Preliminary Stormwater Pollution Prevention Plan:
for
River Ridge

Prepared for:
River Ridge View, LLC
445 Main Street
Beacon, NY 12508

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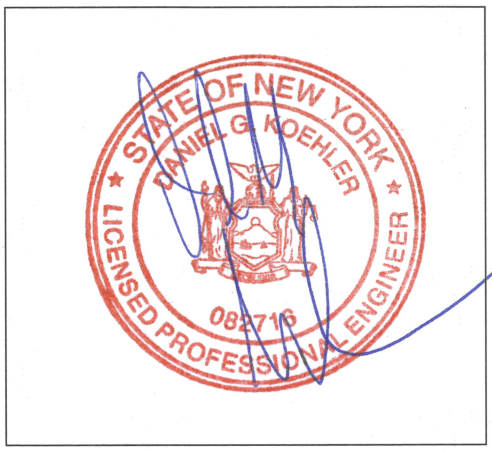

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1.0 INTRODUCTION

1.1 Overview

This Stormwater Pollution Prevention Plan (SWPPP) has been developed in accordance with NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-15-002, dated May 1, 2015 which 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 located in the New York City, East of Hudson watershed, that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.
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 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;

This project qualifies for SPDES coverage under provision 3 as stated above.

The objectives of this SWPPP are as follows:

- To develop a sediment and erosion control plan in accordance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, latest edition, which implements best management practices to stabilize disturbed areas, protect off site areas and sensitive areas and minimize the transport of sediment.
- To demonstrate that the resulting stormwater runoff from the development exiting the site will not adversely impact offsite properties, stormwater conveyance systems or receiving water bodies, and that temporary and permanent stormwater systems and facilities are designed in accordance with the latest revision to the New York State Stormwater Management Design Manual, January 2015.
- To demonstrate that a minimum of 90% of the average annual stormwater runoff from the development is captured and treated through approved water quality measures.

A copy of the Permit, SWPPP, Notice of Intent (NOI), NOI acknowledgment letter, inspection reports and accompanying plans shall be maintained on-site from the date of initiation of construction activities to the date of final stabilization. This SWPPP shall be kept on-site in accordance with the above requirement upon mobilization and start of construction activities.

1.2 Land Disturbance

Per the General Permit, no more than five (5) acres of land disturbance may occur at any one time without written approval from the NYSDEC. 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 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 been temporarily or permanently ceased, and is located in one of the watersheds [NYCDEP], 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 has ceased. The soil stabilization measures selected shall be in conformance with the current version most of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

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.

The project calls for clearing of trees, installation of utilities and associated grading for the construction of eighteen townhouse units and a pocket park. The overall project area is approximately 2.95 acres and the limits of disturbance has been calculated to be 2.35 acres; therefore, a phasing plan for erosion control purposes will not be developed.

2.0 PROJECT DESCRIPTION

2.1 Project Location

The project site is located at Wolcott Avenue (NYS Route 9D), with additional street frontage to Ferry Street and Beekman Street, in the City of Beacon, Dutchess County, New York, and is located on the west side of the road. The total parcel area is approximately 2.95 acres (3 parcels make up the project area). The project study area, regarding storm water pollution prevention, consists of approximately 3.93 acres (total area contributing to the various design points identified in the SWPPP), and consists of mostly wooded area, grassed landscaped areas, parking areas and a church.

2.2 Project Scope and Description

The construction project entails the construction eighteen townhouse units, along with access and egress roads, parking lots, green spaces, a pocket park and stormwater management areas.

The proposed project will disturb approximately 2.35 acres of on-site area. Approximately 0.6 acres of the parcel will remain undisturbed. Development of a phasing plan is not necessary due to less than 5.0-acres of disturbance, however, the project will be phased to facilitate construction.

2.3 Surface Water Bodies

2.3.1 Wetlands

The NYSDEC and USACE wetland maps do not indicate that wetlands are present within the project area.

2.3.2 Streams

NYSDEC mapping indicates that there are no regulated streams located on the property.

2.3.3 Floodplains

Based upon a review of the National Flood Insurance Program Flood Insurance Rate Map panel 36027C 0463E for the City of Beacon, New York, the entire site lies within Zone X – areas determined to be outside the 100-year flood plain.

3.0 NOTICE OF INTENT

Prior to commencement of construction activities, the Owner/Operator shall submit a Notice of Intent (NOI) to the NYSDEC for authorization. The NYSDEC authorization schedule is as follows:

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

- Five (5) business days from the date the NYSDEC receives a complete NOI for construction activities with a SWPPP that has been prepared in conformance with the technical standards, or
- Sixty (60) business days from the date the NYSDEC receives a complete NOI for construction activities with a SWPPP that has not been prepared in conformance with the technical standards.

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

- Five (5) business days from the date the NYSDEC receives a complete NOI and signed "MS4 SWPPP Acceptance" form.

The project area is under the control of a regulated MS4, therefore the NOI shall be submitted directly to the NYSDEC along with the MS4 SWPPP Acceptance form. A blank NOI and SWPPP Acceptance Form has been included within Appendix A.

4.0 SOILS

The hydrologic soil characteristics of the watershed areas were obtained from Soil Survey Mapping of Dutchess County, New York, and available Geographical Information Systems (GIS) and are as follows:

Symbol	Description	Hydrologic Soil Group
DwB	Dutchess-Cardigan complex, undulating, rocky	B
NwC	Nassau-Cardigan complex, rolling, very rocky	D
Ud	Udorthents, smoothed	A

SOIL PROPERTIES

Symbol	Water Table	Restrictive Layer	Bedrock	Erosion Hazard (k)
DwB	>80”	>20-40” *	20-40” *	0.32
NwC	>80”	20-40” *	20-40” *	0.24
Ud	36-72”	>80”	>80”	0.17

*Cardigan component

Supporting information has been provided in Appendix B.

5.0 RAINFALL

5.1 Overview

The rainfall data utilized in the analysis of the watershed was obtained from http://precip.eas.cornell.edu as provided in the NYS Stormwater Design Manual dated January 2015. Supporting information has been provided in Appendix C. The storm events are as follows:

Storm Event	24-Hour Rainfall (in)
1 - year	2.61
10 - year	4.70
100 - year	8.34

5.2 Rainfall Event Sizing Criteria

The stream channel protection volume (Cpv) criteria, intended to protect stream banks from erosion, will be demonstrated by providing 12-24 hour extended detention or infiltration of the Type III 1-year, 24-hour storm event. The channel protection volume criterion is not required where the resulting diameter of the extended detention basin orifice is less than three (3) inches with a trash rack.

The overbank flood control (Qp) criteria, intended to prevent an increase in frequency and magnitude of out of bank flooding generated by new development, will be demonstrated by attenuating the Type III 10-year, 24-hour peak discharge rate to pre-development conditions. The overbank flood criteria can be waived if the project site discharges to a tidal water or fifth order stream.

The extreme flood control (Qf) criteria, intended to prevent the increased risk of flood damage from large storm events, maintain the boundaries of pre-development conditions, and protect the physical integrity of stormwater management practices, will be demonstrated by attenuating the Type III 100-year, 24-hour peak discharge rate to pre-development conditions. The extreme flood control criteria can be waived if the project site discharges to a tidal water or fifth order stream.

The pre and post-development runoff rates were compared utilizing the Type III 1-year (channel protection), 10-year (overbank flood control), and 100-year (extreme flood control) year, 24-hour storm events.

The proposed drainage conveyance system will be designed utilizing the Type III, 25-year storm event.

6.0 STORMWATER ANALYSIS AND MANAGEMENT

6.1 Methodology

6.1.1 Hydrologic Analysis

The HydroCAD stormwater modeling system computer program by Applied Microcomputer Systems was used to analyze, design and document the complete drainage system. The program uses standard hydrograph generation and routing techniques based on the USDA-NRCS Technical Releases TR-20 and TR-55 to develop stormwater runoff rates and volumes.

The program determines the rate and volume of runoff based on inputs of the watershed area, and characteristics of the land including vegetative coverage, slope, soil type, and impervious area.

6.1.2 Stormwater Design Points

Design Points represent the location where the majority of runoff from an area exits the site. The same design points are identified in post-development conditions so that a comparison can be made between the pre-development and post-development conditions. Four design points for the main project area were selected, as follows:

Stormwater Design Points	
SDP	**Description**
1	Discharge from on-site area to the westerly property line (north of the Hammond Plaza)
2	Discharge from on-site area to westerly property line and Ferry Street (south and east of the Hammond Plaza)
3	Discharge from on-site developed area to City of Beacon's municipal stormwater collection system at the southerly property line
4	Discharge from on-site and off-site area to the westerly property line to Beekman Street

6.2 Pre-Development Watershed Conditions

All existing watershed areas are modeled in HydroCAD as 'subcatchment' areas. The pre-development areas are as follows:

Subcatchment 1 is comprised of approximately 0.33 acres of on-site area. The on-site area is undeveloped wooded areas. The subcatchment area contains soils in hydrologic soil groups D. Runoff from the subcatchment travels overland via sheet flow and shallow concentrated flow to SDP 1.

Subcatchment 2 is comprised of approximately 0.55 acres of on-site and off-site area. The on-site area is undeveloped wooded area. Off-site area accounts for a small amount of wooded area and a small amount of impervious area comprised of Ferry Street's cul-de-sac. The subcatchment area contains soils in hydrologic soil D. Runoff from the subcatchment travels overland via sheet flow and shallow concentrated flow to SDP 2.

Subcatchment 3 is comprised of approximately 2.04 acres of on-site and off-site area. The on-site area is mostly undeveloped open grassy meadow and wooded area. The off-site portion of the subcatchment consists of impervious walkways and driveways and grassed areas with some woods. The entire subcatchment area contains soils in hydrologic soil group A, B and D. Runoff from the subcatchment travels overland via sheet flow and shallow concentrated flow where it is intercepted by an existing berm and drainage system that flows via pipe flow to SDP 3.

Subcatchment 4 is comprised of 1.01 acres of on-site and off-site area. The on-site area is comprised of undeveloped woods. Off-site area is a small amount of grassed area and impervious rooftop from the church building to the north of the site, and from the cemetery. The subcatchment contains soils in hydrologic soil groups A & D. Runoff from the subcatchment travels overland via sheet flow and shallow concentrated flow to SDP 4.

Detailed stormwater calculations and routing have been included in Appendix D.

The following table summarizes the pre-development watershed conditions:

Pre-Development Watershed Conditions					
Subcatchment	**Area (ac)**	**Cover**	**Average Curve #**	**Hydrologic Soil Group(s)**	**Time of Concentration**
1	0.33	All wooded area	77	D	10.0 minutes
2	0.55	Mostly woods and a small amount of impervious area	80	D	7.5 minutes
3	2.04	Mostly open meadow, gravel areas, woods and some grass	69	A, B & D	10.8 minutes
4	1.01	Mostly woods, with some grass	74	A & D	12.7 minutes

6.3 Post-Development Watershed Conditions

The proposed development will result in a disturbance of approximately 2.35 acres The land cover will consist of mainly impervious areas, buildings, retaining walls and parking lots, with some grassy green spaces, a gravel walkway trail and stormwater management areas.

The post-developed subcatchment numbers listed below correspond to the pre-developed watershed areas with the same number. Sub watershed areas have been broken out of the main areas that drain directly to a stormwater management area. Two underground infiltration areas are and one water quality unit is proposed to provide treatment of the site runoff from the site access, and attenuation of the design storms.

Subcatchment 10 is comprised of approximately 0.32 acres of on-site area. The area consists of meadow areas and undeveloped wooded areas with a small amount of impervious area (the retaining wall). The entire subcatchment area contains soils in hydrologic soil group D. Runoff from the subcatchment is directed towards the western property line to SDP1. A minimum time of concentration (Tc) of 6 minutes is used for this subcatchment.

Subcatchment 20 is comprised of approximately 0.51 acres of on-site and off-site area. The on-site area is largely undeveloped wooded areas with parts of the retaining wall and landscaped grassed areas. The subcatchment area contains soils in hydrologic soil group D. Runoff from the subcatchment travels via sheet and shallow concentrated flow to SDP2 on the westerly property line.

Subcatchment 30 is comprised of approximately 1.95 acres of on-site area. The on-site area is the main project area, developed with the asphalt access drive, parking lots graded grass areas, residential buildings and retaining walls. The subcatchment area contains soils in hydrologic soil group A, B and D. Runoff from the subcatchment travels overland via sheet flow to the proposed stormwater conveyance system Underground Infiltration Area A that discharges to SDP3.

Subcatchment 31 is comprised of approximately 0.16 acres of on-site area. The area contains meadow areas and undeveloped wooded areas with a small amount of impervious area (the retaining wall). The subcatchment area contains soils in hydrologic soil group B and D. A minimum Tc of 6 minutes is used for this subcatchment.

Subcatchment 32 is comprised of approximately 0.12 acres of on-site area. The area contains meadow areas and undeveloped wooded areas with a small amount of impervious area (the retaining wall). The subcatchment area contains soils in hydrologic soil group D. A minimum Tc of 6 minutes is used for this subcatchment.

Subcatchment 40 is comprised of approximately 0.88 acres of on-site and off-site area. The on-site area is undeveloped wooded area, meadow, portions of the retaining wall, gravel walkway and a small amount of developed graded grass area and impervious rooftops from off-site areas. The subcatchment area contains soils in hydrologic soil group A & D. Runoff from the subcatchment travels overland via sheet flow and shallow concentrated flow to a proposed stormwater conveyance system containing a stormwater pipe with riprap protected flared end sections, into a grassed swale then to Underground Infiltration Area B, which discharges to SDP4.

Subcatchment 41 is comprised of 0.22 acres of on-site area. The subcatchment contains mostly meadow area and undeveloped wooded area, and a portion of the proposed pocket park (gravel area and concrete stairs). The subcatchment area contains soils in hydrologic soil group D. A minimum Tc of 6 minutes is used for this subcatchment, which flows overland westerly to SDP 4.

Detailed stormwater calculations and routing have been included in Appendix E.

The following table summarizes the post-development watershed conditions:

Post-Development Watershed Conditions					
Subcatchment	**Area (ac)**	**Cover**	**Average Curve #**	**Hydrologic Soil Group(s)**	**Time of Concentration**
10	0.26	Mostly meadow and wooded area with some impervious	78	D	6 minutes
20	0.51	Mostly wooded area with some impervious	80	D	7.1 minutes
30	1.95	Mostly impervious with some grassed areas and small amount of gravel path	80	A, B & D	9.8 minutes
31	0.16	Mostly grassed areas with some impervious area	78	B & D	6.0 minutes
32	0.12	Mostly grass area with some impervious	86	D	6.0 minutes
40	0.88	Mostly woods and meadow with some gravel walkways and offsite impervious	79	A & D	8.7 minutes
41	0.22	Mostly meadow and wooded areas with gravel pocket park and impervious staircase	79	D	6.0 minutes

6.4 Hydrologic Review

The stormwater runoff volumes at each discharge point under pre-development and post-development conditions are summarized below.

SDP	**1 - Year**		**10 - Year**		**100 - Year**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
1	0.26	0.24	0.80	0.73	1.87	1.67
2	0.57	0.54	1.59	1.51	3.53	3.34
3	0.72	0.33	3.41	2.79	9.39	8.39
4	0.56	0.40	1.99	1.83	4.95	3.84

As shown above, post-development peak flow rates are less than pre-development rates for the storm events modeled for all stormwater discharge points (SDP's); therefore, the post-developed storm water management controls provide the required storage to attenuate the 1, 10 and 100-year storm events.

Supporting hydrologic analyses for pre-development and post-development conditions are included in Appendices D and E, respectively.

6.5 Stormwater Management System

The final stormwater management system will consist of conveyance systems which will include catch basins, yard drains, culverts, grass-lined swales/dikes and underground infiltration areas where required. The remainder of the drainage area will remain undisturbed with natural vegetation remaining.

6.6 Hydraulic Calculations

Hydraulic sizing of the culverts and swales are based on the 25-year, Type III, 24-hour rainfall event. Sizing calculations will be provided within Appendix F in the final SWPPP.

6.7 Green Infrastructure for Stormwater Management

The SDM encourages the use of green infrastructure (GI) practices for stormwater management. Green infrastructure approach for stormwater management reduces a site's impact on an aquatic ecosystem through the use of site planning techniques, runoff reduction techniques, and certain standard stormwater management practices. The objective is to replicate the pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, and minimizing concentrated runoff by use of runoff control techniques. When implemented, green infrastructure can reduce volume, peak flow, and flow duration, promote infiltration and evapotranspiration, improve groundwater recharge, reduce downstream flooding, and protect downstream water and wetlands.

6.7.1 Green Infrastructure Practices

Green infrastructure consists of implementing several techniques during the site planning process which are:

- Preservation of Natural Resources – Preservation of undisturbed areas; preservation of buffers; reduction of clearing and grading; locating development in less sensitive areas; open space design; soil restoration.
- Reduction of Impervious Cover – Roadway reduction; sidewalk reduction; driveway reduction; cul-de-sac reduction; building footprint reduction; parking reduction.
- Runoff Reduction Techniques – Conservation of natural areas; sheet flow to riparian buffers or filter strips; vegetated open swale; tree planting/tree box; disconnection of roof runoff; stream daylighting for redevelopment projects; bioretention areas; rain gardens; green roofs; stormwater planters; rain tank/cistern; pervious pavement.

During the planning process, the above techniques are implemented to the greatest extent possible to reduce runoff developed by the site.

6.7.2 Five Step Process for Stormwater Site Planning and Selection Design

Stormwater management using GI is summarized in the five-step process described below.

Step 1: Site Planning

The site design will incorporate the preservation of natural resources including protection of wetland areas (where applicable), natural areas, avoidance of sensitive areas, minimizing grading and soil disturbance, minimizing impervious areas on internal access ways, driveways and

parking areas. The site layout will avoid wetlands, waterways, buffers, areas of highly erodible soils and critical areas. The site design will also maintain natural drainage design points.

Step 2: Determine Water Quality Volume (WQv)

Calculate the water quality volume per Chapter 4 of the NYSDEC manual. This is described in detail under Section 6.8.

Step 3: Runoff Reduction by Applying Green Infrastructure Techniques

Green infrastructure practices will be implemented wherever possible to reduce runoff from the site. GI for this site will consist of reduction of access drive width, preservation of undisturbed buffers, providing infiltration practices and use of open channel vegetated conveyance systems.

Step 4: Apply Standard SMP's to Address Remaining WQv

Standard SMP's such as ponds, filtering practices or stormwater wetlands to meet additional water quality volume requirements. No additional standard SMP's will be required for this project.

Step 5: Apply Volume and Peak Rate Control Practices (if needed)

Cpv, Qp and Qf must also be met, either by standard practices, or other accepted techniques such as meeting criteria set forth in the NYS SWDM, where Cpv, Qp and Qf are required. Cpv, Qp and Qf are met by the installation of underground infiltration trenches which reduce the peak flows associated with each criteria.

6.8 Qualitative Practices

Small sized, frequently occurring storms account for the majority of runoff events that generate stormwater runoff. As a result, the runoff from these storms is recognized as a major contributor of pollutants. Therefore, treating these frequently occurring smaller rainfall events and a portion of the larger events offers an opportunity to minimize the water quality impacts associated with developed areas.

The water quality volume, denoted as WQ_v , specifies a treatment volume required to be captured and treated by intercepting 90% of the average annual stormwater runoff volume. This criterion strives to achieve an 80% Total Suspended Solids (TSS) removal and 40% Total Phosphorous (TP) removal on an annual basis.

In numerical terms, it is calculated using the formula below which was obtained from Section 4.2 of the New York State Stormwater Management Design Manual, January 2015:

$$WQ_v = (P \times R_v \times A) / 12$$

Where:

WQ_v = Water Quality Volume (acre-feet)

P = 90% Rainfall Event Number

$R_v = 0.05+0.009 \times I$, where I is percent impervious (minimum $R_v = 0.2$)

A = Site area in acres (contributing area)

The following table has been developed summarizing the pre-treatment volume, water quality volume and treatment practices for the main project area.

Watershed	Total WQv (cf)	Required Pre-Treatment Volume (cf)	Pre-Treatment Practice	Treatment Practice	WQv Provided (cf)
30	5,727	5,727	Hydrodynamic	Infiltration	5,727

All water quality volumes are calculated using the total contributing area. Offsite contributing areas that do not require treatment are diverted as much as possible. Infiltration rates are greater than 5 inches per hour, thus requiring 100% pre-treatment at Underground Detention Area A. The above volumes are total for the entire watershed.

A major concern with runoff into waterbodies is phosphorus loading. Phosphorus, like nitrogen, is an essential nutrient for aquatic life in waterbodies. However, increased amounts of phosphorus entering surface waters promotes excessive algae growth, which decreases water clarity, causes variations in dissolved oxygen, disagreeable odors, habitat loss and fish kills. The protection of waterbodies from the harmful effects of phosphorus can be accomplished from reducing the runoff volume entering surface waters. Reduction of runoff volume reduces the concentrations of pollutants entering the surface water and thus decreases harmful effects. The removal of enhanced phosphorus can be accomplished using stormwater management practices. Whether in particulate or dissolved speciation, phosphorus can be removed using unit operations. Particulate phosphorus in particular can be removed using infiltration basins and through sedimentation of runoff before entering surface water. Primarily, reducing the WQv entering a surface water body will lower phosphorus pollutant loading. The infiltration basin has been sized to infiltrate the entire WQv and 1-year storm.

6.8.2 Pre-Treatment Practices

The following pre-treatment practices have been incorporated into the design of this project. Preventative and corrective maintenance measures to provide long-term effectiveness of stormwater attenuation practices if properly implemented will be included in Appendix L.

6.8.2.1 Overland Flow

A significant portion of the runoff will flow overland to receiving water bodies. Much of the site's existing natural vegetation is proposed to remain, and the post developed land cover will be restored to meadow along the path to the pocket park. The meadow and remaining vegetated areas will capture sediment and floatables for those areas that are not directly conveyed to treatment practices.

6.8.2.2 Grass-Lined Swales

The design incorporates one permanent grass-lined swale/dike to convey stormwater to Underground Infiltration Area B.

6.8.2.3 Stone Check Dams

Stone check dams will be provided in all grass-lined swale that lead to an infiltration practice. Stone check dams provide a pooling area where sediment can be captured and allowed to settle out of suspension. Stone check dams provide a good means of capturing floatables as well.

6.8.2.4 Hydrodynamic Devices

Hydrodynamic devices are designed to intercept and store pollutants such as sediment and floatables for later removal and safe disposal.

One hydrodynamic devices have been included in the design of this project conveying flow into Underground Infiltration Area A.

6.8.3 Treatment Practices

The following treatment practices have been incorporated into the design of this project. Preventative and corrective maintenance measures to provide long-term effectiveness of stormwater attenuation practices if properly implemented will be included in Appendix L.

6.8.3.1 Underground Infiltration Area

Stormwater infiltration practices capture and temporarily store the water quality volume before allowing it to infiltrate through the floor of each practice into the soil over a two-day period. In areas where the subsurface soils exhibit high infiltration rates, the channel protection volume may also be infiltrated. Infiltration facilities are not typically capable of infiltrating the overbank flood or extreme flood volumes. Adequate outflows are required for these larger storm events. Soil testing to obtain infiltration rates are required as part of the design of infiltration facilities. Varying degrees of pre-treatment of the water quality are required based on the field determined infiltration rate of the subsurface soils. 100% of the water quality volume is required where the infiltration rate exceeds 5 inches per hour, 50% for infiltration rates between 2 and 5 inches per hour, and 25% for infiltration rates less than 2 inches per hour. Pre-treatment is typically accomplished through installation of plunge pools and other filtering methods. Infiltration practices must be isolated and protected from stormwater run-off during construction. The contributory drainage area shall be completely constructed and stabilized before connection of the stormwater conveyance system to the infiltration practice. Infiltration basins are typically landscaped by providing a hardy, drought tolerant grass species that is capable of tolerating periodic inundation. The established grass requires mowing twice annually (or as needed). Underground infiltration areas typically consist of stone reservoirs with piping or chambers embedded within the stone. These areas are typically used where surface infiltration areas are limited due to site constraints. Proper maintenance of the contributing conveyance system and pre-treatment practice are important in maintaining infiltration rates.

There are two underground infiltration areas proposed for this project. Underground Infiltration Area A consists of 5 rows of 13 chambers each, utilizing Cultec Recharger Model 330 XLHD. A hydrodynamic device has been provided for pre-treatment prior to discharge to the infiltration basin. Infiltration testing in the area has been performed, and the basin has been designed to infiltrate the entire WQv and CPv. Underground Infiltration Area B consists of 3 rows of 5 chambers each, utilizing Cultec Recharger Model 330 XLHD. The vegetated swale leading to the basin will serve as pre-treatment. The drainage area contributing to Underground Infiltration Area B consists predominantly of off-site area, including runoff from the church and its

cemetery. The intent of this basin is to reduce peak rates of flow from the site toward Beekman Street. A conservative infiltration rate was used for design purposes as excavation in this area was not performed due to archaeological sensitivity. Upon completion of archaeological investigations, infiltration testing in this area will be performed.

6.9 Runoff Reduction Volume (RRv)

RRv (measured in acre-feet) is reduction of the total WQv by application of GI techniques and SMP's to replicate the pre-development hydrology. The minimum required RRv is defined as the specified Reduction Factor (S), provided objective technical justification is documented.

RRv must be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100% of the post-developed WQv's to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow by using runoff control techniques to provide treatment in a distributed manner before runoff reaches the collection system.

RRv is calculated based upon three methods:

1. Reduction of the practice contributing area in WQv computation.
2. Reduction of runoff volume by storage capacity of the practice.
3. Reduction using standard SMP's with runoff reduction capacity.

Projects that cannot meet 100% of the runoff reduction requirement must provide a justification that evaluates each of the GI planning and reduction techniques, and identify the specific limitations of the site according to which application of this criterion is technically infeasible. Projects that do not achieve runoff reduction to pre-construction must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based on the Hydrologic Soil Group(s) (HSG) of the site and is defined as Specific Reduction Factor (S).

The following lists the specific reduction factors for the HSG's.

HSG A = 0.55

HSG B = 0.40

HSG C = 0.30

HSG D = 0.20

The specific reduction factor (S) is based on the HSG's present at the site. The values are defined based on a hydrology analysis of low, medium, and high imperviousness. The reduction is achieved when runoff from a percentage of the impervious area on a site is captured, routed through GI or an SMP, infiltrated to the ground, reused, reduced by evapotranspiration, and eventually removed from the stormwater discharge from the site.

The following equation is used to determine the minimum RRv:

$$RRv \text{ (in acre-feet of storage)} = [(P)(Rv^*)(Ai)]/12$$

$$Ai = (S)(Aic)$$

Ai = impervious cover targeted for runoff reduction

(Aic) = total area of new impervious cover

Rv * = 0.05+0.009(I) where I is 100% impervious

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

The goal of the SWPPP is to utilize as many runoff reduction methods as possible on a site. All GI practices will be quantified and compared to the overall WQv for the site. If the RRv is greater than or equal to the WQv, then standard SMP's can be implemented to control peak rate leaving the site if applicable.

The following table summarizes required 100% RRv, minimum RRv, RRv reduced by use of runoff reduction techniques, RRv provided by standard SMP's with RRv and provided RRv for the main project area.

Watershed	Required Total RRv (cf)	Required Minimum RRv (cf)	RRv reduced by use of runoff reduction techniques (cf)	RRv provided by standard SMP with RRv (cf)*	RRv (cf) Provided
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	5,727	1,584	0	5,727	5,727
4	N/A	N/A	N/A	N/A	N/A

* Treatment practices can be oversized to provide additional runoff reduction (RRv); however, they can only be oversized to provide up to 100% of the RRv. No additional credit can be taken for RRv for practices that provide greater than 100% RRv. The infiltration basin has been sized to infiltrate the 1-year storm.

6.10 Soil Restoration

Soils within disturbed areas tend to over compact as a result of heavy construction traffic; thus, limiting their infiltrative capacity. Under the GP 0-15-002 permit, soil restoration is required in disturbed areas that will be vegetated in order to recover the original properties and porosity of the soil, especially in areas that receive high construction traffic, or areas that have soils that are poorly drained.

Many runoff reduction practices need Soil Restoration measures applied over and adjacent to the practice to achieve runoff reduction performance. Some key benefits of soil restoration are less runoff, better water quality; healthier, aesthetically pleasing landscapes; increased porosity on redevelopment sites where impervious cover is converted to converted to pervious; decreases runoff volume generated and lowers the demand on runoff control structures; enhances direct groundwater recharge; promotes successful long-term re-vegetation by restoring soil organic

matter, permeability, drainage and water holding capacity for healthy root system development of trees, shrubs and deep-rooted ground covers, minimizing lawn chemical requirements, plant drowning during wet periods, and burnout during dry periods.

Soil restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.

6.10.1 Soil Restoration Methods

- Topsoil Application – Applying 6" of topsoil in soils with an HSG of A & B and have only been stripped, cut or filled. Soils with HSG of C or D that have only been stripped require aeration in addition to topsoil.
- Aeration - Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.
- Tilling – Tilling includes the use of a cat-mounted ripper, tractor mounted disc, or tiller in order to expose the compacted soil devoid of oxygen and air to recreate temporary air space which allows for infiltration.
- Full Soil Restoration - Consists of Deep Ripping and De-Compaction, Compost Enhancement, and/or Deep Subsoiling. Deep Ripping includes the use of a cat mounted ripper, and is typically done at 12" to 24" depths. Compost Enhancement is done by using a deep subsoiler after topsoil has been applied. The goal is to alleviate the compaction that may have occurred during the placement of topsoil. This method mixes the topsoil and compost with subsoils.

Restoration techniques shall not be done until construction is complete and traffic will not travel through green areas.

7.0 EROSION AND SEDIMENT CONTROL

7.1 Overview

The most sensitive stage of the development cycle is the period when vegetation is cleared and a site is graded. The potential impacts to on-site and off-site receiving waters and adjoining properties are particularly high at this stage. Trees and topsoil are removed, soils are exposed to erosion, natural topography and drainage patterns are altered. Control of erosion and sediment during these periods is an essential function of this SWPPP and accompanying plans.

Effective and practical measures employed to minimize the erosion potential and prevent sediment from leaving the construction site and reaching streams or other water bodies have been recommended in accordance with:

- New York State Standards and Specifications for Erosion and Sediment Control, July 2016

In order to ensure the effectiveness of the measures recommended herein, routine inspections and documentation, along with procedures for monitoring the findings, maintenance, and corrective actions resulting from each inspection are outlined within this section of the SWPPP.

7.2 Temporary Erosion and Sediment Control Measures

The following temporary measures have been incorporated into the erosion and sediment control plans for the site construction activities. These measures are also detailed on the site plans.

7.2.1 Silt Fence

A silt fence is a temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, entrenched, and supported with woven wire fence. Silt fences are installed on the contours across a slope and used to trap sediment by intercepting and detaining sediment laden runoff from disturbed areas in order to promote sedimentation on the uphill side of the fence.

Silt fences are suitable for perimeter and interior control, placed below areas where runoff may occur in the form of sheet flow. It should not be placed in channels or areas where flow is concentrated. In addition to interior and perimeter control a silt fence can be applied in the following applications:

- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels banks.
- Around temporary spoil area and stockpiles.

7.2.2 Stabilized Construction Entrance

A stabilized construction entrance consists of a pad of aggregate overlaying a geotextile fabric located at a point where construction vehicles enter or exit a site to reduce or eliminate the tracking of sediment onto public right of ways, street, alleys or parking areas, thereby preventing the transportation of sediment into local stormwater collection systems. Efficiency is greatly increased when a washing area is included as part of a stabilized construction entrance.

Stabilized construction entrances shall be a minimum of fifty (50) feet long and twelve (12) feet wide, but not less the full width of points where vehicles enter and exit the site. Where there is only one access point to the site, the stabilized construction entrance shall be a minimum of twenty-four (24) feet wide. Stabilized construction entrances shall be a minimum of six (6) inches in depth consisting of one (1) to four (4) inch stone, or reclaimed or recycled equivalent.

7.2.3 Check Dams

Check dams shall be placed in channels to reduce scour and erosion by reducing flow velocity and promoting sediment settlement. Check dams shall be spaced in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. Check dams, consisting of a well-graded stone two (2) – nine (9) inches in size (NYSDOT – Light Stone) shall maintain a height of two (2) feet with side slopes of 2:1 extending beyond the bank of the channel by a minimum of one and a half (1.5) feet. Check dams shall be anchored in the channel by a cutoff trench of one and a half (1.5) feet in width by a half (0.5) foot in depth.

7.2.4 Inlet Protection

Inlet protection consists of a filtering measure placed around or upstream of a storm drain used to trap sediment by temporary ponding runoff before it enters the storm drain. Inlet protection is not considered to be a primary means of sediment control and should be used with an overall

integrated sediment control program. There are four types of storm drain inlet protection consisting of: excavated drop inlet protection, fabric drop inlet protection, stone and block drop inlet protection and curb drop inlet protection.

Inlet protection shall be implemented for all inlets that could potentially be impacted by sediment laden runoff.

7.2.5 Temporary Channels

Temporary channels in the form of diversion swales or berms may be used to intercept and direct runoff under the following applications:

- Above disturbed areas in order to direct and prevent clean runoff from flowing over disturbed areas until the area is permanently stabilized.
- Below disturbed areas to convey sediment laden runoff to sediment traps.
- Across disturbed slopes to reduce slope lengths.

Where used to convey sediment laden runoff, temporary channels shall be equipped with check dams.

7.2.6 Sediment Traps & Sediment Basins

A sediment trap or basin is a containment area, where sediment laden runoff collected from disturbed areas is temporarily detained allowing sediment to settle out before the runoff is discharged. Sediment traps and basins are formed by excavating an area or constructing an earthen embankment where sediment control is needed.

There are several types of sediment traps. The outlet of a rip rap outlet sediment traps shall be through a partially excavated channel through the embankment lined with rip rap. Pipe outlet sediment traps are equipped with an outlet structure including a perforated riser. The pipe outlet typically is installed through the embankment.

Sediment traps and basins are designed to treat 3,600 cubic feet per acre of drainage area collected. Pipe outlet sediment traps are limited to drainage areas of less than five (5) acres, rip rap outlet sediment traps are limited to fifteen (15) acres of drainage area, and sediment basins can accommodate upwards of one-hundred (100) acres.

Sediment shall be removed and the trap or basin shall be restored to the original dimensions when the sediment has accumulated to ½ of the design depth. The required and provided storage/cleanout elevations have been provided on the plan set. Calculations for sizing the facilities will be provided in the final SWPPP if necessary.

7.2.7 Water Bars

Water bars are temporary earth barriers constructed across construction roads used to intercept and divert roadway runoff toward temporary sediment traps or channels, prevent runoff from concentrating, and minimize the potential of gullies from forming. Spacing of water bars is dependent upon the road slope, and shall be installed in accordance with the schedule depicted on the Erosion and Sediment Control detail sheet, if necessary.

7.2.8 Straw Bale Barriers

Straw bale barriers are used to intercept and contain sediment from disturbed areas of limited size in order to prevent sediment from exiting the site. Bales should be placed in a single row lengthwise along the contour, with ends abutting one another. Straw bales shall be bound and installed so that the bindings are oriented around the sides. Straw bales shall be entrenched a minimum of four (4) inches, backfilled, and anchored using either two stakes or rebar driven through the straw bales to a depth of one and a half (1.5) to two (2) feet below grade.

Straw bales shall be used where no other measure is feasible. They shall not be used where there is a concentration of flow within a channel or other area.

The useful life of a straw bale barrier is three (3) months.

7.2.9 Temporary Soil Stockpiles

Stockpiling of soil is a method of preserving soil and topsoil for regrading and vegetating disturbed areas. Stockpiles shall be located away from environmentally sensitive areas (i.e. wetlands and associated buffers, streams, water bodies) and shall be protected with a peripheral silt fence. Slopes of stockpiles shall not exceed 2V:1H. Temporary stabilization measures shall be completed within seven (7) days of stockpile formation.

7.2.10 Dust Control

Dust controls reduce the surface and air transport of dust, thereby preventing pollutants from mixing into stormwater. Dust control measures for the construction activities associated within this project consist of windbreaks, minimization of soil disturbance (preserving buffer areas of vegetation where practical), mulching, temporary and permanent vegetation cover, barriers (i.e. geotextile on driving surfaces) and water spraying.

Construction activities shall be scheduled to minimize the amount of area disturbed at any one time.

7.2.11 Temporary Soil Stabilization Practices

Stabilization practices reduce the potential for soil detachment by shielding the soil surface from the impact of rainfall and reducing overland flow velocity.

The Contractor shall initiate stabilization measures as soon as possible in portions of the site where construction activities have temporarily or permanently ceased. In areas where soil disturbance activity has temporarily or permanently ceased, and is located in one of the watersheds [NYCDEP] 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.

This requirement does not apply where the initiation of stabilization measures by the 7th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions.

Temporary stabilization practices may include:

7.2.11.1 Mulching

Mulching is a temporary soil stabilization practice. Mulching prevents erosion by protecting soil from raindrop impact and by reducing the velocity of overland flow. Mulching also retains moisture within the soil surface and prevents germination.
Where mulching consists of wood chips or shavings, it shall be applied at a rate of 500-900 lbs per 1000 s.f. Where mulching consists of straw, it shall be applied at a rate of 90-100 lbs. per 1000 s.f.

All temporary grass areas shall receive a standard application of mulch consisting of straw, unless the area is hydro-seeded.

7.2.11.2 Temporary Seeding

Temporary seeding provides additional benefits over other stabilization practices by creating a vegetation system holding soil particles in place with root systems, and maintaining the soils capacity to absorb runoff. Temporary vegetation shall be placed in accordance with project plans.

Irrigation shall be used when the soil is dry or when summer plantings are done.

7.2.11.3 Temporary Erosion Control Blanket

A temporary erosion control blanket is a degradable erosion control blanket used to hold seed and soil in place until vegetation is established in disturbed areas. Temporary erosion control blankets insulate and conserve seed moisture thus reducing evaporation and increasing germination rates, and protects seeds from birds. Temporary erosion control blankets may consist of straw blankets, excelsior blankets (curled wood excelsior), coconut fiber blankets, or wood fiber blankets (reprocessed wood fibers which do not possess or contain any growth or germination inhibiting factors).

7.3 Permanent Erosion and Sediment Control Measures

The following permanent measures have been incorporated into the erosion and sediment control plans for the site construction activities.

7.3.1 Outlet Protection

Outlet protection is used to reduce stormwater velocity and dissipate the energy of flow exiting a culvert before discharging into receiving channels. Rip-rap treatment extends between the point where flows exit the culvert and where the velocity and/or energy from runoff is dissipated to a degree where there is minimal erosion downstream of the discharge point.

A geotextile fabric shall be placed beneath the rip-rap to prevent soil movement into and through the rip-rap.

7.3.2 Permanent Soil Stabilization Practices

Stabilization practices reduce the potential for soil detachment by shielding the soil surface from the impact of rainfall and reducing overland flow velocity.

In areas where soil disturbance activity has temporarily or permanently ceased, and is located in one of the watersheds [NYCDEP] 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.

Permanent stabilization practices may include:

7.3.2.1 Sod

Where exposed soils have the potential to generate off-site sediment loading, sod can provide a immediate form of stabilization and extra protection to a disturbed area. Where applied, sod shall be blue grass or a bluegrass/red fescue mixture or a perennial ryegrass and machine cut with a uniform soil thickness of ¾ inch, plus or minus ¼ inch. Sod shall be used at the discretion of the Owner, unless specifically required by the plans.

7.3.2.2 Permanent Vegetation

Permanent vegetation shall be used to provide a protective cover for exposed areas that have received final grading. Permanent stabilization shall be applied where topsoil has been placed or returned and incorporated into the soil surface. When used, this process shall be followed with the application of straw mulch to protect soil from erosion and seed from drying out.
Irrigation shall be used when the soil is dry or when summer plantings are done.
Permanent vegetation shall be placed in accordance with project plans.

7.3.2.3 Hydroseeding

Hydroseeding is the hydraulic application of seed and fertilizer onto prepared seed beds. When used, this process shall be followed with the application of straw mulch to protect soil from erosion and seed from drying out.
Irrigation shall be used when the soil is dry or when summer plantings are done.
Hydroseeding shall be used at the discretion of the Contractor, unless specifically required by the plans.

7.3.2.4 Permanent Erosion Control Blankets

Permanent erosion control blankets are comprised of synthetic materials that form a high strength mat that helps prevent soil erosion in channels and on steep slopes. Stems and roots become intertwined within the matrix, thus reinforcing the vegetation and anchoring the mat. Permanent erosion control blankets insulate and conserve seed moisture thus reducing evaporation and increasing germination rates, and protect seeds from birds. When used within channels, permanent erosion control blankets can aid in the establishment of vegetation and increase the maximum permissible velocity of the given channel by reinforcing the soil and vegetation to resist the forces of erosion during runoff events.
Permanent erosion control blankets shall be used on slopes steeper than 3:1.

7.4 Erosion and Sediment Control Sequencing Schedule

Implementation schedules for the installation of erosion and sediment control measures prior to and during the course of construction will depend greatly on the actual construction schedule and the varying field conditions that may warrant temporary construction stops and/or work commencing in other locations. The plans include an anticipated construction sequence schedule, of which temporary and permanent erosion and sediment control practices will be required and inspected.

7.5 Maintenance Schedules

Maintenance of the erosion and sediment controls incorporated into this project shall be performed on a regular basis to assure continued effectiveness. This includes repairs and replacement to all erosion and sediment control practices, including cleanout of all sediment retaining measures. Those measures found to be ineffective during routine inspections shall be repaired or replaced and cleaned out (where applicable) before the next anticipated storm event or within 24-hours of being notified, whichever comes first. A more detailed description of the maintenance procedures for the site-specific erosion and sediment control practices has been provided on the plan set.

7.6 Construction Staging Areas

Construction staging areas are areas designated within construction sites where most equipment and materials are stored. The locations of the construction staging areas for this project will be shown on the final plan set.

7.7 Site Assessments, Inspections and Reporting

Regular inspections of the construction site shall be performed by a qualified professional who is familiar with all aspects of the SWPPP and the implemented control practices. Inspections are intended to identify areas where the pollutant control measures at the site are ineffective and have the potential to allow pollutants to enter water bodies or adjoining properties.

7.7.1 Prior to Construction

Prior to the commencement of construction, a qualified professional shall conduct an inspection of the site and certify in an inspection report that the appropriate erosion and sediment control measures have been installed as indicated by the project plan set and SWPPP. This certification shall be forwarded to the Owner's Representative and Contractor for filing in the construction log book.

A copy of the "Pre-Construction Site Assessment Checklist" has been provided in Appendix G.

7.7.2 During Construction

Following the commencement of construction, a qualified professional shall perform inspections of site construction activities in accordance with the SPDES General Permit. Inspections shall occur every seven (7) calendar days. Refer to Section 1.2 of this SWPPP for additional inspection requirements associated with disturbance of greater than five (5) acres at any time.

For project areas 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 Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.

For project areas 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 Regional Office stormwater contact person in writing prior to the shutdown.

The inspections shall include observation of installed and maintained erosion and sediment control measures for consistency with project specifications and documentation of items to be corrected and recommendations for mitigating concerns. The following information, at minimum, shall be recorded during each inspection:

- Date and time of inspection;
- Name and title of person(s) performing inspection;
- A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- 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;
- 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;
- Identification of all erosion and sediment control practices that need repair or maintenance;
- Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;
- 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;
- Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures,

and verify the ability of rock filters around perforated riser pipes to pass water (where applicable);

- Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume;

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

- 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

- A brief description of any erosion and sediment control practice repairs, maintenance or installations made as a result of previous inspection; and

- All deficiencies that are identified with the implementation of the SWPPP.

Summary reports shall be forwarded to the Owner's Representative and Contractor. Reports shall be incorporated into the construction log book. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor 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.

A copy of the "Construction" inspection report has been provided in Appendix M.

7.7.3 Quarterly Report

The Owner shall prepare a written summary of its status with respect to compliance with the SPDES General Permit at a minimum frequency of every three months during which coverage under the permit exists. The summary should address the status of achieving each component of the SWPPP.

7.7.4 End of Term

Termination of coverage under SPDES General Permit is accomplished by filing a Notice of Termination with the NYSDEC. Prior to the filing of the Notice of Termination (NOT), the Owner shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment control structures have been removed and that all permanent erosion control and stormwater facilities have been

installed and are operational 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 NYSDEC. Final stabilization" means that all soil disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextile) have been employed on all unpaved areas and area not covered by permanent structures.

A NOT is provided in Appendix N.

7.8 Construction Log Book

The construction log book shall be maintained on-site from the date of initiation of construction activities to the date of final stabilization and shall be made available to the permitting authority upon request. The construction log book shall contain a record of all inspections; preparer's, qualified professional's; owner's/operator's; contractor's, and sub-contractor's (if applicable) certifications; and weekly and quarterly reports.

8.0 GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES

The following good housekeeping and material management practices shall be followed to reduce the risk of spills or exposure of materials to stormwater runoff.

8.1 Waste Materials

All waste material, including but not limited to trash and construction debris, generated during construction shall be collected and stored in a proper receptacle in accordance with Federal, State, County and Local regulations. No waste material shall be buried on-site. All collected waste material shall be hauled to an approved waste disposal facility.

8.2 Chemical

Chemicals used on-site shall be kept in small quantities and stored in closed water tight containers undercover in a neat orderly manner and kept out of direct contact with stormwater. Chemical products shall not be mixed with one another unless recommended by manufacturer.

All on-site personnel shall have access to material safety data sheets (MSDS) and National Institute for Occupational Safety and Health (NIOSH) Guide to Chemical Hazards (latest edition) for all chemicals stored and used on-site.

Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with chemicals shall be contained, collected, cleaned up immediately and disposed of in accordance with Federal, State, County and Local regulations.

8.3 Fuels and Oil

All on-site vehicles, tools, and construction equipment shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. On-site vehicle and equipment refueling shall be conducted at a location away from access to surface waters and runoff. Any on-site storage tanks shall have a means of secondary containment. Oil products shall be kept in their original containers with original manufacturer's label. In the event of a spill, it shall be contained, cleaned up immediately and the material, including any contaminated soil, shall be disposed of in accordance with Federal, State, County and Local regulations.

Fuel and oil spills in excess of reportable quantities shall be reported to the NYSDEC as soon as the discharge is discovered.

8.4 Fertilizers

Fertilizers used on-site shall be stored in closed water tight containers undercover in a neat orderly manner and kept out of direct contact with stormwater. Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with fertilizers shall be contained, collected, cleaned up immediately, and disposed of in accordance with Federal, State, County and Local regulations.

8.5 Paint

Paints used on-site shall be stored in closed water tight containers undercover in a neat orderly manner and kept out of direct contact with stormwater. Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with paint shall be contained, collected, cleaned up immediately, and disposed of in accordance with Federal, State, County and Local regulations.

8.6 Sanitary Waste Facilities

Should portable units be located on-site, they shall be placed on upland areas away from direct contact with surface waters. They shall be serviced and cleaned on a weekly basis by a licensed portable toilet and septic disposal service. Any spills occurring during service shall be cleaned up immediately and disposed of in accordance with Federal, State, County, and Local regulations.

8.7 Container Disposal

All of a product shall be used up before disposal of the container. Empty containers that may contain chemical residue shall be disposed of in accordance with Federal, State, County and Local regulations.

8.8 Concrete and Asphalt Trucks

Concrete and asphalt trucks shall not be allowed to wash out or discharge surplus material on-site.

8.9 Site Supervisor

It shall be the responsibility of the Contractor's Site Supervisor to inspect daily and ensure the proper use, storage and disposal of all on-site materials.

9.0 SWPPP AMENDMENT

The SWPPP shall be updated by a licensed professional engineer whenever any of the following apply:

1) There is a significant change in design, construction, operation or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP.
2) The SWPPP proves to be ineffective in:
    - Eliminating or significantly minimizing pollutants from sources identified in the SWPPP required by the SPDES Permit; or
    - Achieving the general objective of controlling pollutants in stormwater discharges from permitted construction activity.
3) Identify any new contractor or subcontractor that will implement any measure of the SWPPP.
4) NYSDEC notifies the Permittee that the SWPPP does not meet one or more of the minimum requirements of the SPDES Permit. Within seven (7) days of such notification or as provided for by the NYSDEC, the Permittee shall make amendments to the SWPPP and submit to the NYSDEC a written certification that the requested changes have been made.

10.0 CONTRACTOR CERTIFICATIONS

All contractors and subcontractors that have any responsibility to install, inspect or maintain erosion or sediment control measures shall sign a copy of the certification statement included in Appendix I before undertaking any construction activity at the site identified in the SWPPP.

11.0 OWNER/OPERATOR CERTIFICATION

The Owner/Operator must review and sign the owner/operator certification statement included in Appendix K.

12.0 CONCLUSIONS

This SWPPP demonstrates that the proposed project generally meets the requirements of SPDES GP-0-15-002, as follows:

- An erosion and sediment control plan in accordance with the latest revision to the New York State Standards and Specifications for Erosion and Sediment Control, July 2016, has been developed for the project and is included in the site plan set.
- Hydraulic calculations for all storm events modeled will demonstrate that the resulting stormwater runoff from the development, exiting the site will not adversely impact offsite properties, stormwater conveyance systems or receiving water bodies. Temporary and permanent stormwater systems and facilities are designed in accordance with the latest revision to the New York State Stormwater Management Design Manual, January 2015.
- The project has been designed to capture and treat 90% of the average annual stormwater runoff from the development through approved water quality measures in all available areas.
- The underground infiltration practice will capture 100% of the required runoff reduction volume (RRv) and infiltrate the entire 1-year storm.

APPENDIX A

NOTICE OF INTENT AND MS4 ACCEPTANCE

4364234792

NOTICE OF INTENT

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

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

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

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State ☐☐ Zip ☐☐☐☐☐ - ☐☐☐☐

Phone (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Fax (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Email (Owner/Operator)

FED TAX ID ☐☐ - ☐☐☐☐☐☐☐ (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street
○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street
○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing) 4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
.	.	.	.

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

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

A	**B**	**C**	**D**
%	%	%	%

7. Is this a phased project? ○ **Yes** ○ **No**

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

Start Date / / - **End Date** / /

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

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **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? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

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

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

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

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

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

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

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

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** ○ **No**

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** ○ **No**
If No, skip questions 23 and 27-39.

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** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

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-0-10-001. 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.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

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

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

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 Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

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).

- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

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

Total WQv Required

☐☐☐.☐☐☐ **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 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 Tables 1 and 2 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.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4)	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ Hydrodynamic	
○ Wet Vault	
○ Media Filter	
○ Other _____	

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

Name

Manufacturer

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.

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

Total RRv provided

_____ **acre-feet**

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

○ **Yes** ○ **No**

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)]

Minimum RRv Required

_____ **acre-feet**

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

○ **Yes** ○ **No**

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, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 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.

WQv Provided

☐☐☐.☐☐☐ **acre-feet**

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 - RRv 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). ☐☐☐.☐☐☐

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so 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**

CPv Provided

☐☐☐.☐☐☐ **acre-feet**

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

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

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

Total Overbank Flood Control Criteria (Qp)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

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

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

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

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.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]
- ○ Other [ ]
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

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

44. 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. [N][Y][R][ ][ ][ ][ ][ ][ ]

Owner/Operator Certification

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.

Print First Name

MI

Print Last Name

Owner/Operator Signature

Date

/ /

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:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
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

SOILS DATA

Hydrologic Soil Group—Dutchess County, New York
(FERRY STREET)

Map Scale: 1:1,320 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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 1:24,000.

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: Dutchess County, New York
Survey Area Data: Version 13, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2011—Apr 16, 2012

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

Hydrologic Soil Group— Summary by Map Unit — Dutchess County, New York (NY027)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
DwB	Dutchess-Cardigan complex, undulating, rocky	B	0.1	2.2%
NwC	Nassau-Cardigan complex, rolling, very rocky	D	3.6	80.1%
Ud	Udorthents, smoothed	A	0.8	17.7%
Totals for Area of Interest			**4.4**	**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.

K Factor, Whole Soil—Dutchess County, New York
(FERRY STREET K-FACTOR_SOIL RATINGS)

Map Scale: 1:1,990 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

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
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- Not rated or not available

Soil Rating Lines
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- Not rated or not available

Soil Rating Points
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- 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 1:24,000.

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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: Dutchess County, New York
Survey Area Data: Version 13, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2011—Apr 16, 2012

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.

K Factor, Whole Soil

K Factor, Whole Soil— Summary by Map Unit — Dutchess County, New York (NY027)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
DwB	Dutchess-Cardigan complex, undulating, rocky	.32	1.1	12.4%
NwC	Nassau-Cardigan complex, rolling, very rocky	.24	6.0	64.2%
Ud	Udorthents, smoothed	.17	2.2	23.5%
Totals for Area of Interest			**9.3**	**100.0%**

Description

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

APPENDIX C

RAINFALL DATA, NYSDEC ERM, FLOOD MAP AND WETLAND MAP

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	73.982 degrees West
Latitude	41.505 degrees North
Elevation	0 feet
Date/Time	Tue, 09 May 2017 12:02:08 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.50	0.62	0.82	1.02	1.26	**1yr**	0.88	1.19	1.45	1.77	2.15	2.61	2.96	**1yr**	2.31	2.85	3.29	3.95	4.59	**1yr**
2yr	0.39	0.60	0.74	0.98	1.23	1.53	**2yr**	1.06	1.43	1.75	2.14	2.61	3.16	3.57	**2yr**	2.80	3.43	3.93	4.63	5.28	**2yr**
5yr	0.46	0.71	0.89	1.19	1.52	1.91	**5yr**	1.31	1.76	2.20	2.70	3.28	3.96	4.52	**5yr**	3.51	4.34	4.99	5.77	6.53	**5yr**
10yr	0.51	0.80	1.02	1.38	1.79	2.27	**10yr**	1.55	2.07	2.62	3.21	3.90	4.70	5.40	**10yr**	4.16	5.20	5.98	6.81	7.67	**10yr**
25yr	0.60	0.95	1.21	1.67	2.23	2.85	**25yr**	1.92	2.56	3.30	4.06	4.93	5.90	6.85	**25yr**	5.22	6.59	7.61	8.48	9.49	**25yr**
50yr	0.68	1.09	1.39	1.95	2.63	3.39	**50yr**	2.27	3.00	3.93	4.84	5.86	7.02	8.20	**50yr**	6.21	7.89	9.14	10.03	11.16	**50yr**
100yr	0.77	1.24	1.60	2.27	3.10	4.03	**100yr**	2.68	3.53	4.68	5.77	6.99	8.34	9.83	**100yr**	7.38	9.45	10.98	11.85	13.14	**100yr**
200yr	0.87	1.43	1.85	2.65	3.67	4.79	**200yr**	3.17	4.15	5.58	6.89	8.33	9.93	11.78	**200yr**	8.79	11.33	13.19	14.02	15.47	**200yr**
500yr	1.05	1.73	2.26	3.28	4.59	6.03	**500yr**	3.96	5.15	7.04	8.70	10.51	12.51	14.98	**500yr**	11.07	14.40	16.84	17.51	19.22	**500yr**

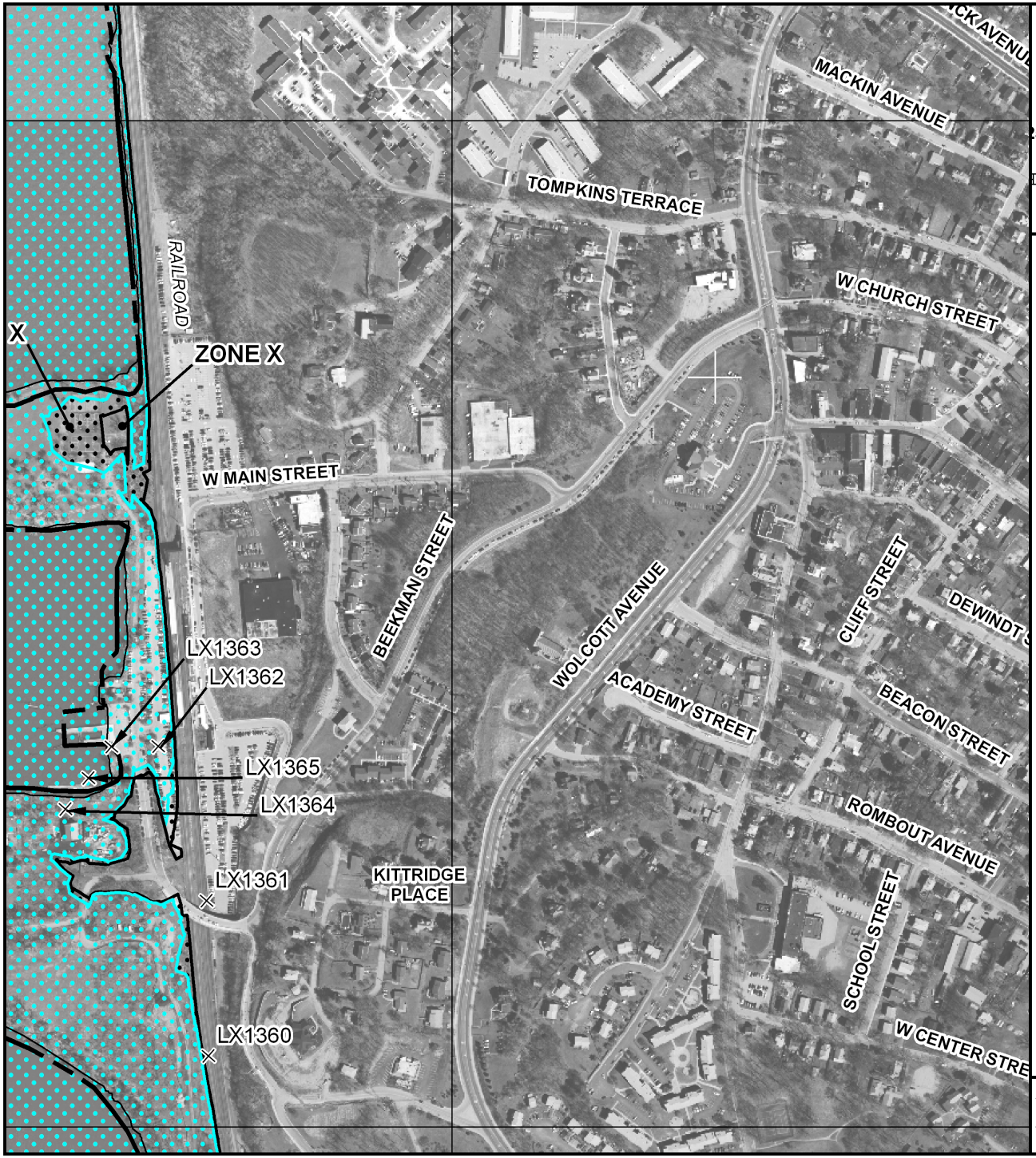
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.09	**1yr**	0.76	1.06	1.24	1.59	2.01	2.08	2.36	**1yr**	1.84	2.27	2.54	3.33	4.08	**1yr**
2yr	0.37	0.58	0.71	0.96	1.19	1.42	**2yr**	1.03	1.39	1.61	2.05	2.58	3.07	3.45	**2yr**	2.71	3.32	3.77	4.47	5.13	**2yr**
5yr	0.42	0.65	0.81	1.11	1.41	1.65	**5yr**	1.22	1.62	1.88	2.42	3.01	3.65	4.16	**5yr**	3.23	4.00	4.56	5.28	6.06	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.85	**10yr**	1.39	1.81	2.11	2.72	3.38	4.14	4.80	**10yr**	3.66	4.62	5.25	5.98	6.87	**10yr**
25yr	0.54	0.82	1.02	1.46	1.92	2.13	**25yr**	1.66	2.09	2.45	3.06	3.94	4.85	5.80	**25yr**	4.30	5.57	6.30	7.03	8.14	**25yr**
50yr	0.60	0.92	1.14	1.64	2.21	2.38	**50yr**	1.91	2.32	2.76	3.42	4.43	5.50	6.70	**50yr**	4.87	6.44	7.25	7.96	9.27	**50yr**
100yr	0.68	1.03	1.29	1.86	2.55	2.66	**100yr**	2.20	2.61	3.12	3.81	5.01	6.19	7.75	**100yr**	5.48	7.46	8.33	9.00	10.56	**100yr**
200yr	0.77	1.16	1.47	2.12	2.96	2.98	**200yr**	2.56	2.91	3.52	4.28	5.66	6.92	9.00	**200yr**	6.12	8.65	9.59	10.17	12.06	**200yr**
500yr	0.92	1.36	1.75	2.55	3.62	3.47	**500yr**	3.13	3.39	4.15	4.99	6.68	8.03	10.97	**500yr**	7.11	10.55	11.57	11.94	14.39	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.56	0.68	0.91	1.12	1.36	**1yr**	0.97	1.33	1.52	1.96	2.42	2.82	3.22	**1yr**	2.49	3.09	3.58	4.24	4.96	**1yr**
2yr	0.40	0.62	0.77	1.04	1.28	1.54	**2yr**	1.10	1.50	1.74	2.25	2.80	3.33	3.70	**2yr**	2.95	3.56	4.11	4.82	5.47	**2yr**
5yr	0.49	0.76	0.94	1.29	1.65	1.96	**5yr**	1.42	1.91	2.25	2.88	3.66	4.26	4.88	**5yr**	3.77	4.70	5.41	6.29	7.01	**5yr**
10yr	0.58	0.89	1.11	1.55	2.00	2.37	**10yr**	1.73	2.32	2.74	3.53	4.48	5.21	6.02	**10yr**	4.61	5.78	6.71	7.69	8.49	**10yr**
25yr	0.72	1.10	1.37	1.96	2.57	3.05	**25yr**	2.22	2.99	3.57	4.73	5.87	6.81	7.93	**25yr**	6.03	7.63	8.93	10.06	10.93	**25yr**
50yr	0.85	1.30	1.62	2.32	3.13	3.72	**50yr**	2.70	3.63	4.36	5.83	7.19	8.35	9.78	**50yr**	7.39	9.40	11.10	12.33	13.24	**50yr**
100yr	1.01	1.53	1.91	2.76	3.79	4.52	**100yr**	3.27	4.42	5.32	7.19	8.81	10.24	12.05	**100yr**	9.06	11.59	13.81	15.13	16.05	**100yr**
200yr	1.19	1.80	2.27	3.29	4.59	5.49	**200yr**	3.96	5.37	6.49	8.86	10.79	12.58	14.87	**200yr**	11.13	14.29	17.18	18.57	19.45	**200yr**
500yr	1.50	2.23	2.87	4.17	5.92	7.11	**500yr**	5.11	6.95	8.45	11.70	14.12	16.55	19.60	**500yr**	14.64	18.84	22.96	24.39	25.07	**500yr**

Powered by ACIS Northeast Regional Climate Center



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0463E

FIRM

FLOOD INSURANCE RATE MAP

for DUTCHESS COUNTY, NEW YORK
(ALL JURISDICTIONS)

CONTAINS:

COMMUNITY	NUMBER
BEACON, CITY OF	360217
FISHKILL, TOWN OF	361337

PANEL 463 OF 602
MAP SUFFIX: E
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

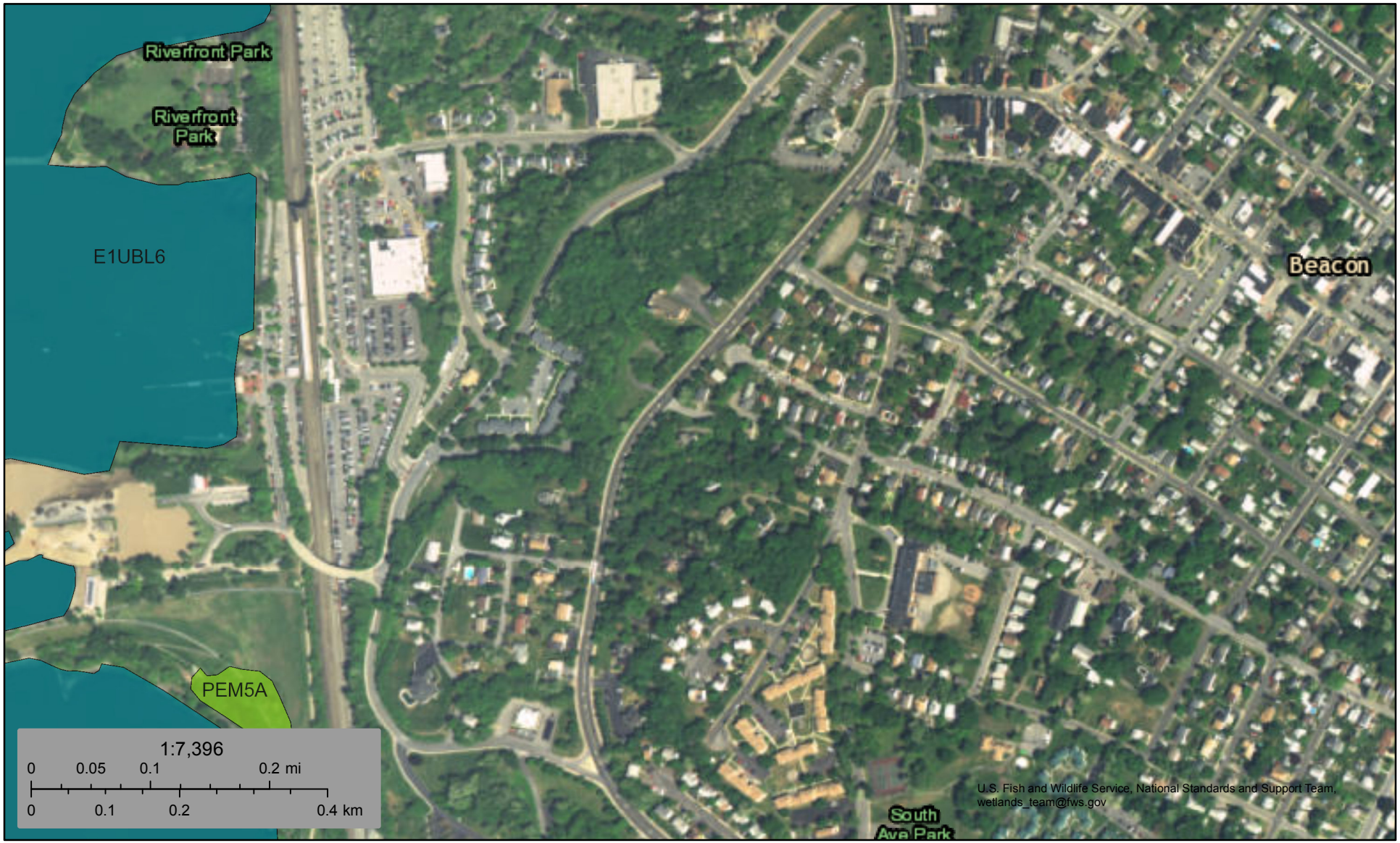
MAP NUMBER
36027C0463E

EFFECTIVE DATE
MAY 2, 2012

Federal Emergency Management Agency

U.S. Fish and Wildlife Service
National Wetlands Inventory

FERRY STREET WETLAND INVENTORY

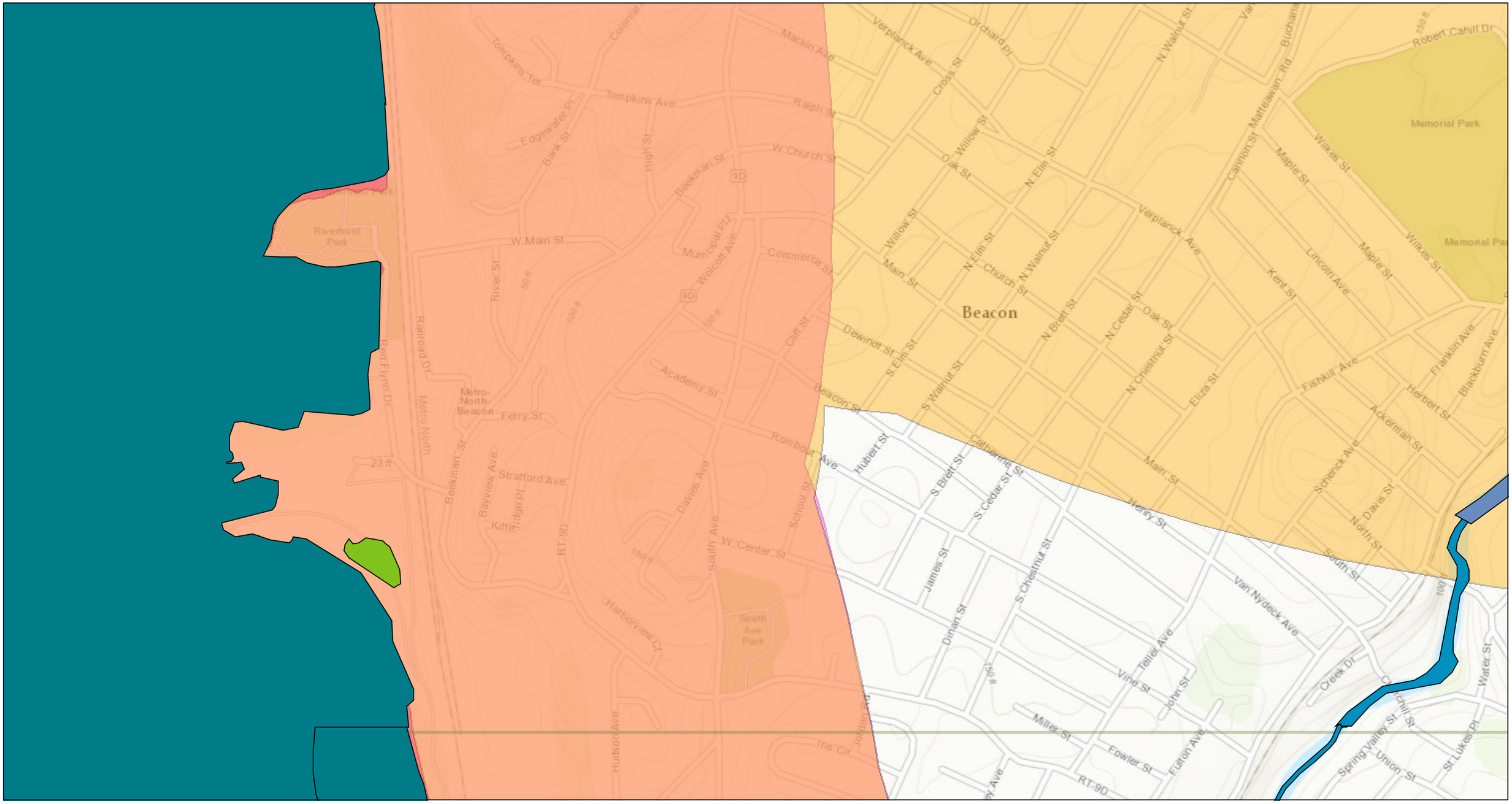


May 9, 2017

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

FERRY STREET ENVIRONMENTAL RESOURCES MAP



May 9, 2017

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

NYS Department of Environmental Conservation
Not a legal document

APPENDIX D

PRE-DEVELOPMENT HYDROCAD MODEL

DA 1 DA 2 DA 3 DA 4

Subcat Reach Pond Link

Routing Diagram for FERRY ST PRE
Prepared by Hudson Land Design Professional Engineering, P.C.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.316	39	>75% Grass cover, Good, HSG A (3, 4)
0.161	80	>75% Grass cover, Good, HSG D (3, 4)
0.498	91	Gravel roads, HSG D (3)
0.084	30	Meadow, non-grazed, HSG A (3)
0.045	58	Meadow, non-grazed, HSG B (3)
0.368	78	Meadow, non-grazed, HSG D (3)
0.225	98	Paved parking & roofs (2, 3, 4)
0.273	30	Woods, Good, HSG A (3)
1.966	77	Woods, Good, HSG D (1, 2, 3, 4)
3.936	**73**	**TOTAL AREA**

Summary for Subcatchment 1: DA 1

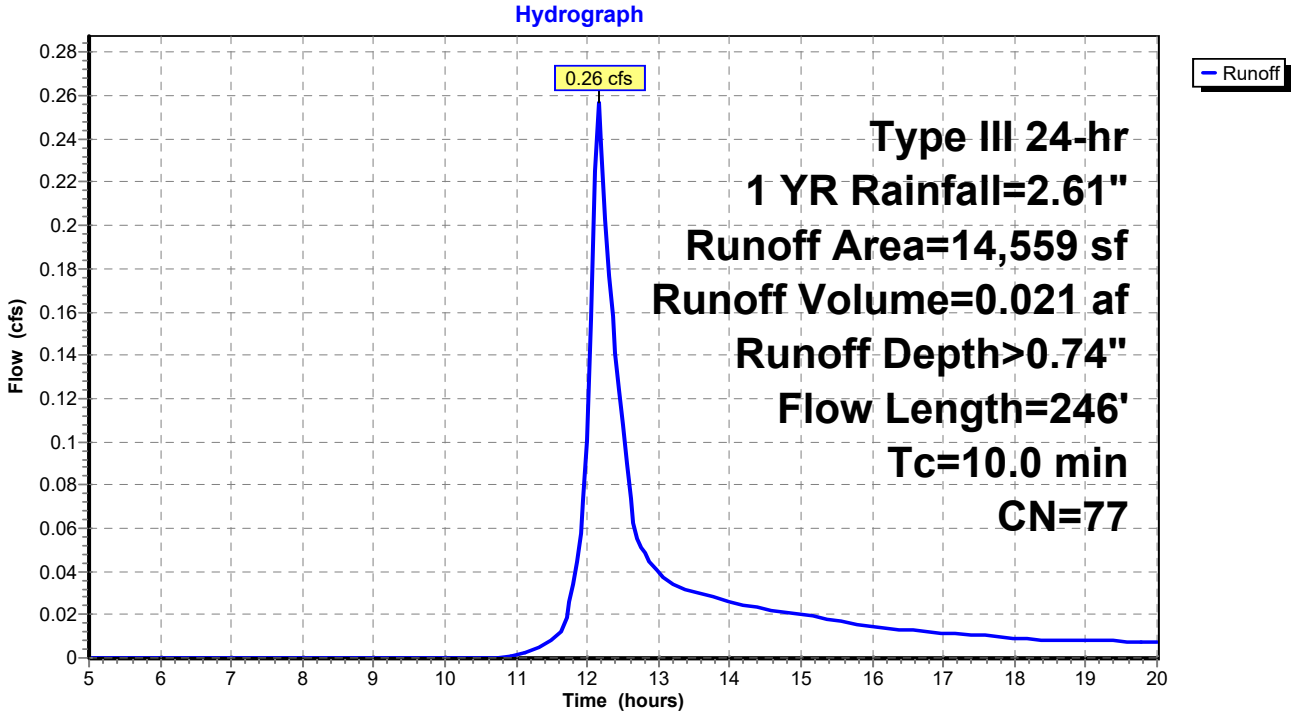
Runoff = 0.26 cfs @ 12.16 hrs, Volume= 0.021 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
14,559	77	Woods, Good, HSG D
14,559		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	15	0.6000	0.21		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	62	0.1120	0.14		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.4	169	0.1630	2.02		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
10.0	246	Total			

Subcatchment 1: DA 1



Summary for Subcatchment 2: DA 2

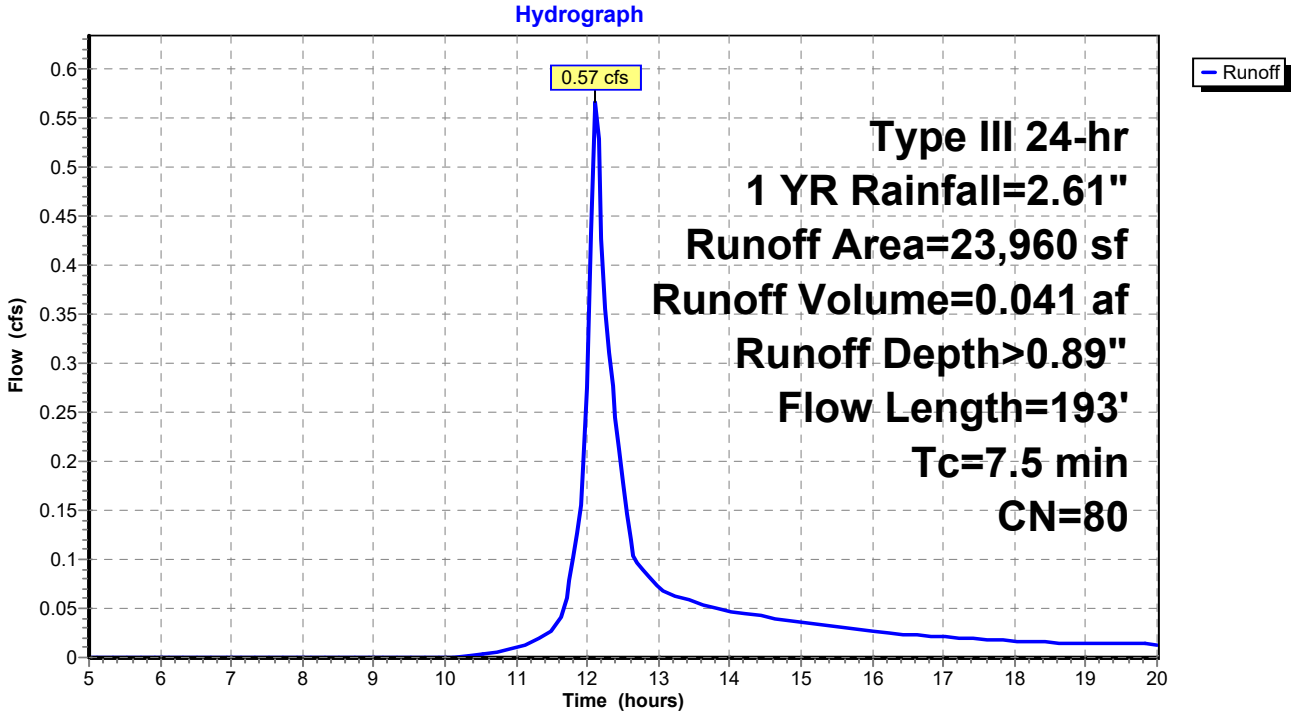
Runoff = 0.57 cfs @ 12.12 hrs, Volume= 0.041 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
21,051	77	Woods, Good, HSG D
2,909	98	Paved parking & roofs
23,960	80	Weighted Average
21,051		87.86% Pervious Area
2,909		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	93	0.2780	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	88	0.0620	5.05		**Shallow Concentrated Flow, S2** Paved Kv= 20.3 fps
0.1	12	0.0833	1.44		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.5	193	Total			

Subcatchment 2: DA 2



Summary for Subcatchment 3: DA 3

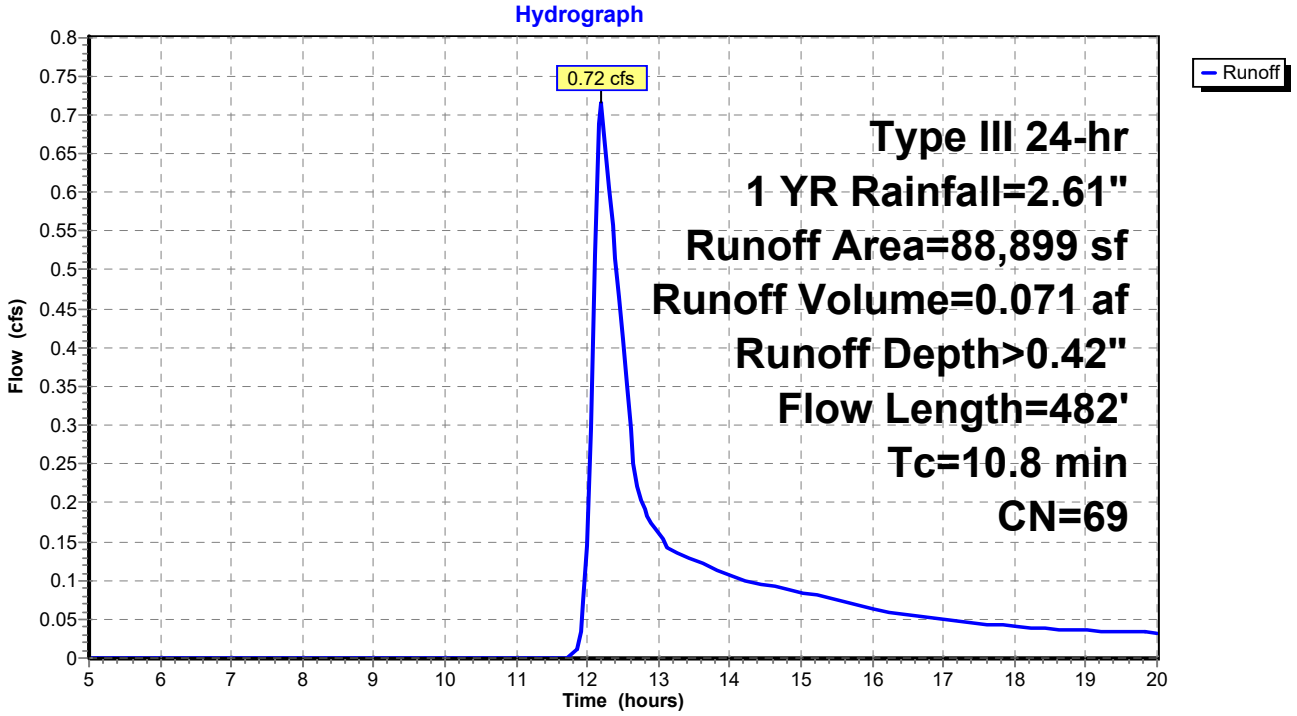
Runoff = 0.72 cfs @ 12.19 hrs, Volume= 0.071 af, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
6,306	80	>75% Grass cover, Good, HSG D
8,040	39	>75% Grass cover, Good, HSG A
3,659	30	Meadow, non-grazed, HSG A
1,952	58	Meadow, non-grazed, HSG B
16,037	78	Meadow, non-grazed, HSG D
11,906	30	Woods, Good, HSG A
16,383	77	Woods, Good, HSG D
2,938	98	Paved parking & roofs
21,678	91	Gravel roads, HSG D
88,899	69	Weighted Average
85,961		96.70% Pervious Area
2,938		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	30	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	19	0.0200	0.98		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
1.2	14	0.0740	0.19		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.1	5	0.0100	0.57		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	33	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.2	30	0.0833	2.02		**Shallow Concentrated Flow, S2** Short Grass Pasture Kv= 7.0 fps
0.9	85	0.0950	1.54		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.6	65	0.0740	1.90		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0320	3.63		**Shallow Concentrated Flow, S5** Paved Kv= 20.3 fps
0.2	9	0.0100	0.70		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, S7** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0270	3.34		**Shallow Concentrated Flow, S8** Paved Kv= 20.3 fps
0.2	19	0.0540	1.63		**Shallow Concentrated Flow, S9** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.4160	3.22		**Shallow Concentrated Flow, S10** Woodland Kv= 5.0 fps
10.8	482	Total			

Subcatchment 3: DA 3



Summary for Subcatchment 4: DA 4

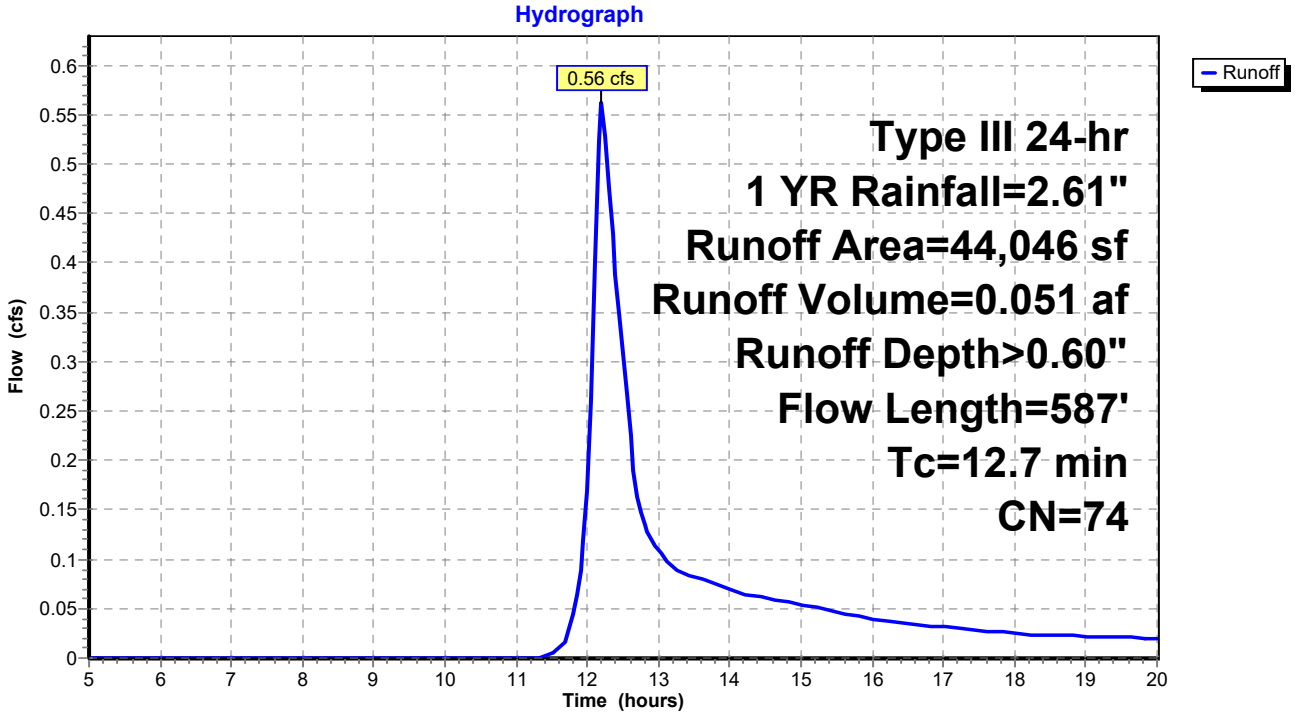
Runoff = 0.56 cfs @ 12.20 hrs, Volume= 0.051 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
5,732	39	>75% Grass cover, Good, HSG A
690	80	>75% Grass cover, Good, HSG D
33,657	77	Woods, Good, HSG D
3,967	98	Paved parking & roofs
44,046	74	Weighted Average
40,079		90.99% Pervious Area
3,967		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	43	0.0230	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	24	0.0420	1.38		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
3.0	29	0.0340	0.16		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.0	5	0.0100	2.03		**Shallow Concentrated Flow, S4** Paved Kv= 20.3 fps
1.6	121	0.0330	1.27		**Shallow Concentrated Flow, S5** Short Grass Pasture Kv= 7.0 fps
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, S6** Woodland Kv= 5.0 fps
0.2	41	0.3630	3.01		**Shallow Concentrated Flow, S7** Woodland Kv= 5.0 fps
1.7	187	0.1290	1.80		**Shallow Concentrated Flow, S8** Woodland Kv= 5.0 fps
0.6	65	0.1550	1.97		**Shallow Concentrated Flow, S9** Woodland Kv= 5.0 fps
12.7	587	Total			

Subcatchment 4: DA 4



Summary for Subcatchment 1: DA 1

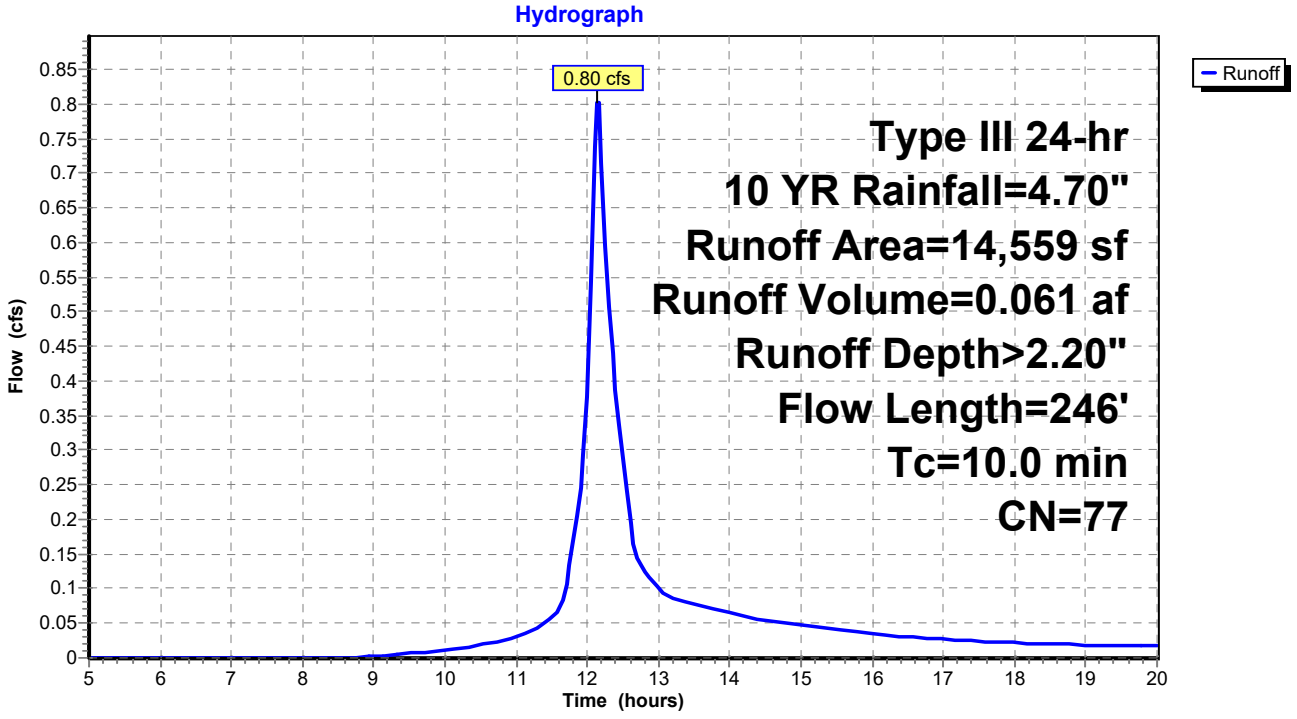
Runoff = 0.80 cfs @ 12.15 hrs, Volume= 0.061 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
14,559	77	Woods, Good, HSG D
14,559		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	15	0.6000	0.21		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	62	0.1120	0.14		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.4	169	0.1630	2.02		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
10.0	246	Total			

Subcatchment 1: DA 1



Summary for Subcatchment 2: DA 2

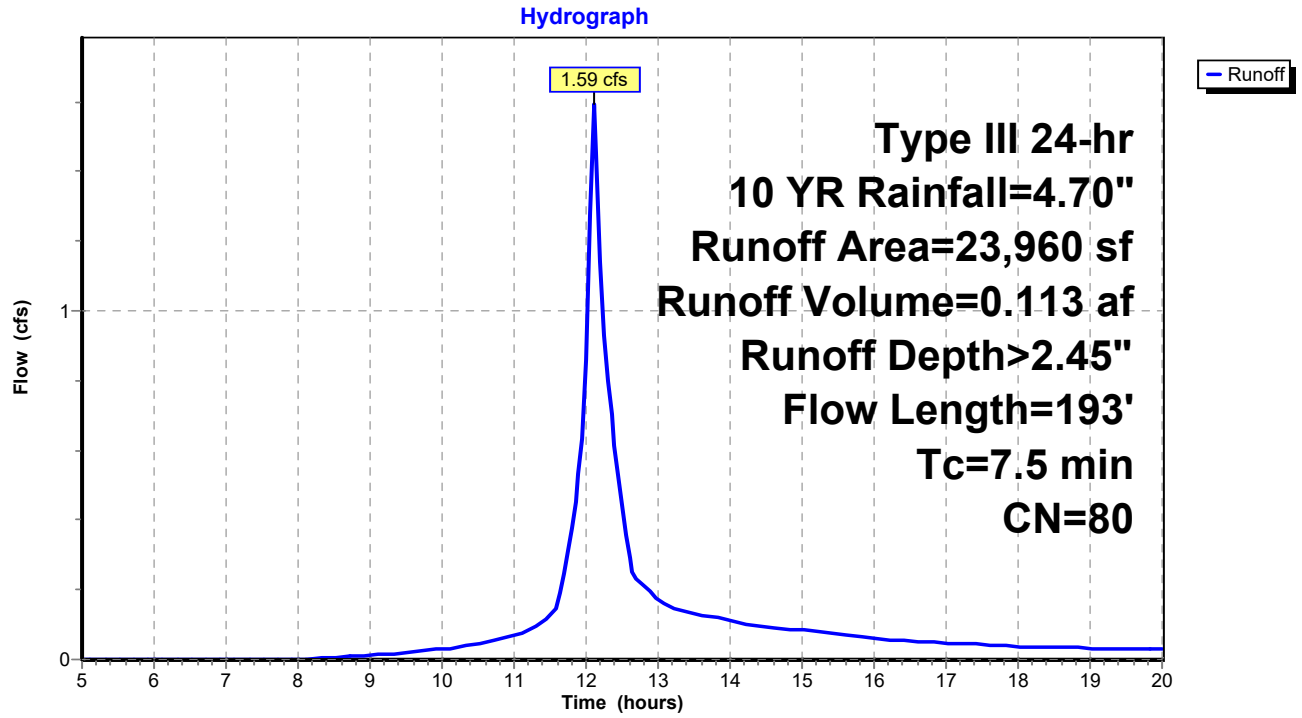
Runoff = 1.59 cfs @ 12.11 hrs, Volume= 0.113 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
21,051	77	Woods, Good, HSG D
2,909	98	Paved parking & roofs
23,960	80	Weighted Average
21,051		87.86% Pervious Area
2,909		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	93	0.2780	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	88	0.0620	5.05		**Shallow Concentrated Flow, S2** Paved Kv= 20.3 fps
0.1	12	0.0833	1.44		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.5	193	Total			

Subcatchment 2: DA 2



Summary for Subcatchment 3: DA 3

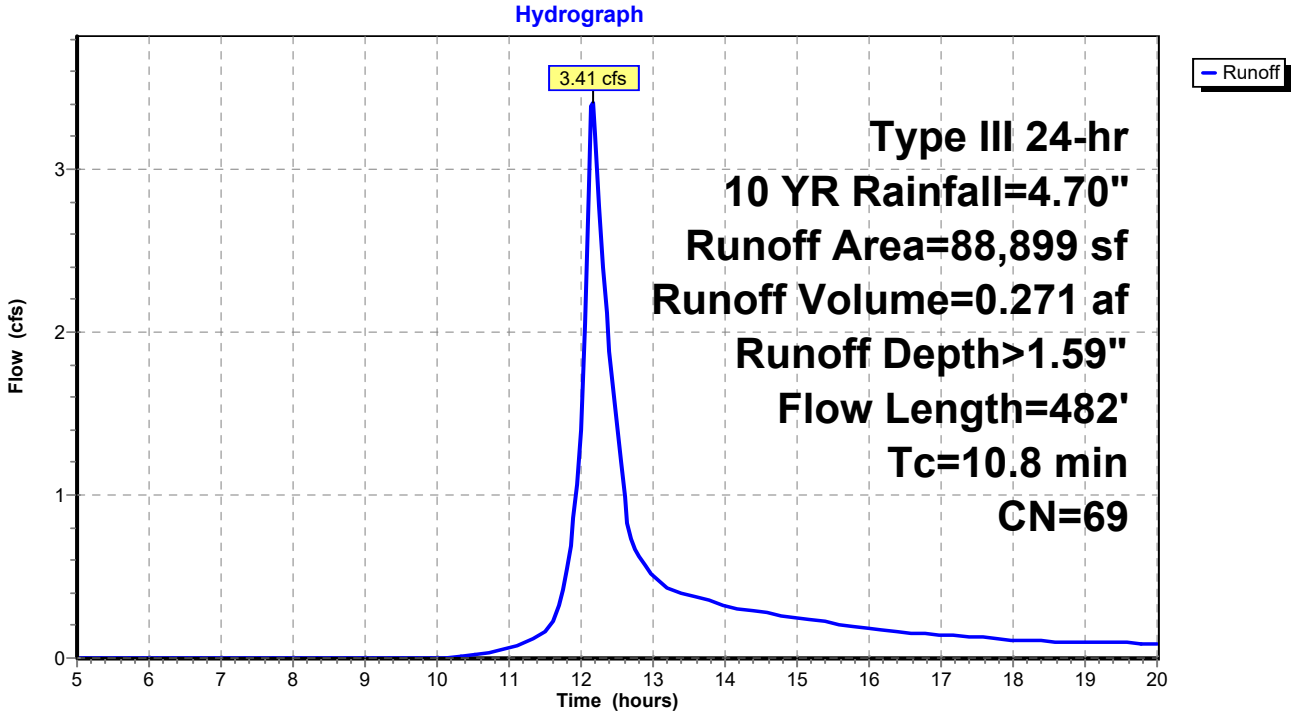
Runoff = 3.41 cfs @ 12.16 hrs, Volume= 0.271 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
6,306	80	>75% Grass cover, Good, HSG D
8,040	39	>75% Grass cover, Good, HSG A
3,659	30	Meadow, non-grazed, HSG A
1,952	58	Meadow, non-grazed, HSG B
16,037	78	Meadow, non-grazed, HSG D
11,906	30	Woods, Good, HSG A
16,383	77	Woods, Good, HSG D
2,938	98	Paved parking & roofs
21,678	91	Gravel roads, HSG D
88,899	69	Weighted Average
85,961		96.70% Pervious Area
2,938		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	30	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	19	0.0200	0.98		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
1.2	14	0.0740	0.19		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.1	5	0.0100	0.57		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	33	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.2	30	0.0833	2.02		**Shallow Concentrated Flow, S2** Short Grass Pasture Kv= 7.0 fps
0.9	85	0.0950	1.54		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.6	65	0.0740	1.90		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0320	3.63		**Shallow Concentrated Flow, S5** Paved Kv= 20.3 fps
0.2	9	0.0100	0.70		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, S7** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0270	3.34		**Shallow Concentrated Flow, S8** Paved Kv= 20.3 fps
0.2	19	0.0540	1.63		**Shallow Concentrated Flow, S9** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.4160	3.22		**Shallow Concentrated Flow, S10** Woodland Kv= 5.0 fps
10.8	482	Total			

Subcatchment 3: DA 3



Summary for Subcatchment 4: DA 4

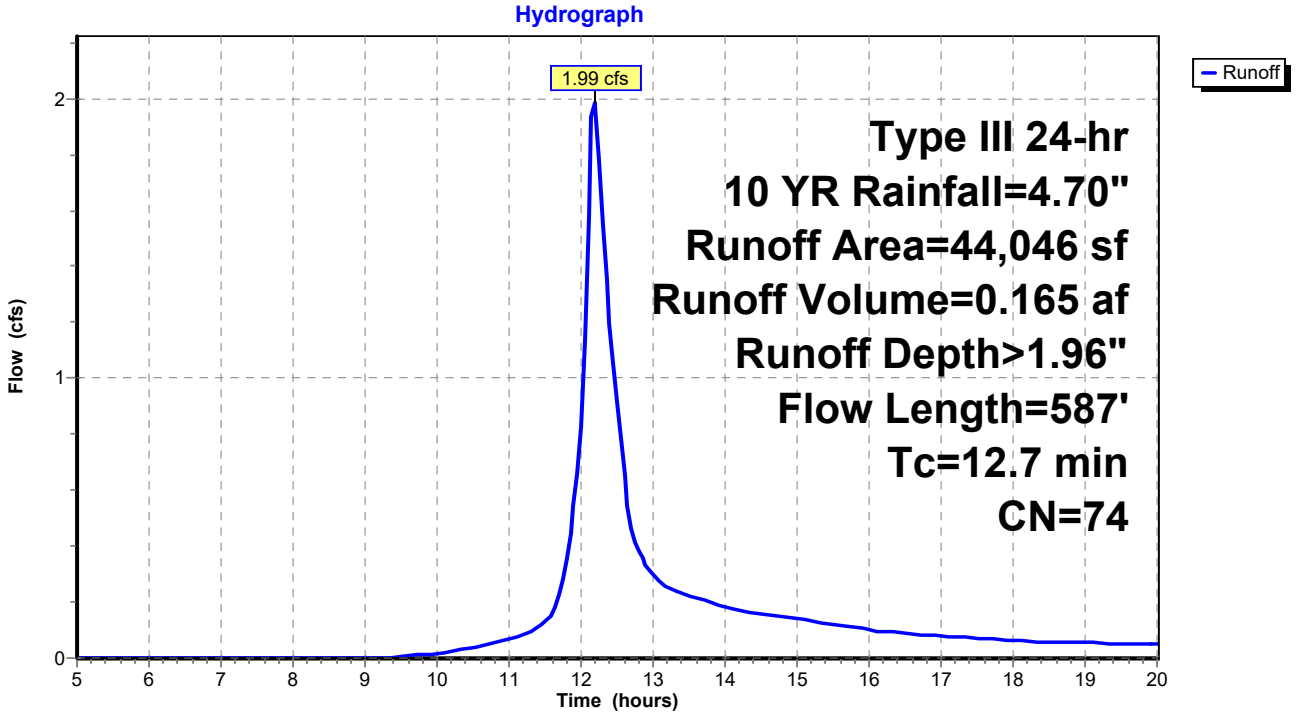
Runoff = 1.99 cfs @ 12.18 hrs, Volume= 0.165 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
5,732	39	>75% Grass cover, Good, HSG A
690	80	>75% Grass cover, Good, HSG D
33,657	77	Woods, Good, HSG D
3,967	98	Paved parking & roofs
44,046	74	Weighted Average
40,079		90.99% Pervious Area
3,967		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	43	0.0230	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	24	0.0420	1.38		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
3.0	29	0.0340	0.16		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.0	5	0.0100	2.03		**Shallow Concentrated Flow, S4** Paved Kv= 20.3 fps
1.6	121	0.0330	1.27		**Shallow Concentrated Flow, S5** Short Grass Pasture Kv= 7.0 fps
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, S6** Woodland Kv= 5.0 fps
0.2	41	0.3630	3.01		**Shallow Concentrated Flow, S7** Woodland Kv= 5.0 fps
1.7	187	0.1290	1.80		**Shallow Concentrated Flow, S8** Woodland Kv= 5.0 fps
0.6	65	0.1550	1.97		**Shallow Concentrated Flow, S9** Woodland Kv= 5.0 fps
12.7	587	Total			

Subcatchment 4: DA 4



Summary for Subcatchment 1: DA 1

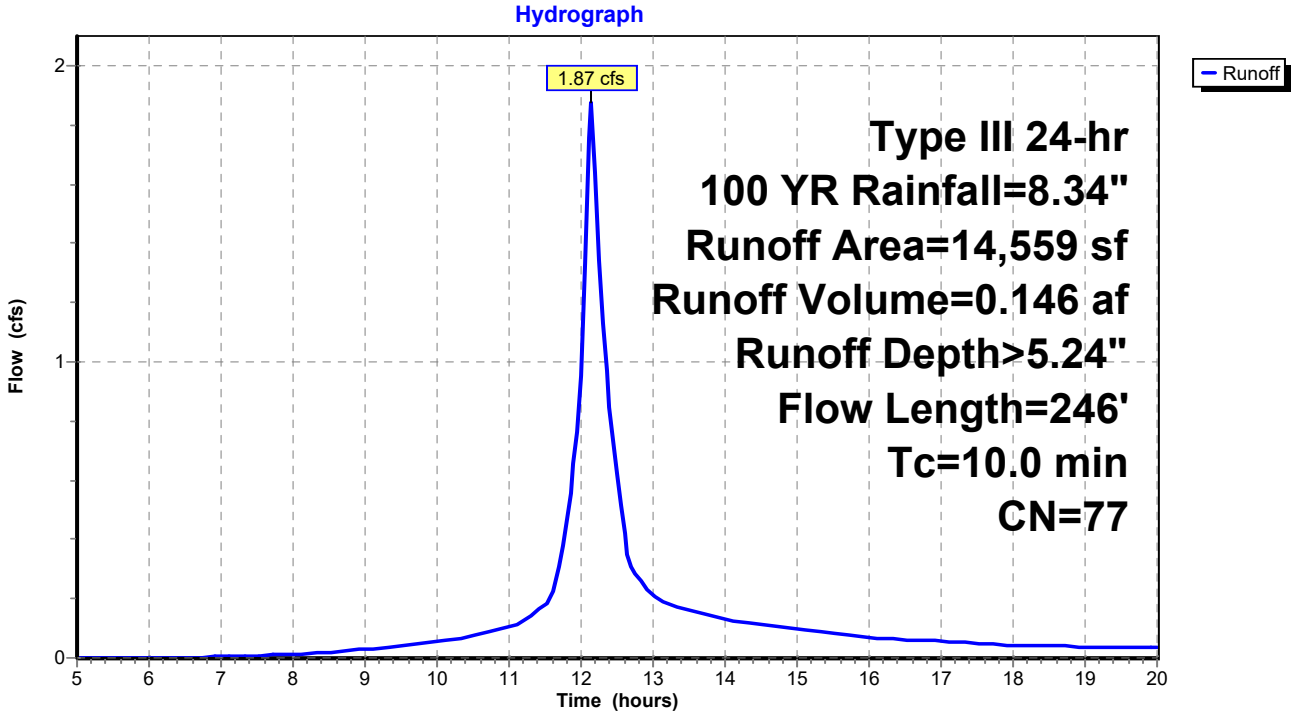
Runoff = 1.87 cfs @ 12.14 hrs, Volume= 0.146 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
14,559	77	Woods, Good, HSG D
14,559		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	15	0.6000	0.21		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	62	0.1120	0.14		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.4	169	0.1630	2.02		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
10.0	246	Total			

Subcatchment 1: DA 1



Summary for Subcatchment 2: DA 2

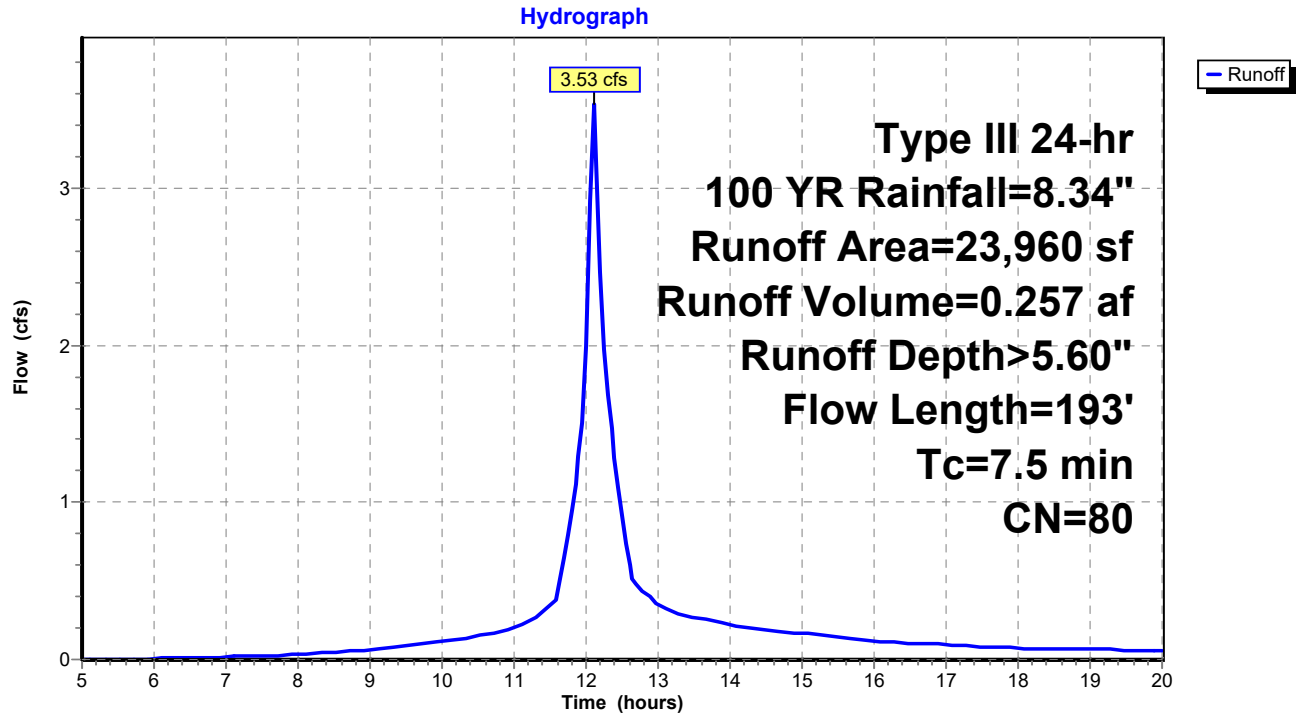
Runoff = 3.53 cfs @ 12.11 hrs, Volume= 0.257 af, Depth> 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
21,051	77	Woods, Good, HSG D
2,909	98	Paved parking & roofs
23,960	80	Weighted Average
21,051		87.86% Pervious Area
2,909		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	93	0.2780	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	88	0.0620	5.05		**Shallow Concentrated Flow, S2** Paved Kv= 20.3 fps
0.1	12	0.0833	1.44		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.5	193	Total			

Subcatchment 2: DA 2



Summary for Subcatchment 3: DA 3

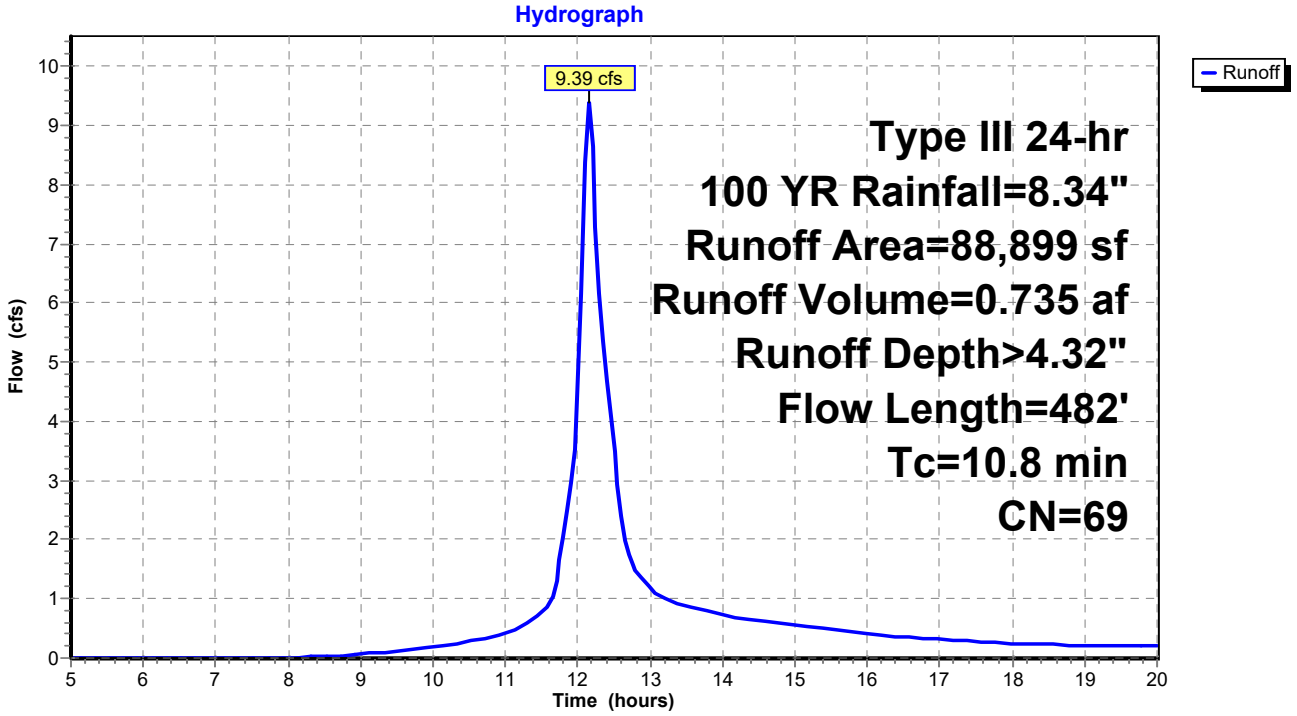
Runoff = 9.39 cfs @ 12.15 hrs, Volume= 0.735 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
6,306	80	>75% Grass cover, Good, HSG D
8,040	39	>75% Grass cover, Good, HSG A
3,659	30	Meadow, non-grazed, HSG A
1,952	58	Meadow, non-grazed, HSG B
16,037	78	Meadow, non-grazed, HSG D
11,906	30	Woods, Good, HSG A
16,383	77	Woods, Good, HSG D
2,938	98	Paved parking & roofs
21,678	91	Gravel roads, HSG D
88,899	69	Weighted Average
85,961		96.70% Pervious Area
2,938		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	30	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	19	0.0200	0.98		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
1.2	14	0.0740	0.19		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.1	5	0.0100	0.57		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	33	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.2	30	0.0833	2.02		**Shallow Concentrated Flow, S2** Short Grass Pasture Kv= 7.0 fps
0.9	85	0.0950	1.54		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.6	65	0.0740	1.90		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0320	3.63		**Shallow Concentrated Flow, S5** Paved Kv= 20.3 fps
0.2	9	0.0100	0.70		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, S7** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0270	3.34		**Shallow Concentrated Flow, S8** Paved Kv= 20.3 fps
0.2	19	0.0540	1.63		**Shallow Concentrated Flow, S9** Short Grass Pasture Kv= 7.0 fps
0.3	51	0.4160	3.22		**Shallow Concentrated Flow, S10** Woodland Kv= 5.0 fps
10.8	482	Total			

Subcatchment 3: DA 3



Summary for Subcatchment 4: DA 4

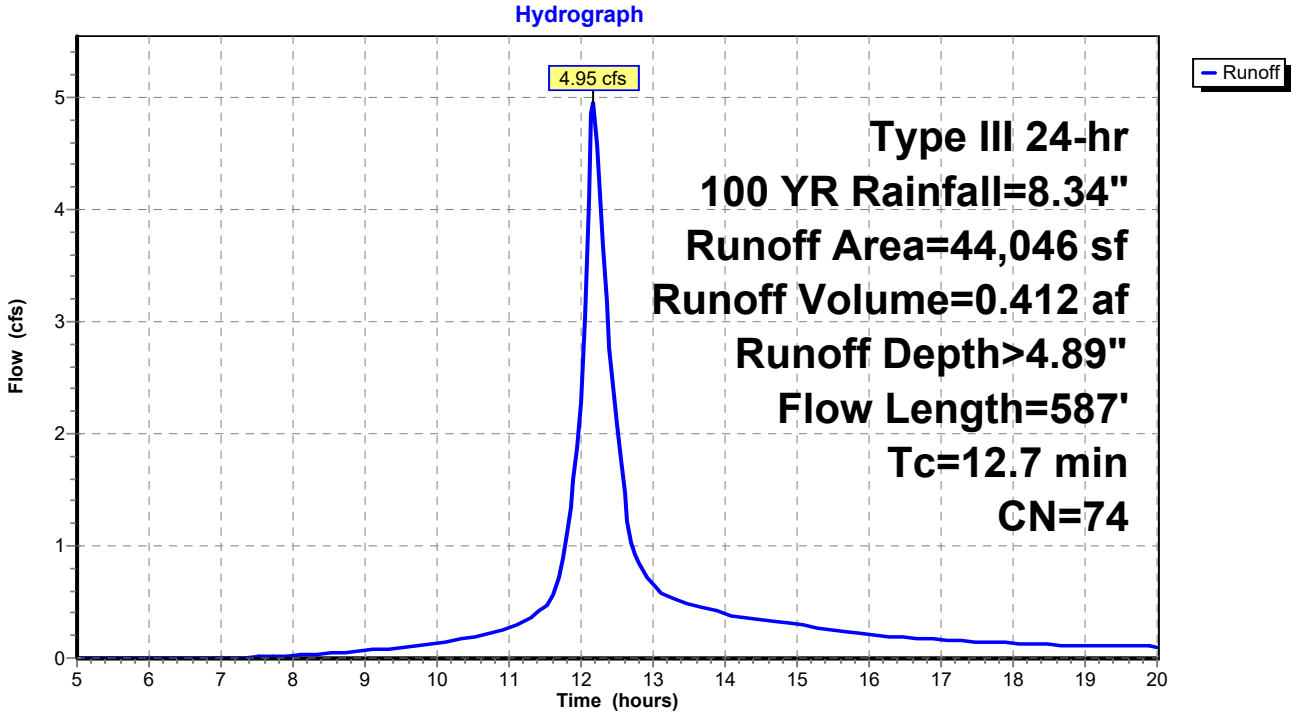
Runoff = 4.95 cfs @ 12.17 hrs, Volume= 0.412 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
5,732	39	>75% Grass cover, Good, HSG A
690	80	>75% Grass cover, Good, HSG D
33,657	77	Woods, Good, HSG D
3,967	98	Paved parking & roofs
44,046	74	Weighted Average
40,079		90.99% Pervious Area
3,967		9.01% Impervious Area

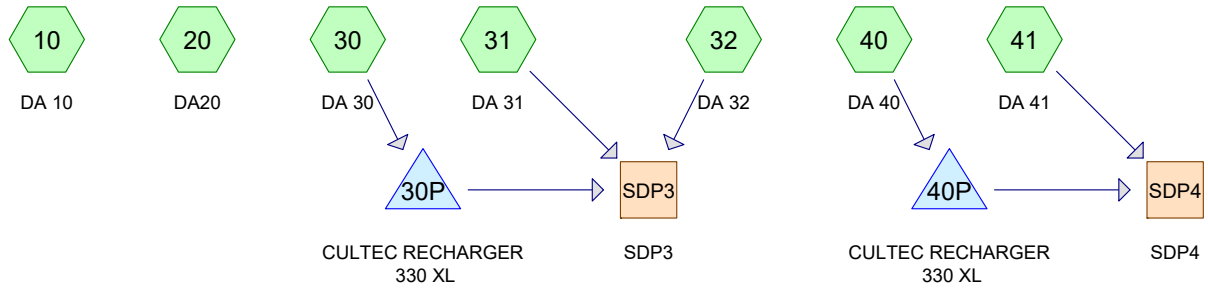
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	43	0.0230	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	24	0.0420	1.38		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
3.0	29	0.0340	0.16		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.0	5	0.0100	2.03		**Shallow Concentrated Flow, S4** Paved Kv= 20.3 fps
1.6	121	0.0330	1.27		**Shallow Concentrated Flow, S5** Short Grass Pasture Kv= 7.0 fps
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, S6** Woodland Kv= 5.0 fps
0.2	41	0.3630	3.01		**Shallow Concentrated Flow, S7** Woodland Kv= 5.0 fps
1.7	187	0.1290	1.80		**Shallow Concentrated Flow, S8** Woodland Kv= 5.0 fps
0.6	65	0.1550	1.97		**Shallow Concentrated Flow, S9** Woodland Kv= 5.0 fps
12.7	587	Total			

Subcatchment 4: DA 4



APPENDIX E

POST-DEVELOPMENT HYDROCAD MODEL



Subcat Reach Pond Link

Routing Diagram for FERRY ST POST (2)
Prepared by Hudson Land Design Professional Engineering, P.C.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.506	39	>75% Grass cover, Good, HSG A (30, 40)
0.050	61	>75% Grass cover, Good, HSG B (30, 31)
0.495	80	>75% Grass cover, Good, HSG D (20, 30, 31, 32, 40)
0.050	91	Gravel roads, HSG D (40, 41)
0.367	78	Meadow, non-grazed, HSG D (10, 40, 41)
1.311	98	Paved parking & roofs (10, 20, 30, 40, 41)
0.036	98	Paved parking, HSG A (32)
0.032	98	Paved parking, HSG D (31)
1.100	77	Woods, Good, HSG D (10, 20, 31, 40, 41)
3.947	**80**	**TOTAL AREA**

Summary for Subcatchment 10: DA 10

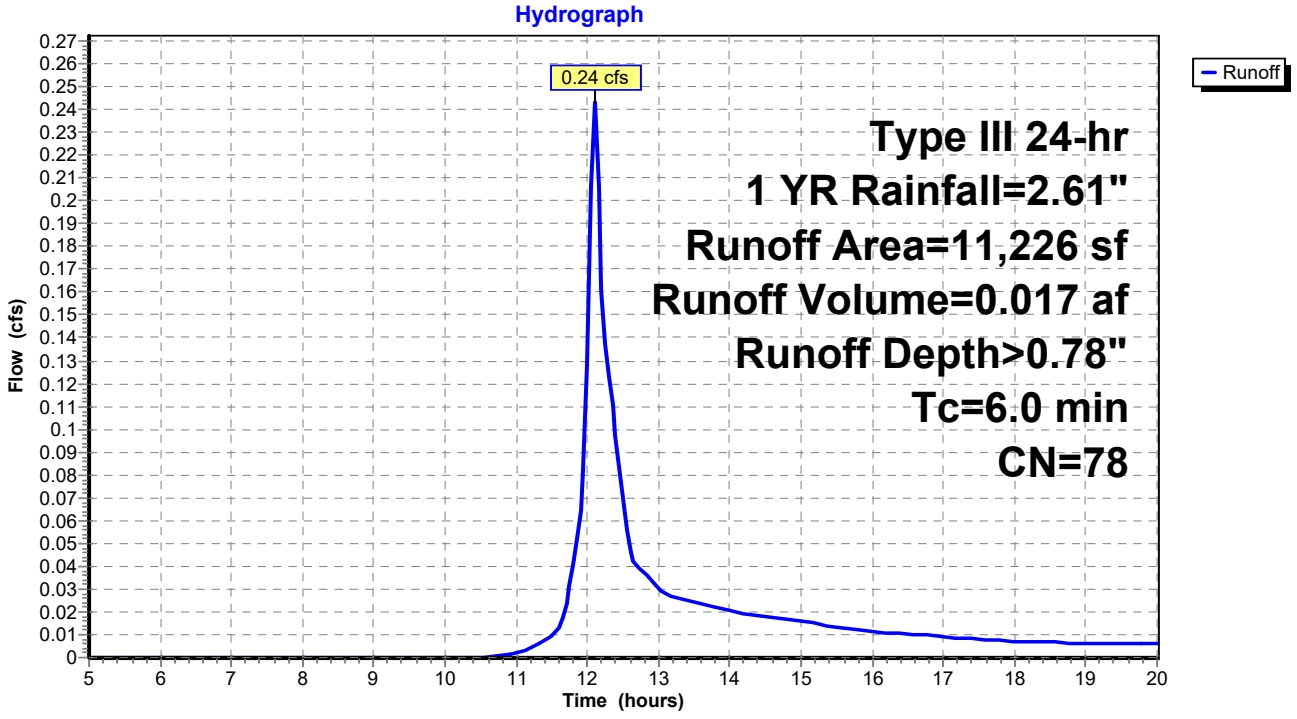
Runoff = 0.24 cfs @ 12.10 hrs, Volume= 0.017 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
7,498	77	Woods, Good, HSG D
3,629	78	Meadow, non-grazed, HSG D
99	98	Paved parking & roofs
11,226	78	Weighted Average
11,127		99.12% Pervious Area
99		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 10: DA 10



Summary for Subcatchment 20: DA20

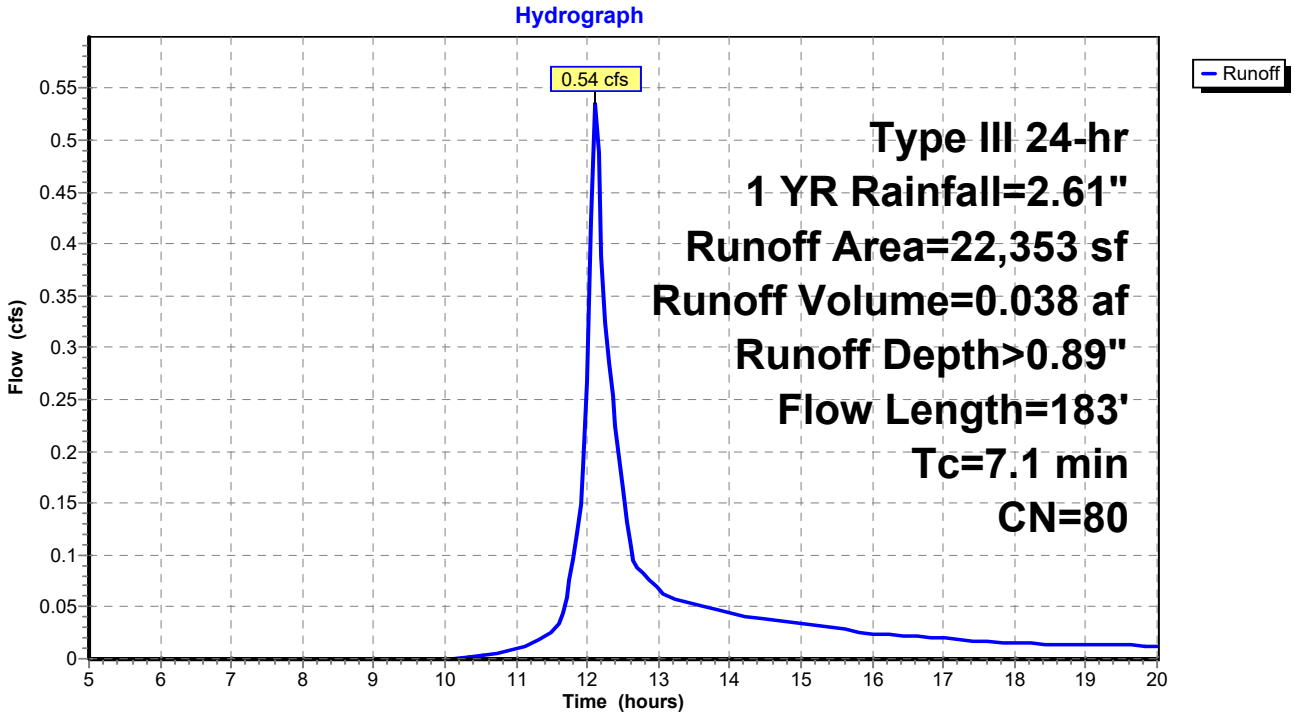
Runoff = 0.54 cfs @ 12.11 hrs, Volume= 0.038 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
18,529	77	Woods, Good, HSG D
3,451	98	Paved parking & roofs
373	80	>75% Grass cover, Good, HSG D
22,353	80	Weighted Average
18,902		84.56% Pervious Area
3,451		15.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	82	0.2930	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	89	0.0670	2.17		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
0.1	12	0.1250	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.1	183	Total			

Subcatchment 20: DA20



Summary for Subcatchment 30: DA 30

Runoff = 1.85 cfs @ 12.15 hrs, Volume= 0.144 af, Depth> 0.88"

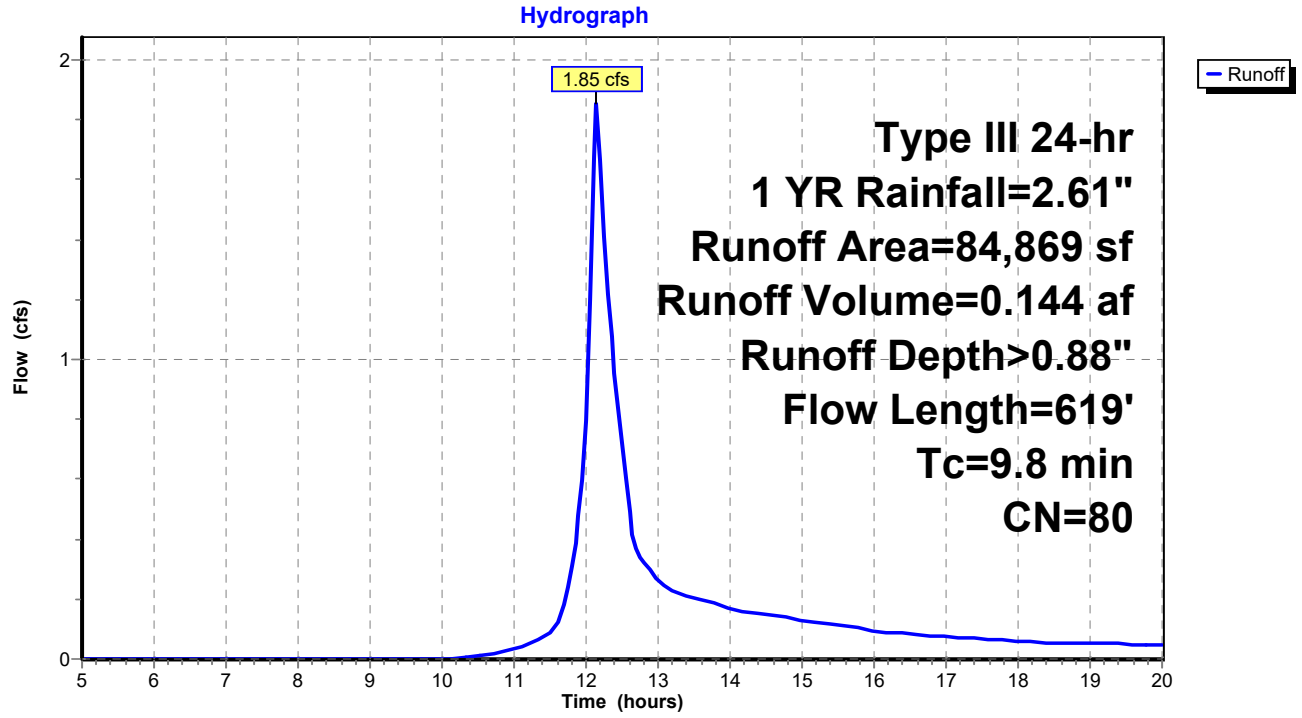
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
20,967	39	>75% Grass cover, Good, HSG A
13,914	80	>75% Grass cover, Good, HSG D
164	61	>75% Grass cover, Good, HSG B
49,824	98	Paved parking & roofs
84,869	80	Weighted Average
35,045		41.29% Pervious Area
49,824		58.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	31	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	18	0.0200	0.97		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
2.2	11	0.0100	0.08		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.2	8	0.0100	0.63		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	32	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.4	63	0.1190	2.41		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0170	7.44	9.12	**Pipe Channel, S7** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	66	0.0639	13.31	16.33	**Pipe Channel, S8** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	79	0.0847	15.32	18.80	**Pipe Channel, S9** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	27	0.0183	7.12	8.74	**Pipe Channel, S10** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	37	0.0107	5.45	6.68	**Pipe Channel, S11** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	53	0.0380	10.26	12.59	**Pipe Channel, S12** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	93	0.0097	5.18	6.36	**Pipe Channel, S13** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior

0.0	8	0.0507	11.85	14.55	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	11	0.1930	23.13	28.38	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.8	619	Total			

Subcatchment 30: DA 30



Summary for Subcatchment 31: DA 31

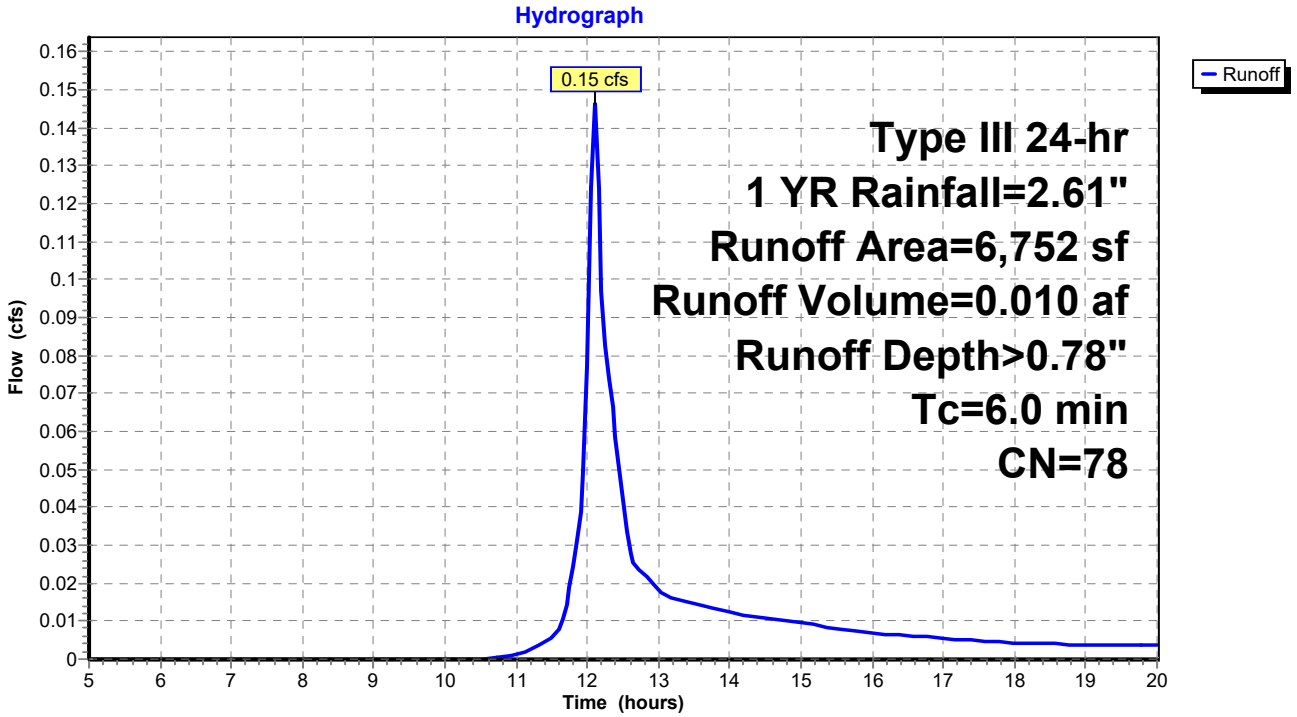
Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.010 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
2,028	61	>75% Grass cover, Good, HSG B
2,587	80	>75% Grass cover, Good, HSG D
762	77	Woods, Good, HSG D
1,375	98	Paved parking, HSG D
6,752	78	Weighted Average
5,377		79.64% Pervious Area
1,375		20.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 31: DA 31



Summary for Subcatchment 32: DA 32

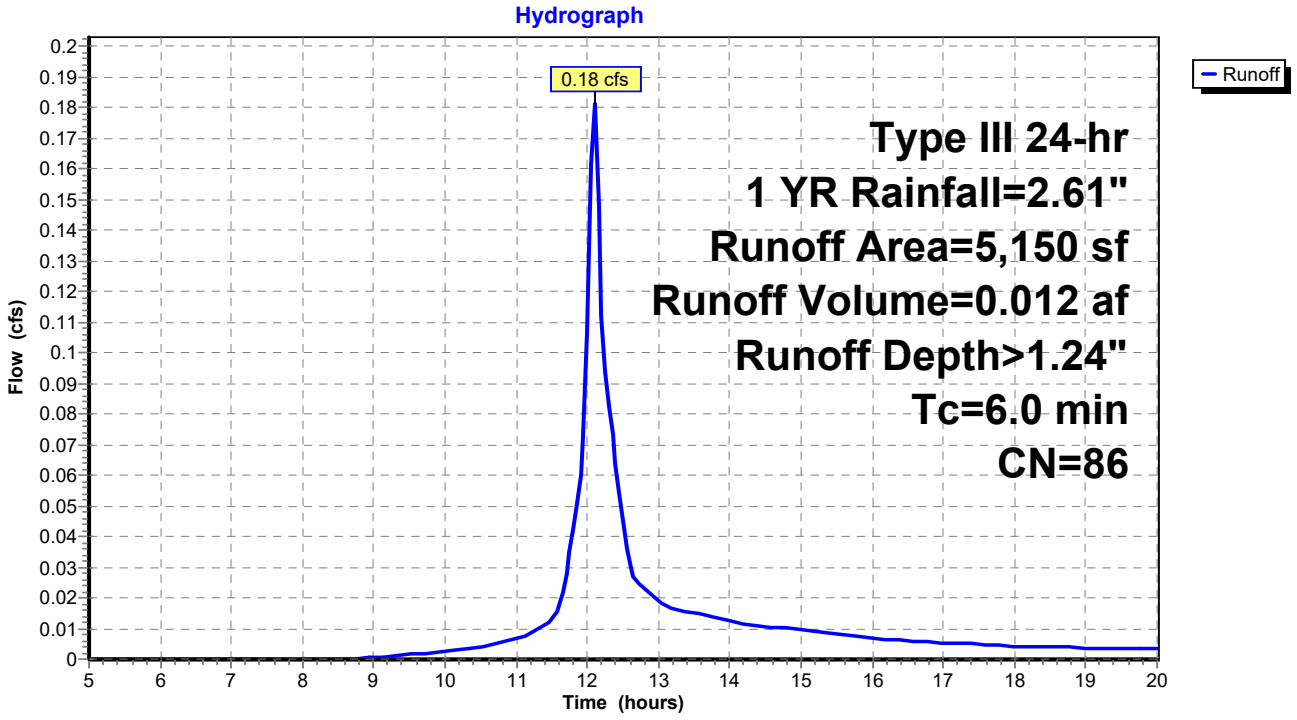
Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
3,575	80	>75% Grass cover, Good, HSG D
1,575	98	Paved parking, HSG A
5,150	86	Weighted Average
3,575		69.42% Pervious Area
1,575		30.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 32: DA 32



Summary for Subcatchment 40: DA 40

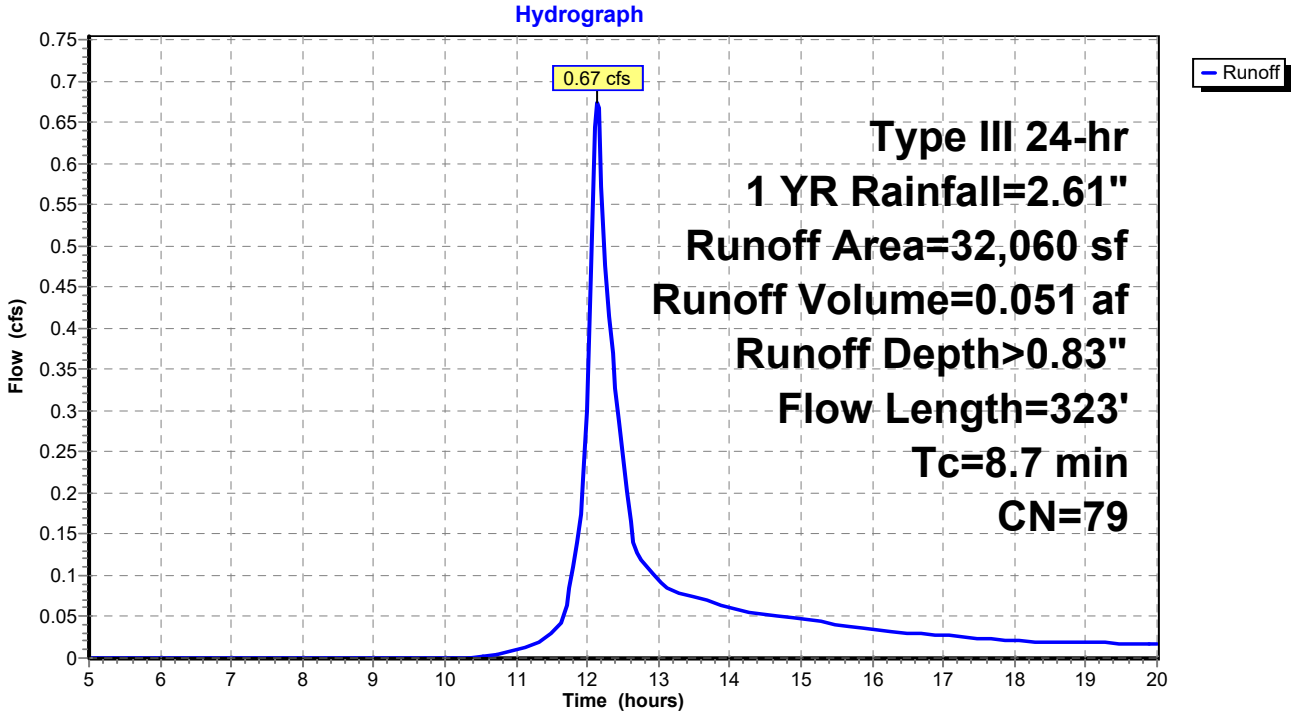
Runoff = 0.67 cfs @ 12.14 hrs, Volume= 0.051 af, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
17,970	77	Woods, Good, HSG D
1,070	39	>75% Grass cover, Good, HSG A
1,114	80	>75% Grass cover, Good, HSG D
7,087	78	Meadow, non-grazed, HSG D
1,245	91	Gravel roads, HSG D
3,574	98	Paved parking & roofs
32,060	79	Weighted Average
28,486		88.85% Pervious Area
3,574		11.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	61	0.1150	0.31		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
3.3	39	0.3300	0.20		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.9	199	0.1260	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.2	24	0.1250	2.47		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
8.7	323	Total			

Subcatchment 40: DA 40



Summary for Subcatchment 41: DA 41

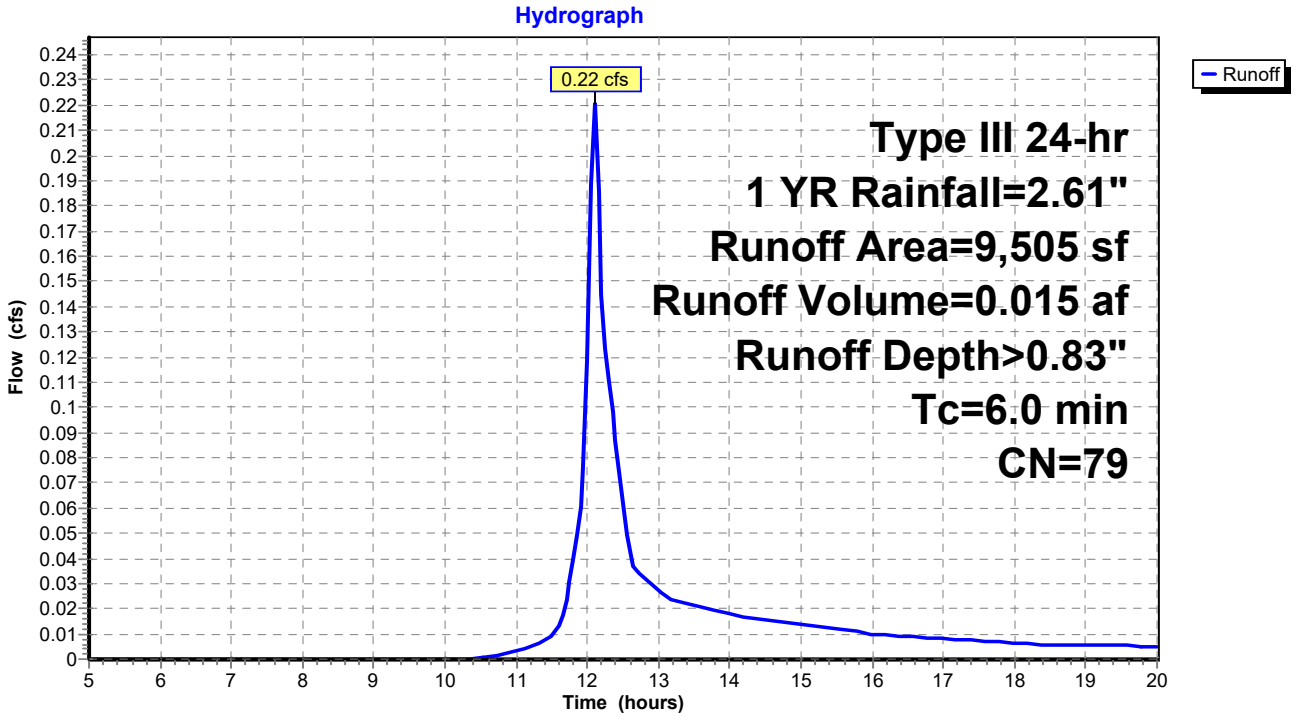
Runoff = 0.22 cfs @ 12.10 hrs, Volume= 0.015 af, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
3,173	77	Woods, Good, HSG D
5,266	78	Meadow, non-grazed, HSG D
927	91	Gravel roads, HSG D
139	98	Paved parking & roofs
9,505	79	Weighted Average
9,366		98.54% Pervious Area
139		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1 (use min Tc)**

Subcatchment 41: DA 41

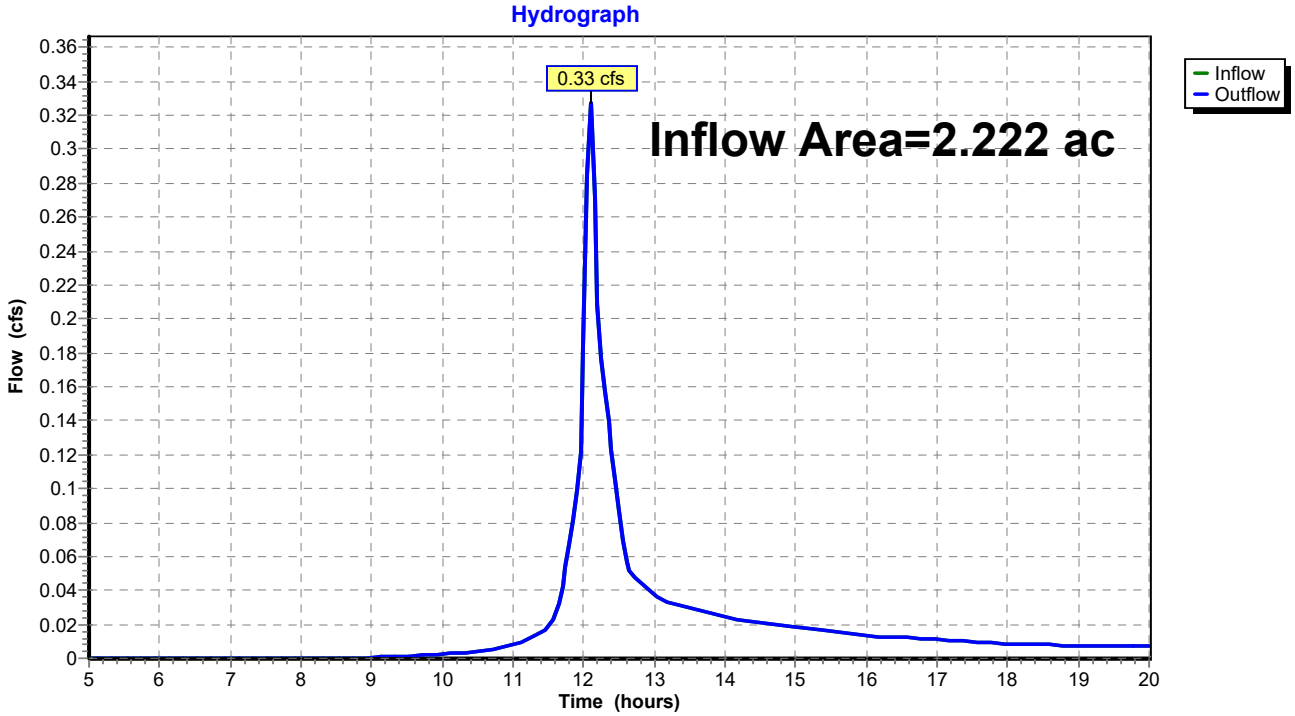


Summary for Reach SDP3: SDP3

Inflow Area = 2.222 ac, 54.53% Impervious, Inflow Depth > 0.12" for 1 YR event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP3: SDP3

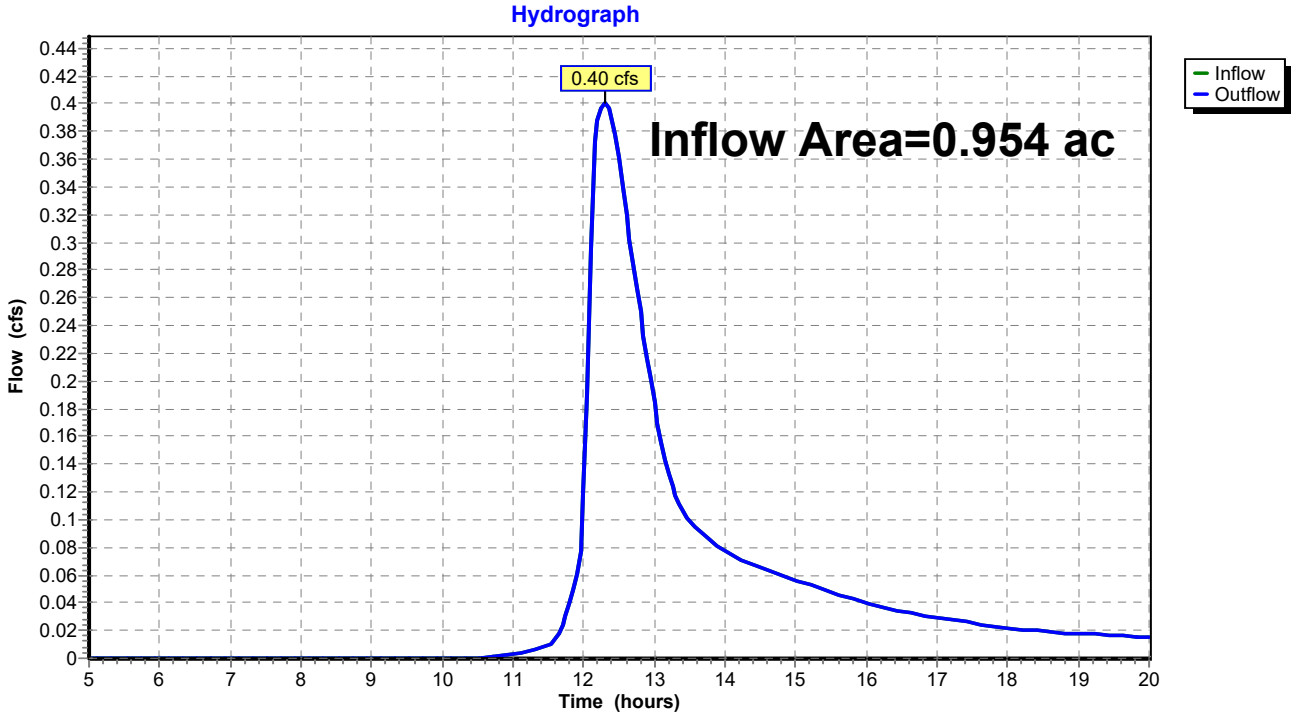


Summary for Reach SDP4: SDP4

Inflow Area = 0.954 ac, 8.93% Impervious, Inflow Depth > 0.67" for 1 YR event
Inflow = 0.40 cfs @ 12.31 hrs, Volume= 0.054 af
Outflow = 0.40 cfs @ 12.31 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP4: SDP4



Summary for Pond 30P: CULTEC RECHARGER 330 XL

Inflow Area = 1.948 ac, 58.71% Impervious, Inflow Depth > 0.88" for 1 YR event
Inflow = 1.85 cfs @ 12.15 hrs, Volume= 0.144 af
Outflow = 0.29 cfs @ 12.89 hrs, Volume= 0.143 af, Atten= 84%, Lag= 44.6 min
Discarded = 0.29 cfs @ 12.89 hrs, Volume= 0.143 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 111.56' @ 12.89 hrs Surf.Area= 0.057 ac Storage= 0.049 af

Plug-Flow detention time= 64.2 min calculated for 0.143 af (99% of inflow)
Center-of-Mass det. time= 63.2 min (878.3 - 815.1)

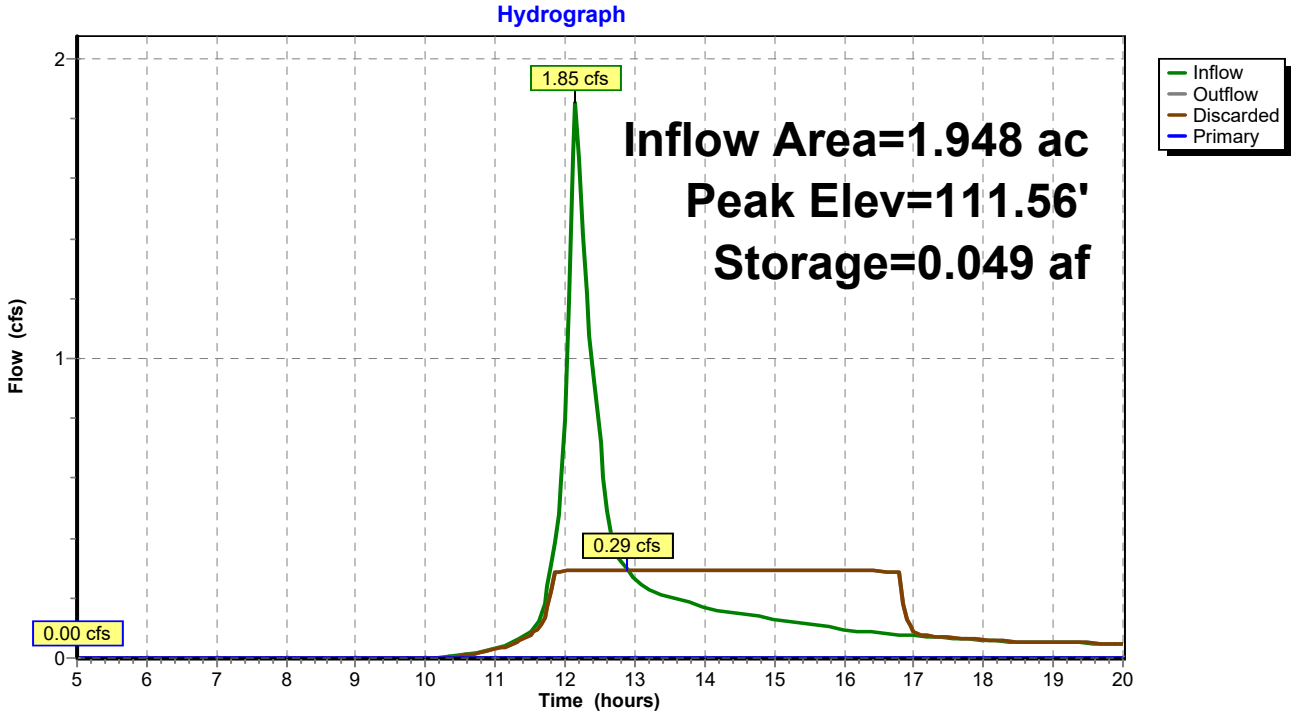
Volume	Invert	Avail.Storage	Storage Description
#1	110.00'	0.152 af	**26.00'W x 96.00'L x 8.00'H Prismatoid** 0.458 af Overall - 0.079 af Embedded = 0.379 af x 40.0% Voids
#2	111.00'	0.079 af	**Cultec R-330XLHD** x 65 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.231 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.00' / 111.90' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	110.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 11.00'

Discarded OutFlow Max=0.29 cfs @ 12.89 hrs HW=111.56' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=110.00' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 30P: CULTEC RECHARGER 330 XL



Summary for Pond 40P: CULTEC RECHARGER 330 XL

Inflow Area = 0.736 ac, 11.15% Impervious, Inflow Depth > 0.83" for 1 YR event
Inflow = 0.67 cfs @ 12.14 hrs, Volume= 0.051 af
Outflow = 0.31 cfs @ 12.42 hrs, Volume= 0.044 af, Atten= 54%, Lag= 17.1 min
Discarded = 0.01 cfs @ 12.42 hrs, Volume= 0.006 af
Primary = 0.30 cfs @ 12.42 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.69' @ 12.42 hrs Surf.Area= 672 sf Storage= 630 cf

Plug-Flow detention time= 69.8 min calculated for 0.044 af (86% of inflow)
Center-of-Mass det. time= 29.7 min (846.6 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	1,555 cf	**16.00'W x 42.00'L x 7.00'H Prismatoid** 4,704 cf Overall - 816 cf Embedded = 3,888 cf x 40.0% Voids
#2	81.00'	816 cf	**Cultec R-330XLHD** x 15 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	87.00'	250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		2,621 cf	Total Available Storage

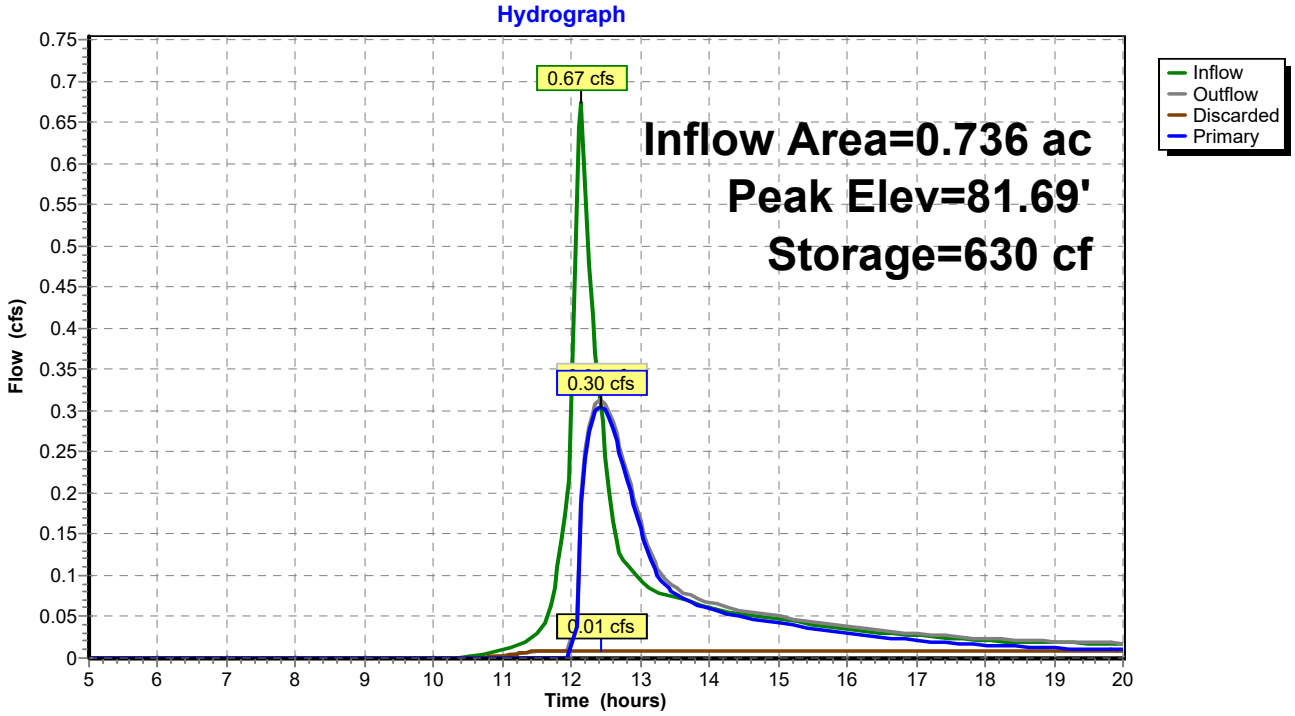
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	100	0	0
88.00	400	250	250

Device	Routing	Invert	Outlet Devices
#1	Primary	81.00'	**4.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.00' / 79.50' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Primary	81.80'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.80' / 80.30' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Discarded	80.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1.00'

Discarded OutFlow Max=0.01 cfs @ 12.42 hrs HW=81.69' (Free Discharge)
└**3=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.30 cfs @ 12.42 hrs HW=81.69' (Free Discharge)
├**1=Culvert** (Inlet Controls 0.30 cfs @ 3.48 fps)
└**2=Culvert** (Controls 0.00 cfs)

Pond 40P: CULTEC RECHARGER 330 XL



Summary for Subcatchment 10: DA 10

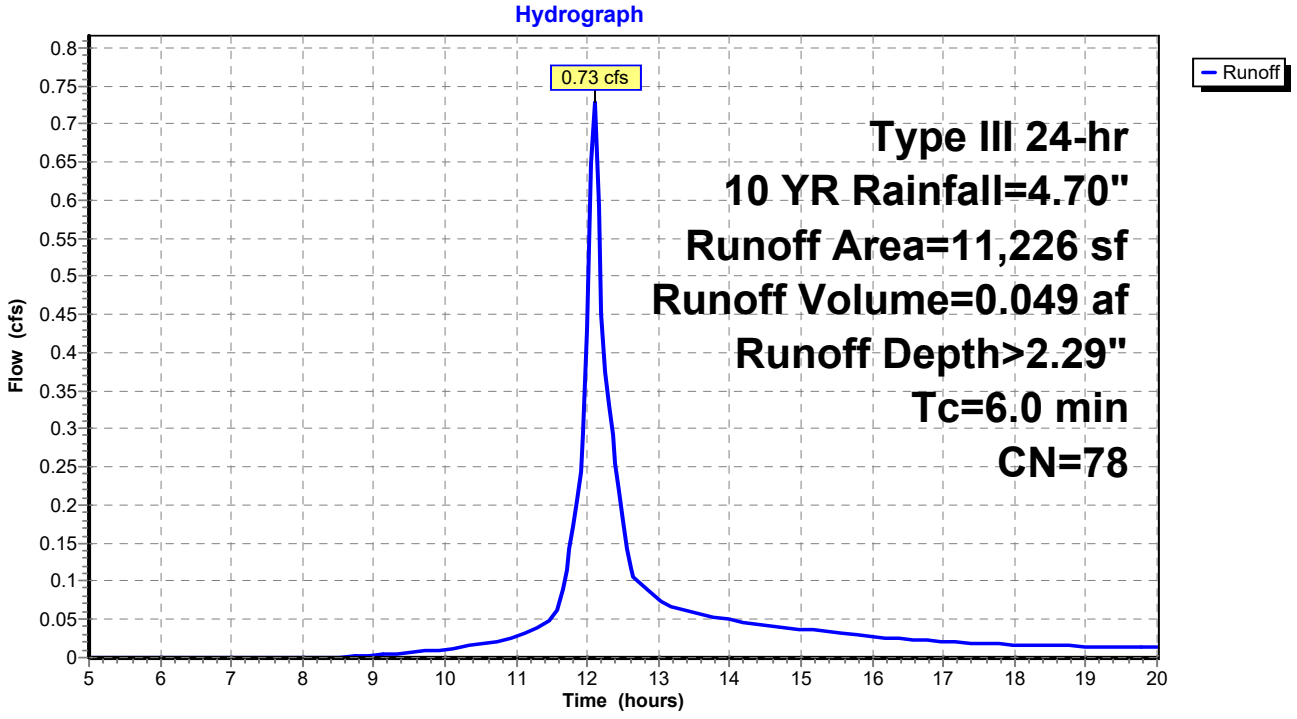
Runoff = 0.73 cfs @ 12.09 hrs, Volume= 0.049 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
7,498	77	Woods, Good, HSG D
3,629	78	Meadow, non-grazed, HSG D
99	98	Paved parking & roofs
11,226	78	Weighted Average
11,127		99.12% Pervious Area
99		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 10: DA 10



Summary for Subcatchment 20: DA20

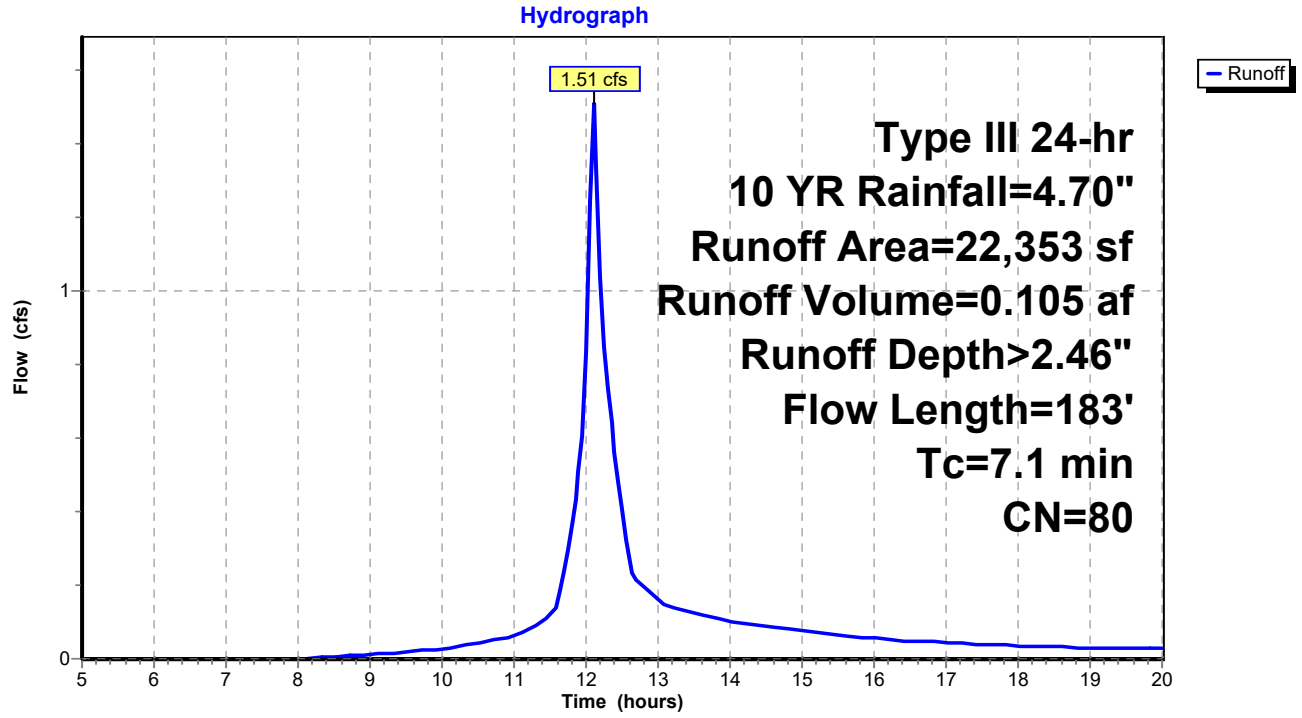
Runoff = 1.51 cfs @ 12.11 hrs, Volume= 0.105 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
18,529	77	Woods, Good, HSG D
3,451	98	Paved parking & roofs
373	80	>75% Grass cover, Good, HSG D
22,353	80	Weighted Average
18,902		84.56% Pervious Area
3,451		15.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	82	0.2930	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	89	0.0670	2.17		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
0.1	12	0.1250	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.1	183	Total			

Subcatchment 20: DA20



Summary for Subcatchment 30: DA 30

Runoff = 5.22 cfs @ 12.14 hrs, Volume= 0.398 af, Depth> 2.45"

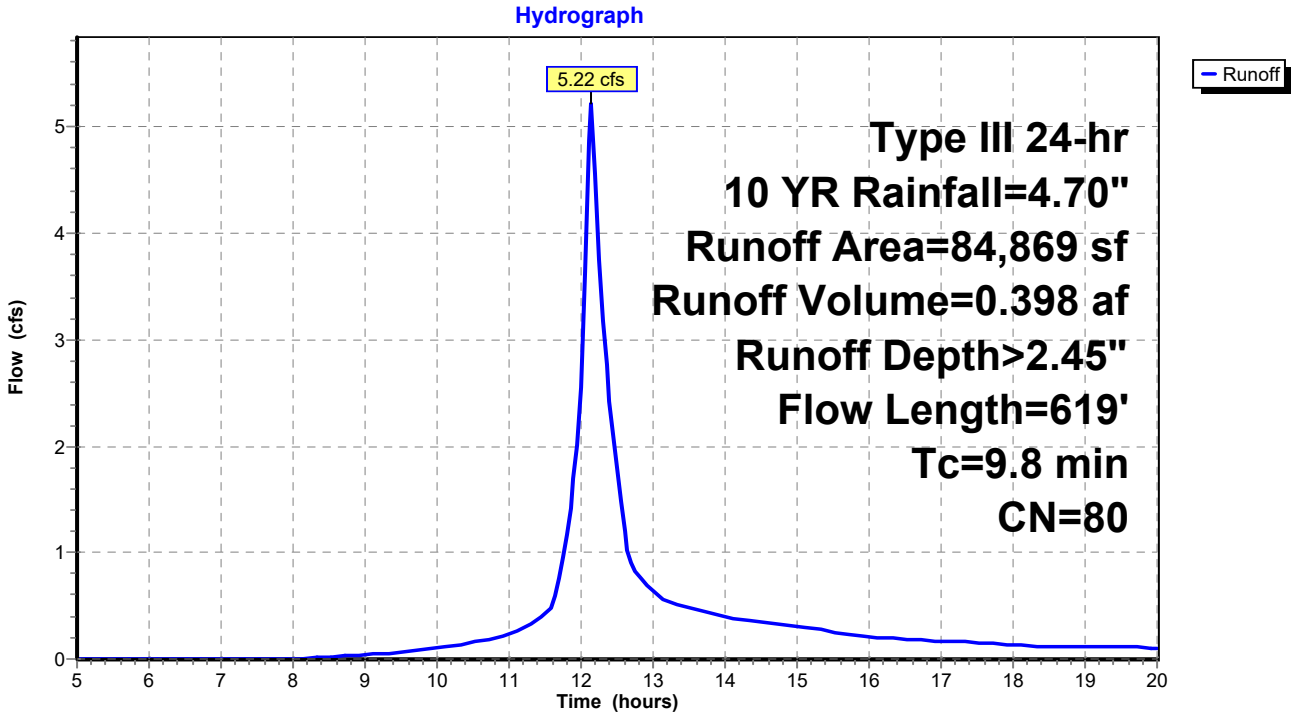
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
20,967	39	>75% Grass cover, Good, HSG A
13,914	80	>75% Grass cover, Good, HSG D
164	61	>75% Grass cover, Good, HSG B
49,824	98	Paved parking & roofs
84,869	80	Weighted Average
35,045		41.29% Pervious Area
49,824		58.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	31	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	18	0.0200	0.97		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
2.2	11	0.0100	0.08		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.2	8	0.0100	0.63		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	32	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.4	63	0.1190	2.41		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0170	7.44	9.12	**Pipe Channel, S7** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	66	0.0639	13.31	16.33	**Pipe Channel, S8** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	79	0.0847	15.32	18.80	**Pipe Channel, S9** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	27	0.0183	7.12	8.74	**Pipe Channel, S10** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	37	0.0107	5.45	6.68	**Pipe Channel, S11** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	53	0.0380	10.26	12.59	**Pipe Channel, S12** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	93	0.0097	5.18	6.36	**Pipe Channel, S13** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior

0.0	8	0.0507	11.85	14.55	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	11	0.1930	23.13	28.38	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.8	619	Total			

Subcatchment 30: DA 30



Summary for Subcatchment 31: DA 31

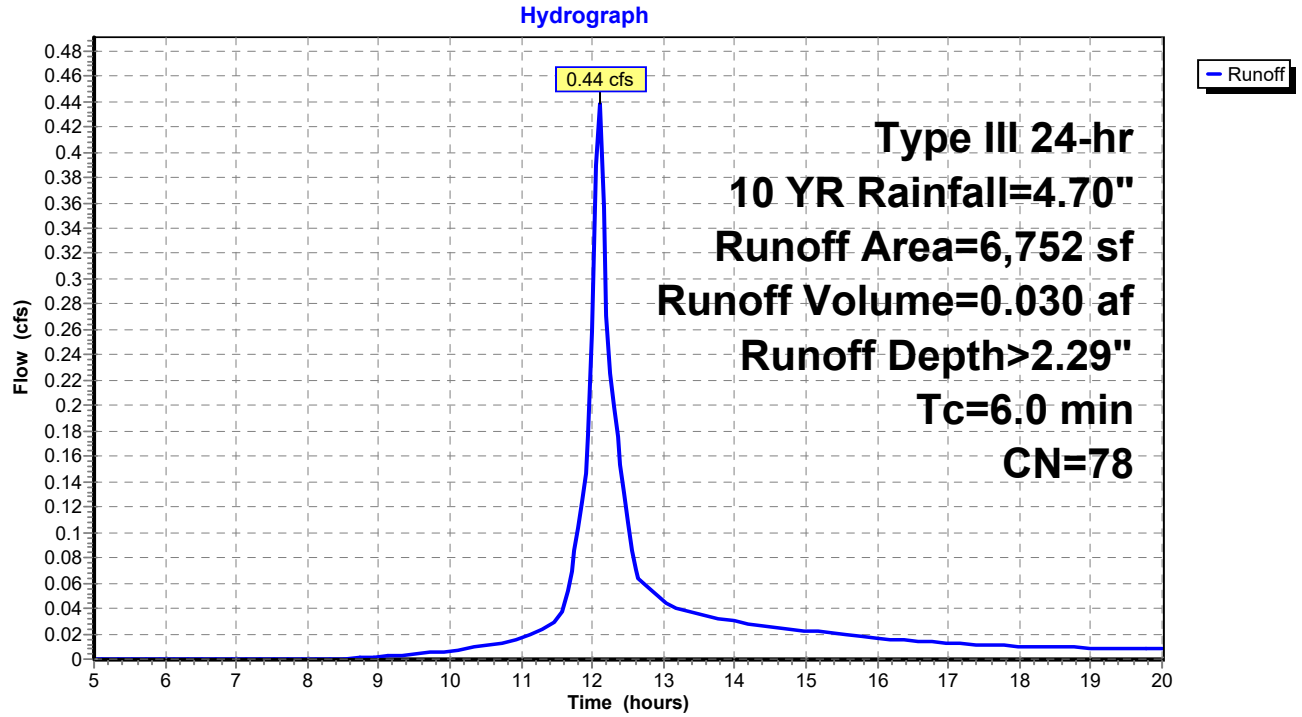
Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
2,028	61	>75% Grass cover, Good, HSG B
2,587	80	>75% Grass cover, Good, HSG D
762	77	Woods, Good, HSG D
1,375	98	Paved parking, HSG D
6,752	78	Weighted Average
5,377		79.64% Pervious Area
1,375		20.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 31: DA 31



Summary for Subcatchment 32: DA 32

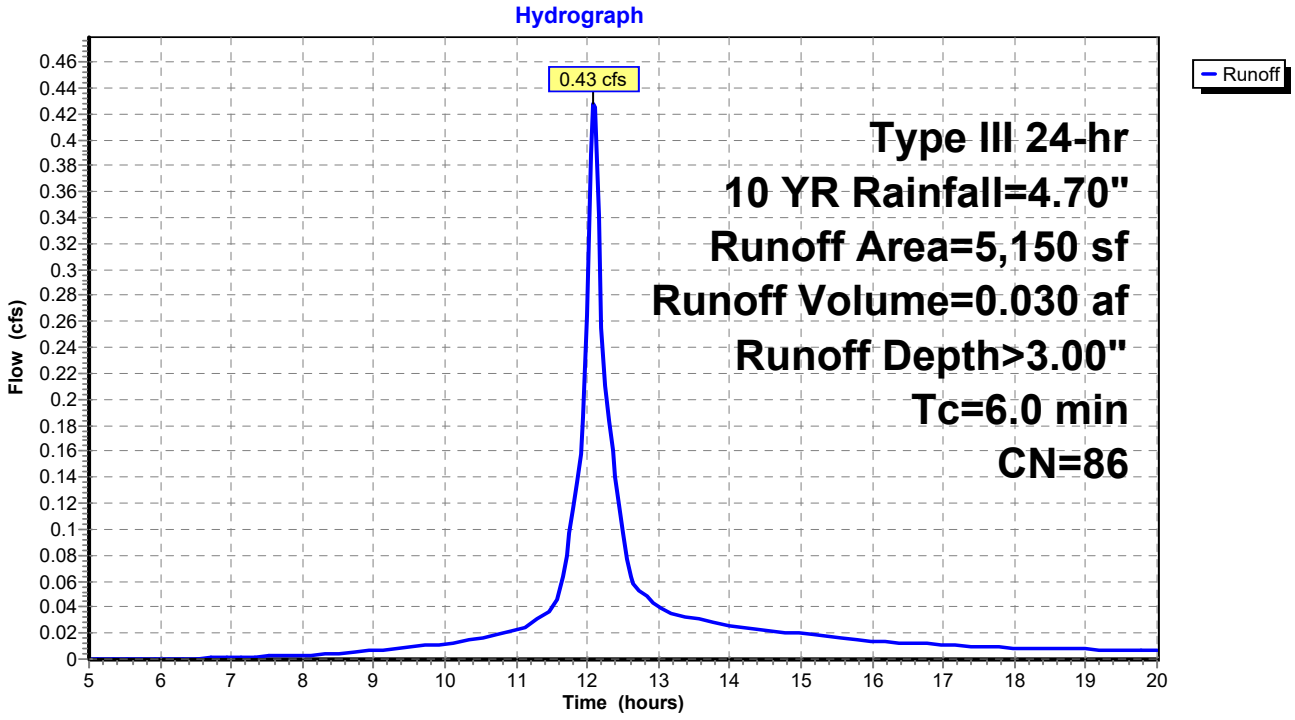
Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
3,575	80	>75% Grass cover, Good, HSG D
1,575	98	Paved parking, HSG A
5,150	86	Weighted Average
3,575		69.42% Pervious Area
1,575		30.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 32: DA 32



Summary for Subcatchment 40: DA 40

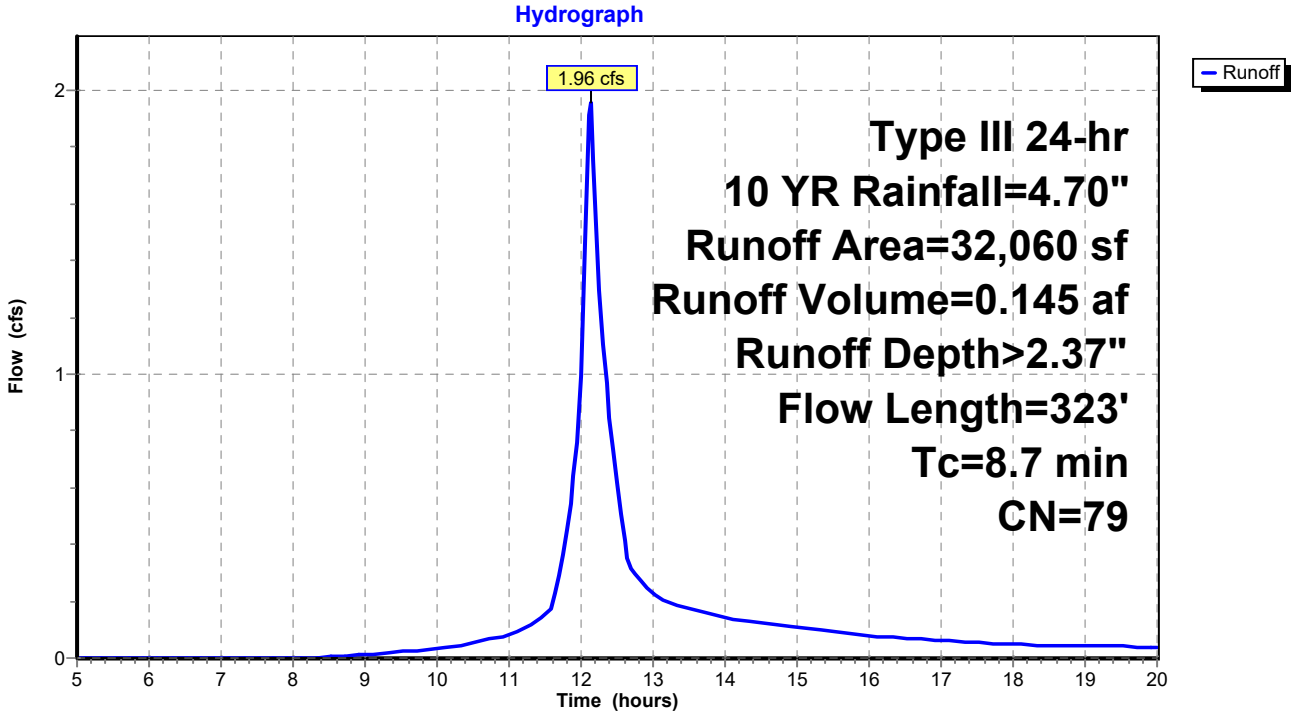
Runoff = 1.96 cfs @ 12.13 hrs, Volume= 0.145 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
17,970	77	Woods, Good, HSG D
1,070	39	>75% Grass cover, Good, HSG A
1,114	80	>75% Grass cover, Good, HSG D
7,087	78	Meadow, non-grazed, HSG D
1,245	91	Gravel roads, HSG D
3,574	98	Paved parking & roofs
32,060	79	Weighted Average
28,486		88.85% Pervious Area
3,574		11.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	61	0.1150	0.31		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
3.3	39	0.3300	0.20		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.9	199	0.1260	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.2	24	0.1250	2.47		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
8.7	323	Total			

Subcatchment 40: DA 40



Summary for Subcatchment 41: DA 41

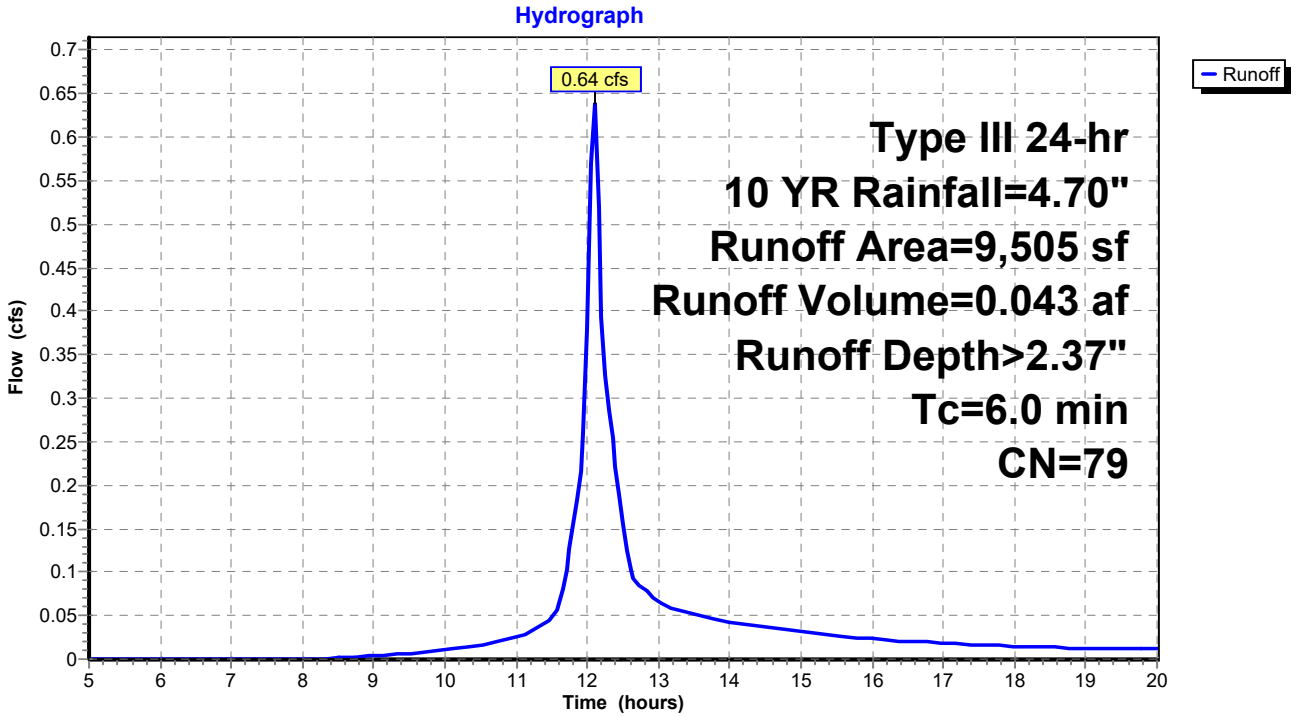
Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.043 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.70"

Area (sf)	CN	Description
3,173	77	Woods, Good, HSG D
5,266	78	Meadow, non-grazed, HSG D
927	91	Gravel roads, HSG D
139	98	Paved parking & roofs
9,505	79	Weighted Average
9,366		98.54% Pervious Area
139		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1 (use min Tc)**

Subcatchment 41: DA 41

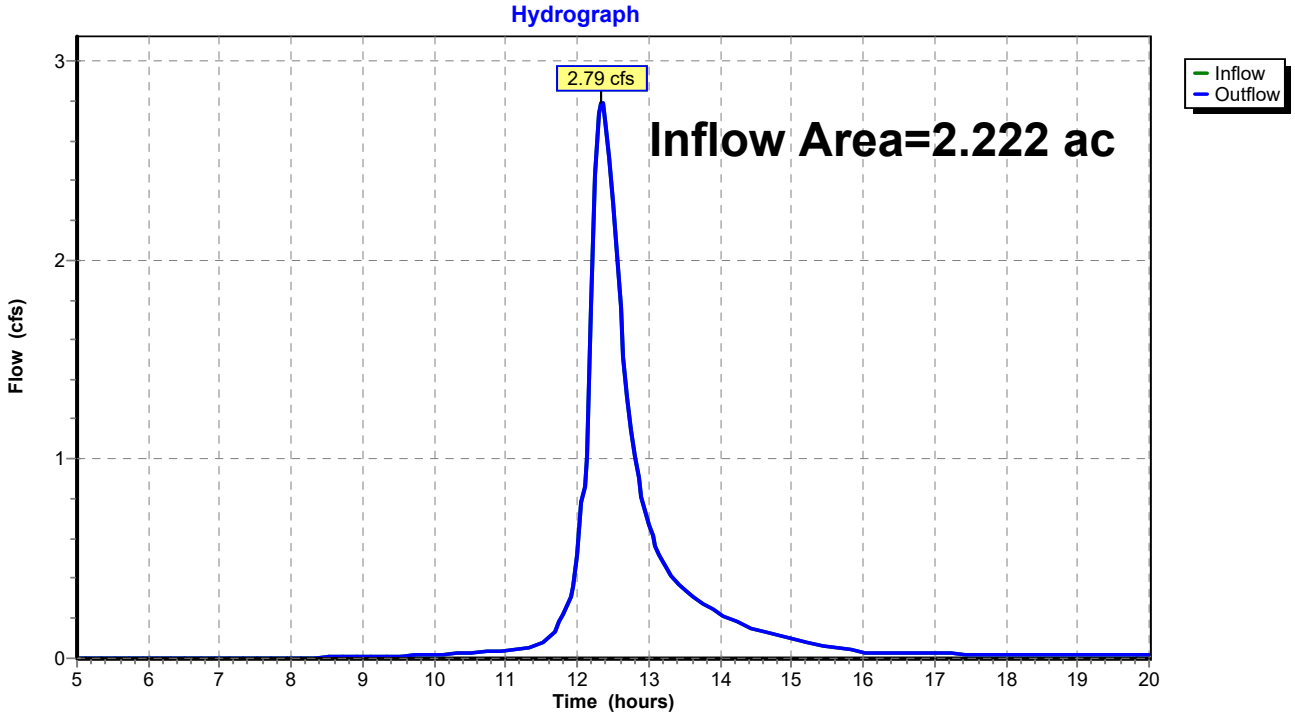


Summary for Reach SDP3: SDP3

Inflow Area = 2.222 ac, 54.53% Impervious, Inflow Depth > 1.08" for 10 YR event
Inflow = 2.79 cfs @ 12.34 hrs, Volume= 0.200 af
Outflow = 2.79 cfs @ 12.34 hrs, Volume= 0.200 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP3: SDP3

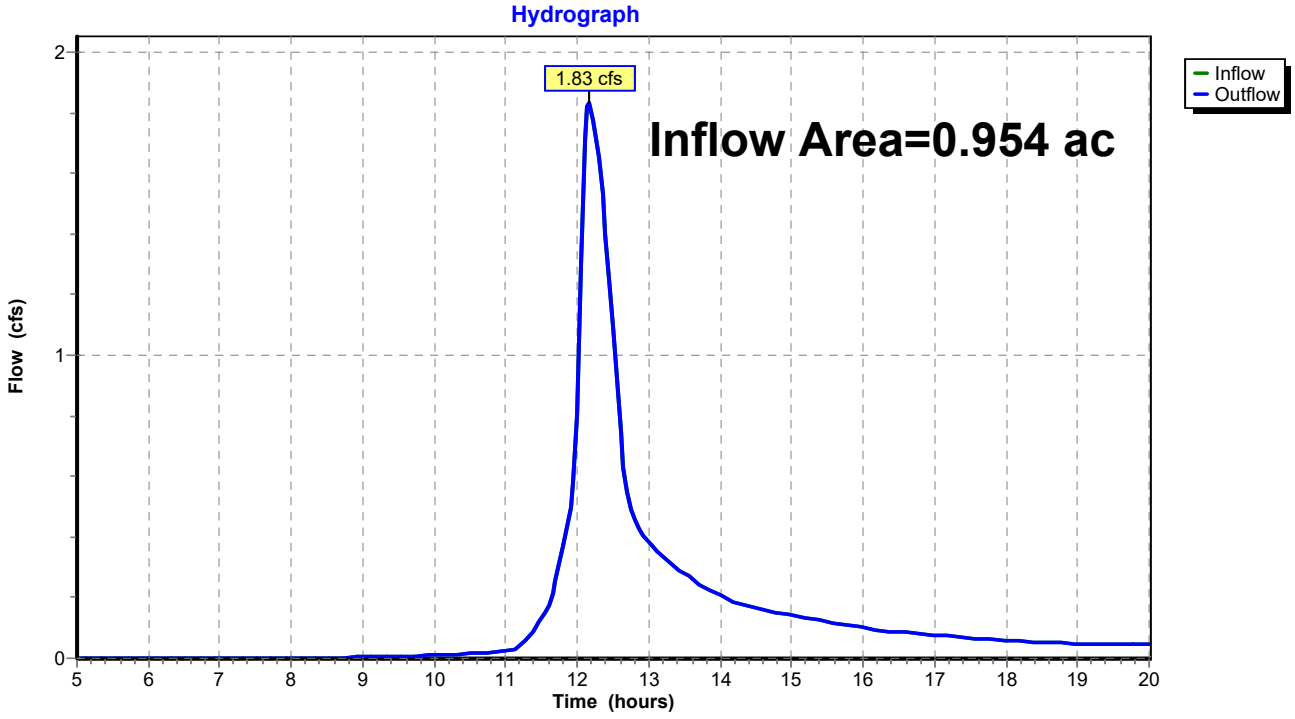


Summary for Reach SDP4: SDP4

Inflow Area = 0.954 ac, 8.93% Impervious, Inflow Depth > 2.18" for 10 YR event
Inflow = 1.83 cfs @ 12.17 hrs, Volume= 0.174 af
Outflow = 1.83 cfs @ 12.17 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP4: SDP4



Summary for Pond 30P: CULTEC RECHARGER 330 XL

Inflow Area = 1.948 ac, 58.71% Impervious, Inflow Depth > 2.45" for 10 YR event
Inflow = 5.22 cfs @ 12.14 hrs, Volume= 0.398 af
Outflow = 2.75 cfs @ 12.36 hrs, Volume= 0.378 af, Atten= 47%, Lag= 13.0 min
Discarded = 0.30 cfs @ 12.36 hrs, Volume= 0.237 af
Primary = 2.45 cfs @ 12.36 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 113.05' @ 12.36 hrs Surf.Area= 0.057 ac Storage= 0.114 af

Plug-Flow detention time= 80.7 min calculated for 0.378 af (95% of inflow)
Center-of-Mass det. time= 62.7 min (854.9 - 792.2)

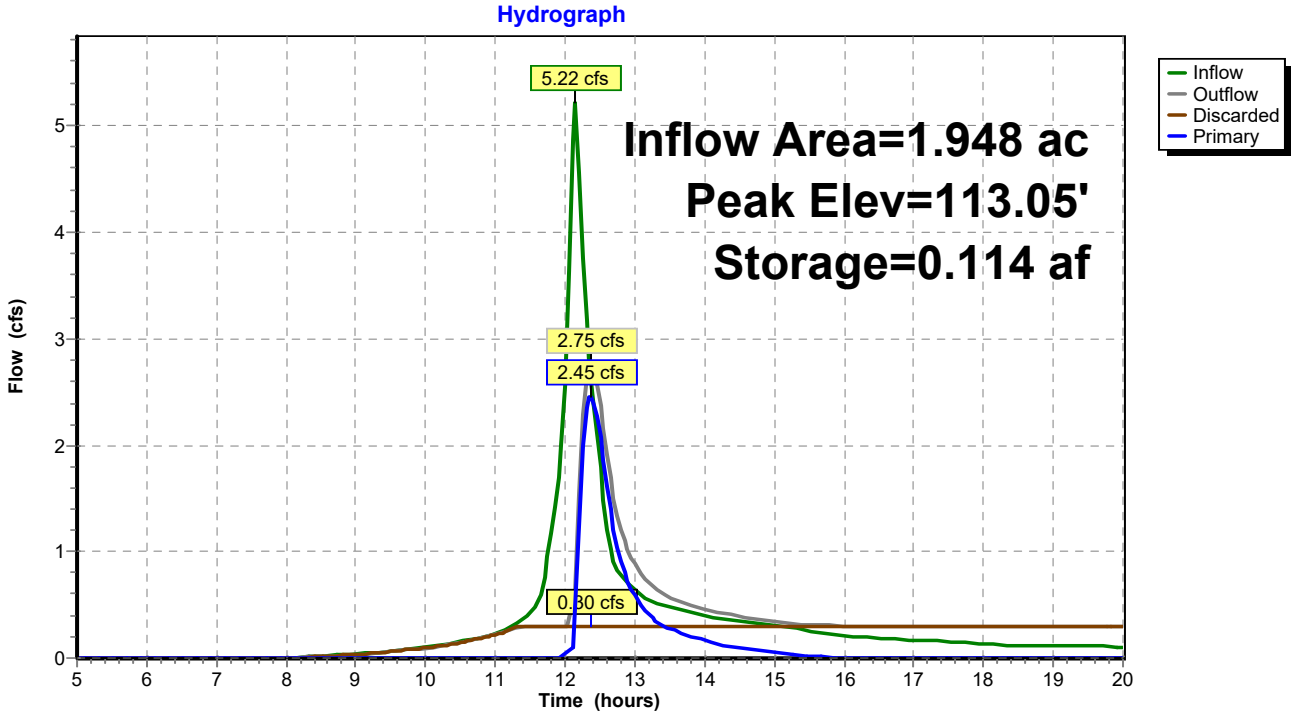
Volume	Invert	Avail.Storage	Storage Description
#1	110.00'	0.152 af	**26.00'W x 96.00'L x 8.00'H Prismatoid** 0.458 af Overall - 0.079 af Embedded = 0.379 af x 40.0% Voids
#2	111.00'	0.079 af	**Cultec R-330XLHD** x 65 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.231 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.00' / 111.90' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	110.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 11.00'

Discarded OutFlow Max=0.30 cfs @ 12.36 hrs HW=113.04' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.30 cfs)

Primary OutFlow Max=2.44 cfs @ 12.36 hrs HW=113.04' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.44 cfs @ 3.70 fps)

Pond 30P: CULTEC RECHARGER 330 XL



Summary for Pond 40P: CULTEC RECHARGER 330 XL

Inflow Area = 0.736 ac, 11.15% Impervious, Inflow Depth > 2.37" for 10 YR event
Inflow = 1.96 cfs @ 12.13 hrs, Volume= 0.145 af
Outflow = 1.43 cfs @ 12.23 hrs, Volume= 0.138 af, Atten= 27%, Lag= 6.2 min
Discarded = 0.01 cfs @ 12.23 hrs, Volume= 0.007 af
Primary = 1.43 cfs @ 12.23 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.90' @ 12.23 hrs Surf.Area= 672 sf Storage= 1,217 cf

Plug-Flow detention time= 37.9 min calculated for 0.137 af (94% of inflow)
Center-of-Mass det. time= 19.4 min (813.0 - 793.5)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	1,555 cf	**16.00'W x 42.00'L x 7.00'H Prismatoid** 4,704 cf Overall - 816 cf Embedded = 3,888 cf x 40.0% Voids
#2	81.00'	816 cf	**Cultec R-330XLHD** x 15 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	87.00'	250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		2,621 cf	Total Available Storage

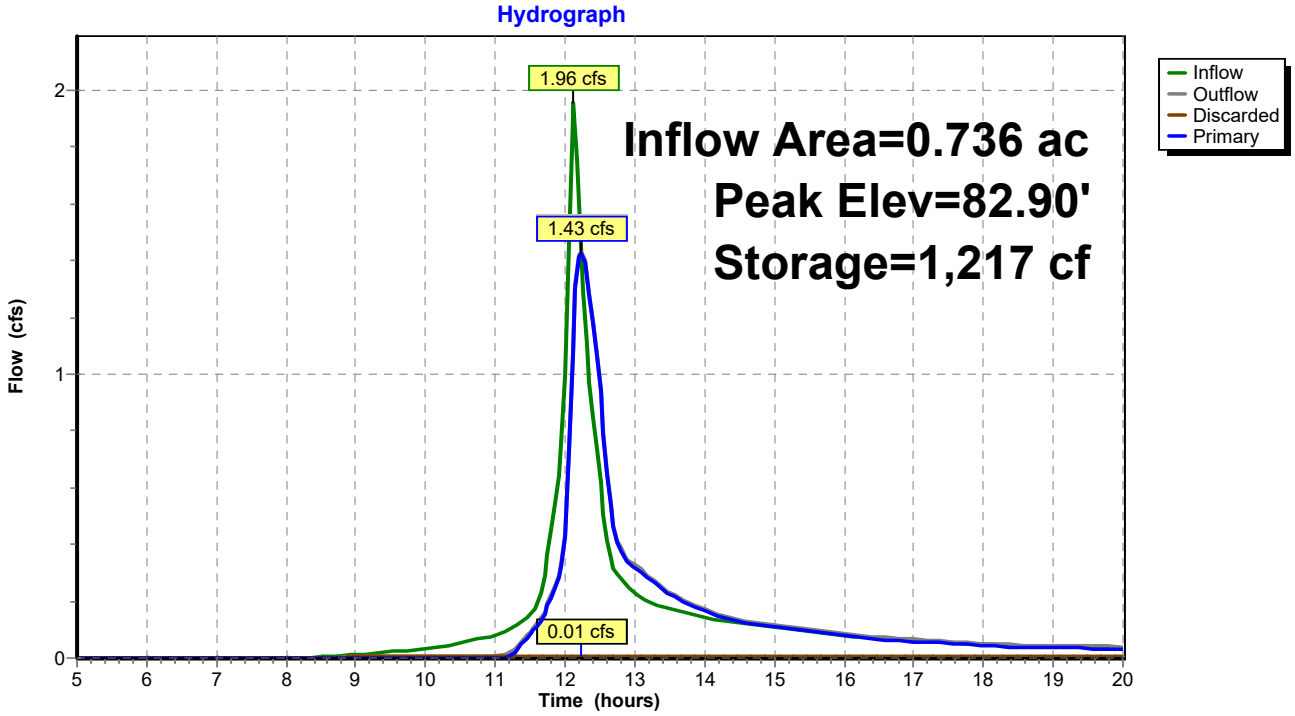
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	100	0	0
88.00	400	250	250

Device	Routing	Invert	Outlet Devices
#1	Primary	81.00'	**4.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.00' / 79.50' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Primary	81.80'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.80' / 80.30' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Discarded	80.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1.00'

Discarded OutFlow Max=0.01 cfs @ 12.23 hrs HW=82.89' (Free Discharge)
└**3=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=1.42 cfs @ 12.23 hrs HW=82.89' (Free Discharge)
├**1=Culvert** (Barrel Controls 0.55 cfs @ 6.30 fps)
└**2=Culvert** (Inlet Controls 0.87 cfs @ 4.42 fps)

Pond 40P: CULTEC RECHARGER 330 XL



Summary for Subcatchment 10: DA 10

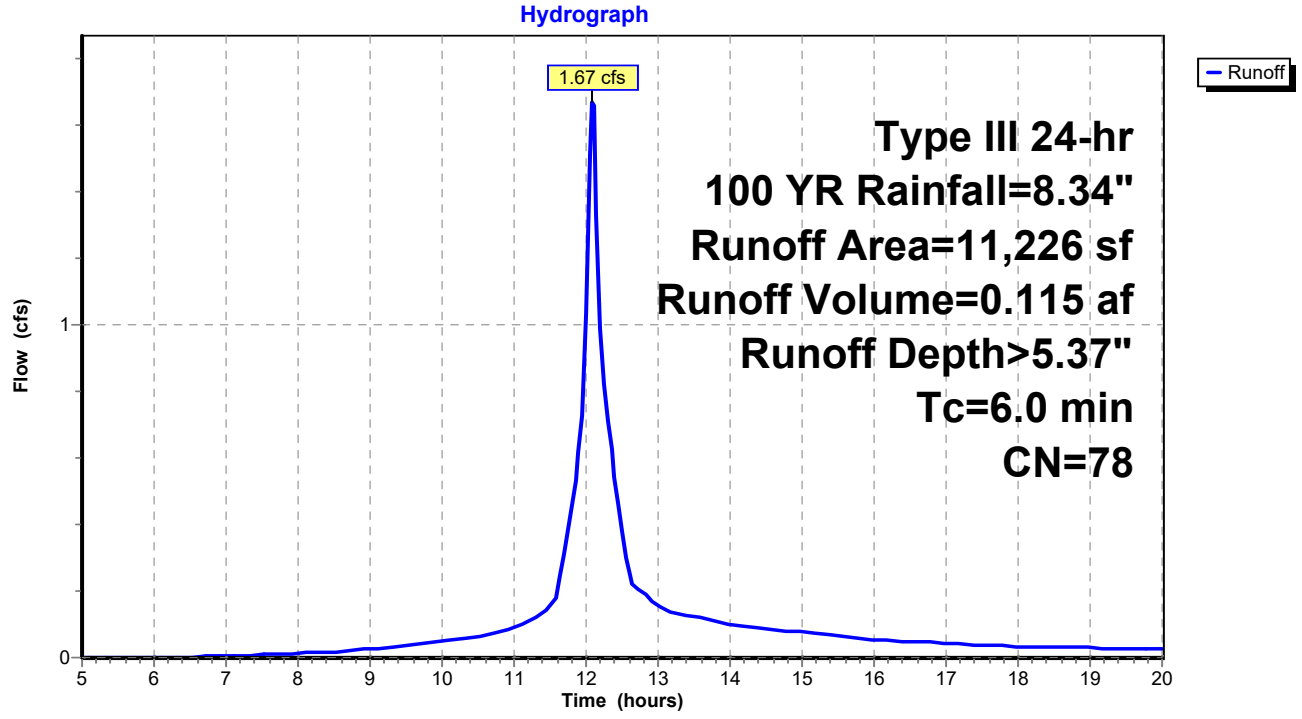
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 0.115 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
7,498	77	Woods, Good, HSG D
3,629	78	Meadow, non-grazed, HSG D
99	98	Paved parking & roofs
11,226	78	Weighted Average
11,127		99.12% Pervious Area
99		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 10: DA 10



Summary for Subcatchment 20: DA20

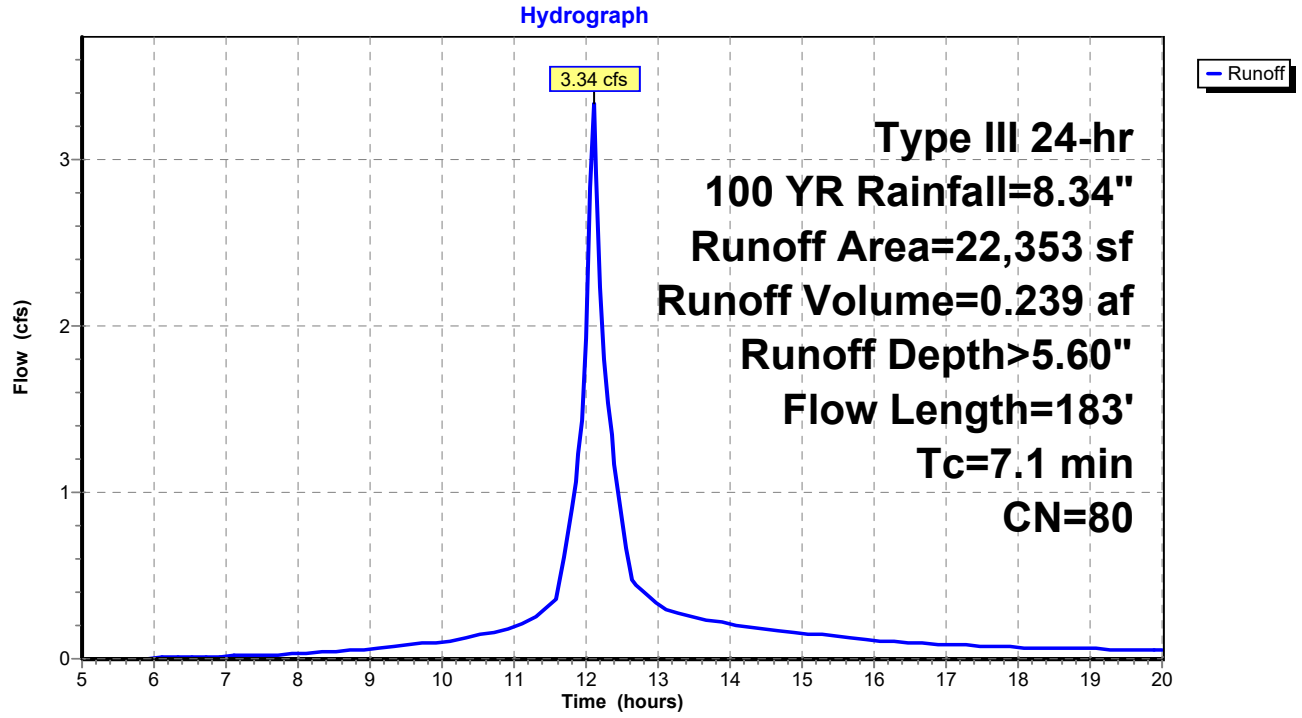
Runoff = 3.34 cfs @ 12.10 hrs, Volume= 0.239 af, Depth> 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
18,529	77	Woods, Good, HSG D
3,451	98	Paved parking & roofs
373	80	>75% Grass cover, Good, HSG D
22,353	80	Weighted Average
18,902		84.56% Pervious Area
3,451		15.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	82	0.2930	0.22		**Sheet Flow, S1** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	89	0.0670	2.17		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
0.1	12	0.1250	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
7.1	183	Total			

Subcatchment 20: DA20



Summary for Subcatchment 30: DA 30

Runoff = 11.58 cfs @ 12.14 hrs, Volume= 0.908 af, Depth> 5.59"

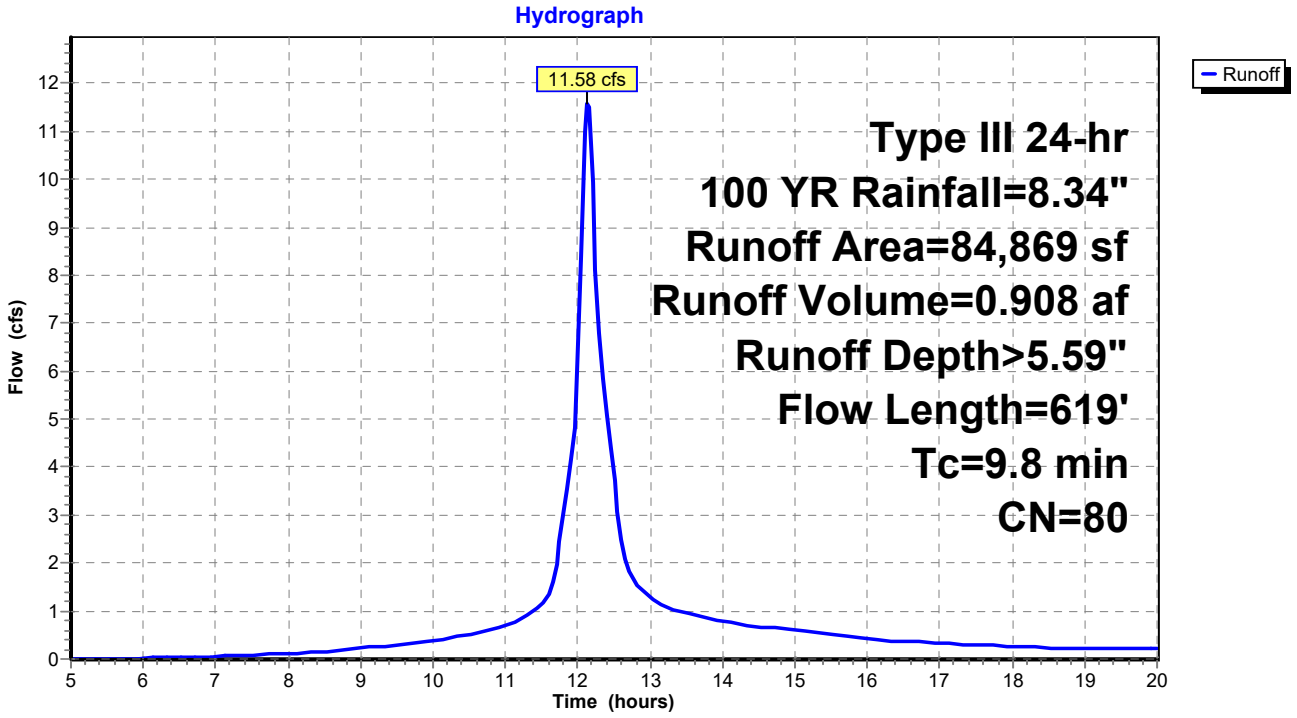
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
20,967	39	>75% Grass cover, Good, HSG A
13,914	80	>75% Grass cover, Good, HSG D
164	61	>75% Grass cover, Good, HSG B
49,824	98	Paved parking & roofs
84,869	80	Weighted Average
35,045		41.29% Pervious Area
49,824		58.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	31	0.0260	0.15		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
0.3	18	0.0200	0.97		**Sheet Flow, S2** Smooth surfaces n= 0.011 P2= 3.16"
2.2	11	0.0100	0.08		**Sheet Flow, S3** Grass: Short n= 0.150 P2= 3.16"
0.2	8	0.0100	0.63		**Sheet Flow, S4** Smooth surfaces n= 0.011 P2= 3.16"
2.2	32	0.0920	0.25		**Sheet Flow, S5** Grass: Short n= 0.150 P2= 3.16"
0.4	63	0.1190	2.41		**Shallow Concentrated Flow, S6** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0170	7.44	9.12	**Pipe Channel, S7** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	66	0.0639	13.31	16.33	**Pipe Channel, S8** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	79	0.0847	15.32	18.80	**Pipe Channel, S9** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	27	0.0183	7.12	8.74	**Pipe Channel, S10** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	37	0.0107	5.45	6.68	**Pipe Channel, S11** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	53	0.0380	10.26	12.59	**Pipe Channel, S12** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	93	0.0097	5.18	6.36	**Pipe Channel, S13** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior

0.0	8	0.0507	11.85	14.55	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	11	0.1930	23.13	28.38	**Pipe Channel, S14** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.8	619	Total			

Subcatchment 30: DA 30



Summary for Subcatchment 31: DA 31

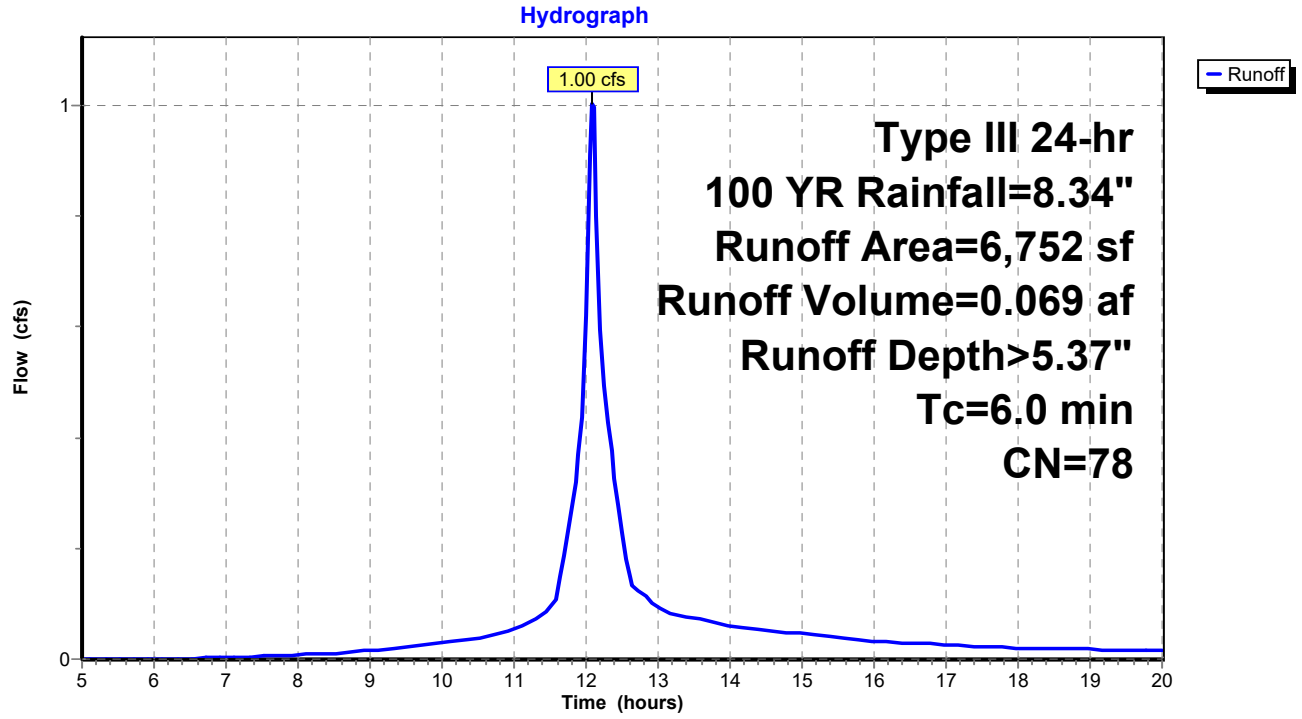
Runoff = 1.00 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
2,028	61	>75% Grass cover, Good, HSG B
2,587	80	>75% Grass cover, Good, HSG D
762	77	Woods, Good, HSG D
1,375	98	Paved parking, HSG D
6,752	78	Weighted Average
5,377		79.64% Pervious Area
1,375		20.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 31: DA 31



Summary for Subcatchment 32: DA 32

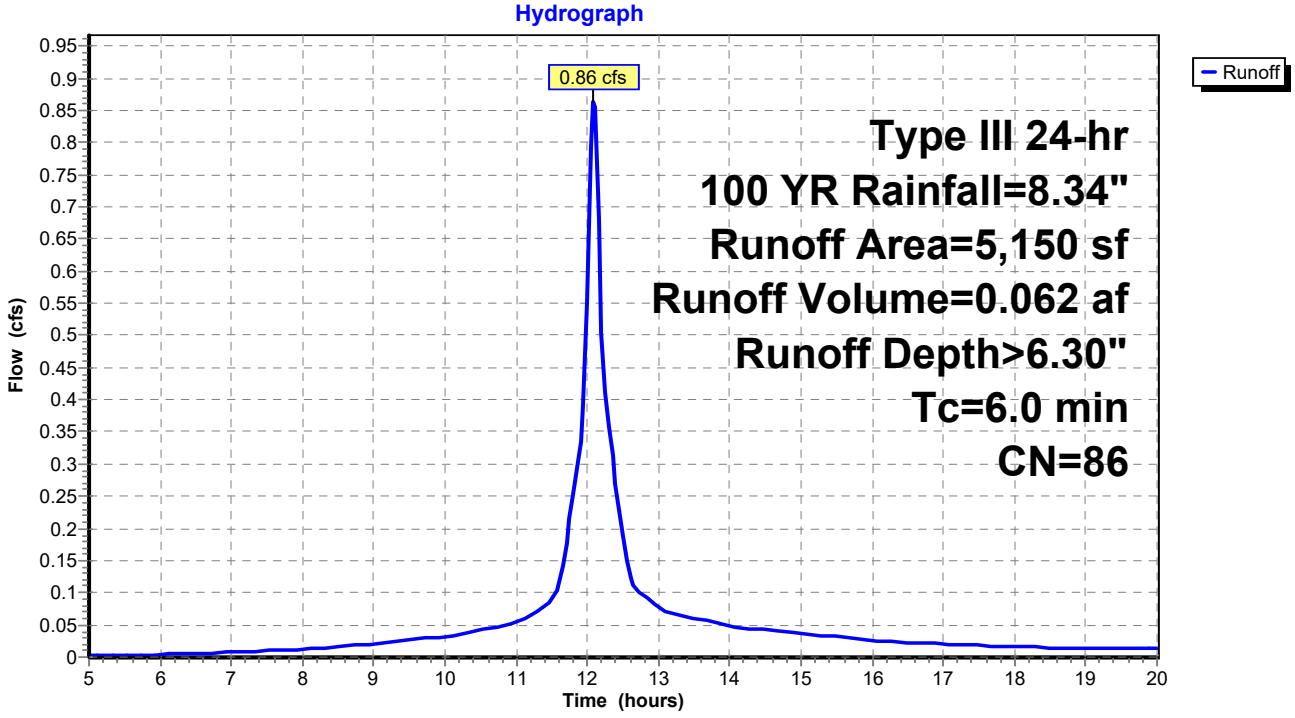
Runoff = 0.86 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
3,575	80	>75% Grass cover, Good, HSG D
1,575	98	Paved parking, HSG A
5,150	86	Weighted Average
3,575		69.42% Pervious Area
1,575		30.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 32: DA 32



Summary for Subcatchment 40: DA 40

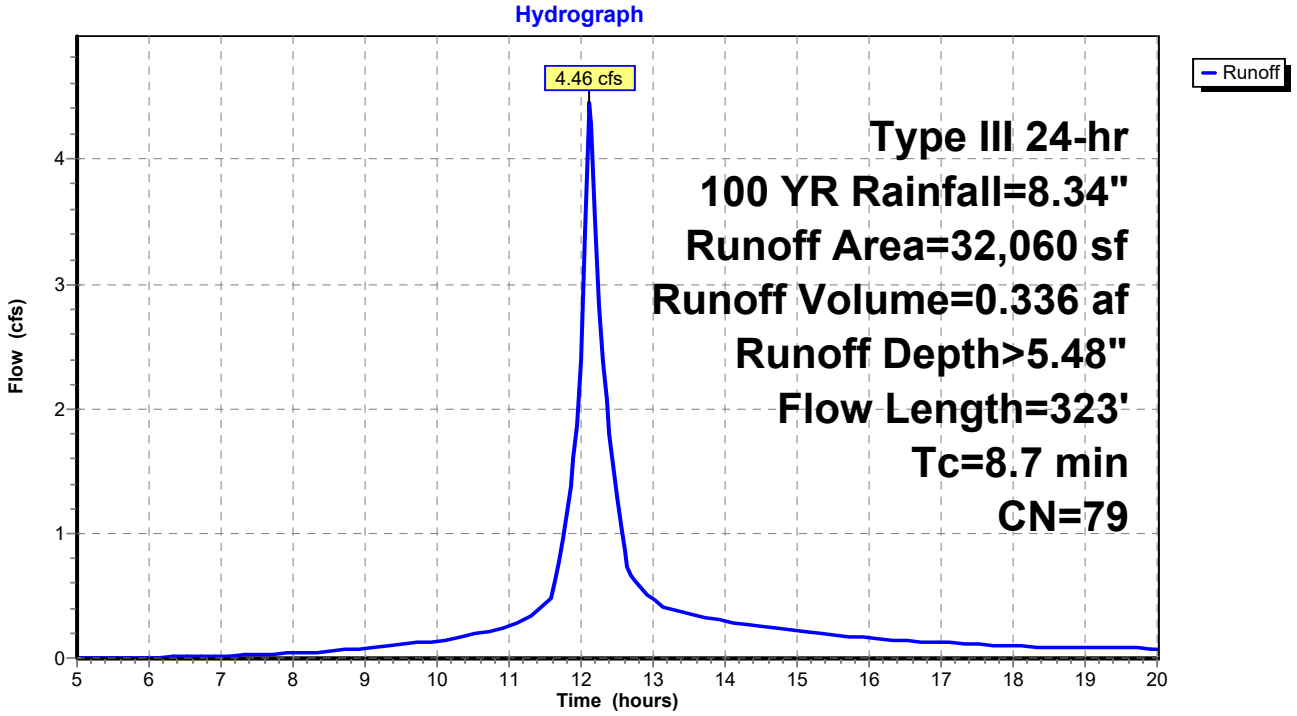
Runoff = 4.46 cfs @ 12.12 hrs, Volume= 0.336 af, Depth> 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
17,970	77	Woods, Good, HSG D
1,070	39	>75% Grass cover, Good, HSG A
1,114	80	>75% Grass cover, Good, HSG D
7,087	78	Meadow, non-grazed, HSG D
1,245	91	Gravel roads, HSG D
3,574	98	Paved parking & roofs
32,060	79	Weighted Average
28,486		88.85% Pervious Area
3,574		11.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	61	0.1150	0.31		**Sheet Flow, S1** Grass: Short n= 0.150 P2= 3.16"
3.3	39	0.3300	0.20		**Sheet Flow, S2** Woods: Light underbrush n= 0.400 P2= 3.16"
1.9	199	0.1260	1.77		**Shallow Concentrated Flow, S3** Woodland Kv= 5.0 fps
0.2	24	0.1250	2.47		**Shallow Concentrated Flow, S4** Short Grass Pasture Kv= 7.0 fps
8.7	323	Total			

Subcatchment 40: DA 40



Summary for Subcatchment 41: DA 41

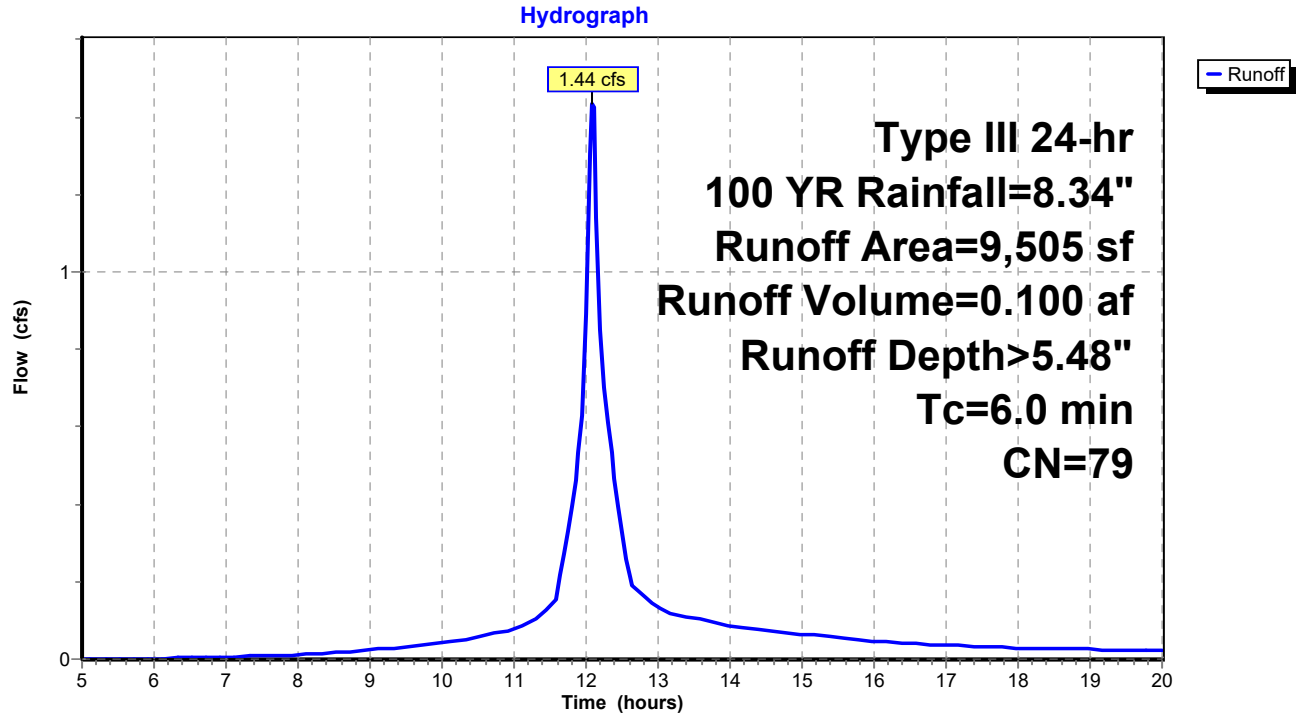
Runoff = 1.44 cfs @ 12.09 hrs, Volume= 0.100 af, Depth> 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.34"

Area (sf)	CN	Description
3,173	77	Woods, Good, HSG D
5,266	78	Meadow, non-grazed, HSG D
927	91	Gravel roads, HSG D
139	98	Paved parking & roofs
9,505	79	Weighted Average
9,366		98.54% Pervious Area
139		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1 (use min Tc)**

Subcatchment 41: DA 41

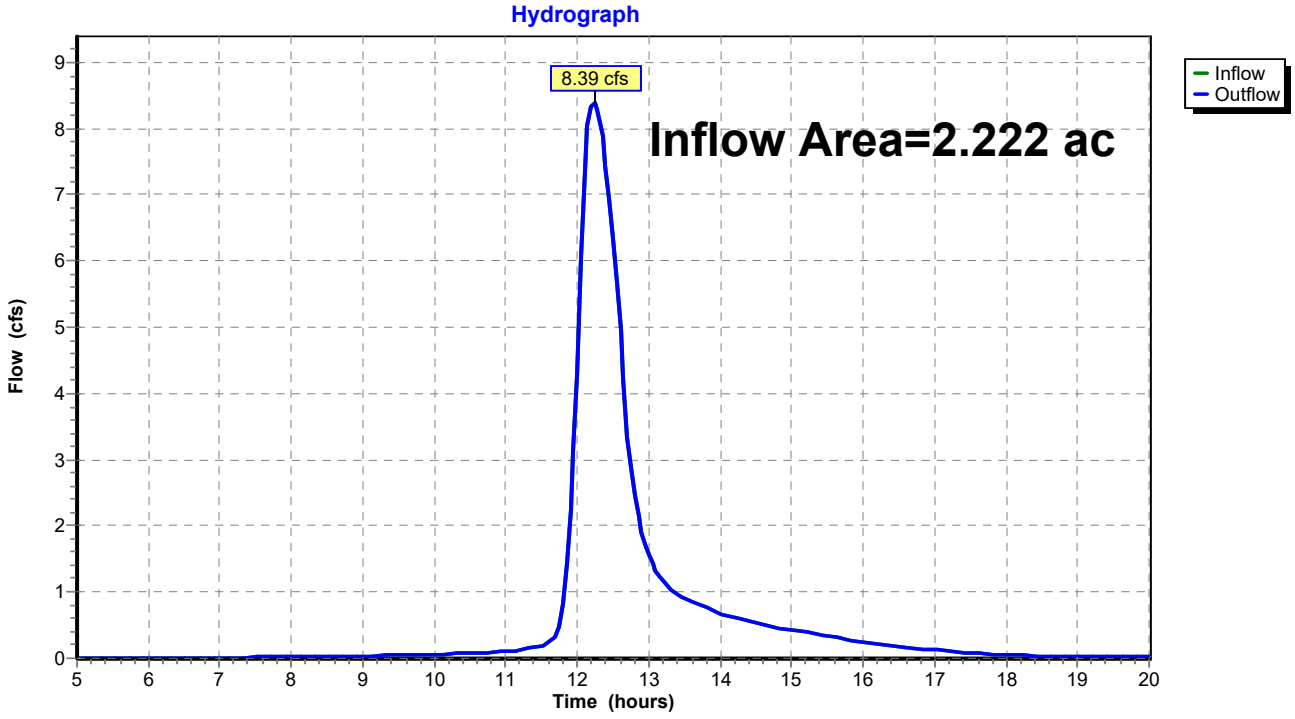


Summary for Reach SDP3: SDP3

Inflow Area = 2.222 ac, 54.53% Impervious, Inflow Depth > 3.73" for 100 YR event
Inflow = 8.39 cfs @ 12.24 hrs, Volume= 0.690 af
Outflow = 8.39 cfs @ 12.24 hrs, Volume= 0.690 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP3: SDP3

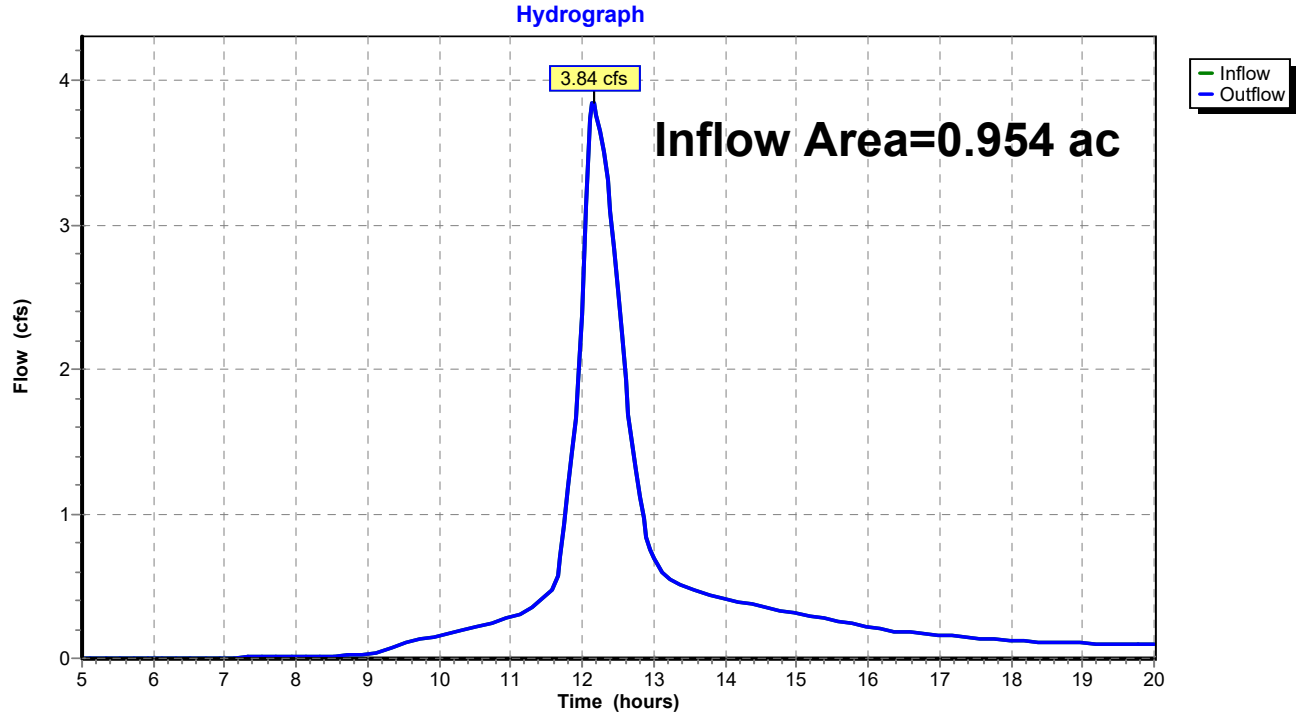


Summary for Reach SDP4: SDP4

Inflow Area = 0.954 ac, 8.93% Impervious, Inflow Depth > 5.26" for 100 YR event
Inflow = 3.84 cfs @ 12.15 hrs, Volume= 0.419 af
Outflow = 3.84 cfs @ 12.15 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SDP4: SDP4



Summary for Pond 30P: CULTEC RECHARGER 330 XL

Inflow Area = 1.948 ac, 58.71% Impervious, Inflow Depth > 5.59" for 100 YR event
Inflow = 11.58 cfs @ 12.14 hrs, Volume= 0.908 af
Outflow = 7.80 cfs @ 12.27 hrs, Volume= 0.848 af, Atten= 33%, Lag= 7.7 min
Discarded = 0.31 cfs @ 12.27 hrs, Volume= 0.288 af
Primary = 7.49 cfs @ 12.27 hrs, Volume= 0.559 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 116.42' @ 12.27 hrs Surf.Area= 0.057 ac Storage= 0.195 af

Plug-Flow detention time= 47.6 min calculated for 0.848 af (93% of inflow)
Center-of-Mass det. time= 23.7 min (796.6 - 772.9)

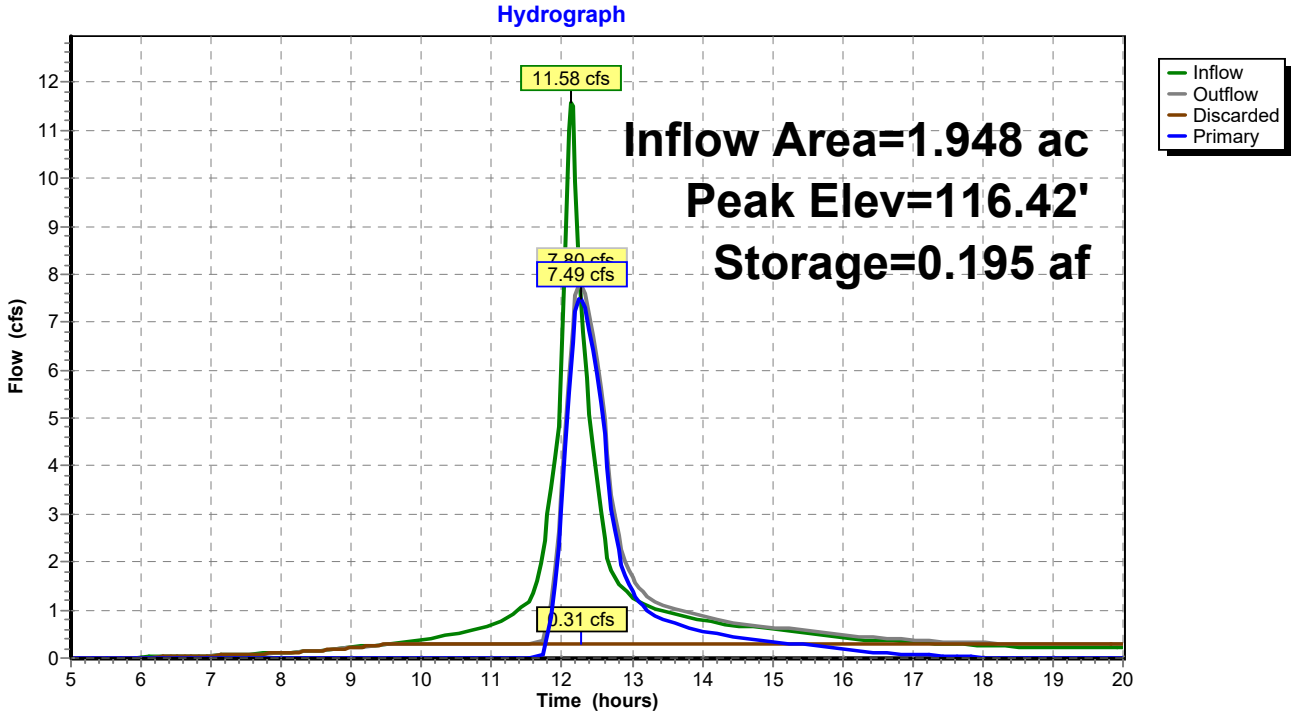
Volume	Invert	Avail.Storage	Storage Description
#1	110.00'	0.152 af	**26.00'W x 96.00'L x 8.00'H Prismatoid** 0.458 af Overall - 0.079 af Embedded = 0.379 af x 40.0% Voids
#2	111.00'	0.079 af	**Cultec R-330XLHD** x 65 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.231 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.00' / 111.90' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	110.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 11.00'

Discarded OutFlow Max=0.31 cfs @ 12.27 hrs HW=116.39' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.31 cfs)

Primary OutFlow Max=7.46 cfs @ 12.27 hrs HW=116.39' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 7.46 cfs @ 9.49 fps)

Pond 30P: CULTEC RECHARGER 330 XL



Summary for Pond 40P: CULTEC RECHARGER 330 XL

Inflow Area = 0.736 ac, 11.15% Impervious, Inflow Depth > 5.48" for 100 YR event
Inflow = 4.46 cfs @ 12.12 hrs, Volume= 0.336 af
Outflow = 2.95 cfs @ 12.25 hrs, Volume= 0.328 af, Atten= 34%, Lag= 7.5 min
Discarded = 0.01 cfs @ 12.25 hrs, Volume= 0.009 af
Primary = 2.94 cfs @ 12.25 hrs, Volume= 0.319 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 87.06' @ 12.25 hrs Surf.Area= 789 sf Storage= 2,377 cf

Plug-Flow detention time= 27.0 min calculated for 0.328 af (98% of inflow)
Center-of-Mass det. time= 17.1 min (791.0 - 773.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	1,555 cf	**16.00'W x 42.00'L x 7.00'H Prismatoid** 4,704 cf Overall - 816 cf Embedded = 3,888 cf x 40.0% Voids
#2	81.00'	816 cf	**Cultec R-330XLHD** x 15 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	87.00'	250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		2,621 cf	Total Available Storage

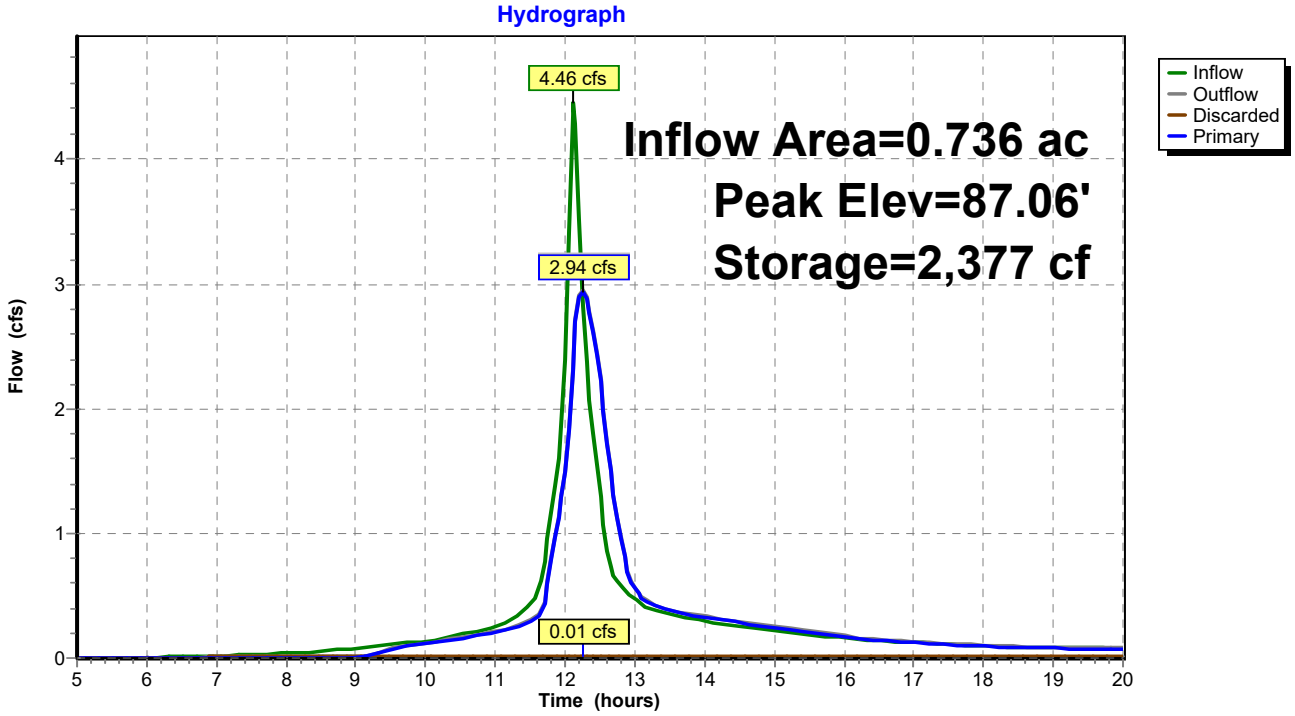
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	100	0	0
88.00	400	250	250

Device	Routing	Invert	Outlet Devices
#1	Primary	81.00'	**4.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.00' / 79.50' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Primary	81.80'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.80' / 80.30' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Discarded	80.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1.00'

Discarded OutFlow Max=0.01 cfs @ 12.25 hrs HW=87.05' (Free Discharge)
└**3=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=2.94 cfs @ 12.25 hrs HW=87.04' (Free Discharge)
├**1=Culvert** (Barrel Controls 0.84 cfs @ 9.66 fps)
└**2=Culvert** (Barrel Controls 2.10 cfs @ 10.68 fps)

Pond 40P: CULTEC RECHARGER 330 XL



APPENDIX F

STORMWATER MANAGEMENT PRACTICE DESIGN

Project: River Ridge Townhouses
Description: Stormwater Management Design
By/Date: DGK 7/24/2017 Reviewed/Date: AG

HUDSON LAND DESIGN
174 Main Street
Beacon NY 12508

STORMWATER MANAGEMENT PRACTICE:
Subcatchment 30

1) Determine Required Water Quality Volume & Stormwater Management Practice

Water quality volume to be treated will be calculated using the 1-year storm from Chapter 10 of the New York State Storm Water Design Manual (January 2015), hereinafter referred to as NYSSDM.

$WQv = 43,560 \times [P \times Rv \times A] / 12$

Where:
WQv = Water quality volume (cf)
P = 1-Year Rainfall Event
Rv = 0.05 + 0.009 x I , where I is % impervious area*
A = Watershed (ac)
* A minimum Rv of 0.2 will be applied to regulated sites.

Watershed	P (in)	Impervious Area (ac)	Impervious (Coverage %)	Rv	Total Area (ac)	WQv (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 30	1.40	1.144	58.7	0.58	1.948	5,727	Overland	Infiltration

Note: Pretreatment will be handeled via hydrodynamic device

2) Subsurface soil conditions Verified with soil tests - see appendix

Design Infiltration Rate (f_c): 5.00 inches per hour

3) Determine Required Pre-Treatment Volume

Determine Pre-Treatment Volume

Design Infiltration Rate: 5.00 inches per hour
Required Minimum Pretreatment Volume: 100%

Watershed	Required WQv (cf)	Required Pre-Treatment Volume (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 30	5,727	5,727	Overland	Infiltration

Notes:
1) Pretreatment volumes per § 6.3.3 of the NYSSDM (January 2015).

4) Determine Runoff Reduction Volume (RR_V)

Goal: Provide 100% RR_V by implementing Green Infrastructure techniques and Stormwater Management Practices

$RR_V = 43,560 \times [P \times Rv \times A] / 12$

Where:
RR_V = Runoff Reduction Volume (cf)
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv = 0.05 + 0.009 x I , where I is % impervious area — R_V: 0.58
A = Watershed (ac)
100% RR_V: 5,727 cf

* Minimum Rv of of 0.2 not applicable to RR_V calculations (use actual calculated Rv).

For projects that cannot meet 100% RR_V: Implement Specific Reduction Factor (S), which provides an absoulte minimum acceptable RR_V.

Drainage Area with Hydrologic Soil Group A:	0.481 acres	Corresponding S: 0.55
Drainage Area with Hydrologic Soil Group B:	0.004 acres	Corresponding S: 0.40
Drainage Area with Hydrologic Soil Group C:	0.000 acres	Corresponding S: 0.30
Drainage Area with Hydrologic Soil Group D:	1.463 acres	Corresponding S: 0.20
Total Area:	1.948 acres	
Total Area Matches		Calculated S: 0.29

Minimum RR_V (acre-feet) = [(P)(Rv*)(Ai)]/12 — Calculated Ai: 0.328
Calculated Rv*: 0.95
Where: Calculated Minimum RR_V: 1584 cf
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv* = 0.05 + 0.009 x I , where I is % impervious area (100%)
Ai = (S)(Aic)
Aic = Total area of new impervious cover



CONTECH®
ENGINEERED SOLUTIONS

CDS®

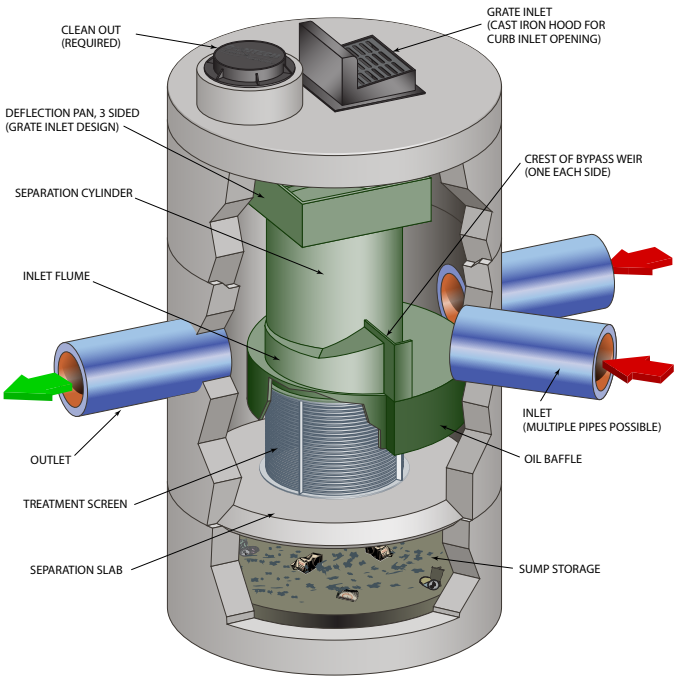
Solutions Guide

Continuous Deflective Separation - CDS®

Superior Stormwater Trash and Sediment Removal

The CDS is a swirl concentrator hybrid technology that uses continuous deflective separation – a combination of swirl concentration and indirect screening to screen, separate and trap debris, sediment, and hydrocarbons from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material debris 2.4 mm or larger, without binding. CDS retains all captured pollutants, even at high flow rates, and provides easy access for maintenance.

CDS is used to meet trash Total Maximum Daily Load (TMDL) requirements, for stormwater quality control, inlet and outlet pollution control, and as pretreatment for filtration, detention/infiltration, bioretention, rainwater harvesting systems, and a variety of green infrastructure practices.



Learn more about the CDS system at www.ContechES.com/CDS ❖ ❖ ❖

CDS® Approvals

CDS has been verified by some of the most stringent stormwater technology evaluation organizations in North America, including:

- Washington State Department of Ecology
- New Jersey Department of Environmental Protection
- Canadian Environmental Technology Verification (ETV)

Performance Claim Verified by the Canadian ETV Program

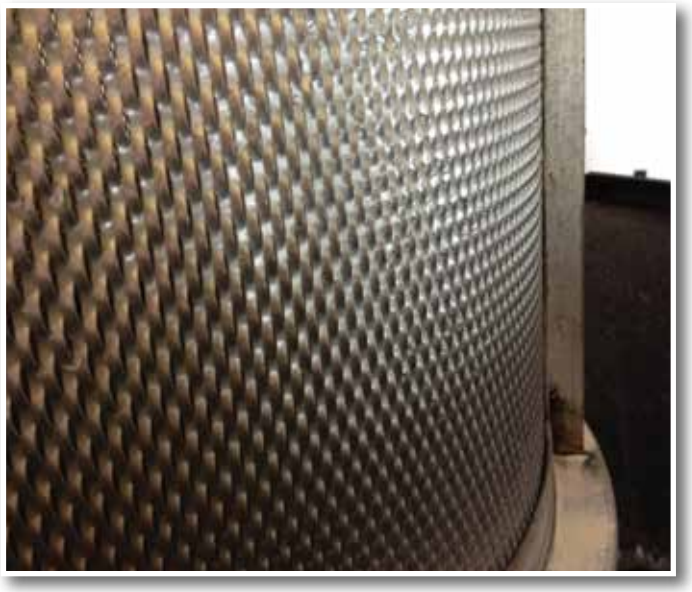
CDS® Features & Benefits

Feature	Benefit
1. Captures and retains 100% of floatables and neutrally buoyant debris 2.4 mm or larger	1. Superior pollutant removal
2. Self-cleaning screen	2. Ease of maintenance
3. Isolated storage sump eliminates scour potential	3. Excellent pollutant retention
4. Internal bypass	4. Eliminates the need for additional structures
5. Multiple pipe inlets and 90-180° angles	5. Design flexibility
6. Numerous regulatory approvals	6. Proven performance

The CDS® Screen

Traditional approaches to trash control typically involve "direct screening" that can easily become clogged, as trash is pinned to the screen as water passes through. Clogged screens can lead to flooding as water backs up.

The design of the CDS screen is fundamentally different. Flow is introduced to the screen face which is louvered so that it is smooth in the downstream direction. The effect created is called "Continuous Deflective Separation." The power of the incoming flow is harnessed to continually shear debris off the screen and to direct trash and sediment toward the center of the separation cylinder.

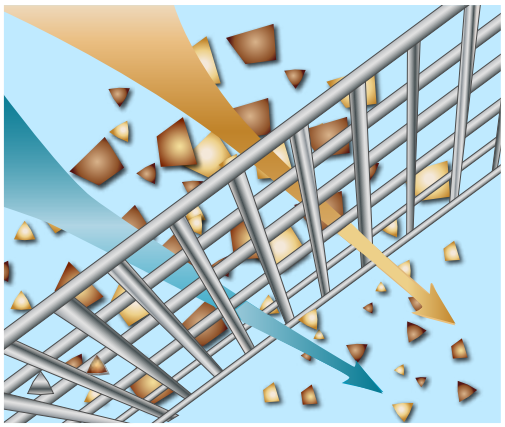


Key Features:

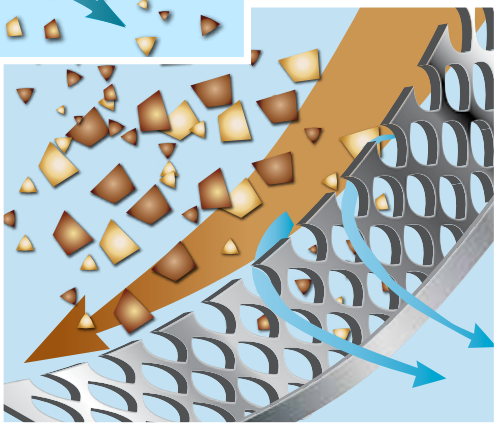
Self-Cleaning Screening Technology

- CDS Screen captures neutrally buoyant materials missed by other separator systems.
- Screen is hydraulically designed to be self-cleaning.
- Runoff entering the separation cylinder must pass through the screen prior to discharge, eliminating potential for scouring previously captured trash at high flow rates.

The CDS Screen – Self-Cleaning Screening Technology ❖ ❖ ❖



Direct Screening – particles that are larger than the aperture size of the screen can cause clogging, resulting in flooding if not maintained frequently.



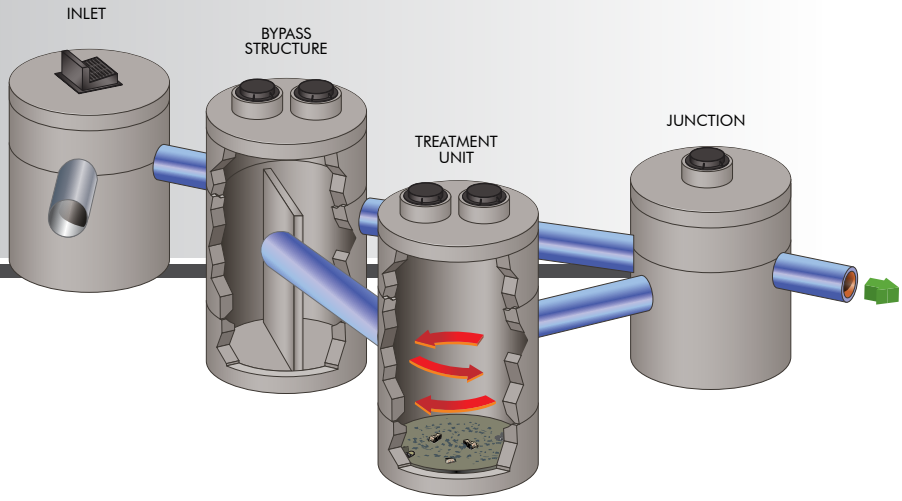
Continuous Deflective Separation Indirect Screening – water velocities within the swirl chamber continually shear debris off the screen to keep it clean.

CDS® Configuration - One System that Can Do It All!

The CDS effectively treats stormwater runoff while reducing the number of structures on your site.

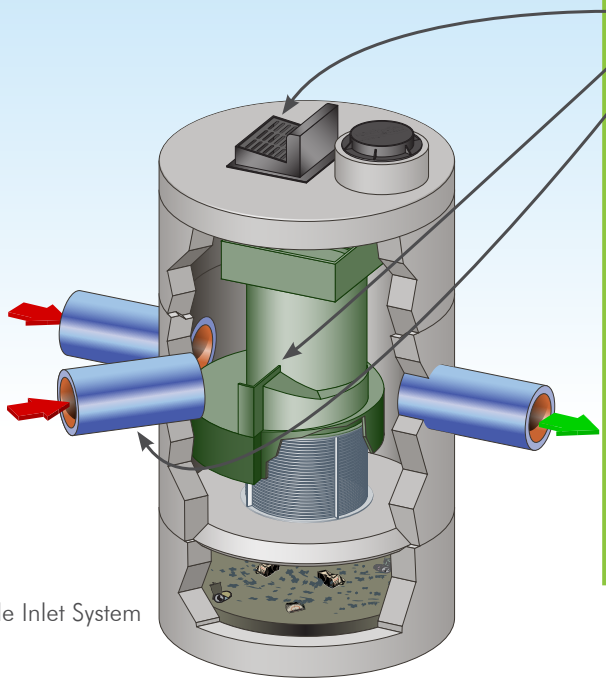
WHY GO THROUGH ALL THIS?

TRADITIONAL STORMWATER TREATMENT SITE DESIGN



ONE SYSTEM CAN DO IT ALL!

- Inline, offline, grate inlet, and drop inlet configurations available
- Internal and external peak bypass options available



CDS® Multiple Inlet System

Save Time, Space, and Money with CDS®

- Grate inlet option available
- Internal bypass weir
- Accepts multiple inlets at a variety of angles
- Advanced hydrodynamic separator
- Captures and retains 100% of floatables and neutrally buoyant debris 2.4 mm or larger
- Indirect screening capability keeps screen from clogging
- Retention of all captured pollutants, even at high flows
- Performance verified by NJCAT, WA Ecology, and ETV Canada

CDS® Applications

CDS is commonly used in the following stormwater applications:

- Stormwater quality control – trash, debris, sediment, and hydrocarbon removal
- Urban retrofit and redevelopment
- Inlet and outlet protection
- Pretreatment for filtration, detention/infiltration, bioretention, rainwater harvesting systems, and Low Impact Development designs.

CDS provides trash control.

CDS pretreats a bioswale.

CDS pretreats a rainwater harvesting cistern.

CDS standalone system removes trash and sediment.

CDS® Models and Capacities

	CDS MODEL	Treatment Flow Rates[1]			Estimated Maximum Peak Conveyance Flow[3] (cfs)/(L/s)	Minimum Sump Storage Capacity[4] (yd^3)/(m^3)	Minimum Oil Storage Capacity[4] (gal)/(L)
		75 microns (cfs)/(L/s)	125 microns[2] (cfs)/(L/s)	Trash & Debris (cfs)/(L/s)			
PRECAST	CDS2015-4	0.5 (14.2)	0.7 (19.8)	1.0 (28.3)	10 (283)	0.9 (0.7)	61 (232)
	CDS2015-5	0.5 (14.2)	0.7(19.8)	1.0 (28.3)	10 (283)	1.5 (1.1)	83 (313)
	CDS2020-5	0.7 (19.8)	1.1 (31.2)	1.5 (42.5)	14 (396)	1.5 (1.1)	99 (376)
	CDS2025-5	1.1 (31.2)	1.6 (45.3)	2.2 (62.3)	14 (396)	1.5 (1.1)	116 (439)
	CDS3020-6	1.4 (39.6)	2.0 (56.6)	2.8 (79.3)	20 (566)	2.1 (1.6)	184 (696)
	CDS3025-6	1.7 (48.1)	2.5 (70.8)	3.5 (99.2)	20 (566)	2.1 (1.6)	210 (795)
	CDS3030-6	2.0 (56.6)	3.0 (85.0)	4.2 (118.9)	20 (566)	2.1 (1.6)	236 (895)
	CDS3035-6	2.6 (73.6)	3.8 (106.2)	5.3 (150.0)	20 (566)	2.1 (1.6)	263 (994)
	CDS4030-8	3.1 (87.7)	4.5 (127.4)	6.3 (178.3)	30 (850)	5.6 (4.3)	426 (1612)
	CDS4040-8	4.1 (116.1)	6.0 (169.9)	8.4 (237.8)	30 (850)	5.6 (4.3)	520 (1970)
	CDS4045-8	5.1 (144.4)	7.5 (212.4)	10.5 (297.2)	30 (850)	5.6 (4.3)	568 (2149)
	CDS5640-10	6.1 (172.7)	9.0 (254.9)	12.6 (356.7)	50 (1416)	8.7 (6.7)	758 (2869)
	CDS5653-10	9.5 (268.9)	14.0 (396.5)	19.6 (554.8)	50 (1416)	8.7 (6.7)	965 (3652)
	CDS5668-10	12.9 (365.1)	19.0 (538.1)	26.6 (752.9)	50 (1416)	8.7 (6.7)	1172 (4435)
	CDS5678-10	17.0 (481.2)	25.0 (708.0)	35.0 (990.7)	50 (1416)	8.7 (6.7)	1309 (4956)
	CDS9280-12	27.2 (770.2)	40.0 (1132.7)	56.0 (1585.7)	Offline	16.8 (12.8)	N/A
	CDS9290-12	35.4 (1002.4)	52.0 (1472.5)	72 (2038.8)		16.8 (12.8)	
	CDS92100-12	42.8 (1212.0)	63.0 (1783.9)	88 (2491.9)		16.8 (12.8)	
CAST-IN-PLACE	CDS150134-22	100.7 (2851.5)	148.0 (4190.9)	270 (7645.6)		56.3 (43.0)	
	CDS200164-26	183.6 (5199.0)	270.0 (7645.6)	378.0 (10703.8)		78.7 (60.2)	
	CDS240160-32	204 (5776.6)	300.0 (8495.1)	420.0 (8495.1)		119.1 (91.1)	
	Additional Cast-in-Place models available upon request.						

1. Alternative PSD/D_{50} sizing is available upon request.
2. 125 micron flows are based on the CDS Washington State Department of Ecology approval for 80% removal of a particle size distribution (PSD) having a mean particle size (D_{50}) of 125 microns.
3. Estimated maximum peak conveyance flow is calculated using conservative values and may be exceeded on sites with lower inflow velocities and sufficient head over the weir.
4. Sump and oil capacities can be customized to meet site needs

CDS® Maintenance

Systems vary in their maintenance needs, and the selection of a cost-effective and easy-to-access treatment system can mean a huge difference in maintenance expenses for years to come.

A CDS unit is designed to minimize maintenance and make it as easy and inexpensive as possible to keep our systems working properly.

Most CDS units can easily be cleaned in 30 minutes.

Inspection

Inspection is the key to effective maintenance. Pollutant deposition and transport may vary from year to year and site to site. Semi-annual inspections will help ensure that the system is cleaned out at the appropriate time. Inspections should be performed more frequently where site conditions may cause rapid accumulation of pollutants.

Recommendations for CDS Maintenance

The recommended cleanout of solids within the CDS unit's sump should occur at 75% of the sump capacity. Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection and cleanout of the separation chamber and sump, and another allows inspection and cleanout of sediment captured and retained behind the screen. A vacuum truck is recommended for cleanout of the CDS unit and can be easily accomplished in less than 30 minutes for most installations.

DYOHDS™ Tool

Design Your Own Hydrodynamic Separator

Features

- Choose from three HDS technologies - CDS®, Vortechs® and VortSentry® HS
- Site specific questions ensure the selected unit will comply with site constraints
- Unit size based on selected mean particle size and targeted removal percentage
- Localized rainfall data allows for region specific designs
- PDF report includes detailed performance calculations, specification and standard drawing for the unit that was sized

DYO Project design made easy.

Design Your Own (DYO) Hydrodynamic Separator online at www.ContechES.com/dyohds

Next Steps

Learn more

See our CDS systems in action at **www.ContechES.com/videos**

Connect with Us

We're here to make your job easier – and that includes being able to get in touch with us when you need to. **www.ContechES.com/localresources**

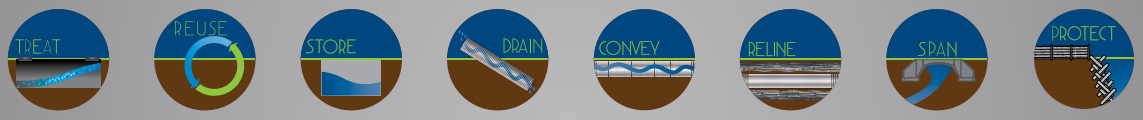
Start a Project

If you are ready to begin a project, visit us at **www.ContechES.com/startaproject**

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, retaining walls, sanitary sewer, stormwater, erosion control and soil stabilization products.

CONTECH® ENGINEERED SOLUTIONS

COMPLETE SITE SOLUTIONS



Stormwater Solutions

Helping to satisfy stormwater management requirements on land development projects

- Stormwater Treatment
- Detention/Infiltration
- Rainwater Harvesting
- Biofiltration/Bioretention

Pipe Solutions

Meeting project needs for durability, hydraulics, corrosion resistance, and stiffness

- Corrugated Metal Pipe (CMP)
- Steel Reinforced Polyethylene (SRPE)
- High Density Polyethylene (HDPE)
- Polyvinyl Chloride (PVC)

Structures Solutions

Providing innovative options and support for crossings, culverts, and bridges

- Plate, Precast & Truss bridges
- Hard Armor
- Retaining Walls
- Tunnel Liner Plate

Get Social With Us!

CDS Brochure - 06/2017 (PDF)

CONTECH® ENGINEERED SOLUTIONS

We print our brochures entirely on Forest Stewardship Council certified paper. FSC certification ensures that the paper in our brochures contain fiber from well-managed and responsibly harvested forests that meet strict environmental and socioeconomic standards.

FSC

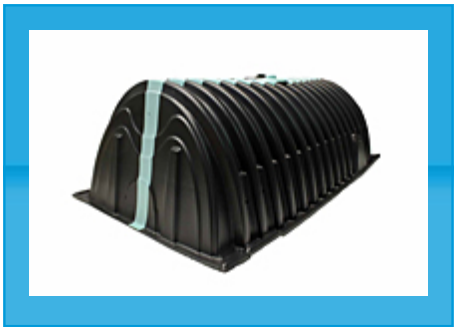
CULTEC, Inc.
878 Federal Road
P.O. Box 280
Brookfield, CT 06804 USA

Phone: 203.775.4416
Fax: 203.775.1462
Email: custservice@cultec.com
Website: www.cultec.com

MODEL # 330XLHD, RECHARGER® 330XLHD

The Recharger® 330XLHD is a 30.5" (775 mm) tall, high capacity chamber. Typically when using this model, fewer chambers are required resulting in less labor and a smaller installation area. The Recharger® 330XLHD has the side portal internal manifold feature. HVLV™ FC-24 Feed Connectors are

+ more



Specifications | Technical References

Specifications

Length	8.50 ft 2.59 m
Width	52 in 1321 mm
Height	30.50 in 775 mm
Installed Length	7.00 ft 2.13 m
Length Adjustment per Run	1.50 ft 0.46 m

Chamber Storage	7.459 ft³/ft 52.21 ft³/unit 391 gal 0.69 m³/m 1.48 m³/unit 1478.44 L
Min. Installed Storage	11.32 ft³/ft 79.26 ft³/unit 593 gal 1.05 m³/m 2.24 m³/unit 2244.25 L
Min. Area Required per Unit	33.83 ft² 3.14 m²
Min. Center-to-Center Spacing (Design Unit Width)	4.83 ft 1.47 m
Max. Allowable Cover	3.66 m 12 ft
Max. Inlet Opening in End Wall	24 in 600 mm
Max. Allowable O.D. in Side Portal	11.75 in 298 mm
Compatible Feed Connector	HVLV FC-24 Feed Connector

Technical References

Downloads	CAD - Recharger 330XLHD Stormwater Design Aide CAD - Recharger 330XLHD Stormwater Details PDF - Contactor & Recharger Stormwater Installation Instructions - CULG012 PDF - Recharger 330XLHD Stormwater Details PDF - Recharger 330XLHD Submittal Package - Stormwater XLS - CULTEC Recharger 330XLHD Incremental Storage Calculator

APPENDIX G

PRE-CONSTRUCTION SITE ASSESSMENT CHECKLIST

I. PRE-CONSTRUCTION MEETING DOCUMENTS
Project Name _____
Permit No. _____ Date of Authorization _____
Name of Operator _____
Prime Contractor _____

a. Preamble to Site Assessment and Inspections
The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Operators Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Name (please print): _____

Title _____ **Date:** _____

Address: _____

Phone: _____ **Email:** _____

Signature: _____

c. Qualified Professional's Credentials & Certification

"I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print): _____

Title _____ **Date:** _____

Address: _____

Phone: _____ **Email:** _____

Signature: _____

d. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

APPENDIX H

INFILTRATION AREA CONSTRUCTION INSPECTION CHECKLIST

Infiltration Basin Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Runoff diverted		
Soil permeability tested		
Groundwater / bedrock depth		
2. Excavation		
Size and location		
Side slopes stable		
Excavation does not compact subsoils		
3. Embankment		
Barrel		
Anti-seep collar or Filter diaphragm		
Fill material		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
4. Final Excavation		
Drainage area stabilized		
Sediment removed from facility		
Basin floor tilled		
Facility stabilized		
5. Final Inspection		
Pretreatment facility in place		
Inlets / outlets		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

Open Channel System Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility location staked out		
2. Excavation		
Size and location		
Side slope stable		
Soil permeability		
Groundwater / bedrock		
Lateral slopes completely level		
Longitudinal slopes within design range		
Excavation does not compact subsoils		
3. Check dams		
Dimensions		
Spacing		
Materials		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Structural Components		
Underdrain installed correctly		
Inflow installed correctly		
Pretreatment devices installed		
5. Vegetation		
Complies with planting specifications		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
6. Final inspection		
Dimensions		
Check dams		
Proper outlet		
Effective stand of vegetation and stabilization		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

APPENDIX I

CONTRACTOR AND SUBCONTRACTOR CERTIFICATIONS

CERTIFICATION STATEMENT

"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 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 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."

Contractor:

Name:_____

Signature:_____

Title:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Site Address:_____

_____

_____

_____

Specific SWPPP Responsibilities:

_____

_____

_____

_____

_____

Date of Certification: _____

Name and Title of Trained Contractor for SWPPP Implementation:_____

_____

CERTIFICATION STATEMENT

"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 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 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."

Sub-Contractor:

Name:_____

Signature:_____

Title:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Site Address:_____

_____

_____

_____

Specific SWPPP Responsibilities:

_____

_____

_____

_____

_____

Date of Certification: _____

Name and Title of Trained Contractor for SWPPP Implementation:_____

_____

APPENDIX J

QUALIFIED PROFESSIONAL'S CERTIFICATION

QUALIFIED PROFESSIONAL'S CERTIFICATION

" I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the Pre-Construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (Print):_____

Title:_____

Date:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Company Email:_____

Signature:_____

APPENDIX K

OWNER / OPERATOR CERTIFICATION

CERTIFICATION STATEMENT

" 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 also certify under penalty of law that that this document and the corresponding documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, I am acknowledging that this SWPPP has been developed and will be implemented as the first element of construction and agree to comply with all the terms and conditions of the general permit for which the NOI is being submitted."

Name (Print):_____

Title:_____

Date:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Company Email:_____

Signature:_____

APPENDIX L

POST DEVELOPMENT MAINTENANCE AND INSPECTION CHECKLIST

Contactor® & Recharger®
Stormwater Chambers The Chamber With The Stripe®

Operation and Maintenance Guidelines

CULTEC™

Operation & Maintenance

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pre-treatment device). CCTV inspection of this row can be deployed through this access port to determine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access

This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

Major Maintenance *(continued)*

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique.
	45 to 50 years after commissioning	• Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

CULTEC™
Chamber of Choice™

CULTEC, Inc.
878 Federal Road • P.O. Box 280 • Brookfield, CT 06804
Phone: 203-775-4416 • Toll Free: 800-4-CULTEC • Fax: 203-775-1462
Web: www.cultec.com • E-mail: custservice@cultec.com

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

CONTECH ENGINEERED SOLUTIONS
800.925.5240
www.ContechES.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Infiltration Trench Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Trench surface clear of debris		
Inflow pipes clear of debris		
Overflow spillway clear of debris		
Inlet area clear of debris		
2. Sediment Traps or Forebays (Annual)		
Obviously trapping sediment		
Greater than 50% of storage volume remaining		
3. Dewatering (Monthly)		
Trench dewaters between storms		
4. Sediment Cleanout of Trench (Annual)		
No evidence of sedimentation in trench		
Sediment accumulation doesn't yet require cleanout		
5. Inlets (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Good condition		
No evidence of erosion		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repair		
No evidence of erosion		
7. Aggregate Repairs (Annual)		
Surface of aggregate clean		
Top layer of stone does not need replacement		
Trench does not need rehabilitation		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

APPENDIX M

CONSTRUCTION INSPECTION REPORT

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:
Inspection Forms will be filled out during the entire construction phase of the project.
Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

_____	_____
Inspector (print name)	**Date of Inspection**
_____	_____
Qualified Professional (print name)	**Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions
Yes No NA
[ ] [ ] [ ] Is construction site litter and debris appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing
Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering
Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

Runoff Control Practices (continued)

4. Stone Check Dam
Yes No NA
[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles
Yes No NA
[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation
Yes No NA
[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance
Yes No NA
[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence
Yes No NA
[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:
1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	Today's Date:	Reporting Month:
Location:	Permit Identification #:	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Signature of Permittee or Duly Authorized Representative

Name of Permittee or Duly Authorized Representative Date

Duly authorized representatives must have written authorization, submitted to DEC, to sign any permit documents.

APPENDIX N

NOTICE OF TERMINATION

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:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

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)