STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

FOR

MERCY COLLEGE – DOBBS FERRY LOT R REPAIRS/GROVE PAVILION CONSTRUCTION

Dobbs Ferry, New York
&
Irvington, New York

PREPARED FOR:

Mercy College

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FA Project No. 21013.00

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1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) addresses the proposed stormwater mitigation measures and pollution prevention devices associated with the redevelopment of Lot R to address slope failure, and a new pavilion, Grove Pavilion, between Victory Hall and Hudson Hall and connecting packed gravel paths. Much of the project is in the Village of Dobbs Ferry, New York, however it is also partially located in Irvington, New York.

The project requires a SWPPP prepared in compliance with the Phase II requirements of the New York State Pollutant Discharge Elimination System (SPDES) General Permit GP-0-20-001 for stormwater discharges associated with construction activity. The SWPPP includes, but is not limited to, this document with appendices, erosion control and storm drainage plans, storm drainage and erosion control details in the construction drawings, the Notice of Intent, Notice of Intent Acknowledgment Letter, Acknowledgement form from Dobbs Ferry MS4, General Permit, Notice of Termination, all records of inspections and activities which are created during the project, and other documents referenced in this SWPPP. Changes, modifications, revisions, additions, or deletions become part of the SWPPP as they occur.

This Plan was created with the guidance of the New York State Stormwater Management Design Manual and the New York Standards for Erosion and Sediment Control and documents in compliance with the Phase II SPDES requirements. The SWPPP and associated erosion control measures must be implemented at the start of construction. The SWPPP will terminate when disturbed areas are stabilized, permanent erosion and sedimentation controls are installed, temporary erosion and sedimentation controls are removed, construction activities have ceased, and a completed Notice of Termination has been filed.

2.0 Project Information

Project Name:	Mercy College - Dobbs Ferry Lot R Repairs and Grove Pavilion
Project Location:	555 Broadway Dobbs Ferry, NY 10522
Owner/Operator:	Mercy College 555 Broadway Dobbs Ferry, NY 10522 (914) 674-7473 Contact: Thomas R. Simmonds

2.1 Project Description

The project will be constructed on the Mercy College Dobbs Ferry Campus in two locations. The parking lot reconstruction work will take place on the west limit of campus at Lot R. The Grove Pavilion work will take between Victory and Hudson Halls. The combined area of construction disturbance is 2.20 acres. Lot R repairs will disturb approximately 1.39 acres, and the Grove Pavilion construction will disturb approximately 0.81 acres. The project area is bounded by NYS-9 (Broadway) to the East, Hudson Road West to the north, Hudson River to the west, and Landing Drive to the South.

Using SPDES General Permit GP-0-20-001 guidelines for coverage, the project is classified as a redevelopment with an increase in impervious area. The Lot R portion will not increase impervious area. The Grove Pavilion portion will increase impervious area. Per Appendix B, Table 2 of the General Permit, it requires preparation of SWPPP that includes post-construction stormwater management practices.

See Appendix A for location map and erosion control plans and details. See construction documents for additional plans, details, and information relevant to the project.

2.2 Project Soils

Per the National Resource Conservation Service (NRCS) Soil Survey, the Dobbs Ferry Campus is comprised of five different soils. See table below for hydrologic soil group, soil name, and approximate percentage of soil within project limits.

HSG	Soils Name	% Project Area
B	Charlton fine sandy loam	36.1%
B	Charlton loam	4.6%
A	Knickerbocker fine sandy loam	12.3%
A	Riverhead loam	6.9%
B	Udorthents (Disturbed natural soils / Fill)	40.0%

As mapped by NRCS, depth to water table is consistent across the different soil types and is generally greater than 20 feet.

2.3 Historical and Cultural Areas

Construction activities that have the potential to affect historic and/or archeological resources require documentation that such impacts have been resolved to be eligible for coverage under the General Permit. Per New York State Office of Parks, Recreation, and Historic Preservation's (OPRHP) Cultural Resource Information System (CRIS), all areas of the site are located outside of Archaeological Sensitive Areas. See Appendix B for CRIS mapping. Because the project is within 500 feet of the Old Croton Aqueduct State Park, a separate application to the Village of Dobbs Ferry Architectural and Historic Review Board has been prepared and submitted to the Village Planning Board.

3.0 Pre-Development Conditions

The existing campus west of South Broadway is approximately 45.5 acres and features residence halls, academic buildings, athletic and recreation fields, student services buildings, and parking lots. The drainage shed area for this project is 7.14 acres, consisting of 11 drainage shed areas detailed in Table 3-1 below.

Table 3-1: Existing Drainage Shed Description

Drainage Shed	Area	Area (Description)	Flow Path
SA-1	0.416 acres	Ex. driveway to Lot R, north portion of Lot R, grassed slope between Lot R and athletic field parking	Sheet flows to catch basins where it is conveyed to culverts crossing rail tracks to discharge point at Hudson River.
SA-2	0.465 acres	Ex. driveway, parking, and lawn in north-central portion of Lot R	Sheet flows to catch basins, where it is conveyed to culverts crossing rail tracks to discharge point at Hudson River.
SA-3	0.248 acres	Ex. driveway, parking, and lawn in central portion of Lot R	Sheet flows to catch basins, where it is conveyed to culverts crossing rail tracks to discharge point at Hudson River.
SA-4	0.350 acres	Ex. driveway, parking, and lawn in south-central portion of Lot R	Sheet flows to catch basins, where it is conveyed to culverts crossing rail tracks to discharge point at Hudson River.
SA-5	0.411 acres	Ex. driveway, parking, and lawn in south portion of Lot R, runoff from upslope woods.	Sheet flows to catch basins, where it is conveyed to culverts crossing rail tracks to discharge point at Hudson River.
SA-6	0.150 acres	Wooded area downslope of Lot R	Sheet flows down slope to culverts crossing rail tracks to discharge point at Hudson River.
SB-1	0.171 acres	Ex. upper Lot R parking lot and driveways north parking aisle	Sheet flows to catch basins at west edge of parking lot.
SB-2	1.506 acres	Ex. upper Lot R parking lot and driveways north-central parking aisle	
SB-3	0.119 acres	Ex. upper Lot R parking lot and driveways south-central parking aisle	
SB-4	0.367 acres	Ex. upper Lot R parking lot and driveways south parking aisle and adjacent lawn	
SC-1	2.942 acres	Ex. lawn between Victory and Hudson Hall.	Sheet flows south to ex. pocket pond with outlet control to a culvert and discharges to North Brook/Hudson River.

4.0 Post-Development Conditions

The proposed project will disturb approximately 2.2 acres across the two project areas and is classified as a redevelopment with an increase in impervious area. Impervious area will only be added in the Grove Pavilion project area. There are 12 proposed drainage sheds, detailed in Table 4-1 (next page).

Table 4-1: Proposed Drainage Shed Description

Drainage Shed	Area	Area (Description)	Flow Path
SA-1	0.409 acres	Redeveloped driveway to Lot R, north portion of Lot R, and grassed slope between Lot R and athletic field parking	Sheet flow to ex. catch basin → new catch basin → ex. 8" culvert under MTA tracks → discharge to Hudson River
SA-2	0.467 acres	Redeveloped driveways, parking, and lawn in north-central portion of Lot R	Sheet flow to new catch basins → ex. 8" culvert under MTA tracks → discharge to Hudson River
SA-3	0.249 acres	Redeveloped driveway, parking, and lawn in central portion of Lot R	
SA-4	0.350 acres	Redeveloped driveway, parking, and lawn in south-central portion of Lot R	
SA-5	0.411 acres	Redeveloped driveway, parking, and lawn in south portion of Lot R	Sheet flow to ex. catch basin → ex. 8" culvert under MTA tracks → discharge to Hudson River.
SA-6	0.153 acres	Wooded area downslope of Lot R	Sheet flow down slope to ex. 8" culverts under MTA tracks → discharge at Hudson River.
SB-1	0.171 acres	Ex. upper Lot R lot and driveways north parking aisle	Sheet flows to ex. catch basin → new catch basins → new stormwater treatment structure → ex. site drainage system to north of project area → discharge to Hudson River
SB-2	0.567 acres	Ex. upper Lot R lot and driveways north-central parking aisle	Sheet flows to new catch basins → new stormwater treatment structure → ex. site drainage system to north of project area → discharge to Hudson River
SB-3	0.517 acres	Ex. upper Lot R lot and driveways south-central parking aisle	
SB-4	0.908 acres	Ex. upper Lot R lot and driveways south parking aisle and adjacent lawn	
SC-1	0.099 acres	New Grove Pavilion	Sheet flows to rooftop drainage system → new pretreatment sump → new dry well → ex. pocket pond → ex. site drainage → discharge to Hudson River.
SC-2	2.482 acres	Ex. Driveway and Lawns, new walking paths	Sheet flows to ex. pocket pond → ex. site drainage → discharge to Hudson River.

Refer to Appendix D for the proposed drainage shed plan and post-development hydrology calculations.

5.0 Stormwater Quantity and Quality Analysis

5.1 Approach to Drainage Analysis

Per the New York State Stormwater Management Design Manual, the proposed project is a redevelopment with increase in impervious area. The proposed design will satisfy Water Quality Volume, Runoff Reduction Volume, Stream Channel Protection Volume, Overbank Flood Control, and Extreme Flood Control requirements set forth by NYSDEC.

Pre- and post-development runoffs were calculated using SCS TR-55 methodology and HydroCAD Version 10.00-25. HydroCAD was utilized to determine pre- and post-development runoff volumes and peak discharge rates for the 1-, 10-, and 100-year design storms. Rainfall depths used in the hydrologic analysis were imported from the NOAA Atlas 14 Point Precipitation Frequency Estimates for Dobbs Ferry, NY. Rainfall depths utilized were 2.92 inches, 5.54 inches, and 8.64 inches for the 1-, 10-, and 100-year storm events, respectively. The Water Quality (WQ) storm was analyzed using a rainfall depth of 1.3 inches. A series of hydrograph models were developed for analyzed storm events. See

Appendix B for precipitation data and Appendix C and D for detailed HydroCAD calculations for existing and proposed conditions.

5.2 Pre-Development Analysis

See Figure 5-1, next page, for Drainage Shed Areas. See Table 5-1 for a summary of hydrologic modeling for existing conditions. See Appendix C for detailed calculations.

Table 5-1: Pre-Development Conditions

Drainage Shed	Area	CN	Time of Conc. (min)	Design Storm	Peak Discharge Rate (cfs)
SA-1	0.414 acres	86	5.0	1-yr 10-yr 100-yr	0.84 2.01 3.39
SA-2	0.465 acres	82	5.0	1-yr 10-yr 100-yr	0.74 2.00 3.56
SA-3	0.248 acres	82	5.0	1-yr 10-yr 100-yr	0.39 1.07 1.90
SA-4	0.350 acres	82	5.1	1-yr 10-yr 100-yr	0.56 1.51 2.68
SA-5	0.410 acres	73	31.7	1-yr 10-yr 100-yr	0.37 1.35 2.67
SA-6	0.152 acres	60	5.0	1-yr 10-yr 100-yr	0.02 0.15 0.37
SB-1	0.171 acres	90	5.0	1-yr 10-yr 100-yr	0.39 0.88 1.44
SB-2	1.505 acres	96	5.0	1-yr 10-yr 100-yr	4.24 8.35 13.16
SB-3	0.119 acres	83	5.0	1-yr 10-yr 100-yr	0.20 0.53 0.92
SB-4	0.367 acres	83	5.0	1-yr 10-yr 100-yr	0.61 1.62 2.85
SC-1	1.99 acres	71	20.3	1-yr 10-yr 100-yr	1.44 5.80 11.87
Total Combined Discharge					
Total Site Discharge	7.144 acres	80	---	1-yr 10-yr 100-yr	8.37 20.55 36.67

FIGURE 5-1: PRE-DEVELOPMENT SHED AREAS

5.3 Post-Development Analysis

See Figure 5-2, next page, for Drainage Shed areas for post-development analysis. See Table 5-2 for a summary of hydrologic modeling for post-development conditions. See Appendix D for Detailed calculations.

Table 5-2: Post-Development Conditions

Drainage Shed	Area (acres)	CN	Time of Conc. (min)	Design Storm	Peak Discharge Rate (cfs)
SA-1	0.409 acres	87	7.0	1-yr 10-yr 100-yr	0.77 1.84 3.11
SA-2	0.467 acres	82	8.2	1-yr 10-yr 100-yr	0.66 1.80 3.20
SA-3	0.249 acres	82	7.7	1-yr 10-yr 100-yr	0.36 0.98 1.73
SA-4	0.350 acres	82	8.0	1-yr 10-yr 100-yr	0.50 1.36 2.41
SA-5	0.411 acres	73	5.3	1-yr 10-yr 100-yr	0.36 1.34 2.65
SA-6	0.153 acres	60	34.7	1-yr 10-yr 100-yr	0.02 0.14 0.36
SB-1	0.171 acres	90	5.0	1-yr 10-yr 100-yr	0.39 0.88 1.44
SB-2	0.567 acres	98	5.0	1-yr 10-yr 100-yr	1.66 3.19 4.98
SB-3	0.517 acres	94	5.0	1-yr 10-yr 100-yr	1.38 2.81 4.47
SB-4	0.908 acres	88	5.0	1-yr 10-yr 100-yr	1.93 4.48 7.48
SC-1	0.099 acres	98	5.0	1-yr 10-yr 100-yr	0.29 0.56 0.87
SC-2	2.482 acres	71	20.3	1-yr 10-yr 100-yr	1.39 5.60 11.47
Total Combined Discharge					
Total Site Discharge	7.143 acres	85	---	1-yr 10-yr 100-yr	7.91 19.84 36.03

FIGURE 5-2: POST-DEVELOPMENT SHED AREAS

5.4 Stormwater Management Practices

Hydrodynamic Treatment Structure

A hydrodynamic stormwater treatment structure is proposed to meet the calculated water quality volume for the project site. The treatment structure will be located to capture flow from Sheds SA-1, 2, 3, and 4. See the drainage area map in Appendix D for the approximate location of the proposed treatment structure.

The hydrodynamic treatment structure was selected and designed based on the flows from the entire contributing drainage shed area. The volume treated for the contributing shed area is larger than the calculated water quality volume for the project, therefore the water quality requirements for the project will be satisfied.

Downspout Disconnection/Dry Well

The new Grove Pavilion building will feature downspouts that tie to a pretreatment sump basin and then to a dry well before being discharged to the existing pocket pond on site. The pretreatment sump has a storage capacity of 0.005 af. The dry well has a storage capacity of 0.007 af. Combined, they provide a total storage capacity of 0.012 af, satisfying the runoff reduction requirements for this project.

Pocket Pond Expansion

The existing pocket pond in the Grove Pavilion will be regraded to add approximately 305 cf of storage. This will reduce discharge to the existing stormwater system and satisfy the storm attenuation requirements for this project.

5.5 Stormwater Sizing Requirements

The main objective in designing the proposed stormwater system is to meet NYSDEC requirements for water quality treatment and attenuation of post-developed stormwater flows from exceeding that of the pre-developed rates. This will be accomplished using an alternative treatment practice for Lot R (hydrodynamic separator) and a dry well/expanded pond forebay for Grove Pavilion work. NYSDEC stormwater quantity and quality requirements are described below.

Water Quality Volume (WQv)

The water quality volume (WQv) is intended to improve water quality by capturing and treating runoff from small, frequent storm events that tend to contain higher pollutant levels. New York has defined the WQv as the volume of runoff generated from the entire 90th percentile rain event.

The WQv was calculated for the Lot R area was calculated as follows:

$$WQ_v = \frac{(P)\,(Rv)\,(A)}{12}$$

			Where:
WQ_v =			WQ_v = water quality volume (acre-ft or cf)
P =	1.30	in	P = 90% rainfall event (inches)
I =	73.8	%	I = percent impervious cover (%)
I new =	0.0	%	I new= percent impervious cover that is new
I rdv =	73.8	%	I rdv= percent impervious cover that is redeveloped
A =	1.387	acres	A = area disturbed (acres)

R_v =	0.5479		R_v = 0.05 + 0.009(I new + .75 * I rdv)
WQ_v =	**0.0823**	**acre-ft**	
	3,586	**cf**	

The WQv for the Grove Pavilion area was calculated as follows:

$$WQ_v = \frac{(P)\ (Rv)\ (A)}{12}$$

Where:

WQ_v = water quality volume (acre-ft or cf)

P =	1.30	in	P = 90% rainfall event (inches)
I =	27.8	%	I = percent impervious cover (%)
I new =	25.1	%	I new= percent impervious cover that is new
I rdv =	2.7	%	I rdv= percent impervious cover that is redeveloped
A =	0.810	acres	A = area disturbed (acres)
R_v =	0.2939		R_v = 0.05 + 0.009(I new + .75 * I rdv)
WQ_v =	**0.0258**	**acre-ft**	
	1,123	**cf**	

The combined WQv for the project is 0.1081 acre-feet, which will be treated with a hydrodynamic separator. 0.1081 acre-feet corresponds to a design flow of 0.60 cfs. The stormwater treatment structure captures and treats 1.75 cfs of flow during the WQv event, satisfying this requirement.

Runoff Reduction Volume (RRv)

The runoff reduction volume (RRv) is achieved by infiltration, groundwater recharge, reuse, recycle, or evaporation/evapotranspiration of the post-development water quality volume. The intent is to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, and discharge volume, while also minimizing concentrated flow before runoff reaches the collection system.

Per Chapter 9 of the Stormwater Design Manual, redevelopment projects are only required to meet RRv requirements for the portion of the construction that is new impervious area. The RRv for this project is calculated as follows:

$$RR_v = \frac{(P)\ (Rv^*)\ (Ai)}{12}$$

Where:

RR_v = runoff reduction volume (acre-ft or cf)

P = 90% rainfall event (inches)

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

Ai = impervious cover targeted for runoff reduction (ac)

Aic = total area of new impervious cover (ac)

S = specific reduction factor

HSG A=0.55, HSG B=0.40, HSG C=0.30, HSG D=0.20

P =	1.3	in
R_v*=	0.95	
Aic =	0.203	acres
S =	0.4	
RR_v =	**0.008**	**acre-ft**
	364	**cf**

As shown above, the required RRv is 364 cf. This will be accomplished via the dry well and pretreatment sump.

Stream Channel Protection Volume (CPv)

The stream channel protection volume requirement (CPv) is designed to protect stream channels from erosion. In New York State, this goal is accomplished by providing 24-hour extended detention of the post-developed 1-year, 24-hour storm runoff volume. This project discharges to a fifth order stream (Hudson River), so this requirement does not apply.

Overbank Flood Control (Q_p)

The primary purpose of the overbank flood control criteria is to prevent increasing the frequency and magnitude of out-of-bank flooding generated by urban development. Overbank flood control requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to pre-development rates. The proposed stormwater management practices reduce the 10-year peak discharge from 20.55 cfs pre-development to 19.84 cfs post-development, satisfying this requirement.

Extreme Flood Control (Q_f)

The intent of the extreme flood criteria is to prevent increased risk of flood damage from large storm events, maintain boundaries of the pre-development 100-year floodplain, and protect the physical integrity of stormwater management practices. 100-year control requires storage to attenuate the post development 100-year, 24-hour peak discharge rate (Q_f) to pre-development rates. The proposed stormwater management practices reduce the 100-year peak discharge from 36.66 cfs pre-development to 36.03 cfs post-development, satisfying this requirement.

6.0 Erosion and Sediment Control Measures

The primary goal of pollution prevention efforts during project construction is to control soil and pollutants that originate on the site and prevent them from flowing to surface waters. The purpose of this SWPPP is to provide guidelines for achieving that goal. A successful pollution prevention program also relies upon careful inspection and adjustments during the construction process in order to enhance its effectiveness.

6.1 Erosion and Sedimentation Controls

The following measures for the prevention of erosion and sediment transport are specified for the site or will most likely be necessary due to the conditions at the site. There are several other controls that may be necessary due to unforeseen conditions. The contractor shall familiarize himself with all controls described in the “New York State Standards and Specifications for Erosion and Sediment Control.” Construction specifications and details for all control measures can be found in plans or in the “New York State Standards and Specifications for Erosion and Sediment Control.”

1. Silt Fencing – Construct temporary barriers of geotextile fabric installed on contours across a slope to intercept sediment laden runoff from small drainage areas of disturbed soil. The intent is to reduce runoff velocity and cause deposition of transported sediment load. Silt fencing is to be utilized during site demolition and remain in place until areas upstream of silt fence have been properly stabilized.

2. Compost Filter Sock - Install degradable geotextile mesh tube filled with compost filter media. The intent is to filter sediment and other pollutants to prevent their migration

offsite. Filter socks are to be utilized during site demolition and remain in place until the upstream areas have been properly stabilized.

3. Drainage Structure Inlet Protection – Construct temporary, somewhat permeable barriers around inlets in the form of fences, berms, or excavations around openings to trap water and reduce the sediment content of runoff by settling. The intent is to prevent heavily sediment laden water from entering a storm drain system through inlets. Inlet protection is to be utilized during site demolition and remain in place until inlet's entire drainage area has been properly stabilized.

4. Dust Control – Control dust resulting from land-disturbing activities. The intent is to prevent surface and air movement of dust from disturbed soil surfaces that may cause offsite damage, health hazards, and traffic safety problems. This practice applies to construction roads, access points, and other disturbed areas subject to surface dust movement. Maintain dust control measures through dry weather periods until all disturbed areas are stabilized. For non-driving areas, apply seeding or mulching to control dust. For driving areas, place woven geotextile barriers on driving surfaces or spray surfaces with water at frequency necessary to control dust.

5. Seeding – Apply perennial grass seed mixture conforming to project specifications to disturbed soils. The intent is to provide temporary or permanent erosion and sediment control by covering all bare ground surfaces that exist because of construction. Apply seeding in all exposed areas for temporary and permanent stabilization of soils as soon as practical.

6. Mulching – Apply coarse plant residue or chips, or other suitable materials, to cover disturbed soil surface. Intent is to provide initial erosion control while a seeding or shrub planting is establishing. Apply mulching in all exposed areas for temporary and permanent stabilization of soils as soon as practical.

7. Topsoiling – Spread topsoil over final graded areas to specified depth prior to seeding to establish vegetation. No vehicle or pedestrian traffic will be allowed on these areas until final stabilization has been fully established. Intent is to provide acceptable plant cover growing conditions, thereby reducing erosion; reduce irrigation water needs; and reduce need for fertilizer application. Apply topsoiling in all exposed areas for temporary and permanent stabilization of soils as soon as practical.

8. Erosion Control Blanket – Install erosion control blankets on seeded earthen slopes steeper than 3H:1V and on streambanks and shorelines where moving water is likely to erode newly seeded or planted areas. Begin at downslope end, anchoring mat at the bottom and top ends of blanket. Inspect weekly and after each runoff event until perennial vegetation is established to minimum uniform 80% coverage throughout blanketed area. Replace or restore damaged or displaced blankets within 2 calendar days.

6.2 Construction Sequencing

The following construction sequencing for erosion control measures describes the intended order of construction activities.

1. Obtain plan approval and all applicable permits.

2. Set up stabilized construction entrance and determine equipment and material storage area. Stabilize bare areas in entrances, construction routes, or equipment areas immediately as work takes place.

3. Install temporary erosion and sediment control measures to comply with drawings and specifications prior to any site disturbance activities. A Qualified Inspector shall inspect all erosion and sediment control practices weekly. Maintain all erosion and sediment control devices as necessary throughout the construction period.

4. Begin demolition and excavation operations for Lot R and Grove Pavilion work.

5. Install new stormwater and electrical lines, stormwater structures, and underdrains.

6. Complete wall repairs at Lot R as directed by geotechnical engineer.

7. Construct new building and sidewalk at Grove Pavilion area.

8. Install new landscaping at Grove Pavilion area.

9. Finish grade and construct pavement for Lot R work, restore all disturbed areas in both project locations for final stabilization.

10. All erosion and sediment control features shall be maintained until all disturbed areas are stabilized. After acceptance of restoration by the Qualified Inspector, remove all temporary erosion and sediment control features.

11. Upon completion of the project, a Notice of Termination (NOT) form is to be filed with NYSDEC.

6.3 Other Pollution Prevention Controls

The following pollution prevention measures shall be implemented as necessary to control litter, construction chemicals, construction debris, and other forms of waste from becoming a pollutant source in the stormwater discharge.

1. Solid Waste Disposal – No solid materials, including building materials, are allowed to be discharged from the site with stormwater. All solid waste, including disposable materials incidental to major construction activities, must be collected/placed in containers. Containers will be emptied as necessary by a contract trash disposal service and hauled away from site. General Contractor shall denote location of solid waste receptacles on Erosion Control Plan. Substances that have potential for polluting surface water and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from site.

2. Sanitary Facilities – All personnel involved with construction activities must comply with state and local sanitary or septic system regulations. Temporary sanitary facilities will be provided at site during construction. They must be utilized by all construction personnel and will be serviced by a commercial operator. General Contractor shall denote location of sanitary facilities on Erosion Control Plan.

3. Water Source – Non-stormwater components of site discharge must be clean water. Water used for construction which discharges from site must originate from a public water supply or private well approved by DOH. Water used for construction that does not originate from an approved public supply must not discharge from site.

4. Concrete Waste from Concrete Ready-Mix Trucks – Discharge of excess or waste concrete and/or wash water from concrete trucks will be allowed on the construction site, but only in specifically designated areas prepared to prevent contact between concrete and/or wash water and stormwater discharged from site. Alternatively, waste concrete can be placed into forms to make riprap or other useful concrete products. Cured residue from concrete washout diked areas shall

be disposed in accordance with applicable state and federal regulations. Location of concrete washout is on Erosion Control Plan.

5. Fuel Tanks – Temporary onsite fuel tanks for construction vehicles shall meet all state and federal regulations. Tanks shall have approved spill containment with capacity required by applicable regulations. Tank shall be in sound condition free of rust or other damage which might compromise containment. Hoses, valves, fittings, caps, filler nozzles, and associated hardware shall be maintained in proper working condition at all times. General Contractor shall denote location of fuel tanks on Erosion Control Plan.

6. Hazardous Waste Management and Spill Reporting – Any hazardous or potentially hazardous waste brought onto construction site will be handled properly to reduce potential for stormwater pollution. Should an accidental spill occur, immediate action must be taken by General Contractor to contain and remove spilled material. All hazardous materials must be disposed of by Contractor in manner specified by local, state, and federal regulations and by manufacturer of such products. As soon as possible, spill must be reported to appropriate federal, state, and local agencies.

7.0 Maintenance and Inspection

7.1 Construction Maintenance and Inspection

Maintenance and inspection of the stormwater management and pollution prevention devices must occur on a regular basis throughout construction. The SWPPP shall be modified as necessary throughout construction process to prevent pollutants from leaving site. The maintenance and inspection procedures during construction are as follows:

1. Prior to commencement of construction activity, contractor and subcontractors shall identify at least one person from each respective companies that will be responsible for implementation of SWPPP. Prior to commencement of any construction activity, all designated trained contractors shall read, understand, and sign a Contractor's Certification Statement contained in SWPPP. At least one trained contractor shall be on the site during performance of any soil-disturbing activities. See Appendix G for certification form.

2. The owner/operator is responsible for designating a qualified individual familiar with proposed construction activities and knowledgeable in stormwater pollution prevention to perform inspections. The individual responsible for site inspections shall be a qualified inspector as defined in permit. Qualified inspector will inspect site for compliance with SWPPP and permit, identify components requiring maintenance or remedial action, and transmit this information to trained contractor within one business day of completion of inspection. Under direction of trained contractor, all maintenance or remedial action identified shall be implemented prior to next inspection. Inspection period shall be at least once every seven calendar days, unless conditions require more frequent inspections, or as specified in the permit. Refer to Appendix H for inspection forms.

3. The owner/operator shall have qualified inspector conduct an assessment of site prior to commencement of construction and certify in an inspection report that appropriate erosion and sediment controls described within the SWPPP and required by permit have been adequately installed to ensure site is prepared for commencement of construction.

4. All erosion and sediment control measures shall be installed and maintained in accordance with the project plans and the most current issuance of “New York State

Standards and Specifications for Erosion and Sediment Control," commonly known as "The Blue Book."

5. Greater than five acres of soil shall not be disturbed at any time without prior written authorization from NYSDEC and compliance with requirements outlined in permit. If authorized and more than 5 acres of land is disturbed, qualified inspector shall conduct at least two site inspections every seven calendar days. The two inspections shall be separated by a minimum of two full calendar days.

6. The trained contractor shall maintain on site a current record of all SWPPP inspections, together with a copy of the project SWPPP, including any revisions, additions, or modifications.

7. At a minimum, the trained contractor(s) shall:
    a. Inspect all erosion control measures (silt fence, inlet protection, filter socks, etc.) being implemented in the active work area daily to ensure they are being maintained in effective operating condition. Repair any deficiencies immediately.
    b. Seed and plant areas to be stabilized, including repairing bare spots, washouts, and maintaining a healthy growth of stabilizing cover(s).
    c. Monitor adjacent roadways to ensure tracked mud, dust, dirt, or rocks are swept as necessary.
    d. See that general worksite housekeeping is maintained.

8. Prior to filing the Notice of Termination, the qualified inspector shall perform a final site inspection. The inspector shall certify that the site has undergone final stabilization and that all temporary erosion and sediment controls not needed for long-term erosion control have been removed.

7.2 Post-Construction Operation and Maintenance

Upon completion of construction, the property owner is responsible for ensuring that the stormwater facilities are regularly inspected and maintained. Maintenance and inspection procedures are as follows:

Hydrodynamic Treatment Structure

1. Inspect the water quality treatment structure for debris and accumulation of sediment on a quarterly basis and following significant rainfall events or snowmelts.

2. Remove and properly dispose of any collected debris and sediment in accordance with applicable state, federal and local regulations. Structure should be pumped out at a minimum of once a year and when the sediment depth in the first chamber is at 50% of the design sediment storage depth.

3. The treatment structure shall be inspected as identified in the maintenance and inspection procedures included in Appendix H. A record of all inspections should be kept with the SWPPP.

Pretreatment Sump/Dry Well

1. Inspect the dry well for debris and accumulation of sediment on a quarterly basis and following significant rainfall events or snowmelts.

2. Remove and properly dispose of any collected debris and sediment in accordance with applicable state, federal and local regulations. Structure should be pumped out

at a minimum of once a year and when the sediment depth in the first chamber is at 50% of the design sediment storage depth.

3. The well shall be inspected as identified in the maintenance and inspection procedures included in Appendix H. A record of all inspections should be kept with the SWPPP.

APPENDIX A
MAPS AND PLANS

Location Map

Erosion and Sediment Control Plan

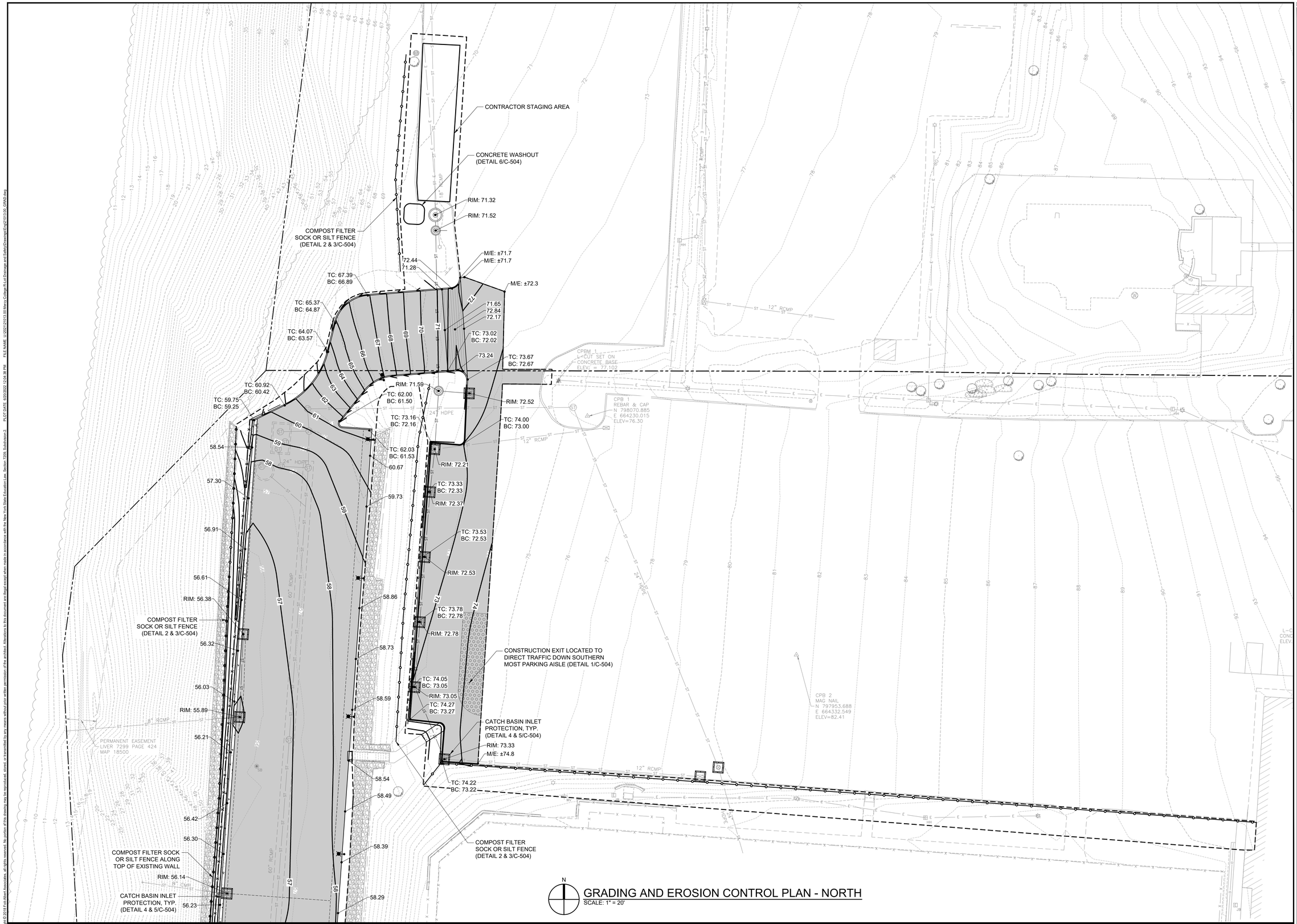
Grading and Storm Drainage Plan

Erosion Control and Storm Drainage Details

MERCY COLLEGE PARKING LOT R IMPROVEMENTS

555 BROADWAY
DOBBS FERRY, NY 10522

Date:	06/17/2022	Proj. Manager:	DLP
Drawn By:	HMC	Checked By:	DLP
Scale:	N.T.S	Project:	21013.00
Sheet:	LOCATION MAP		



GRADING AND EROSION CONTROL PLAN - NORTH
SCALE: 1" = 20'

MATCHLINE: SEE SHEET C-108

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GRADING AND EROSION CONTROL PLAN - NORTH

MERCY COLLEGE
PARKING LOT R IMPROVEMENTS

555 BROADWAY
DOBBS FERRY, NEW YORK, 10522

Seal:

STATE OF NEW YORK
GERARD J. SCOTT
No. 062576-1
LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

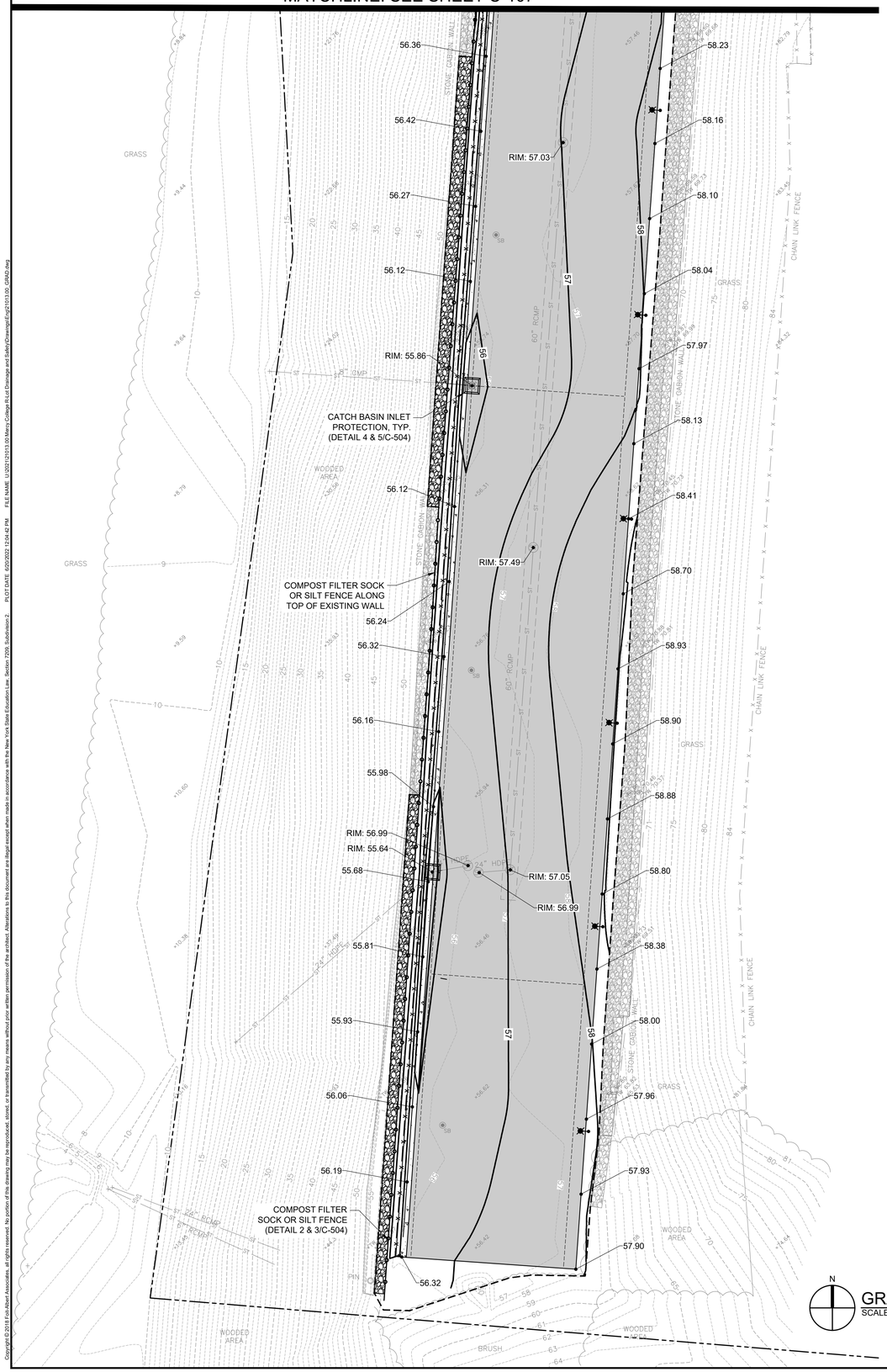
Scale: 1" = 20'

Date: 06/17/2022	Project Manager: DLP
Drawn By: TAS	Checked By: DLP

Project: 21013.00

Sheet: C-107

MATCHLINE: SEE SHEET C-107



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GRADING AND EROSION CONTROL PLAN - SOUTH
SCALE: 1" = 20'

Consultants:

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GRADING AND EROSION CONTROL PLAN - SOUTH

MERCY COLLEGE
PARKING LOT R IMPROVEMENTS
555 BROADWAY
DOBBS FERRY, NEW YORK, 10522

Seal:

STATE OF NEW YORK
GERARD J. KLEINTZ
No. 062576
LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

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Date: 06/17/2022	Project Manager: DLP
Drawn By: TAS	Checked By: DLP

Project: 21013.00

Sheet: **C-108**

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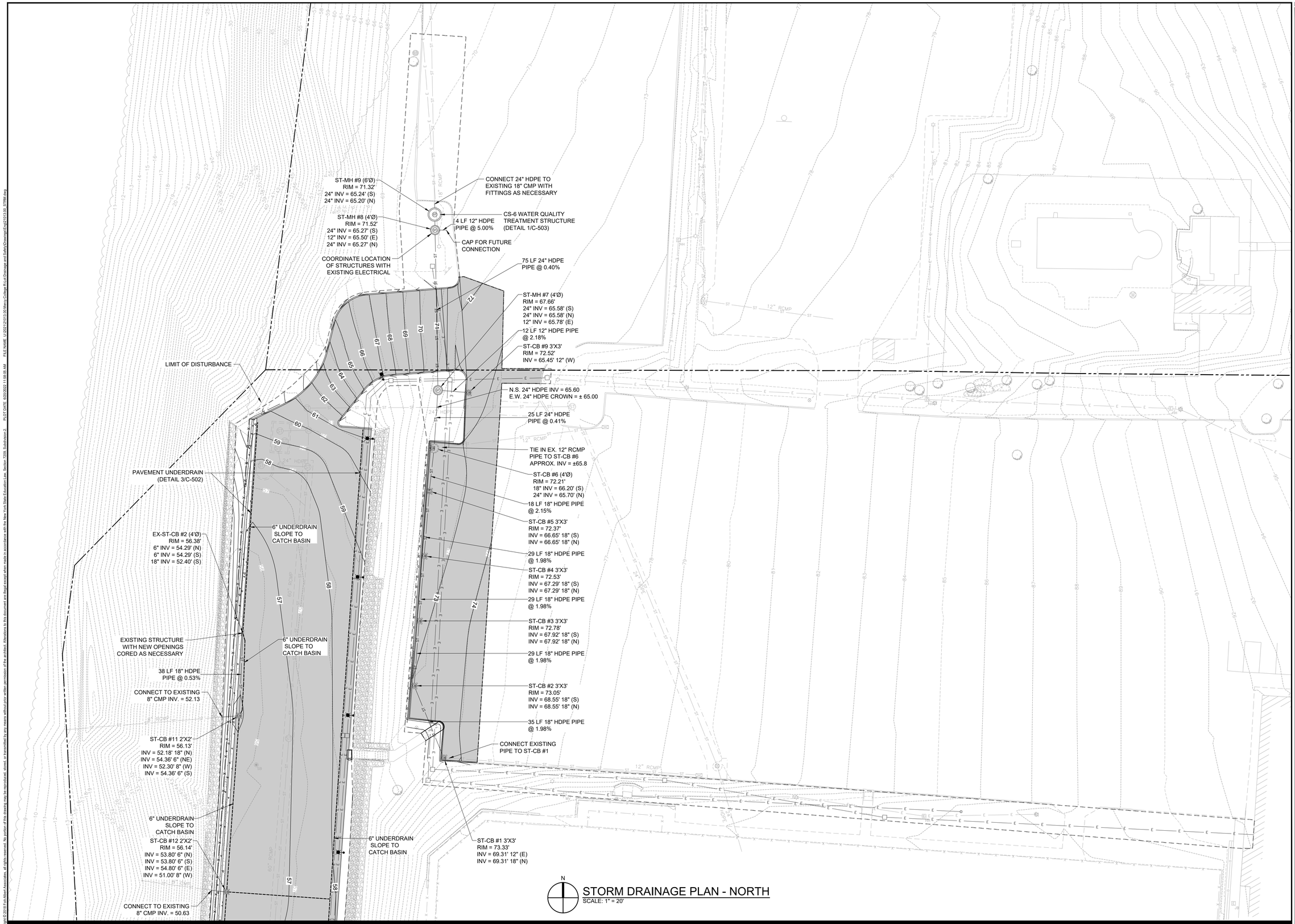

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Buffalo, NY 14203
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STORM DRAINAGE PLAN - NORTH

MERCY COLLEGE PARKING LOT R IMPROVEMENTS

555 BROADWAY
DOBBS FERRY, NEW YORK, 10522

Seal: STATE OF NEW YORK · GERARD J. [illegible] · No. 062576-1 · LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

Scale: 1" = 20'

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Project: 21013.00

Sheet: C-109

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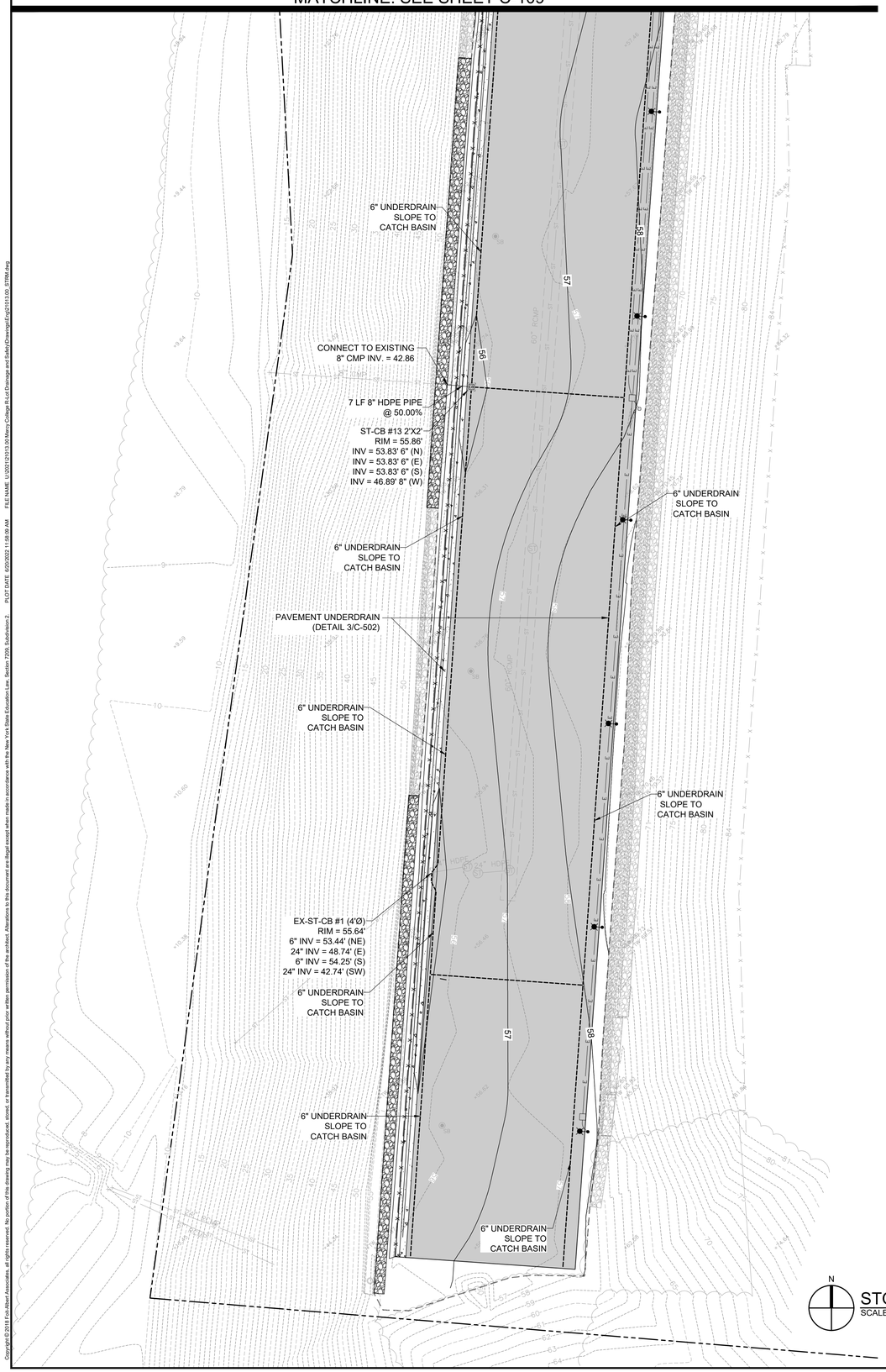
MATCHLINE: SEE SHEET C-109



N

STORM DRAINAGE PLAN - SOUTH

SCALE: 1" = 20'

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STORM DRAINAGE PLAN - SOUTH

MERCY COLLEGE
PARKING LOT R IMPROVEMENTS
555 BROADWAY
DOBBS FERRY, NEW YORK, 10522

Seal:

STATE OF NEW YORK · GERARD J. SCHUTZ · No. 062578 · LICENSED PROFESSIONAL ENGINEER

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Date: 06/17/2022	Project Manager: DLP
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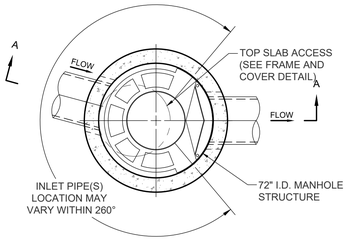
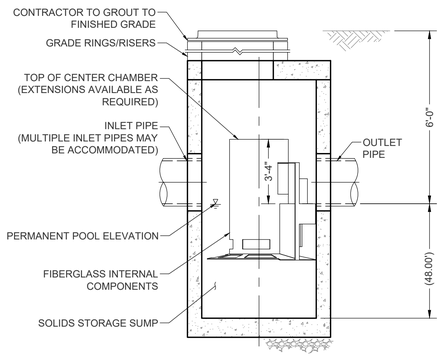
Project: 21013.00

Sheet: **C-110**

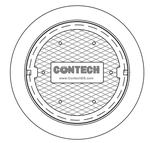


PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

CASCADE SEPARATOR DESIGN NOTES
THE STANDARD CS-6 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

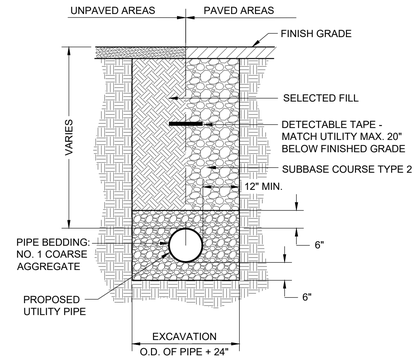
SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			ST-MH #9
WATER QUALITY FLOW RATE (cfs)			3.0
PEAK FLOW RATE (cfs)			11.35
RETURN PERIOD OF PEAK FLOW (yrs)			10-YR
RIM ELEVATION			71.52
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	65.24	HDPE	24"
OUTLET PIPE	65.20	HDPE	24"
NOTES / SPECIAL REQUIREMENTS:			

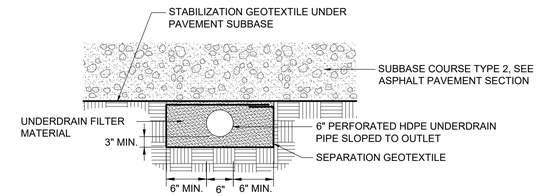
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

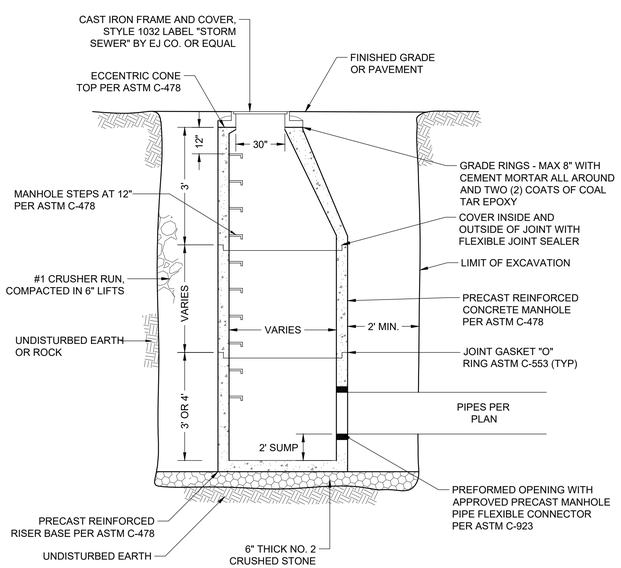
1 / C-503 STORM WATER TREATMENT UNIT DETAIL
NOT TO SCALE



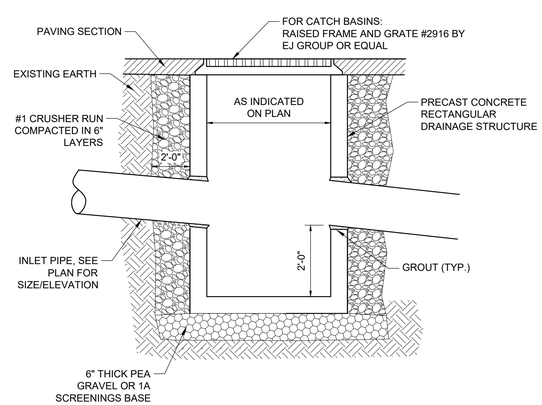
2 / C-502 DRAINAGE PIPE DETAIL
NOT TO SCALE



3 / C-502 PAVEMENT UNDERDRAIN DETAIL
NOT TO SCALE



4 / C-502 STORM MANHOLE DETAIL
NOT TO SCALE



5 / C-502 STORM CATCH BASIN DETAIL
NOT TO SCALE

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DETAILS (2 OF 4)

MERCY COLLEGE
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555 BROADWAY
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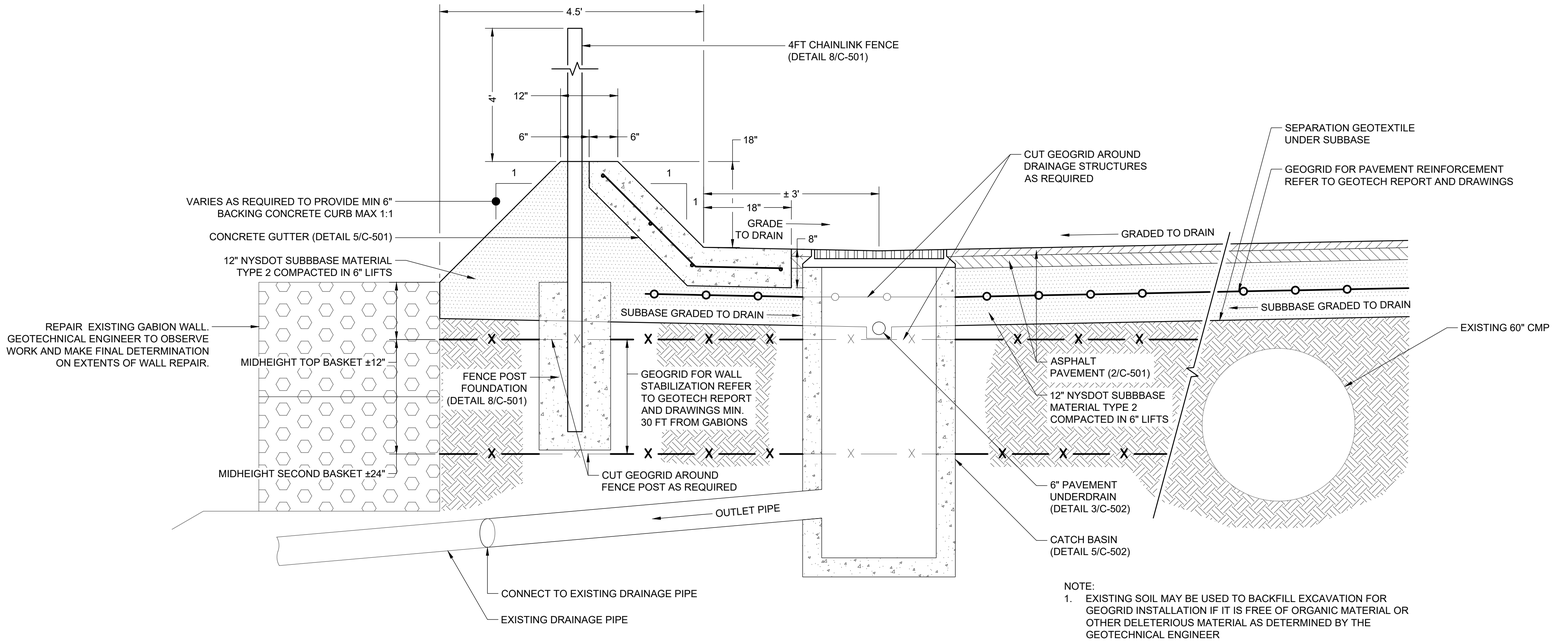
Seal:
STATE OF NEW YORK · GERARD J. SCOTT · No. 062576 · LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

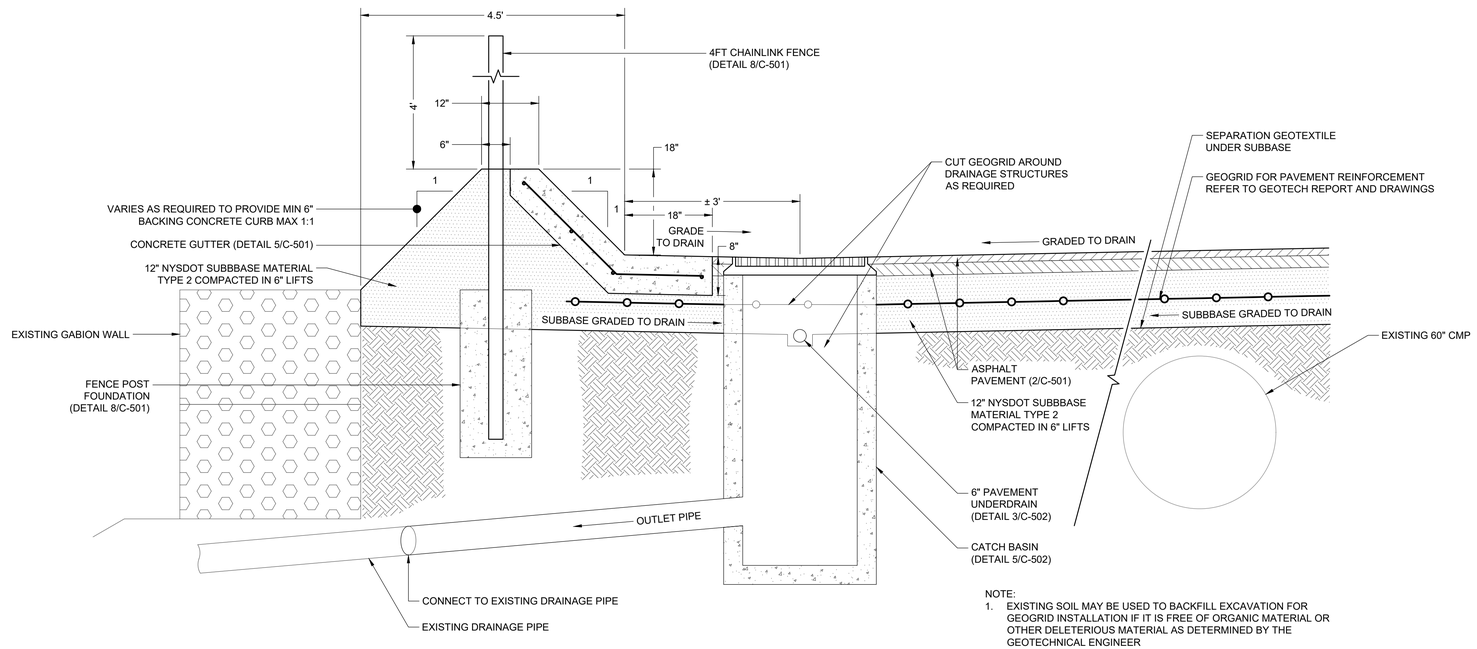
Scale: NTS
Date: 06/17/2022
Project Manager: DLP
Drawn By: TAS
Checked By: DLP
Project: 21013.00
Sheet: **C-502**



NOTE:
1. EXISTING SOIL MAY BE USED TO BACKFILL EXCAVATION FOR GEOGRID INSTALLATION IF IT IS FREE OF ORGANIC MATERIAL OR OTHER DELETERIOUS MATERIAL AS DETERMINED BY THE GEOTECHNICAL ENGINEER

1 / C-503 TYPICAL PARKING LOT SECTION (WALL REPAIRS)

NOT TO SCALE



NOTE:
1. EXISTING SOIL MAY BE USED TO BACKFILL EXCAVATION FOR GEOGRID INSTALLATION IF IT IS FREE OF ORGANIC MATERIAL OR OTHER DELETERIOUS MATERIAL AS DETERMINED BY THE GEOTECHNICAL ENGINEER

2 / C-503 TYPICAL PARKING LOT SECTION (WITHOUT WALL REPAIRS)

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DETAILS (3 OF 4)

MERCY COLLEGE
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555 BROADWAY
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Seal:

STATE OF NEW YORK
GERARD J. KEARNEY
062576
LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

Scale: NTS

Date: 06/17/2022 | Project Manager: DLP

Drawn By: TAS | Checked By: DLP

Project: 21013.00

Sheet: C-503

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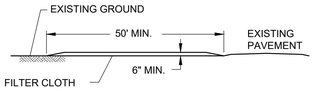
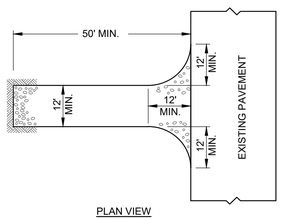


PROFILE VIEW



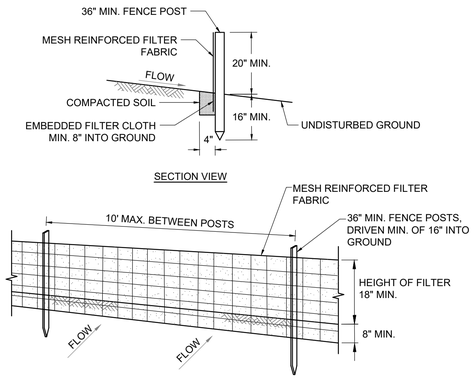
PLAN VIEW

NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS - NOT LESS THAN SIX INCHES.
4. WIDTH - 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24 FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES MUST BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT MUST BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN.
10. DIMENSIONS OF CONSTRUCTION ENTRANCE SHOWN ON EROSION AND SEDIMENT CONTROL PLAN MAY DIFFER FROM MINIMUM DIMENSIONS SHOWN HERE. LAYOUT AND DIMENSIONS OF ENTRANCE ON EROSION AND SEDIMENT CONTROL PLAN TAKE PRECEDENCE.

1 / C-504 CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE

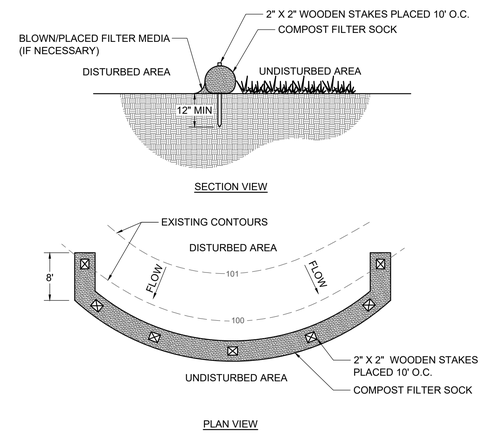


NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS ARE TO BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE IS TO BE WOVEN WIRE, 14 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY MUST BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH IS TO BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS ARE TO BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE MUST BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 / C-504 SILT FENCE DETAIL

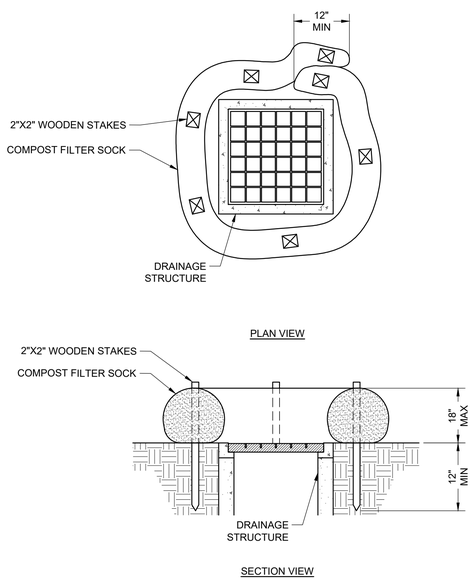
NOT TO SCALE



NOTES:
1. WHEN PLACED IN PAVEMENT AREAS, USE CONCRETE BLOCKS OR SANDBAGS AS NEEDED ON THE DOWNSTREAM SIDE OF FILTER SOCKS AND IN PLACE OF WOODEN STAKES TO HOLD FILTER SOCKS IN PLACE.

3 / C-504 COMPOST FILTER SOCK DETAIL

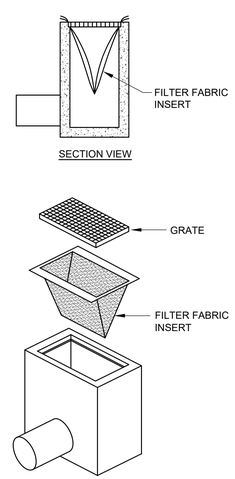
NOT TO SCALE



NOTES:
1. WHEN PLACED IN PAVEMENT AREAS, USE CONCRETE BLOCKS OR SANDBAGS AS NEEDED ON THE DOWNSTREAM SIDE OF FILTER SOCKS AND IN PLACE OF WOODEN STAKES TO HOLD FILTER SOCKS IN PLACE.

4 / C-504 COMPOST FILTER SOCK INLET PROTECTION DETAIL

NOT TO SCALE

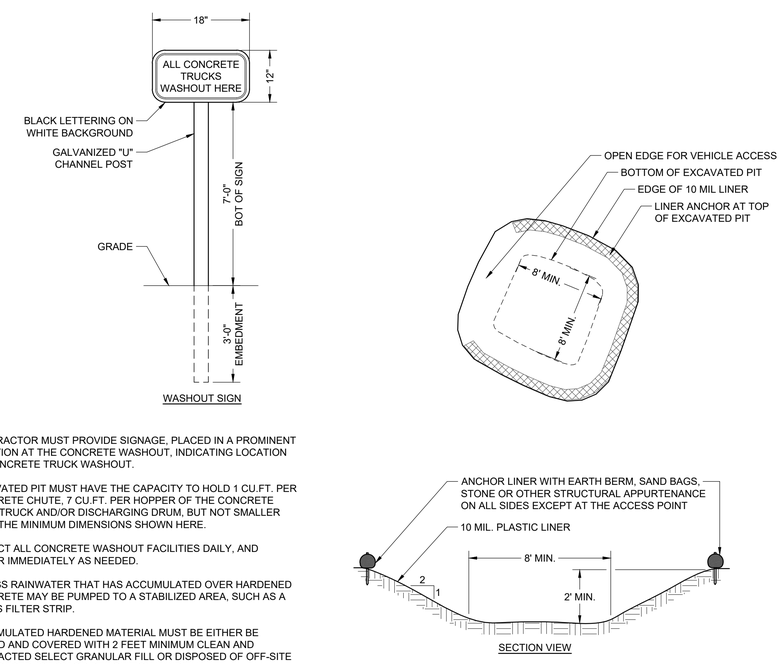


NOTES:

1. INSPECT ON A WEEKLY BASIS AND REMOVE SILT AS NECESSARY.

5 / C-504 FILTER FABRIC INLET PROTECTION DETAIL

NOT TO SCALE



NOTES:

1. CONTRACTOR MUST PROVIDE SIGNAGE, PLACED IN A PROMINENT LOCATION AT THE CONCRETE WASHOUT, INDICATING LOCATION OF CONCRETE TRUCK WASHOUT.
2. EXCAVATED PIT MUST HAVE THE CAPACITY TO HOLD 1 CU.FT. PER CONCRETE CHUTE, 7 CU.FT. PER HOPPER OF THE CONCRETE PUMP TRUCK AND/OR DISCHARGING DRUM, BUT NOT SMALLER THAN THE MINIMUM DIMENSIONS SHOWN HERE.
3. INSPECT ALL CONCRETE WASHOUT FACILITIES DAILY, AND REPAIR IMMEDIATELY AS NEEDED.
4. EXCESS RAINWATER THAT HAS ACCUMULATED OVER HARDENED CONCRETE MAY BE PUMPED TO A STABILIZED AREA, SUCH AS A GRASS FILTER STRIP.
5. ACCUMULATED HARDENED MATERIAL MUST BE EITHER BE BURIED AND COVERED WITH 2 FEET MINIMUM CLEAN AND COMPACTED SELECT GRANULAR FILL OR DISPOSED OF OFF-SITE IN A CONSTRUCTION OR DEMOLITION LANDFILL.

6 / C-504 CONCRETE WASHOUT BASIN DETAIL

NOT TO SCALE

Consultants:

FoitAlbert ASSOCIATES
Architecture. Engineering. Surveying. Environmental.
299 Main Street, Suite 200
Buffalo, NY 14203
P. (716) 856-3933
www.foit-albert.com

DETAILS (4 OF 4)

MERCY COLLEGE
PARKING LOT R IMPROVEMENTS
555 BROADWAY
DOBBS FERRY, NEW YORK, 10522

Seal: STATE OF NEW YORK · GERARD J. SCOTT · No. 062576-1 · LICENSED PROFESSIONAL ENGINEER

Revision Number	Revision Date

Scale: NTS
Date: 06/17/2022
Project Manager: DLP
Drawn By: TAS
Checked By: DLP
Project: 21013.00
Sheet: C-504

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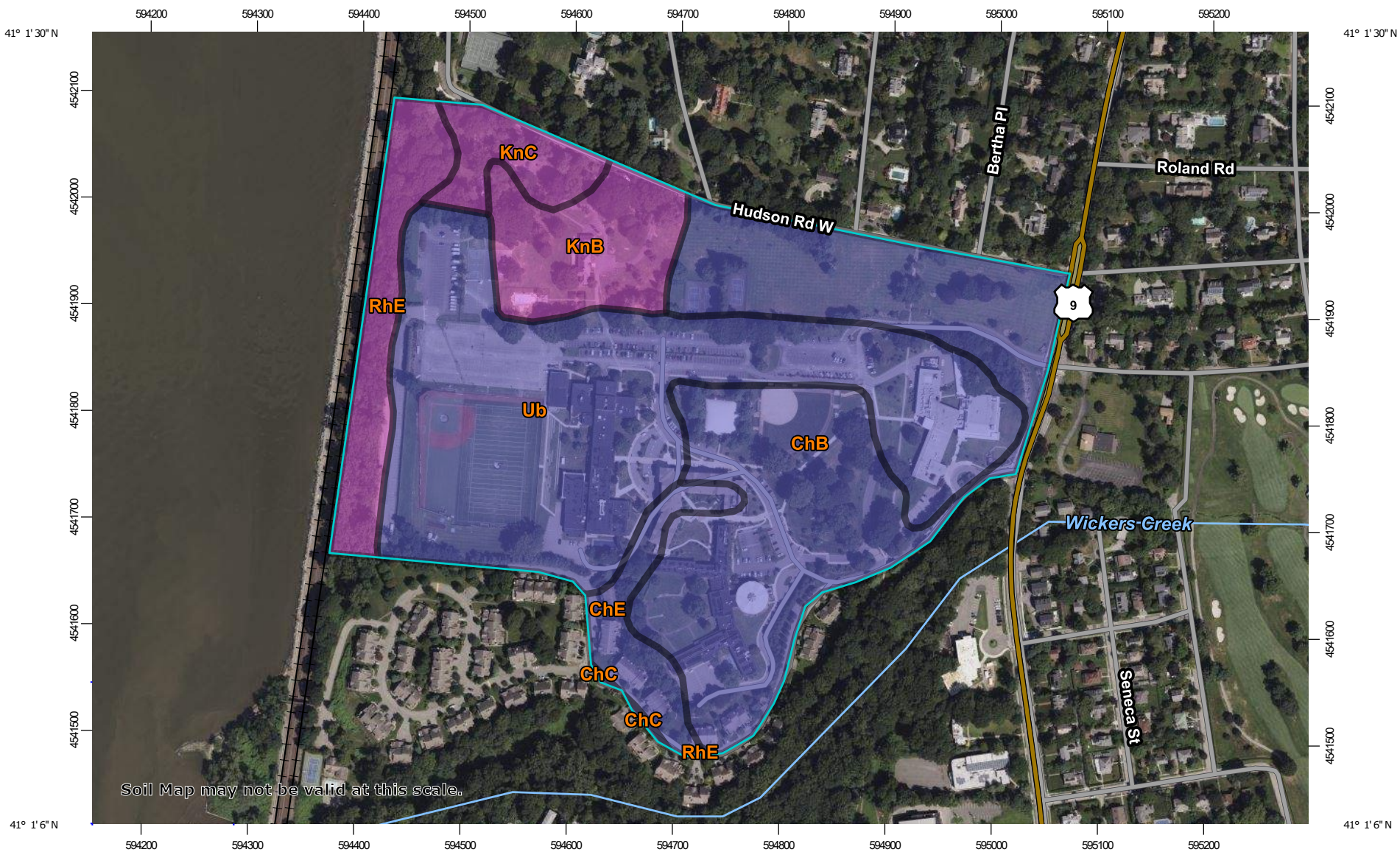
APPENDIX B
SITE INFORMATION

Soils Report

Historical and Cultural Resources Documentation

Precipitation Data

Hydrologic Soil Group—Westchester County, New York
(Mercy College Dobbs Ferry Campus)



Map Scale: 1:5,230 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

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 1:12,000.

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: Westchester County, New York
Survey Area Data: Version 17, Sep 1, 2021

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

Date(s) aerial images were photographed: Apr 13, 2021—Sep 14, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ChB	Charlton fine sandy loam, 3 to 8 percent slopes	B	22.5	35.9%
ChC	Charlton fine sandy loam, 8 to 15 percent slopes	B	0.1	0.2%
ChE	Charlton loam, 25 to 35 percent slopes	B	2.9	4.6%
KnB	Knickerbocker fine sandy loam, 2 to 8 percent slopes	A	5.3	8.4%
KnC	Knickerbocker fine sandy loam, 8 to 15 percent slopes	A	2.5	3.9%
RhE	Riverhead loam, 25 to 50 percent slopes	A	4.4	6.9%
Ub	Udorthents, smoothed	B	25.0	40.0%
Totals for Area of Interest			**62.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOAA Atlas 14, Volume 10, Version 3
Location name: Irvington, New York, USA*
Latitude: 41.022°, Longitude: -73.874°
Elevation: 113.25 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.371 (0.295-0.464)	0.434 (0.345-0.542)	0.536 (0.424-0.672)	0.621 (0.488-0.783)	0.737 (0.559-0.968)	0.826 (0.612-1.11)	0.917 (0.654-1.27)	1.01 (0.686-1.45)	1.14 (0.741-1.69)	1.24 (0.784-1.87)
10-min	0.526 (0.418-0.657)	0.614 (0.488-0.768)	0.759 (0.601-0.953)	0.879 (0.692-1.11)	1.05 (0.791-1.37)	1.17 (0.867-1.57)	1.30 (0.926-1.80)	1.43 (0.973-2.05)	1.62 (1.05-2.39)	1.76 (1.11-2.65)
15-min	0.618 (0.492-0.773)	0.723 (0.574-0.904)	0.894 (0.708-1.12)	1.03 (0.815-1.31)	1.23 (0.931-1.61)	1.38 (1.02-1.85)	1.53 (1.09-2.12)	1.69 (1.15-2.41)	1.90 (1.24-2.81)	2.07 (1.31-3.12)
30-min	0.854 (0.679-1.07)	0.996 (0.792-1.25)	1.23 (0.973-1.54)	1.42 (1.12-1.80)	1.69 (1.28-2.21)	1.89 (1.40-2.53)	2.10 (1.49-2.90)	2.31 (1.57-3.30)	2.59 (1.69-3.83)	2.81 (1.78-4.24)
60-min	1.09 (0.867-1.36)	1.27 (1.01-1.59)	1.57 (1.24-1.96)	1.81 (1.42-2.28)	2.15 (1.63-2.81)	2.41 (1.78-3.22)	2.67 (1.90-3.68)	2.93 (1.99-4.18)	3.28 (2.13-4.85)	3.55 (2.25-5.36)
2-hr	1.46 (1.17-1.81)	1.68 (1.35-2.09)	2.04 (1.63-2.55)	2.34 (1.86-2.94)	2.76 (2.10-3.59)	3.07 (2.29-4.08)	3.39 (2.43-4.66)	3.73 (2.54-5.29)	4.18 (2.73-6.15)	4.54 (2.88-6.81)
3-hr	1.70 (1.37-2.10)	1.96 (1.57-2.42)	2.38 (1.91-2.96)	2.73 (2.17-3.41)	3.21 (2.46-4.17)	3.57 (2.67-4.74)	3.95 (2.85-5.42)	4.35 (2.97-6.15)	4.91 (3.21-7.19)	5.36 (3.41-8.01)
6-hr	2.13 (1.72-2.61)	2.48 (2.01-3.05)	3.06 (2.47-3.78)	3.54 (2.84-4.39)	4.21 (3.25-5.45)	4.71 (3.55-6.23)	5.23 (3.81-7.18)	5.82 (3.99-8.18)	6.67 (4.38-9.72)	7.38 (4.71-11.0)
12-hr	2.54 (2.07-3.10)	3.04 (2.48-3.71)	3.87 (3.14-4.74)	4.55 (3.67-5.61)	5.49 (4.27-7.08)	6.19 (4.70-8.17)	6.94 (5.10-9.53)	7.82 (5.37-10.9)	9.12 (5.99-13.2)	10.2 (6.53-15.1)
24-hr	2.92 (2.40-3.54)	3.58 (2.94-4.34)	4.65 (3.80-5.66)	5.54 (4.50-6.78)	6.76 (5.29-8.68)	7.67 (5.87-10.1)	8.64 (6.40-11.8)	9.81 (6.77-13.6)	11.6 (7.63-16.6)	13.1 (8.39-19.2)
2-day	3.31 (2.74-3.99)	4.08 (3.37-4.91)	5.33 (4.39-6.44)	6.37 (5.21-7.74)	7.79 (6.14-9.95)	8.85 (6.82-11.6)	9.99 (7.45-13.6)	11.4 (7.88-15.7)	13.5 (8.91-19.2)	15.3 (9.83-22.2)
3-day	3.62 (3.01-4.33)	4.44 (3.68-5.32)	5.78 (4.78-6.95)	6.89 (5.66-8.34)	8.42 (6.66-10.7)	9.55 (7.38-12.4)	10.8 (8.06-14.6)	12.3 (8.51-16.8)	14.5 (9.62-20.6)	16.4 (10.6-23.8)
4-day	3.89 (3.24-4.64)	4.74 (3.95-5.67)	6.14 (5.10-7.37)	7.30 (6.02-8.82)	8.90 (7.06-11.3)	10.1 (7.81-13.1)	11.4 (8.52-15.4)	12.9 (8.98-17.7)	15.2 (10.1-21.6)	17.2 (11.1-24.9)
7-day	4.62 (3.88-5.49)	5.55 (4.65-6.60)	7.06 (5.89-8.43)	8.32 (6.89-9.98)	10.0 (8.00-12.6)	11.3 (8.81-14.6)	12.7 (9.54-17.0)	14.3 (10.0-19.5)	16.8 (11.2-23.7)	18.8 (12.2-27.1)
10-day	5.33 (4.49-6.32)	6.31 (5.31-7.48)	7.91 (6.62-9.40)	9.23 (7.68-11.0)	11.1 (8.83-13.8)	12.4 (9.66-15.9)	13.9 (10.4-18.4)	15.5 (10.9-21.1)	18.0 (12.0-25.3)	20.0 (13.0-28.7)
20-day	7.54 (6.40-8.86)	8.64 (7.32-10.2)	10.4 (8.82-12.3)	11.9 (10.0-14.2)	14.0 (11.2-17.3)	15.6 (12.2-19.7)	17.2 (12.9-22.5)	18.9 (13.3-25.5)	21.3 (14.3-29.7)	23.2 (15.1-33.1)
30-day	9.41 (8.02-11.0)	10.6 (9.04-12.4)	12.6 (10.7-14.8)	14.2 (12.0-16.8)	16.5 (13.3-20.2)	18.2 (14.2-22.8)	19.9 (14.9-25.8)	21.7 (15.4-29.1)	24.1 (16.2-33.4)	25.9 (16.8-36.6)
45-day	11.8 (10.1-13.7)	13.1 (11.2-15.3)	15.3 (13.0-17.9)	17.1 (14.4-20.1)	19.5 (15.8-23.8)	21.5 (16.8-26.7)	23.4 (17.5-29.9)	25.2 (17.9-33.5)	27.5 (18.6-38.0)	29.2 (19.1-41.2)
60-day	13.8 (11.8-16.0)	15.2 (13.0-17.7)	17.5 (15.0-20.5)	19.5 (16.5-22.9)	22.1 (17.9-26.9)	24.2 (19.0-30.0)	26.2 (19.6-33.4)	28.1 (20.0-37.3)	30.5 (20.6-41.9)	32.1 (21.0-45.2)

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

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

Please refer to NOAA Atlas 14 document for more information.

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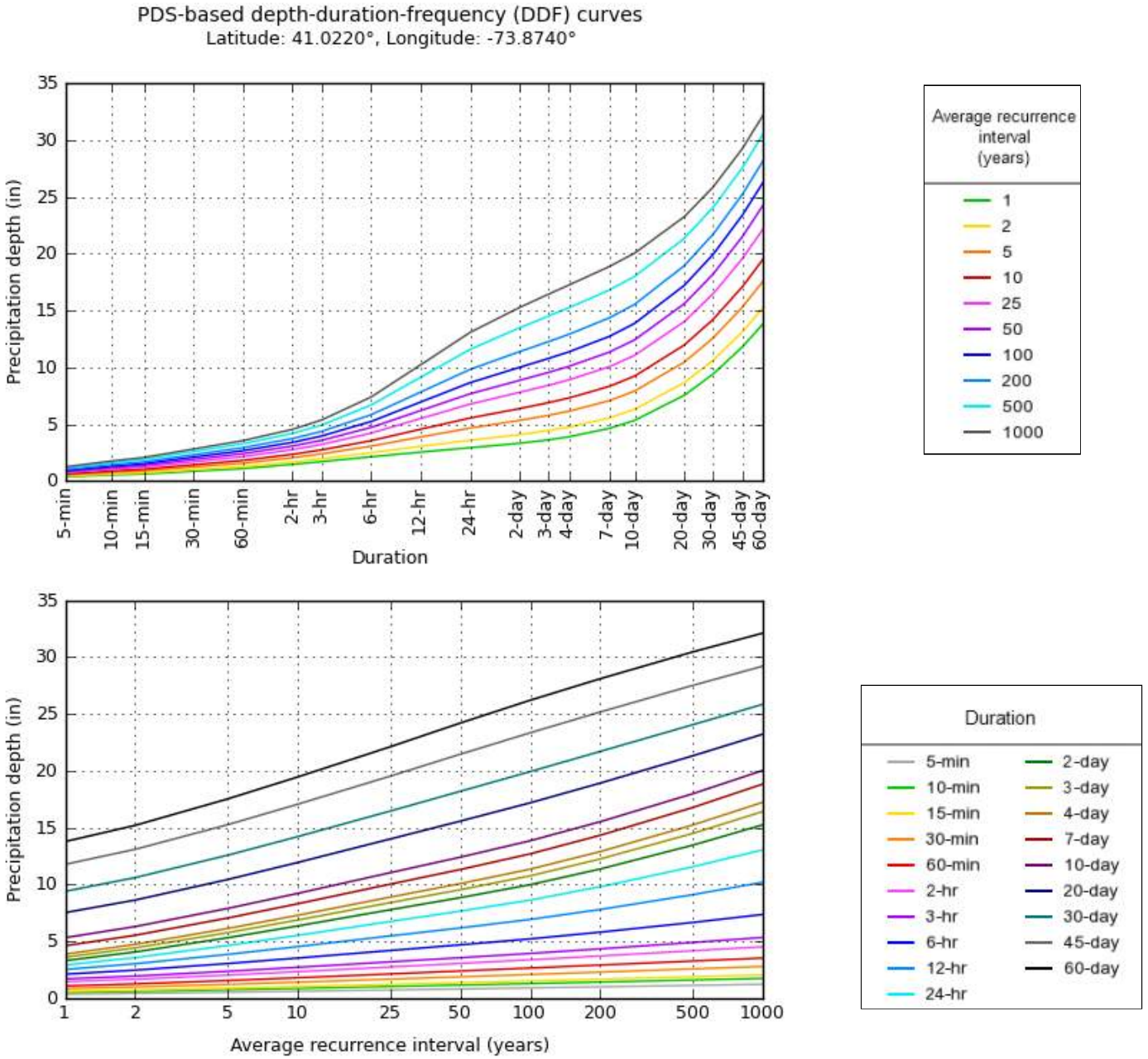
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Apr 28 15:56:16 2022

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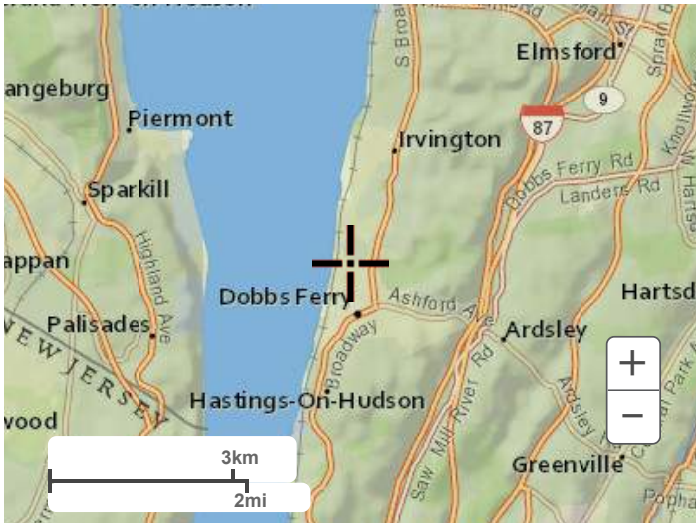
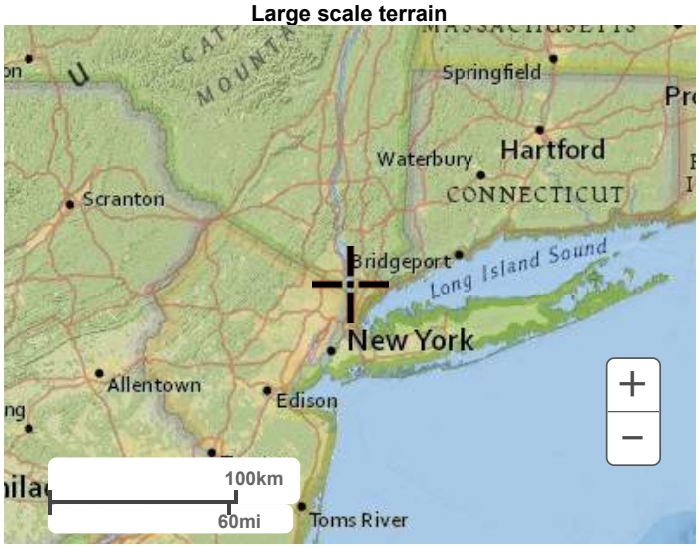
Maps & aerials

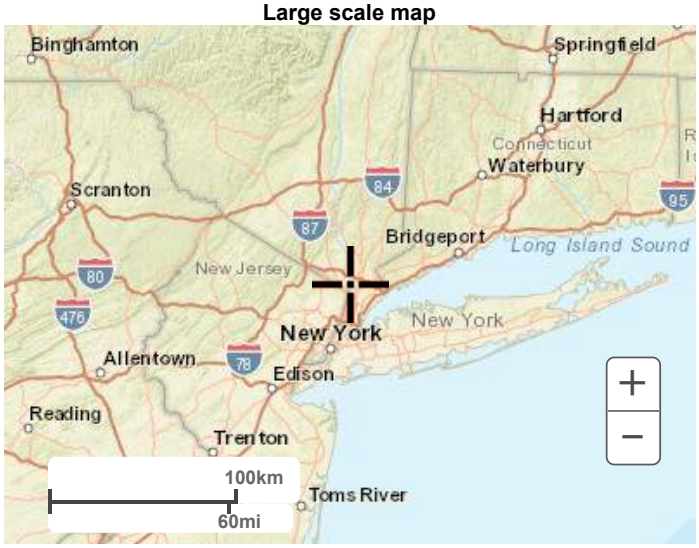
Small scale terrain



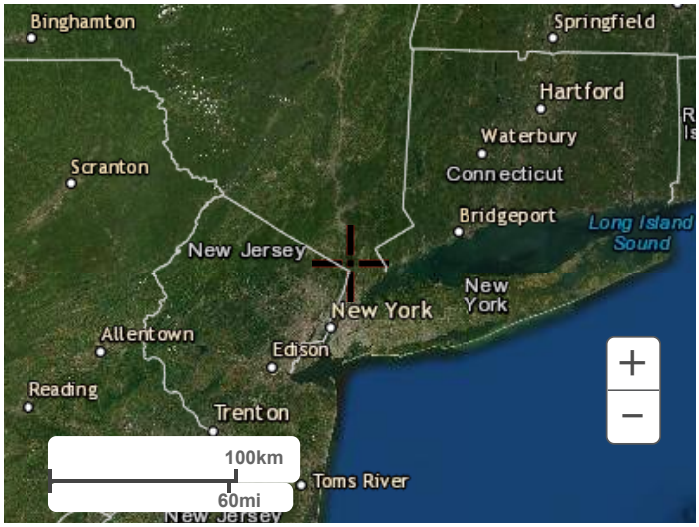
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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APPENDIX C
PRE-DEVELOPMENT HYDROLOGY

Pre-Development Drainage Shed Plan

Pre-Development Hydrologic Analysis

Subcat Reach Pond Link

Routing Diagram for 21013.00_Existing
Prepared by Foit-Albert Associates, Printed 6/17/2022
HydroCAD® 10.00-26 s/n 06347 © 2020 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "21013_Proposed Lot R Repairs.hcp"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.858	98	(SB-1, SB-2, SB-3, SB-4)
3.312	61	>75% Grass cover, Good, HSG B (SA-1, SA-2, SA-3, SA-4, SA-5, SB-1, SB-2, SB-3, SB-4, SC-1)
0.801	98	Paved parking, HSG B (SC-1)
1.024	98	Pavement (SA-1, SA-2, SA-3, SA-4, SA-5)
0.150	60	Woods, Fair, HSG B (SA-6)
7.145	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
4.263	HSG B	SA-1, SA-2, SA-3, SA-4, SA-5, SA-6, SB-1, SB-2, SB-3, SB-4, SC-1
0.000	HSG C	
0.000	HSG D	
2.882	Other	SA-1, SA-2, SA-3, SA-4, SA-5, SB-1, SB-2, SB-3, SB-4
7.145		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.858	1.858		SB-1, SB-2, SB-3, SB-4
0.000	3.312	0.000	0.000	0.000	3.312	>75% Grass cover, Good	SA-1, SA-2, SA-3, SA-4, SA-5, SB-1, SB-2, SB-3, SB-4, SC-1
0.000	0.801	0.000	0.000	0.000	0.801	Paved parking	SC-1
0.000	0.000	0.000	0.000	1.024	1.024	Pavement	SA-1, SA-2, SA-3, SA-4, SA-5
0.000	0.150	0.000	0.000	0.000	0.150	Woods, Fair	SA-6
0.000	**4.263**	**0.000**	**0.000**	**2.882**	**7.145**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	122.50	120.00	93.0	0.0269	0.012	15.0	0.0	0.0
2	Ex-SA-CB-1	52.41	52.34	40.0	0.0018	0.010	8.0	0.0	0.0
3	Ex-SA-CB-2	52.14	11.61	80.0	0.5066	0.011	8.0	0.0	0.0
4	Ex-SA-CB-3	54.13	53.53	5.0	0.1200	0.025	8.0	0.0	0.0
5	Ex-SA-CB-3	52.63	27.23	35.0	0.7257	0.025	8.0	0.0	0.0
6	Ex-SA-CB-4	52.25	49.76	5.0	0.4980	0.011	8.0	0.0	0.0
7	Ex-SA-CB-4	42.86	13.62	59.0	0.4956	0.025	8.0	0.0	0.0
8	Ex-SA-CB-5	42.74	18.46	85.2	0.2850	0.013	24.0	0.0	0.0
9	Ex-SB-CB-1	71.65	65.80	79.2	0.0739	0.011	12.0	0.0	0.0
10	Ex-SB-CB-2	65.70	64.76	221.0	0.0043	0.011	24.0	0.0	0.0
11	Ex-SB-CB-3	69.26	65.85	151.0	0.0226	0.011	12.0	0.0	0.0
12	Ex-SB-CB-4	75.46	69.31	121.6	0.0506	0.011	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Ex. driveway to Lot Runoff Area=18,131 sf 69.69% Impervious Runoff Depth=1.67"
Flow Length=255' Slope=0.0109 '/' Tc=5.0 min CN=87 Runoff=0.84 cfs 0.058 af

SubcatchmentSA-2: Ex. driveway, parking, Runoff Area=0.465 ac 56.56% Impervious Runoff Depth=1.32"
Flow Length=169' Tc=5.0 min CN=82 Runoff=0.74 cfs 0.051 af

SubcatchmentSA-3: Ex. driveway, parking, Runoff Area=0.248 ac 56.85% Impervious Runoff Depth=1.32"
Flow Length=199' Tc=5.0 min CN=82 Runoff=0.39 cfs 0.027 af

SubcatchmentSA-4: Ex. driveway, parking, Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=1.32"
Flow Length=162' Tc=5.0 min CN=82 Runoff=0.56 cfs 0.038 af

SubcatchmentSA-5: Ex. driveway, parking, Runoff Area=0.411 ac 32.12% Impervious Runoff Depth=0.81"
Flow Length=257' Tc=5.1 min CN=73 Runoff=0.37 cfs 0.028 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=0.31"
Flow Length=300' Slope=0.2500 '/' Tc=31.7 min CN=60 Runoff=0.02 cfs 0.004 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=1.91"
Flow Length=314' Tc=5.0 min CN=90 Runoff=0.39 cfs 0.027 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=1.506 ac 95.42% Impervious Runoff Depth=2.47"
Flow Length=701' Tc=5.0 min CN=96 Runoff=4.24 cfs 0.310 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.119 ac 59.66% Impervious Runoff Depth=1.38"
Flow Length=225' Tc=5.0 min CN=83 Runoff=0.20 cfs 0.014 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.367 ac 58.31% Impervious Runoff Depth=1.38"
Flow Length=701' Tc=5.0 min CN=83 Runoff=0.61 cfs 0.042 af

SubcatchmentSC-1: Ex. lawn and copse Runoff Area=2.942 ac 27.23% Impervious Runoff Depth=0.71"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=1.44 cfs 0.175 af

Pond 2P: Ex. Pocket Pond Peak Elev=124.09' Storage=2,937 cf Inflow=1.44 cfs 0.175 af
Outflow=0.97 cfs 0.175 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=55.59' Inflow=0.84 cfs 0.058 af
Outflow=0.84 cfs 0.058 af

Pond Ex-SA-CB-2: Ex-SA-CB-2 Peak Elev=53.90' Storage=5 cf Inflow=1.58 cfs 0.109 af
Primary=1.58 cfs 0.109 af Secondary=0.00 cfs 0.000 af Outflow=1.58 cfs 0.109 af

Pond Ex-SA-CB-3: Ex-SA-CB-3 Peak Elev=56.10' Storage=12 cf Inflow=0.39 cfs 0.027 af
Primary=0.39 cfs 0.027 af Secondary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.027 af

Pond Ex-SA-CB-4: Ex-SA-CB-4 Peak Elev=55.38' Storage=38 cf Inflow=0.56 cfs 0.038 af
Primary=0.56 cfs 0.038 af Secondary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.038 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.02' Storage=1 cf Inflow=0.37 cfs 0.028 af
Primary=0.37 cfs 0.028 af Secondary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.028 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=72.00' Inflow=0.39 cfs 0.027 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=0.39 cfs 0.027 af

Pond Ex-SB-CB-2: Ex-SB-CB-2 Peak Elev=66.86' Storage=3 cf Inflow=5.44 cfs 0.393 af
24.0" Round Culvert n=0.011 L=221.0' S=0.0043 '/' Outflow=5.44 cfs 0.393 af

Pond Ex-SB-CB-3: Ex-SB-CB-3 Peak Elev=69.78' Storage=2 cf Inflow=0.81 cfs 0.056 af
12.0" Round Culvert n=0.011 L=151.0' S=0.0226 '/' Outflow=0.81 cfs 0.056 af

Pond Ex-SB-CB-4: Ex-SB-CB-4 Peak Elev=79.59' Storage=12 cf Inflow=0.61 cfs 0.042 af
Outflow=0.61 cfs 0.042 af

Link 1L: Flow to the North Inflow=5.44 cfs 0.393 af
Primary=5.44 cfs 0.393 af

Link 2L: Culvert to Hudson River 1 Inflow=1.58 cfs 0.109 af
Primary=1.58 cfs 0.109 af

Link 3L: Culvert to Hudson River 2 Inflow=0.37 cfs 0.028 af
Primary=0.37 cfs 0.028 af

Link Hudson: Hudson River Inflow=8.37 cfs 0.773 af
Primary=8.37 cfs 0.773 af

Total Runoff Area = 7.145 ac Runoff Volume = 0.775 af Average Runoff Depth = 1.30"
48.45% Pervious = 3.462 ac 51.55% Impervious = 3.683 ac

mary for Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athle

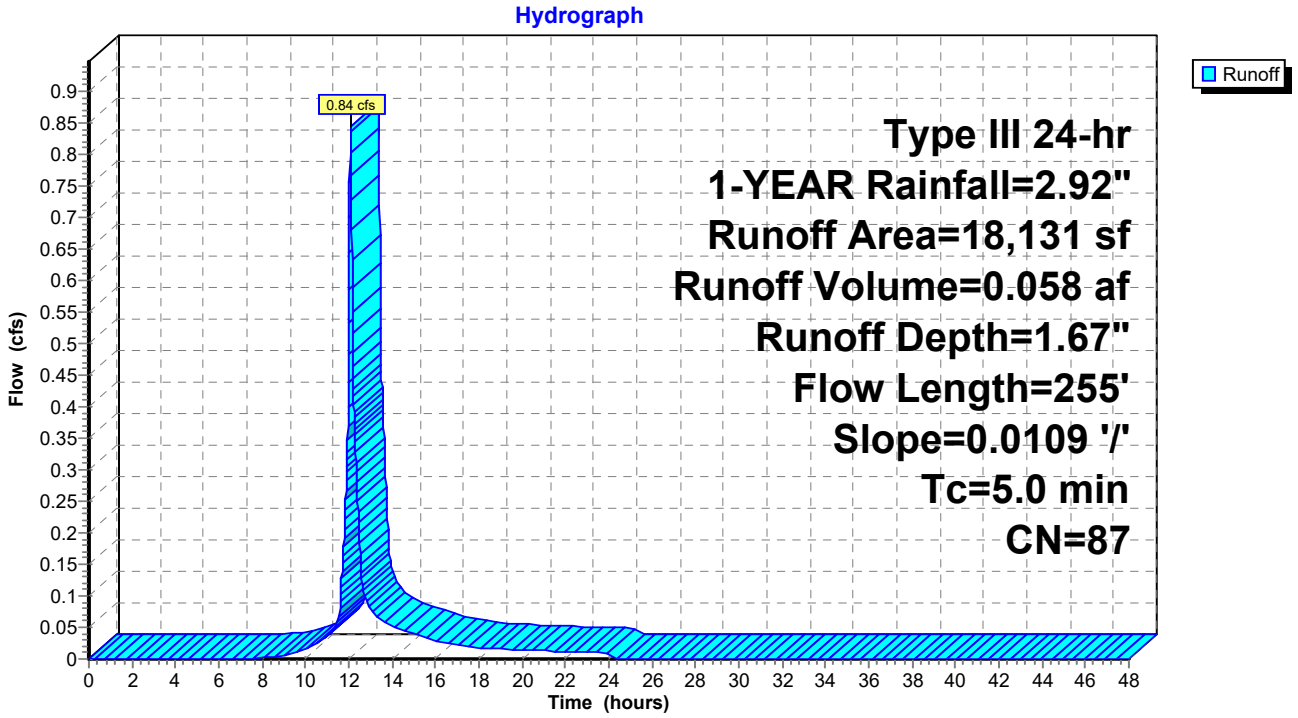
Runoff = 0.84 cfs @ 12.07 hrs, Volume= 0.058 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (sf)	CN	Description
*	12,636	98	Pavement
	5,495	61	>75% Grass cover, Good, HSG B
	18,131	87	Weighted Average
	5,495		30.31% Pervious Area
	12,636		69.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	255	0.0109	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
3.2	255	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athletic fiel



Summary for Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R

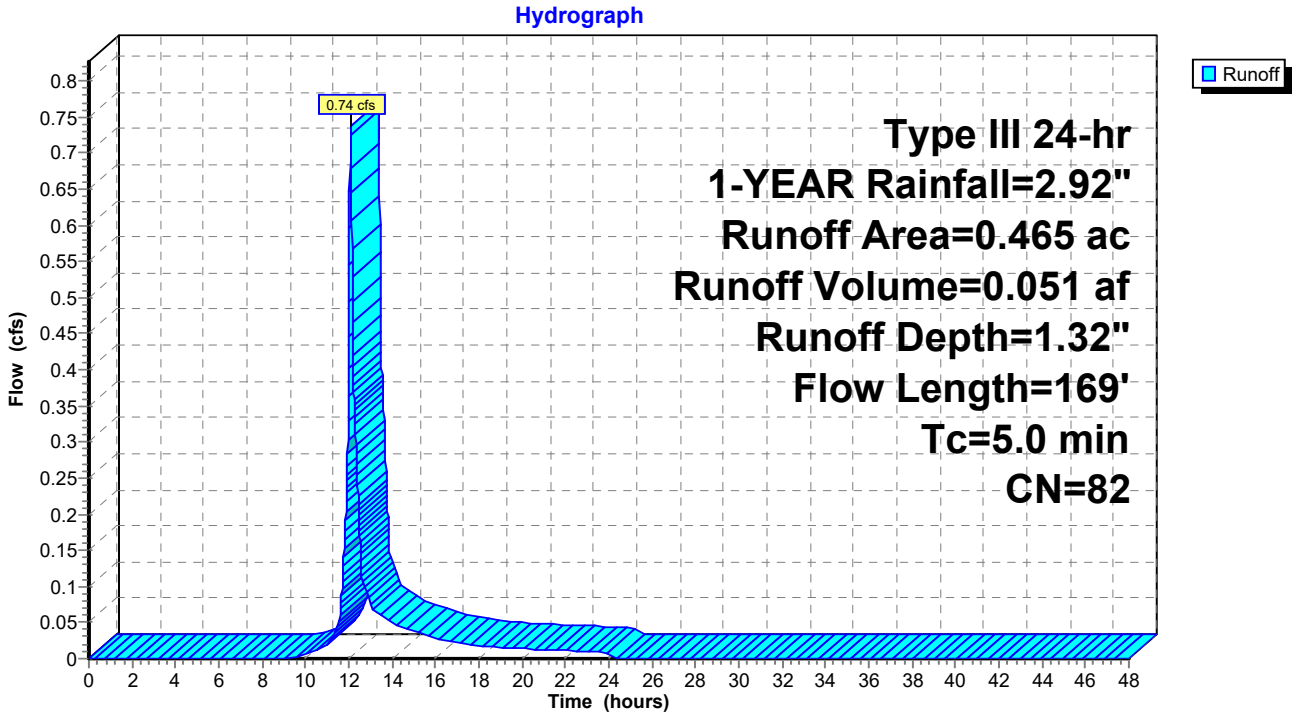
Runoff = 0.74 cfs @ 12.08 hrs, Volume= 0.051 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.263	98	Pavement
	0.202	61	>75% Grass cover, Good, HSG B
	0.465	82	Weighted Average
	0.202		43.44% Pervious Area
	0.263		56.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	77	0.3500	0.52		**Sheet Flow, SF Grass** Grass: Short n= 0.150 P2= 3.42"
0.7	92	0.0600	2.17		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.1	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R



Summary for Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R

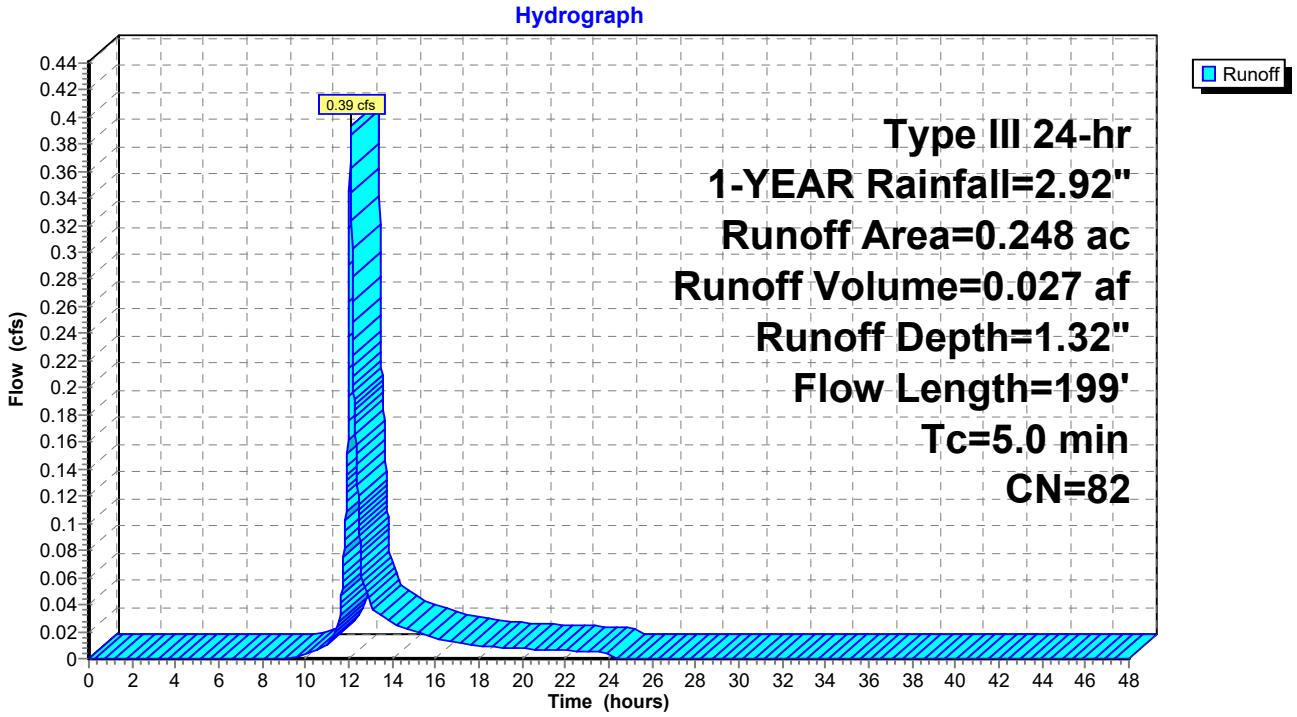
Runoff = 0.39 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.141	98	Pavement
	0.107	61	>75% Grass cover, Good, HSG B
	0.248	82	Weighted Average
	0.107		43.15% Pervious Area
	0.141		56.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.5600	0.57		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.7	154	0.0175	1.47		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.0	199	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R



Summary for Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R

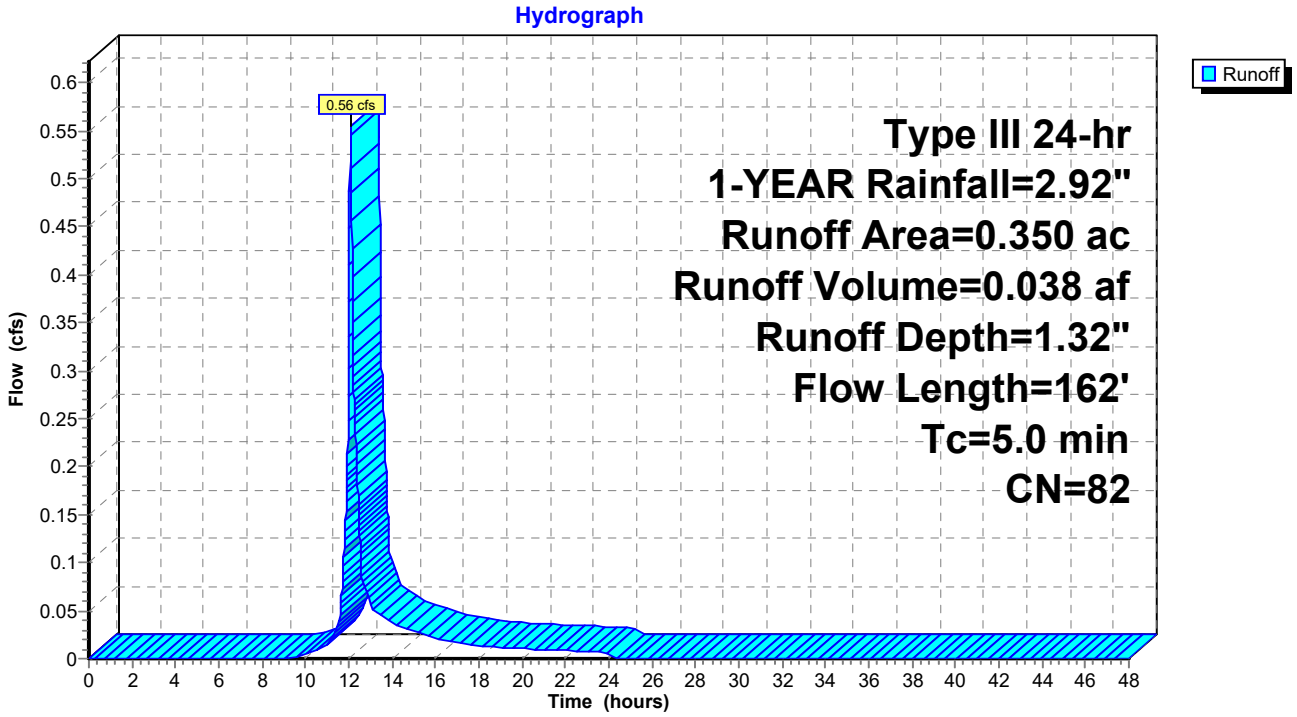
Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.038 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.198	98	Pavement
	0.152	61	>75% Grass cover, Good, HSG B
	0.350	82	Weighted Average
	0.152		43.43% Pervious Area
	0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	43	0.6000	0.58		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
0.9	119	0.0522	2.16		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
2.1	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R



for Subcatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up

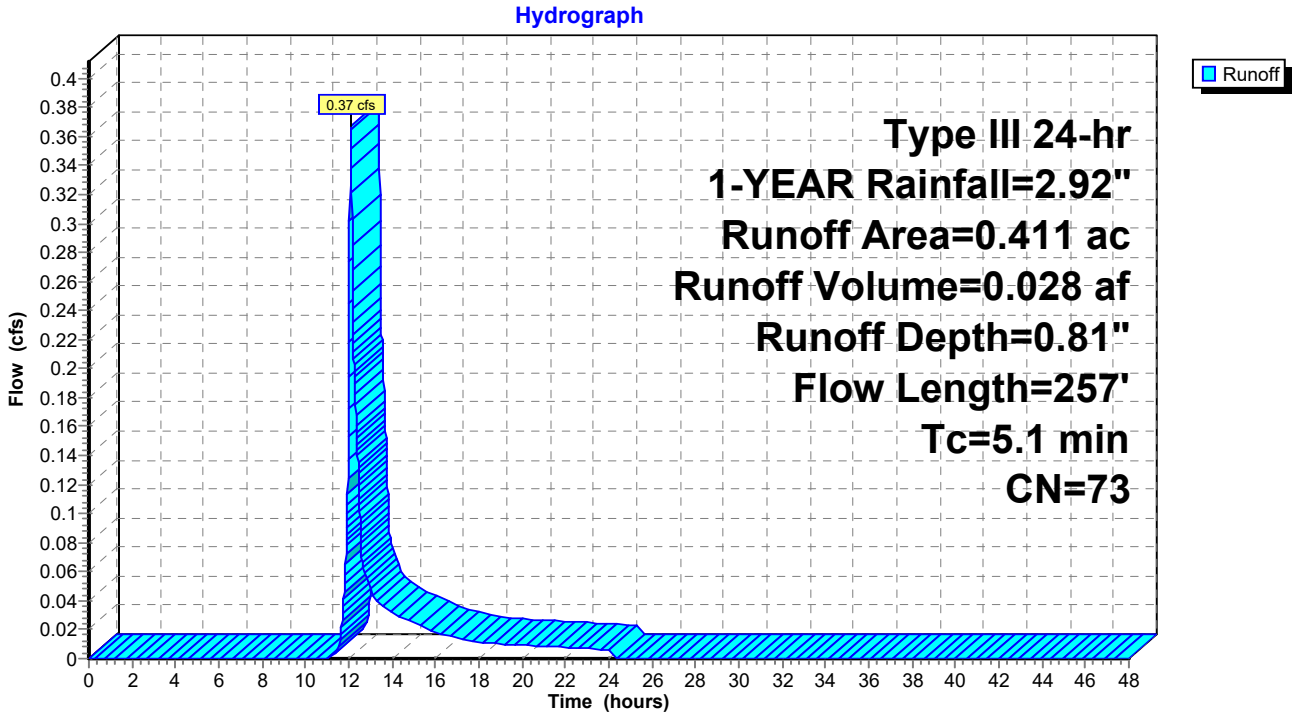
Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.132	98	Pavement
	0.279	61	>75% Grass cover, Good, HSG B
	0.411	73	Weighted Average
	0.279		67.88% Pervious Area
	0.132		32.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	94	0.2400	0.47		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.8	163	0.0185	1.52		**Sheet Flow, Sheet Flow Pavement** Smooth surfaces n= 0.011 P2= 3.42"
5.1	257	Total			

ocatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up slope



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

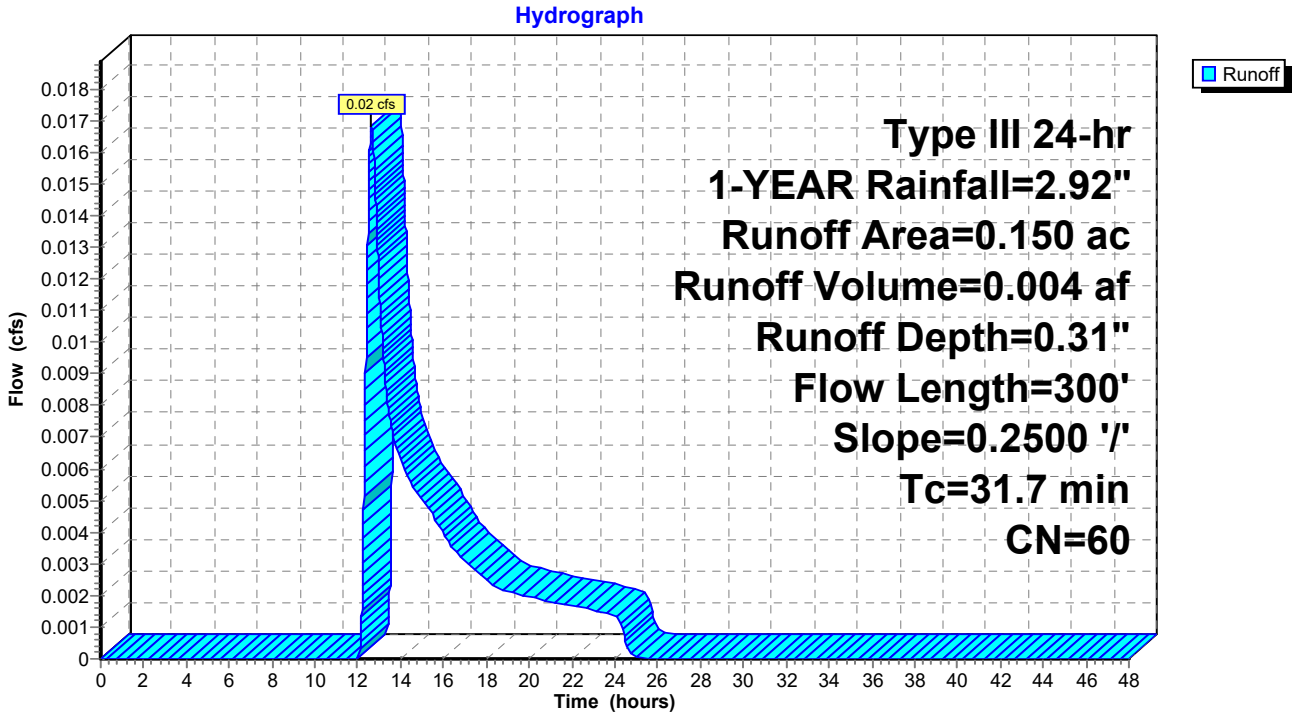
Runoff = 0.02 cfs @ 12.64 hrs, Volume= 0.004 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.150	60	Woods, Fair, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.7	300	0.2500	0.16		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.42"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot, driveways

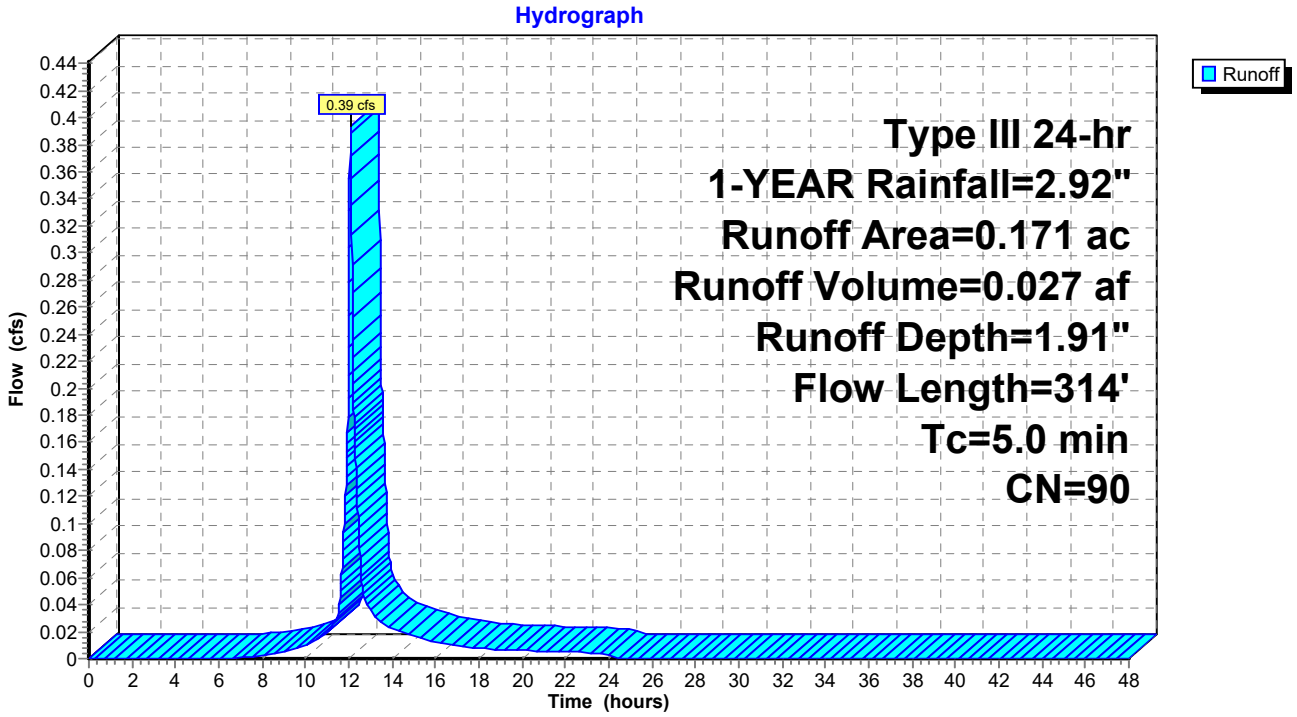
Runoff = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	300	0.0580	2.71		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot, driveways



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking ais

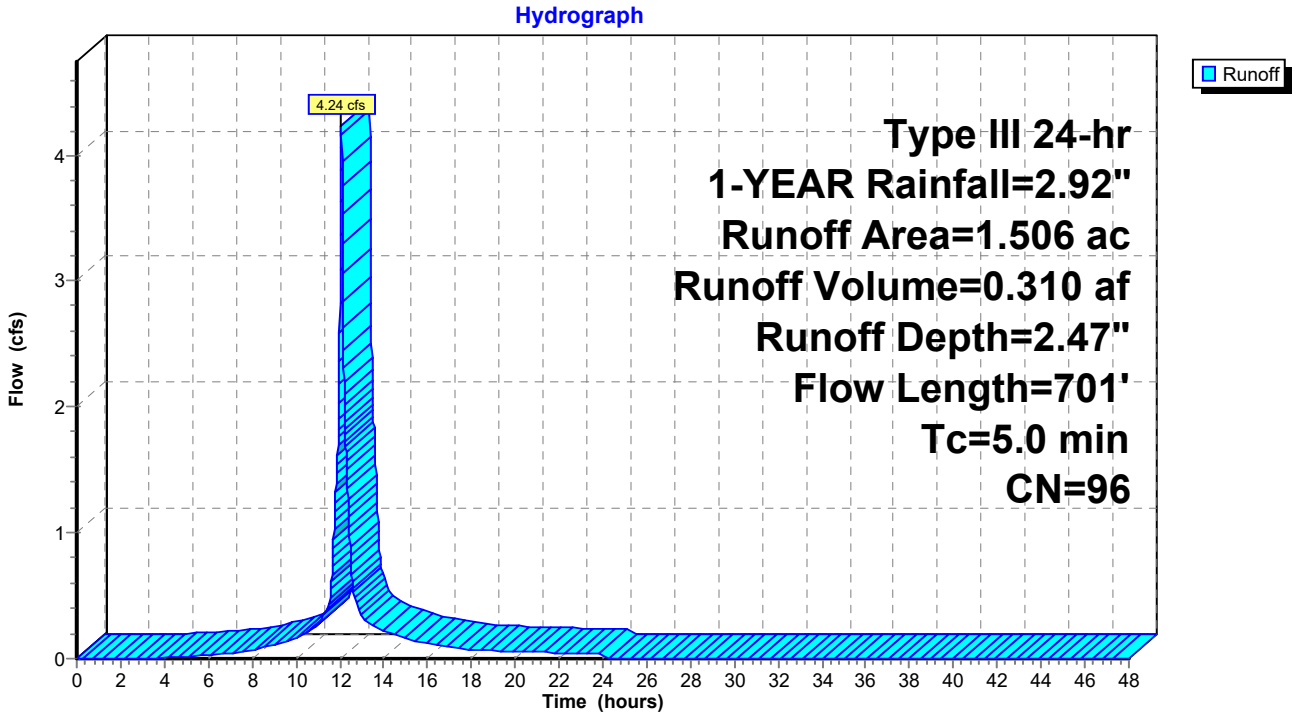
Runoff = 4.24 cfs @ 12.07 hrs, Volume= 0.310 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	1.437	98	
	0.069	61	>75% Grass cover, Good, HSG B
	1.506	96	Weighted Average
	0.069		4.58% Pervious Area
	1.437		95.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

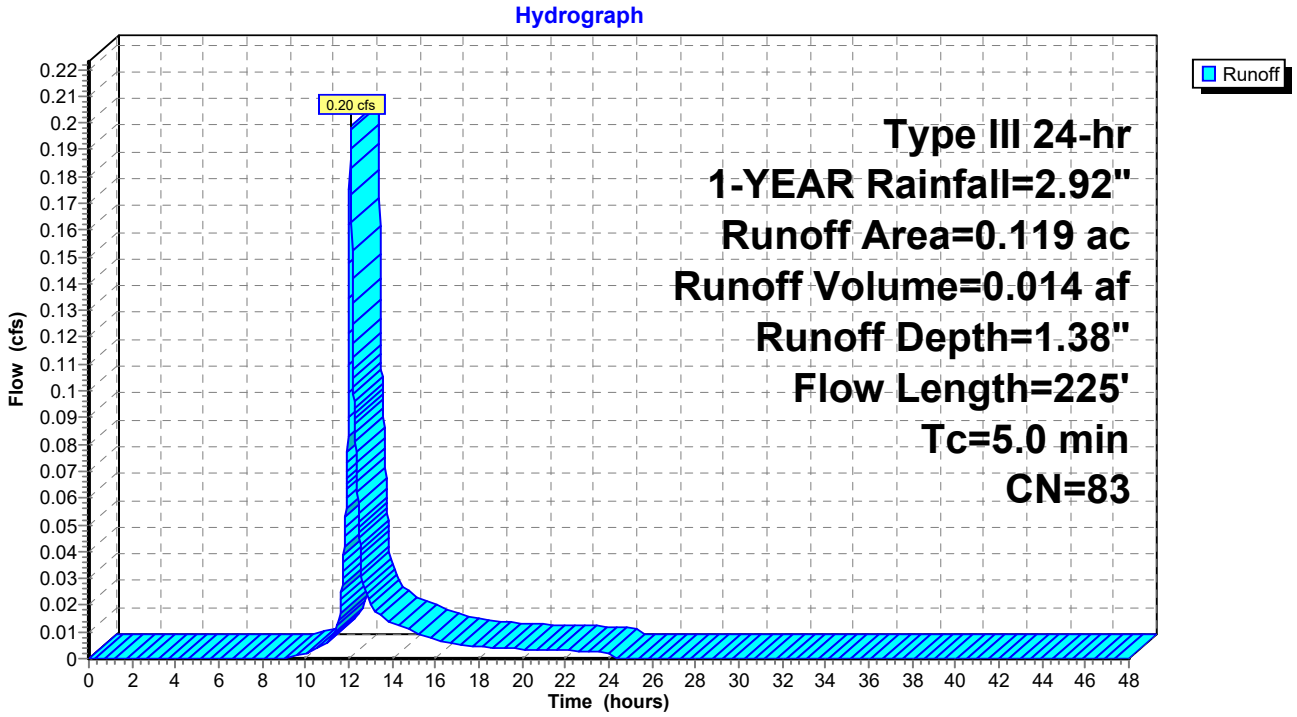
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.014 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.071	98	
	0.048	61	>75% Grass cover, Good, HSG B
	0.119	83	Weighted Average
	0.048		40.34% Pervious Area
	0.071		59.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	211	0.0470	2.32		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.6	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

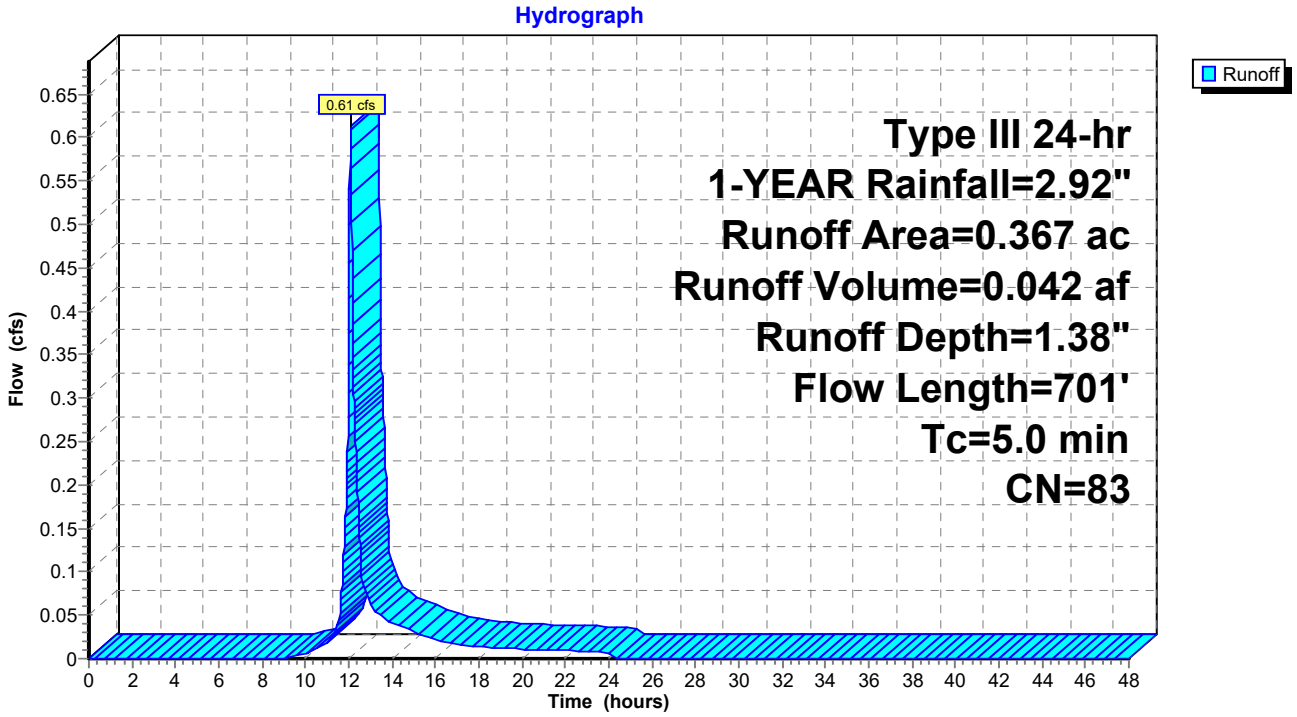
Runoff = 0.61 cfs @ 12.08 hrs, Volume= 0.042 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.214	98	
	0.153	61	>75% Grass cover, Good, HSG B
	0.367	83	Weighted Average
	0.153		41.69% Pervious Area
	0.214		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.

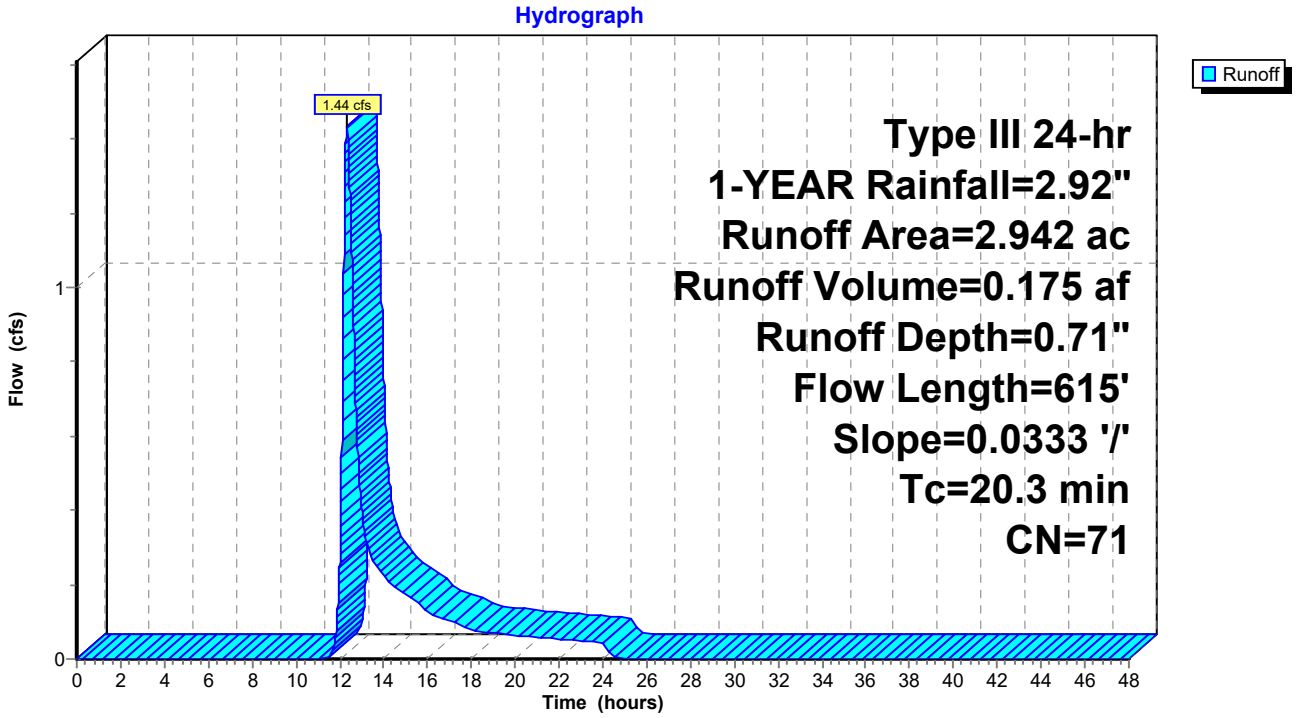
Runoff = 1.44 cfs @ 12.32 hrs, Volume= 0.175 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.801	98	Paved parking, HSG B
	2.141	61	>75% Grass cover, Good, HSG B
	2.942	71	Weighted Average
	2.141		72.77% Pervious Area
	0.801		27.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.



Summary for Pond 2P: Ex. Pocket Pond

Inflow Area = 2.942 ac, 27.23% Impervious, Inflow Depth = 0.71" for 1-YEAR event
Inflow = 1.44 cfs @ 12.32 hrs, Volume= 0.175 af
Outflow = 0.97 cfs @ 12.60 hrs, Volume= 0.175 af, Atten= 32%, Lag= 16.4 min
Primary = 0.97 cfs @ 12.60 hrs, Volume= 0.175 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 123.50' Surf.Area= 3,562 sf Storage= 1,614 cf
Peak Elev= 124.09' @ 12.60 hrs Surf.Area= 4,039 sf Storage= 2,937 cf (1,323 cf above start)

Plug-Flow detention time= 180.9 min calculated for 0.138 af (79% of inflow)
Center-of-Mass det. time= 44.0 min (936.3 - 892.3)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,156 cf	**additional storage to main bay (Irregular)** Listed below (Recalc)
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,034 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

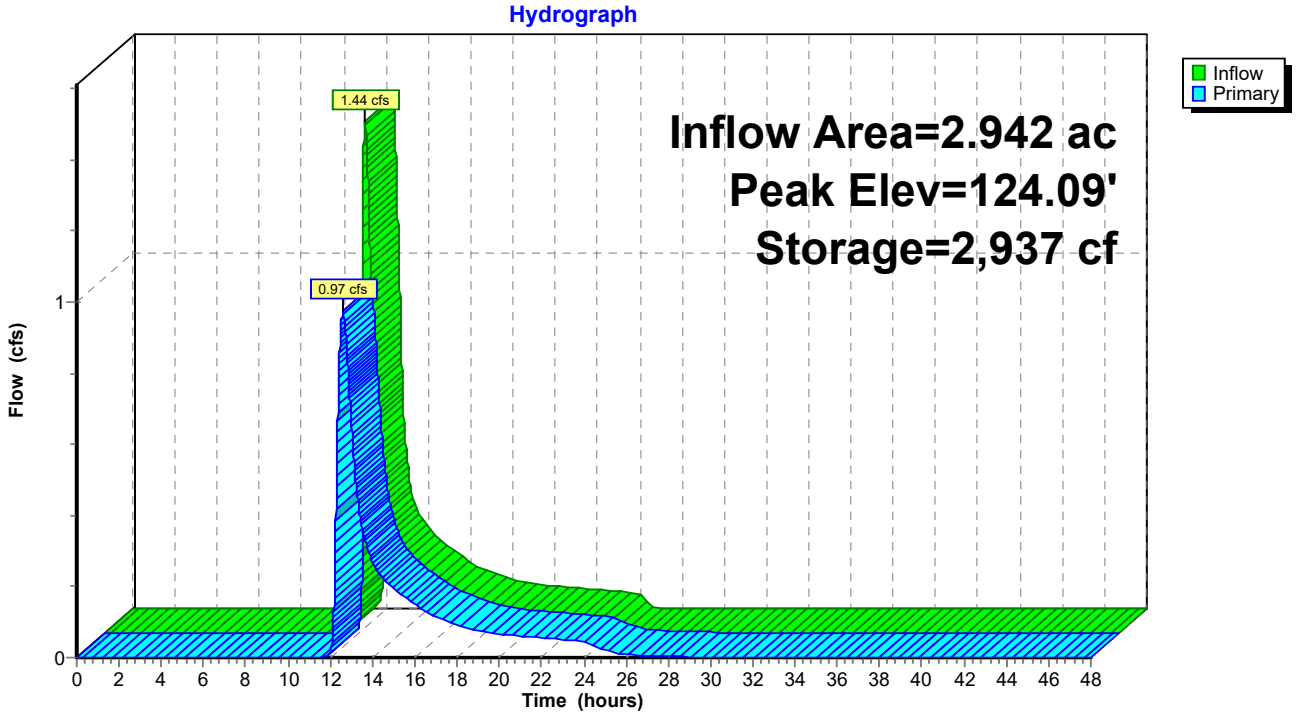
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	110	70.5	0	0	110
126.00	620	103.0	1,156	1,156	652

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.97 cfs @ 12.60 hrs HW=124.09' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Passes 0.97 cfs of 5.80 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.97 cfs @ 2.61 fps)
  └─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 2P: Ex. Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

[58] Hint: Peaked 0.03' above defined flood level

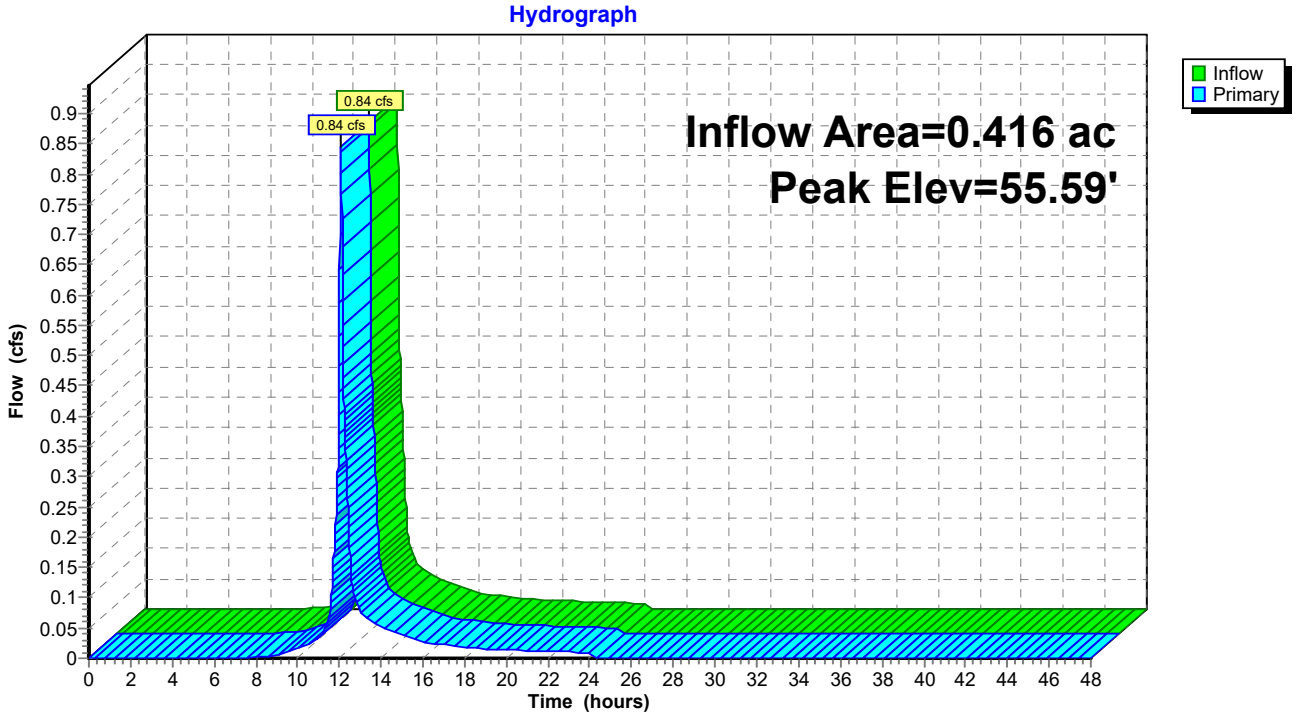
Inflow Area =	0.416 ac, 69.69% Impervious, Inflow Depth = 1.67" for 1-YEAR event				
Inflow =	0.84 cfs @ 12.07 hrs, Volume=	0.058 af			
Outflow =	0.84 cfs @ 12.07 hrs, Volume=	0.058 af, Atten= 0%, Lag= 0.0 min			
Primary =	0.84 cfs @ 12.07 hrs, Volume=	0.058 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.59' @ 12.07 hrs
Flood Elev= 55.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.41'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.41' / 52.34' S= 0.0018 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.07 hrs HW=55.59' TW=53.89' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.84 cfs of 1.73 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 0.84 cfs @ 0.60 fps)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-2: Ex-SA-CB-2

Inflow Area = 0.881 ac, 62.76% Impervious, Inflow Depth = 1.48" for 1-YEAR event
Inflow = 1.58 cfs @ 12.08 hrs, Volume= 0.109 af
Outflow = 1.58 cfs @ 12.08 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.1 min
Primary = 1.58 cfs @ 12.08 hrs, Volume= 0.109 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 53.90' @ 12.08 hrs Surf.Area= 3 sf Storage= 5 cf
Flood Elev= 55.34' Surf.Area= 3 sf Storage= 10 cf

Plug-Flow detention time= 0.2 min calculated for 0.109 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (830.4 - 830.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.13'	262 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

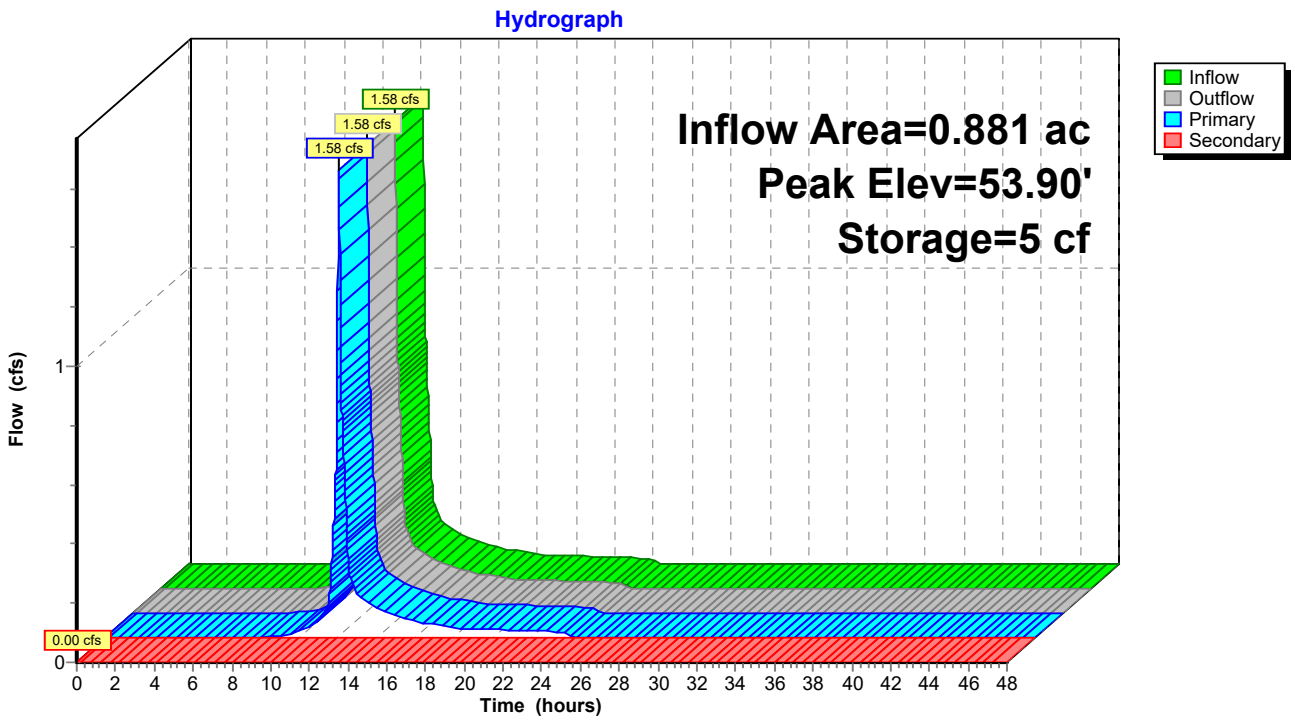
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.13	3	8.0	0	0	3
55.34	3	8.0	10	10	29
56.00	1,085	204.0	252	262	3,336

Device	Routing	Invert	Outlet Devices
#1	Primary	52.14'	**8.0" Round Culvert** L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.14' / 11.61' S= 0.5066 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Secondary	55.84'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=1.58 cfs @ 12.08 hrs HW=53.89' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.58 cfs @ 4.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.13' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-2: Ex-SA-CB-2



Summary for Pond Ex-SA-CB-3: Ex-SA-CB-3

[58] Hint: Peaked 0.02' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area =	0.248 ac, 56.85% Impervious, Inflow Depth = 1.32" for 1-YEAR event				
Inflow =	0.39 cfs @	12.08 hrs,	Volume=	0.027 af	
Outflow =	0.39 cfs @	12.08 hrs,	Volume=	0.027 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.39 cfs @	12.08 hrs,	Volume=	0.027 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 56.10' @ 12.08 hrs Surf.Area= 11 sf Storage= 12 cf
Flood Elev= 56.08' Surf.Area= 4 sf Storage= 12 cf

Plug-Flow detention time= 8.4 min calculated for 0.027 af (99% of inflow)
Center-of-Mass det. time= 2.4 min (842.3 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.62'	1,126 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

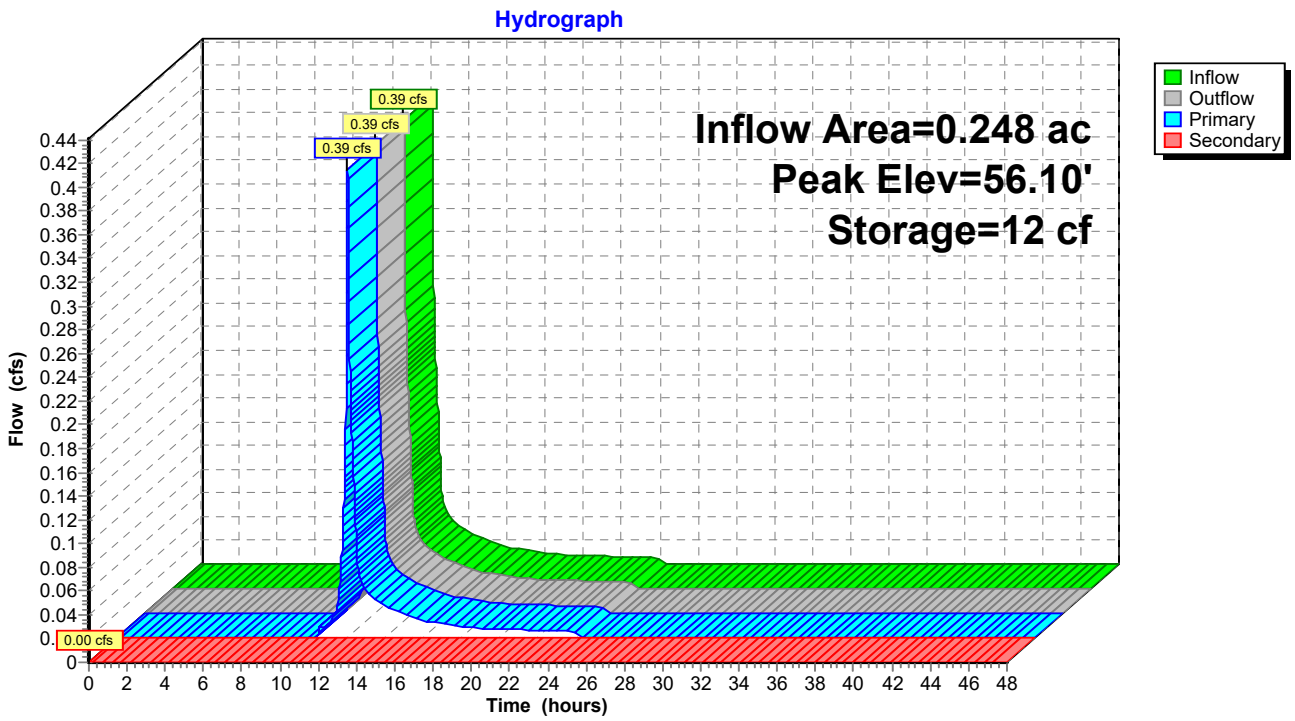
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.62	3	8.0	0	0	3
56.08	4	8.0	12	12	31
57.00	3,511	272.0	1,114	1,126	5,914

Device	Routing	Invert	Outlet Devices
#1	Device 2	54.13'	**8.0" Round CB to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 54.13' / 53.53' S= 0.1200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Primary	52.63'	**8.0" Round MH to Slope** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.63' / 27.23' S= 0.7257 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.58'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	56.08'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.39 cfs @ 12.08 hrs HW=56.10' TW=0.00' (Dynamic Tailwater)
└─**2=MH to Slope** (Passes 0.39 cfs of 2.35 cfs potential flow)
  └─**1=CB to MH** (Passes 0.39 cfs of 1.70 cfs potential flow)
    └─**4=Orifice/Grate** (Weir Controls 0.39 cfs @ 0.47 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.62' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-3: Ex-SA-CB-3



Summary for Pond Ex-SA-CB-4: Ex-SA-CB-4

[58] Hint: Peaked 0.03' above defined flood level

Inflow Area =	0.350 ac, 56.57% Impervious, Inflow Depth = 1.32" for 1-YEAR event				
Inflow =	0.56 cfs @	12.08 hrs,	Volume=	0.038 af	
Outflow =	0.56 cfs @	12.08 hrs,	Volume=	0.038 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.56 cfs @	12.08 hrs,	Volume=	0.038 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.38' @ 12.08 hrs Surf.Area= 7 sf Storage= 38 cf
Flood Elev= 55.35' Surf.Area= 3 sf Storage= 38 cf

Plug-Flow detention time= 17.8 min calculated for 0.038 af (98% of inflow)
Center-of-Mass det. time= 4.9 min (844.8 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	42.85'	5,622 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

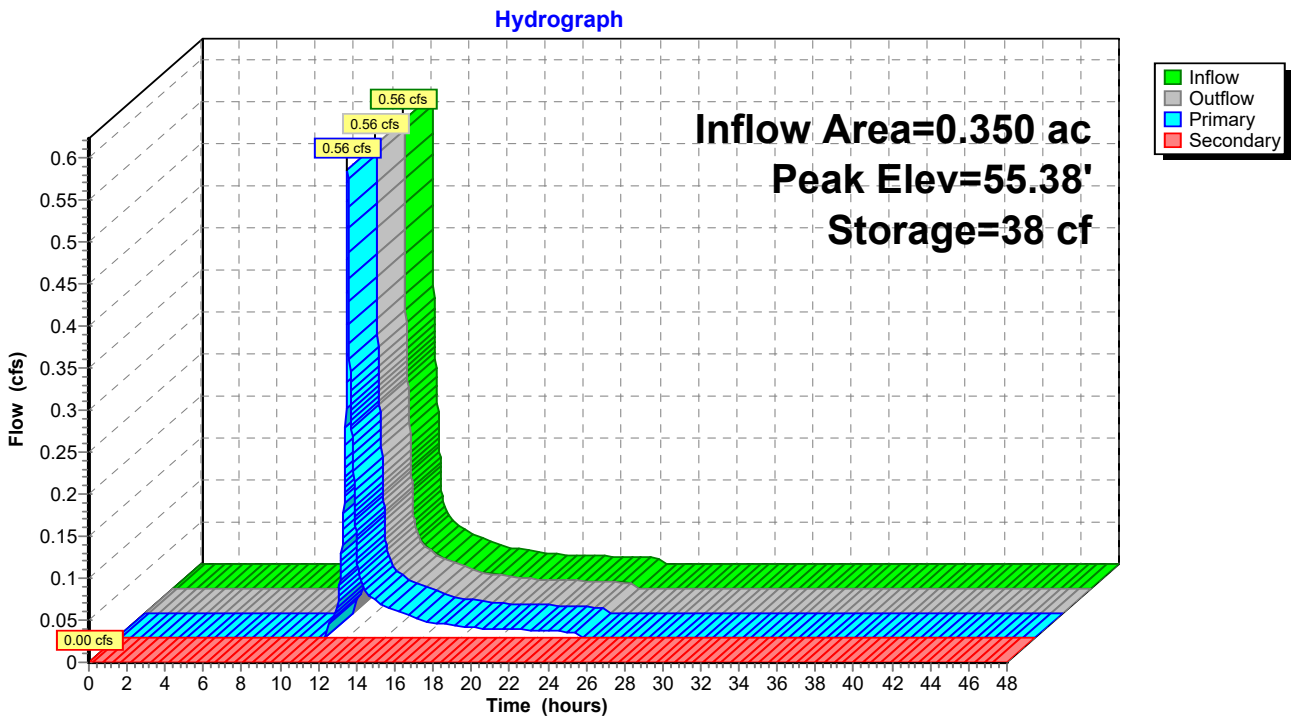
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.85	3	8.0	0	0	3
55.35	3	8.0	38	38	103
56.00	579	167.0	135	173	2,318
58.00	5,767	334.0	5,449	5,622	8,995

Device	Routing	Invert	Outlet Devices
#1	Device 2	52.25'	**8.0" Round Culvert to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.25' / 49.76' S= 0.4980 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Primary	42.86'	**8.0" Round Culvert** L= 59.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.86' / 13.62' S= 0.4956 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.00'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	55.35'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.55 cfs @ 12.08 hrs HW=55.38' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.55 cfs of 4.63 cfs potential flow)
  └─**1=Culvert to MH** (Passes 0.55 cfs of 2.22 cfs potential flow)
    └─**4=Orifice/Grate** (Weir Controls 0.55 cfs @ 0.52 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.85' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-4: Ex-SA-CB-4



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 0.81" for 1-YEAR event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 43.02' @ 12.09 hrs Surf.Area= 3 sf Storage= 1 cf
Flood Elev= 55.24' Surf.Area= 4 sf Storage= 44 cf

Plug-Flow detention time= 0.1 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (870.9 - 870.8)

Volume	Invert	Avail.Storage	Storage Description
#1	42.73'	548 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

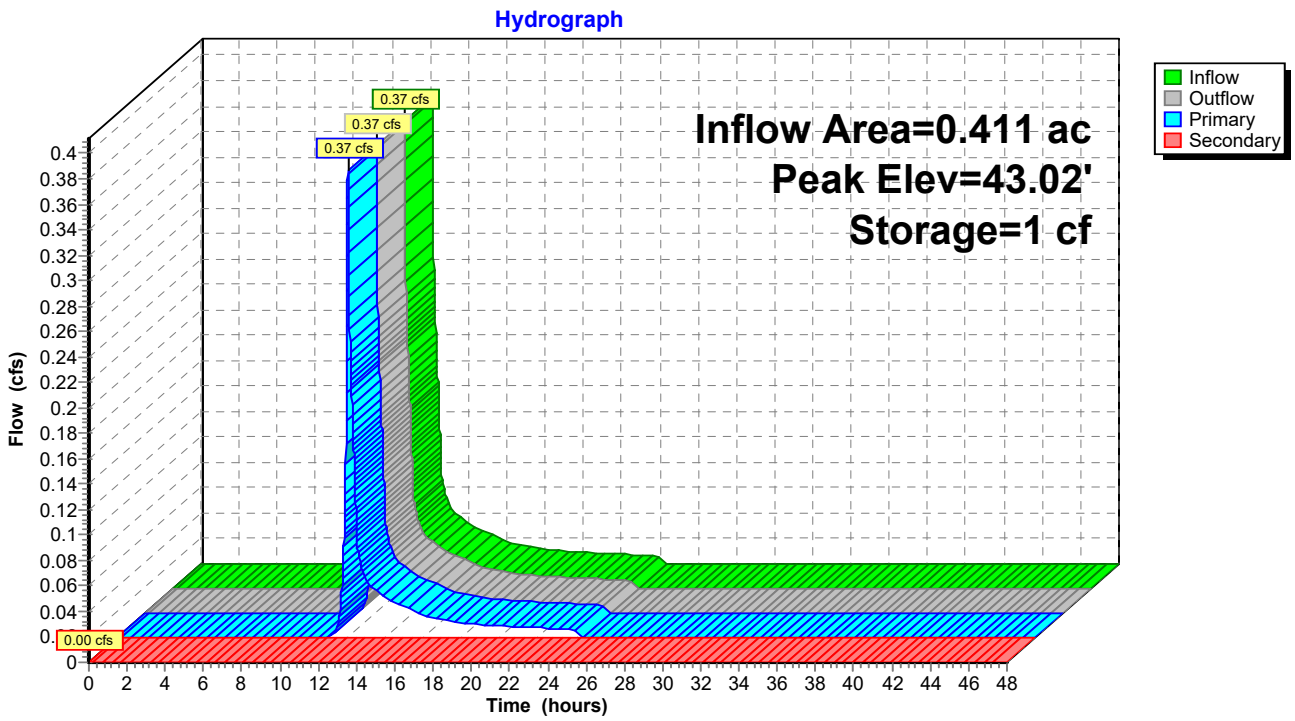
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.73	3	8.0	0	0	3
55.24	4	8.0	44	44	103
56.00	1,901	371.0	505	548	11,052

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**24.0" Round Culvert** L= 85.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2850 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Secondary	55.74'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=43.01' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.37 cfs @ 1.41 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.73' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

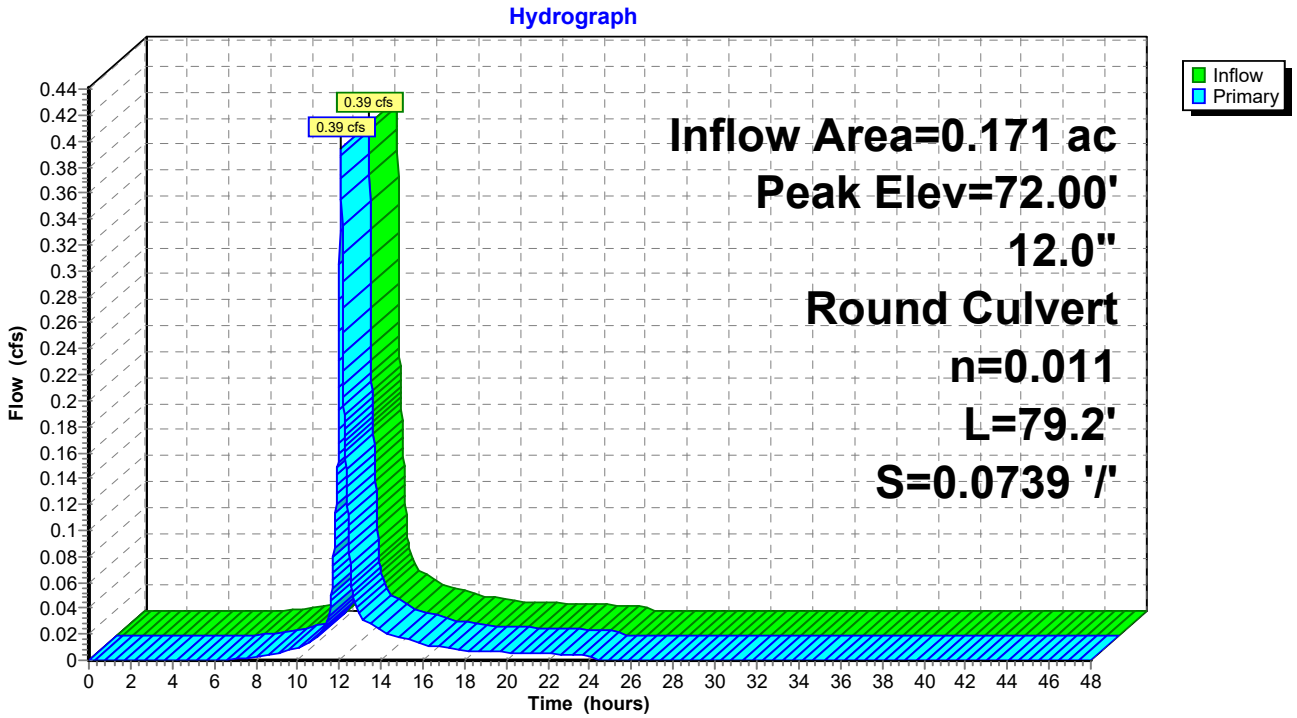
Inflow Area = 0.171 ac, 79.53% Impervious, Inflow Depth = 1.91" for 1-YEAR event
Inflow = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af
Outflow = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 72.00' @ 12.07 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.07 hrs HW=72.00' TW=66.86' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.39 cfs @ 1.59 fps)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond Ex-SB-CB-2: Ex-SB-CB-2

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 2.18" for 1-YEAR event
Inflow = 5.44 cfs @ 12.07 hrs, Volume= 0.393 af
Outflow = 5.44 cfs @ 12.07 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.0 min
Primary = 5.44 cfs @ 12.07 hrs, Volume= 0.393 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 66.86' @ 12.07 hrs Surf.Area= 3 sf Storage= 3 cf
Flood Elev= 72.00' Surf.Area= 3 sf Storage= 19 cf

Plug-Flow detention time= 0.2 min calculated for 0.393 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (786.9 - 786.9)

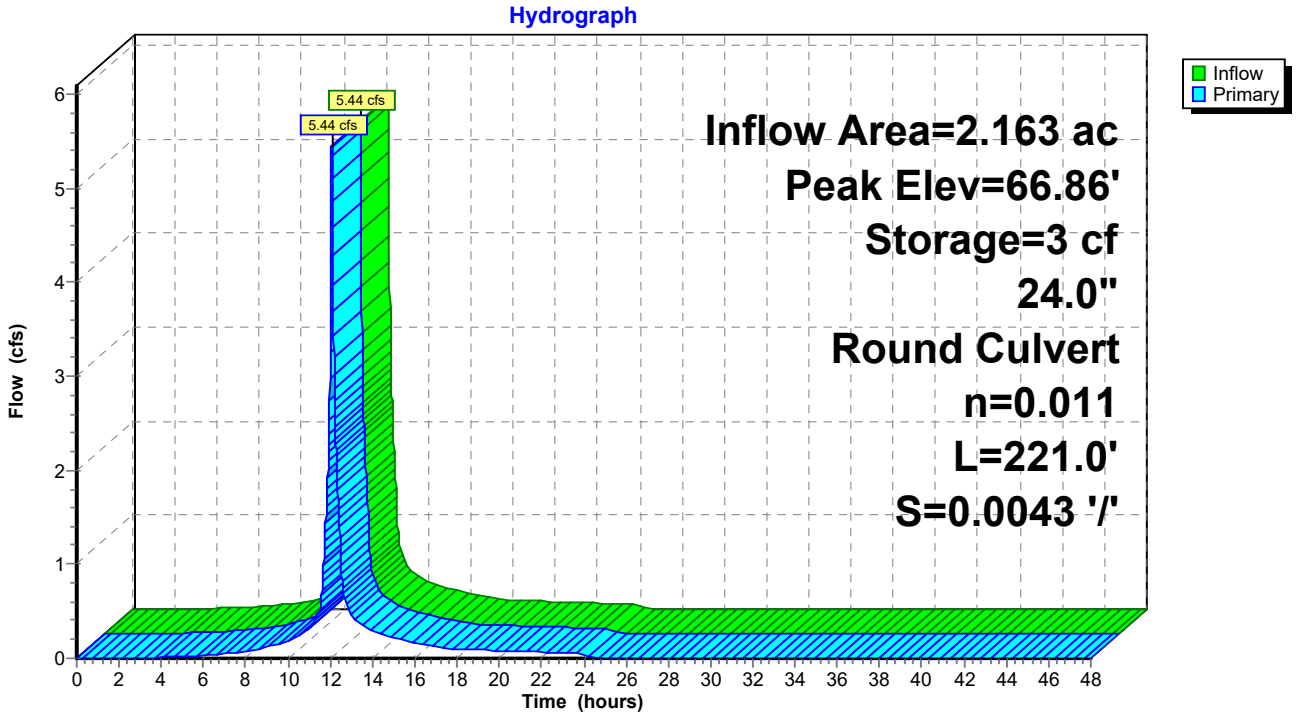
Volume	Invert	Avail.Storage	Storage Description
#1	65.69'	444 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
65.69	3	8.0	0	0	3
72.00	3	8.0	19	19	53
72.50	258	63.0	48	67	365
73.00	1,400	258.0	376	444	5,347

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 221.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 64.76' S= 0.0043 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=5.43 cfs @ 12.07 hrs HW=66.86' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 5.43 cfs @ 2.89 fps)

Pond Ex-SB-CB-2: Ex-SB-CB-2



Summary for Pond Ex-SB-CB-3: Ex-SB-CB-3

Inflow Area = 0.486 ac, 58.64% Impervious, Inflow Depth = 1.38" for 1-YEAR event
Inflow = 0.81 cfs @ 12.08 hrs, Volume= 0.056 af
Outflow = 0.81 cfs @ 12.08 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.08 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 69.78' @ 12.08 hrs Surf.Area= 3 sf Storage= 2 cf
Flood Elev= 73.41' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 0.3 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (837.8 - 837.7)

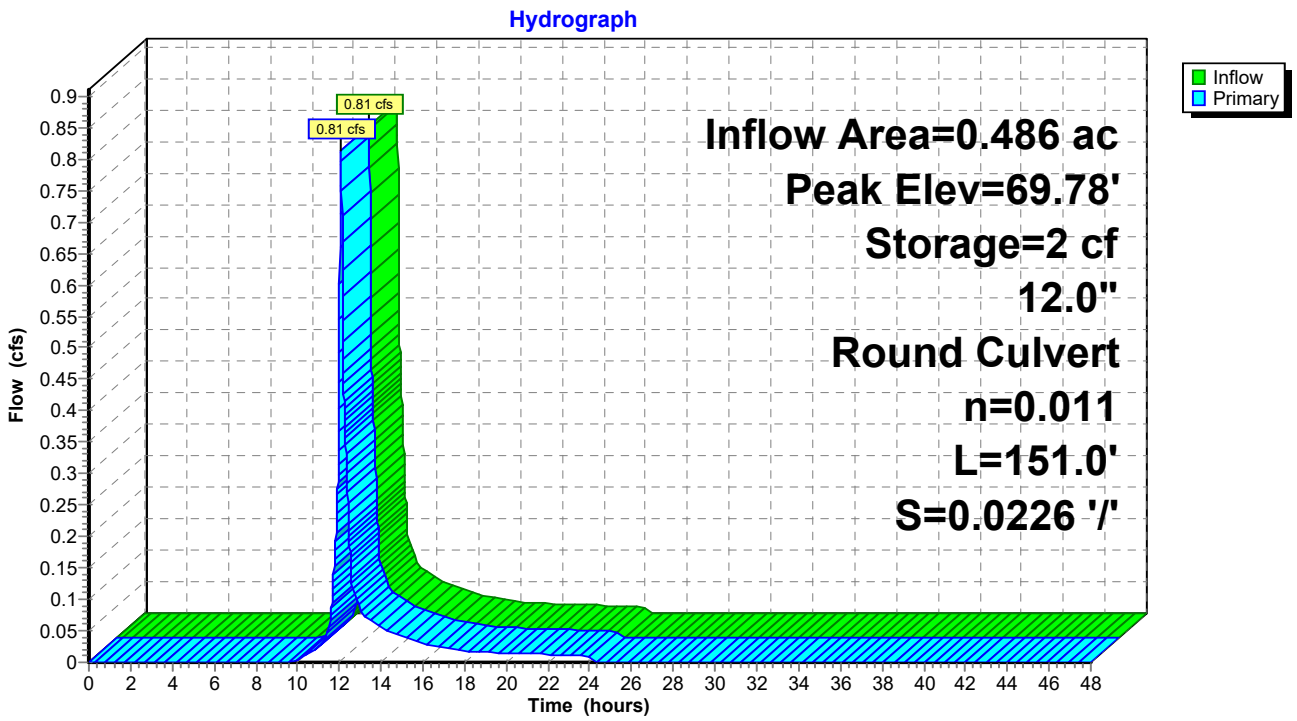
Volume	Invert	Avail.Storage	Storage Description
#1	69.25'	999 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.25	3	8.0	0	0	3
73.41	3	8.0	12	12	36
74.00	161	54.0	37	49	264
75.00	440	91.0	289	338	697
76.00	911	126.0	661	999	1,311

Device	Routing	Invert	Outlet Devices
#1	Primary	69.26'	**12.0" Round Culvert** L= 151.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 69.26' / 65.85' S= 0.0226 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.08 hrs HW=69.78' TW=66.85' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.81 cfs @ 1.95 fps)

Pond Ex-SB-CB-3: Ex-SB-CB-3



Summary for Pond Ex-SB-CB-4: Ex-SB-CB-4

[58] Hint: Peaked 0.03' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=6)

Inflow Area = 0.367 ac, 58.31% Impervious, Inflow Depth = 1.38" for 1-YEAR event
Inflow = 0.61 cfs @ 12.08 hrs, Volume= 0.042 af
Outflow = 0.61 cfs @ 12.08 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.08 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 79.59' @ 12.08 hrs Surf.Area= 4 sf Storage= 12 cf
Flood Elev= 79.56' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 5.7 min calculated for 0.042 af (99% of inflow)
Center-of-Mass det. time= 1.7 min (838.1 - 836.4)

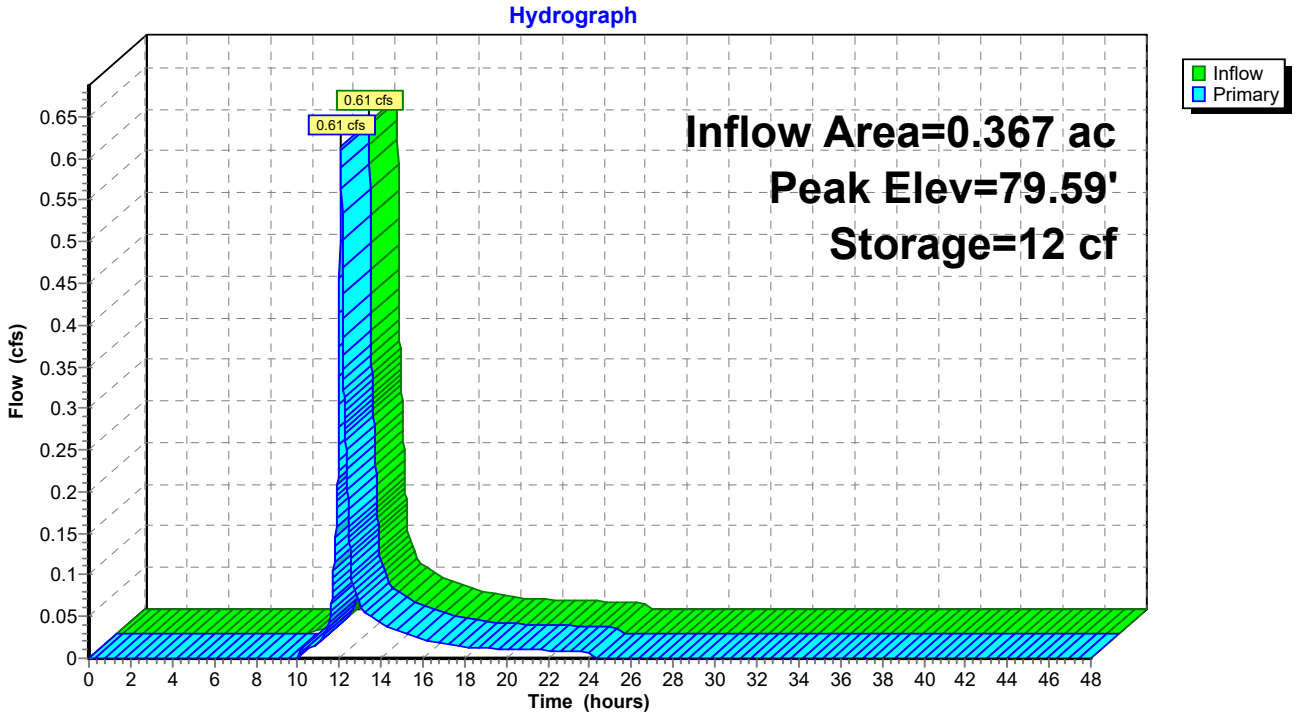
Volume	Invert	Avail.Storage	Storage Description
#1	75.45'	716 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.45	3	8.0	0	0	3
79.56	3	8.0	12	12	36
81.00	306	83.0	163	175	583
82.00	816	135.0	541	716	1,492

Device	Routing	Invert	Outlet Devices
#1	Primary	75.46'	**12.0" Round Culvert** L= 121.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.46' / 69.31' S= 0.0506 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	79.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.61 cfs @ 12.08 hrs HW=79.59' TW=69.78' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.61 cfs of 5.69 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.61 cfs @ 0.54 fps)

Pond Ex-SB-CB-4: Ex-SB-CB-4

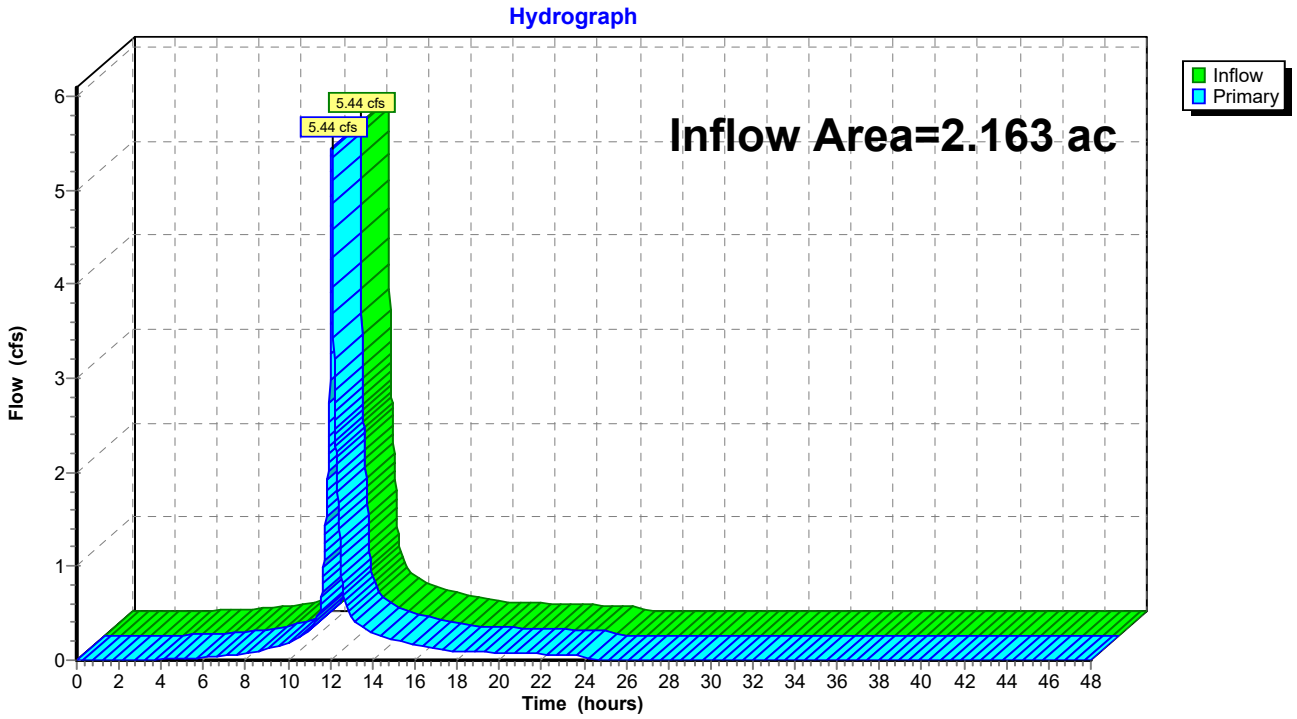


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 2.18" for 1-YEAR event
Inflow = 5.44 cfs @ 12.07 hrs, Volume= 0.393 af
Primary = 5.44 cfs @ 12.07 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

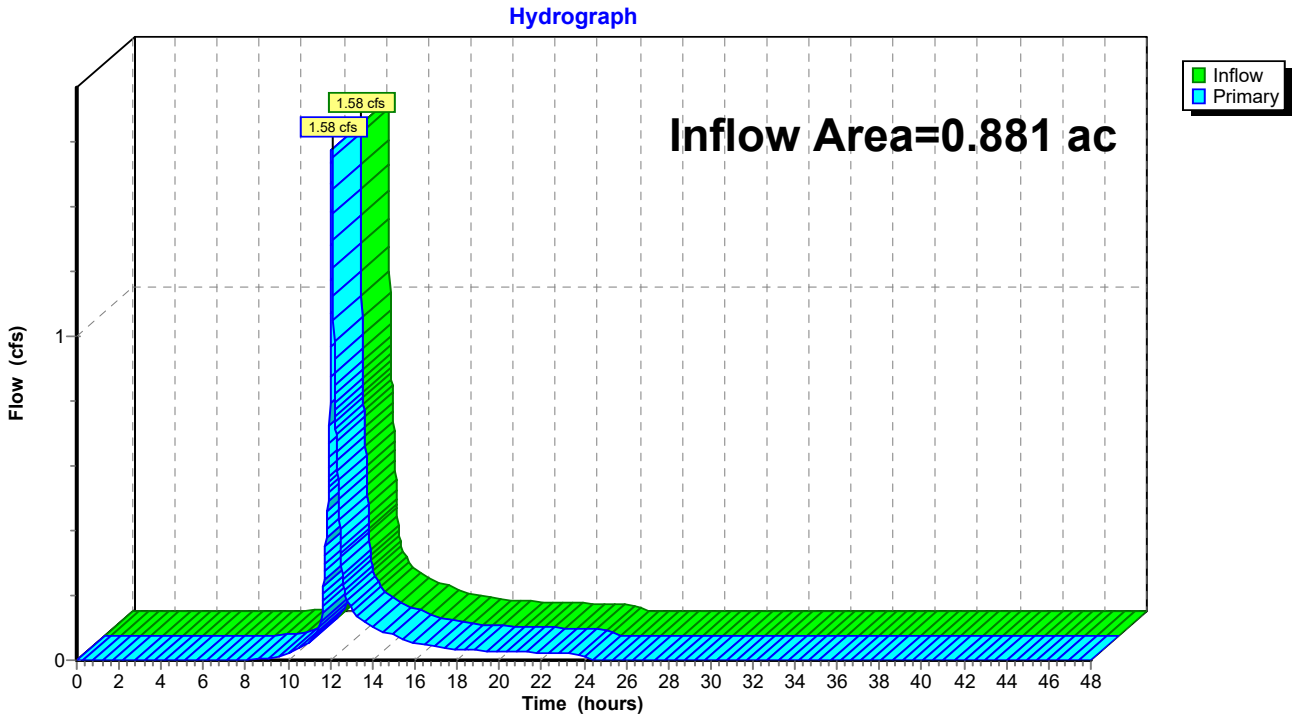


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 0.881 ac, 62.76% Impervious, Inflow Depth = 1.48" for 1-YEAR event
Inflow = 1.58 cfs @ 12.08 hrs, Volume= 0.109 af
Primary = 1.58 cfs @ 12.08 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

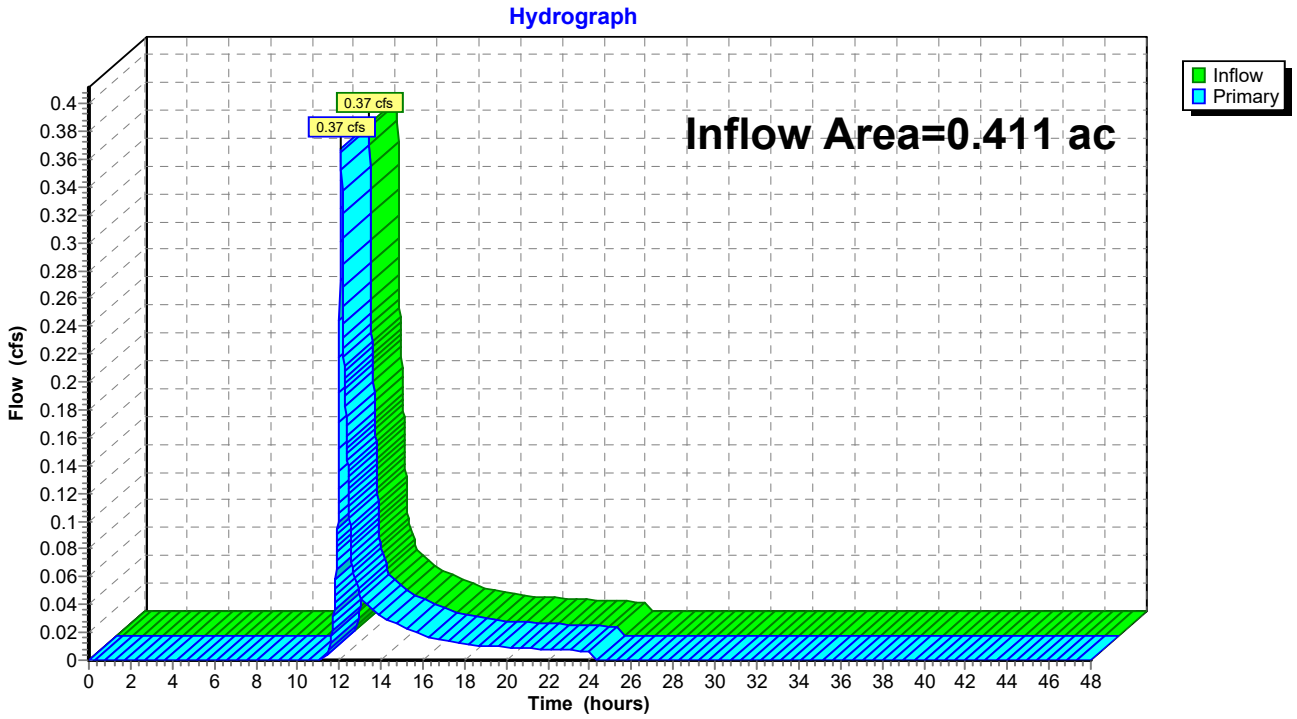


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 0.81" for 1-YEAR event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af
Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

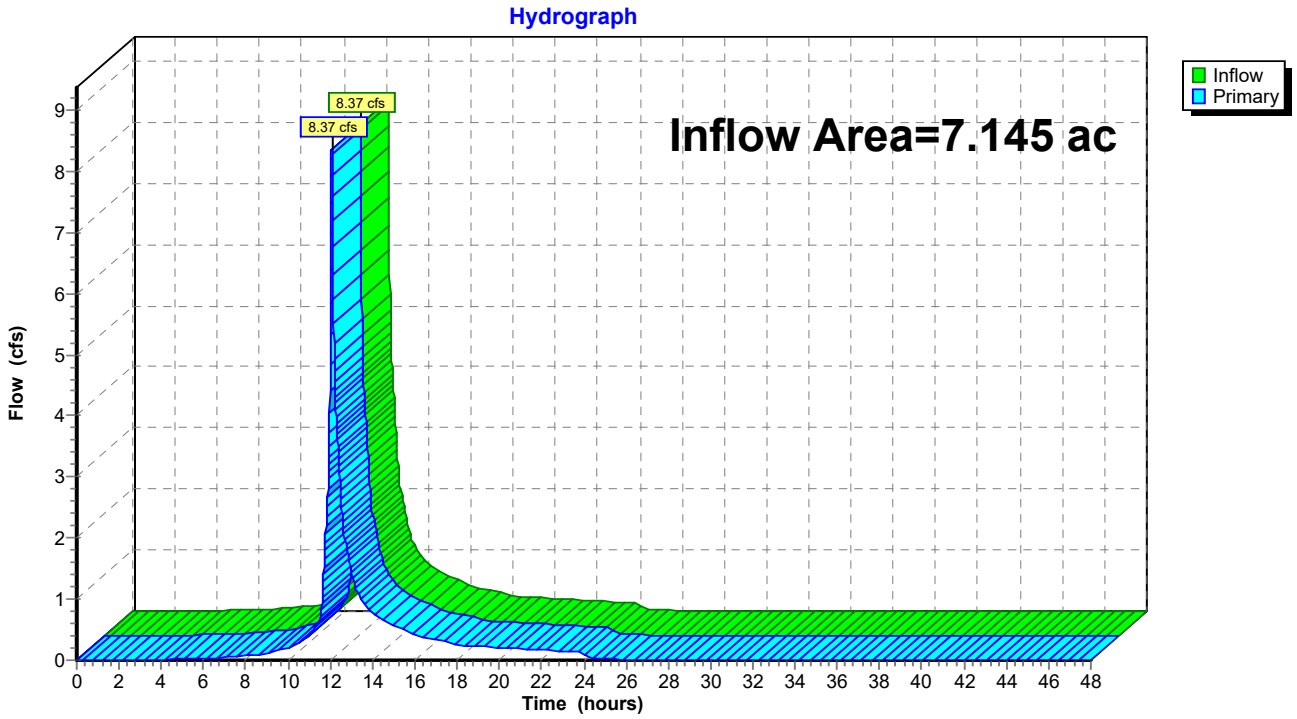


Summary for Link Hudson: Hudson River

Inflow Area = 7.145 ac, 51.55% Impervious, Inflow Depth = 1.30" for 1-YEAR event
Inflow = 8.37 cfs @ 12.07 hrs, Volume= 0.773 af
Primary = 8.37 cfs @ 12.07 hrs, Volume= 0.773 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link Hudson: Hudson River



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Ex. driveway to Lot Runoff Area=18,131 sf 69.69% Impervious Runoff Depth=4.08"
Flow Length=255' Slope=0.0109 '/' Tc=5.0 min CN=87 Runoff=2.01 cfs 0.141 af

SubcatchmentSA-2: Ex. driveway, parking, Runoff Area=0.465 ac 56.56% Impervious Runoff Depth=3.57"
Flow Length=169' Tc=5.0 min CN=82 Runoff=2.00 cfs 0.138 af

SubcatchmentSA-3: Ex. driveway, parking, Runoff Area=0.248 ac 56.85% Impervious Runoff Depth=3.57"
Flow Length=199' Tc=5.0 min CN=82 Runoff=1.07 cfs 0.074 af

SubcatchmentSA-4: Ex. driveway, parking, Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=3.57"
Flow Length=162' Tc=5.0 min CN=82 Runoff=1.51 cfs 0.104 af

SubcatchmentSA-5: Ex. driveway, parking, Runoff Area=0.411 ac 32.12% Impervious Runoff Depth=2.71"
Flow Length=257' Tc=5.1 min CN=73 Runoff=1.35 cfs 0.093 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=300' Slope=0.2500 '/' Tc=31.7 min CN=60 Runoff=0.15 cfs 0.020 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=4.40"
Flow Length=314' Tc=5.0 min CN=90 Runoff=0.88 cfs 0.063 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=1.506 ac 95.42% Impervious Runoff Depth=5.07"
Flow Length=701' Tc=5.0 min CN=96 Runoff=8.35 cfs 0.636 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.119 ac 59.66% Impervious Runoff Depth=3.67"
Flow Length=225' Tc=5.0 min CN=83 Runoff=0.53 cfs 0.036 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.367 ac 58.31% Impervious Runoff Depth=3.67"
Flow Length=701' Tc=5.0 min CN=83 Runoff=1.62 cfs 0.112 af

SubcatchmentSC-1: Ex. lawn and copse Runoff Area=2.942 ac 27.23% Impervious Runoff Depth=2.53"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=5.80 cfs 0.621 af

Pond 2P: Ex. Pocket Pond Peak Elev=124.75' Storage=4,704 cf Inflow=5.80 cfs 0.621 af
Outflow=5.32 cfs 0.621 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=58.19' Inflow=2.01 cfs 0.141 af
Outflow=2.01 cfs 0.141 af

Pond Ex-SA-CB-2: Ex-SA-CB-2 Peak Elev=55.88' Storage=156 cf Inflow=4.02 cfs 0.280 af
Primary=2.45 cfs 0.269 af Secondary=1.56 cfs 0.011 af Outflow=4.01 cfs 0.280 af

Pond Ex-SA-CB-3: Ex-SA-CB-3 Peak Elev=56.12' Storage=13 cf Inflow=1.07 cfs 0.074 af
Primary=1.07 cfs 0.073 af Secondary=0.00 cfs 0.000 af Outflow=1.07 cfs 0.073 af

Pond Ex-SA-CB-4: Ex-SA-CB-4 Peak Elev=55.40' Storage=38 cf Inflow=1.51 cfs 0.104 af
Primary=1.51 cfs 0.103 af Secondary=0.00 cfs 0.000 af Outflow=1.51 cfs 0.103 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.28' Storage=2 cf Inflow=1.35 cfs 0.093 af
Primary=1.35 cfs 0.093 af Secondary=0.00 cfs 0.000 af Outflow=1.35 cfs 0.093 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=72.20' Inflow=0.88 cfs 0.063 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=0.88 cfs 0.063 af

Pond Ex-SB-CB-2: Ex-SB-CB-2 Peak Elev=67.59' Storage=6 cf Inflow=11.37 cfs 0.847 af
24.0" Round Culvert n=0.011 L=221.0' S=0.0043 '/' Outflow=11.37 cfs 0.847 af

Pond Ex-SB-CB-3: Ex-SB-CB-3 Peak Elev=70.28' Storage=3 cf Inflow=2.15 cfs 0.148 af
12.0" Round Culvert n=0.011 L=151.0' S=0.0226 '/' Outflow=2.15 cfs 0.148 af

Pond Ex-SB-CB-4: Ex-SB-CB-4 Peak Elev=79.62' Storage=13 cf Inflow=1.62 cfs 0.112 af
Outflow=1.62 cfs 0.112 af

Link 1L: Flow to the North Inflow=11.37 cfs 0.847 af
Primary=11.37 cfs 0.847 af

Link 2L: Culvert to Hudson River 1 Inflow=4.01 cfs 0.280 af
Primary=4.01 cfs 0.280 af

Link 3L: Culvert to Hudson River 2 Inflow=1.35 cfs 0.093 af
Primary=1.35 cfs 0.093 af

Link Hudson: Hudson River Inflow=20.55 cfs 2.037 af
Primary=20.55 cfs 2.037 af

Total Runoff Area = 7.145 ac Runoff Volume = 2.039 af Average Runoff Depth = 3.42"
48.45% Pervious = 3.462 ac 51.55% Impervious = 3.683 ac

mary for Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athle

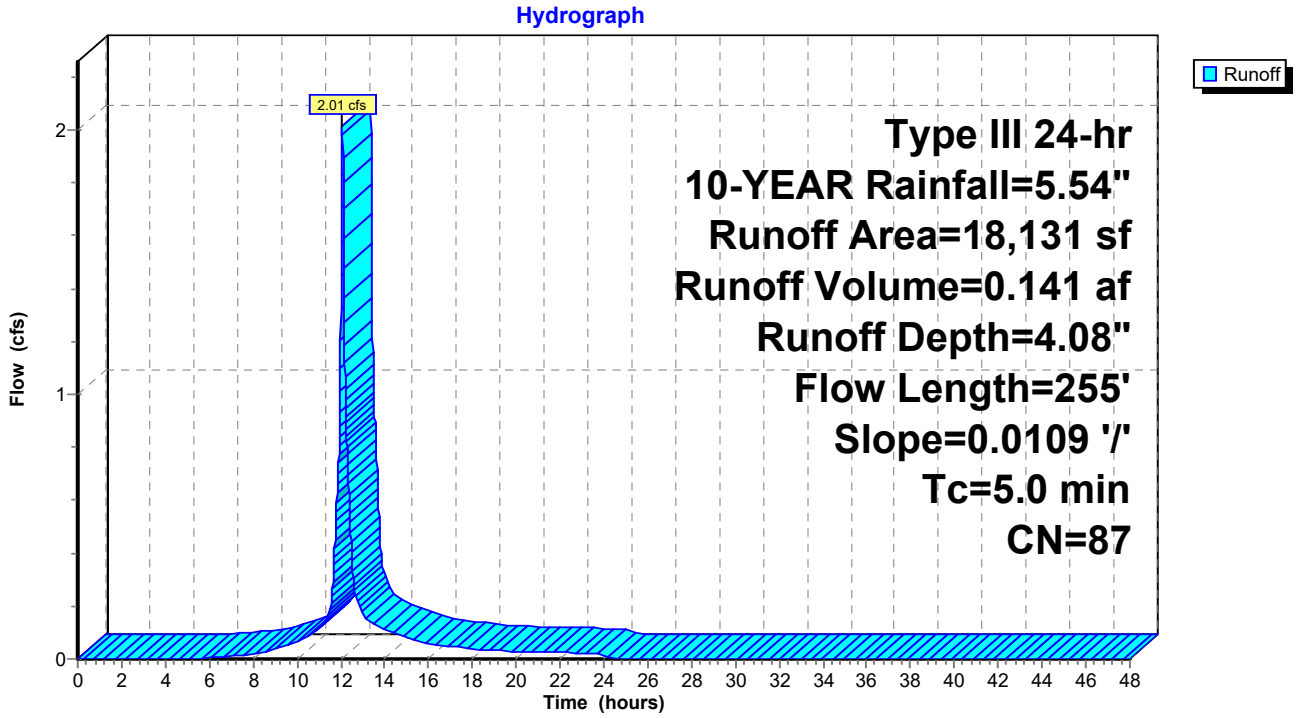
Runoff = 2.01 cfs @ 12.07 hrs, Volume= 0.141 af, Depth= 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (sf)	CN	Description
*	12,636	98	Pavement
	5,495	61	>75% Grass cover, Good, HSG B
	18,131	87	Weighted Average
	5,495		30.31% Pervious Area
	12,636		69.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	255	0.0109	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
3.2	255	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athletic fiel



Summary for Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R

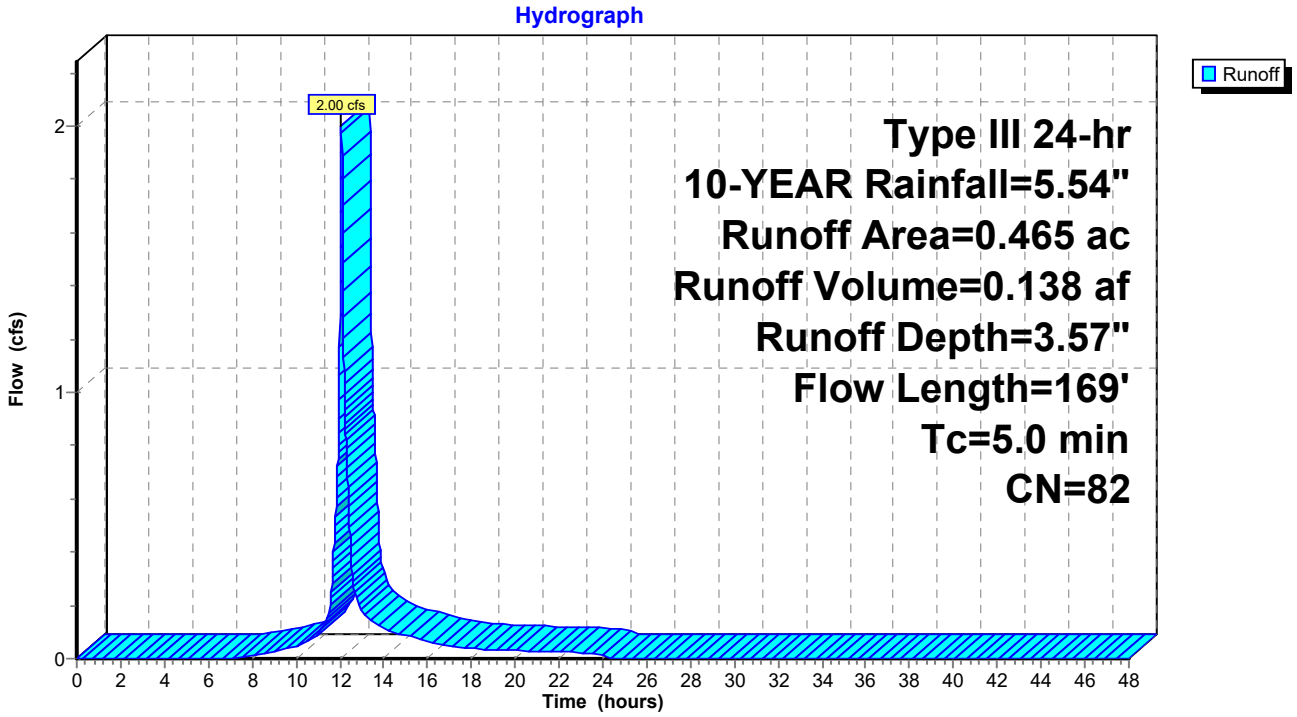
Runoff = 2.00 cfs @ 12.07 hrs, Volume= 0.138 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.263	98	Pavement
	0.202	61	>75% Grass cover, Good, HSG B
	0.465	82	Weighted Average
	0.202		43.44% Pervious Area
	0.263		56.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	77	0.3500	0.52		**Sheet Flow, SF Grass** Grass: Short n= 0.150 P2= 3.42"
0.7	92	0.0600	2.17		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.1	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R



Summary for Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R

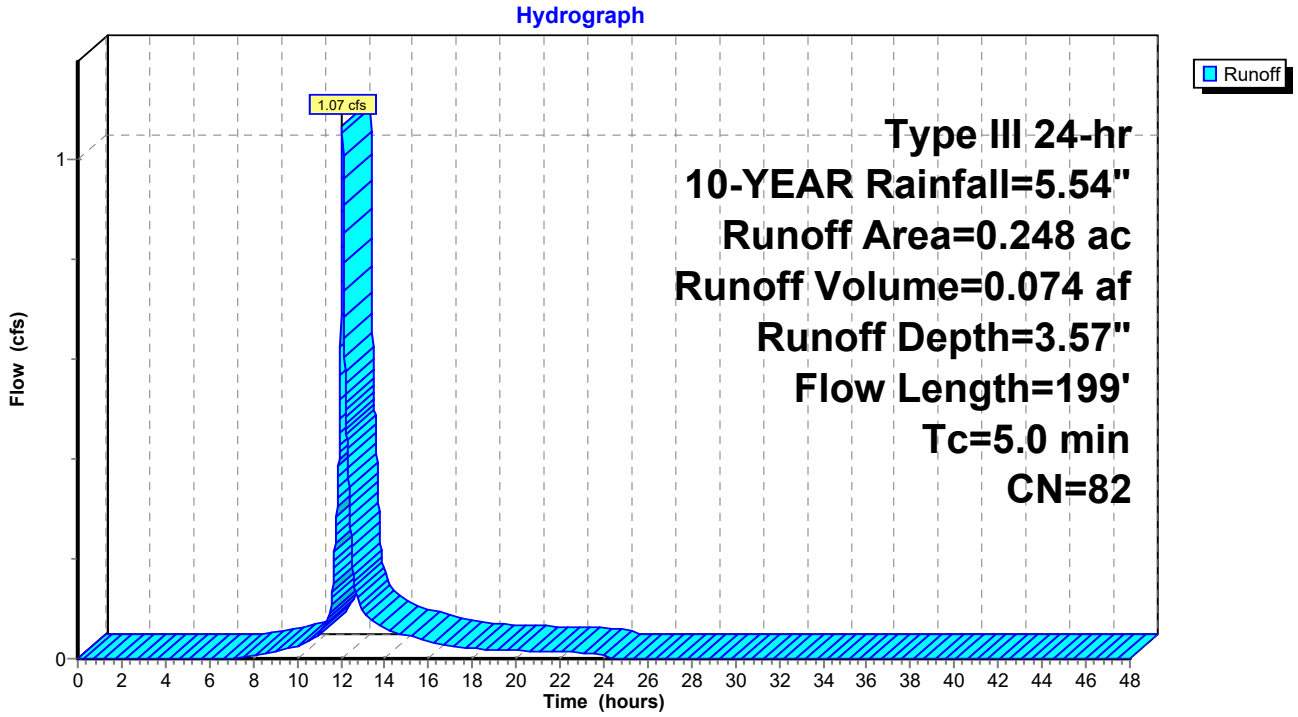
Runoff = 1.07 cfs @ 12.07 hrs, Volume= 0.074 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.141	98	Pavement
	0.107	61	>75% Grass cover, Good, HSG B
	0.248	82	Weighted Average
	0.107		43.15% Pervious Area
	0.141		56.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.5600	0.57		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.7	154	0.0175	1.47		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.0	199	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R



Summary for Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R

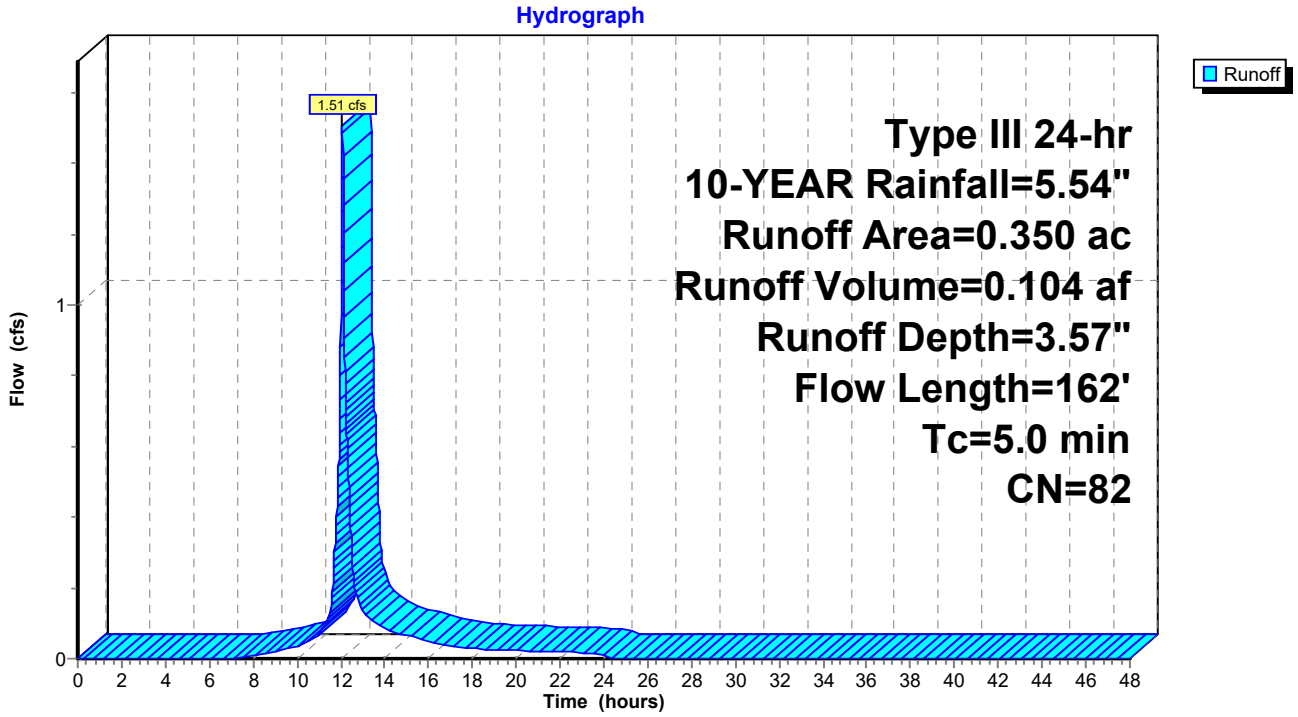
Runoff = 1.51 cfs @ 12.07 hrs, Volume= 0.104 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.198	98	Pavement
	0.152	61	>75% Grass cover, Good, HSG B
	0.350	82	Weighted Average
	0.152		43.43% Pervious Area
	0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	43	0.6000	0.58		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
0.9	119	0.0522	2.16		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
2.1	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R



for Subcatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up

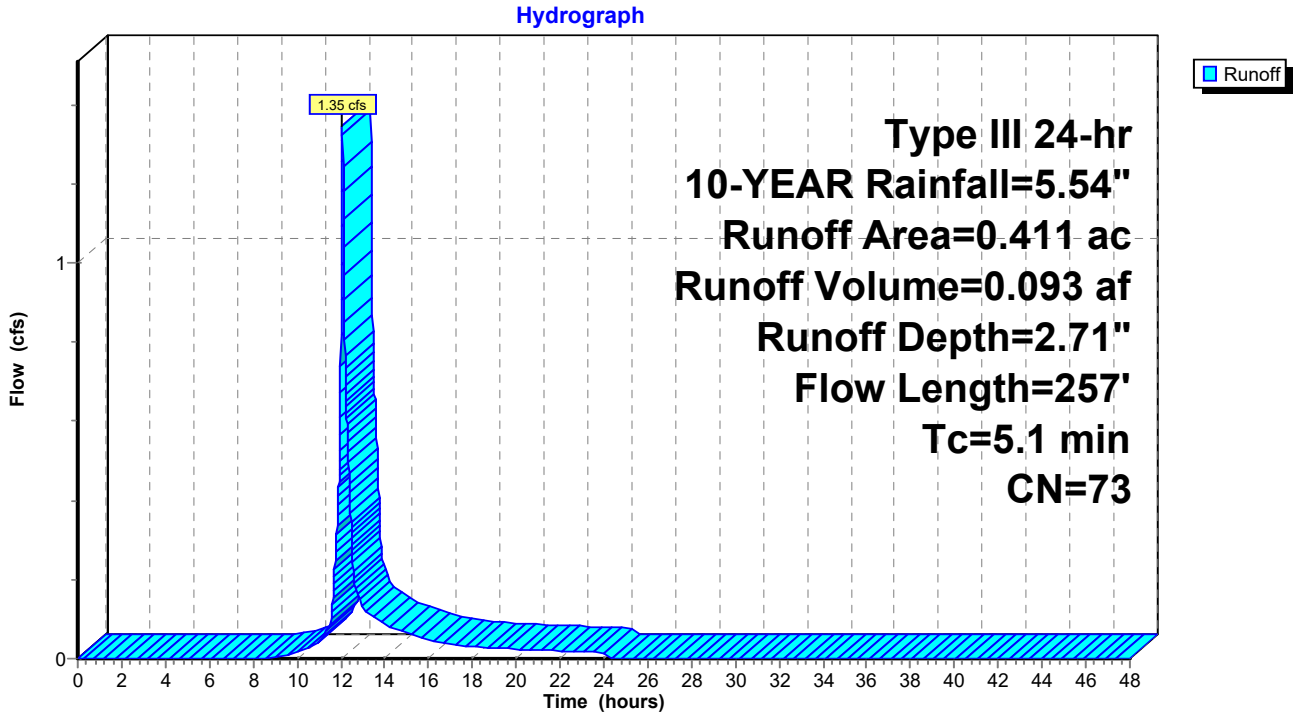
Runoff = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.132	98	Pavement
	0.279	61	>75% Grass cover, Good, HSG B
	0.411	73	Weighted Average
	0.279		67.88% Pervious Area
	0.132		32.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	94	0.2400	0.47		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.8	163	0.0185	1.52		**Sheet Flow, Sheet Flow Pavement** Smooth surfaces n= 0.011 P2= 3.42"
5.1	257	Total			

ocatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up slope



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

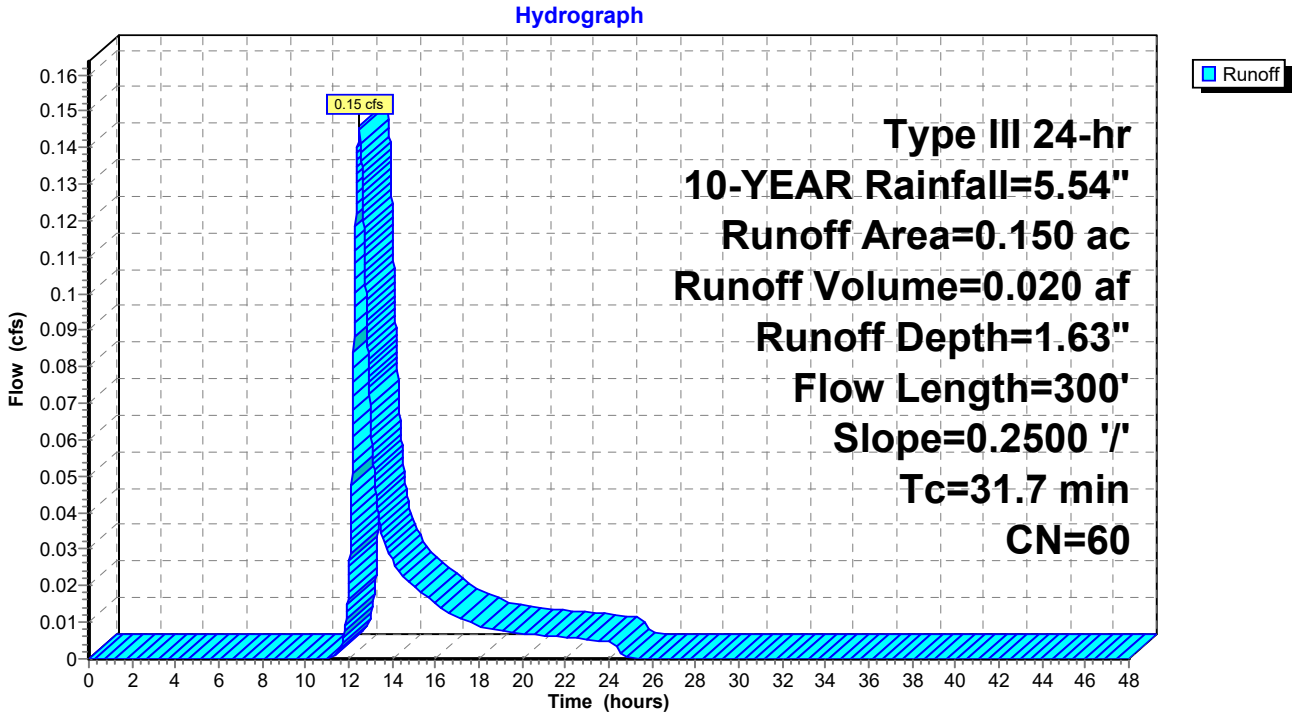
Runoff = 0.15 cfs @ 12.50 hrs, Volume= 0.020 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.150	60	Woods, Fair, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.7	300	0.2500	0.16		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.42"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot, driveways

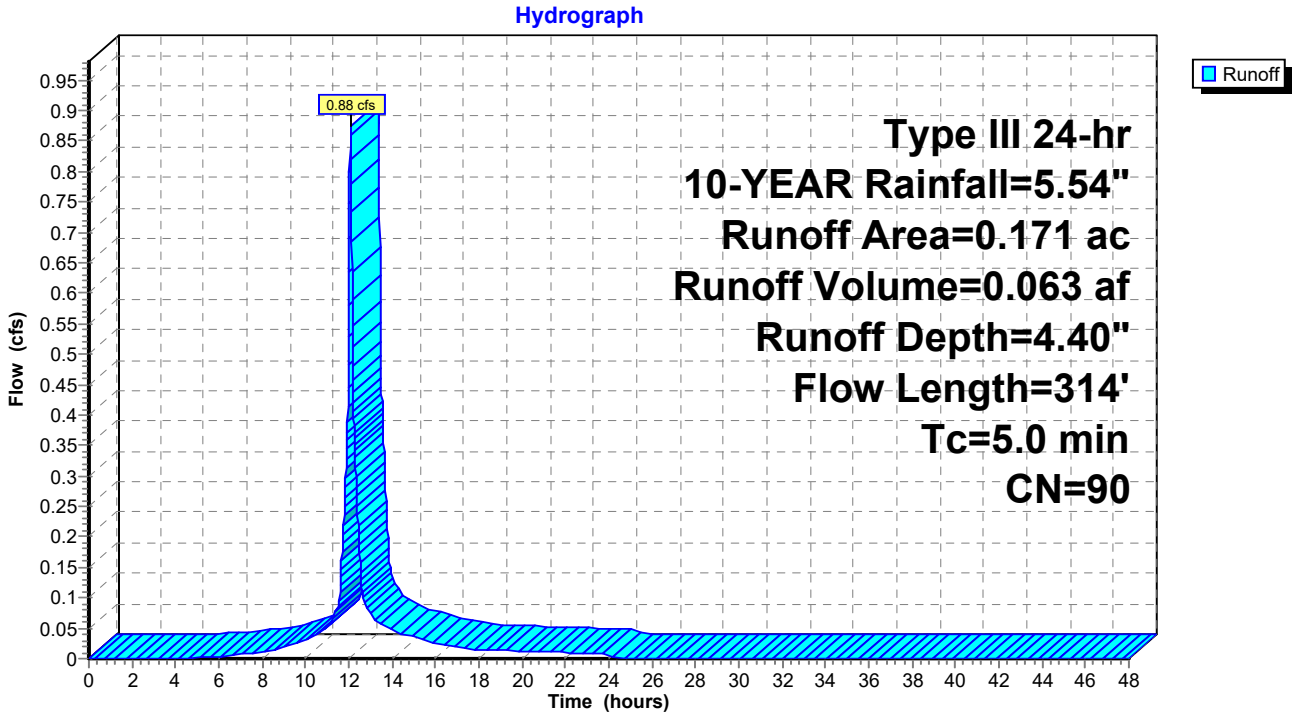
Runoff = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	300	0.0580	2.71		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot, driveways



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking ais

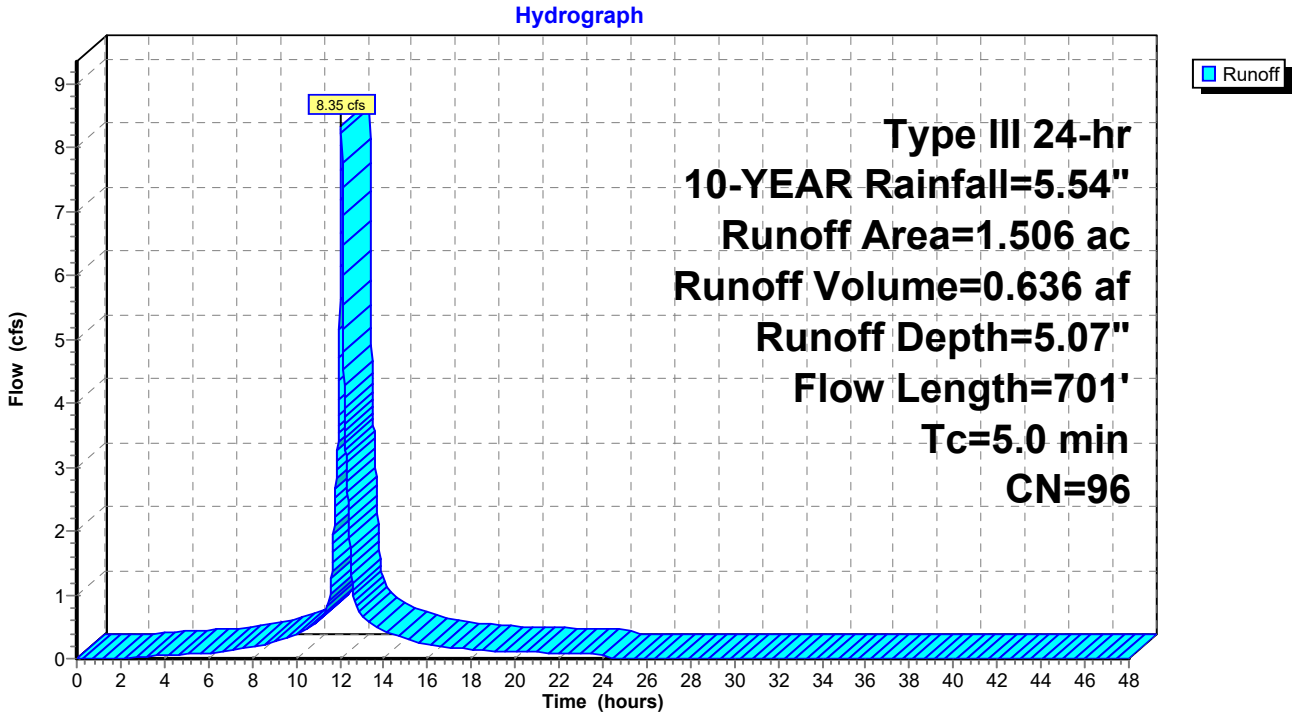
Runoff = 8.35 cfs @ 12.07 hrs, Volume= 0.636 af, Depth= 5.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	1.437	98	
	0.069	61	>75% Grass cover, Good, HSG B
	1.506	96	Weighted Average
	0.069		4.58% Pervious Area
	1.437		95.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

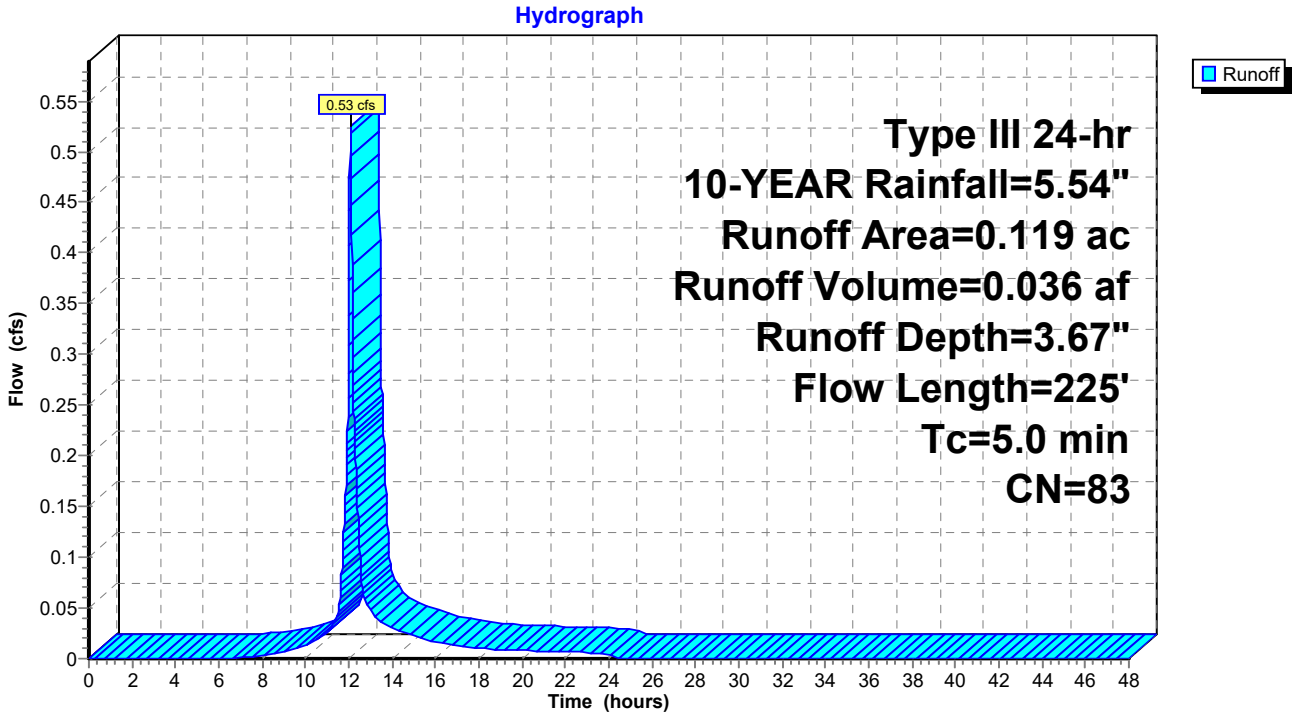
Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.036 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.071	98	
	0.048	61	>75% Grass cover, Good, HSG B
	0.119	83	Weighted Average
	0.048		40.34% Pervious Area
	0.071		59.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	211	0.0470	2.32		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.6	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

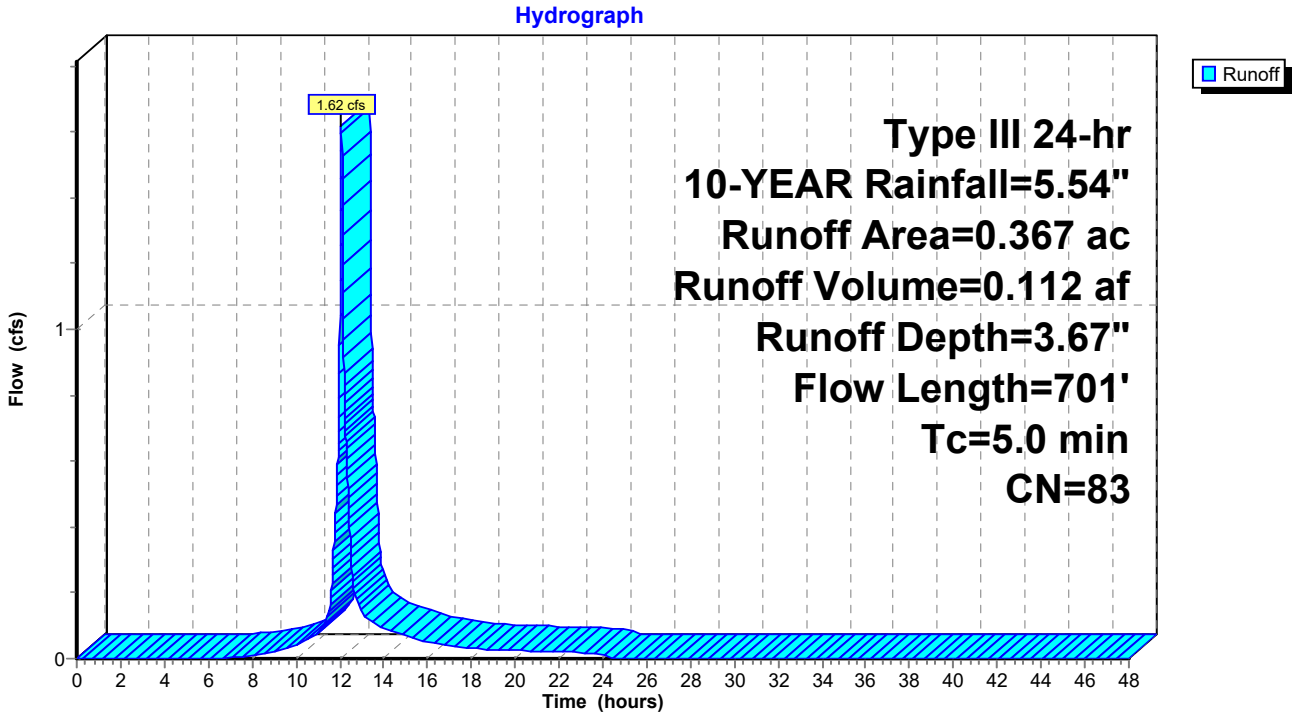
Runoff = 1.62 cfs @ 12.07 hrs, Volume= 0.112 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.214	98	
	0.153	61	>75% Grass cover, Good, HSG B
	0.367	83	Weighted Average
	0.153		41.69% Pervious Area
	0.214		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.

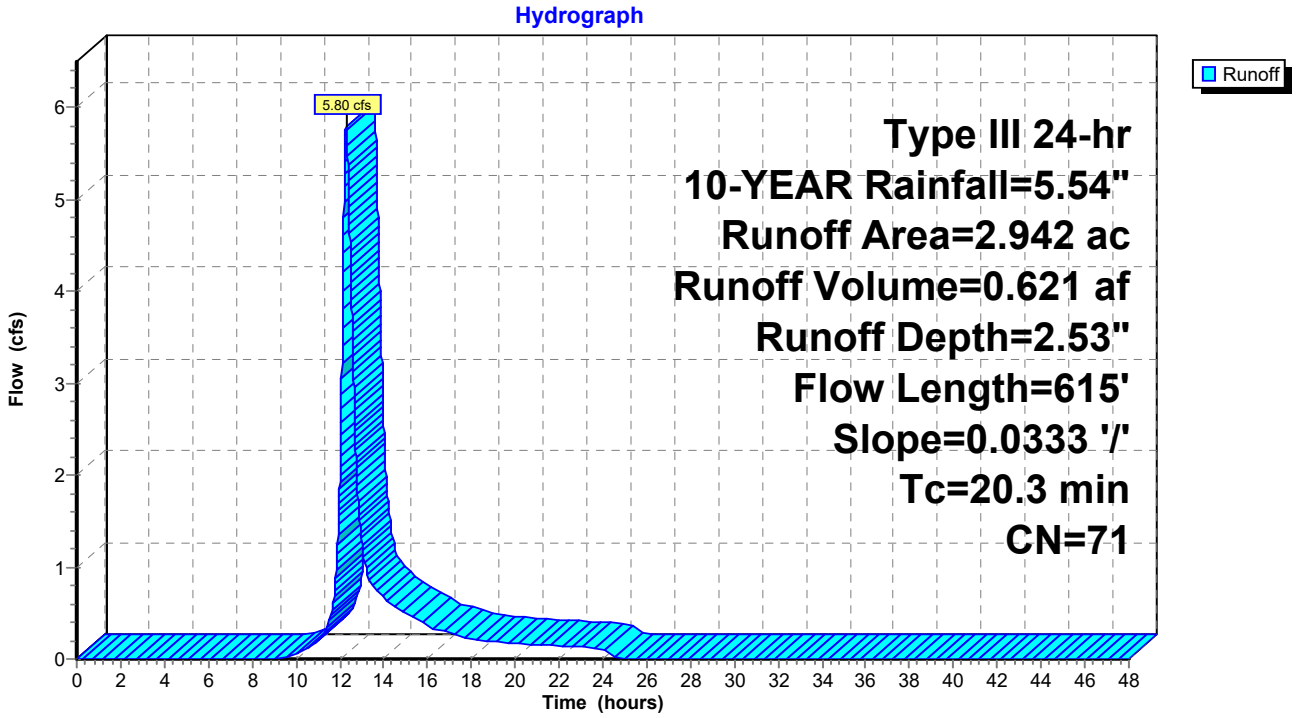
Runoff = 5.80 cfs @ 12.29 hrs, Volume= 0.621 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.801	98	Paved parking, HSG B
	2.141	61	>75% Grass cover, Good, HSG B
	2.942	71	Weighted Average
	2.141		72.77% Pervious Area
	0.801		27.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.



Summary for Pond 2P: Ex. Pocket Pond

Inflow Area = 2.942 ac, 27.23% Impervious, Inflow Depth = 2.53" for 10-YEAR event
Inflow = 5.80 cfs @ 12.29 hrs, Volume= 0.621 af
Outflow = 5.32 cfs @ 12.38 hrs, Volume= 0.621 af, Atten= 8%, Lag= 5.3 min
Primary = 5.32 cfs @ 12.38 hrs, Volume= 0.621 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 123.50' Surf.Area= 3,562 sf Storage= 1,614 cf
Peak Elev= 124.75' @ 12.38 hrs Surf.Area= 4,453 sf Storage= 4,704 cf (3,090 cf above start)

Plug-Flow detention time= 67.9 min calculated for 0.584 af (94% of inflow)
Center-of-Mass det. time= 24.7 min (877.8 - 853.1)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,156 cf	**additional storage to main bay (Irregular)** Listed below (Recalc)
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,034 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

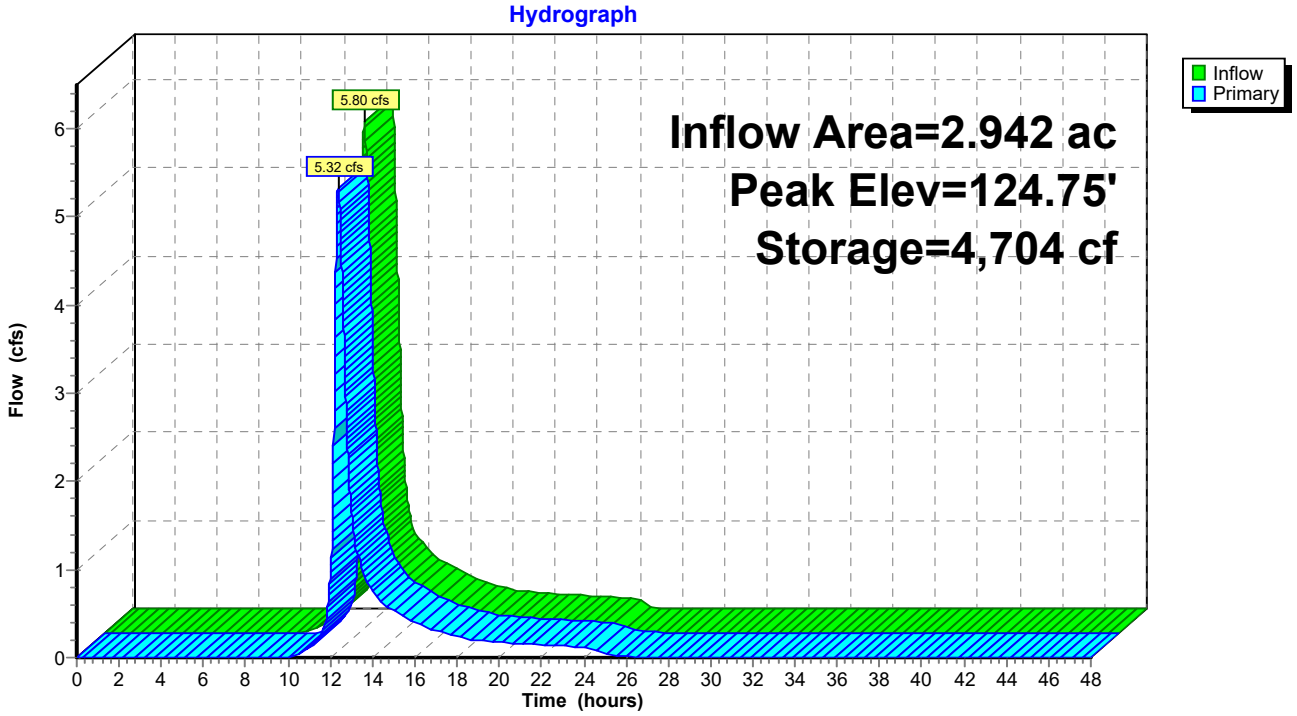
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	110	70.5	0	0	110
126.00	620	103.0	1,156	1,156	652

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.31 cfs @ 12.38 hrs HW=124.75' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Passes 5.31 cfs of 7.53 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 1.99 cfs @ 4.50 fps)
  └─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 3.33 cfs @ 2.43 fps)

Pond 2P: Ex. Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

[58] Hint: Peaked 2.63' above defined flood level

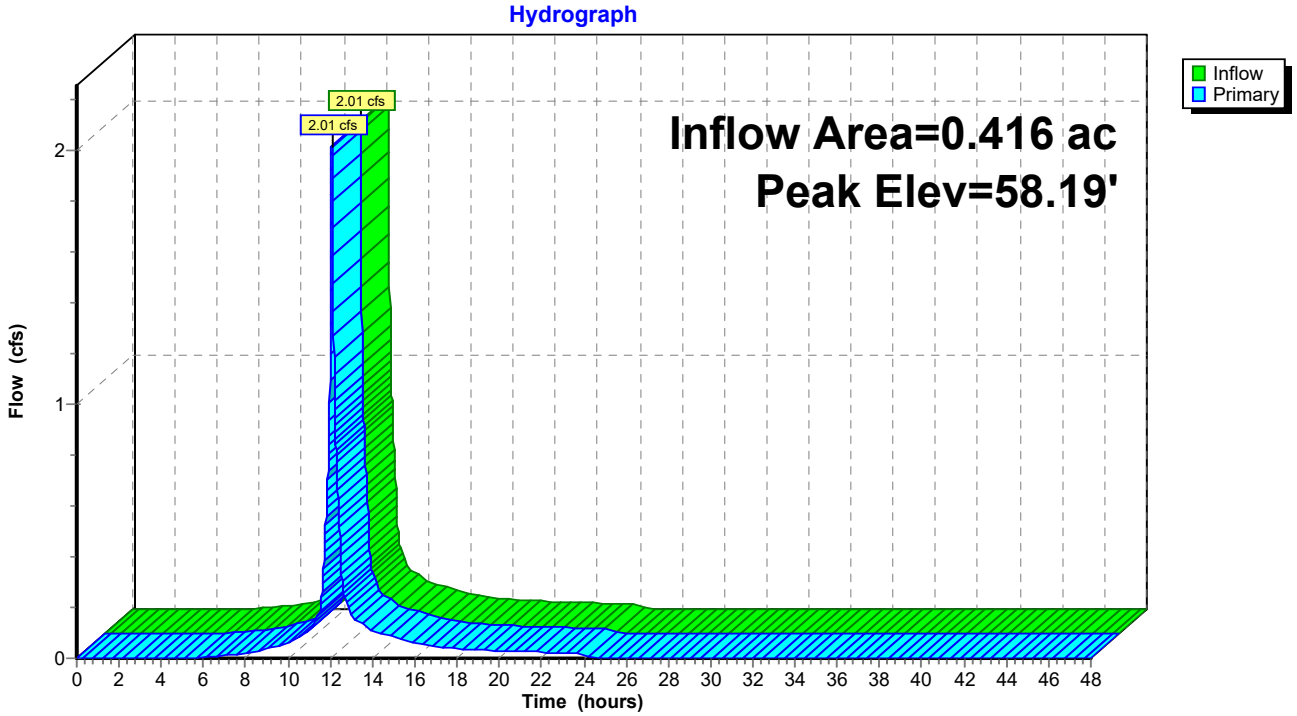
Inflow Area =	0.416 ac, 69.69% Impervious, Inflow Depth = 4.08" for 10-YEAR event				
Inflow =	2.01 cfs @ 12.07 hrs, Volume=	0.141 af			
Outflow =	2.01 cfs @ 12.07 hrs, Volume=	0.141 af, Atten= 0%, Lag= 0.0 min			
Primary =	2.01 cfs @ 12.07 hrs, Volume=	0.141 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 58.19' @ 12.07 hrs
Flood Elev= 55.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.41'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.41' / 52.34' S= 0.0018 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.01 cfs @ 12.07 hrs HW=58.18' TW=55.88' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.01 cfs @ 5.76 fps)
└─**2=Orifice/Grate** (Passes 2.01 cfs of 10.07 cfs potential flow)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-2: Ex-SA-CB-2

[58] Hint: Peaked 0.54' above defined flood level

Inflow Area =	0.881 ac,	62.76% Impervious,	Inflow Depth =	3.81"	for 10-YEAR event
Inflow =	4.02 cfs @	12.07 hrs,	Volume=	0.280 af	
Outflow =	4.01 cfs @	12.08 hrs,	Volume=	0.280 af,	Atten= 0%, Lag= 0.3 min
Primary =	2.45 cfs @	12.08 hrs,	Volume=	0.269 af	
Secondary =	1.56 cfs @	12.08 hrs,	Volume=	0.011 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.88' @ 12.08 hrs Surf.Area= 756 sf Storage= 156 cf
Flood Elev= 55.34' Surf.Area= 3 sf Storage= 10 cf

Plug-Flow detention time= 0.4 min calculated for 0.280 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (804.0 - 803.8)

Volume	Invert	Avail.Storage	Storage Description
#1	52.13'	262 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

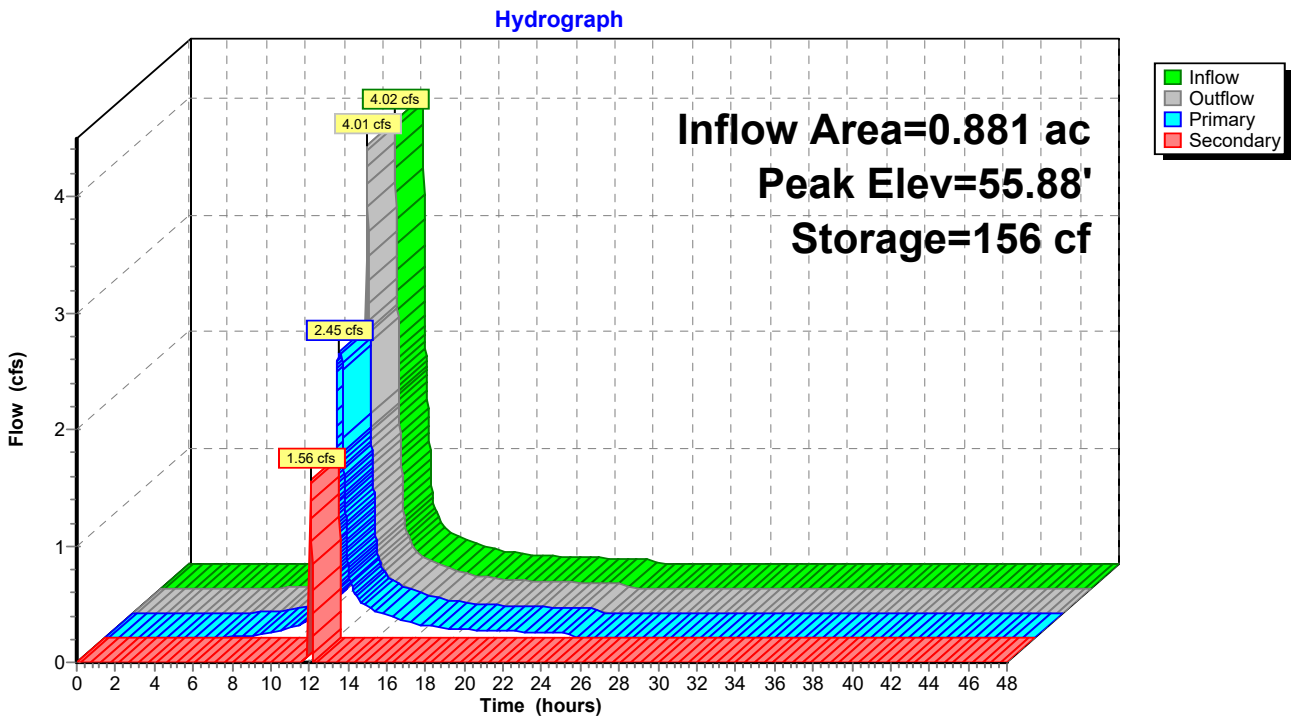
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.13	3	8.0	0	0	3
55.34	3	8.0	10	10	29
56.00	1,085	204.0	252	262	3,336

Device	Routing	Invert	Outlet Devices
#1	Primary	52.14'	**8.0" Round Culvert** L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.14' / 11.61' S= 0.5066 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Secondary	55.84'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=2.45 cfs @ 12.08 hrs HW=55.88' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.45 cfs @ 7.02 fps)

Secondary OutFlow Max=1.55 cfs @ 12.08 hrs HW=55.88' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.55 cfs @ 0.69 fps)

Pond Ex-SA-CB-2: Ex-SA-CB-2



Summary for Pond Ex-SA-CB-3: Ex-SA-CB-3

[58] Hint: Peaked 0.04' above defined flood level

Inflow Area =	0.248 ac, 56.85% Impervious, Inflow Depth = 3.57" for 10-YEAR event				
Inflow =	1.07 cfs @ 12.07 hrs, Volume=	0.074 af			
Outflow =	1.07 cfs @ 12.07 hrs, Volume=	0.073 af, Atten= 0%, Lag= 0.0 min			
Primary =	1.07 cfs @ 12.07 hrs, Volume=	0.073 af			
Secondary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 56.12' @ 12.07 hrs Surf.Area= 20 sf Storage= 13 cf
Flood Elev= 56.08' Surf.Area= 4 sf Storage= 12 cf

Plug-Flow detention time= 3.7 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (812.5 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	52.62'	1,126 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

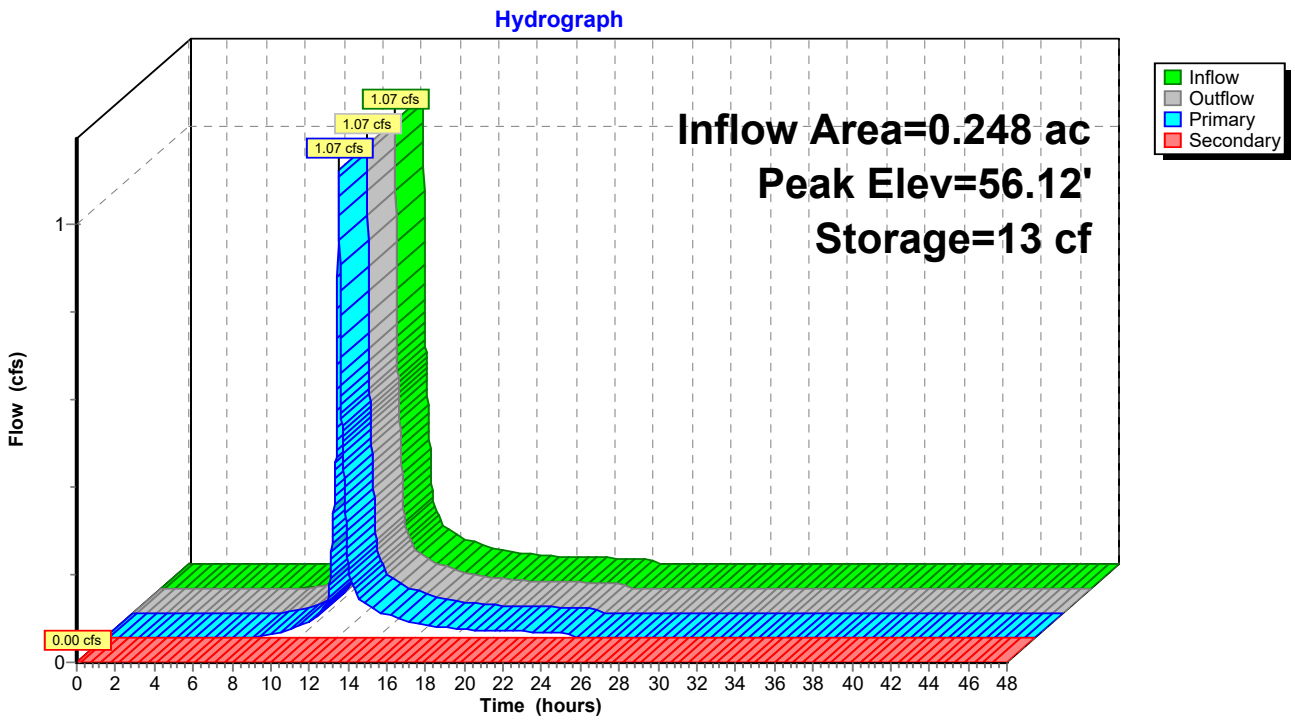
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.62	3	8.0	0	0	3
56.08	4	8.0	12	12	31
57.00	3,511	272.0	1,114	1,126	5,914

Device	Routing	Invert	Outlet Devices
#1	Device 2	54.13'	**8.0" Round CB to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 54.13' / 53.53' S= 0.1200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Primary	52.63'	**8.0" Round MH to Slope** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.63' / 27.23' S= 0.7257 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.58'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	56.08'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.07 cfs @ 12.07 hrs HW=56.12' TW=0.00' (Dynamic Tailwater)
└─**2=MH to Slope** (Passes 1.07 cfs of 2.36 cfs potential flow)
  └─**1=CB to MH** (Passes 1.07 cfs of 1.71 cfs potential flow)
    └─**4=Orifice/Grate** (Weir Controls 1.07 cfs @ 0.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.62' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-3: Ex-SA-CB-3



Summary for Pond Ex-SA-CB-4: Ex-SA-CB-4

[58] Hint: Peaked 0.05' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=11)

Inflow Area =	0.350 ac, 56.57% Impervious, Inflow Depth = 3.57" for 10-YEAR event				
Inflow =	1.51 cfs @	12.07 hrs,	Volume=	0.104 af	
Outflow =	1.51 cfs @	12.07 hrs,	Volume=	0.103 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.51 cfs @	12.07 hrs,	Volume=	0.103 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.40' @ 12.07 hrs Surf.Area= 12 sf Storage= 38 cf
Flood Elev= 55.35' Surf.Area= 3 sf Storage= 38 cf

Plug-Flow detention time= 7.9 min calculated for 0.103 af (99% of inflow)
Center-of-Mass det. time= 2.8 min (814.0 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	42.85'	5,622 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

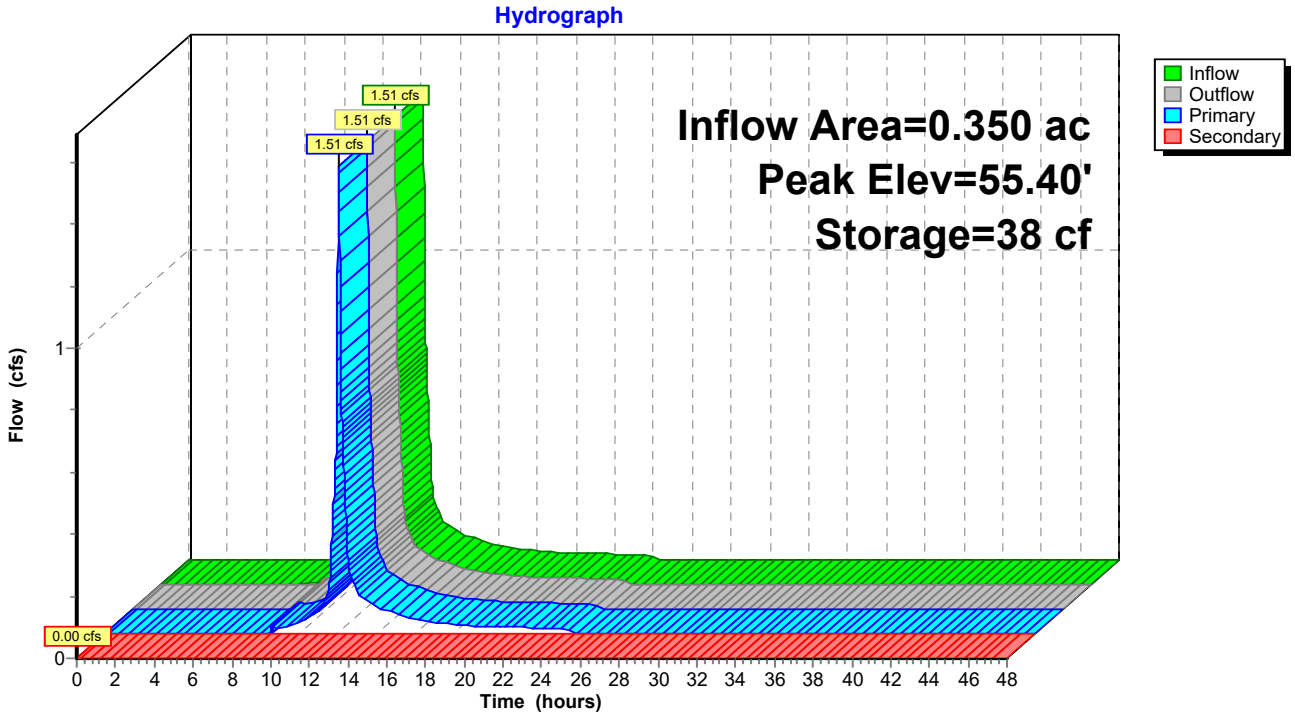
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.85	3	8.0	0	0	3
55.35	3	8.0	38	38	103
56.00	579	167.0	135	173	2,318
58.00	5,767	334.0	5,449	5,622	8,995

Device	Routing	Invert	Outlet Devices
#1	Device 2	52.25'	**8.0" Round Culvert to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.25' / 49.76' S= 0.4980 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Primary	42.86'	**8.0" Round Culvert** L= 59.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.86' / 13.62' S= 0.4956 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.00'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	55.35'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.51 cfs @ 12.07 hrs HW=55.40' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.51 cfs of 4.64 cfs potential flow)
  └─**1=Culvert to MH** (Passes 1.51 cfs of 2.23 cfs potential flow)
    └─**4=Orifice/Grate** (Orifice Controls 1.51 cfs @ 1.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.85' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-4: Ex-SA-CB-4



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 2.71" for 10-YEAR event
Inflow = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af
Outflow = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Primary = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 43.28' @ 12.08 hrs Surf.Area= 3 sf Storage= 2 cf
Flood Elev= 55.24' Surf.Area= 4 sf Storage= 44 cf

Plug-Flow detention time= 0.1 min calculated for 0.093 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (834.2 - 834.1)

Volume	Invert	Avail.Storage	Storage Description
#1	42.73'	548 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

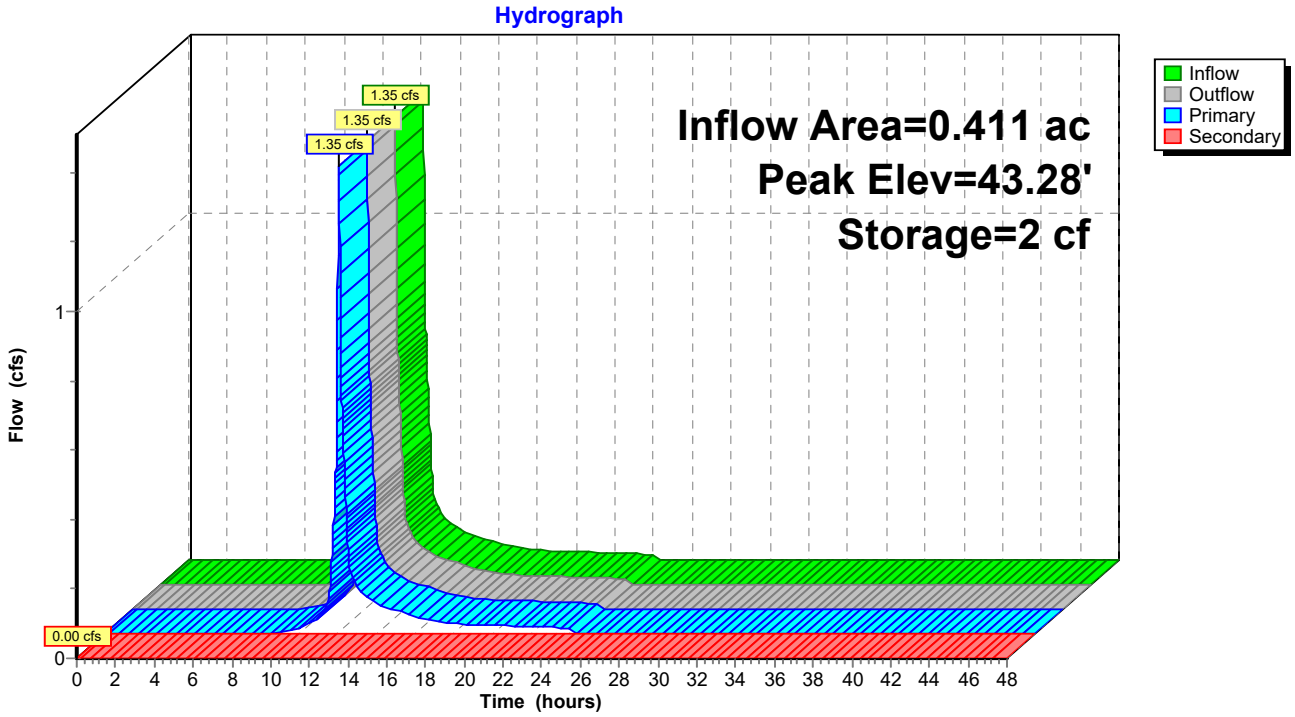
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.73	3	8.0	0	0	3
55.24	4	8.0	44	44	103
56.00	1,901	371.0	505	548	11,052

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**24.0" Round Culvert** L= 85.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2850 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Secondary	55.74'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=1.34 cfs @ 12.08 hrs HW=43.28' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 1.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.73' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

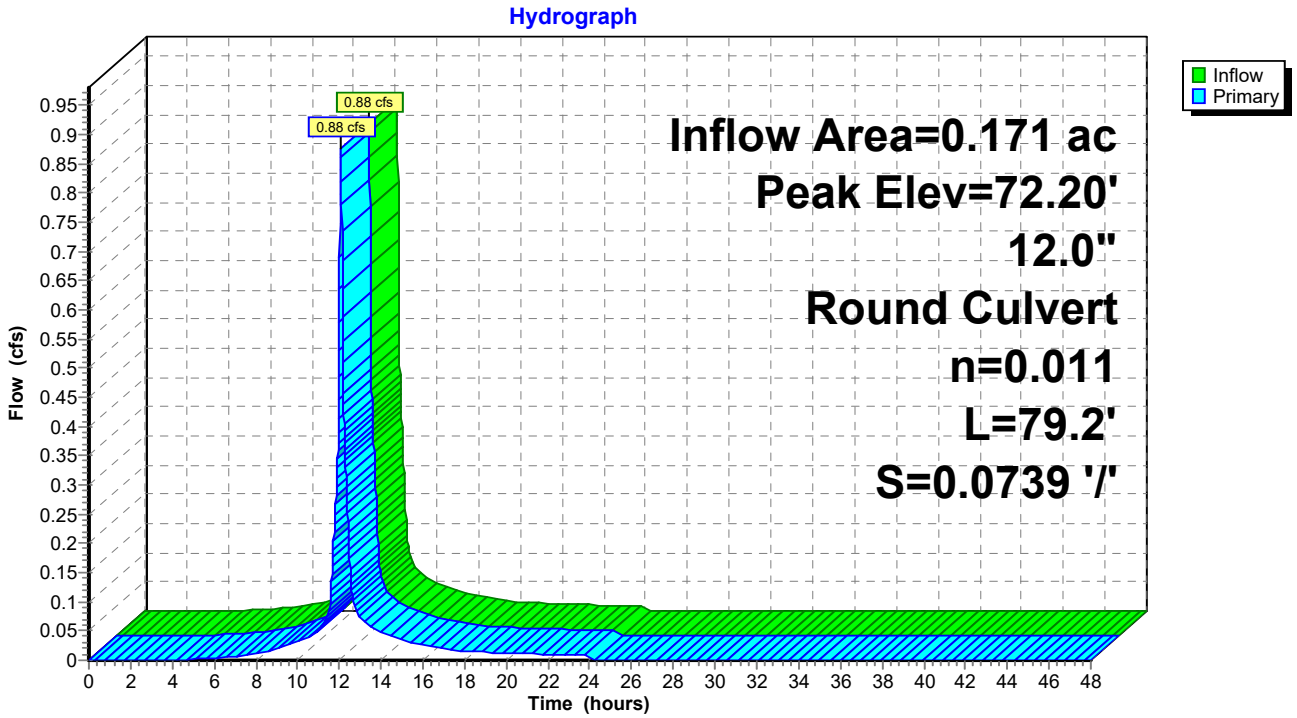
Inflow Area = 0.171 ac, 79.53% Impervious, Inflow Depth = 4.40" for 10-YEAR event
Inflow = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af
Outflow = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 72.20' @ 12.07 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.07 hrs HW=72.20' TW=67.59' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.87 cfs @ 1.99 fps)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond Ex-SB-CB-2: Ex-SB-CB-2

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 4.70" for 10-YEAR event
Inflow = 11.37 cfs @ 12.07 hrs, Volume= 0.847 af
Outflow = 11.37 cfs @ 12.07 hrs, Volume= 0.847 af, Atten= 0%, Lag= 0.0 min
Primary = 11.37 cfs @ 12.07 hrs, Volume= 0.847 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 67.59' @ 12.07 hrs Surf.Area= 3 sf Storage= 6 cf
Flood Elev= 72.00' Surf.Area= 3 sf Storage= 19 cf

Plug-Flow detention time= 0.0 min calculated for 0.847 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (769.9 - 769.9)

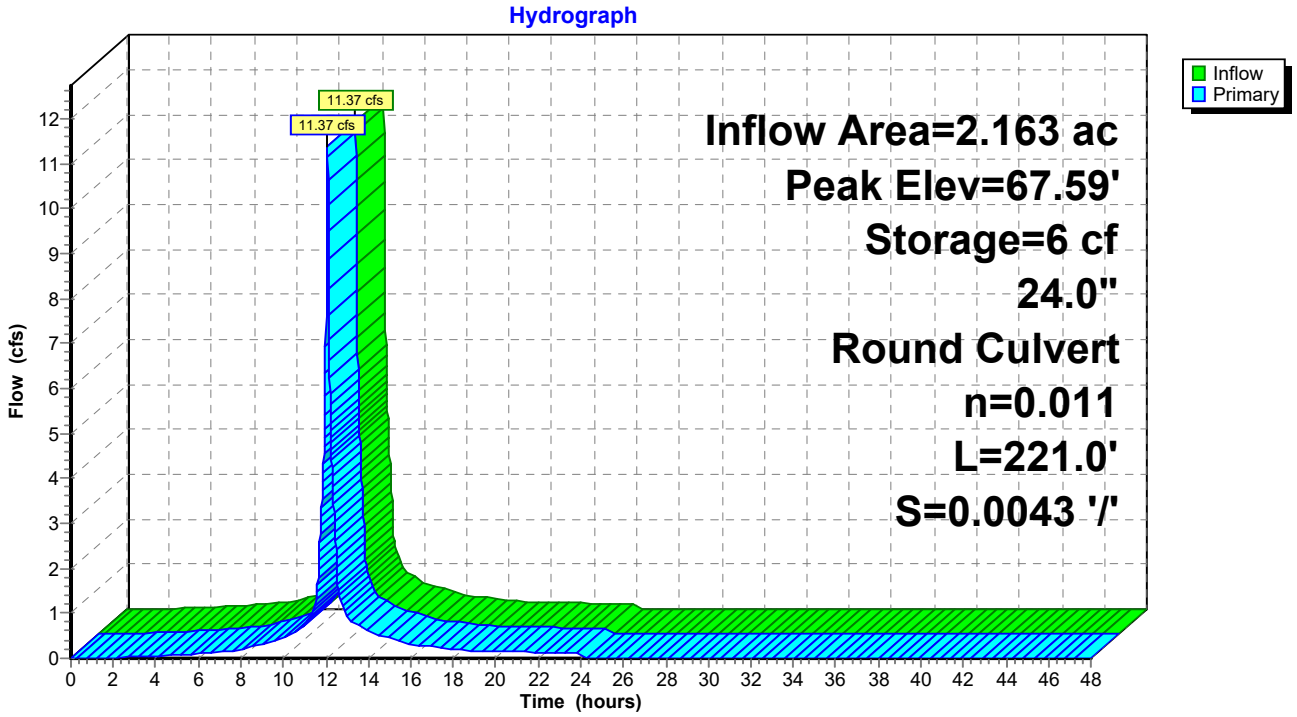
Volume	Invert	Avail.Storage	Storage Description
#1	65.69'	444 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
65.69	3	8.0	0	0	3
72.00	3	8.0	19	19	53
72.50	258	63.0	48	67	365
73.00	1,400	258.0	376	444	5,347

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 221.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 64.76' S= 0.0043 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=11.36 cfs @ 12.07 hrs HW=67.59' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.36 cfs @ 3.70 fps)

Pond Ex-SB-CB-2: Ex-SB-CB-2



Summary for Pond Ex-SB-CB-3: Ex-SB-CB-3

Inflow Area = 0.486 ac, 58.64% Impervious, Inflow Depth = 3.66" for 10-YEAR event
Inflow = 2.15 cfs @ 12.07 hrs, Volume= 0.148 af
Outflow = 2.15 cfs @ 12.07 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.0 min
Primary = 2.15 cfs @ 12.07 hrs, Volume= 0.148 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 70.28' @ 12.07 hrs Surf.Area= 3 sf Storage= 3 cf
Flood Elev= 73.41' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 0.2 min calculated for 0.148 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (809.2 - 809.2)

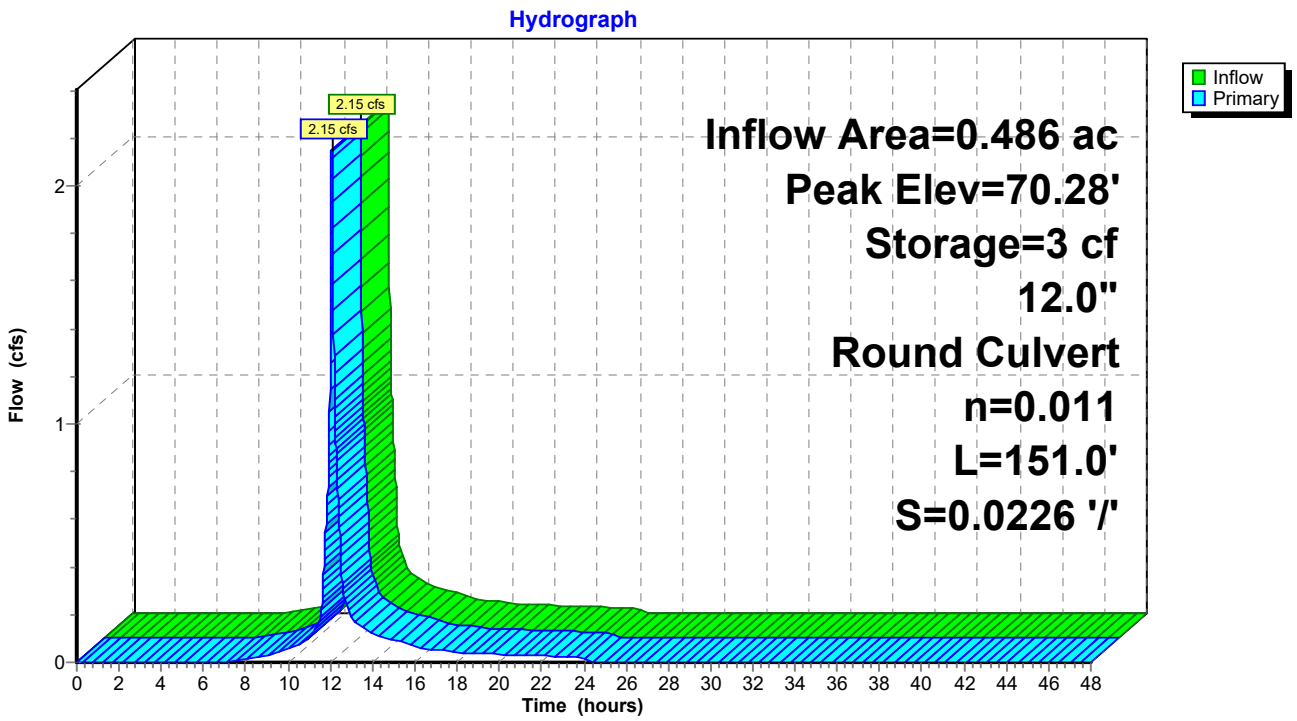
Volume	Invert	Avail.Storage	Storage Description
#1	69.25'	999 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.25	3	8.0	0	0	3
73.41	3	8.0	12	12	36
74.00	161	54.0	37	49	264
75.00	440	91.0	289	338	697
76.00	911	126.0	661	999	1,311

Device	Routing	Invert	Outlet Devices
#1	Primary	69.26'	**12.0" Round Culvert** L= 151.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 69.26' / 65.85' S= 0.0226 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.14 cfs @ 12.07 hrs HW=70.28' TW=67.59' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.14 cfs @ 2.73 fps)

Pond Ex-SB-CB-3: Ex-SB-CB-3



Summary for Pond Ex-SB-CB-4: Ex-SB-CB-4

[58] Hint: Peaked 0.06' above defined flood level

Inflow Area = 0.367 ac, 58.31% Impervious, Inflow Depth = 3.67" for 10-YEAR event
Inflow = 1.62 cfs @ 12.07 hrs, Volume= 0.112 af
Outflow = 1.62 cfs @ 12.07 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.07 hrs, Volume= 0.112 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 79.62' @ 12.07 hrs Surf.Area= 6 sf Storage= 13 cf
Flood Elev= 79.56' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 2.6 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (809.4 - 808.4)

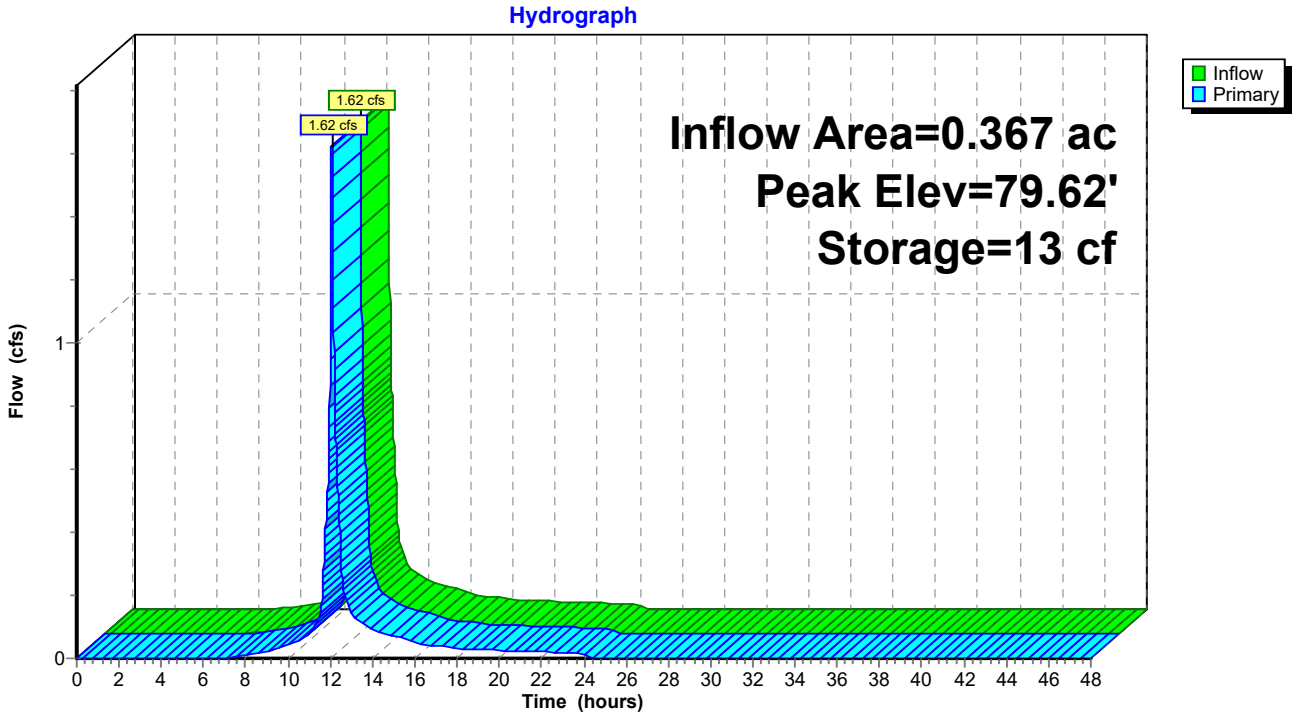
Volume	Invert	Avail.Storage	Storage Description
#1	75.45'	716 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.45	3	8.0	0	0	3
79.56	3	8.0	12	12	36
81.00	306	83.0	163	175	583
82.00	816	135.0	541	716	1,492

Device	Routing	Invert	Outlet Devices
#1	Primary	75.46'	**12.0" Round Culvert** L= 121.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.46' / 69.31' S= 0.0506 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	79.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.62 cfs @ 12.07 hrs HW=79.62' TW=70.28' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.62 cfs of 5.71 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 1.62 cfs @ 1.17 fps)

Pond Ex-SB-CB-4: Ex-SB-CB-4

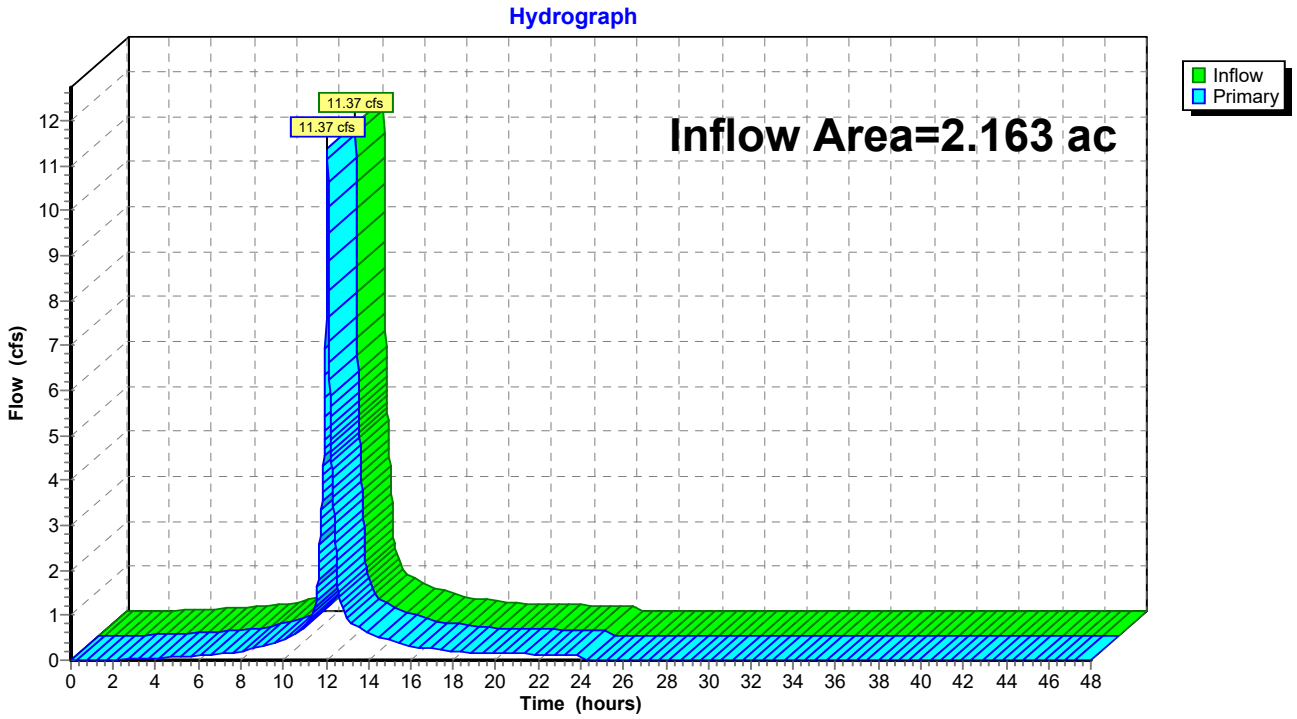


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 4.70" for 10-YEAR event
Inflow = 11.37 cfs @ 12.07 hrs, Volume= 0.847 af
Primary = 11.37 cfs @ 12.07 hrs, Volume= 0.847 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

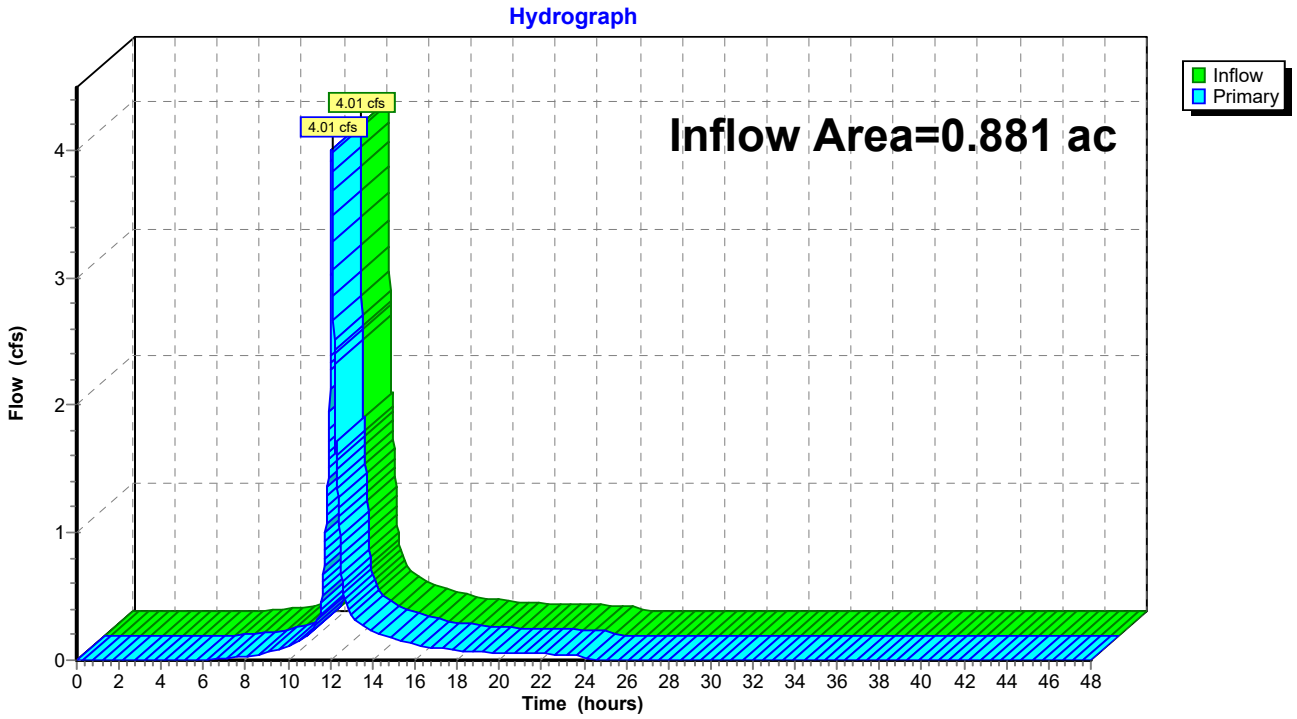


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 0.881 ac, 62.76% Impervious, Inflow Depth = 3.81" for 10-YEAR event
Inflow = 4.01 cfs @ 12.08 hrs, Volume= 0.280 af
Primary = 4.01 cfs @ 12.08 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

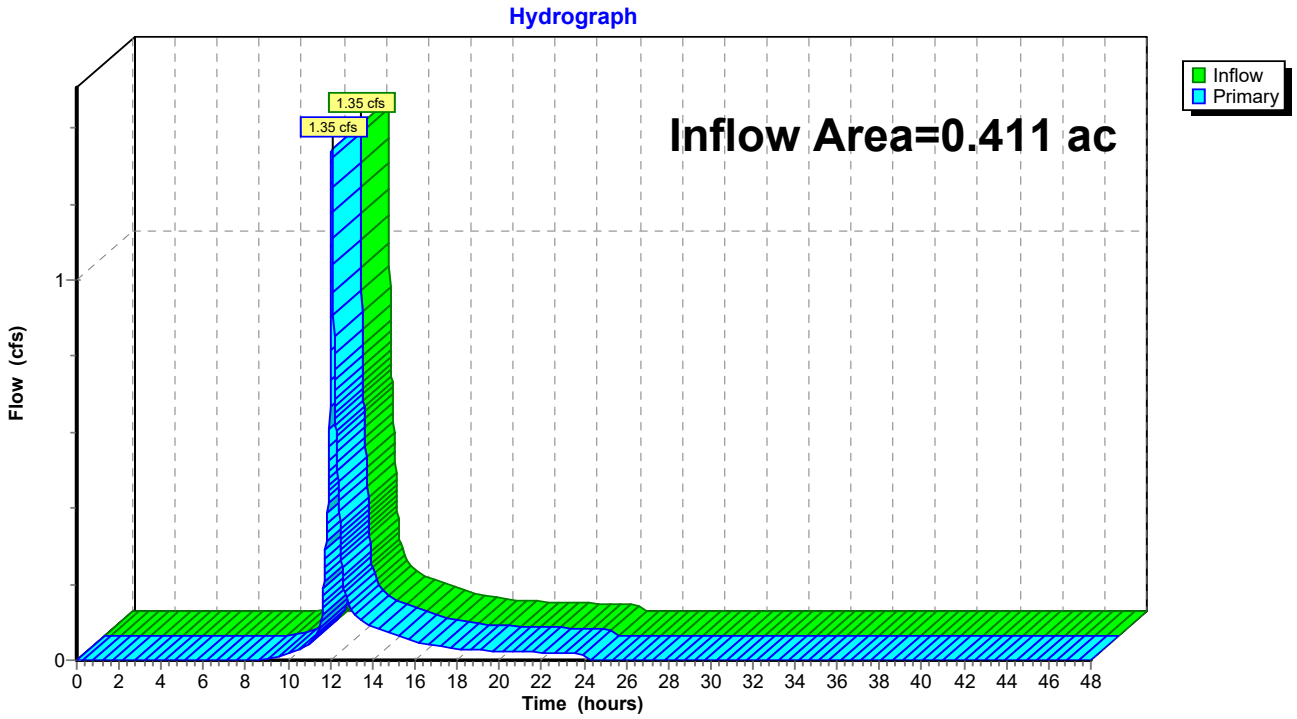


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 2.71" for 10-YEAR event
Inflow = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af
Primary = 1.35 cfs @ 12.08 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

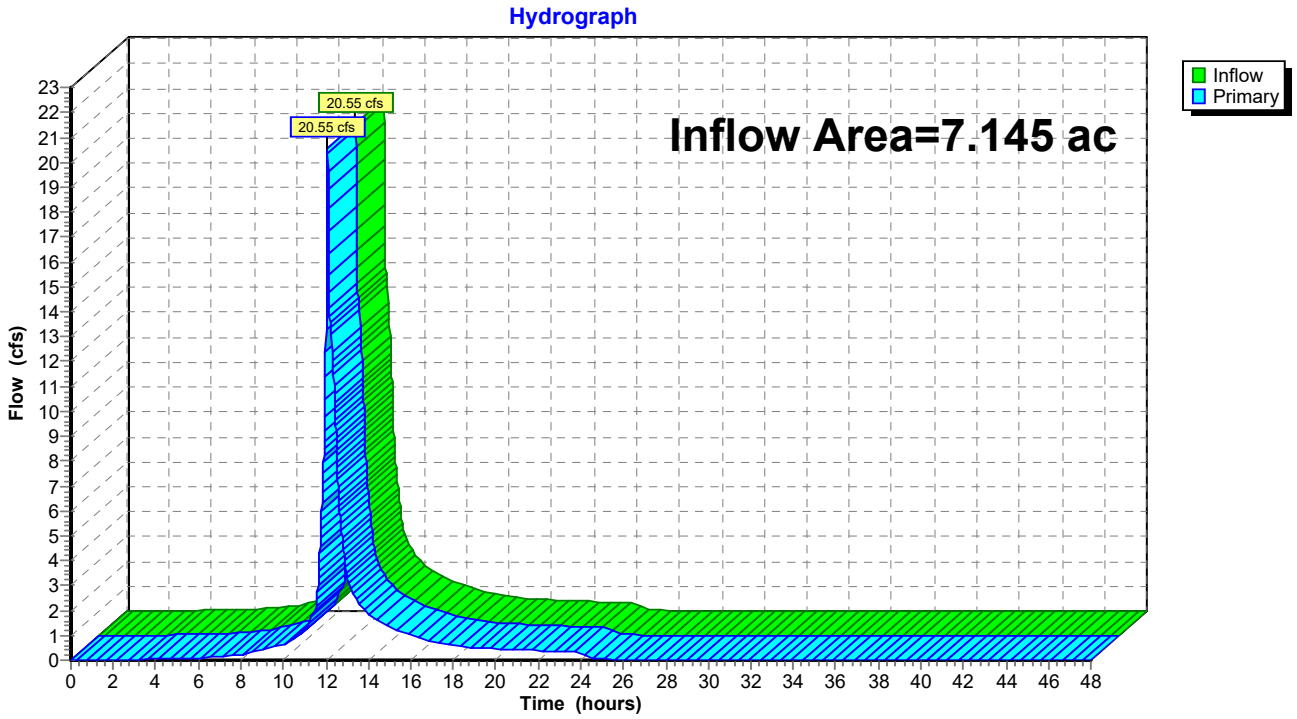


Summary for Link Hudson: Hudson River

Inflow Area = 7.145 ac, 51.55% Impervious, Inflow Depth = 3.42" for 10-YEAR event
Inflow = 20.55 cfs @ 12.07 hrs, Volume= 2.037 af
Primary = 20.55 cfs @ 12.07 hrs, Volume= 2.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link Hudson: Hudson River



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Ex. driveway to Lot Runoff Area=18,131 sf 69.69% Impervious Runoff Depth=7.07"
Flow Length=255' Slope=0.0109 '/' Tc=5.0 min CN=87 Runoff=3.39 cfs 0.245 af

SubcatchmentSA-2: Ex. driveway, parking, Runoff Area=0.465 ac 56.56% Impervious Runoff Depth=6.47"
Flow Length=169' Tc=5.0 min CN=82 Runoff=3.56 cfs 0.251 af

SubcatchmentSA-3: Ex. driveway, parking, Runoff Area=0.248 ac 56.85% Impervious Runoff Depth=6.47"
Flow Length=199' Tc=5.0 min CN=82 Runoff=1.90 cfs 0.134 af

SubcatchmentSA-4: Ex. driveway, parking, Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=6.47"
Flow Length=162' Tc=5.0 min CN=82 Runoff=2.68 cfs 0.189 af

SubcatchmentSA-5: Ex. driveway, parking, Runoff Area=0.411 ac 32.12% Impervious Runoff Depth=5.38"
Flow Length=257' Tc=5.1 min CN=73 Runoff=2.67 cfs 0.184 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=3.82"
Flow Length=300' Slope=0.2500 '/' Tc=31.7 min CN=60 Runoff=0.37 cfs 0.048 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=7.44"
Flow Length=314' Tc=5.0 min CN=90 Runoff=1.44 cfs 0.106 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=1.506 ac 95.42% Impervious Runoff Depth=8.16"
Flow Length=701' Tc=5.0 min CN=96 Runoff=13.16 cfs 1.024 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.119 ac 59.66% Impervious Runoff Depth=6.59"
Flow Length=225' Tc=5.0 min CN=83 Runoff=0.92 cfs 0.065 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.367 ac 58.31% Impervious Runoff Depth=6.59"
Flow Length=701' Tc=5.0 min CN=83 Runoff=2.85 cfs 0.202 af

SubcatchmentSC-1: Ex. lawn and copse Runoff Area=2.942 ac 27.23% Impervious Runoff Depth=5.14"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=11.87 cfs 1.260 af

Pond 2P: Ex. Pocket Pond Peak Elev=125.59' Storage=7,426 cf Inflow=11.87 cfs 1.260 af
Outflow=9.27 cfs 1.260 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=62.47' Inflow=3.39 cfs 0.245 af
Outflow=3.39 cfs 0.245 af

Pond Ex-SA-CB-2: Ex-SA-CB-2 Peak Elev=55.93' Storage=194 cf Inflow=6.95 cfs 0.496 af
Primary=2.47 cfs 0.436 af Secondary=4.48 cfs 0.060 af Outflow=6.94 cfs 0.496 af

Pond Ex-SA-CB-3: Ex-SA-CB-3 Peak Elev=56.29' Storage=30 cf Inflow=1.90 cfs 0.134 af
Primary=1.79 cfs 0.133 af Secondary=0.00 cfs 0.000 af Outflow=1.79 cfs 0.133 af

Pond Ex-SA-CB-4: Ex-SA-CB-4 Peak Elev=55.84' Storage=99 cf Inflow=2.68 cfs 0.189 af
Primary=2.39 cfs 0.188 af Secondary=0.00 cfs 0.000 af Outflow=2.39 cfs 0.188 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.52' Storage=2 cf Inflow=2.67 cfs 0.184 af
Primary=2.67 cfs 0.184 af Secondary=0.00 cfs 0.000 af Outflow=2.67 cfs 0.184 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=72.39' Inflow=1.44 cfs 0.106 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=1.44 cfs 0.106 af

Pond Ex-SB-CB-2: Ex-SB-CB-2 Peak Elev=69.06' Storage=10 cf Inflow=18.36 cfs 1.397 af
24.0" Round Culvert n=0.011 L=221.0' S=0.0043 '/' Outflow=18.36 cfs 1.397 af

Pond Ex-SB-CB-3: Ex-SB-CB-3 Peak Elev=71.35' Storage=6 cf Inflow=3.77 cfs 0.267 af
12.0" Round Culvert n=0.011 L=151.0' S=0.0226 '/' Outflow=3.77 cfs 0.267 af

Pond Ex-SB-CB-4: Ex-SB-CB-4 Peak Elev=79.74' Storage=14 cf Inflow=2.85 cfs 0.202 af
Outflow=2.85 cfs 0.201 af

Link 1L: Flow to the North Inflow=18.36 cfs 1.397 af
Primary=18.36 cfs 1.397 af

Link 2L: Culvert to Hudson River 1 Inflow=6.94 cfs 0.496 af
Primary=6.94 cfs 0.496 af

Link 3L: Culvert to Hudson River 2 Inflow=2.67 cfs 0.184 af
Primary=2.67 cfs 0.184 af

Link Hudson: Hudson River Inflow=36.67 cfs 3.706 af
Primary=36.67 cfs 3.706 af

Total Runoff Area = 7.145 ac Runoff Volume = 3.707 af Average Runoff Depth = 6.23"
48.45% Pervious = 3.462 ac 51.55% Impervious = 3.683 ac

mary for Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athle

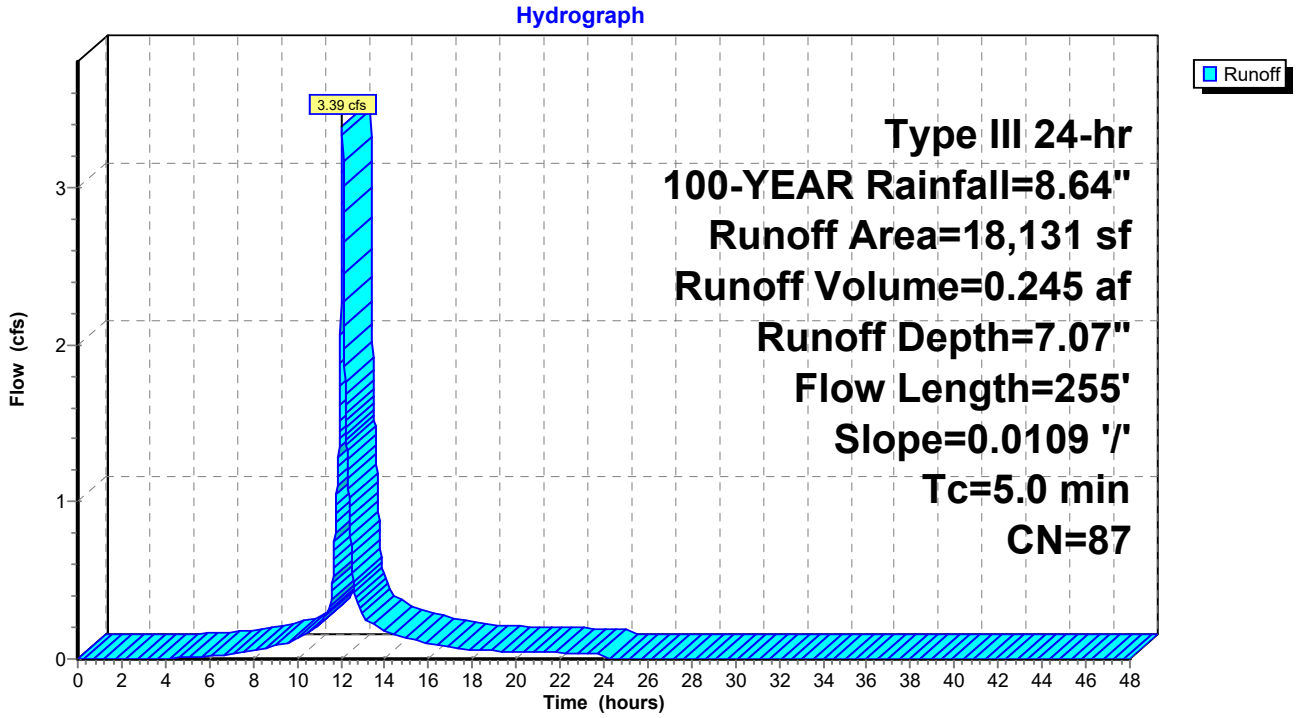
Runoff = 3.39 cfs @ 12.07 hrs, Volume= 0.245 af, Depth= 7.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (sf)	CN	Description
*	12,636	98	Pavement
	5,495	61	>75% Grass cover, Good, HSG B
	18,131	87	Weighted Average
	5,495		30.31% Pervious Area
	12,636		69.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	255	0.0109	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
3.2	255	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-1: Ex. driveway to Lot R, north Lot R, grassed slope between Lot R and athletic fiel



Summary for Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R

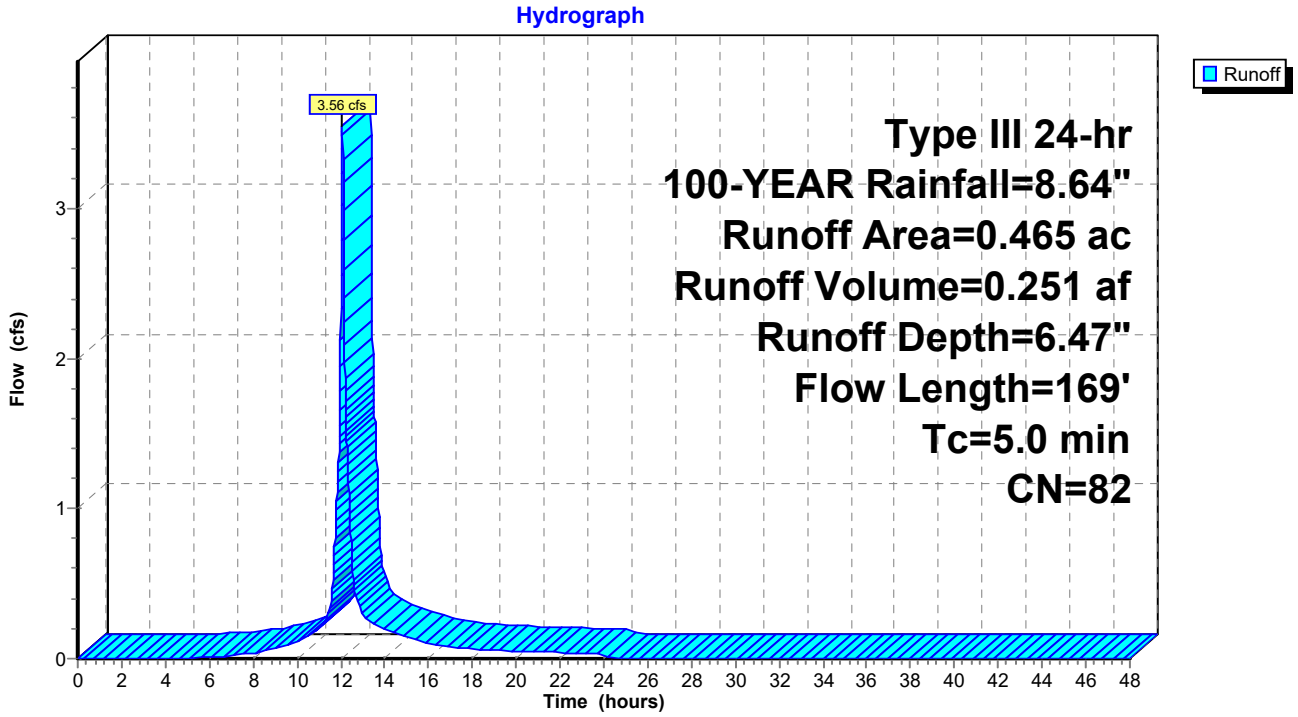
Runoff = 3.56 cfs @ 12.07 hrs, Volume= 0.251 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.263	98	Pavement
	0.202	61	>75% Grass cover, Good, HSG B
	0.465	82	Weighted Average
	0.202		43.44% Pervious Area
	0.263		56.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	77	0.3500	0.52		**Sheet Flow, SF Grass** Grass: Short n= 0.150 P2= 3.42"
0.7	92	0.0600	2.17		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.1	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-2: Ex. driveway, parking, lawn in north-central Lot R



Summary for Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R

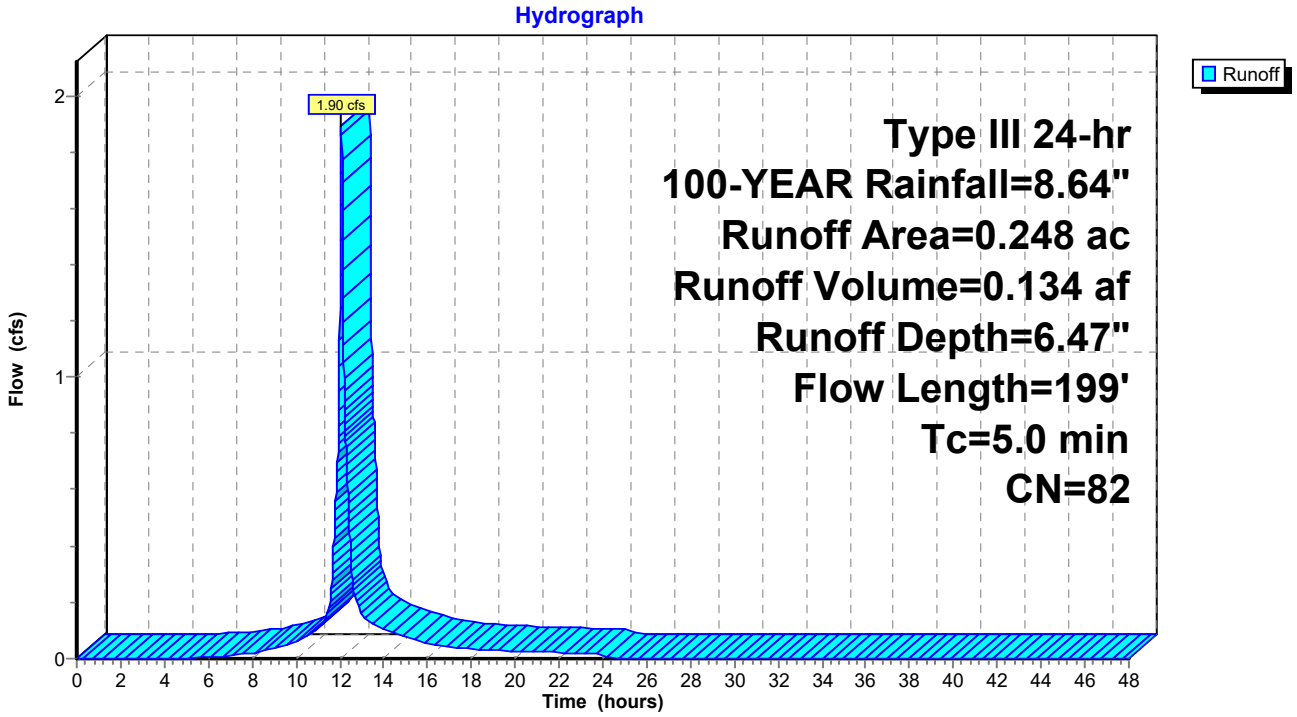
Runoff = 1.90 cfs @ 12.07 hrs, Volume= 0.134 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.141	98	Pavement
	0.107	61	>75% Grass cover, Good, HSG B
	0.248	82	Weighted Average
	0.107		43.15% Pervious Area
	0.141		56.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.5600	0.57		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.7	154	0.0175	1.47		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
3.0	199	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-3: Ex. driveway, parking, lawn in central Lot R



Summary for Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R

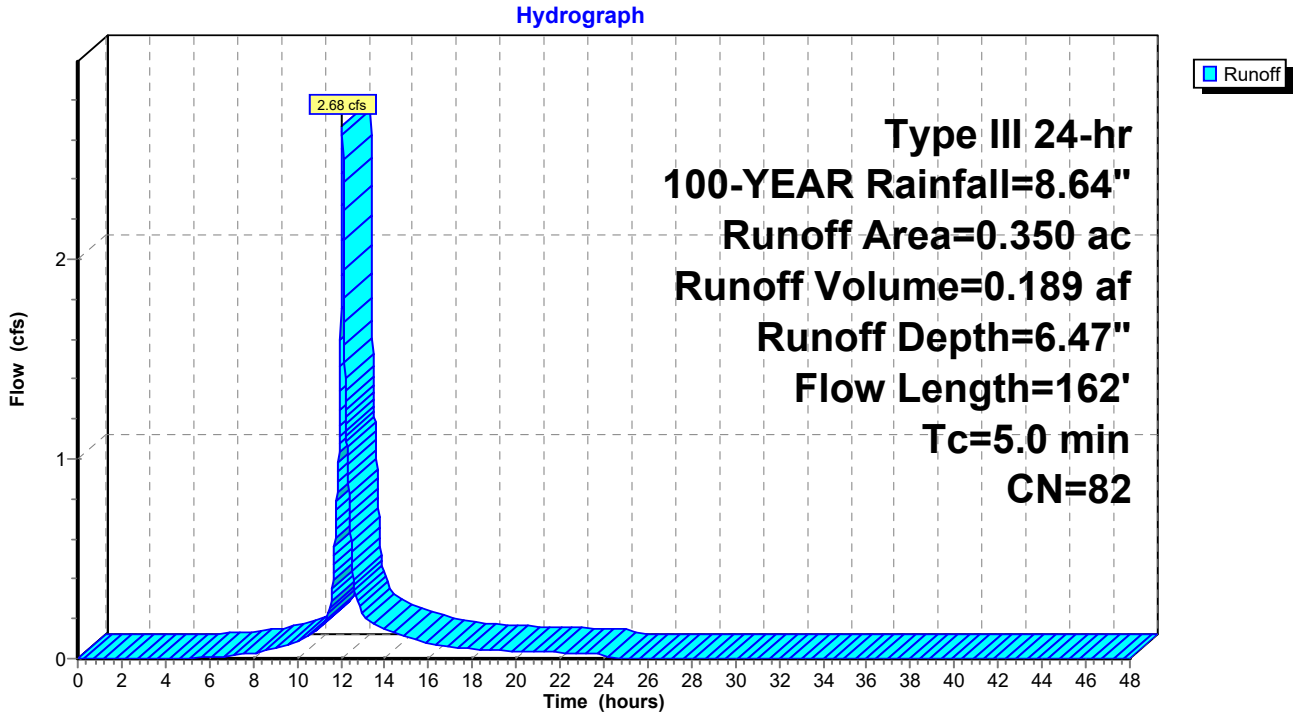
Runoff = 2.68 cfs @ 12.07 hrs, Volume= 0.189 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.198	98	Pavement
	0.152	61	>75% Grass cover, Good, HSG B
	0.350	82	Weighted Average
	0.152		43.43% Pervious Area
	0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	43	0.6000	0.58		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
0.9	119	0.0522	2.16		**Sheet Flow, SF Pavement** Smooth surfaces n= 0.011 P2= 3.42"
2.1	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SA-4: Ex. driveway, parking, lawn in south-central Lot R



for Subcatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up

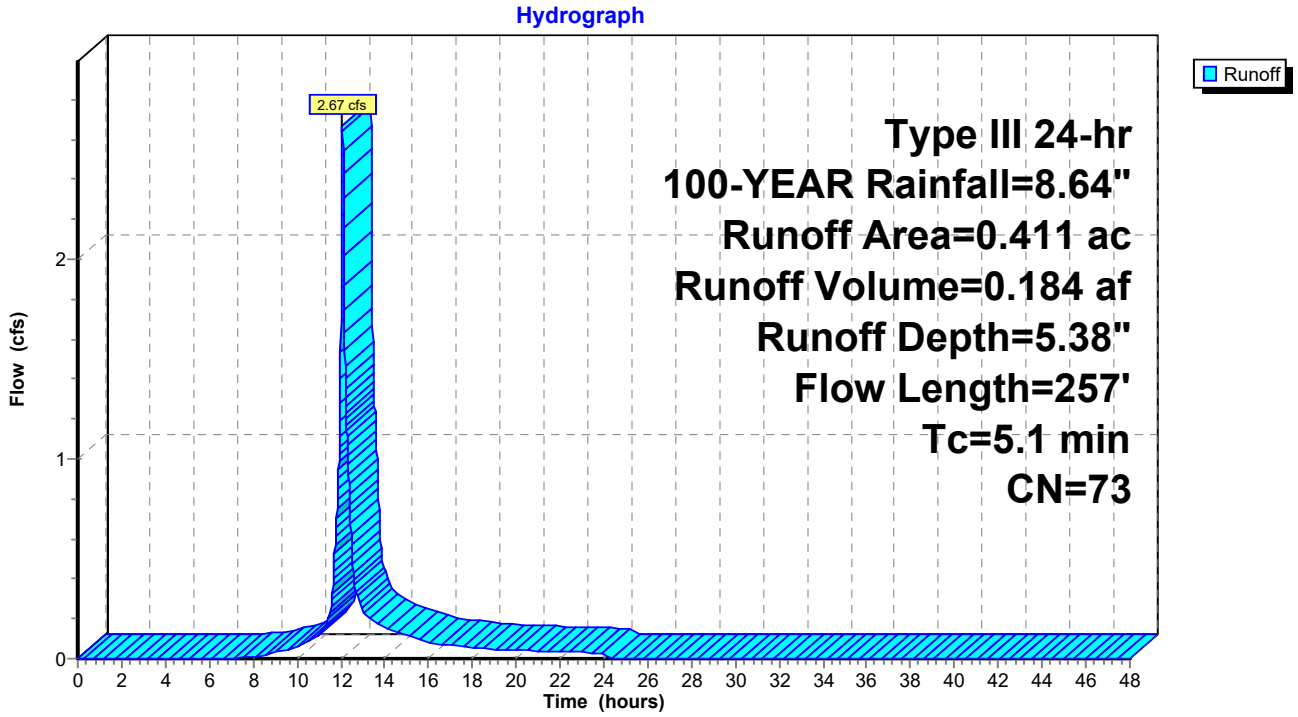
Runoff = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.132	98	Pavement
	0.279	61	>75% Grass cover, Good, HSG B
	0.411	73	Weighted Average
	0.279		67.88% Pervious Area
	0.132		32.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	94	0.2400	0.47		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.42"
1.8	163	0.0185	1.52		**Sheet Flow, Sheet Flow Pavement** Smooth surfaces n= 0.011 P2= 3.42"
5.1	257	Total			

ocatchment SA-5: Ex. driveway, parking, and lawn in southern portion of lot R and runon from up slope



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

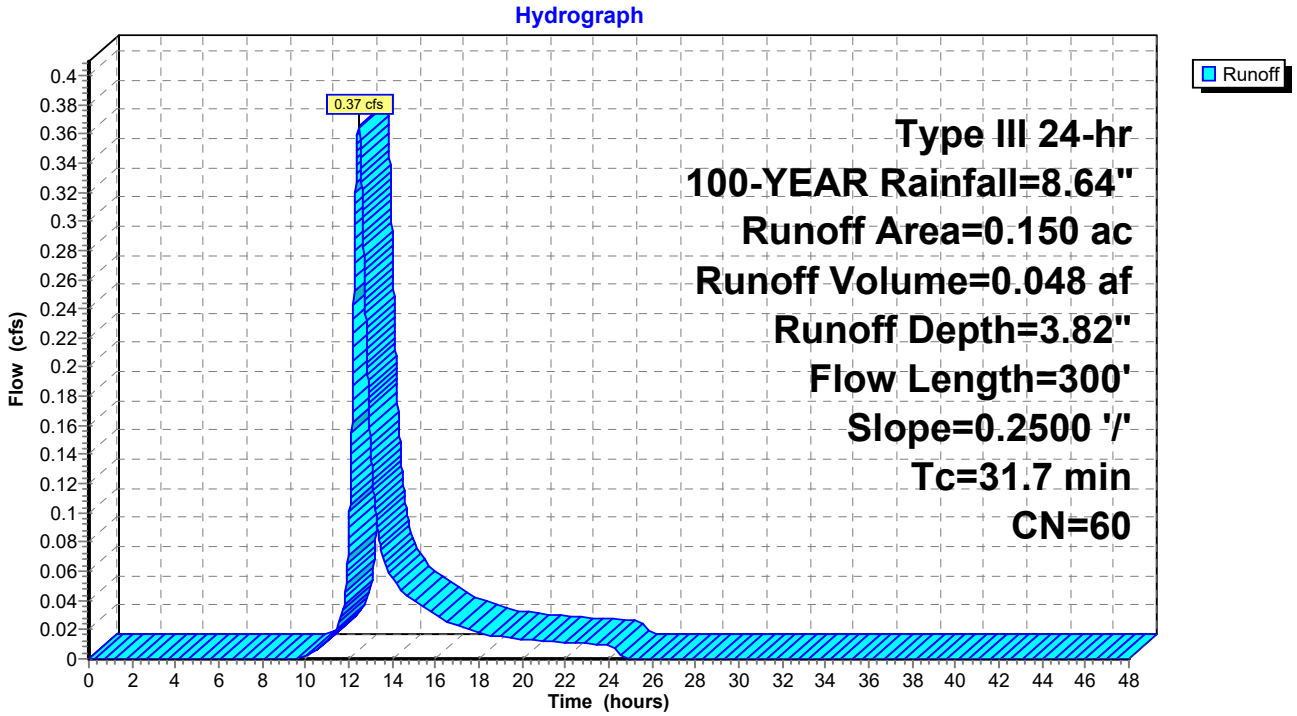
Runoff = 0.37 cfs @ 12.44 hrs, Volume= 0.048 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.150	60	Woods, Fair, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.7	300	0.2500	0.16		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.42"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot, driveways

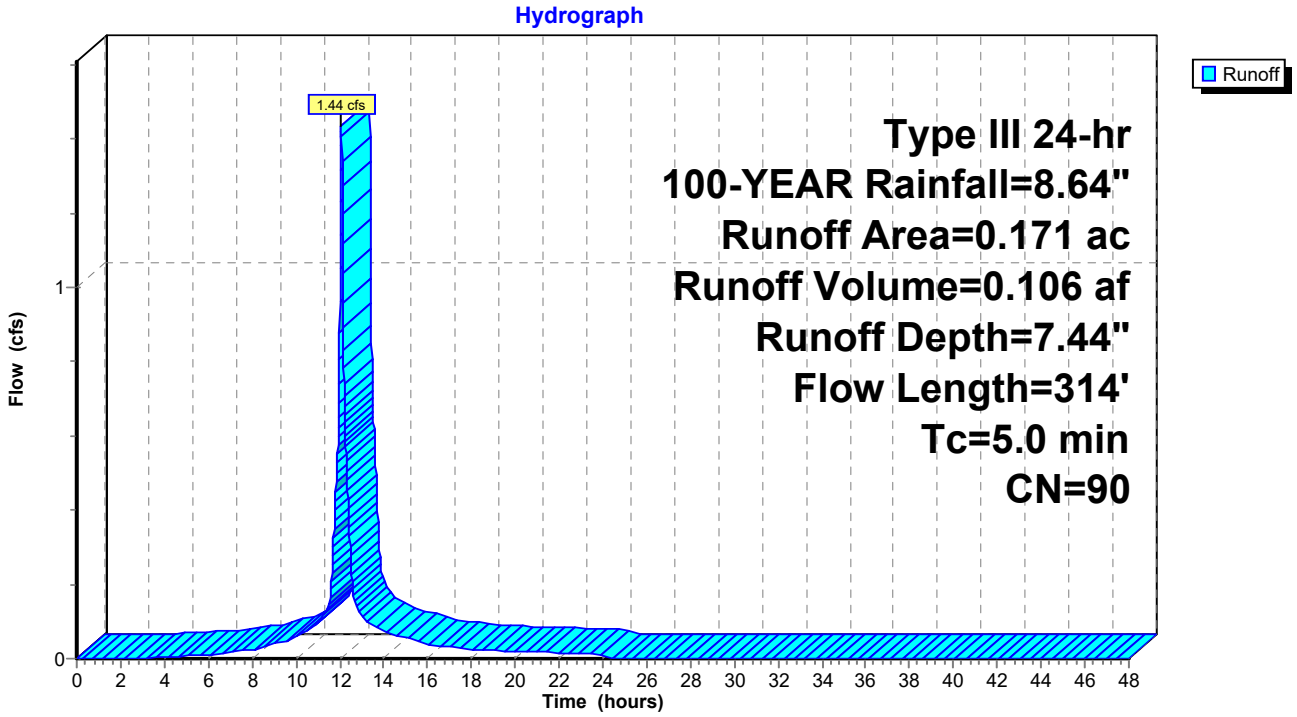
Runoff = 1.44 cfs @ 12.07 hrs, Volume= 0.106 af, Depth= 7.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	300	0.0580	2.71		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot, driveways



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking ais

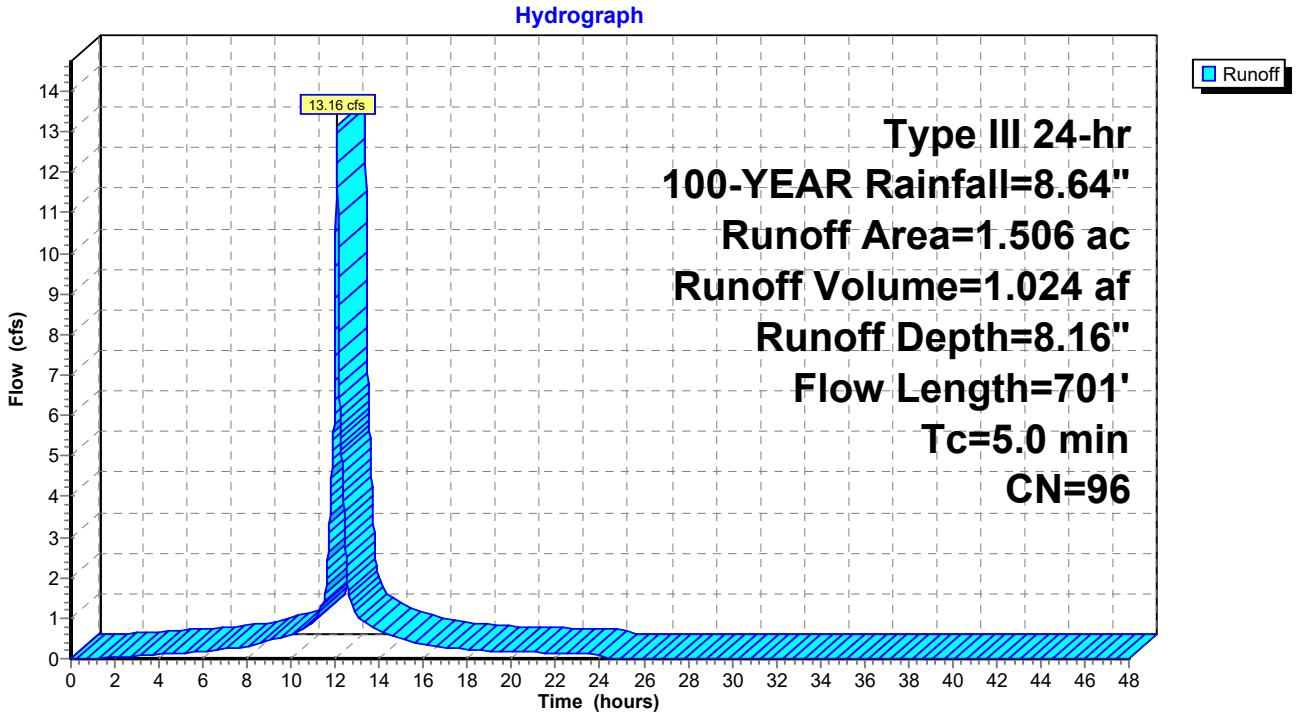
Runoff = 13.16 cfs @ 12.07 hrs, Volume= 1.024 af, Depth= 8.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	1.437	98	
	0.069	61	>75% Grass cover, Good, HSG B
	1.506	96	Weighted Average
	0.069		4.58% Pervious Area
	1.437		95.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways, north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

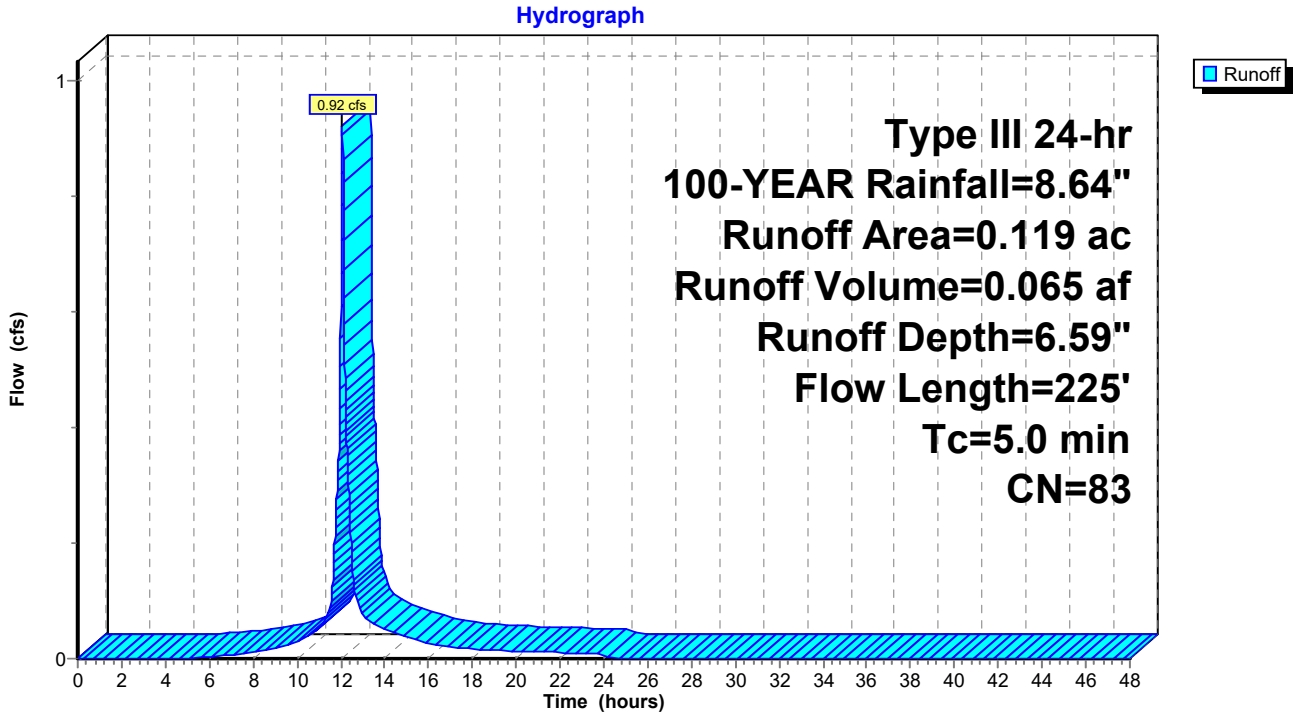
Runoff = 0.92 cfs @ 12.07 hrs, Volume= 0.065 af, Depth= 6.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.071	98	
	0.048	61	>75% Grass cover, Good, HSG B
	0.119	83	Weighted Average
	0.048		40.34% Pervious Area
	0.071		59.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	211	0.0470	2.32		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.6	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

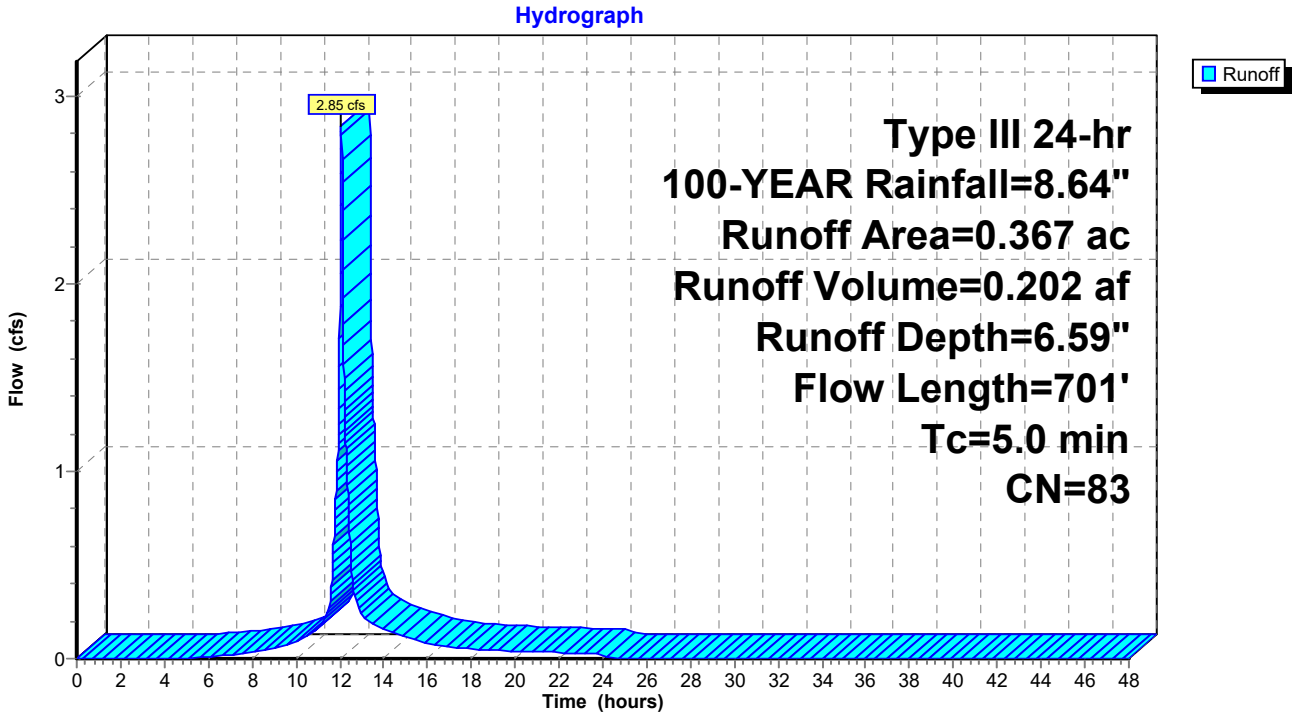
Runoff = 2.85 cfs @ 12.07 hrs, Volume= 0.202 af, Depth= 6.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.214	98	
	0.153	61	>75% Grass cover, Good, HSG B
	0.367	83	Weighted Average
	0.153		41.69% Pervious Area
	0.214		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	300	0.0690	2.91		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.42"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.2	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.

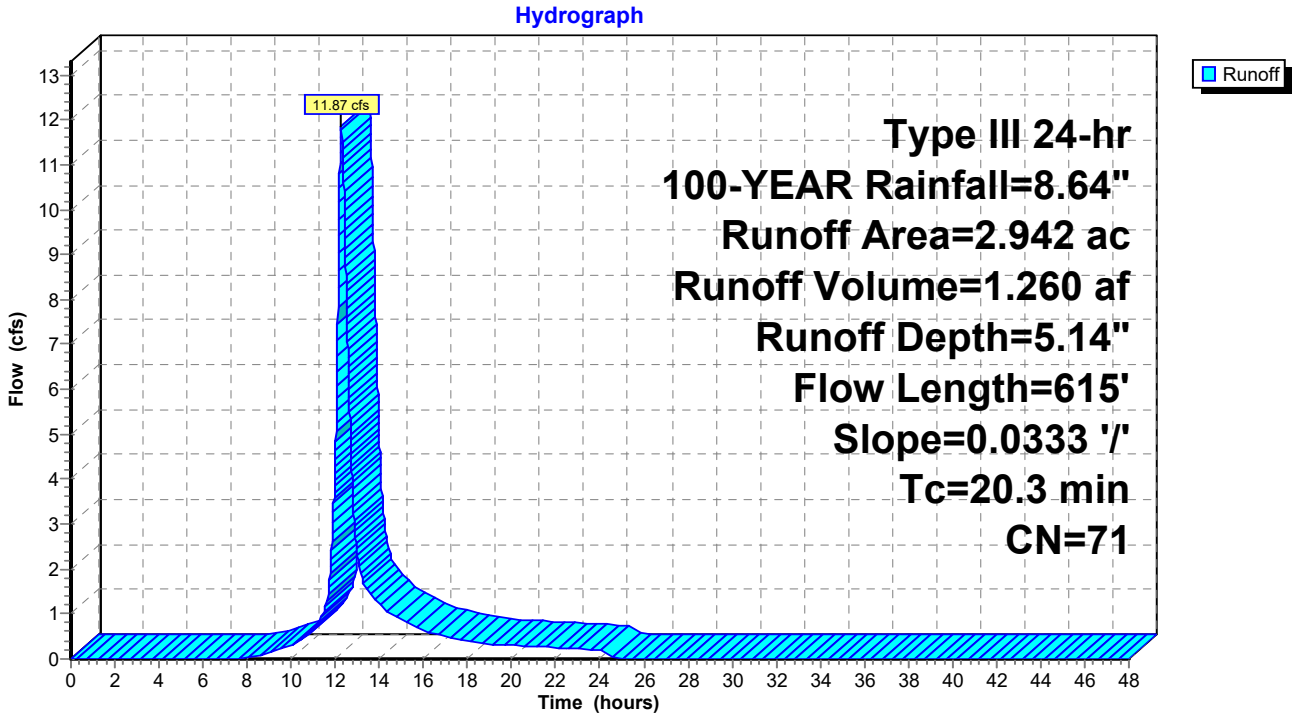
Runoff = 11.87 cfs @ 12.28 hrs, Volume= 1.260 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.801	98	Paved parking, HSG B
	2.141	61	>75% Grass cover, Good, HSG B
	2.942	71	Weighted Average
	2.141		72.77% Pervious Area
	0.801		27.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-1: Ex. lawn and copse between Victory Hall and Hudson Hall.



Summary for Pond 2P: Ex. Pocket Pond

Inflow Area = 2.942 ac, 27.23% Impervious, Inflow Depth = 5.14" for 100-YEAR event
Inflow = 11.87 cfs @ 12.28 hrs, Volume= 1.260 af
Outflow = 9.27 cfs @ 12.44 hrs, Volume= 1.260 af, Atten= 22%, Lag= 9.6 min
Primary = 9.27 cfs @ 12.44 hrs, Volume= 1.260 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 123.50' Surf.Area= 3,562 sf Storage= 1,614 cf
Peak Elev= 125.59' @ 12.44 hrs Surf.Area= 5,235 sf Storage= 7,426 cf (5,812 cf above start)

Plug-Flow detention time= 43.7 min calculated for 1.223 af (97% of inflow)
Center-of-Mass det. time= 19.1 min (851.8 - 832.6)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,156 cf	**additional storage to main bay (Irregular)** Listed below (Recalc)
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,034 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

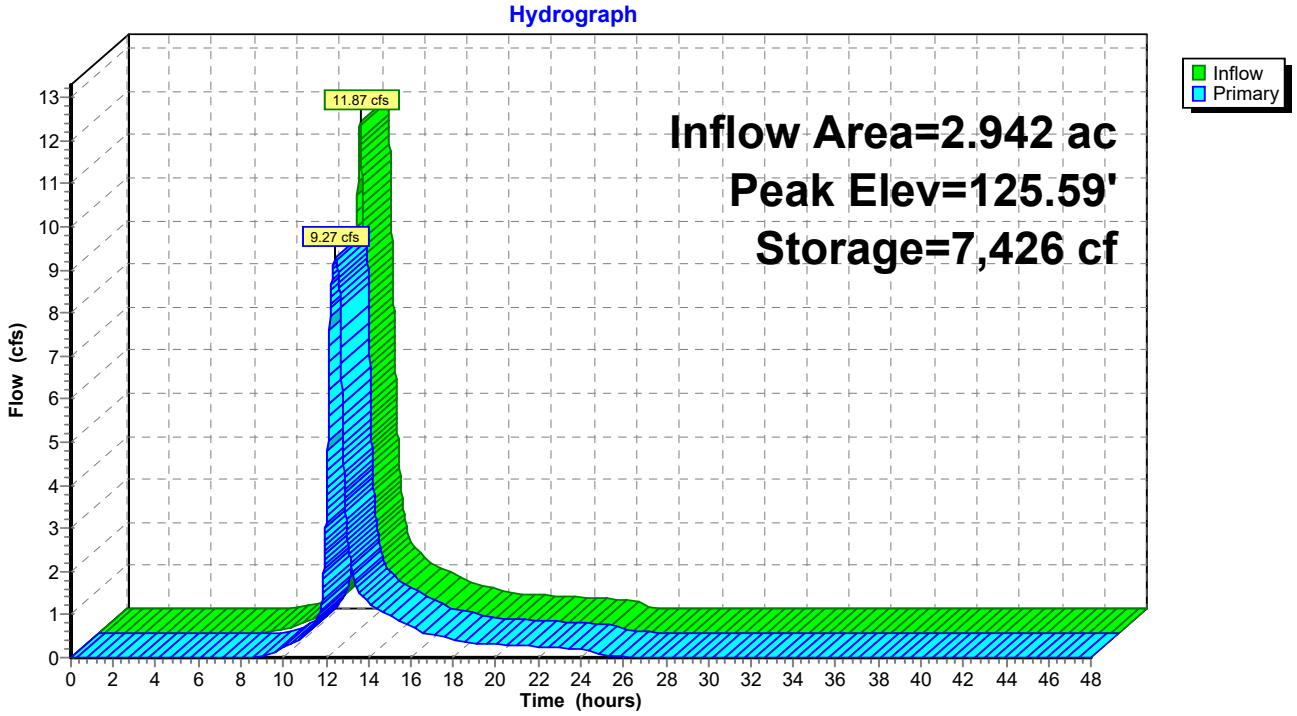
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	110	70.5	0	0	110
126.00	620	103.0	1,156	1,156	652

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=9.27 cfs @ 12.44 hrs HW=125.59' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Inlet Controls 9.27 cfs @ 7.56 fps)
  ├─**1=Orifice/Grate** (Passes < 2.78 cfs potential flow)
  └─**2=Sharp-Crested Vee/Trap Weir** (Passes < 13.38 cfs potential flow)

Pond 2P: Ex. Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

[58] Hint: Peaked 6.91' above defined flood level

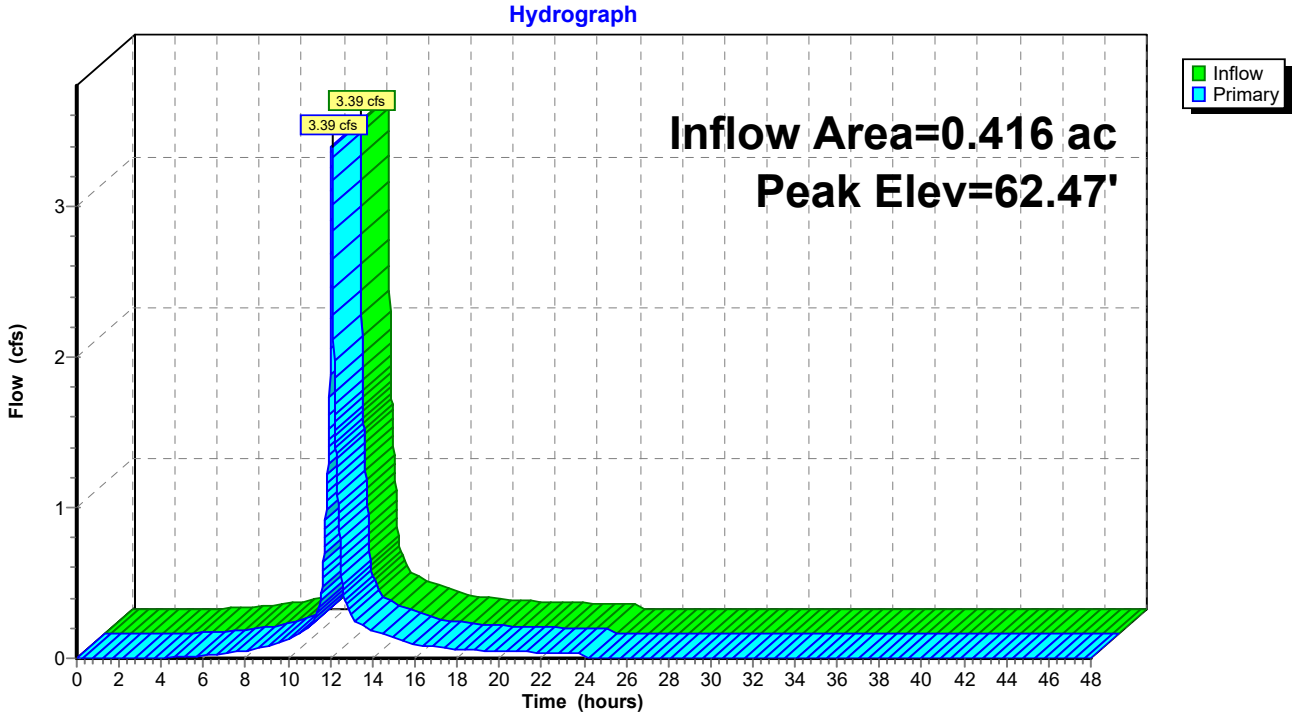
Inflow Area =	0.416 ac, 69.69% Impervious, Inflow Depth = 7.07" for 100-YEAR event				
Inflow =	3.39 cfs @ 12.07 hrs, Volume=	0.245 af			
Outflow =	3.39 cfs @ 12.07 hrs, Volume=	0.245 af, Atten= 0%, Lag= 0.0 min			
Primary =	3.39 cfs @ 12.07 hrs, Volume=	0.245 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 62.47' @ 12.07 hrs
Flood Elev= 55.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.41'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.41' / 52.34' S= 0.0018 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.39 cfs @ 12.07 hrs HW=62.46' TW=55.93' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.39 cfs @ 9.71 fps)
└─**2=Orifice/Grate** (Passes 3.39 cfs of 16.98 cfs potential flow)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-2: Ex-SA-CB-2

[58] Hint: Peaked 0.59' above defined flood level

Inflow Area =	0.881 ac,	62.76% Impervious,	Inflow Depth =	6.75"	for 100-YEAR event
Inflow =	6.95 cfs @	12.07 hrs,	Volume=	0.496 af	
Outflow =	6.94 cfs @	12.07 hrs,	Volume=	0.496 af,	Atten= 0%, Lag= 0.2 min
Primary =	2.47 cfs @	12.07 hrs,	Volume=	0.436 af	
Secondary =	4.48 cfs @	12.07 hrs,	Volume=	0.060 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.93' @ 12.07 hrs Surf.Area= 880 sf Storage= 194 cf
Flood Elev= 55.34' Surf.Area= 3 sf Storage= 10 cf

Plug-Flow detention time= 0.2 min calculated for 0.496 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (788.3 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.13'	262 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

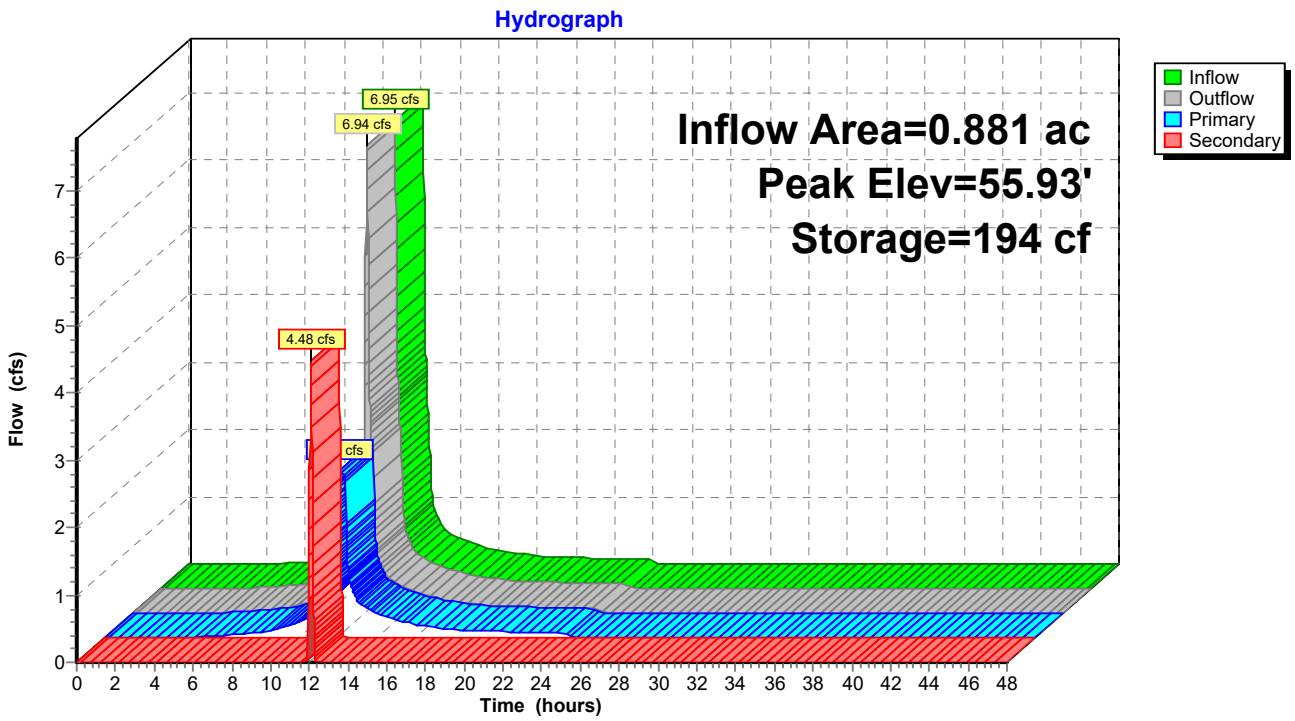
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.13	3	8.0	0	0	3
55.34	3	8.0	10	10	29
56.00	1,085	204.0	252	262	3,336

Device	Routing	Invert	Outlet Devices
#1	Primary	52.14'	**8.0" Round Culvert** L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.14' / 11.61' S= 0.5066 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Secondary	55.84'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=2.47 cfs @ 12.07 hrs HW=55.93' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.47 cfs @ 7.07 fps)

Secondary OutFlow Max=4.46 cfs @ 12.07 hrs HW=55.93' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 4.46 cfs @ 0.98 fps)

Pond Ex-SA-CB-2: Ex-SA-CB-2



Summary for Pond Ex-SA-CB-3: Ex-SA-CB-3

[58] Hint: Peaked 0.21' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=32)

Inflow Area =	0.248 ac, 56.85% Impervious, Inflow Depth = 6.47" for 100-YEAR event				
Inflow =	1.90 cfs @	12.07 hrs,	Volume=	0.134 af	
Outflow =	1.79 cfs @	12.10 hrs,	Volume=	0.133 af,	Atten= 5%, Lag= 1.5 min
Primary =	1.79 cfs @	12.10 hrs,	Volume=	0.133 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 56.29' @ 12.10 hrs Surf.Area= 224 sf Storage= 30 cf
Flood Elev= 56.08' Surf.Area= 4 sf Storage= 12 cf

Plug-Flow detention time= 2.3 min calculated for 0.133 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (795.4 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1	52.62'	1,126 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

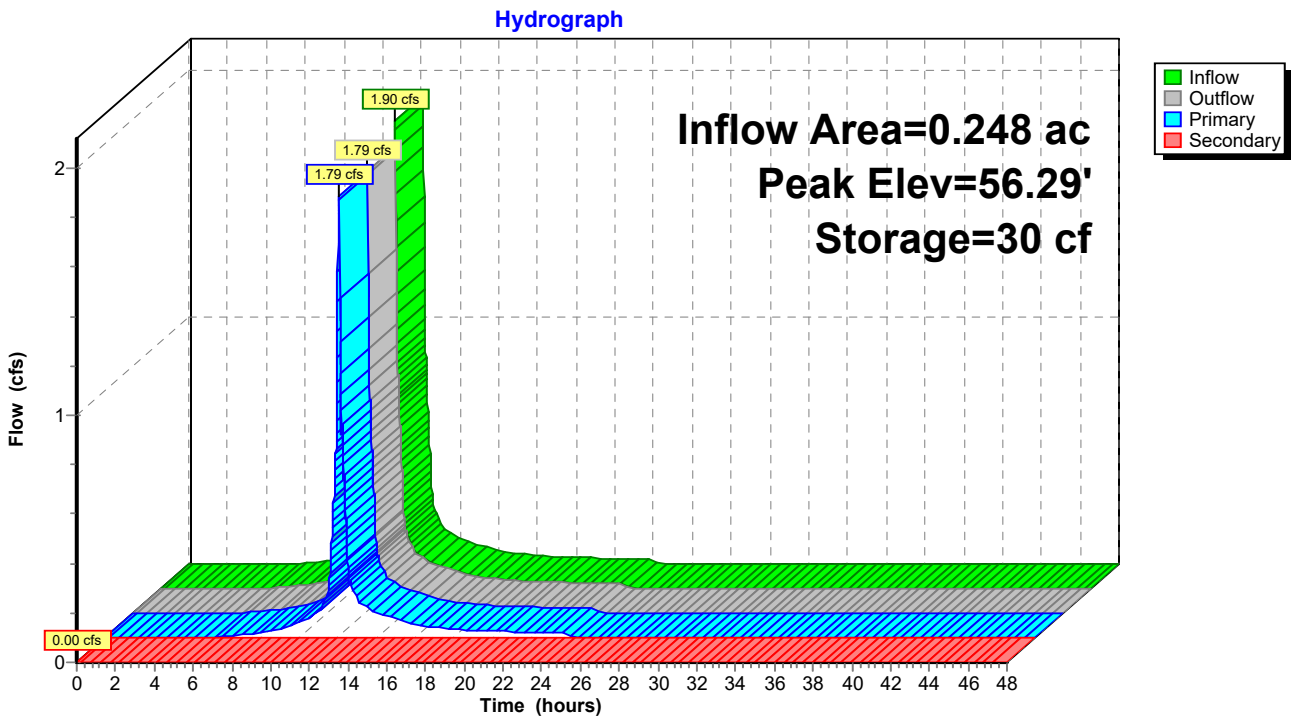
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.62	3	8.0	0	0	3
56.08	4	8.0	12	12	31
57.00	3,511	272.0	1,114	1,126	5,914

Device	Routing	Invert	Outlet Devices
#1	Device 2	54.13'	**8.0" Round CB to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 54.13' / 53.53' S= 0.1200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Primary	52.63'	**8.0" Round MH to Slope** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.63' / 27.23' S= 0.7257 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.58'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	56.08'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.79 cfs @ 12.10 hrs HW=56.29' TW=0.00' (Dynamic Tailwater)
└─**2=MH to Slope** (Passes 1.79 cfs of 2.42 cfs potential flow)
  └─**1=CB to MH** (Inlet Controls 1.79 cfs @ 5.13 fps)
    └─**4=Orifice/Grate** (Passes 1.79 cfs of 3.03 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.62' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-3: Ex-SA-CB-3



Summary for Pond Ex-SA-CB-4: Ex-SA-CB-4

[58] Hint: Peaked 0.49' above defined flood level
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=88)

Inflow Area =	0.350 ac, 56.57% Impervious, Inflow Depth = 6.47" for 100-YEAR event				
Inflow =	2.68 cfs @	12.07 hrs,	Volume=	0.189 af	
Outflow =	2.39 cfs @	12.11 hrs,	Volume=	0.188 af,	Atten= 11%, Lag= 2.3 min
Primary =	2.39 cfs @	12.11 hrs,	Volume=	0.188 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 55.84' @ 12.11 hrs Surf.Area= 342 sf Storage= 99 cf
Flood Elev= 55.35' Surf.Area= 3 sf Storage= 38 cf

Plug-Flow detention time= 4.9 min calculated for 0.188 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (796.5 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.85'	5,622 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

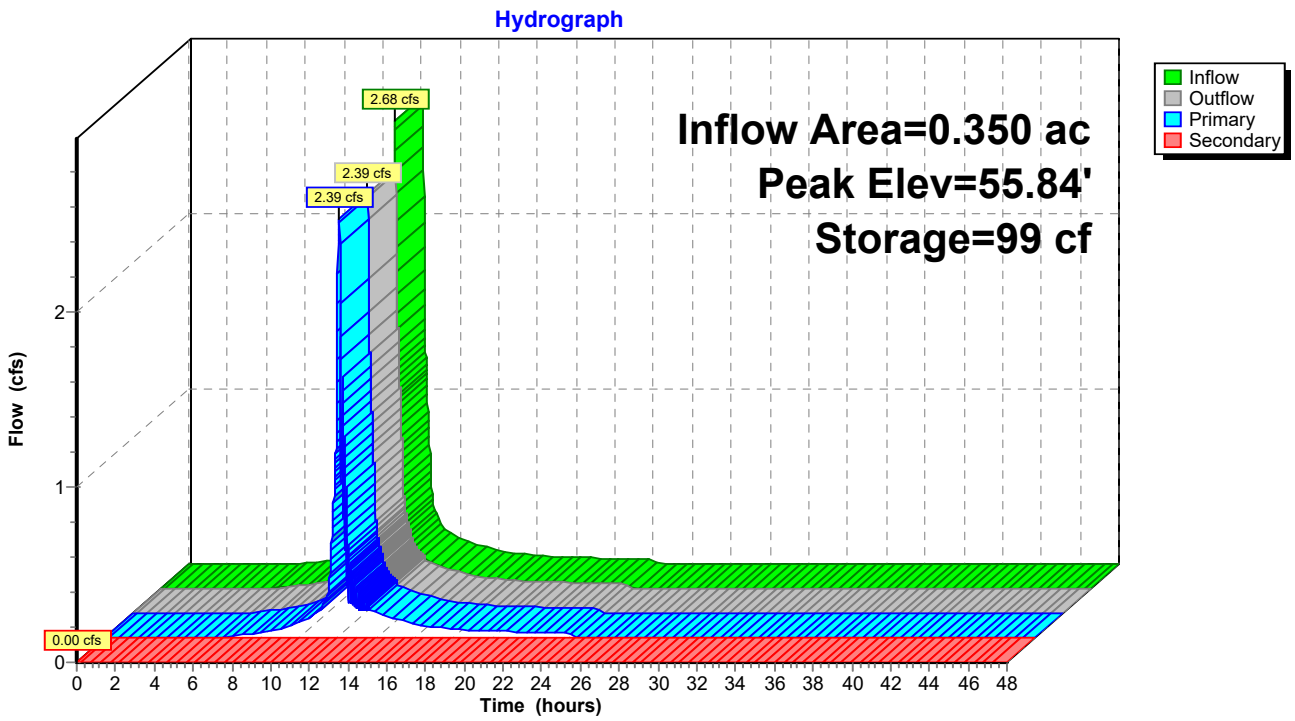
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.85	3	8.0	0	0	3
55.35	3	8.0	38	38	103
56.00	579	167.0	135	173	2,318
58.00	5,767	334.0	5,449	5,622	8,995

Device	Routing	Invert	Outlet Devices
#1	Device 2	52.25'	**8.0" Round Culvert to MH** L= 5.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.25' / 49.76' S= 0.4980 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.35 sf
#2	Primary	42.86'	**8.0" Round Culvert** L= 59.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.86' / 13.62' S= 0.4956 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#3	Secondary	56.00'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Device 1	55.35'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.39 cfs @ 12.11 hrs HW=55.84' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.39 cfs of 4.72 cfs potential flow)
  └─**1=Culvert to MH** (Inlet Controls 2.39 cfs @ 6.86 fps)
    └─**4=Orifice/Grate** (Passes 2.39 cfs of 4.64 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.85' TW=0.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-4: Ex-SA-CB-4



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 5.38" for 100-YEAR event
Inflow = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af
Outflow = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
Primary = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 43.52' @ 12.08 hrs Surf.Area= 3 sf Storage= 2 cf
Flood Elev= 55.24' Surf.Area= 4 sf Storage= 44 cf

Plug-Flow detention time= 0.2 min calculated for 0.184 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (814.5 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.73'	548 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

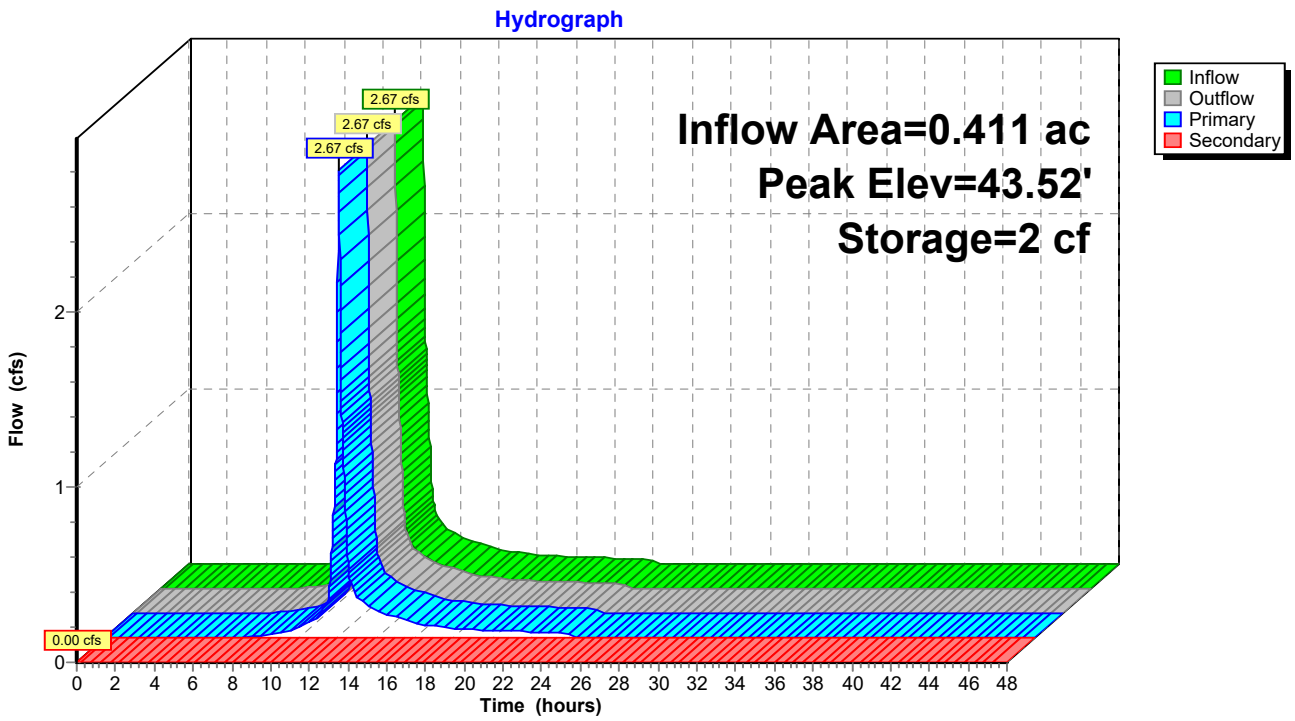
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.73	3	8.0	0	0	3
55.24	4	8.0	44	44	103
56.00	1,901	371.0	505	548	11,052

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**24.0" Round Culvert** L= 85.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2850 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Secondary	55.74'	**50.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Primary OutFlow Max=2.66 cfs @ 12.08 hrs HW=43.52' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.66 cfs @ 2.37 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.73' TW=0.00' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

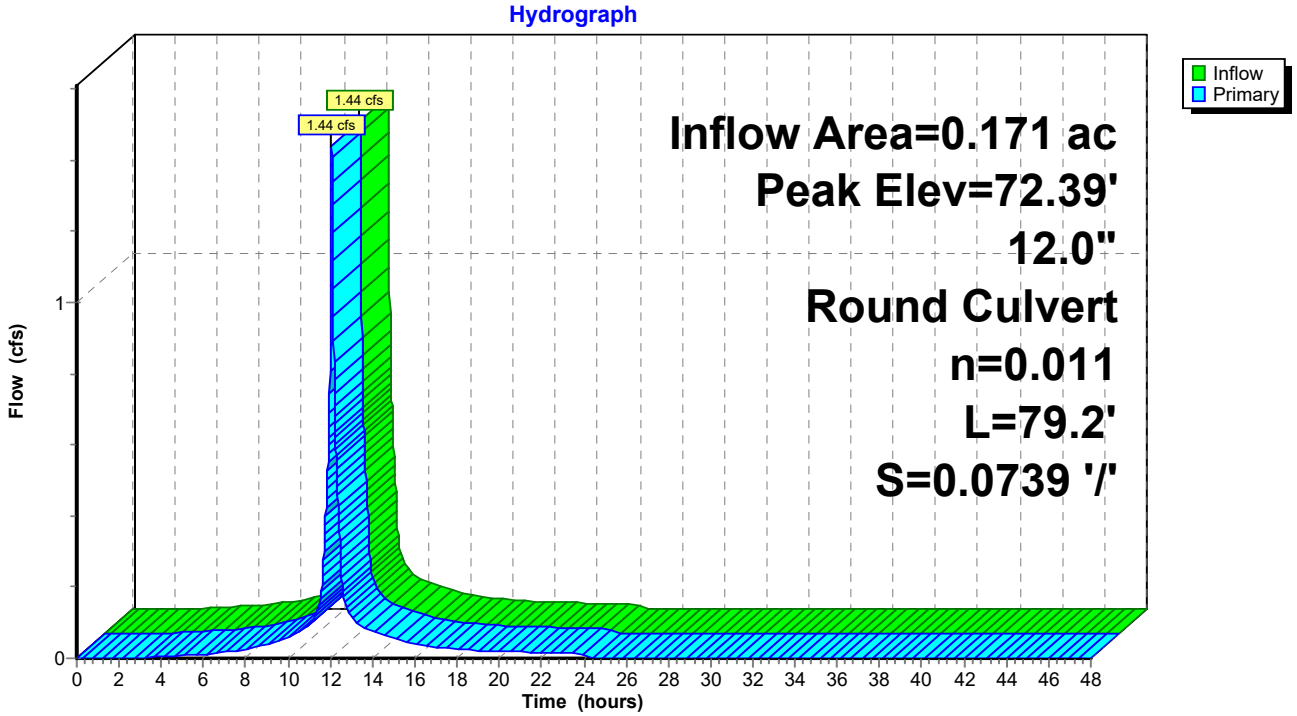
Inflow Area = 0.171 ac, 79.53% Impervious, Inflow Depth = 7.44" for 100-YEAR event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 0.106 af
Outflow = 1.44 cfs @ 12.07 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min
Primary = 1.44 cfs @ 12.07 hrs, Volume= 0.106 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 72.39' @ 12.07 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.44 cfs @ 12.07 hrs HW=72.39' TW=69.06' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.44 cfs @ 2.31 fps)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond Ex-SB-CB-2: Ex-SB-CB-2

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 7.75" for 100-YEAR event
Inflow = 18.36 cfs @ 12.07 hrs, Volume= 1.397 af
Outflow = 18.36 cfs @ 12.07 hrs, Volume= 1.397 af, Atten= 0%, Lag= 0.0 min
Primary = 18.36 cfs @ 12.07 hrs, Volume= 1.397 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 69.06' @ 12.07 hrs Surf.Area= 3 sf Storage= 10 cf
Flood Elev= 72.00' Surf.Area= 3 sf Storage= 19 cf

Plug-Flow detention time= 0.2 min calculated for 1.397 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (759.9 - 759.9)

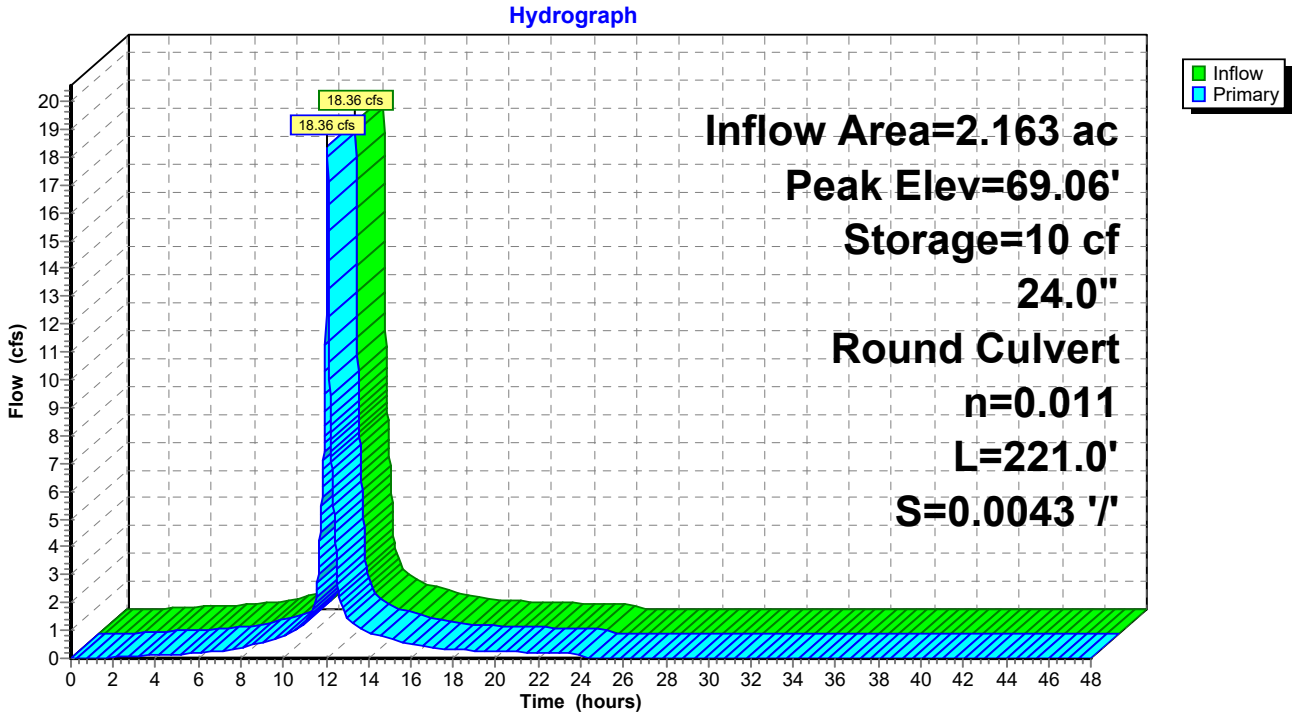
Volume	Invert	Avail.Storage	Storage Description
#1	65.69'	444 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
65.69	3	8.0	0	0	3
72.00	3	8.0	19	19	53
72.50	258	63.0	48	67	365
73.00	1,400	258.0	376	444	5,347

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 221.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 64.76' S= 0.0043 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=18.35 cfs @ 12.07 hrs HW=69.06' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.35 cfs @ 5.84 fps)

Pond Ex-SB-CB-2: Ex-SB-CB-2



Summary for Pond Ex-SB-CB-3: Ex-SB-CB-3

Inflow Area = 0.486 ac, 58.64% Impervious, Inflow Depth = 6.58" for 100-YEAR event
Inflow = 3.77 cfs @ 12.07 hrs, Volume= 0.267 af
Outflow = 3.77 cfs @ 12.07 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min
Primary = 3.77 cfs @ 12.07 hrs, Volume= 0.267 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 71.35' @ 12.07 hrs Surf.Area= 3 sf Storage= 6 cf
Flood Elev= 73.41' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 0.1 min calculated for 0.267 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (792.6 - 792.5)

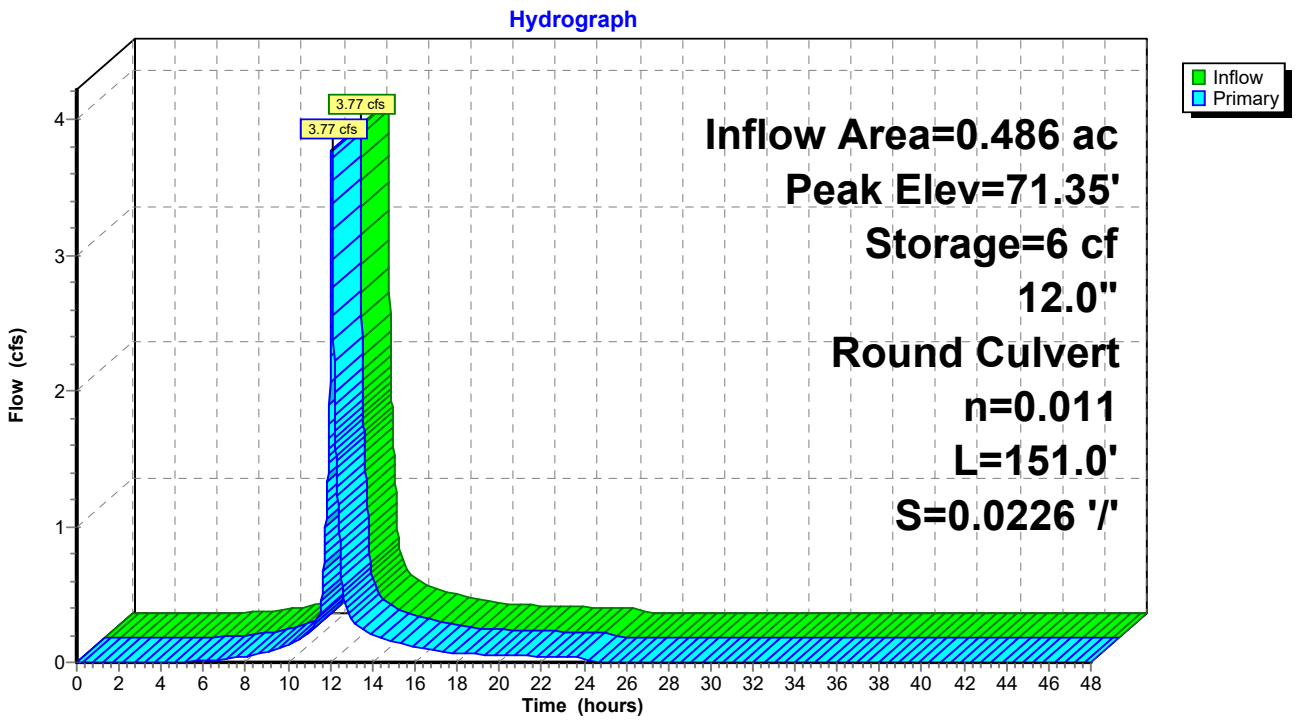
Volume	Invert	Avail.Storage	Storage Description
#1	69.25'	999 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.25	3	8.0	0	0	3
73.41	3	8.0	12	12	36
74.00	161	54.0	37	49	264
75.00	440	91.0	289	338	697
76.00	911	126.0	661	999	1,311

Device	Routing	Invert	Outlet Devices
#1	Primary	69.26'	**12.0" Round Culvert** L= 151.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 69.26' / 65.85' S= 0.0226 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.76 cfs @ 12.07 hrs HW=71.35' TW=69.05' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.76 cfs @ 4.79 fps)

Pond Ex-SB-CB-3: Ex-SB-CB-3



Summary for Pond Ex-SB-CB-4: Ex-SB-CB-4

[58] Hint: Peaked 0.18' above defined flood level

Inflow Area = 0.367 ac, 58.31% Impervious, Inflow Depth = 6.59" for 100-YEAR event
Inflow = 2.85 cfs @ 12.07 hrs, Volume= 0.202 af
Outflow = 2.85 cfs @ 12.07 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.0 min
Primary = 2.85 cfs @ 12.07 hrs, Volume= 0.201 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 79.74' @ 12.07 hrs Surf.Area= 14 sf Storage= 14 cf
Flood Elev= 79.56' Surf.Area= 3 sf Storage= 12 cf

Plug-Flow detention time= 1.6 min calculated for 0.201 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (792.7 - 792.0)

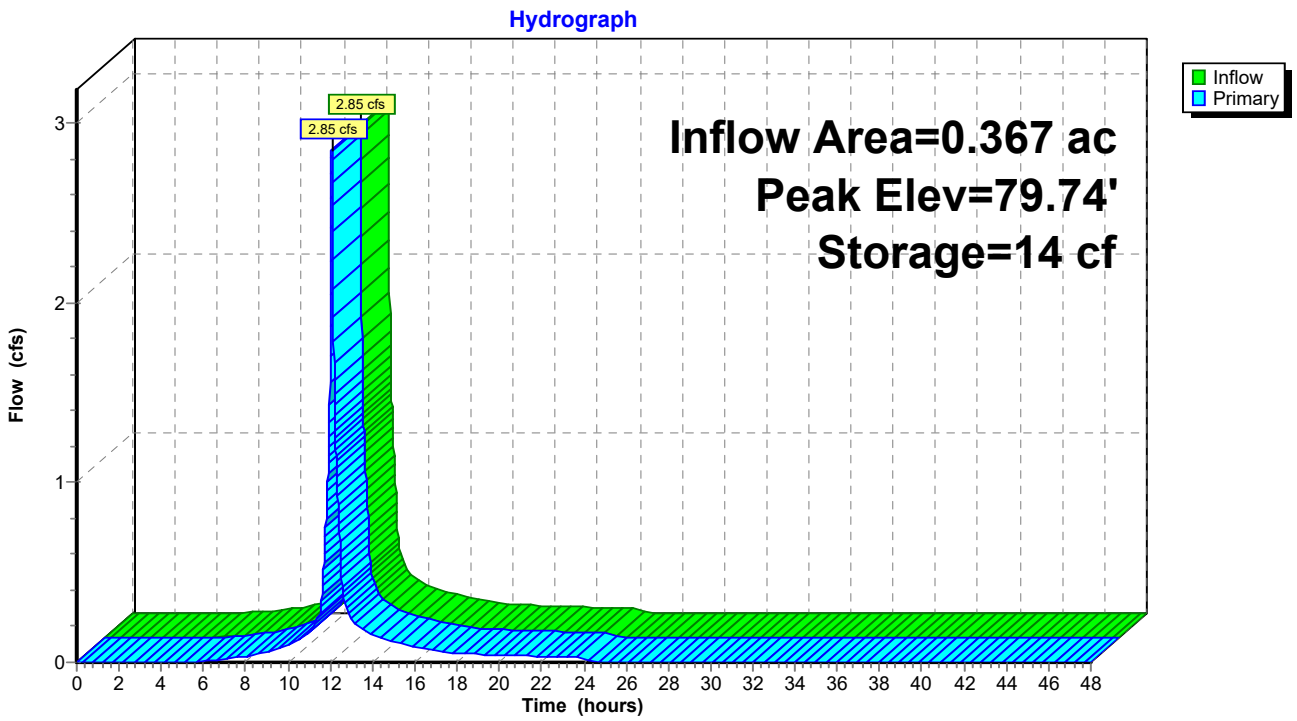
Volume	Invert	Avail.Storage	Storage Description
#1	75.45'	716 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.45	3	8.0	0	0	3
79.56	3	8.0	12	12	36
81.00	306	83.0	163	175	583
82.00	816	135.0	541	716	1,492

Device	Routing	Invert	Outlet Devices
#1	Primary	75.46'	**12.0" Round Culvert** L= 121.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.46' / 69.31' S= 0.0506 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	79.56'	**0.9" x 6.9" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.84 cfs @ 12.07 hrs HW=79.74' TW=71.35' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.84 cfs of 5.81 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 2.84 cfs @ 2.06 fps)

Pond Ex-SB-CB-4: Ex-SB-CB-4

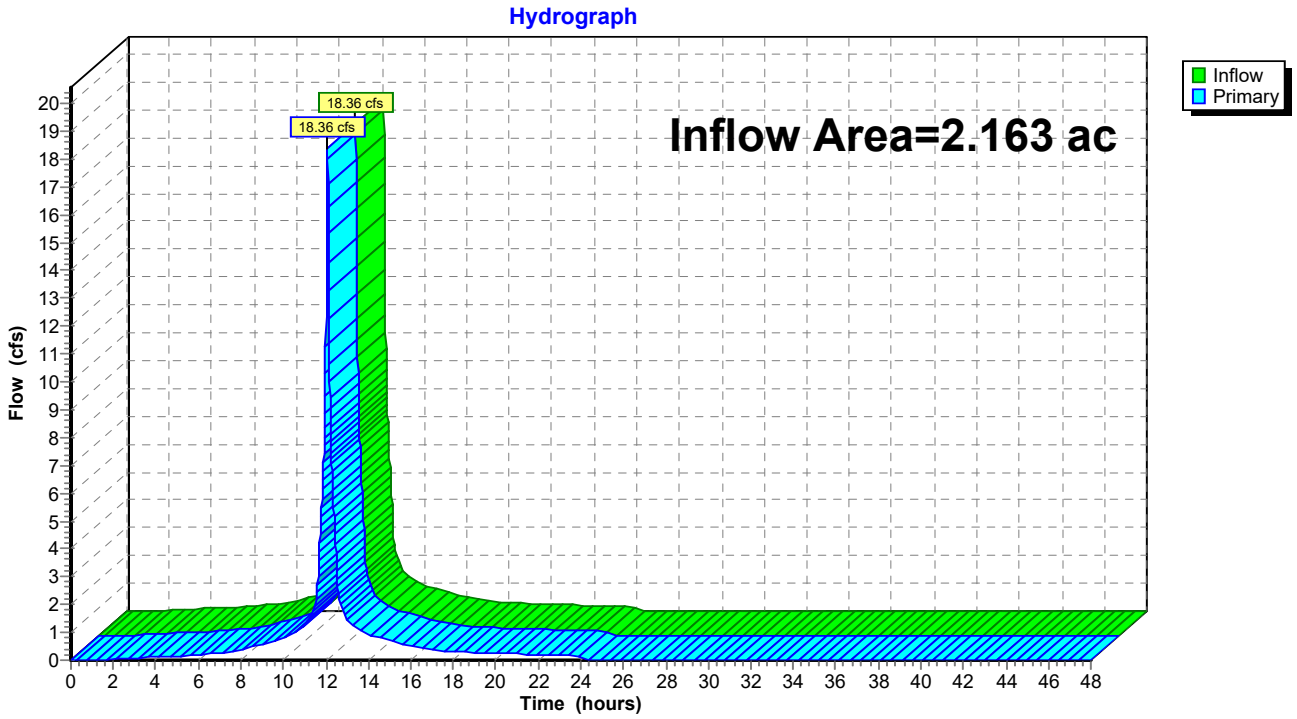


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 85.90% Impervious, Inflow Depth = 7.75" for 100-YEAR event
Inflow = 18.36 cfs @ 12.07 hrs, Volume= 1.397 af
Primary = 18.36 cfs @ 12.07 hrs, Volume= 1.397 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

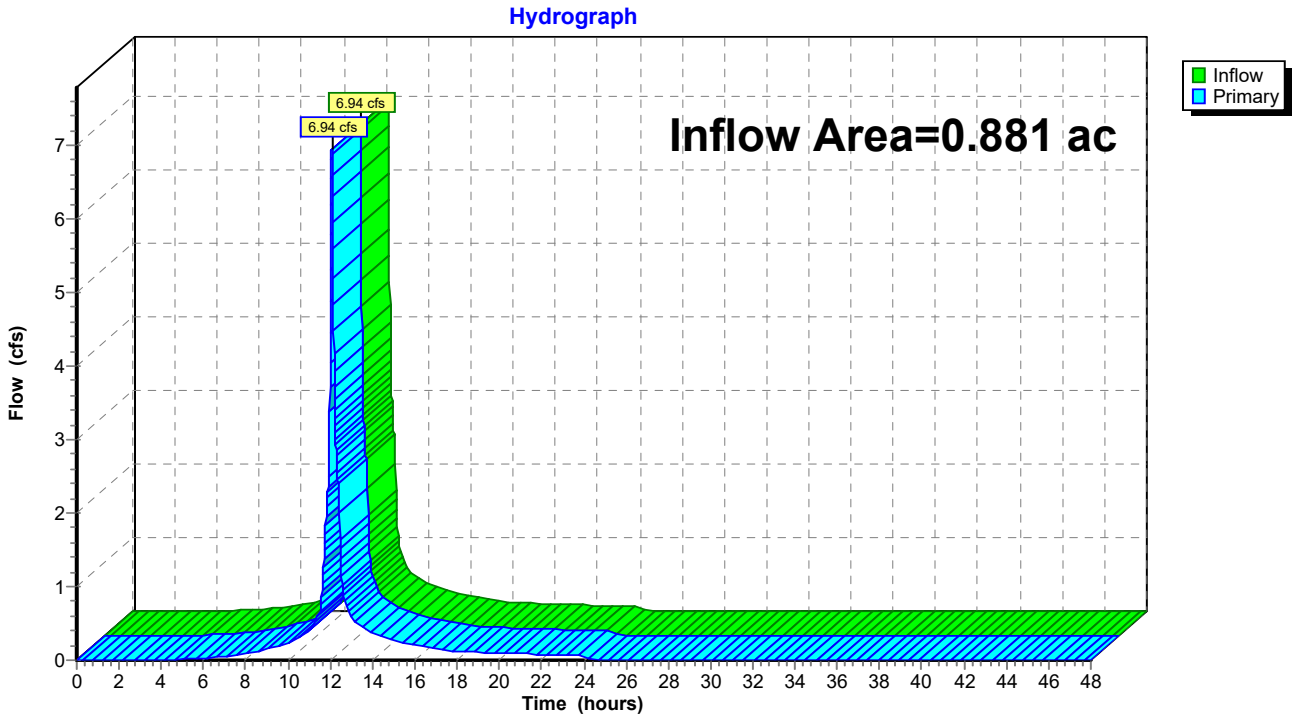


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 0.881 ac, 62.76% Impervious, Inflow Depth = 6.75" for 100-YEAR event
Inflow = 6.94 cfs @ 12.07 hrs, Volume= 0.496 af
Primary = 6.94 cfs @ 12.07 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

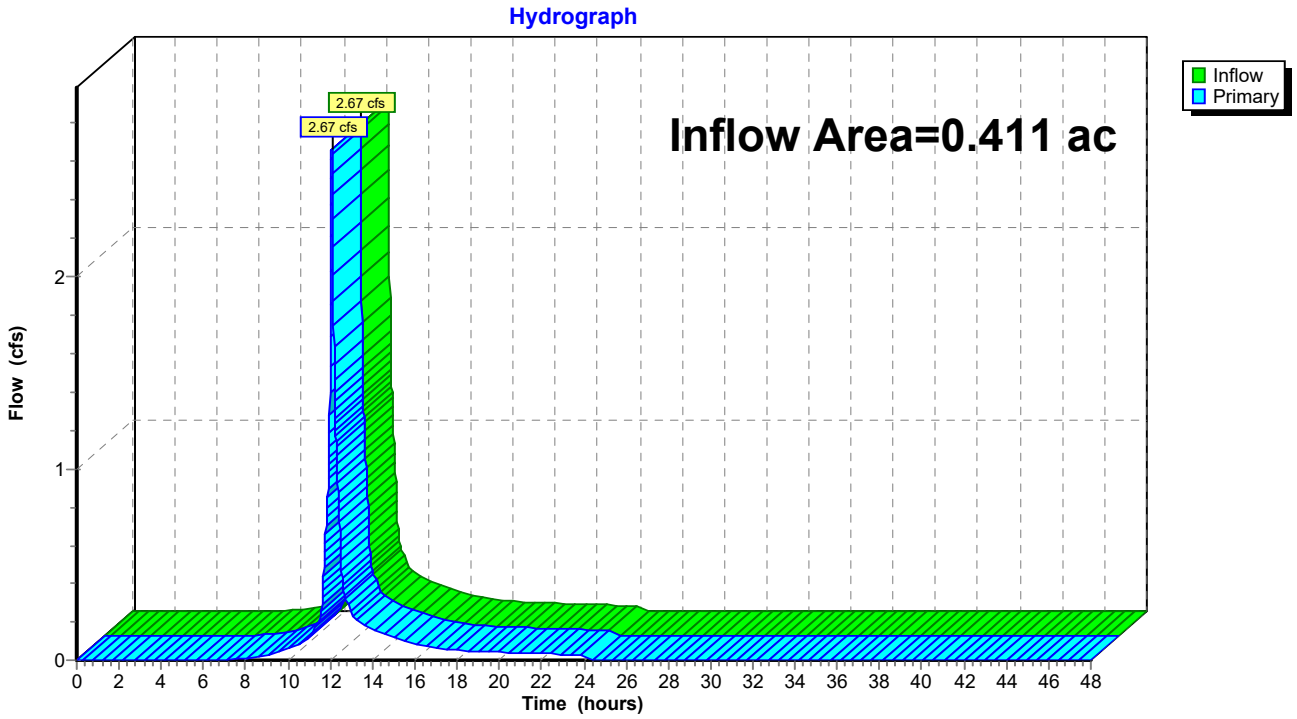


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.411 ac, 32.12% Impervious, Inflow Depth = 5.38" for 100-YEAR event
Inflow = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af
Primary = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

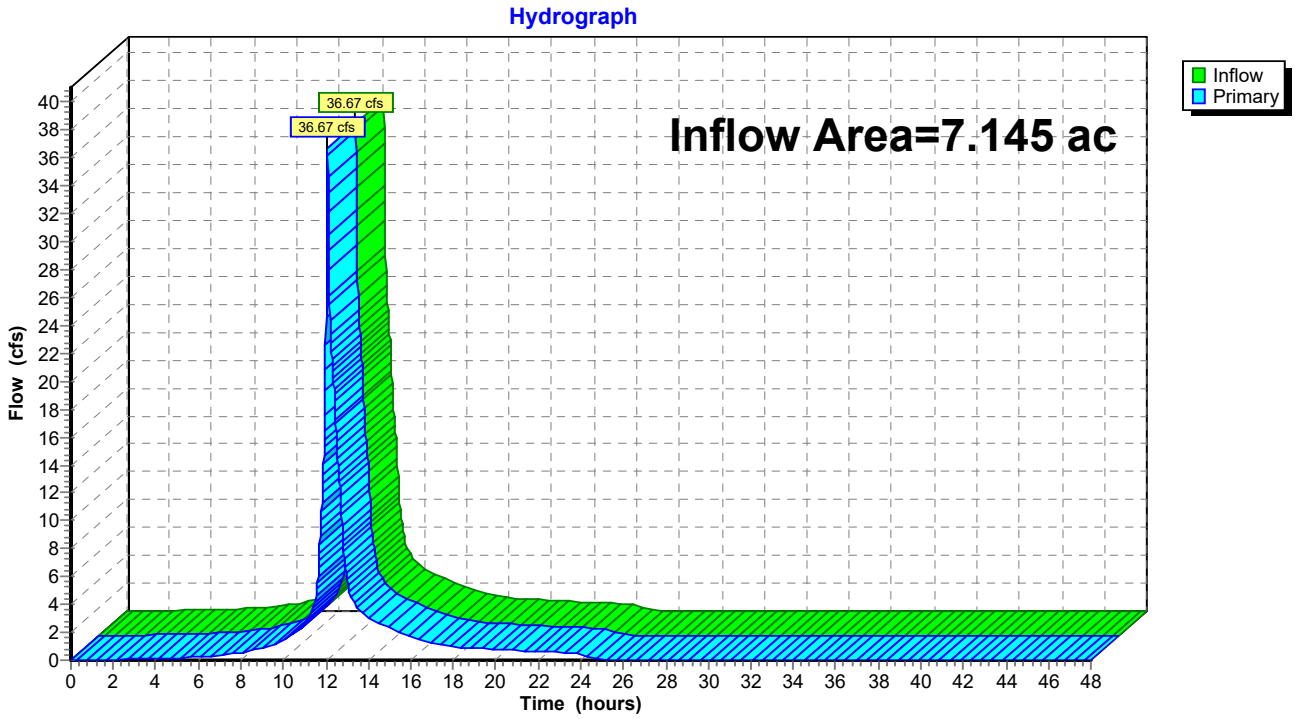


Summary for Link Hudson: Hudson River

Inflow Area = 7.145 ac, 51.55% Impervious, Inflow Depth = 6.22" for 100-YEAR event
Inflow = 36.67 cfs @ 12.08 hrs, Volume= 3.706 af
Primary = 36.67 cfs @ 12.08 hrs, Volume= 3.706 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

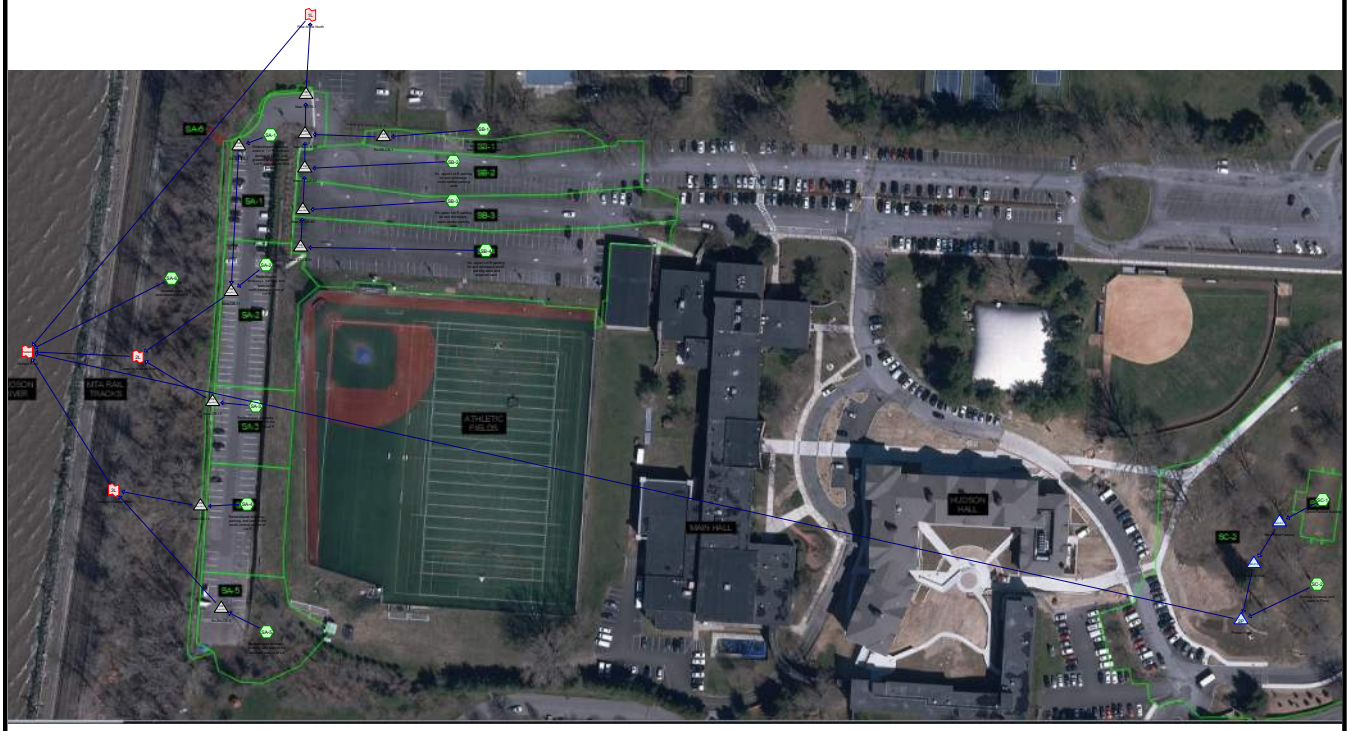
Link Hudson: Hudson River



APPENDIX D
POST-DEVELOPMENT HYDROLOGY

Post-Development Drainage Shed Plan

Post-Development Hydrologic Analysis



Subcat Reach Pond Link

Routing Diagram for 21013.00_Proposed
Prepared by Foit-Albert Associates, Printed 6/17/2022
HydroCAD® 10.00-26 s/n 06347 © 2020 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "Proposed Grove Pavilion.hcp"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.862	98	(SB-1, SB-2, SB-3, SB-4)
0.032	39	>75% Grass cover, Good, HSG A (SB-3)
3.193	61	>75% Grass cover, Good, HSG B (SA-1, SA-2, SA-3, SA-4, SA-5, SB-1, SB-4, SC-2)
0.104	98	New walking paths (SC-2)
1.700	98	Paved parking, HSG B (SA-1, SA-2, SA-3, SA-4, SA-5, SC-2)
0.099	98	Roofs, HSG A (SC-1)
0.153	60	Woods, Fair, HSG B (SA-6)
7.143	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.131	HSG A	SB-3, SC-1
5.046	HSG B	SA-1, SA-2, SA-3, SA-4, SA-5, SA-6, SB-1, SB-4, SC-2
0.000	HSG C	
0.000	HSG D	
1.966	Other	SB-1, SB-2, SB-3, SB-4, SC-2
7.143		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.862	1.862		SB-1, SB-2, SB-3, SB-4
0.032	3.193	0.000	0.000	0.000	3.225	>75% Grass cover, Good	SA-1, SA-2, SA-3, SA-4, SA-5, SB-1, SB-3, SB-4, SC-2
0.000	0.000	0.000	0.000	0.104	0.104	New walking paths	SC-2
0.000	1.700	0.000	0.000	0.000	1.700	Paved parking	SA-1, SA-2, SA-3, SA-4, SA-5, SC-2
0.099	0.000	0.000	0.000	0.000	0.099	Roofs	SC-1
0.000	0.153	0.000	0.000	0.000	0.153	Woods, Fair	SA-6
0.131	**5.046**	**0.000**	**0.000**	**1.966**	**7.143**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	122.50	120.00	93.0	0.0269	0.012	15.0	0.0	0.0
2	Ex-SA-CB-1	52.40	52.30	51.0	0.0020	0.013	18.0	0.0	0.0
3	Ex-SA-CB-5	42.74	18.46	86.0	0.2823	0.013	18.0	0.0	0.0
4	Ex-SB-CB-1	71.65	65.80	79.2	0.0739	0.011	12.0	0.0	0.0
5	New CB-1	68.55	67.92	29.0	0.0217	0.013	18.0	0.0	0.0
6	New CB-2	68.55	67.92	29.0	0.0217	0.013	18.0	0.0	0.0
7	New CB-3	67.92	66.20	85.0	0.0202	0.013	18.0	0.0	0.0
8	New CB-6	65.70	65.24	113.0	0.0041	0.013	24.0	0.0	0.0
9	New SWTS	65.24	57.38	300.0	0.0262	0.025	18.0	0.0	0.0
10	New-CB-11	52.18	52.13	8.0	0.0062	0.013	8.0	0.0	0.0
11	New-CB-12	51.00	50.63	10.0	0.0370	0.013	8.0	0.0	0.0
12	New-CB-13	46.89	42.86	7.0	0.5757	0.013	8.0	0.0	0.0
13	SC-P-1	127.33	127.25	2.0	0.0400	0.013	12.0	0.0	0.0
14	SC-P-2	127.33	122.50	116.0	0.0416	0.013	12.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Redeveloped Runoff Area=0.409 ac 70.17% Impervious Runoff Depth=1.67"
Flow Length=227' Slope=0.1500 '/' Tc=7.0 min CN=87 Runoff=0.77 cfs 0.057 af

SubcatchmentSA-2: Redeveloped Runoff Area=0.467 ac 56.75% Impervious Runoff Depth=1.32"
Flow Length=171' Slope=0.0500 '/' Tc=8.2 min CN=82 Runoff=0.66 cfs 0.051 af

SubcatchmentSA-3: Redeveloped Runoff Area=0.249 ac 56.63% Impervious Runoff Depth=1.32"
Flow Length=135' Slope=0.0500 '/' Tc=7.7 min CN=82 Runoff=0.36 cfs 0.027 af

SubcatchmentSA-4: Redeveloped Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=1.32"
Flow Length=158' Slope=0.0500 '/' Tc=8.0 min CN=82 Runoff=0.50 cfs 0.038 af

SubcatchmentSA-5: Redeveloped Runoff Area=0.411 ac 31.63% Impervious Runoff Depth=0.81"
Flow Length=223' Slope=0.0500 '/' Tc=5.3 min CN=73 Runoff=0.36 cfs 0.028 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.153 ac 0.00% Impervious Runoff Depth=0.31"
Flow Length=300' Slope=0.2500 '/' Tc=34.7 min CN=60 Runoff=0.02 cfs 0.004 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=1.91"
Flow Length=314' Tc=5.0 min CN=90 Runoff=0.39 cfs 0.027 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=0.567 ac 100.00% Impervious Runoff Depth=2.69"
Flow Length=701' Tc=5.0 min CN=98 Runoff=1.66 cfs 0.127 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.517 ac 93.81% Impervious Runoff Depth=2.27"
Flow Length=225' Tc=5.0 min CN=94 Runoff=1.38 cfs 0.098 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.908 ac 74.23% Impervious Runoff Depth=1.75"
Flow Length=701' Tc=5.0 min CN=88 Runoff=1.93 cfs 0.132 af

SubcatchmentSC-1: Grove Pavilion Runoff Area=4,312 sf 100.00% Impervious Runoff Depth=2.69"
Tc=5.0 min CN=98 Runoff=0.29 cfs 0.022 af

SubcatchmentSC-2: Existing Driveway Runoff Area=2.842 ac 27.55% Impervious Runoff Depth=0.71"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=1.39 cfs 0.169 af

Pond 2P: Pocket Pond Peak Elev=124.10' Storage=3,180 cf Inflow=1.49 cfs 0.180 af
Outflow=1.01 cfs 0.180 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=53.33' Inflow=0.77 cfs 0.057 af
18.0" Round Culvert n=0.013 L=51.0' S=0.0020 '/' Outflow=0.77 cfs 0.057 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.00' Inflow=0.36 cfs 0.028 af
18.0" Round Culvert n=0.013 L=86.0' S=0.2823 '/' Outflow=0.36 cfs 0.028 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=72.00' Inflow=0.39 cfs 0.027 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=0.39 cfs 0.027 af

Pond New CB-1: New ST-CB #1 Peak Elev=69.75' Inflow=1.93 cfs 0.132 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=1.93 cfs 0.132 af

Pond New CB-2: New ST-CB #2 Peak Elev=69.64' Inflow=3.30 cfs 0.230 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=3.30 cfs 0.230 af

Pond New CB-3: New ST-CB #3 Peak Elev=69.22' Inflow=4.96 cfs 0.357 af
18.0" Round Culvert n=0.013 L=85.0' S=0.0202 '/' Outflow=4.96 cfs 0.357 af

Pond New CB-6: New ST-CB #6 Peak Elev=67.12' Inflow=5.36 cfs 0.384 af
24.0" Round Culvert n=0.013 L=113.0' S=0.0041 '/' Outflow=5.36 cfs 0.384 af

Pond New SWTS: New SWTS-1 Peak Elev=66.62' Inflow=5.36 cfs 0.384 af
18.0" Round Culvert n=0.025 L=300.0' S=0.0262 '/' Outflow=5.36 cfs 0.384 af

Pond New-CB-11: New-CB-11 Peak Elev=53.30' Inflow=1.43 cfs 0.108 af
8.0" Round Culvert n=0.013 L=8.0' S=0.0062 '/' Outflow=1.43 cfs 0.108 af

Pond New-CB-12: New-CB-12 Peak Elev=51.39' Inflow=0.36 cfs 0.027 af
8.0" Round Culvert n=0.013 L=10.0' S=0.0370 '/' Outflow=0.36 cfs 0.027 af

Pond New-CB-13: New-CB-13 Peak Elev=47.30' Inflow=0.50 cfs 0.038 af
8.0" Round Culvert n=0.013 L=7.0' S=0.5757 '/' Outflow=0.50 cfs 0.038 af

Pond SC-P-1: New Pond Forebay Peak Elev=127.68' Storage=0.003 af Inflow=0.29 cfs 0.022 af
12.0" Round Culvert n=0.013 L=2.0' S=0.0400 '/' Outflow=0.29 cfs 0.022 af

Pond SC-P-2: New Dry Well Peak Elev=127.59' Storage=0.005 af Inflow=0.29 cfs 0.022 af
Discarded=0.01 cfs 0.012 af Primary=0.28 cfs 0.010 af Outflow=0.29 cfs 0.022 af

Link 1L: Flow to the North Inflow=5.36 cfs 0.384 af
Primary=5.36 cfs 0.384 af

Link 2L: Culvert to Hudson River 1 Inflow=1.79 cfs 0.135 af
Primary=1.79 cfs 0.135 af

Link 3L: Culvert to Hudson River 2 Inflow=0.85 cfs 0.066 af
Primary=0.85 cfs 0.066 af

Link Hudson: Hudson River Inflow=7.91 cfs 0.769 af
Primary=7.91 cfs 0.769 af

Total Runoff Area = 7.143 ac Runoff Volume = 0.781 af Average Runoff Depth = 1.31"
47.29% Pervious = 3.378 ac 52.71% Impervious = 3.765 ac

ent SA-1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between L

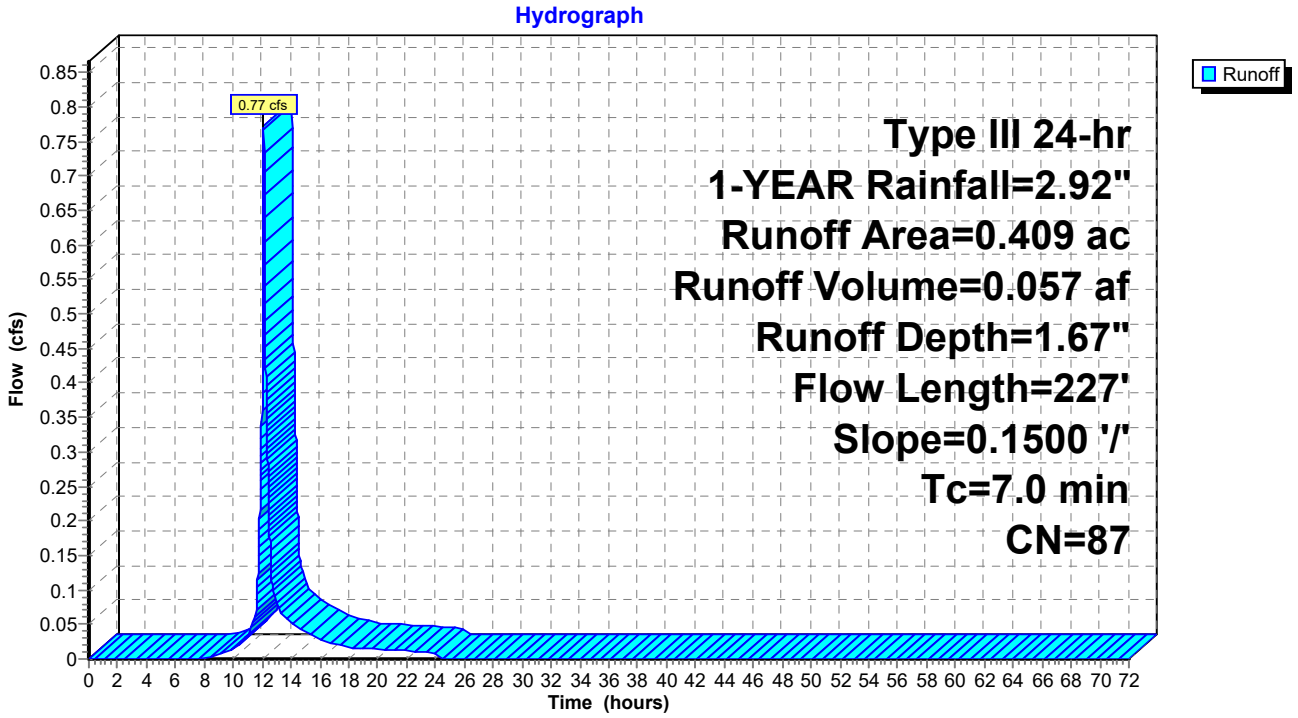
Runoff = 0.77 cfs @ 12.10 hrs, Volume= 0.057 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.287	98	Paved parking, HSG B
0.122	61	>75% Grass cover, Good, HSG B
0.409	87	Weighted Average
0.122		29.83% Pervious Area
0.287		70.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.0	227	0.1500	1.91		**Lag/CN Method,**
7.0	227	Total			

1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between Lot R ar



mmary for Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion o

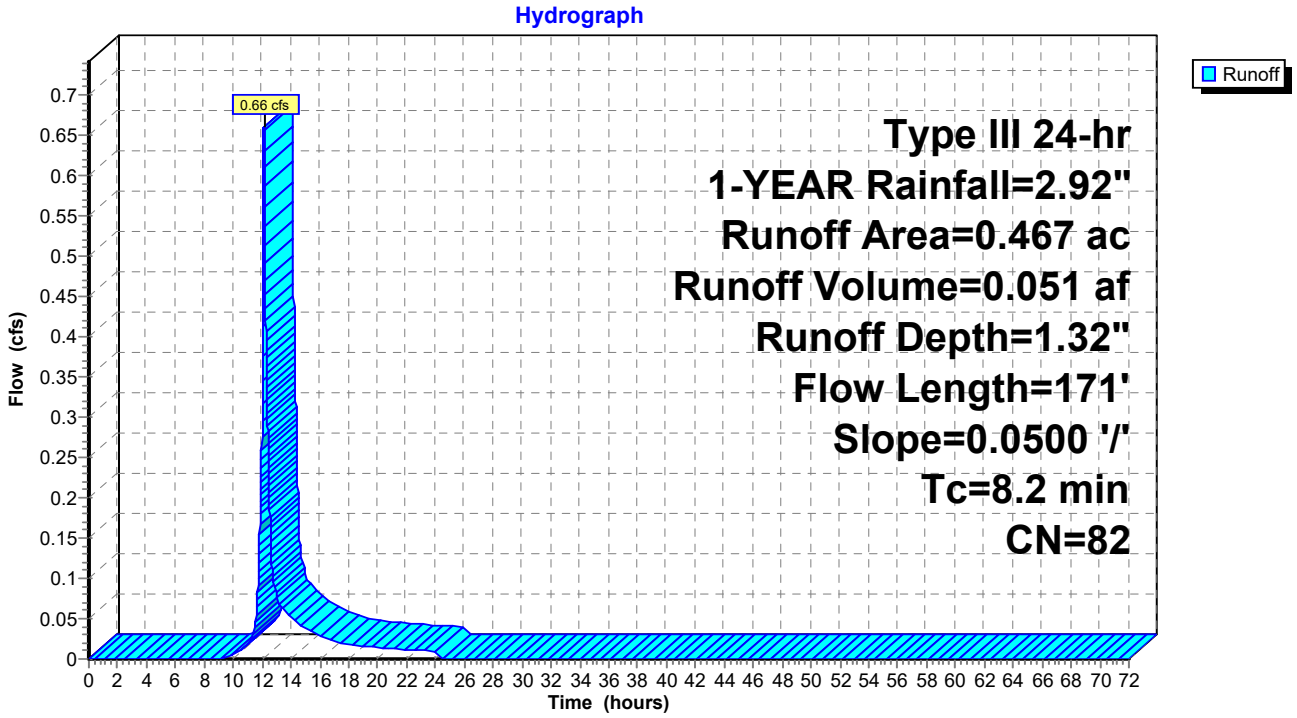
Runoff = 0.66 cfs @ 12.12 hrs, Volume= 0.051 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.265	98	Paved parking, HSG B
0.202	61	>75% Grass cover, Good, HSG B
0.467	82	Weighted Average
0.202		43.25% Pervious Area
0.265		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.2	171	0.0500	0.88		**Lag/CN Method,**
8.2	171	Total			

Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion of Lot R



Summary for Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of L

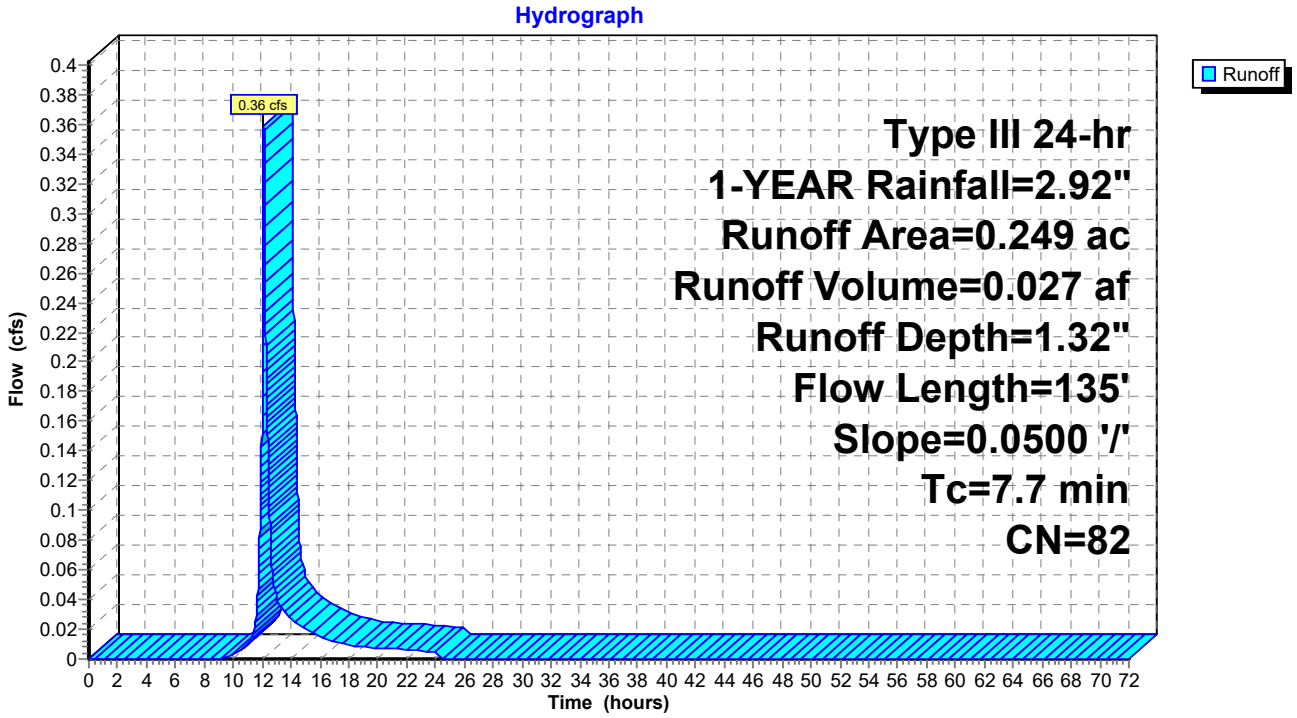
Runoff = 0.36 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.141	98	Paved parking, HSG B
0.108	61	>75% Grass cover, Good, HSG B
0.249	82	Weighted Average
0.108		43.37% Pervious Area
0.141		56.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.7	135	0.0500	0.84		**Lag/CN Method,**
7.7	135	Total			

Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of Lot R



mmary for Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion o

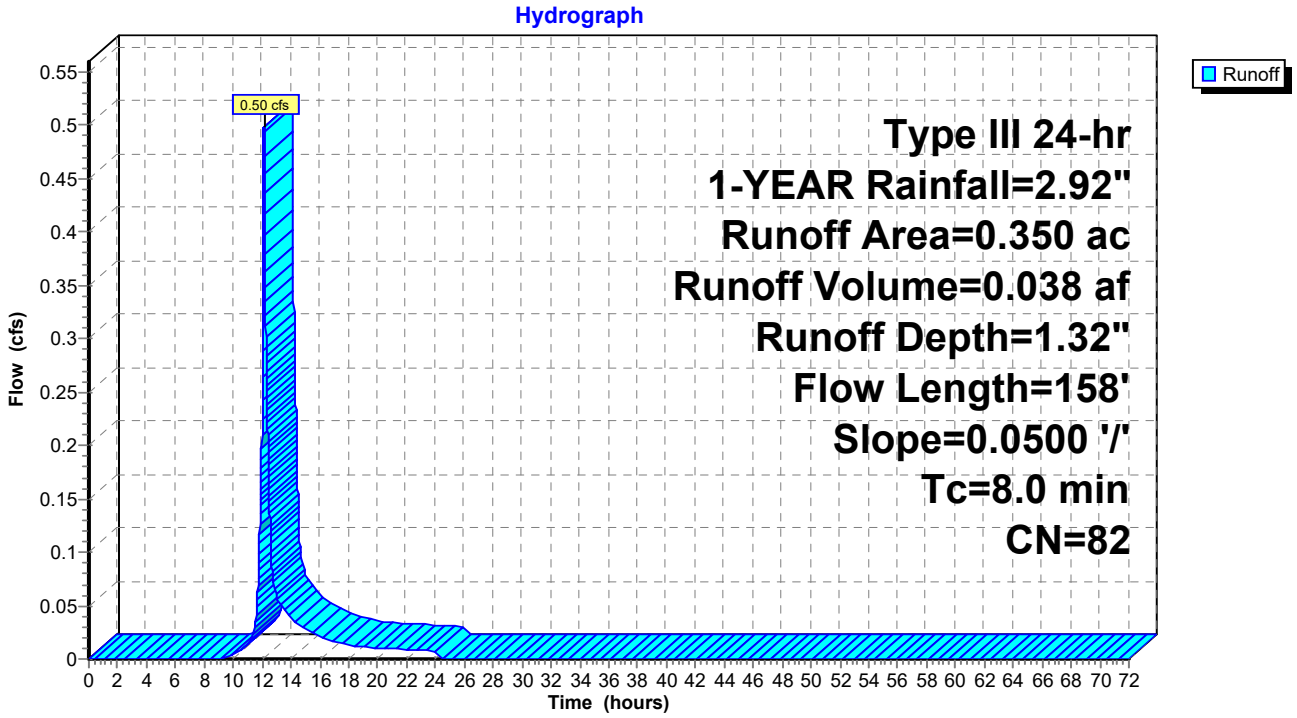
Runoff = 0.50 cfs @ 12.12 hrs, Volume= 0.038 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.198	98	Paved parking, HSG B
0.152	61	>75% Grass cover, Good, HSG B
0.350	82	Weighted Average
0.152		43.43% Pervious Area
0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.0	158	0.0500	0.86		**Lag/CN Method,**
8.0	158	Total			

Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion of Lot R



Summary for Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of L

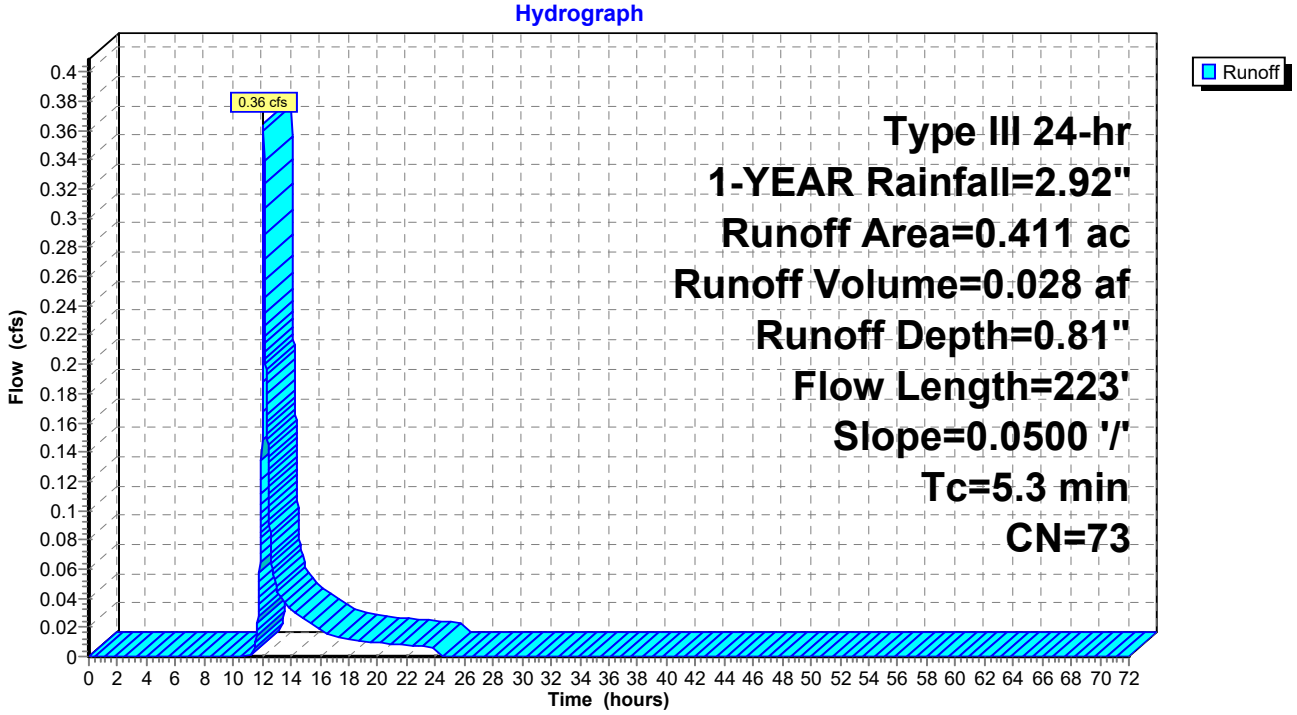
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.028 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG B
0.281	61	>75% Grass cover, Good, HSG B
0.411	73	Weighted Average
0.281		68.37% Pervious Area
0.130		31.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	223	0.0500	0.71		**Lag/CN Method,**

Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of Lot R



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

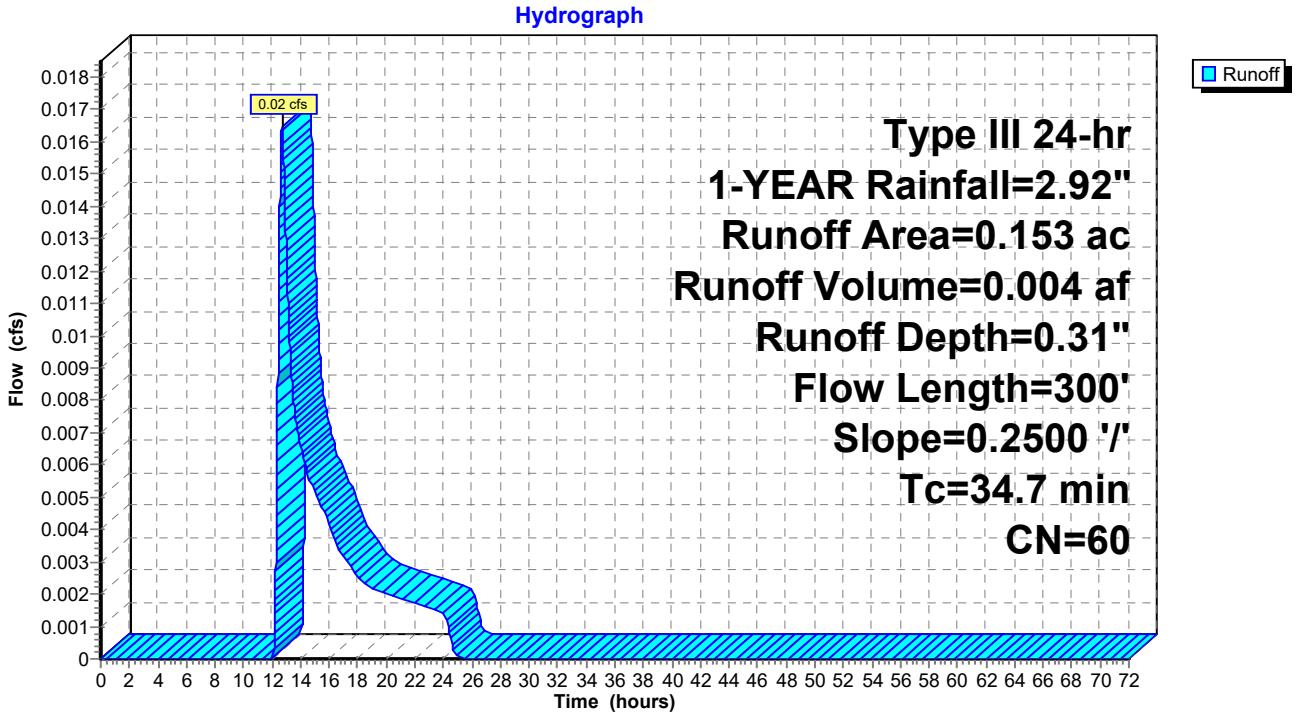
Runoff = 0.02 cfs @ 12.69 hrs, Volume= 0.004 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (ac)	CN	Description
0.153	60	Woods, Fair, HSG B
0.153		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	300	0.2500	0.14		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.85"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle

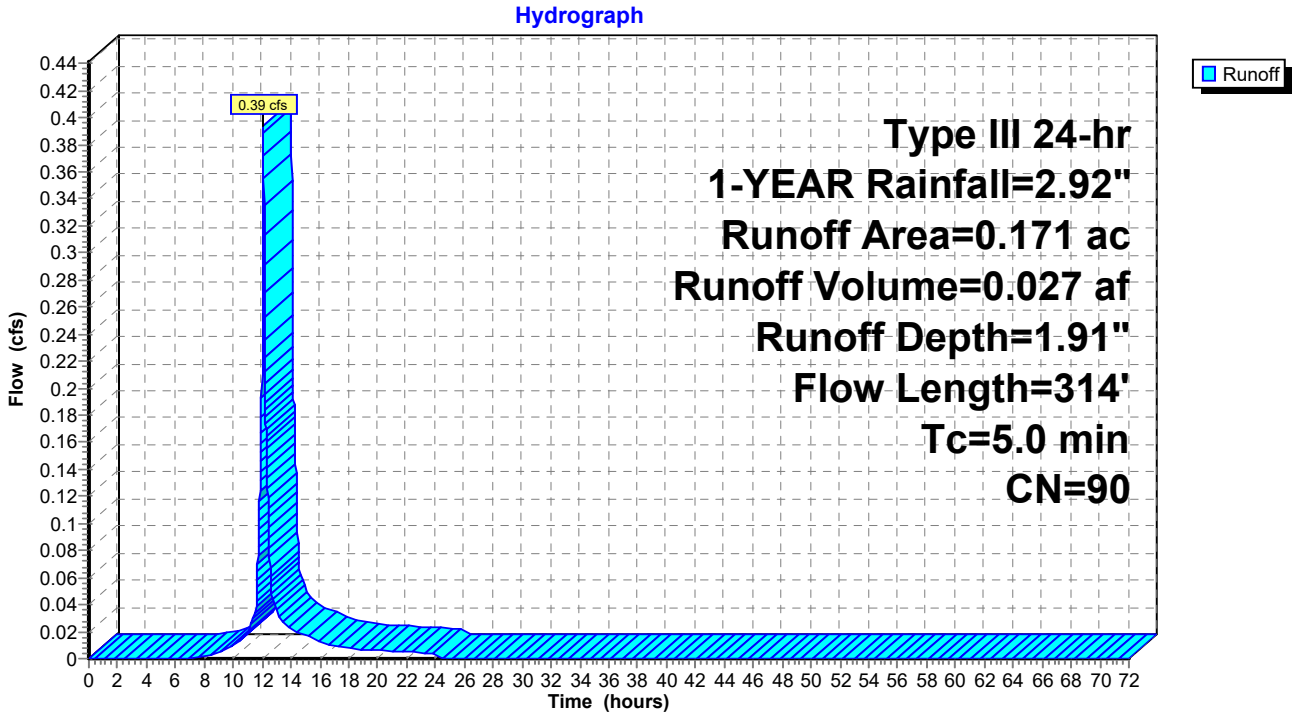
Runoff = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	300	0.0580	2.48		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
2.0	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking ais

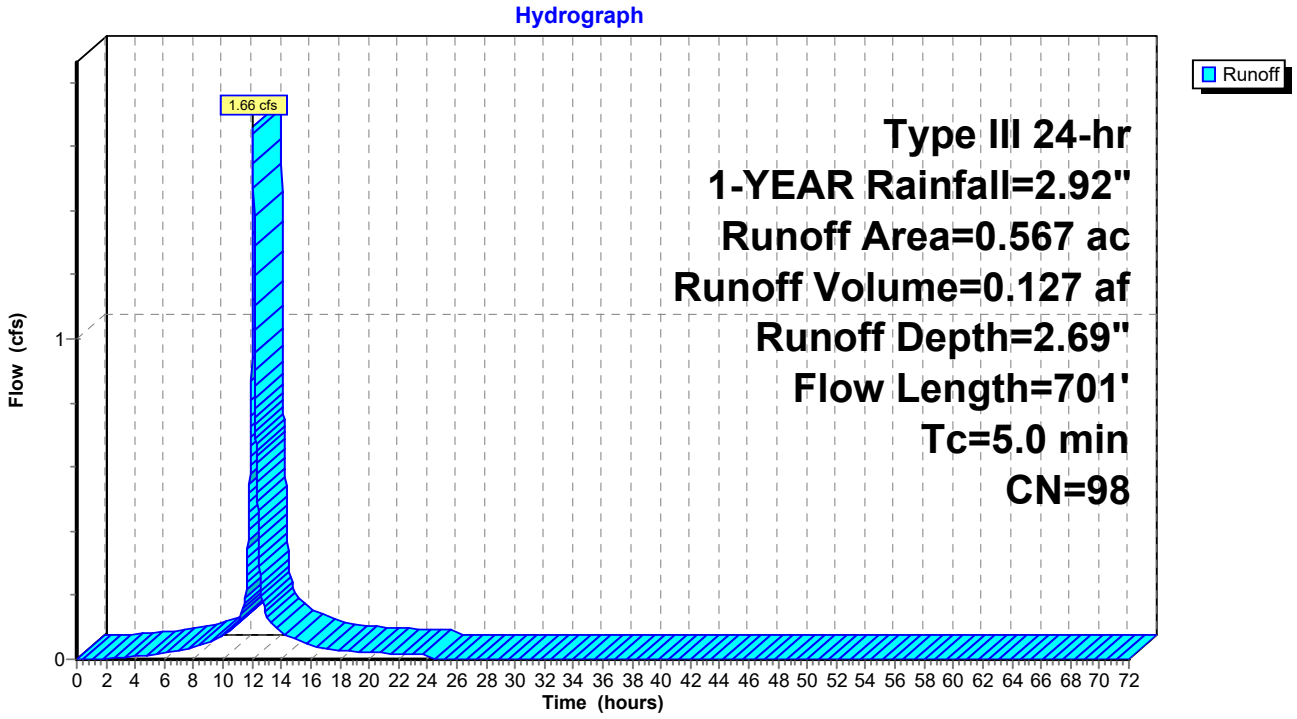
Runoff = 1.66 cfs @ 12.07 hrs, Volume= 0.127 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.567	98	
	0.567		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

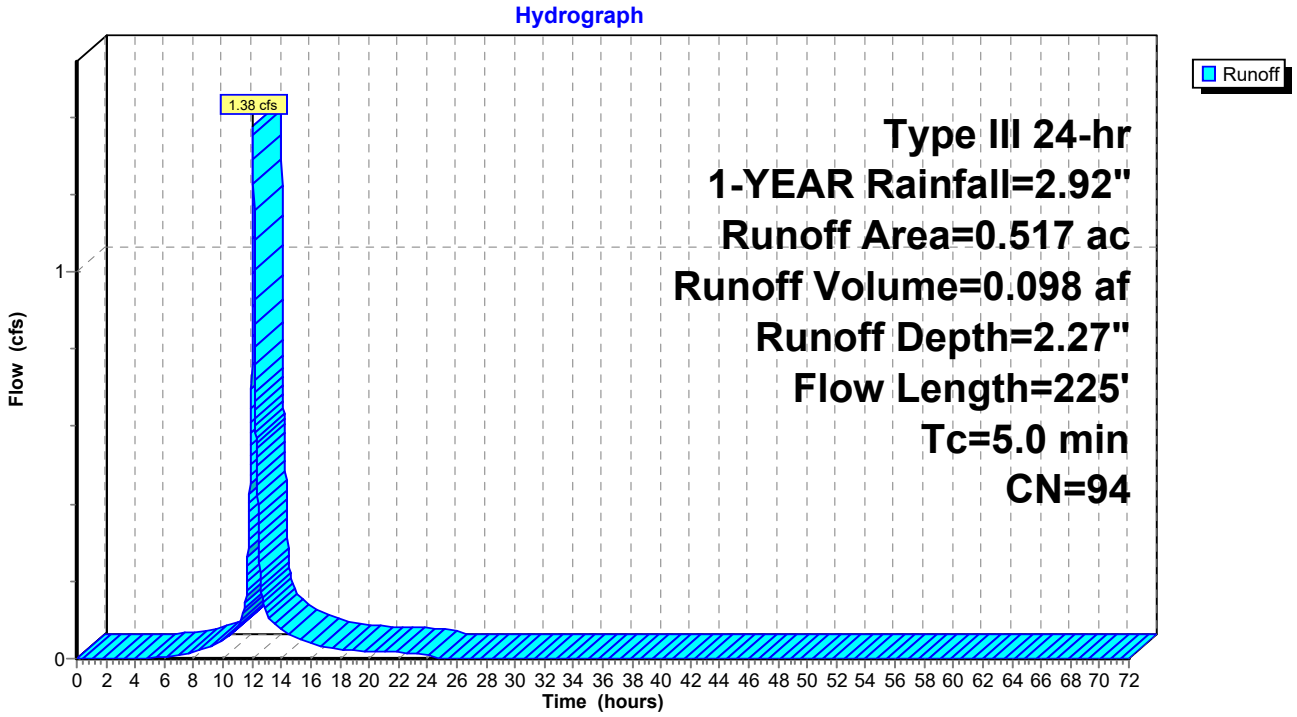
Runoff = 1.38 cfs @ 12.07 hrs, Volume= 0.098 af, Depth= 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.485	98	
	0.032	39	>75% Grass cover, Good, HSG A
	0.517	94	Weighted Average
	0.032		6.19% Pervious Area
	0.485		93.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	211	0.0470	2.12		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

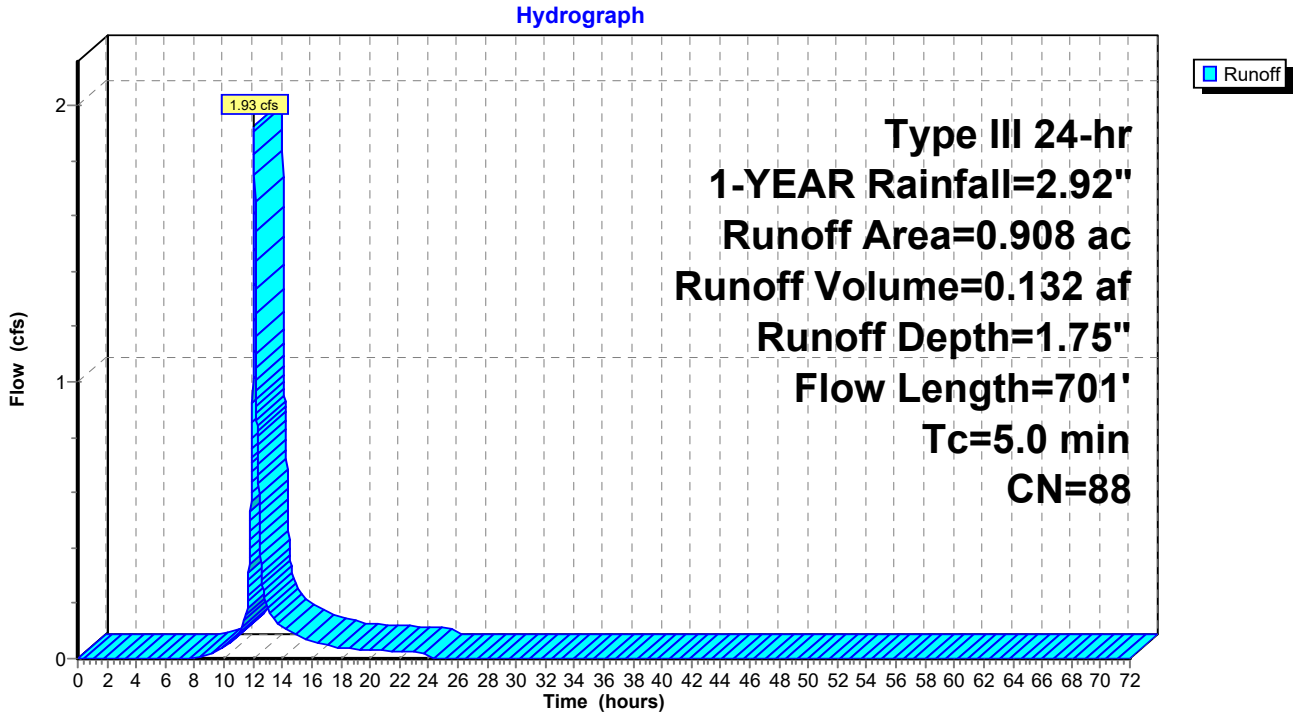
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
*	0.674	98	
	0.234	61	>75% Grass cover, Good, HSG B
	0.908	88	Weighted Average
	0.234		25.77% Pervious Area
	0.674		74.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Grove Pavilion Building

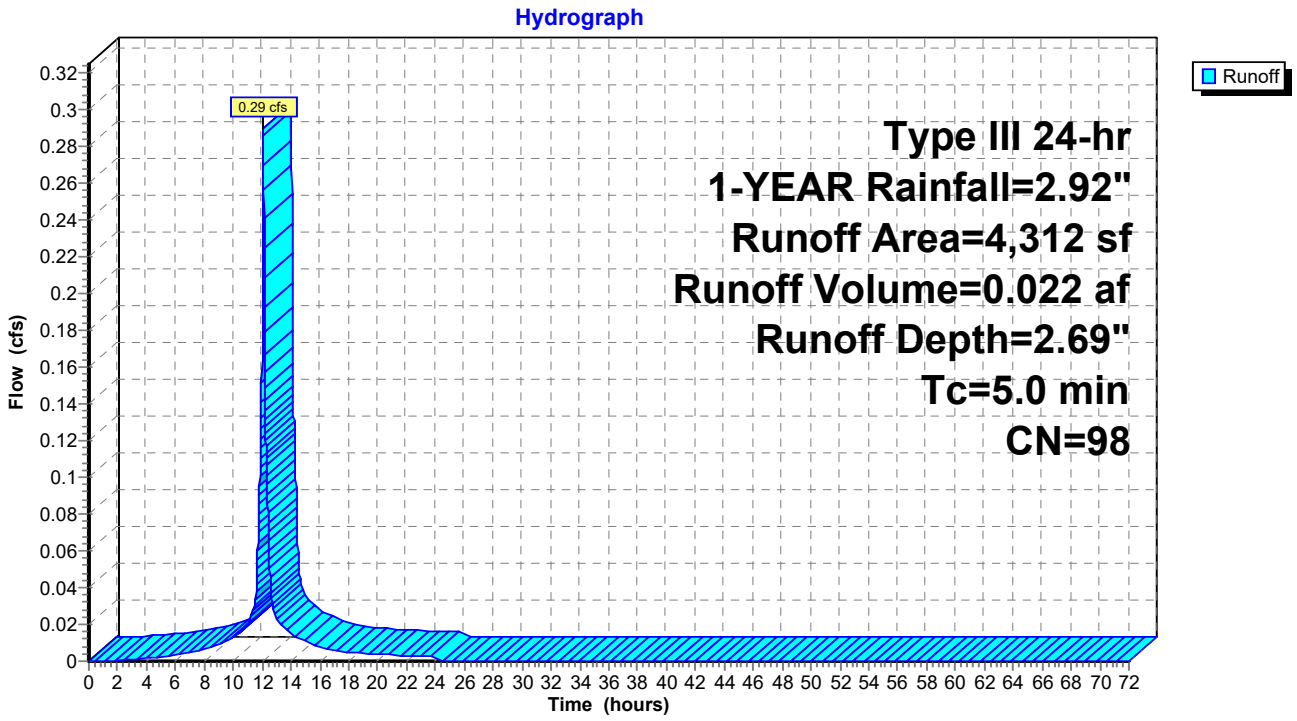
Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

Area (sf)	CN	Description
4,312	98	Roofs, HSG A
4,312		100.00% Impervious Area

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

Subcatchment SC-1: Grove Pavilion Building



Summary for Subcatchment SC-2: Existing Driveway and lawns to Pond

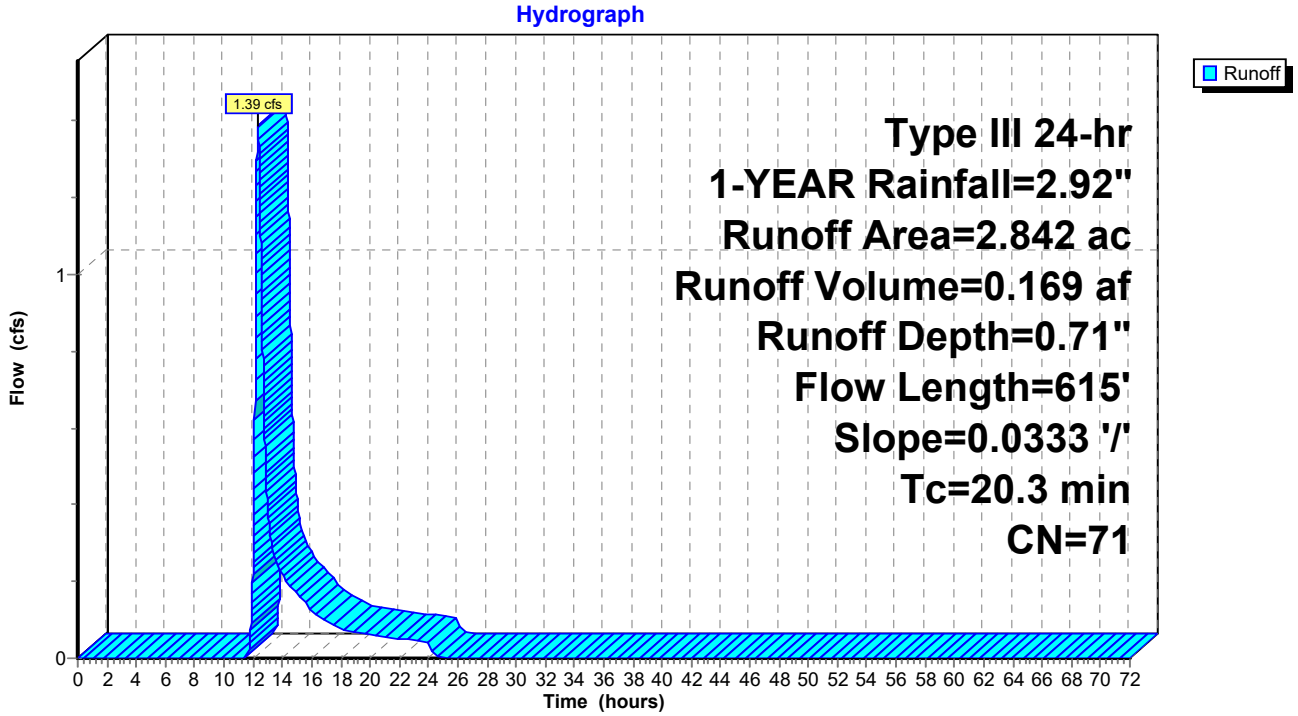
Runoff = 1.39 cfs @ 12.32 hrs, Volume= 0.169 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.92"

	Area (ac)	CN	Description
	0.679	98	Paved parking, HSG B
	2.059	61	>75% Grass cover, Good, HSG B
*	0.104	98	New walking paths
	2.842	71	Weighted Average
	2.059		72.45% Pervious Area
	0.783		27.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-2: Existing Driveway and lawns to Pond



Summary for Pond 2P: Pocket Pond

Inflow Area = 2.941 ac, 29.99% Impervious, Inflow Depth = 0.73" for 1-YEAR event
Inflow = 1.49 cfs @ 12.31 hrs, Volume= 0.180 af
Outflow = 1.01 cfs @ 12.58 hrs, Volume= 0.180 af, Atten= 32%, Lag= 16.2 min
Primary = 1.01 cfs @ 12.58 hrs, Volume= 0.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 123.50' Surf.Area= 3,693 sf Storage= 1,744 cf
Peak Elev= 124.10' @ 12.58 hrs Surf.Area= 4,173 sf Storage= 3,180 cf (1,436 cf above start)

Plug-Flow detention time= 189.0 min calculated for 0.139 af (78% of inflow)
Center-of-Mass det. time= 48.1 min (932.6 - 884.5)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,560 cf	**additional storage to main bay (Irregular)** Listed below (Recalc) x 1.25
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,438 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

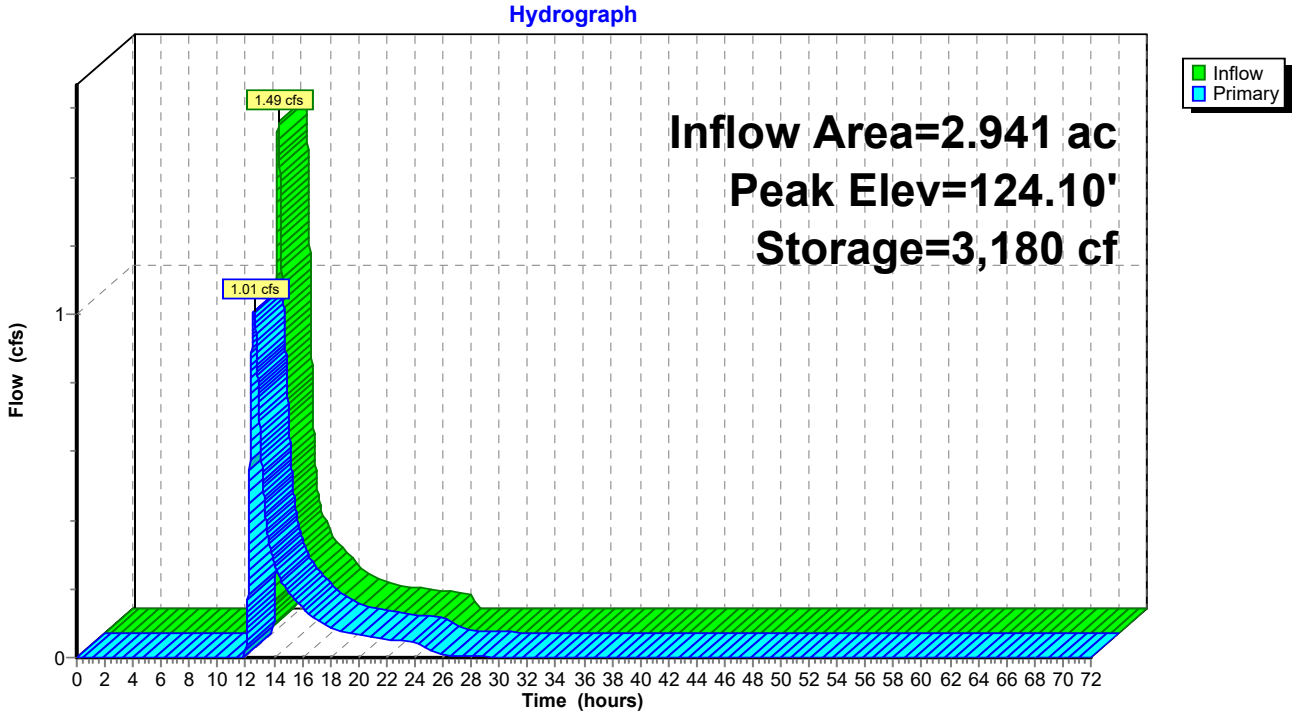
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	190	75.0	0	0	190
126.00	555	108.6	1,248	1,248	777

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.01 cfs @ 12.58 hrs HW=124.10' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Passes 1.01 cfs of 5.85 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 1.01 cfs @ 2.65 fps)
  └─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 2P: Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

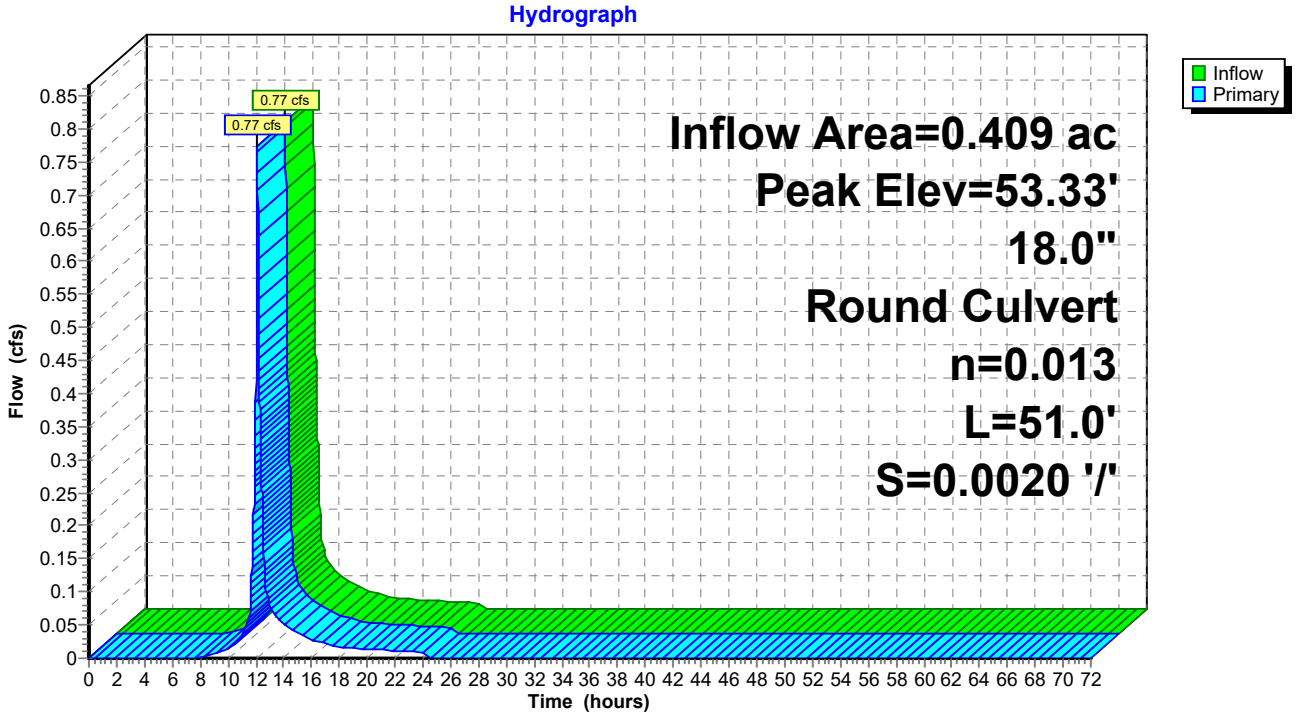
Inflow Area = 0.409 ac, 70.17% Impervious, Inflow Depth = 1.67" for 1-YEAR event
Inflow = 0.77 cfs @ 12.10 hrs, Volume= 0.057 af
Outflow = 0.77 cfs @ 12.10 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 12.10 hrs, Volume= 0.057 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 53.33' @ 12.11 hrs
Flood Elev= 56.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 52.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.77 cfs @ 12.10 hrs HW=53.33' TW=53.29' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.77 cfs @ 0.96 fps)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

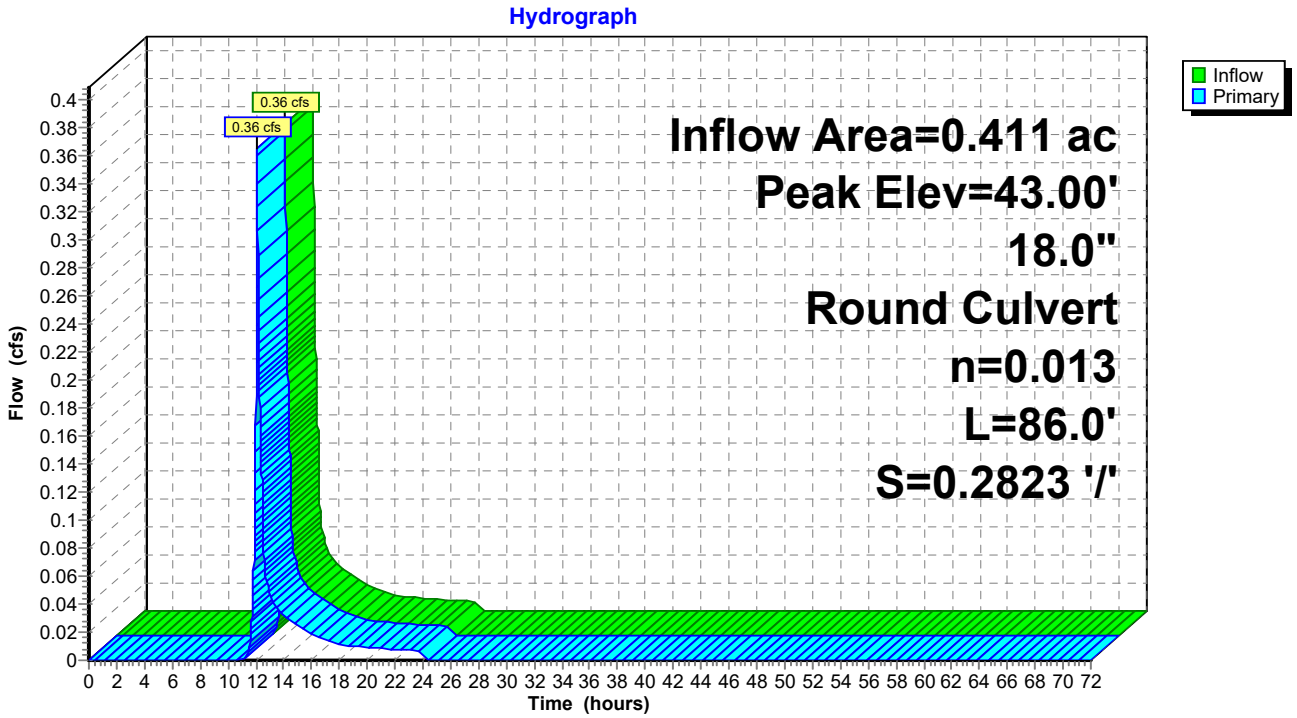
Inflow Area = 0.411 ac, 31.63% Impervious, Inflow Depth = 0.81" for 1-YEAR event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.09 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 43.00' @ 12.09 hrs
Flood Elev= 55.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**18.0" Round Culvert** L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2823 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.36 cfs @ 12.09 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.36 cfs @ 1.75 fps)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

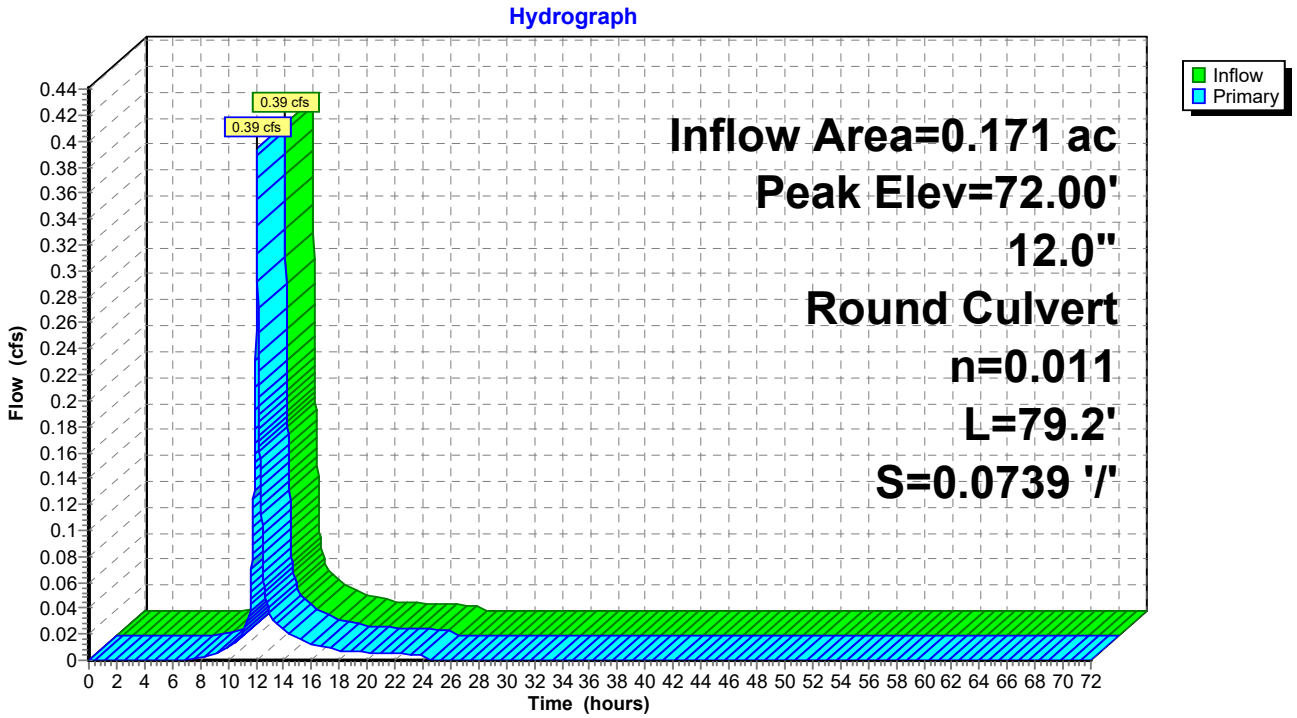
Inflow Area = 0.171 ac, 79.53% Impervious, Inflow Depth = 1.91" for 1-YEAR event
Inflow = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af
Outflow = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.07 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 72.00' @ 12.07 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.07 hrs HW=72.00' TW=67.12' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.39 cfs @ 1.59 fps)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond New CB-1: New ST-CB #1

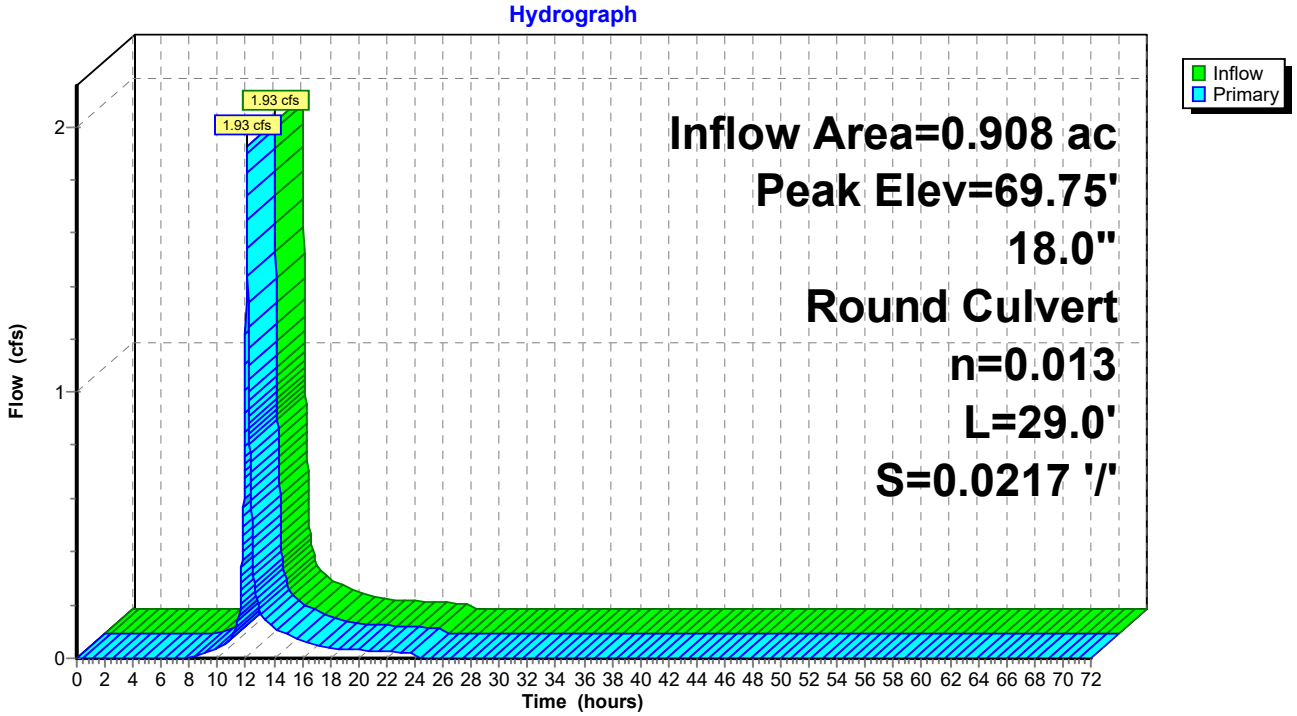
Inflow Area =	0.908 ac, 74.23% Impervious, Inflow Depth = 1.75" for 1-YEAR event				
Inflow =	1.93 cfs @	12.07 hrs,	Volume=	0.132 af	
Outflow =	1.93 cfs @	12.07 hrs,	Volume=	0.132 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.93 cfs @	12.07 hrs,	Volume=	0.132 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 69.75' @ 12.08 hrs
Flood Elev= 73.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=1.90 cfs @ 12.07 hrs HW=69.74' TW=69.63' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.90 cfs @ 1.26 fps)

Pond New CB-1: New ST-CB #1



Summary for Pond New CB-2: New ST-CB #2

[80] Warning: Exceeded Pond New CB-1 by 0.05' @ 7.01 hrs (0.00 cfs 0.000 af)

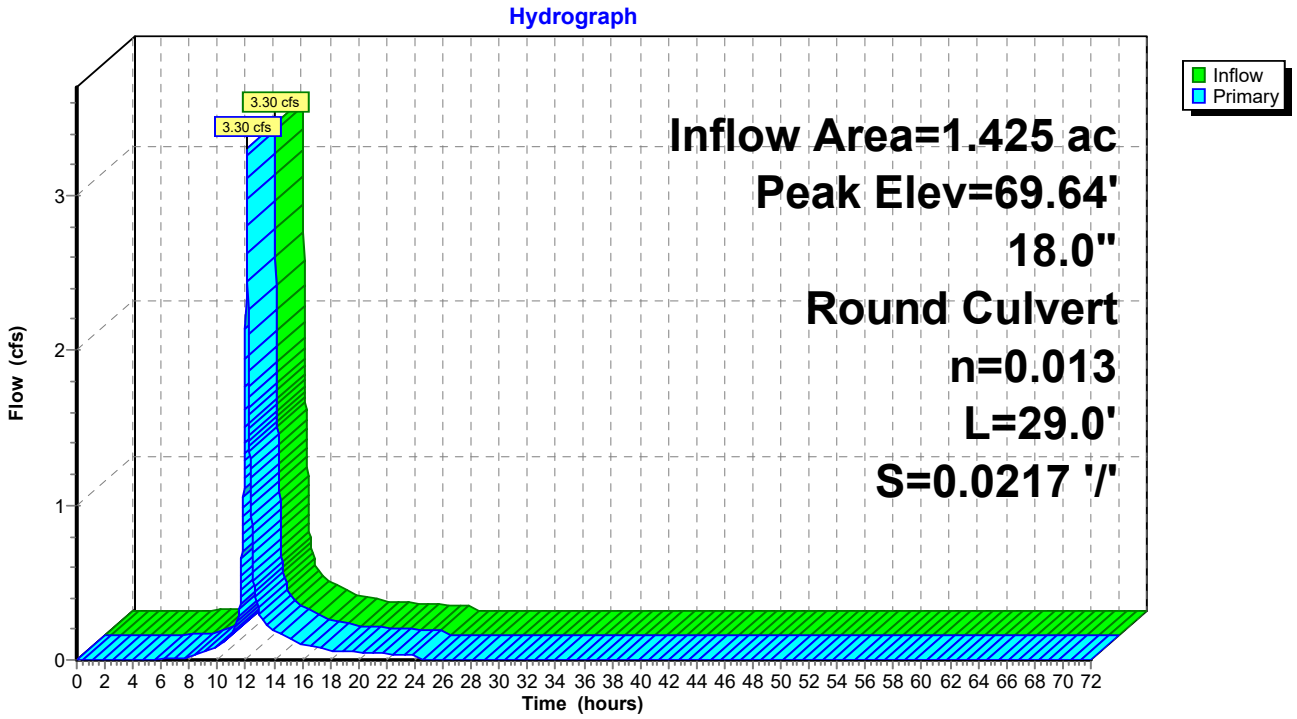
Inflow Area =	1.425 ac,	81.33% Impervious,	Inflow Depth =	1.94"	for 1-YEAR event
Inflow =	3.30 cfs @	12.07 hrs,	Volume=	0.230 af	
Outflow =	3.30 cfs @	12.07 hrs,	Volume=	0.230 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.30 cfs @	12.07 hrs,	Volume=	0.230 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 69.64' @ 12.07 hrs
Flood Elev= 73.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.29 cfs @ 12.07 hrs HW=69.63' TW=69.21' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 3.29 cfs @ 3.37 fps)

Pond New CB-2: New ST-CB #2



Summary for Pond New CB-3: New ST-CB #3

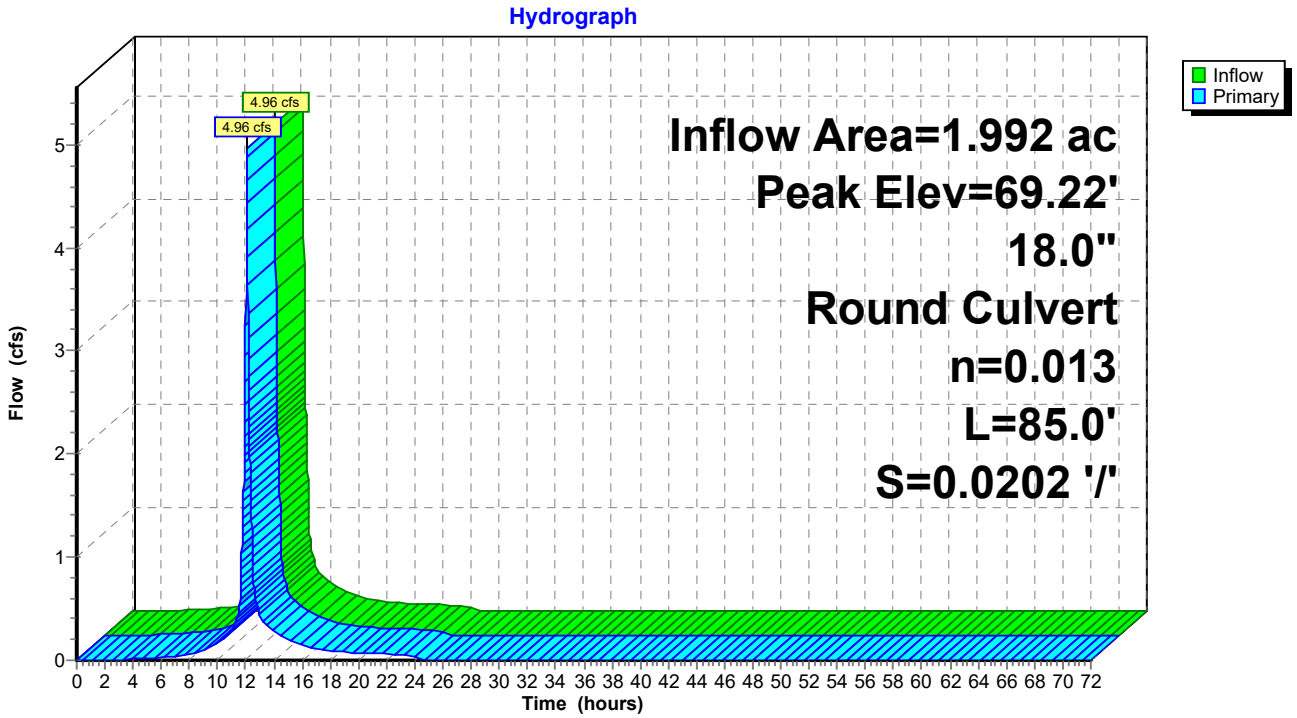
Inflow Area =	1.992 ac, 86.65% Impervious, Inflow Depth = 2.15" for 1-YEAR event				
Inflow =	4.96 cfs @	12.07 hrs,	Volume=	0.357 af	
Outflow =	4.96 cfs @	12.07 hrs,	Volume=	0.357 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.96 cfs @	12.07 hrs,	Volume=	0.357 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 69.22' @ 12.07 hrs
Flood Elev= 72.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.92'	**18.0" Round Culvert** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.92' / 66.20' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.95 cfs @ 12.07 hrs HW=69.21' TW=67.12' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.95 cfs @ 3.06 fps)

Pond New CB-3: New ST-CB #3



Summary for Pond New CB-6: New ST-CB #6

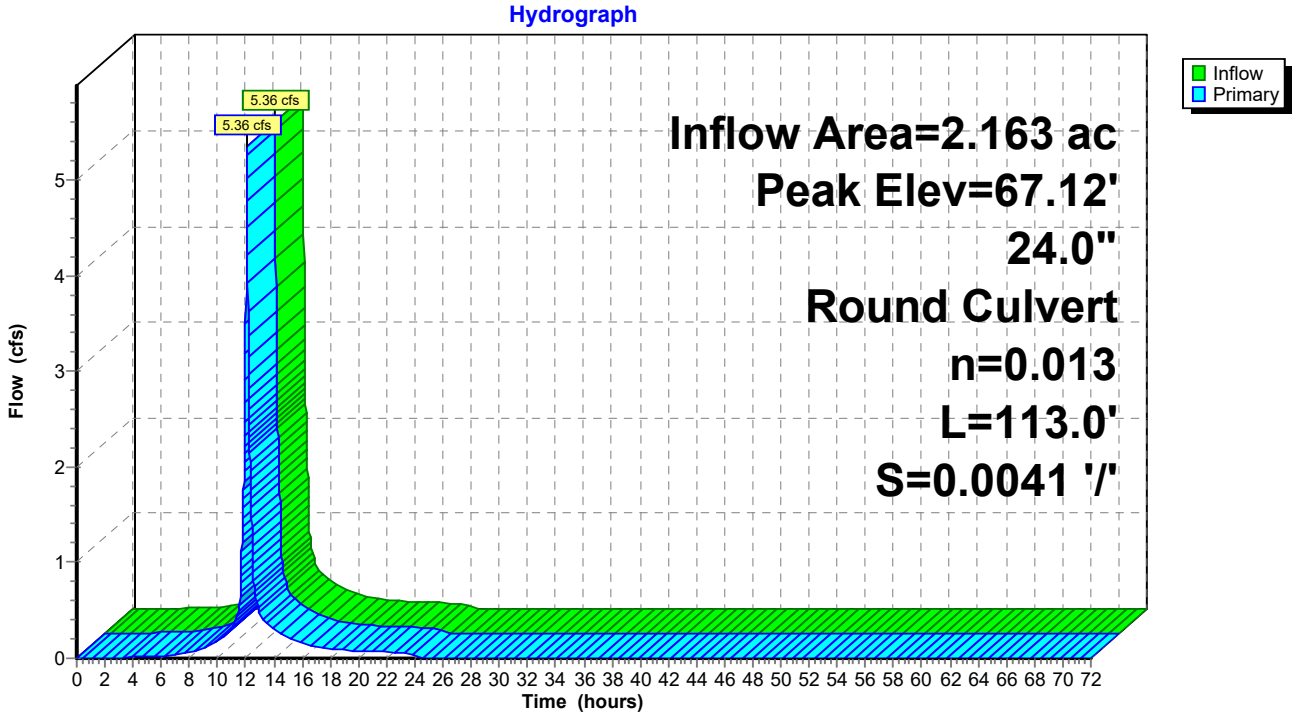
Inflow Area =	2.163 ac, 86.08% Impervious, Inflow Depth = 2.13" for 1-YEAR event				
Inflow =	5.36 cfs @	12.07 hrs,	Volume=	0.384 af	
Outflow =	5.36 cfs @	12.07 hrs,	Volume=	0.384 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.36 cfs @	12.07 hrs,	Volume=	0.384 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 67.12' @ 12.07 hrs
Flood Elev= 72.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 65.24' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.35 cfs @ 12.07 hrs HW=67.12' TW=66.61' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.35 cfs @ 3.16 fps)

Pond New CB-6: New ST-CB #6



Summary for Pond New SWTS: New SWTS-1

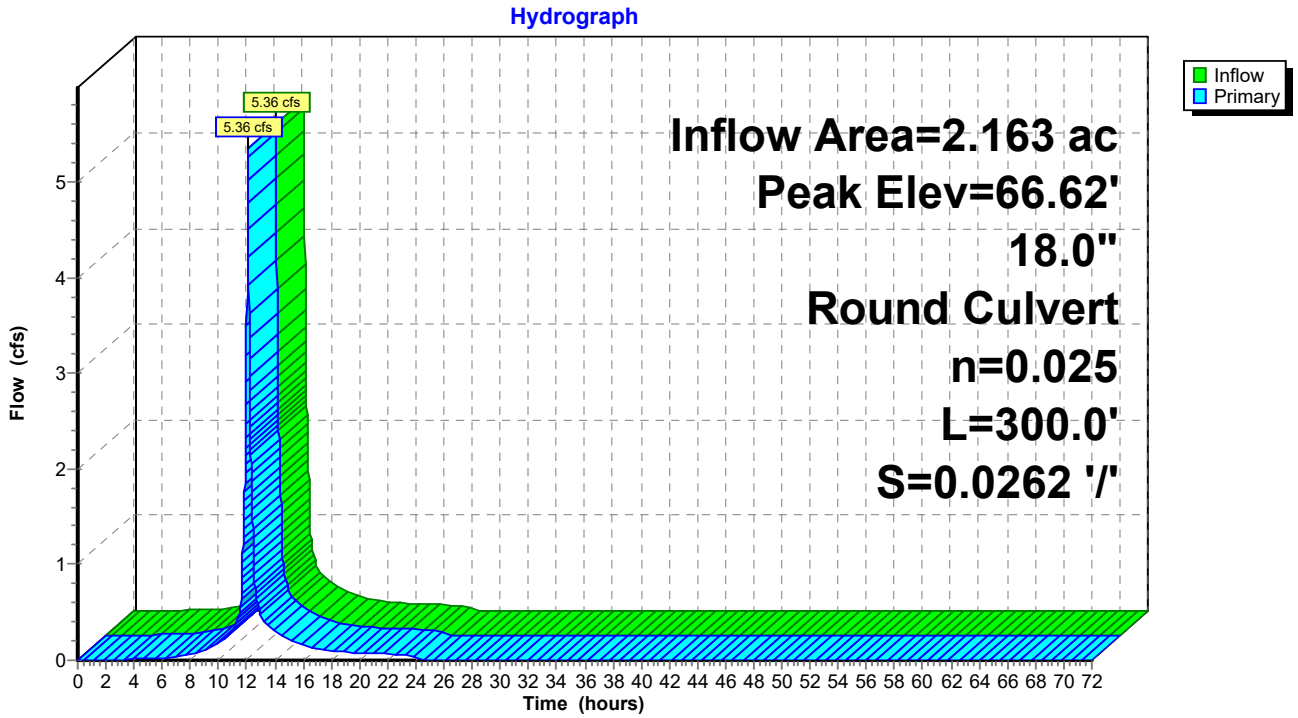
Inflow Area = 2.163 ac, 86.08% Impervious, Inflow Depth = 2.13" for 1-YEAR event
Inflow = 5.36 cfs @ 12.07 hrs, Volume= 0.384 af
Outflow = 5.36 cfs @ 12.07 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min
Primary = 5.36 cfs @ 12.07 hrs, Volume= 0.384 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 66.62' @ 12.07 hrs
Flood Elev= 71.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.24'	**18.0" Round Culvert** L= 300.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.24' / 57.38' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=5.35 cfs @ 12.07 hrs HW=66.61' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 5.35 cfs @ 3.15 fps)

Pond New SWTS: New SWTS-1



Summary for Pond New-CB-11: New-CB-11

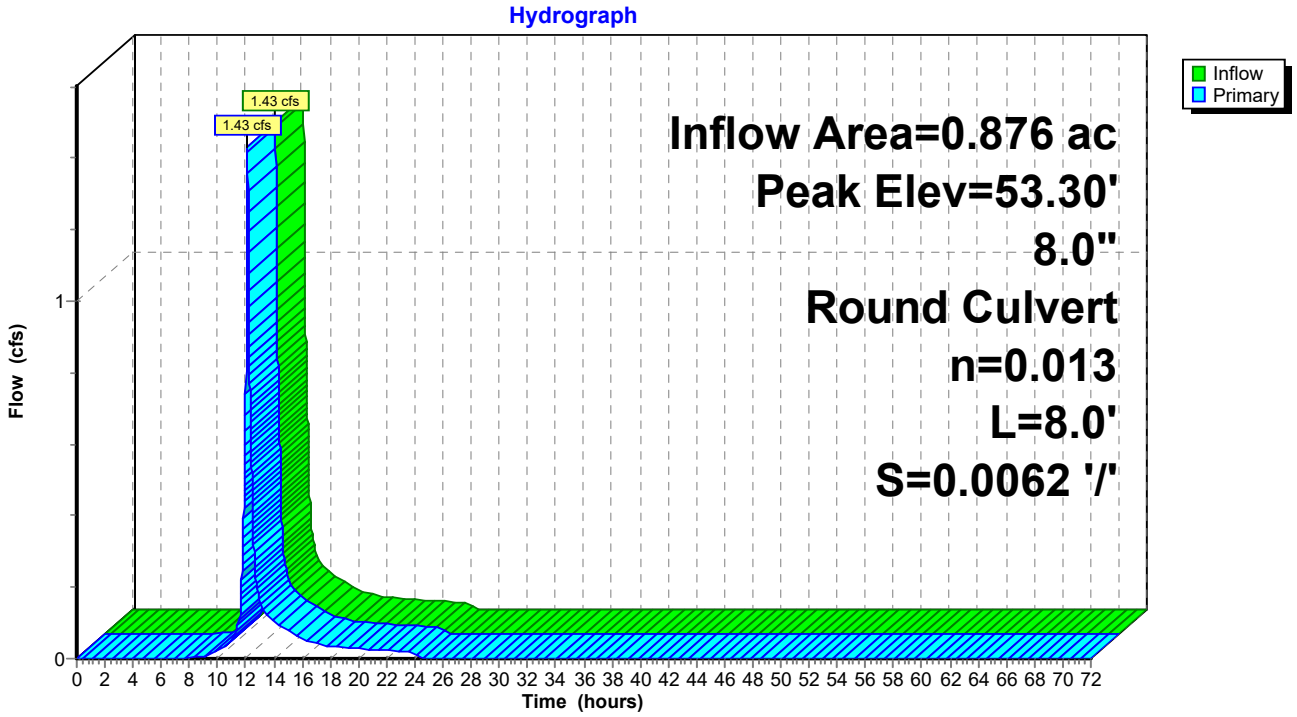
Inflow Area = 0.876 ac, 63.01% Impervious, Inflow Depth = 1.48" for 1-YEAR event
Inflow = 1.43 cfs @ 12.11 hrs, Volume= 0.108 af
Outflow = 1.43 cfs @ 12.11 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Primary = 1.43 cfs @ 12.11 hrs, Volume= 0.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 53.30' @ 12.11 hrs
Flood Elev= 55.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.18'	**8.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.18' / 52.13' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.43 cfs @ 12.11 hrs HW=53.30' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.43 cfs @ 4.09 fps)

Pond New-CB-11: New-CB-11



Summary for Pond New-CB-12: New-CB-12

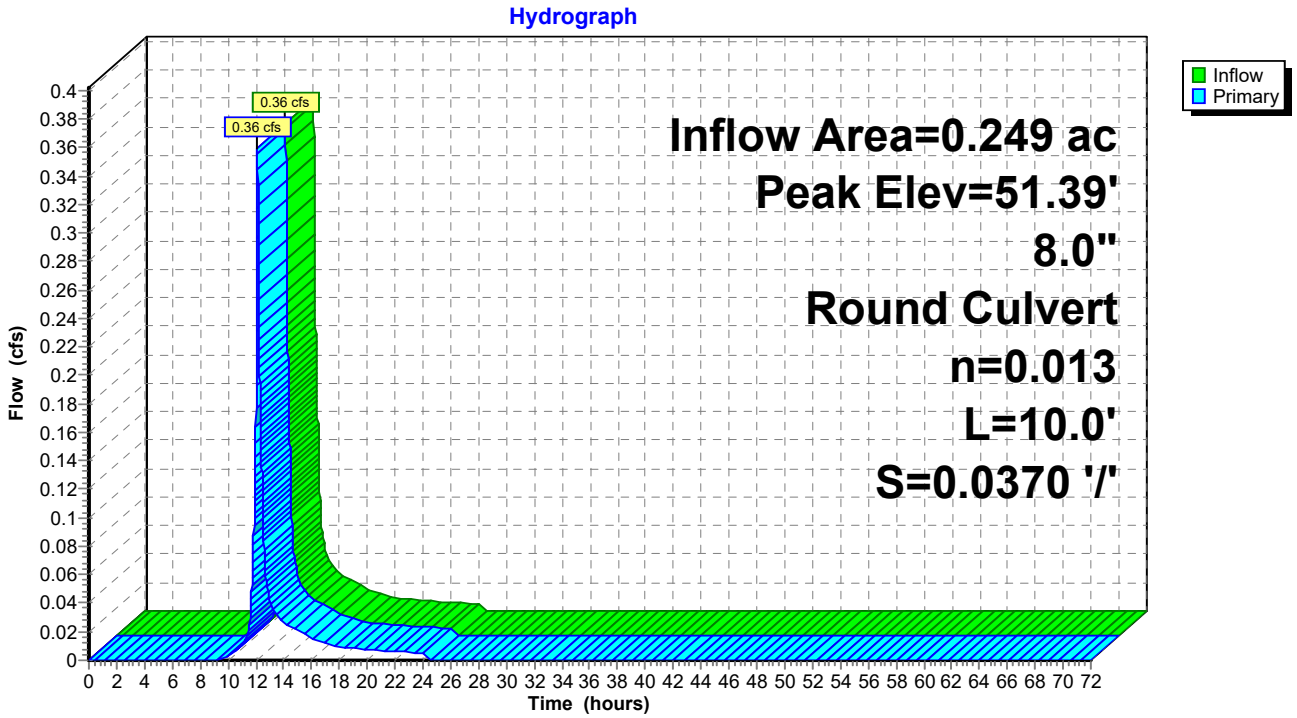
Inflow Area = 0.249 ac, 56.63% Impervious, Inflow Depth = 1.32" for 1-YEAR event
Inflow = 0.36 cfs @ 12.11 hrs, Volume= 0.027 af
Outflow = 0.36 cfs @ 12.11 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.11 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 51.39' @ 12.11 hrs
Flood Elev= 56.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.00'	**8.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.00' / 50.63' S= 0.0370 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.36 cfs @ 12.11 hrs HW=51.39' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.36 cfs @ 1.68 fps)

Pond New-CB-12: New-CB-12



Summary for Pond New-CB-13: New-CB-13

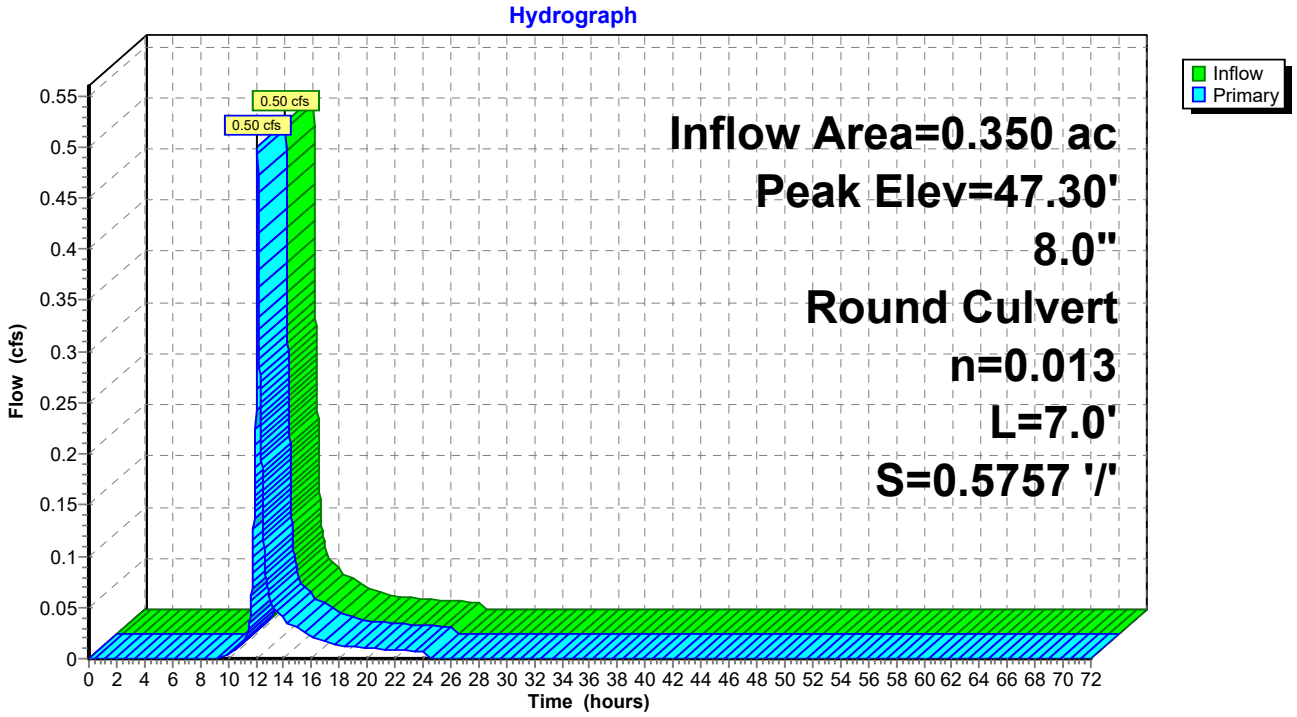
Inflow Area = 0.350 ac, 56.57% Impervious, Inflow Depth = 1.32" for 1-YEAR event
Inflow = 0.50 cfs @ 12.12 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.12 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.12 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 47.30' @ 12.12 hrs
Flood Elev= 55.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.89'	**8.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.89' / 42.86' S= 0.5757 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.50 cfs @ 12.12 hrs HW=47.30' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 2.19 fps)

Pond New-CB-13: New-CB-13



Summary for Pond SC-P-1: New Pond Forebay

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 2.69" for 1-YEAR event
Inflow = 0.29 cfs @ 12.07 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.08 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.3 min
Primary = 0.29 cfs @ 12.08 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 127.33' Surf.Area= 0.001 ac Storage= 0.003 af
Peak Elev= 127.68' @ 12.08 hrs Surf.Area= 0.001 ac Storage= 0.003 af (0.000 af above start)

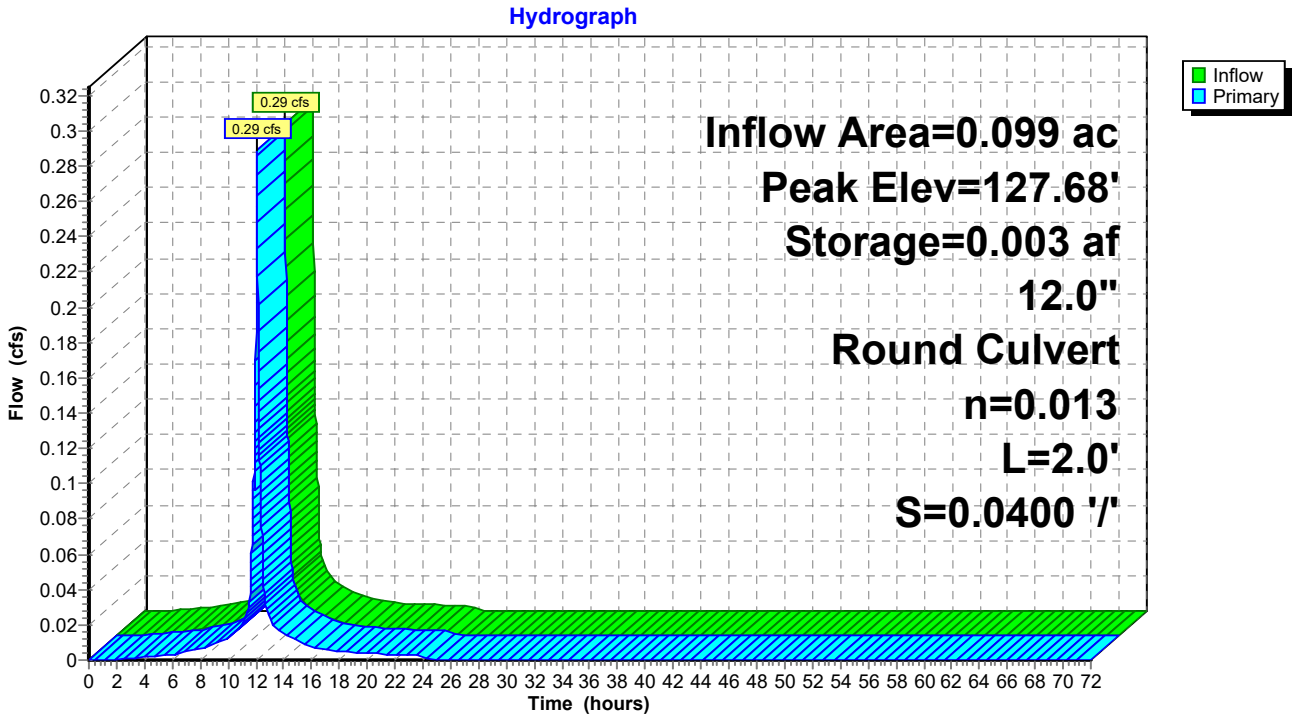
Plug-Flow detention time= 98.9 min calculated for 0.020 af (88% of inflow)
Center-of-Mass det. time= 2.0 min (759.4 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	123.33'	0.005 af	**6.00'D x 7.00'H Pretreatment Sump**

Device	Routing	Invert	Outlet Devices
#1	Primary	127.33'	**12.0" Round Culvert** L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.33' / 127.25' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.08 hrs HW=127.68' TW=127.59' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.29 cfs @ 1.73 fps)

Pond SC-P-1: New Pond Forebay



Summary for Pond SC-P-2: New Dry Well

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 2.69" for 1-YEAR event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.08 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.012 af
Primary = 0.28 cfs @ 12.08 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 127.59' @ 12.08 hrs Surf.Area= 0.002 ac Storage= 0.005 af

Plug-Flow detention time= 255.3 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 255.4 min (1,014.8 - 759.4)

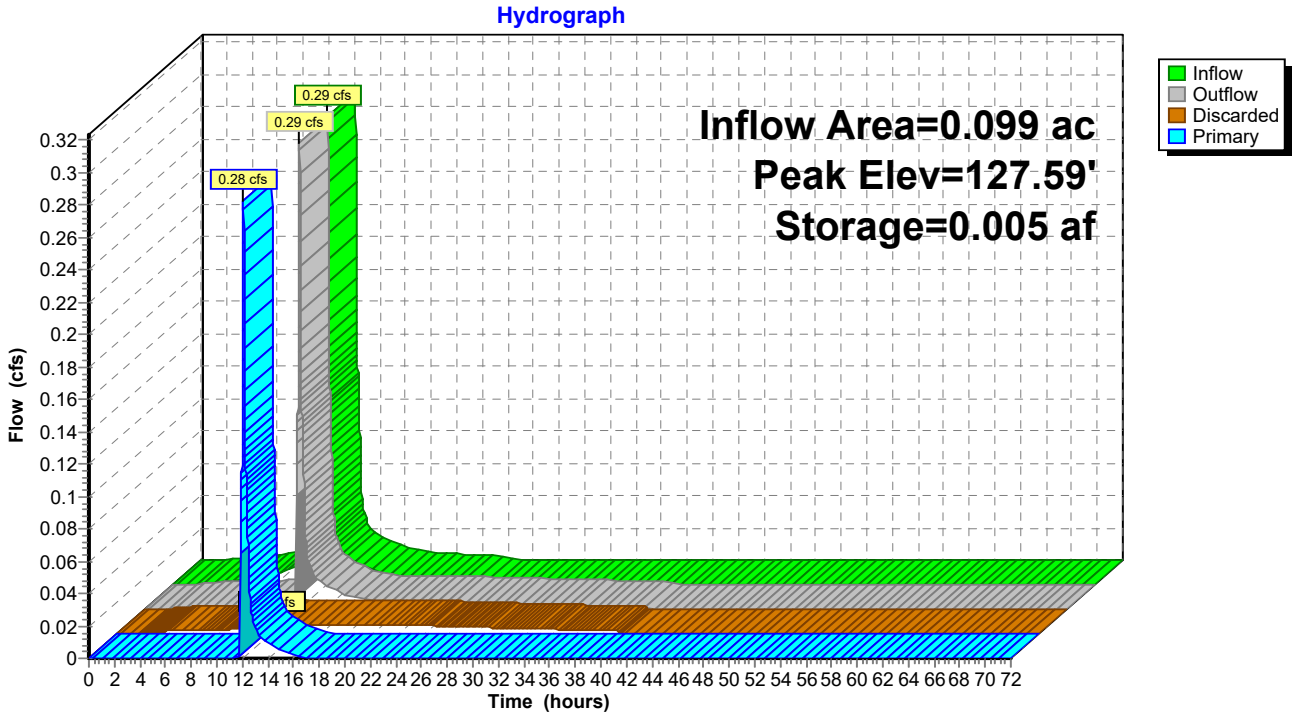
Volume	Invert	Avail.Storage	Storage Description
#1	121.83'	0.003 af	**10.00'D x 7.50'H Vertical Cone/Cylinder** 0.014 af Overall - 0.005 af Embedded = 0.008 af x 40.0% Voids
#2	123.33'	0.004 af	**6.00'D x 6.00'H Vertical Cone/Cylinder**Inside #1 0.005 af Overall - 6.0" Wall Thickness = 0.004 af
		0.007 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.83'	**1.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	127.33'	**12.0" Round Culvert** L= 116.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.33' / 122.50' S= 0.0416 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=127.59' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.28 cfs @ 12.08 hrs HW=127.59' TW=123.64' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.28 cfs @ 1.74 fps)

Pond SC-P-2: New Dry Well

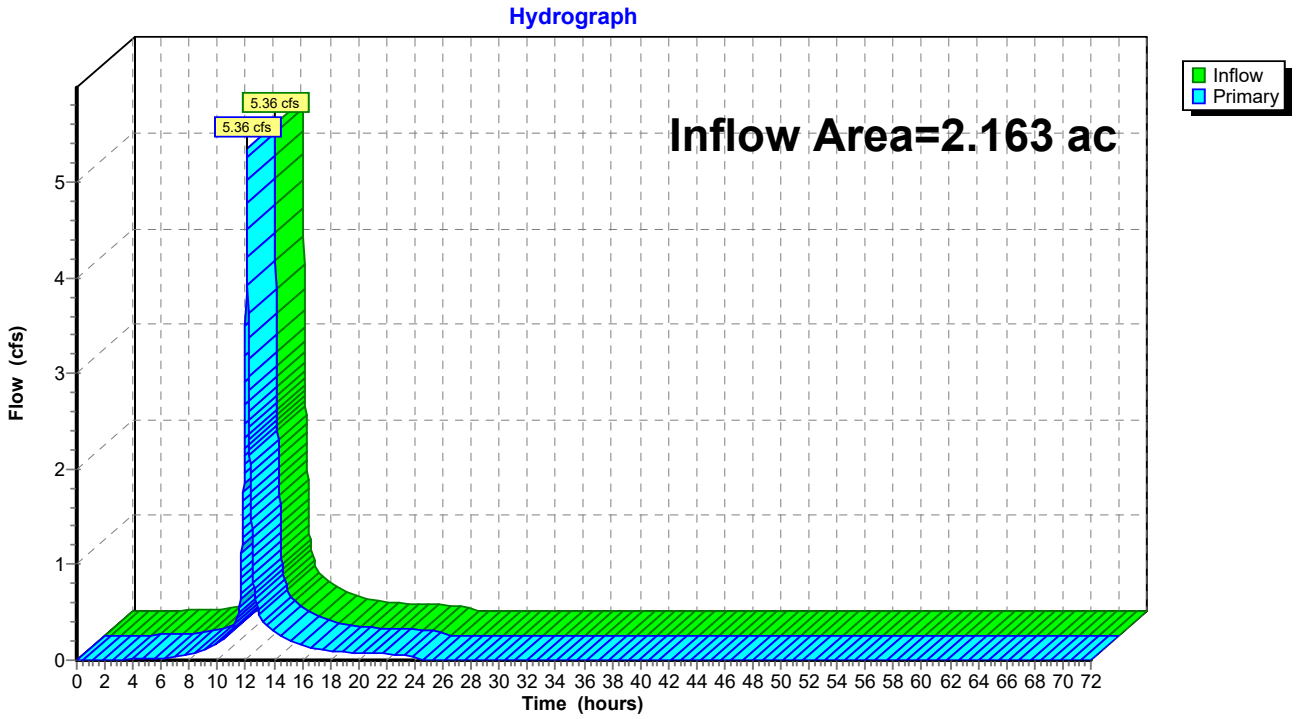


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 86.08% Impervious, Inflow Depth = 2.13" for 1-YEAR event
Inflow = 5.36 cfs @ 12.07 hrs, Volume= 0.384 af
Primary = 5.36 cfs @ 12.07 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

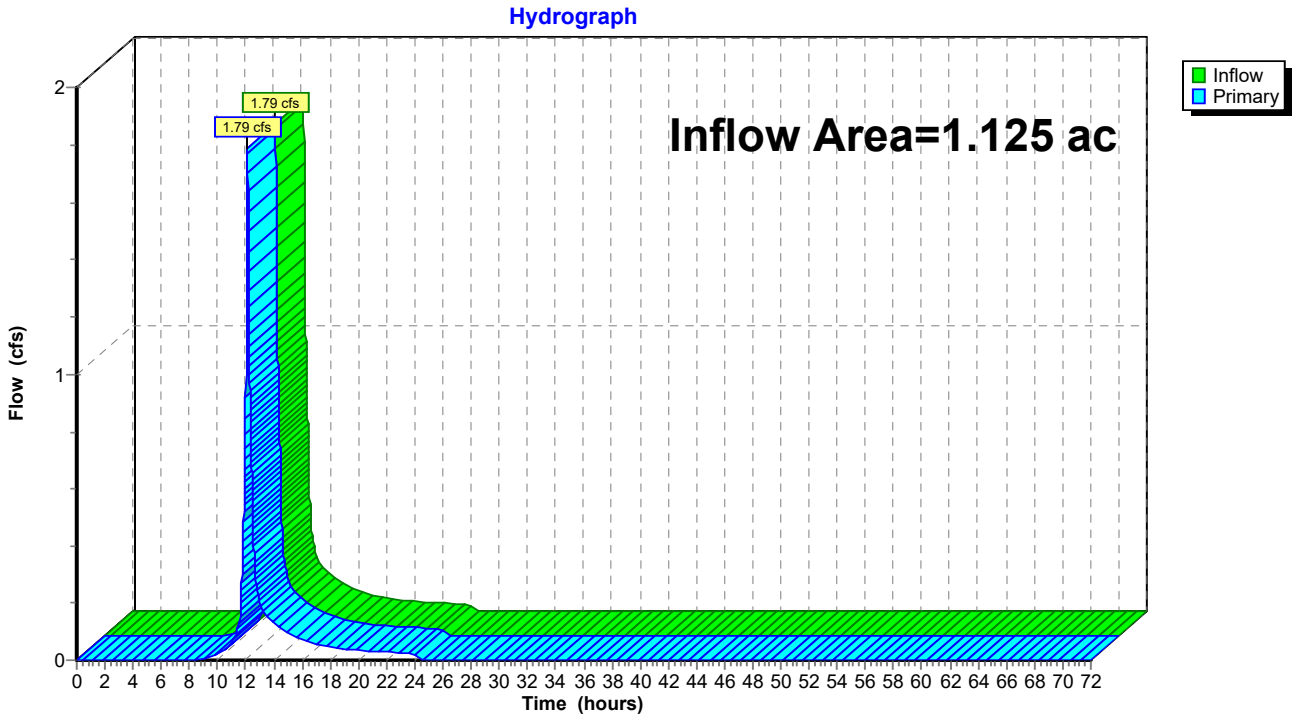


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 1.125 ac, 61.60% Impervious, Inflow Depth = 1.44" for 1-YEAR event
Inflow = 1.79 cfs @ 12.11 hrs, Volume= 0.135 af
Primary = 1.79 cfs @ 12.11 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

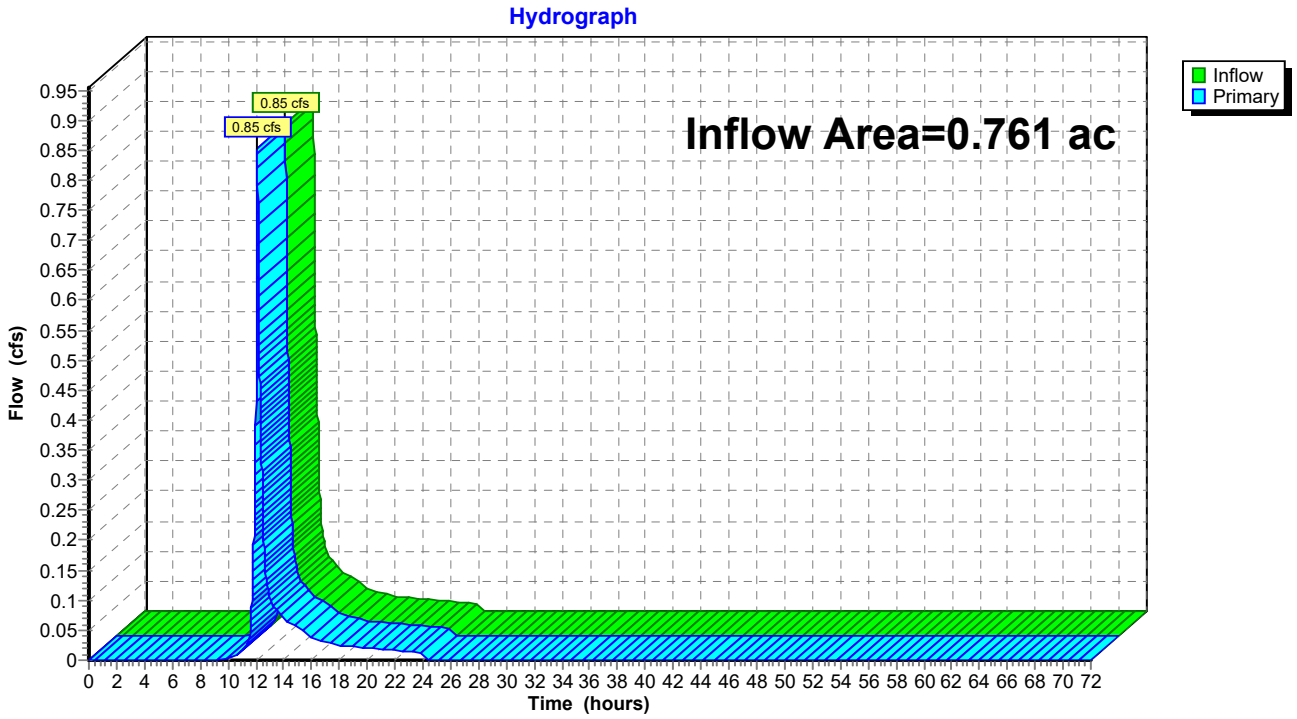


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.761 ac, 43.10% Impervious, Inflow Depth = 1.04" for 1-YEAR event
Inflow = 0.85 cfs @ 12.10 hrs, Volume= 0.066 af
Primary = 0.85 cfs @ 12.10 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

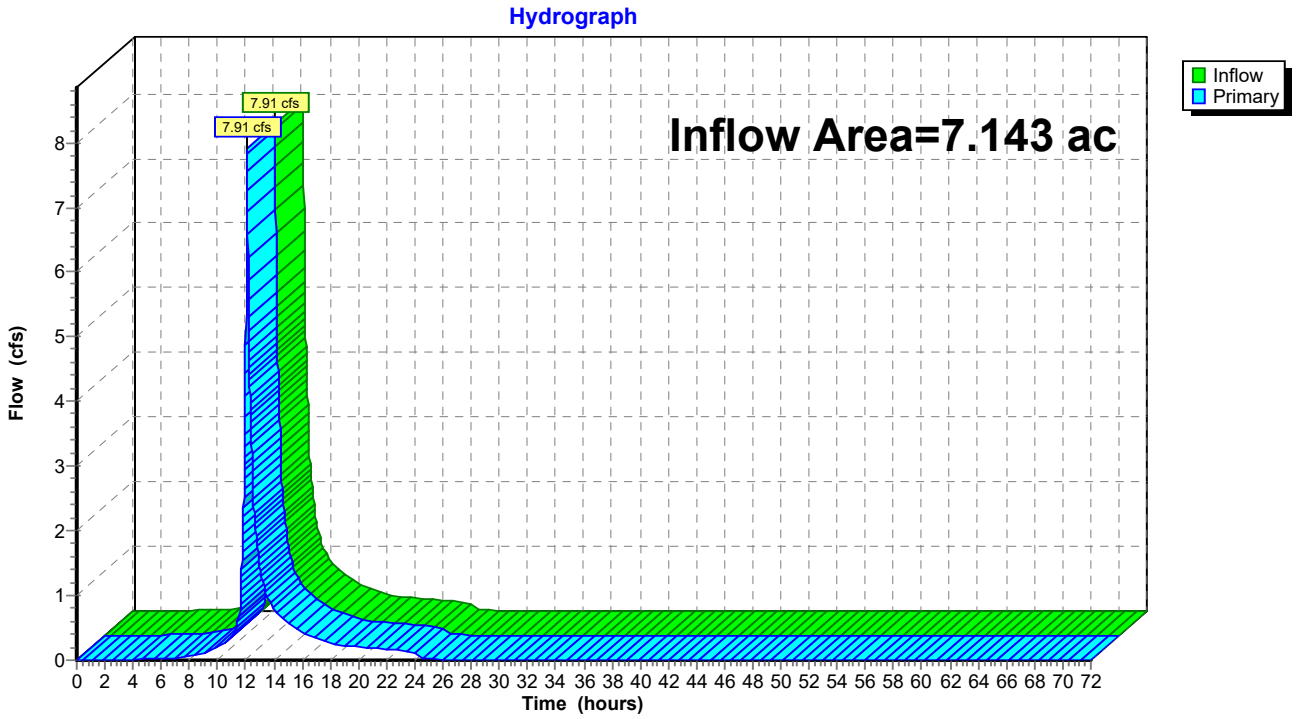


Summary for Link Hudson: Hudson River

Inflow Area = 7.143 ac, 52.71% Impervious, Inflow Depth = 1.29" for 1-YEAR event
Inflow = 7.91 cfs @ 12.08 hrs, Volume= 0.769 af
Primary = 7.91 cfs @ 12.08 hrs, Volume= 0.769 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Hudson: Hudson River



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Redeveloped Runoff Area=0.409 ac 70.17% Impervious Runoff Depth=4.08"
Flow Length=227' Slope=0.1500 '/' Tc=7.0 min CN=87 Runoff=1.84 cfs 0.139 af

SubcatchmentSA-2: Redeveloped Runoff Area=0.467 ac 56.75% Impervious Runoff Depth=3.57"
Flow Length=171' Slope=0.0500 '/' Tc=8.2 min CN=82 Runoff=1.80 cfs 0.139 af

SubcatchmentSA-3: Redeveloped Runoff Area=0.249 ac 56.63% Impervious Runoff Depth=3.57"
Flow Length=135' Slope=0.0500 '/' Tc=7.7 min CN=82 Runoff=0.98 cfs 0.074 af

SubcatchmentSA-4: Redeveloped Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=3.57"
Flow Length=158' Slope=0.0500 '/' Tc=8.0 min CN=82 Runoff=1.36 cfs 0.104 af

SubcatchmentSA-5: Redeveloped Runoff Area=0.411 ac 31.63% Impervious Runoff Depth=2.71"
Flow Length=223' Slope=0.0500 '/' Tc=5.3 min CN=73 Runoff=1.34 cfs 0.093 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.153 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=300' Slope=0.2500 '/' Tc=34.7 min CN=60 Runoff=0.14 cfs 0.021 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=4.40"
Flow Length=314' Tc=5.0 min CN=90 Runoff=0.88 cfs 0.063 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=0.567 ac 100.00% Impervious Runoff Depth=5.30"
Flow Length=701' Tc=5.0 min CN=98 Runoff=3.19 cfs 0.251 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.517 ac 93.81% Impervious Runoff Depth=4.84"
Flow Length=225' Tc=5.0 min CN=94 Runoff=2.81 cfs 0.209 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.908 ac 74.23% Impervious Runoff Depth=4.18"
Flow Length=701' Tc=5.0 min CN=88 Runoff=4.48 cfs 0.317 af

SubcatchmentSC-1: Grove Pavilion Runoff Area=4,312 sf 100.00% Impervious Runoff Depth=5.30"
Tc=5.0 min CN=98 Runoff=0.56 cfs 0.044 af

SubcatchmentSC-2: Existing Driveway Runoff Area=2.842 ac 27.55% Impervious Runoff Depth=2.53"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=5.60 cfs 0.600 af

Pond 2P: Pocket Pond Peak Elev=124.75' Storage=4,995 cf Inflow=5.81 cfs 0.630 af
Outflow=5.34 cfs 0.629 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=57.22' Inflow=1.84 cfs 0.139 af
18.0" Round Culvert n=0.013 L=51.0' S=0.0020 '/' Outflow=1.84 cfs 0.139 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.26' Inflow=1.34 cfs 0.093 af
18.0" Round Culvert n=0.013 L=86.0' S=0.2823 '/' Outflow=1.34 cfs 0.093 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=74.07' Inflow=0.88 cfs 0.063 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=0.88 cfs 0.063 af

Pond New CB-1: New ST-CB #1 Peak Elev=77.93' Inflow=4.48 cfs 0.317 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=4.48 cfs 0.317 af

Pond New CB-2: New ST-CB #2 Peak Elev=77.56' Inflow=7.29 cfs 0.525 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=7.29 cfs 0.525 af

Pond New CB-3: New ST-CB #3 Peak Elev=76.38' Inflow=10.48 cfs 0.776 af
18.0" Round Culvert n=0.013 L=85.0' S=0.0202 '/' Outflow=10.48 cfs 0.776 af

Pond New CB-6: New ST-CB #6 Peak Elev=74.00' Inflow=11.35 cfs 0.838 af
24.0" Round Culvert n=0.013 L=113.0' S=0.0041 '/' Outflow=11.35 cfs 0.838 af

Pond New SWTS: New SWTS-1 Peak Elev=73.10' Inflow=11.35 cfs 0.838 af
18.0" Round Culvert n=0.025 L=300.0' S=0.0262 '/' Outflow=11.35 cfs 0.838 af

Pond New-CB-11: New-CB-11 Peak Elev=57.18' Inflow=3.63 cfs 0.278 af
8.0" Round Culvert n=0.013 L=8.0' S=0.0062 '/' Outflow=3.63 cfs 0.278 af

Pond New-CB-12: New-CB-12 Peak Elev=51.87' Inflow=0.98 cfs 0.074 af
8.0" Round Culvert n=0.013 L=10.0' S=0.0370 '/' Outflow=0.98 cfs 0.074 af

Pond New-CB-13: New-CB-13 Peak Elev=47.88' Inflow=1.36 cfs 0.104 af
8.0" Round Culvert n=0.013 L=7.0' S=0.5757 '/' Outflow=1.36 cfs 0.104 af

Pond SC-P-1: New Pond Forebay Peak Elev=127.84' Storage=0.003 af Inflow=0.56 cfs 0.044 af
12.0" Round Culvert n=0.013 L=2.0' S=0.0400 '/' Outflow=0.56 cfs 0.044 af

Pond SC-P-2: New Dry Well Peak Elev=127.70' Storage=0.006 af Inflow=0.56 cfs 0.044 af
Discarded=0.01 cfs 0.014 af Primary=0.55 cfs 0.030 af Outflow=0.55 cfs 0.044 af

Link 1L: Flow to the North Inflow=11.35 cfs 0.838 af
Primary=11.35 cfs 0.838 af

Link 2L: Culvert to Hudson River 1 Inflow=4.61 cfs 0.352 af
Primary=4.61 cfs 0.352 af

Link 3L: Culvert to Hudson River 2 Inflow=2.65 cfs 0.197 af
Primary=2.65 cfs 0.197 af

Link Hudson: Hudson River Inflow=19.84 cfs 2.037 af
Primary=19.84 cfs 2.037 af

Total Runoff Area = 7.143 ac Runoff Volume = 2.051 af Average Runoff Depth = 3.45"
47.29% Pervious = 3.378 ac 52.71% Impervious = 3.765 ac

ent SA-1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between L

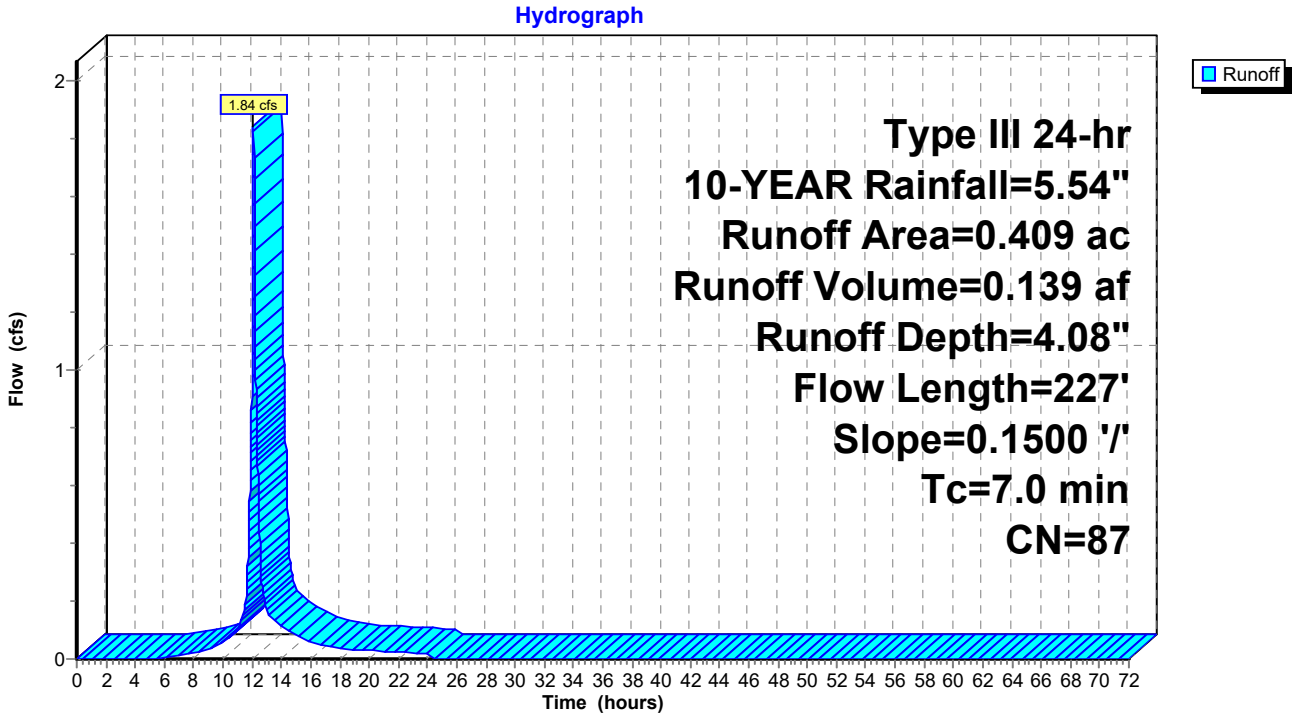
Runoff = 1.84 cfs @ 12.10 hrs, Volume= 0.139 af, Depth= 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.287	98	Paved parking, HSG B
0.122	61	>75% Grass cover, Good, HSG B
0.409	87	Weighted Average
0.122		29.83% Pervious Area
0.287		70.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.0	227	0.1500	1.91		**Lag/CN Method,**
7.0	227	Total			

1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between Lot R a



mmary for Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion o

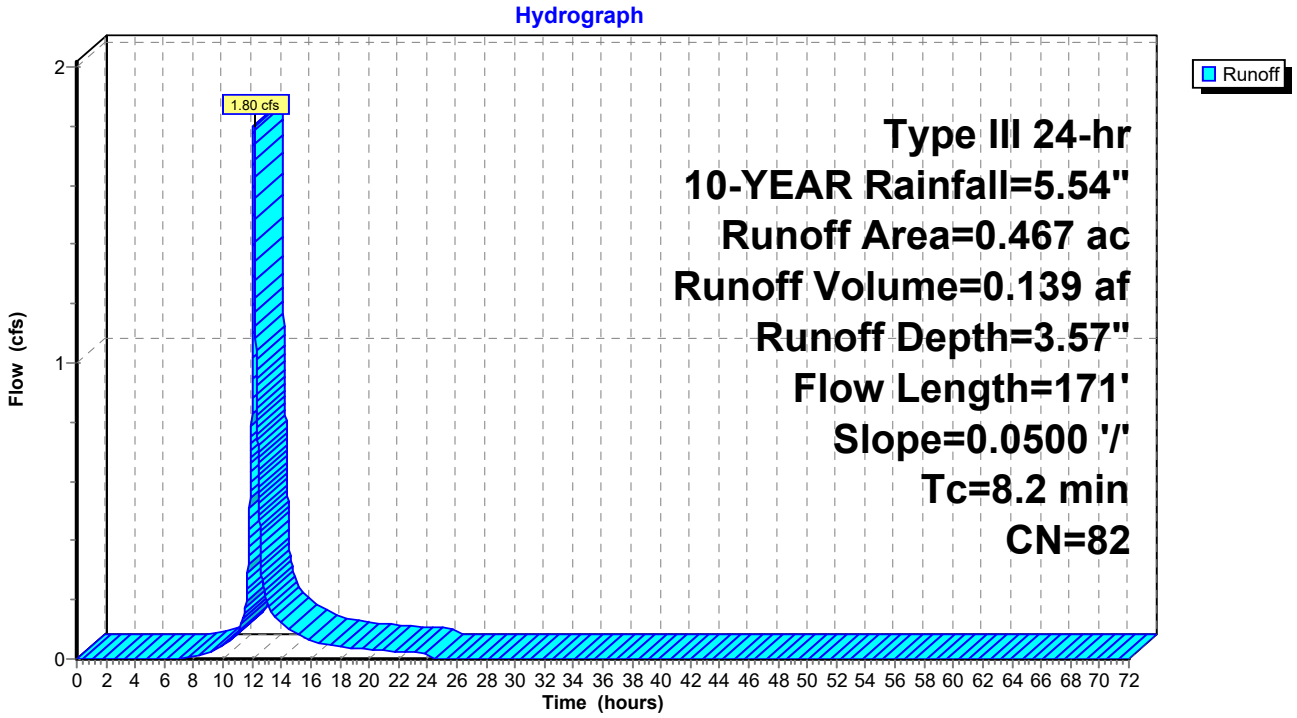
Runoff = 1.80 cfs @ 12.11 hrs, Volume= 0.139 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.265	98	Paved parking, HSG B
0.202	61	>75% Grass cover, Good, HSG B
0.467	82	Weighted Average
0.202		43.25% Pervious Area
0.265		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.2	171	0.0500	0.88		**Lag/CN Method,**
8.2	171	Total			

Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion of Lot R



Summary for Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of L

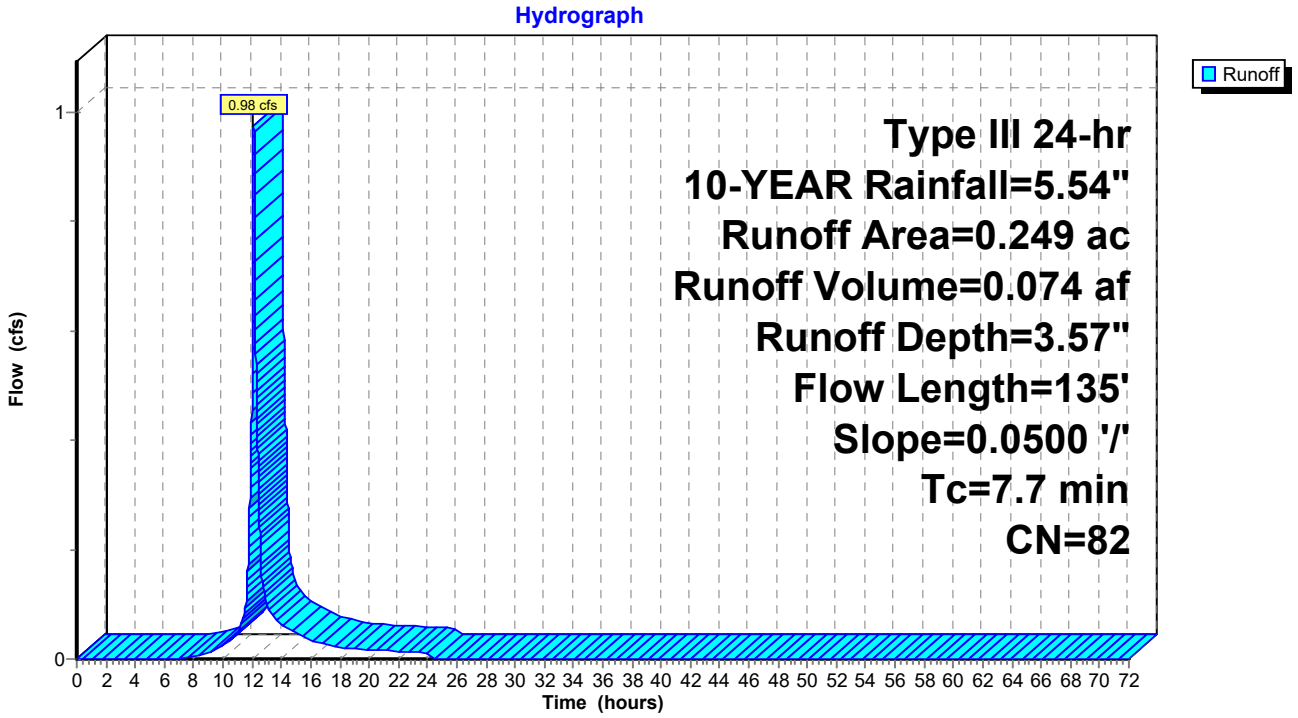
Runoff = 0.98 cfs @ 12.11 hrs, Volume= 0.074 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.141	98	Paved parking, HSG B
0.108	61	>75% Grass cover, Good, HSG B
0.249	82	Weighted Average
0.108		43.37% Pervious Area
0.141		56.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.7	135	0.0500	0.84		**Lag/CN Method,**
7.7	135	Total			

Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of Lot R



mmary for Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion o

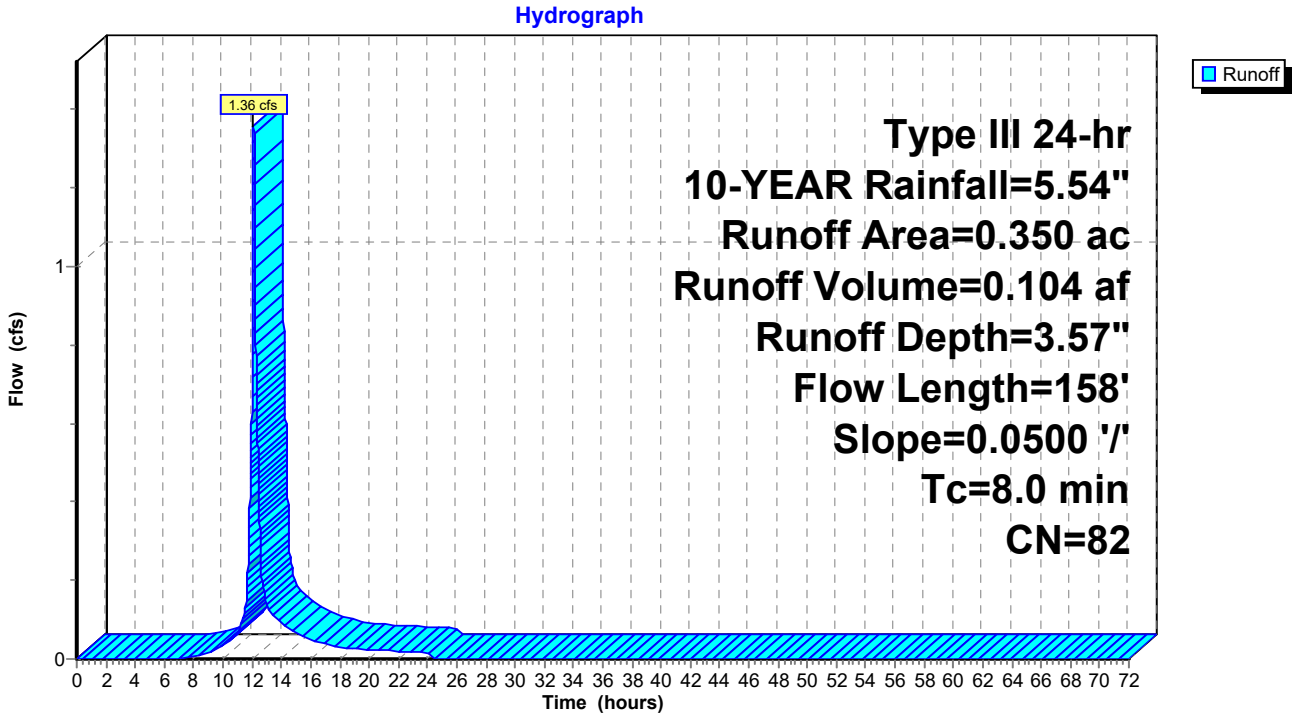
Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.104 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.198	98	Paved parking, HSG B
0.152	61	>75% Grass cover, Good, HSG B
0.350	82	Weighted Average
0.152		43.43% Pervious Area
0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.0	158	0.0500	0.86		**Lag/CN Method,**
8.0	158	Total			

Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion of Lot R



Summary for Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of L

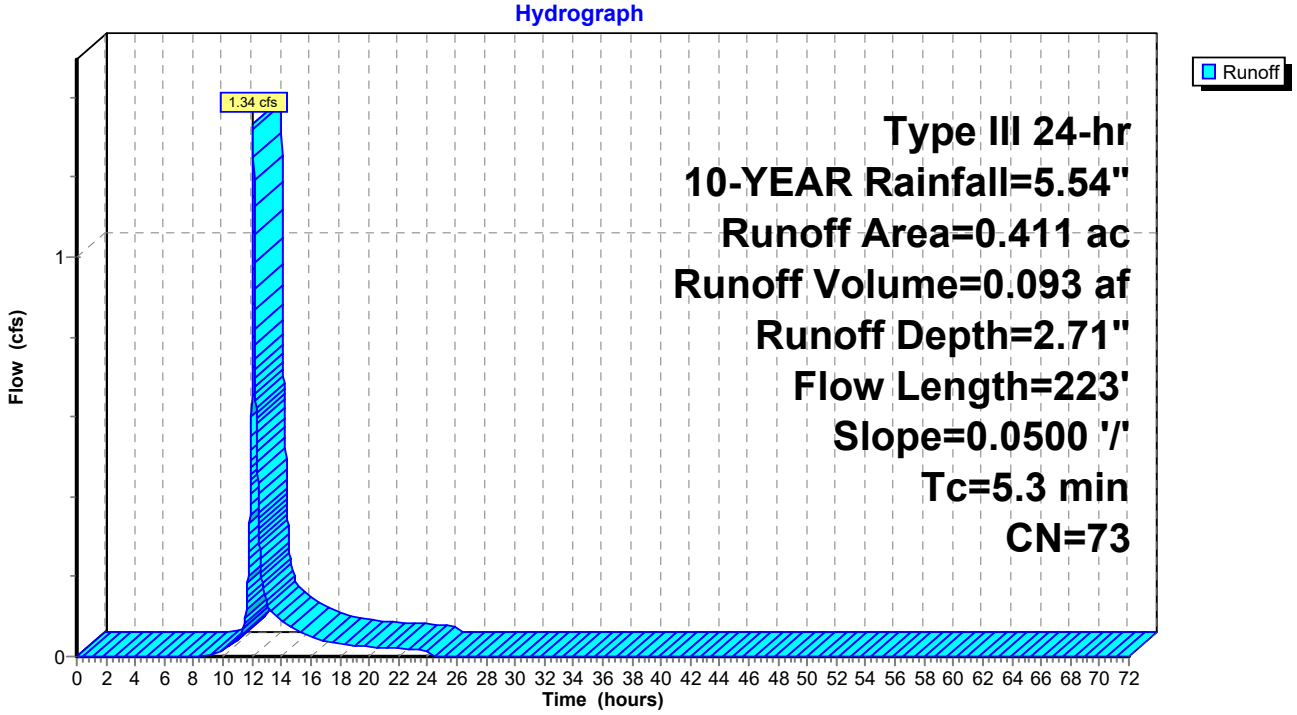
Runoff = 1.34 cfs @ 12.08 hrs, Volume= 0.093 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG B
0.281	61	>75% Grass cover, Good, HSG B
0.411	73	Weighted Average
0.281		68.37% Pervious Area
0.130		31.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	223	0.0500	0.71		**Lag/CN Method,**

Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of Lot R



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

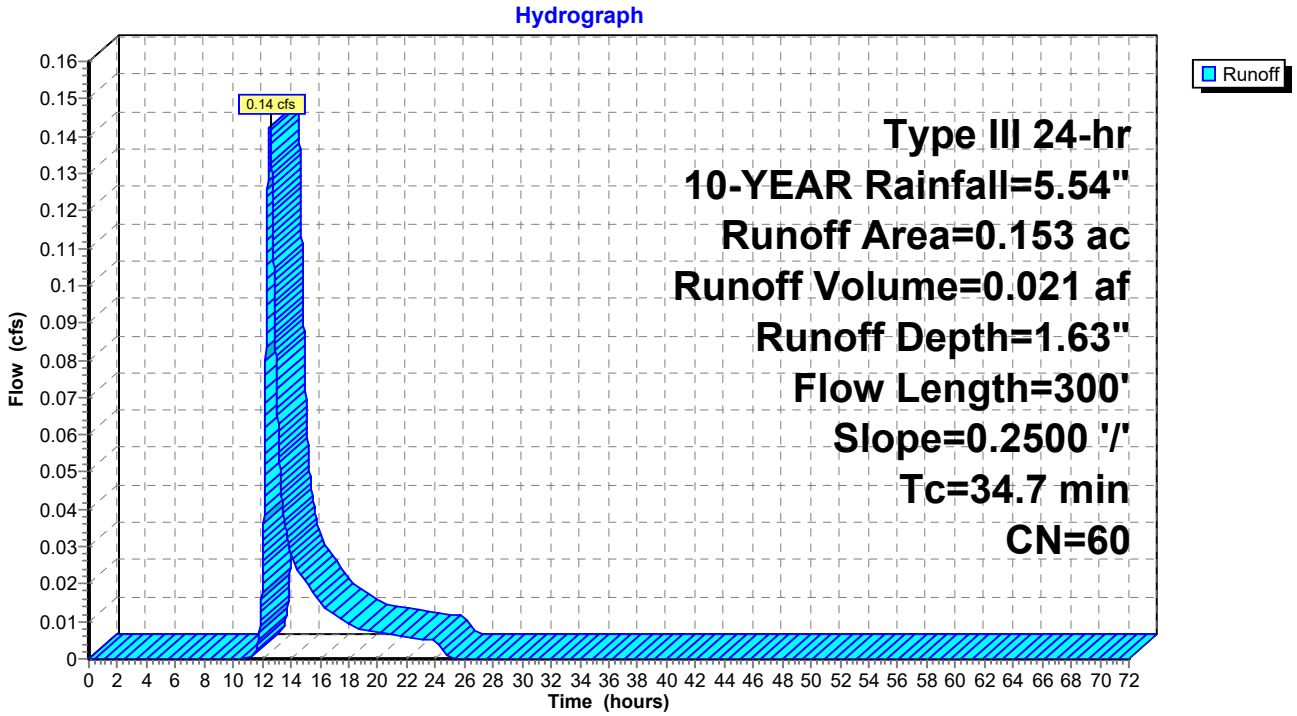
Runoff = 0.14 cfs @ 12.53 hrs, Volume= 0.021 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (ac)	CN	Description
0.153	60	Woods, Fair, HSG B
0.153		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	300	0.2500	0.14		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.85"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle

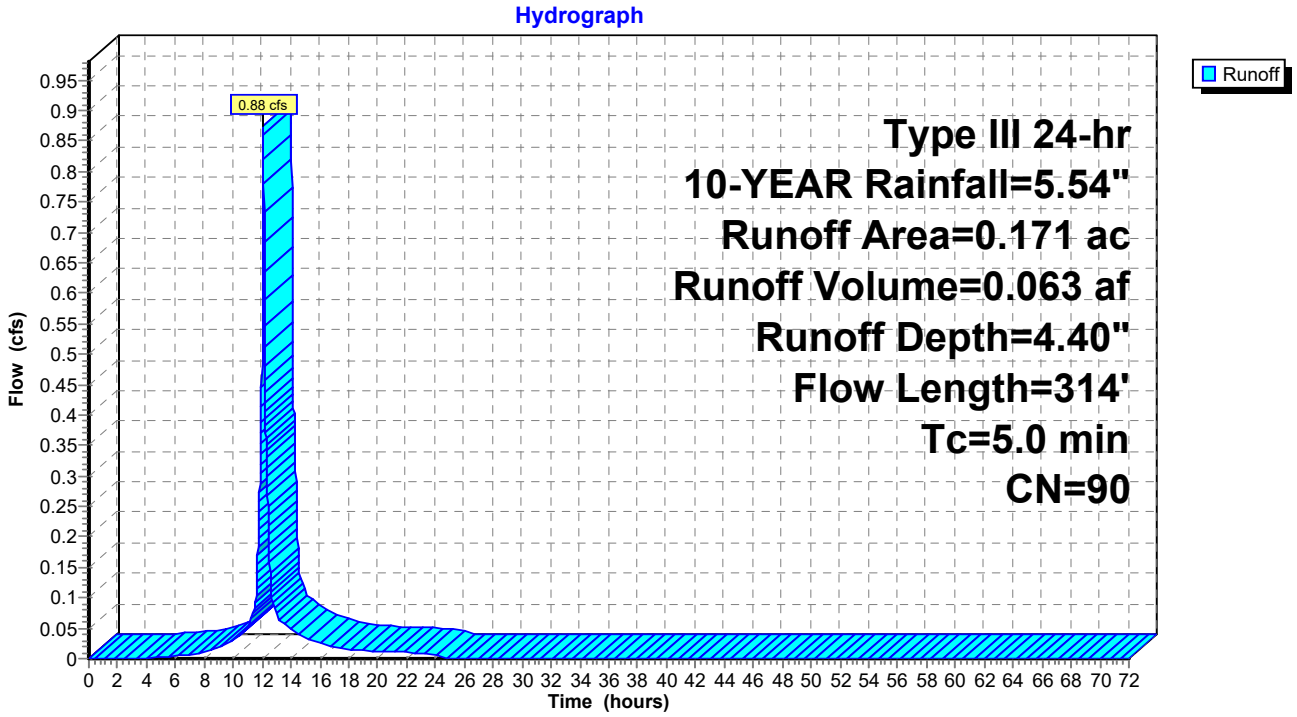
Runoff = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	300	0.0580	2.48		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
2.0	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking ais

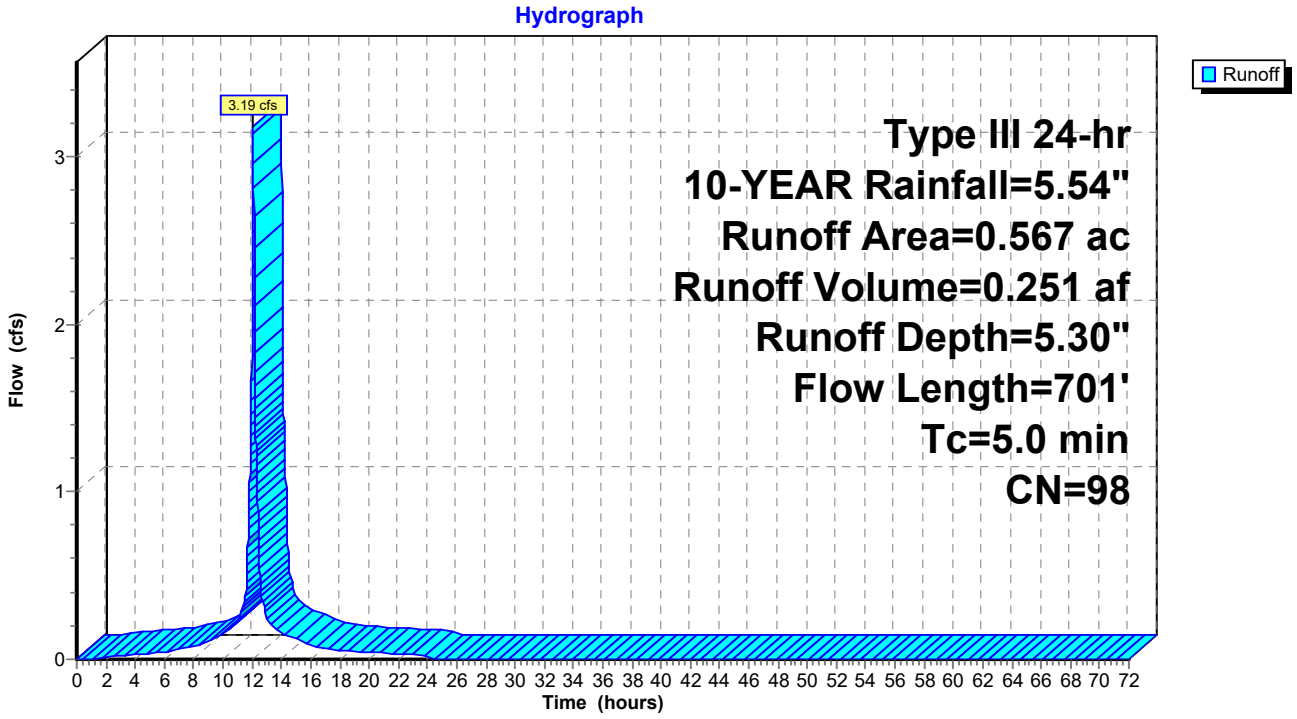
Runoff = 3.19 cfs @ 12.07 hrs, Volume= 0.251 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.567	98	
	0.567		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

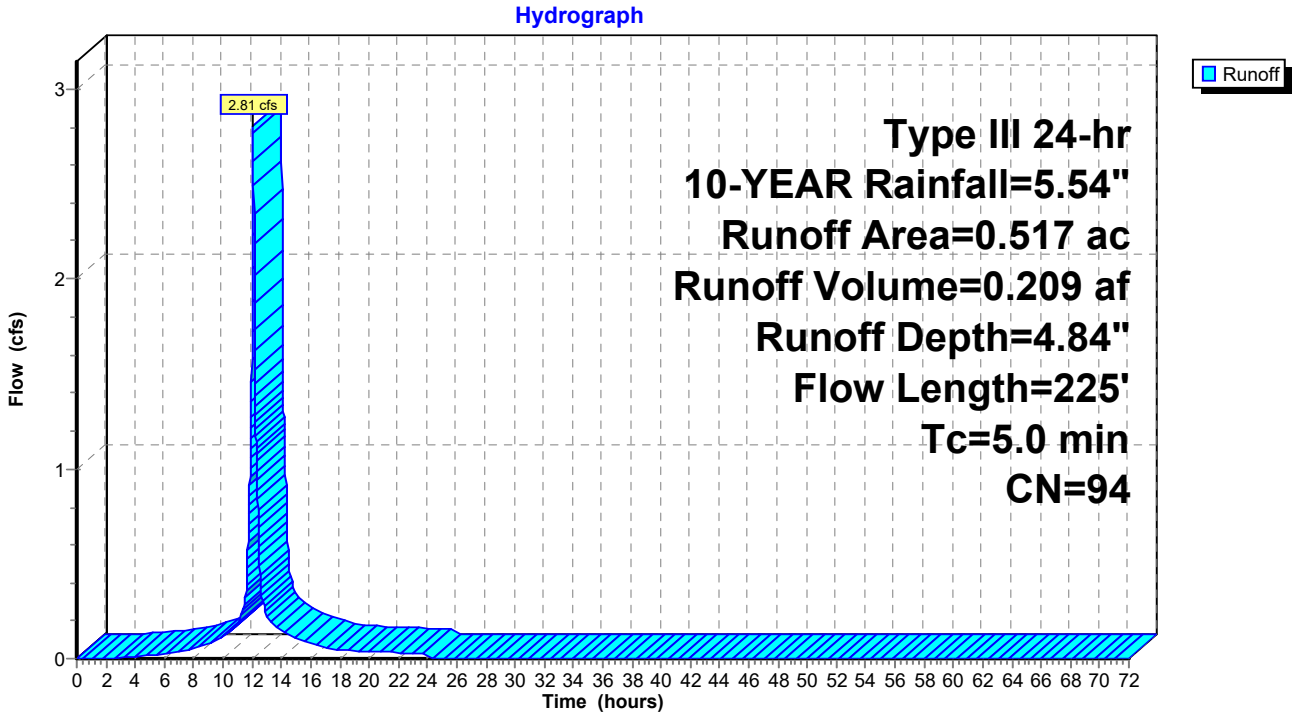
Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.209 af, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.485	98	
	0.032	39	>75% Grass cover, Good, HSG A
	0.517	94	Weighted Average
	0.032		6.19% Pervious Area
	0.485		93.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	211	0.0470	2.12		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

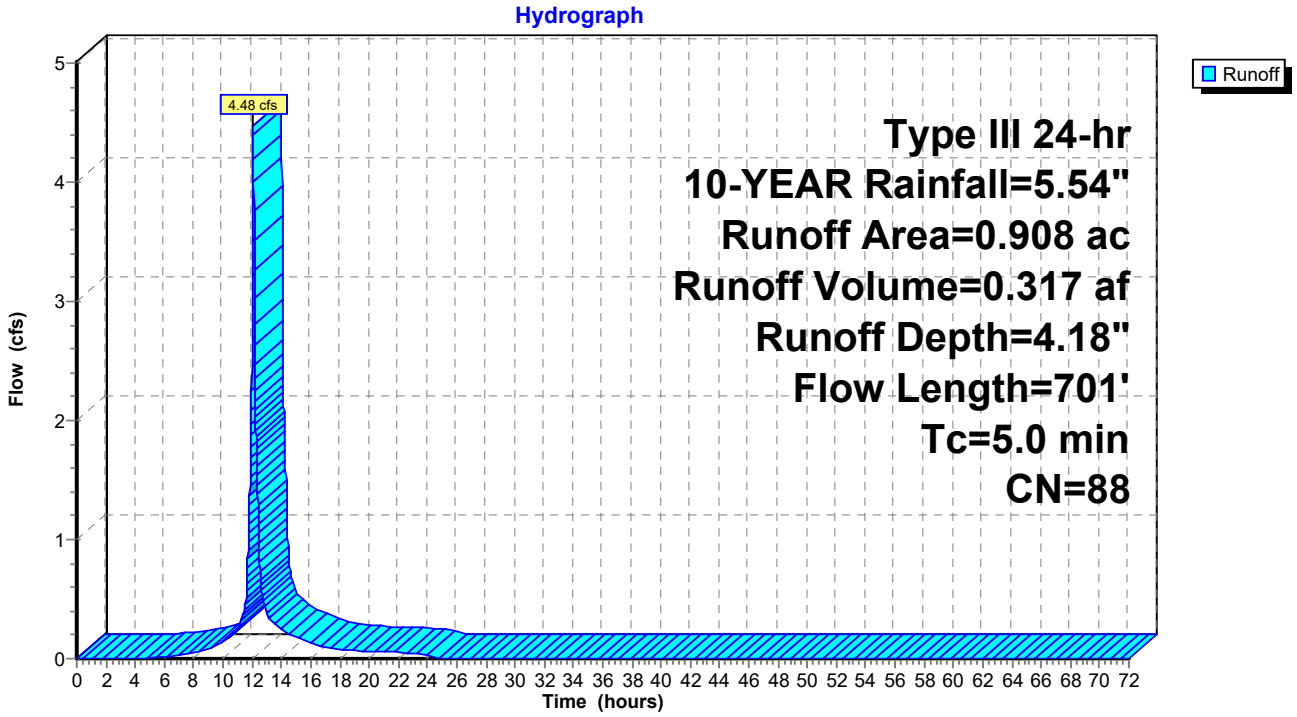
Runoff = 4.48 cfs @ 12.07 hrs, Volume= 0.317 af, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
*	0.674	98	
	0.234	61	>75% Grass cover, Good, HSG B
	0.908	88	Weighted Average
	0.234		25.77% Pervious Area
	0.674		74.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Grove Pavilion Building

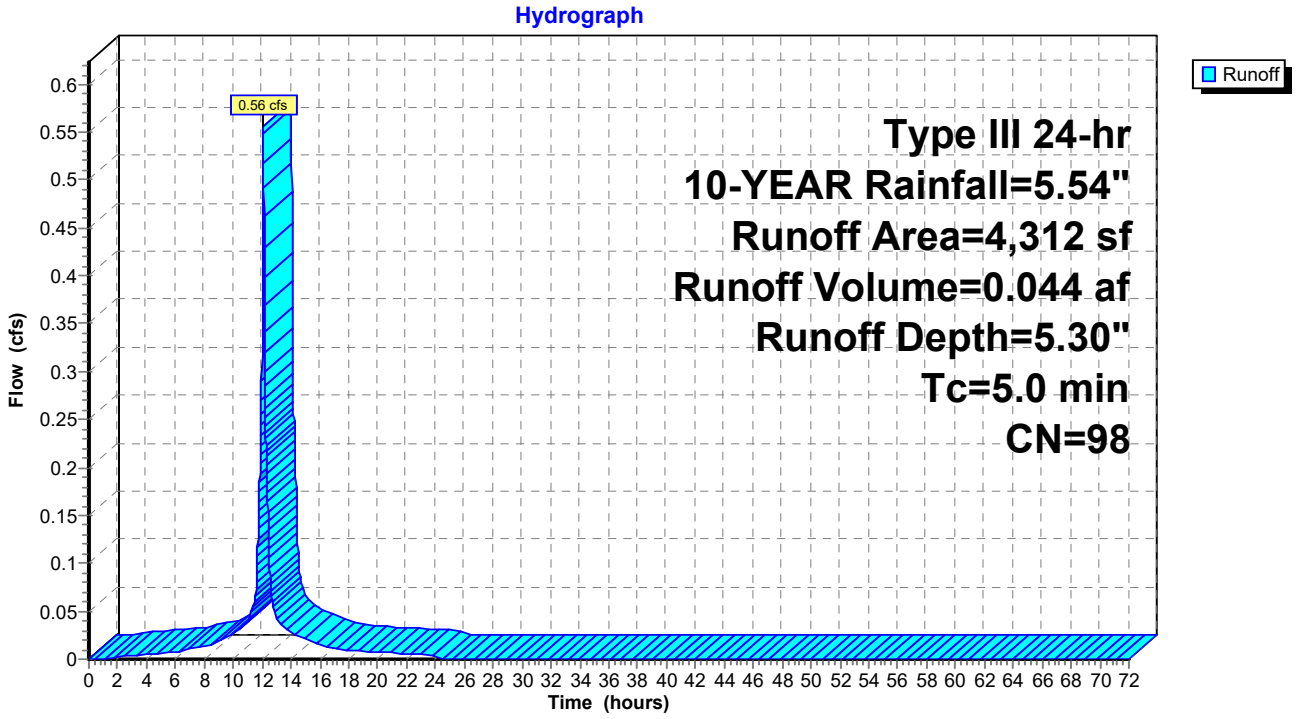
Runoff = 0.56 cfs @ 12.07 hrs, Volume= 0.044 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

Area (sf)	CN	Description
4,312	98	Roofs, HSG A
4,312		100.00% Impervious Area

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

Subcatchment SC-1: Grove Pavilion Building



Summary for Subcatchment SC-2: Existing Driveway and lawns to Pond

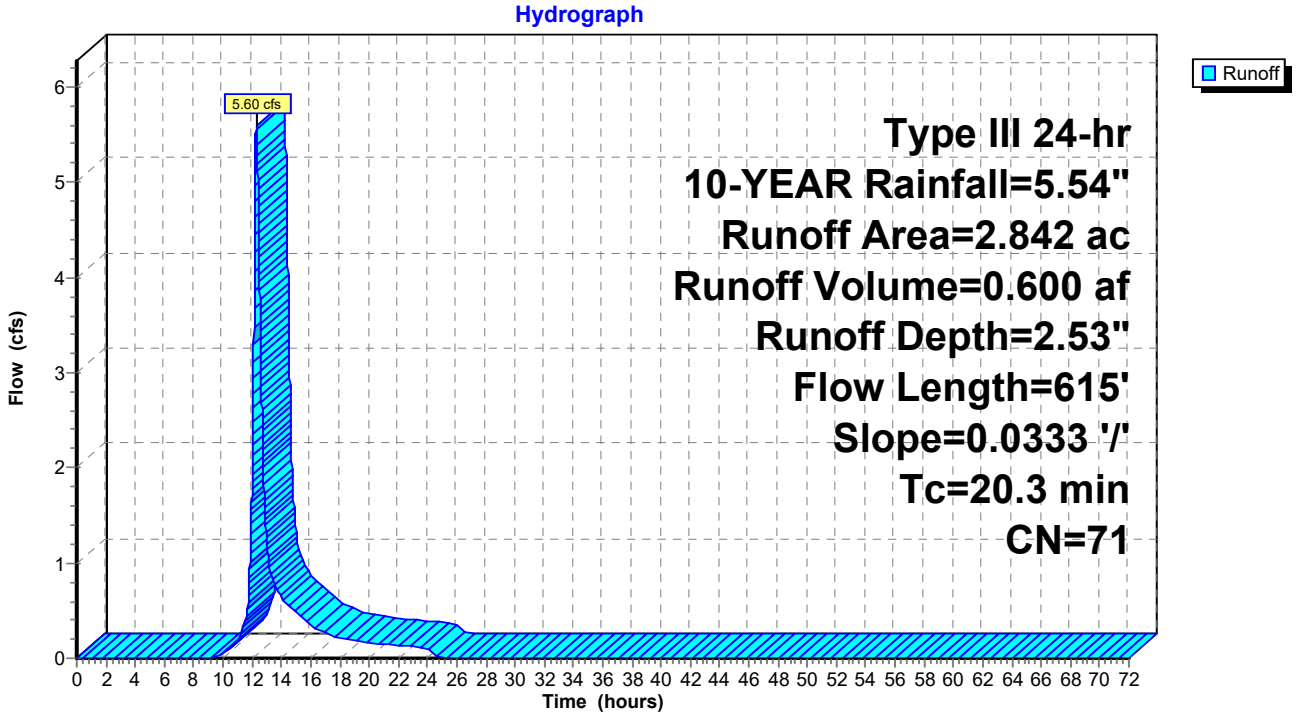
Runoff = 5.60 cfs @ 12.29 hrs, Volume= 0.600 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.54"

	Area (ac)	CN	Description
	0.679	98	Paved parking, HSG B
	2.059	61	>75% Grass cover, Good, HSG B
*	0.104	98	New walking paths
	2.842	71	Weighted Average
	2.059		72.45% Pervious Area
	0.783		27.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-2: Existing Driveway and lawns to Pond



Summary for Pond 2P: Pocket Pond

Inflow Area = 2.941 ac, 29.99% Impervious, Inflow Depth = 2.57" for 10-YEAR event
Inflow = 5.81 cfs @ 12.29 hrs, Volume= 0.630 af
Outflow = 5.34 cfs @ 12.37 hrs, Volume= 0.629 af, Atten= 8%, Lag= 5.1 min
Primary = 5.34 cfs @ 12.37 hrs, Volume= 0.629 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 123.50' Surf.Area= 3,693 sf Storage= 1,744 cf
Peak Elev= 124.75' @ 12.37 hrs Surf.Area= 4,567 sf Storage= 4,995 cf (3,251 cf above start)

Plug-Flow detention time= 72.1 min calculated for 0.589 af (94% of inflow)
Center-of-Mass det. time= 26.6 min (875.2 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,560 cf	**additional storage to main bay (Irregular)** Listed below (Recalc) x 1.25
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,438 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

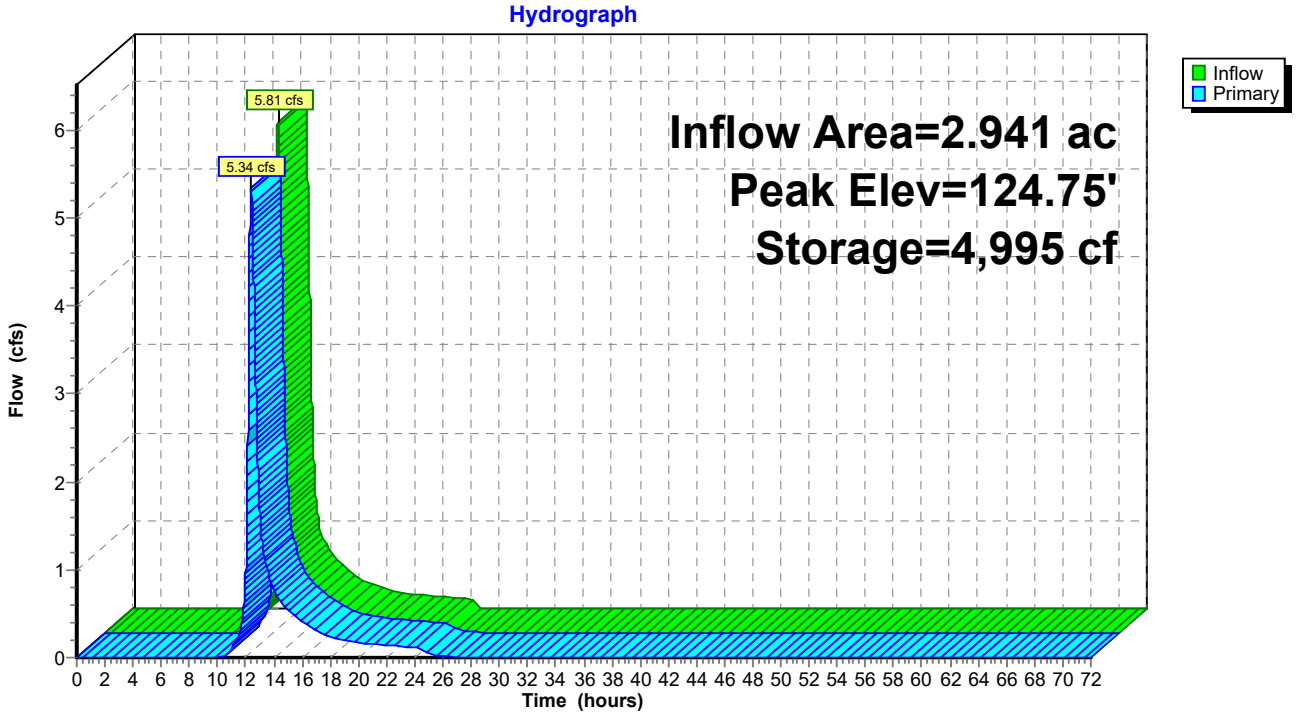
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	190	75.0	0	0	190
126.00	555	108.6	1,248	1,248	777

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.34 cfs @ 12.37 hrs HW=124.75' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Passes 5.34 cfs of 7.53 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 1.99 cfs @ 4.51 fps)
  └─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 3.35 cfs @ 2.43 fps)

Pond 2P: Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

[58] Hint: Peaked 0.73' above defined flood level

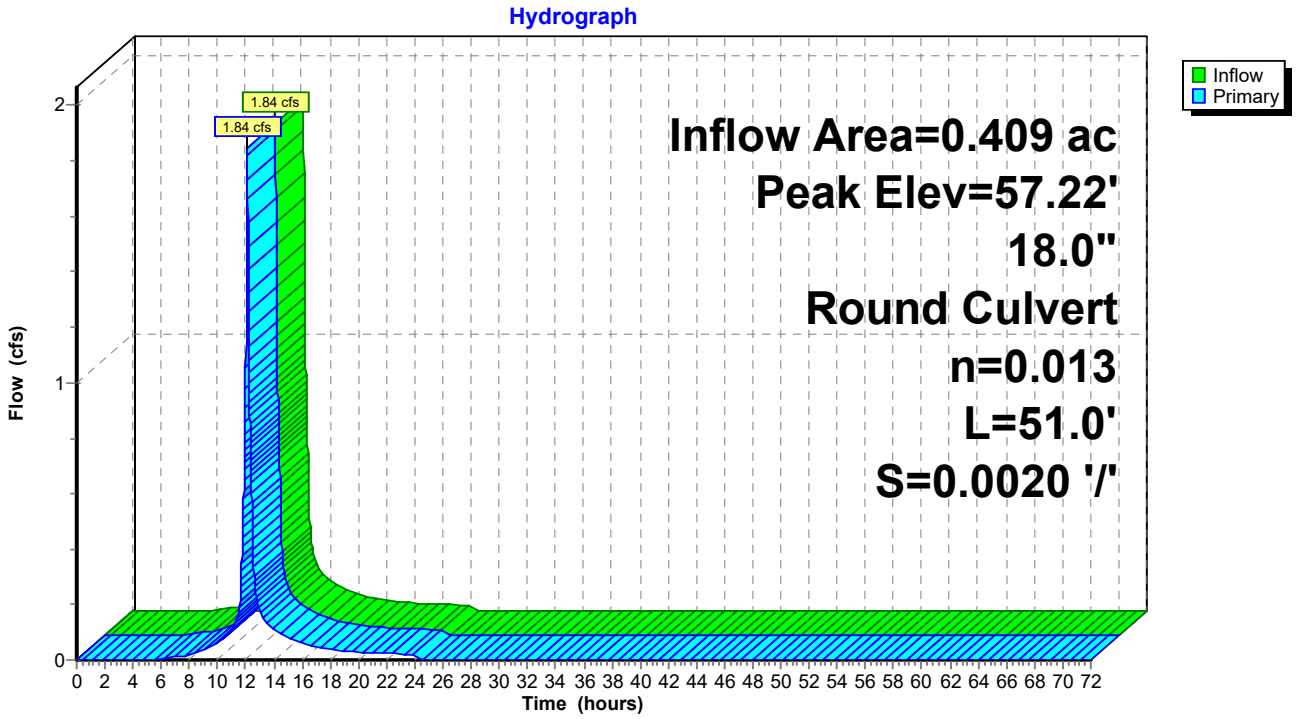
Inflow Area =	0.409 ac,	70.17% Impervious,	Inflow Depth =	4.08"	for 10-YEAR event
Inflow =	1.84 cfs @	12.10 hrs,	Volume=	0.139 af	
Outflow =	1.84 cfs @	12.10 hrs,	Volume=	0.139 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.84 cfs @	12.10 hrs,	Volume=	0.139 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 57.22' @ 12.11 hrs
Flood Elev= 56.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 52.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.84 cfs @ 12.10 hrs HW=57.18' TW=57.13' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.84 cfs @ 1.04 fps)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

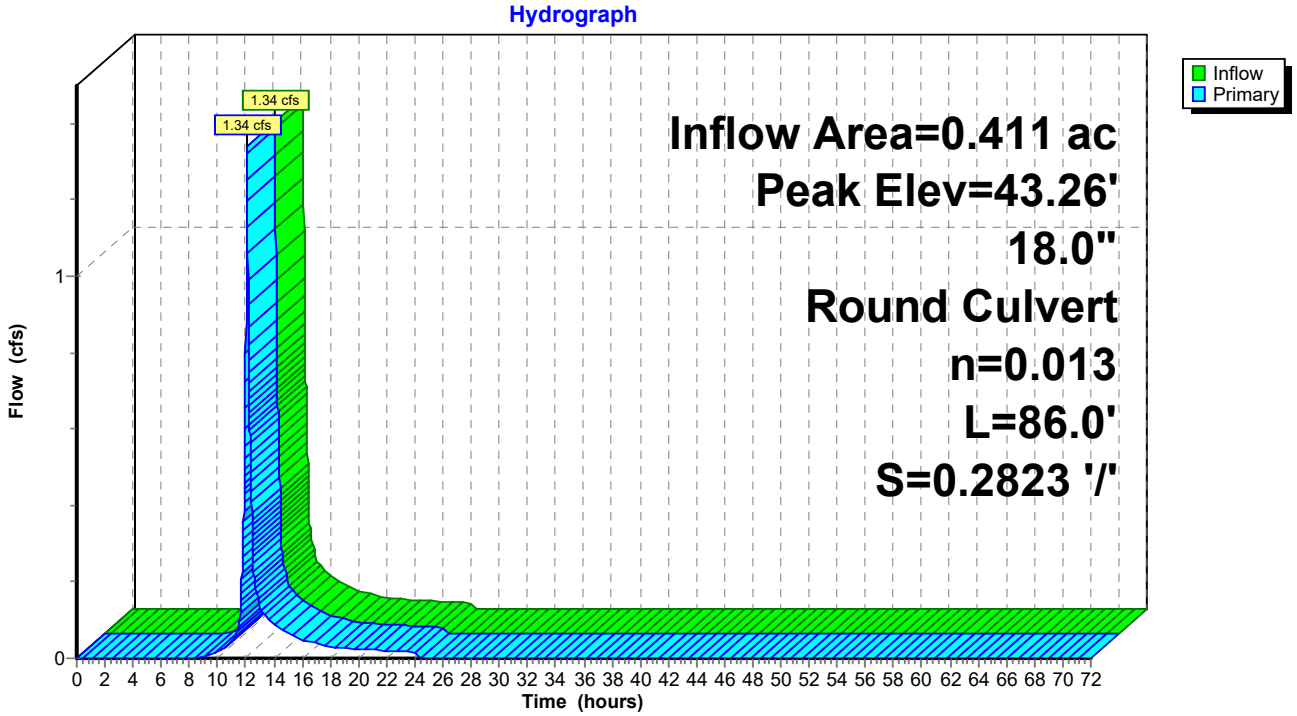
Inflow Area =	0.411 ac, 31.63% Impervious, Inflow Depth = 2.71" for 10-YEAR event				
Inflow =	1.34 cfs @	12.08 hrs,	Volume=	0.093 af	
Outflow =	1.34 cfs @	12.08 hrs,	Volume=	0.093 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.34 cfs @	12.08 hrs,	Volume=	0.093 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 43.26' @ 12.08 hrs
Flood Elev= 55.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**18.0" Round Culvert** L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2823 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=1.34 cfs @ 12.08 hrs HW=43.26' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 2.46 fps)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

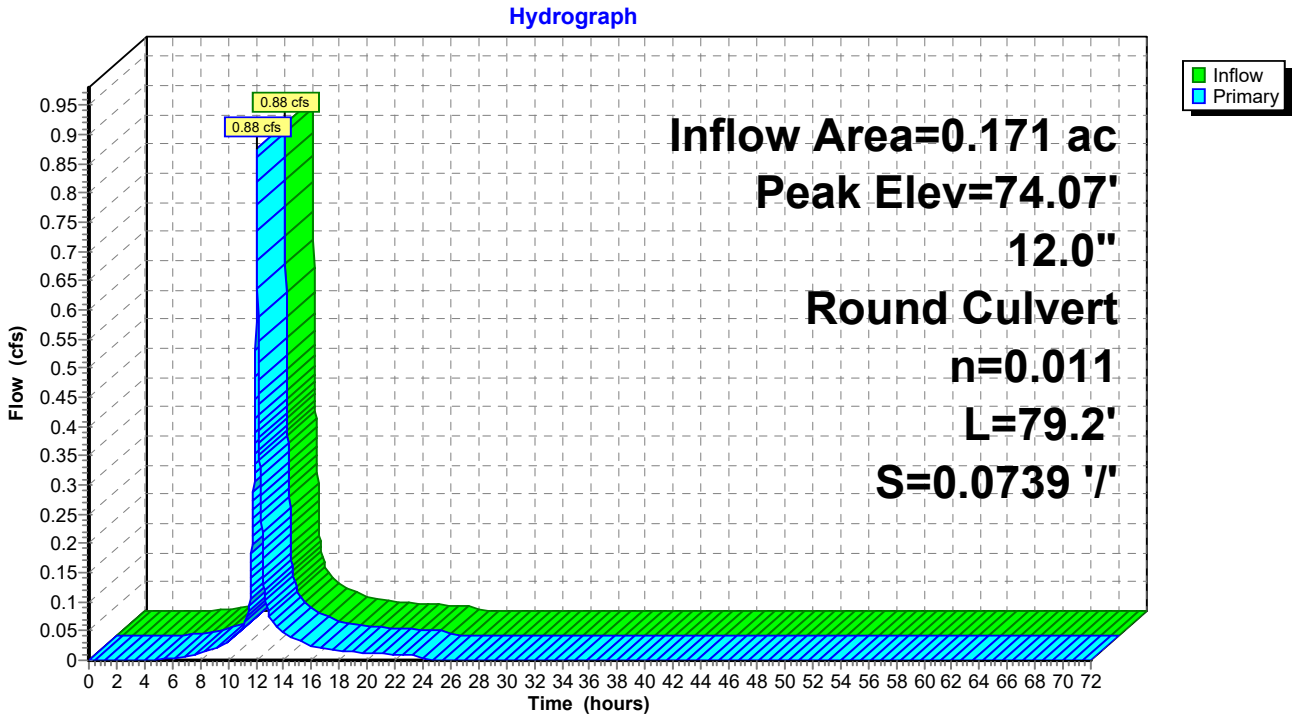
Inflow Area = 0.171 ac, 79.53% Impervious, Inflow Depth = 4.40" for 10-YEAR event
Inflow = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af
Outflow = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.07 hrs, Volume= 0.063 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 74.07' @ 12.08 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=73.82' TW=73.97' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond New CB-1: New ST-CB #1

[58] Hint: Peaked 4.60' above defined flood level

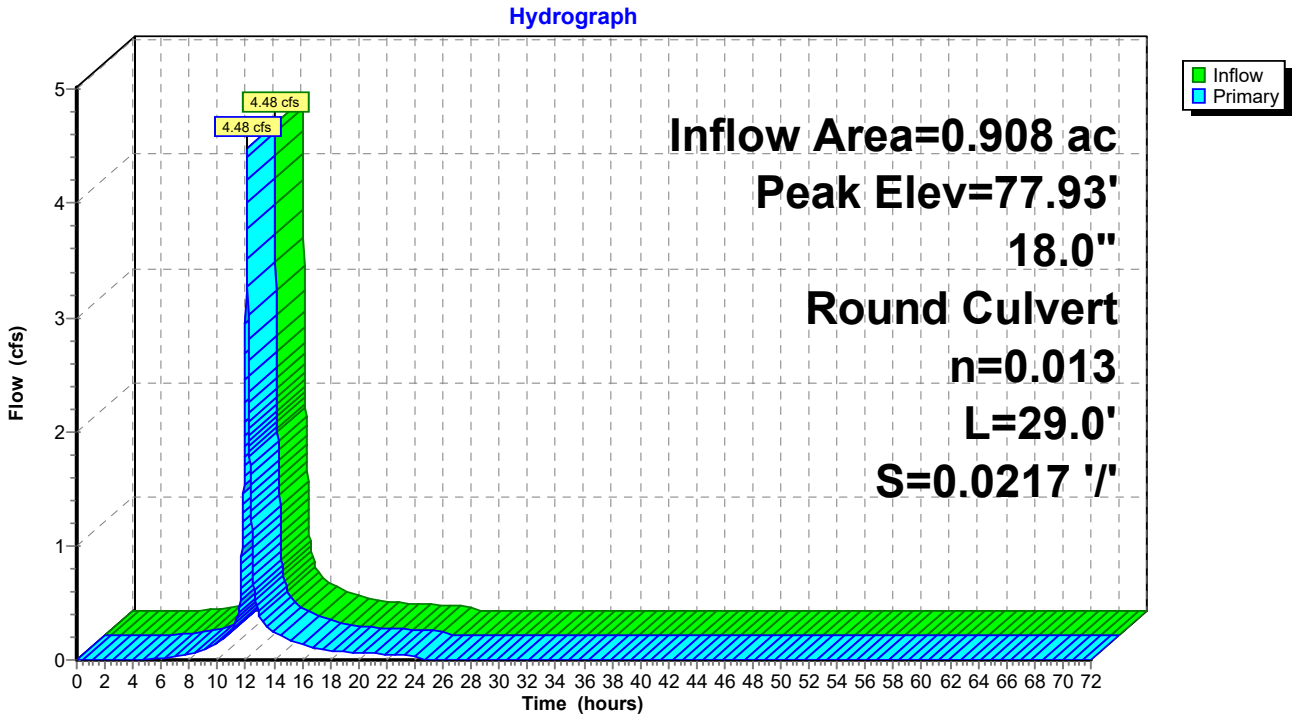
Inflow Area =	0.908 ac,	74.23% Impervious,	Inflow Depth =	4.18"	for 10-YEAR event
Inflow =	4.48 cfs @	12.07 hrs,	Volume=	0.317 af	
Outflow =	4.48 cfs @	12.07 hrs,	Volume=	0.317 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.48 cfs @	12.07 hrs,	Volume=	0.317 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 77.93' @ 12.09 hrs
Flood Elev= 73.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=77.02' TW=77.33' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Pond New CB-1: New ST-CB #1



Summary for Pond New CB-2: New ST-CB #2

[58] Hint: Peaked 4.51' above defined flood level
[80] Warning: Exceeded Pond New CB-1 by 1.26' @ 12.05 hrs (7.53 cfs 0.021 af)

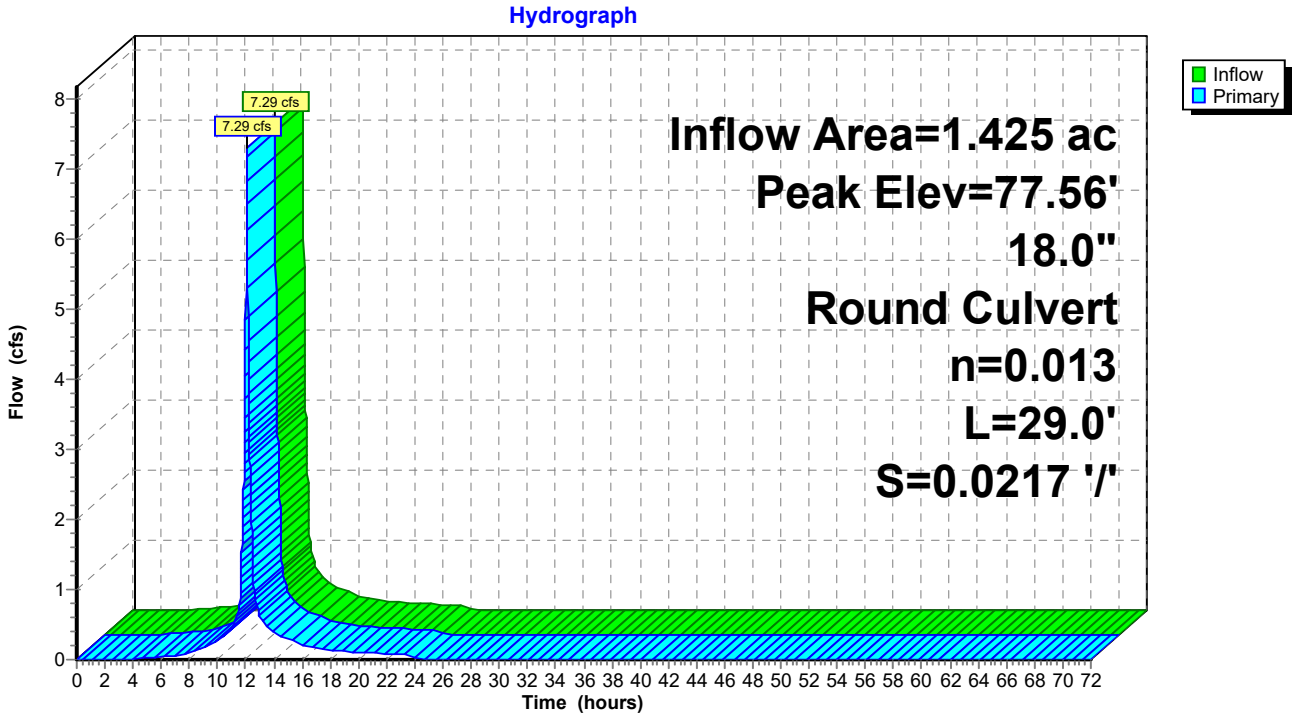
Inflow Area =	1.425 ac, 81.33% Impervious, Inflow Depth = 4.42" for 10-YEAR event				
Inflow =	7.29 cfs @	12.07 hrs,	Volume=	0.525 af	
Outflow =	7.29 cfs @	12.07 hrs,	Volume=	0.525 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.29 cfs @	12.07 hrs,	Volume=	0.525 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 77.56' @ 12.08 hrs
Flood Elev= 73.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.23 cfs @ 12.07 hrs HW=77.32' TW=76.16' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.23 cfs @ 4.09 fps)

Pond New CB-2: New ST-CB #2



Summary for Pond New CB-3: New ST-CB #3

[58] Hint: Peaked 3.60' above defined flood level

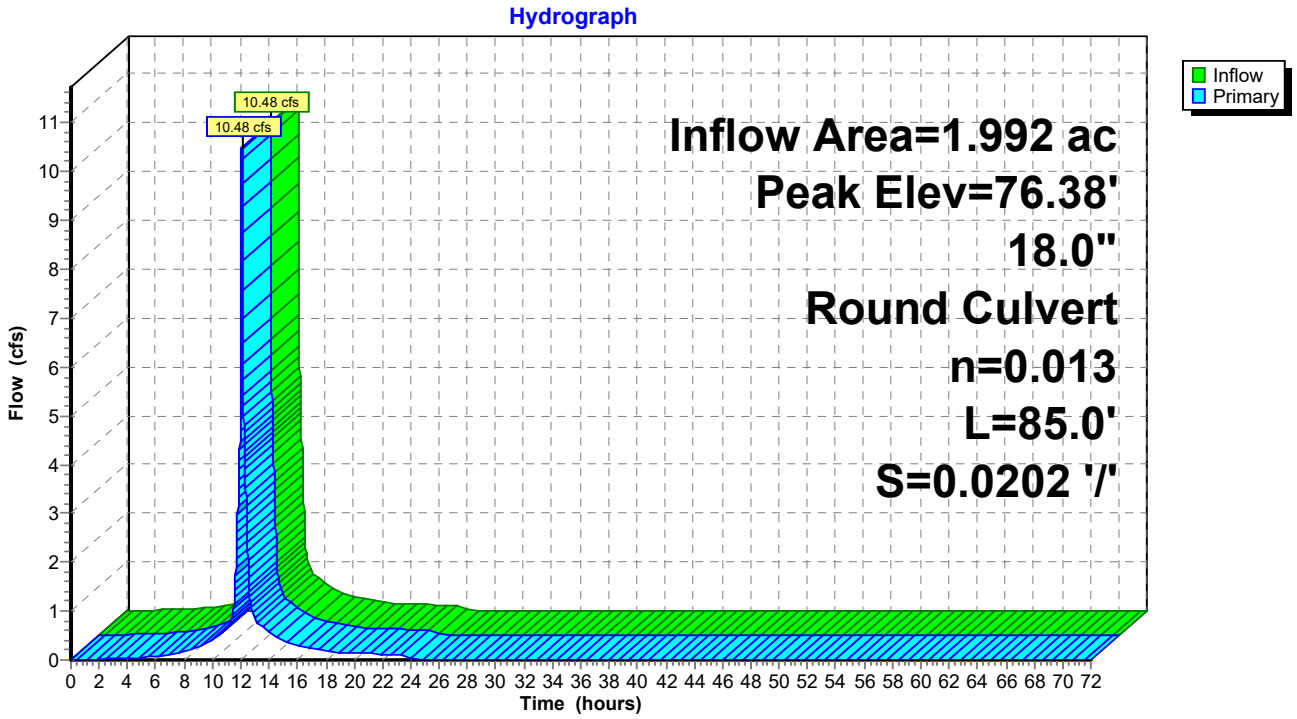
Inflow Area =	1.992 ac, 86.65% Impervious, Inflow Depth = 4.67" for 10-YEAR event				
Inflow =	10.48 cfs @ 12.07 hrs, Volume=	0.776 af			
Outflow =	10.48 cfs @ 12.07 hrs, Volume=	0.776 af, Atten= 0%, Lag= 0.0 min			
Primary =	10.48 cfs @ 12.07 hrs, Volume=	0.776 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.38' @ 12.08 hrs
Flood Elev= 72.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.92'	**18.0" Round Culvert** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.92' / 66.20' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.90 cfs @ 12.07 hrs HW=76.15' TW=73.98' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 9.90 cfs @ 5.60 fps)

Pond New CB-3: New ST-CB #3



Summary for Pond New CB-6: New ST-CB #6

[58] Hint: Peaked 1.91' above defined flood level
[80] Warning: Exceeded Pond Ex-SB-CB-1 by 0.73' @ 12.06 hrs (2.55 cfs 0.005 af)

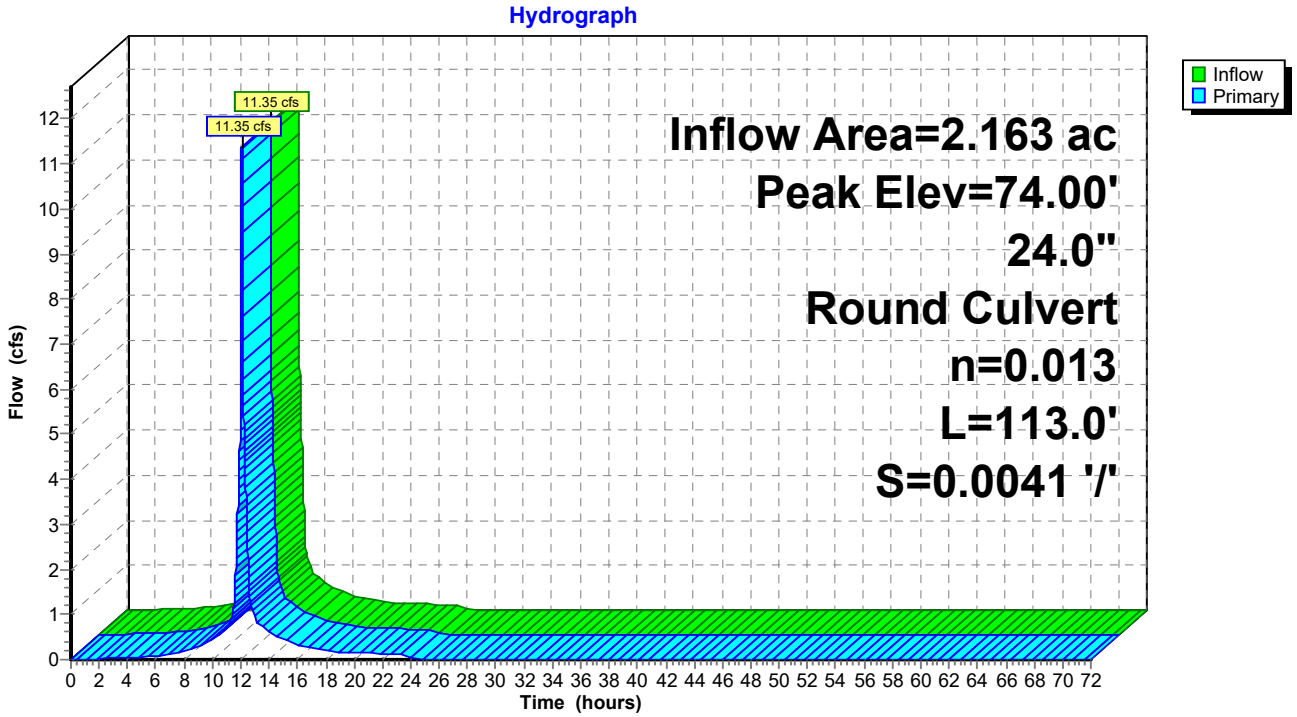
Inflow Area =	2.163 ac, 86.08% Impervious, Inflow Depth = 4.65" for 10-YEAR event				
Inflow =	11.35 cfs @	12.07 hrs,	Volume=	0.838 af	
Outflow =	11.35 cfs @	12.07 hrs,	Volume=	0.838 af,	Atten= 0%, Lag= 0.0 min
Primary =	11.35 cfs @	12.07 hrs,	Volume=	0.838 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 74.00' @ 12.07 hrs
Flood Elev= 72.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 65.24' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.34 cfs @ 12.07 hrs HW=73.98' TW=73.08' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 11.34 cfs @ 3.61 fps)

Pond New CB-6: New ST-CB #6



Summary for Pond New SWTS: New SWTS-1

[58] Hint: Peaked 1.86' above defined flood level

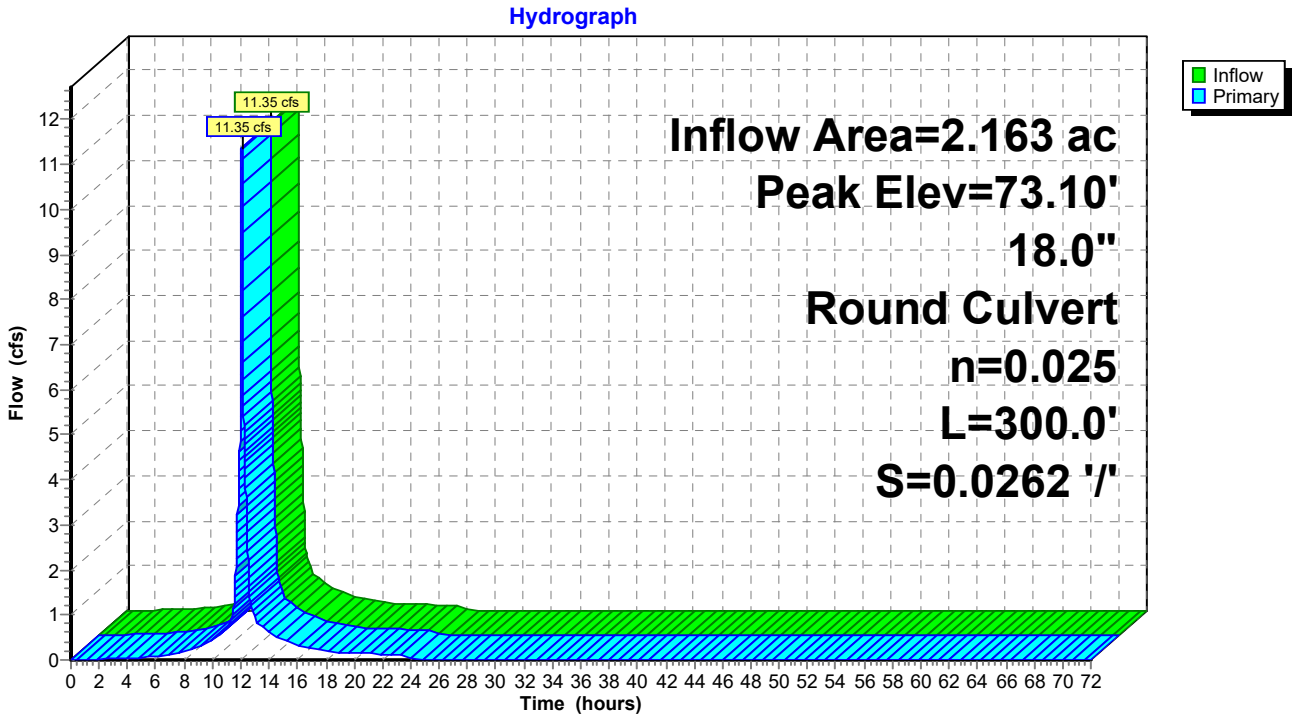
Inflow Area =	2.163 ac, 86.08% Impervious, Inflow Depth = 4.65" for 10-YEAR event				
Inflow =	11.35 cfs @ 12.07 hrs, Volume=	0.838 af			
Outflow =	11.35 cfs @ 12.07 hrs, Volume=	0.838 af, Atten= 0%, Lag= 0.0 min			
Primary =	11.35 cfs @ 12.07 hrs, Volume=	0.838 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 73.10' @ 12.07 hrs
Flood Elev= 71.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.24'	**18.0" Round Culvert** L= 300.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.24' / 57.38' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=11.34 cfs @ 12.07 hrs HW=73.08' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 11.34 cfs @ 6.42 fps)

Pond New SWTS: New SWTS-1



Summary for Pond New-CB-11: New-CB-11

[58] Hint: Peaked 1.88' above defined flood level

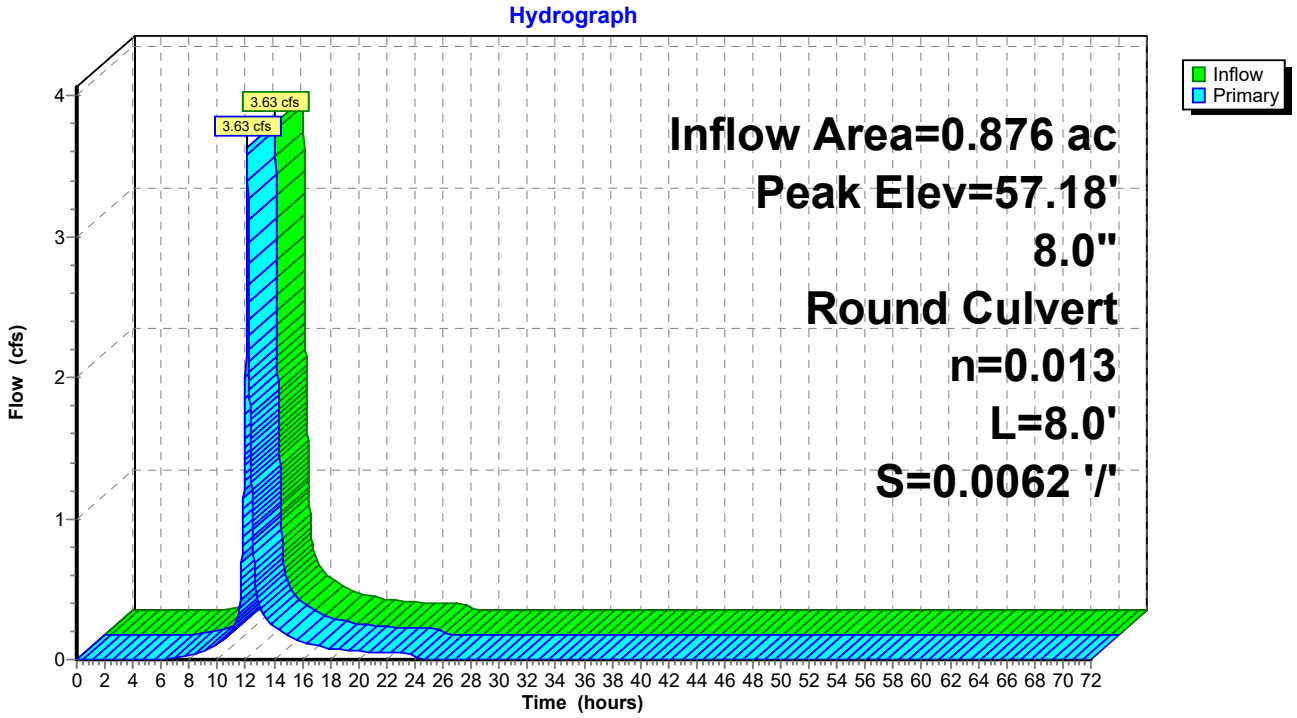
Inflow Area =	0.876 ac, 63.01% Impervious, Inflow Depth = 3.81" for 10-YEAR event				
Inflow =	3.63 cfs @ 12.11 hrs, Volume=	0.278 af			
Outflow =	3.63 cfs @ 12.11 hrs, Volume=	0.278 af, Atten= 0%, Lag= 0.0 min			
Primary =	3.63 cfs @ 12.11 hrs, Volume=	0.278 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 57.18' @ 12.11 hrs
Flood Elev= 55.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.18'	**8.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.18' / 52.13' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=3.62 cfs @ 12.11 hrs HW=57.16' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.62 cfs @ 10.38 fps)

Pond New-CB-11: New-CB-11



Summary for Pond New-CB-12: New-CB-12

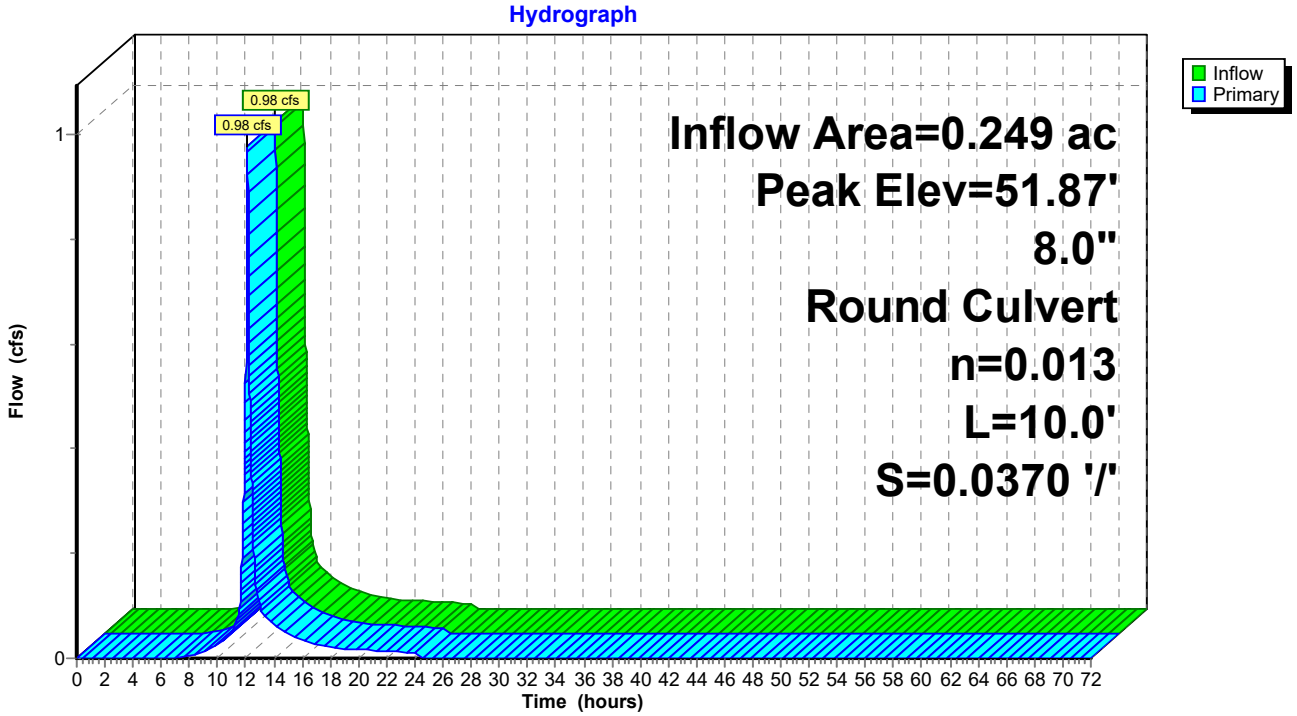
Inflow Area =	0.249 ac, 56.63% Impervious, Inflow Depth = 3.57" for 10-YEAR event				
Inflow =	0.98 cfs @	12.11 hrs,	Volume=	0.074 af	
Outflow =	0.98 cfs @	12.11 hrs,	Volume=	0.074 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.98 cfs @	12.11 hrs,	Volume=	0.074 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 51.87' @ 12.11 hrs
Flood Elev= 56.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.00'	**8.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.00' / 50.63' S= 0.0370 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.98 cfs @ 12.11 hrs HW=51.87' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.98 cfs @ 2.80 fps)

Pond New-CB-12: New-CB-12



Summary for Pond New-CB-13: New-CB-13

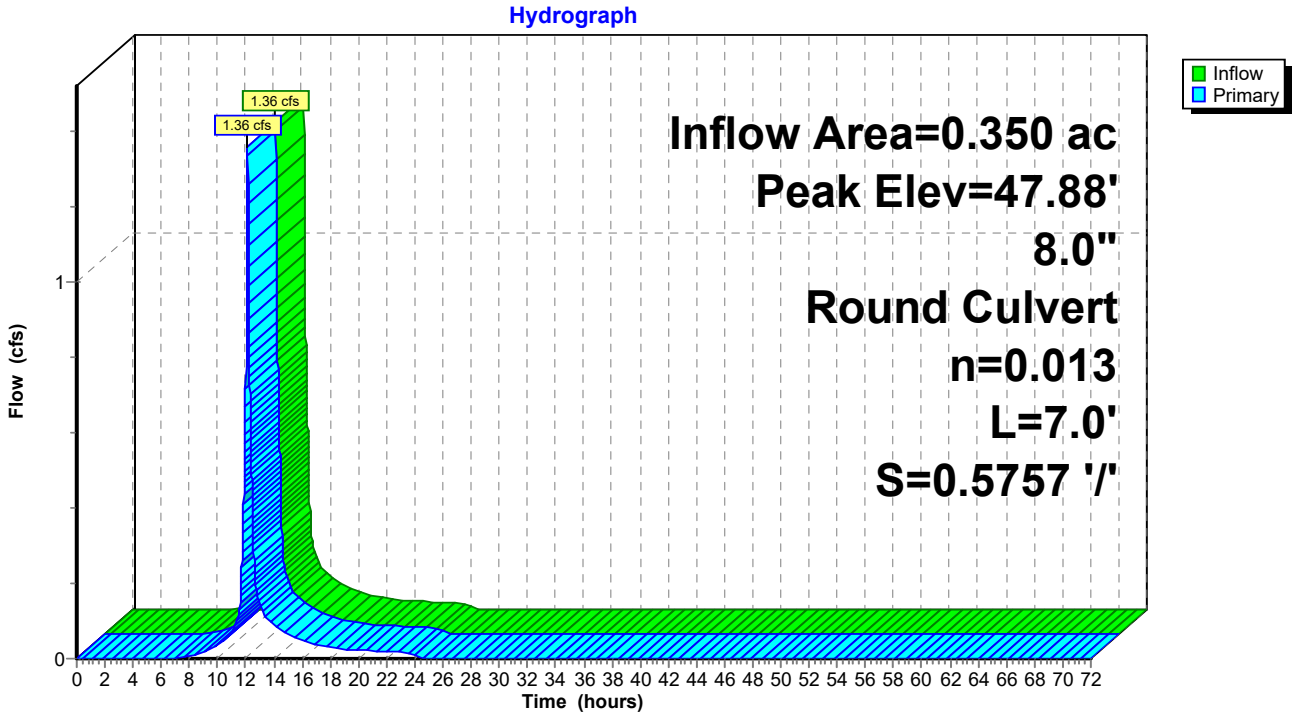
Inflow Area = 0.350 ac, 56.57% Impervious, Inflow Depth = 3.57" for 10-YEAR event
Inflow = 1.36 cfs @ 12.11 hrs, Volume= 0.104 af
Outflow = 1.36 cfs @ 12.11 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
Primary = 1.36 cfs @ 12.11 hrs, Volume= 0.104 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 47.88' @ 12.11 hrs
Flood Elev= 55.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.89'	**8.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.89' / 42.86' S= 0.5757 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.36 cfs @ 12.11 hrs HW=47.87' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.36 cfs @ 3.89 fps)

Pond New-CB-13: New-CB-13



Summary for Pond SC-P-1: New Pond Forebay

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 5.30" for 10-YEAR event
Inflow = 0.56 cfs @ 12.07 hrs, Volume= 0.044 af
Outflow = 0.56 cfs @ 12.07 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.2 min
Primary = 0.56 cfs @ 12.07 hrs, Volume= 0.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 127.33' Surf.Area= 0.001 ac Storage= 0.003 af
Peak Elev= 127.84' @ 12.08 hrs Surf.Area= 0.001 ac Storage= 0.003 af (0.000 af above start)

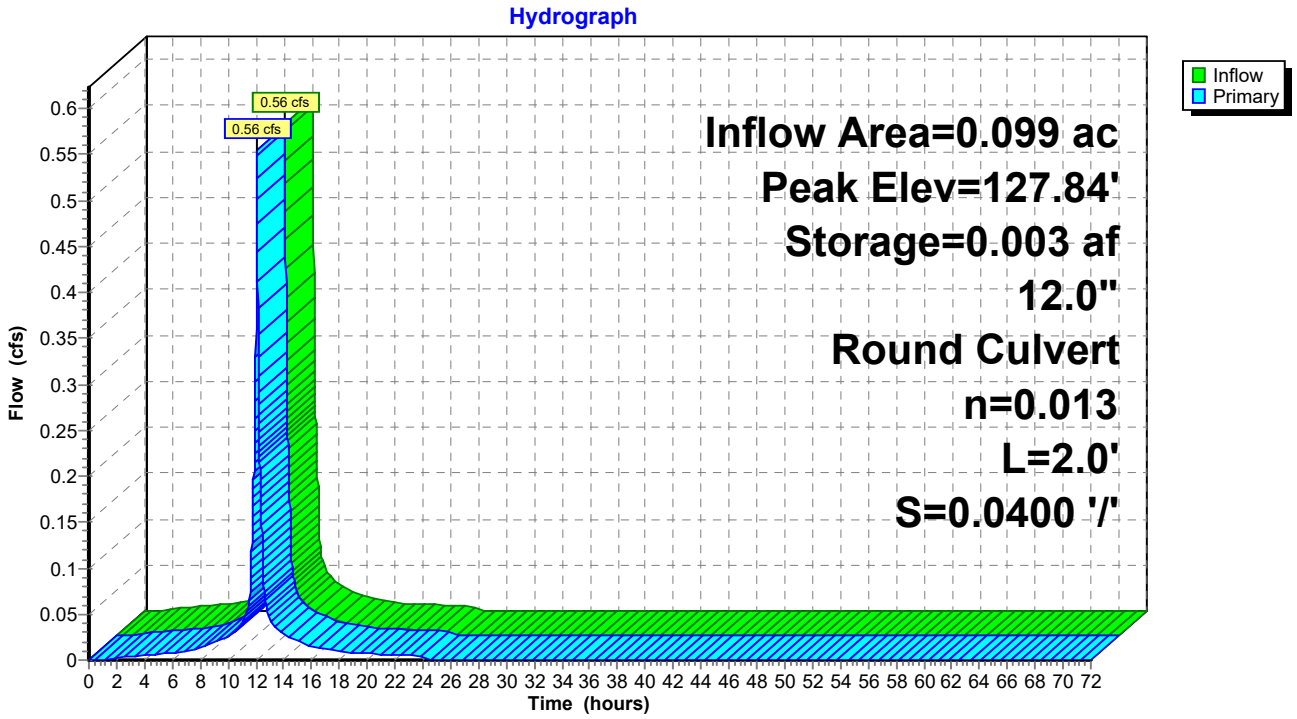
Plug-Flow detention time= 64.0 min calculated for 0.041 af (94% of inflow)
Center-of-Mass det. time= 1.5 min (746.9 - 745.4)

Volume	Invert	Avail.Storage	Storage Description
#1	123.33'	0.005 af	**6.00'D x 7.00'H Pretreatment Sump**

Device	Routing	Invert	Outlet Devices
#1	Primary	127.33'	**12.0" Round Culvert** L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.33' / 127.25' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.07 hrs HW=127.83' TW=127.70' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.55 cfs @ 1.40 fps)

Pond SC-P-1: New Pond Forebay



Summary for Pond SC-P-2: New Dry Well

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 5.30" for 10-YEAR event
Inflow = 0.56 cfs @ 12.07 hrs, Volume= 0.044 af
Outflow = 0.55 cfs @ 12.08 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.014 af
Primary = 0.55 cfs @ 12.08 hrs, Volume= 0.030 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 127.70' @ 12.08 hrs Surf.Area= 0.002 ac Storage= 0.006 af

Plug-Flow detention time= 164.7 min calculated for 0.044 af (100% of inflow)
Center-of-Mass det. time= 164.7 min (911.7 - 746.9)

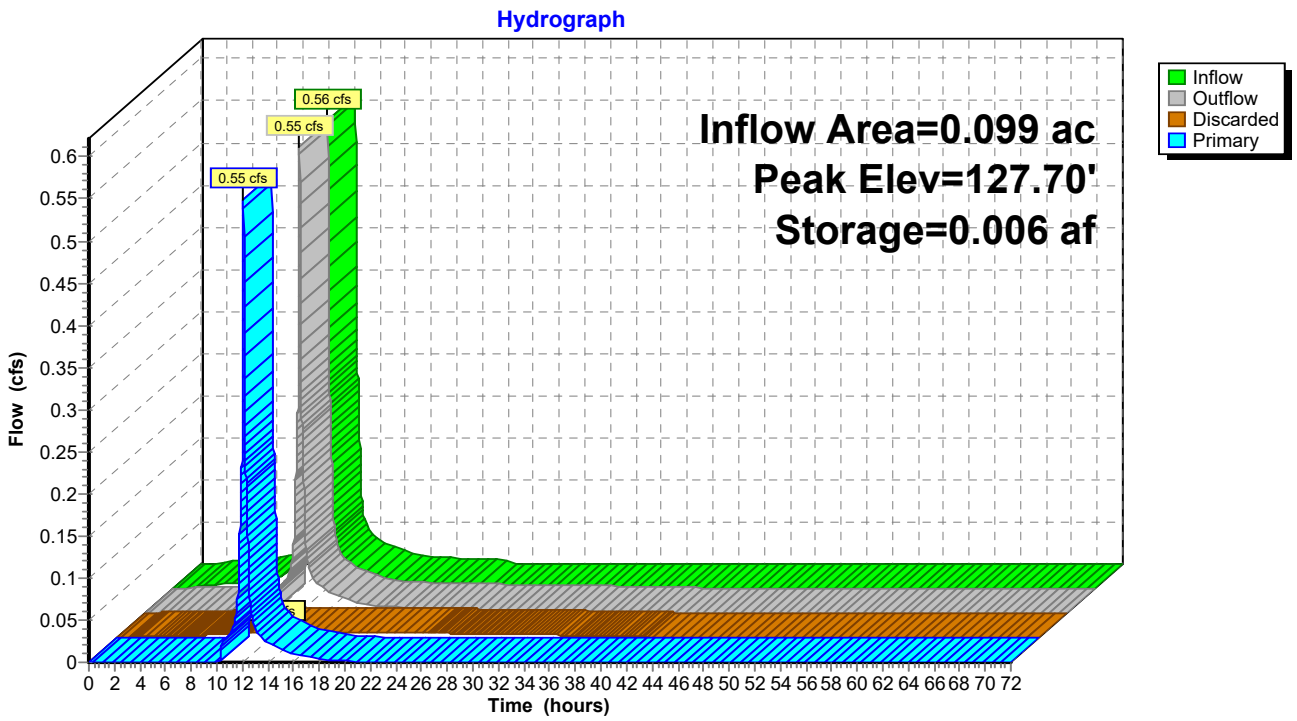
Volume	Invert	Avail.Storage	Storage Description
#1	121.83'	0.003 af	**10.00'D x 7.50'H Vertical Cone/Cylinder** 0.014 af Overall - 0.005 af Embedded = 0.008 af x 40.0% Voids
#2	123.33'	0.004 af	**6.00'D x 6.00'H Vertical Cone/Cylinder**Inside #1 0.005 af Overall - 6.0" Wall Thickness = 0.004 af
		0.007 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.83'	**1.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	127.33'	**12.0" Round Culvert** L= 116.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.33' / 122.50' S= 0.0416 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=127.70' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.55 cfs @ 12.08 hrs HW=127.70' TW=124.27' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.55 cfs @ 2.07 fps)

Pond SC-P-2: New Dry Well

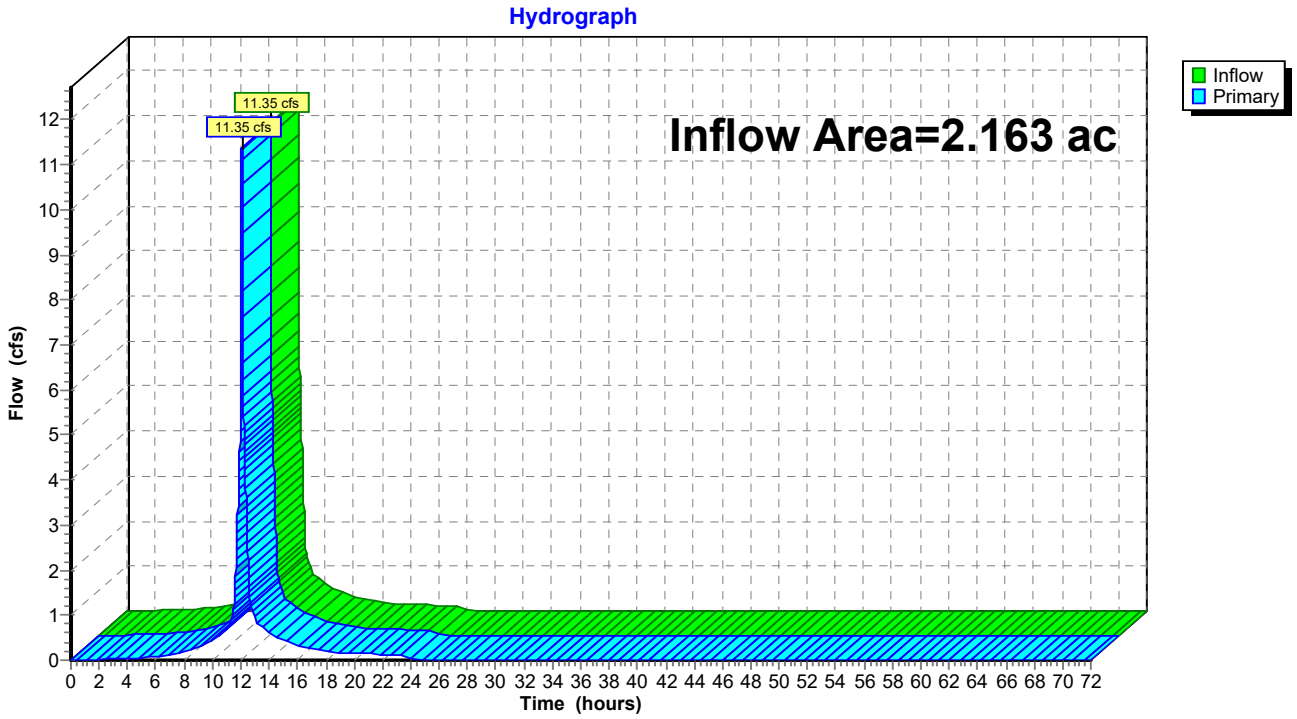


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 86.08% Impervious, Inflow Depth = 4.65" for 10-YEAR event
Inflow = 11.35 cfs @ 12.07 hrs, Volume= 0.838 af
Primary = 11.35 cfs @ 12.07 hrs, Volume= 0.838 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

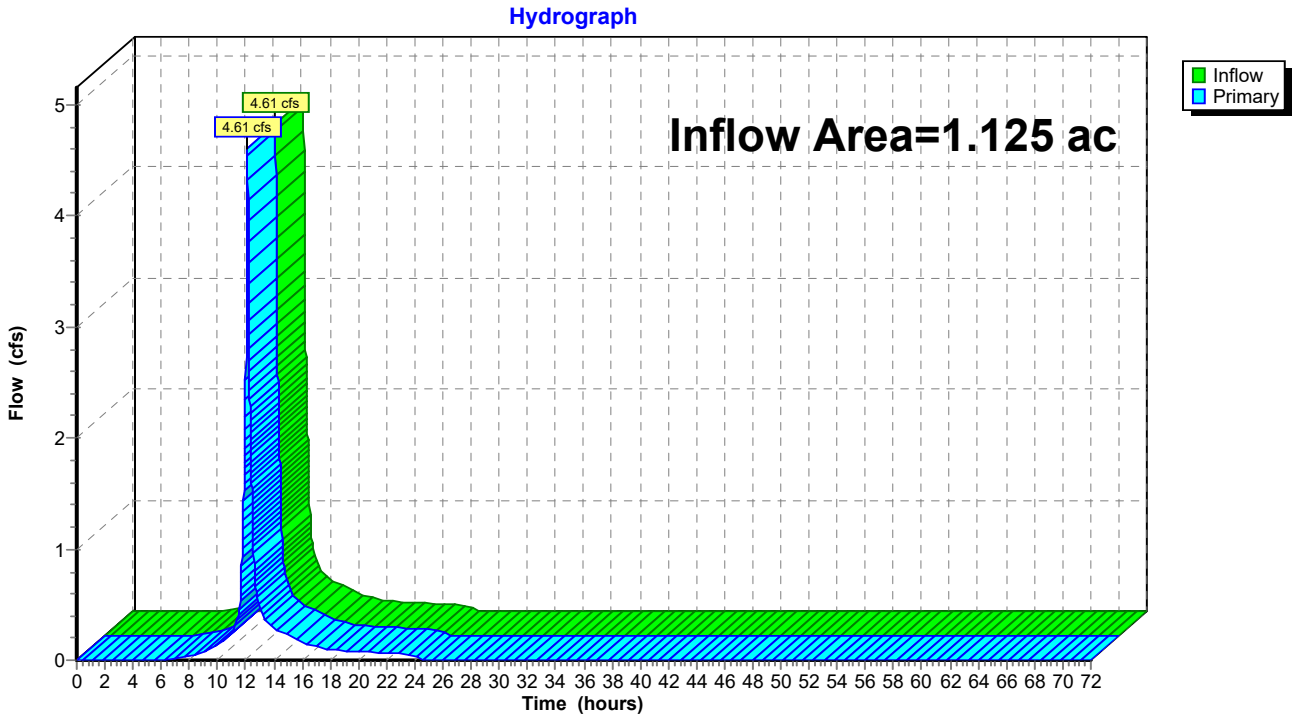


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 1.125 ac, 61.60% Impervious, Inflow Depth = 3.75" for 10-YEAR event
Inflow = 4.61 cfs @ 12.11 hrs, Volume= 0.352 af
Primary = 4.61 cfs @ 12.11 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

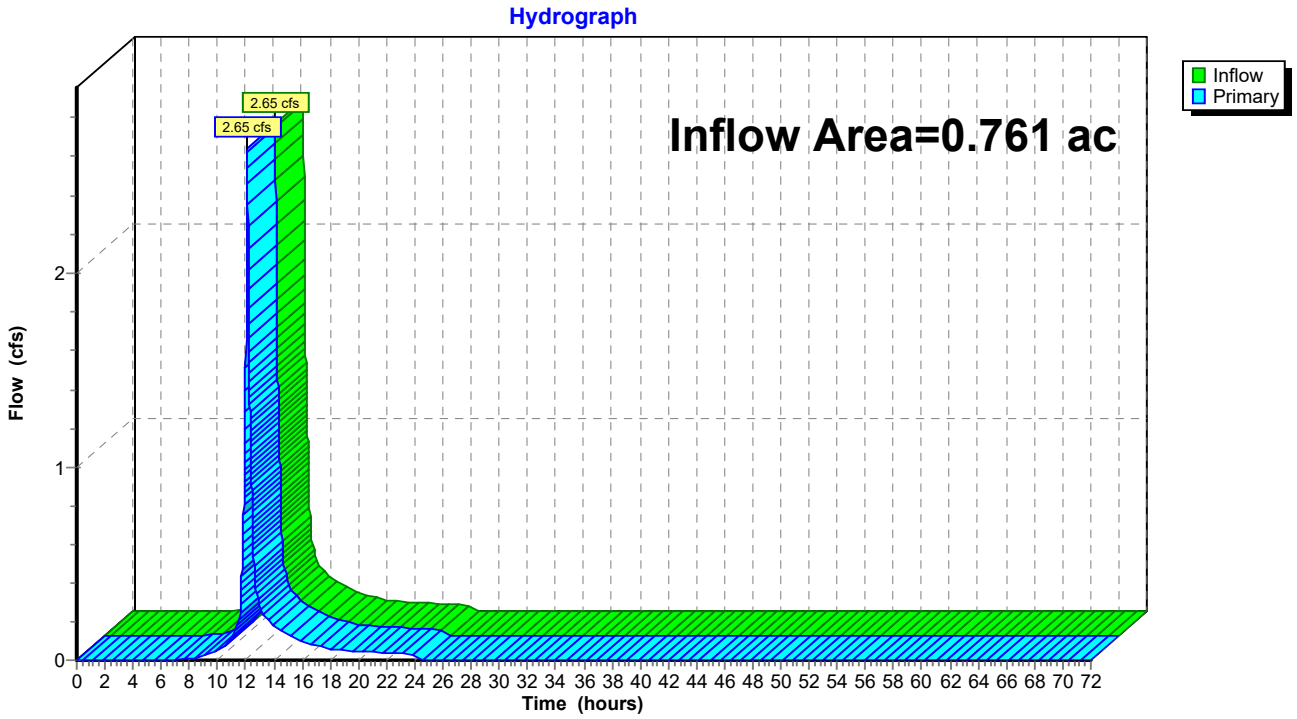


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.761 ac, 43.10% Impervious, Inflow Depth = 3.10" for 10-YEAR event
Inflow = 2.65 cfs @ 12.10 hrs, Volume= 0.197 af
Primary = 2.65 cfs @ 12.10 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

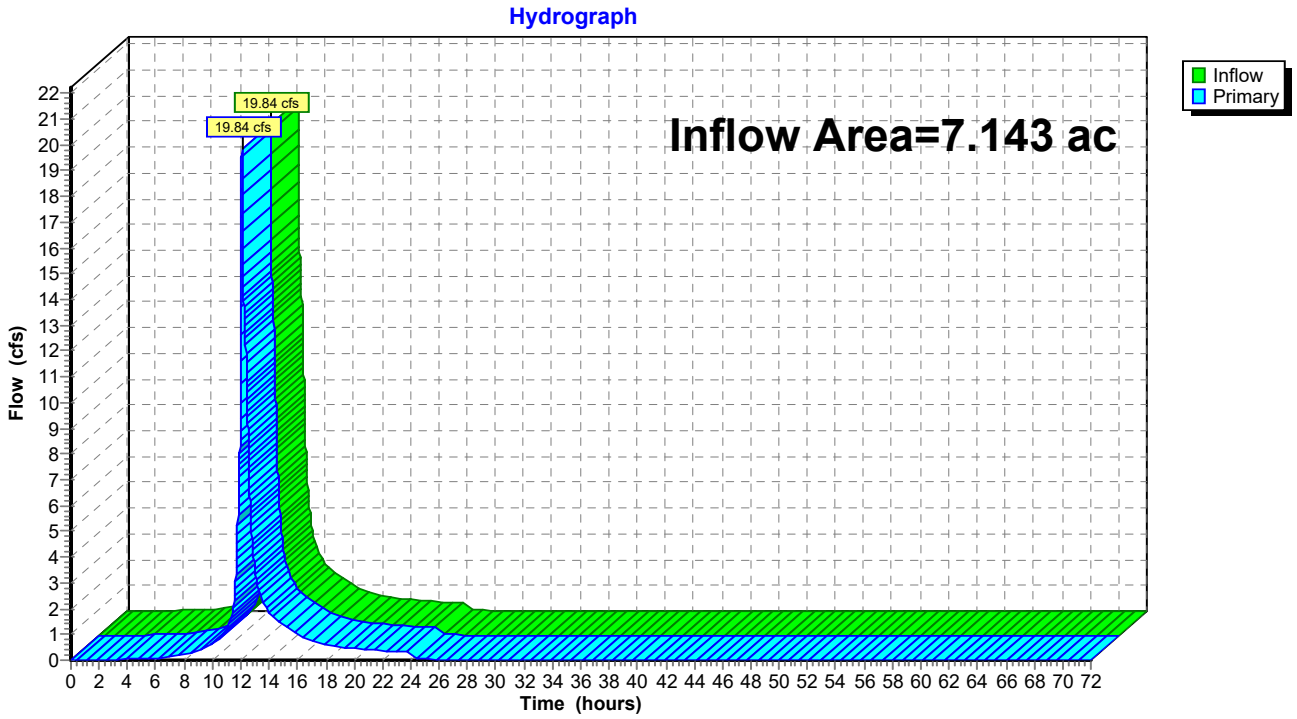


Summary for Link Hudson: Hudson River

Inflow Area = 7.143 ac, 52.71% Impervious, Inflow Depth = 3.42" for 10-YEAR event
Inflow = 19.84 cfs @ 12.09 hrs, Volume= 2.037 af
Primary = 19.84 cfs @ 12.09 hrs, Volume= 2.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Hudson: Hudson River



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentSA-1: Redeveloped Runoff Area=0.409 ac 70.17% Impervious Runoff Depth=7.07"
Flow Length=227' Slope=0.1500 '/' Tc=7.0 min CN=87 Runoff=3.11 cfs 0.241 af

SubcatchmentSA-2: Redeveloped Runoff Area=0.467 ac 56.75% Impervious Runoff Depth=6.47"
Flow Length=171' Slope=0.0500 '/' Tc=8.2 min CN=82 Runoff=3.20 cfs 0.252 af

SubcatchmentSA-3: Redeveloped Runoff Area=0.249 ac 56.63% Impervious Runoff Depth=6.47"
Flow Length=135' Slope=0.0500 '/' Tc=7.7 min CN=82 Runoff=1.73 cfs 0.134 af

SubcatchmentSA-4: Redeveloped Runoff Area=0.350 ac 56.57% Impervious Runoff Depth=6.47"
Flow Length=158' Slope=0.0500 '/' Tc=8.0 min CN=82 Runoff=2.41 cfs 0.189 af

SubcatchmentSA-5: Redeveloped Runoff Area=0.411 ac 31.63% Impervious Runoff Depth=5.38"
Flow Length=223' Slope=0.0500 '/' Tc=5.3 min CN=73 Runoff=2.65 cfs 0.184 af

SubcatchmentSA-6: Wooded slope Runoff Area=0.153 ac 0.00% Impervious Runoff Depth=3.82"
Flow Length=300' Slope=0.2500 '/' Tc=34.7 min CN=60 Runoff=0.36 cfs 0.049 af

SubcatchmentSB-1: Ex. upper Lot R Runoff Area=0.171 ac 79.53% Impervious Runoff Depth=7.44"
Flow Length=314' Tc=5.0 min CN=90 Runoff=1.44 cfs 0.106 af

SubcatchmentSB-2: Ex. upper Lot R Runoff Area=0.567 ac 100.00% Impervious Runoff Depth=8.40"
Flow Length=701' Tc=5.0 min CN=98 Runoff=4.98 cfs 0.397 af

SubcatchmentSB-3: Ex. upper Lot R Runoff Area=0.517 ac 93.81% Impervious Runoff Depth=7.92"
Flow Length=225' Tc=5.0 min CN=94 Runoff=4.47 cfs 0.341 af

SubcatchmentSB-4: Ex. upper Lot R Runoff Area=0.908 ac 74.23% Impervious Runoff Depth=7.19"
Flow Length=701' Tc=5.0 min CN=88 Runoff=7.48 cfs 0.544 af

SubcatchmentSC-1: Grove Pavilion Runoff Area=4,312 sf 100.00% Impervious Runoff Depth=8.40"
Tc=5.0 min CN=98 Runoff=0.87 cfs 0.069 af

SubcatchmentSC-2: Existing Driveway Runoff Area=2.842 ac 27.55% Impervious Runoff Depth=5.14"
Flow Length=615' Slope=0.0333 '/' Tc=20.3 min CN=71 Runoff=11.47 cfs 1.217 af

Pond 2P: Pocket Pond Peak Elev=125.58' Storage=7,749 cf Inflow=11.81 cfs 1.272 af
Outflow=9.25 cfs 1.272 af

Pond Ex-SA-CB-1: Ex-SA-CB-1 Peak Elev=66.62' Inflow=3.11 cfs 0.241 af
18.0" Round Culvert n=0.013 L=51.0' S=0.0020 '/' Outflow=3.11 cfs 0.241 af

Pond Ex-SA-CB-5: Ex-SA-CB-5 Peak Elev=43.50' Inflow=2.65 cfs 0.184 af
18.0" Round Culvert n=0.013 L=86.0' S=0.2823 '/' Outflow=2.65 cfs 0.184 af

Pond Ex-SB-CB-1: Ex-SB-CB-1 Peak Elev=98.70' Inflow=1.44 cfs 0.106 af
12.0" Round Culvert n=0.011 L=79.2' S=0.0739 '/' Outflow=1.44 cfs 0.106 af

Pond New CB-1: New ST-CB #1 Peak Elev=108.92' Inflow=7.48 cfs 0.544 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=7.48 cfs 0.544 af

Pond New CB-2: New ST-CB #2 Peak Elev=107.90' Inflow=11.96 cfs 0.886 af
18.0" Round Culvert n=0.013 L=29.0' S=0.0217 '/' Outflow=11.96 cfs 0.886 af

Pond New CB-3: New ST-CB #3 Peak Elev=104.74' Inflow=16.94 cfs 1.282 af
18.0" Round Culvert n=0.013 L=85.0' S=0.0202 '/' Outflow=16.94 cfs 1.282 af

Pond New CB-6: New ST-CB #6 Peak Elev=98.51' Inflow=18.38 cfs 1.388 af
24.0" Round Culvert n=0.013 L=113.0' S=0.0041 '/' Outflow=18.38 cfs 1.388 af

Pond New SWTS: New SWTS-1 Peak Elev=96.14' Inflow=18.38 cfs 1.388 af
18.0" Round Culvert n=0.025 L=300.0' S=0.0262 '/' Outflow=18.38 cfs 1.388 af

Pond New-CB-11: New-CB-11 Peak Elev=66.49' Inflow=6.28 cfs 0.493 af
8.0" Round Culvert n=0.013 L=8.0' S=0.0062 '/' Outflow=6.28 cfs 0.493 af

Pond New-CB-12: New-CB-12 Peak Elev=53.04' Inflow=1.73 cfs 0.134 af
8.0" Round Culvert n=0.013 L=10.0' S=0.0370 '/' Outflow=1.73 cfs 0.134 af

Pond New-CB-13: New-CB-13 Peak Elev=49.28' Inflow=2.41 cfs 0.189 af
8.0" Round Culvert n=0.013 L=7.0' S=0.5757 '/' Outflow=2.41 cfs 0.189 af

Pond SC-P-1: New Pond Forebay Peak Elev=127.98' Storage=0.003 af Inflow=0.87 cfs 0.069 af
12.0" Round Culvert n=0.013 L=2.0' S=0.0400 '/' Outflow=0.87 cfs 0.069 af

Pond SC-P-2: New Dry Well Peak Elev=127.80' Storage=0.006 af Inflow=0.87 cfs 0.069 af
Discarded=0.01 cfs 0.015 af Primary=0.86 cfs 0.054 af Outflow=0.87 cfs 0.069 af

Link 1L: Flow to the North Inflow=18.38 cfs 1.388 af
Primary=18.38 cfs 1.388 af

Link 2L: Culvert to Hudson River 1 Inflow=8.02 cfs 0.627 af
Primary=8.02 cfs 0.627 af

Link 3L: Culvert to Hudson River 2 Inflow=4.97 cfs 0.373 af
Primary=4.97 cfs 0.373 af

Link Hudson: Hudson River Inflow=36.03 cfs 3.709 af
Primary=36.03 cfs 3.709 af

Total Runoff Area = 7.143 ac Runoff Volume = 3.724 af Average Runoff Depth = 6.26"
47.29% Pervious = 3.378 ac 52.71% Impervious = 3.765 ac

ent SA-1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between L

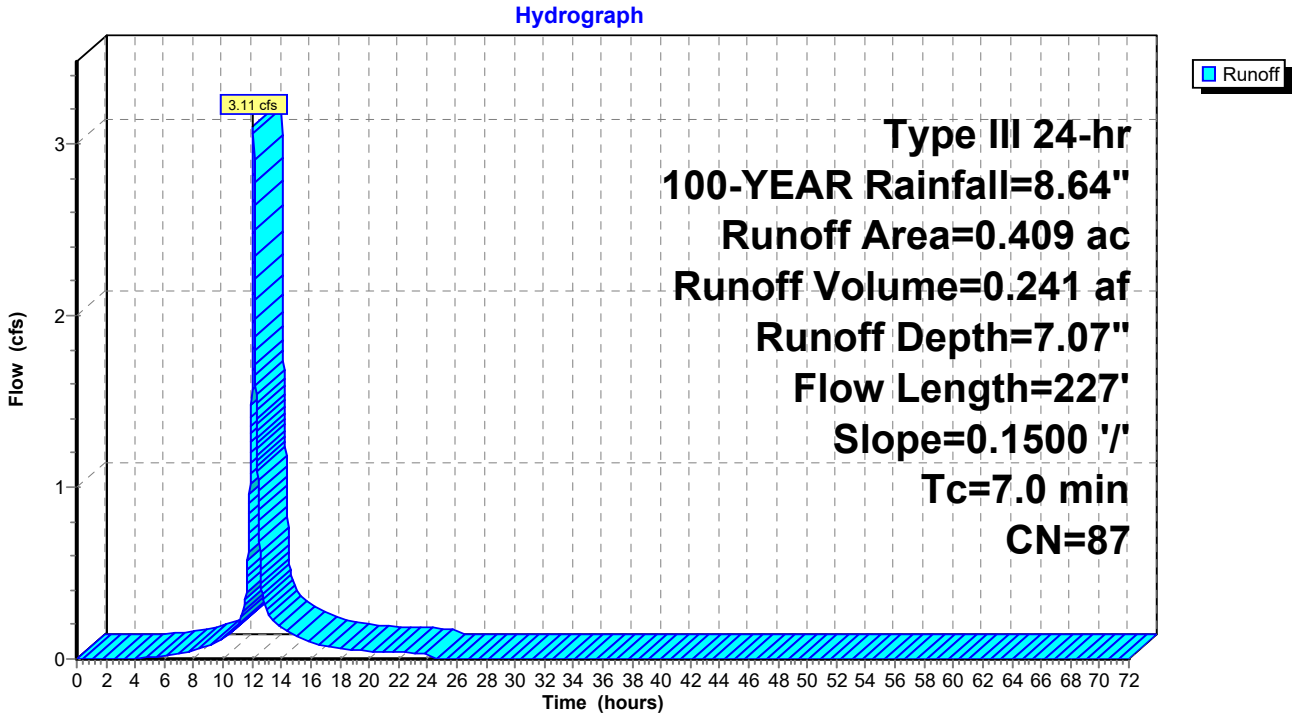
Runoff = 3.11 cfs @ 12.10 hrs, Volume= 0.241 af, Depth= 7.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.287	98	Paved parking, HSG B
0.122	61	>75% Grass cover, Good, HSG B
0.409	87	Weighted Average
0.122		29.83% Pervious Area
0.287		70.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.0	227	0.1500	1.91		**Lag/CN Method,**
7.0	227	Total			

1: Redeveloped driveway down to Lot R, northern portion of Lot R, and grassed slope between Lot R ar



mmary for Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion o

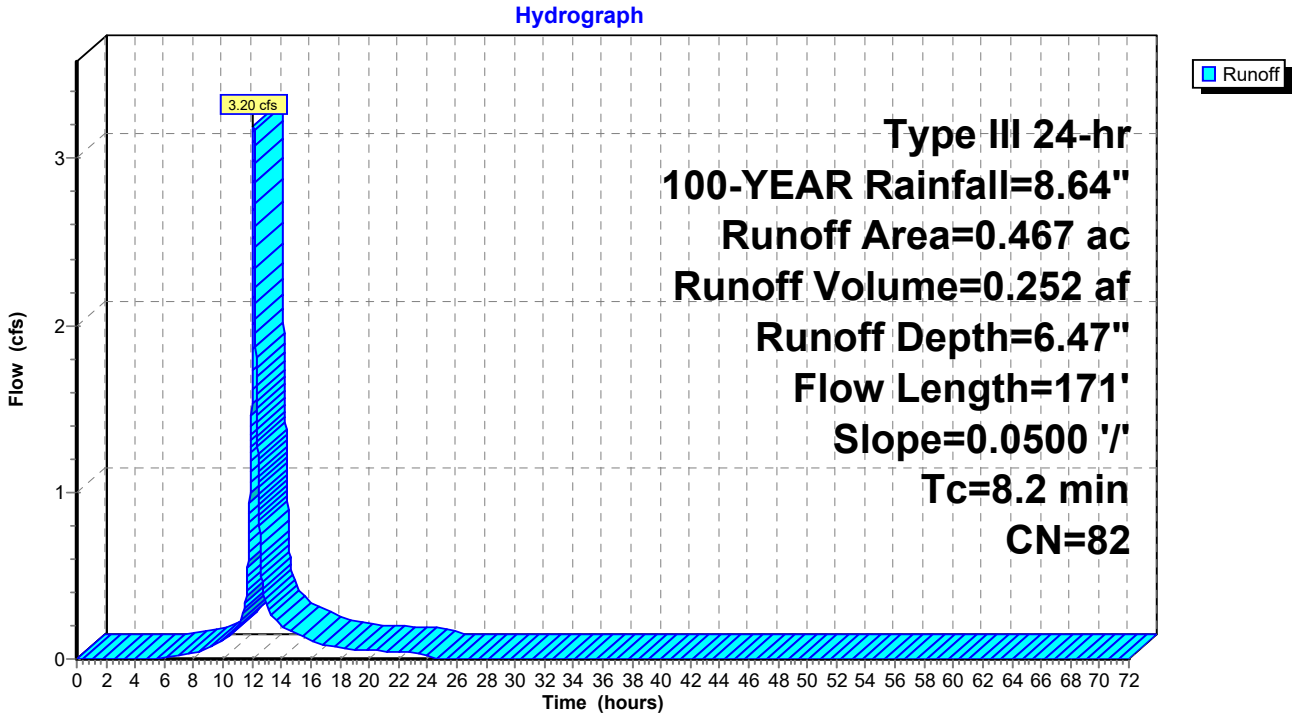
Runoff = 3.20 cfs @ 12.11 hrs, Volume= 0.252 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.265	98	Paved parking, HSG B
0.202	61	>75% Grass cover, Good, HSG B
0.467	82	Weighted Average
0.202		43.25% Pervious Area
0.265		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.2	171	0.0500	0.88		**Lag/CN Method,**
8.2	171	Total			

Subcatchment SA-2: Redeveloped driveways, parking, and lawn in the north-central portion of Lot R



Summary for Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of Lo

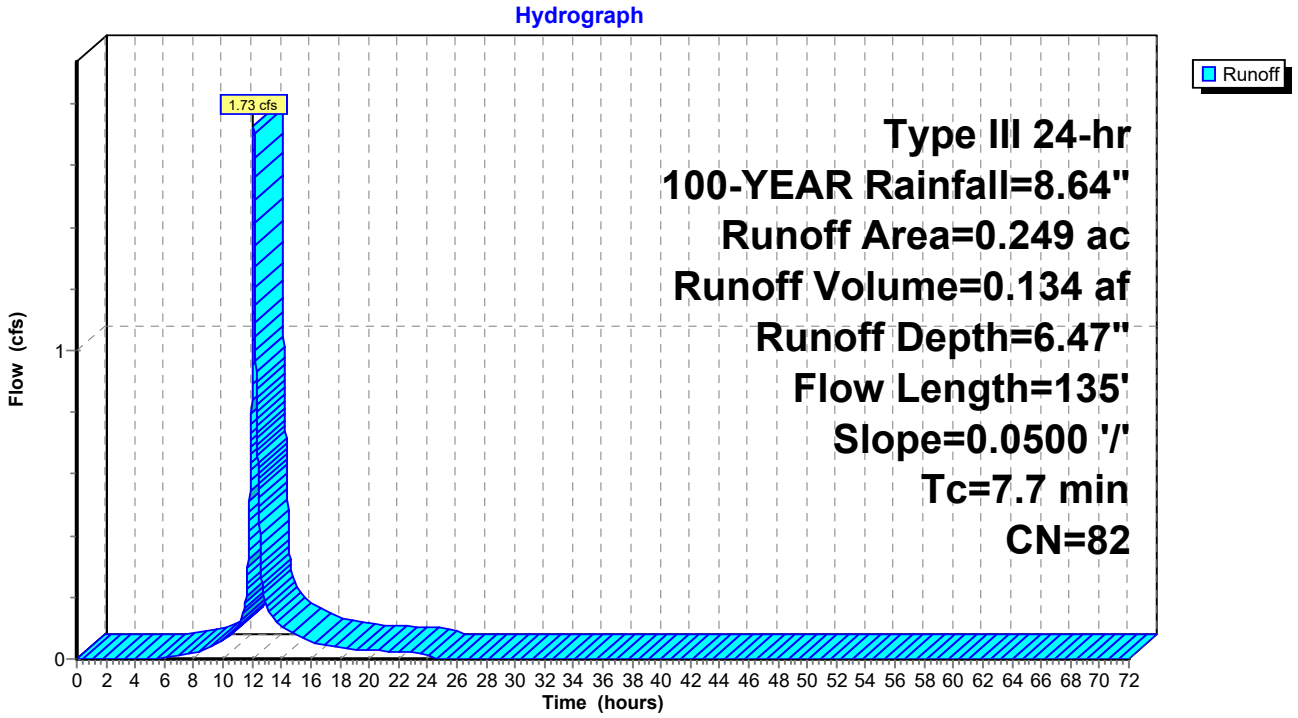
Runoff = 1.73 cfs @ 12.11 hrs, Volume= 0.134 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.141	98	Paved parking, HSG B
0.108	61	>75% Grass cover, Good, HSG B
0.249	82	Weighted Average
0.108		43.37% Pervious Area
0.141		56.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
2.7	135	0.0500	0.84		**Lag/CN Method,**
7.7	135	Total			

Subcatchment SA-3: Redeveloped driveway, parking, and lawn in the central portion of Lot R



mmary for Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion o

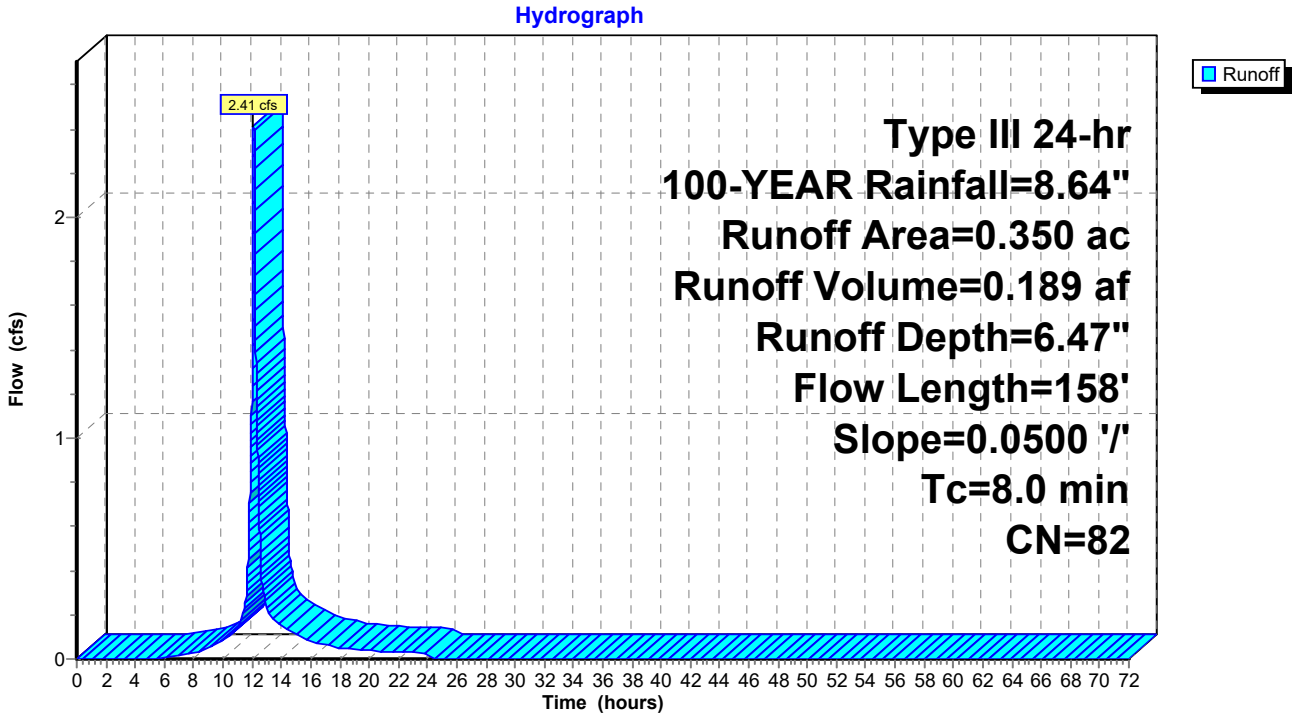
Runoff = 2.41 cfs @ 12.11 hrs, Volume= 0.189 af, Depth= 6.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.198	98	Paved parking, HSG B
0.152	61	>75% Grass cover, Good, HSG B
0.350	82	Weighted Average
0.152		43.43% Pervious Area
0.198		56.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN**
3.0	158	0.0500	0.86		**Lag/CN Method,**
8.0	158	Total			

Subcatchment SA-4: Redeveloped driveway, parking, and lawn in the south-central portion of Lot R



Summary for Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of L

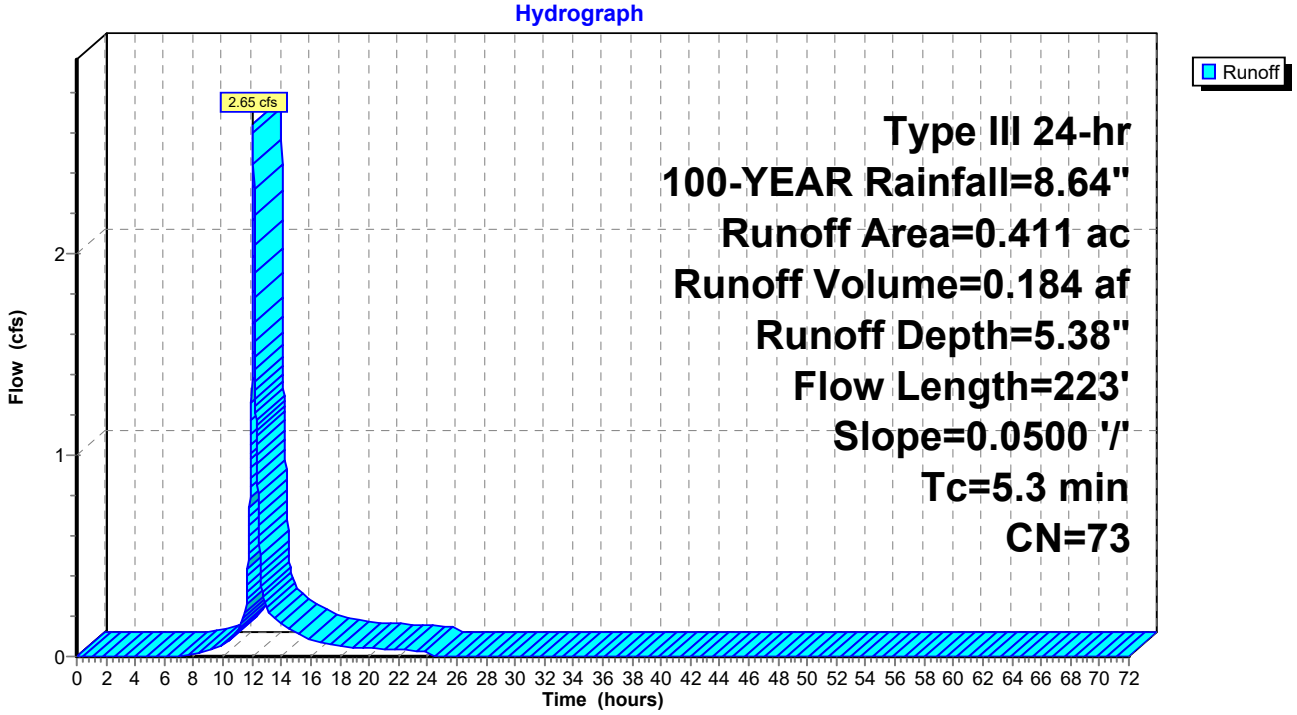
Runoff = 2.65 cfs @ 12.08 hrs, Volume= 0.184 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG B
0.281	61	>75% Grass cover, Good, HSG B
0.411	73	Weighted Average
0.281		68.37% Pervious Area
0.130		31.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	223	0.0500	0.71		**Lag/CN Method,**

Subcatchment SA-5: Redeveloped driveway, parking, and lawn in the southern portion of Lot R



Summary for Subcatchment SA-6: Wooded slope downstream of Lot R

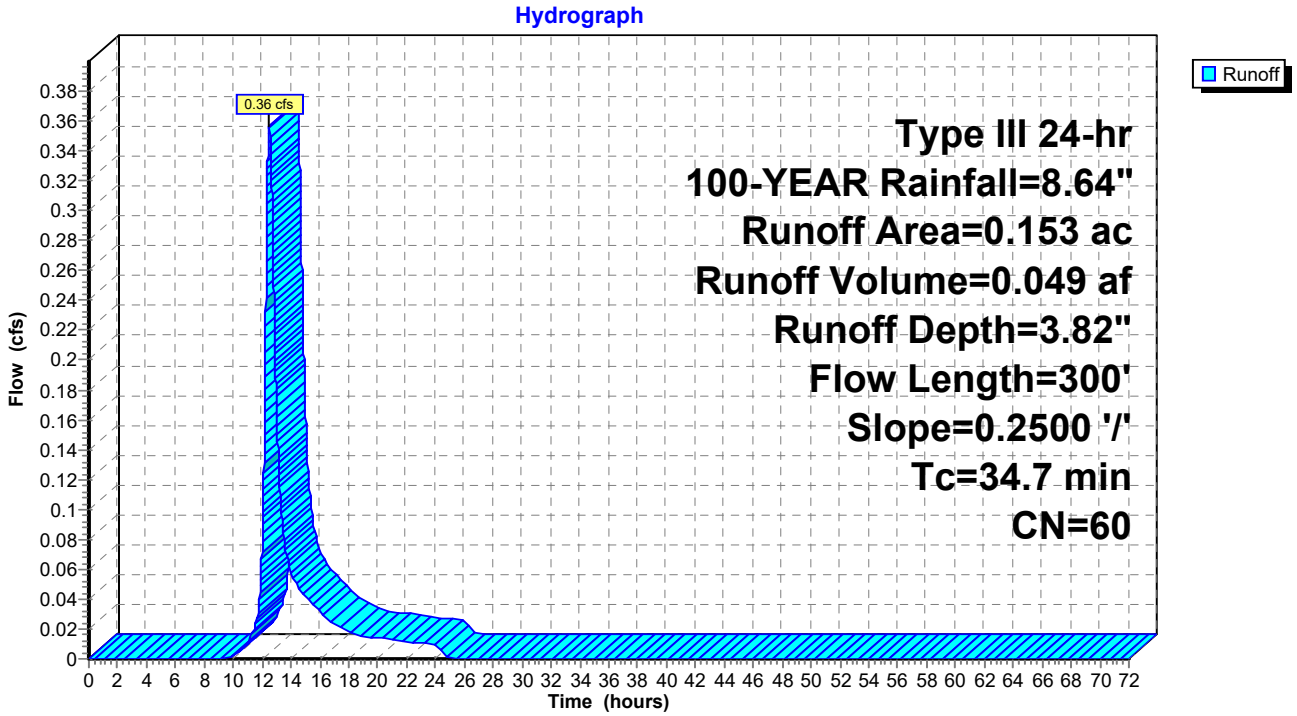
Runoff = 0.36 cfs @ 12.50 hrs, Volume= 0.049 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (ac)	CN	Description
0.153	60	Woods, Fair, HSG B
0.153		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	300	0.2500	0.14		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.85"

Subcatchment SA-6: Wooded slope downstream of Lot R



Summary for Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle

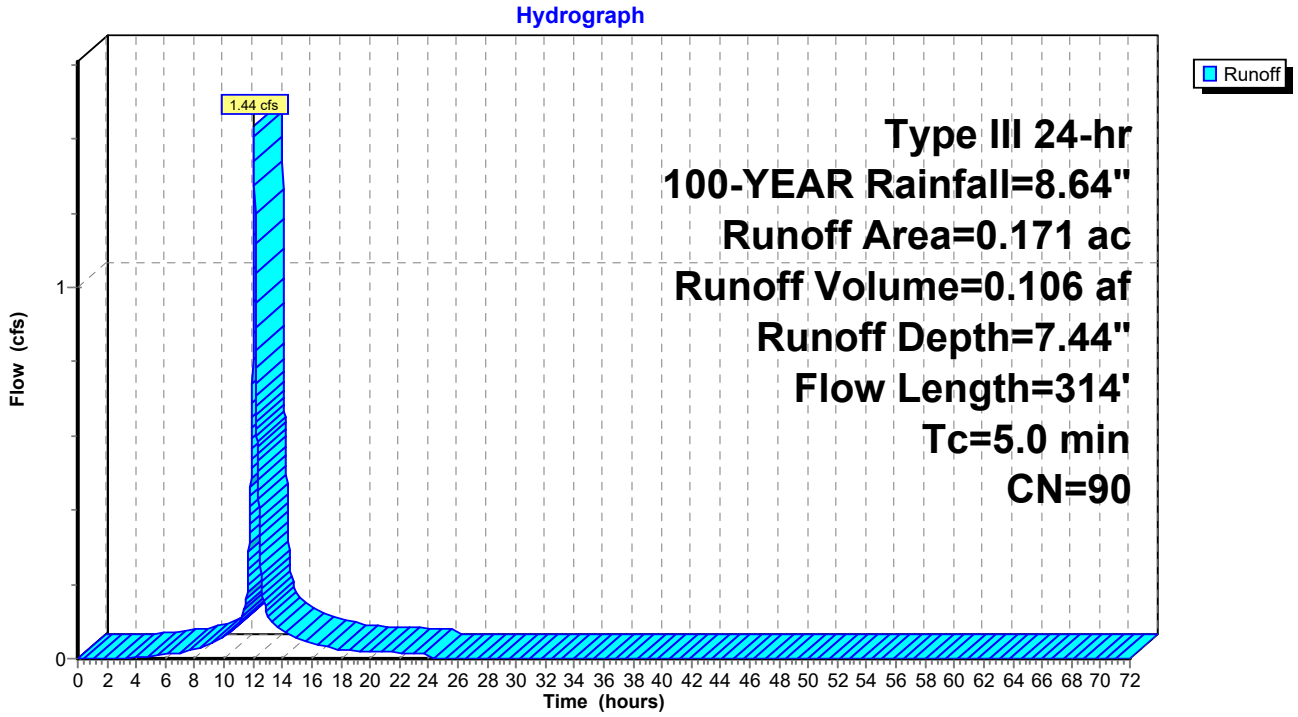
Runoff = 1.44 cfs @ 12.07 hrs, Volume= 0.106 af, Depth= 7.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.136	98	
	0.035	61	>75% Grass cover, Good, HSG B
	0.171	90	Weighted Average
	0.035		20.47% Pervious Area
	0.136		79.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	300	0.0580	2.48		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.0	14	0.0650	5.18		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
2.0	314	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-1: Ex. upper Lot R parking lot and driveways northern parking aisle



Summary for Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking ais

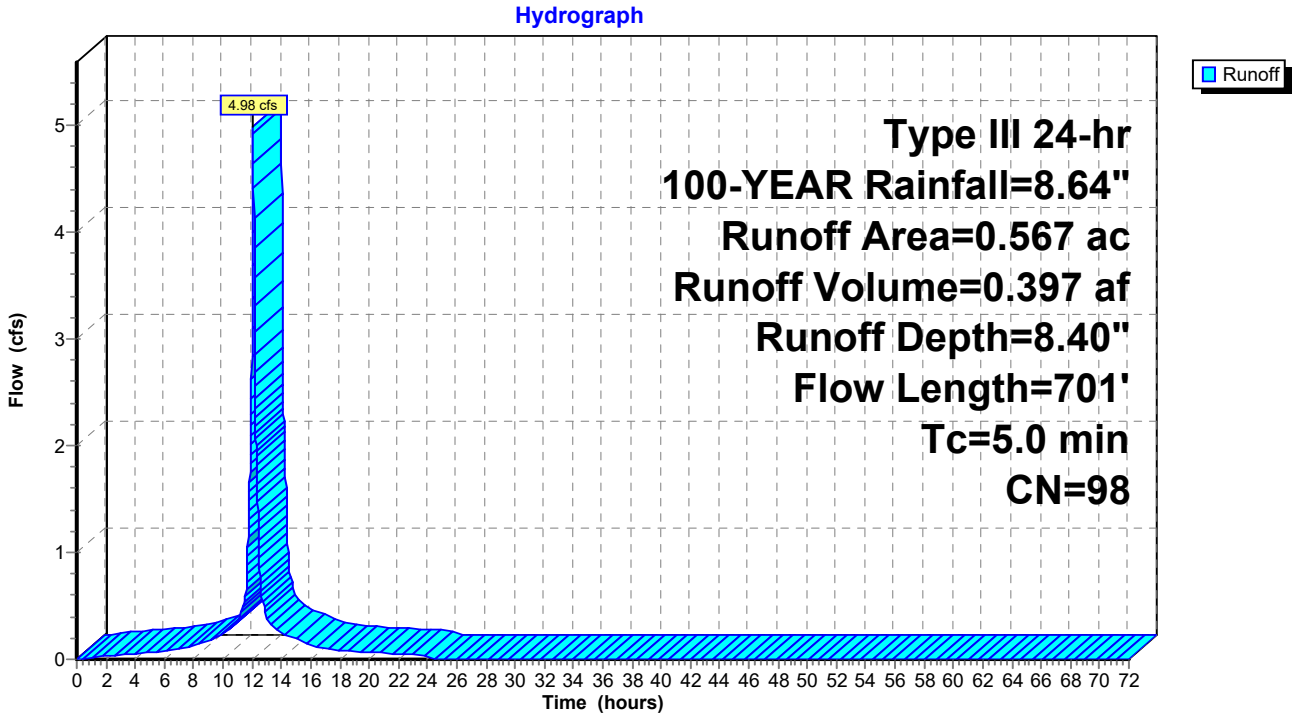
Runoff = 4.98 cfs @ 12.07 hrs, Volume= 0.397 af, Depth= 8.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.567	98	
	0.567		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-2: Ex. upper Lot R parking lot and driveways north-central parking aisle



Summary for Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking ais

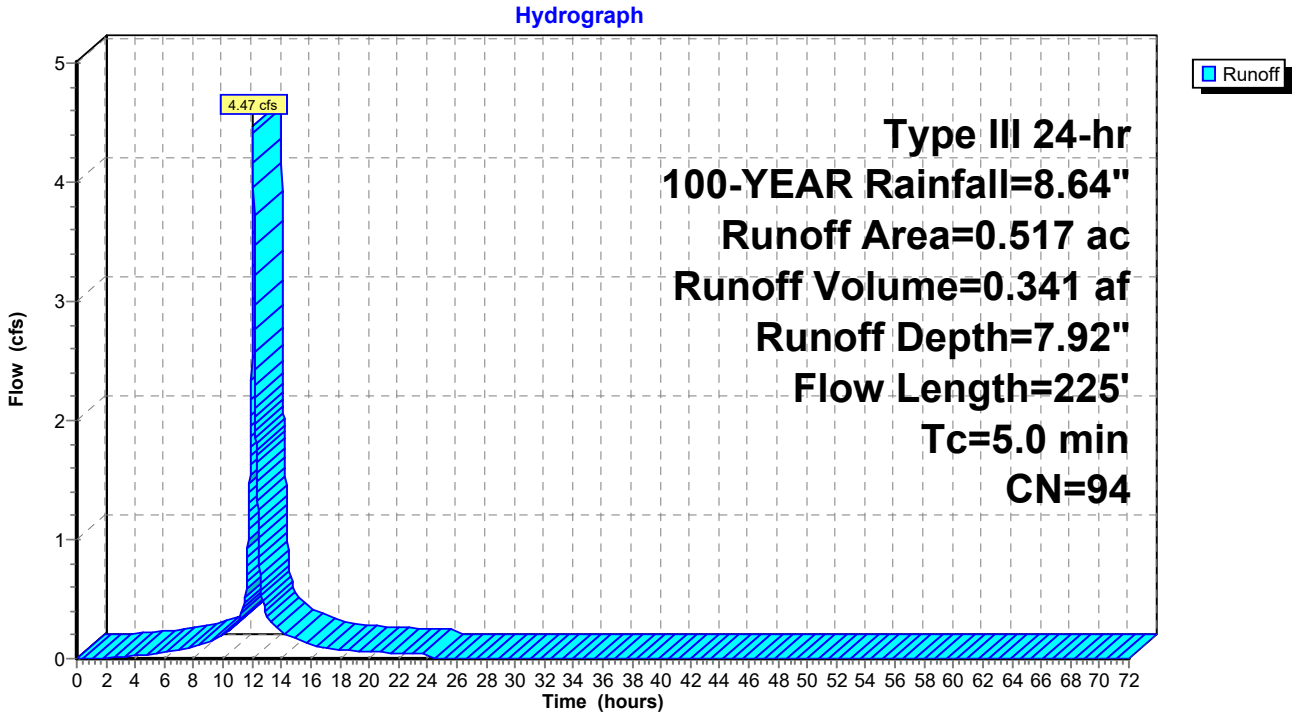
Runoff = 4.47 cfs @ 12.07 hrs, Volume= 0.341 af, Depth= 7.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.485	98	
	0.032	39	>75% Grass cover, Good, HSG A
	0.517	94	Weighted Average
	0.032		6.19% Pervious Area
	0.485		93.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	211	0.0470	2.12		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
0.1	14	0.0190	2.80		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
1.8	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-3: Ex. upper Lot R parking lot and driveways south-central parking aisle



mary for Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjac

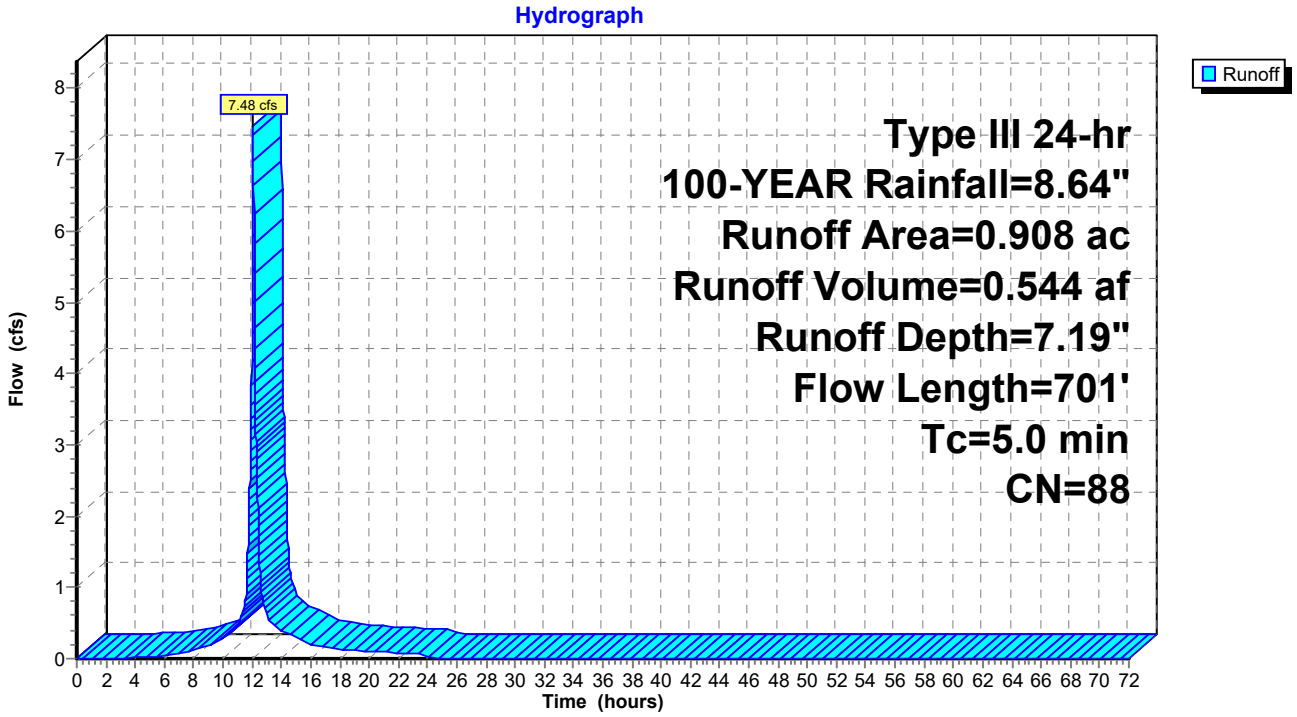
Runoff = 7.48 cfs @ 12.07 hrs, Volume= 0.544 af, Depth= 7.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
*	0.674	98	
	0.234	61	>75% Grass cover, Good, HSG B
	0.908	88	Weighted Average
	0.234		25.77% Pervious Area
	0.674		74.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	300	0.0690	2.65		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.85"
1.5	401	0.0480	4.45		**Shallow Concentrated Flow, SC Flow** Paved Kv= 20.3 fps
3.4	701	Total, Increased to minimum Tc = 5.0 min			

Subcatchment SB-4: Ex. upper Lot R parking lot and driveways south parking aisle and adjacent law



Summary for Subcatchment SC-1: Grove Pavilion Building

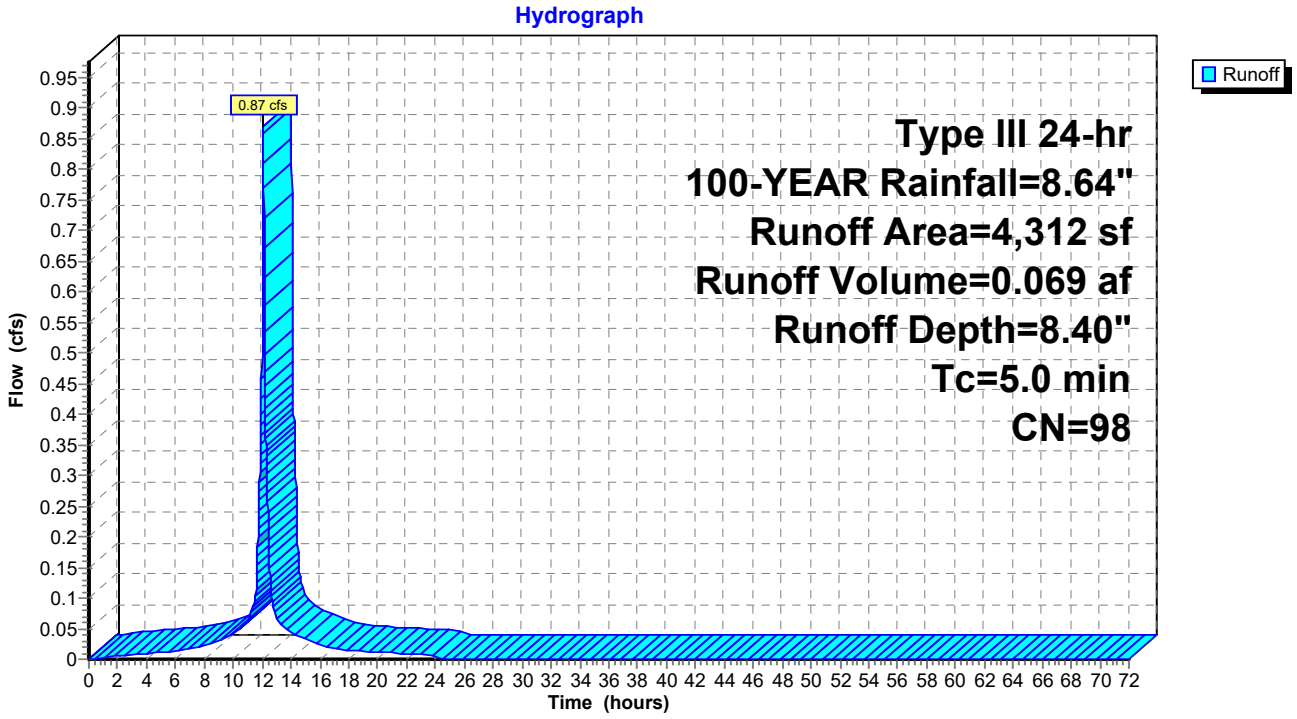
Runoff = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af, Depth= 8.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

Area (sf)	CN	Description
4,312	98	Roofs, HSG A
4,312		100.00% Impervious Area

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

Subcatchment SC-1: Grove Pavilion Building



Summary for Subcatchment SC-2: Existing Driveway and lawns to Pond

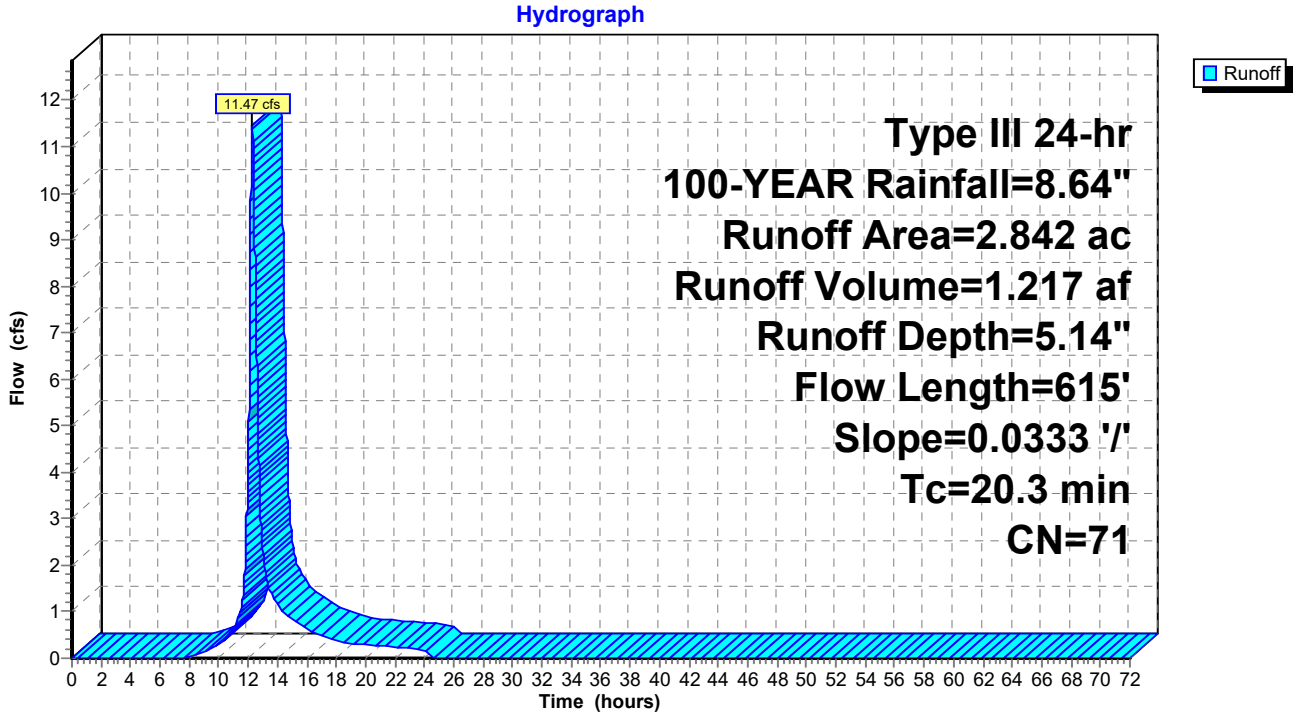
Runoff = 11.47 cfs @ 12.28 hrs, Volume= 1.217 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.64"

	Area (ac)	CN	Description
	0.679	98	Paved parking, HSG B
	2.059	61	>75% Grass cover, Good, HSG B
*	0.104	98	New walking paths
	2.842	71	Weighted Average
	2.059		72.45% Pervious Area
	0.783		27.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min tc**
15.3	615	0.0333	0.67		**Lag/CN Method,**
20.3	615	Total			

Subcatchment SC-2: Existing Driveway and lawns to Pond



Summary for Pond 2P: Pocket Pond

Inflow Area = 2.941 ac, 29.99% Impervious, Inflow Depth = 5.19" for 100-YEAR event
Inflow = 11.81 cfs @ 12.27 hrs, Volume= 1.272 af
Outflow = 9.25 cfs @ 12.44 hrs, Volume= 1.272 af, Atten= 22%, Lag= 9.9 min
Primary = 9.25 cfs @ 12.44 hrs, Volume= 1.272 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 123.50' Surf.Area= 3,693 sf Storage= 1,744 cf
Peak Elev= 125.58' @ 12.44 hrs Surf.Area= 5,311 sf Storage= 7,749 cf (6,005 cf above start)

Plug-Flow detention time= 46.2 min calculated for 1.231 af (97% of inflow)
Center-of-Mass det. time= 20.4 min (850.0 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	122.50'	219 cf	**forebay (Prismatic)** Listed below (Recalc)
#2	122.50'	427 cf	**main basin (Prismatic)** Listed below (Recalc)
#3	122.50'	1,560 cf	**additional storage to main bay (Irregular)** Listed below (Recalc) x 1.25
#4	123.00'	7,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		9,438 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	294	0	0
123.00	580	219	219

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
122.50	723	0	0
123.00	983	427	427

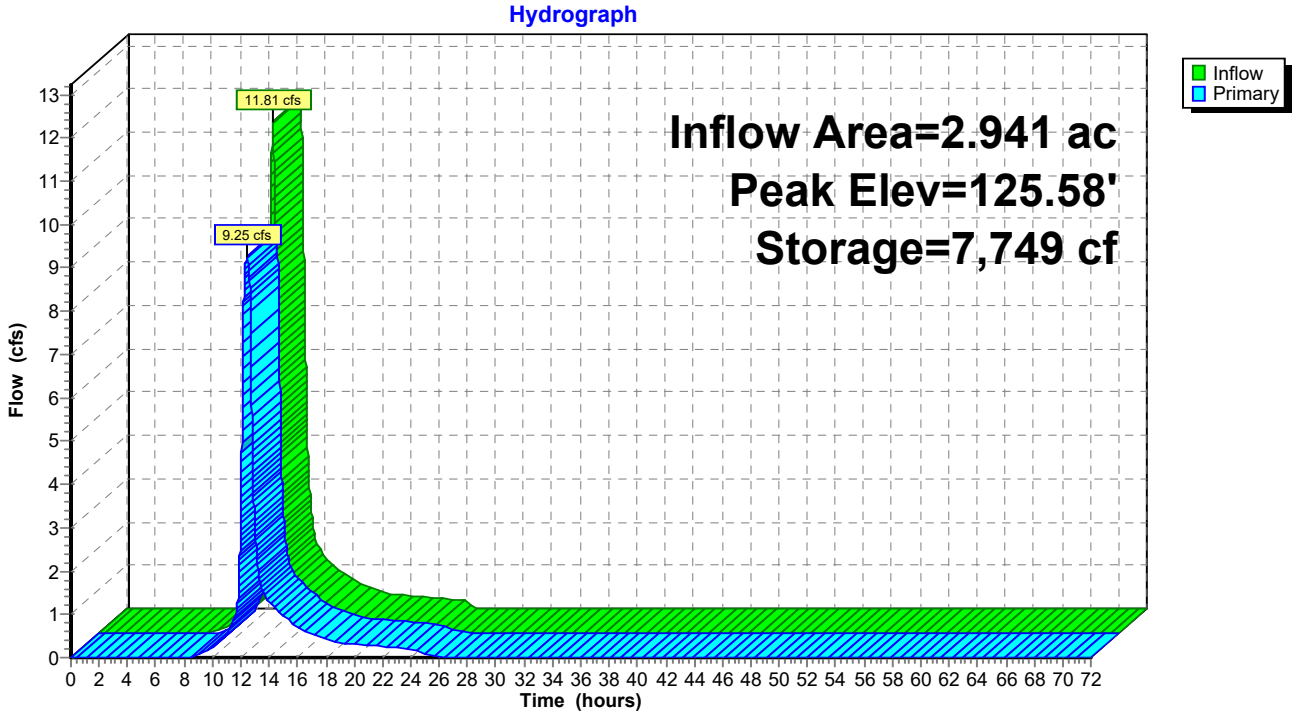
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
122.50	190	75.0	0	0	190
126.00	555	108.6	1,248	1,248	777

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
123.00	1,460	130.1	0	0	1,460
124.00	2,145	204.2	1,792	1,792	3,438
125.00	2,625	217.4	2,381	4,173	3,929
126.00	3,518	268.3	3,061	7,233	5,911

Device	Routing	Invert	Outlet Devices
#1	Device 3	123.50'	**9.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	124.20'	**2.5' long x 3.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	122.50'	**15.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.50' / 120.00' S= 0.0269 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=9.25 cfs @ 12.44 hrs HW=125.58' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Inlet Controls 9.25 cfs @ 7.54 fps)
  ├─**1=Orifice/Grate** (Passes < 2.77 cfs potential flow)
  └─**2=Sharp-Crested Vee/Trap Weir** (Passes < 13.20 cfs potential flow)

Pond 2P: Pocket Pond



Summary for Pond Ex-SA-CB-1: Ex-SA-CB-1

[58] Hint: Peaked 10.13' above defined flood level

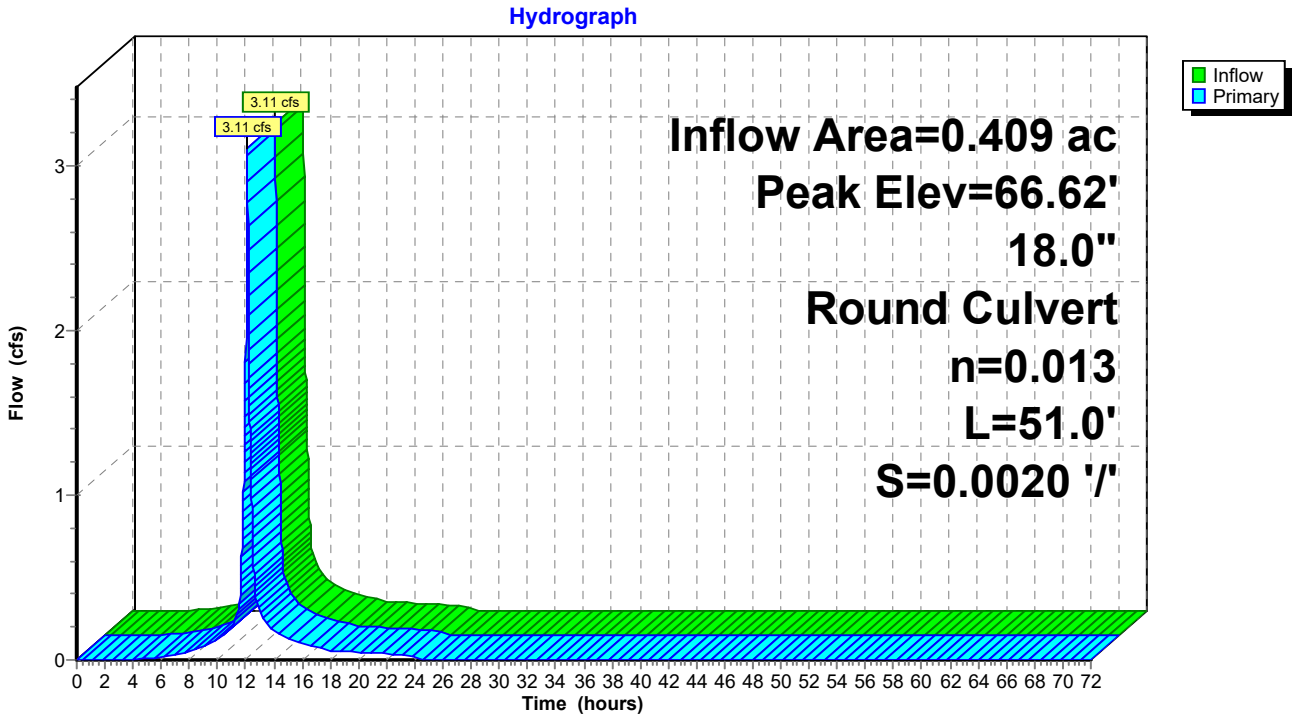
Inflow Area =	0.409 ac,	70.17% Impervious,	Inflow Depth =	7.07"	for 100-YEAR event
Inflow =	3.11 cfs @	12.10 hrs,	Volume=	0.241 af	
Outflow =	3.11 cfs @	12.10 hrs,	Volume=	0.241 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.11 cfs @	12.10 hrs,	Volume=	0.241 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 66.62' @ 12.11 hrs
Flood Elev= 56.49'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 52.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.11 cfs @ 12.10 hrs HW=66.47' TW=66.34' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.11 cfs @ 1.76 fps)

Pond Ex-SA-CB-1: Ex-SA-CB-1



Summary for Pond Ex-SA-CB-5: Ex-SA-CB-5

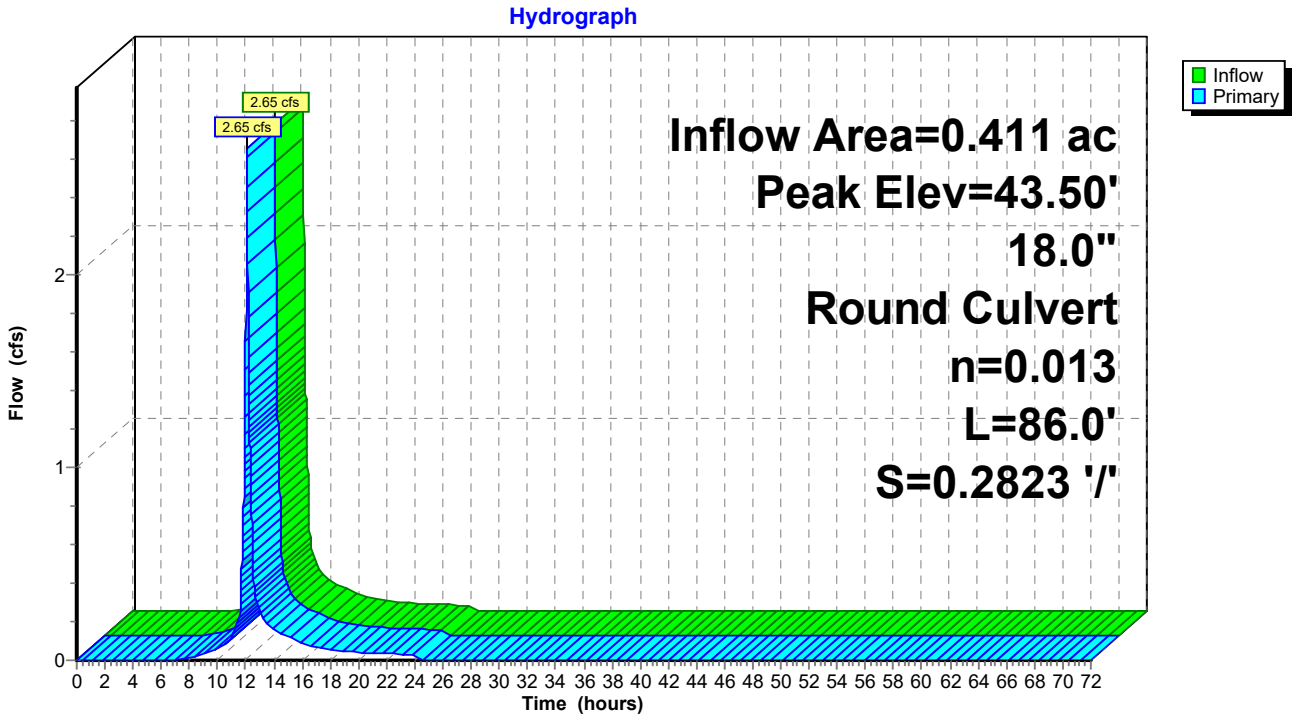
Inflow Area = 0.411 ac, 31.63% Impervious, Inflow Depth = 5.38" for 100-YEAR event
Inflow = 2.65 cfs @ 12.08 hrs, Volume= 0.184 af
Outflow = 2.65 cfs @ 12.08 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
Primary = 2.65 cfs @ 12.08 hrs, Volume= 0.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 43.50' @ 12.08 hrs
Flood Elev= 55.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.74'	**18.0" Round Culvert** L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.74' / 18.46' S= 0.2823 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.65 cfs @ 12.08 hrs HW=43.50' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.65 cfs @ 2.96 fps)

Pond Ex-SA-CB-5: Ex-SA-CB-5



Summary for Pond Ex-SB-CB-1: Ex-SB-CB-1

[58] Hint: Peaked 23.00' above defined flood level

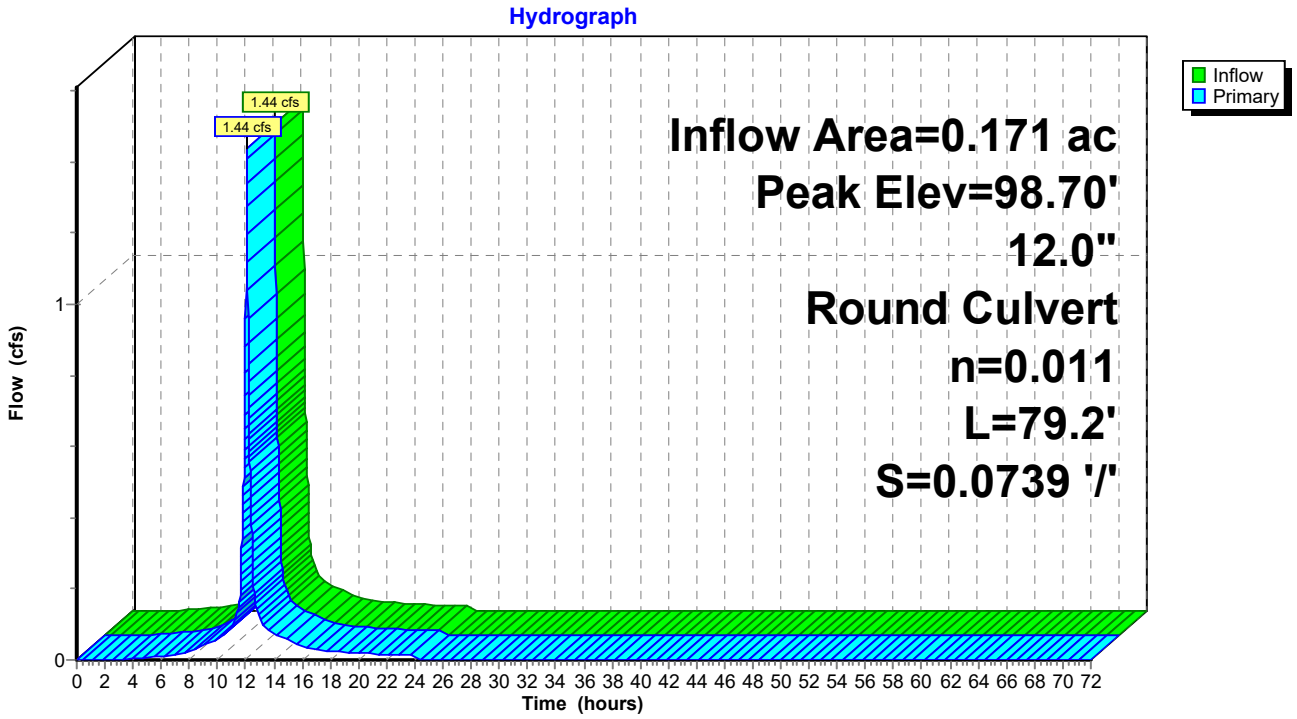
Inflow Area =	0.171 ac, 79.53% Impervious, Inflow Depth = 7.44" for 100-YEAR event				
Inflow =	1.44 cfs @ 12.07 hrs, Volume=	0.106 af			
Outflow =	1.44 cfs @ 12.07 hrs, Volume=	0.106 af, Atten= 0%, Lag= 0.0 min			
Primary =	1.44 cfs @ 12.07 hrs, Volume=	0.106 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.70' @ 12.08 hrs
Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.65'	**12.0" Round Culvert** L= 79.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.65' / 65.80' S= 0.0739 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=98.05' TW=98.47' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Pond Ex-SB-CB-1: Ex-SB-CB-1



Summary for Pond New CB-1: New ST-CB #1

[58] Hint: Peaked 35.59' above defined flood level

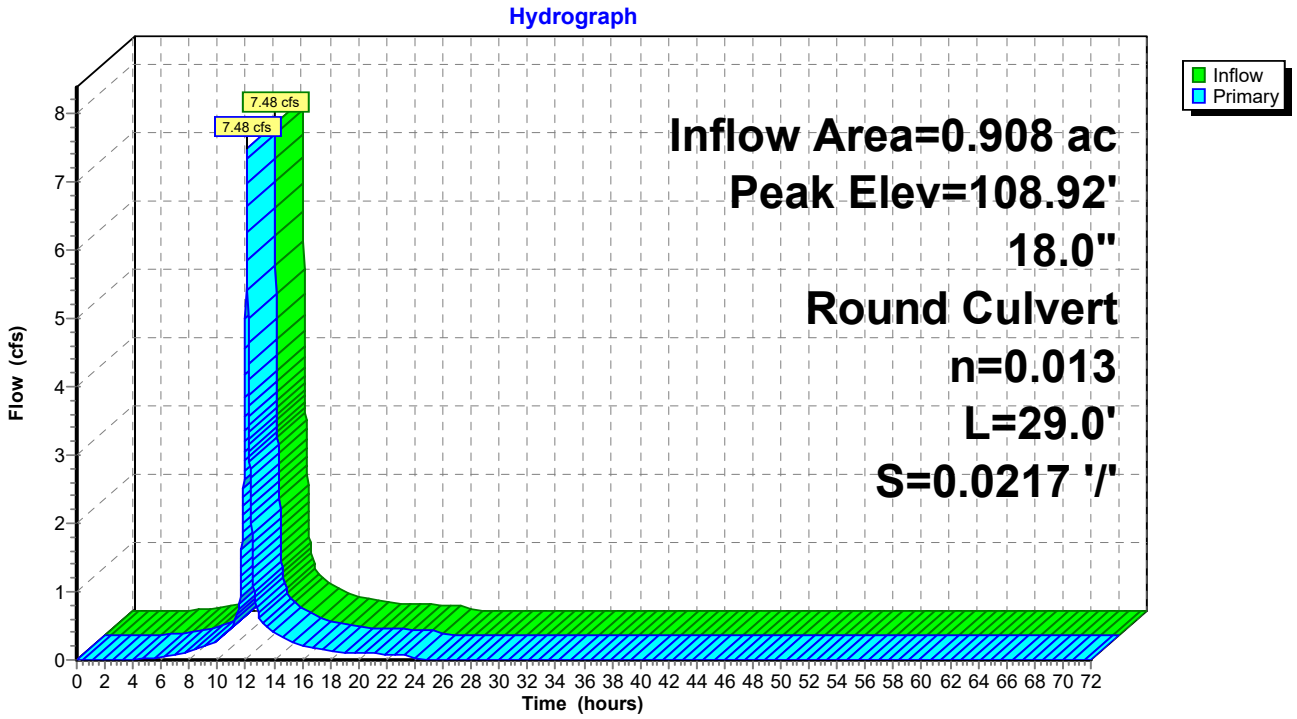
Inflow Area =	0.908 ac,	74.23% Impervious,	Inflow Depth =	7.19"	for 100-YEAR event
Inflow =	7.48 cfs @	12.07 hrs,	Volume=	0.544 af	
Outflow =	7.48 cfs @	12.07 hrs,	Volume=	0.544 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.48 cfs @	12.07 hrs,	Volume=	0.544 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 108.92' @ 12.09 hrs
Flood Elev= 73.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=106.50' TW=107.32' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Pond New CB-1: New ST-CB #1



Summary for Pond New CB-2: New ST-CB #2

[58] Hint: Peaked 34.85' above defined flood level
[80] Warning: Exceeded Pond New CB-1 by 3.49' @ 12.04 hrs (12.55 cfs 0.084 af)

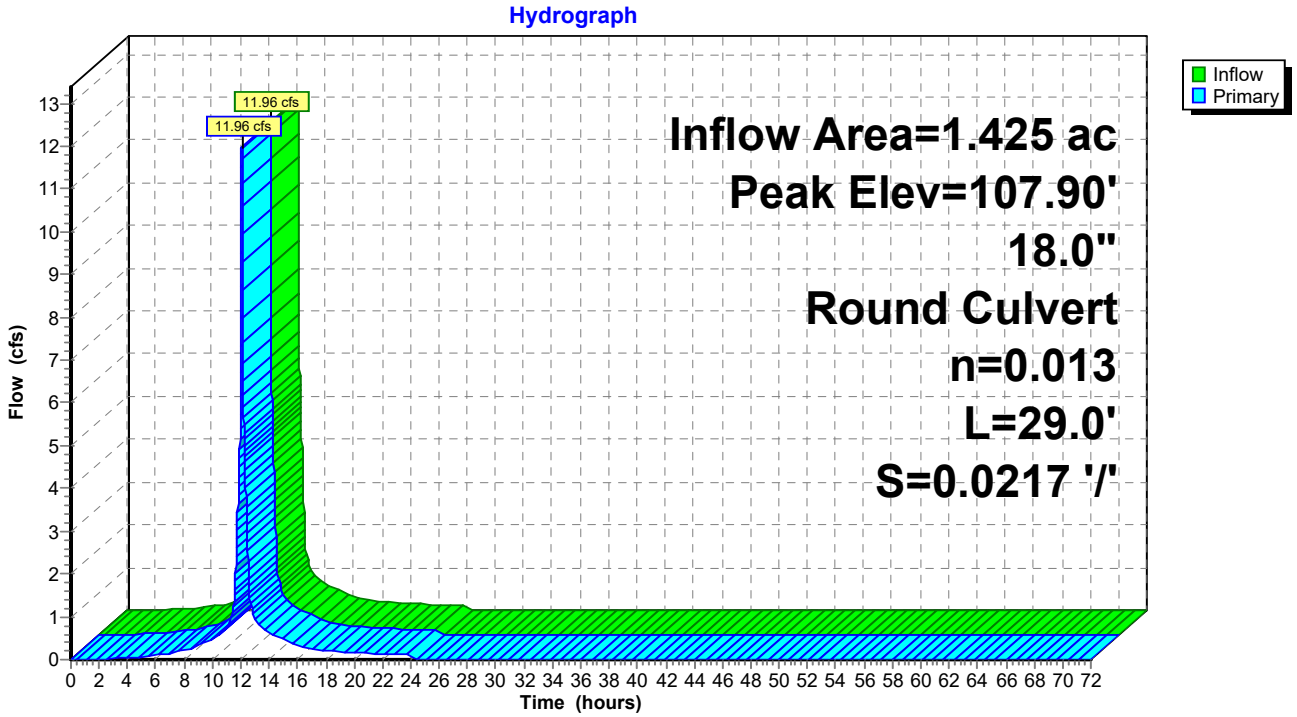
Inflow Area =	1.425 ac,	81.33% Impervious,	Inflow Depth =	7.46"	for 100-YEAR event
Inflow =	11.96 cfs @	12.07 hrs,	Volume=	0.886 af	
Outflow =	11.96 cfs @	12.07 hrs,	Volume=	0.886 af,	Atten= 0%, Lag= 0.0 min
Primary =	11.96 cfs @	12.07 hrs,	Volume=	0.886 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 107.90' @ 12.08 hrs
Flood Elev= 73.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.55'	**18.0" Round Culvert** L= 29.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.55' / 67.92' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=11.87 cfs @ 12.07 hrs HW=107.30' TW=104.18' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 11.87 cfs @ 6.72 fps)

Pond New CB-2: New ST-CB #2



Summary for Pond New CB-3: New ST-CB #3

[58] Hint: Peaked 31.96' above defined flood level

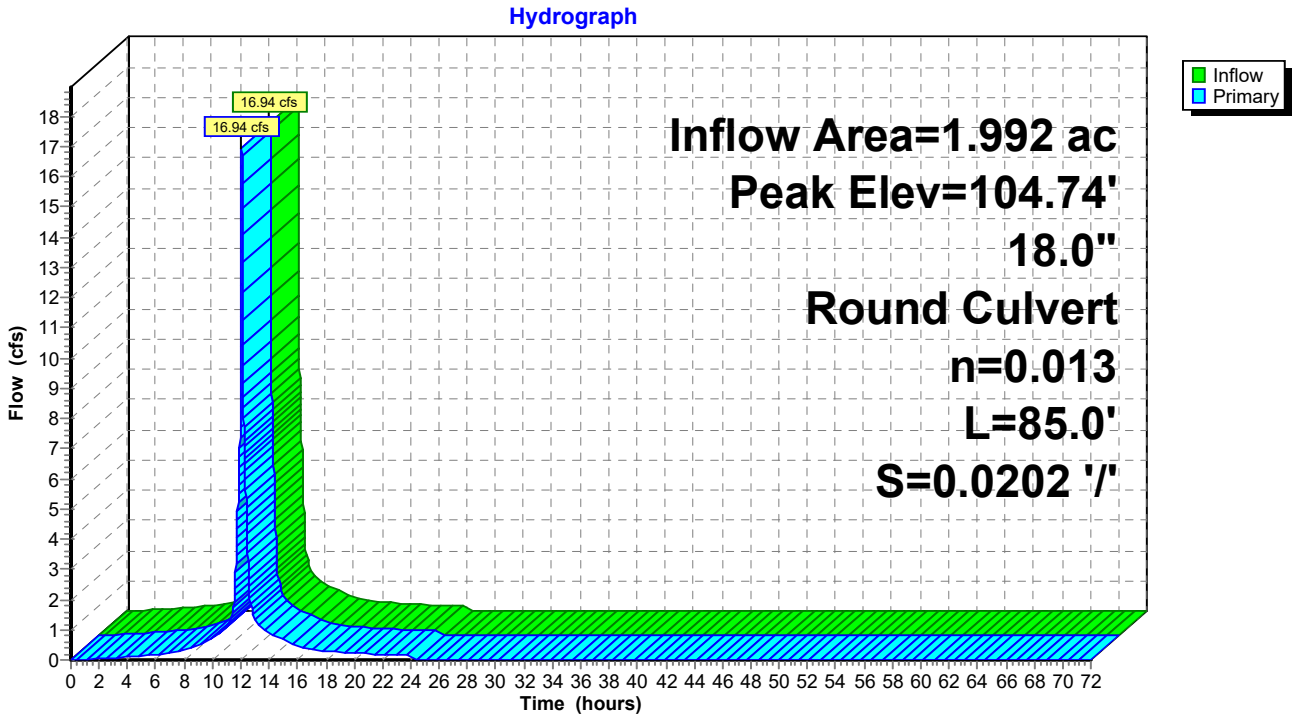
Inflow Area =	1.992 ac,	86.65% Impervious,	Inflow Depth =	7.73"	for 100-YEAR event
Inflow =	16.94 cfs @	12.07 hrs,	Volume=	1.282 af	
Outflow =	16.94 cfs @	12.07 hrs,	Volume=	1.282 af,	Atten= 0%, Lag= 0.0 min
Primary =	16.94 cfs @	12.07 hrs,	Volume=	1.282 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 104.74' @ 12.08 hrs
Flood Elev= 72.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.92'	**18.0" Round Culvert** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.92' / 66.20' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=16.01 cfs @ 12.07 hrs HW=104.16' TW=98.48' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 16.01 cfs @ 9.06 fps)

Pond New CB-3: New ST-CB #3



Summary for Pond New CB-6: New ST-CB #6

[58] Hint: Peaked 26.42' above defined flood level
[80] Warning: Exceeded Pond Ex-SB-CB-1 by 3.71' @ 12.03 hrs (5.75 cfs 0.035 af)

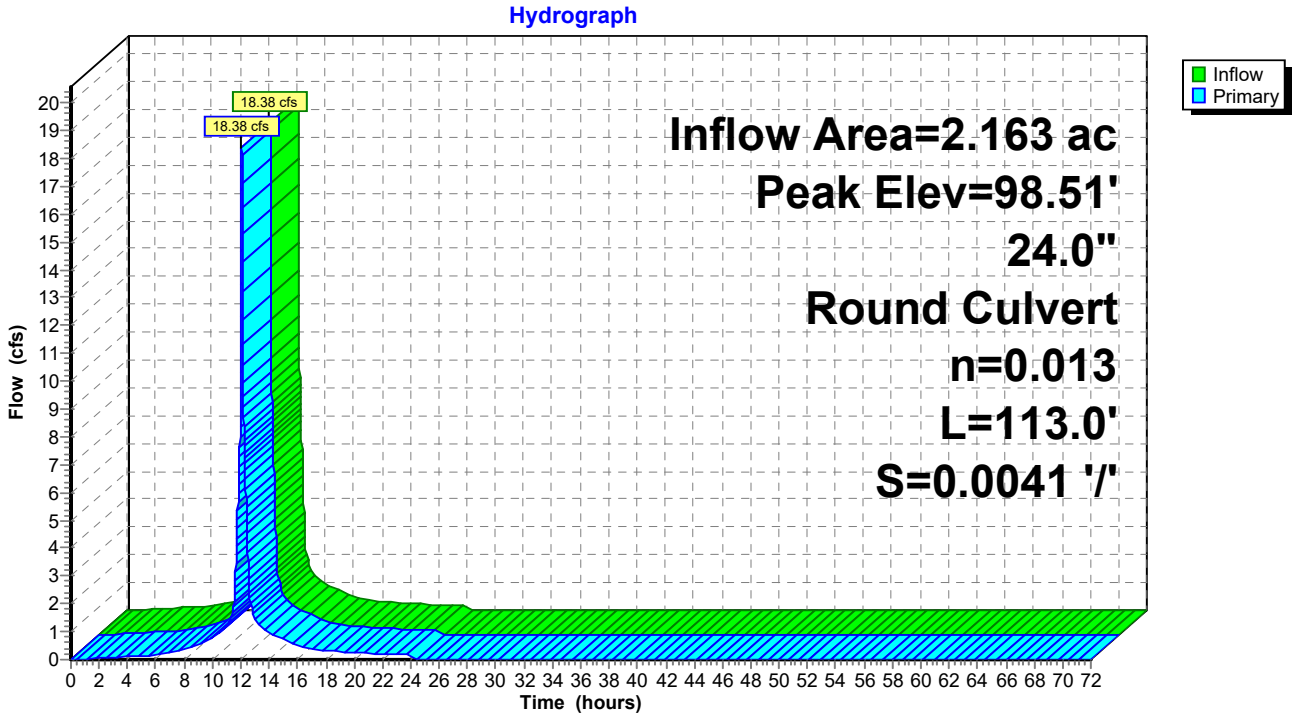
Inflow Area =	2.163 ac,	86.08% Impervious,	Inflow Depth =	7.70"	for 100-YEAR event
Inflow =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af	
Outflow =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.51' @ 12.07 hrs
Flood Elev= 72.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.70'	**24.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.70' / 65.24' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=18.37 cfs @ 12.07 hrs HW=98.48' TW=96.11' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.37 cfs @ 5.85 fps)

Pond New CB-6: New ST-CB #6



Summary for Pond New SWTS: New SWTS-1

[58] Hint: Peaked 24.90' above defined flood level

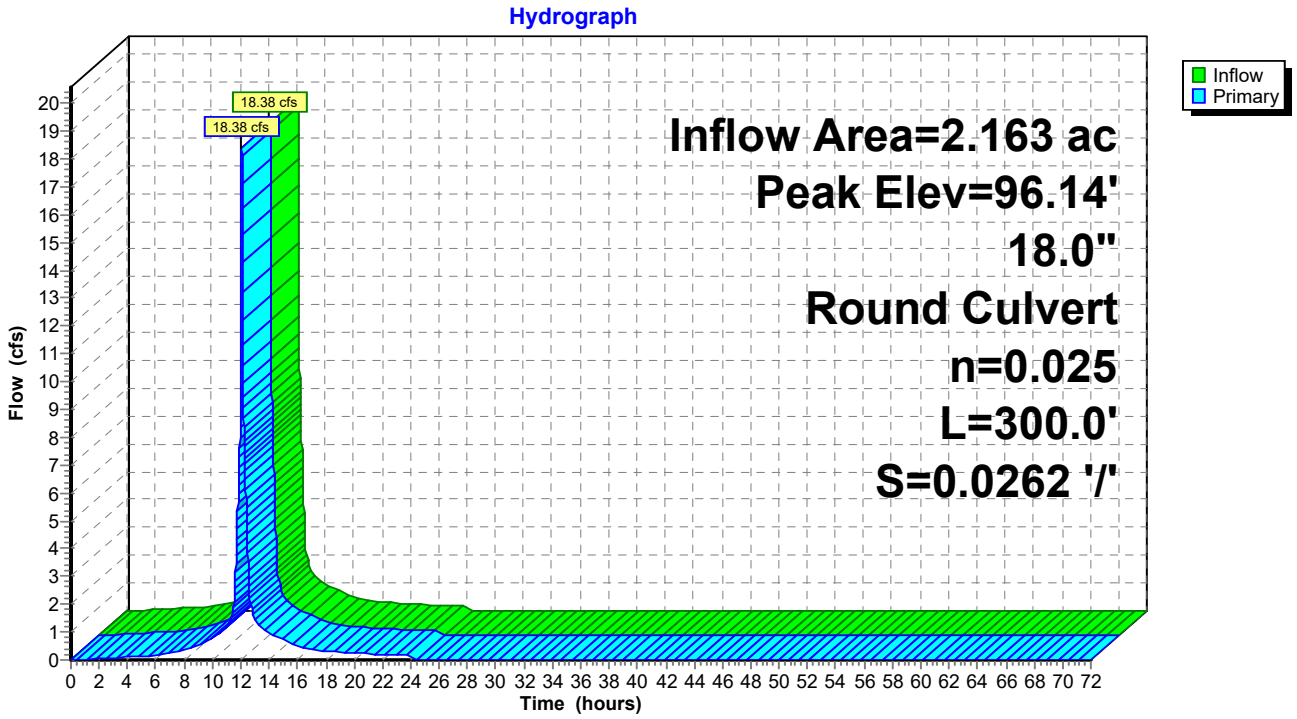
Inflow Area =	2.163 ac,	86.08% Impervious,	Inflow Depth =	7.70"	for 100-YEAR event
Inflow =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af	
Outflow =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.38 cfs @	12.07 hrs,	Volume=	1.388 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.14' @ 12.07 hrs
Flood Elev= 71.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.24'	**18.0" Round Culvert** L= 300.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 65.24' / 57.38' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=18.37 cfs @ 12.07 hrs HW=96.11' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 18.37 cfs @ 10.40 fps)

Pond New SWTS: New SWTS-1



Summary for Pond New-CB-11: New-CB-11

[58] Hint: Peaked 11.19' above defined flood level

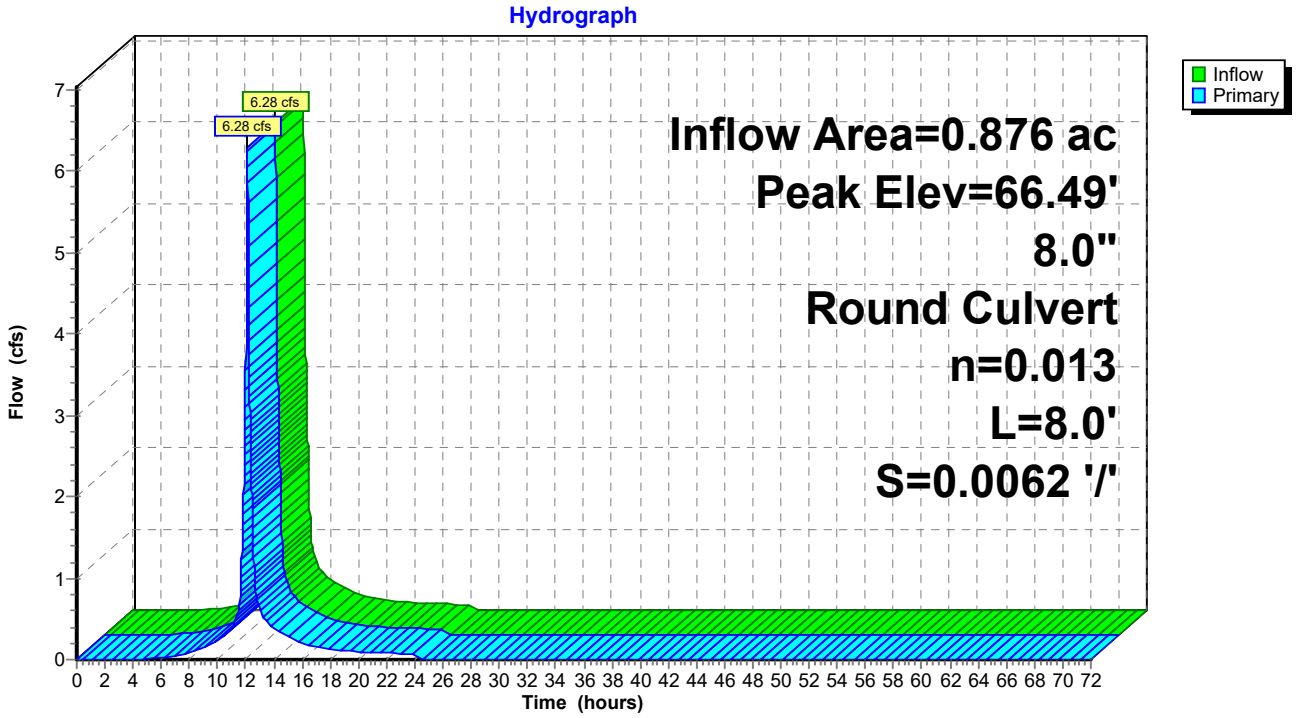
Inflow Area =	0.876 ac, 63.01% Impervious, Inflow Depth = 6.75" for 100-YEAR event				
Inflow =	6.28 cfs @ 12.11 hrs, Volume=	0.493 af			
Outflow =	6.28 cfs @ 12.11 hrs, Volume=	0.493 af, Atten= 0%, Lag= 0.0 min			
Primary =	6.28 cfs @ 12.11 hrs, Volume=	0.493 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 66.49' @ 12.11 hrs
Flood Elev= 55.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.18'	**8.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.18' / 52.13' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=6.27 cfs @ 12.11 hrs HW=66.44' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 6.27 cfs @ 17.97 fps)

Pond New-CB-11: New-CB-11



Summary for Pond New-CB-12: New-CB-12

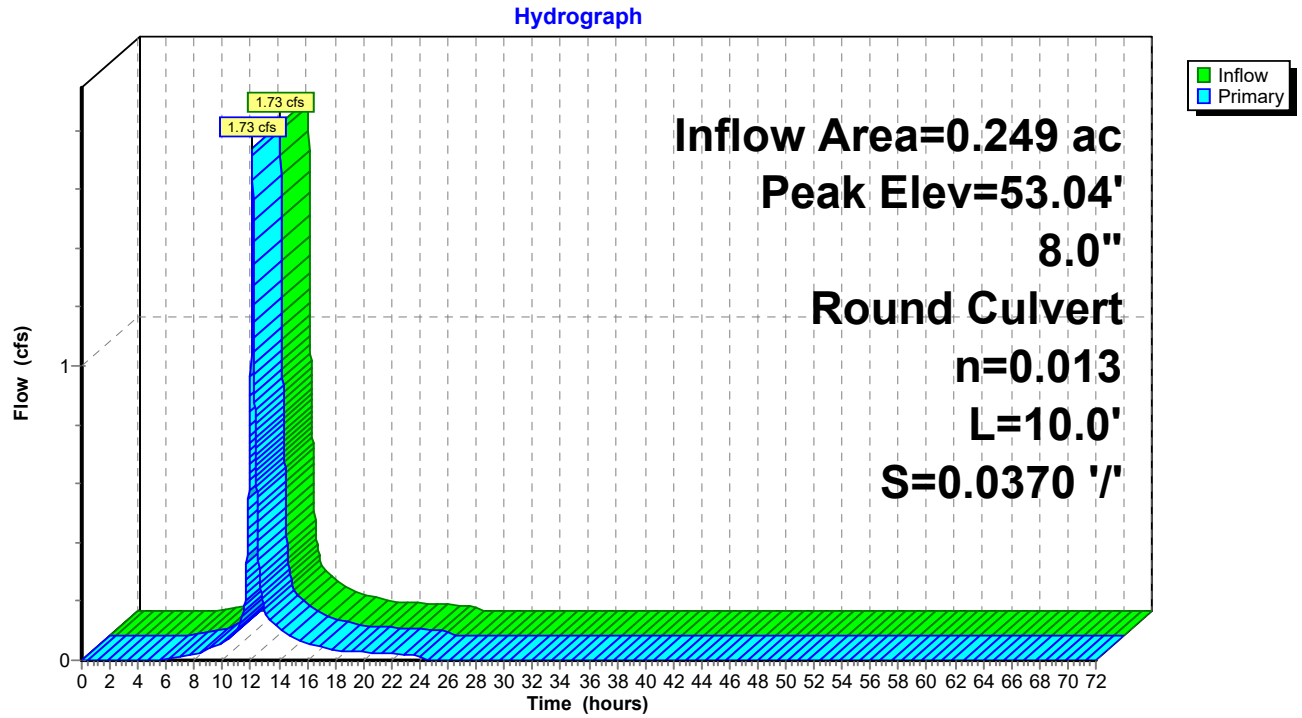
Inflow Area =	0.249 ac, 56.63% Impervious, Inflow Depth = 6.47" for 100-YEAR event				
Inflow =	1.73 cfs @ 12.11 hrs, Volume=	0.134 af			
Outflow =	1.73 cfs @ 12.11 hrs, Volume=	0.134 af, Atten= 0%, Lag= 0.0 min			
Primary =	1.73 cfs @ 12.11 hrs, Volume=	0.134 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 53.04' @ 12.11 hrs
Flood Elev= 56.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.00'	**8.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.00' / 50.63' S= 0.0370 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.73 cfs @ 12.11 hrs HW=53.04' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.73 cfs @ 4.96 fps)

Pond New-CB-12: New-CB-12



Summary for Pond New-CB-13: New-CB-13

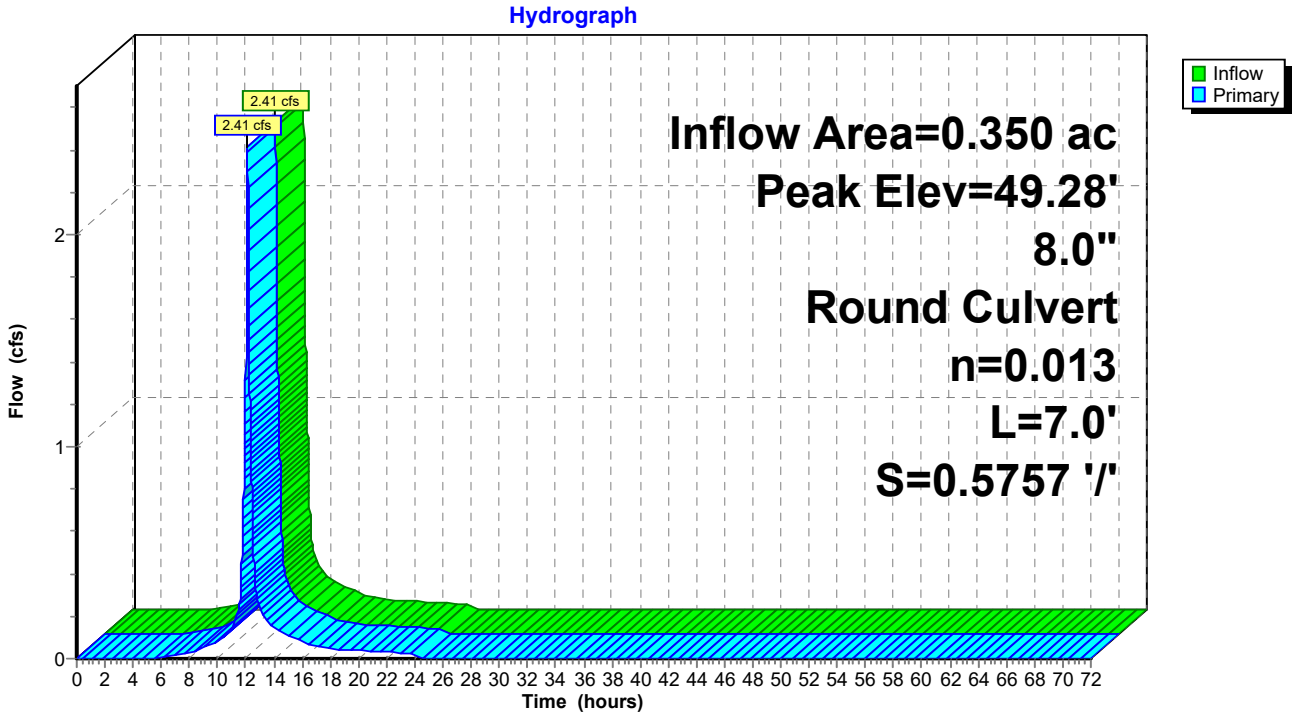
Inflow Area = 0.350 ac, 56.57% Impervious, Inflow Depth = 6.47" for 100-YEAR event
Inflow = 2.41 cfs @ 12.11 hrs, Volume= 0.189 af
Outflow = 2.41 cfs @ 12.11 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min
Primary = 2.41 cfs @ 12.11 hrs, Volume= 0.189 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 49.28' @ 12.11 hrs
Flood Elev= 55.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.89'	**8.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.89' / 42.86' S= 0.5757 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=2.41 cfs @ 12.11 hrs HW=49.28' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.41 cfs @ 6.91 fps)

Pond New-CB-13: New-CB-13



Summary for Pond SC-P-1: New Pond Forebay

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 8.40" for 100-YEAR event
Inflow = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af
Outflow = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.2 min
Primary = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 127.33' Surf.Area= 0.001 ac Storage= 0.003 af
Peak Elev= 127.98' @ 12.07 hrs Surf.Area= 0.001 ac Storage= 0.003 af (0.000 af above start)

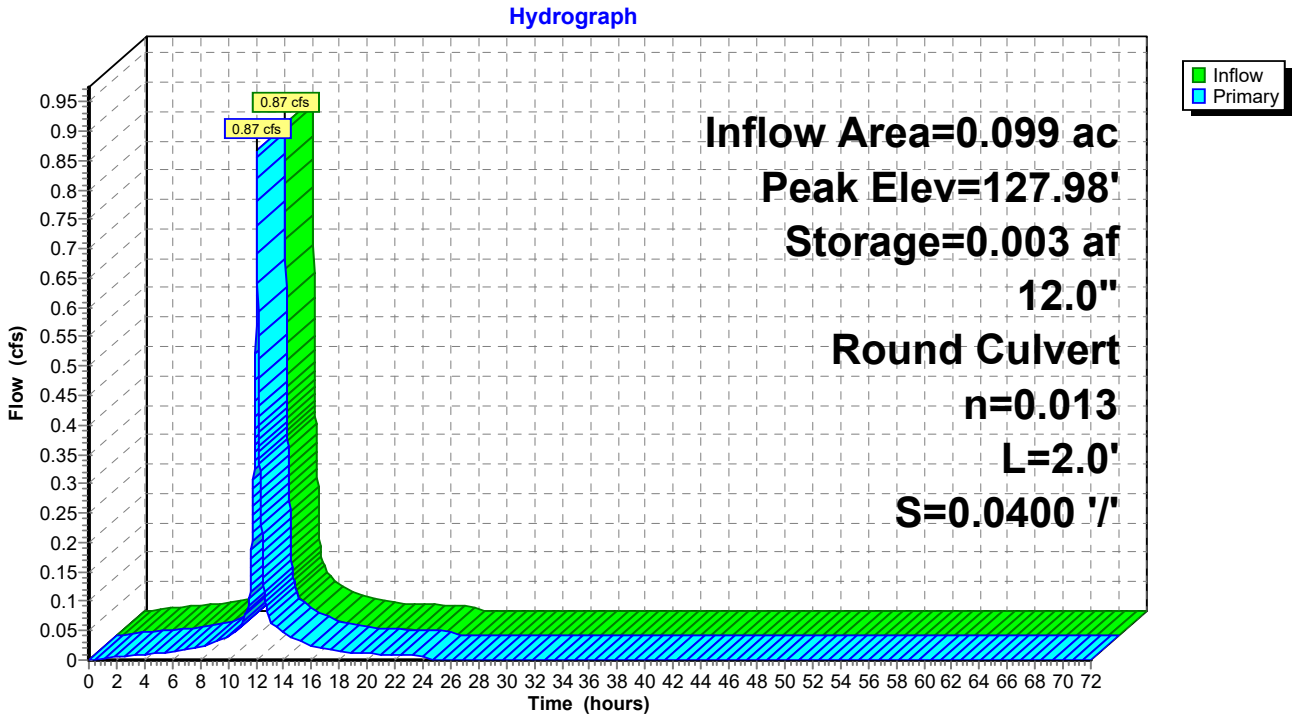
Plug-Flow detention time= 45.1 min calculated for 0.067 af (96% of inflow)
Center-of-Mass det. time= 1.3 min (740.6 - 739.4)

Volume	Invert	Avail.Storage	Storage Description
#1	123.33'	0.005 af	**6.00'D x 7.00'H Pretreatment Sump**

Device	Routing	Invert	Outlet Devices
#1	Primary	127.33'	**12.0" Round Culvert** L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.33' / 127.25' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.07 hrs HW=127.98' TW=127.80' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.87 cfs @ 1.60 fps)

Pond SC-P-1: New Pond Forebay



Summary for Pond SC-P-2: New Dry Well

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 8.40" for 100-YEAR event
Inflow = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af
Outflow = 0.87 cfs @ 12.08 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.2 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.015 af
Primary = 0.86 cfs @ 12.08 hrs, Volume= 0.054 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 127.80' @ 12.08 hrs Surf.Area= 0.002 ac Storage= 0.006 af

Plug-Flow detention time= 114.0 min calculated for 0.069 af (100% of inflow)
Center-of-Mass det. time= 114.2 min (854.8 - 740.6)

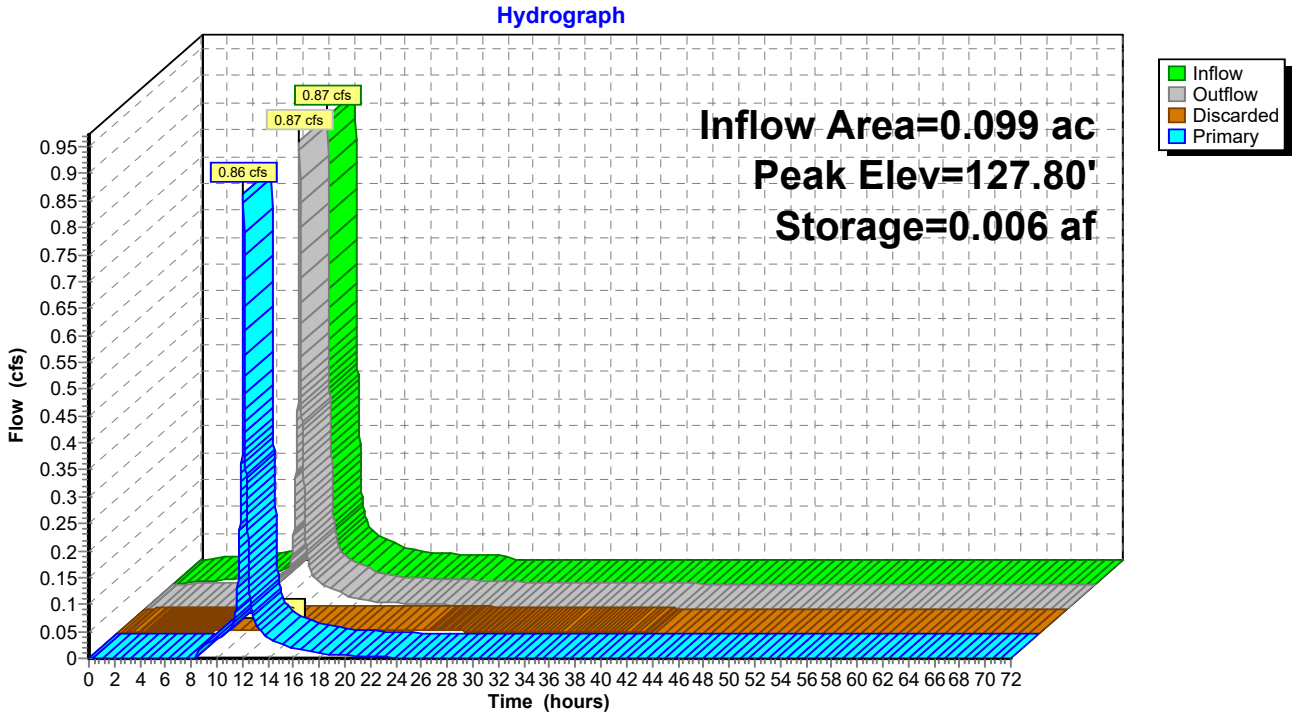
Volume	Invert	Avail.Storage	Storage Description
#1	121.83'	0.003 af	**10.00'D x 7.50'H Vertical Cone/Cylinder** 0.014 af Overall - 0.005 af Embedded = 0.008 af x 40.0% Voids
#2	123.33'	0.004 af	**6.00'D x 6.00'H Vertical Cone/Cylinder**Inside #1 0.005 af Overall - 6.0" Wall Thickness = 0.004 af
		0.007 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.83'	**1.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	127.33'	**12.0" Round Culvert** L= 116.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.33' / 122.50' S= 0.0416 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=127.80' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.86 cfs @ 12.08 hrs HW=127.80' TW=124.71' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.86 cfs @ 2.34 fps)

Pond SC-P-2: New Dry Well

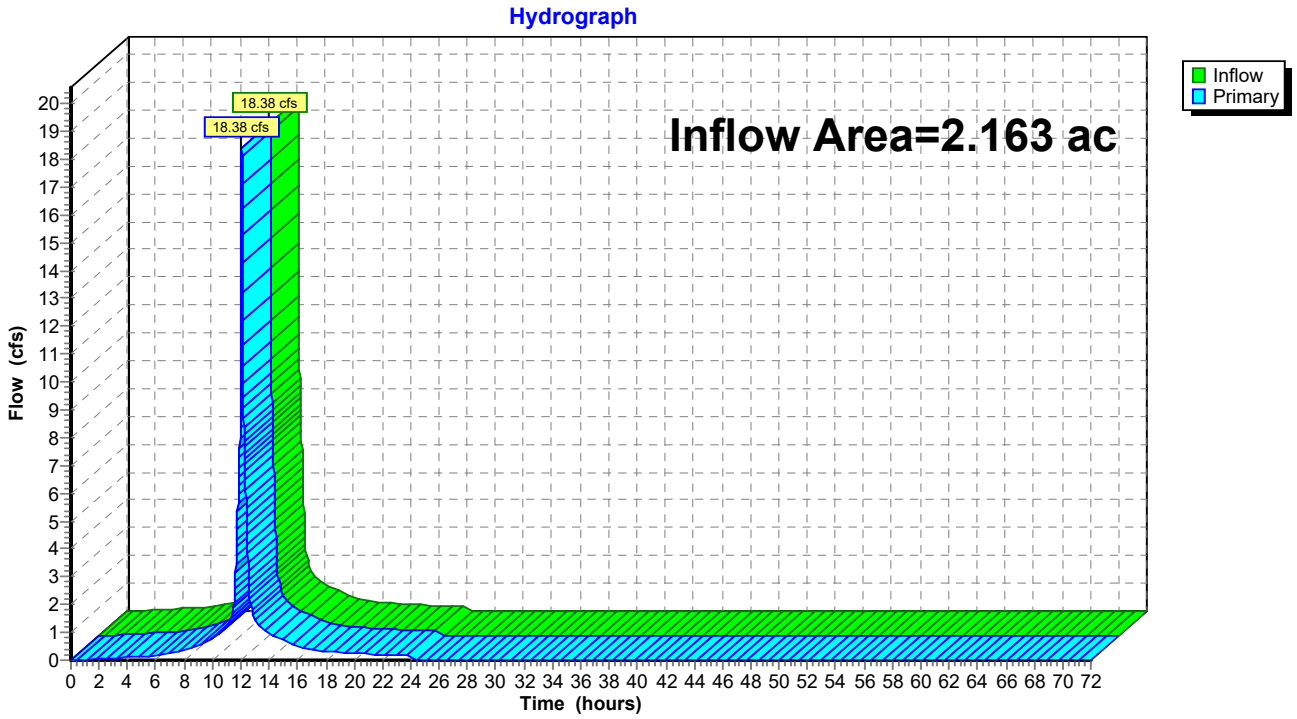


Summary for Link 1L: Flow to the North

Inflow Area = 2.163 ac, 86.08% Impervious, Inflow Depth = 7.70" for 100-YEAR event
Inflow = 18.38 cfs @ 12.07 hrs, Volume= 1.388 af
Primary = 18.38 cfs @ 12.07 hrs, Volume= 1.388 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Flow to the North

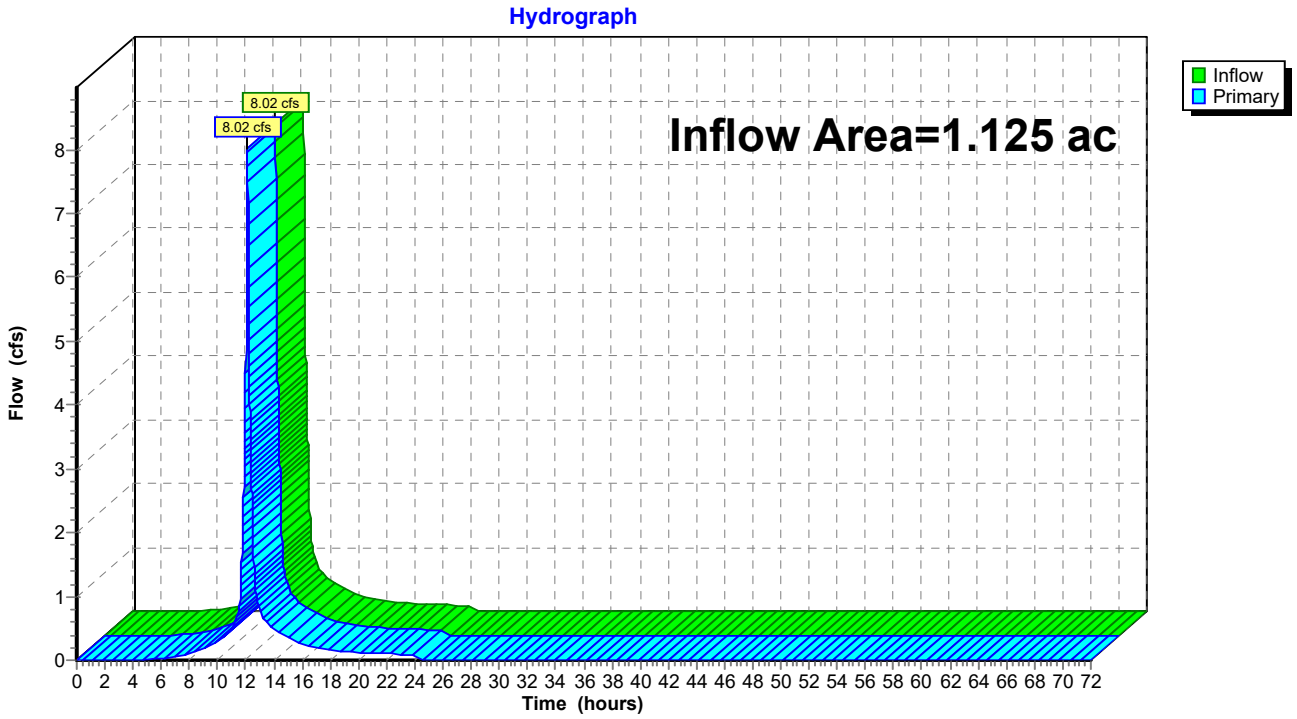


Summary for Link 2L: Culvert to Hudson River 1

Inflow Area = 1.125 ac, 61.60% Impervious, Inflow Depth = 6.69" for 100-YEAR event
Inflow = 8.02 cfs @ 12.11 hrs, Volume= 0.627 af
Primary = 8.02 cfs @ 12.11 hrs, Volume= 0.627 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Culvert to Hudson River 1

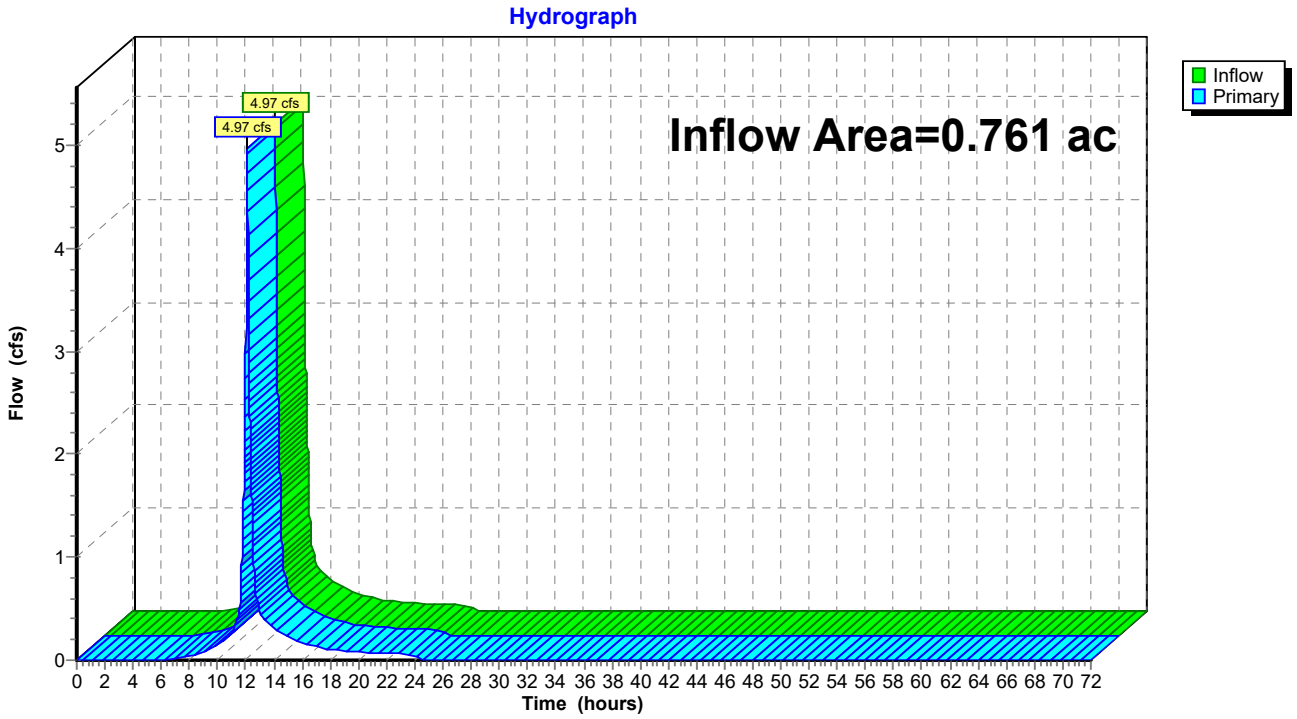


Summary for Link 3L: Culvert to Hudson River 2

Inflow Area = 0.761 ac, 43.10% Impervious, Inflow Depth = 5.88" for 100-YEAR event
Inflow = 4.97 cfs @ 12.09 hrs, Volume= 0.373 af
Primary = 4.97 cfs @ 12.09 hrs, Volume= 0.373 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Culvert to Hudson River 2

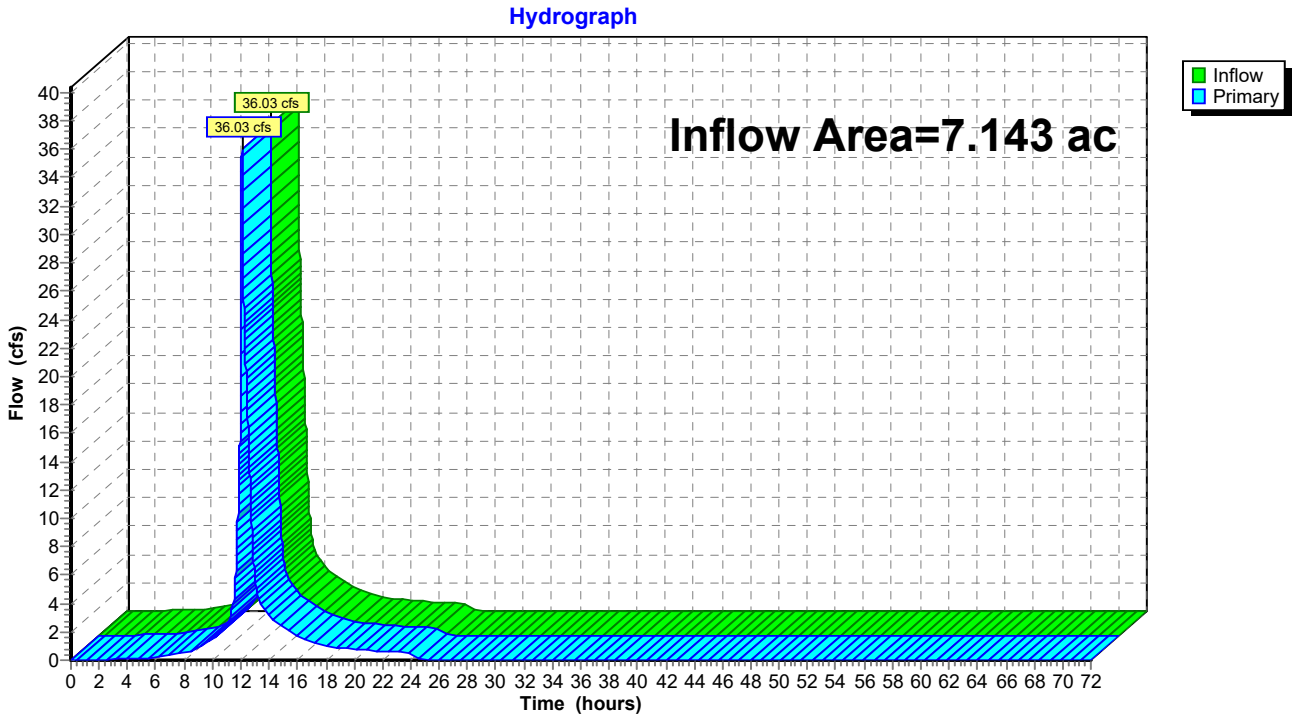


Summary for Link Hudson: Hudson River

Inflow Area = 7.143 ac, 52.71% Impervious, Inflow Depth = 6.23" for 100-YEAR event
Inflow = 36.03 cfs @ 12.09 hrs, Volume= 3.709 af
Primary = 36.03 cfs @ 12.09 hrs, Volume= 3.709 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Hudson: Hudson River



APPENDIX E
SPDES GENERAL PERMIT

General Permit GP-0-20-001

See NYSDEC's website for most up-to-date permit information:
https://www.dec.ny.gov/docs/water_pdf/constgp020001.pdf

APPENDIX F
NYSDEC FORMS

Notice of Intent (NOI)

Notice of Termination (NOT)

MS4 Acceptance Form

NOI Acknowledgement Letter

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.32

(Submission #: HPF-GMMX-HG4MB, version 1)

Details

Originally Started By	HILLARY CHIARELLA
Alternate Identifier	Mercy College Site, Parking, and Accessibility Improvements
Submission ID	HPF-GMMX-HG4MB
Submission Reason	New
Status	Draft

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)
Mercy College Tarrytown

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

Owner/Operator Contact Person First Name
Thomas

Owner/Operator Mailing Address
555 Broadway

City
Dobbs Ferry

State
NY

Zip
10522

Phone
9146747473

Email
tsimmonds1@mercy.edu

Federal Tax ID
NONE PROVIDED

Project Location

Project/Site Name
Mercy College Site, Parking, and Accessibility Improvements

Street Address (Not P.O. Box)
828 South Broadway

Side of Street
West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Tarrytown

State
NY

Zip
10591

DEC Region
3

County
WESTCHESTER

Name of Nearest Cross Street
East Sunnyside Lane

Distance to Nearest Cross Street (Feet)
450

Project In Relation to Cross Street
North

Tax Map Numbers Section-Block-Parcel
1.260-135-1

Tax Map Numbers
NONE PROVIDED

1. Coordinates

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

Navigate to your location and click on the map to get the X,Y coordinates
41.049608,-73.860225

Project Details

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

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

Pre-Development Existing Landuse
Parking Lot

Post-Development Future Land Use
Parking Lot

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

---

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)
10.2

Total Area to be Disturbed (acres)
1.39

Existing Impervious Area to be Disturbed (acres)
0.2912

Future Impervious Area Within Disturbed Area (acres)
0.8081

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

---

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

A (%)
0

B (%)
100

C (%)
0

D (%)
0

7. Is this a phased project?
Yes

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

Start Date
NONE PROVIDED

End Date
NONE PROVIDED

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

9a. Type of waterbody identified in question 9?
River Off Site

Other Waterbody Type Off Site Description
NONE PROVIDED

9b. If "wetland" was selected in 9A, how was the wetland identified?
NONE PROVIDED

10. Has the surface waterbody(ies in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001?
No

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001?
No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?
Yes

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?
NONE PROVIDED

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

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

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

16. What is the name of the municipality/entity that owns the separate storm sewer system?
NONE PROVIDED

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

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

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

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

Required SWPPP Components

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

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

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

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

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

SWPPP Preparer
Foit-Albert Associates

Contact Name (Last, Space, First)
Pericak, Deanne

Mailing Address
295 Main Street, Ste. 200

City
Buffalo

State
NY

Zip
14203

Phone
7168563933

Email
dpericak@foit-albert.com

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form
2) The certified SWPPP preparer should sign this form
3) Scan the signed form
4) Upload the scanned document
Download SWPPP Preparer Certification Form

Please upload the SWPPP Preparer Certification

NONE PROVIDED

Comment

NONE PROVIDED

Erosion & Sediment Control Criteria

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

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

Temporary Structural
Dust Control
Silt Fence
Stabilized Construction Entrance
Storm Drain Inlet Protection

Biotechnical
None

Vegetative Measures
Mulching
Protecting Vegetation
Seeding
Topsoiling

Permanent Structural
Land Grading

Other
Compost Filter Sock

Post-Construction Criteria

*** IMPORTANT: Completion of Questions 27-39 is not required if response to**

Question 22 is No.

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

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).
All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)
0.072

29. Post-construction SMP Identification
Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28).

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

Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)
0.075

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

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

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)
NONE PROVIDED

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?
NONE PROVIDED

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

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

33. SMPs
Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30).

Also, provide the total impervious area that contributes runoff to each practice selected.

NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)
NONE PROVIDED

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

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).
NONE PROVIDED

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?
NONE PROVIDED

If Yes, go to question 36.

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

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

CPv Required (acre-feet)
0.186

CPv Provided (acre-feet)
0.292

36a. The need to provide channel protection has been waived because:
NONE PROVIDED

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

Overbank Flood Control Criteria (Qp)

Pre-Development (CFS)
10.67

Post-Development (CFS)
9.26

Total Extreme Flood Control Criteria (Qf)

Pre-Development (CFS)
24.82

Post-Development (CFS)
25.58

37a. The need to meet the Qp and Qf criteria has been waived because:
NONE PROVIDED

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

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

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.
NONE PROVIDED

Post-Construction SMP Identification

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

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)
NONE PROVIDED

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)
NONE PROVIDED

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
NONE PROVIDED

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
NONE PROVIDED

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)
NONE PROVIDED

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)
NONE PROVIDED

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)
NONE PROVIDED

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)
NONE PROVIDED

Total Contributing Impervious Acres for Vegetated Swale (RR-5)
NONE PROVIDED

Total Contributing Impervious Acres for Rain Garden (RR-6)
NONE PROVIDED

Total Contributing Impervious Acres for Stormwater Planter (RR-7)
NONE PROVIDED

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)
NONE PROVIDED

Total Contributing Impervious Acres for Porous Pavement (RR-9)
NONE PROVIDED

Total Contributing Impervious Acres for Green Roof (RR-10)
NONE PROVIDED

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)
NONE PROVIDED

Total Contributing Impervious Acres for Infiltration Basin (I-2)
NONE PROVIDED

Total Contributing Impervious Acres for Dry Well (I-3)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Infiltration System (I-4)
NONE PROVIDED

Total Contributing Impervious Acres for Bioretention (F-5)
0.612

Total Contributing Impervious Acres for Dry Swale (O-1)
NONE PROVIDED

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Pond (P-2)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Extended Detention (P-3)
NONE PROVIDED

Total Contributing Impervious Acres for Multiple Pond System (P-4)
NONE PROVIDED

Total Contributing Impervious Acres for Pocket Pond (P-5)
NONE PROVIDED

Total Contributing Impervious Acres for Surface Sand Filter (F-1)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Sand Filter (F-2)
NONE PROVIDED

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)
NONE PROVIDED

Total Contributing Impervious Acres for Organic Filter (F-4)
NONE PROVIDED

Total Contributing Impervious Acres for Shallow Wetland (W-1)
NONE PROVIDED

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)
NONE PROVIDED

Total Contributing Impervious Acres for Pond/Wetland System (W-3)
NONE PROVIDED

Total Contributing Impervious Acres for Pocket Wetland (W-4)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Swale (O-2)
NONE PROVIDED

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

Total Contributing Impervious Area for Hydrodynamic
NONE PROVIDED

Total Contributing Impervious Area for Wet Vault
NONE PROVIDED

Total Contributing Impervious Area for Media Filter
NONE PROVIDED

"Other" Alternative SMP?
NONE PROVIDED

Total Contributing Impervious Area for "Other"
NONE PROVIDED

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

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

Manufacturer of Alternative SMP
NONE PROVIDED

Name of Alternative SMP
NONE PROVIDED

Other Permits

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

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

If Other, then identify
NONE PROVIDED

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

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

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

MS4 SWPPP Acceptance

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

If No, skip question 44

44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?
Yes

MS4 SWPPP Acceptance Form Download
Download form from the link below. Complete, sign, and upload.
MS4 SWPPP Acceptance Form

MS4 Acceptance Form Upload

NONE PROVIDED

Comment

NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download

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

Owner/Operator Certification Form (PDF, 45KB)

Upload Owner/Operator Certification Form

NONE PROVIDED

Comment

NONE PROVIDED

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)

APPENDIX G
CERTIFICATION FORMS

Contractor Certification

SWPPP Contractor (Sub-contractor) Certification Statement

In accordance with **SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES**, Permit Number GP-0-15-002, Part III.A.6,

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

Project Title: _____

Elements of the SWPPP for which the undersigned is responsible:

_____

_____

_____

Name of Contracting Company: _____

Address: _____

Phone:_____

_____

Authorized Representative of Contracting Company (print):

Title: _____

_____

Signature: Date:

Name of Trained Contractor*:_____ ID #:_____

_____

Signature: Date:

Name of Trained Contractor*:_____ ID #:_____

_____

Signature: Date:

* as defined in GP-0-15-002

APPENDIX H
MAINTENANCE AND INSPECTION FORMS

Construction Inspection Checklist

Maintenance and Inspection Procedures

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. Pre-Construction Meeting Documents
   a. Preamble to Site Assessment and Inspections
   b. Pre-Construction Site Assessment Checklist

II. Construction Duration Inspections
   a. Directions
   b. Modification to the SWPPP

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 inspector[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. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. 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.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector 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 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
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. 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 Access

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. 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? _____

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 Inspector (print name) **Qualified Inspector 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 at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] 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, debris and spoils 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.

3. Stabilized Construction Access

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?

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.

Runoff Control Practices (continued)

2. Flow 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

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. Silt Fence and Linear Barriers

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)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured 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.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.
Sediment accumulation ___% of design capacity.

3. 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 trap slopes and disturbed areas are stabilized.
Sediment accumulation is ___% of design capacity.

4. 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 basin dewatering pool is dewatering at appropriate rate.
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. All practices shall be maintained in accordance with their respective standards.

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:

CONTECH®
ENGINEERED SOLUTIONS

Cascade Separator® Inspection and Maintenance Guide

CASCADE
separator®

Maintenance

The Cascade Separator® system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects sediment and debris will depend upon on-site activities and site pollutant characteristics. For example, unstable soils or heavy winter sanding will cause the sediment storage sump 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 (i.e. spring and fall). However, more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment wash-down areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

A visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet chamber, flumes or outlet channel. 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 in this Inspection and Maintenance Guide.

Access to the Cascade Separator unit is typically achieved through one manhole access cover. The opening allows for inspection and cleanout of the center chamber (cylinder) and sediment storage sump, as well as inspection of the inlet chamber and slanted skirt. For large units, multiple manhole covers allow access to the chambers and sump.

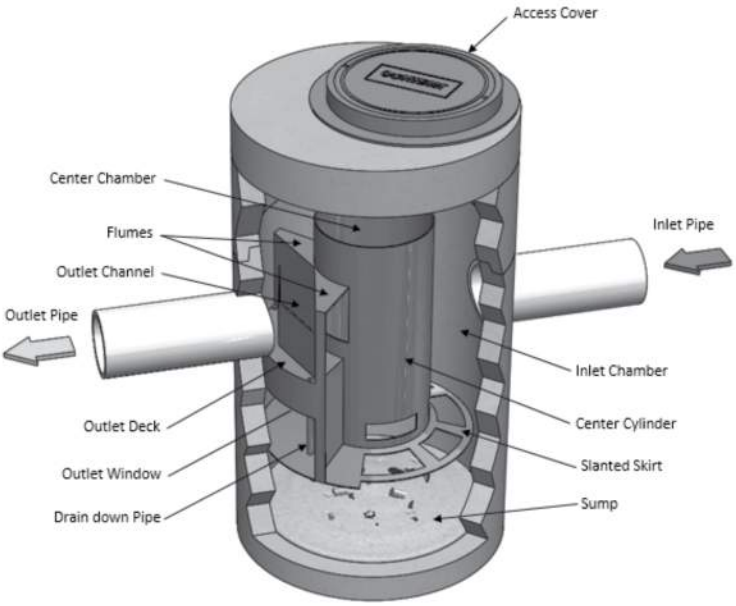
The Cascade Separator system should be cleaned before the level of sediment in the sump reaches the maximum sediment depth and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it must be replaced when significant discoloration has occurred. Performance may be impacted when maximum sediment storage capacity is exceeded. Contech recommends maintaining the system when sediment level reaches 50% of maximum storage volume. The level of sediment is easily determined by measuring the distance from the system outlet invert (standing water level) 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. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the chart in this document to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage.

Cleaning

Cleaning of a Cascade Separator system 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 cover and insert the vacuum tube down through the center chamber and into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The areas outside the center chamber and the slanted skirt should also be washed off if pollutant build-up exists in these areas.

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. 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. Then the system 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 to ensure proper safety precautions. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the Cascade Separator system must be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal. If any components are damaged, replacement parts can be ordered from the manufacturer.



Cascade Separator® Maintenance Indicators and Sediment Storage Capacities

Model Number	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CS-3	3	0.9	1.5	0.5	0.4	0.3
CS-4	4	1.2	2.5	0.8	0.7	0.5
CS-5	5	1.3	3	0.9	1.1	0.8
CS-6	6	1.8	3.5	1	1.6	1.2
CS-8	8	2.4	4.8	1.4	2.8	2.1
CS-10	10	3.0	6.2	1.9	4.4	3.3
CS-12	12	3.6	7.5	2.3	6.3	4.8

Note: The information in the chart is for standard units. Units may have been designed with non-standard sediment storage depth.

A Cascade Separator unit can be easily cleaned in less than 30 minutes.

A vacuum truck excavates pollutants from the systems.

Cascade Separator® Inspection & Maintenance Log

Cascade Model:			Location:		
Date	Depth Below Invert to Top of Sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The depth to sediment is determined by taking a measurement from the manhole outlet invert (standing water level) to the top of the sediment pile. Once this measurement is recorded, it should be compared to the chart in the maintenance guide to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage. 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.

SUPPORT

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

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