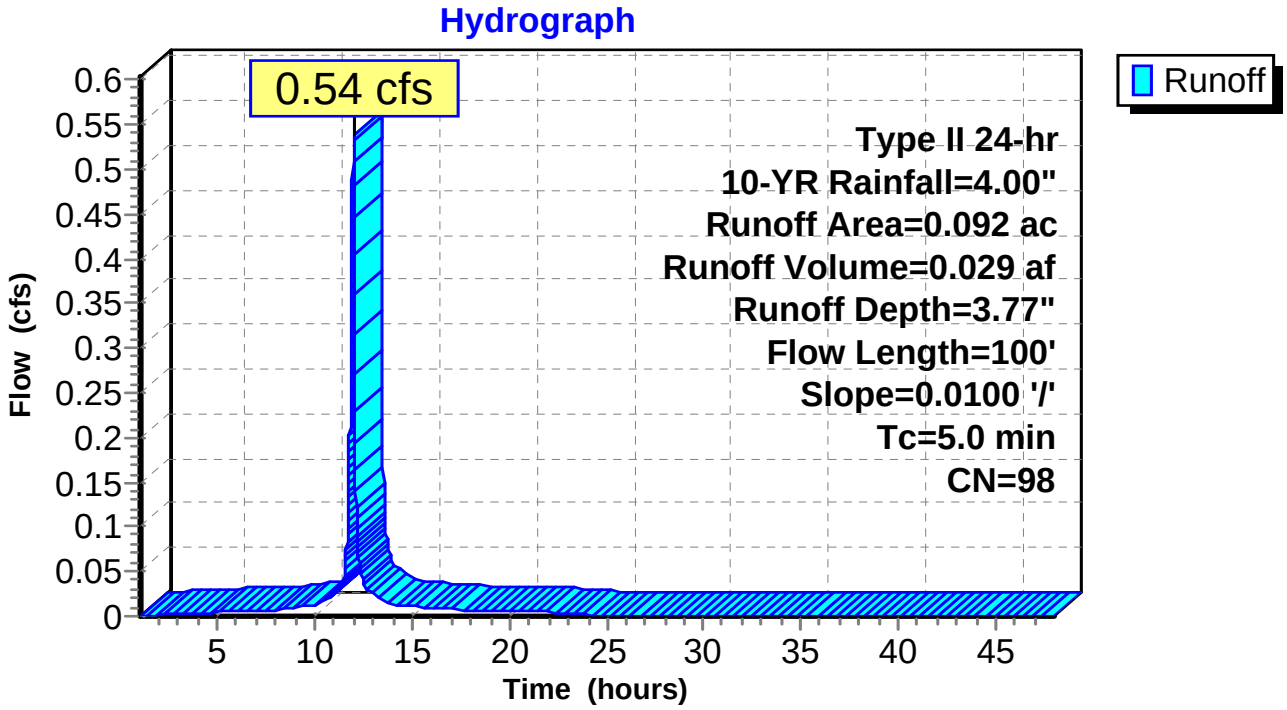
Runoff = 0.54 cfs @ 11.96 hrs, Volume= 0.029 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.092	98	Paved parking, HSG A
0.092		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.97		**Sheet Flow, ROOF** Smooth surfaces n= 0.011 P2= 2.75"
1.7	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1A: Subcatchment 1



Summary for Pond 3P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 1.81" for 10-YR event
Inflow = 3.67 cfs @ 11.96 hrs, Volume= 0.164 af
Outflow = 2.25 cfs @ 12.03 hrs, Volume= 0.163 af, Atten= 39%, Lag= 4.1 min
Discarded = 0.01 cfs @ 12.03 hrs, Volume= 0.014 af
Primary = 2.24 cfs @ 12.03 hrs, Volume= 0.149 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 199.69' @ 12.03 hrs Surf.Area= 1,263 sf Storage= 1,316 cf

Plug-Flow detention time= 70.5 min calculated for 0.163 af (99% of inflow)
Center-of-Mass det. time= 66.7 min (902.9 - 836.3)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	1,309 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** x 2 3,506 cf Overall - 233 cf Embedded = 3,273 cf x 40.0% Voids
#2	195.10'	226 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** x 2 Inside #1 233 cf Overall - 0.5" Wall Thickness = 226 cf
		1,536 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	197.08'	**8.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 197.08' / 196.47' S= 0.0094 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.37'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

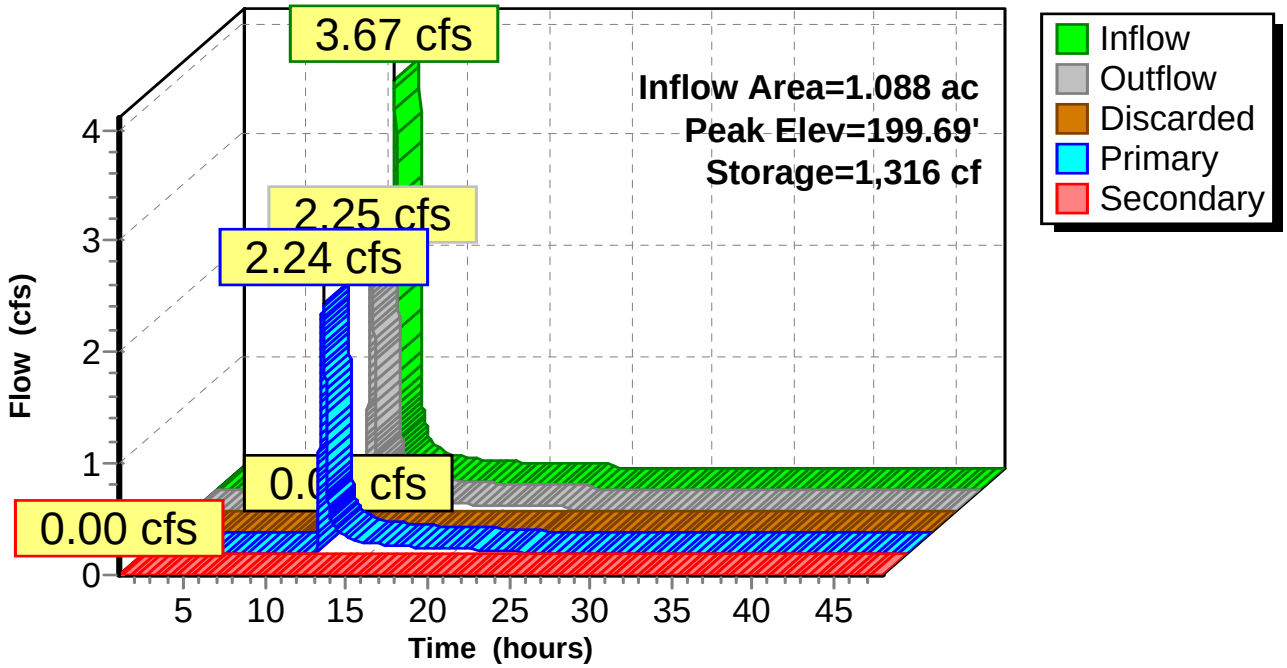
Discarded OutFlow Max=0.01 cfs @ 12.03 hrs HW=199.69' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.23 cfs @ 12.03 hrs HW=199.69' (Free Discharge)
↑**2=Culvert** (Barrel Controls 2.23 cfs @ 6.40 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
↑**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: EXISTING DRYWELL

Hydrograph



Summary for Pond 4P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 1.64" for 10-YR event
Inflow = 2.24 cfs @ 12.03 hrs, Volume= 0.149 af
Outflow = 2.11 cfs @ 12.09 hrs, Volume= 0.149 af, Atten= 6%, Lag= 3.3 min
Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.005 af
Primary = 2.10 cfs @ 12.09 hrs, Volume= 0.144 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 198.37' @ 12.09 hrs Surf.Area= 418 sf Storage= 370 cf

Plug-Flow detention time= 25.2 min calculated for 0.149 af (100% of inflow)
Center-of-Mass det. time= 24.6 min (866.1 - 841.5)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	655 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** 1,753 cf Overall - 116 cf Embedded = 1,637 cf x 40.0% Voids
#2	195.10'	113 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** Inside #1 116 cf Overall - 0.5" Wall Thickness = 113 cf
		768 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	196.47'	**8.0" Round Culvert** L= 55.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 196.47' / 195.00' S= 0.0267 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.07'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

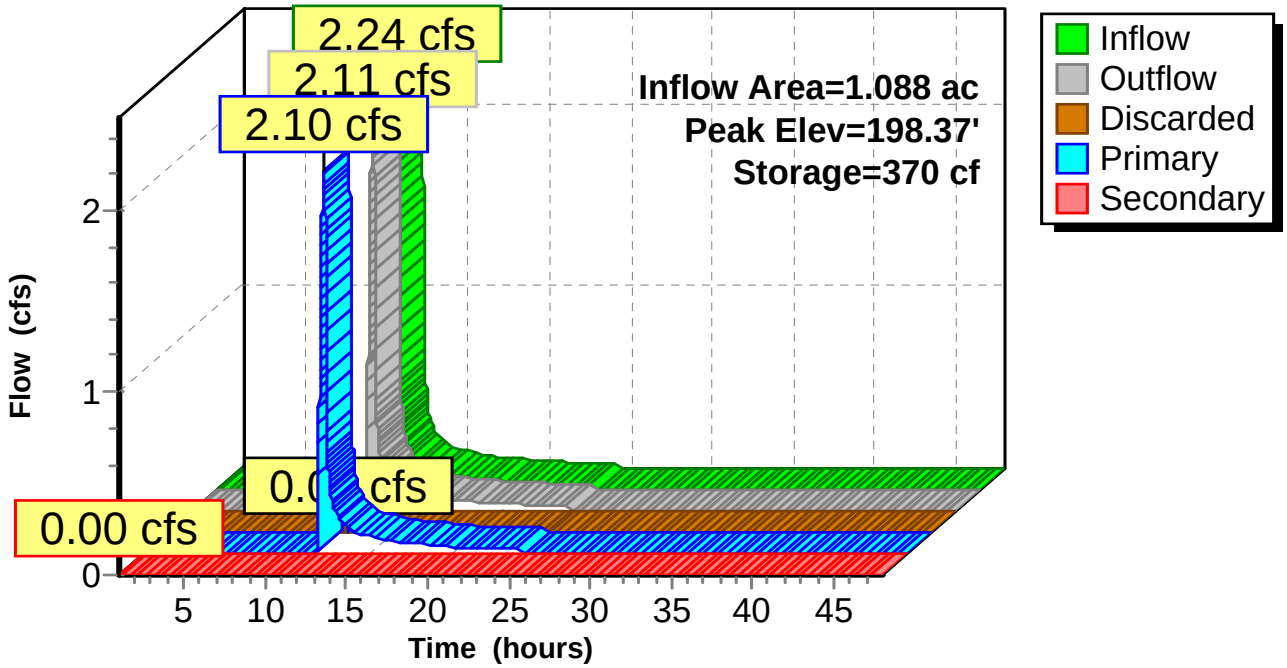
Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=198.37' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=2.10 cfs @ 12.09 hrs HW=198.37' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 2.10 cfs @ 6.02 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
↑└**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: EXISTING DRYWELL

Hydrograph



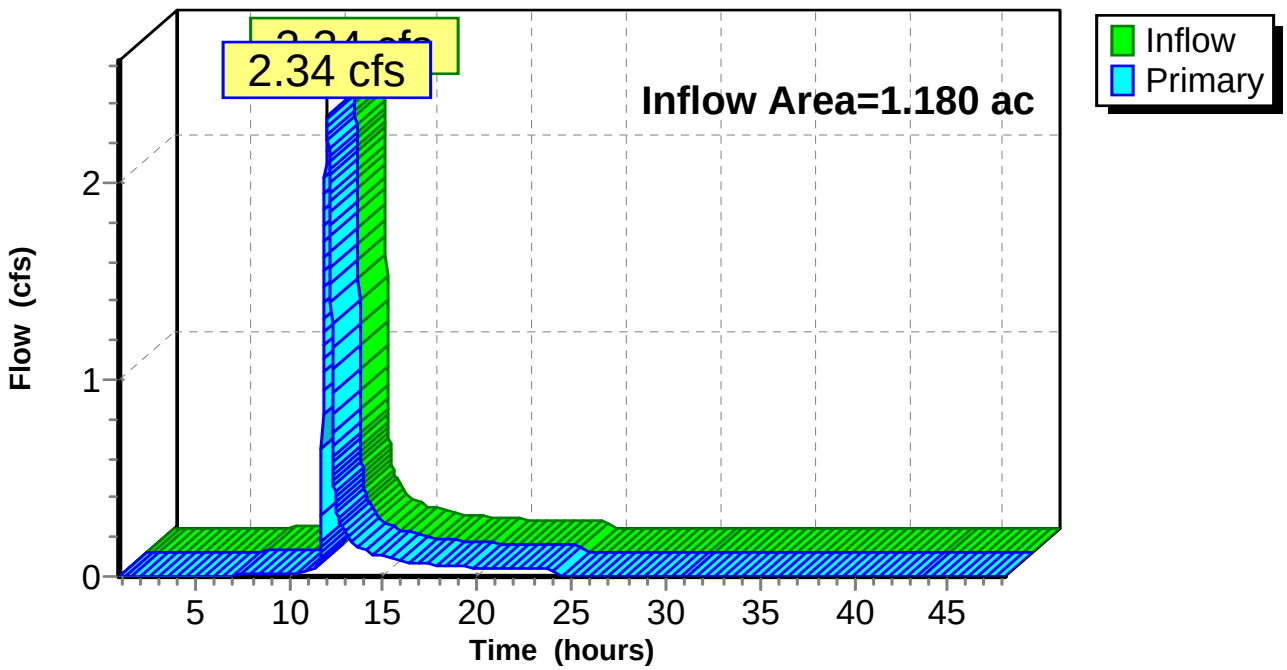
Summary for Link AP-1: Analysis Point 1

Inflow Area = 1.180 ac, 68.73% Impervious, Inflow Depth = 1.75" for 10-YR event
Inflow = 2.34 cfs @ 12.01 hrs, Volume= 0.173 af
Primary = 2.34 cfs @ 12.01 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point 1

Hydrograph



Time span=1.00-48.00 hrs, dt=0.01 hrs, 4701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=1.088 ac 66.08% Impervious Runoff Depth=4.01"
Flow Length=128' Tc=5.0 min CN=77 Runoff=7.93 cfs 0.363 af

Subcatchment 1A: Subcatchment 1 Runoff Area=0.092 ac 100.00% Impervious Runoff Depth>6.36"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=98 Runoff=0.89 cfs 0.049 af

Pond 3P: EXISTING DRYWELL Peak Elev=200.90' Storage=1,536 cf Inflow=7.93 cfs 0.363 af
Discarded=0.02 cfs 0.016 af Primary=2.71 cfs 0.294 af Secondary=7.89 cfs 0.053 af Outflow=10.62 cfs 0.362 af

Pond 4P: EXISTING DRYWELL Peak Elev=200.58' Storage=768 cf Inflow=10.60 cfs 0.346 af
Discarded=0.01 cfs 0.006 af Primary=3.26 cfs 0.303 af Secondary=7.51 cfs 0.038 af Outflow=10.78 cfs 0.346 af

Link AP-1: Analysis Point 1 Inflow=11.65 cfs 0.390 af
Primary=11.65 cfs 0.390 af

Total Runoff Area = 1.180 ac Runoff Volume = 0.412 af Average Runoff Depth = 4.19"
31.27% Pervious = 0.369 ac 68.73% Impervious = 0.811 ac

Summary for Subcatchment 1: Subcatchment 1

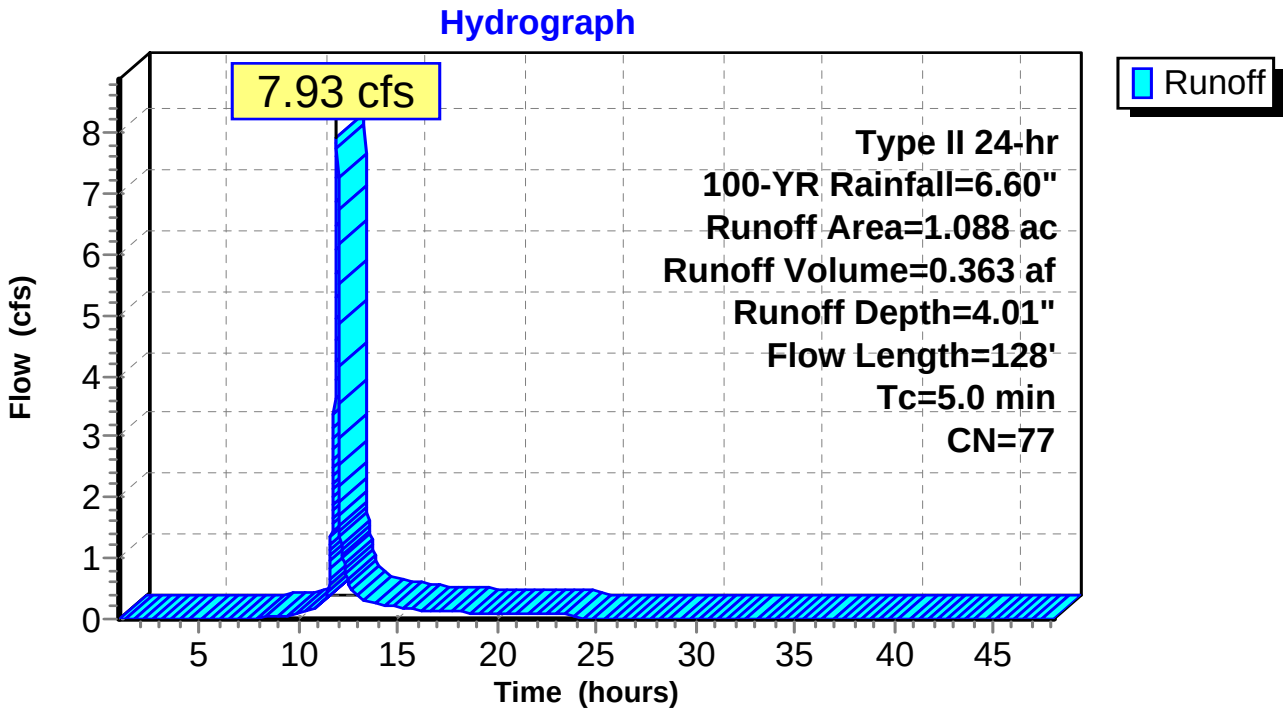
Runoff = 7.93 cfs @ 11.96 hrs, Volume= 0.363 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.095	30	Woods, Good, HSG A
0.719	98	Paved parking, HSG A
0.274	39	>75% Grass cover, Good, HSG A
1.088	77	Weighted Average
0.369		33.92% Pervious Area
0.719		66.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0260	1.42		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
0.1	28	0.0360	3.85		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
1.3	128	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 1A: Subcatchment 1

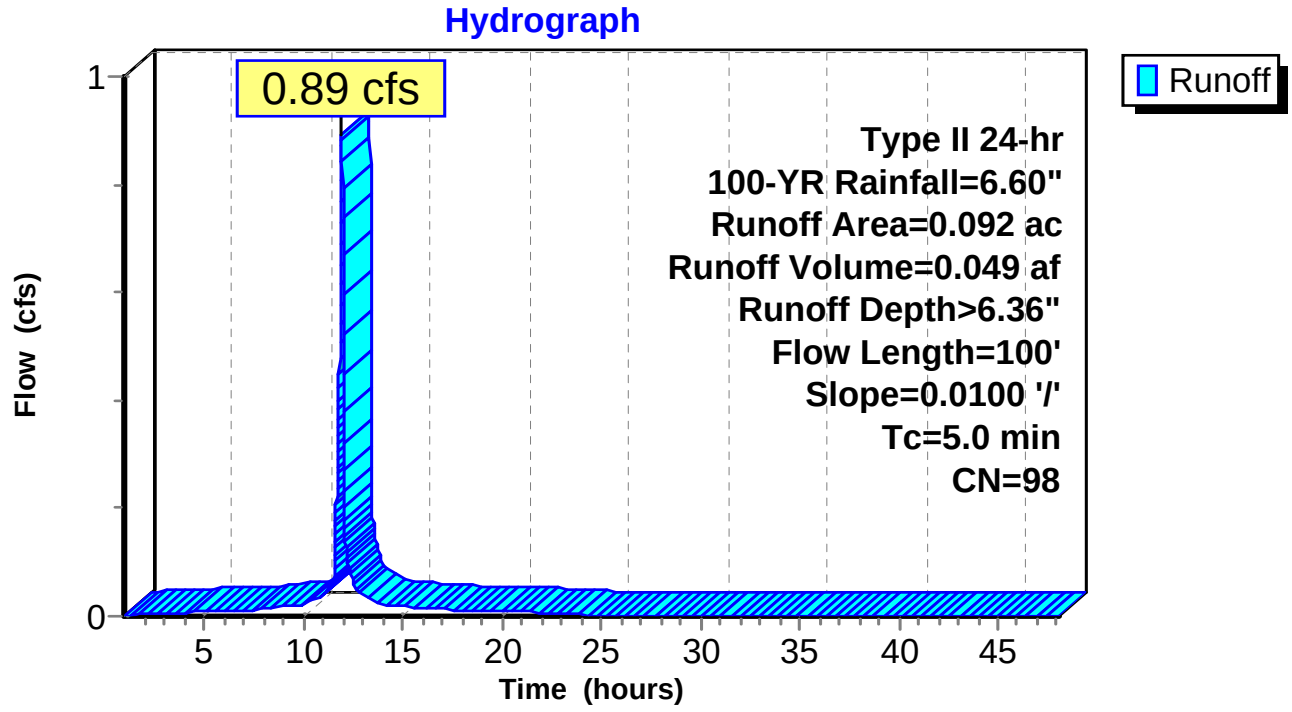
Runoff = 0.89 cfs @ 11.96 hrs, Volume= 0.049 af, Depth> 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.092	98	Paved parking, HSG A
0.092		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.97		**Sheet Flow, ROOF** Smooth surfaces n= 0.011 P2= 2.75"
1.7	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1A: Subcatchment 1



Summary for Pond 3P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 4.01" for 100-YR event
Inflow = 7.93 cfs @ 11.96 hrs, Volume= 0.363 af
Outflow = 10.62 cfs @ 11.96 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.89 hrs, Volume= 0.016 af
Primary = 2.71 cfs @ 11.96 hrs, Volume= 0.294 af
Secondary = 7.89 cfs @ 11.96 hrs, Volume= 0.053 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 200.90' @ 11.96 hrs Surf.Area= 1,414 sf Storage= 1,536 cf

Plug-Flow detention time= 36.5 min calculated for 0.362 af (100% of inflow)
Center-of-Mass det. time= 34.8 min (848.4 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	1,309 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** x 2 3,506 cf Overall - 233 cf Embedded = 3,273 cf x 40.0% Voids
#2	195.10'	226 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** x 2 Inside #1 233 cf Overall - 0.5" Wall Thickness = 226 cf
		1,536 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	197.08'	**8.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 197.08' / 196.47' S= 0.0094 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.37'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

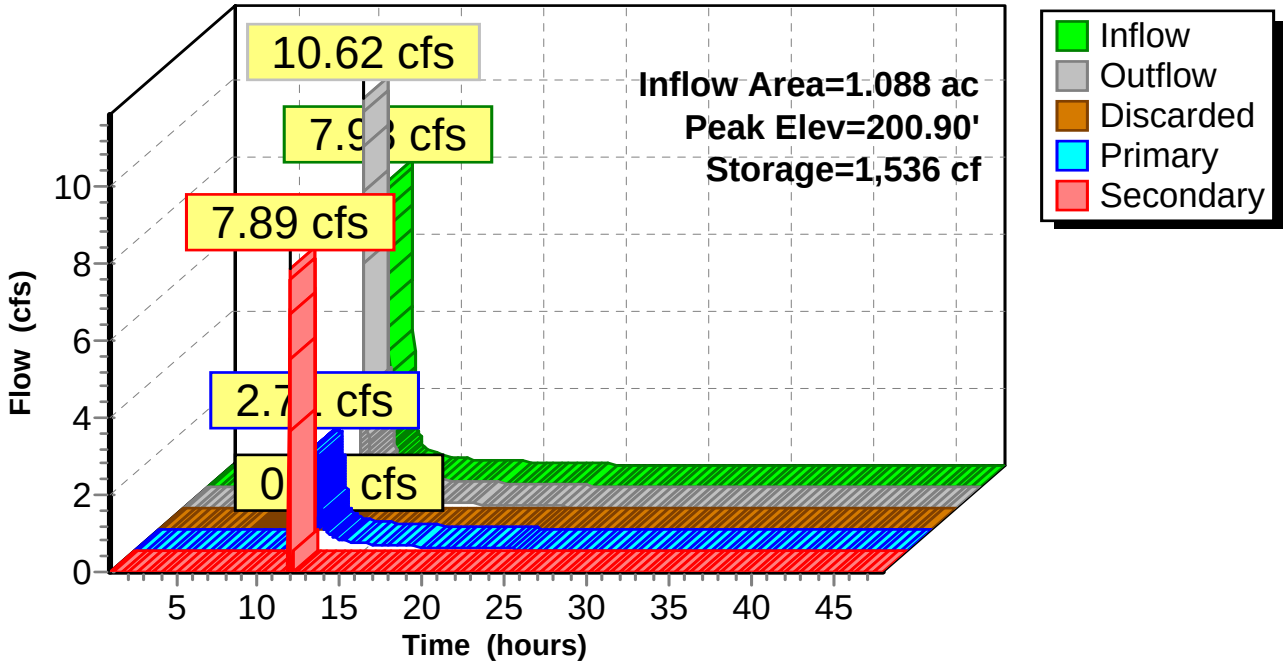
Discarded OutFlow Max=0.02 cfs @ 11.89 hrs HW=200.45' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.71 cfs @ 11.96 hrs HW=200.90' (Free Discharge)
↑**2=Culvert** (Barrel Controls 2.71 cfs @ 7.77 fps)

Secondary OutFlow Max=7.87 cfs @ 11.96 hrs HW=200.90' (Free Discharge)
↑**3=Orifice/Grate** (Weir Controls 7.87 cfs @ 2.38 fps)

Pond 3P: EXISTING DRYWELL

Hydrograph



Summary for Pond 4P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 3.82" for 100-YR event
Inflow = 10.60 cfs @ 11.96 hrs, Volume= 0.346 af
Outflow = 10.78 cfs @ 11.97 hrs, Volume= 0.346 af, Atten= 0%, Lag= 0.6 min
Discarded = 0.01 cfs @ 11.93 hrs, Volume= 0.006 af
Primary = 3.26 cfs @ 11.97 hrs, Volume= 0.303 af
Secondary = 7.51 cfs @ 11.97 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 200.58' @ 11.97 hrs Surf.Area= 707 sf Storage= 768 cf

Plug-Flow detention time= 12.2 min calculated for 0.346 af (100% of inflow)
Center-of-Mass det. time= 12.3 min (832.8 - 820.5)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	655 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** 1,753 cf Overall - 116 cf Embedded = 1,637 cf x 40.0% Voids
#2	195.10'	113 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** Inside #1 116 cf Overall - 0.5" Wall Thickness = 113 cf
		768 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	196.47'	**8.0" Round Culvert** L= 55.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 196.47' / 195.00' S= 0.0267 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.07'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

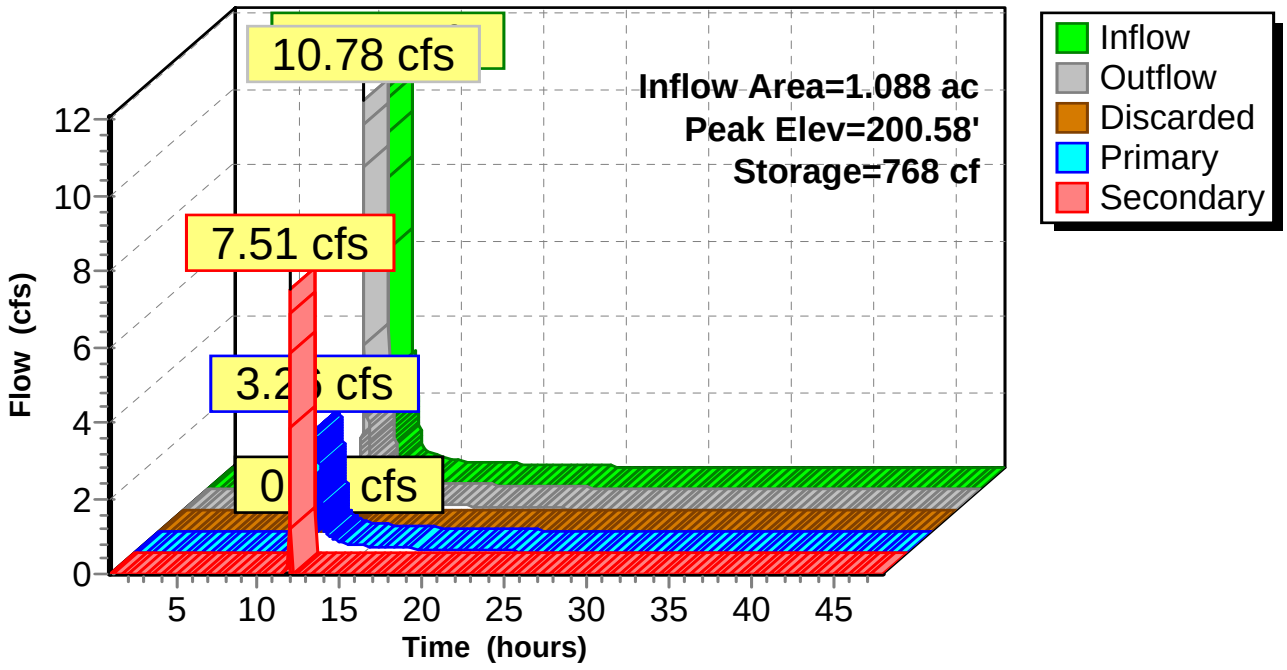
Discarded OutFlow Max=0.01 cfs @ 11.93 hrs HW=200.55' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.26 cfs @ 11.97 hrs HW=200.58' (Free Discharge)
↑└**2=Culvert** (Barrel Controls 3.26 cfs @ 9.35 fps)

Secondary OutFlow Max=7.51 cfs @ 11.97 hrs HW=200.58' (Free Discharge)
↑└**3=Orifice/Grate** (Weir Controls 7.51 cfs @ 2.34 fps)

Pond 4P: EXISTING DRYWELL

Hydrograph



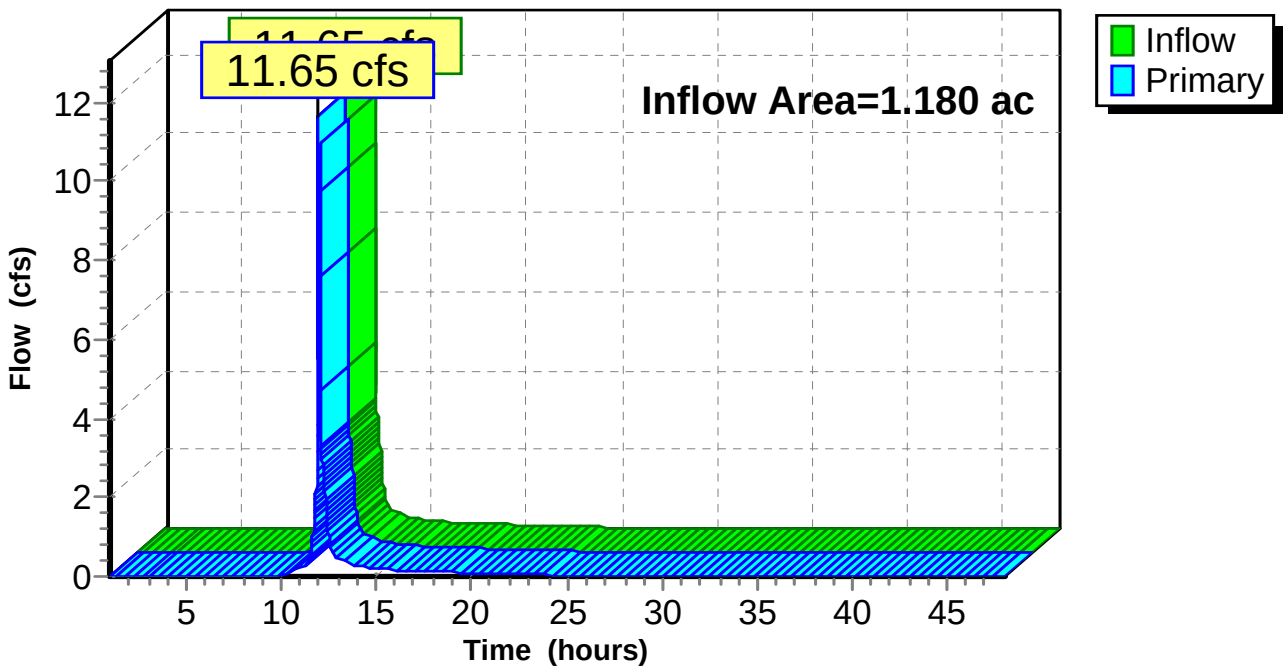
Summary for Link AP-1: Analysis Point 1

Inflow Area = 1.180 ac, 68.73% Impervious, Inflow Depth > 3.96" for 100-YR event
Inflow = 11.65 cfs @ 11.95 hrs, Volume= 0.390 af
Primary = 11.65 cfs @ 11.95 hrs, Volume= 0.390 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point 1

Hydrograph



Time span=1.00-48.00 hrs, dt=0.01 hrs, 4701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=1.088 ac 66.08% Impervious Runoff Depth=0.09"
Flow Length=128' Tc=5.0 min CN=77 Runoff=0.08 cfs 0.008 af

Subcatchment 1A: Subcatchment 1 Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=0.94"
Flow Length=100' Slope=0.0100 '/' Tc=5.0 min CN=98 Runoff=0.15 cfs 0.007 af

Pond 3P: EXISTING DRYWELL Peak Elev=196.25' Storage=190 cf Inflow=0.08 cfs 0.008 af
Discarded=0.00 cfs 0.008 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.008 af

Pond 4P: EXISTING DRYWELL Peak Elev=194.10' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link AP-1: Analysis Point 1 Inflow=0.15 cfs 0.007 af
Primary=0.15 cfs 0.007 af

Total Runoff Area = 1.180 ac Runoff Volume = 0.015 af Average Runoff Depth = 0.15"
31.27% Pervious = 0.369 ac 68.73% Impervious = 0.811 ac

Summary for Subcatchment 1: Subcatchment 1

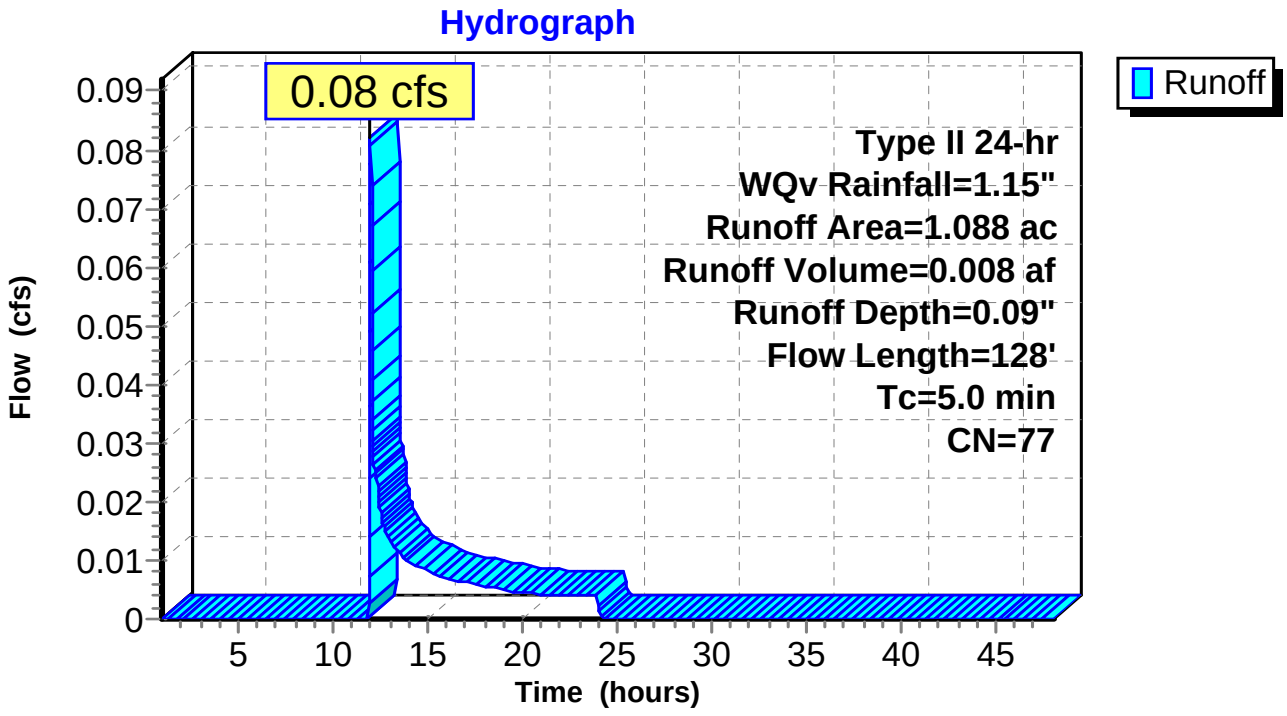
Runoff = 0.08 cfs @ 12.01 hrs, Volume= 0.008 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.095	30	Woods, Good, HSG A
0.719	98	Paved parking, HSG A
0.274	39	>75% Grass cover, Good, HSG A
1.088	77	Weighted Average
0.369		33.92% Pervious Area
0.719		66.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0260	1.42		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
0.1	28	0.0360	3.85		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
1.3	128	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 1A: Subcatchment 1

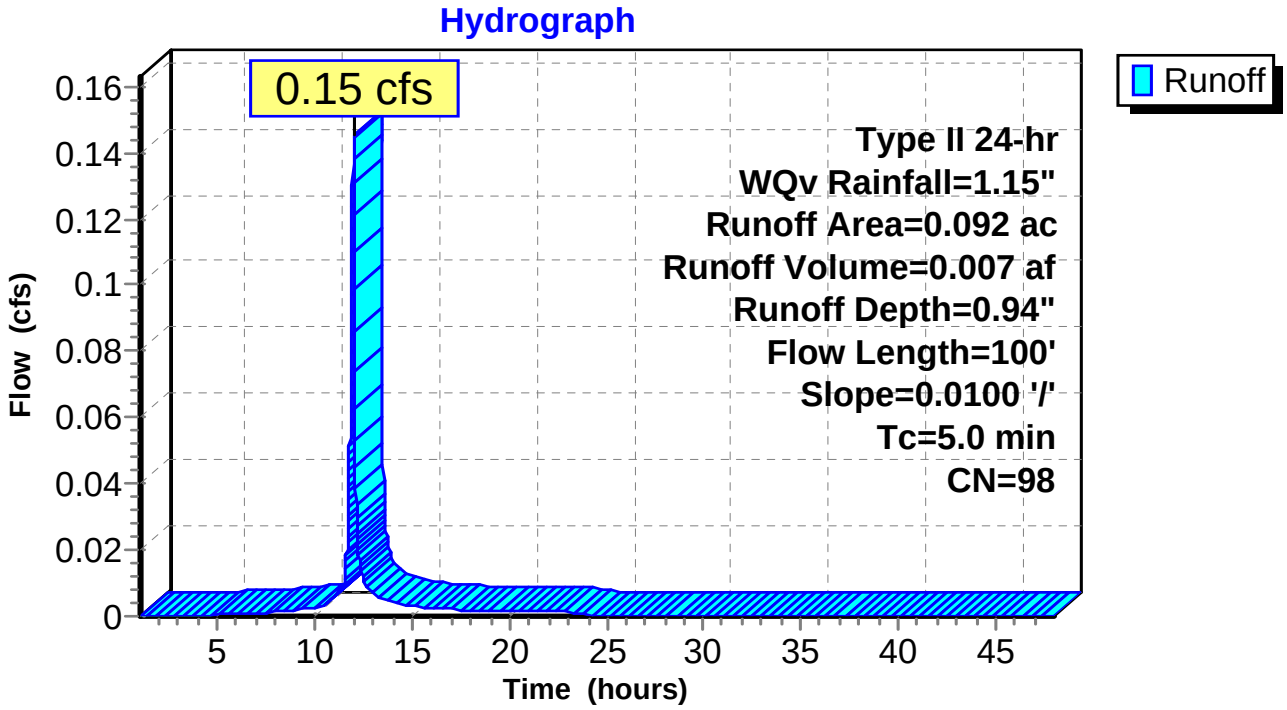
Runoff = 0.15 cfs @ 11.96 hrs, Volume= 0.007 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.092	98	Paved parking, HSG A
0.092		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.97		**Sheet Flow, ROOF** Smooth surfaces n= 0.011 P2= 2.75"
1.7	100	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1A: Subcatchment 1



Summary for Pond 3P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 0.09" for WQv event
Inflow = 0.08 cfs @ 12.01 hrs, Volume= 0.008 af
Outflow = 0.00 cfs @ 24.03 hrs, Volume= 0.008 af, Atten= 95%, Lag= 721.1 min
Discarded = 0.00 cfs @ 24.03 hrs, Volume= 0.008 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 196.25' @ 24.03 hrs Surf.Area= 335 sf Storage= 190 cf

Plug-Flow detention time= 643.8 min calculated for 0.008 af (99% of inflow)
Center-of-Mass det. time= 641.3 min (1,600.5 - 959.2)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	1,309 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** x 2 3,506 cf Overall - 233 cf Embedded = 3,273 cf x 40.0% Voids
#2	195.10'	226 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** x 2 Inside #1 233 cf Overall - 0.5" Wall Thickness = 226 cf
		1,536 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	197.08'	**8.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 197.08' / 196.47' S= 0.0094 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.37'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

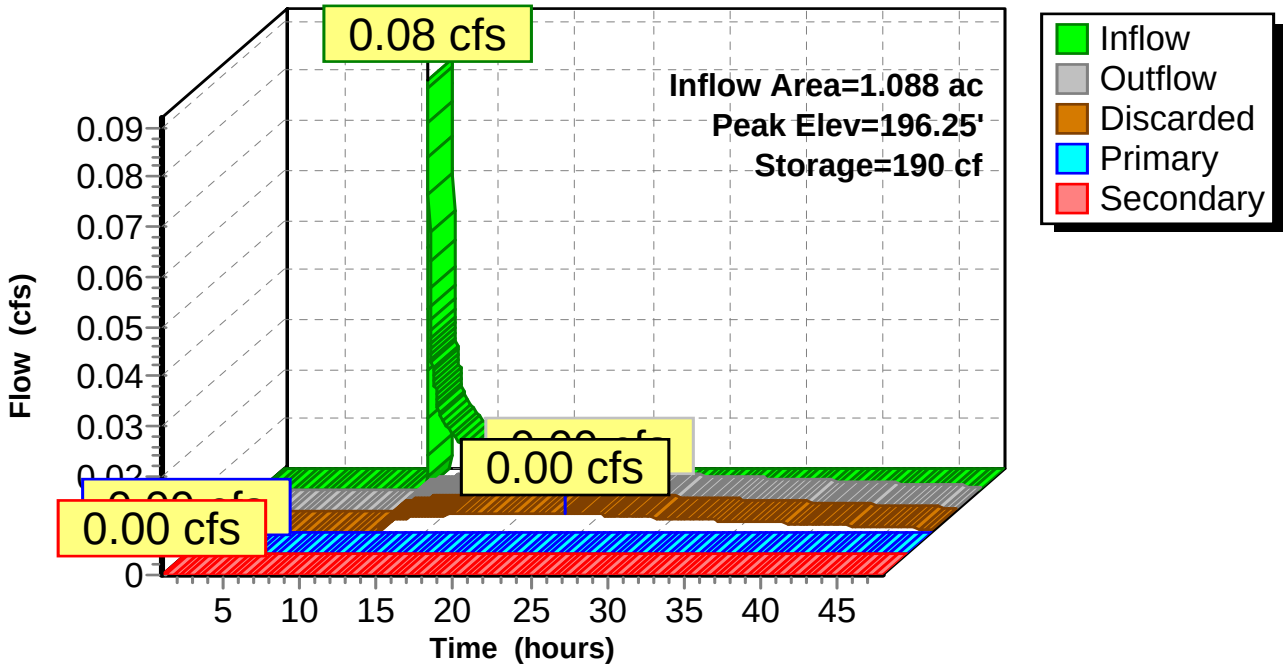
Discarded OutFlow Max=0.00 cfs @ 24.03 hrs HW=196.25' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: EXISTING DRYWELL

Hydrograph



Summary for Pond 4P: EXISTING DRYWELL

Inflow Area = 1.088 ac, 66.08% Impervious, Inflow Depth = 0.00" for WQv event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 194.10' @ 1.00 hrs Surf.Area= 28 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	194.10'	655 cf	**6.00'D x 6.00'H Vertical Cone/Cylinder Z=2.0** 1,753 cf Overall - 116 cf Embedded = 1,637 cf x 40.0% Voids
#2	195.10'	113 cf	**6.00'D x 4.00'H Vertical Cone/Cylinder** Inside #1 116 cf Overall - 0.5" Wall Thickness = 113 cf
		768 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	194.10'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	196.47'	**8.0" Round Culvert** L= 55.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 196.47' / 195.00' S= 0.0267 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#3	Secondary	200.07'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

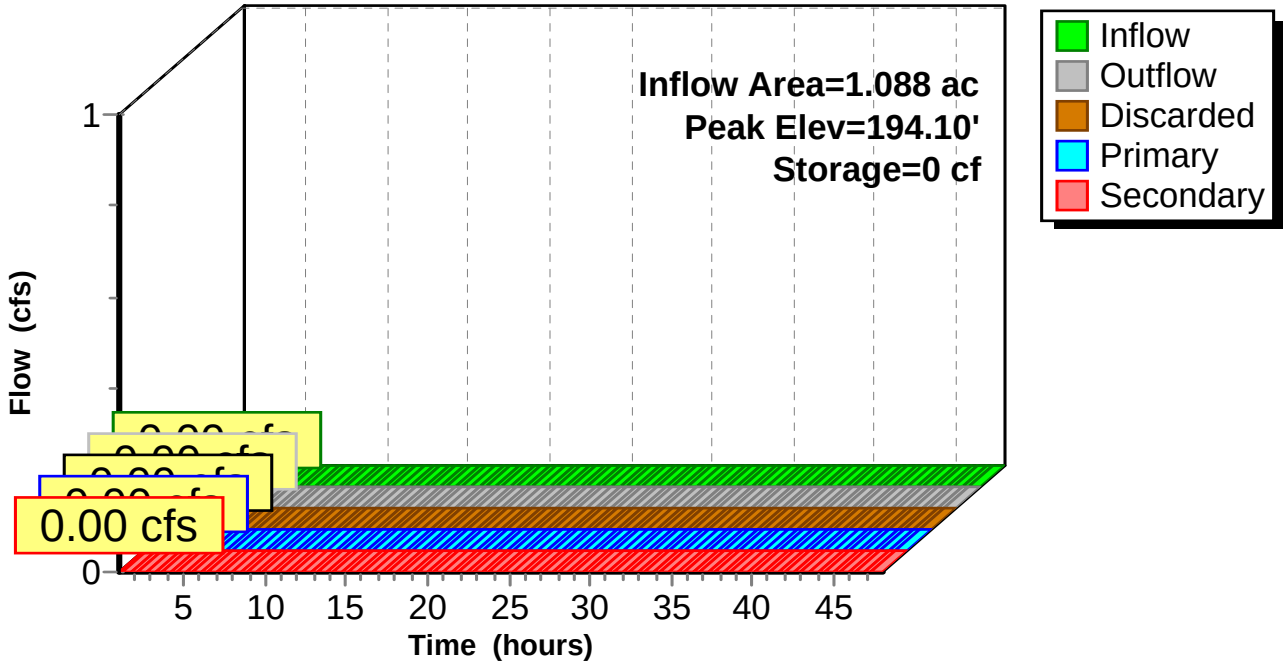
Discarded OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=194.10' (Free Discharge)
3=Orifice/Grate (Controls 0.00 cfs)

Pond 4P: EXISTING DRYWELL

Hydrograph



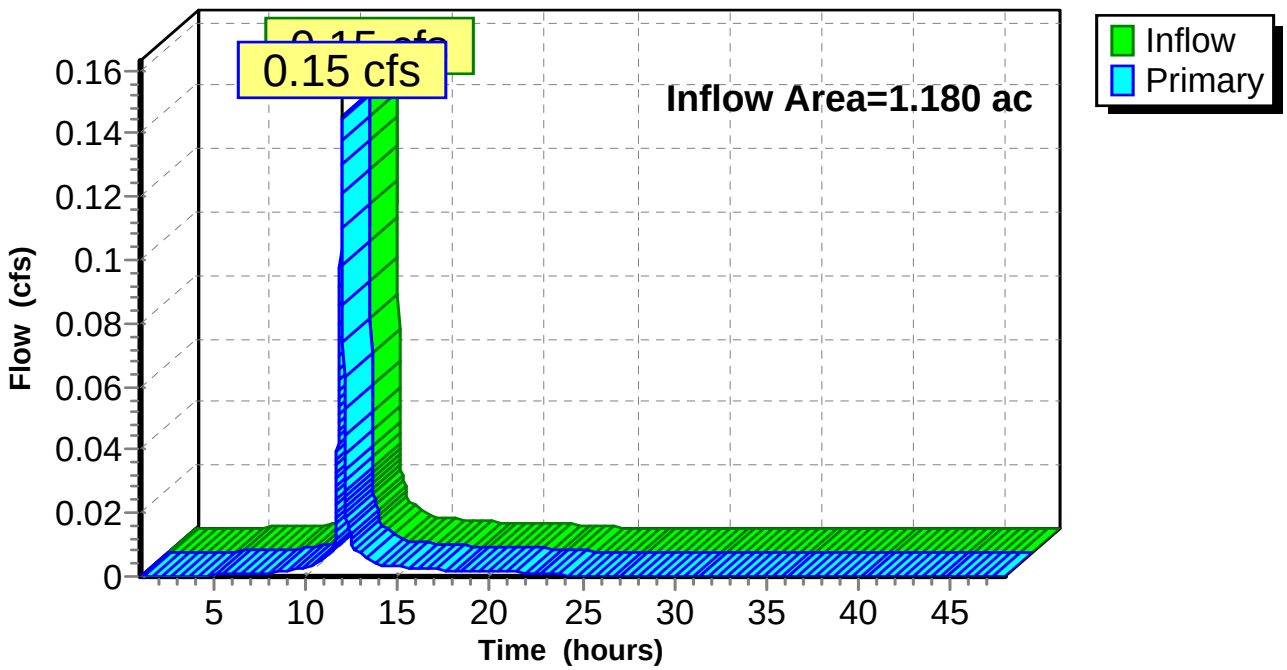
Summary for Link AP-1: Analysis Point 1

Inflow Area = 1.180 ac, 68.73% Impervious, Inflow Depth = 0.07" for WQv event
Inflow = 0.15 cfs @ 11.96 hrs, Volume= 0.007 af
Primary = 0.15 cfs @ 11.96 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point 1

Hydrograph



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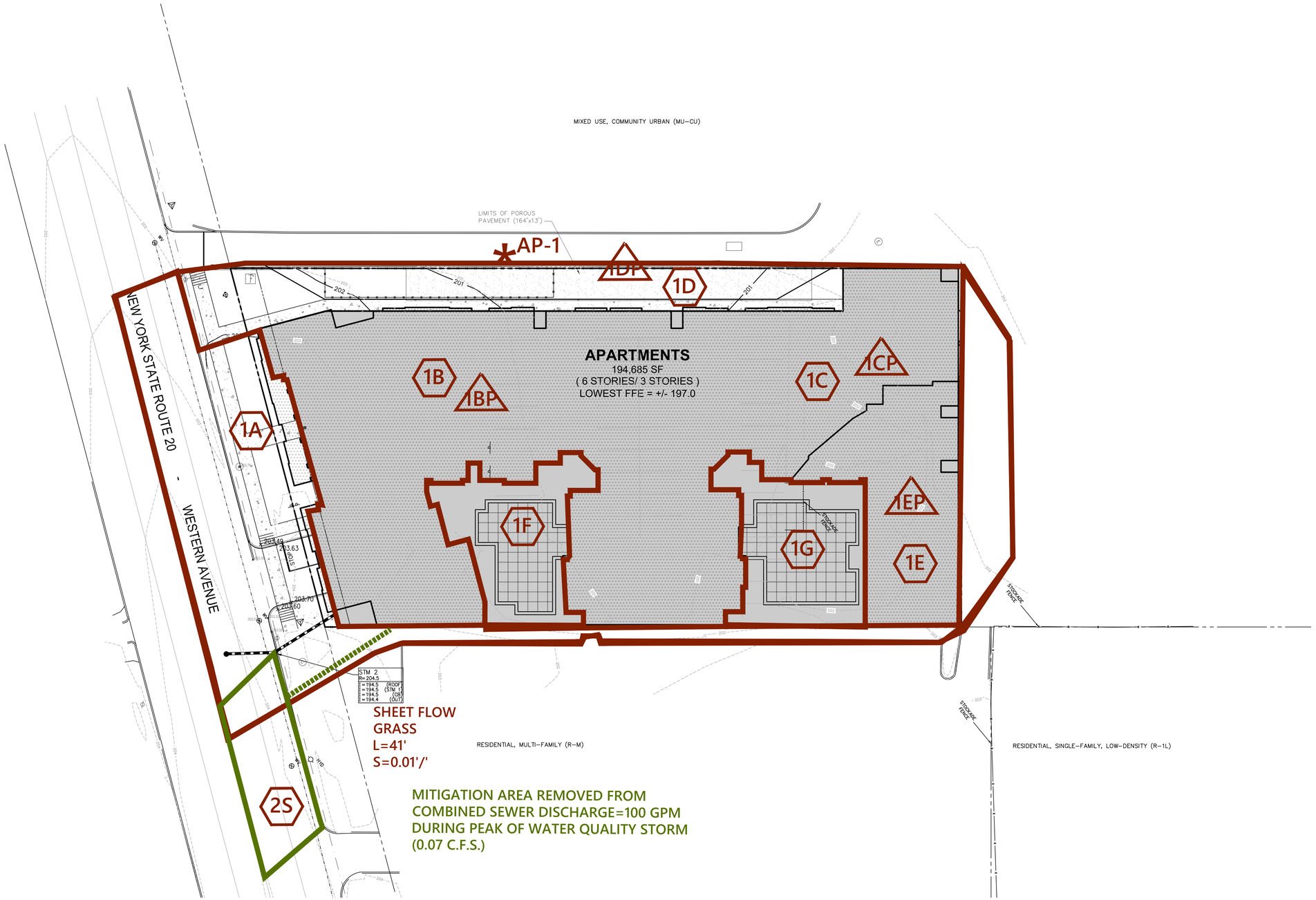


0 10 20 40 Feet

1211 Western Avenue

1211 Western Avenue
Albany, New York 12203

No.	Revision	Date	Appvd.
5	City of Albany Comments	10/XX/2018	MBT
4	P.B Submission	9/17/2018	MBT
3	Revised Building	5/1/2018	MBT
2	Revised Building	3/6/2018	MBT
1	Revised Building	12/28/2017	MBT

Designed by: AWK
Checked by: MBT

Issued for: Site Plan Review
Date: November 1, 2017

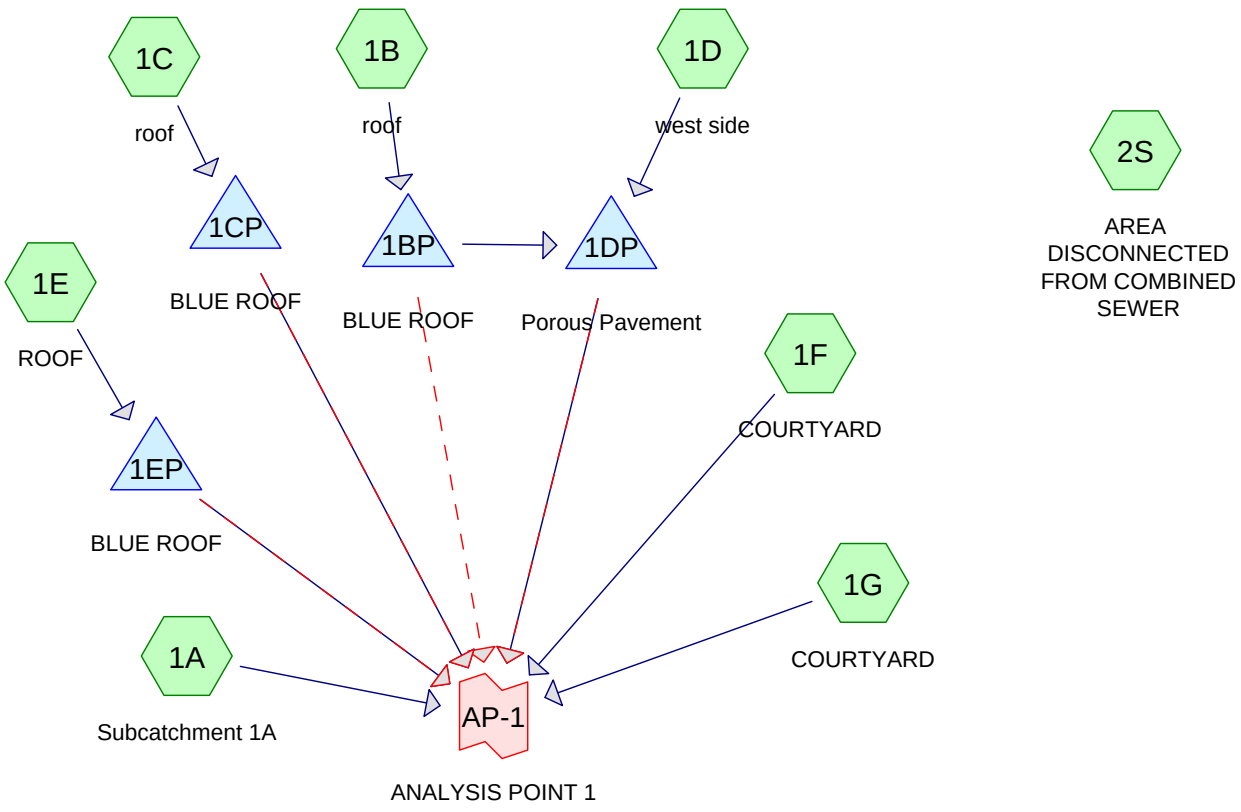
Not Approved for Construction

Drawing Title
Proposed Conditions Drainage Plan

Drawing Number
PCD

Sheet 1 of 1

Project Number
26138.00



Subcat Reach Pond Link

Routing Diagram for 26138.00 PR
Prepared by VHB, Printed 10/12/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.135	39	>75% Grass cover, Good, HSG A (1A, 1F, 1G)
0.084	80	>75% Grass cover, Good, HSG D (1A)
0.704	98	Paved parking, HSG A (1B, 1C, 1D)
0.277	98	Paved parking, HSG B (1A, 1F, 1G, 2S)
0.092	98	Roofs, HSG B (1E)
1.292	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.839	HSG A	1A, 1B, 1C, 1D, 1F, 1G
0.369	HSG B	1A, 1E, 1F, 1G, 2S
0.000	HSG C	
0.084	HSG D	1A
0.000	Other	
1.292		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.135	0.000	0.000	0.084	0.000	0.219	>75% Grass cover, Good	1A, 1F, 1G
0.704	0.277	0.000	0.000	0.000	0.981	Paved parking	1A, 1B, 1C, 1D, 1F, 1G, 2S
0.000	0.092	0.000	0.000	0.000	0.092	Roofs	1E
0.839	**0.369**	**0.000**	**0.084**	**0.000**	**1.292**	**TOTAL AREA**	

Time span=0.50-60.00 hrs, dt=0.01 hrs, 5951 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Subcatchment 1A Runoff Area=0.317 ac 52.37% Impervious Runoff Depth=0.73"
Flow Length=41' Slope=0.0100 '/' Tc=6.8 min CN=81 Runoff=0.40 cfs 0.019 af

Subcatchment 1B: roof Runoff Area=0.264 ac 100.00% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=98 Runoff=0.81 cfs 0.043 af

Subcatchment 1C: roof Runoff Area=0.310 ac 100.00% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=98 Runoff=0.95 cfs 0.051 af

Subcatchment 1D: west side Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=1.97"
Tc=90.0 min CN=98 Runoff=0.10 cfs 0.021 af

Subcatchment 1E: ROOF Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.015 af

Subcatchment 1F: COURTYARD Runoff Area=0.064 ac 46.87% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=67 Runoff=0.02 cfs 0.001 af

Subcatchment 1G: COURTYARD Runoff Area=0.070 ac 51.43% Impervious Runoff Depth=0.29"
Tc=6.0 min CN=69 Runoff=0.03 cfs 0.002 af

Subcatchment 2S: AREA DISCONNECTED Runoff Area=0.045 ac 100.00% Impervious Runoff Depth=1.97"
Flow Length=150' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.14 cfs 0.007 af

Pond 1BP: BLUE ROOF Peak Elev=275.08' Storage=975 cf Inflow=0.81 cfs 0.043 af
Primary=0.06 cfs 0.033 af Secondary=0.13 cfs 0.010 af Outflow=0.20 cfs 0.043 af

Pond 1CP: BLUE ROOF Peak Elev=275.06' Storage=1,456 cf Inflow=0.95 cfs 0.051 af
Primary=0.04 cfs 0.047 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.047 af

Pond 1DP: Porous Pavement Peak Elev=198.03' Storage=897 cf Inflow=0.14 cfs 0.054 af
Outflow=0.02 cfs 0.054 af

Pond 1EP: BLUE ROOF Peak Elev=245.18' Storage=659 cf Inflow=0.28 cfs 0.015 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link AP-1: ANALYSIS POINT 1 Inflow=0.56 cfs 0.080 af
Primary=0.56 cfs 0.080 af

Total Runoff Area = 1.292 ac Runoff Volume = 0.161 af Average Runoff Depth = 1.49"
16.95% Pervious = 0.219 ac 83.05% Impervious = 1.073 ac

Summary for Subcatchment 1A: Subcatchment 1A

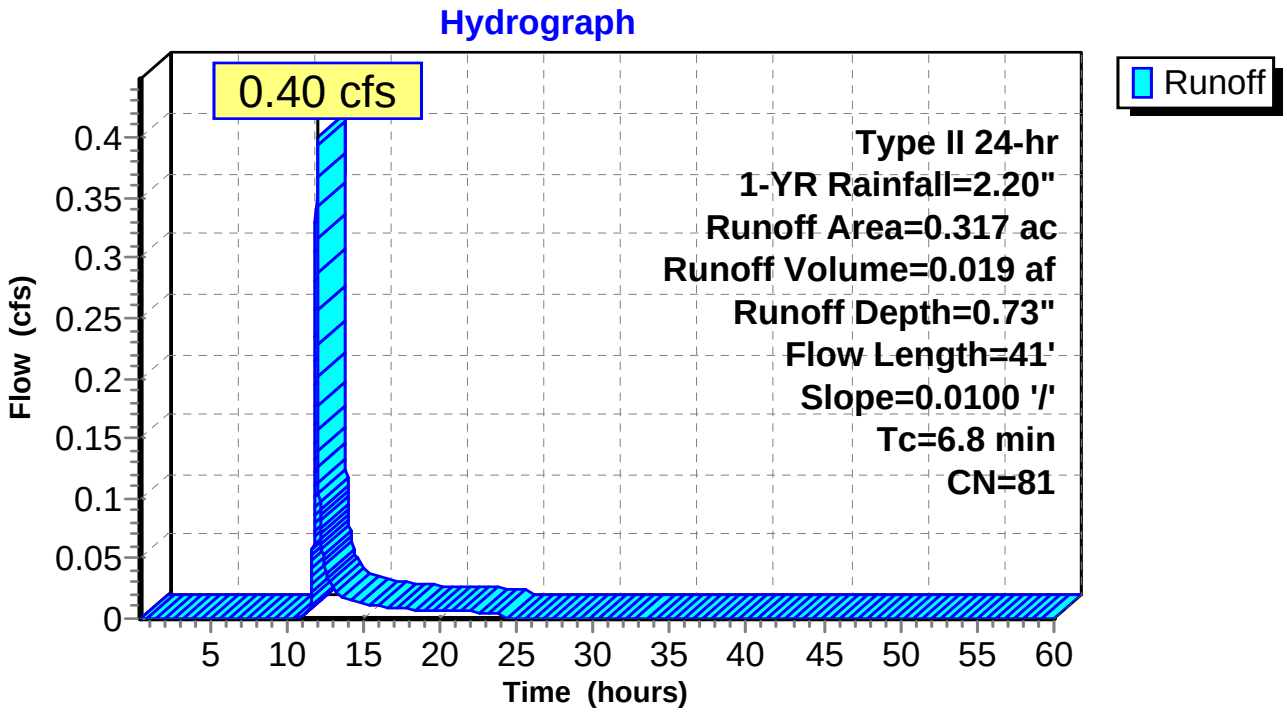
Runoff = 0.40 cfs @ 11.99 hrs, Volume= 0.019 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.084	80	>75% Grass cover, Good, HSG D
0.067	39	>75% Grass cover, Good, HSG A
0.166	98	Paved parking, HSG B
0.317	81	Weighted Average
0.151		47.63% Pervious Area
0.166		52.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	41	0.0100	0.10		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 2.75"

Subcatchment 1A: Subcatchment 1A



Summary for Subcatchment 1B: roof

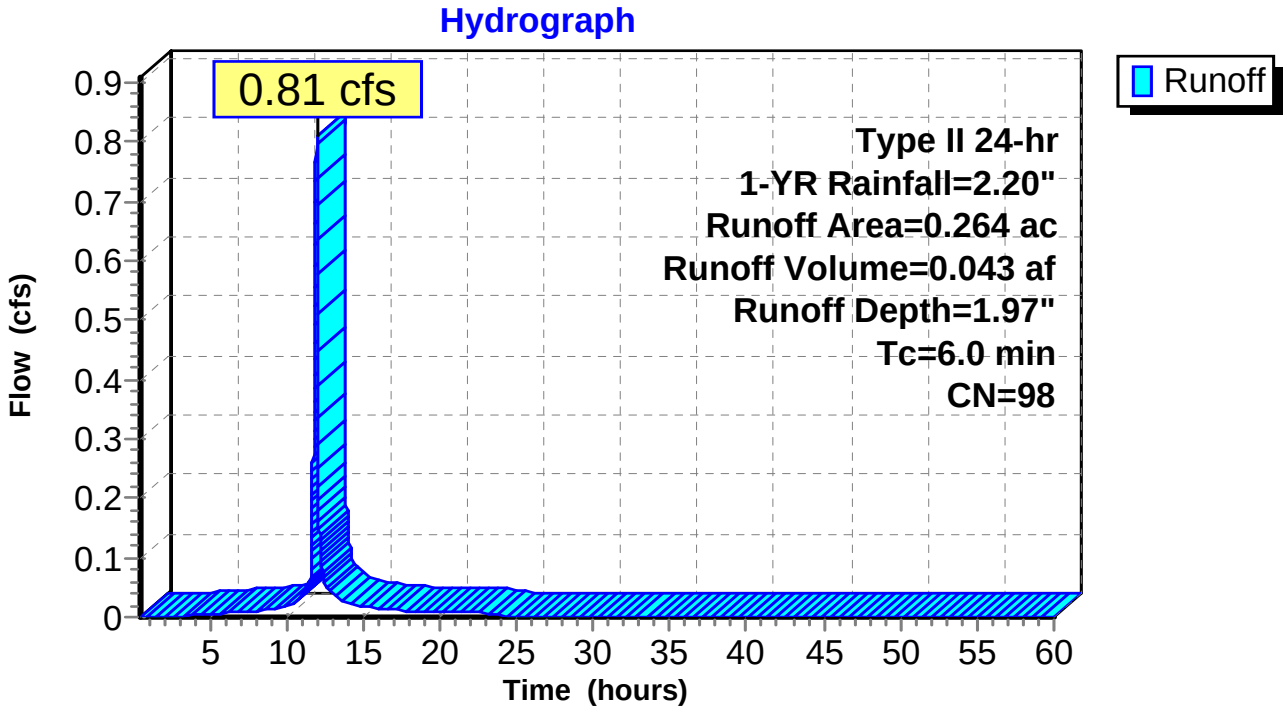
Runoff = 0.81 cfs @ 11.97 hrs, Volume= 0.043 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.264	98	Paved parking, HSG A
0.264		100.00% Impervious Area

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

Subcatchment 1B: roof



Summary for Subcatchment 1C: roof

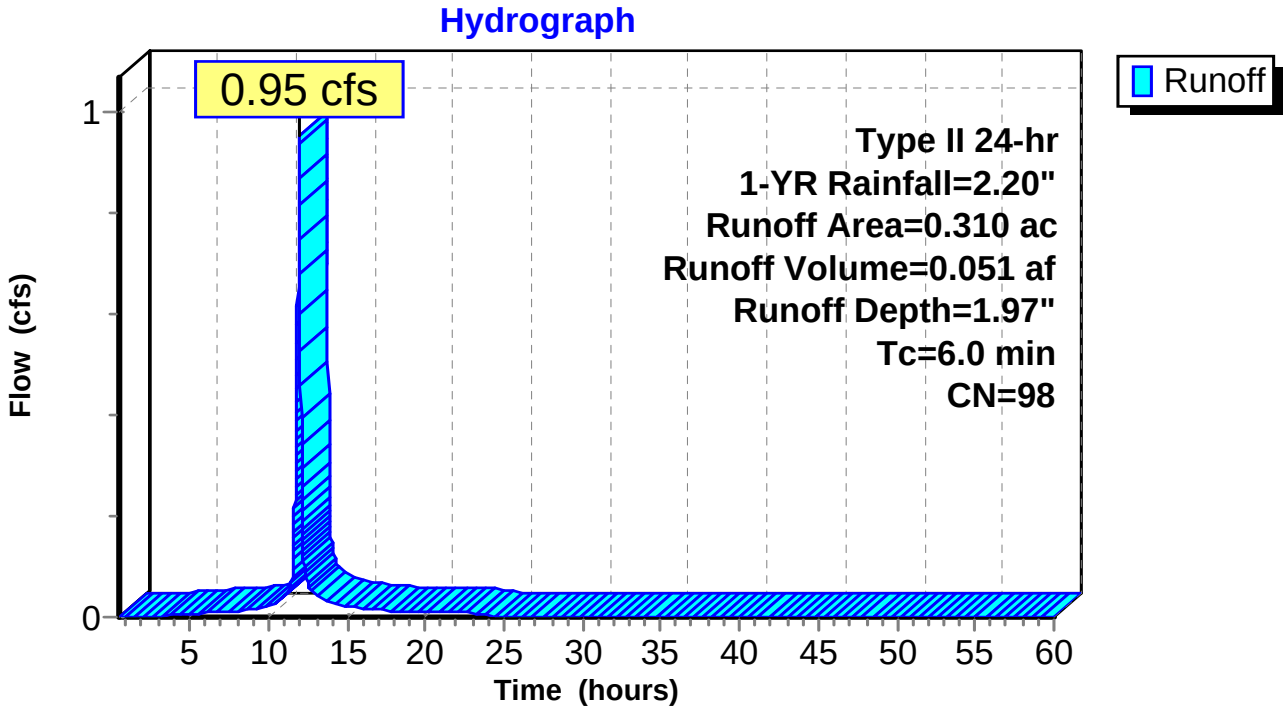
Runoff = 0.95 cfs @ 11.97 hrs, Volume= 0.051 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG A
0.310		100.00% Impervious Area

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

Subcatchment 1C: roof



Summary for Subcatchment 1D: west side

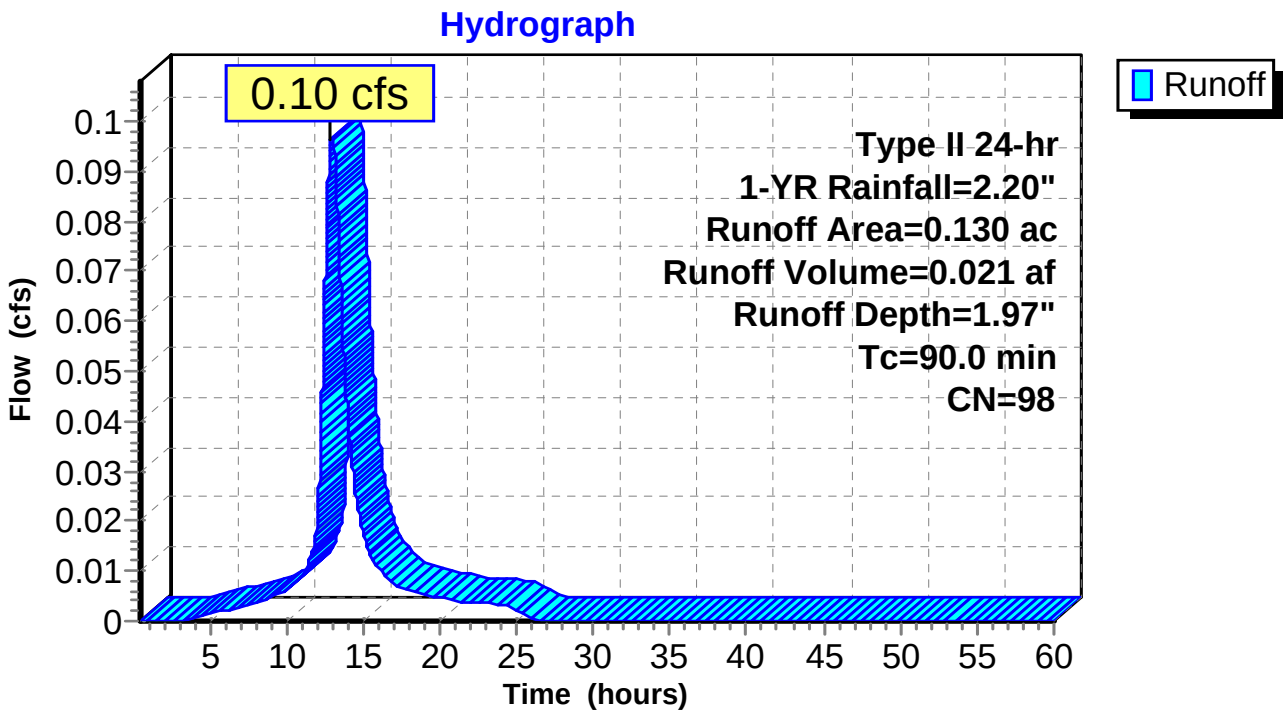
Runoff = 0.10 cfs @ 12.91 hrs, Volume= 0.021 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG A
0.130		100.00% Impervious Area

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

Subcatchment 1D: west side



Summary for Subcatchment 1E: ROOF

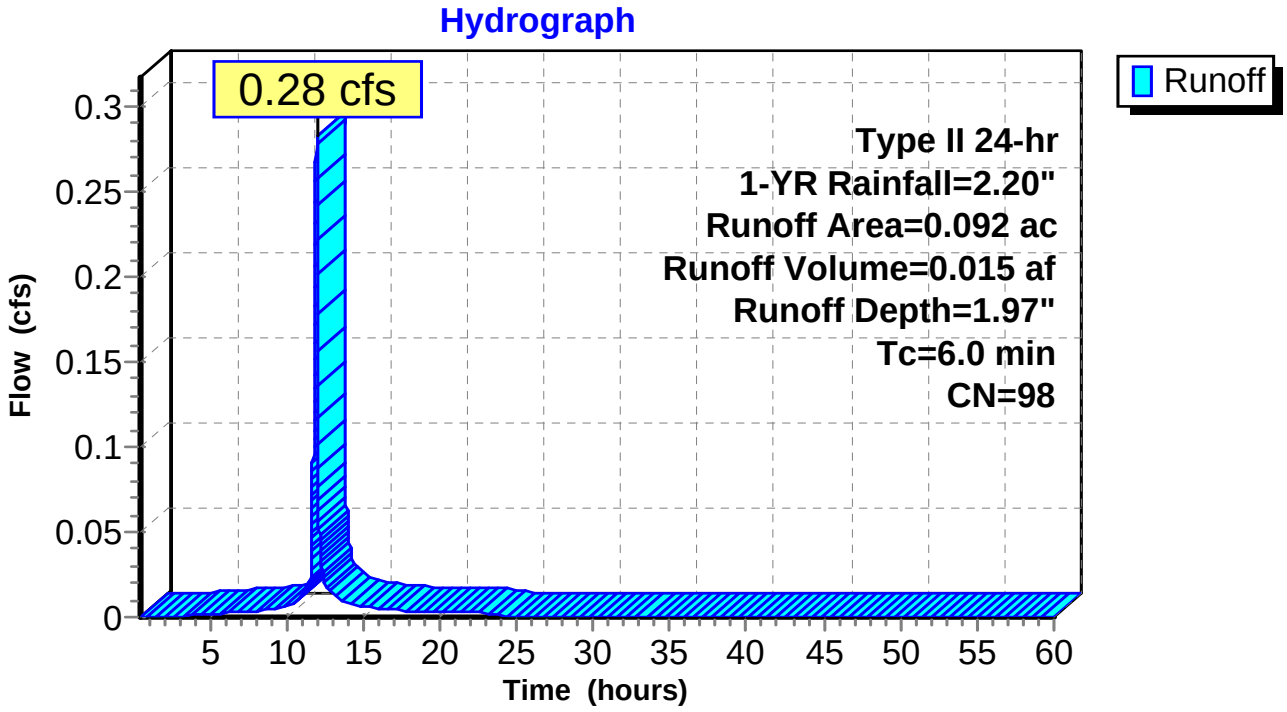
Runoff = 0.28 cfs @ 11.97 hrs, Volume= 0.015 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.092	98	Roofs, HSG B
0.092		100.00% Impervious Area

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

Subcatchment 1E: ROOF



Summary for Subcatchment 1F: COURTYARD

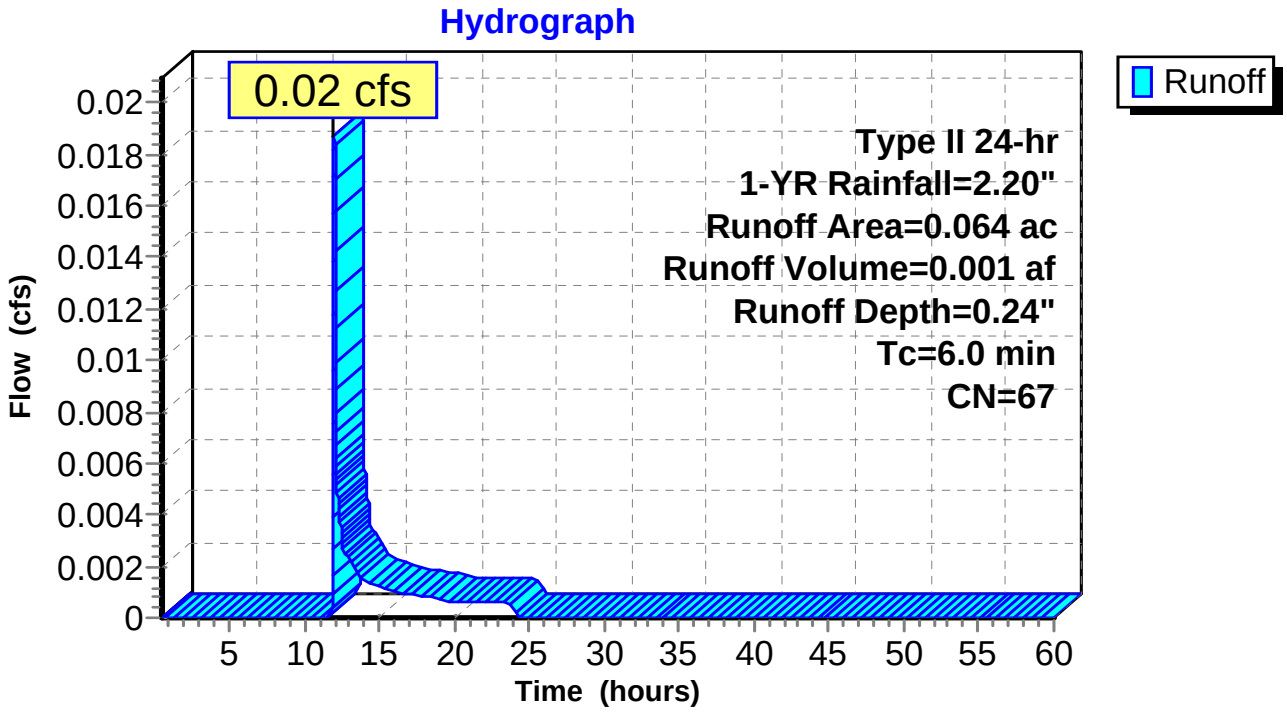
Runoff = 0.02 cfs @ 12.00 hrs, Volume= 0.001 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.030	98	Paved parking, HSG B
0.064	67	Weighted Average
0.034		53.13% Pervious Area
0.030		46.87% Impervious Area

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

Subcatchment 1F: COURTYARD



Summary for Subcatchment 1G: COURTYARD

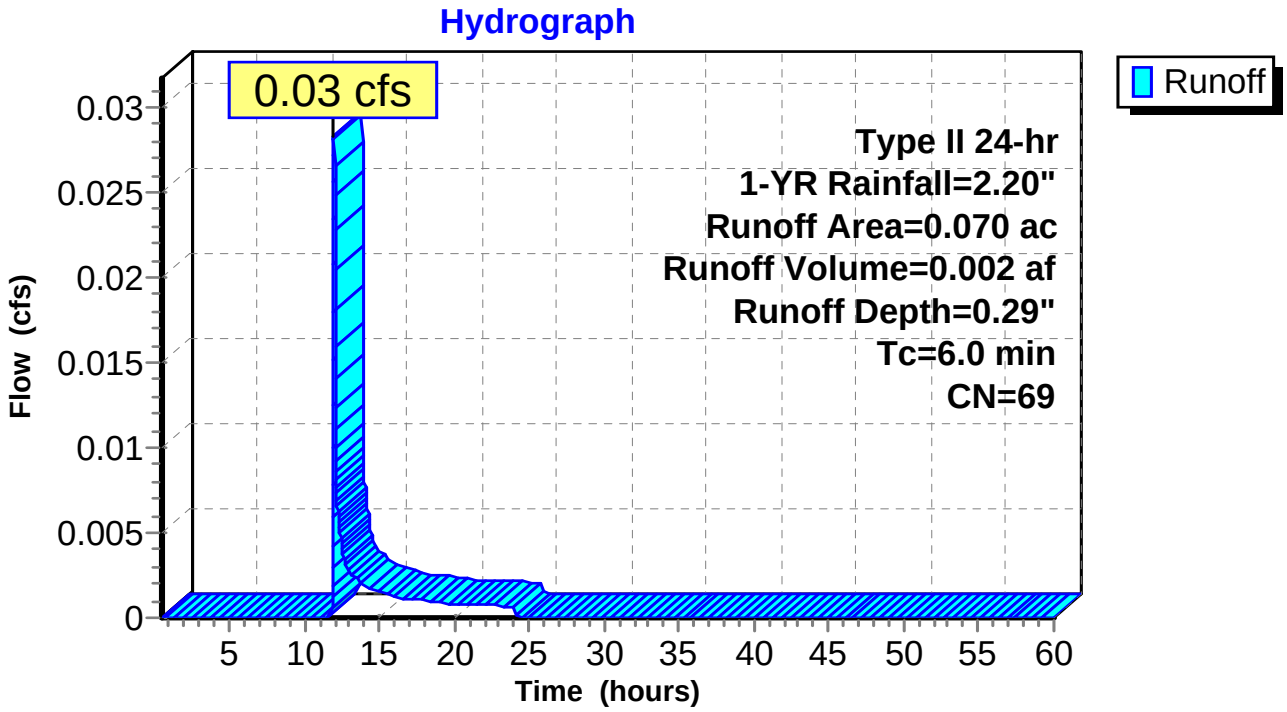
Runoff = 0.03 cfs @ 12.00 hrs, Volume= 0.002 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.036	98	Paved parking, HSG B
0.070	69	Weighted Average
0.034		48.57% Pervious Area
0.036		51.43% Impervious Area

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

Subcatchment 1G: COURTYARD



Summary for Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER

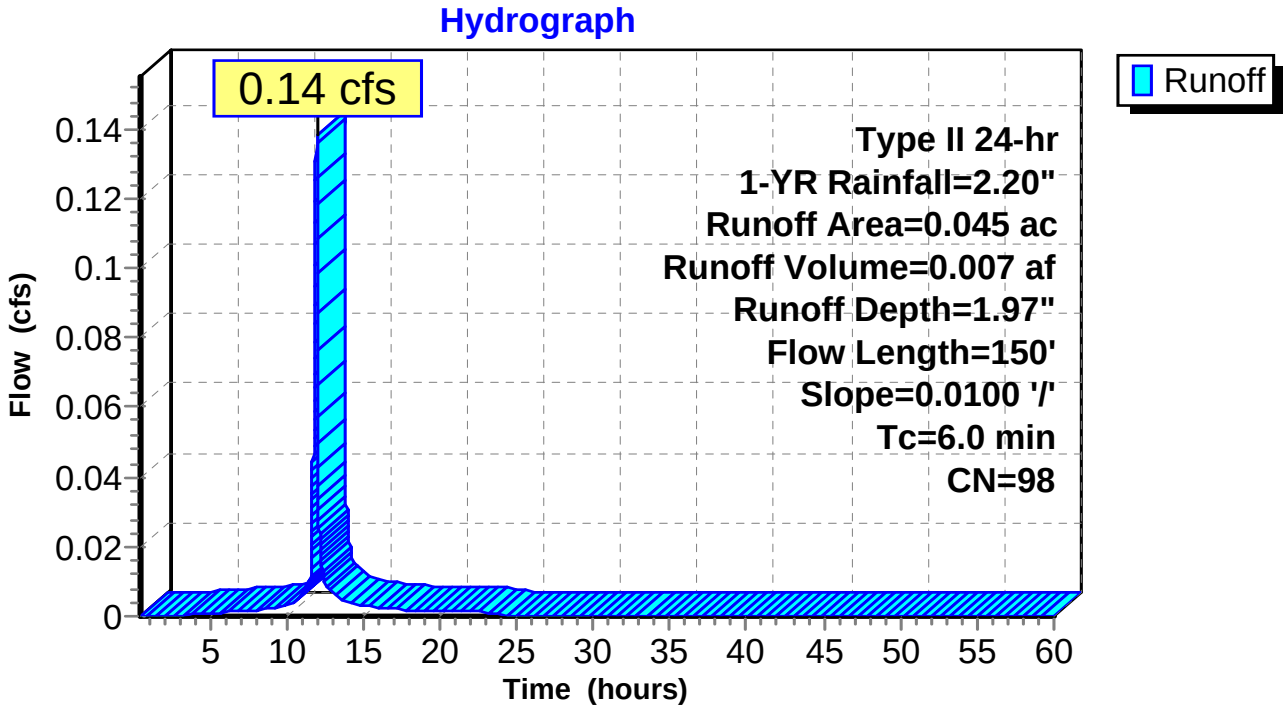
Runoff = 0.14 cfs @ 11.97 hrs, Volume= 0.007 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-YR Rainfall=2.20"

Area (ac)	CN	Description
0.045	98	Paved parking, HSG B
0.045		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	150	0.0100	1.05		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
2.4	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER



Summary for Pond 1BP: BLUE ROOF

Inflow Area = 0.264 ac,100.00% Impervious, Inflow Depth = 1.97" for 1-YR event
Inflow = 0.81 cfs @ 11.97 hrs, Volume= 0.043 af
Outflow = 0.20 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 76%, Lag= 8.5 min
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.033 af
Secondary = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.08' @ 12.11 hrs Surf.Area= 11,500 sf Storage= 975 cf

Plug-Flow detention time= 303.6 min calculated for 0.043 af (99% of inflow)
Center-of-Mass det. time= 298.8 min (1,060.1 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	11,500 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	11,500	1,200.0	0	0	11,500
276.00	11,500	1,200.0	11,500	11,500	12,700

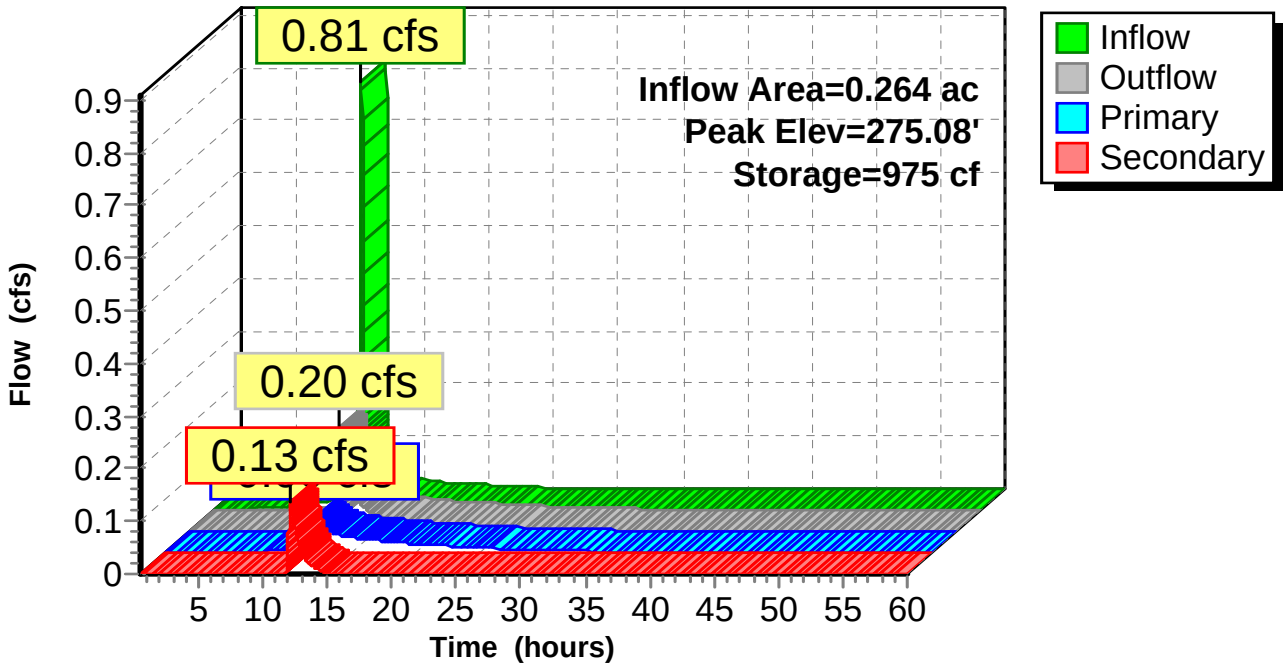
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.05'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.06 cfs @ 12.11 hrs HW=275.08' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.95 fps)

Secondary OutFlow Max=0.13 cfs @ 12.11 hrs HW=275.08' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.61 fps)

Pond 1BP: BLUE ROOF

Hydrograph



Summary for Pond 1CP: BLUE ROOF

Inflow Area = 0.310 ac,100.00% Impervious, Inflow Depth = 1.97" for 1-YR event
Inflow = 0.95 cfs @ 11.97 hrs, Volume= 0.051 af
Outflow = 0.04 cfs @ 13.25 hrs, Volume= 0.047 af, Atten= 96%, Lag= 77.2 min
Primary = 0.04 cfs @ 13.25 hrs, Volume= 0.047 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.06' @ 13.25 hrs Surf.Area= 24,000 sf Storage= 1,456 cf

Plug-Flow detention time= 682.3 min calculated for 0.047 af (93% of inflow)
Center-of-Mass det. time= 643.3 min (1,404.6 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	24,000 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	24,000	2,100.0	0	0	24,000
276.00	24,000	2,100.0	24,000	24,000	26,100

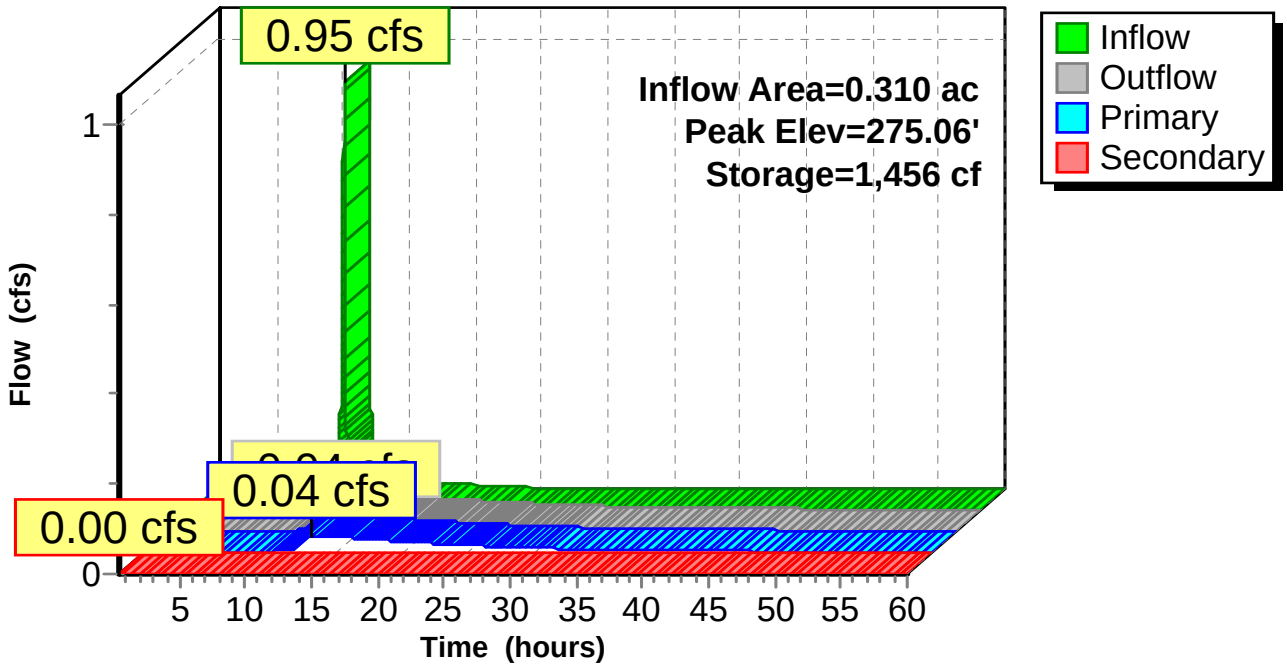
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.35'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.04 cfs @ 13.25 hrs HW=275.06' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=275.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1CP: BLUE ROOF

Hydrograph



Summary for Pond 1DP: Porous Pavement

Inflow Area = 0.394 ac,100.00% Impervious, Inflow Depth > 1.66" for 1-YR event
Inflow = 0.14 cfs @ 12.90 hrs, Volume= 0.054 af
Outflow = 0.02 cfs @ 11.78 hrs, Volume= 0.054 af, Atten= 82%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.78 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 198.03' @ 18.58 hrs Surf.Area= 2,153 sf Storage= 897 cf

Plug-Flow detention time= 353.0 min calculated for 0.054 af (100% of inflow)
Center-of-Mass det. time= 352.6 min (1,381.0 - 1,028.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	197.25'	1,435 cf	**13.12'W x 164.04'L x 2.98'H Field A** 6,413 cf Overall - 2,825 cf Embedded = 3,588 cf x 40.0% Voids
#2A	197.83'	2,656 cf	**Rainstore3 04** x 200 Inside #1 Inside= 39.4"W x 15.7"H => 4.05 sf x 3.28'L = 13.3 cf Outside= 39.4"W x 15.7"H => 4.31 sf x 3.28'L = 14.1 cf 4 Rows of 50 Chambers
		4,091 cf	Total Available Storage

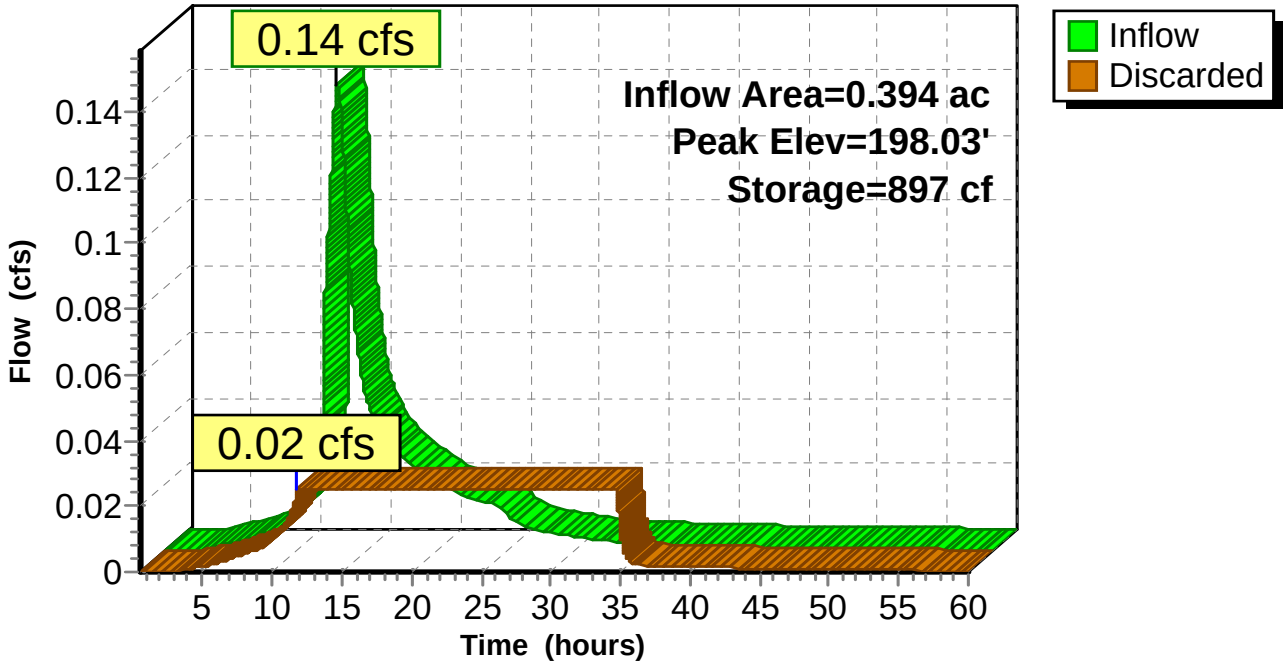
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	197.25'	**0.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.78 hrs HW=197.28' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 1DP: Porous Pavement

Hydrograph



Summary for Pond 1EP: BLUE ROOF

Inflow Area = 0.092 ac,100.00% Impervious, Inflow Depth = 1.97" for 1-YR event
Inflow = 0.28 cfs @ 11.97 hrs, Volume= 0.015 af
Outflow = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 245.18' @ 24.34 hrs Surf.Area= 3,700 sf Storage= 659 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	245.00'	3,700 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
245.00	3,700	320.0	0	0	3,700
246.00	3,700	320.0	3,700	3,700	4,020

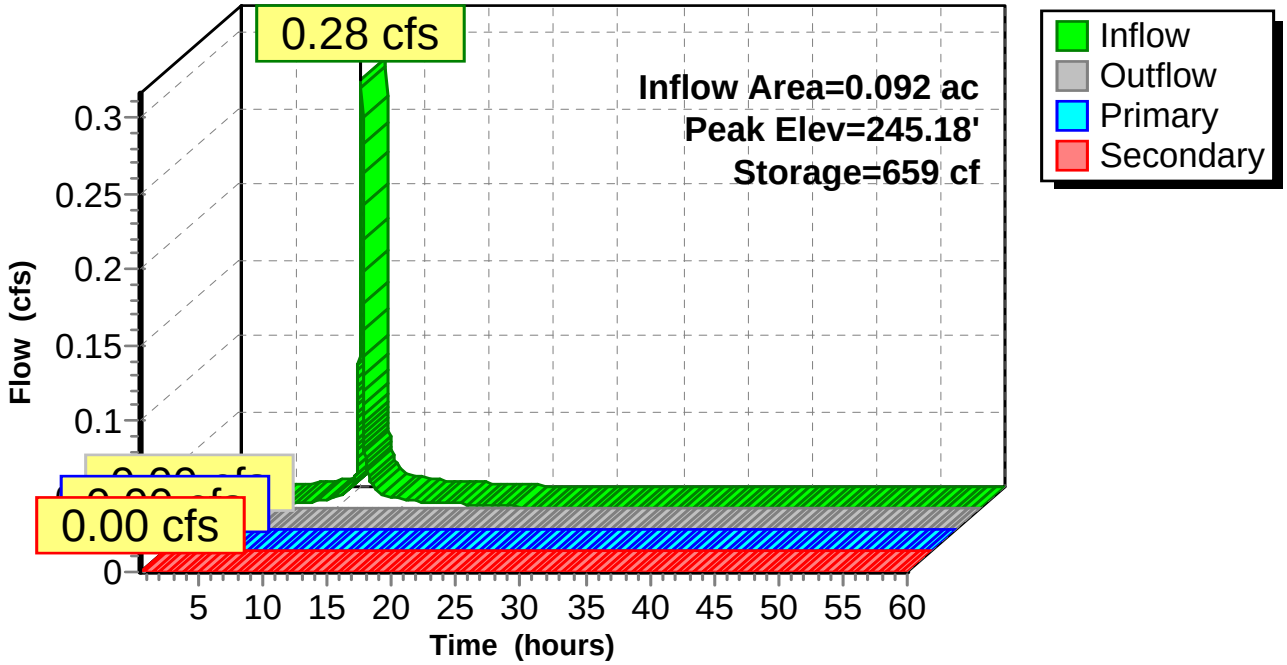
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1EP: BLUE ROOF

Hydrograph

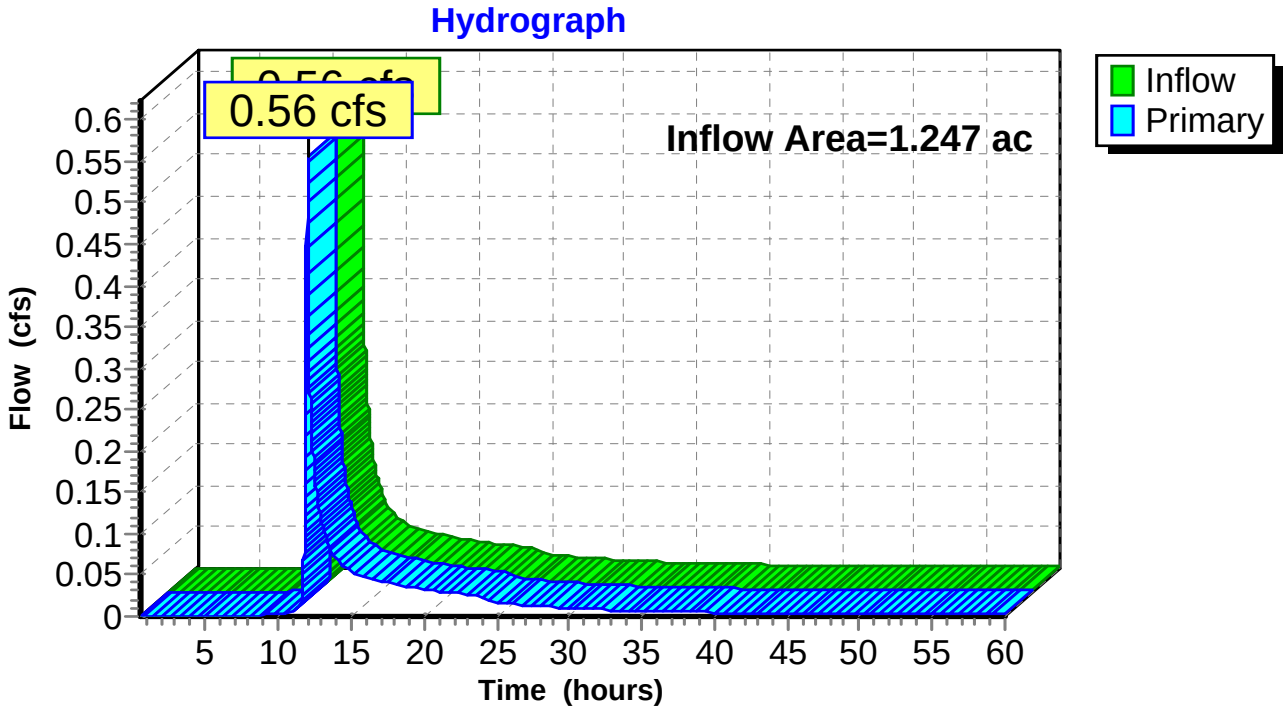


Summary for Link AP-1: ANALYSIS POINT 1

Inflow Area = 1.247 ac, 82.44% Impervious, Inflow Depth > 0.77" for 1-YR event
Inflow = 0.56 cfs @ 12.00 hrs, Volume= 0.080 af
Primary = 0.56 cfs @ 12.00 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs

Link AP-1: ANALYSIS POINT 1



Time span=0.50-60.00 hrs, dt=0.01 hrs, 5951 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Subcatchment 1A Runoff Area=0.317 ac 52.37% Impervious Runoff Depth=2.12"
Flow Length=41' Slope=0.0100 '/' Tc=6.8 min CN=81 Runoff=1.16 cfs 0.056 af

Subcatchment 1B: roof Runoff Area=0.264 ac 100.00% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=98 Runoff=1.50 cfs 0.083 af

Subcatchment 1C: roof Runoff Area=0.310 ac 100.00% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=98 Runoff=1.76 cfs 0.097 af

Subcatchment 1D: west side Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=3.77"
Tc=90.0 min CN=98 Runoff=0.18 cfs 0.041 af

Subcatchment 1E: ROOF Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.029 af

Subcatchment 1F: COURTYARD Runoff Area=0.064 ac 46.87% Impervious Runoff Depth=1.14"
Tc=6.0 min CN=67 Runoff=0.13 cfs 0.006 af

Subcatchment 1G: COURTYARD Runoff Area=0.070 ac 51.43% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=69 Runoff=0.16 cfs 0.007 af

Subcatchment 2S: AREA DISCONNECTED Runoff Area=0.045 ac 100.00% Impervious Runoff Depth=3.77"
Flow Length=150' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.26 cfs 0.014 af

Pond 1BP: BLUE ROOF Peak Elev=275.14' Storage=1,571 cf Inflow=1.50 cfs 0.083 af
Primary=0.09 cfs 0.048 af Secondary=0.52 cfs 0.035 af Outflow=0.61 cfs 0.082 af

Pond 1CP: BLUE ROOF Peak Elev=275.11' Storage=2,717 cf Inflow=1.76 cfs 0.097 af
Primary=0.08 cfs 0.093 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.093 af

Pond 1DP: Porous Pavement Peak Elev=198.53' Storage=1,909 cf Inflow=0.24 cfs 0.088 af
Outflow=0.02 cfs 0.088 af

Pond 1EP: BLUE ROOF Peak Elev=245.34' Storage=1,257 cf Inflow=0.52 cfs 0.029 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link AP-1: ANALYSIS POINT 1 Inflow=1.93 cfs 0.197 af
Primary=1.93 cfs 0.197 af

Total Runoff Area = 1.292 ac Runoff Volume = 0.333 af Average Runoff Depth = 3.10"
16.95% Pervious = 0.219 ac 83.05% Impervious = 1.073 ac

Summary for Subcatchment 1A: Subcatchment 1A

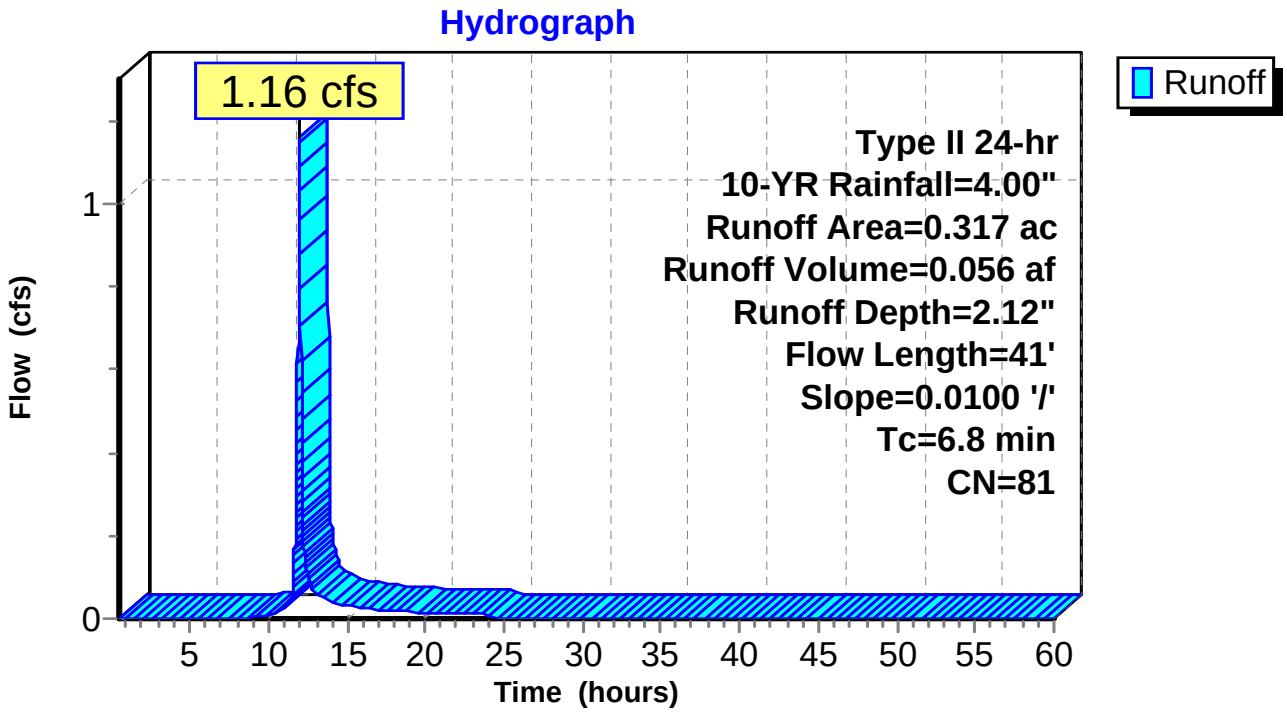
Runoff = 1.16 cfs @ 11.98 hrs, Volume= 0.056 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.084	80	>75% Grass cover, Good, HSG D
0.067	39	>75% Grass cover, Good, HSG A
0.166	98	Paved parking, HSG B
0.317	81	Weighted Average
0.151		47.63% Pervious Area
0.166		52.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	41	0.0100	0.10		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 2.75"

Subcatchment 1A: Subcatchment 1A



Summary for Subcatchment 1B: roof

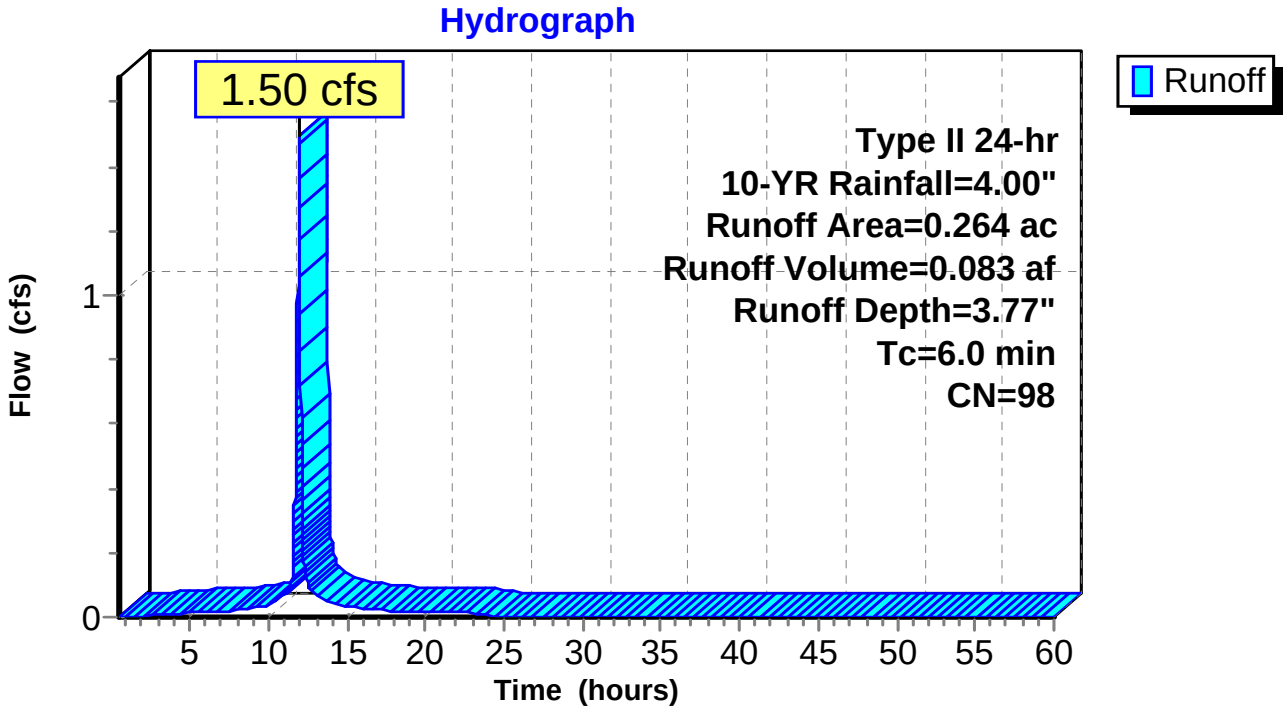
Runoff = 1.50 cfs @ 11.97 hrs, Volume= 0.083 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.264	98	Paved parking, HSG A
0.264		100.00% Impervious Area

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

Subcatchment 1B: roof



Summary for Subcatchment 1C: roof

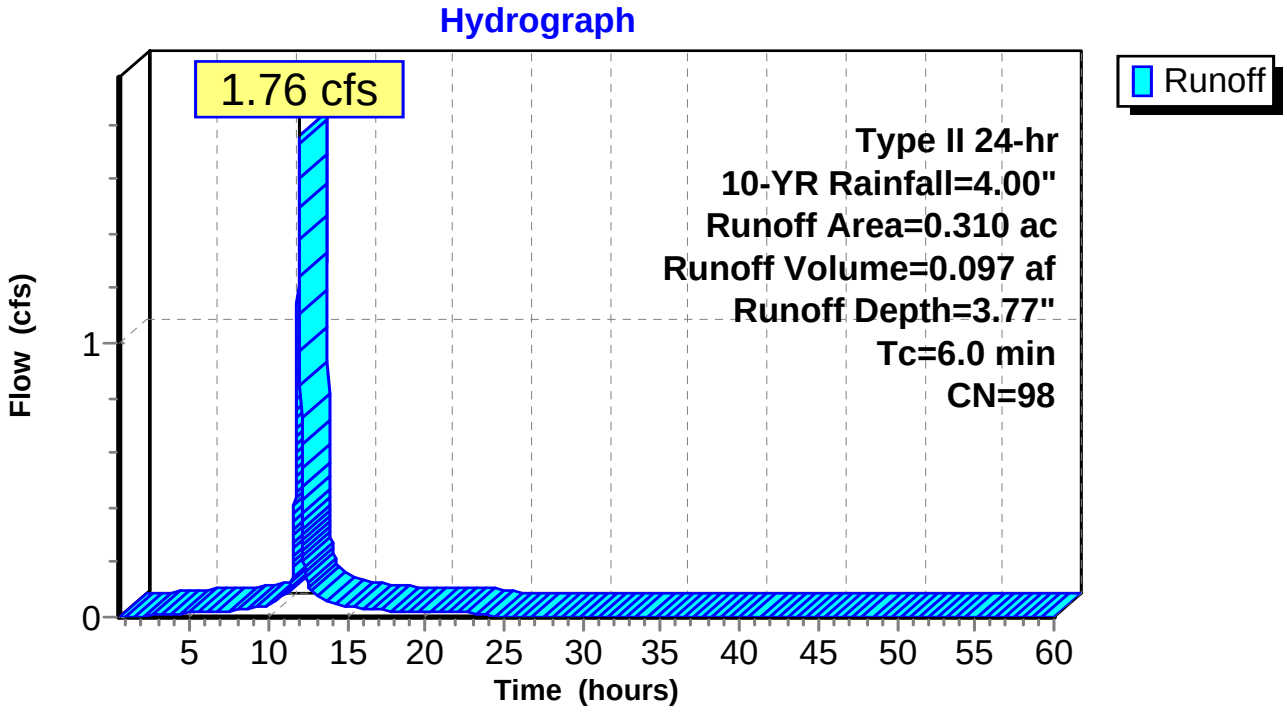
Runoff = 1.76 cfs @ 11.97 hrs, Volume= 0.097 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG A
0.310		100.00% Impervious Area

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

Subcatchment 1C: roof



Summary for Subcatchment 1D: west side

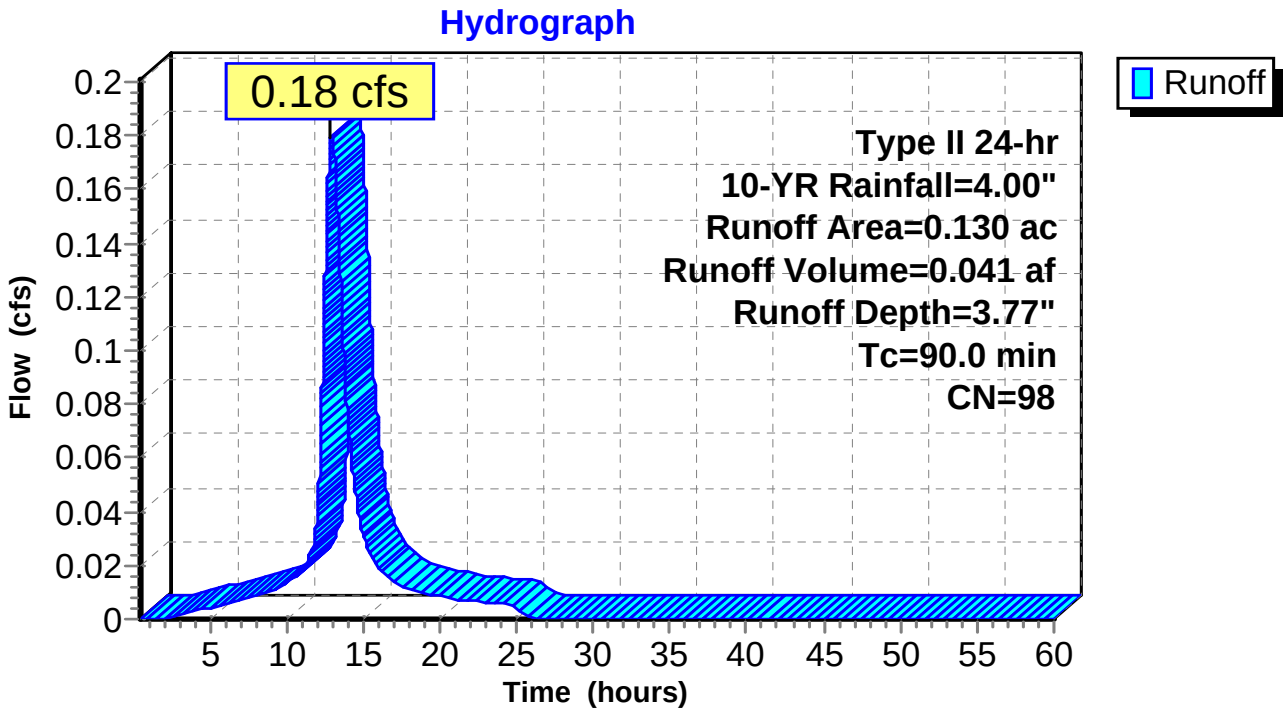
Runoff = 0.18 cfs @ 12.91 hrs, Volume= 0.041 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG A
0.130		100.00% Impervious Area

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

Subcatchment 1D: west side



Summary for Subcatchment 1E: ROOF

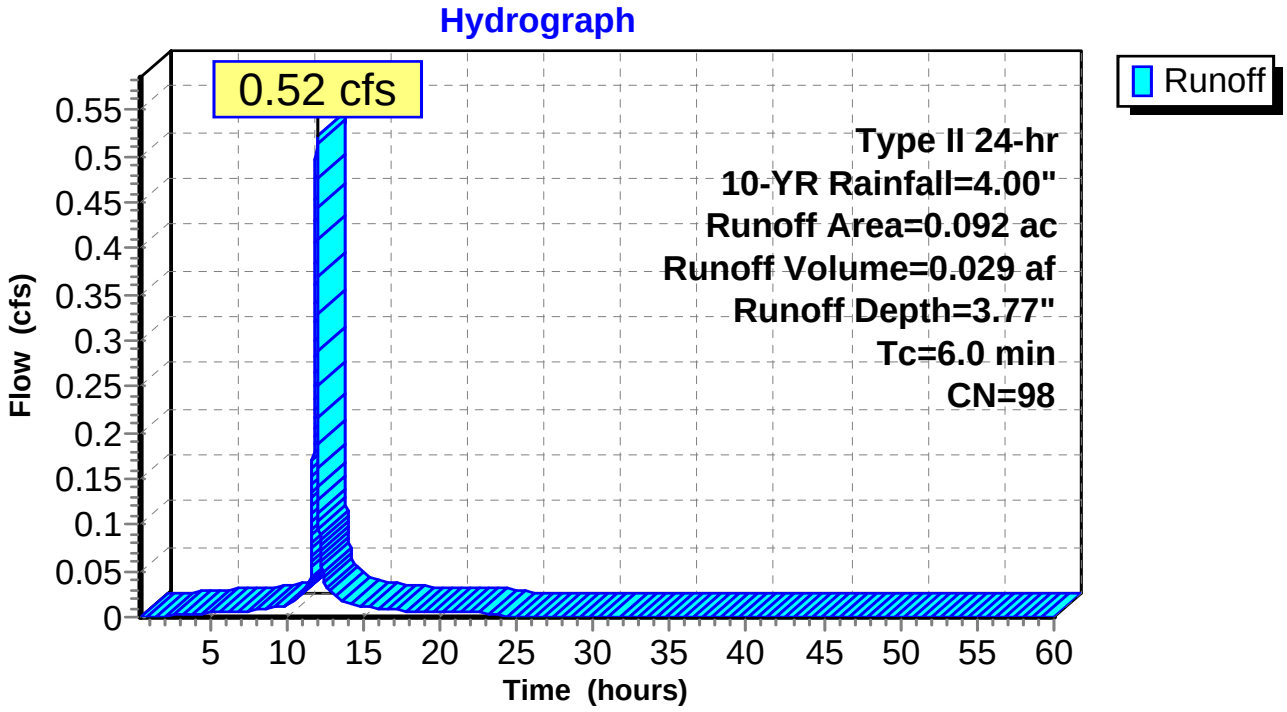
Runoff = 0.52 cfs @ 11.97 hrs, Volume= 0.029 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.092	98	Roofs, HSG B
0.092		100.00% Impervious Area

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

Subcatchment 1E: ROOF



Summary for Subcatchment 1F: COURTYARD

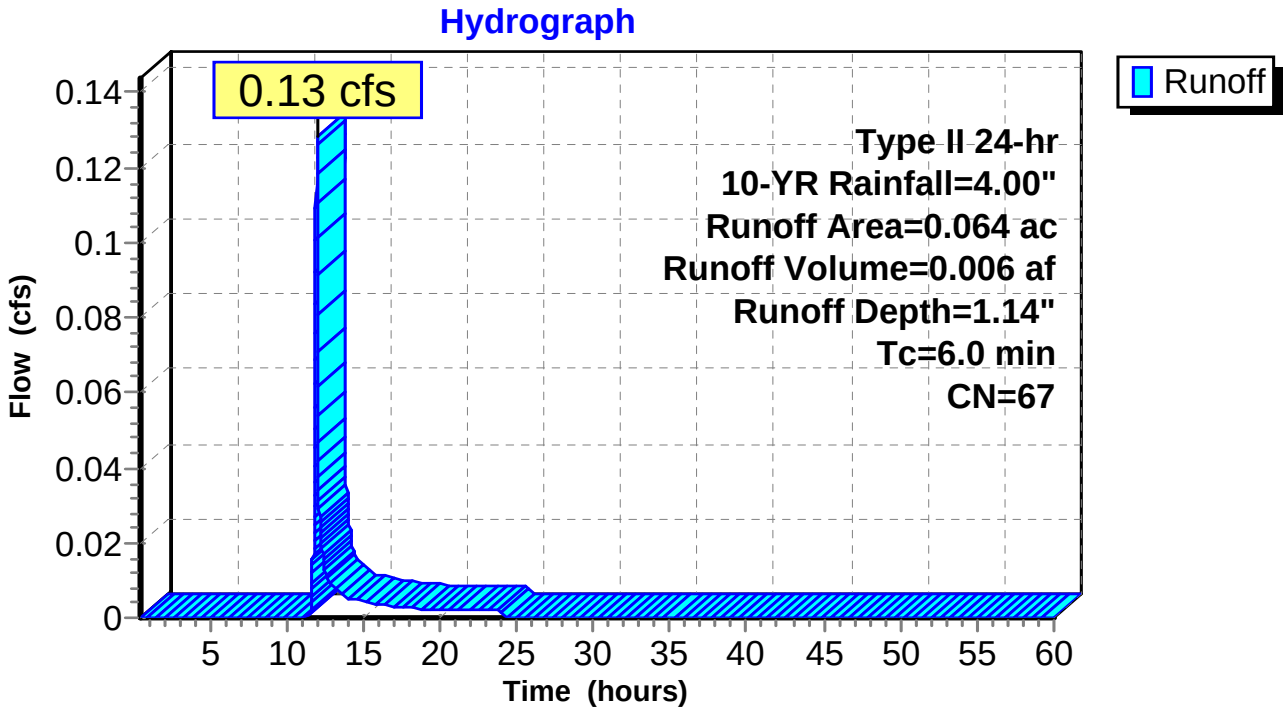
Runoff = 0.13 cfs @ 11.98 hrs, Volume= 0.006 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.030	98	Paved parking, HSG B
0.064	67	Weighted Average
0.034		53.13% Pervious Area
0.030		46.87% Impervious Area

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

Subcatchment 1F: COURTYARD



Summary for Subcatchment 1G: COURTYARD

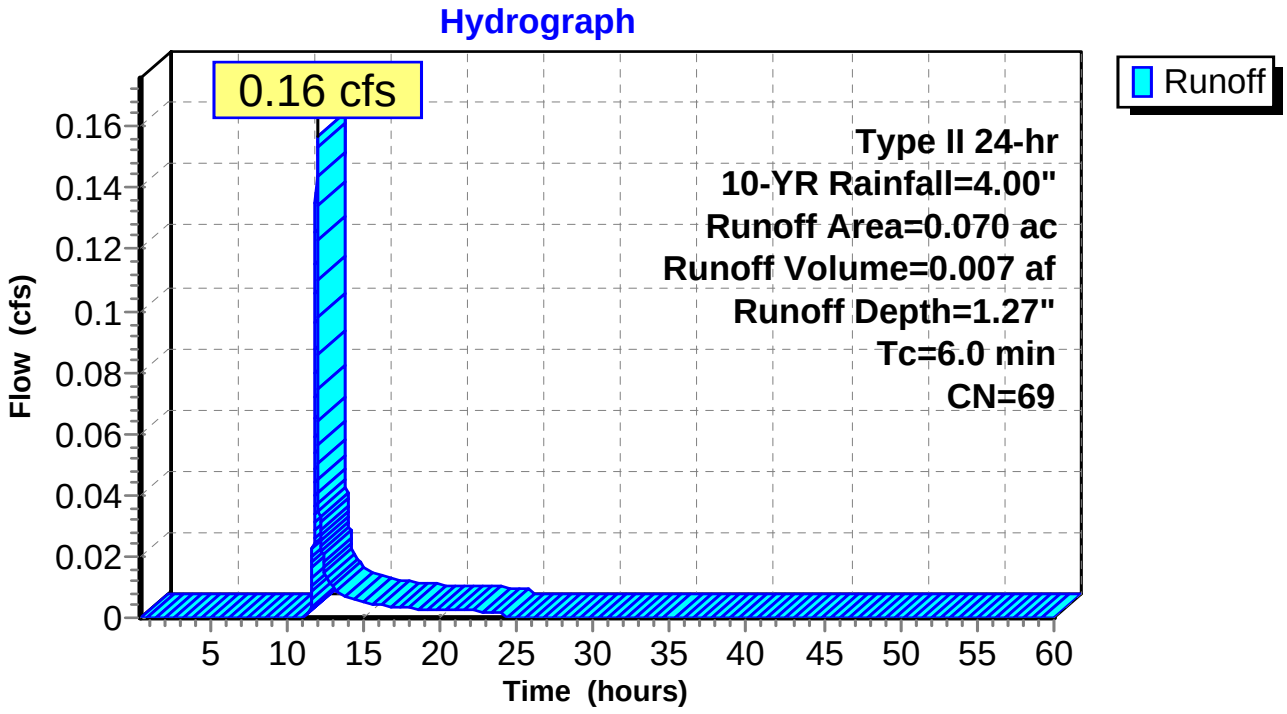
Runoff = 0.16 cfs @ 11.98 hrs, Volume= 0.007 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.036	98	Paved parking, HSG B
0.070	69	Weighted Average
0.034		48.57% Pervious Area
0.036		51.43% Impervious Area

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

Subcatchment 1G: COURTYARD



Summary for Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER

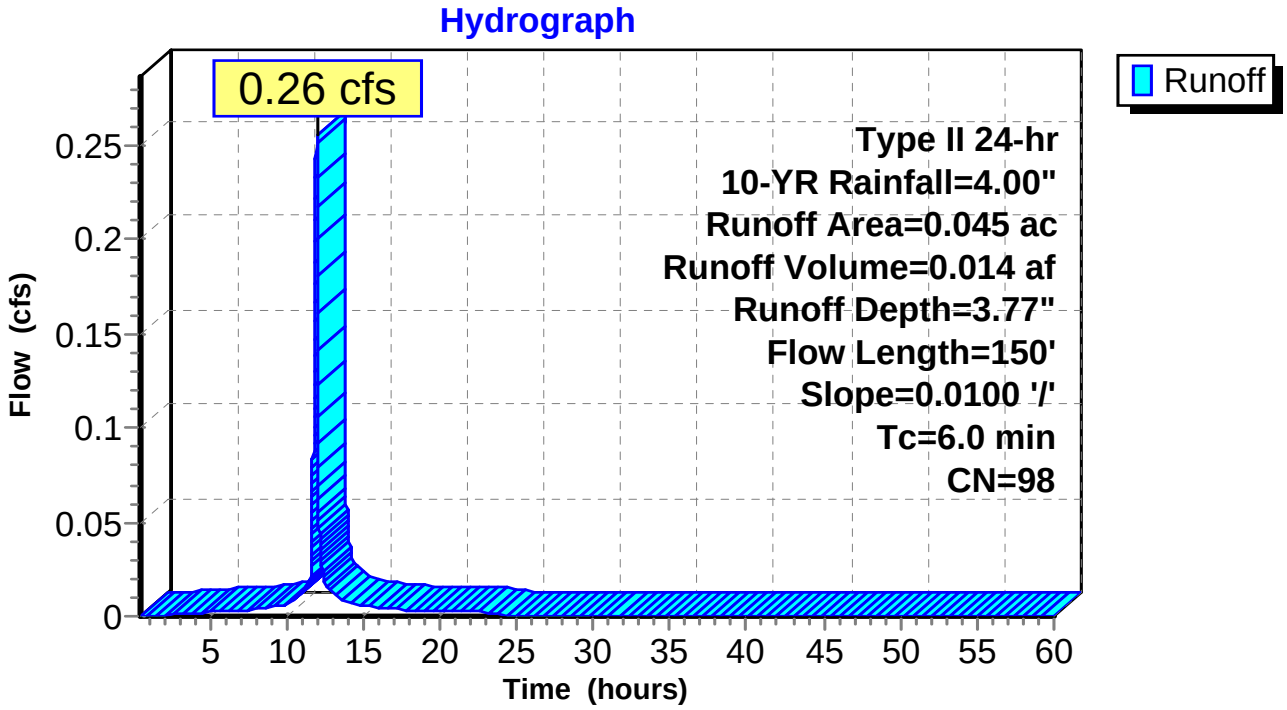
Runoff = 0.26 cfs @ 11.97 hrs, Volume= 0.014 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.00"

Area (ac)	CN	Description
0.045	98	Paved parking, HSG B
0.045		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	150	0.0100	1.05		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
2.4	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER



Summary for Pond 1BP: BLUE ROOF

Inflow Area = 0.264 ac,100.00% Impervious, Inflow Depth = 3.77" for 10-YR event
Inflow = 1.50 cfs @ 11.97 hrs, Volume= 0.083 af
Outflow = 0.61 cfs @ 12.07 hrs, Volume= 0.082 af, Atten= 59%, Lag= 6.2 min
Primary = 0.09 cfs @ 12.07 hrs, Volume= 0.048 af
Secondary = 0.52 cfs @ 12.07 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.14' @ 12.07 hrs Surf.Area= 11,500 sf Storage= 1,571 cf

Plug-Flow detention time= 211.1 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 208.1 min (956.1 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	11,500 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	11,500	1,200.0	0	0	11,500
276.00	11,500	1,200.0	11,500	11,500	12,700

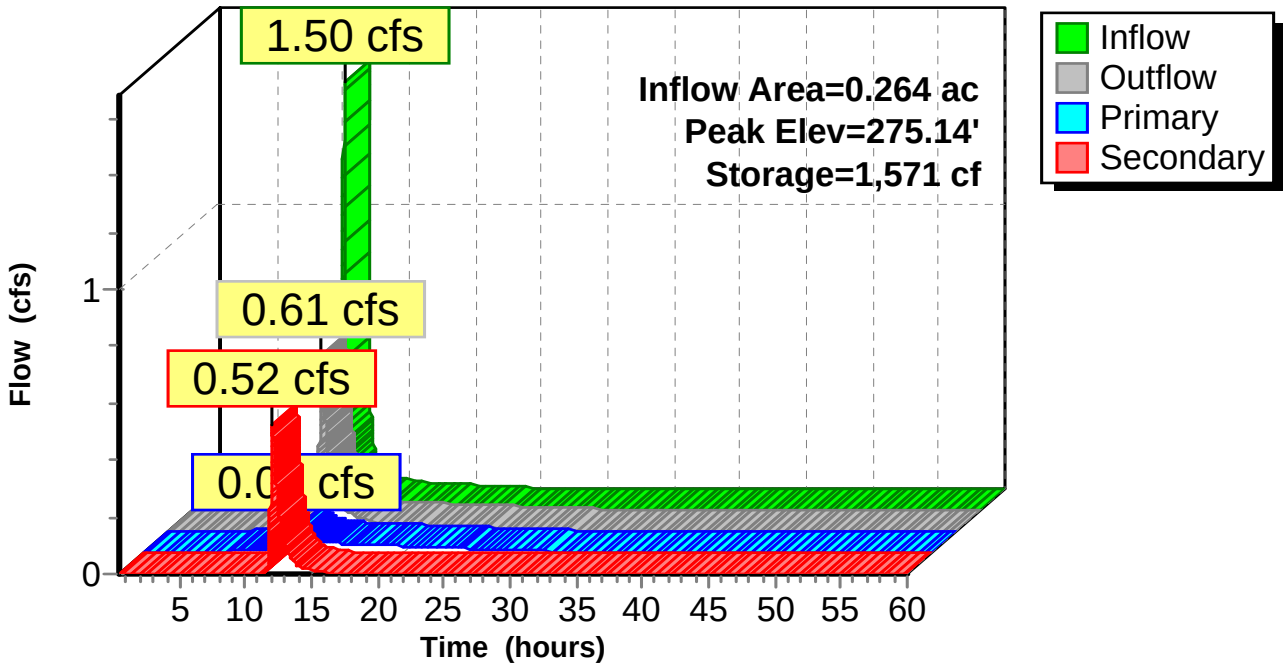
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.05'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 12.07 hrs HW=275.14' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.78 fps)

Secondary OutFlow Max=0.52 cfs @ 12.07 hrs HW=275.14' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 0.52 cfs @ 0.96 fps)

Pond 1BP: BLUE ROOF

Hydrograph



Summary for Pond 1CP: BLUE ROOF

Inflow Area = 0.310 ac,100.00% Impervious, Inflow Depth = 3.77" for 10-YR event
Inflow = 1.76 cfs @ 11.97 hrs, Volume= 0.097 af
Outflow = 0.08 cfs @ 13.04 hrs, Volume= 0.093 af, Atten= 95%, Lag= 64.3 min
Primary = 0.08 cfs @ 13.04 hrs, Volume= 0.093 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.11' @ 13.04 hrs Surf.Area= 24,000 sf Storage= 2,717 cf

Plug-Flow detention time= 585.9 min calculated for 0.093 af (96% of inflow)
Center-of-Mass det. time= 558.4 min (1,306.4 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	24,000 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	24,000	2,100.0	0	0	24,000
276.00	24,000	2,100.0	24,000	24,000	26,100

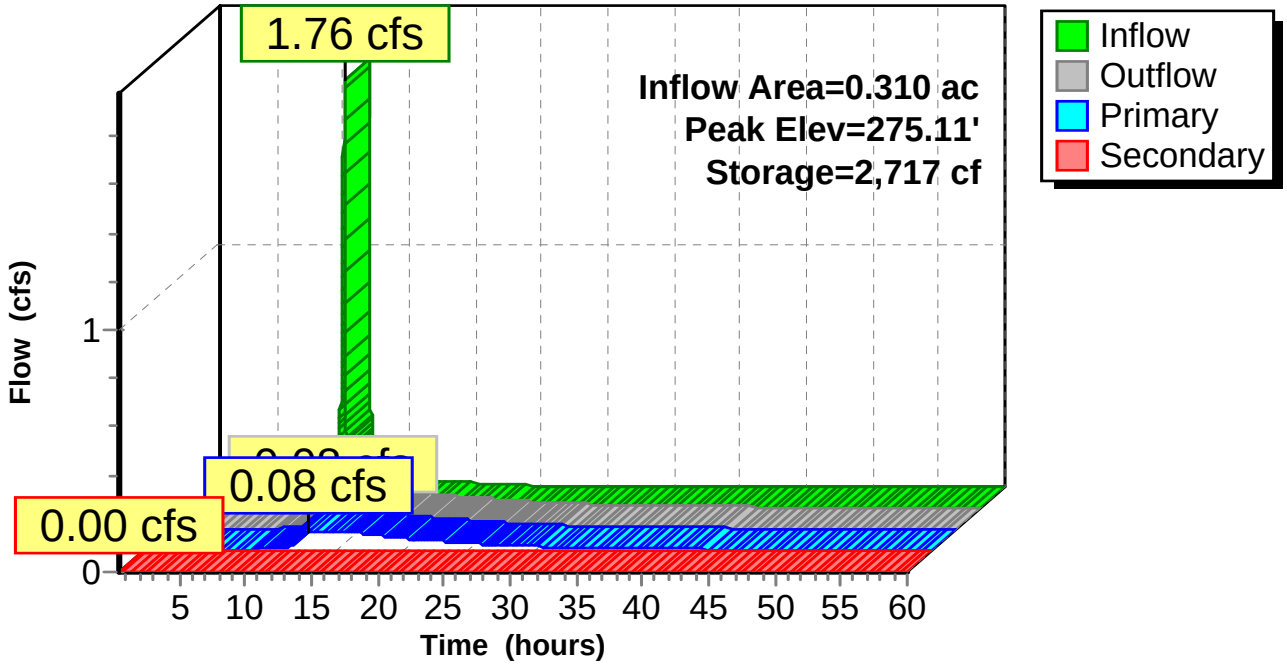
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.35'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 13.04 hrs HW=275.11' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 1.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=275.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1CP: BLUE ROOF

Hydrograph



Summary for Pond 1DP: Porous Pavement

Inflow Area = 0.394 ac,100.00% Impervious, Inflow Depth > 2.69" for 10-YR event
Inflow = 0.24 cfs @ 12.90 hrs, Volume= 0.088 af
Outflow = 0.02 cfs @ 9.92 hrs, Volume= 0.088 af, Atten= 90%, Lag= 0.0 min
Discarded = 0.02 cfs @ 9.92 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 198.53' @ 22.52 hrs Surf.Area= 2,153 sf Storage= 1,909 cf

Plug-Flow detention time= 727.1 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 726.7 min (1,701.1 - 974.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	197.25'	1,435 cf	**13.12'W x 164.04'L x 2.98'H Field A** 6,413 cf Overall - 2,825 cf Embedded = 3,588 cf x 40.0% Voids
#2A	197.83'	2,656 cf	**Rainstore3 04** x 200 Inside #1 Inside= 39.4"W x 15.7"H => 4.05 sf x 3.28'L = 13.3 cf Outside= 39.4"W x 15.7"H => 4.31 sf x 3.28'L = 14.1 cf 4 Rows of 50 Chambers
		4,091 cf	Total Available Storage

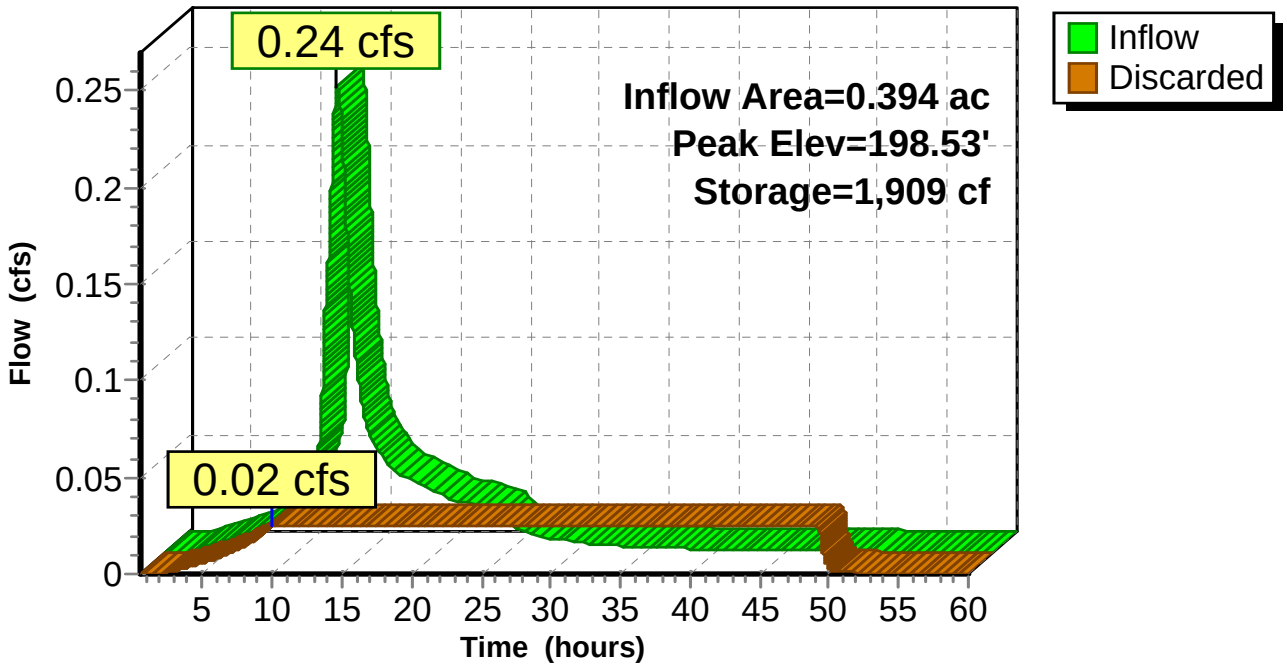
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	197.25'	**0.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 9.92 hrs HW=197.28' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 1DP: Porous Pavement

Hydrograph



Summary for Pond 1EP: BLUE ROOF

Inflow Area = 0.092 ac,100.00% Impervious, Inflow Depth = 3.77" for 10-YR event
Inflow = 0.52 cfs @ 11.97 hrs, Volume= 0.029 af
Outflow = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 245.34' @ 24.34 hrs Surf.Area= 3,700 sf Storage= 1,257 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	245.00'	3,700 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
245.00	3,700	320.0	0	0	3,700
246.00	3,700	320.0	3,700	3,700	4,020

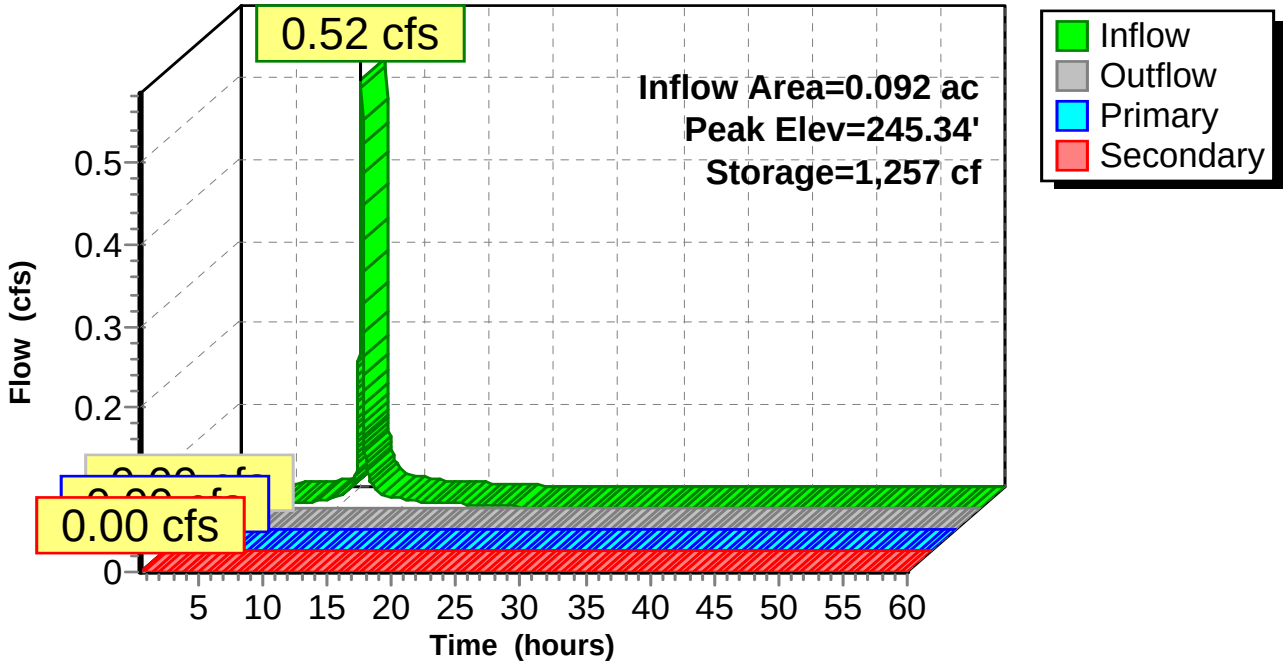
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1EP: BLUE ROOF

Hydrograph

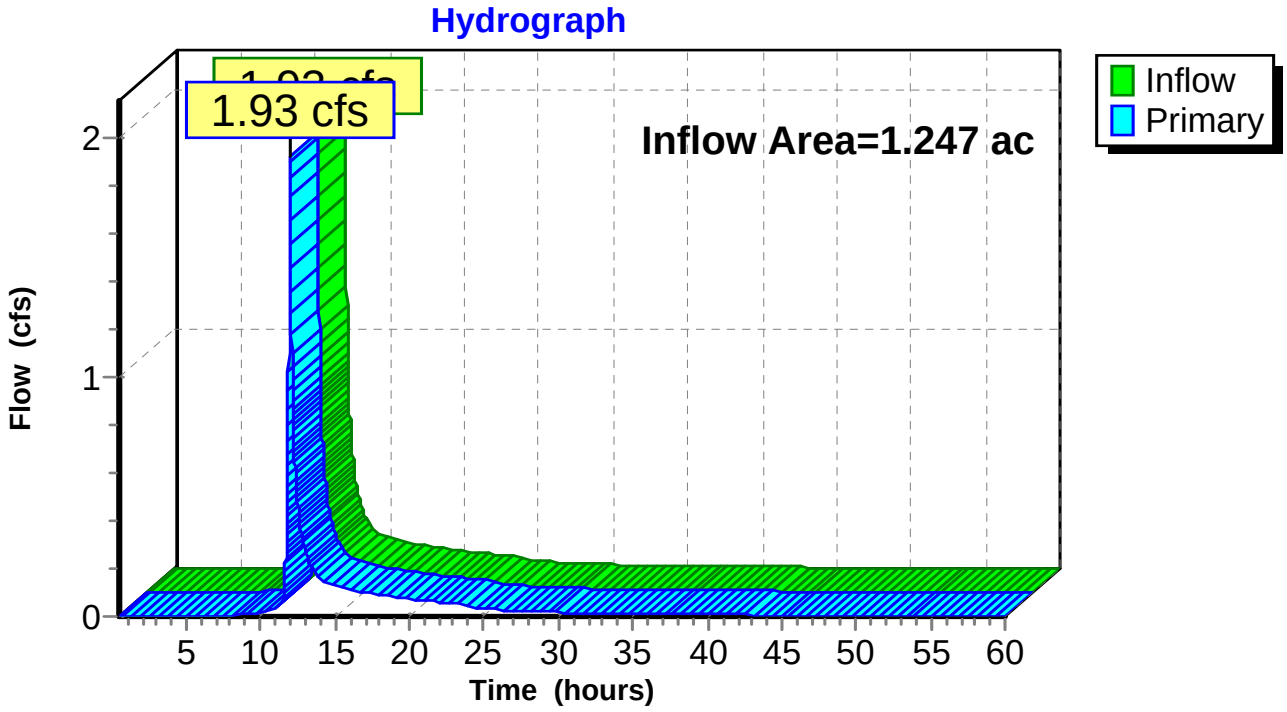


Summary for Link AP-1: ANALYSIS POINT 1

Inflow Area = 1.247 ac, 82.44% Impervious, Inflow Depth > 1.90" for 10-YR event
Inflow = 1.93 cfs @ 11.99 hrs, Volume= 0.197 af
Primary = 1.93 cfs @ 11.99 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs

Link AP-1: ANALYSIS POINT 1



Time span=0.50-60.00 hrs, dt=0.01 hrs, 5951 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Subcatchment 1A Runoff Area=0.317 ac 52.37% Impervious Runoff Depth=4.43"
Flow Length=41' Slope=0.0100 '/' Tc=6.8 min CN=81 Runoff=2.36 cfs 0.117 af

Subcatchment 1B: roof Runoff Area=0.264 ac 100.00% Impervious Runoff Depth=6.36"
Tc=6.0 min CN=98 Runoff=2.49 cfs 0.140 af

Subcatchment 1C: roof Runoff Area=0.310 ac 100.00% Impervious Runoff Depth=6.36"
Tc=6.0 min CN=98 Runoff=2.92 cfs 0.164 af

Subcatchment 1D: west side Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=6.36"
Tc=90.0 min CN=98 Runoff=0.30 cfs 0.069 af

Subcatchment 1E: ROOF Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=6.36"
Tc=6.0 min CN=98 Runoff=0.87 cfs 0.049 af

Subcatchment 1F: COURTYARD Runoff Area=0.064 ac 46.87% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=67 Runoff=0.34 cfs 0.016 af

Subcatchment 1G: COURTYARD Runoff Area=0.070 ac 51.43% Impervious Runoff Depth=3.19"
Tc=6.0 min CN=69 Runoff=0.40 cfs 0.019 af

Subcatchment 2S: AREA DISCONNECTED Runoff Area=0.045 ac 100.00% Impervious Runoff Depth=6.36"
Flow Length=150' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.42 cfs 0.024 af

Pond 1BP: BLUE ROOF Peak Elev=275.19' Storage=2,213 cf Inflow=2.49 cfs 0.140 af
Primary=0.10 cfs 0.064 af Secondary=1.11 cfs 0.076 af Outflow=1.21 cfs 0.140 af

Pond 1CP: BLUE ROOF Peak Elev=275.19' Storage=4,655 cf Inflow=2.92 cfs 0.164 af
Primary=0.10 cfs 0.159 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.159 af

Pond 1DP: Porous Pavement Peak Elev=199.57' Storage=3,525 cf Inflow=0.37 cfs 0.133 af
Outflow=0.02 cfs 0.114 af

Pond 1EP: BLUE ROOF Peak Elev=245.57' Storage=2,124 cf Inflow=0.87 cfs 0.049 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link AP-1: ANALYSIS POINT 1 Inflow=4.10 cfs 0.386 af
Primary=4.10 cfs 0.386 af

Total Runoff Area = 1.292 ac Runoff Volume = 0.598 af Average Runoff Depth = 5.55"
16.95% Pervious = 0.219 ac 83.05% Impervious = 1.073 ac

Summary for Subcatchment 1A: Subcatchment 1A

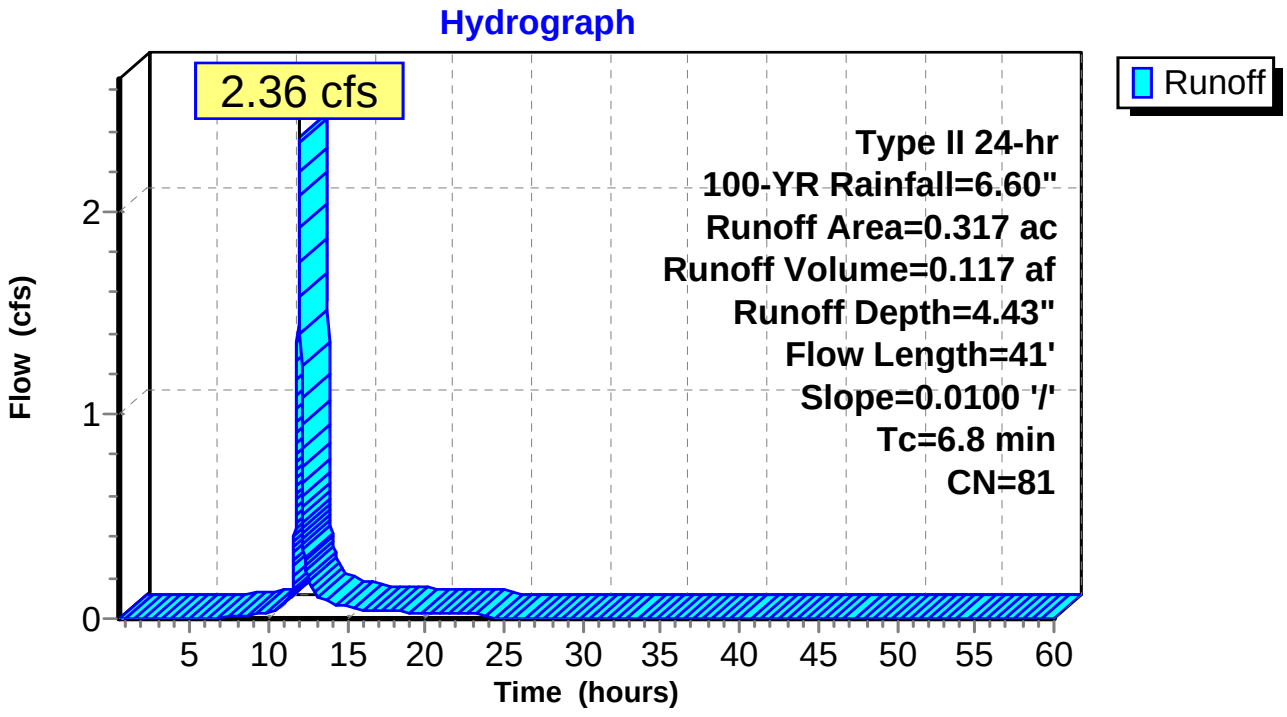
Runoff = 2.36 cfs @ 11.98 hrs, Volume= 0.117 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.084	80	>75% Grass cover, Good, HSG D
0.067	39	>75% Grass cover, Good, HSG A
0.166	98	Paved parking, HSG B
0.317	81	Weighted Average
0.151		47.63% Pervious Area
0.166		52.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	41	0.0100	0.10		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 2.75"

Subcatchment 1A: Subcatchment 1A



Summary for Subcatchment 1B: roof

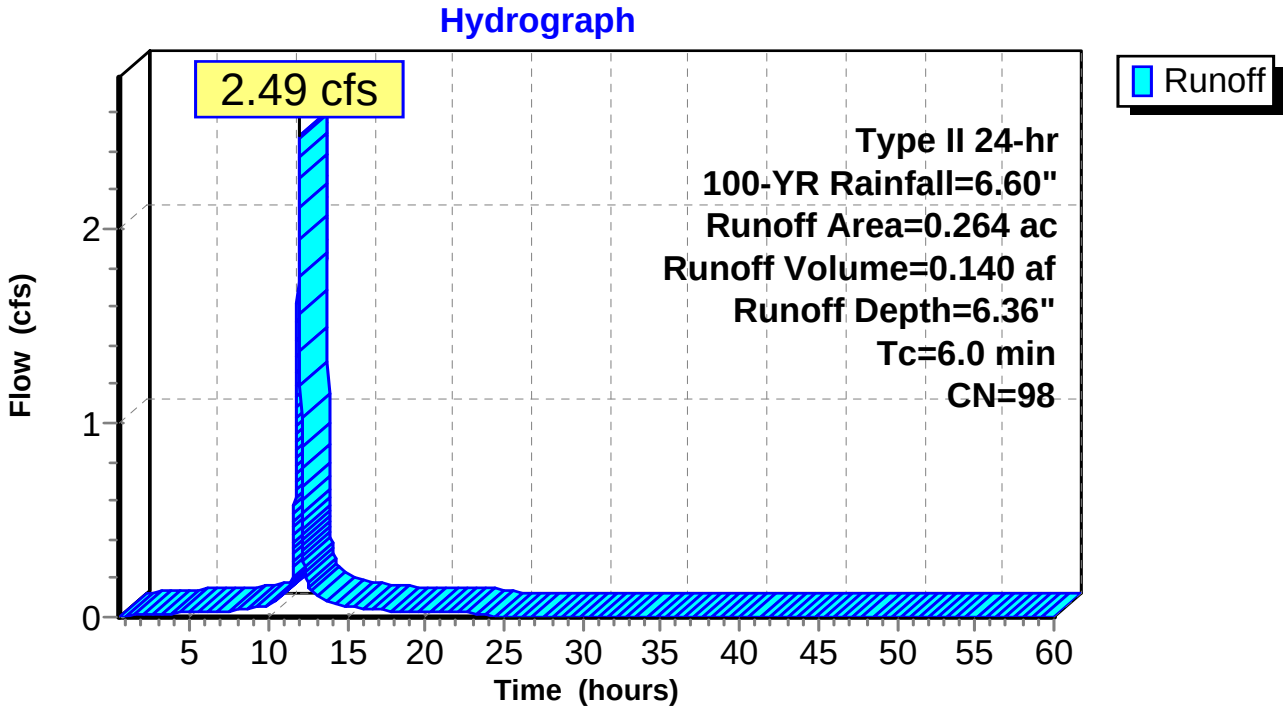
Runoff = 2.49 cfs @ 11.97 hrs, Volume= 0.140 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.264	98	Paved parking, HSG A
0.264		100.00% Impervious Area

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

Subcatchment 1B: roof



Summary for Subcatchment 1C: roof

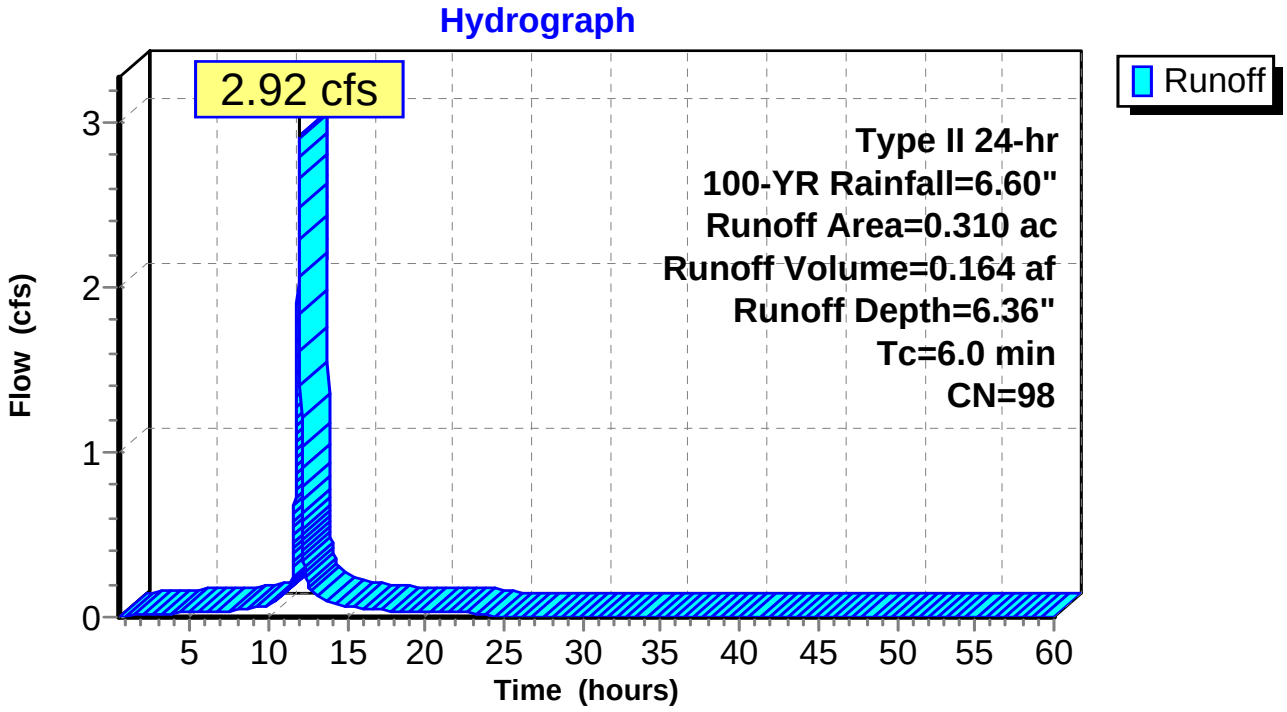
Runoff = 2.92 cfs @ 11.97 hrs, Volume= 0.164 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG A
0.310		100.00% Impervious Area

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

Subcatchment 1C: roof



Summary for Subcatchment 1D: west side

Runoff = 0.30 cfs @ 12.91 hrs, Volume= 0.069 af, Depth= 6.36"

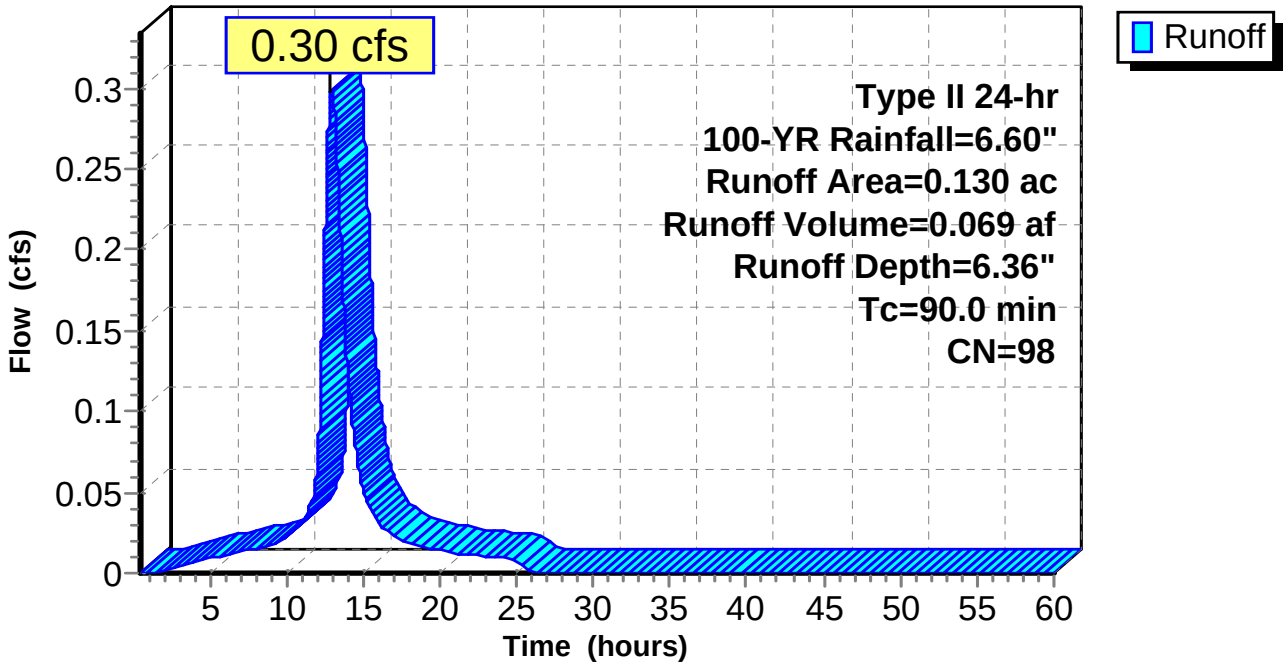
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG A
0.130		100.00% Impervious Area

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

Subcatchment 1D: west side

Hydrograph



Summary for Subcatchment 1E: ROOF

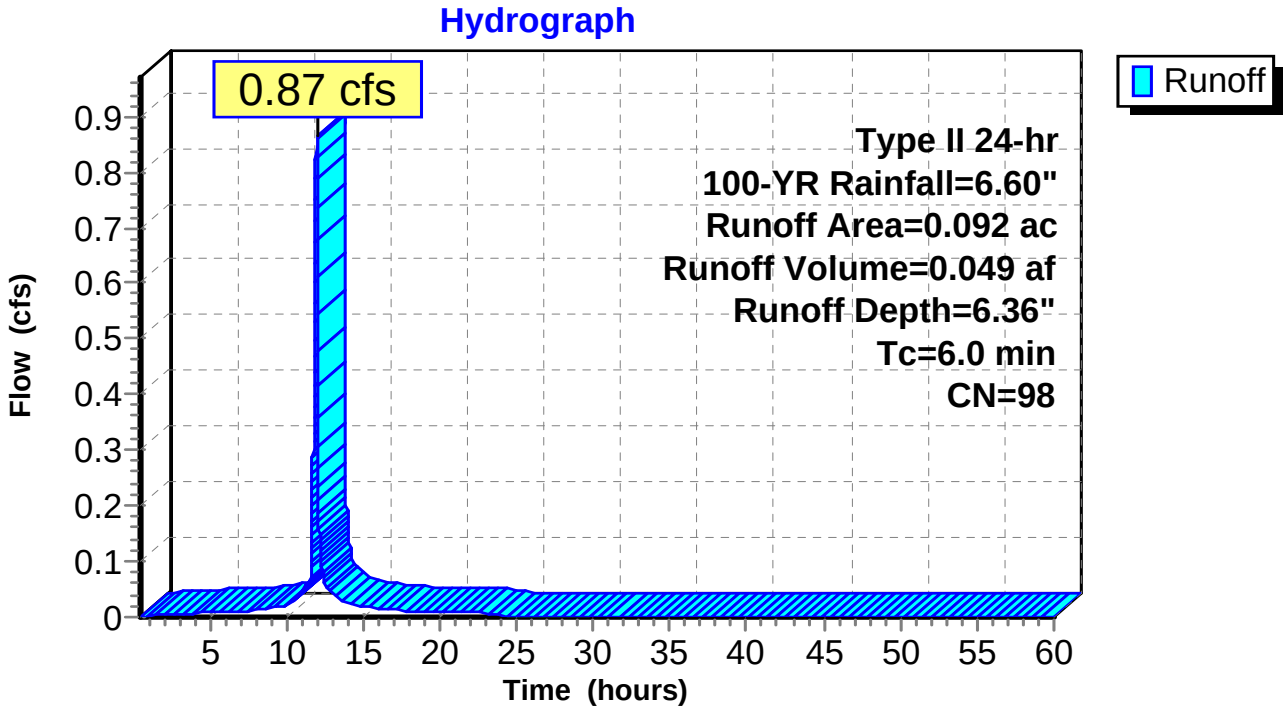
Runoff = 0.87 cfs @ 11.97 hrs, Volume= 0.049 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.092	98	Roofs, HSG B
0.092		100.00% Impervious Area

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

Subcatchment 1E: ROOF



Summary for Subcatchment 1F: COURTYARD

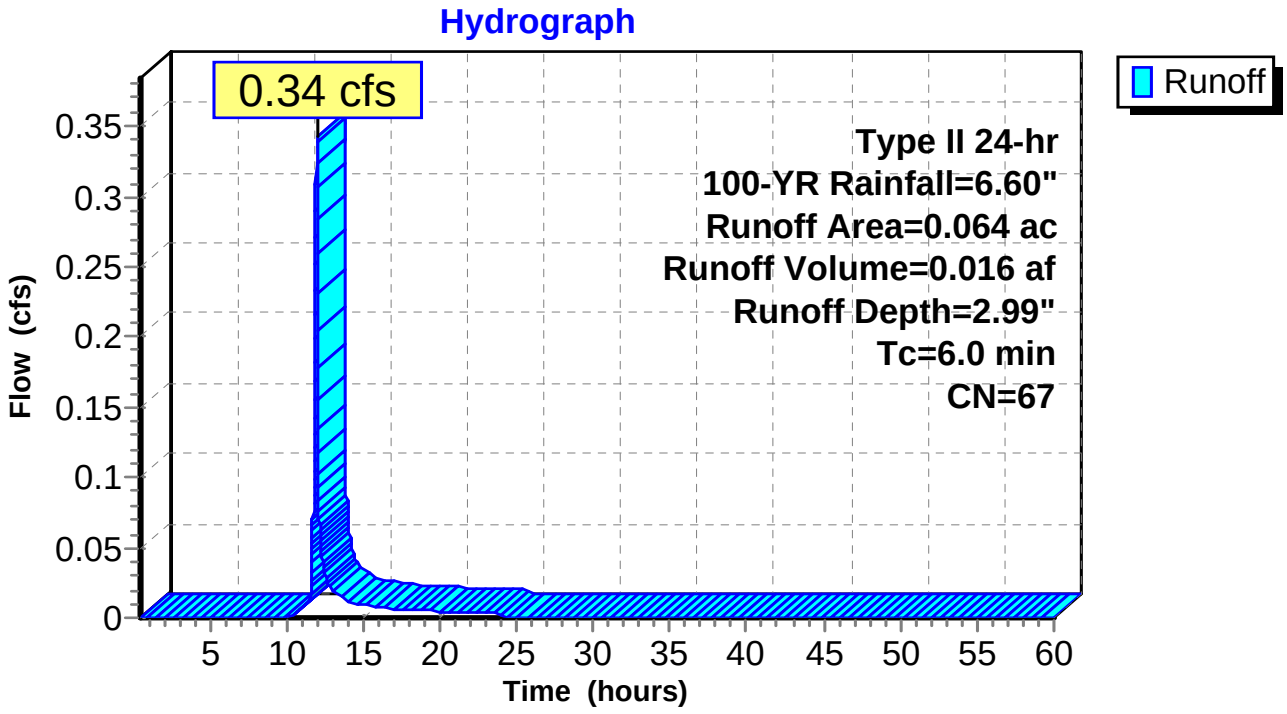
Runoff = 0.34 cfs @ 11.98 hrs, Volume= 0.016 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.030	98	Paved parking, HSG B
0.064	67	Weighted Average
0.034		53.13% Pervious Area
0.030		46.87% Impervious Area

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

Subcatchment 1F: COURTYARD



Summary for Subcatchment 1G: COURTYARD

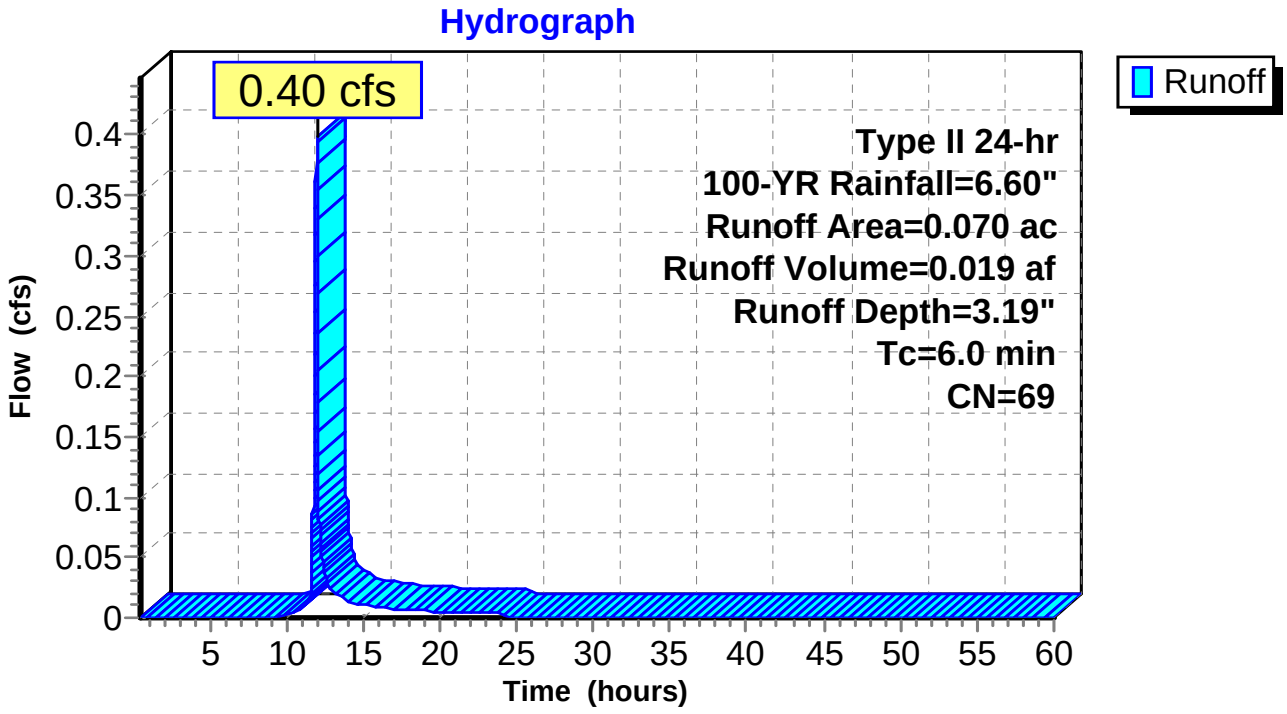
Runoff = 0.40 cfs @ 11.97 hrs, Volume= 0.019 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.036	98	Paved parking, HSG B
0.070	69	Weighted Average
0.034		48.57% Pervious Area
0.036		51.43% Impervious Area

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

Subcatchment 1G: COURTYARD



Summary for Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER

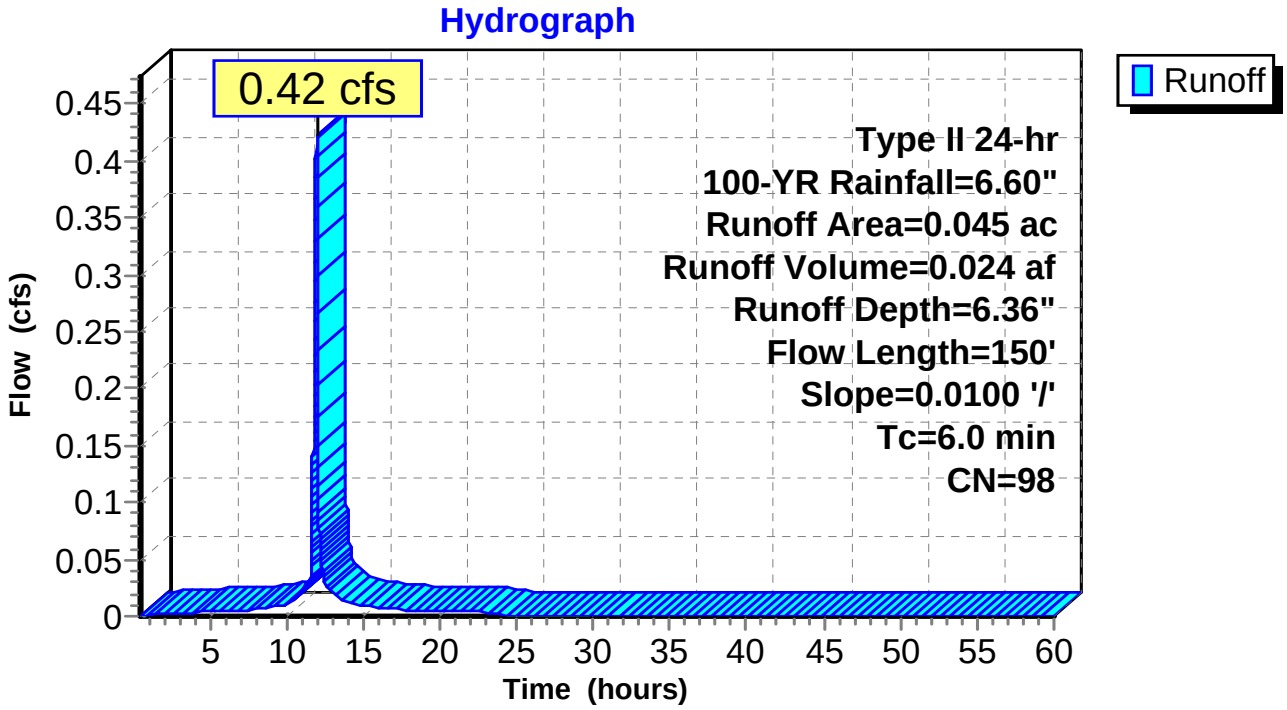
Runoff = 0.42 cfs @ 11.97 hrs, Volume= 0.024 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.60"

Area (ac)	CN	Description
0.045	98	Paved parking, HSG B
0.045		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	150	0.0100	1.05		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
2.4	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER



Summary for Pond 1BP: BLUE ROOF

Inflow Area = 0.264 ac,100.00% Impervious, Inflow Depth = 6.36" for 100-YR event
Inflow = 2.49 cfs @ 11.97 hrs, Volume= 0.140 af
Outflow = 1.21 cfs @ 12.06 hrs, Volume= 0.140 af, Atten= 51%, Lag= 5.5 min
Primary = 0.10 cfs @ 12.06 hrs, Volume= 0.064 af
Secondary = 1.11 cfs @ 12.06 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.19' @ 12.06 hrs Surf.Area= 11,500 sf Storage= 2,213 cf

Plug-Flow detention time= 158.1 min calculated for 0.140 af (100% of inflow)
Center-of-Mass det. time= 156.4 min (896.0 - 739.6)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	11,500 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	11,500	1,200.0	0	0	11,500
276.00	11,500	1,200.0	11,500	11,500	12,700

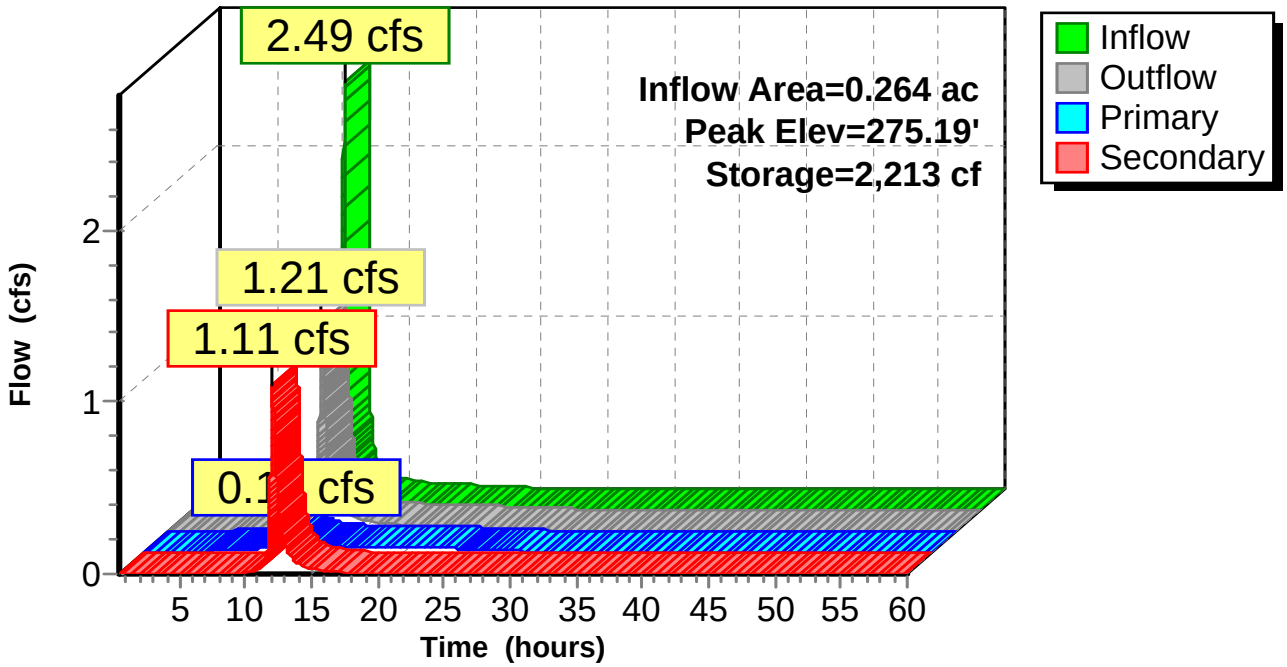
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.05'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 12.06 hrs HW=275.19' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.11 fps)

Secondary OutFlow Max=1.10 cfs @ 12.06 hrs HW=275.19' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 1.10 cfs @ 1.23 fps)

Pond 1BP: BLUE ROOF

Hydrograph



Summary for Pond 1CP: BLUE ROOF

Inflow Area = 0.310 ac,100.00% Impervious, Inflow Depth = 6.36" for 100-YR event
Inflow = 2.92 cfs @ 11.97 hrs, Volume= 0.164 af
Outflow = 0.10 cfs @ 13.47 hrs, Volume= 0.159 af, Atten= 96%, Lag= 90.0 min
Primary = 0.10 cfs @ 13.47 hrs, Volume= 0.159 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.19' @ 13.47 hrs Surf.Area= 24,000 sf Storage= 4,655 cf

Plug-Flow detention time= 625.9 min calculated for 0.159 af (97% of inflow)
Center-of-Mass det. time= 604.7 min (1,344.3 - 739.6)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	24,000 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	24,000	2,100.0	0	0	24,000
276.00	24,000	2,100.0	24,000	24,000	26,100

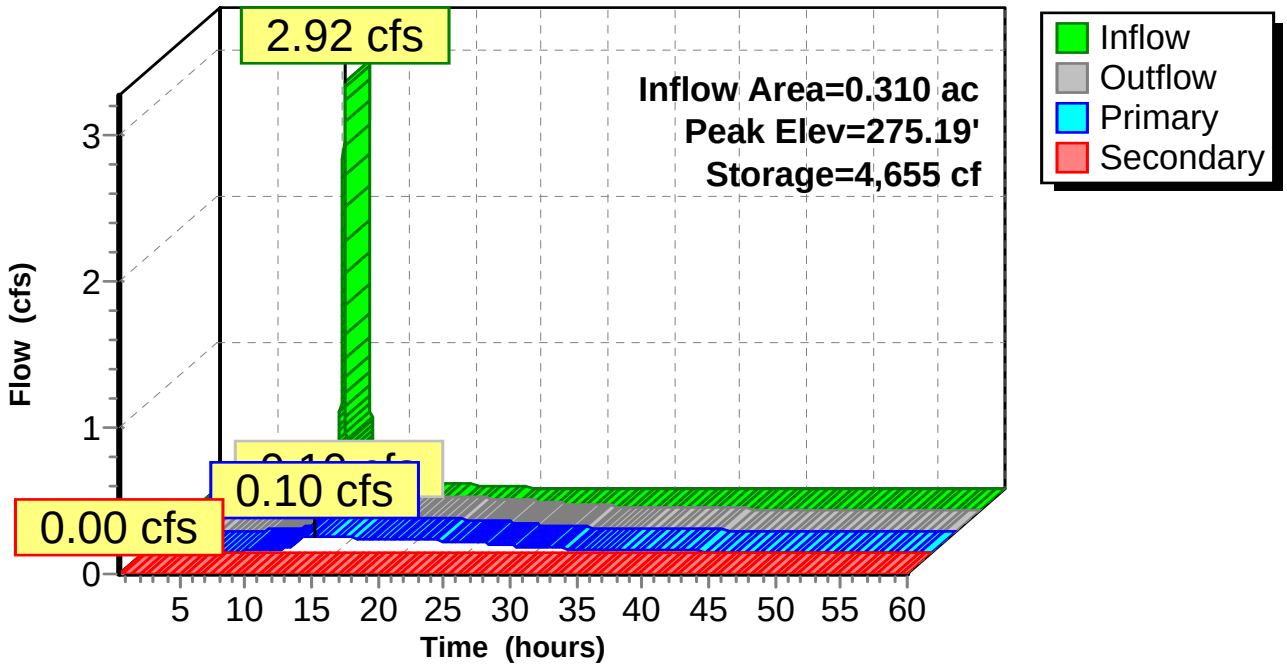
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.35'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 13.47 hrs HW=275.19' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.12 fps)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=275.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1CP: BLUE ROOF

Hydrograph



Summary for Pond 1DP: Porous Pavement

Inflow Area = 0.394 ac,100.00% Impervious, Inflow Depth > 4.05" for 100-YR event
Inflow = 0.37 cfs @ 12.90 hrs, Volume= 0.133 af
Outflow = 0.02 cfs @ 7.08 hrs, Volume= 0.114 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.02 cfs @ 7.08 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 199.57' @ 25.07 hrs Surf.Area= 2,153 sf Storage= 3,525 cf

Plug-Flow detention time= 1,128.2 min calculated for 0.114 af (86% of inflow)
Center-of-Mass det. time= 1,003.8 min (1,937.1 - 933.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	197.25'	1,435 cf	**13.12'W x 164.04'L x 2.98'H Field A** 6,413 cf Overall - 2,825 cf Embedded = 3,588 cf x 40.0% Voids
#2A	197.83'	2,656 cf	**Rainstore3 04** x 200 Inside #1 Inside= 39.4"W x 15.7"H => 4.05 sf x 3.28'L = 13.3 cf Outside= 39.4"W x 15.7"H => 4.31 sf x 3.28'L = 14.1 cf 4 Rows of 50 Chambers
		4,091 cf	Total Available Storage

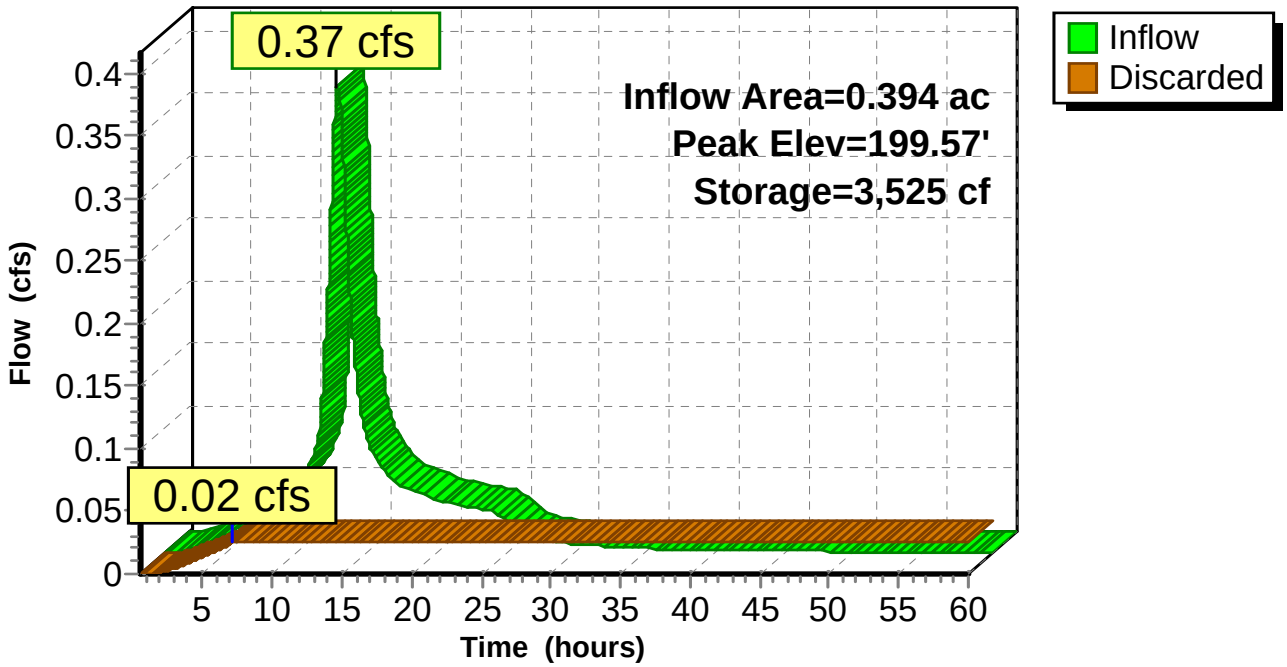
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	197.25'	**0.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 7.08 hrs HW=197.28' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 1DP: Porous Pavement

Hydrograph



Summary for Pond 1EP: BLUE ROOF

Inflow Area = 0.092 ac,100.00% Impervious, Inflow Depth = 6.36" for 100-YR event
Inflow = 0.87 cfs @ 11.97 hrs, Volume= 0.049 af
Outflow = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 245.57' @ 24.34 hrs Surf.Area= 3,700 sf Storage= 2,124 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	245.00'	3,700 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
245.00	3,700	320.0	0	0	3,700
246.00	3,700	320.0	3,700	3,700	4,020

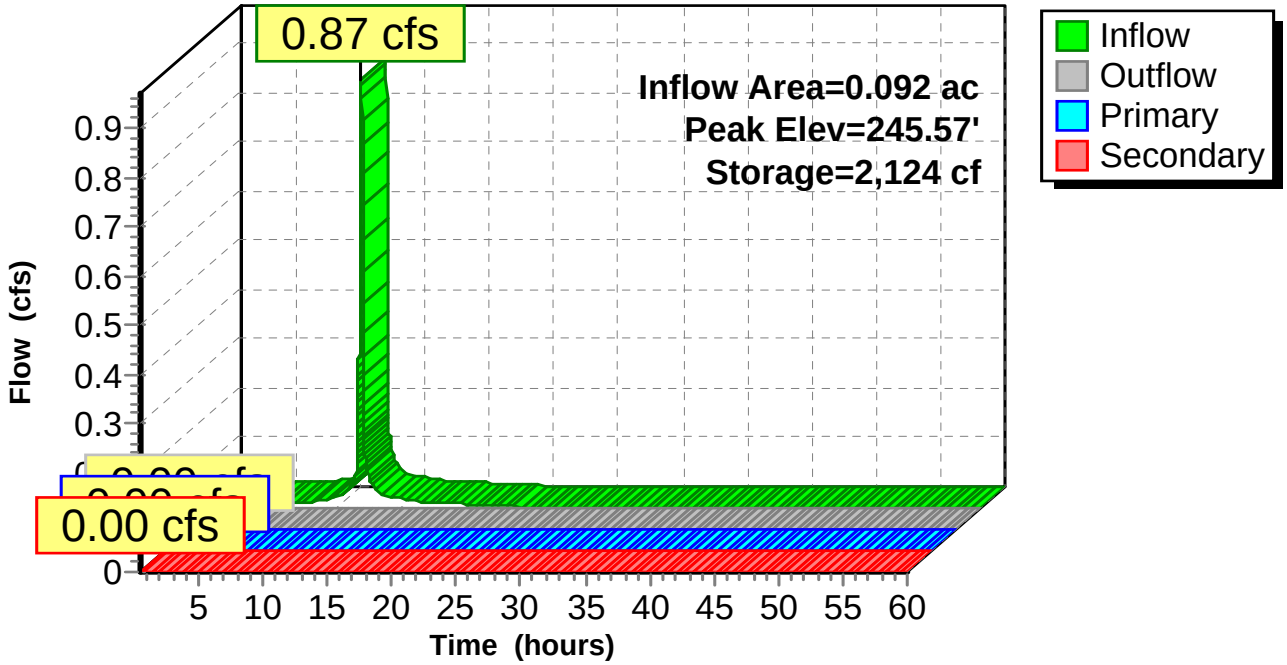
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1EP: BLUE ROOF

Hydrograph

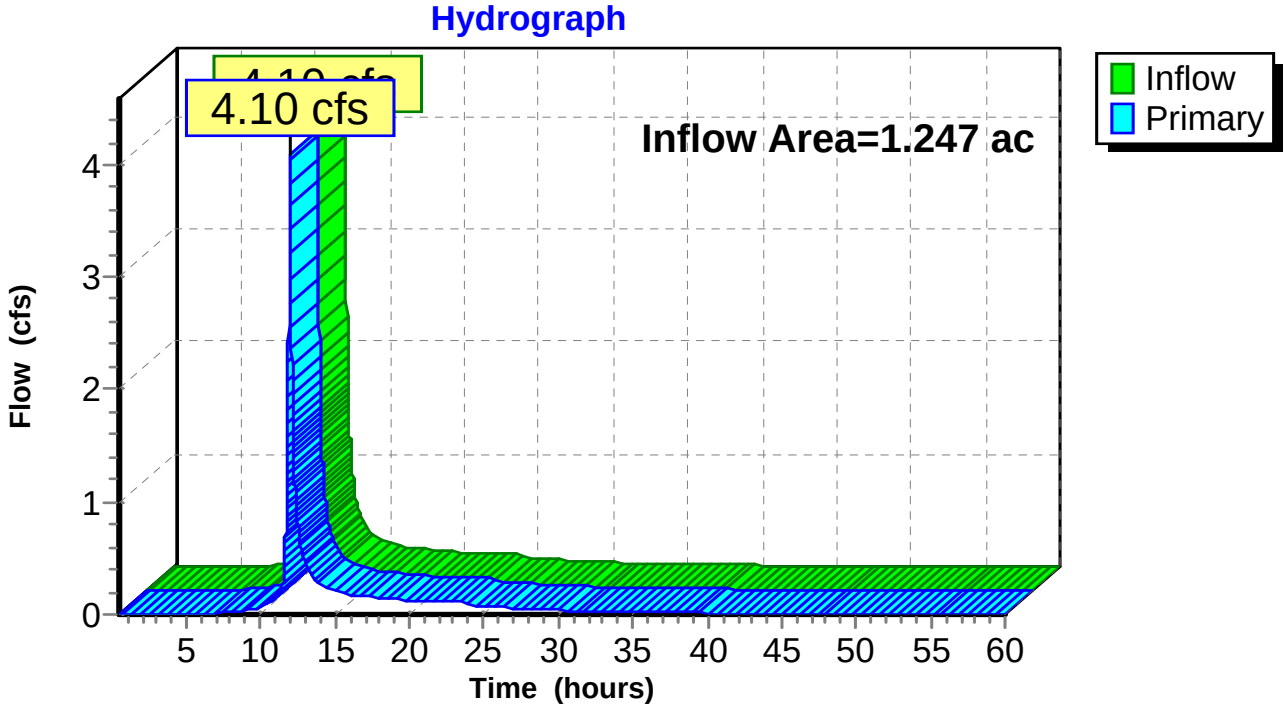


Summary for Link AP-1: ANALYSIS POINT 1

Inflow Area = 1.247 ac, 82.44% Impervious, Inflow Depth > 3.72" for 100-YR event
Inflow = 4.10 cfs @ 11.99 hrs, Volume= 0.386 af
Primary = 4.10 cfs @ 11.99 hrs, Volume= 0.386 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs

Link AP-1: ANALYSIS POINT 1



Time span=0.50-60.00 hrs, dt=0.01 hrs, 5951 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Subcatchment 1A Runoff Area=0.317 ac 52.37% Impervious Runoff Depth=0.15"
Flow Length=41' Slope=0.0100 '/' Tc=6.8 min CN=81 Runoff=0.06 cfs 0.004 af

Subcatchment 1B: roof Runoff Area=0.264 ac 100.00% Impervious Runoff Depth=0.94"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.021 af

Subcatchment 1C: roof Runoff Area=0.310 ac 100.00% Impervious Runoff Depth=0.94"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.024 af

Subcatchment 1D: west side Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=0.94"
Tc=90.0 min CN=98 Runoff=0.05 cfs 0.010 af

Subcatchment 1E: ROOF Runoff Area=0.092 ac 100.00% Impervious Runoff Depth=0.94"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.007 af

Subcatchment 1F: COURTYARD Runoff Area=0.064 ac 46.87% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=67 Runoff=0.00 cfs 0.000 af

Subcatchment 1G: COURTYARD Runoff Area=0.070 ac 51.43% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=69 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: AREA DISCONNECTED Runoff Area=0.045 ac 100.00% Impervious Runoff Depth=0.94"
Flow Length=150' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.07 cfs 0.004 af

Pond 1BP: BLUE ROOF Peak Elev=275.05' Storage=531 cf Inflow=0.40 cfs 0.021 af
Primary=0.03 cfs 0.020 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.020 af

Pond 1CP: BLUE ROOF Peak Elev=275.03' Storage=716 cf Inflow=0.47 cfs 0.024 af
Primary=0.01 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.022 af

Pond 1DP: Porous Pavement Peak Elev=197.58' Storage=288 cf Inflow=0.07 cfs 0.031 af
Outflow=0.02 cfs 0.031 af

Pond 1EP: BLUE ROOF Peak Elev=245.08' Storage=313 cf Inflow=0.14 cfs 0.007 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link AP-1: ANALYSIS POINT 1 Inflow=0.07 cfs 0.026 af
Primary=0.07 cfs 0.026 af

Total Runoff Area = 1.292 ac Runoff Volume = 0.070 af Average Runoff Depth = 0.65"
16.95% Pervious = 0.219 ac 83.05% Impervious = 1.073 ac

Summary for Subcatchment 1A: Subcatchment 1A

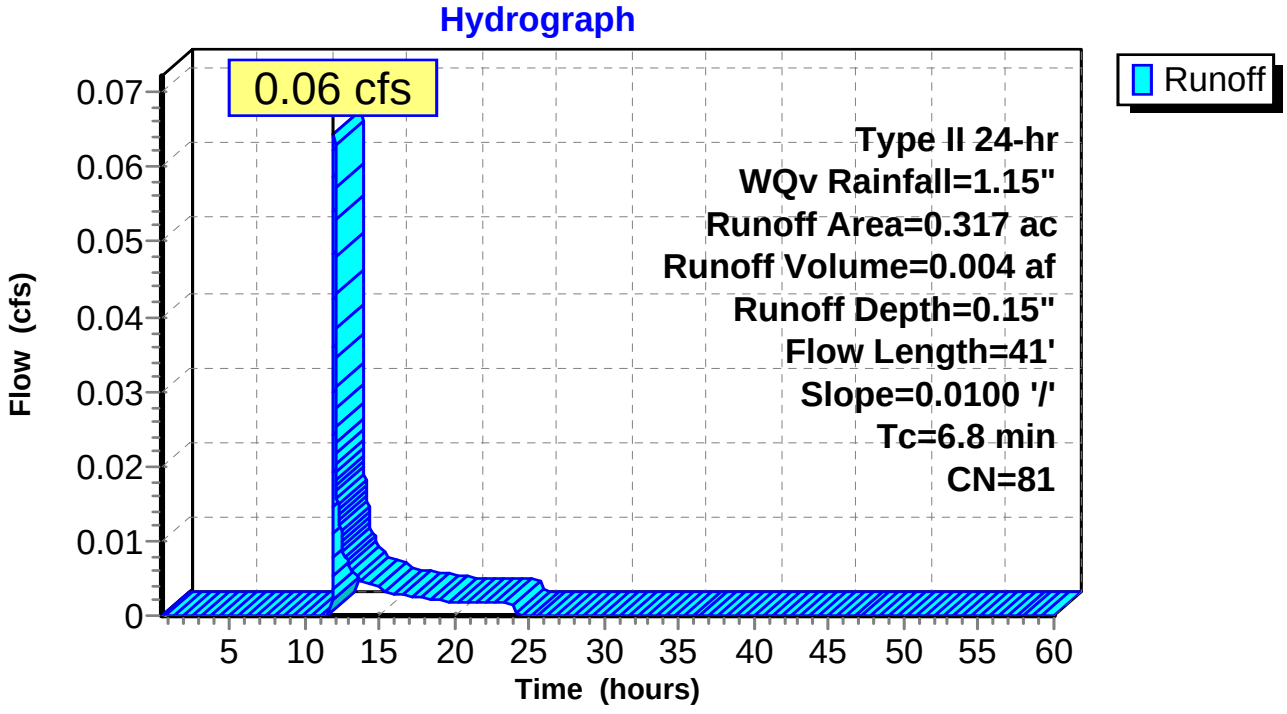
Runoff = 0.06 cfs @ 12.01 hrs, Volume= 0.004 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.084	80	>75% Grass cover, Good, HSG D
0.067	39	>75% Grass cover, Good, HSG A
0.166	98	Paved parking, HSG B
0.317	81	Weighted Average
0.151		47.63% Pervious Area
0.166		52.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	41	0.0100	0.10		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 2.75"

Subcatchment 1A: Subcatchment 1A



Summary for Subcatchment 1B: roof

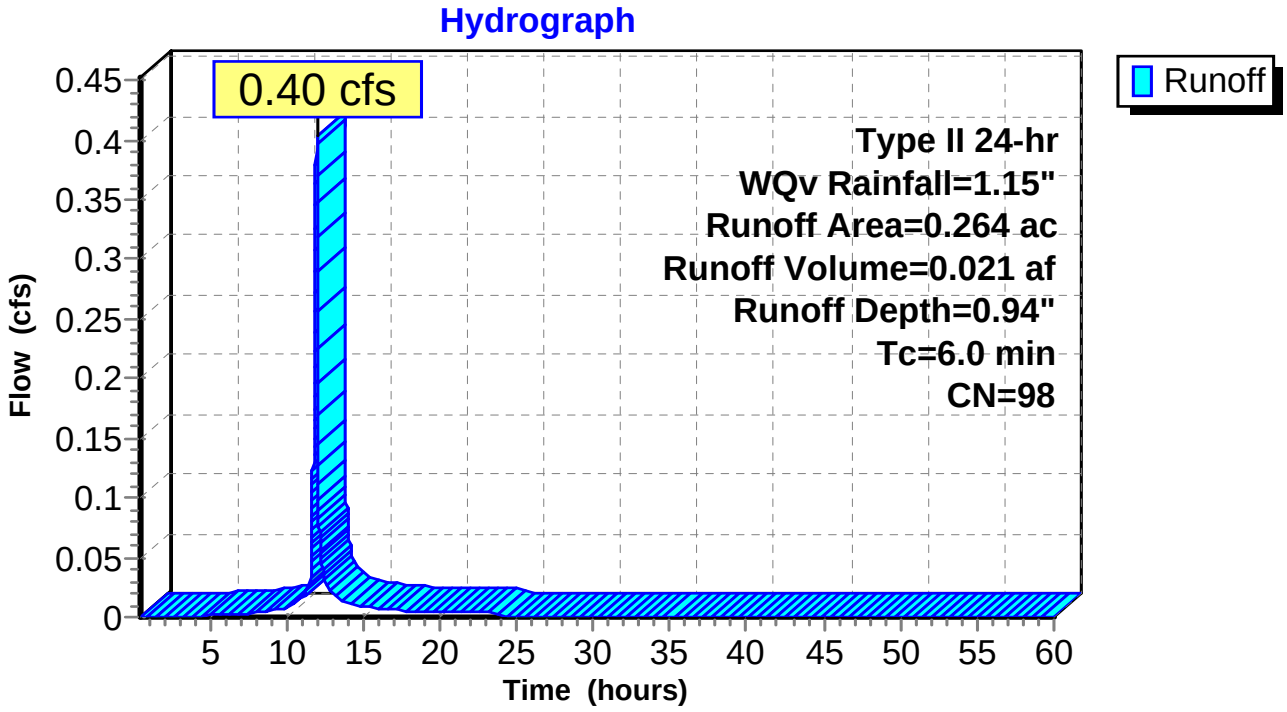
Runoff = 0.40 cfs @ 11.97 hrs, Volume= 0.021 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.264	98	Paved parking, HSG A
0.264		100.00% Impervious Area

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

Subcatchment 1B: roof



Summary for Subcatchment 1C: roof

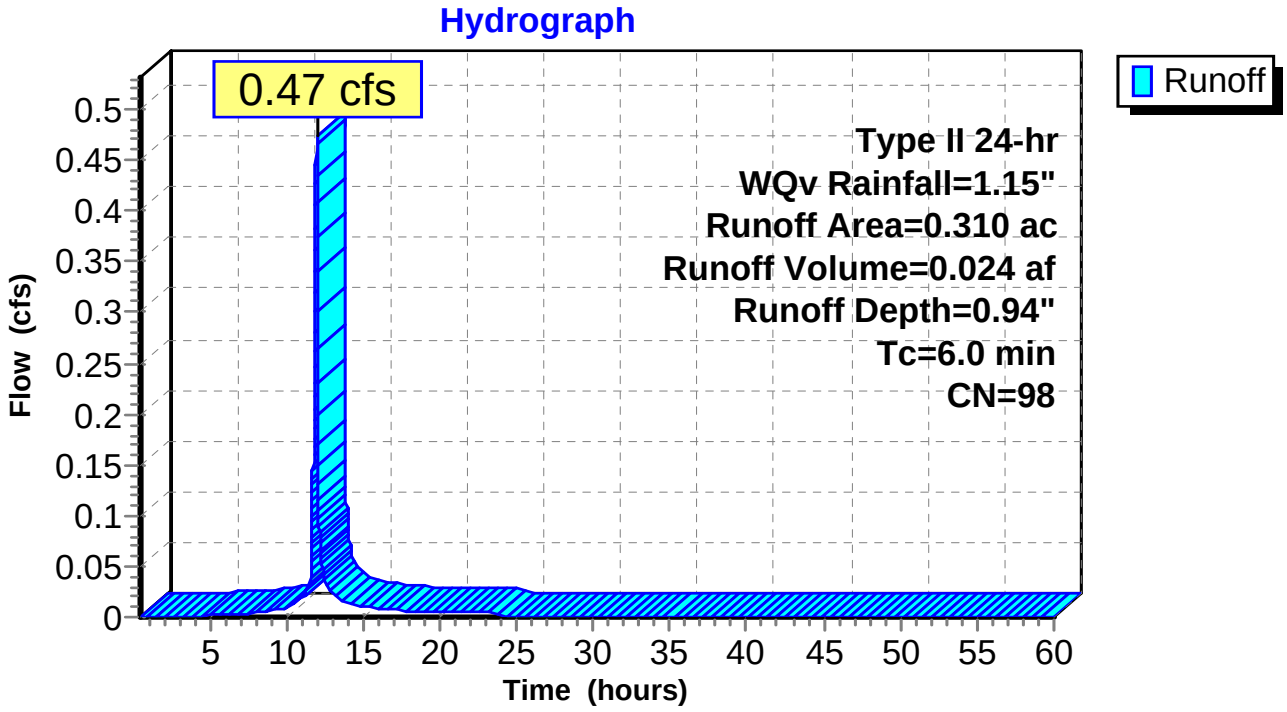
Runoff = 0.47 cfs @ 11.97 hrs, Volume= 0.024 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG A
0.310		100.00% Impervious Area

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

Subcatchment 1C: roof



Summary for Subcatchment 1D: west side

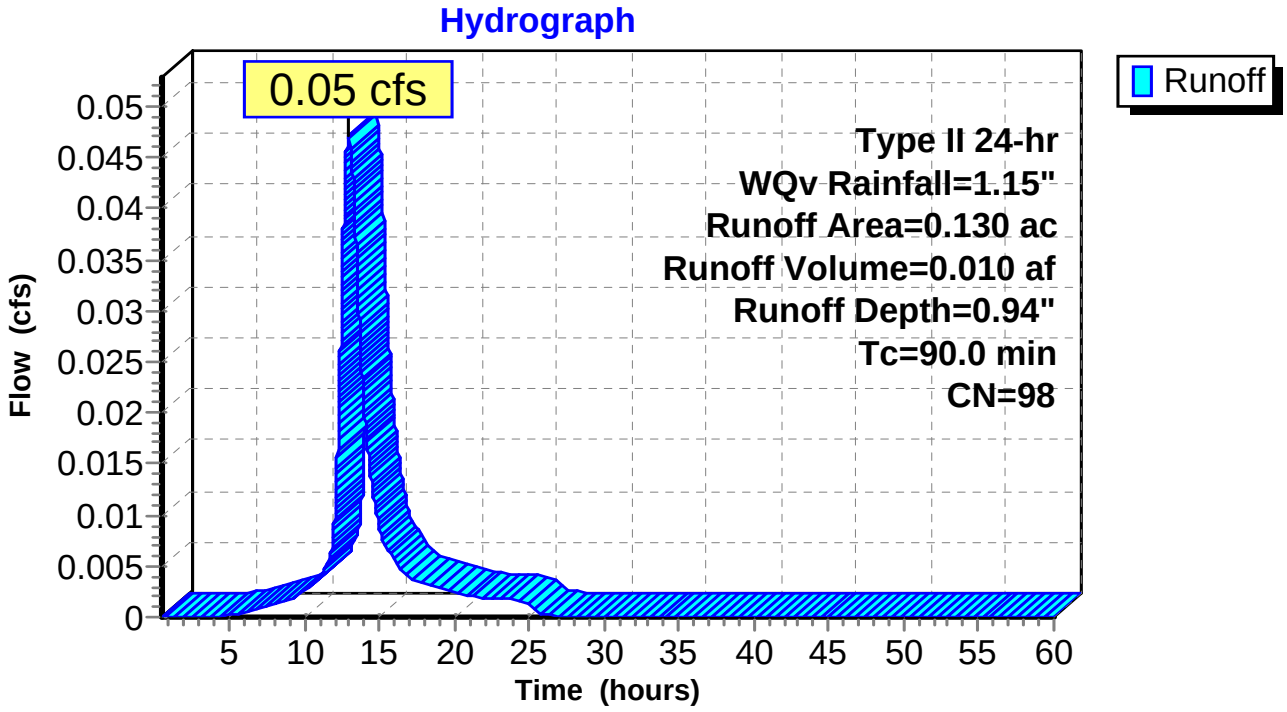
Runoff = 0.05 cfs @ 12.99 hrs, Volume= 0.010 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG A
0.130		100.00% Impervious Area

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

Subcatchment 1D: west side



Summary for Subcatchment 1E: ROOF

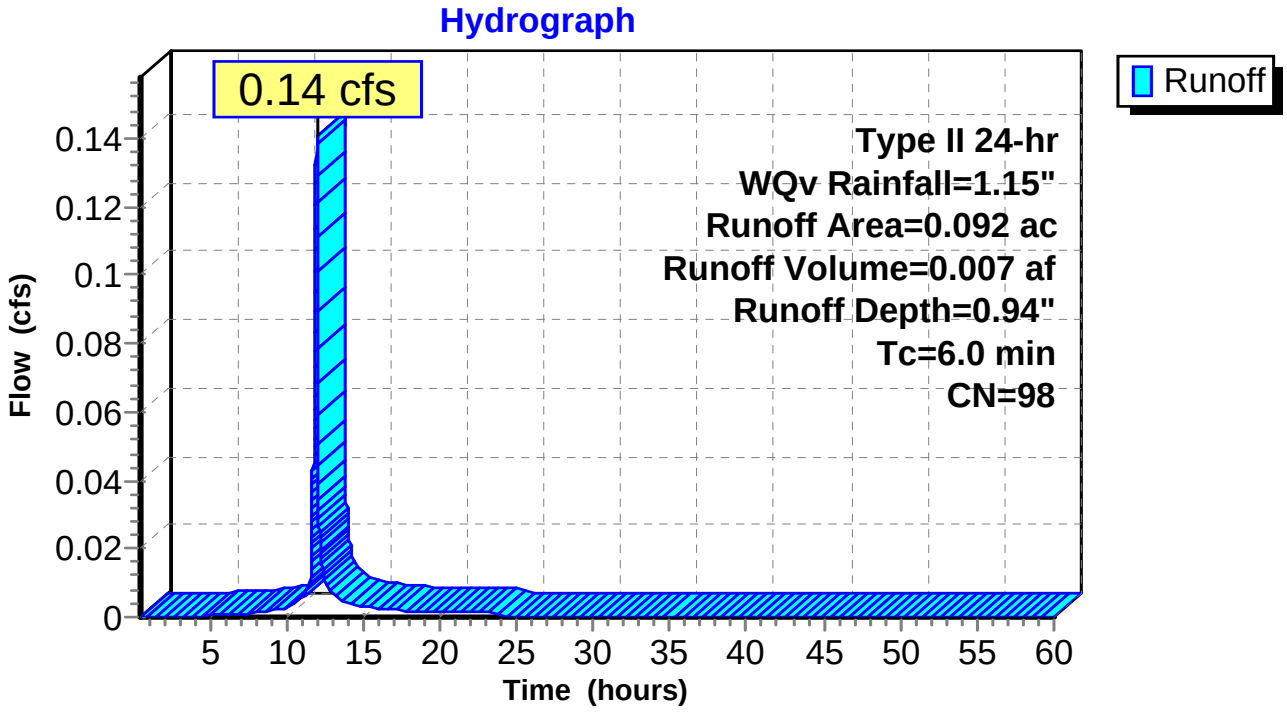
Runoff = 0.14 cfs @ 11.97 hrs, Volume= 0.007 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.092	98	Roofs, HSG B
0.092		100.00% Impervious Area

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

Subcatchment 1E: ROOF



Summary for Subcatchment 1F: COURTYARD

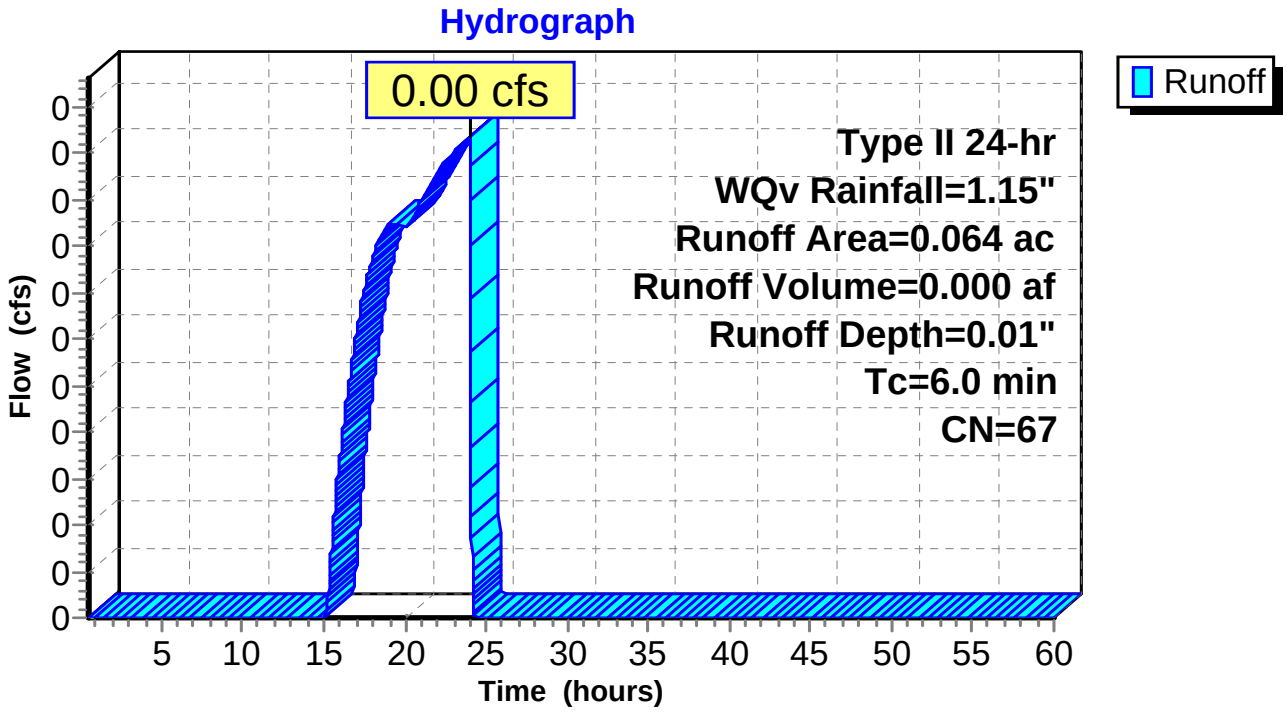
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.030	98	Paved parking, HSG B
0.064	67	Weighted Average
0.034		53.13% Pervious Area
0.030		46.87% Impervious Area

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

Subcatchment 1F: COURTYARD



Summary for Subcatchment 1G: COURTYARD

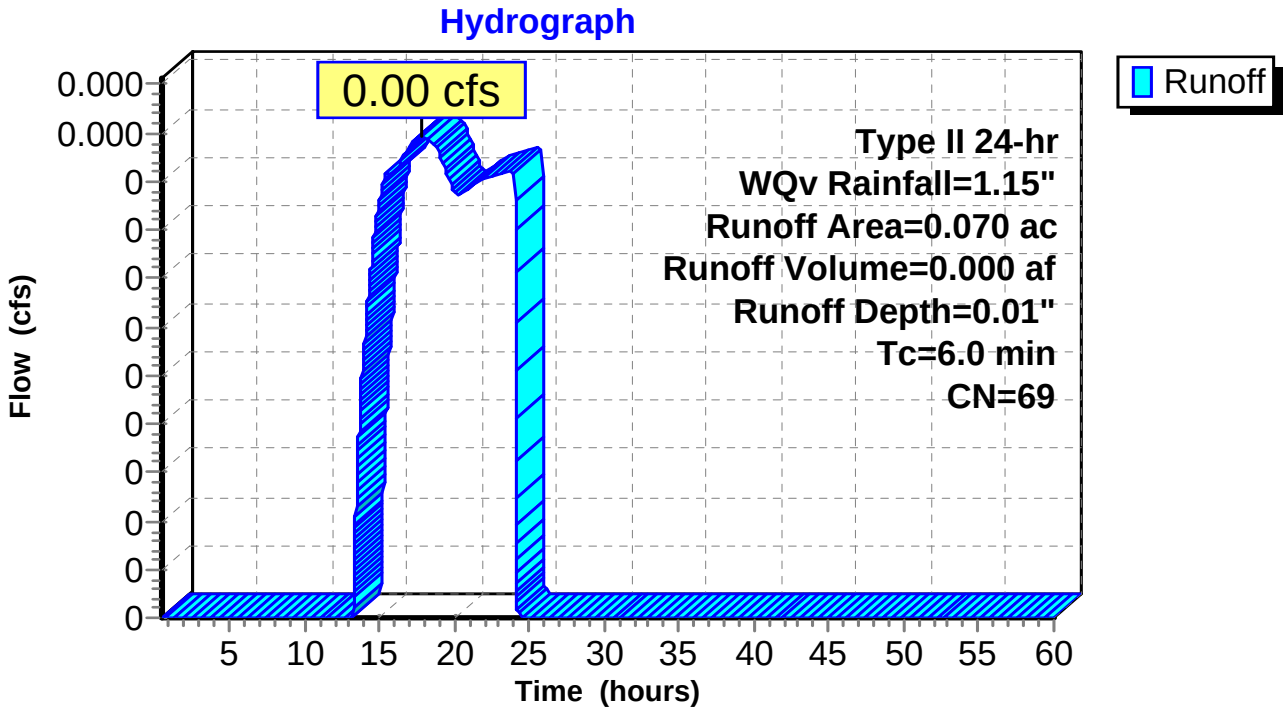
Runoff = 0.00 cfs @ 17.78 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.034	39	>75% Grass cover, Good, HSG A
0.036	98	Paved parking, HSG B
0.070	69	Weighted Average
0.034		48.57% Pervious Area
0.036		51.43% Impervious Area

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

Subcatchment 1G: COURTYARD



Summary for Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER

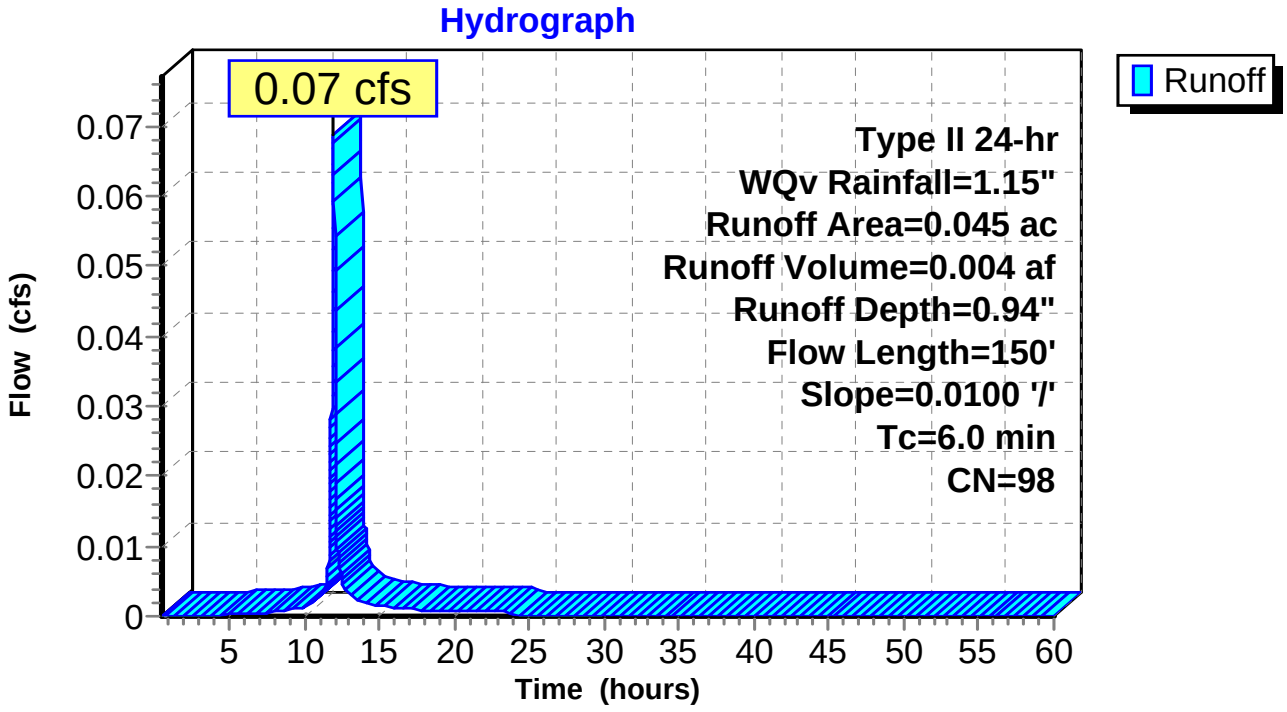
Runoff = 0.07 cfs @ 11.97 hrs, Volume= 0.004 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Type II 24-hr WQv Rainfall=1.15"

Area (ac)	CN	Description
0.045	98	Paved parking, HSG B
0.045		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	150	0.0100	1.05		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 2.75"
2.4	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: AREA DISCONNECTED FROM COMBINED SEWER



Summary for Pond 1BP: BLUE ROOF

Inflow Area = 0.264 ac,100.00% Impervious, Inflow Depth = 0.94" for WQv event
Inflow = 0.40 cfs @ 11.97 hrs, Volume= 0.021 af
Outflow = 0.03 cfs @ 12.62 hrs, Volume= 0.020 af, Atten= 94%, Lag= 39.1 min
Primary = 0.03 cfs @ 12.62 hrs, Volume= 0.020 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.05' @ 12.62 hrs Surf.Area= 11,500 sf Storage= 531 cf

Plug-Flow detention time= 452.8 min calculated for 0.020 af (99% of inflow)
Center-of-Mass det. time= 444.9 min (1,224.9 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	11,500 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	11,500	1,200.0	0	0	11,500
276.00	11,500	1,200.0	11,500	11,500	12,700

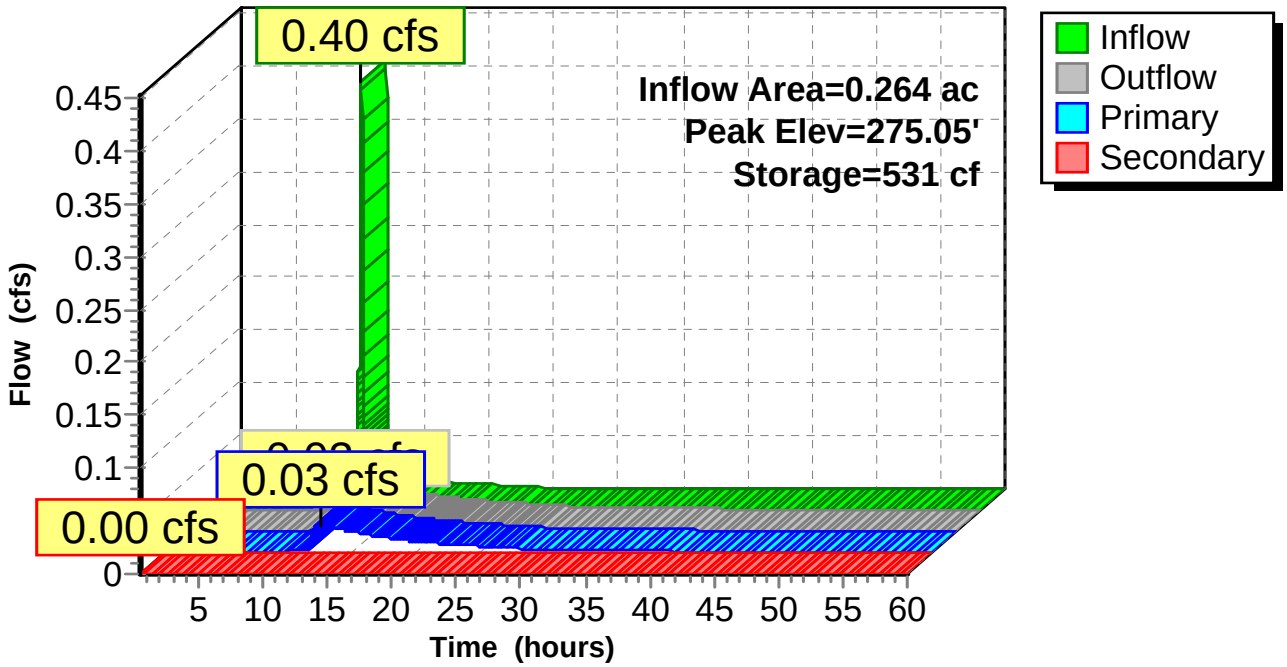
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.05'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 12.62 hrs HW=275.05' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.03 cfs @ 0.70 fps)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=275.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1BP: BLUE ROOF

Hydrograph



Summary for Pond 1CP: BLUE ROOF

Inflow Area = 0.310 ac,100.00% Impervious, Inflow Depth = 0.94" for WQv event
Inflow = 0.47 cfs @ 11.97 hrs, Volume= 0.024 af
Outflow = 0.01 cfs @ 14.04 hrs, Volume= 0.022 af, Atten= 97%, Lag= 124.1 min
Primary = 0.01 cfs @ 14.04 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 275.03' @ 14.04 hrs Surf.Area= 24,000 sf Storage= 716 cf

Plug-Flow detention time= 829.8 min calculated for 0.022 af (89% of inflow)
Center-of-Mass det. time= 775.1 min (1,555.2 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	24,000 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	24,000	2,100.0	0	0	24,000
276.00	24,000	2,100.0	24,000	24,000	26,100

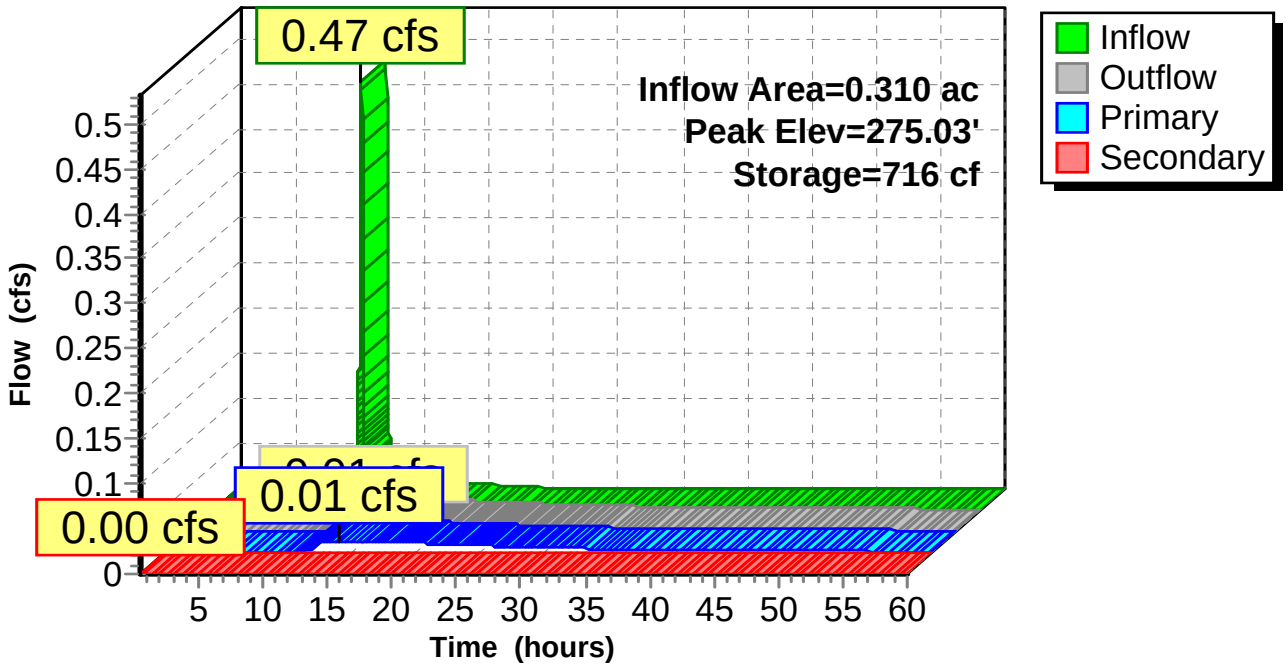
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.35'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 14.04 hrs HW=275.03' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=275.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1CP: BLUE ROOF

Hydrograph



Summary for Pond 1DP: Porous Pavement

Inflow Area = 0.394 ac,100.00% Impervious, Inflow Depth > 0.93" for WQv event
Inflow = 0.07 cfs @ 12.91 hrs, Volume= 0.031 af
Outflow = 0.02 cfs @ 12.22 hrs, Volume= 0.031 af, Atten= 66%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.22 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 197.58' @ 15.60 hrs Surf.Area= 2,153 sf Storage= 288 cf

Plug-Flow detention time= 98.6 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 98.1 min (1,200.9 - 1,102.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	197.25'	1,435 cf	**13.12'W x 164.04'L x 2.98'H Field A** 6,413 cf Overall - 2,825 cf Embedded = 3,588 cf x 40.0% Voids
#2A	197.83'	2,656 cf	**Rainstore3 04** x 200 Inside #1 Inside= 39.4"W x 15.7"H => 4.05 sf x 3.28'L = 13.3 cf Outside= 39.4"W x 15.7"H => 4.31 sf x 3.28'L = 14.1 cf 4 Rows of 50 Chambers
		4,091 cf	Total Available Storage

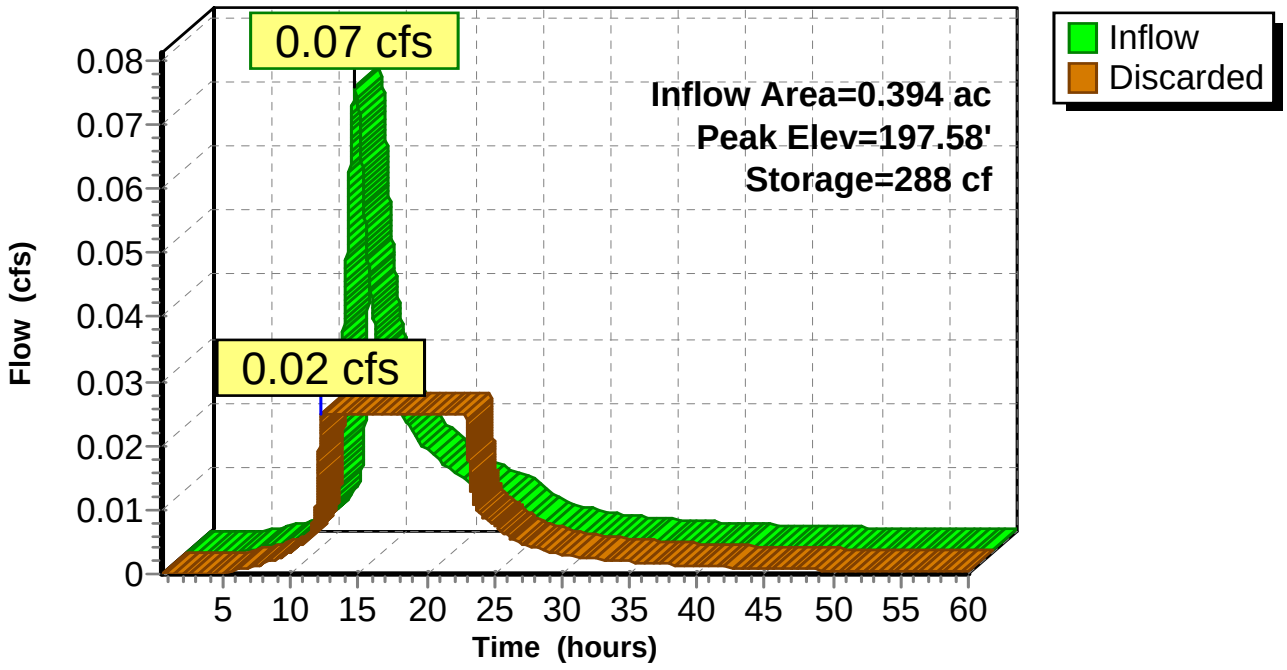
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	197.25'	**0.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.22 hrs HW=197.28' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 1DP: Porous Pavement

Hydrograph



Summary for Pond 1EP: BLUE ROOF

Inflow Area = 0.092 ac,100.00% Impervious, Inflow Depth = 0.94" for WQv event
Inflow = 0.14 cfs @ 11.97 hrs, Volume= 0.007 af
Outflow = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs
Peak Elev= 245.08' @ 24.34 hrs Surf.Area= 3,700 sf Storage= 313 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	245.00'	3,700 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
245.00	3,700	320.0	0	0	3,700
246.00	3,700	320.0	3,700	3,700	4,020

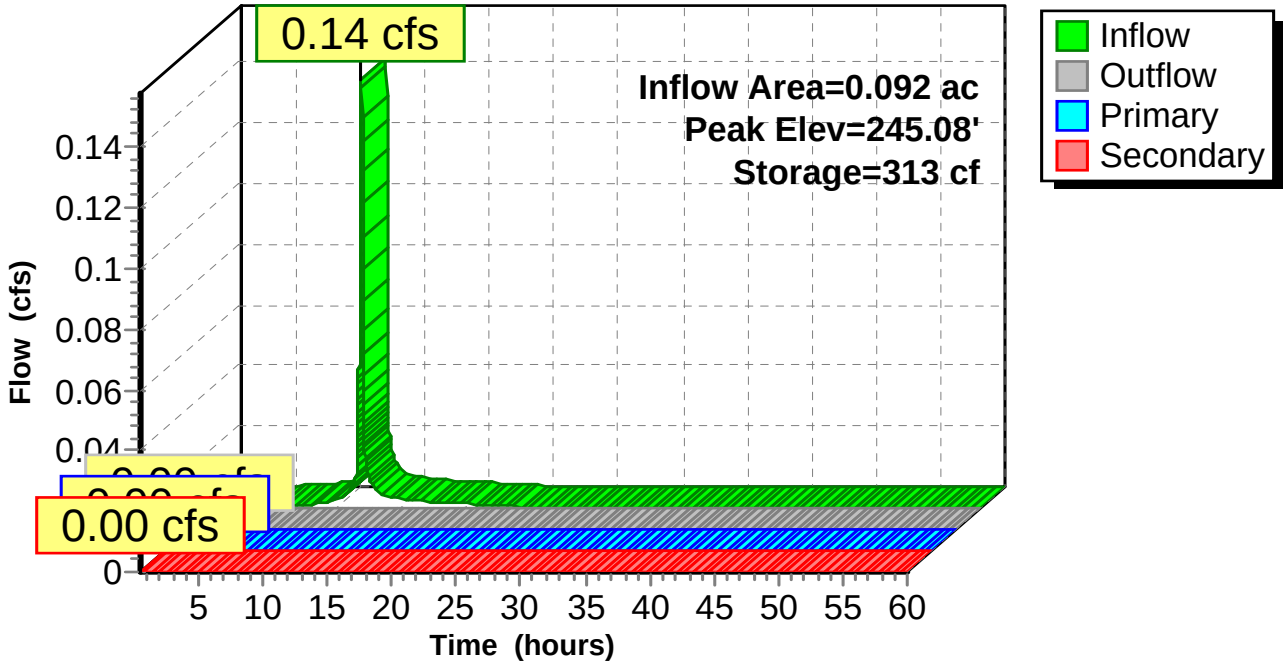
Device	Routing	Invert	Outlet Devices
#1	Primary	275.00'	**3.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	275.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=245.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 1EP: BLUE ROOF

Hydrograph

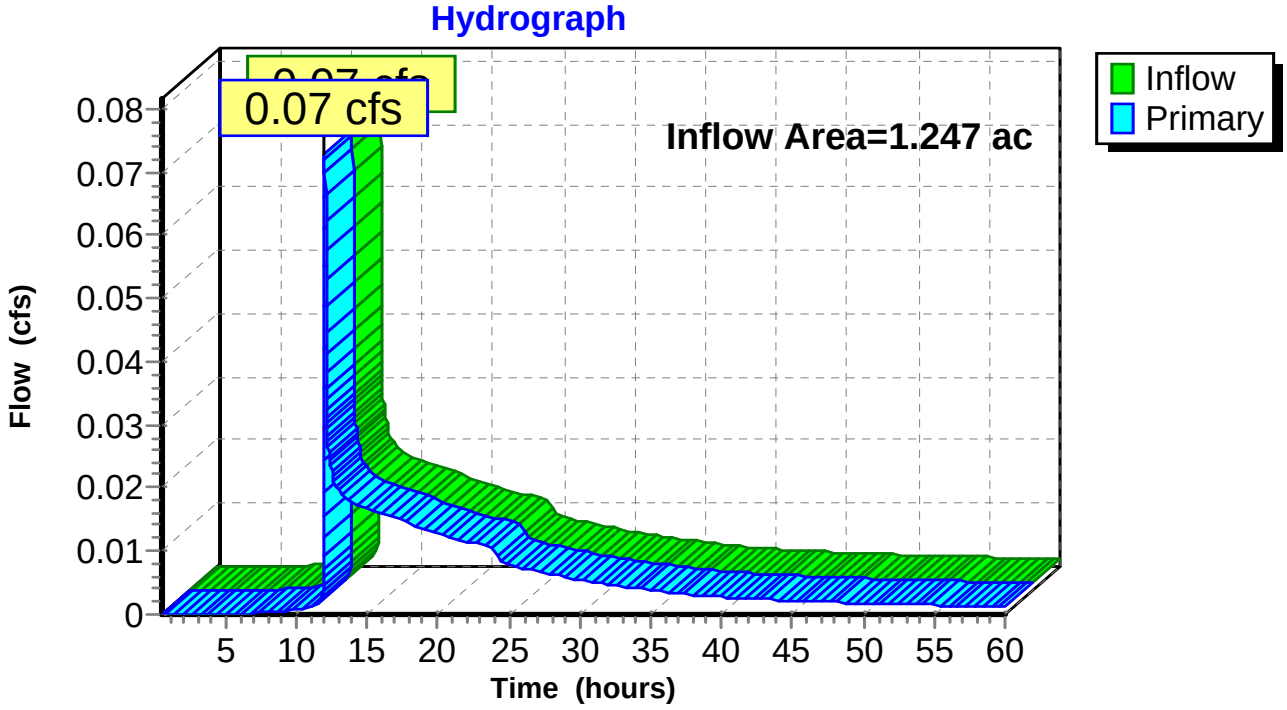


Summary for Link AP-1: ANALYSIS POINT 1

Inflow Area = 1.247 ac, 82.44% Impervious, Inflow Depth > 0.25" for WQv event
Inflow = 0.07 cfs @ 12.01 hrs, Volume= 0.026 af
Primary = 0.07 cfs @ 12.01 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.50-60.00 hrs, dt= 0.01 hrs

Link AP-1: ANALYSIS POINT 1



Appendix E

BMP Specifications

STANDARD AND SPECIFICATIONS FOR DUST CONTROL

Definition

The control of dust resulting from land-disturbing activities.

Purpose

To prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the local permitting authority.

Construction Specifications

A. Non-driving Areas – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. Driving Areas – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

Barriers – Woven geotextiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

Windbreak – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

All Stormwater Pollution Prevention Plans must contain the NYS DEC issued “Conditions for Use” and “Application Instructions” for any polymers used on the site. This information can be obtained from the NYS DEC website.

Maintenance

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.

STANDARD AND SPECIFICATIONS FOR LANDGRADING

Definition

Reshaping of the existing land surface in accordance with a plan as determined by engineering survey and layout.

Purpose

The purpose of a landgrading specification is to provide for erosion control and vegetative establishment on those areas where the existing land surface is to be reshaped by grading according to plan.

Design Criteria

The grading plan should be based upon the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surrounding to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, effect on adjacent properties and drainage patterns, measures for drainage and water removal, and vegetative treatment, etc.

Many counties have regulations and design procedures already established for land grading and cut and fill slopes. Where these requirements exist, they shall be followed.

The plan must show existing and proposed contours of the area(s) to be graded. The plan shall also include practices for erosion control, slope stabilization, safe disposal of runoff water and drainage, such as waterways, lined ditches, reverse slope benches (include grade and cross section), grade stabilization structures, retaining walls, and surface and subsurface drains. The plan shall also include phasing of these practices. The following shall be incorporated into the plan:

1. Provisions shall be made to safely conduct surface runoff to storm drains, protected outlets, or to stable water courses to ensure that surface runoff will not damage slopes or other graded areas; see standards and specifications for Grassed Waterway, Diversion, Grade Stabilization Structure.

2. Cut and fill slopes that are to be stabilized with grasses shall not be steeper than 2:1. When slopes exceed 2:1, special design and stabilization consideration are required and shall be adequately shown on the plans. (Note: Where the slope is to be mowed, the slope should be no steeper than 3:1, although 4:1 is preferred because of safety factors related to mowing steep slopes.)

3. Reverse slope benches or diversion shall be provided whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slope it shall be increased to 30 feet and for 4:1 to 40 feet. Benches shall be located to divide the slope face as equally as possible and shall convey the water to a stable outlet. Soils, seeps, rock outcrops, etc., shall also be taken into consideration when designing benches.

   A. Benches shall be a minimum of six feet wide to provide for ease of maintenance.

   B. Benches shall be designed with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Bench gradient to the outlet shall be between 2 percent and 3 percent, unless accompanied by appropriate design and computations.

   C. The flow length within a bench shall not exceed 800 feet unless accompanied by appropriate design and computations; see Standard and Specifications for Diversion on page 5B.1

4. Surface water shall be diverted from the face of all cut and/or fill slopes by the use of diversions, ditches and swales or conveyed downslope by the use of a designed structure, except where:

   A. The face of the slope is or shall be stabilized and the face of all graded slopes shall be protected from surface runoff until they are stabilized.

B. The face of the slope shall not be subject to any concentrated flows of surface water such as from natural drainage ways, graded swales, downspouts, etc.

C. The face of the slope will be protected by special erosion control materials, sod, gravel, riprap, or other stabilization method.

5. Cut slopes occurring in ripable rock shall be serrated as shown in Figure 5B.23 on page 5B.51. The serrations shall be made with conventional equipment as the excavation is made. Each step or serration shall be constructed on the contour and will have steps cut at nominal two-foot intervals with nominal three-foot horizontal shelves. These steps will vary depending on the slope ratio or the cut slope. The nominal slope line is 1 ½: 1. These steps will weather and act to hold moisture, lime, fertilizer, and seed thus producing a much quicker and longer-lived vegetative cover and better slope stabilization. Overland flow shall be diverted from the top of all serrated cut slopes and carried to a suitable outlet.

6. Subsurface drainage shall be provided where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

7. Slopes shall not be created so close to property lines as to endanger adjoining properties without adequately protecting such properties against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.

8. Fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris, and other objectionable material. It should be free of stones over two (2) inches in diameter where compacted by hand or mechanical tampers or over eight (8) inches in diameter where compacted by rollers or other equipment. Frozen material shall not be placed in the fill nor shall the fill material be placed on a frozen foundation.

9. Stockpiles, borrow areas, and spoil shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

10. All disturbed areas shall be stabilized structurally or vegetatively in compliance with the Standard and Specifications for Critical Area Treatment in Section 3.

Construction Specifications

See Figures 5B.23 and 5B.24 for details.

1. All graded or disturbed areas, including slopes, shall be protected during clearing and construction in accordance with the erosion and sediment control plan until they are adequately stabilized.

2. All erosion and sediment control practices and measures shall be constructed, applied and maintained in accordance with the sediment control plan and the "New York Standards and Specifications for Erosion and Sediment Control."

3. Topsoil required for the establishment of vegetation shall be stockpiled in amount necessary to complete finished grading of all exposed areas.

4. Areas to be filled shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable material.

5. Areas that are to be topsoiled shall be scarified to a minimum depth of four inches prior to placement of topsoil.

6. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence, or other related problems. Fill intended to support buildings, structures, and conduits, etc., shall be compacted in accordance with local requirements or codes.

7. All fill shall be placed and compacted in layers not to exceed 9 inches in thickness.

8. Except for approved landfills or nonstructural fills, fill material shall be free of frozen particles, brush, roots, sod, or other foreign objectionable materials that would interfere with, or prevent, construction of satisfactory fills.

9. Frozen material or soft, mucky or highly compressible materials shall not be incorporated into fill slopes or structural fills.

10. Fill shall not be placed on saturated or frozen surfaces.

11. All benches shall be kept free of sediment during all phases of development.

12. Seeps or springs encountered during construction shall be handled in accordance with the Standard and Specification for Subsurface Drain on page 5B.44 or other approved methods.

13. All graded areas shall be permanently stabilized immediately following finished grading.

14. Stockpiles, borrow areas, and spoil areas shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

Figure 5B.23
Typical Section of Serrated Cut Slope

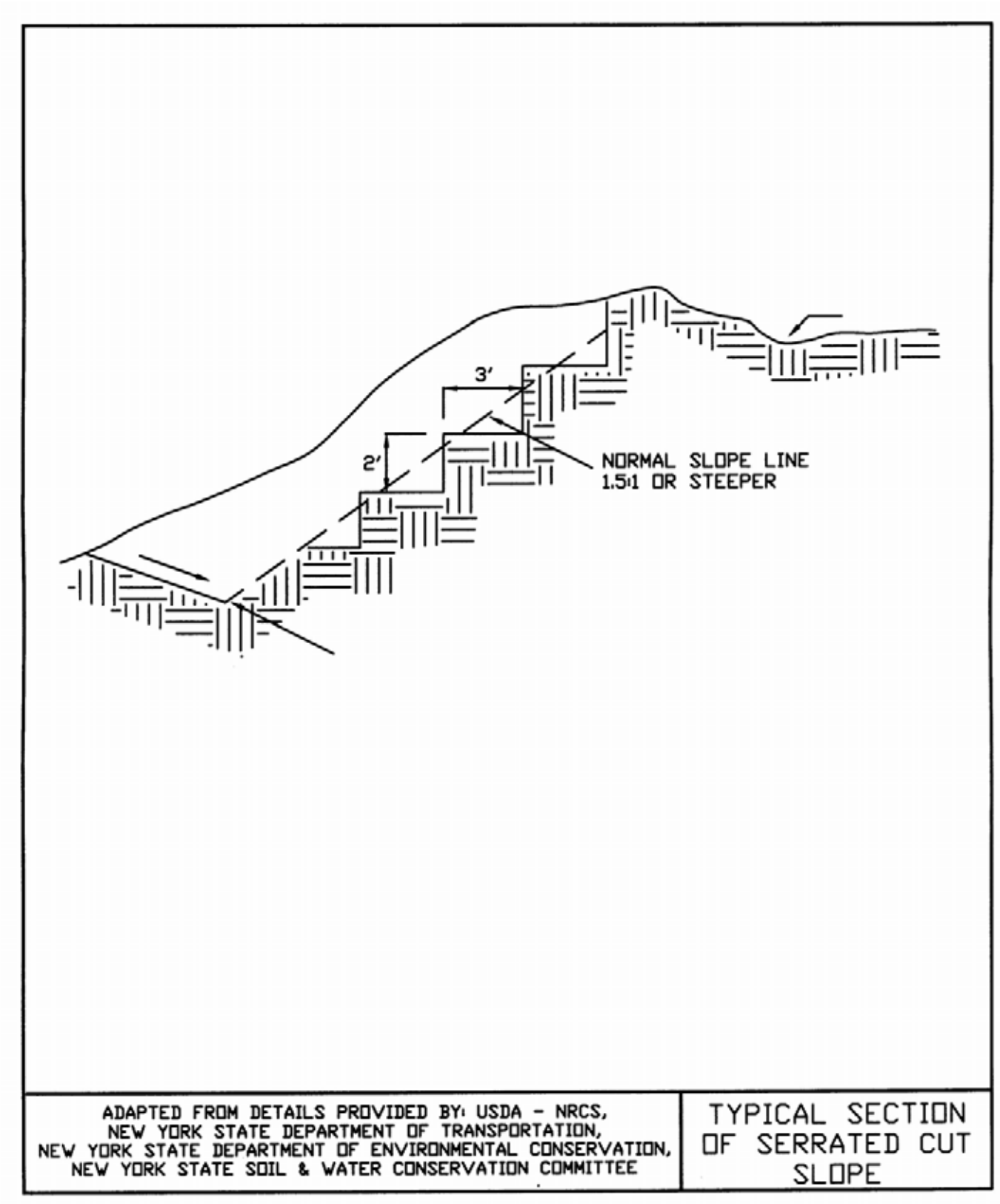


Figure 5B.24 (1)
Landgrading

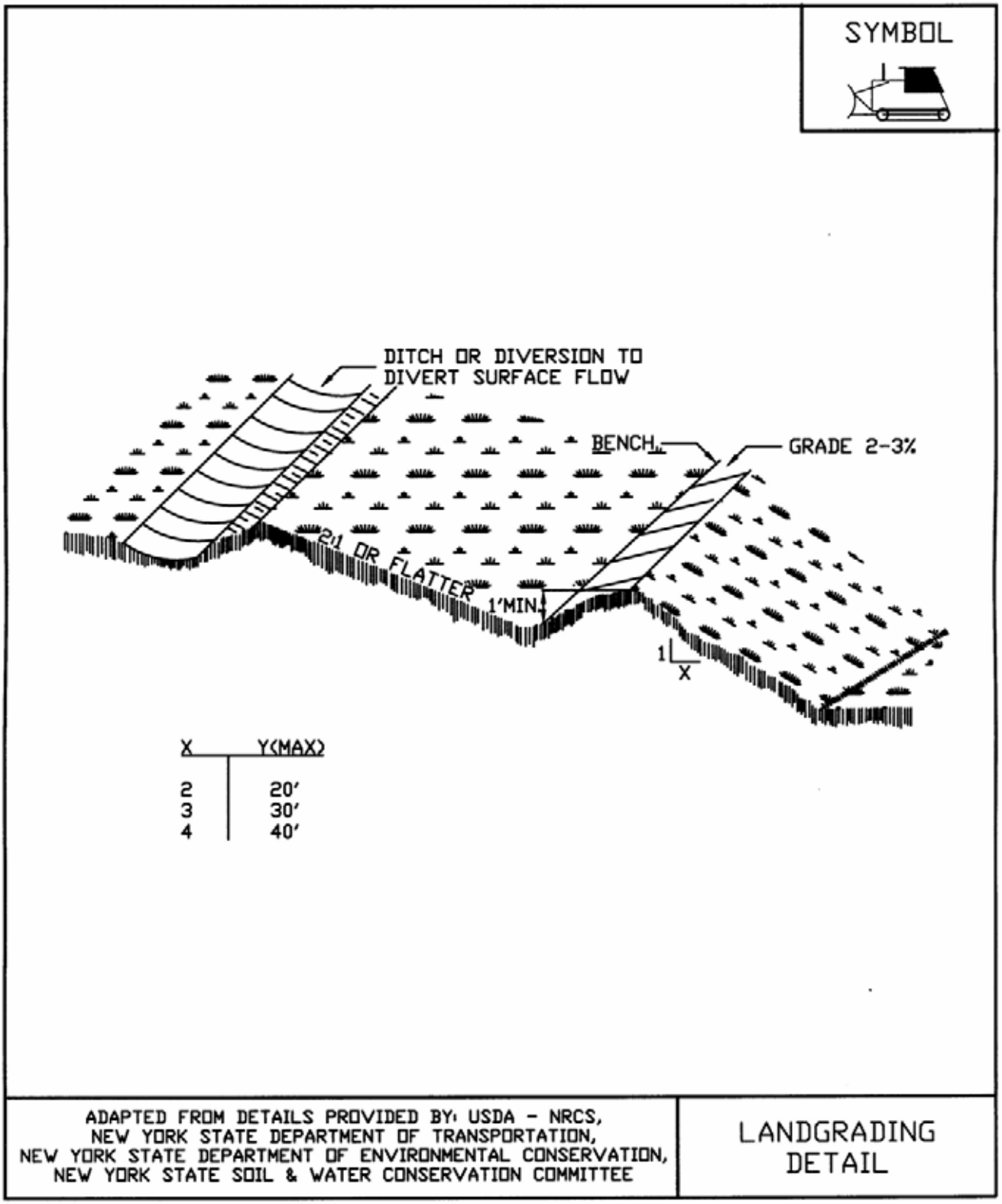


Figure 5B.24 (2)
Landgrading —Construction Specifications

CONSTRUCTION SPECIFICATIONS

1. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN UNTIL THEY ARE PERMANENTLY STABILIZED.
2. ALL SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN AND THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS".
3. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNT NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS.
4. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL.
5. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF FOUR INCHES PRIOR TO PLACEMENT OF TOPSOIL.
6. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
7. ALL FILL TO BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
8. EXCEPT FOR APPROVED LANDFILLS, FILL MATERIAL SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
9. FROZEN MATERIALS OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED IN FILLS.
10. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
11. ALL BENCHES SHALL BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF DEVELOPMENT.
12. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
13. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
14. STOCKPILES, BORROW AREAS AND SPOIL AREAS SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATION.

ADAPTED FROM DETAILS PROVIDED BY: USDA – NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	LANDGRADING SPECIFICATIONS

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STANDARD AND SPECIFICATIONS FOR SURFACE ROUGHENING

Definition

Roughening a bare soil surface whether through creating horizontal grooves across a slope, stair-stepping, or tracking with construction equipment.

Purpose

To aid the establishment of vegetative cover from seed, to reduce runoff velocity and increase infiltration, and to reduce erosion and provide for trapping of sediment.

Conditions Where Practice Applies

All construction slopes require surface roughening to facilitate stabilization with vegetation, particularly slopes steeper than 3:1.

Design Criteria

There are many different methods to achieve a roughened soil surface on a slope. No specific design criteria is required. However, the selection of the appropriate method depends on the type of slope. Methods include tracking, grooving, and stair-stepping. Steepness, mowing requirements, and/or a cut or fill slope operation are all factors considered in choosing a roughening method.

Construction Specifications

A. Cut Slope, No mowing.

1. Stair-step grade or groove cut slopes with a gradient steeper than 3:1 (Figure 5B.25).

2. Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes of soft rock with some soil are particularly suited to stair-step grading.

3. Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" to the vertical wall.

4. Do not make vertical cuts more than 2 feet in soft materials or 3 feet in rocky materials.

Grooving uses machinery to create a series of ridges and depressions that run perpendicular to the slope following the contour. Groove using any appropriate implement that can be safely operated on the slope, such as disks, tillers, spring harrows, or the teeth of a front-end loader bucket. Do not make the grooves less than 3 inches deep or more than 15 inches apart.

B. Fill Slope, No mowing

1. Place fill to create slopes with a gradient steeper than 3:1 in lifts 9 inches or less and properly compacted. Ensure the face of the slope consists of loose, uncompacted fill 4 to 6 inches deep. Use grooving as described above to roughen the slope, if necessary.

2. Do not blade or scrape the final slope face.

C. Cuts/Fills, Mowed Maintenance

1. Make mowed slopes no steeper than 3:1.

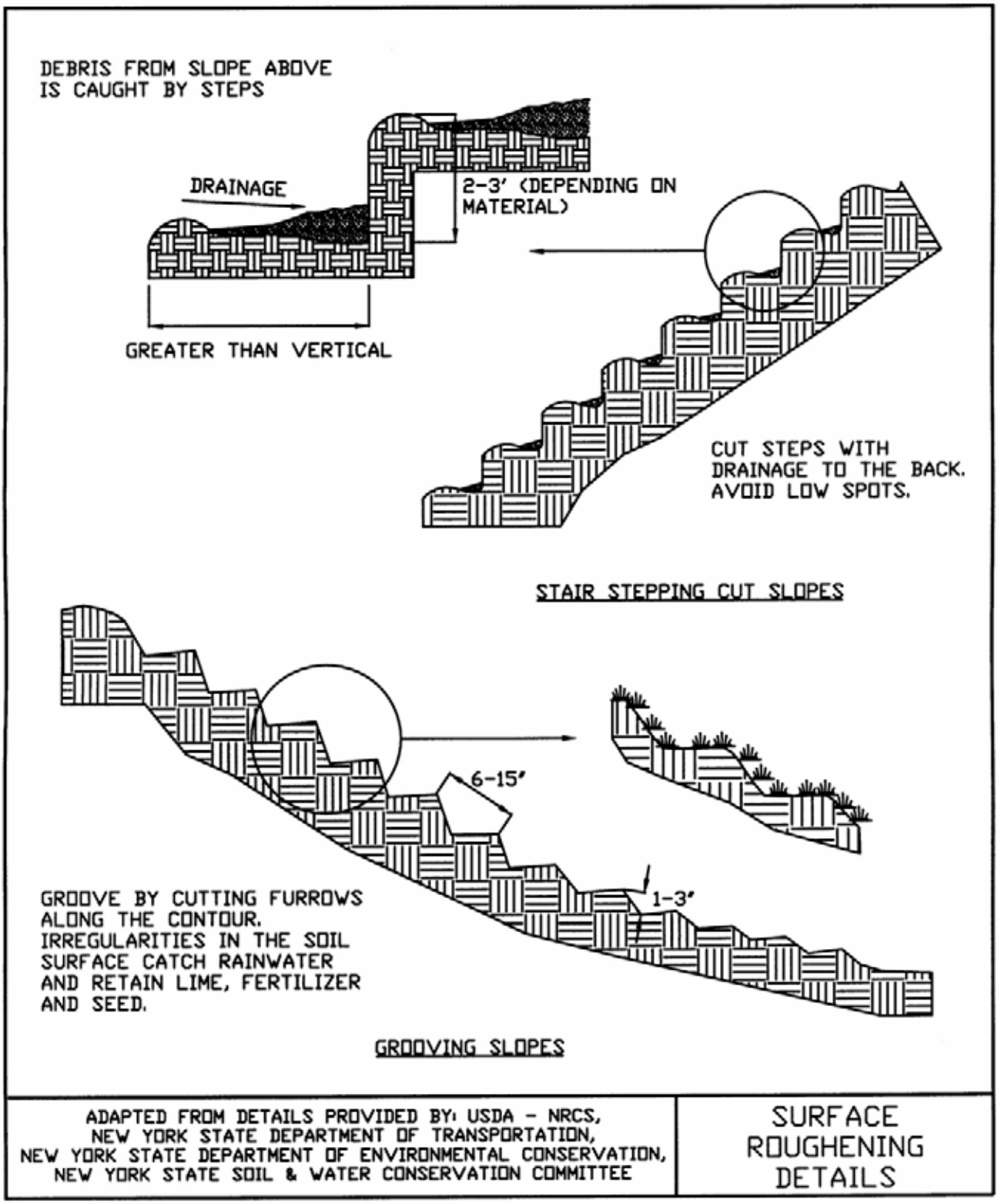
2. Roughen these areas to shallow grooves by normal tilling, disking, harrowing, or use of cultipacker-seeder. Make the final pass of such tillage equipment on the contour.

3. Make grooves at least 1 inch deep and a maximum of 10 inches apart.

4. Excessive roughness is undesirable where mowing is planned.

Tracking should be used primarily in sandy soils to avoid undue compaction of the soil surface. Tracking is generally not as effective as the other roughening methods described. (It has been used as a method to track down mulch.) Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.

Figure 5B.25
Surface Roughening



STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7”	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2”	9 cu. yds.	405 cu. yds.	3”	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/ yd. 60-90 lbs./roll	48” x 50 yds. or 48” x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8” x 100” 2-sided plastic, 48” x 180” 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3” pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3”	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 3.8
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS FOR PERMANENT CRITICAL AREA PLANTINGS

Definition

Establishing grasses with other forbs and/or shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

Purpose

To reduce erosion and sediment transport.

Conditions Where Practice Applies

This practice applies to all disturbed areas void of, or having insufficient, cover to prevent erosion and sediment transport. See additional standards for special situations such as sand dunes and sand and gravel pits.

Criteria

All water control measures will be installed as needed prior to final grading and seedbed preparation. Any severely compacted sections will require chiseling or disking to provide an adequate rooting zone, to a minimum depth of 12". The seedbed must be prepared to allow good soil to seed contact, with the soil not too soft and not too compact. Adequate soil moisture must be present to accomplish this. If surface is powder dry or sticky wet, postpone operations until moisture changes to a favorable condition. If seeding is accomplished within 24 hours of final grading, additional scarification is generally not needed, especially on ditch or stream banks. Remove all stones and other debris from the surface that are greater than 4 inches, or that will interfere with future mowing or maintenance.

Soil amendments should be incorporated into the upper 2 inches of soil when feasible. **The soil should be tested to determine the amounts of amendments needed.** Apply ground agricultural limestone to attain a pH of 6.0 in the upper 2 inches of soil. If soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 600 lbs. per acre of 5-10-10 or equivalent. If manure is used, apply a quantity to meet the nutrients of the above fertilizer. This requires an appropriate manure analysis prior to applying to the site. Do not use manure on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

Seed mixtures may vary depending on location within the state and time of seeding. Generally, warm season grasses should only be seeded during early spring, April to May. These grasses are primarily used for vegetating excessively drained sands and gravels. See Standard and Specification for Sand and Gravel Mine Reclamation. Other grasses may be seeded any time of the year when the soil is not frozen and is workable. When legumes such as birdsfoot trefoil are included, spring seedings are preferred. See Table 3.1 "Permanent Critical Area Planting Mixture Recommendations" for additional seed mixtures.

General Seed Mix:
[1] add inoculant immediately prior to seeding

	Variety	lbs./acre	lbs/1000 sq. ft.
Birdsfoot trefoil[1] OR	Empire/Pardee	8[2]	0.20
Common white clover[1]	Common	8	0.20
PLUS			
Tall fescue	KY-31/Rebel	20	0.45
PLUS			
Redtop OR	Common	2	0.05
Ryegrass (perennial)	Pennfine/Linn	5	0.10

[2] Mix 4 lbs each of Empire and Pardee OR 4 lbs of Birdsfoot and 4 lbs white clover per acre.

Time of Seeding: The optimum timing for the general seed mixture is early spring. Permanent seedings may be made any time of year if properly mulched and adequate moisture is provided. Late June through early August is not a good time to seed, but may facilitate covering the land without additional disturbance if construction is completed. Portions of the seeding may fail due to drought and heat. These areas may need reseeding in late summer/fall or the following spring.

Method of seeding: Broadcasting, drilling, cultipack type

seeding, or hydroseeding are acceptable methods. Proper soil to seed contact is key to successful seedings.

Mulching: Mulching is essential to obtain a uniform stand of seeded plants. Optimum benefits of mulching new seedings are obtained with the use of small grain straw applied at a rate of 2 tons per acre, and anchored with a netting or tackifier. See the mulch standard and specification for choices and requirements.

Irrigation: Watering may be essential to establish a new seeding when a drought condition occurs shortly after a new seeding emerges. Irrigation is a specialized practice and care must be taken not to exceed the application rate for the soil or subsoil. When disconnecting irrigation pipe, be sure pipes are drained in a safe manor, not creating an erosion concern.

Table 3.1
Permanent Critical Area Planting Mixture Recommendations

Seed mixture	Variety	Rate in lbs. per acre	Rate in lbs. Per 1000 sq. ft.
Mix #1			
Creeping red fescue	Ensylva, Pennlawn, Boreal	10	.25
Perennial ryegrass	Pennfine, Linn	10	.25

*This mix is used extensively for shaded areas.

Mix #2

Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	20	.5

*This rate is in pure live seed, this would be an excellent choice along the upland edge of a wetland to filter runoff and provide wildlife benefits. In areas where erosion may be a problem, a companion seeding of sand lovegrass should be added to provide quick cover at a rate of 2 lbs. per acre (0.05 lbs. per 1000 sq. ft.).

Mix #3

Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	4	.1
Big bluestem	Niagara	4	.1
Little bluestem	Aldous or Camper	2	.05
Indiangrass	Rumsey	4	.1
Coastal panicgrass	Atlantic	2	.05
Sideoats grama	El Reno or Trailway	2	.05
Wildflower mix		.5	.01

*This mix has been successful on sand and gravel plantings. It is very difficult to seed without a warm season grass seeder such as a Truax seed drill. Broadcasting this seed is very difficult due to the fluffy nature of some of the seed, such as bluestems and indiangrass.

Mix #4

Switchgrass	Shelter, Pathfinder Trailblazer, or Blackwell	10	.25
Coastal panicgrass	Atlantic	10	.25

*This mix is salt tolerant, a good choice along the upland edge of tidal areas and roadsides.

Mix #5

Saltmeadow cordgrass (Spartina patens)—This grass is used for tidal shoreline protection and tidal marsh restoration. It is planted by vegetative stem divisions.

'Cape' American beachgrass can be planted for sand dune stabilization above the saltmeadow cordgrass zone.

Mix #6

Creeping red fescue	Ensylva, Pennlawn, Boreal	20	.45
Tall fescue	KY 31, Rebel	20	.45
Perennial ryegrass	Pennfine, Linn	5	.10
Birdsfoot trefoil	Empire, Pardee	10	.45

*General purpose erosion control mix. Not to be used for a turf planting or play grounds.

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

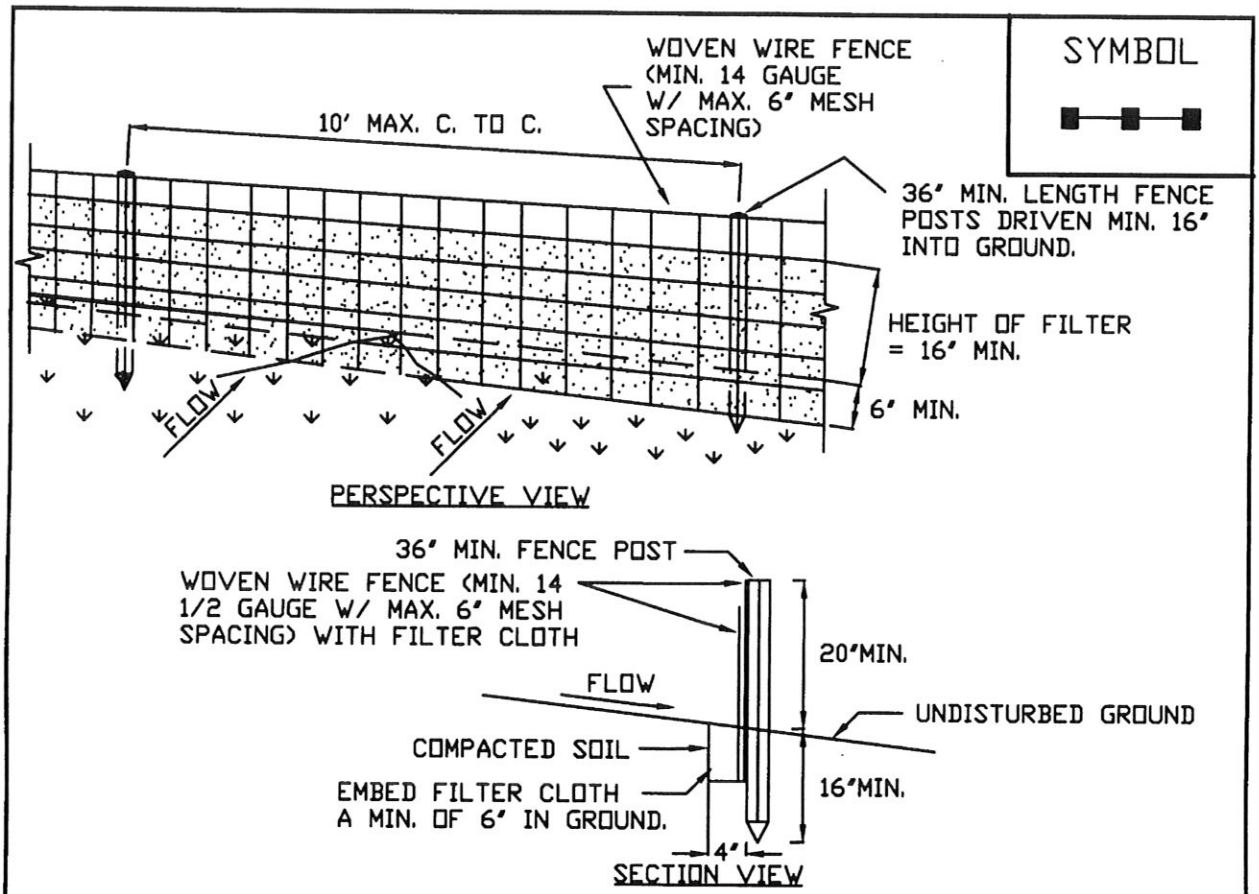
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER 'T' OR 'U' TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN 'BULGES' DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

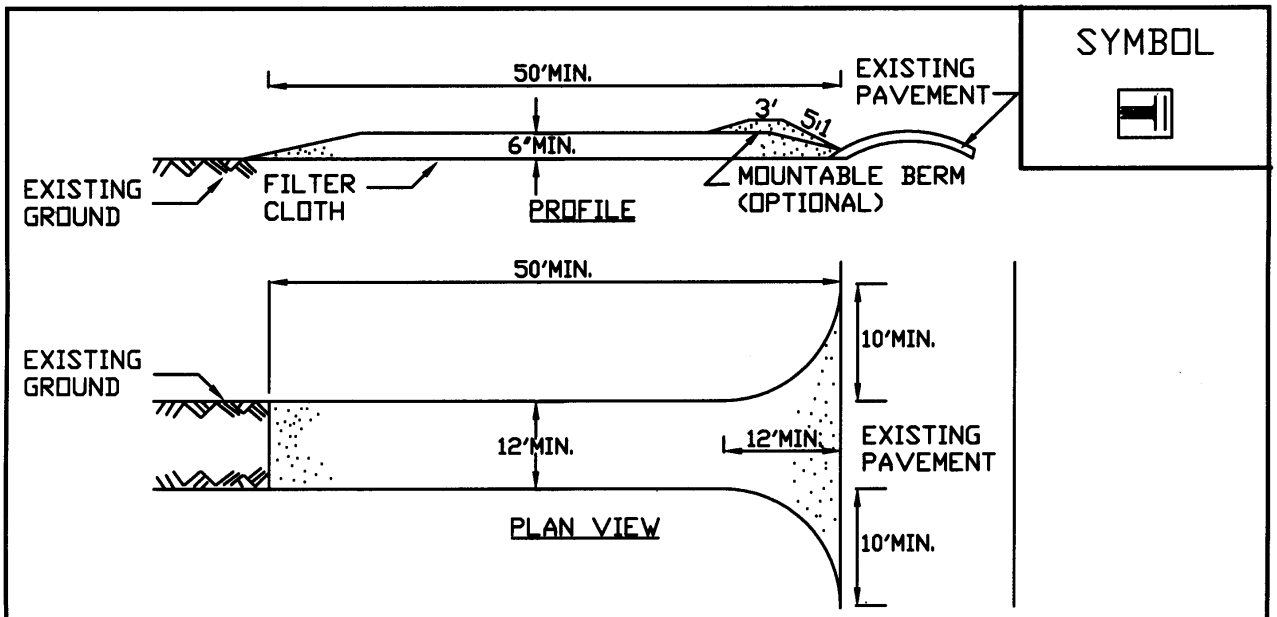
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR TOPSOILING

Definition

Spreading a specified quality and quantity of topsoil materials on graded or constructed subsoil areas.

Purpose

To provide acceptable plant cover growing conditions, thereby reducing erosion; to reduce irrigation water needs; and to reduce the need for nitrogen fertilizer application.

Conditions Where Practice Applies

Topsoil is applied to subsoils that are droughty (low available moisture for plants), stony, slowly permeable, salty or extremely acid. It is also used to backfill around shrub and tree transplants. This standard does not apply to wetland soils.

Design Criteria

1. Preserve existing topsoil in place where possible, thereby reducing the need for added topsoil.

2. Conserve by stockpiling topsoil and friable fine textured subsoils that must be stripped from the excavated site and applied after final grading where vegetation will be established.

3. Refer to USDA Soil Conservation Service (presently Natural Resource Conservation Service) soil surveys or soil interpretation record sheets for further soil texture information for selecting appropriate design topsoil depths.

Site Preparation

1. As needed, install erosion control practices such as diversions, channels, sediment traps, and stabilizing measures, or maintain if already installed.

2. Complete rough grading and final grade, allowing for depth of topsoil to be added.

3. Scarify all compact, slowly permeable, medium and fine textured subsoil areas. Scarify at approximately right angles to the slope direction in soil areas that are steeper than 5 percent. Areas that have been overly compacted shall be decompacted to a minimum depth of 12 inches with a deep ripper or chisel plow prior to topsoiling.

4. Remove refuse, woody plant parts, stones over 3 inches in diameter, and other litter.

Topsoil Materials

1. Topsoil shall have at least 6 percent by weight of fine textured stable organic material, and no greater than 20 percent. Muck soil shall not be considered topsoil.

2. Topsoil shall have not less than 20 percent fine textured material (passing the NO. 200 sieve) and not more than 15 percent clay.

3. Topsoil treated with soil sterilants or herbicides shall be so identified to the purchaser.

4. Topsoil shall be relatively free of stones over 1 1/2 inches in diameter, trash, noxious weeds such as nut sedge and quackgrass, and will have less than 10 percent gravel.

5. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

Application and Grading

1. Topsoil shall be distributed to a uniform depth over the area. It shall not be placed when it is partly frozen, muddy, or on frozen slopes or over ice, snow, or standing water puddles.

2. Topsoil placed and graded on slopes steeper than 5 percent shall be promptly fertilized, seeded, mulched, and stabilized by "tracking" with suitable equipment.

3. Apply topsoil in the following amounts:

Site Conditions	Intended Use	Minimum Topsoil Depth
1. Deep sand or loamy sand	Mowed lawn	6 in.
	Tall legumes, unmowed	2 in.
	Tall grass, unmowed	1 in.
2. Deep sandy loam	Mowed lawn	5 in.
	Tall legumes, unmowed	2 in.
	Tall grass, unmowed	none
3. Six inches or more: silt loam, loam, or silt	Mowed lawn	4 in.
	Tall legumes, unmowed	1 in.
	Tall grass, unmowed	1 in.

STANDARD AND SPECIFICATIONS FOR WINTER STABILIZATION

Definition & Scope

A temporary site specific, enhanced erosion and sediment control plan to manage runoff and sediment at the site during construction activities in the winter months to protect off-site water resources.

Conditions Where Practice Applies

This standard applies to all construction activities involved with ongoing land disturbance and exposure between November 15th to the following April 1st.

Design Criteria

1. Prepare a snow management plan with adequate storage for snow and control of melt water, requiring cleared snow to be stored in a manner not affecting ongoing construction activities.

2. Enlarge and stabilize access points to provide for snow management and stockpiling. Snow management activities must not destroy or degrade installed erosion and sediment control practices.

3. A minimum 25 foot buffer shall be maintained from all perimeter controls such as silt fence. Mark silt fence with tall stakes that are visible above the snow pack.

4. Edges of disturbed areas that drain to a waterbody within 100 feet will have 2 rows of silt fence, 5 feet apart, installed on the contour.

5. Drainage structures must be kept open and free of snow and ice dams. All debris, ice dams, or debris from plowing operations, that restrict the flow of runoff and meltwater, shall be removed.

6. Sediment barriers must be installed at all appropriate perimeter and sensitive locations. Silt fence and other practices requiring earth disturbance must be installed before the ground freezes.

7. Soil stockpiles must be protected by the use of established vegetation, anchored straw mulch, rolled stabilization matting, or other durable covering. A barrier must be installed at least 15 feet from the toe of the stockpile to prevent soil migration and to capture loose soil.

8. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures should be initiated by the end of the next business day and completed within three (3) days. Rolled erosion control blankets must be used on all slopes 3 horizontal to 1 vertical or steeper.

9. If straw mulch alone is used for temporary stabilization, it shall be applied at double the standard rate of 2 tons per acre, making the application rate 4 tons per acre. Other manufactured mulches should be applied at double the manufacturer's recommended rate.

10. To ensure adequate stabilization of disturbed soil in advance of a melt event, areas of disturbed soil should be stabilized at the end of each work day unless:

    a. work will resume within 24 hours in the same area and no precipitation is forecast or;

    b. the work is in disturbed areas that collect and retain runoff, such as open utility trenches, foundation excavations, or water management areas.

11. Use stone paths to stabilize access perimeters of buildings under construction and areas where construction vehicle traffic is anticipated. Stone paths should be a minimum 10 feet in width but wider as necessary to accommodate equipment.

Maintenance

The site shall be inspected frequently to ensure that the erosion and sediment control plan is performing its winter stabilization function. If the site will not have earth disturbing activities ongoing during the "winter season", **all** bare exposed soil must be stabilized by established vegetation, straw or other acceptable mulch, matting, rock, or other approved material such as rolled erosion control products. Seeding of areas with mulch cover is preferred but seeding alone is not acceptable for proper stabilization.

Compliance inspections must be performed and reports filed properly in accordance with the SWPPP for all sites under a winter shutdown.

References

1. Northeastern Illinois Soil and Sedimentation Control Steering Committee. October 1981. Procedures and Standards for Urban Soil Erosion and Sediment Control in Illinois.
2. J.F. Rushing, V.M. Moore, J.S. Tingle, Q. Mason, and T. McCaffery, 2005. Dust Abatement Methods for Lines of Communication and Base Camps in Temperate Climates. ERDC/GSL TR-05-23, October 2005.

Appendix F

Correspondence and Documentation

Map Scale: 1:864 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Albany County, New York
Survey Area Data: Version 15, Oct 8, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
EnA	Elnora loamy fine sand, 0 to 3 percent slopes	A/D	0.4	38.4%
Ur	Urban land		0.7	57.7%
Us	Urban land-Udipsamments complex, 0 to 8 percent slopes		0.0	4.0%
Totals for Area of Interest			**1.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix G

Construction Log Book/Forms

Contractor/Subcontractor SPDES Permit Certification

Description: _____

Town, Village, City: _____

County: _____

Check Applicable Box: □ Prime Contractor □ Subcontractor

Name of Contractor/
Subcontractor: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Fax: _____

Mandatory Certification: The SPEDS General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-10-001) requires the Prime Contractor (and subcontractors) to certify they understand the Stormwater Pollution Prevention Plan (SWPPP), the General Permit conditions, and their responsibilities for compliance. The certification must be signed prior to performing any contract work. The certification shall be signed by an Owner, Principal, President, Secretary or Treasurer of the Firm.

> "*I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.*"

Signature: _____ Date: _____

Name: _____ Title: _____

Effective April 30, 2010, the SPDES General Permit also requires the Prime Contractor to identify at least one trained individual who will be responsible for implementing the SWPPP and who shall be on-site on a daily basis when soil disturbance activities are being performed. (Prior training is not required if the trained individual is a licensed Professional Engineer, licensed Landscape Architect, or CPESC.) Provide the name and title of the trained individual who will be on-site and responsible for SWPPP implementation on this Contract:

Name/Title of Trained Individual: _____

Name of Training Course: _____

Training Provider: _____

Date of Training: _____

Contractor/Subcontractor SPDES Permit Certification

Description: _____

Town, Village, City: _____

County: _____

Check Applicable Box: □ Prime Contractor □ Subcontractor

Name of Contractor/
Subcontractor: _____

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Name/Title of Trained Individual: _____

Name of Training Course: _____

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Contractor/Subcontractor SPDES Permit Certification

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Name/Title of Trained Individual: _____

Name of Training Course: _____

Training Provider: _____

Date of Training: _____

Contractor/Subcontractor SPDES Permit Certification

Description: _____

Town, Village, City: _____

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Check Applicable Box: □ Prime Contractor □ Subcontractor

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Signature: _____ Date: _____

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Name/Title of Trained Individual: _____

Name of Training Course: _____

Training Provider: _____

Date of Training: _____

Appendix H

Operations and Maintenance Plan

1211 WESTERN AVENUE
GSX VENTURES

STORMWATER MANAGEMENT SYSTEM
OPERATION AND MAINTENANCE PLAN

INTRODUCTION

This Post Construction Operations and Maintenance Manual was prepared for the project to address long-term control of runoff and pollutants from the site after construction. The plan was developed pursuant to the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit No. GP-0-15-002.

The Facility Owner is responsible for the construction and the post-development construction inspection and monitoring for this property. The Facility Owner shall designate a qualified inspector who will be responsible for the construction phase of the project and the implementation of the pollution prevention measures shown on the plan sheets and in the SWPPP. Requirements for the qualified inspector are set forth in the NYSDEC SPDES general permit GP-0-15-002 included in the SWPPP.

The responsibilities set forth in the SWPPP will continue for the life of the site and shall transfer with property ownership.

Responsible Party: The site owner is responsible for the operation and maintenance of the stormwater facilities outlined herein.

PREVENTATIVE MEASURES

The most effective way to maintain water quality within a facility is to prevent pollution at its onset.

A maintenance program should include education, trash collection, proper and legal disposal of hazardous wastes and chemicals, minimal use of chemicals and pesticides in lawn care, early detection and clean up of automotive leaks, removal of up stream sediment on a regular basis, and storing materials indoors to reduce runoff.

Pollution includes, but is not limited to:

- Sediment, trash, and debris
- Chemicals
- Animal Waste
- Runoff from Stored Materials
- Illicit discharge to storm drainage systems

1. **PROJECT SITE COVER**

a. Inspections

Site cover and associated structures and embankments should be inspected periodically for the first few months following construction and then on a biannual basis. Site Inspections should also be performed following all major (i.e., intense storms, thunder storms, cloud burst, etc.) storm events. Items to be inspected include (but are not limited to):

i. Differential settlement of embankments, cracking or erosion.
ii. Lack of vigor and density of grass turf or vegetation.
iii. Accumulation of sediments or litter on lawn areas, paved areas, or within catch basin sumps.
iv. Accumulation of pollutants, including oils or grease, in catch basin sumps.
v. Damage or fatigue of storm sewer structures or associated components.

b. Mowing and Sweeping

Vegetated areas and landscaping should be maintained to promote vigorous and dense growth. Lawn areas should be mowed a minimum of three times a year (more frequent mowing may be desired for aesthetic reasons). Resultant yard waste shall be collected and composted or disposed of off-site.

Paved areas should be swept at least twice per year. Additional sweeping may be appropriate in the early spring for removal of deicing materials.

c. Debris and Litter Removal

Accumulation of litter and debris should be removed during each mowing or sweep operation.

d. Structural Repair or Replacement

Components of the system which require repair or replacement should be addressed immediately following identification.

e. Catch Basins

The frequency for cleanout of catch basin sumps will depend on the efficiency of mowing, sweeping, and debris and litter removal. Sumps should be cleaned when accumulation of sediments are within six inches of the catch basin outlet pipe.

Disposal of material from catch basins sumps, drainage manholes, and pipes shall be in accordance with local, state, and federal guidelines.

f. Drywell Basins

The underground system shall be inspected every six months for sediment buildup. Sediment shall be removed as necessary or whenever capacity falls to 95%. An Operation

and Maintenance Inspection shall be performed and recorded. Sediment should be removed from piping where it connects to any structure using a jet to pull sediment into the structure sump and then removed and disposed of.

g. Winter Maintenance

To prevent impacts to storm water management facilities, the following winter maintenance limitations, restrictions or requirements are recommended:

i. Remove snow and ice from inlet structures, basin inlet and outlet structures, and away from culvert end sections.

ii. Snow removed from paved areas should not be piled at inlets/outlets of the storm water management basis.

iii. Use of deicing materials should be limited to environmentally-friendly chemical products. Use of salt mixtures should be kept to a minimum.

iv. Sand should not be used for deicing.

v. Materials used for deicing should be removed during the early spring by sweeping and/or vacuuming.

h. Porous Pavement Maintenance

A legally binding and enforceable maintenance agreement shall be executed between the facility owner and the local review authority to ensure the following:

Porous Pavement maintenance monthly inspections ensuring that the pavement is clear of debris, that pavement dewaters soon after storm events and that area is clear of sediments. Every 3 to 4 months the pavements should be vacuum swept and at least once per year the pavement shall be inspected for spalling.

STORMWATER MANAGEMENT SYSTEM MAINTENANCE AGREEMENT
Title of Project

THIS AGREEMENT ("Agreement") is made and entered into on the __ day of _____, 201_, by and between

Owner's Name, a (example: New York limited liability company) with an address at ***Street Address***, Albany, New York 1220***X*** (hereinafter referred to as the "Facility Owner"), and

CITY OF ALBANY, a municipal corporation with an address at 24 Eagle Street, Albany, New York 12207 (hereinafter referred to as the "City").

WITNESSETH:

WHEREAS, the Facility Owner is the owner of the subject parcel of land in the City of Albany, County of Albany and State of New York as more particularly located at ***Project Street Address***, Albany New York.

WHEREAS, the City and the Facility Owner desire that the stormwater management system be built in accordance with the approved project documents and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components; and

WHEREAS, the City has requested this legally binding and enforceable maintenance agreement from the Facility Owner; and

WHEREAS, the Facility Owner is representing the following design documents, with their City approved revisions, as containing all necessary information to construct, operate and maintain the stormwater management system for the lifetime of the facility:

a. Plan set submitted to the City representing a stormwater management system including stormwater collection, conveyance and storage using structures designed and specified by ***Insert Engineering Firm***, Consulting Engineers, sealed by I***nsert Engineer***, P.E., as the Engineer of Record. The plan sheets showing features associated with the stormwater management system are listed below.

Sheet#	Date	Drawing Title
C-1 ***(Name as appropriate)***	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Existing Conditions Plan. XXXX Project* ***(Name as appropriate)***
C-2	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Site Demolition Plan. XXXX Project* ***(Name as appropriate)***
C-3	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Proposed Site Plan. XXXX Project* ***(Name as appropriate)***
C-4	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Detailed Site Plan. XXXX Project* ***(Name as appropriate)***
C-5	*1* ***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Sediment & Erosion Control Plan & SWPPP Details. XXXX Project* ***(Name as appropriate)***
C-6	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Landscaping Plan. XXXX Project* ***(Name as appropriate)***
C-7	***XX/XX/XX****, Last Revised* ***XX/XX/XX***	*Electrical Plan. XXXX Project* ***(Name as appropriate)***

b. "***Insert Stormwater Report Name***" prepared by ***I****nsert Engineering firm, Insert Firm's Address,* dated ***Xxxxx XX, 20XX***.

IN CONSIDERATION THEREOF, the parties agree as follow:

1. The Facility Owner shall be responsible for maintaining the storm water facility in a manner to prevent silt from becoming tributary to the City's storm water drainage system.

2. Operation and maintenance, including inspection and cleaning of the full storm water drainage system, shall be the responsibility of the Facility Owner.

3. In the event the Facility Owner fails to maintain the system in a manner to control storm water the City may order the system cleaned and bill the Facility Owner the full cost of this work at labor cost (direct labor plus 50% salary burden) and materials (at cost) if work is performed by the Department of Water & Water Supply; or the cost of a subcontractor plus 10% of the subcontractor's bill if the Department of Water & Water Supply obtains a subcontractor to perform the work. Invoices are payable to the Department of Water & Water Supply within ten (10) business days from the date of invoice. In the event payment for costs is not received within said ten (10) day period, the Department of Water & Water Supply shall have the right to file a lien in the amount of the invoice, together with reasonable costs of collection incurred in connection therewith, against the property of the Facility Owner.

4. The City has the right to access the premises for periodic inspections and to perform any maintenance of the stormwater system.

5. The Facility Owner shall disclose this Agreement to any successor or assignees in interest.

6. This Agreement is binding on the Facility Owner and any successor or assignees in interest hereof.

7. Facility Owner agrees to defend, indemnify, and save harmless the CITY and its officers, employees and agents, from and against all claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses (including, without limitation, reasonable attorney's fees and court costs) arising out of, or in consequence of, any negligent or intentional act or omission of Facility Owner to the extent of its or their responsibility for such claims, actions, causes of action, injuries, damages, losses, liabilities, and expenses. The provisions of this Article shall survive any termination or expiration of this Agreement.

[Signatures on next page]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their duly authorized officers as of the day and year first above written.

CITY OF ALBANY, NEWYORK

BY: _____

KATHY M. SHEEHAN
MAYOR, CITY OF ALBANY

NAME OF PROJECT OWNER

BY:

NAME:
TITLE:

STATE OF NEW YORK)
) ss.:
COUNTY OF ALBANY)

On the _ day of_____ , 201_, before me the undersigned, a Notary Public in and for said State, personally appeared_____ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

_____

Notary Public

STATE OF NEW YORK)
) ss.:
COUNTY OF ALBANY)

On the _ day of_____ , 201_, before me the undersigned, a Notary Public in and for said State, personally appeared_____ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or person upon behalf of which the individual acted, executed the instrument.

_____

Notary Public

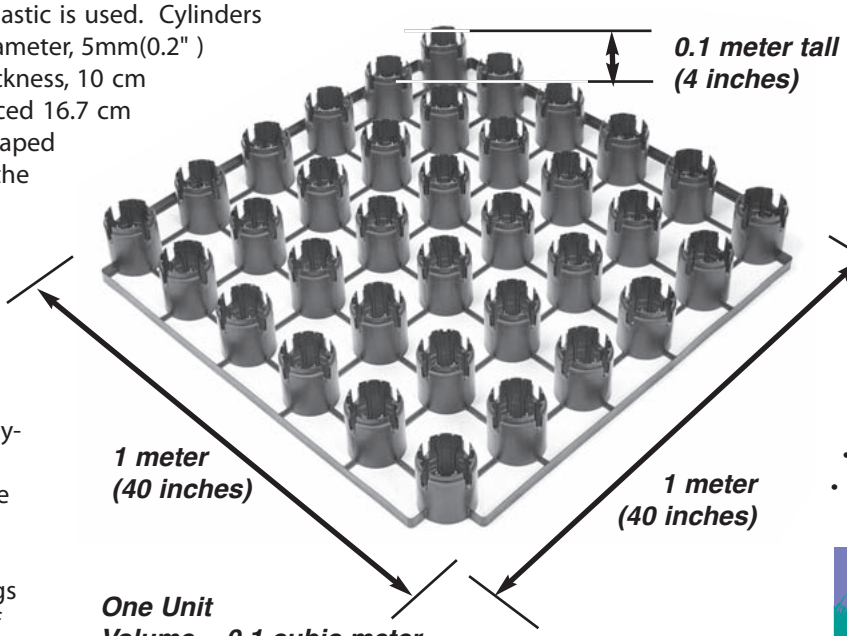
Rainstore^3

Underground "tank" storage for stormwater.

PRODUCT DESCRIPTION

Basic Structure

Rainstore3 is a structure of thin-walled cylindrical columns injection molded of recycled resins of either high impact polypropylene (HIPP), or high density polyethylene (HDPE) plastic for strength, durability, and green industry benefit. For potable water storage, virgin plastic is used. Cylinders are 10cm (4") diameter, 5mm(0.2") average wall thickness, 10 cm (4") tall, and spaced 16.7 cm (4.6") apart. T-shaped beams connect the cylinders and resist external lateral soil/water pressure. Compression fittings between layers create a rigid structure for ease of transport and installation. Four archway openings in the bottom of each cylinder allow water to move freely throughout assembled columns. A single Rainstore ^{3} injection molded unit is comprised of 36 cylindrical columns that occupy one square meter (40" x 40" x 4"). A stack of 10 units will comprise one cubic meter (35.31 cubic feet), with approximately 250 gallons of net water storage.



One Unit
Volume = 0.1 cubic meter
(3.531 cubic feet)
25 gallons of net water storage
Weight = 14.0 pounds (30.87 kilograms)

RS3 allows for water containment depths from 10 cm to 2.4 meters (4" to 94" or 7.9'). Standard depths of 0.5 m (1.6'),1 m (3.2 '),1.5 m (4.9'), and 2 m (6.6') are stocked and custom depths are also available. Side bumpers provide foolproof, accurate spacing. Structures may be moved by hand cart. A level compacted gravel base will insure proper alignment. RS3 withstands repeated freeze-thaw cycles, will not rust, break down, crack, is not affected by chemicals, extremes of pH, oils, salts, or fertilizers. Ethylene plastics have a projected service life in excess of 100 years provided they are not exposed to UV light.

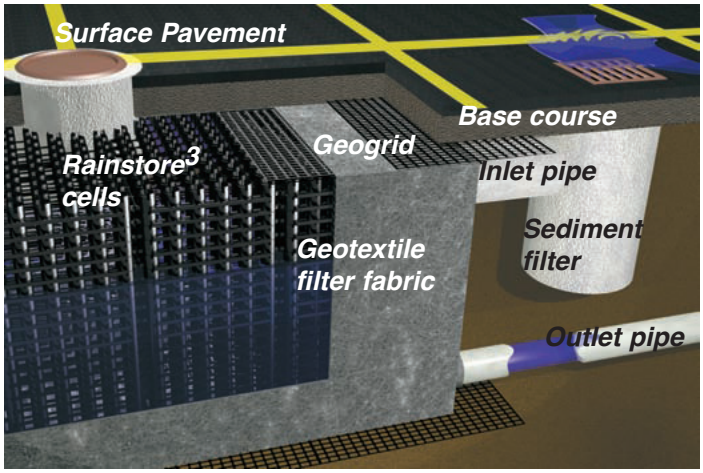
Applications Include:

- Subsurface Water Storage--Detention, Retention
- Water Reuse and Recycling
- Process Water Storage--Heating and Cooling
- Combined Water Conveyance and Storage
- Energy Dissipation at Pipe Outfall
- Septic Leach Fields and Wetlands Treatment
- Dry Wells, Wet Vaults, and Cisterns

Benefits Include:

- Heavy Load Capacity Above Chamber
- Maximum Excavation to Storage Efficiency
- 94% Void Space
- Large Surface Area for Rapid Exfiltration
- Simple and Low Cost Liner Materials
- Modular for Design Flexibility
- Rapid Installation

Invisible Structures, Inc.
800-233-1510• 303-233-8383
Fax 800-233-1522
www.invisiblestructures.com
1600 Jackson St. Suite 310
Golden, CO 80401



Maintenance of a Rainstore3 Stormwater Storage Chamber

"How do I clean or maintain a Rainstore3 system?"

Invisible Structures, Inc. recommends that stormwater be pretreated prior to discharging into the chambers to avoid foreign matter accumlation inside the chamber. This can be accomplished by a variety of techniques or products. Some examples are:

Short Term Storage (Detention Basin)

"Zero" maintenance – the Preferred Method:

Use a natural, or "Bio-Filter", inlet device – essentially a porous pavement or swale, to pre-filter trash and sediment laden runoff before capture and conveyance into a Rainstore3 chamber. Use of a simple 10-12" deep sand, or sand/gravel, filter pavement or swale will provide adequate vertical flow capacity (20 to 35+ inches per hour) and residence time to capture coarse debris and trash at the surface, with sediment and hydrocarbons (and even most traffic generated metals) kept in voids of the section for treatment action by bacteria and oxidation.

Water passing through the filter section can pass directly into the top of a Rainstore3 chamber, or be collected and transported over larger distances via Draincore2.

Only super fine sediments will pass through this section and be conveyed into the chamber. With relatively short storage times (24 to 48 hours) most of these sediments shall remain suspended, or be easily re-suspended by the next rain event for removal. Long term accumulations to a depth affecting exfiltration rates can be measured in decades, not years.

Trash pickup from the surface requires that Zero be in quotes. Also be aware that grass surface porous pavements (Grasspave2) offer greater biological activity, but at a higher surface maintenance cost – mowing, fertilization and irrigation. Gravel surface porous pavements (Gravelpave2) still provide biological activity at a level lower than with grass, but with lower maintenance required.

Short Term Storage (Detention Basin)

Low, but periodic maintenance:

Use a structural form of catch basin with a deep sump prior to use of a hooded elbow inlet into the chamber. Whether standard catch basins or sophisticated cyclonic flow devices are used, the objective is to remove any coarse debris and sediment (sand and larger) from entering the Rainstore3 chamber. Periodic maintenance will be required to remove trash and sediment that accumulates in the device. Frequency shall depend upon the physical nature of sediments carried and allowed into the "screening" device.

Fine sediments may still be transported into the chamber via the inlet pipe and will likely be dispersed rather evenly over the entire chamber bottom surface area, where they will then settle to the bottom – depending upon the duration of time water is left in the chamber and the size of the particle. Particles smaller than the AOS of the porous fabric liner will pass through the liner and continue migration until stopped by underlying soils. Particles larger than the AOS shall remain inside the chamber, and can be periodically re-suspended by injecting high-pressure water into a Maintenance Port, with removal of the sediment laden water via sump pump from the same, or other, port.

Eventually, especially if maintenance is too infrequent, the bottom of the chamber may develop a thick sediment layer sufficient to obstruct exfiltration through the bottom of the chamber. The sides of the chamber shall continue to function, but time for total water evacuation will increase.

This approach is most closely related to more traditional design responses, but is not the best solution long term for the client. Standard catch basins are lowest initial cost, but much higher in maintenance cost. Commercial cyclonic devices may have lower maintenance cost, but offer higher levels of cleaning efficiency at much higher initial investment cost.

Long Term Storage (Water Harvest Basin)

"Zero" maintenance – the Preferred Method:

Use a natural, or "Bio-Filter", inlet device – essentially a porous pavement or swale, to pre-filter trash and sediment laden runoff before capture and conveyance into a Rainstore3 chamber. Use of a simple 10-12" deep sand, or sand/gravel, filter pavement or swale will provide adequate vertical flow capacity (20 to 35+ inches per hour) and residence time to capture coarse debris and trash at the surface, with sediment and hydrocarbons (and even most traffic generated metals) kept in voids of the section for treatment action by bacteria and oxidation.

Water passing through the filter section can pass directly into the top of a Rainstore3 chamber, or be collected and transported over larger distances via Draincore2.

Only super fine sediments will pass through this section and be conveyed into the chamber. With relatively short storage times (24 to 48 hours) most of these sediments shall be easily re-suspended by the next rain event for removal. This level of sediment can be safely captured and transported via pumps for water reuse in irrigation or gray water applications, or further filtered by an automatic sand filter device with "back-flush" capabilities.

A Note About Sump Pumps

Many of our clients have designed elaborate pump stations to remove water from Rainstore3 chambers (usually for water harvest applications). We would like to make you aware that several pump manufacturers now make standard small diameter profile sump pumps that could be useful and cost effective alternatives to subsurface pump stations that are usually placed adjacent to the chamber. With top surface evacuation pumps, all liner penetrations are kept to the top edges of the chamber and minimize potential leak points on harvest applications.

Some of the pumps are less than 3.5" diameter, which could fit inside any of the ring columns of theRainstore3 structure itself. Most of the others are less than 7.5" diameter, and will fit inside an 8" pipe placed in a Maintenance Port configuration – removal of one "corner" column of rings. Provided that electricity and outlet pipes can be easily accommodated within the 12" minimum cover over the chamber, these sump pumps may provide a ready, easy and economical alternative to more expensive pump stations.