

Watchtower Educational Center Amended Site Plan

TOWN OF PATTERSON, PUTNAM COUNTY, NEW YORK

Preliminary Stormwater Pollution Prevention Plan

AKRF Project Number: 80167

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1.0 OBJECTIVE

AKRF Engineering, P.C. (AKRF) prepared this Stormwater Pollution Prevention Plan (SPPP) in accordance with the following applicable rules, regulations, and guidance documents:

- New York State Department of Environmental Conservation (NYSDEC) Stormwater Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities Permit No. GP-0-10-001 (SPDES GP-0-10-001);
- New York State Stormwater Management Design Manual, latest version produced by NYSDEC;
- New York State Standards and Specifications for Erosion and Sediment Control, latest version produced by NYSDEC;
- City of New York, Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and its Sources;
- Town of Patterson, Stormwater, Soil Erosion and Sediment Control (Town Code Chapter 133).

The objectives of this SPPP are to:

1. Outline Owner and Contractor responsibilities to maintain compliance with SPDES GP-0-10-001, including required inspections, maintenance, forms, and certifications.
2. Outline measures to install, inspect, and maintain erosion and sediment control measures for the proposed project. The objective of these measures is to eliminate or significantly minimize pollutant discharges to the adjacent surface water bodies during construction activities.
3. Describe the post-construction water quality treatment practices that are designed to capture and treat the stormwater runoff from the proposed project drainage areas.
4. Specify post-construction stormwater management structures on-site such that the proposed peak flows do not exceed the pre-development peak flows, thus providing channel protection, overbank flood control, and control of the peak discharge control from the extreme storm event.

2.0 OWNER'S RESPONSIBILITIES

Watchtower Bible and Tract Society of New York, Inc., the "Owner," is responsible to ensure that the Contractor installs and maintains the erosion and sediment control measures in accordance with this SPPP. The Owner is also responsible to ensure that the appropriate forms and certifications contained herein are completed prior to and throughout the duration of demolition and construction activities. The Owner shall keep a copy of this document, associated attachments, and any inspection reports generated on-site for the duration of the project and for a minimum of 5 years from the date that the site achieves final stabilization.

The Owner should ensure that the provisions of the SPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization and the Notice of Termination (NOT) has been submitted to the appropriate NYSDEC office.

The Owner should maintain a copy of the SPDES GP-0-10-001, Notice of Intent (NOI), NOI acknowledgement letter, SPPP, MS4 SPPP Acceptance Form and inspection reports at the construction site until all disturbed areas have achieved final stabilization and the Notice of Termination has been submitted to NYSDEC. The documents must be maintained in a secure location, such as a job trailer, on-

site construction office, or mailbox with lock that is accessible during normal working hours to an individual performing a compliance inspection.

3.0 CONTRACTOR'S RESPONSIBILITIES

The Contractor is responsible for reading this entire SPPP and related project specifications and reviewing all forms, certifications, and contract drawings to become familiar with all aspects related to the SPDES GP-0-10-001. The Contractor shall retain a signed copy of this SPPP and all associated attachments on-site from the initiation of demolition and proposed construction activities to the date of final stabilization. The Contractor is responsible for completing the certification contained herein prior to the commencement of demolition and proposed construction activities. The certification shall be signed by a president or any person who performs similar decision making functions and by the on-site individual having responsibility for the firm. Each of the subcontractors involved in the implementation of erosion and sediment control measures must also complete a certification. The Contractor is responsible for each of the subcontractors employed by the Contractor that are involved in the implementation of erosion and sediment controls.

It is the duty of the Contractor to properly install and maintain all erosion and sediment control measures on the site as per this SPPP. The Contractor shall also be responsible for the inspection of all erosion and sediment control measures for the proposed project site by a qualified inspector as per this SPPP. Should the Owner, an owner's representative, or any local authority having jurisdiction deem that the SPPP or the Contractor's implementation of the SPPP proves to be ineffective in eliminating or significantly minimizing the pollutants or achieving the goals of the SPDES GP-0-10-001, the Contractor shall take any necessary action to conform to the objectives of the permit at no additional cost to the Owner.

The Contractor shall inspect and report the disturbed and stabilized areas for the duration of the project as indicated on the Record of Stabilization and Demolition and Construction Activities form contained herein. It is the duty of the Contractor to properly inspect and maintain all erosion and sediment control measures installed on the site as per this SPPP. Any revision to the SPPP in design, demolition and construction activities, inspection, or maintenance shall be reflected by the Contractor in the on-site copy of the SPPP in a timely manner. At the beginning of this work, the Contractor must designate a qualified inspector. The Contractor shall coordinate with the Resident Engineer to ensure that all of the inspection requirements are in conformance with this SPPP and the requirements of the SPDES GP-0-10-001. On a monthly basis, copies of all inspection forms and maintenance records shall be organized and filed accordingly by the Contractor.

4.0 PRE-DEVELOPMENT CONDITIONS

The Watchtower Educational Center (WEC) is located adjacent to Route 22 in the Town of Patterson, Putnam County, New York. The properties consist of approximately 691 acres of land on the east and west side of Route 22. The footprint of the proposed project will be located on lot #53, adjacent to the existing WEC development on the eastern slopes of the valley formed by Cranberry Mountain to the east and the Great Swamp to the west. Therefore most of the discussion within the report will be focused on that portion of the site.

The site is bounded by the Great Swamp to the west and Thunder Ridge Ski Area to the north. NYS Route 22 separates the WEC property, with the majority of the developed property existing on the parcels east of Route 22. The property located on the west of Route 22 is primarily agricultural use.

Residents and students are housed in six residence buildings at the facility and eat in the common dining room. Personnel who support the office and school functions, including maintenance, cleaning, housekeeping, and food service personnel, live at the facility. Additionally, thousands of guests and visitors arrive annually to tour the facilities and to see relatives or friends. A number of these guests stay overnight in the Patterson Inn, located on parcel #54 of the WEC.

The offices, schools, maintenance, and other support services generally operate five days a week. The property west of NYS Route 22 comprises three separate tax parcels. This portion of the property is largely used for agricultural and recreational purposes. Barns and equipment sheds house and care for approximately 80 mature cows. Much of the western property comprises open fields and is used to pasture livestock. Several playing fields for volleyball, softball, and soccer are provided for use by residents. Five houses provide residential accommodations. Additionally, garden plots are made available for residents' personal use. Several wells for the WEC are located on the northern end. The westernmost portion of the property is within the Great Swamp, an expansive state-designated and protected wetland.

4.1 Existing Soil Conditions

The following soils are found on the property or adjacent sites based on the United States Department of Agriculture (USDA) Natural Resource Conservation Service Soil Survey of Putnam and Westchester Counties, New York.

4.1.1 Stockbridge Series

The Stockbridge series is the predominant soil series in the area of the project site that would be disturbed in the development of the proposed project, and is located within the orchard, pasture areas, and the main visitor parking area. The Stockbridge series consists of very deep, well-drained soils that formed in the loamy glacial till derived mainly from limestone, marble, and schist. These soils are usually found on glaciated uplands. Slopes in the Stockbridge series range from 2 to 25 percent in the proposed disturbance area of the project site.

Three phases of the Stockbridge series occur in the proposed disturbance area: Stockbridge silt loam, 2 to 8 percent slopes (SbB); Stockbridge silt loam, 8 to 15 percent slopes (SbC); and Stockbridge silt loam, 15 to 25 percent slopes (SbD). All three phases have a perched water table at a depth of more than 6 feet throughout the year. The permeability for this soil is moderate in the surface layer and in the upper part of the subsoil, and slow or moderately slow in the lower part of the subsoil and in the substratum. Available water capacity is high, with a bedrock depth of more than 60 inches. Surface runoff grades from slow to rapid, and erosion hazard increases from slight to severe as slope percentage increases. This soil series is well suited for the cultivation of crops. According to the USDA, these soils do have some moderate to severe limitations for dwellings with basements, roads, and septic tank absorption fields due to their slope and slow permeability. Some moderate limitations are associated with proposed roadways due to seasonal frost action and slope. Development constraints due to slope can also occur on those Stockbridge soil mapping units having slopes from 8 to 25 percent; however, these limitations may be overcome with proper engineering and site design.

The Stockbridge soil found in much of Patterson and underlying the existing orchard site on the WEC campus is noted for silt loam with poor cohesive properties. In cohesionless soils such as this, the soil particles do not stick together effectively due to their physical and chemical properties. Once this silt loam is in suspension, it takes a significant period

of time to settle out due to its light weight and inability to adhere to other particles. The owner has experience implementing effective erosion controls to overcome these limitations gained during the initial construction of the WEC and on more recent maintenance activities. Limitations on size of disturbance and diligent maintenance of erosion control measures have proved effective at preventing the migration of very small, colloidal particles off-site.

4.1.2 Charlton Series

The Charlton series consists of very deep, well-drained soils on the sides and tops of glaciated hills. These soils formed in glacial till derived from granite, schist, and gneiss. Slopes in the Charlton series range from 2 to 35 percent on the project site. Three phases of the Charlton series occur on the project site: Charlton loam, 15 to 25 percent (ChD), Charlton loam, 25 to 35 percent (ChE), and Charlton-Chatfield complex, 2 to 15 percent (CrC). All three phases have a perched water table at a depth of more than 6 feet throughout the year. Permeability of the Charlton soils is moderate or moderately rapid throughout the profile. Available water capacity is moderate and bedrock is at a depth of more than 60 inches. Surface runoff is rapid to very rapid and erosion hazard severe to very severe in the Charlton loam phases. Surface runoff is rated medium and erosion hazard moderate for the Charlton-Chatfield phase. The soil is poorly suited to the cultivation of crops. This series does experience some moderate to severe construction limitations due to slope; however, these limitations may be overcome with proper engineering and site designs.

4.1.3 Chatfield Series

The Chatfield series exists on the project site as a complex of Chatfield and Charlton soils. These soil complexes are present in the northern portion of the orchard and in the area of the proposed Audio/Video Building expansion. The soil in the Chatfield series consists of moderately deep, well-drained, and somewhat excessively drained soils on the sides and tops of glaciated hills. These soils formed in glacial till deposits over highly fractured, folded, and tilted granite, schist, and gneiss. Slopes range from 2 to 35 percent on the project site. The depth to bedrock ranges from 20 to 40 inches to 60 inches below grade. The permeability is moderate to moderately rapid throughout the soil profile. The erosion hazard may be severe during construction and surface runoff is rated as rapid. The available water capacity of the Chatfield-Charlton complex is low to moderate. According to the USDA, the Chatfield-Charlton series has severe limitations for building site and sanitary facility development due to the shallow depth to bedrock and slope.

4.1.4 Sutton Series

Sutton loam is present in the southern portion of the pasture on the project site. The Sutton series consists of very deep, moderately well-drained soils formed in gravelly glacial till derived mainly from granite, schist, and gneiss. This soil series is typically found on the lower concave side slopes, in slight depressions, and along drainageways in the uplands. Slope of the Sutton loam present on site ranges from 3 to 8 percent. The permeability of the soil is moderate to moderately rapid throughout the profile. The available water capacity is high. The erosion hazard and surface runoff are moderate. This soil series does have some moderate to severe limitations for building site development due to the wetness and slope. The high water table, approximately 1.5 to 2.5 feet below the surface from November through April, is the main limitation for dwellings

with basements; however, with proper engineering these limitations may be overcome. The potential for frost action limits the construction of local roads and streets.

4.1.5 Hollis Series

Hollis-Rock Outcrop and Chatfield-Hollis soils are located in the region of the proposed excess soil deposition area (spoil area) upslope from the existing WEC buildings in an area currently occupied by the WEC's primary landscaping compost area (vegetation clippings and some soil stockpiling). It is bordered by forest and rock outcrops. The Hollis series consists of shallow, well-drained, or somewhat excessively drained soils on bedrock-controlled uplands. These soils are typically found on the sides and tops of hills and in valleys. Slopes for the HrF series range from 35 to 60 percent. Permeability is moderate or moderately rapid. Erosion hazard is very severe, surface runoff is very rapid, and water capacity is very low. Building site development for Hollis soils are described as "severe" due to shallow depth to bedrock and slope. The region of on-site Hollis soils is not proposed for building site development.

**Table 4-1
Project Site Soil Types**

Symbol	Soil Series Name	Hydrologic Soil Group	Drainage Characteristics
ChB	Charlton loam, 2 to 8 percent slopes	B	Gently sloping, very deep, and well-drained soil on hilltops and parts of hillsides formed in glacial till derived from granite, schist, and gneiss. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is slight, surface runoff medium, and water capacity moderate. K factor: 0.24)
ChC	Charlton loam, 8 to 15 percent slopes	B	Strongly sloping, very deep, and well drained soil found on hillsides. (Permeability is moderate to moderately rapid throughout the profile. Erosion hazard is moderate, surface runoff medium, and water capacity moderate. K factor 0.24)
ChD*	Charlton loam, 15 to 25 percent slopes	B	Very deep and moderately steep, well-drained soil found on hillsides. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is severe, surface runoff rapid, and water capacity moderate. K factor 0.24)
ChE*	Charlton loam, 25 to 35 percent slopes	B	Steep, very deep, and well-drained soil found on hillsides. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is very severe, surface runoff very rapid, and water capacity moderate. K factor 0.24)
CIB	Charleton loam, 2 to 8 percent slopes, very stony	B	Gently sloping, very deep and well drained soil on hilltops and parts of hillsides. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is slight, surface runoff medium, and water capacity moderate. K factor 0.20 to 0.24)
CrC*	Charlton-Chatfield complex, 2 to 15 percent slopes, rolling, very rocky	B	Very deep and moderately deep, well-drained, and somewhat excessively drained Chatfield soil and well-drained Charlton soil found on hilltops and hillsides. Generally 50 percent Charlton soil, 30 percent Chatfield soil, and 20 percent other soils and rock outcrop. Rock outcrop covers 2 to 10 percent of the surface. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is moderate, surface runoff medium, and water capacity moderate. K factor 0.24)
CsD*	Chatfield-Charlton complex, hilly, very rocky, 15 to 35 percent slopes	B	Very deep and moderately deep, well-drained, and somewhat excessively drained Chatfield and the well-drained Charlton soil found on hilltops and hillsides. [Permeability is moderate or moderately rapid. Erosion hazard is severe, surface runoff rapid, and water capacity low (Chatfield) to moderate (Charlton). K factor 0.24.
CtC*	Chatfield-Hollis-Rock outcrop complex, rolling	B	Rolling, moderately deep, well-drained to somewhat excessively drained soils and areas of rock outcrop (granite, gneiss, schist). (Permeability is moderate or moderately rapid. Erosion hazard is moderate, surface runoff medium, and water capacity low to very low. K factor 0.20 to 0.24)
CuD*	Chatfield-Hollis-Rock outcrop complex, hilly	B	Moderately deep to shallow, well-drained and somewhat excessively drained soil and areas of rock outcrop on hillsides in bedrock-controlled landscapes. (Permeability is moderate or moderately rapid. Erosion hazard is severe, surface runoff rapid, and water capacity low to very low. K factor 0.20 to 0.24)
HrF	Hollis-Rock outcrop complex, very steep	C/D	Shallow, very steep, well-drained and somewhat excessively drained soil and areas of rock outcrop on hillsides in bedrock controlled landscapes. Slopes range from 35 to 60 percent. (Permeability is moderate or moderately rapid. Erosion hazard is very severe, surface runoff is very rapid and water capacity is very low. K factor 0.24 to 0.32)
PnB*	Paxton fine sandy loam, 2 to 8 percent slopes	C	Gently sloping, very deep, and well drained soil found on broad ridges and small hills. (Permeability is moderate on the surface and slow or very slow in the substratum. Erosion hazard is slight, surface runoff is medium, and water capacity is moderate. K factor 0.24 to 0.32.)

Table 4-1
Project Site Soil Types

Symbol	Soil Series Name	Hydrologic Soil Group	Drainage Characteristics
SbB*	Stockbridge silt loam, 2 to 8 percent slopes	C	Very deep, gently sloping, and well-drained soil found on the top of broad ridges and hills. (Permeability is moderate in the surface layer and in the upper part of the subsoil and slow or moderately slow in the lower part of the subsoil and in the stratum. Erosion hazard is slight, surface runoff slow, and water capacity is high. K factor 0.24 to 0.37.)
SbC	Stockbridge silt loam, 8 to 15 percent slopes	C	Very deep, strongly sloping, and well-drained soil found on the sides of broad ridges and hills. (Permeability is moderate in the surface layer and in the upper part of the subsoil and low or moderately slow in the lower part of the subsoil and in the substratum. Erosion hazard is moderate, surface runoff medium, and water capacity high. K factor 0.24 to 0.37.)
SbD*	Stockbridge silt loam, 15 to 25 percent slopes	C	Very deep, moderately steep, and well-drained soil found on the sides of ridges and hills. (Permeability is moderate in the surface layer and in the upper part of the subsoil and slow or moderately slow in the lower part of the subsoil and in the substratum. Erosion hazard is severe, surface runoff rapid, and water capacity high. K factor 0.24 to 0.37.)
SgC*	Stockbridge-Rock outcrop complex, rolling, 5 to 15 percent slopes	C	Very deep, well-drained Stockbridge soil and areas of limestone rock outcrop found in on landscapes where limestone bedrock is dominant. Slopes range from 5 to 15 percent. (Permeability is moderate in the surface layer and the upper part of the subsoil and slow or moderately low in the lower part of the subsoil and in the substratum. Erosion hazard is moderate, surface runoff medium, and water capacity high. K factor 0.24 to 0.37.)
SuB*	Sutton loam, 3 to 8 percent slopes	B	Gently sloping, very deep, and moderately well-drained soil found on concave foot slopes and along drainage ways in the uplands. (Permeability is moderate or moderately rapid throughout the profile. Erosion hazard is moderate, surface runoff medium, and water capacity high. K factor 0.24 to 0.28.)
5. Source: Soil Survey of Putnam and Westchester Counties, New York, USDA Soil Conservation Service. Note: * indicates soil unit is within the proposed footprint of disturbance. "K" Factor given indicates the erosion potential of each soil type. This indicates the susceptibility of a soil to sheet and rill erosion by water. Values of "K" range from 0.05 to 0.69. The higher the value the more susceptible the soil to erosion.			

4.2 Existing Natural Features

A portion of the WEC property is located within a designated floodplain, a NYSDEC wetland, and an established Critical Environmental Area (CEA). However, the proposed WEC project, will not disturb soils within NYSDEC regulated wetlands or this protected 100 foot adjacent area. The proposed project site and all of its roadways, buildings, and site improvements will be located east of Route 22, at least 600 feet away from the setback boundary of this state wetland. No endangered or threatened plant and animal species inhabit the property.

4.2.1 Watercourses

There are a few intermittent and perennial watercourses located throughout the property. Located near the proposed project on the east side of Route 22 four watercourses were delineated by New York City Department of Environmental Protection (NYCDEP) staff and survey located. There are two intermittent watercourses; one located at the northeast portion adjacent to the recreational area and the other adjacent to the visitor parking lot. The one located near the recreation area is tributary to Mountain Brook. The other is

tributary to the unnamed stream located near the Patterson Inn. There are two perennial watercourses; Mountain Brook, which starts along the northeastern portion of the site just north of the water storage tanks and traverses the property westward and the unnamed tributary, which conveys surface water through a portion of the site and exits east of the Patterson Inn. Mountain Brook, as it traverses the WEC site, is a 2nd order stream with its source originating both on WEC's site and on State lands to the east. All four watercourses convey water into the Great Swamp and ultimately discharge into the East Branch Reservoir. The Watercourse Delineation Map, which is signed by NYCDEP staff, can be found in Appendix E.

To fully evaluate the potential downstream impacts associated with the proposed project, a visual assessment of an approximately 1,800 foot segment of Mountain Brook was performed in April 2009. The study segment begins immediately below an in-stream reservoir located on Mountain Brook within the WEC property and extends to the intersection of Mountain Brook and NYS Route 22. Within the study segment, Mountain Brook is a moderately-steep, mildly-meandering stream that is partially confined within the valley walls. The channel bed was either flat or consisted of an undulating sequence of steps, composed of large cobbles and boulders, and intervening pools. The stream channel appeared to be laterally and vertically stable. Banks were generally steep and well-vegetated with active erosion sites confined to outer meander bends. Bedload transport rates are low as evidenced by a lack of mid-channel and point-bar formation. Several in-stream bedrock outcroppings and grade controls were observed in the lower half of the study area, suggesting a high degree of resistance to vertical adjustment within these areas.

4.3 Existing Utilities

There is an existing stormwater conveyance system for the WEC and stormwater ponds that were designed and constructed in accordance with the rules and regulations that were in existence at the time of the development. Generally the property drains toward Mountain Brook or an unnamed stream, which both ultimately discharge to the Great Swamp.

The site is currently serviced with potable water from a network of groundwater supply wells located throughout the property. This water is treated at the on-site Water Treatment Facility located south of the Audio/Video Building. Sanitary sewage is currently collected via a wastewater collection system and conveyed by gravity and force mains to a Wastewater Treatment Facility located slightly north of the existing recycling center.

5.0 PROPOSED PROJECT DESCRIPTION

The WEC amended site plan will consist of approximately 904,000 square feet of new gross floor area building space with a footprint of approximately 186,000 square feet of new impervious surfaces. The following improvements and impervious surfaces are proposed as part of this project:

- Two residential buildings that will accommodate approximately 500 residents located northwest of the existing Audio/Video Building;
- Maintenance and North Office Building located southwest of the existing Audio/Video Building;
- Additions to the Audio/Video Building;

- A Recycling Building for municipal waste and recyclable materials;
- A Visitor Services Building;
- Additions to the South Services Building and Main Lobby Building;
- Enlarge potable water surge tank to improve reliability of water system;
- Diesel fueling station with a 2,500 gallon tank and associated containment facilities;
- New road and sidewalks to service the proposed buildings;
- Expansion of the visitors parking lot;
- Expansion of the Patterson Inn parking area; and
- Additional passenger pick-up and drop-off areas along loop road and at the lower loop road.

In the area of the proposed Recycling Building, the existing on-site concrete Batch Plant would be used to provide construction materials but would be removed after completion of the proposed project. This would be a decrease in impervious surfaces in this catchment area.

In developing the proposed project, the footprint of a majority of the proposed project would displace land that is currently cleared and actively used for orchard, pasture, and facilities related to the existing WEC. The orchard and lawn areas comprising the bulk of the project site have remained heavily maintained (mowed/cleared) for many years as a working farm, and more recently since the time of the orchard planting in 1987. Other design considerations that were carefully evaluated and implemented were to reduce the potential impervious surfaces associated with a parking lot by constructing a below grade parking facility. Of the proposed 434 parking spaces, 351 (80%) will be built below the proposed buildings. This will further minimize the impacts on water quality and quantity associated with the large at grade parking areas. Where feasible, pervious pavers are proposed to reduce the runoff by infiltrating the smaller storm events. These are specifically proposed adjacent to watercourse 100 foot buffer areas allowing for infiltration and reducing pollutant loading.

Potential impacts to the stormwater runoff are increase in peak runoff, pollutant loads, and temperature of runoff, due to the change in land use, construction of new impervious surfaces, and change in grading. The potential changes to stormwater runoff may potentially change the hydraulic conditions of the receiving water bodies. Because of the change in land use and the increase in impervious surfaces, a smaller volume of stormwater is infiltrated into the soil, increasing the peak flow of stormwater runoff. The post-construction stormwater management practices outlined in this report have been designed to attenuate the stormwater runoff and reduce the peak flows to pre-development conditions to the maximum extent attainable.

In addition to the potential changes to stormwater runoff flow, water quality of the receiving water bodies may also be impacted due to the increase in nutrient and particulate loading. Pollutants are deposited and collected on the impervious surfaces, which are conveyed during rain events and deposited in the receiving water bodies and can impact the natural resources. There is an increased potential for sediment deposition during construction activities when soil is exposed and land grading activities are implemented. An erosion and sediment control plan that includes best management practices and a sequence of construction will help to reduce the potential for sediment transport in stormwater runoff. There are various sources of pollutants depending on land use activities, such as leachate from garbage tips, agricultural uses, pesticide applications, fertilizers, detergents, etc. Therefore, this SPPP addresses potential pollutants in the design of structural and non-structural post-construction stormwater treatment practices. Post-construction stormwater practices are designed based on contributing drainage area, soil

type, existing slopes, and target volume. However, through good site planning and inspection and maintenance procedures the potential for transport of pollutants can be greatly reduced.

The proposed stormwater management system has been designed to address the criteria outlined in Chapter 10 – Enhanced Phosphorous Removal Supplement of the New York State Stormwater Management Design Manual (NYSSMDM). The implementation of a stormwater management system is integral in the mitigation of the potential impacts associated with the proposed project.

5.1 Anticipated Permits

The following is a list of anticipated permits for the construction activities associated with the proposed project.

5.1.1 New York State Department of Environmental Conservation

Coverage under the SPDES GP-0-10-001 will be required as part of the proposed development. This SPPP is being prepared in compliance with the requirements of the New York State Stormwater Management Design Manual.

In addition to the SPDES GP-0-10-001, a Dam Permit will be required for the construction of the proposed upper pond located between the proposed residences and Maintenance/North Office building. The design criteria outlined within the NYSDEC Guidelines for Design of Dam in Appendix A of the New York State Stormwater Management Design Manual will be used to design the pond embankment.

5.1.2 Putnam County Department of Health

Health Department approval will be required for the extension of the wastewater collection system and new building connections.

5.1.3 Town of Patterson

- Planning Board Site Plan Approval
- Zoning Board Approval of Area Variance and adjustments to Special Use Permit.
- Stormwater, Soil Erosion and Sediment Control (Town Code Chapter 133)
- The Town of Patterson as a regulated, land use MS4 is responsible to review the SPPP and complete the MS4 acceptance form prior to WEC filing the Notice of Intent with the NYSDEC.

The following table is a complete list of all permits required for the proposed project.

**Table 5-1
Required Permits and Approvals**

Approval/Permit/Review	Involved/Interested Agency
Town of Patterson	
Site Plan Approval	Planning Board
Modification to Special Use Permit	Zoning Board of Appeals (ZBA)
Area Variance (for height)	Zoning Board of Appeals ZBA
Area Variance (for reduced parking dimensions)	ZBA
Putnam County	
Modification to Water System	Department of Health (PCDOH)
Modification to Wastewater System	PCDOH
Agency Review under 239-m	County Planning Board
New York City	
Stormwater Pollution Prevention Plan (SPPP)	Department of Environmental Protection (NYCDEP)
Modification to Wastewater System	NYCDEP
New York State	
Driveway Permit (NYS Route 22)	Department of Transportation (NYSDOT)
SPDES Permit (GP-0-10-001)	Department of Environmental Conservation (NYSDEC)
Modification to Wastewater System	NYSDEC
Article 15 Dam Permit	NYSDEC
Modification to Water System	Department of Health (NYSDOH)

6.0 TEMPORARY EROSION AND SEDIMENT CONTROLS

The proposed new buildings will be arranged on the project site to maximize the use of the lesser-sloped areas. In addition, the location of the proposed project was chosen to utilize previously disturbed (cleared/regraded) areas for the new buildings and the existing roadway network rather than the more steeply sloped and forested areas elsewhere on the WEC property. Retaining walls would also be considered as a means to mitigate the steep slopes. In this way, significant impacts to topography and slopes will be avoided. The chosen project location will result in the least potential for erosion and minimize bedrock disruption. The conversion of the existing orchard to fully vegetated land will also reduce the potential for seasonal wind erosion. The proposed grading plan is shown on the large-scale plans (Drawings CG-101 to 107).

The majority of the proposed development will be located in the existing orchard, which has a moderate slope, less than 15%. Disturbance to slopes greater than 25 percent would be minimized, totaling approximately 5.6 acres and comprising 11 percent of the overall area of site disturbance. Disturbance to slopes greater than 15 percent would be approximately 20.5 acres, representing 42 percent of the total site disturbance and 9 percent of the overall slopes greater than 15 percent contained on the WEC properties.

Table 6-1 indicates the acreage of disturbance by slope category.

Table 6-1
Slope Disturbance

Slope Category	Acreage of Disturbance
0-10 percent	20.0 acres
10-15 percent	8.4 acres
15 percent to 25 percent	14.9 acres
25 percent or greater	5.6 acres

A slope stability analysis is required by the Town of Patterson for slopes greater than 3H: 1V (horizontal: vertical), such as the proposed new road construction in the office building area. If necessary, final graded slopes would be stabilized using “reinforced earth” methods with geogrid in layers as the fill is brought up to grade. Retaining walls will be constructed on the east side of the proposed Maintenance and North Office building as well as possibly on the west side of the new loop road.

The proposed project will require excavation of soil and the grading of topography, which will result in the exposure of soil to natural forces. Several soil types located on the project site have severe erosion potential, including the Charlton loam and the steeper slopes of Stockbridge silt loam. If not properly managed, the temporary exposure of bare soil accelerates the potential for erosion. This acceleration in soil erosion could potentially lead to siltation of the on- and off-site wetlands, ponds, and streams, located on and adjacent to the project site. This may cause a reduction in surface water quality. Measures to avoid impacts from the proposed project are discussed below.

The proposed amended site plan of the WEC would result in the alteration of a portion of the geology, soils, and topography on a comparatively small portion of the applicant’s property. Specifically, the proposed area of disturbance will occur on approximately 49 acres, or approximately 7 percent of the approximately 691 acres of land owned by the applicant.

The proposed site design has been developed to strike a balance between surface disturbance and the need for excavation. Reducing the footprint of surface disturbance through the placement of building floors and parking areas below ground level is a central component of the design. In addition, to minimize steep slope disturbance, the proposed project has been located on the comparatively less steep portion of the project site, currently occupied by the orchard and lawn area.

The proposed project will require the excavation of approximately 196,100 cubic yards of earth material, of which 42,910 cubic yards is expected to be rock. Of the total excavated material, more than half (110,600 cubic yards) will be used as fill in the regrading of the construction area. The net excess material of 85,500 cubic yards is to be disposed of on the WEC property. A detailed table of cut/fill volumes by construction activity can be provided upon request.

The majority of the soil and rock material excavated during construction of the proposed project will be used for grading the area west of the proposed detention pond, as shown on the large scale plans CG-101 to CG-107. As the design of the proposed project has progressed, the latest cut/fill calculations have determined that excess earth material to be excavated from the construction site will require deposition elsewhere on the project site parcel. This excess soil material will be permanently deposited on the WEC property at one of two proposed locations. The preferred location is the area in and around the existing “excess soil deposition area” to the east of the existing structures. Placement of this excess material at this location has been included in the overall 49 acre limit-of-disturbance footprint for the project as a whole.

An alternate site would be the existing “north pasture” area, currently used for the grazing of cows. This alternative will require the installation of a stream crossing of Mountain Brook. Following input from the Town and involved agencies, one of these two sites will be chosen.

At either location, soil will be deposited with appropriate erosion controls to avoid movement of sediment offsite and will be permanently re-vegetated to avoid any long-term water quality impacts.

At the preferred location, access will be via an existing gravel road leading to the existing “excess soil deposition area.” This existing road and culverts will be maintained without any modifications. The limits of disturbance of the fill material will be kept away from the existing natural rock faces flanking the existing “excess soil deposition area” to the east and west. The fill will be contained using DEC soil stabilization methods (i.e., Sediment basins and traps, riprap outlets, topsoiling, hydroseeding, silt fences). In order to terminate ('toe-in') portions of the lower edges of the spoils area, precast concrete interlocking block or rip-rap will be placed. A graded filter of gravel and sand sizes (or filter fabric) will be placed behind it to prevent soil migration.

As the alternate location, the “north pasture” area, similar methods of erosion control will be applied. A portion of the construction access will be using an existing gravel road. The remaining section will be provided via a new gravel road and new bridge across Mountain Brook.

For either spoils locations, top soil will be placed over the soil and immediately replanted. All stockpiled topsoil berms will be immediately stabilized within 7 days of achieving final grade.

6.1 Erosion and Sediment Control Practices

The following are specific erosion control measures as identified in the large scale drawings prepared for this project.

6.1.1 Stabilized Construction Entrance (SCE) /Exit

All construction entrances and exits shall have a stabilized aggregate pad underlain with filter cloth to prevent construction vehicles from tracking sediment off-site. Stabilized construction entrances shall be located throughout the project site at specific transition areas between concrete/asphalt to exposed earth.

6.1.2 Silt Fence

Silt fence shall be installed on the down gradient edge of disturbed areas parallel to existing or proposed contours or along the property line as perimeter control. Silt fence are to be used where stakes can be properly driven into the ground as per the Silt Fence Barrier Detail in the New York State Standards and Specifications for Erosion and Sediment Control and as shown on the Drawings (See large scale drawings Appendix F).

Silt fence controls sediment runoff where the soil has been disturbed by slowing the flow of water and encouraging the deposition of sediment before the water passes through the straw bale or silt fence. Built-up sediment shall be removed from silt fences when it has reached one-third the height of the bale/fence and properly disposed.

6.1.3 Storm Drain Inlet Protection

Inlet protection shall be installed at all inlets, existing and proposed where the surrounding area has been disturbed. The inlet protection shall be constructed in accordance with NYSDEC Standards and Specifications for Erosion and Sediment Control. Typically they should be constructed to pass stormwater through, but prevent silt and sediment from entering the drainage system.

6.1.4 Stockpile Detail

Stockpiled soil is to be protected, stabilized, and sited in accordance with the Soil Stockpile Detail, as shown on the Detail Sheets. Soil stockpiles and exposed soil shall be stabilized by seed, mulch, or other appropriate measures, when activities temporarily cease during construction for 7 days or more in accordance with NYSDEC requirements.

6.1.5 Dust Control

During the demolition and construction process, debris and any disturbed earth shall be wet down with water, if necessary to control dust. After demolition and construction activities, all disturbed areas shall be covered and/or vegetated to provide for dust control on the site.

6.1.6 Temporary Seeding and Stabilization

In areas where demolition and construction activities, clearing, and grubbing have ceased, temporary seeding or permanent landscaping shall be performed to control sediment laden runoff and provide stabilization to control erosion during storm events. This temporary seeding/stabilization or permanent landscaping shall be in place no later than 14 days after demolition and construction activity has ceased.

6.1.7 Sump Pit

A temporary pit is constructed to trap and filter water for pumping to a suitable discharge area. The purpose is to remove excessive water from excavations. Sump pits are constructed when water collects during the excavation phase of construction.

6.1.8 Dewatering

Due to the depth of excavation for the building foundation and proximity to on-site watercourses, there may be areas of construction where the groundwater table will be intercepted and dewatering activities will take place. Site-specific practices and appropriate filtering devices should be employed by the contractor so as to avoid discharging turbid water to the surface waters of the state of New York.

A sediment tank may be used in conjunction with other practices that will settle and filter the sediment from the stormwater runoff. The sediment tank is a compartmented tank container to which sediment laden water is pumped to trap and retain the sediment. The purpose of the tank is to trap and retain sediment prior to pumping the water to drainage ways, adjoining properties, and rights-of-way below the sediment tank site. In conjunction with the portable sediment tank, the mechanical filtering devices may be necessary to filter out the finer particulates.

6.1.9 Water Bar

A ridge or ridge and channel constructed diagonally across a sloping road or utility right-of-way that is subject to erosion. The purpose of the water bar is to limit the accumulation of erosive velocity of water by diverting surface runoff at pre-designed intervals. This should be used if there are signs of rilling or erosive conditions along the construction road.

6.1.10 Perimeter Dike/Swale

The purpose of a perimeter dike/swale is to prevent off-site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

6.1.11 Temporary Sediment Basin

The purpose of a sediment basin is to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin. The basin will be installed down gradient of construction operations which expose critical areas to soil erosion. The basin shall be maintained until the disturbed area is protected against erosion by permanent stabilization.

6.1.12 Snow Removal

During winter operations, snow accumulations will be removed from active work sites and placed in a snow dump located on the project site. The snow dump will be located in an area that will prevent any potential for stormwater pollution.

6.1.13 Materials Handling

The Contractor must store construction and waste materials as far as practical from any environmentally sensitive areas. Where possible, materials shall be stored in a covered area to minimize any potential runoff. The Contractor shall incorporate storage practices to minimize exposure of the materials to stormwater, and spill prevention and response where practicable. Prior to commencing any construction activities the contractor shall obtain all necessary permits or verify that all permits have been obtained.

6.2 Sequence of Construction

The phasing of the project is important for the continued operation of the WEC during the construction process. The protection of the natural resources, specifically the watercourses, was also carefully factored in the development of the sequence of construction.

Access roads must be maintained to facilitate traffic flow throughout the property. The construction activities have been broken into ten phases to allow the construction of the buildings as shown in Drawing Number CD-101: Overall Construction Phase Plan. Some of the boundaries for the phases overlap and therefore the sum of the areas of disturbance for the individual phases is greater than the total actual area of disturbance for the project which is 49.1 acres.

The WEC project will exceed 5 acres of disturbance during the construction process for five of the ten phases, thus a waiver will be necessary from the MS4, the Town of Patterson. The SPPP will comply with the requirements of the General permits with respects to increased frequency of inspections, increased frequency of soil stabilization, and multiple levels of erosion and sediment control practices.

A pre-construction meeting shall be held with representatives of the Town, NYCDEP, the Resident Engineer, and the Contractor prior to any site disturbance. Any potential changes to the Erosion and Sediment Control Plan should be discussed at this time.

Table 6-2
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 1 (45 Days)	9.2 Acres	<u>Recycling Building, Construction Entrances, Lower Pond, Temporary Construction Facilities</u> 1. Establish construction entrances off of Route 22 and install road to connect to existing road by Recycling Building. 2. Establish construction entrances for new Loop Road and existing road to area of new Recycling Building. 3. Excavate and install foundation and stabilize area of new Recycling Building. 4. Excavate/fill and grade for overflow event parking. 5. Establish construction storage area by G Residence. 6. Install construction trailers and temporary parking area. 7. Establish temporary rock crushing and top soil storage area. 8. Construct Lower Pond sediment basin. Basin to be converted to permanent detention pond following completion of construction activities. 9. Establish Lower Pond berm area. 10. Install silt fencing around perimeter of construction areas. 11. Install drain inlet protection and sediment traps for existing catch basins that are downstream of the proposed work area. 12. Sump pit and dewatering to be used, as necessary, during the excavation of the building foundation. 13. Install silt fencing around soil stockpiles. Seed and mulch all stockpiles. 14. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.
Phase 2 (40 Days)	8.7 Acres	<u>Loop Road, Audio/Video Building, Staging Area</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed expansion of the A/V Building. 2. Install silt fencing around perimeter of construction areas. 3. Install drain inlet protection and sediment traps around the existing catch basins and yard drains. 4. Blast, excavate and install temporary surface from station 50+00 to 55+00 on loop road. 5. Blast, excavate and install temporary surface for staging materials at location of future North Audio/Video Building. 6. Install haul road from new Loop Road to Lower Pond berm area. 7. Preparing staging area and road for stockpiling of excavated materials. 8. Stockpile Lower Pond Berm. 9. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 10. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.

Table 6-2
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 3 (70 Days)	3.8 Acres	<u>G Residence, Courtyard between G Residence and H Residence, North Bridge from G to H Residence</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed loop road. 2. Install silt fencing around perimeter of construction areas. 3. Install inlet protection around existing drainage inlets. 4. Excavate and install foundation and stabilize area of new G Residence. 5. Level and install temporary surface for staging materials at location of new residence courtyard. 6. Stockpile Lower Pond Berm. 7. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 8. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.
Phase 4 (120 Days)	4.5 Acres	<u>H Residence, South Bridge from H to G Residence</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed loop road. 2. Install silt fencing around perimeter of construction areas. 3. Excavate and install foundation and stabilize area of new H Residence. 4. Stockpile Lower Pond Berm. 5. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 6. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.

Table 6-2
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 5 (120 Days)	9.3 Acres	<u>Maintenance/North Office Building, Loop Road, Tunnel from H residence to Maintenance/North Office Building, Upper Pond</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed loop road. 2. Install silt fencing around perimeter of construction areas. 3. Install inlet protection around existing and proposed drain inlets. 4. Excavate Maintenance/North Office building area to bedrock. 5. Use excavated soils to construct Loop Road from station 0+00 to 11+00. 6. Construct Upper Pond sediment basin. Basin to be converted to permanent detention pond following completion of construction activities. 7. Excavate and install utility tunnel between H residence and Maintenance/North Office Building. 8. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 9. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.
Phase 6 (140 Days)	7.5 Acres	<u>Maintenance/North Office Building, Loop Road, Cart Path</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed loop road. 2. Install silt fencing around perimeter of construction areas. 3. Blast, excavate and install foundation and stabilize area of Maintenance/North Office Building. 4. Establish backfill storage berm in location of new West A/V Building. 5. Construct Loop Road from station 11+00 to 20+00. 6. Stockpile materials in upper storage area berm. 7. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 8. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.
Phase 7 (60 Days)	2.4 Acres	<u>Visitor Parking Lot</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed work area. 2. Install silt fencing around perimeter of construction areas. 3. Install inlet protection around existing and proposed drain inlets. 4. Construct new Visitor Parking Lot and stabilize surrounding area. 5. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.

Table 6-2
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 8 (40 Days)	3.9 Acres	<u>Tunnel from Powerhouse to Maintenance/North Office Building, Maintenance/North Office Building retaining walls</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed loop road. 2. Install silt fencing around perimeter of construction areas. 3. Excavate, install foundation, and stabilize area of tunnel connected to Maintenance/North Office Building. 4. Backfill Maintenance/North Office Building foundation. 5. Install Maintenance/North Office Building retaining walls and backfill. 6. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 7. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.
Phase 9 (90 Days)	2.4 Acres	<u>Loop Road, Audio/Video Building, Tunnel from A/V Building to Maintenance/North Office Building</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed parking area. 2. Install inlet protection around existing and proposed drain inlets. 3. Construct Loop Road from station 55+00 to 60+00 and adjacent parking areas. 4. Blast, excavate, install foundation, and stabilize area of West Audio/Video Building. 5. Blast, excavate, install foundation, and stabilize area of tunnel from West Audio/Video Building to Maintenance/North Office Building. 6. Excavate, install foundation, and stabilize area of North Audio/Video Building. 7. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 8. Before advancing to the next phase all denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers.

Table 6-2
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 10 (90 Days)	5.4 Acres	<u>Bus Parking Lot, Lobby Addition, South Services Building Addition, Visitor Services Building, Passenger pick-up and drop-off areas at E Residence, F Residence, and parking at Patterson Inn</u> 1. Provide SCE in the transition areas between the existing paved loop road and in the area of the proposed construction activities. 2. Install double row of silt fence on the downstream sides of the work area. 3. Install silt fencing around perimeter of construction areas. 4. Remove existing parking lot and construct new Bus Parking Lot. 5. Excavate, install foundation, and stabilize area of Lobby Addition. 6. Excavate, install foundation, and stabilize area of South Services Building Addition. 7. Excavate, install foundation, and stabilize area of new Visitor Services Building. 8. Construct passenger pick-up/drop-off areas at E Residence, F Residence and parking at Patterson Inn. 9. Sump pit and dewatering to be used, as necessary, during the excavation of the utility trenches and building foundation. 10. All denuded areas to be stabilized with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and possibly soil stabilizers. 11. Finalize site landscaping.
Total 815 Days	57.1 Acres	

7.0 POST-CONSTRUCTION WATER QUALITY AND QUANTITY CONTROLS

Post-construction water quality and quantity controls are required to meet pollutant removal goals, reduce channel erosion, prevent overbank flooding, and control extreme floods. These controls help mitigate the effects of development by controlling suspended solids content and peak flows of runoff from developed sites. The NYSDEC has developed unified sizing criteria to size stormwater management measures. However, as previously mentioned, the project is located within the NYCDEP watershed where the SPPP design must also address specific NYCDEP requirements. The NYCDEP requirements for the treatment volume, also referred to as water quality volume (WQv), is to capture and treat the runoff generated from a 2-year, 24-hour storm event. Therefore the WQv and channel protection volume criteria will follow the NYCDEP requirements as they are more stringent. The NYSDEC requirements for overbank flood and extreme storm are the same as NYCDEP requirements for attenuating the larger storm events.

The current NYCDEP WRR requires conformance with NYSDEC SPDES General Permit 93-06 and 'Reducing the Impacts of Stormwater Runoff from New Development' for the design of stormwater treatment practices. This manual and General Permit have been superseded at the State level with updated guidance and design requirements. Certain practices, such as filtering practices, specified in the current NYSSMDM are not typically accepted within the NYC watershed. Additionally, the NYCDEP WRR requires capture and treatment of stormwater runoff generated from the 2-year, 24 hour storm event for projects located within a phosphorous restricted basin.

While there are plans for the NYCDEP to modify the WRR and incorporate the latest NYSDEC SPDES GP-0-10-001, it is unclear when this change will occur and whether there will be additional stipulations within the revised WRR. Therefore the stormwater treatment practices have been designed to meet the current WRR, including the requirement that the stormwater ponds be designed to capture and treat the runoff generated from the 2-year, 24-hour storm event from new impervious surfaces. This meets or exceeds the requirements of Chapter 10 – Enhanced Phosphorous Removal Standards outlined in the NYSSMDM. The NYSDEC requirement for Water Quality Volume (WQv) for enhanced phosphorous removal is to capture the estimated runoff from the 1-year, 24-hour design storm. The method for estimating the runoff volume is based on the USDA NRCS Technical Release 20 and Technical Release 55.

7.1 Regulations

7.1.1 NYSDEC Sizing Criteria

The following table is representative of the storm design criteria required within the New York State Stormwater Management Design Manual.

Table 7-1
NYSDEC Uniform Sizing Criteria

Water Quality Volume (WQv)*	WQv = Detention of the 1 year storm event
Channel Protection (C_p)*	C _p = 24 hour extended detention of post-developed 1-year, 24-hour storm event.
Overbank Flood (Q_p)	Control the peak discharge from the 10-year storm to 10-year predevelopment rates.
Extreme Storm (Q_f)	Control the peak discharge from the 100-year storm to 100-year predevelopment rates. Safely pass the 100-year storm event.

* NYCDEP requirements are more stringent.

As the project is within the NYCDEP East of Hudson Watershed, the requirements and guidelines within Chapters 9 and 10 of the New York State Stormwater Management Design Manual were used to design the stormwater management system. The major portion of development that will occur in the area of the existing orchard will incorporate the enhanced phosphorous requirements outlined in Chapter 10.

7.1.2 New York City Department of Environmental Protection Requirements

The project is located within the East Branch Reservoir watershed, which is part of New York City's surface water drinking water supply. NYCDEP is currently operating under a Memorandum of Agreement with the United States Environmental Protection Agency for filtration avoidance. Under this agreement certain provisions regarding impervious surface and stormwater runoff were incorporated within the City of New York, Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and its Sources (WRR) promulgated in 1997 and revised in

2002. The following sections of the WRR regarding impervious surfaces and stormwater are applicable to this project.

- Section 1-39(c) requires NYCDEP's review and approval of an SPPP.
- Section 18-39(a)(1) prohibits impervious surfaces within 100 feet of a NYCDEP delineated watercourse.
- Section 18-39(c)(2) states that proposed development within a phosphorous restricted basin requires the capture and treatment of stormwater runoff generated from a 2-year, 24-hour storm event.

There are portions of proposed work that will be within 100-feet of the existing watercourses. Pervious pavers, such as Turfstone™, are proposed in these areas. These are not considered impervious surface by the NYCDEP, therefore a variance from Section 18-39(a)(1) is not required.

7.2 Design Analysis

In order to evaluate the pre- and post-development drainage conditions, the site has been delineated into six discharge analysis points based on pre-development hydrology; Design Points 1, 2, 3, 4, 5 and 6. These points were analyzed to evaluate the effects of the proposed development on surface water runoff. The design points and their pre- and post-development contributing subcatchment areas are shown on Pre- and Post-Development Drainage Maps, Drawings C-1 and C-2.

To analyze the peak flow in pre-and post-development conditions Hydrocad®, a computer aided design tool is used to evaluate and analyze the stormwater runoff from the site. The program also models the surface flow through the proposed stormwater practices determining the plug-flow and center-of-mass detention time within the ponds. A simultaneous routing process is used to evaluate the impacts associated with stormwater practices in series. The program is based on United State Department of Agriculture, Natural Resources Conservation Service (NRCS) Technical Releases TR20 and TR55. TR55 and TR20 are tools that were developed to calculate the volume and peak discharge rates of stormwater runoff generated in different rainfall events over a 24-hour period. Runoff volumes and rates are calculated by determining the curve numbers (CN) and calculating the time of concentration (T_c) for each subcatchment area depending on the given rainfall value. The CN values are based on the TR55 table and the hydrologic soil group, cover type, hydrologic condition and antecedent runoff condition. The T_c represents the time it takes for surface water to travel the hydraulically most distant point within the subcatchment area.

The following rainfall values for Putnam County, shown in Table 7-2, were used in the analysis. For the purposes of the hydrologic analysis the runoff was based on Type III rainfall distribution for the northeast region. The following rainfall values are based on the 24-hour storm event. These values represent the rainfall distribution for various 24-hour storm frequencies.

Table 7-2
Rainfall Values

Rainfall Value (inches)	24-hour Storm Event (Year)
3.1	1
3.5	2
5.5	10
6.0	25
9.5	100

Source: Northeast Regional Climate Center

Test pits and percolation tests were performed throughout the proposed development areas to help determine the types of stormwater treatment practices that will offer the best performance see Table 7-3. Test pit locations were survey located and can be found on the large-scale plan C-101 Existing Conditions Plan.

Based on the results, infiltration was generally not feasible due to depth to groundwater or the slow percolation rate. Therefore, stormwater detention ponds were identified as the best method for stormwater treatment. The existing stormwater ponds on the Watchtower campus are in-stream stormwater practices and could not be adapted for stormwater treatment. Therefore, two new stormwater management ponds are proposed. Treatment of stormwater runoff must occur prior to discharge to a surface water body.

Table 7-3
Soil Testing

Deep Test Hole Number	Description
1	3'6" Total Depth, Bedrock was encountered
15	13' Total Depth, 9' Groundwater seep, 11' Standing Groundwater
16	11' Total Depth, 8'3" Groundwater seep
17	13'6" Total Depth, 10'6" Groundwater seep
18	13'2" Total Depth, 6'9" Groundwater seep, 12'7" Standing Water
19	13'8" Total Depth
20	12'6" Total Depth
22	10' Total Depth
23	10' Total Depth, 7' Groundwater seep, 9' Standing water
24	13' Total Depth, seasonal high groundwater table and bedrock were not encountered
25	12' Total Depth, seasonal high groundwater table and bedrock were not encountered
27	14' Total Depth, 10'4" Groundwater seep
28	14'3" Total Depth, seasonal high groundwater table and bedrock were not encountered
29	12 Total Depth, seasonal high groundwater table and bedrock were not encountered
30	12.7' Total Depth, 9' Groundwater seep, 11' Standing Groundwater
31	18" Bedrock encountered
32	3'6" Bedrock encountered
33	4' Total Depth, rock encountered at 36"

7.2.1 Design Point 1

To address the stormwater runoff from the proposed development, two stormwater ponds are proposed. The stormwater detention ponds are designed in series to capture and treat the stormwater runoff from the 2-year 24-hour storm event in accordance with NYCDEP requirements for treatment of pollutants. These stormwater ponds also provide attenuation of peak flows from the larger storm events.

Design Point 1 is located along Mountain Brook, downstream of the existing reservoir. Currently stormwater runoff is conveyed to various portions of the stream via overland flow. There are several point discharges from stormwater runoff as well as a point discharge pipe from the existing Wastewater Treatment Facility. Because this is a long segment of Mountain Brook, the hydrologic analysis was broken into three segments or design points, 1A, 1B and 1C, to provide an evaluation of the potential downstream impacts to Mountain Brook. Based on the proposed stormwater management system, a portion of the catchment areas would be diverted to a discharge point further downstream from the existing discharge. Therefore, by breaking up Design Point 1 into three segments, an analysis of the effects of this diversion can be more accurately reflected.

The contributing drainage area consists of land use types varying from wooded areas, landscaped areas, orchard, impervious surfaces from the existing buildings and the loop road. The proposed development includes the following proposed surfaces: extended loop road, expansion of the A/V Building, the residence buildings, Maintenance and North Office Building, the Recycling Building, event parking overflow, and the visitors parking area.

Mountain Brook is a stable stream that shows little evidence of recent movement, either laterally or vertically. Both the channel bed and banks are highly resistant to erosion. In many cases the degree of movement is limited by steep valley walls and/or bedrock outcroppings in the channel bed. These attributes are suggestive of a stream system with a relatively low sensitivity to hydrologic changes. Mild-to-moderate increases (i.e., <10-20%) in stormwater discharges are unlikely to significantly destabilize the channel. However, hydrologic changes are capable of producing unintended and unforeseen changes to stream channels. To minimize the potential for stormwater impacts, the following recommendations are provided:

- Stormwater outfalls will be located away from the active channel margin.
- Stormwater outfalls should be located in the downstream portion of the study segment where frequent bedrock controls will help to reduce the potential for vertical channel adjustment.

Increases in impervious surfaces associated with the proposed project will also indirectly reduce groundwater recharge. This reduction in groundwater recharge may, in turn, result in lower rates of baseflow, that portion of a stream's flow not directly associated with storm events, within Mountain Brook upstream of the proposed outfall location. The installation of footing drains around the perimeter of proposed structures may also divert shallow groundwater that will otherwise contribute to baseflow.

To address NYCDEP requirements, stormwater treatment practices in series are necessary to provide sufficient treatment to meet the pre-development pollutant loading requirements. Therefore, two ponds were designed in series to provide treatment. Due to elevations, road layout, and the existing topography, two ponds could not be placed within proximity of the proposed residences; therefore the second pond was located south of the proposed recycling facility. The ponds are referred to as Ponds 1 and 2 in the HydroCAD® analysis.

The stormwater ponds have been designed to capture and treat the stormwater runoff associated with the 2-year, 24-hour storm event and to meet the required elements of the NYSSMDM design criteria for stormwater ponds, specifically wet pond (P-2). The volume of the permanent pool for each pond is sized to capture 100% of the water quality volume (WQv), the runoff from the 1-year, 24-hour storm event.

Approximately 90% of the proposed impervious surfaces would be captured in a stormwater conveyance system that would direct stormwater runoff to the proposed ponds. Less than 10%

will be treated by pervious pavers or through the implementation of a vegetated filter strip or no-mow zone. These are typically referred to as low impact development practices that will allow for filtration of the pollutants and decrease the runoff.

The post-development contributing area, 1B, for the upper pond is less than the required 25 acres (see Post-Development Drainage Map). However the second pond in series will treat catchment areas 1C, 1G, 1H, 1M, and 1N, as well as 1B, which totals to approximately 25 acres required by NYSSMDM. The following design parameters were included in the development of the stormwater ponds.

- Forebay - A forebay will be provided at each inlet point. This will provide primary settling for the larger particulates. The sediment forebay will be sized to contain 10% of the WQv. The depth of the upper pond forebay is four feet, while the lower pond is six feet. The outfall from the inlet pipe will be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker will be installed to assist in the long term inspection and maintenance plan. This will help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The detention pond side slopes are 4:1(H:1).
- Aquatic bench - A 15' wide aquatic bench has been provided within each pond. The aquatic bench is set at the top elevation of the permanent pool allowing for water tolerant vegetation to establish at this level. This type of vegetation will be species native to the NYC watershed.
- Vegetation – Landscape plans include various species including grasses for the sideslopes and emergent wetland species. The plant variety will provide treatment through nutrient uptake.
- Permanent pool - The depth in the upper pond will be approximately 4 feet, which is approximately equal to the volume of the 1-year, 24-hour storm. The depth within the lower pond is approximately 6 feet deep, storing the approximately volume of the 2-year, 24-hour storm. The NYSDEC design requirement for permanent pool is that it equal 100% of the WQv. Based on the NYCDEP guidelines within "Reducing the Impacts of Stormwater Runoff from New Development" (NYSDEC 1992) for a Design 6 Wet Pond, the permanent pool should equal four times the volume of runoff or two weeks retention time. This assumption is based on the requirement that the basins be sized to treat the runoff from 0.5 inches of runoff or the mean storm and not the 2-year storm. The permanent pool volume for the proposed ponds is equal to 2 times the runoff volume of the 1-year, 24-hour storm event. The 90% rainfall event is approximately 1.2 inches. The permanent pool volume would be roughly equal to 12 times the runoff volume from the 90% rainfall event and therefore exceeds the criteria. The runoff depth for the drainage areas contributing to the proposed ponds produces an average runoff depth of 1.86 inches, for a 2-year, 24-hour storm event.
- Geometry – Both ponds have been designed with a length to width ratio of 1.5:1 as required by NYSSMDM.
- Energy Dissipater - A rip rap velocity dissipater will be installed at the inlet and outlet of the lower pond. The lower pond discharges to Mountain Brook where the banks are stable and the stream bed is rocky. This will minimize the potential for erosion of the stream bed.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided.

- Maintenance access – A 12' minimum width access path will be provided for long term maintenance of the stormwater ponds.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that will detain the 2-year, 24-hour storm event for a minimum of 24 hours, meeting the requirements outlined in the WRR. The larger storm events will also be conveyed through an opening at the top of the structure designed to attenuate the larger storm events.

The peak flows from each of the design point segment 1A, 1B and 1C is presented in the following table. The points were then routed, with the respective travel time through Mountain Brook to present a cumulative hydrograph at the point where it leaves the project site, the culvert under Route 22. These numbers are reflected in the last row, Combined (1A, 1B, and 1C). The time to peak at the culvert for both pre and post development occurred in hour 12, varying by several minutes depending on the storm event.

Table 7-4
Comparison of Pre- and Post-Development Flow Design Point 1

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 1A	2.15	3.25	10.30	12.51	29.91
Post DP 1A	1.84	2.94	10.00	12.04	27.93
Pre DP 1B	24.31	31.36	71.61	82.47	162.54
Post DP 1B	22.58	28.58	61.73	70.48	133.46
Pre DP 1C	14.26	18.72	43.95	50.72	100.05
Post 1C	12.78	16.68	38.61	44.47	90.84
Pre Combined (1A, 1B, 1C)	33.71	45.05	113.50	132.47	273.47
Post Combined (1A, 1B, 1C)	29.75	39.21	96.17	111.86	236.17

*cfs – cubic feet per second

7.2.2 Design Point 2

Design Point 2 is located in the eastern portion of the site adjacent to the watercourse. In the post-development condition, Design Point 2 includes pervious pavers for the proposed access road passenger pick-up/drop-off areas. The design guidelines of Chapter 9 of the NYSSMDM were incorporated into the stormwater analysis. The types of stormwater treatment practices were limited by the various surface and subsurface site constraints. Therefore Turfstone™ pavers, or another NYCDEP approved product, are proposed as a pervious surface. There are certain design constraints that prohibit the implementation of conventional or standard stormwater treatment measures: existing stormwater conveyance system, existing utilities, steep slopes, and the proximity of the existing watercourse. Therefore, a stormwater treatment practice is not proposed

for this drainage area. The results of the pre- and post-development flows demonstrate that the impact of these pavers is minimal. Treatment and attenuation are being provided to the maximum extent attainable. A no-mow zone will be implemented along the edges of the watercourse to provide a vegetated buffer.

Table 7-5
Comparison of Pre- and Post-Development Flow

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 2	1.57	1.92	3.79	4.27	7.62
Post DP 2	1.65	2.01	3.89	4.37	7.71

7.2.3 Design Point 3

Design Point 3 is located along the existing portion of loop road adjacent to an existing watercourse and includes woods, lawn and impervious surfaces associated with the existing buildings, roadways, and paths. In the proposed condition, Design Point 3 includes pervious pavers for the access road passenger pick-up/drop-off areas. The types of stormwater treatment practices were limited by the various existing surface and subsurface site constraints. Therefore Turfstone™ pavers, or another NYCDEP approved product, are proposed as a pervious surface. The stormwater runoff in the pre-and post-development conditions will be collected by the existing stormwater conveyance system. However, an existing grassed swale will be modified with check dams at the outlet of the stormwater conveyance system. The check dams will provide velocity dissipation where suspended solids will settle out. The results of the pre- and post-development flows demonstrate that the impact of these pavers is minimal. Due to the existing site constraints within this catchment area, the proposed treatment being provided is to the maximum extent attainable.

Table 7-6
Comparison of Pre- and Post-Development Flow and Volume

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 3	14.27	19.77	52.36	61.34	128.63
Post DP 3	14.27	19.77	52.36	61.34	128.63

7.2.4 Design Point 4

Design Point 4 is located at the source of the intermittent watercourse adjacent to the visitors' parking lot. The contributing catchment area consists of a portion of the roof from existing school and south service building as well as the impervious surface associated with the sidewalks and loop road. In the post-development condition, the runoff associated with the expansion of the

South Services Building will be conveyed to the proposed upper pond part of DP 1C. The types of stormwater treatment practices were limited by the various existing surface and subsurface site constraints.

Table 7-7
Comparison of Pre- and Post-Development Flow

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 4	2.09	2.51	4.62	5.15	8.85
Post DP 4	1.97	2.33	4.17	4.62	7.80

*cfs – cubic feet per second

7.2.5 Design Point 5

Design Point 5 is located in the southern portion of the site adjacent to the watercourse. In the proposed condition, Design Point 5 includes pervious pavers of the parking areas. The types of stormwater treatment practices were limited by the various surface and subsurface site constraints. Therefore Turfstone™ pavers, or another NYCDEP approved product, are proposed as a pervious surface. Standard stormwater treatment practices are not proposed for this drainage area. The results of the pre- and post-development flows demonstrate that the impacts of these pavers are minimal and therefore attenuation will not be required.

Table 7-8
Comparison of Pre- and Post-Development Flow

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 5	1.89	2.24	4.00	4.44	7.49
Post DP 5	2.10	2.47	4.35	4.82	8.05

*cfs – cubic feet per second

7.2.6 Design Point 6

Design Point 6 is located along the intermittent watercourse adjacent to the visitors' parking lot. The proposed Visitor Services Building will be diverted from DP 4 and conveyed to the lower stormwater pond part of DP 1C. In the proposed condition, a portion of the contributing drainage area will be diverted to DP 1C where treatment and attenuation of the proposed impervious surface will occur. The impervious surface associated with the Main Lobby expansion is replacing a portion of the existing driveway and sidewalks. Therefore there is no increase in impervious surface in this catchment area.

Table 7-9
Comparison of Pre- and Post-Development Flow

	1-YR Storm Event (cfs)	2-YR Storm Event (cfs)	10-YR Storm Event (cfs)	25-YR Storm Event (cfs)	100-YR Storm Event (cfs)
Pre DP 6	21.60	25.31	43.84	48.43	80.26
Post DP 6	14.39	16.97	29.89	33.11	55.39

*cfs – cubic feet per second

7.2.7 Diesel Fueling Station

A new diesel fueling station with a 2,500 gallon tank and associated containment facilities is proposed between the existing warehouse and vehicle repair buildings located along the southern property. The fueling station and storage tank have been located more than 100 feet from the existing watercourse as is required by NYCDEP WRR. This area is currently an impervious surface and will have a minor impact on water quality and no impact on water quantity as there is no increase in impervious surface. An oil grit separator will be designed and installed to capture and remove any potential pollutants associated with the fueling station.

7.3 Nonstructural Stormwater Management

Nonstructural stormwater management practices include the following:

- Concentrated development of impervious surfaces, especially in areas of previous disturbance (i.e., the orchard areas).
- Long term soil stabilization through landscaping and maintenance in the developed areas. Prevention of soil loss, through establishment of vegetation and a landscape plan that will increase the amount of tree canopy and healthy ground cover. The landscape plan will also maximize the travel time of stormwater runoff and minimize concentrated flows.
- Increasing the no-mow zones around the watercourses that traverse through the developed portions of the site.
- The grounds maintenance program limits the potential for excessive nutrient loading, specifically controlling the application of phosphate-based fertilizers.
- Pervious pavers, will reduce the amount of stormwater runoff through infiltration. The gravel and block pavers will trap sediments and other pollutants also reducing the amount in the runoff.
- Impervious surfaces for parking have been greatly reduced by locating 351 parking spaces in the cellar level of the Maintenance/North Office Building.
- There is a potential for an increase in pollutants associated with parking areas such as petroleum, antifreeze, and refuse. In developing the site plan, parking was designed to be subsurface garages below the proposed buildings. This allowed for a smaller footprint for at grade parking surfaces. For those parking surfaces at grade, the current maintenance operations demonstrate the high level of maintenance and upkeep which will continue with the new portions of the site. A hood will be installed at the downstream end of the proposed catch basins to trap floatables and within the catch basin. The deep sumps will also trap the

petroleum and antifreeze attached to sediment particles. The accumulated material will be cleaned out of the catch basins in accordance with the long term inspection and maintenance plan.

7.4 Better Site Design

In order to counteract the impacts of stormwater runoff, from new development and redevelopment, alternative approaches to design and construction have emerged. The Better Site Design (BSD) manual, developed by NYSDEC, offers guidance for the design of new and redevelopment projects with the focus on conserving natural areas, reducing impervious cover and better integrating stormwater treatment. Many of the design practices listed within the BSD manual have been incorporated into the proposed site work at WEC.

BSD #1 – Preservation of Undisturbed

The first approach to the overall design at WEC is the preservation of undisturbed site area in order to maintain natural features and native vegetative areas. The majority of the proposed project occurs over lands that were previously disturbed. This technique coincides with BSD practice #1: preservation of undisturbed and BSD practice #3: reduction of clearing and grading. Both practices ensure that no unnecessary earthwork is performed and instead help to limit overall site disturbance by developing in areas where disturbance has already occurred.

BSD #2 – Preservation of Buffers

It is also important to note that, in order to reduce excessive grading and to remain outside of the watercourse buffer zone, retaining walls are proposed where necessary. Not only will the walls help to reduce grading but they will also help to reduce steeper unnatural slopes and thus minimize erosion potential. Designing the proposed development outside of the preservation buffer will contribute to improved water quality and riparian ecosystems and habitats. This practice is advised in BSD practice #2: preservation of buffers.

BSD #3 – Reduction of Clearing and Grading

As previously mentioned, the footprint of a majority of the proposed project would displace land that is currently cleared and actively used for orchard, pasture, and facilities related to the existing WEC. The orchard and lawn areas comprising the bulk of the proposed project impervious surfaces are heavily maintained (mowed/cleared) since the time of the initial construction of the WEC in 1989.

BSD #4 – Locating Sites in Less Sensitive Areas

Thus, by constructing the new development in an area already disturbed, the project has helped to maintain the site's natural character and existing habitat. The basis for this design method is described in the BSD manual as practice #4: locating sites in less sensitive areas. By directing development towards an area of the site with flatter slopes and less environmental impact, the WEC will help to preserve natural floodplain right-of-ways, minimize soil erosion, and reduce earthwork/habitat disturbance.

BSD #10 – Building Footprint Reduction

One of the most significant design approaches that the applicant has incorporated into its design is defined under BSD practice #10: building footprint reduction. Under this methodology the impervious footprints of on-site buildings can be reduced by using taller buildings while still maintaining the same floor to area ratio. The most significant benefit achieved from this approach is impervious cover reduction and therefore reductions in stormwater runoff and pollutants.

Alternative Drawing AS-102 represents the site layout if the project were to be constructed in conformance with the zoning height restrictions. This would result in an increase in impervious surface by 135,228 square feet. In addition to the increase in impervious surface, there would be a larger amount of disturbance and potential encroachment into the watercourse and wetland buffers. There would be significant cost in constructing a conveyance system to collect stormwater runoff from this area and convey it west across Route 22 to the proposed stormwater ponds in series.

BSD #11 – Parking Reduction

Another design consideration that was carefully evaluated and implemented included reducing impervious surfaces associated with parking surfaces by constructing a below grade parking facility. This design approach aligns directly with BSD practice #11: parking reduction. Below grade parking reduces surface impervious areas, minimizes development area, and reduces clearing and grading. Of the proposed 434 parking spaces proposed, 351 (80%) will be built below the proposed Maintenance and North Office Building. This will further minimize the impacts on water quality and quantity associated with parking.

BSD #15 – Infiltration

Where feasible, pervious pavers are proposed in order to reduce the runoff by promoting infiltration during the smaller storm events. These pavers are specifically proposed adjacent to watercourse 100 foot buffer areas, where allowing for infiltration and reducing pollutant loading reduction will be most effective. Permeable pavers are proposed to be installed at the Recycling Building (7,500+/- sf), event overflow parking (15,000+/- sf), parking area at existing hotel (2,500+/- sf), a portion of the visitor parking lot (15,000+/- sf), and the parallel parking along the existing loop road (2,000+/- sf).

Some of the other BSD practices were not appropriate for WEC's campus type of development or redevelopment strategies. For example BSD# 6 – driveway reduction typically applies to residential type development for single family homes, and it would not be appropriate to use permeable pavement. BSD # 14 – bioretention and rain gardens are generally inappropriate practices for larger impervious surfaces, such as office buildings.

7.5 Summary

The proposed stormwater management system has been designed to treat the Water Quality Volume (WQv) and attenuate the larger storm events to predevelopment conditions. The project is designed based on Chapter 10 of the NYSSMDM.

The proposed project incorporates stormwater management practices that will treat runoff from the proposed project. These practices, designed in accordance with the regulations established by NYSDEC and NYCDEP, will include water quality treatment, peak flow attenuation, and temporary and permanent erosion and sediment control measures. The proposed facilities will be sufficient to mitigate the potential impacts of the proposed project related to the quantity and quality of stormwater runoff.

7.6 Pollutant Loading Analysis

As required by NYCDEP, a pollutant loading analysis was performed to evaluate the quality of the stormwater runoff through the proposed stormwater treatment system. In accordance with the WRR, the NYCDEP currently follows the requirements of the NYSDEC General Permit 93-06, where analysis of the total phosphorous, total nitrogen, biochemical oxygen demand and total

suspended solids are required. The pollutant coefficient method as outlined in ‘Reducing the Impacts from Urban Runoff’ was used to evaluate the effects of the change in land use due to the project on the surface water conditions. Various sources of the pollutant coefficient values were used to best evaluate the pre- and post-development conditions. The following table represents the various coefficients that were used in the analysis.

Table 7-10
Pollutant Loading Coefficients

Land Use Type	Coefficient (lbs/acre/year)			
	TSS ¹	BOD ²	TP ¹	TN ¹
Forested/Wooded	76.54	6	0.0979	1.78
Orchard/Grass/ Landscaped	307.94	19	0.1157	3.74
Impervious surfaces	716.45	111	0.712	4.63

¹ Source of these pollutant loading coefficients values is the ‘Fundamentals of Urban Runoff Management: Technical and Institutional Issues’ produced by the Terrene Institute in cooperation with USEPA, 1994.

² Sources of these pollutant loading coefficients is the ‘Reducing the Impacts of Stormwater Runoff from New Development’, produced by NYSDEC, April 1992.

A pollutant loading analysis was performed at each of the design points. The annual pollutant loading rates were calculated for the following constituents: total suspended solids (TSS), biochemical oxygen demand (BOD), total phosphorous (TP), and total nitrogen (TN). The backup for these calculations can be found in the Appendix E of this report. Pollutant removal rates presented within this table represent a range from low to high. By providing catch basins with deep sumps the higher end of the range was used to demonstrate the post-development pollutant loading. In addition to deep sump catch basins, several no-mow zones will be identified increasing the buffer around the streams. Street sweeping is performed in the spring after the winter application of sand and salt, reducing the sediment loading to the structures.

Table 7-11
Total Suspended Solids (TSS)

Design Analysis Point	Pre-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading w/ Treatment (lbs/year)
1A	2,678.7	503.4	NA
1B	17,958.0	13,960.8	NA
1C	5,212.6	15,522.4	4,690.7
<i>Subtotal Design Point 1</i>	<i>25,849.4</i>	<i>29,986.6</i>	<i>19,155.0</i>
2	503.4	518.9	493.1
3	4,227.5	4,227.5	NA
4	560.3	515.8	NA
5	513.5	555.5	515.4
6	4,193.2	2,894.1	NA

Table 7-12
Biochemical Oxygen Demand (BOD)

Design Analysis Point	Pre-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading w/ Treatment (lbs/year)
1A	160.1	66.3	NA
1B	1,926.4	1,694.1	NA
1C	375.3	1,666.7	732.3
<i>Subtotal Design Point 1</i>	<i>2461.8</i>	<i>3,427.1</i>	<i>2492.7</i>
2	66.3	69.9	65.8
3	548.3	548.3	NA
4	71.3	68.6	NA
5	73.3	79.8	73.6
6	575.7	387.8	NA

Table 7-13
Total Phosphorous (TP)

Design Analysis Point	Pre-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading w/ Treatment (lbs/year)
1A	1.3	0.4	NA
1B	13.5	11.5	NA
1C	2.5	10.5	3.3
<i>Subtotal Design Point 1</i>	<i>17.3</i>	<i>22.4</i>	<i>15.2</i>
2	0.4	0.45	0.4
3	4.5	3.5	NA
4	0.5	0.4	NA
5	0.5	0.54	0.5
6	3.7	2.5	NA

Table 7-14
Total Nitrogen (TN)

Design Analysis Point	Pre-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading (lbs/year)	Post-Development Pollutant Loading w/ Treatment (lbs/year)
1A	29.5	4.0	NA
1B	173.4	129.7	NA
1C	60.7	145.3	77.8
<i>Subtotal Design Point 1</i>	<i>263.6</i>	<i>279.0</i>	<i>211.5</i>
2	4.0	4.0	3.9
3	33.8	33.8	NA
4	4.6	4.0	NA
5	3.7	4.0	3.8
6	31.6	22.4	NA

8.0 INSPECTION AND MAINTENANCE

8.1 Inspections and Record Keeping During Construction

Once the contract has been let, the name, address, and phone number of responsible parties for maintenance will be provided to the NYSDEC. The following is a description of the maintenance and inspection practices that will be implemented as part of the project. Maintenance and inspection is important to ensure that the stabilization and structural practices that are part of the SPPP continue to be effective in preventing sediment and other pollutants from entering the stormwater system. It is the responsibility of the owner or operator to ensure that inspections are completed in accordance with NYSDEC regulations.

8.1.1 Record Forms

Inspection and maintenance is important to ensure that the erosion and sediment control practices that are part of the SPPP continue to be effective in preventing sediment and

other pollutants from entering the stormwater system. It is the responsibility of the owner to ensure that inspections are completed in accordance with SPDES GP-0-10-001.

As a part of the SPPP inspection and maintenance activities during construction, forms shall be updated and kept on-site, including:

- Erosion and Sediment Control Inspection Report
- Monthly Summary of Inspection Activities
- Record of Stabilization and Construction Activities (used when 5 acres or more would be disturbed at any given time).

Inspections would be conducted by the qualified inspector periodically according to the schedule required by the SPDES GP 0-10-001. During each inspection, the qualified inspector would record the areas of disturbance, deficiencies in erosion and sediment control practices, required maintenance, and areas of temporary or permanent stabilization. The need for modifications to the Erosion and Sediment Control Plan would be identified and implemented immediately.

The Erosion and Sediment Control Inspection Report will be completed by a qualified inspector to fully document each inspection. A qualified inspector is a person knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other NYSDEC endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided the person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that an individual performing the site inspection has received four hours of training, which has been endorsed by the NYSDEC, from a Soil and Water Conservation District, CPESC, Inc., or other NYSDEC endorsed entity, in proper erosion and sediment control principles no later than two years from the date SPDES GP-0-10-001 is issued. After receiving the initial training, an individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four hours of training every three years.

8.1.2 Inspections

Inspections shall be conducted by the qualified inspector periodically according to the following schedule:

1. When construction activities are ongoing, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.
2. When construction activities are ongoing and the owner or operator has received authorization in accordance with Part II.C.3 of GP-0-10-001 to disturb greater than five acres of soil at any one time, the qualified inspector shall conduct at least two site inspections every seven calendar days. When performing two inspections every seven calendar days, the inspections shall be separated by a minimum of two full calendar days.
3. If soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30)

calendar days. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.

4. If soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to the shutdown. If soil disturbance activities have not resumed within 2 years from the date of shutdown, the owner or operator shall have the qualified inspector(s) perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion and sediment control measures have been removed, and that all post-construction stormwater management practices have been constructed in conformance with the SPPP by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the Notice of Termination (NOT). The owner or operator shall then submit the completed NOT form in accordance with NYSDEC regulations.

During each inspection, the qualified inspector should fill out the Erosion and Sediment Control Inspection Report as directed below:

On the Erosion and Sediment Control Inspection Report site map show the following:

- Disturbed site areas and drainage pathways.
- Site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period.
- Site areas that have undergone temporary or permanent stabilization.
- In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

Record the following information on the Erosion and Sediment Control Inspection Report:

- For each structural measure, circle YES, NO, or N/A (not applicable) to indicate if the pollutant control measure is in conformance with specifications.
- For each structural measure, circle YES, NO, or N/A to indicate whether the structural measure is performing effectively in minimizing stormwater pollution.
- Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume in the allocated location on the Inspection Form Chart (i.e., 10 percent, 20 percent, and 50 percent).
- A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e., pipes, culverts, ditches, etc.) and overland flow;

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

The qualified inspector will give a brief explanation for all locations where he/she has noted that the structural practice was either not in conformance with specifications or in need of repair. This should be noted in the Erosion and Sediment Control Inspection Report. The qualified inspector will then give a brief recommendation for soil erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced.

8.1.3 Erosion And Sediment Control Maintenance Measures

All maintenance described below shall be completed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. Any material removed from erosion and sediment control measure shall be properly disposed.

All measures will be maintained in good working order; if repairs are found to be necessary, the qualified inspector shall notify the owner or operator and appropriate contractor (and subcontractor) of any corrective actions needed within one business day. The contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

A maintenance inspection report, titled "Erosion and Sediment Control Inspection Report," will be made after each inspection conducted by a qualified inspector.

Disturbed areas and materials storage areas will be inspected for evidence of potential pollutants entering stormwater systems. Within one business day of the completion of the inspection, the qualified inspector shall notify the owner or operator and the appropriate contractor (or subcontractor) of any corrective actions that need to be taken. The contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

A Monthly Summary of Site Inspection Activities will be prepared and kept on file with completed Erosion and Sediment Control Inspection Report. A Record of Stabilization and Construction Activities will be prepared and kept on file with the completed Construction Duration Inspection Forms.

The following are the maintenance requirements for each practice that will be implemented at the site.

8.1.4 Stabilized Construction Entrance/Exit

The stabilized construction entrance/exit shall be maintained in a condition that will prevent the tracking or flow of sediment onto public rights-of-way. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately; streets shall be swept as needed. The gravel pad shall be replaced as necessary. Sediment tracked onto public streets should be removed or cleaned on a daily basis.

8.1.5 Straw Bales/Silt Fence

Maintenance of all straw bales and silt fence shall be performed as needed. If a straw bale or silt fence is knocked down, it shall be replaced immediately. When a straw bale or silt fence appears deteriorated or ineffective and/or built up sediment reaches one-third the height of the bale or fence, the straw bale or silt fence shall be replaced and/or cleaned accordingly. When “bulges” of material develop on the fence, they shall be removed.

Straw bales and silt fence control sediment runoff where the soil has been disturbed by slowing the flow of water and encouraging the deposition of sediment before the water passes through the straw bale or silt fence. Built-up sediment shall be removed from straw bales and silt fences when it has reached one-third the height of the bale/fence and properly disposed.

8.1.6 Sump Pit

The sump pit will be inspected for proper control of runoff and sediment materials. Clean water should be pumped to a grassy area. If the contractor notices any visible contrast in the water, proper filtration shall be provided to release off site.

8.1.7 Clean Material Stockpile Detail

The silt fencing should be inspected for bulges and proper installation. The soil stockpile should be stabilized with grass or rolled erosion control blanket.

8.1.8 Storm Drain Inlet Protection

Maintenance and inspection of the filter fabric cloth beneath inlet grates in paved areas or the filter fabric drop inlet protection around the drop inlet shall be conducted. The filter fabric cloth shall be cleaned to allow water to pass and prevent clogging the drainage structure. The drainage inlet protection should be inspected for integrity and visible sediment buildup. Collected sediment should be removed from the drainage inlet protection and shall be disposed of properly in accordance with all applicable local, state, and federal requirements.

8.1.9 Dust Control

Maintain all dust control measures through dry weather periods until all disturbed areas are stabilized.

8.1.10 Soil Stabilization

To ensure that the site is properly seeded and stabilized, the Contractor must initiate stabilization measures as soon as practicable in areas of the site where construction activities have permanently ceased and in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. The Contractor will be responsible for the maintenance of the vegetated cover for the duration of construction activities. The areas shall be monitored to ensure that vegetation achieves good coverage over the entire disturbed section. Additional seeding shall be completed as needed. Watering shall be provided as needed.

In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven days from the date the soil disturbance activity ceased. The

soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

8.1.11 Perimeter Dike/Swale

The dike/swale should be properly stabilized with rolled erosion control blanket or other stabilization measures. Any rilling or areas of cutting should be immediately stabilized. Further investigation as to the cause should also be performed to determine if other upstream erosion and sediment control measures are needed. When accumulated sediment reached a depth of 1/3 of the total depth of the swale, this material shall be removed and properly disposed.

8.1.12 Temporary Sediment Basin

Any rilling and erosion of the basin sideslopes should be evaluated and adequate stabilization should be provided. Rolled erosion control blankets or other stabilization practices should be installed on the sideslopes. The outlet structure should be inspected for damages, accumulation of sediment, trash and debris, and overall performance. If sediment-laden stormwater is leaving the basin then additional erosion and sediment control practices may be required.

8.1.13 Containment for Temporary Fueling Area

During construction a temporary fueling area will be located near the Recycling facility. The downstream catch basins will have a temporary insert to filter any petroleum out of the stormwater runoff. All NYSDEC and EPA regulations will be followed with regard to the spill prevention plan.

8.2 Post-Construction Operation And Maintenance

Following completion of construction, a long term inspection and maintenance program will be implemented to ensure the proper function of the stormwater management system. The program will be carried out by the facilities manager. A detailed checklist of pond inspection and maintenance is included in the SPPP. The maintenance program will include the following:

1. The side slopes of the pond will be mowed at a minimum twice a year. If necessary, invasive woody vegetation around and in the pond will be removed to prevent it from becoming established within the pond.
2. Litter and debris will be removed from catch basins, vegetated swales, ponds, and the outlet control structures.
3. The stormwater management system should be inspected after each major storm event (greater than 2-year, 24-hour storm) to ensure the small orifices and inlets remain open.
4. Silt will be cleaned from catch basins and other drainage structures when the depth exceeds half of the depth of the sump.
5. Sediment will be removed from detention ponds as needed, but at a minimum of every five years. A backhoe or excavator will be used to remove sediment accumulation from the bottom of the detention pond. However, vehicles shall be prevented from traversing the sideslopes to the extent possible to avoid damaging established vegetation. Repairs to the embankment should be done with hand tools to the extent practical.
6. Use of road salt for maintenance of parking areas will be minimized.

7. Eroded areas and gullies will be restored and re-seeded as soon as possible.

In addition to inspection and maintenance of the stormwater management system, inspection of the overall site for areas of potential contamination will also be noted. As demonstrated by the neat grounds and impeccable cleanliness, maintenance is already an important goal at the WEC. Maintenance of existing landscaped areas is performed consistently throughout the year. This will be continued with the WEC amended site plan. Pest control would continue to follow the WEC existing practices, which include an Integrated Pest Management program in conjunction with guidance from the Cornell Cooperative Extension Agency, applicable regulations, and best practices. All potential pollutants, such as petroleum products, chemicals, etc, will be properly stored in designated areas that will minimize contact with precipitation.

WEST NILE VIRUS

The stormwater detention ponds proposed for the project are NYSDEC wet ponds (P-2). Recent field observations conclude that constructed wetlands and stormwater management ponds actually pose a low risk in spreading the West Nile Virus since the mosquito species that are found in wetlands and stormwater management ponds tend not to be the variety that are known to carry the West Nile Virus. Within a healthy aquatic ecosystem, other aquatic invertebrates (dragonfly larvae and other species) prey on mosquito larvae thereby reducing mosquito populations. The SPPP submitted to the NYSDEC and NYCDEP will include a regular maintenance schedule to be implemented at the completion of construction. This may include the stocking of the ponds with species to feed on potential mosquito larvae, and possible aeration systems to be exercised during periods of minimal flow through the ponds.

DRAWINGS



LEGEND

- _____ DRAINAGE BOUNDARY
- _____ WATERCOURSE LINE
- _____ SET BACK LINE
- _____ To Flow Path

REVISIONS

No.	DATE	DESCRIPTION
1	06/24/09	DRAFT EIS

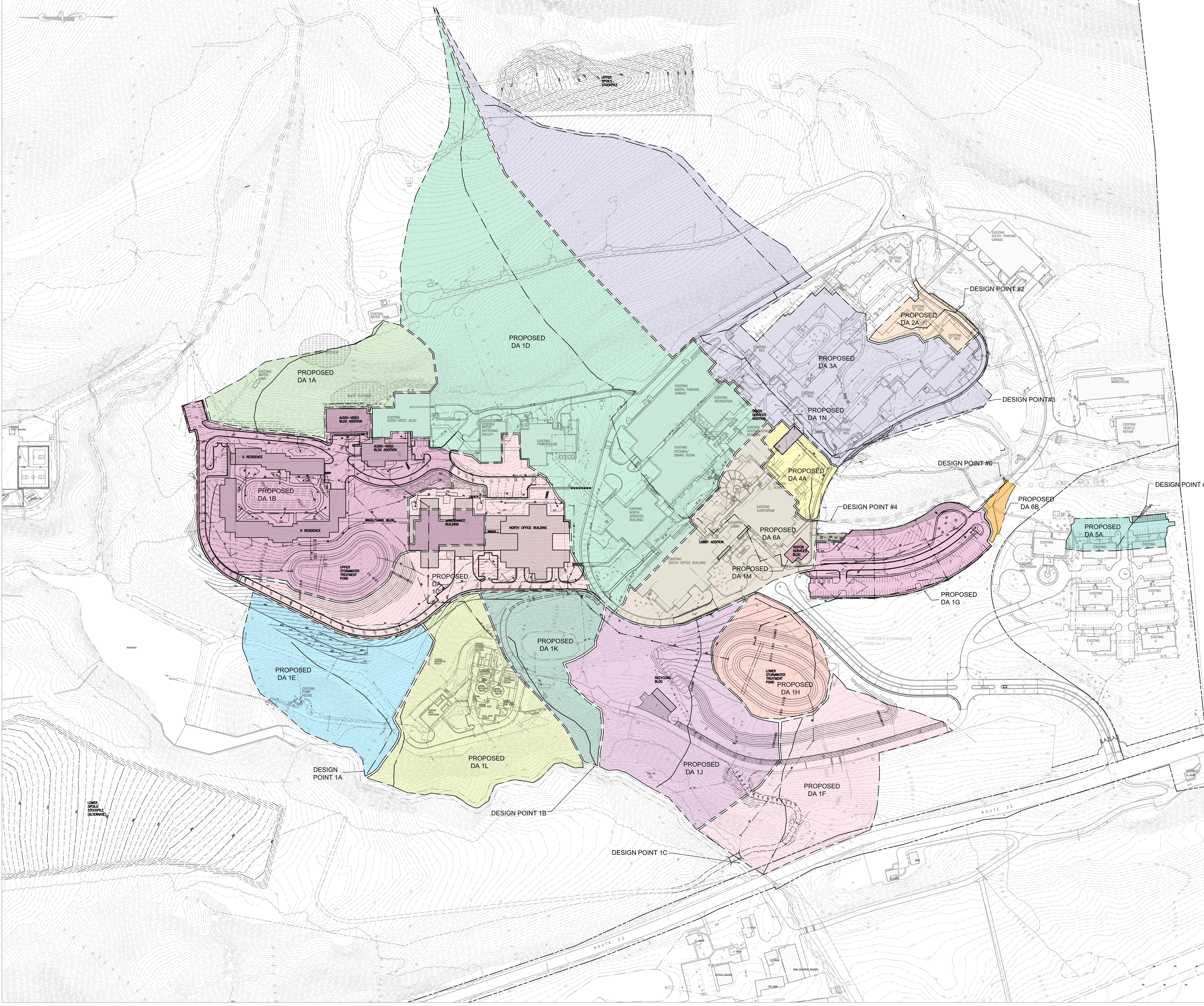
PROJECT
WATCHTOWER
EDUCATION CENTER
NYS ROUTE 22
PATTERSON, NY

DRAWN BY JT	CHECKED BY JM
SCALE 1" = 100'	DATE 01/21/2009

SHEET TITLE

PRE -DEVELOPMENT
DRAINAGE MAP

SHEET NO.
C-1
SHEET 1 OF 2



LEGEND

- DRAINAGE BOUNDARY
- WATERCOURSE LINE
- SET BACK LINE
- PROPOSED PERMEABLE PAVEMENT

REVISIONS		
No.	DATE	DESCRIPTION
1	06/24/09	DRAFT EIS
PROJECT		
WATCHTOWER EDUCATION CENTER NYS ROUTE 22 PATTERSON, NY		
DRAWN BY		CHECKED BY
JT		JM
SCALE		DATE
1" = 100'		01/21/2009
SHEET TITLE		
POST-DEVELOPMENT DRAINAGE MAP		
SHEET NO.		
C-2		

SPPP APPENDIX A
CONTRACTOR'S CERTIFICATION
OWNER'S CERTIFICATION
PREPARER'S CERTIFICATION

CONTRACTOR'S CERTIFICATION

"I hereby certify that I understand and agree to comply with the terms and conditions of the SPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

SIGNED: _____ DATE: _____

NAME: _____

FIRM: _____

ADDRESS: _____

PHONE: _____

SITE: _____

SPPP IMPLEMENTER'S
NAME _____

SPPP IMPLEMENTER'S
TITLE _____

CONTRACTOR'S
SCOPE _____

TRAINED
CONTRACTOR'S NAME _____

TRAINED
CONTRACTOR'S TITLE _____

*The SPPP Implementer must be a trained contractor responsible for SPPP implementation, an employee of the firm who has received training in accordance with SPEDES GP-0-10-001.

OWNER'S CERTIFICATION

"I hereby certify that I understand and agree to comply with the terms and conditions of the SPPP 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 New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

SIGNED: _____ DATE: _____

NAME: _____

FIRM: _____

ADDRESS: _____

PHONE: _____

SITE: _____

PREPARER'S CERTIFICATION

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

SIGNED:

DATE:

NAME:

Andrew Malek, P.E.

TITLE:

Senior Vice President

FIRM:

AKRF Engineering, P.C.

ADDRESS:

440 Park Avenue South

New York, NY 10016

PHONE:

(646)-388-9746

DOCUMENT:

Stormwater Pollution Prevention Plan (SPPP)

SITE:

SPPP APPENDIX B
CONSTRUCTION INSPECTION LOGS

SITE PLAN/SKETCH

Provide a concise sketch indicating construction activities, location and description of stormwater runoff from the site, stabilization activities, and soil erosion and sediment control BMPs. Indicate BMPs improperly installed or in need of repair. The inspector shall notify the contractor(s) and subcontractor(s) of necessary repairs of BMPs required within one business day of this inspection.

Provide a brief description of soil and weather conditions:

Qualified Inspector (print name)

Date of Inspection

Qualified Professional (print name)

Qualified Professional Signature

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

Maintaining Water Quality

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

Housekeeping

1. General Site Conditions

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

2. Temporary Stream Crossing

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

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

☐	☐	☐	Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
☐	☐	☐	Clean water from upstream pool is being pumped to the downstream pool.
☐	☐	☐	Sediment laden water from work area is being discharged to a silt-trapping device.
☐	☐	☐	Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader

Yes No NA

☐	☐	☐	Installed per plan.
☐	☐	☐	Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
☐	☐	☐	Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

☐	☐	☐	Installed per plan with minimum side slopes 2H:1V or flatter.
☐	☐	☐	Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
☐	☐	☐	Sediment-laden runoff directed to sediment trapping structure

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 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 seeding and mulch have been applied to idle areas.☐ ☐ ☐ 4 inches minimum of topsoil has been applied under permanent seeding**Sediment Control****1. Stabilized Construction Entrance****Yes No NA**☐ ☐ ☐ Stone is clean enough to effectively remove mud from vehicles.☐ ☐ ☐ Installed per standards and specifications?☐ ☐ ☐ Does all traffic use the stabilized entrance to enter and leave site?☐ ☐ ☐ Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

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

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

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

4. Temporary Sediment Trap

Yes	No	NA	
☐	☐	☐	Outlet structure is constructed per the approved plan or drawing.
☐	☐	☐	Geotextile fabric has been placed beneath rock fill.
			Sediment accumulation is ____% of design capacity.

5. Temporary Sediment Basin

Yes No NA

☐	☐	☐	Basin and outlet structure constructed per the approved plan.
☐	☐	☐	Basin side slopes are stabilized with seed/mulch.
☐	☐	☐	Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
			Sediment accumulation is ____% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix C of this document and Appendix F of the New York State Stormwater Management Design Manual.

The Operator shall amend the SPPP whenever:

- MODIFICATION & REASON:**

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

MONTHLY SUMMARY OF SITE INSPECTION ACTIVITIES

Name of Permitted Facility:	Today's Date:	Reporting Month:
Location:	Permit Identification No.	
Name and Telephone of Site Inspector:		

[illegible]

INSPECTION FORM

RECORD OF STABILIZATION, DEMOLITION, AND CONSTRUCTION ACTIVITIES

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the notice of termination is filed. Maintain this form in log book at the project site.

MAJOR GRADING, CONSTRUCTION OR STABILIZATION ACTIVITIES

Description of Activity: _____
Begin Date: _____ Site Contractor: _____
Location: _____
End Date: _____

Description of Activity: _____
Begin Date: _____ Site Contractor: _____
Location: _____
End Date: _____

Description of Activity: _____
Begin Date: _____ Site Contractor: _____
Location: _____
End Date: _____

Description of Activity: _____
Begin Date: _____ Site Contractor: _____
Location: _____
End Date: _____

Description of Activity: _____
Begin Date: _____ Site Contractor: _____
Location: _____
End Date: _____

SPPP APPENDIX C
INSPECTION AND MAINTENANCE FORMS FOR POST-CONSTRUCTION PRACTICES
STORMWATER POND

STORMWATER POND INSPECTION AND MAINTENANCE CHECKLIST PAGE XX OF XX		
Project Name:	Location:	
Site Status:	Weather Condition:	
Inspector:	Date:	Time:
Maintenance Item	Satisfactory/ Unsatisfactory	Comments
Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe downstream upstream		
d. Emergency spillway		
6. Pond, toe & chimney drains clear and functioning		
7. Seeps/leaks on downstream face		
8. Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam .As-Built.		
10. Emergency spillway clear of obstructions and debris		
11. Inspect sideslopes and pipe connections to determine exposure for geomembrane seal		
Riser and principal spillway (Annual)		
Type: Reinforced concrete _____ Corrugated pipe _____		
1. Low flow orifice obstructed		
2. Low flow trash rack.		

**STORMWATER POND INSPECTION AND MAINTENANCE CHECKLIST PAGE XX
OF XX**

Project Name:	Location:	
Site Status:	Weather Condition:	
Inspector:	Date:	Time:
Maintenance Item	Satisfactory/ Unsatisfactory	Comments
a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance		
a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels		
a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (exposed rebar)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve		
a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve		
a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
Sediment Forebay		

STORMWATER POND INSPECTION AND MAINTENANCE CHECKLIST PAGE XX OF XX

Project Name:	Location:	
Site Status:	Weather Condition:	
Inspector:	Date:	Time:
Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4. Endwalls / Headwalls		
Other (monthly)		
1. Encroachment on pond, wetland or easement area		
2. Complaints from residents		
3.Aesthetics		
a. Grass growing required		
b. Graffiti removal needed		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing		

STORMWATER POND INSPECTION AND MAINTENANCE CHECKLIST PAGE XX OF XX

Project Name:	Location:	
Site Status:	Weather Condition:	
Inspector:	Date:	Time:
Maintenance Item	Satisfactory/ Unsatisfactory	Comments
Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants:		
Survival of desired wetland plant species		
Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants choked. with sediment		
7. Eutrophication level of the wetland.		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

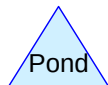
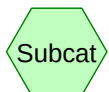
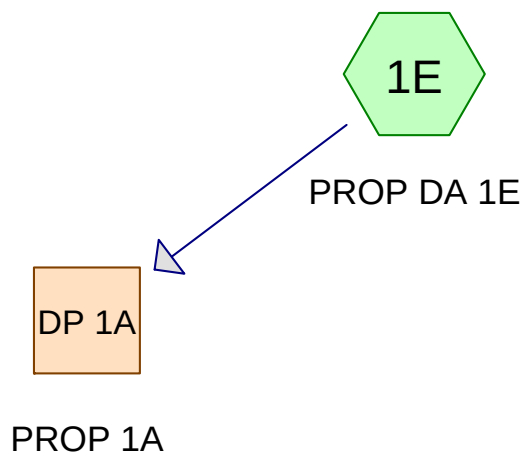
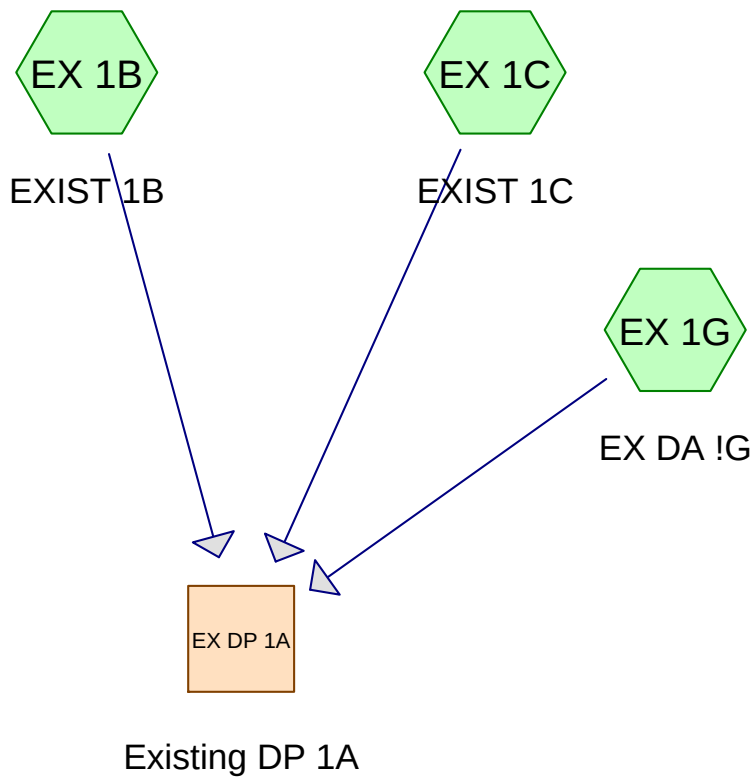
Project Location _____
 Site Status: _____
 Date: _____
 Time: _____
 Inspector: _____

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipaters (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

SPPP APPENDIX D
HYDROLOGIC ROUTING CALCULATIONS



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

Printed 2/12/2010

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Page 2

Summary for Subcatchment 1E: PROP DA 1E

Runoff = 1.84 cfs @ 12.14 hrs, Volume= 0.205 af, Depth= 0.48"

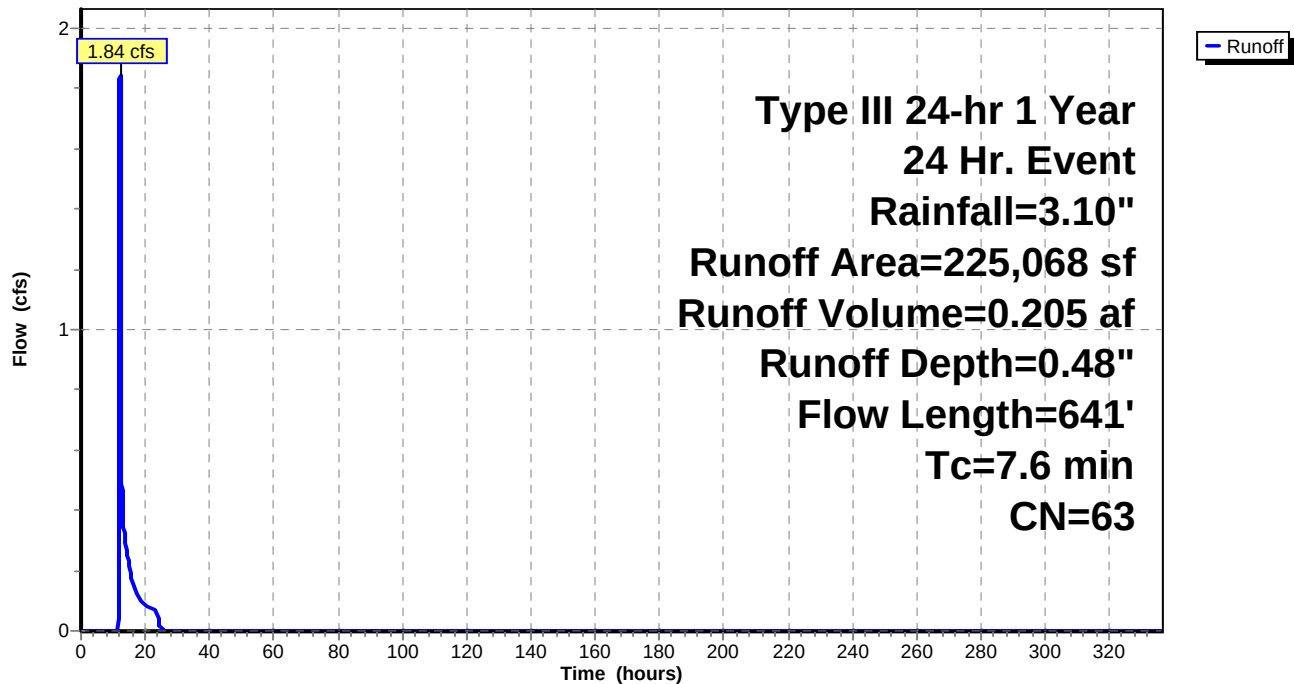
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
210,868	61	>75% Grass cover, Good, HSG B
14,200	85	Gravel roads, HSG B
225,068	63	Weighted Average
225,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	75	0.1000	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
3.7	566	0.1360	2.58		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	641	Total			

Subcatchment 1E: PROP DA 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1E: PROP DA 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.48	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.48	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.48	0.00
15.00	2.65	0.30	0.22	275.00	3.10	0.48	0.00
20.00	2.97	0.42	0.09	280.00	3.10	0.48	0.00
25.00	3.10	0.48	0.00	285.00	3.10	0.48	0.00
30.00	3.10	0.48	0.00	290.00	3.10	0.48	0.00
35.00	3.10	0.48	0.00	295.00	3.10	0.48	0.00
40.00	3.10	0.48	0.00	300.00	3.10	0.48	0.00
45.00	3.10	0.48	0.00	305.00	3.10	0.48	0.00
50.00	3.10	0.48	0.00	310.00	3.10	0.48	0.00
55.00	3.10	0.48	0.00	315.00	3.10	0.48	0.00
60.00	3.10	0.48	0.00	320.00	3.10	0.48	0.00
65.00	3.10	0.48	0.00	325.00	3.10	0.48	0.00
70.00	3.10	0.48	0.00	330.00	3.10	0.48	0.00
75.00	3.10	0.48	0.00	335.00	3.10	0.48	0.00
80.00	3.10	0.48	0.00				
85.00	3.10	0.48	0.00				
90.00	3.10	0.48	0.00				
95.00	3.10	0.48	0.00				
100.00	3.10	0.48	0.00				
105.00	3.10	0.48	0.00				
110.00	3.10	0.48	0.00				
115.00	3.10	0.48	0.00				
120.00	3.10	0.48	0.00				
125.00	3.10	0.48	0.00				
130.00	3.10	0.48	0.00				
135.00	3.10	0.48	0.00				
140.00	3.10	0.48	0.00				
145.00	3.10	0.48	0.00				
150.00	3.10	0.48	0.00				
155.00	3.10	0.48	0.00				
160.00	3.10	0.48	0.00				
165.00	3.10	0.48	0.00				
170.00	3.10	0.48	0.00				
175.00	3.10	0.48	0.00				
180.00	3.10	0.48	0.00				
185.00	3.10	0.48	0.00				
190.00	3.10	0.48	0.00				
195.00	3.10	0.48	0.00				
200.00	3.10	0.48	0.00				
205.00	3.10	0.48	0.00				
210.00	3.10	0.48	0.00				
215.00	3.10	0.48	0.00				
220.00	3.10	0.48	0.00				
225.00	3.10	0.48	0.00				
230.00	3.10	0.48	0.00				
235.00	3.10	0.48	0.00				
240.00	3.10	0.48	0.00				
245.00	3.10	0.48	0.00				
250.00	3.10	0.48	0.00				
255.00	3.10	0.48	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1B: EXIST 1B

Runoff = 0.84 cfs @ 12.31 hrs, Volume= 0.116 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

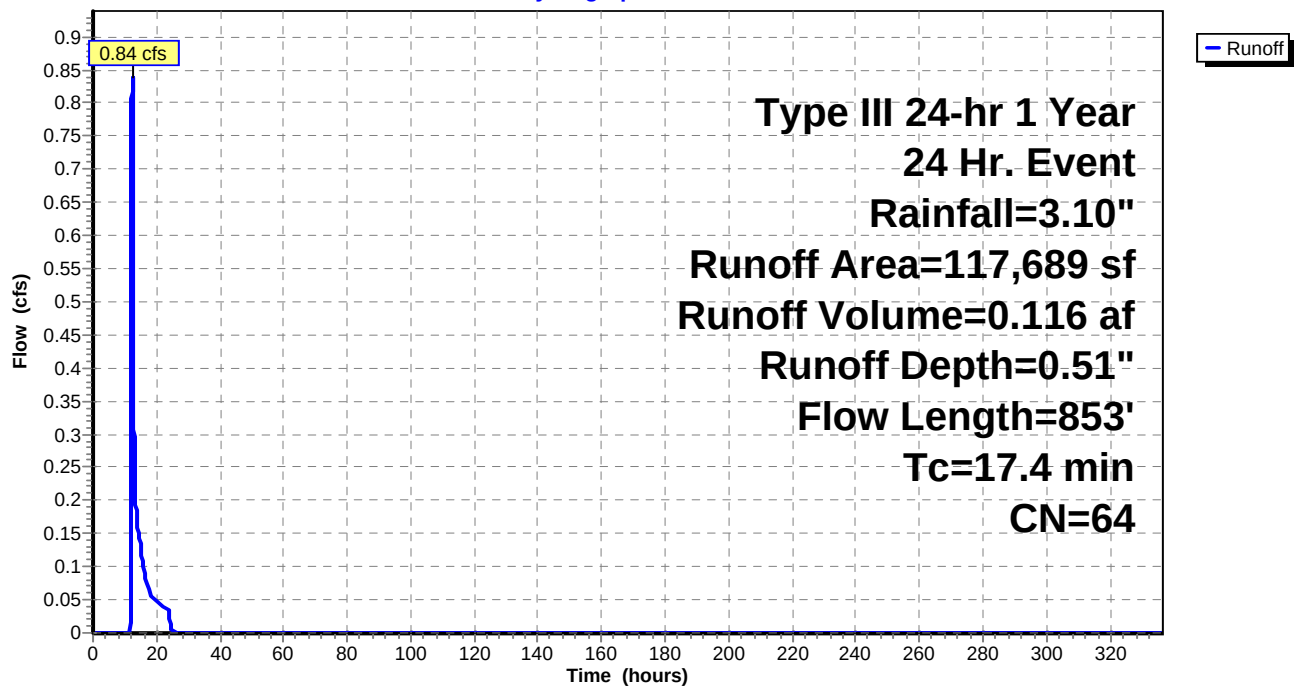
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
104,956	61	>75% Grass cover, Good, HSG B
12,733	85	Gravel roads, HSG B
117,689	64	Weighted Average
117,689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	150	0.0130	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.0	703	0.1337	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
17.4	853	Total			

Subcatchment EX 1B: EXIST 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1B: EXIST 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.51	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.51	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.51	0.00
15.00	2.65	0.32	0.13	275.00	3.10	0.51	0.00
20.00	2.97	0.45	0.05	280.00	3.10	0.51	0.00
25.00	3.10	0.51	0.00	285.00	3.10	0.51	0.00
30.00	3.10	0.51	0.00	290.00	3.10	0.51	0.00
35.00	3.10	0.51	0.00	295.00	3.10	0.51	0.00
40.00	3.10	0.51	0.00	300.00	3.10	0.51	0.00
45.00	3.10	0.51	0.00	305.00	3.10	0.51	0.00
50.00	3.10	0.51	0.00	310.00	3.10	0.51	0.00
55.00	3.10	0.51	0.00	315.00	3.10	0.51	0.00
60.00	3.10	0.51	0.00	320.00	3.10	0.51	0.00
65.00	3.10	0.51	0.00	325.00	3.10	0.51	0.00
70.00	3.10	0.51	0.00	330.00	3.10	0.51	0.00
75.00	3.10	0.51	0.00	335.00	3.10	0.51	0.00
80.00	3.10	0.51	0.00				
85.00	3.10	0.51	0.00				
90.00	3.10	0.51	0.00				
95.00	3.10	0.51	0.00				
100.00	3.10	0.51	0.00				
105.00	3.10	0.51	0.00				
110.00	3.10	0.51	0.00				
115.00	3.10	0.51	0.00				
120.00	3.10	0.51	0.00				
125.00	3.10	0.51	0.00				
130.00	3.10	0.51	0.00				
135.00	3.10	0.51	0.00				
140.00	3.10	0.51	0.00				
145.00	3.10	0.51	0.00				
150.00	3.10	0.51	0.00				
155.00	3.10	0.51	0.00				
160.00	3.10	0.51	0.00				
165.00	3.10	0.51	0.00				
170.00	3.10	0.51	0.00				
175.00	3.10	0.51	0.00				
180.00	3.10	0.51	0.00				
185.00	3.10	0.51	0.00				
190.00	3.10	0.51	0.00				
195.00	3.10	0.51	0.00				
200.00	3.10	0.51	0.00				
205.00	3.10	0.51	0.00				
210.00	3.10	0.51	0.00				
215.00	3.10	0.51	0.00				
220.00	3.10	0.51	0.00				
225.00	3.10	0.51	0.00				
230.00	3.10	0.51	0.00				
235.00	3.10	0.51	0.00				
240.00	3.10	0.51	0.00				
245.00	3.10	0.51	0.00				
250.00	3.10	0.51	0.00				
255.00	3.10	0.51	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1C: EXIST 1C

Runoff = 0.56 cfs @ 12.26 hrs, Volume= 0.076 af, Depth= 0.48"

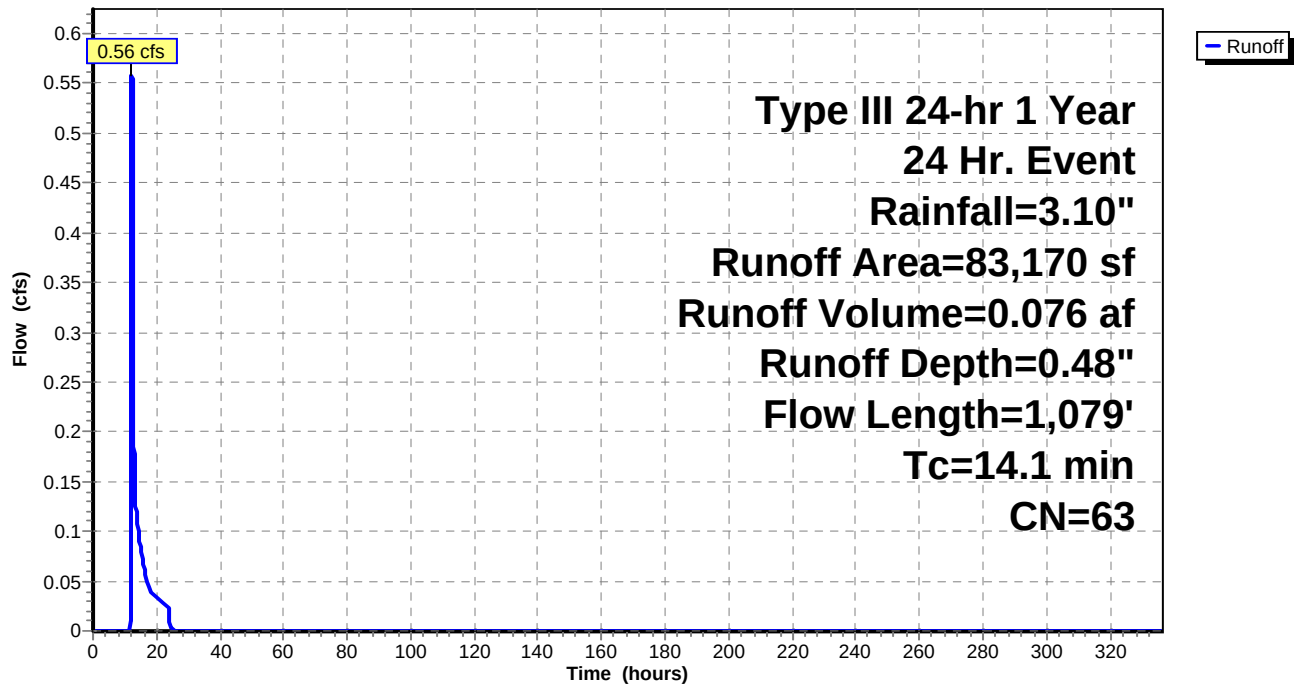
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
77,817	61	>75% Grass cover, Good, HSG B
5,353	85	Gravel roads, HSG B
83,170	63	Weighted Average
83,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	150	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	929	0.1340	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
14.1	1,079	Total			

Subcatchment EX 1C: EXIST 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1C: EXIST 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.48	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.48	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.48	0.00
15.00	2.65	0.30	0.09	275.00	3.10	0.48	0.00
20.00	2.97	0.42	0.03	280.00	3.10	0.48	0.00
25.00	3.10	0.48	0.00	285.00	3.10	0.48	0.00
30.00	3.10	0.48	0.00	290.00	3.10	0.48	0.00
35.00	3.10	0.48	0.00	295.00	3.10	0.48	0.00
40.00	3.10	0.48	0.00	300.00	3.10	0.48	0.00
45.00	3.10	0.48	0.00	305.00	3.10	0.48	0.00
50.00	3.10	0.48	0.00	310.00	3.10	0.48	0.00
55.00	3.10	0.48	0.00	315.00	3.10	0.48	0.00
60.00	3.10	0.48	0.00	320.00	3.10	0.48	0.00
65.00	3.10	0.48	0.00	325.00	3.10	0.48	0.00
70.00	3.10	0.48	0.00	330.00	3.10	0.48	0.00
75.00	3.10	0.48	0.00	335.00	3.10	0.48	0.00
80.00	3.10	0.48	0.00				
85.00	3.10	0.48	0.00				
90.00	3.10	0.48	0.00				
95.00	3.10	0.48	0.00				
100.00	3.10	0.48	0.00				
105.00	3.10	0.48	0.00				
110.00	3.10	0.48	0.00				
115.00	3.10	0.48	0.00				
120.00	3.10	0.48	0.00				
125.00	3.10	0.48	0.00				
130.00	3.10	0.48	0.00				
135.00	3.10	0.48	0.00				
140.00	3.10	0.48	0.00				
145.00	3.10	0.48	0.00				
150.00	3.10	0.48	0.00				
155.00	3.10	0.48	0.00				
160.00	3.10	0.48	0.00				
165.00	3.10	0.48	0.00				
170.00	3.10	0.48	0.00				
175.00	3.10	0.48	0.00				
180.00	3.10	0.48	0.00				
185.00	3.10	0.48	0.00				
190.00	3.10	0.48	0.00				
195.00	3.10	0.48	0.00				
200.00	3.10	0.48	0.00				
205.00	3.10	0.48	0.00				
210.00	3.10	0.48	0.00				
215.00	3.10	0.48	0.00				
220.00	3.10	0.48	0.00				
225.00	3.10	0.48	0.00				
230.00	3.10	0.48	0.00				
235.00	3.10	0.48	0.00				
240.00	3.10	0.48	0.00				
245.00	3.10	0.48	0.00				
250.00	3.10	0.48	0.00				
255.00	3.10	0.48	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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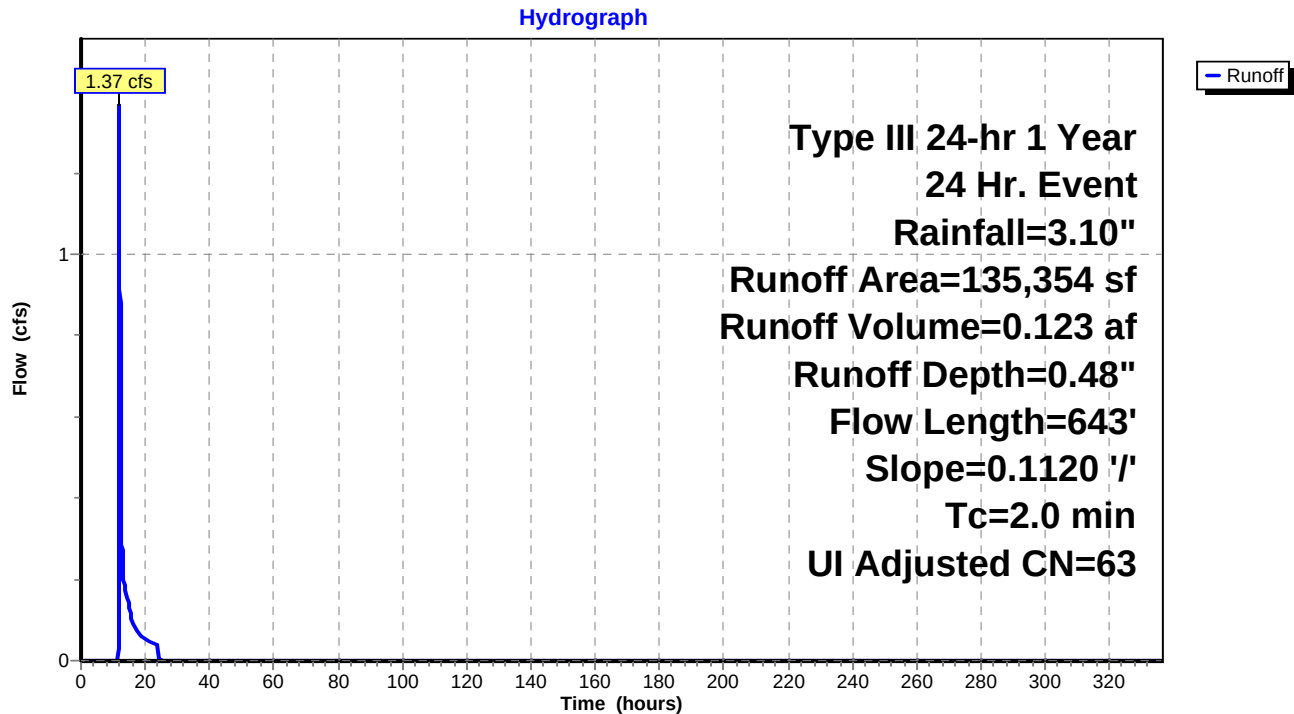
Summary for Subcatchment EX 1G: EX DA !G

Runoff = 1.37 cfs @ 12.05 hrs, Volume= 0.123 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
121,243	61	>75% Grass cover, Good, HSG B
13,897	85	Gravel roads, HSG B
214	98	Unconnected roofs, HSG B
135,354	64	Weighted Average, UI Adjusted CN = 63
135,140		99.84% Pervious Area
214		0.16% Impervious Area
214		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	643	0.1120	5.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps

Subcatchment EX 1G: EX DA !G

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1G: EX DA !G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.48	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.48	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.48	0.00
15.00	2.65	0.30	0.13	275.00	3.10	0.48	0.00
20.00	2.97	0.42	0.05	280.00	3.10	0.48	0.00
25.00	3.10	0.48	0.00	285.00	3.10	0.48	0.00
30.00	3.10	0.48	0.00	290.00	3.10	0.48	0.00
35.00	3.10	0.48	0.00	295.00	3.10	0.48	0.00
40.00	3.10	0.48	0.00	300.00	3.10	0.48	0.00
45.00	3.10	0.48	0.00	305.00	3.10	0.48	0.00
50.00	3.10	0.48	0.00	310.00	3.10	0.48	0.00
55.00	3.10	0.48	0.00	315.00	3.10	0.48	0.00
60.00	3.10	0.48	0.00	320.00	3.10	0.48	0.00
65.00	3.10	0.48	0.00	325.00	3.10	0.48	0.00
70.00	3.10	0.48	0.00	330.00	3.10	0.48	0.00
75.00	3.10	0.48	0.00	335.00	3.10	0.48	0.00
80.00	3.10	0.48	0.00				
85.00	3.10	0.48	0.00				
90.00	3.10	0.48	0.00				
95.00	3.10	0.48	0.00				
100.00	3.10	0.48	0.00				
105.00	3.10	0.48	0.00				
110.00	3.10	0.48	0.00				
115.00	3.10	0.48	0.00				
120.00	3.10	0.48	0.00				
125.00	3.10	0.48	0.00				
130.00	3.10	0.48	0.00				
135.00	3.10	0.48	0.00				
140.00	3.10	0.48	0.00				
145.00	3.10	0.48	0.00				
150.00	3.10	0.48	0.00				
155.00	3.10	0.48	0.00				
160.00	3.10	0.48	0.00				
165.00	3.10	0.48	0.00				
170.00	3.10	0.48	0.00				
175.00	3.10	0.48	0.00				
180.00	3.10	0.48	0.00				
185.00	3.10	0.48	0.00				
190.00	3.10	0.48	0.00				
195.00	3.10	0.48	0.00				
200.00	3.10	0.48	0.00				
205.00	3.10	0.48	0.00				
210.00	3.10	0.48	0.00				
215.00	3.10	0.48	0.00				
220.00	3.10	0.48	0.00				
225.00	3.10	0.48	0.00				
230.00	3.10	0.48	0.00				
235.00	3.10	0.48	0.00				
240.00	3.10	0.48	0.00				
245.00	3.10	0.48	0.00				
250.00	3.10	0.48	0.00				
255.00	3.10	0.48	0.00				

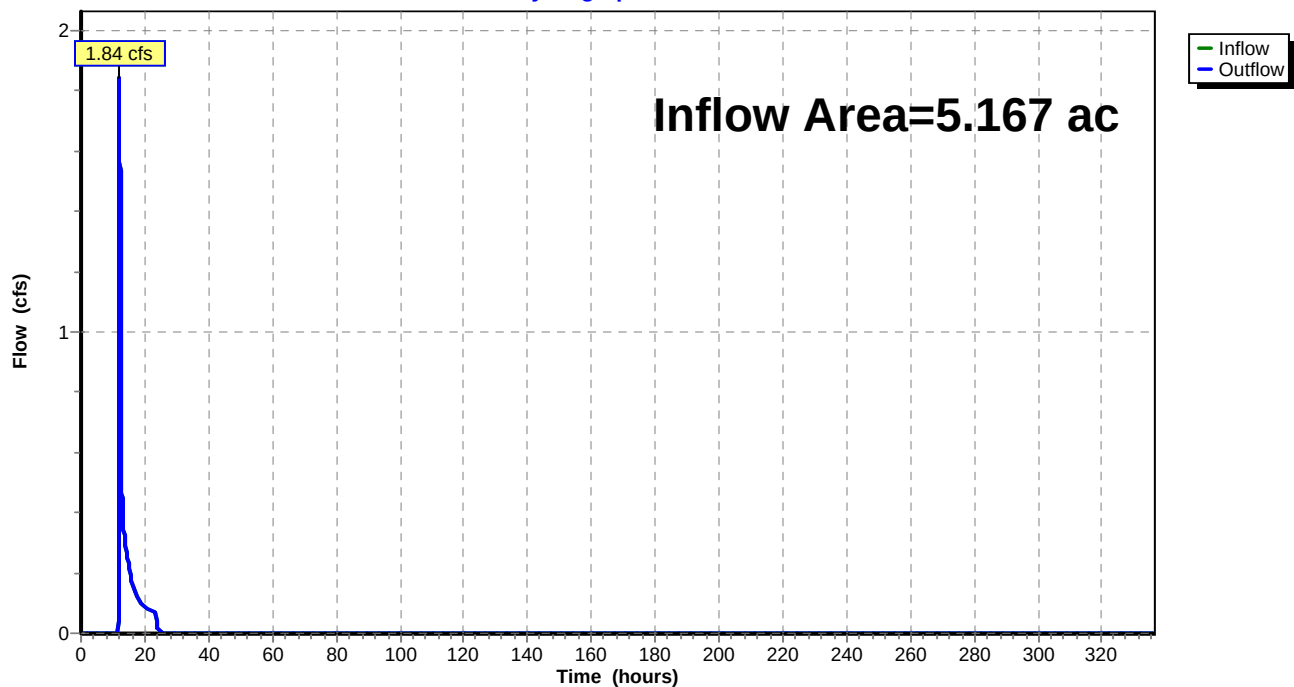
Summary for Reach DP 1A: PROP 1A

Inflow Area = 5.167 ac, 0.00% Impervious, Inflow Depth = 0.48" for 1 Year, 24 Hr. Event event
Inflow = 1.84 cfs @ 12.14 hrs, Volume= 0.205 af
Outflow = 1.84 cfs @ 12.14 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach DP 1A: PROP 1A

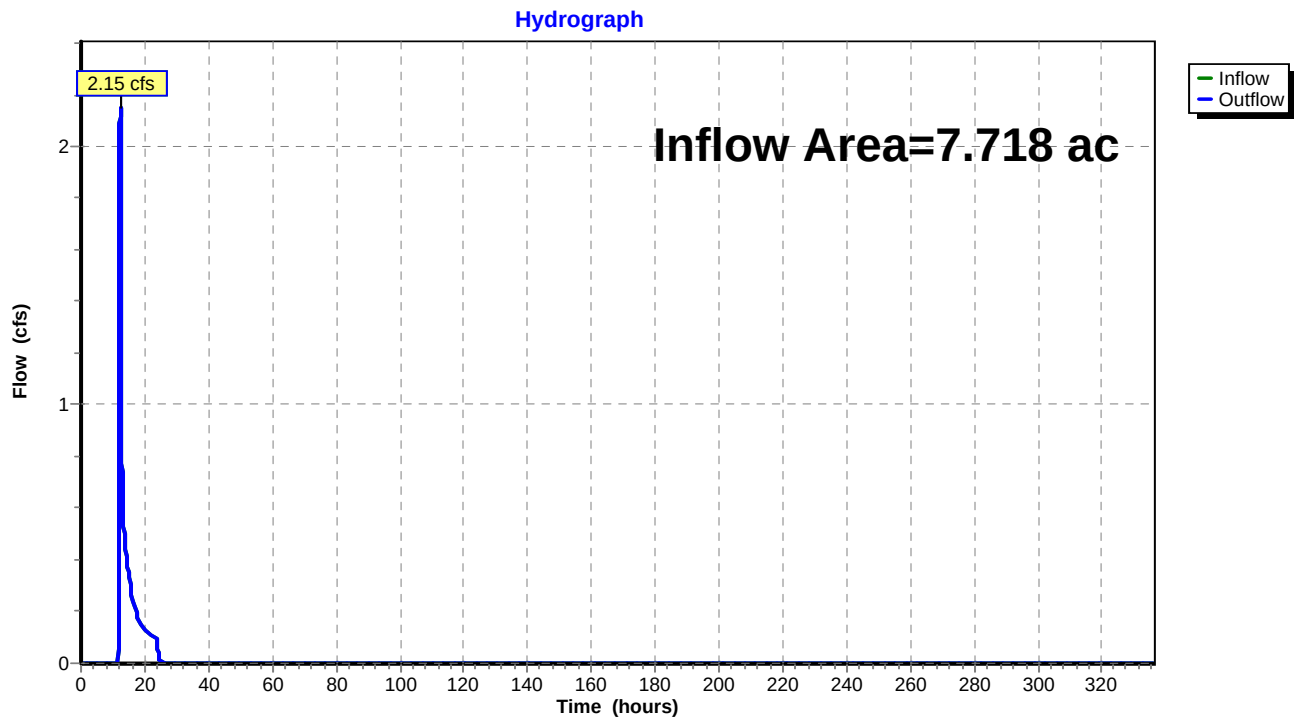
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.22		0.22	275.00	0.00		0.00
20.00	0.09		0.09	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Summary for Reach EX DP 1A: Existing DP 1A

Inflow Area = 7.718 ac, 0.06% Impervious, Inflow Depth = 0.49" for 1 Year, 24 Hr. Event event
Inflow = 2.15 cfs @ 12.27 hrs, Volume= 0.314 af
Outflow = 2.15 cfs @ 12.27 hrs, Volume= 0.314 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP 1A: Existing DP 1A



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach EX DP 1A: Existing DP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.35		0.35	275.00	0.00		0.00
20.00	0.13		0.13	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1E: PROP DA 1E

Runoff = 2.94 cfs @ 12.13 hrs, Volume= 0.284 af, Depth= 0.66"

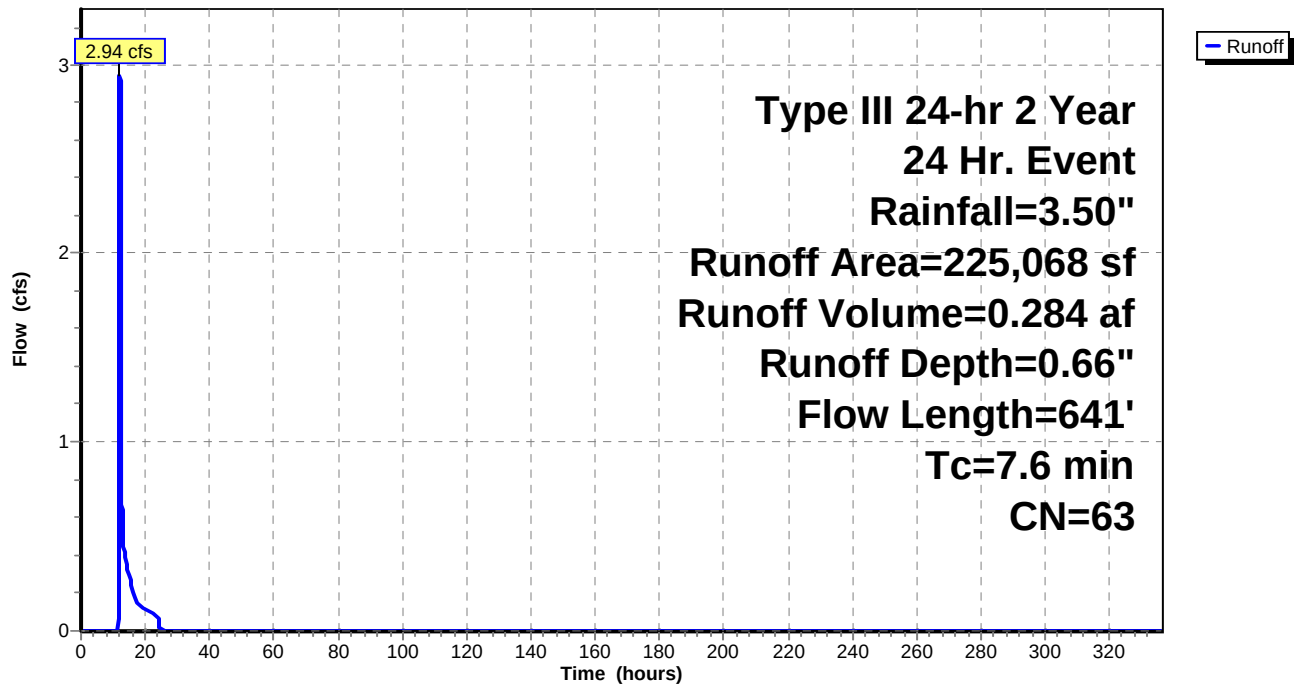
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
210,868	61	>75% Grass cover, Good, HSG B
14,200	85	Gravel roads, HSG B
225,068	63	Weighted Average
225,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	75	0.1000	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
3.7	566	0.1360	2.58		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	641	Total			

Subcatchment 1E: PROP DA 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1E: PROP DA 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.66	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.66	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.66	0.00
15.00	2.99	0.43	0.29	275.00	3.50	0.66	0.00
20.00	3.35	0.59	0.11	280.00	3.50	0.66	0.00
25.00	3.50	0.66	0.00	285.00	3.50	0.66	0.00
30.00	3.50	0.66	0.00	290.00	3.50	0.66	0.00
35.00	3.50	0.66	0.00	295.00	3.50	0.66	0.00
40.00	3.50	0.66	0.00	300.00	3.50	0.66	0.00
45.00	3.50	0.66	0.00	305.00	3.50	0.66	0.00
50.00	3.50	0.66	0.00	310.00	3.50	0.66	0.00
55.00	3.50	0.66	0.00	315.00	3.50	0.66	0.00
60.00	3.50	0.66	0.00	320.00	3.50	0.66	0.00
65.00	3.50	0.66	0.00	325.00	3.50	0.66	0.00
70.00	3.50	0.66	0.00	330.00	3.50	0.66	0.00
75.00	3.50	0.66	0.00	335.00	3.50	0.66	0.00
80.00	3.50	0.66	0.00				
85.00	3.50	0.66	0.00				
90.00	3.50	0.66	0.00				
95.00	3.50	0.66	0.00				
100.00	3.50	0.66	0.00				
105.00	3.50	0.66	0.00				
110.00	3.50	0.66	0.00				
115.00	3.50	0.66	0.00				
120.00	3.50	0.66	0.00				
125.00	3.50	0.66	0.00				
130.00	3.50	0.66	0.00				
135.00	3.50	0.66	0.00				
140.00	3.50	0.66	0.00				
145.00	3.50	0.66	0.00				
150.00	3.50	0.66	0.00				
155.00	3.50	0.66	0.00				
160.00	3.50	0.66	0.00				
165.00	3.50	0.66	0.00				
170.00	3.50	0.66	0.00				
175.00	3.50	0.66	0.00				
180.00	3.50	0.66	0.00				
185.00	3.50	0.66	0.00				
190.00	3.50	0.66	0.00				
195.00	3.50	0.66	0.00				
200.00	3.50	0.66	0.00				
205.00	3.50	0.66	0.00				
210.00	3.50	0.66	0.00				
215.00	3.50	0.66	0.00				
220.00	3.50	0.66	0.00				
225.00	3.50	0.66	0.00				
230.00	3.50	0.66	0.00				
235.00	3.50	0.66	0.00				
240.00	3.50	0.66	0.00				
245.00	3.50	0.66	0.00				
250.00	3.50	0.66	0.00				
255.00	3.50	0.66	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment EX 1B: EXIST 1B

Runoff = 1.28 cfs @ 12.28 hrs, Volume= 0.159 af, Depth= 0.71"

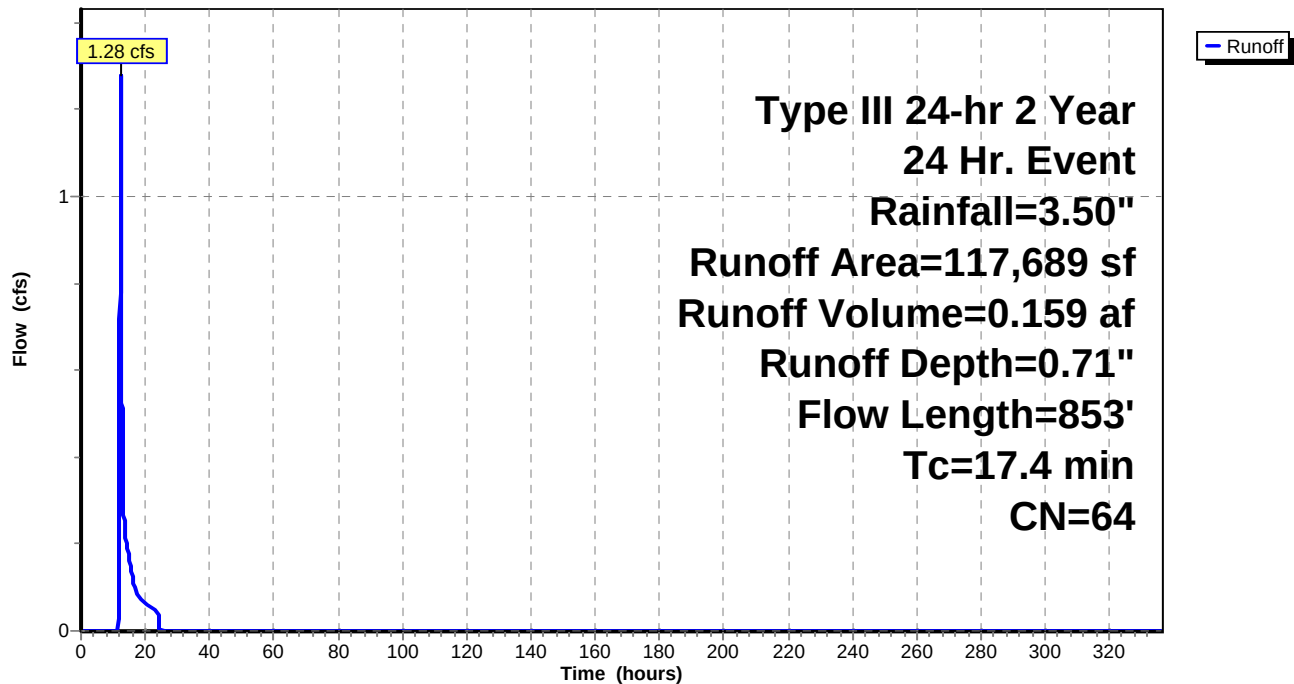
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
104,956	61	>75% Grass cover, Good, HSG B
12,733	85	Gravel roads, HSG B
117,689	64	Weighted Average
117,689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	150	0.0130	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.0	703	0.1337	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
17.4	853	Total			

Subcatchment EX 1B: EXIST 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1B: EXIST 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.71	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.71	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.71	0.00
15.00	2.99	0.46	0.17	275.00	3.50	0.71	0.00
20.00	3.35	0.63	0.06	280.00	3.50	0.71	0.00
25.00	3.50	0.71	0.00	285.00	3.50	0.71	0.00
30.00	3.50	0.71	0.00	290.00	3.50	0.71	0.00
35.00	3.50	0.71	0.00	295.00	3.50	0.71	0.00
40.00	3.50	0.71	0.00	300.00	3.50	0.71	0.00
45.00	3.50	0.71	0.00	305.00	3.50	0.71	0.00
50.00	3.50	0.71	0.00	310.00	3.50	0.71	0.00
55.00	3.50	0.71	0.00	315.00	3.50	0.71	0.00
60.00	3.50	0.71	0.00	320.00	3.50	0.71	0.00
65.00	3.50	0.71	0.00	325.00	3.50	0.71	0.00
70.00	3.50	0.71	0.00	330.00	3.50	0.71	0.00
75.00	3.50	0.71	0.00	335.00	3.50	0.71	0.00
80.00	3.50	0.71	0.00				
85.00	3.50	0.71	0.00				
90.00	3.50	0.71	0.00				
95.00	3.50	0.71	0.00				
100.00	3.50	0.71	0.00				
105.00	3.50	0.71	0.00				
110.00	3.50	0.71	0.00				
115.00	3.50	0.71	0.00				
120.00	3.50	0.71	0.00				
125.00	3.50	0.71	0.00				
130.00	3.50	0.71	0.00				
135.00	3.50	0.71	0.00				
140.00	3.50	0.71	0.00				
145.00	3.50	0.71	0.00				
150.00	3.50	0.71	0.00				
155.00	3.50	0.71	0.00				
160.00	3.50	0.71	0.00				
165.00	3.50	0.71	0.00				
170.00	3.50	0.71	0.00				
175.00	3.50	0.71	0.00				
180.00	3.50	0.71	0.00				
185.00	3.50	0.71	0.00				
190.00	3.50	0.71	0.00				
195.00	3.50	0.71	0.00				
200.00	3.50	0.71	0.00				
205.00	3.50	0.71	0.00				
210.00	3.50	0.71	0.00				
215.00	3.50	0.71	0.00				
220.00	3.50	0.71	0.00				
225.00	3.50	0.71	0.00				
230.00	3.50	0.71	0.00				
235.00	3.50	0.71	0.00				
240.00	3.50	0.71	0.00				
245.00	3.50	0.71	0.00				
250.00	3.50	0.71	0.00				
255.00	3.50	0.71	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1C: EXIST 1C

Runoff = 0.88 cfs @ 12.24 hrs, Volume= 0.105 af, Depth= 0.66"

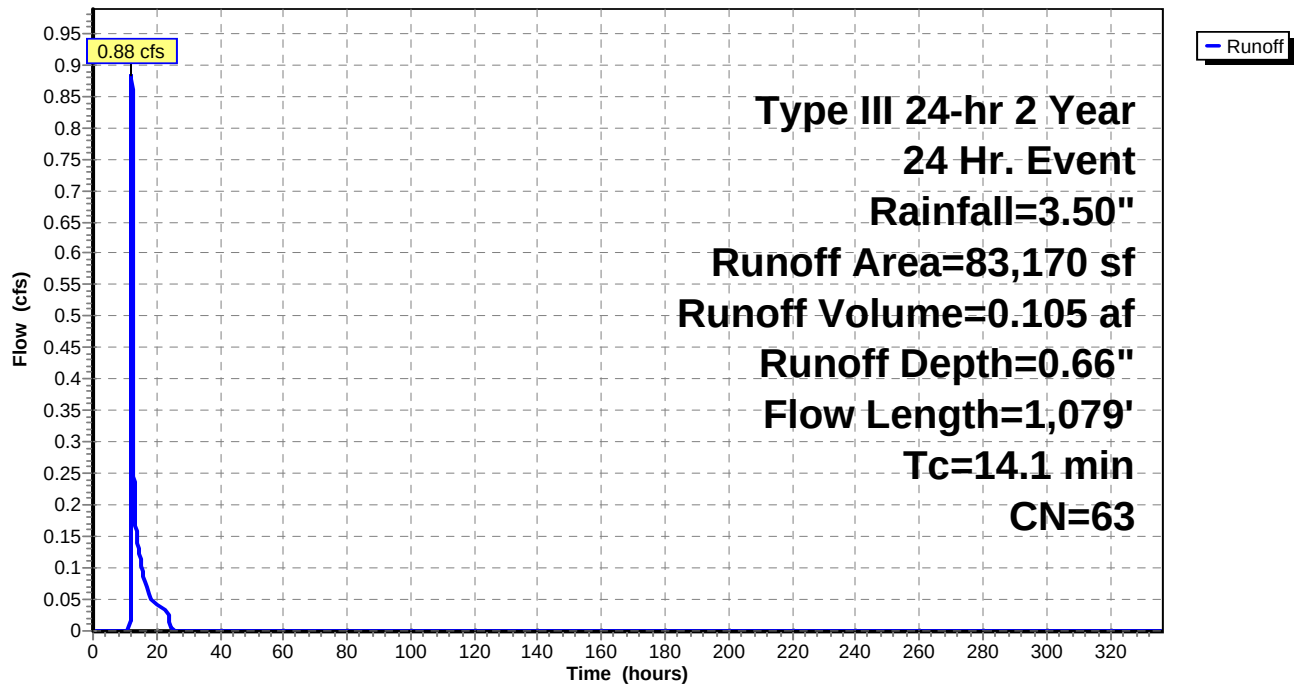
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
77,817	61	>75% Grass cover, Good, HSG B
5,353	85	Gravel roads, HSG B
83,170	63	Weighted Average
83,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	150	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	929	0.1340	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
14.1	1,079	Total			

Subcatchment EX 1C: EXIST 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1C: EXIST 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.66	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.66	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.66	0.00
15.00	2.99	0.43	0.11	275.00	3.50	0.66	0.00
20.00	3.35	0.59	0.04	280.00	3.50	0.66	0.00
25.00	3.50	0.66	0.00	285.00	3.50	0.66	0.00
30.00	3.50	0.66	0.00	290.00	3.50	0.66	0.00
35.00	3.50	0.66	0.00	295.00	3.50	0.66	0.00
40.00	3.50	0.66	0.00	300.00	3.50	0.66	0.00
45.00	3.50	0.66	0.00	305.00	3.50	0.66	0.00
50.00	3.50	0.66	0.00	310.00	3.50	0.66	0.00
55.00	3.50	0.66	0.00	315.00	3.50	0.66	0.00
60.00	3.50	0.66	0.00	320.00	3.50	0.66	0.00
65.00	3.50	0.66	0.00	325.00	3.50	0.66	0.00
70.00	3.50	0.66	0.00	330.00	3.50	0.66	0.00
75.00	3.50	0.66	0.00	335.00	3.50	0.66	0.00
80.00	3.50	0.66	0.00				
85.00	3.50	0.66	0.00				
90.00	3.50	0.66	0.00				
95.00	3.50	0.66	0.00				
100.00	3.50	0.66	0.00				
105.00	3.50	0.66	0.00				
110.00	3.50	0.66	0.00				
115.00	3.50	0.66	0.00				
120.00	3.50	0.66	0.00				
125.00	3.50	0.66	0.00				
130.00	3.50	0.66	0.00				
135.00	3.50	0.66	0.00				
140.00	3.50	0.66	0.00				
145.00	3.50	0.66	0.00				
150.00	3.50	0.66	0.00				
155.00	3.50	0.66	0.00				
160.00	3.50	0.66	0.00				
165.00	3.50	0.66	0.00				
170.00	3.50	0.66	0.00				
175.00	3.50	0.66	0.00				
180.00	3.50	0.66	0.00				
185.00	3.50	0.66	0.00				
190.00	3.50	0.66	0.00				
195.00	3.50	0.66	0.00				
200.00	3.50	0.66	0.00				
205.00	3.50	0.66	0.00				
210.00	3.50	0.66	0.00				
215.00	3.50	0.66	0.00				
220.00	3.50	0.66	0.00				
225.00	3.50	0.66	0.00				
230.00	3.50	0.66	0.00				
235.00	3.50	0.66	0.00				
240.00	3.50	0.66	0.00				
245.00	3.50	0.66	0.00				
250.00	3.50	0.66	0.00				
255.00	3.50	0.66	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1G: EX DA !G

Runoff = 2.17 cfs @ 12.05 hrs, Volume= 0.171 af, Depth= 0.66"

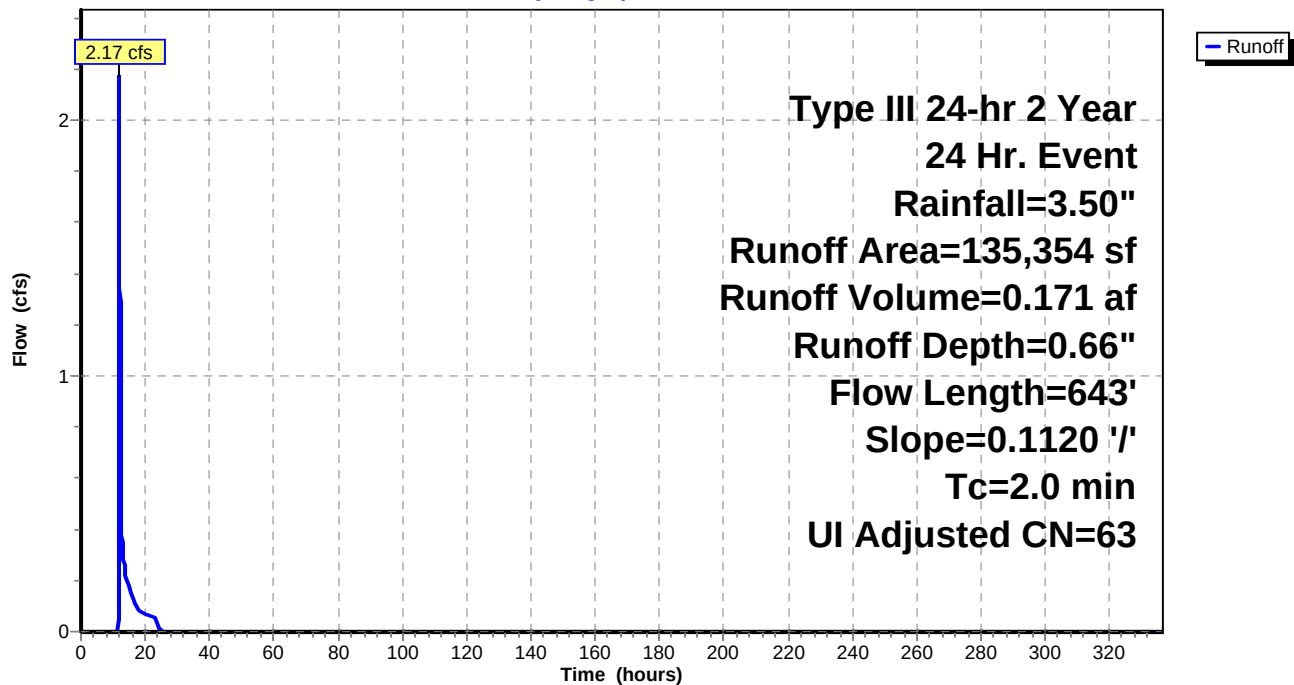
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
121,243	61	>75% Grass cover, Good, HSG B
13,897	85	Gravel roads, HSG B
214	98	Unconnected roofs, HSG B
135,354	64	Weighted Average, UI Adjusted CN = 63
135,140		99.84% Pervious Area
214		0.16% Impervious Area
214		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	643	0.1120	5.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps

Subcatchment EX 1G: EX DA !G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1G: EX DA !G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.66	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.66	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.66	0.00
15.00	2.99	0.43	0.17	275.00	3.50	0.66	0.00
20.00	3.35	0.59	0.07	280.00	3.50	0.66	0.00
25.00	3.50	0.66	0.00	285.00	3.50	0.66	0.00
30.00	3.50	0.66	0.00	290.00	3.50	0.66	0.00
35.00	3.50	0.66	0.00	295.00	3.50	0.66	0.00
40.00	3.50	0.66	0.00	300.00	3.50	0.66	0.00
45.00	3.50	0.66	0.00	305.00	3.50	0.66	0.00
50.00	3.50	0.66	0.00	310.00	3.50	0.66	0.00
55.00	3.50	0.66	0.00	315.00	3.50	0.66	0.00
60.00	3.50	0.66	0.00	320.00	3.50	0.66	0.00
65.00	3.50	0.66	0.00	325.00	3.50	0.66	0.00
70.00	3.50	0.66	0.00	330.00	3.50	0.66	0.00
75.00	3.50	0.66	0.00	335.00	3.50	0.66	0.00
80.00	3.50	0.66	0.00				
85.00	3.50	0.66	0.00				
90.00	3.50	0.66	0.00				
95.00	3.50	0.66	0.00				
100.00	3.50	0.66	0.00				
105.00	3.50	0.66	0.00				
110.00	3.50	0.66	0.00				
115.00	3.50	0.66	0.00				
120.00	3.50	0.66	0.00				
125.00	3.50	0.66	0.00				
130.00	3.50	0.66	0.00				
135.00	3.50	0.66	0.00				
140.00	3.50	0.66	0.00				
145.00	3.50	0.66	0.00				
150.00	3.50	0.66	0.00				
155.00	3.50	0.66	0.00				
160.00	3.50	0.66	0.00				
165.00	3.50	0.66	0.00				
170.00	3.50	0.66	0.00				
175.00	3.50	0.66	0.00				
180.00	3.50	0.66	0.00				
185.00	3.50	0.66	0.00				
190.00	3.50	0.66	0.00				
195.00	3.50	0.66	0.00				
200.00	3.50	0.66	0.00				
205.00	3.50	0.66	0.00				
210.00	3.50	0.66	0.00				
215.00	3.50	0.66	0.00				
220.00	3.50	0.66	0.00				
225.00	3.50	0.66	0.00				
230.00	3.50	0.66	0.00				
235.00	3.50	0.66	0.00				
240.00	3.50	0.66	0.00				
245.00	3.50	0.66	0.00				
250.00	3.50	0.66	0.00				
255.00	3.50	0.66	0.00				

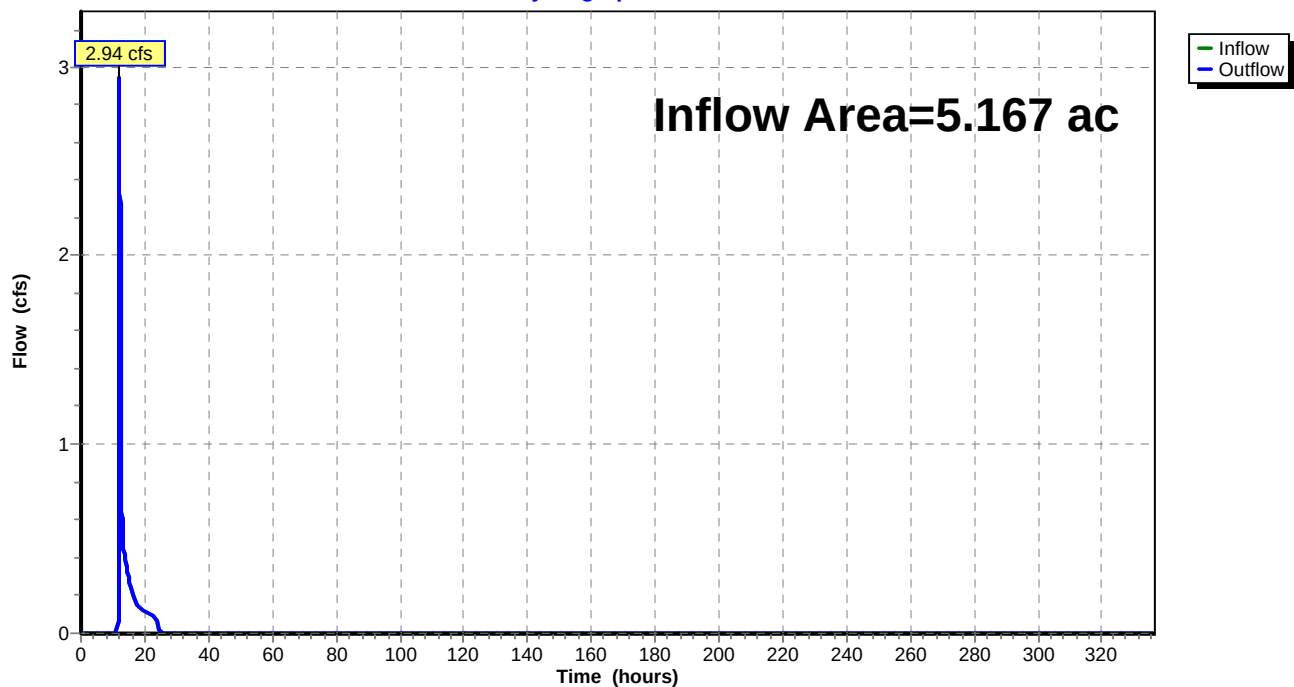
Summary for Reach DP 1A: PROP 1A

Inflow Area = 5.167 ac, 0.00% Impervious, Inflow Depth = 0.66" for 2 Year, 24 Hr. Event event
Inflow = 2.94 cfs @ 12.13 hrs, Volume= 0.284 af
Outflow = 2.94 cfs @ 12.13 hrs, Volume= 0.284 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Reach DP 1A: PROP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.29		0.29	275.00	0.00		0.00
20.00	0.11		0.11	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

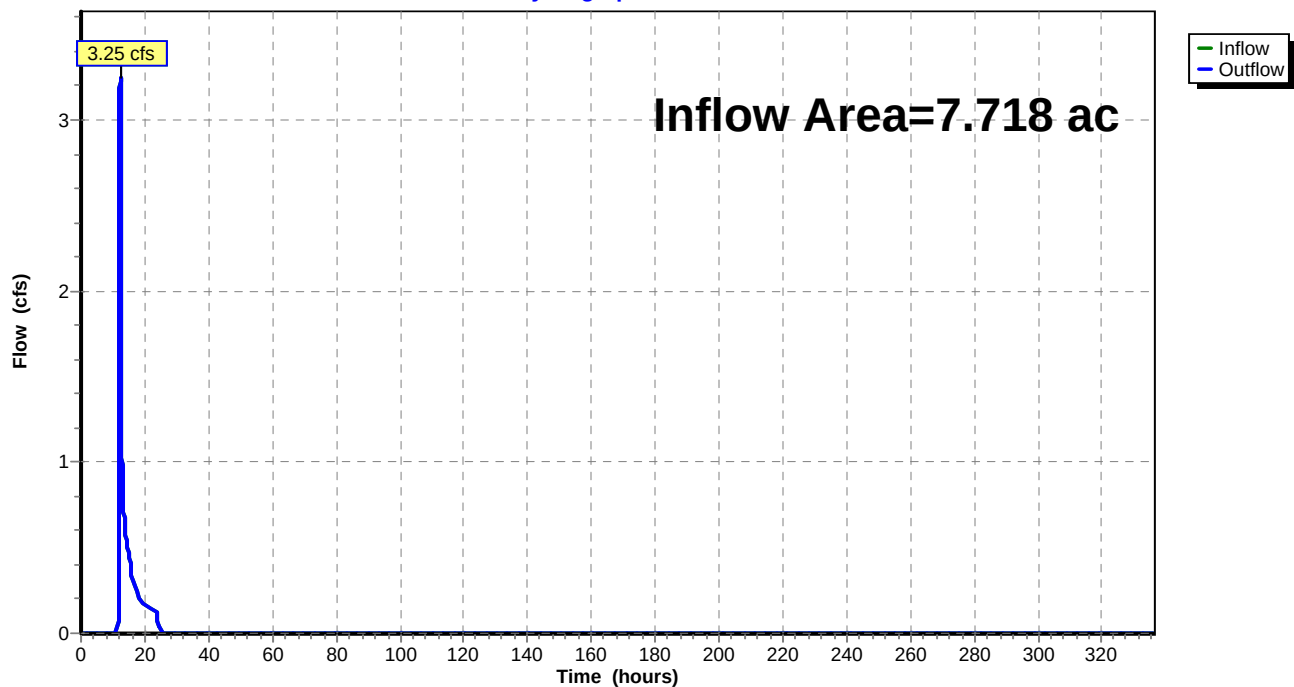
Summary for Reach EX DP 1A: Existing DP 1A

Inflow Area = 7.718 ac, 0.06% Impervious, Inflow Depth = 0.68" for 2 Year, 24 Hr. Event event
Inflow = 3.25 cfs @ 12.24 hrs, Volume= 0.434 af
Outflow = 3.25 cfs @ 12.24 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP 1A: Existing DP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Reach EX DP 1A: Existing DP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.45		0.45	275.00	0.00		0.00
20.00	0.17		0.17	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1E: PROP DA 1E

Runoff = 10.00 cfs @ 12.12 hrs, Volume= 0.790 af, Depth= 1.83"

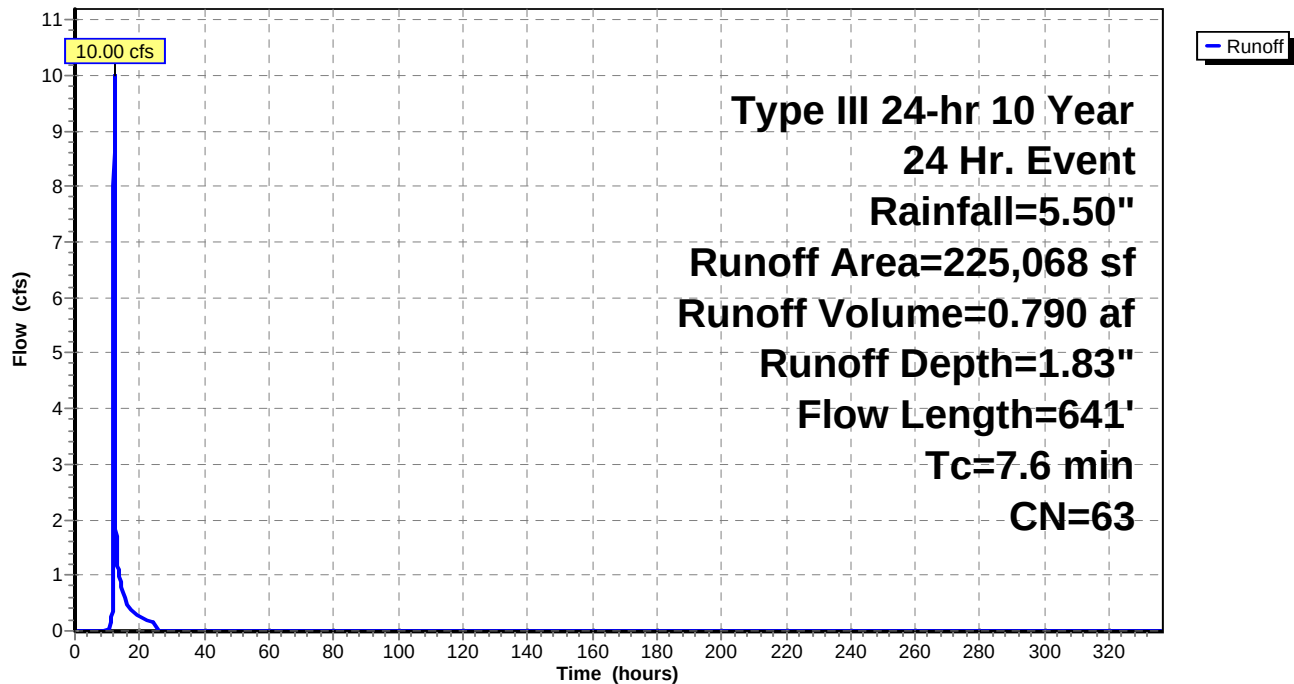
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
210,868	61	>75% Grass cover, Good, HSG B
14,200	85	Gravel roads, HSG B
225,068	63	Weighted Average
225,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	75	0.1000	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
3.7	566	0.1360	2.58		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	641	Total			

Subcatchment 1E: PROP DA 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1E: PROP DA 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.83	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.83	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.83	0.00
15.00	4.70	1.32	0.68	275.00	5.50	1.83	0.00
20.00	5.26	1.68	0.25	280.00	5.50	1.83	0.00
25.00	5.50	1.83	0.00	285.00	5.50	1.83	0.00
30.00	5.50	1.83	0.00	290.00	5.50	1.83	0.00
35.00	5.50	1.83	0.00	295.00	5.50	1.83	0.00
40.00	5.50	1.83	0.00	300.00	5.50	1.83	0.00
45.00	5.50	1.83	0.00	305.00	5.50	1.83	0.00
50.00	5.50	1.83	0.00	310.00	5.50	1.83	0.00
55.00	5.50	1.83	0.00	315.00	5.50	1.83	0.00
60.00	5.50	1.83	0.00	320.00	5.50	1.83	0.00
65.00	5.50	1.83	0.00	325.00	5.50	1.83	0.00
70.00	5.50	1.83	0.00	330.00	5.50	1.83	0.00
75.00	5.50	1.83	0.00	335.00	5.50	1.83	0.00
80.00	5.50	1.83	0.00				
85.00	5.50	1.83	0.00				
90.00	5.50	1.83	0.00				
95.00	5.50	1.83	0.00				
100.00	5.50	1.83	0.00				
105.00	5.50	1.83	0.00				
110.00	5.50	1.83	0.00				
115.00	5.50	1.83	0.00				
120.00	5.50	1.83	0.00				
125.00	5.50	1.83	0.00				
130.00	5.50	1.83	0.00				
135.00	5.50	1.83	0.00				
140.00	5.50	1.83	0.00				
145.00	5.50	1.83	0.00				
150.00	5.50	1.83	0.00				
155.00	5.50	1.83	0.00				
160.00	5.50	1.83	0.00				
165.00	5.50	1.83	0.00				
170.00	5.50	1.83	0.00				
175.00	5.50	1.83	0.00				
180.00	5.50	1.83	0.00				
185.00	5.50	1.83	0.00				
190.00	5.50	1.83	0.00				
195.00	5.50	1.83	0.00				
200.00	5.50	1.83	0.00				
205.00	5.50	1.83	0.00				
210.00	5.50	1.83	0.00				
215.00	5.50	1.83	0.00				
220.00	5.50	1.83	0.00				
225.00	5.50	1.83	0.00				
230.00	5.50	1.83	0.00				
235.00	5.50	1.83	0.00				
240.00	5.50	1.83	0.00				
245.00	5.50	1.83	0.00				
250.00	5.50	1.83	0.00				
255.00	5.50	1.83	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1B: EXIST 1B

Runoff = 4.12 cfs @ 12.25 hrs, Volume= 0.431 af, Depth= 1.91"

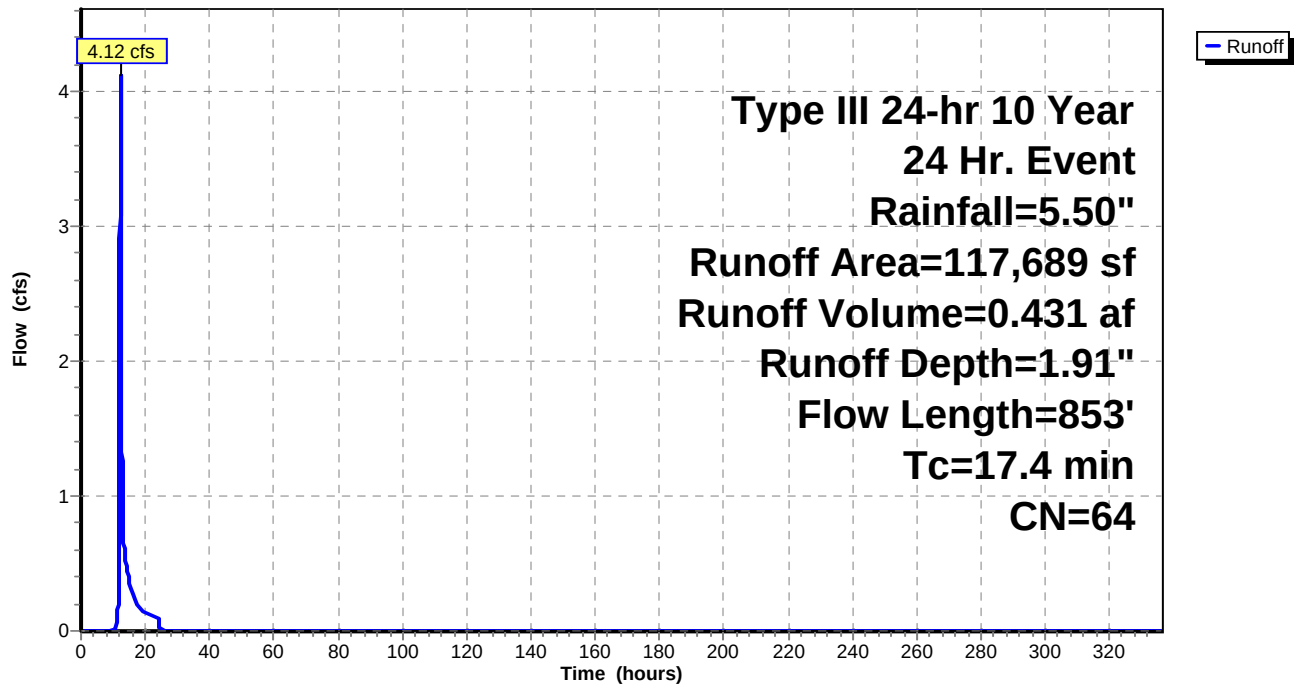
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
104,956	61	>75% Grass cover, Good, HSG B
12,733	85	Gravel roads, HSG B
117,689	64	Weighted Average
117,689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	150	0.0130	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.0	703	0.1337	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
17.4	853	Total			

Subcatchment EX 1B: EXIST 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1B: EXIST 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.91	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.91	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.91	0.00
15.00	4.70	1.39	0.38	275.00	5.50	1.91	0.00
20.00	5.26	1.75	0.13	280.00	5.50	1.91	0.00
25.00	5.50	1.91	0.00	285.00	5.50	1.91	0.00
30.00	5.50	1.91	0.00	290.00	5.50	1.91	0.00
35.00	5.50	1.91	0.00	295.00	5.50	1.91	0.00
40.00	5.50	1.91	0.00	300.00	5.50	1.91	0.00
45.00	5.50	1.91	0.00	305.00	5.50	1.91	0.00
50.00	5.50	1.91	0.00	310.00	5.50	1.91	0.00
55.00	5.50	1.91	0.00	315.00	5.50	1.91	0.00
60.00	5.50	1.91	0.00	320.00	5.50	1.91	0.00
65.00	5.50	1.91	0.00	325.00	5.50	1.91	0.00
70.00	5.50	1.91	0.00	330.00	5.50	1.91	0.00
75.00	5.50	1.91	0.00	335.00	5.50	1.91	0.00
80.00	5.50	1.91	0.00				
85.00	5.50	1.91	0.00				
90.00	5.50	1.91	0.00				
95.00	5.50	1.91	0.00				
100.00	5.50	1.91	0.00				
105.00	5.50	1.91	0.00				
110.00	5.50	1.91	0.00				
115.00	5.50	1.91	0.00				
120.00	5.50	1.91	0.00				
125.00	5.50	1.91	0.00				
130.00	5.50	1.91	0.00				
135.00	5.50	1.91	0.00				
140.00	5.50	1.91	0.00				
145.00	5.50	1.91	0.00				
150.00	5.50	1.91	0.00				
155.00	5.50	1.91	0.00				
160.00	5.50	1.91	0.00				
165.00	5.50	1.91	0.00				
170.00	5.50	1.91	0.00				
175.00	5.50	1.91	0.00				
180.00	5.50	1.91	0.00				
185.00	5.50	1.91	0.00				
190.00	5.50	1.91	0.00				
195.00	5.50	1.91	0.00				
200.00	5.50	1.91	0.00				
205.00	5.50	1.91	0.00				
210.00	5.50	1.91	0.00				
215.00	5.50	1.91	0.00				
220.00	5.50	1.91	0.00				
225.00	5.50	1.91	0.00				
230.00	5.50	1.91	0.00				
235.00	5.50	1.91	0.00				
240.00	5.50	1.91	0.00				
245.00	5.50	1.91	0.00				
250.00	5.50	1.91	0.00				
255.00	5.50	1.91	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1C: EXIST 1C

Runoff = 3.01 cfs @ 12.21 hrs, Volume= 0.292 af, Depth= 1.83"

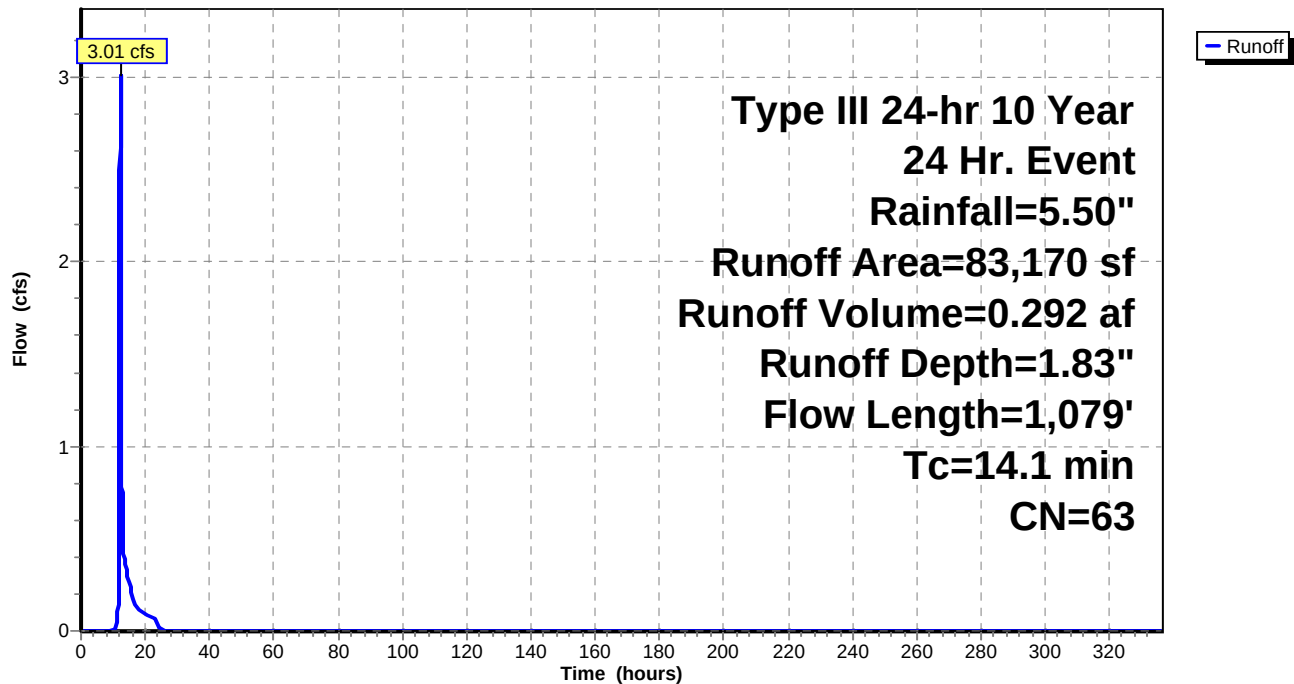
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
77,817	61	>75% Grass cover, Good, HSG B
5,353	85	Gravel roads, HSG B
83,170	63	Weighted Average
83,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	150	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	929	0.1340	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
14.1	1,079	Total			

Subcatchment EX 1C: EXIST 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1C: EXIST 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.83	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.83	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.83	0.00
15.00	4.70	1.32	0.26	275.00	5.50	1.83	0.00
20.00	5.26	1.68	0.09	280.00	5.50	1.83	0.00
25.00	5.50	1.83	0.00	285.00	5.50	1.83	0.00
30.00	5.50	1.83	0.00	290.00	5.50	1.83	0.00
35.00	5.50	1.83	0.00	295.00	5.50	1.83	0.00
40.00	5.50	1.83	0.00	300.00	5.50	1.83	0.00
45.00	5.50	1.83	0.00	305.00	5.50	1.83	0.00
50.00	5.50	1.83	0.00	310.00	5.50	1.83	0.00
55.00	5.50	1.83	0.00	315.00	5.50	1.83	0.00
60.00	5.50	1.83	0.00	320.00	5.50	1.83	0.00
65.00	5.50	1.83	0.00	325.00	5.50	1.83	0.00
70.00	5.50	1.83	0.00	330.00	5.50	1.83	0.00
75.00	5.50	1.83	0.00	335.00	5.50	1.83	0.00
80.00	5.50	1.83	0.00				
85.00	5.50	1.83	0.00				
90.00	5.50	1.83	0.00				
95.00	5.50	1.83	0.00				
100.00	5.50	1.83	0.00				
105.00	5.50	1.83	0.00				
110.00	5.50	1.83	0.00				
115.00	5.50	1.83	0.00				
120.00	5.50	1.83	0.00				
125.00	5.50	1.83	0.00				
130.00	5.50	1.83	0.00				
135.00	5.50	1.83	0.00				
140.00	5.50	1.83	0.00				
145.00	5.50	1.83	0.00				
150.00	5.50	1.83	0.00				
155.00	5.50	1.83	0.00				
160.00	5.50	1.83	0.00				
165.00	5.50	1.83	0.00				
170.00	5.50	1.83	0.00				
175.00	5.50	1.83	0.00				
180.00	5.50	1.83	0.00				
185.00	5.50	1.83	0.00				
190.00	5.50	1.83	0.00				
195.00	5.50	1.83	0.00				
200.00	5.50	1.83	0.00				
205.00	5.50	1.83	0.00				
210.00	5.50	1.83	0.00				
215.00	5.50	1.83	0.00				
220.00	5.50	1.83	0.00				
225.00	5.50	1.83	0.00				
230.00	5.50	1.83	0.00				
235.00	5.50	1.83	0.00				
240.00	5.50	1.83	0.00				
245.00	5.50	1.83	0.00				
250.00	5.50	1.83	0.00				
255.00	5.50	1.83	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1G: EX DA !G

Runoff = 7.36 cfs @ 12.04 hrs, Volume= 0.475 af, Depth= 1.83"

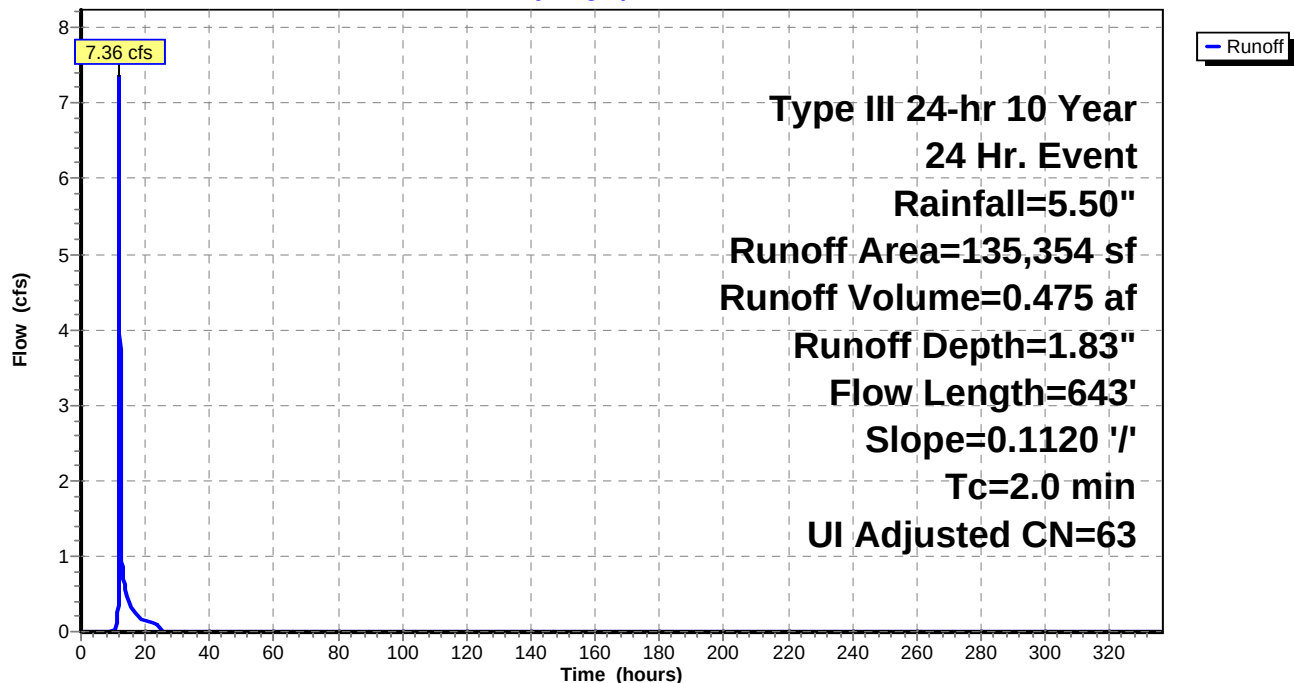
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
121,243	61	>75% Grass cover, Good, HSG B
13,897	85	Gravel roads, HSG B
214	98	Unconnected roofs, HSG B
135,354	64	Weighted Average, UI Adjusted CN = 63
135,140		99.84% Pervious Area
214		0.16% Impervious Area
214		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	643	0.1120	5.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps

Subcatchment EX 1G: EX DA !G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1G: EX DA !G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.83	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.83	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.83	0.00
15.00	4.70	1.32	0.40	275.00	5.50	1.83	0.00
20.00	5.26	1.68	0.15	280.00	5.50	1.83	0.00
25.00	5.50	1.83	0.00	285.00	5.50	1.83	0.00
30.00	5.50	1.83	0.00	290.00	5.50	1.83	0.00
35.00	5.50	1.83	0.00	295.00	5.50	1.83	0.00
40.00	5.50	1.83	0.00	300.00	5.50	1.83	0.00
45.00	5.50	1.83	0.00	305.00	5.50	1.83	0.00
50.00	5.50	1.83	0.00	310.00	5.50	1.83	0.00
55.00	5.50	1.83	0.00	315.00	5.50	1.83	0.00
60.00	5.50	1.83	0.00	320.00	5.50	1.83	0.00
65.00	5.50	1.83	0.00	325.00	5.50	1.83	0.00
70.00	5.50	1.83	0.00	330.00	5.50	1.83	0.00
75.00	5.50	1.83	0.00	335.00	5.50	1.83	0.00
80.00	5.50	1.83	0.00				
85.00	5.50	1.83	0.00				
90.00	5.50	1.83	0.00				
95.00	5.50	1.83	0.00				
100.00	5.50	1.83	0.00				
105.00	5.50	1.83	0.00				
110.00	5.50	1.83	0.00				
115.00	5.50	1.83	0.00				
120.00	5.50	1.83	0.00				
125.00	5.50	1.83	0.00				
130.00	5.50	1.83	0.00				
135.00	5.50	1.83	0.00				
140.00	5.50	1.83	0.00				
145.00	5.50	1.83	0.00				
150.00	5.50	1.83	0.00				
155.00	5.50	1.83	0.00				
160.00	5.50	1.83	0.00				
165.00	5.50	1.83	0.00				
170.00	5.50	1.83	0.00				
175.00	5.50	1.83	0.00				
180.00	5.50	1.83	0.00				
185.00	5.50	1.83	0.00				
190.00	5.50	1.83	0.00				
195.00	5.50	1.83	0.00				
200.00	5.50	1.83	0.00				
205.00	5.50	1.83	0.00				
210.00	5.50	1.83	0.00				
215.00	5.50	1.83	0.00				
220.00	5.50	1.83	0.00				
225.00	5.50	1.83	0.00				
230.00	5.50	1.83	0.00				
235.00	5.50	1.83	0.00				
240.00	5.50	1.83	0.00				
245.00	5.50	1.83	0.00				
250.00	5.50	1.83	0.00				
255.00	5.50	1.83	0.00				

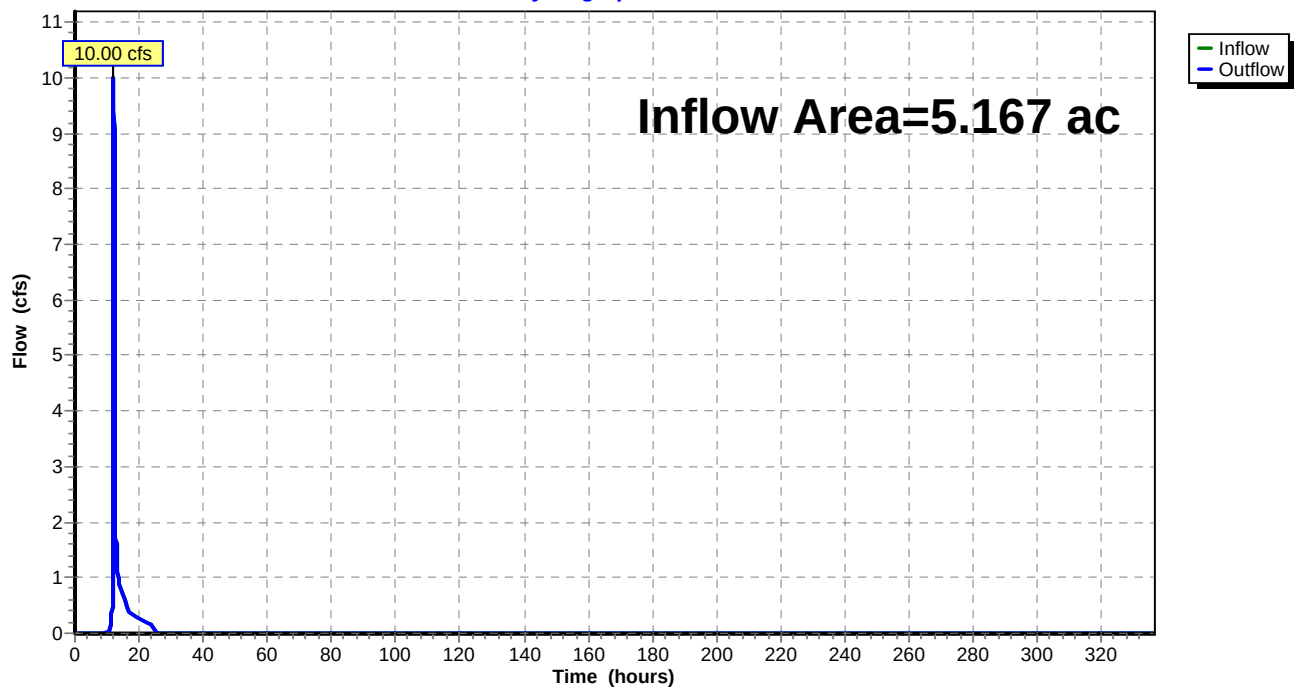
Summary for Reach DP 1A: PROP 1A

Inflow Area = 5.167 ac, 0.00% Impervious, Inflow Depth = 1.83" for 10 Year, 24 Hr. Event event
Inflow = 10.00 cfs @ 12.12 hrs, Volume= 0.790 af
Outflow = 10.00 cfs @ 12.12 hrs, Volume= 0.790 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach DP 1A: PROP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.68		0.68	275.00	0.00		0.00
20.00	0.25		0.25	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

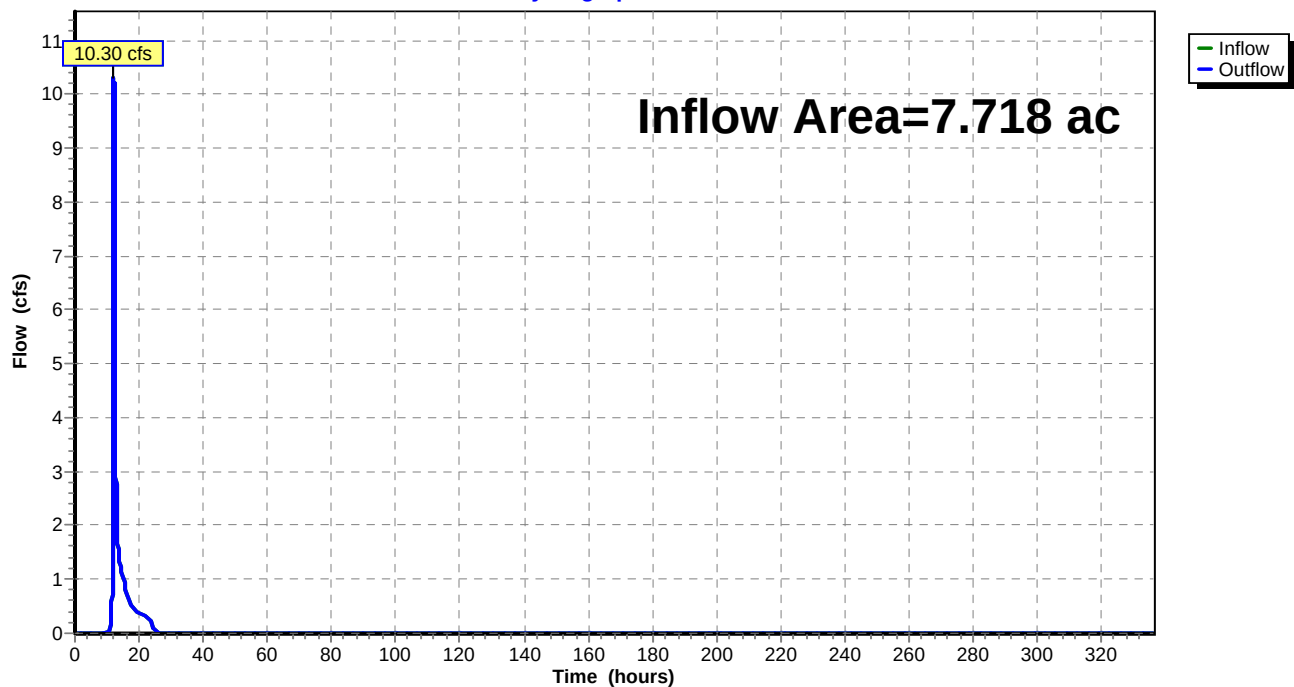
Summary for Reach EX DP 1A: Existing DP 1A

Inflow Area = 7.718 ac, 0.06% Impervious, Inflow Depth = 1.86" for 10 Year, 24 Hr. Event event
Inflow = 10.30 cfs @ 12.05 hrs, Volume= 1.198 af
Outflow = 10.30 cfs @ 12.05 hrs, Volume= 1.198 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP 1A: Existing DP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach EX DP 1A: Existing DP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	1.03		1.03	275.00	0.00		0.00
20.00	0.37		0.37	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1E: PROP DA 1E

Runoff = 12.04 cfs @ 12.12 hrs, Volume= 0.937 af, Depth= 2.18"

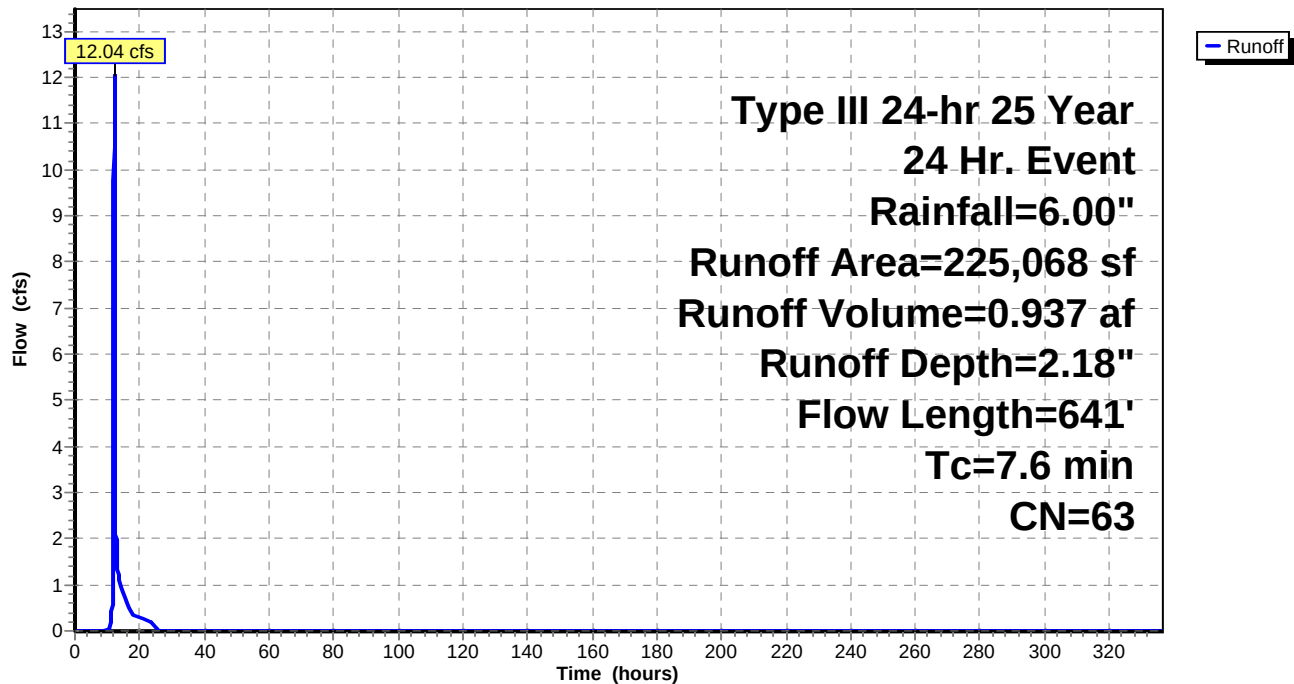
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
210,868	61	>75% Grass cover, Good, HSG B
14,200	85	Gravel roads, HSG B
225,068	63	Weighted Average
225,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	75	0.1000	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
3.7	566	0.1360	2.58		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	641	Total			

Subcatchment 1E: PROP DA 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1E: PROP DA 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.18	0.00
10.00	1.13	0.00	0.00	270.00	6.00	2.18	0.00
15.00	5.13	1.59	0.78	275.00	6.00	2.18	0.00
20.00	5.74	2.00	0.28	280.00	6.00	2.18	0.00
25.00	6.00	2.18	0.00	285.00	6.00	2.18	0.00
30.00	6.00	2.18	0.00	290.00	6.00	2.18	0.00
35.00	6.00	2.18	0.00	295.00	6.00	2.18	0.00
40.00	6.00	2.18	0.00	300.00	6.00	2.18	0.00
45.00	6.00	2.18	0.00	305.00	6.00	2.18	0.00
50.00	6.00	2.18	0.00	310.00	6.00	2.18	0.00
55.00	6.00	2.18	0.00	315.00	6.00	2.18	0.00
60.00	6.00	2.18	0.00	320.00	6.00	2.18	0.00
65.00	6.00	2.18	0.00	325.00	6.00	2.18	0.00
70.00	6.00	2.18	0.00	330.00	6.00	2.18	0.00
75.00	6.00	2.18	0.00	335.00	6.00	2.18	0.00
80.00	6.00	2.18	0.00				
85.00	6.00	2.18	0.00				
90.00	6.00	2.18	0.00				
95.00	6.00	2.18	0.00				
100.00	6.00	2.18	0.00				
105.00	6.00	2.18	0.00				
110.00	6.00	2.18	0.00				
115.00	6.00	2.18	0.00				
120.00	6.00	2.18	0.00				
125.00	6.00	2.18	0.00				
130.00	6.00	2.18	0.00				
135.00	6.00	2.18	0.00				
140.00	6.00	2.18	0.00				
145.00	6.00	2.18	0.00				
150.00	6.00	2.18	0.00				
155.00	6.00	2.18	0.00				
160.00	6.00	2.18	0.00				
165.00	6.00	2.18	0.00				
170.00	6.00	2.18	0.00				
175.00	6.00	2.18	0.00				
180.00	6.00	2.18	0.00				
185.00	6.00	2.18	0.00				
190.00	6.00	2.18	0.00				
195.00	6.00	2.18	0.00				
200.00	6.00	2.18	0.00				
205.00	6.00	2.18	0.00				
210.00	6.00	2.18	0.00				
215.00	6.00	2.18	0.00				
220.00	6.00	2.18	0.00				
225.00	6.00	2.18	0.00				
230.00	6.00	2.18	0.00				
235.00	6.00	2.18	0.00				
240.00	6.00	2.18	0.00				
245.00	6.00	2.18	0.00				
250.00	6.00	2.18	0.00				
255.00	6.00	2.18	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1B: EXIST 1B

Runoff = 4.94 cfs @ 12.25 hrs, Volume= 0.510 af, Depth= 2.26"

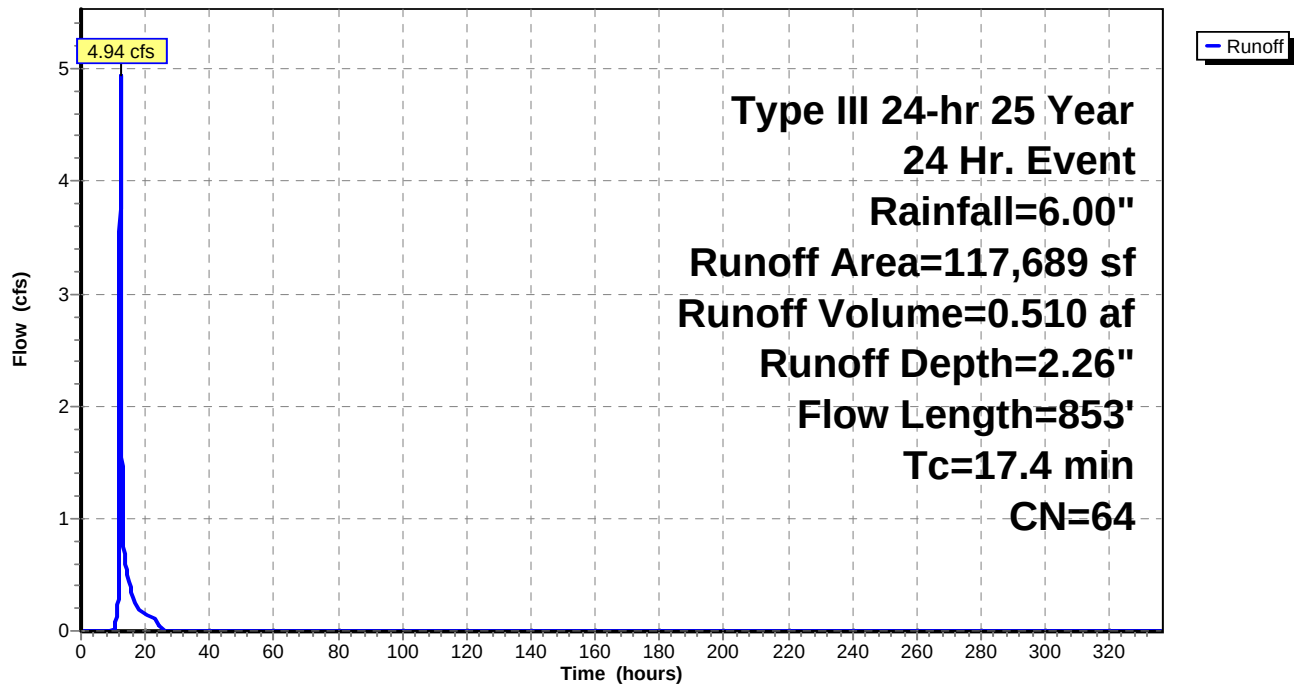
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
104,956	61	>75% Grass cover, Good, HSG B
12,733	85	Gravel roads, HSG B
117,689	64	Weighted Average
117,689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	150	0.0130	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.0	703	0.1337	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
17.4	853	Total			

Subcatchment EX 1B: EXIST 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1B: EXIST 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.26	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.26	0.00
10.00	1.13	0.00	0.00	270.00	6.00	2.26	0.00
15.00	5.13	1.66	0.43	275.00	6.00	2.26	0.00
20.00	5.74	2.08	0.15	280.00	6.00	2.26	0.00
25.00	6.00	2.26	0.00	285.00	6.00	2.26	0.00
30.00	6.00	2.26	0.00	290.00	6.00	2.26	0.00
35.00	6.00	2.26	0.00	295.00	6.00	2.26	0.00
40.00	6.00	2.26	0.00	300.00	6.00	2.26	0.00
45.00	6.00	2.26	0.00	305.00	6.00	2.26	0.00
50.00	6.00	2.26	0.00	310.00	6.00	2.26	0.00
55.00	6.00	2.26	0.00	315.00	6.00	2.26	0.00
60.00	6.00	2.26	0.00	320.00	6.00	2.26	0.00
65.00	6.00	2.26	0.00	325.00	6.00	2.26	0.00
70.00	6.00	2.26	0.00	330.00	6.00	2.26	0.00
75.00	6.00	2.26	0.00	335.00	6.00	2.26	0.00
80.00	6.00	2.26	0.00				
85.00	6.00	2.26	0.00				
90.00	6.00	2.26	0.00				
95.00	6.00	2.26	0.00				
100.00	6.00	2.26	0.00				
105.00	6.00	2.26	0.00				
110.00	6.00	2.26	0.00				
115.00	6.00	2.26	0.00				
120.00	6.00	2.26	0.00				
125.00	6.00	2.26	0.00				
130.00	6.00	2.26	0.00				
135.00	6.00	2.26	0.00				
140.00	6.00	2.26	0.00				
145.00	6.00	2.26	0.00				
150.00	6.00	2.26	0.00				
155.00	6.00	2.26	0.00				
160.00	6.00	2.26	0.00				
165.00	6.00	2.26	0.00				
170.00	6.00	2.26	0.00				
175.00	6.00	2.26	0.00				
180.00	6.00	2.26	0.00				
185.00	6.00	2.26	0.00				
190.00	6.00	2.26	0.00				
195.00	6.00	2.26	0.00				
200.00	6.00	2.26	0.00				
205.00	6.00	2.26	0.00				
210.00	6.00	2.26	0.00				
215.00	6.00	2.26	0.00				
220.00	6.00	2.26	0.00				
225.00	6.00	2.26	0.00				
230.00	6.00	2.26	0.00				
235.00	6.00	2.26	0.00				
240.00	6.00	2.26	0.00				
245.00	6.00	2.26	0.00				
250.00	6.00	2.26	0.00				
255.00	6.00	2.26	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1C: EXIST 1C

Runoff = 3.63 cfs @ 12.20 hrs, Volume= 0.346 af, Depth= 2.18"

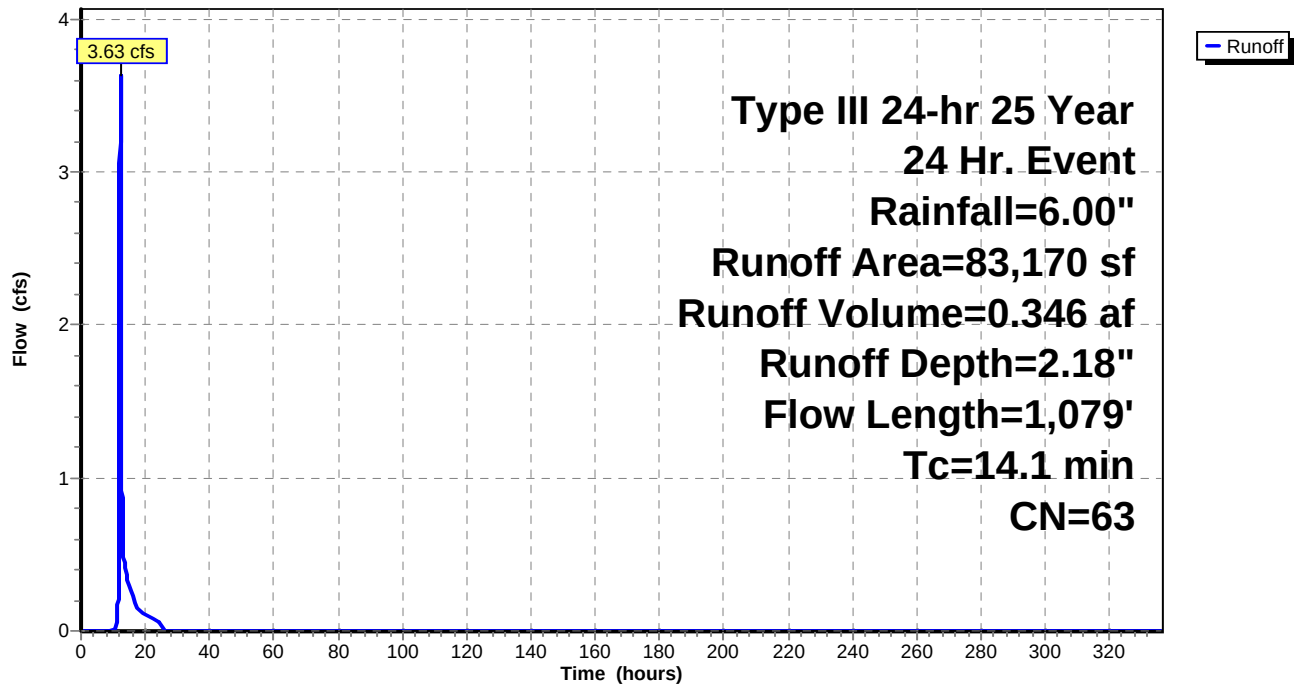
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
77,817	61	>75% Grass cover, Good, HSG B
5,353	85	Gravel roads, HSG B
83,170	63	Weighted Average
83,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	150	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	929	0.1340	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
14.1	1,079	Total			

Subcatchment EX 1C: EXIST 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1C: EXIST 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.18	0.00
10.00	1.13	0.00	0.00	270.00	6.00	2.18	0.00
15.00	5.13	1.59	0.30	275.00	6.00	2.18	0.00
20.00	5.74	2.00	0.11	280.00	6.00	2.18	0.00
25.00	6.00	2.18	0.00	285.00	6.00	2.18	0.00
30.00	6.00	2.18	0.00	290.00	6.00	2.18	0.00
35.00	6.00	2.18	0.00	295.00	6.00	2.18	0.00
40.00	6.00	2.18	0.00	300.00	6.00	2.18	0.00
45.00	6.00	2.18	0.00	305.00	6.00	2.18	0.00
50.00	6.00	2.18	0.00	310.00	6.00	2.18	0.00
55.00	6.00	2.18	0.00	315.00	6.00	2.18	0.00
60.00	6.00	2.18	0.00	320.00	6.00	2.18	0.00
65.00	6.00	2.18	0.00	325.00	6.00	2.18	0.00
70.00	6.00	2.18	0.00	330.00	6.00	2.18	0.00
75.00	6.00	2.18	0.00	335.00	6.00	2.18	0.00
80.00	6.00	2.18	0.00				
85.00	6.00	2.18	0.00				
90.00	6.00	2.18	0.00				
95.00	6.00	2.18	0.00				
100.00	6.00	2.18	0.00				
105.00	6.00	2.18	0.00				
110.00	6.00	2.18	0.00				
115.00	6.00	2.18	0.00				
120.00	6.00	2.18	0.00				
125.00	6.00	2.18	0.00				
130.00	6.00	2.18	0.00				
135.00	6.00	2.18	0.00				
140.00	6.00	2.18	0.00				
145.00	6.00	2.18	0.00				
150.00	6.00	2.18	0.00				
155.00	6.00	2.18	0.00				
160.00	6.00	2.18	0.00				
165.00	6.00	2.18	0.00				
170.00	6.00	2.18	0.00				
175.00	6.00	2.18	0.00				
180.00	6.00	2.18	0.00				
185.00	6.00	2.18	0.00				
190.00	6.00	2.18	0.00				
195.00	6.00	2.18	0.00				
200.00	6.00	2.18	0.00				
205.00	6.00	2.18	0.00				
210.00	6.00	2.18	0.00				
215.00	6.00	2.18	0.00				
220.00	6.00	2.18	0.00				
225.00	6.00	2.18	0.00				
230.00	6.00	2.18	0.00				
235.00	6.00	2.18	0.00				
240.00	6.00	2.18	0.00				
245.00	6.00	2.18	0.00				
250.00	6.00	2.18	0.00				
255.00	6.00	2.18	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1G: EX DA !G

Runoff = 8.87 cfs @ 12.03 hrs, Volume= 0.564 af, Depth= 2.18"

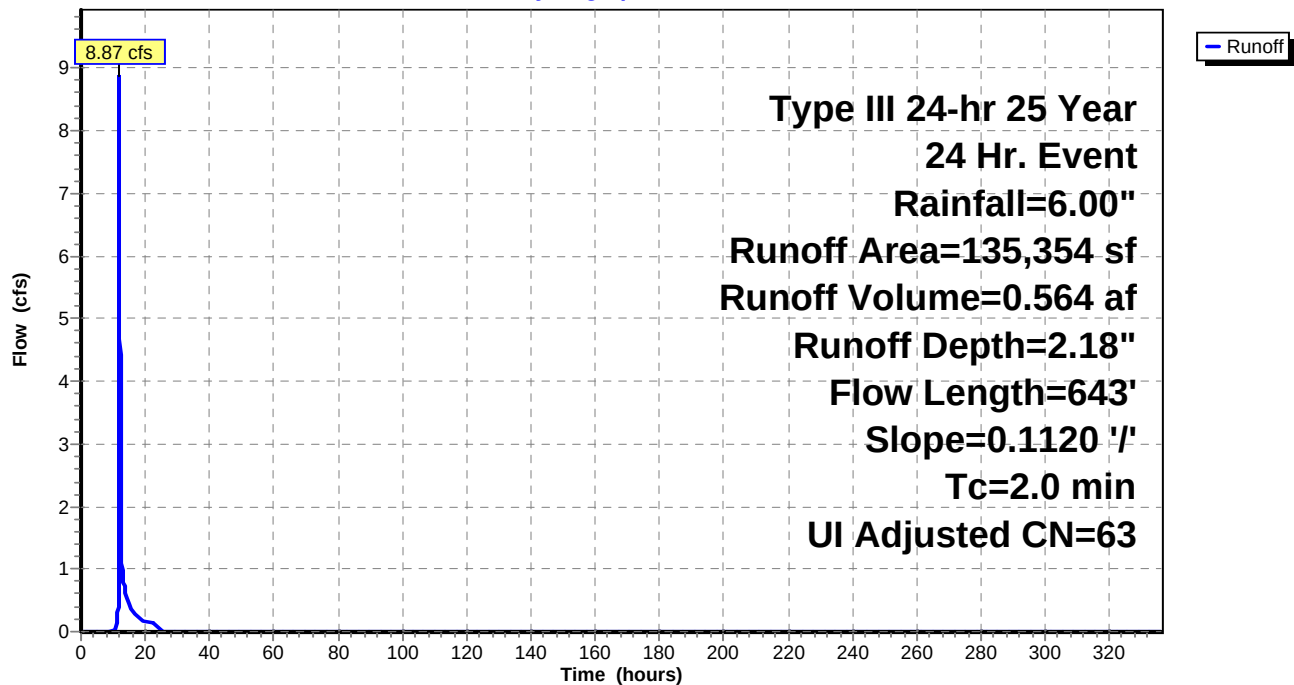
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
121,243	61	>75% Grass cover, Good, HSG B
13,897	85	Gravel roads, HSG B
214	98	Unconnected roofs, HSG B
135,354	64	Weighted Average, UI Adjusted CN = 63
135,140		99.84% Pervious Area
214		0.16% Impervious Area
214		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	643	0.1120	5.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps

Subcatchment EX 1G: EX DA !G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1G: EX DA !G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.18	0.00
10.00	1.13	0.00	0.00	270.00	6.00	2.18	0.00
15.00	5.13	1.59	0.46	275.00	6.00	2.18	0.00
20.00	5.74	2.00	0.17	280.00	6.00	2.18	0.00
25.00	6.00	2.18	0.00	285.00	6.00	2.18	0.00
30.00	6.00	2.18	0.00	290.00	6.00	2.18	0.00
35.00	6.00	2.18	0.00	295.00	6.00	2.18	0.00
40.00	6.00	2.18	0.00	300.00	6.00	2.18	0.00
45.00	6.00	2.18	0.00	305.00	6.00	2.18	0.00
50.00	6.00	2.18	0.00	310.00	6.00	2.18	0.00
55.00	6.00	2.18	0.00	315.00	6.00	2.18	0.00
60.00	6.00	2.18	0.00	320.00	6.00	2.18	0.00
65.00	6.00	2.18	0.00	325.00	6.00	2.18	0.00
70.00	6.00	2.18	0.00	330.00	6.00	2.18	0.00
75.00	6.00	2.18	0.00	335.00	6.00	2.18	0.00
80.00	6.00	2.18	0.00				
85.00	6.00	2.18	0.00				
90.00	6.00	2.18	0.00				
95.00	6.00	2.18	0.00				
100.00	6.00	2.18	0.00				
105.00	6.00	2.18	0.00				
110.00	6.00	2.18	0.00				
115.00	6.00	2.18	0.00				
120.00	6.00	2.18	0.00				
125.00	6.00	2.18	0.00				
130.00	6.00	2.18	0.00				
135.00	6.00	2.18	0.00				
140.00	6.00	2.18	0.00				
145.00	6.00	2.18	0.00				
150.00	6.00	2.18	0.00				
155.00	6.00	2.18	0.00				
160.00	6.00	2.18	0.00				
165.00	6.00	2.18	0.00				
170.00	6.00	2.18	0.00				
175.00	6.00	2.18	0.00				
180.00	6.00	2.18	0.00				
185.00	6.00	2.18	0.00				
190.00	6.00	2.18	0.00				
195.00	6.00	2.18	0.00				
200.00	6.00	2.18	0.00				
205.00	6.00	2.18	0.00				
210.00	6.00	2.18	0.00				
215.00	6.00	2.18	0.00				
220.00	6.00	2.18	0.00				
225.00	6.00	2.18	0.00				
230.00	6.00	2.18	0.00				
235.00	6.00	2.18	0.00				
240.00	6.00	2.18	0.00				
245.00	6.00	2.18	0.00				
250.00	6.00	2.18	0.00				
255.00	6.00	2.18	0.00				

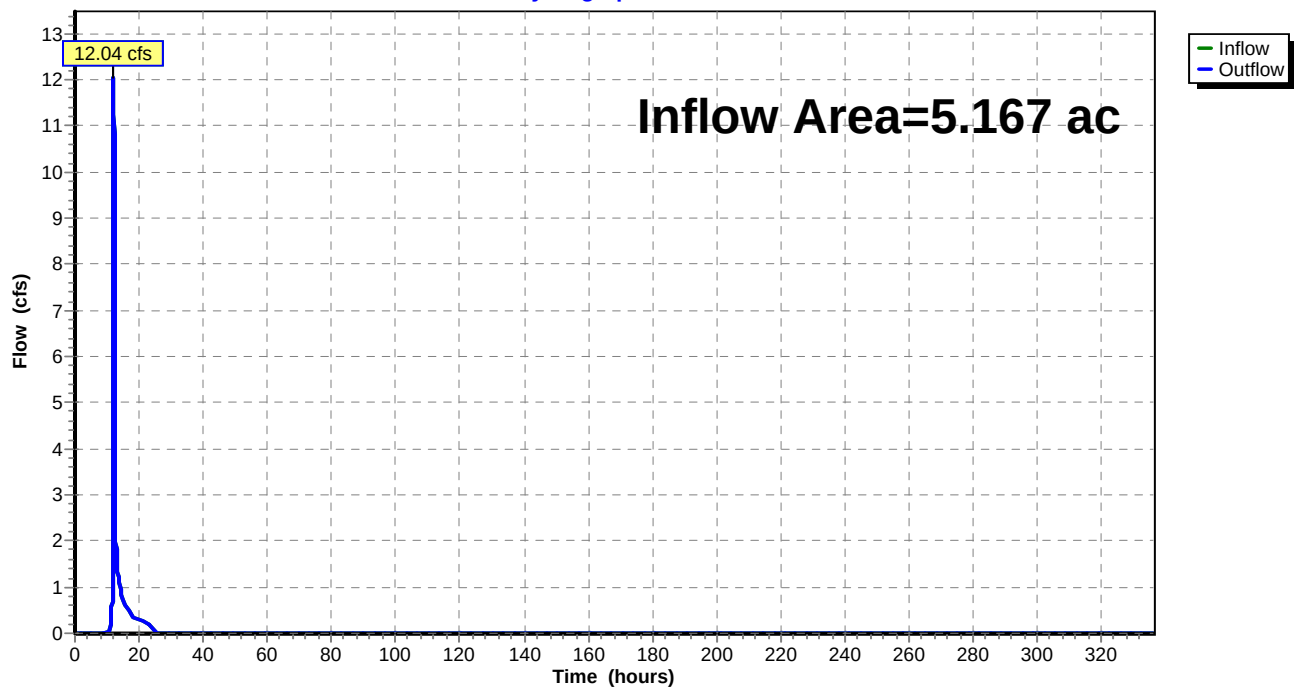
Summary for Reach DP 1A: PROP 1A

Inflow Area = 5.167 ac, 0.00% Impervious, Inflow Depth = 2.18" for 25 Year, 24 Hr. Event event
Inflow = 12.04 cfs @ 12.12 hrs, Volume= 0.937 af
Outflow = 12.04 cfs @ 12.12 hrs, Volume= 0.937 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach DP 1A: PROP 1A

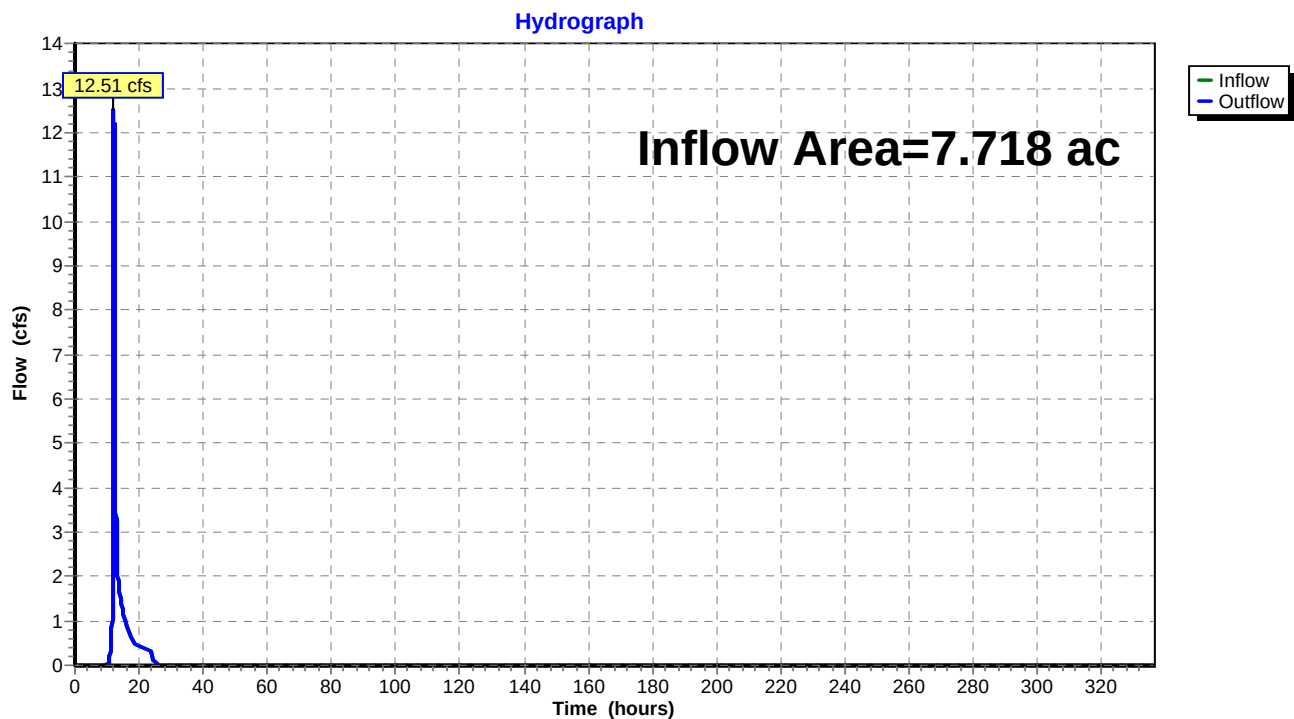
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	0.78		0.78	275.00	0.00		0.00
20.00	0.28		0.28	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Summary for Reach EX DP 1A: Existing DP 1A

Inflow Area = 7.718 ac, 0.06% Impervious, Inflow Depth = 2.21" for 25 Year, 24 Hr. Event event
Inflow = 12.51 cfs @ 12.05 hrs, Volume= 1.419 af
Outflow = 12.51 cfs @ 12.05 hrs, Volume= 1.419 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP 1A: Existing DP 1A



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Hydrograph for Reach EX DP 1A: Existing DP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	1.19		1.19	275.00	0.00		0.00
20.00	0.43		0.43	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1E: PROP DA 1E

Runoff = 27.93 cfs @ 12.11 hrs, Volume= 2.102 af, Depth= 4.88"

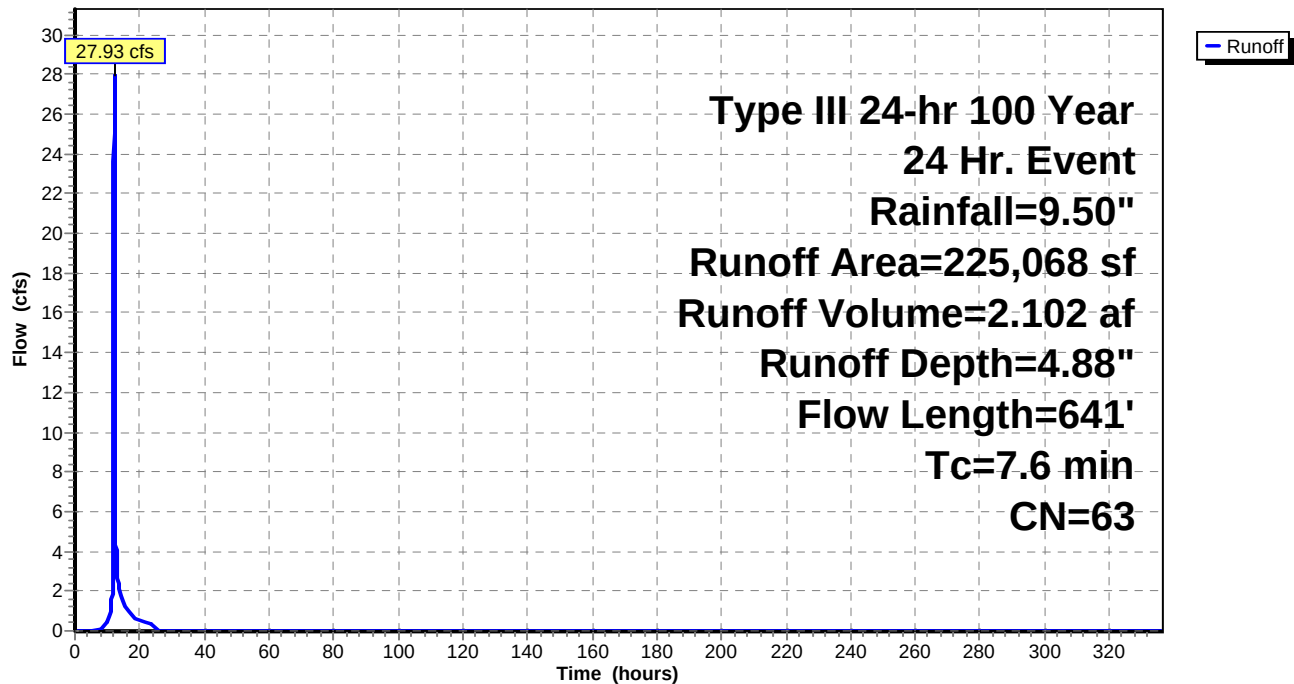
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
210,868	61	>75% Grass cover, Good, HSG B
14,200	85	Gravel roads, HSG B
225,068	63	Weighted Average
225,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	75	0.1000	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
3.7	566	0.1360	2.58		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	641	Total			

Subcatchment 1E: PROP DA 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1E: PROP DA 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	4.88	0.00
5.00	0.54	0.00	0.00	265.00	9.50	4.88	0.00
10.00	1.80	0.06	0.40	270.00	9.50	4.88	0.00
15.00	8.12	3.76	1.52	275.00	9.50	4.88	0.00
20.00	9.09	4.55	0.53	280.00	9.50	4.88	0.00
25.00	9.50	4.88	0.00	285.00	9.50	4.88	0.00
30.00	9.50	4.88	0.00	290.00	9.50	4.88	0.00
35.00	9.50	4.88	0.00	295.00	9.50	4.88	0.00
40.00	9.50	4.88	0.00	300.00	9.50	4.88	0.00
45.00	9.50	4.88	0.00	305.00	9.50	4.88	0.00
50.00	9.50	4.88	0.00	310.00	9.50	4.88	0.00
55.00	9.50	4.88	0.00	315.00	9.50	4.88	0.00
60.00	9.50	4.88	0.00	320.00	9.50	4.88	0.00
65.00	9.50	4.88	0.00	325.00	9.50	4.88	0.00
70.00	9.50	4.88	0.00	330.00	9.50	4.88	0.00
75.00	9.50	4.88	0.00	335.00	9.50	4.88	0.00
80.00	9.50	4.88	0.00				
85.00	9.50	4.88	0.00				
90.00	9.50	4.88	0.00				
95.00	9.50	4.88	0.00				
100.00	9.50	4.88	0.00				
105.00	9.50	4.88	0.00				
110.00	9.50	4.88	0.00				
115.00	9.50	4.88	0.00				
120.00	9.50	4.88	0.00				
125.00	9.50	4.88	0.00				
130.00	9.50	4.88	0.00				
135.00	9.50	4.88	0.00				
140.00	9.50	4.88	0.00				
145.00	9.50	4.88	0.00				
150.00	9.50	4.88	0.00				
155.00	9.50	4.88	0.00				
160.00	9.50	4.88	0.00				
165.00	9.50	4.88	0.00				
170.00	9.50	4.88	0.00				
175.00	9.50	4.88	0.00				
180.00	9.50	4.88	0.00				
185.00	9.50	4.88	0.00				
190.00	9.50	4.88	0.00				
195.00	9.50	4.88	0.00				
200.00	9.50	4.88	0.00				
205.00	9.50	4.88	0.00				
210.00	9.50	4.88	0.00				
215.00	9.50	4.88	0.00				
220.00	9.50	4.88	0.00				
225.00	9.50	4.88	0.00				
230.00	9.50	4.88	0.00				
235.00	9.50	4.88	0.00				
240.00	9.50	4.88	0.00				
245.00	9.50	4.88	0.00				
250.00	9.50	4.88	0.00				
255.00	9.50	4.88	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1B: EXIST 1B

Runoff = 11.33 cfs @ 12.24 hrs, Volume= 1.128 af, Depth= 5.01"

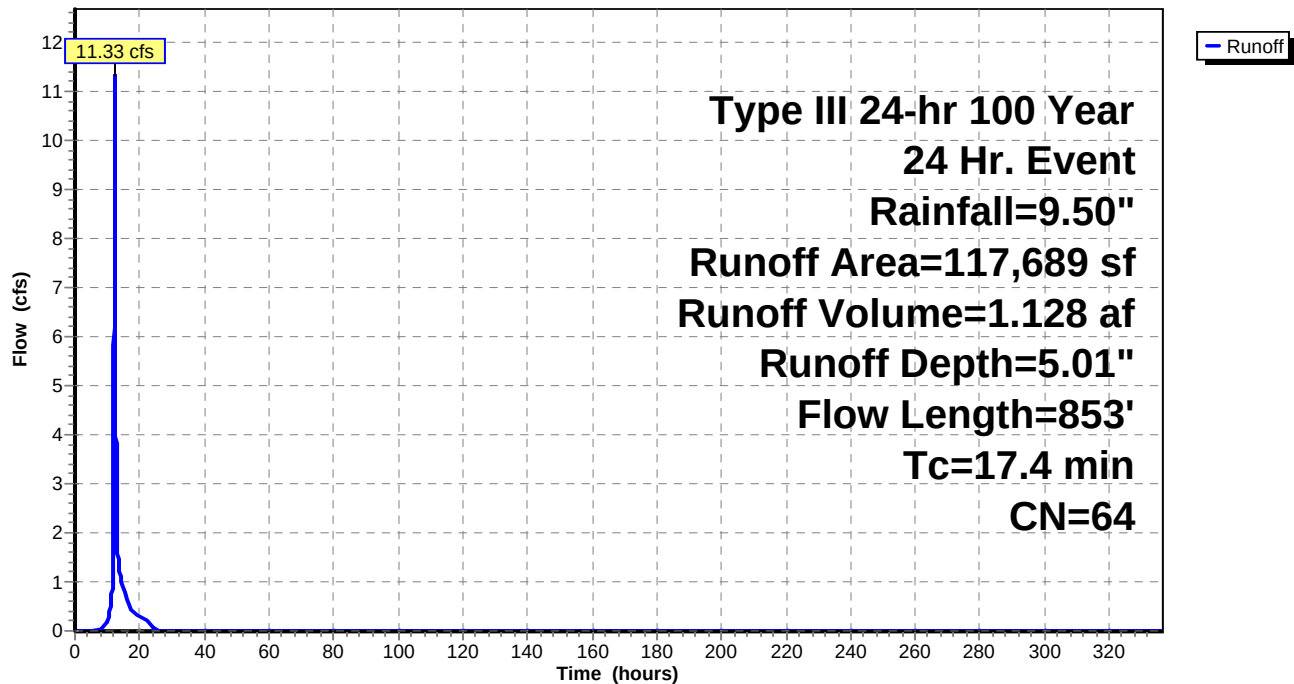
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
104,956	61	>75% Grass cover, Good, HSG B
12,733	85	Gravel roads, HSG B
117,689	64	Weighted Average
117,689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	150	0.0130	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.0	703	0.1337	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
17.4	853	Total			

Subcatchment EX 1B: EXIST 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1B: EXIST 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	5.01	0.00
5.00	0.54	0.00	0.00	265.00	9.50	5.01	0.00
10.00	1.80	0.07	0.20	270.00	9.50	5.01	0.00
15.00	8.12	3.87	0.84	275.00	9.50	5.01	0.00
20.00	9.09	4.67	0.29	280.00	9.50	5.01	0.00
25.00	9.50	5.01	0.00	285.00	9.50	5.01	0.00
30.00	9.50	5.01	0.00	290.00	9.50	5.01	0.00
35.00	9.50	5.01	0.00	295.00	9.50	5.01	0.00
40.00	9.50	5.01	0.00	300.00	9.50	5.01	0.00
45.00	9.50	5.01	0.00	305.00	9.50	5.01	0.00
50.00	9.50	5.01	0.00	310.00	9.50	5.01	0.00
55.00	9.50	5.01	0.00	315.00	9.50	5.01	0.00
60.00	9.50	5.01	0.00	320.00	9.50	5.01	0.00
65.00	9.50	5.01	0.00	325.00	9.50	5.01	0.00
70.00	9.50	5.01	0.00	330.00	9.50	5.01	0.00
75.00	9.50	5.01	0.00	335.00	9.50	5.01	0.00
80.00	9.50	5.01	0.00				
85.00	9.50	5.01	0.00				
90.00	9.50	5.01	0.00				
95.00	9.50	5.01	0.00				
100.00	9.50	5.01	0.00				
105.00	9.50	5.01	0.00				
110.00	9.50	5.01	0.00				
115.00	9.50	5.01	0.00				
120.00	9.50	5.01	0.00				
125.00	9.50	5.01	0.00				
130.00	9.50	5.01	0.00				
135.00	9.50	5.01	0.00				
140.00	9.50	5.01	0.00				
145.00	9.50	5.01	0.00				
150.00	9.50	5.01	0.00				
155.00	9.50	5.01	0.00				
160.00	9.50	5.01	0.00				
165.00	9.50	5.01	0.00				
170.00	9.50	5.01	0.00				
175.00	9.50	5.01	0.00				
180.00	9.50	5.01	0.00				
185.00	9.50	5.01	0.00				
190.00	9.50	5.01	0.00				
195.00	9.50	5.01	0.00				
200.00	9.50	5.01	0.00				
205.00	9.50	5.01	0.00				
210.00	9.50	5.01	0.00				
215.00	9.50	5.01	0.00				
220.00	9.50	5.01	0.00				
225.00	9.50	5.01	0.00				
230.00	9.50	5.01	0.00				
235.00	9.50	5.01	0.00				
240.00	9.50	5.01	0.00				
245.00	9.50	5.01	0.00				
250.00	9.50	5.01	0.00				
255.00	9.50	5.01	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1C: EXIST 1C

Runoff = 8.45 cfs @ 12.20 hrs, Volume= 0.777 af, Depth= 4.88"

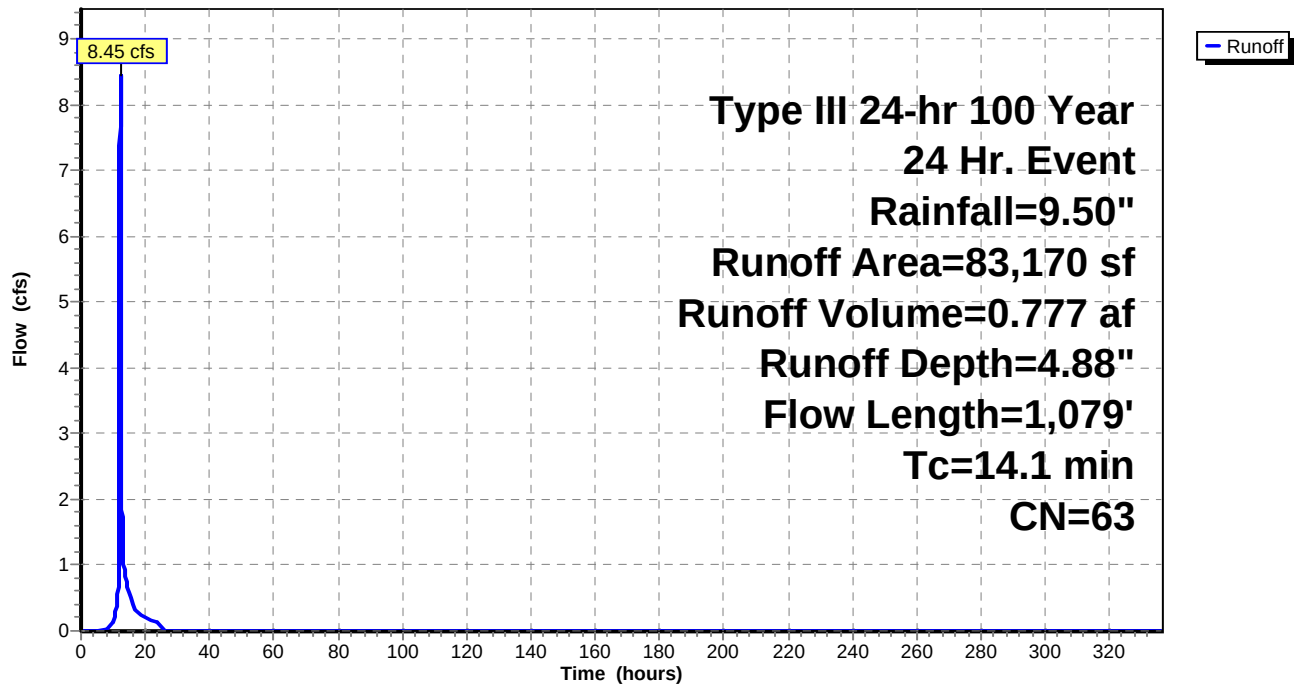
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
77,817	61	>75% Grass cover, Good, HSG B
5,353	85	Gravel roads, HSG B
83,170	63	Weighted Average
83,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	150	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	929	0.1340	5.89		Shallow Concentrated Flow, Orchard Unpaved Kv= 16.1 fps
14.1	1,079	Total			

Subcatchment EX 1C: EXIST 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1C: EXIST 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	4.88	0.00
5.00	0.54	0.00	0.00	265.00	9.50	4.88	0.00
10.00	1.80	0.06	0.13	270.00	9.50	4.88	0.00
15.00	8.12	3.76	0.58	275.00	9.50	4.88	0.00
20.00	9.09	4.55	0.20	280.00	9.50	4.88	0.00
25.00	9.50	4.88	0.00	285.00	9.50	4.88	0.00
30.00	9.50	4.88	0.00	290.00	9.50	4.88	0.00
35.00	9.50	4.88	0.00	295.00	9.50	4.88	0.00
40.00	9.50	4.88	0.00	300.00	9.50	4.88	0.00
45.00	9.50	4.88	0.00	305.00	9.50	4.88	0.00
50.00	9.50	4.88	0.00	310.00	9.50	4.88	0.00
55.00	9.50	4.88	0.00	315.00	9.50	4.88	0.00
60.00	9.50	4.88	0.00	320.00	9.50	4.88	0.00
65.00	9.50	4.88	0.00	325.00	9.50	4.88	0.00
70.00	9.50	4.88	0.00	330.00	9.50	4.88	0.00
75.00	9.50	4.88	0.00	335.00	9.50	4.88	0.00
80.00	9.50	4.88	0.00				
85.00	9.50	4.88	0.00				
90.00	9.50	4.88	0.00				
95.00	9.50	4.88	0.00				
100.00	9.50	4.88	0.00				
105.00	9.50	4.88	0.00				
110.00	9.50	4.88	0.00				
115.00	9.50	4.88	0.00				
120.00	9.50	4.88	0.00				
125.00	9.50	4.88	0.00				
130.00	9.50	4.88	0.00				
135.00	9.50	4.88	0.00				
140.00	9.50	4.88	0.00				
145.00	9.50	4.88	0.00				
150.00	9.50	4.88	0.00				
155.00	9.50	4.88	0.00				
160.00	9.50	4.88	0.00				
165.00	9.50	4.88	0.00				
170.00	9.50	4.88	0.00				
175.00	9.50	4.88	0.00				
180.00	9.50	4.88	0.00				
185.00	9.50	4.88	0.00				
190.00	9.50	4.88	0.00				
195.00	9.50	4.88	0.00				
200.00	9.50	4.88	0.00				
205.00	9.50	4.88	0.00				
210.00	9.50	4.88	0.00				
215.00	9.50	4.88	0.00				
220.00	9.50	4.88	0.00				
225.00	9.50	4.88	0.00				
230.00	9.50	4.88	0.00				
235.00	9.50	4.88	0.00				
240.00	9.50	4.88	0.00				
245.00	9.50	4.88	0.00				
250.00	9.50	4.88	0.00				
255.00	9.50	4.88	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1G: EX DA !G

Runoff = 20.56 cfs @ 12.03 hrs, Volume= 1.264 af, Depth= 4.88"

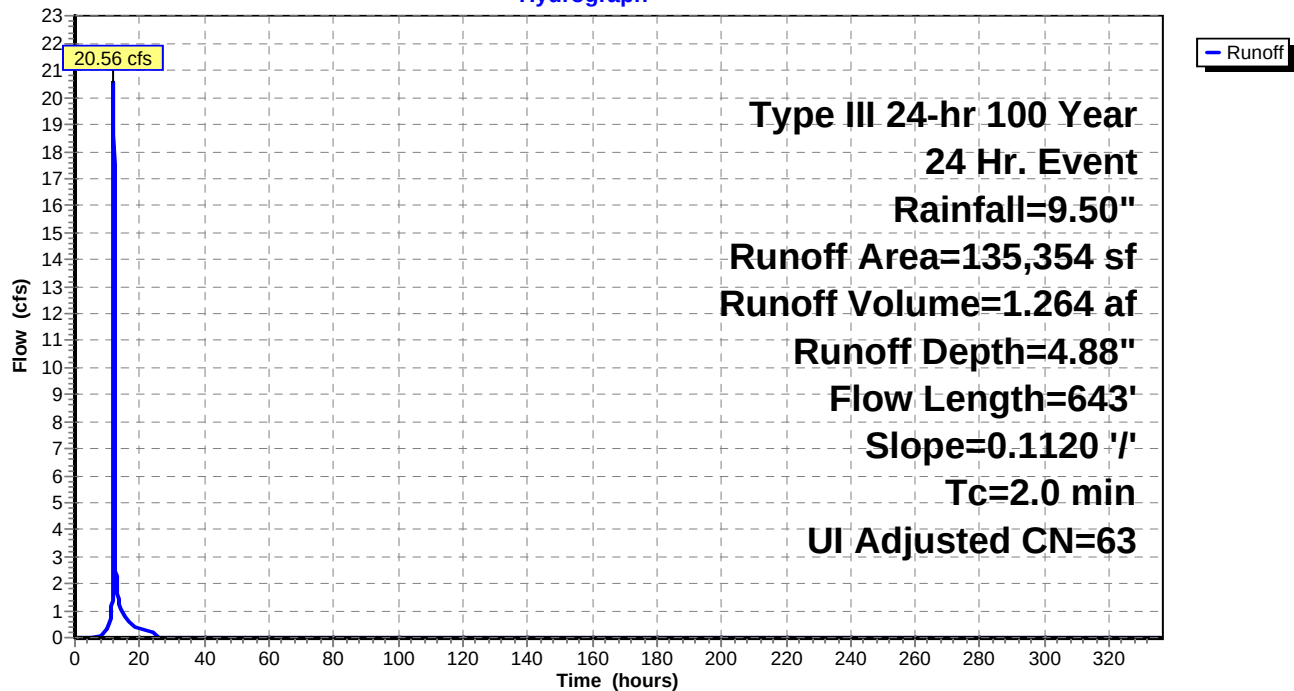
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
121,243	61	>75% Grass cover, Good, HSG B
13,897	85	Gravel roads, HSG B
214	98	Unconnected roofs, HSG B
135,354	64	Weighted Average, UI Adjusted CN = 63
135,140		99.84% Pervious Area
214		0.16% Impervious Area
214		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	643	0.1120	5.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps

Subcatchment EX 1G: EX DA !G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1G: EX DA !G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	4.88	0.00
5.00	0.54	0.00	0.00	265.00	9.50	4.88	0.00
10.00	1.80	0.06	0.26	270.00	9.50	4.88	0.00
15.00	8.12	3.76	0.89	275.00	9.50	4.88	0.00
20.00	9.09	4.55	0.32	280.00	9.50	4.88	0.00
25.00	9.50	4.88	0.00	285.00	9.50	4.88	0.00
30.00	9.50	4.88	0.00	290.00	9.50	4.88	0.00
35.00	9.50	4.88	0.00	295.00	9.50	4.88	0.00
40.00	9.50	4.88	0.00	300.00	9.50	4.88	0.00
45.00	9.50	4.88	0.00	305.00	9.50	4.88	0.00
50.00	9.50	4.88	0.00	310.00	9.50	4.88	0.00
55.00	9.50	4.88	0.00	315.00	9.50	4.88	0.00
60.00	9.50	4.88	0.00	320.00	9.50	4.88	0.00
65.00	9.50	4.88	0.00	325.00	9.50	4.88	0.00
70.00	9.50	4.88	0.00	330.00	9.50	4.88	0.00
75.00	9.50	4.88	0.00	335.00	9.50	4.88	0.00
80.00	9.50	4.88	0.00				
85.00	9.50	4.88	0.00				
90.00	9.50	4.88	0.00				
95.00	9.50	4.88	0.00				
100.00	9.50	4.88	0.00				
105.00	9.50	4.88	0.00				
110.00	9.50	4.88	0.00				
115.00	9.50	4.88	0.00				
120.00	9.50	4.88	0.00				
125.00	9.50	4.88	0.00				
130.00	9.50	4.88	0.00				
135.00	9.50	4.88	0.00				
140.00	9.50	4.88	0.00				
145.00	9.50	4.88	0.00				
150.00	9.50	4.88	0.00				
155.00	9.50	4.88	0.00				
160.00	9.50	4.88	0.00				
165.00	9.50	4.88	0.00				
170.00	9.50	4.88	0.00				
175.00	9.50	4.88	0.00				
180.00	9.50	4.88	0.00				
185.00	9.50	4.88	0.00				
190.00	9.50	4.88	0.00				
195.00	9.50	4.88	0.00				
200.00	9.50	4.88	0.00				
205.00	9.50	4.88	0.00				
210.00	9.50	4.88	0.00				
215.00	9.50	4.88	0.00				
220.00	9.50	4.88	0.00				
225.00	9.50	4.88	0.00				
230.00	9.50	4.88	0.00				
235.00	9.50	4.88	0.00				
240.00	9.50	4.88	0.00				
245.00	9.50	4.88	0.00				
250.00	9.50	4.88	0.00				
255.00	9.50	4.88	0.00				

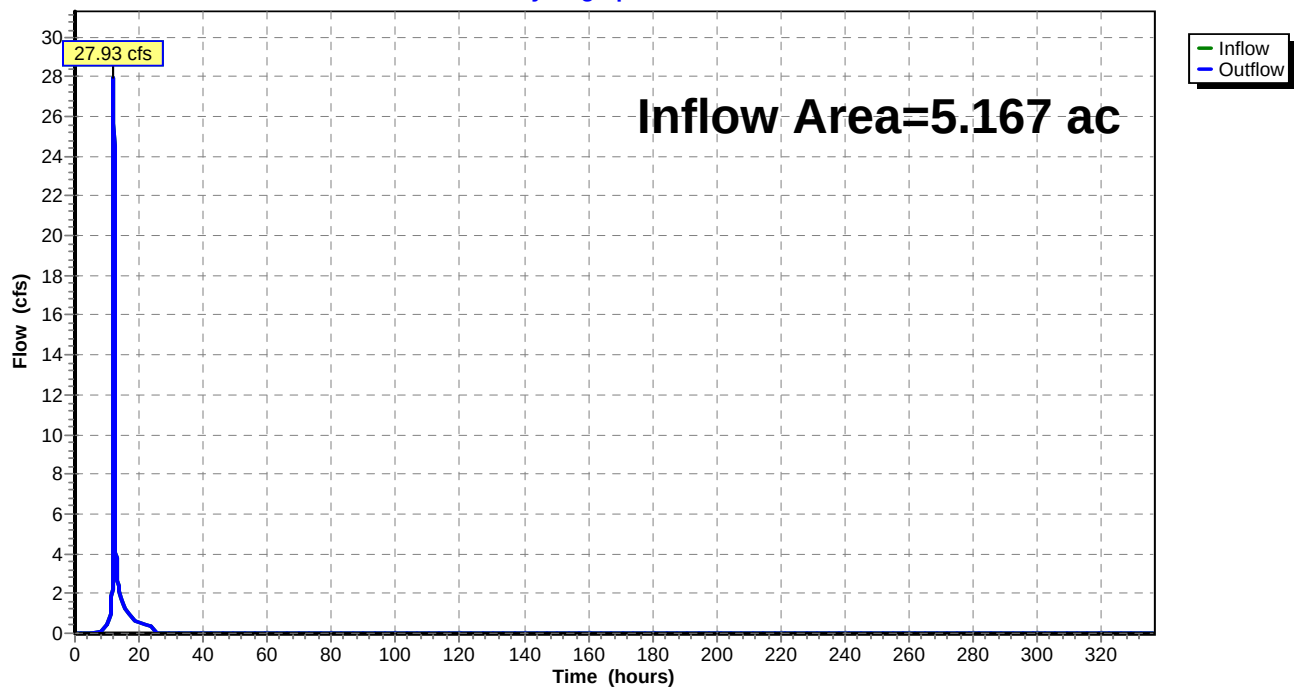
Summary for Reach DP 1A: PROP 1A

Inflow Area = 5.167 ac, 0.00% Impervious, Inflow Depth = 4.88" for 100 Year, 24 Hr. Event event
Inflow = 27.93 cfs @ 12.11 hrs, Volume= 2.102 af
Outflow = 27.93 cfs @ 12.11 hrs, Volume= 2.102 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach DP 1A: PROP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.40		0.40	270.00	0.00		0.00
15.00	1.52		1.52	275.00	0.00		0.00
20.00	0.53		0.53	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

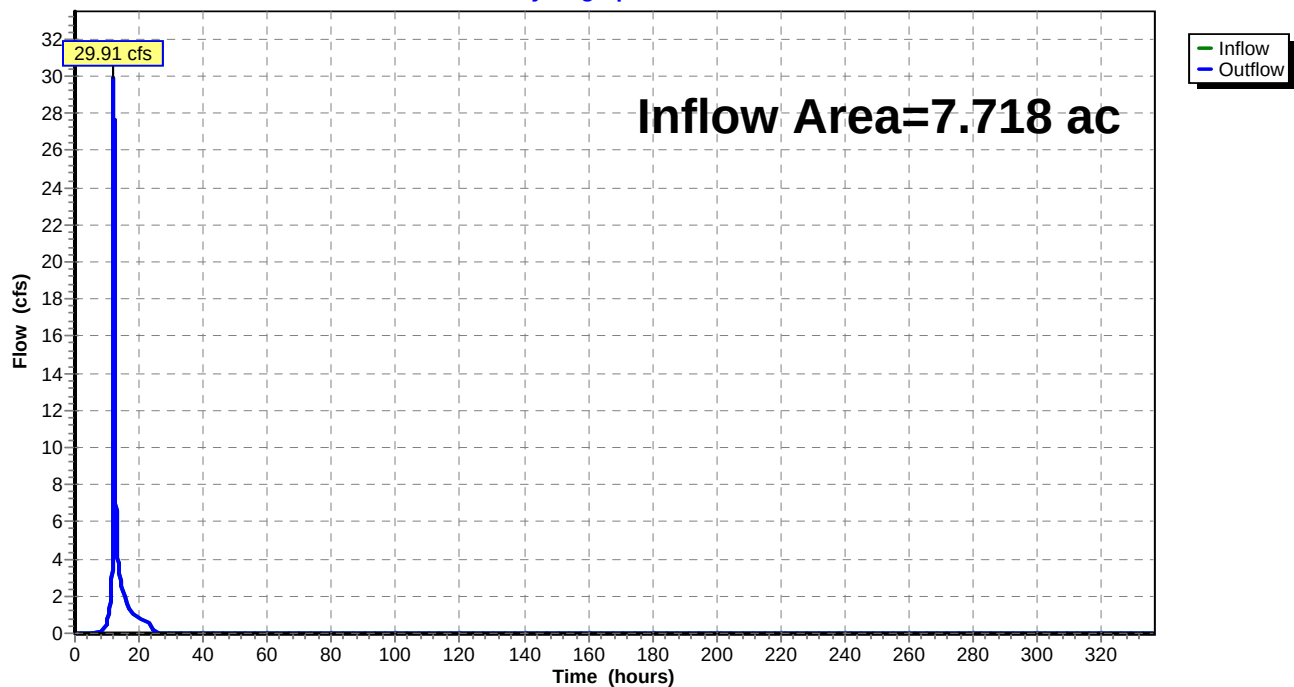
Summary for Reach EX DP 1A: Existing DP 1A

Inflow Area = 7.718 ac, 0.06% Impervious, Inflow Depth = 4.93" for 100 Year, 24 Hr. Event event
Inflow = 29.91 cfs @ 12.04 hrs, Volume= 3.169 af
Outflow = 29.91 cfs @ 12.04 hrs, Volume= 3.169 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP 1A: Existing DP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

Prepared by AKRF Engineering, PC

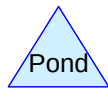
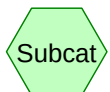
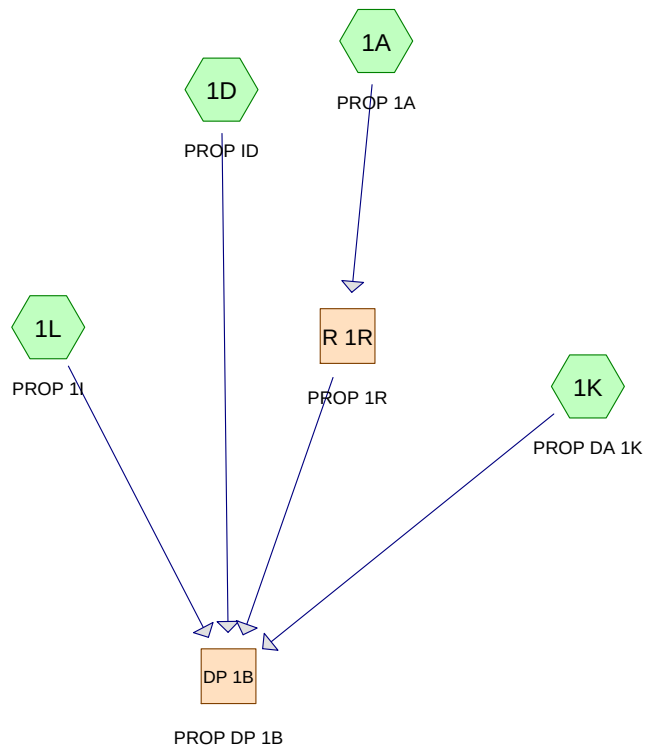
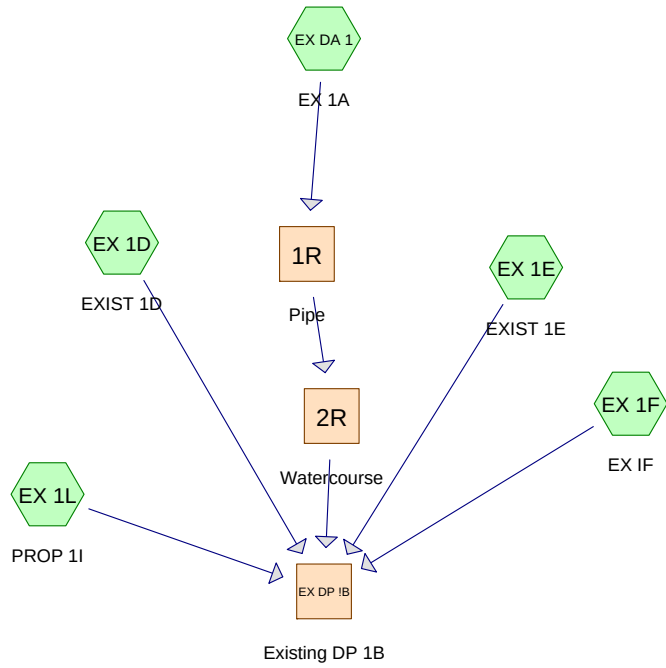
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Hydrograph for Reach EX DP 1A: Existing DP 1A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.59		0.59	270.00	0.00		0.00
15.00	2.30		2.30	275.00	0.00		0.00
20.00	0.80		0.80	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1A: PROP 1A

Runoff = 0.31 cfs @ 12.50 hrs, Volume= 0.074 af, Depth= 0.22"

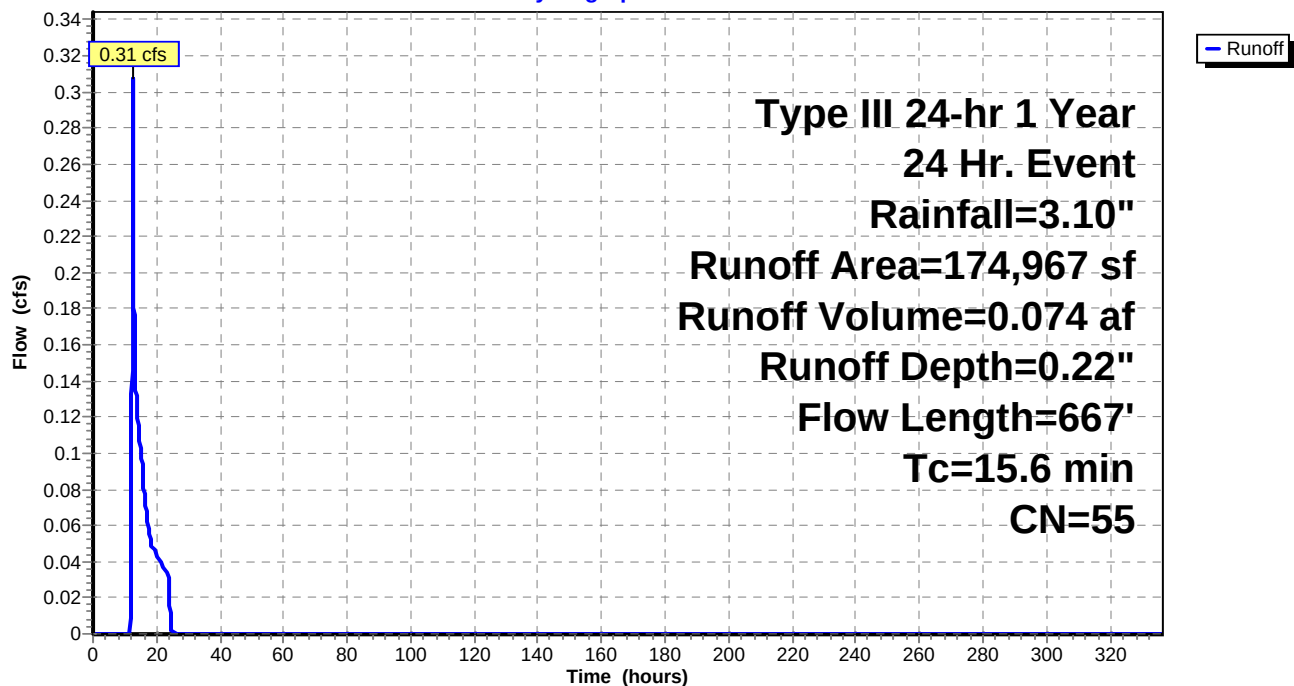
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
174,967	55	Woods, Good, HSG B
174,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	567	0.1790	6.81		Shallow Concentrated Flow, woods
					Unpaved Kv= 16.1 fps
15.6	667	Total			

Subcatchment 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1A: PROP 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.22	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.22	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.22	0.00
15.00	2.65	0.11	0.10	275.00	3.10	0.22	0.00
20.00	2.97	0.19	0.04	280.00	3.10	0.22	0.00
25.00	3.10	0.22	0.00	285.00	3.10	0.22	0.00
30.00	3.10	0.22	0.00	290.00	3.10	0.22	0.00
35.00	3.10	0.22	0.00	295.00	3.10	0.22	0.00
40.00	3.10	0.22	0.00	300.00	3.10	0.22	0.00
45.00	3.10	0.22	0.00	305.00	3.10	0.22	0.00
50.00	3.10	0.22	0.00	310.00	3.10	0.22	0.00
55.00	3.10	0.22	0.00	315.00	3.10	0.22	0.00
60.00	3.10	0.22	0.00	320.00	3.10	0.22	0.00
65.00	3.10	0.22	0.00	325.00	3.10	0.22	0.00
70.00	3.10	0.22	0.00	330.00	3.10	0.22	0.00
75.00	3.10	0.22	0.00	335.00	3.10	0.22	0.00
80.00	3.10	0.22	0.00				
85.00	3.10	0.22	0.00				
90.00	3.10	0.22	0.00				
95.00	3.10	0.22	0.00				
100.00	3.10	0.22	0.00				
105.00	3.10	0.22	0.00				
110.00	3.10	0.22	0.00				
115.00	3.10	0.22	0.00				
120.00	3.10	0.22	0.00				
125.00	3.10	0.22	0.00				
130.00	3.10	0.22	0.00				
135.00	3.10	0.22	0.00				
140.00	3.10	0.22	0.00				
145.00	3.10	0.22	0.00				
150.00	3.10	0.22	0.00				
155.00	3.10	0.22	0.00				
160.00	3.10	0.22	0.00				
165.00	3.10	0.22	0.00				
170.00	3.10	0.22	0.00				
175.00	3.10	0.22	0.00				
180.00	3.10	0.22	0.00				
185.00	3.10	0.22	0.00				
190.00	3.10	0.22	0.00				
195.00	3.10	0.22	0.00				
200.00	3.10	0.22	0.00				
205.00	3.10	0.22	0.00				
210.00	3.10	0.22	0.00				
215.00	3.10	0.22	0.00				
220.00	3.10	0.22	0.00				
225.00	3.10	0.22	0.00				
230.00	3.10	0.22	0.00				
235.00	3.10	0.22	0.00				
240.00	3.10	0.22	0.00				
245.00	3.10	0.22	0.00				
250.00	3.10	0.22	0.00				
255.00	3.10	0.22	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1D: PROP ID

Runoff = 18.48 cfs @ 12.51 hrs, Volume= 2.552 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

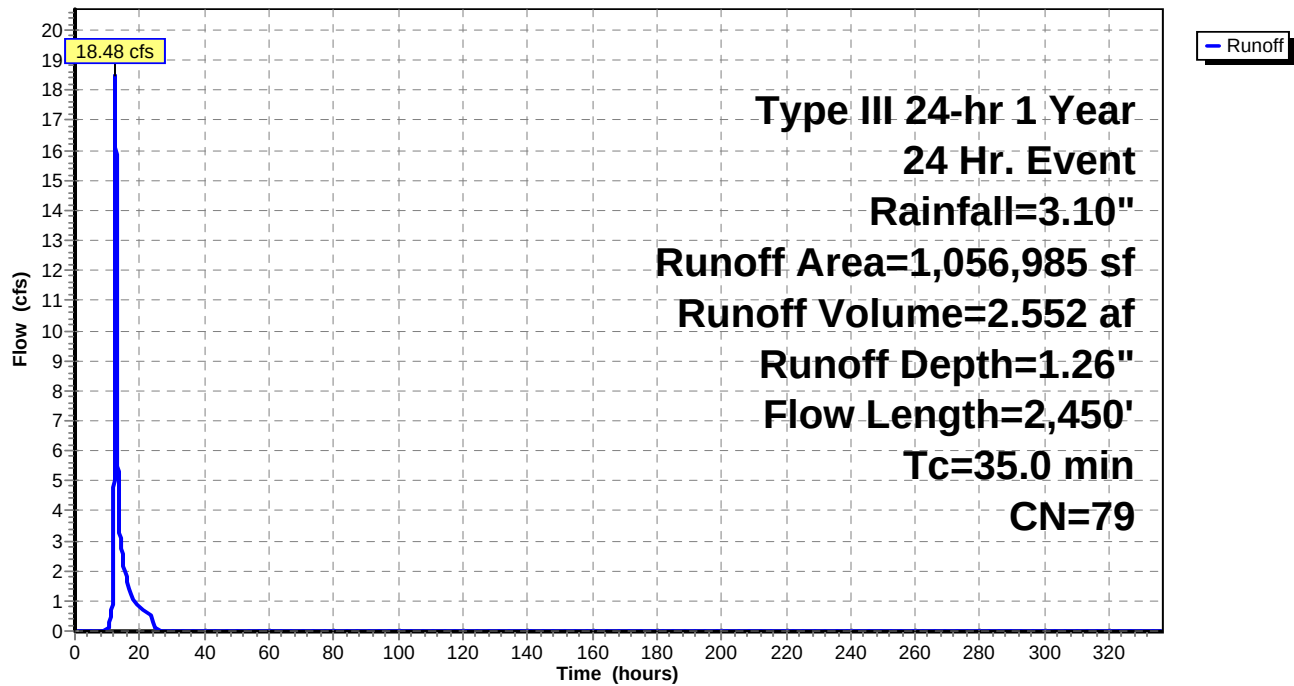
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
250,952	74	>75% Grass cover, Good, HSG C
1,056,985	79	Weighted Average
589,151		55.74% Pervious Area
467,834		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	800	0.1000	22.77	71.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
35.0	2,450	Total			

Subcatchment 1D: PROP ID

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1D: PROP ID

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.26	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.26	0.00
10.00	0.59	0.00	0.01	270.00	3.10	1.26	0.00
15.00	2.65	0.94	2.26	275.00	3.10	1.26	0.00
20.00	2.97	1.16	0.76	280.00	3.10	1.26	0.00
25.00	3.10	1.26	0.03	285.00	3.10	1.26	0.00
30.00	3.10	1.26	0.00	290.00	3.10	1.26	0.00
35.00	3.10	1.26	0.00	295.00	3.10	1.26	0.00
40.00	3.10	1.26	0.00	300.00	3.10	1.26	0.00
45.00	3.10	1.26	0.00	305.00	3.10	1.26	0.00
50.00	3.10	1.26	0.00	310.00	3.10	1.26	0.00
55.00	3.10	1.26	0.00	315.00	3.10	1.26	0.00
60.00	3.10	1.26	0.00	320.00	3.10	1.26	0.00
65.00	3.10	1.26	0.00	325.00	3.10	1.26	0.00
70.00	3.10	1.26	0.00	330.00	3.10	1.26	0.00
75.00	3.10	1.26	0.00	335.00	3.10	1.26	0.00
80.00	3.10	1.26	0.00				
85.00	3.10	1.26	0.00				
90.00	3.10	1.26	0.00				
95.00	3.10	1.26	0.00				
100.00	3.10	1.26	0.00				
105.00	3.10	1.26	0.00				
110.00	3.10	1.26	0.00				
115.00	3.10	1.26	0.00				
120.00	3.10	1.26	0.00				
125.00	3.10	1.26	0.00				
130.00	3.10	1.26	0.00				
135.00	3.10	1.26	0.00				
140.00	3.10	1.26	0.00				
145.00	3.10	1.26	0.00				
150.00	3.10	1.26	0.00				
155.00	3.10	1.26	0.00				
160.00	3.10	1.26	0.00				
165.00	3.10	1.26	0.00				
170.00	3.10	1.26	0.00				
175.00	3.10	1.26	0.00				
180.00	3.10	1.26	0.00				
185.00	3.10	1.26	0.00				
190.00	3.10	1.26	0.00				
195.00	3.10	1.26	0.00				
200.00	3.10	1.26	0.00				
205.00	3.10	1.26	0.00				
210.00	3.10	1.26	0.00				
215.00	3.10	1.26	0.00				
220.00	3.10	1.26	0.00				
225.00	3.10	1.26	0.00				
230.00	3.10	1.26	0.00				
235.00	3.10	1.26	0.00				
240.00	3.10	1.26	0.00				
245.00	3.10	1.26	0.00				
250.00	3.10	1.26	0.00				
255.00	3.10	1.26	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1K: PROP DA 1K

Runoff = 4.37 cfs @ 12.10 hrs, Volume= 0.324 af, Depth= 1.26"

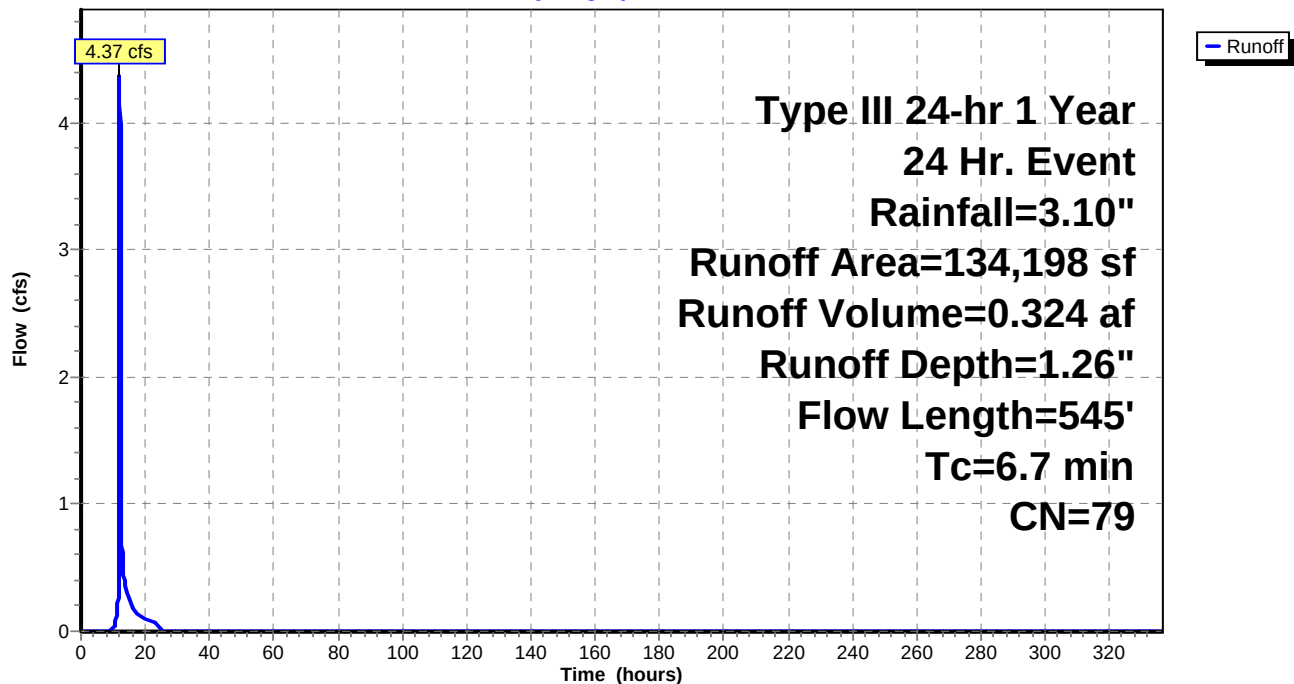
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
108,493	74	>75% Grass cover, Good, HSG C
9,729	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
134,198	79	Weighted Average
108,493		80.85% Pervious Area
25,705		19.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	80	0.1000	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	195	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	270	0.1850	22.86	228.55	Channel Flow, Area= 10.0 sf Perim= 9.0' r= 1.11' n= 0.030 Earth, grassed & winding
6.7	545	Total			

Subcatchment 1K: PROP DA 1K

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1K: PROP DA 1K

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.26	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.26	0.00
10.00	0.59	0.00	0.01	270.00	3.10	1.26	0.00
15.00	2.65	0.94	0.26	275.00	3.10	1.26	0.00
20.00	2.97	1.16	0.09	280.00	3.10	1.26	0.00
25.00	3.10	1.26	0.00	285.00	3.10	1.26	0.00
30.00	3.10	1.26	0.00	290.00	3.10	1.26	0.00
35.00	3.10	1.26	0.00	295.00	3.10	1.26	0.00
40.00	3.10	1.26	0.00	300.00	3.10	1.26	0.00
45.00	3.10	1.26	0.00	305.00	3.10	1.26	0.00
50.00	3.10	1.26	0.00	310.00	3.10	1.26	0.00
55.00	3.10	1.26	0.00	315.00	3.10	1.26	0.00
60.00	3.10	1.26	0.00	320.00	3.10	1.26	0.00
65.00	3.10	1.26	0.00	325.00	3.10	1.26	0.00
70.00	3.10	1.26	0.00	330.00	3.10	1.26	0.00
75.00	3.10	1.26	0.00	335.00	3.10	1.26	0.00
80.00	3.10	1.26	0.00				
85.00	3.10	1.26	0.00				
90.00	3.10	1.26	0.00				
95.00	3.10	1.26	0.00				
100.00	3.10	1.26	0.00				
105.00	3.10	1.26	0.00				
110.00	3.10	1.26	0.00				
115.00	3.10	1.26	0.00				
120.00	3.10	1.26	0.00				
125.00	3.10	1.26	0.00				
130.00	3.10	1.26	0.00				
135.00	3.10	1.26	0.00				
140.00	3.10	1.26	0.00				
145.00	3.10	1.26	0.00				
150.00	3.10	1.26	0.00				
155.00	3.10	1.26	0.00				
160.00	3.10	1.26	0.00				
165.00	3.10	1.26	0.00				
170.00	3.10	1.26	0.00				
175.00	3.10	1.26	0.00				
180.00	3.10	1.26	0.00				
185.00	3.10	1.26	0.00				
190.00	3.10	1.26	0.00				
195.00	3.10	1.26	0.00				
200.00	3.10	1.26	0.00				
205.00	3.10	1.26	0.00				
210.00	3.10	1.26	0.00				
215.00	3.10	1.26	0.00				
220.00	3.10	1.26	0.00				
225.00	3.10	1.26	0.00				
230.00	3.10	1.26	0.00				
235.00	3.10	1.26	0.00				
240.00	3.10	1.26	0.00				
245.00	3.10	1.26	0.00				
250.00	3.10	1.26	0.00				
255.00	3.10	1.26	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1L: PROP 1I

Runoff = 7.22 cfs @ 12.11 hrs, Volume= 0.564 af, Depth= 1.03"

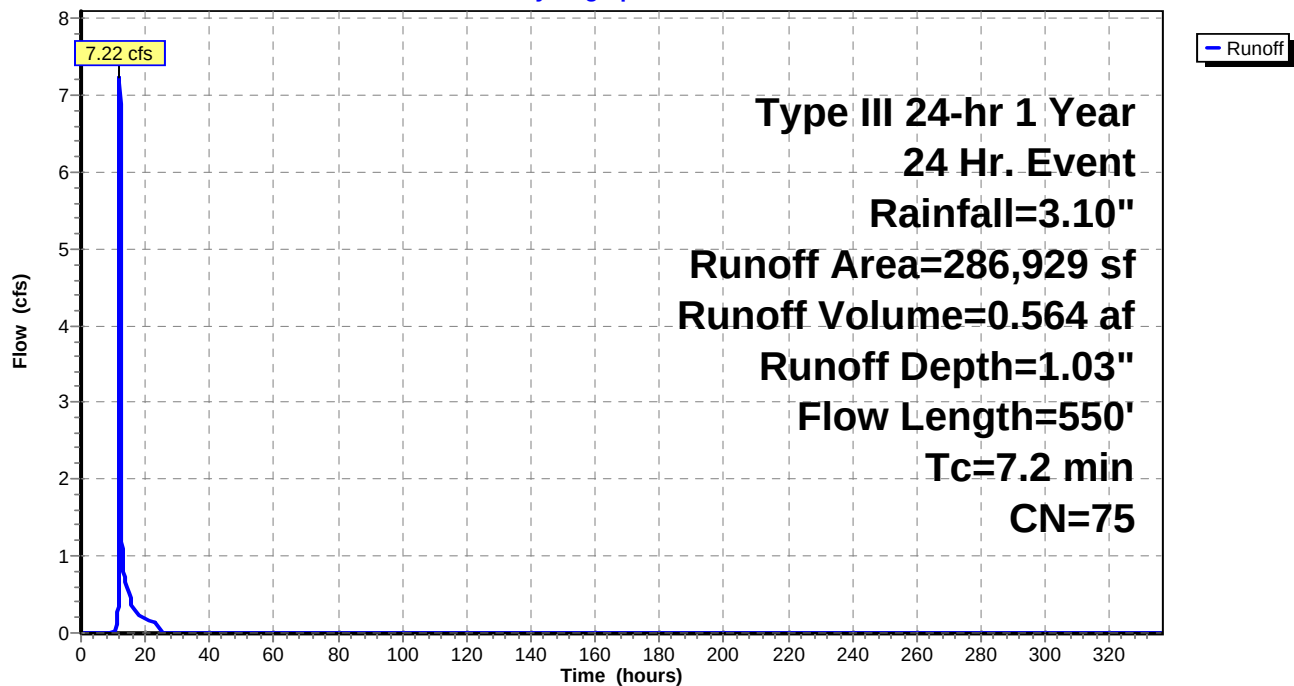
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
86,205	61	>75% Grass cover, Good, HSG B
145,054	74	>75% Grass cover, Good, HSG C
286,929	75	Weighted Average
231,259		80.60% Pervious Area
55,670		19.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	450	0.1640	2.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	550	Total			

Subcatchment 1L: PROP 1I

Hydrograph



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Hydrograph for Subcatchment 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.03	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.03	0.00
10.00	0.59	0.00	0.00	270.00	3.10	1.03	0.00
15.00	2.65	0.74	0.48	275.00	3.10	1.03	0.00
20.00	2.97	0.94	0.18	280.00	3.10	1.03	0.00
25.00	3.10	1.03	0.00	285.00	3.10	1.03	0.00
30.00	3.10	1.03	0.00	290.00	3.10	1.03	0.00
35.00	3.10	1.03	0.00	295.00	3.10	1.03	0.00
40.00	3.10	1.03	0.00	300.00	3.10	1.03	0.00
45.00	3.10	1.03	0.00	305.00	3.10	1.03	0.00
50.00	3.10	1.03	0.00	310.00	3.10	1.03	0.00
55.00	3.10	1.03	0.00	315.00	3.10	1.03	0.00
60.00	3.10	1.03	0.00	320.00	3.10	1.03	0.00
65.00	3.10	1.03	0.00	325.00	3.10	1.03	0.00
70.00	3.10	1.03	0.00	330.00	3.10	1.03	0.00
75.00	3.10	1.03	0.00	335.00	3.10	1.03	0.00
80.00	3.10	1.03	0.00				
85.00	3.10	1.03	0.00				
90.00	3.10	1.03	0.00				
95.00	3.10	1.03	0.00				
100.00	3.10	1.03	0.00				
105.00	3.10	1.03	0.00				
110.00	3.10	1.03	0.00				
115.00	3.10	1.03	0.00				
120.00	3.10	1.03	0.00				
125.00	3.10	1.03	0.00				
130.00	3.10	1.03	0.00				
135.00	3.10	1.03	0.00				
140.00	3.10	1.03	0.00				
145.00	3.10	1.03	0.00				
150.00	3.10	1.03	0.00				
155.00	3.10	1.03	0.00				
160.00	3.10	1.03	0.00				
165.00	3.10	1.03	0.00				
170.00	3.10	1.03	0.00				
175.00	3.10	1.03	0.00				
180.00	3.10	1.03	0.00				
185.00	3.10	1.03	0.00				
190.00	3.10	1.03	0.00				
195.00	3.10	1.03	0.00				
200.00	3.10	1.03	0.00				
205.00	3.10	1.03	0.00				
210.00	3.10	1.03	0.00				
215.00	3.10	1.03	0.00				
220.00	3.10	1.03	0.00				
225.00	3.10	1.03	0.00				
230.00	3.10	1.03	0.00				
235.00	3.10	1.03	0.00				
240.00	3.10	1.03	0.00				
245.00	3.10	1.03	0.00				
250.00	3.10	1.03	0.00				
255.00	3.10	1.03	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1D: EXIST 1D

Runoff = 1.42 cfs @ 12.40 hrs, Volume= 0.233 af, Depth= 0.40"

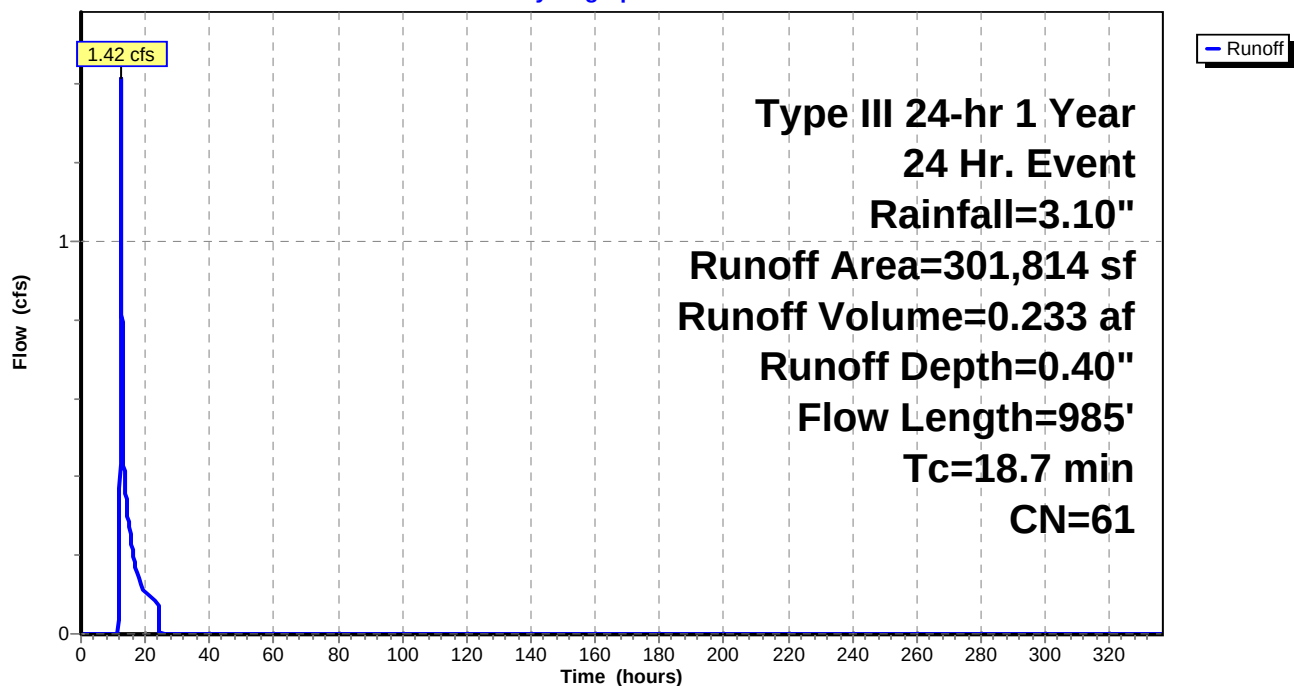
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
301,814	61	>75% Grass cover, Good, HSG B
301,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	115	0.0340	0.16		Sheet Flow, Orchard
					Grass: Dense n= 0.240 P2= 3.50"
6.4	870	0.1057	2.28		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
18.7	985	Total			

Subcatchment EX 1D: EXIST 1D

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1D: EXIST 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.40	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.40	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.40	0.00
15.00	2.65	0.24	0.28	275.00	3.10	0.40	0.00
20.00	2.97	0.35	0.11	280.00	3.10	0.40	0.00
25.00	3.10	0.40	0.00	285.00	3.10	0.40	0.00
30.00	3.10	0.40	0.00	290.00	3.10	0.40	0.00
35.00	3.10	0.40	0.00	295.00	3.10	0.40	0.00
40.00	3.10	0.40	0.00	300.00	3.10	0.40	0.00
45.00	3.10	0.40	0.00	305.00	3.10	0.40	0.00
50.00	3.10	0.40	0.00	310.00	3.10	0.40	0.00
55.00	3.10	0.40	0.00	315.00	3.10	0.40	0.00
60.00	3.10	0.40	0.00	320.00	3.10	0.40	0.00
65.00	3.10	0.40	0.00	325.00	3.10	0.40	0.00
70.00	3.10	0.40	0.00	330.00	3.10	0.40	0.00
75.00	3.10	0.40	0.00	335.00	3.10	0.40	0.00
80.00	3.10	0.40	0.00				
85.00	3.10	0.40	0.00				
90.00	3.10	0.40	0.00				
95.00	3.10	0.40	0.00				
100.00	3.10	0.40	0.00				
105.00	3.10	0.40	0.00				
110.00	3.10	0.40	0.00				
115.00	3.10	0.40	0.00				
120.00	3.10	0.40	0.00				
125.00	3.10	0.40	0.00				
130.00	3.10	0.40	0.00				
135.00	3.10	0.40	0.00				
140.00	3.10	0.40	0.00				
145.00	3.10	0.40	0.00				
150.00	3.10	0.40	0.00				
155.00	3.10	0.40	0.00				
160.00	3.10	0.40	0.00				
165.00	3.10	0.40	0.00				
170.00	3.10	0.40	0.00				
175.00	3.10	0.40	0.00				
180.00	3.10	0.40	0.00				
185.00	3.10	0.40	0.00				
190.00	3.10	0.40	0.00				
195.00	3.10	0.40	0.00				
200.00	3.10	0.40	0.00				
205.00	3.10	0.40	0.00				
210.00	3.10	0.40	0.00				
215.00	3.10	0.40	0.00				
220.00	3.10	0.40	0.00				
225.00	3.10	0.40	0.00				
230.00	3.10	0.40	0.00				
235.00	3.10	0.40	0.00				
240.00	3.10	0.40	0.00				
245.00	3.10	0.40	0.00				
250.00	3.10	0.40	0.00				
255.00	3.10	0.40	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1E: EXIST 1E

Runoff = 8.86 cfs @ 12.09 hrs, Volume= 0.646 af, Depth= 1.08"

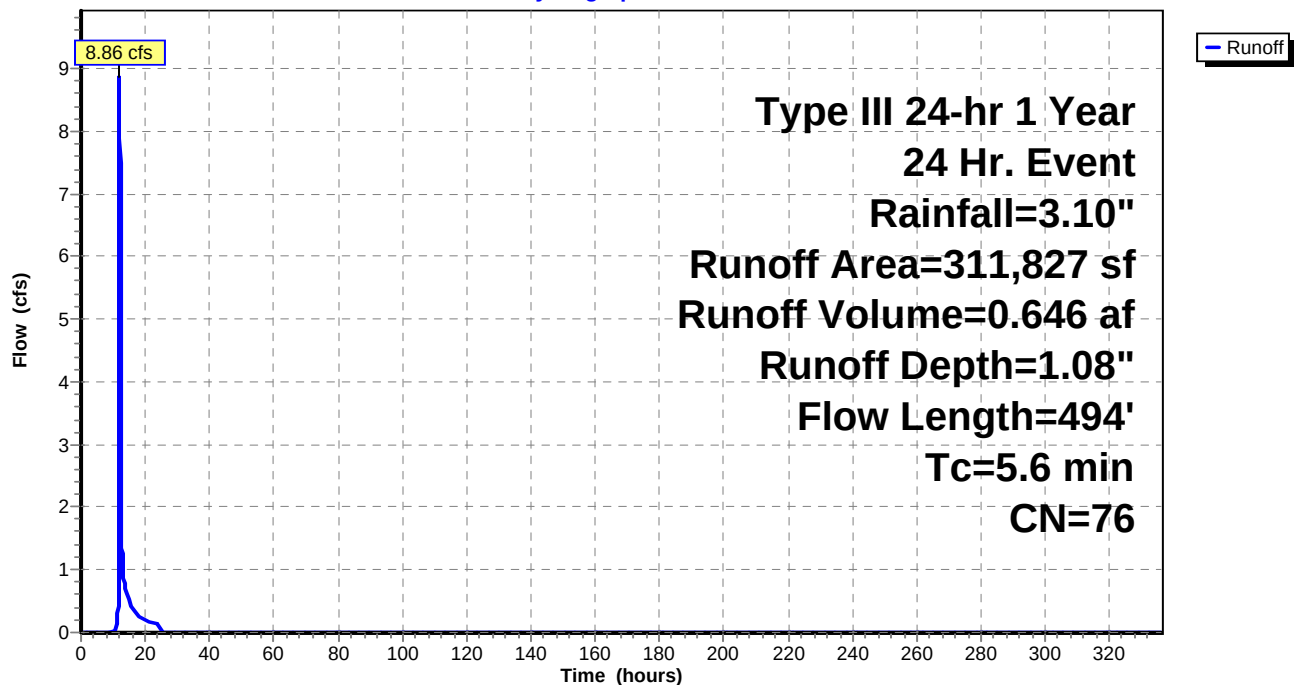
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
250,622	74	>75% Grass cover, Good, HSG C
26,824	61	>75% Grass cover, Good, HSG B
18,405	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
311,827	76	Weighted Average
277,446		88.97% Pervious Area
34,381		11.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	75	0.1600	0.39		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
2.4	419	0.1800	2.97		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
5.6	494	Total			

Subcatchment EX 1E: EXIST 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1E: EXIST 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.08	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.08	0.00
10.00	0.59	0.00	0.00	270.00	3.10	1.08	0.00
15.00	2.65	0.79	0.54	275.00	3.10	1.08	0.00
20.00	2.97	0.99	0.20	280.00	3.10	1.08	0.00
25.00	3.10	1.08	0.00	285.00	3.10	1.08	0.00
30.00	3.10	1.08	0.00	290.00	3.10	1.08	0.00
35.00	3.10	1.08	0.00	295.00	3.10	1.08	0.00
40.00	3.10	1.08	0.00	300.00	3.10	1.08	0.00
45.00	3.10	1.08	0.00	305.00	3.10	1.08	0.00
50.00	3.10	1.08	0.00	310.00	3.10	1.08	0.00
55.00	3.10	1.08	0.00	315.00	3.10	1.08	0.00
60.00	3.10	1.08	0.00	320.00	3.10	1.08	0.00
65.00	3.10	1.08	0.00	325.00	3.10	1.08	0.00
70.00	3.10	1.08	0.00	330.00	3.10	1.08	0.00
75.00	3.10	1.08	0.00	335.00	3.10	1.08	0.00
80.00	3.10	1.08	0.00				
85.00	3.10	1.08	0.00				
90.00	3.10	1.08	0.00				
95.00	3.10	1.08	0.00				
100.00	3.10	1.08	0.00				
105.00	3.10	1.08	0.00				
110.00	3.10	1.08	0.00				
115.00	3.10	1.08	0.00				
120.00	3.10	1.08	0.00				
125.00	3.10	1.08	0.00				
130.00	3.10	1.08	0.00				
135.00	3.10	1.08	0.00				
140.00	3.10	1.08	0.00				
145.00	3.10	1.08	0.00				
150.00	3.10	1.08	0.00				
155.00	3.10	1.08	0.00				
160.00	3.10	1.08	0.00				
165.00	3.10	1.08	0.00				
170.00	3.10	1.08	0.00				
175.00	3.10	1.08	0.00				
180.00	3.10	1.08	0.00				
185.00	3.10	1.08	0.00				
190.00	3.10	1.08	0.00				
195.00	3.10	1.08	0.00				
200.00	3.10	1.08	0.00				
205.00	3.10	1.08	0.00				
210.00	3.10	1.08	0.00				
215.00	3.10	1.08	0.00				
220.00	3.10	1.08	0.00				
225.00	3.10	1.08	0.00				
230.00	3.10	1.08	0.00				
235.00	3.10	1.08	0.00				
240.00	3.10	1.08	0.00				
245.00	3.10	1.08	0.00				
250.00	3.10	1.08	0.00				
255.00	3.10	1.08	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1F: EX IF

Runoff = 18.18 cfs @ 12.51 hrs, Volume= 2.514 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

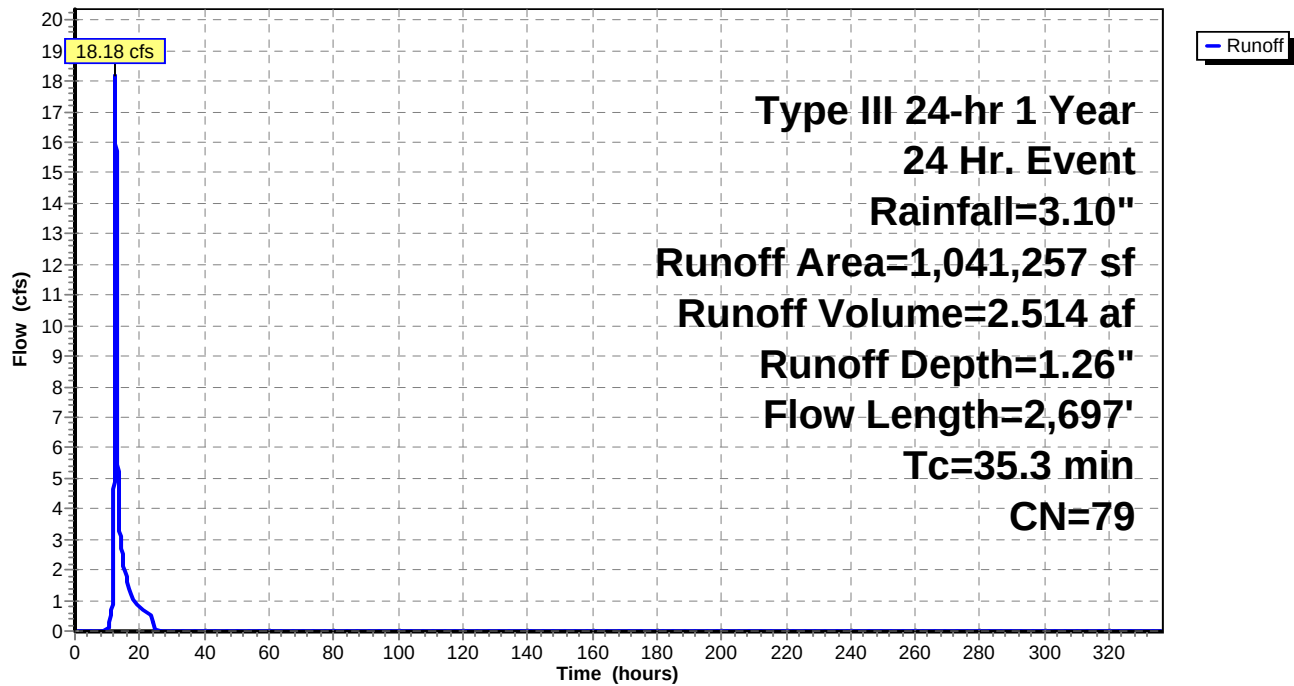
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
235,224	74	>75% Grass cover, Good, HSG C
1,041,257	79	Weighted Average
573,423		55.07% Pervious Area
467,834		44.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	1,047	0.1000	19.74	62.00	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
35.3	2,697	Total			

Subcatchment EX 1F: EX IF

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1F: EX IF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.26	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.26	0.00
10.00	0.59	0.00	0.01	270.00	3.10	1.26	0.00
15.00	2.65	0.94	2.23	275.00	3.10	1.26	0.00
20.00	2.97	1.16	0.75	280.00	3.10	1.26	0.00
25.00	3.10	1.26	0.03	285.00	3.10	1.26	0.00
30.00	3.10	1.26	0.00	290.00	3.10	1.26	0.00
35.00	3.10	1.26	0.00	295.00	3.10	1.26	0.00
40.00	3.10	1.26	0.00	300.00	3.10	1.26	0.00
45.00	3.10	1.26	0.00	305.00	3.10	1.26	0.00
50.00	3.10	1.26	0.00	310.00	3.10	1.26	0.00
55.00	3.10	1.26	0.00	315.00	3.10	1.26	0.00
60.00	3.10	1.26	0.00	320.00	3.10	1.26	0.00
65.00	3.10	1.26	0.00	325.00	3.10	1.26	0.00
70.00	3.10	1.26	0.00	330.00	3.10	1.26	0.00
75.00	3.10	1.26	0.00	335.00	3.10	1.26	0.00
80.00	3.10	1.26	0.00				
85.00	3.10	1.26	0.00				
90.00	3.10	1.26	0.00				
95.00	3.10	1.26	0.00				
100.00	3.10	1.26	0.00				
105.00	3.10	1.26	0.00				
110.00	3.10	1.26	0.00				
115.00	3.10	1.26	0.00				
120.00	3.10	1.26	0.00				
125.00	3.10	1.26	0.00				
130.00	3.10	1.26	0.00				
135.00	3.10	1.26	0.00				
140.00	3.10	1.26	0.00				
145.00	3.10	1.26	0.00				
150.00	3.10	1.26	0.00				
155.00	3.10	1.26	0.00				
160.00	3.10	1.26	0.00				
165.00	3.10	1.26	0.00				
170.00	3.10	1.26	0.00				
175.00	3.10	1.26	0.00				
180.00	3.10	1.26	0.00				
185.00	3.10	1.26	0.00				
190.00	3.10	1.26	0.00				
195.00	3.10	1.26	0.00				
200.00	3.10	1.26	0.00				
205.00	3.10	1.26	0.00				
210.00	3.10	1.26	0.00				
215.00	3.10	1.26	0.00				
220.00	3.10	1.26	0.00				
225.00	3.10	1.26	0.00				
230.00	3.10	1.26	0.00				
235.00	3.10	1.26	0.00				
240.00	3.10	1.26	0.00				
245.00	3.10	1.26	0.00				
250.00	3.10	1.26	0.00				
255.00	3.10	1.26	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1L: PROP 1I

Runoff = 7.13 cfs @ 12.05 hrs, Volume= 0.485 af, Depth= 0.92"

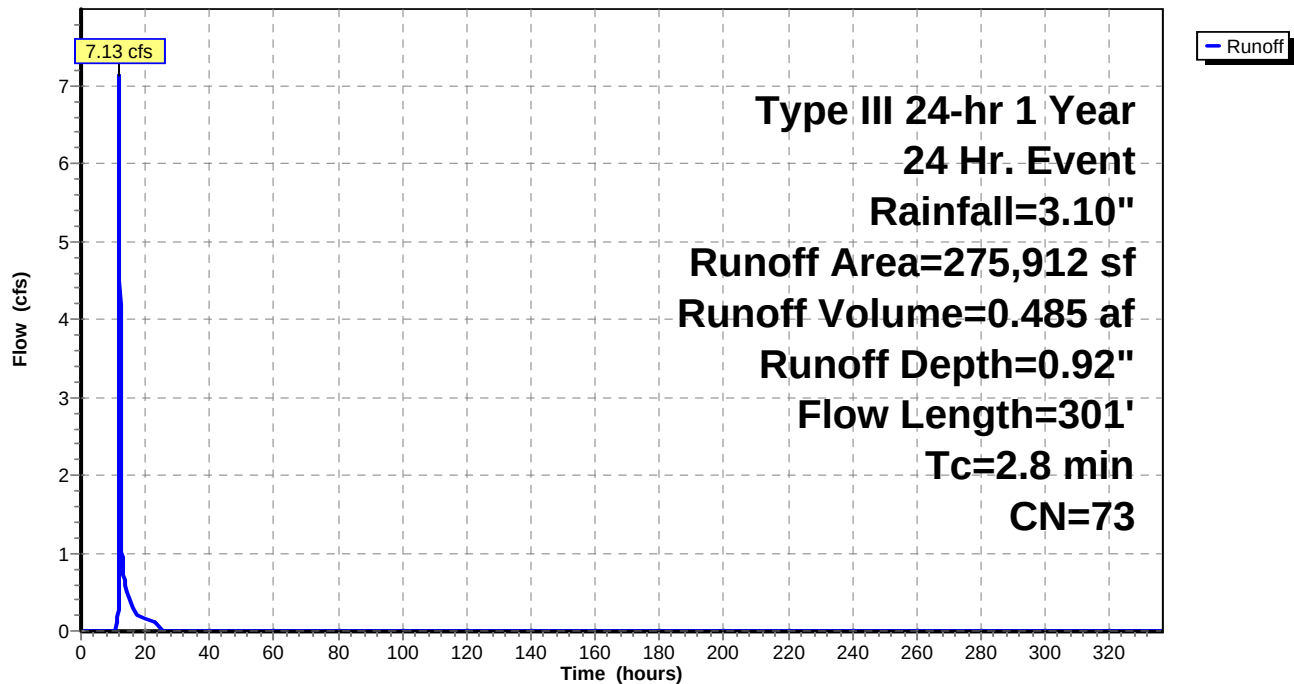
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
116,330	61	>75% Grass cover, Good, HSG B
103,912	74	>75% Grass cover, Good, HSG C
275,912	73	Weighted Average
220,242		79.82% Pervious Area
55,670		20.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.1800	0.37		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	251	0.1830	6.89		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	301	Total			

Subcatchment EX 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.92	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.92	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.92	0.00
15.00	2.65	0.65	0.42	275.00	3.10	0.92	0.00
20.00	2.97	0.84	0.16	280.00	3.10	0.92	0.00
25.00	3.10	0.92	0.00	285.00	3.10	0.92	0.00
30.00	3.10	0.92	0.00	290.00	3.10	0.92	0.00
35.00	3.10	0.92	0.00	295.00	3.10	0.92	0.00
40.00	3.10	0.92	0.00	300.00	3.10	0.92	0.00
45.00	3.10	0.92	0.00	305.00	3.10	0.92	0.00
50.00	3.10	0.92	0.00	310.00	3.10	0.92	0.00
55.00	3.10	0.92	0.00	315.00	3.10	0.92	0.00
60.00	3.10	0.92	0.00	320.00	3.10	0.92	0.00
65.00	3.10	0.92	0.00	325.00	3.10	0.92	0.00
70.00	3.10	0.92	0.00	330.00	3.10	0.92	0.00
75.00	3.10	0.92	0.00	335.00	3.10	0.92	0.00
80.00	3.10	0.92	0.00				
85.00	3.10	0.92	0.00				
90.00	3.10	0.92	0.00				
95.00	3.10	0.92	0.00				
100.00	3.10	0.92	0.00				
105.00	3.10	0.92	0.00				
110.00	3.10	0.92	0.00				
115.00	3.10	0.92	0.00				
120.00	3.10	0.92	0.00				
125.00	3.10	0.92	0.00				
130.00	3.10	0.92	0.00				
135.00	3.10	0.92	0.00				
140.00	3.10	0.92	0.00				
145.00	3.10	0.92	0.00				
150.00	3.10	0.92	0.00				
155.00	3.10	0.92	0.00				
160.00	3.10	0.92	0.00				
165.00	3.10	0.92	0.00				
170.00	3.10	0.92	0.00				
175.00	3.10	0.92	0.00				
180.00	3.10	0.92	0.00				
185.00	3.10	0.92	0.00				
190.00	3.10	0.92	0.00				
195.00	3.10	0.92	0.00				
200.00	3.10	0.92	0.00				
205.00	3.10	0.92	0.00				
210.00	3.10	0.92	0.00				
215.00	3.10	0.92	0.00				
220.00	3.10	0.92	0.00				
225.00	3.10	0.92	0.00				
230.00	3.10	0.92	0.00				
235.00	3.10	0.92	0.00				
240.00	3.10	0.92	0.00				
245.00	3.10	0.92	0.00				
250.00	3.10	0.92	0.00				
255.00	3.10	0.92	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX DA 1: EX 1A

Runoff = 0.55 cfs @ 12.58 hrs, Volume= 0.122 af, Depth= 0.31"

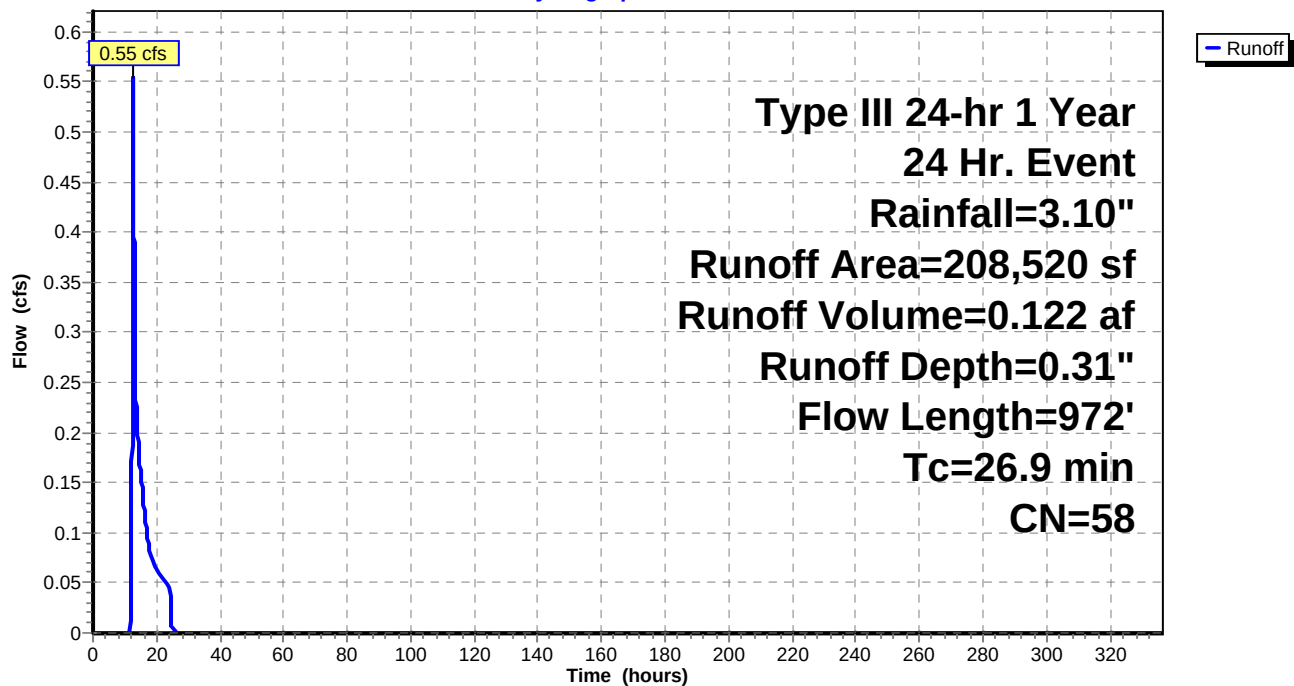
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
167,674	55	Woods, Good, HSG B
40,846	69	50-75% Grass cover, Fair, HSG B
208,520	58	Weighted Average
208,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	125	0.0320	0.10		Sheet Flow, Wooded Woods: Light underbrush n= 0.400 P2= 3.50"
5.7	679	0.1560	1.97		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
0.9	168	0.0230	3.08		Shallow Concentrated Flow, Gravel drive Paved Kv= 20.3 fps
26.9	972	Total			

Subcatchment EX DA 1: EX 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX DA 1: EX 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.31	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.31	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.31	0.00
15.00	2.65	0.17	0.16	275.00	3.10	0.31	0.00
20.00	2.97	0.26	0.06	280.00	3.10	0.31	0.00
25.00	3.10	0.31	0.00	285.00	3.10	0.31	0.00
30.00	3.10	0.31	0.00	290.00	3.10	0.31	0.00
35.00	3.10	0.31	0.00	295.00	3.10	0.31	0.00
40.00	3.10	0.31	0.00	300.00	3.10	0.31	0.00
45.00	3.10	0.31	0.00	305.00	3.10	0.31	0.00
50.00	3.10	0.31	0.00	310.00	3.10	0.31	0.00
55.00	3.10	0.31	0.00	315.00	3.10	0.31	0.00
60.00	3.10	0.31	0.00	320.00	3.10	0.31	0.00
65.00	3.10	0.31	0.00	325.00	3.10	0.31	0.00
70.00	3.10	0.31	0.00	330.00	3.10	0.31	0.00
75.00	3.10	0.31	0.00	335.00	3.10	0.31	0.00
80.00	3.10	0.31	0.00				
85.00	3.10	0.31	0.00				
90.00	3.10	0.31	0.00				
95.00	3.10	0.31	0.00				
100.00	3.10	0.31	0.00				
105.00	3.10	0.31	0.00				
110.00	3.10	0.31	0.00				
115.00	3.10	0.31	0.00				
120.00	3.10	0.31	0.00				
125.00	3.10	0.31	0.00				
130.00	3.10	0.31	0.00				
135.00	3.10	0.31	0.00				
140.00	3.10	0.31	0.00				
145.00	3.10	0.31	0.00				
150.00	3.10	0.31	0.00				
155.00	3.10	0.31	0.00				
160.00	3.10	0.31	0.00				
165.00	3.10	0.31	0.00				
170.00	3.10	0.31	0.00				
175.00	3.10	0.31	0.00				
180.00	3.10	0.31	0.00				
185.00	3.10	0.31	0.00				
190.00	3.10	0.31	0.00				
195.00	3.10	0.31	0.00				
200.00	3.10	0.31	0.00				
205.00	3.10	0.31	0.00				
210.00	3.10	0.31	0.00				
215.00	3.10	0.31	0.00				
220.00	3.10	0.31	0.00				
225.00	3.10	0.31	0.00				
230.00	3.10	0.31	0.00				
235.00	3.10	0.31	0.00				
240.00	3.10	0.31	0.00				
245.00	3.10	0.31	0.00				
250.00	3.10	0.31	0.00				
255.00	3.10	0.31	0.00				

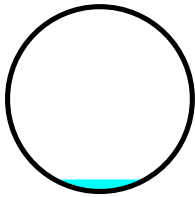
Summary for Reach 1R: Pipe

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 0.31" for 1 Year, 24 Hr. Event event
 Inflow = 0.55 cfs @ 12.58 hrs, Volume= 0.122 af
 Outflow = 0.55 cfs @ 12.63 hrs, Volume= 0.122 af, Atten= 1%, Lag= 2.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 6.47 fps, Min. Travel Time= 3.3 min
 Avg. Velocity = 3.71 fps, Avg. Travel Time= 5.7 min

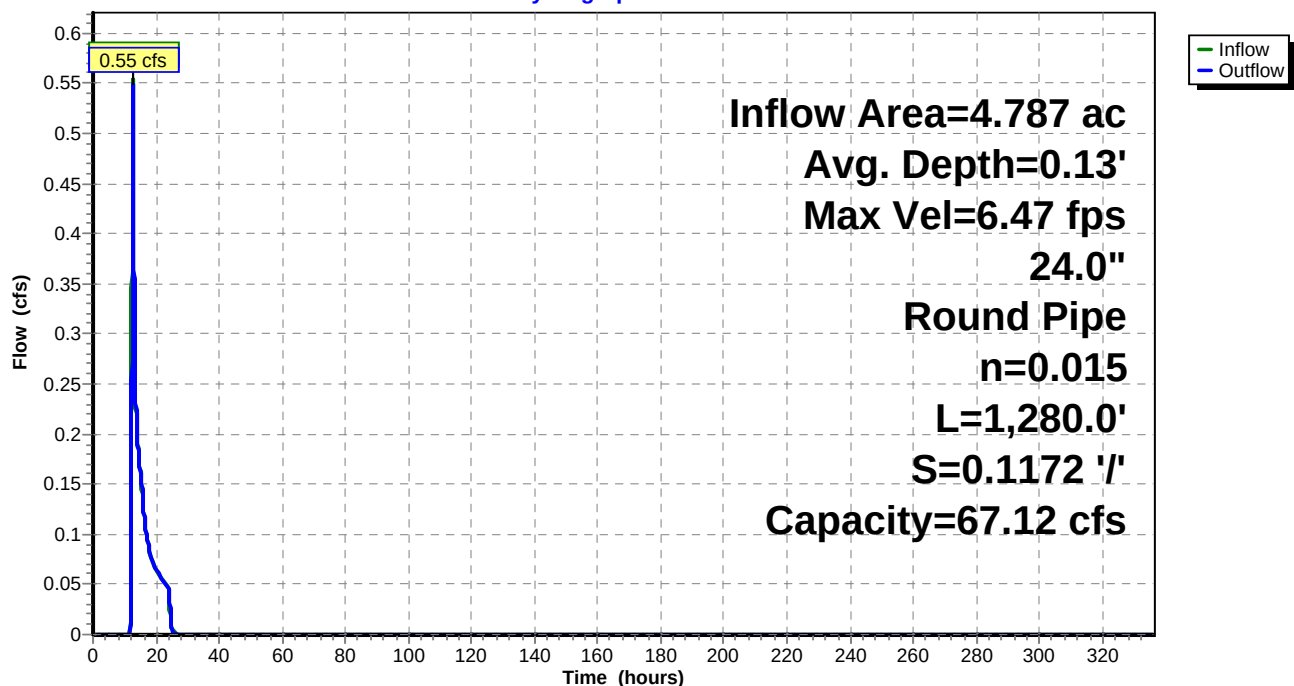
Peak Storage= 108 cf @ 12.63 hrs, Average Depth at Peak Storage= 0.13'
 Bank-Full Depth= 2.00', Capacity at Bank-Full= 67.12 cfs

24.0" Round Pipe
 n= 0.015 Concrete sewer w/manholes & inlets
 Length= 1,280.0' Slope= 0.1172 '/'
 Inlet Invert= 732.00', Outlet Invert= 582.00'



Reach 1R: Pipe

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach 1R: Pipe

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.00	0.00
10.00	0.00	0	732.00	0.00
20.00	0.06	24	732.05	0.06
30.00	0.00	0	732.00	0.00
40.00	0.00	0	732.00	0.00
50.00	0.00	0	732.00	0.00
60.00	0.00	0	732.00	0.00
70.00	0.00	0	732.00	0.00
80.00	0.00	0	732.00	0.00
90.00	0.00	0	732.00	0.00
100.00	0.00	0	732.00	0.00
110.00	0.00	0	732.00	0.00
120.00	0.00	0	732.00	0.00
130.00	0.00	0	732.00	0.00
140.00	0.00	0	732.00	0.00
150.00	0.00	0	732.00	0.00
160.00	0.00	0	732.00	0.00
170.00	0.00	0	732.00	0.00
180.00	0.00	0	732.00	0.00
190.00	0.00	0	732.00	0.00
200.00	0.00	0	732.00	0.00
210.00	0.00	0	732.00	0.00
220.00	0.00	0	732.00	0.00
230.00	0.00	0	732.00	0.00
240.00	0.00	0	732.00	0.00
250.00	0.00	0	732.00	0.00
260.00	0.00	0	732.00	0.00
270.00	0.00	0	732.00	0.00
280.00	0.00	0	732.00	0.00
290.00	0.00	0	732.00	0.00
300.00	0.00	0	732.00	0.00
310.00	0.00	0	732.00	0.00
320.00	0.00	0	732.00	0.00
330.00	0.00	0	732.00	0.00

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Stage-Area-Storage for Reach 1R: Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
732.00	0.0	0	733.04	1.7	2,113
732.02	0.0	7	733.06	1.7	2,164
732.04	0.0	19	733.08	1.7	2,215
732.06	0.0	35	733.10	1.8	2,266
732.08	0.0	54	733.12	1.8	2,317
732.10	0.1	75	733.14	1.8	2,368
732.12	0.1	99	733.16	1.9	2,418
732.14	0.1	124	733.18	1.9	2,469
732.16	0.1	151	733.20	2.0	2,519
732.18	0.1	179	733.22	2.0	2,569
732.20	0.2	209	733.24	2.0	2,619
732.22	0.2	241	733.26	2.1	2,669
732.24	0.2	273	733.28	2.1	2,718
732.26	0.2	307	733.30	2.2	2,767
732.28	0.3	342	733.32	2.2	2,816
732.30	0.3	378	733.34	2.2	2,864
732.32	0.3	415	733.36	2.3	2,912
732.34	0.4	453	733.38	2.3	2,959
732.36	0.4	492	733.40	2.3	3,007
732.38	0.4	532	733.42	2.4	3,053
732.40	0.4	573	733.44	2.4	3,100
732.42	0.5	614	733.46	2.5	3,145
732.44	0.5	656	733.48	2.5	3,190
732.46	0.5	699	733.50	2.5	3,235
732.48	0.6	742	733.52	2.6	3,279
732.50	0.6	786	733.54	2.6	3,323
732.52	0.6	831	733.56	2.6	3,365
732.54	0.7	876	733.58	2.7	3,407
732.56	0.7	922	733.60	2.7	3,449
732.58	0.8	968	733.62	2.7	3,489
732.60	0.8	1,015	733.64	2.8	3,529
732.62	0.8	1,062	733.66	2.8	3,568
732.64	0.9	1,109	733.68	2.8	3,606
732.66	0.9	1,157	733.70	2.8	3,643
732.68	0.9	1,206	733.72	2.9	3,679
732.70	1.0	1,254	733.74	2.9	3,714
732.72	1.0	1,303	733.76	2.9	3,748
732.74	1.1	1,353	733.78	3.0	3,781
732.76	1.1	1,402	733.80	3.0	3,812
732.78	1.1	1,452	733.82	3.0	3,842
732.80	1.2	1,502	733.84	3.0	3,871
732.82	1.2	1,552	733.86	3.0	3,897
732.84	1.3	1,603	733.88	3.1	3,923
732.86	1.3	1,653	733.90	3.1	3,946
732.88	1.3	1,704	733.92	3.1	3,967
732.90	1.4	1,755	733.94	3.1	3,986
732.92	1.4	1,806	733.96	3.1	4,002
732.94	1.5	1,857	733.98	3.1	4,014
732.96	1.5	1,908	734.00	3.1	4,021
732.98	1.5	1,959			
733.00	1.6	2,011			
733.02	1.6	2,062			

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Reach 2R: Watercourse

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 0.31" for 1 Year, 24 Hr. Event event
 Inflow = 0.55 cfs @ 12.63 hrs, Volume= 0.122 af
 Outflow = 0.55 cfs @ 12.65 hrs, Volume= 0.122 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 3.67 fps, Min. Travel Time= 1.5 min

Avg. Velocity= 2.04 fps, Avg. Travel Time= 2.7 min

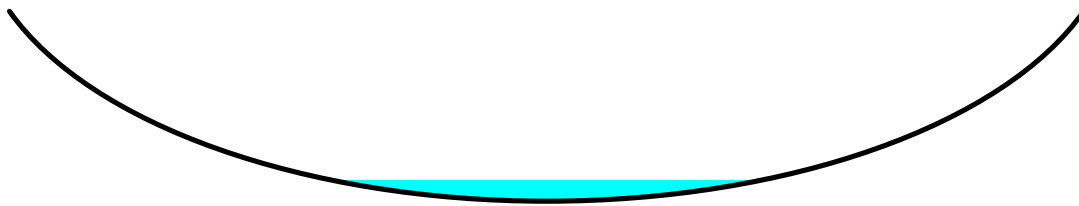
Peak Storage= 50 cf @ 12.65 hrs, Average Depth at Peak Storage= 0.11'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 60.85 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

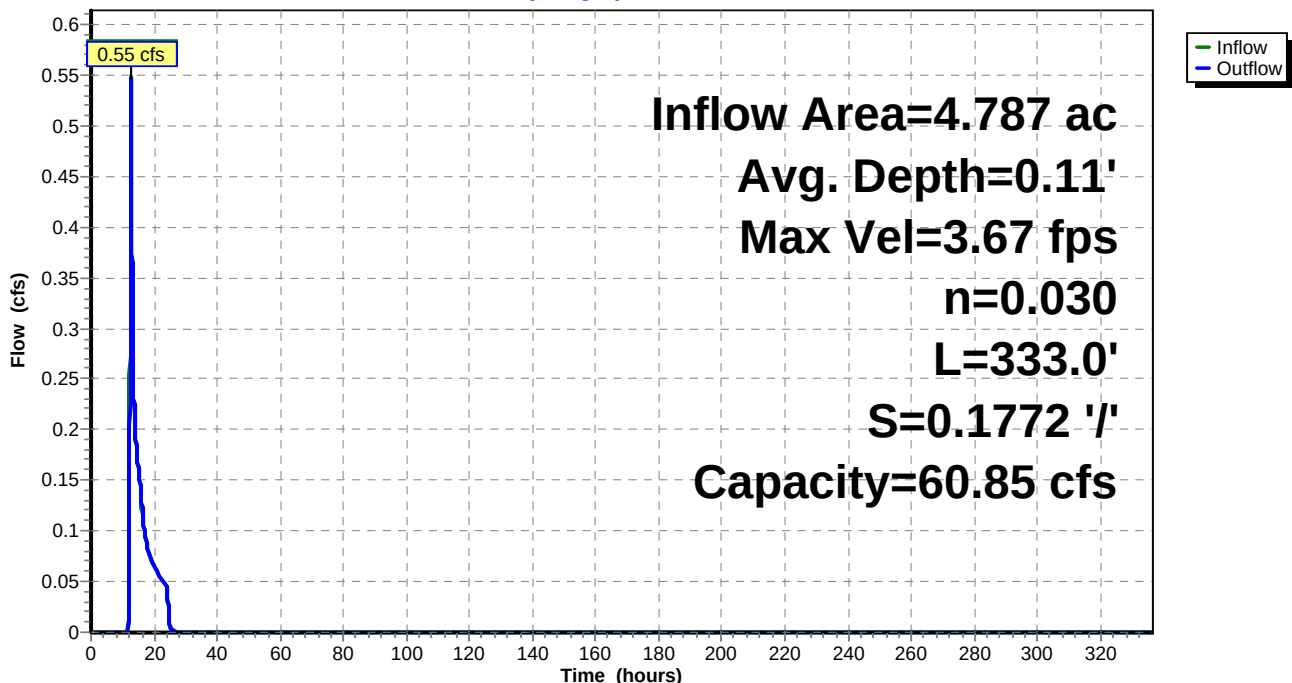
Length= 333.0' Slope= 0.1772 '/'

Inlet Invert= 581.00', Outlet Invert= 522.00'



Reach 2R: Watercourse

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach 2R: Watercourse

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	581.00	0.00
10.00	0.00	0	581.00	0.00
20.00	0.06	11	581.04	0.06
30.00	0.00	0	581.00	0.00
40.00	0.00	0	581.00	0.00
50.00	0.00	0	581.00	0.00
60.00	0.00	0	581.00	0.00
70.00	0.00	0	581.00	0.00
80.00	0.00	0	581.00	0.00
90.00	0.00	0	581.00	0.00
100.00	0.00	0	581.00	0.00
110.00	0.00	0	581.00	0.00
120.00	0.00	0	581.00	0.00
130.00	0.00	0	581.00	0.00
140.00	0.00	0	581.00	0.00
150.00	0.00	0	581.00	0.00
160.00	0.00	0	581.00	0.00
170.00	0.00	0	581.00	0.00
180.00	0.00	0	581.00	0.00
190.00	0.00	0	581.00	0.00
200.00	0.00	0	581.00	0.00
210.00	0.00	0	581.00	0.00
220.00	0.00	0	581.00	0.00
230.00	0.00	0	581.00	0.00
240.00	0.00	0	581.00	0.00
250.00	0.00	0	581.00	0.00
260.00	0.00	0	581.00	0.00
270.00	0.00	0	581.00	0.00
280.00	0.00	0	581.00	0.00
290.00	0.00	0	581.00	0.00
300.00	0.00	0	581.00	0.00
310.00	0.00	0	581.00	0.00
320.00	0.00	0	581.00	0.00
330.00	0.00	0	581.00	0.00

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Stage-Area-Storage for Reach 2R: Watercourse

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
581.00	0.0	0	581.52	1.5	499
581.01	0.0	1	581.53	1.5	514
581.02	0.0	4	581.54	1.6	529
581.03	0.0	7	581.55	1.6	543
581.04	0.0	11	581.56	1.7	558
581.05	0.0	15	581.57	1.7	573
581.06	0.1	20	581.58	1.8	588
581.07	0.1	25	581.59	1.8	604
581.08	0.1	30	581.60	1.9	619
581.09	0.1	36	581.61	1.9	635
581.10	0.1	42	581.62	2.0	650
581.11	0.1	49	581.63	2.0	666
581.12	0.2	55	581.64	2.0	682
581.13	0.2	62	581.65	2.1	698
581.14	0.2	70	581.66	2.1	714
581.15	0.2	77	581.67	2.2	730
581.16	0.3	85	581.68	2.2	747
581.17	0.3	93	581.69	2.3	763
581.18	0.3	102	581.70	2.3	780
581.19	0.3	110	581.71	2.4	797
581.20	0.4	119	581.72	2.4	814
581.21	0.4	128	581.73	2.5	831
581.22	0.4	137	581.74	2.5	848
581.23	0.4	147	581.75	2.6	865
581.24	0.5	157	581.76	2.7	883
581.25	0.5	167	581.77	2.7	900
581.26	0.5	177	581.78	2.8	918
581.27	0.6	187	581.79	2.8	935
581.28	0.6	197	581.80	2.9	953
581.29	0.6	208	581.81	2.9	971
581.30	0.7	219	581.82	3.0	989
581.31	0.7	230	581.83	3.0	1,007
581.32	0.7	241	581.84	3.1	1,025
581.33	0.8	253	581.85	3.1	1,044
581.34	0.8	264	581.86	3.2	1,062
581.35	0.8	276	581.87	3.2	1,081
581.36	0.9	288	581.88	3.3	1,100
581.37	0.9	300	581.89	3.4	1,118
581.38	0.9	312	581.90	3.4	1,137
581.39	1.0	324	581.91	3.5	1,156
581.40	1.0	337	581.92	3.5	1,175
581.41	1.1	350	581.93	3.6	1,195
581.42	1.1	363	581.94	3.6	1,214
581.43	1.1	376	581.95	3.7	1,233
581.44	1.2	389	581.96	3.8	1,253
581.45	1.2	402	581.97	3.8	1,273
581.46	1.2	416	581.98	3.9	1,292
581.47	1.3	429	581.99	3.9	1,312
581.48	1.3	443	582.00	4.0	1,332
581.49	1.4	457			
581.50	1.4	471			
581.51	1.5	485			

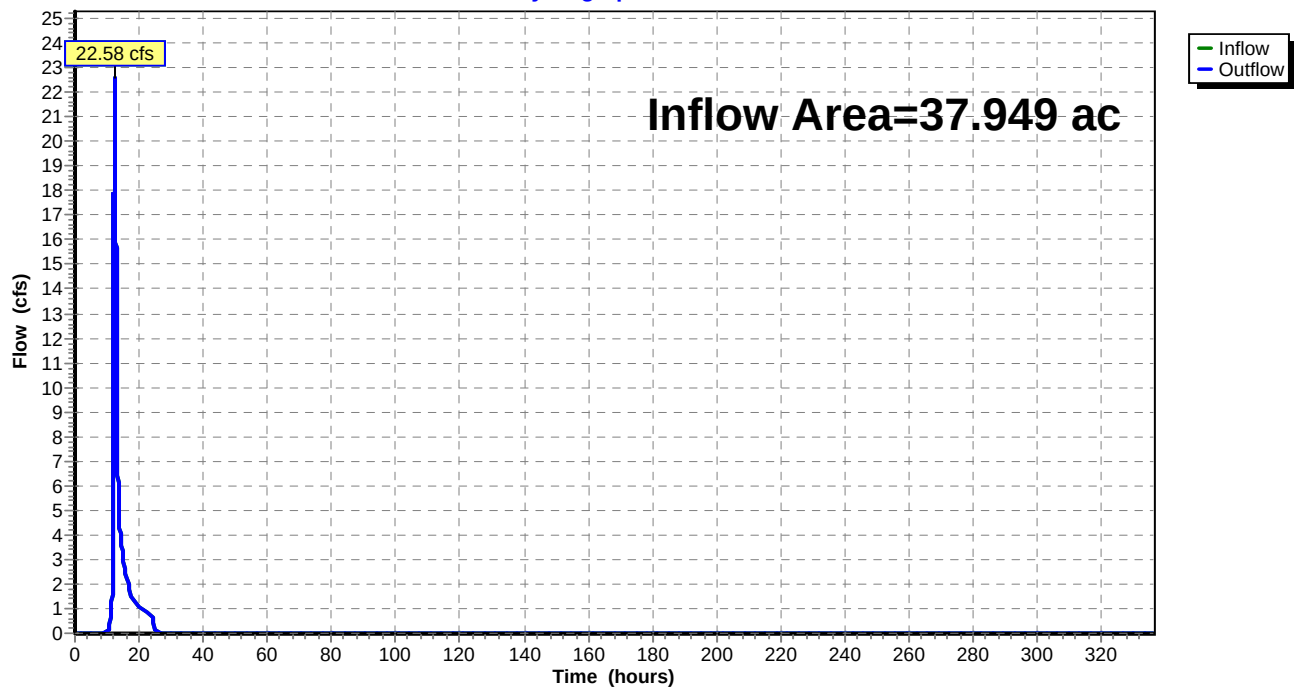
Summary for Reach DP 1B: PROP DP 1B

Inflow Area = 37.949 ac, 33.22% Impervious, Inflow Depth = 1.11" for 1 Year, 24 Hr. Event event
Inflow = 22.58 cfs @ 12.45 hrs, Volume= 3.514 af
Outflow = 22.58 cfs @ 12.45 hrs, Volume= 3.514 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1B: PROP DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach DP 1B: PROP DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.02		0.02	270.00	0.00		0.00
15.00	3.11		3.11	275.00	0.00		0.00
20.00	1.07		1.07	280.00	0.00		0.00
25.00	0.03		0.03	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

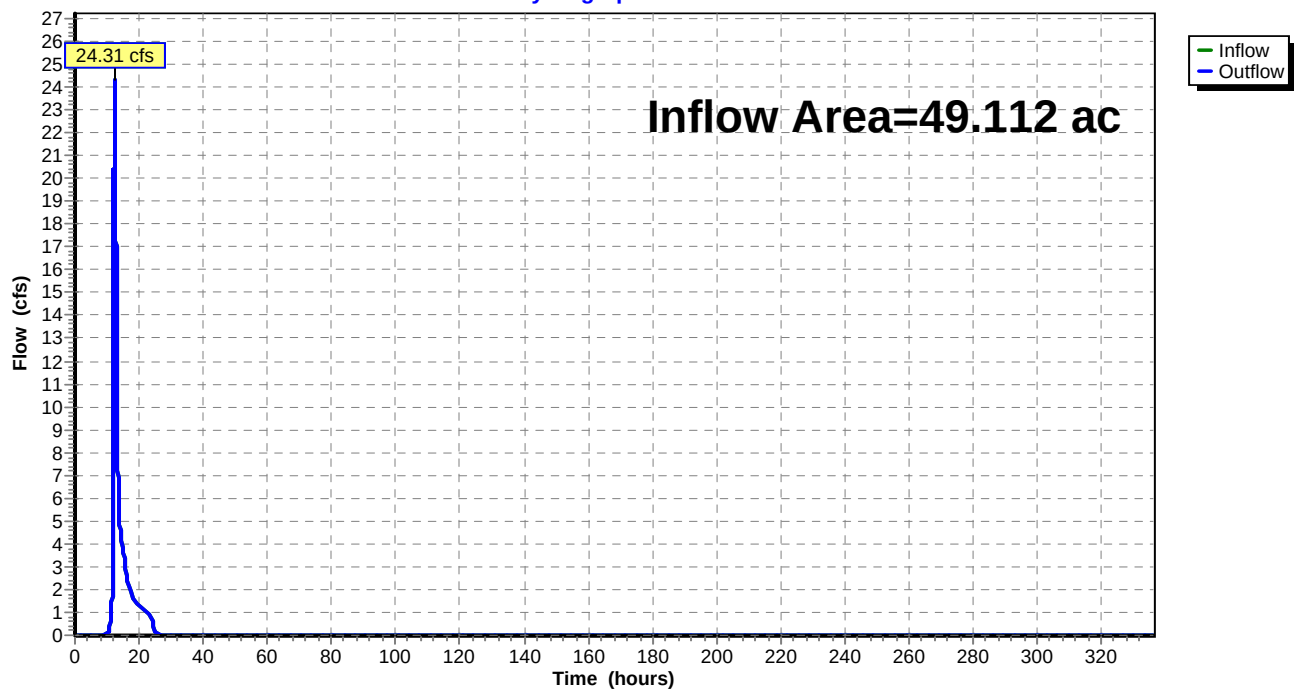
Summary for Reach EX DP !B: Existing DP 1B

Inflow Area = 49.112 ac, 26.08% Impervious, Inflow Depth = 0.98" for 1 Year, 24 Hr. Event event
Inflow = 24.31 cfs @ 12.43 hrs, Volume= 4.001 af
Outflow = 24.31 cfs @ 12.43 hrs, Volume= 4.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP !B: Existing DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach EX DP 1B: Existing DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.01		0.01	270.00	0.00		0.00
15.00	3.64		3.64	275.00	0.00		0.00
20.00	1.28		1.28	280.00	0.00		0.00
25.00	0.03		0.03	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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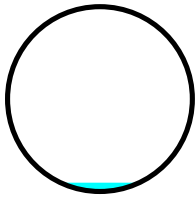
Summary for Reach R 1R: PROP 1R

Inflow Area = 4.017 ac, 0.00% Impervious, Inflow Depth = 0.22" for 1 Year, 24 Hr. Event event
 Inflow = 0.31 cfs @ 12.50 hrs, Volume= 0.074 af
 Outflow = 0.30 cfs @ 12.53 hrs, Volume= 0.074 af, Atten= 1%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 5.69 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 3.50 fps, Avg. Travel Time= 4.5 min

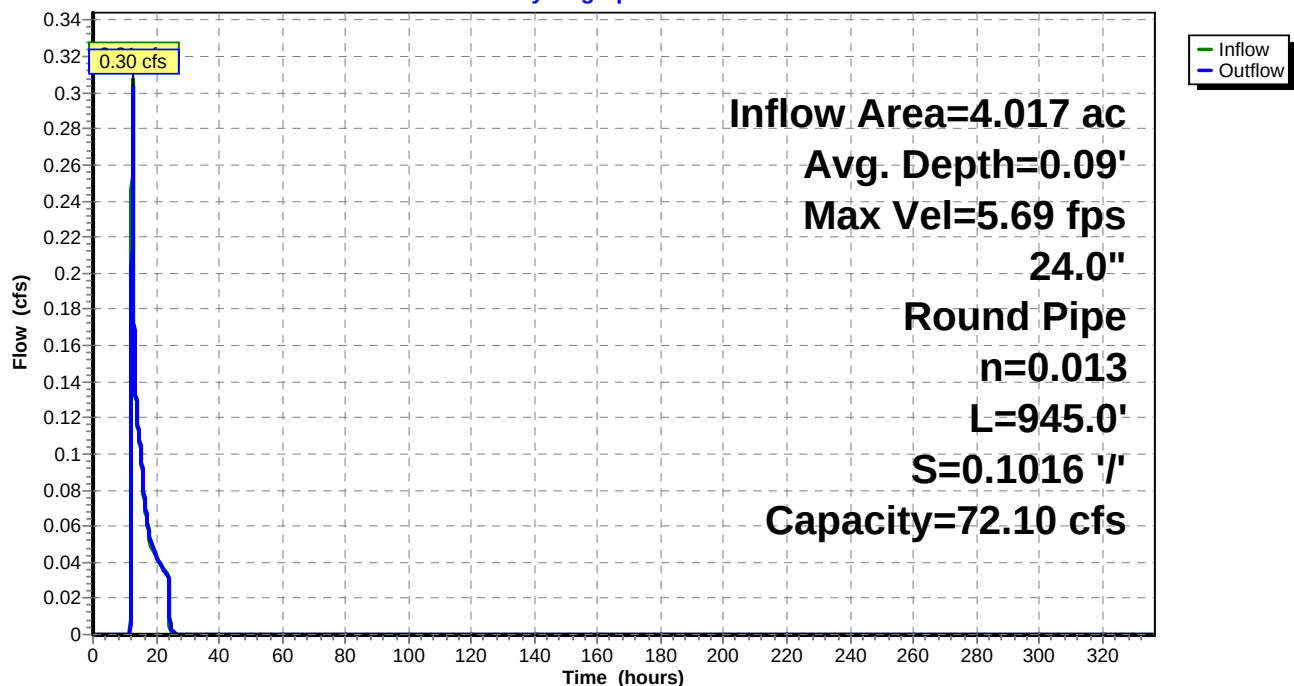
Peak Storage= 50 cf @ 12.53 hrs, Average Depth at Peak Storage= 0.09'
 Bank-Full Depth= 2.00', Capacity at Bank-Full= 72.10 cfs

24.0" Round Pipe
 n= 0.013 Corrugated PE, smooth interior
 Length= 945.0' Slope= 0.1016 '/
 Inlet Invert= 746.00', Outlet Invert= 650.00'



Reach R 1R: PROP 1R

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach R 1R: PROP 1R

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	746.00	0.00
10.00	0.00	0	746.00	0.00
20.00	0.04	13	746.04	0.04
30.00	0.00	0	746.00	0.00
40.00	0.00	0	746.00	0.00
50.00	0.00	0	746.00	0.00
60.00	0.00	0	746.00	0.00
70.00	0.00	0	746.00	0.00
80.00	0.00	0	746.00	0.00
90.00	0.00	0	746.00	0.00
100.00	0.00	0	746.00	0.00
110.00	0.00	0	746.00	0.00
120.00	0.00	0	746.00	0.00
130.00	0.00	0	746.00	0.00
140.00	0.00	0	746.00	0.00
150.00	0.00	0	746.00	0.00
160.00	0.00	0	746.00	0.00
170.00	0.00	0	746.00	0.00
180.00	0.00	0	746.00	0.00
190.00	0.00	0	746.00	0.00
200.00	0.00	0	746.00	0.00
210.00	0.00	0	746.00	0.00
220.00	0.00	0	746.00	0.00
230.00	0.00	0	746.00	0.00
240.00	0.00	0	746.00	0.00
250.00	0.00	0	746.00	0.00
260.00	0.00	0	746.00	0.00
270.00	0.00	0	746.00	0.00
280.00	0.00	0	746.00	0.00
290.00	0.00	0	746.00	0.00
300.00	0.00	0	746.00	0.00
310.00	0.00	0	746.00	0.00
320.00	0.00	0	746.00	0.00
330.00	0.00	0	746.00	0.00

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Stage-Area-Storage for Reach R 1R: PROP 1R

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
746.00	0.0	0	747.04	1.7	1,560
746.02	0.0	5	747.06	1.7	1,598
746.04	0.0	14	747.08	1.7	1,635
746.06	0.0	26	747.10	1.8	1,673
746.08	0.0	40	747.12	1.8	1,711
746.10	0.1	55	747.14	1.8	1,748
746.12	0.1	73	747.16	1.9	1,786
746.14	0.1	91	747.18	1.9	1,823
746.16	0.1	111	747.20	2.0	1,860
746.18	0.1	132	747.22	2.0	1,897
746.20	0.2	155	747.24	2.0	1,934
746.22	0.2	178	747.26	2.1	1,970
746.24	0.2	202	747.28	2.1	2,007
746.26	0.2	227	747.30	2.2	2,043
746.28	0.3	253	747.32	2.2	2,079
746.30	0.3	279	747.34	2.2	2,114
746.32	0.3	307	747.36	2.3	2,150
746.34	0.4	335	747.38	2.3	2,185
746.36	0.4	363	747.40	2.3	2,220
746.38	0.4	393	747.42	2.4	2,254
746.40	0.4	423	747.44	2.4	2,288
746.42	0.5	453	747.46	2.5	2,322
746.44	0.5	484	747.48	2.5	2,355
746.46	0.5	516	747.50	2.5	2,388
746.48	0.6	548	747.52	2.6	2,421
746.50	0.6	580	747.54	2.6	2,453
746.52	0.6	613	747.56	2.6	2,485
746.54	0.7	647	747.58	2.7	2,516
746.56	0.7	680	747.60	2.7	2,546
746.58	0.8	715	747.62	2.7	2,576
746.60	0.8	749	747.64	2.8	2,605
746.62	0.8	784	747.66	2.8	2,634
746.64	0.9	819	747.68	2.8	2,662
746.66	0.9	854	747.70	2.8	2,690
746.68	0.9	890	747.72	2.9	2,716
746.70	1.0	926	747.74	2.9	2,742
746.72	1.0	962	747.76	2.9	2,767
746.74	1.1	999	747.78	3.0	2,791
746.76	1.1	1,035	747.80	3.0	2,814
746.78	1.1	1,072	747.82	3.0	2,836
746.80	1.2	1,109	747.84	3.0	2,858
746.82	1.2	1,146	747.86	3.0	2,877
746.84	1.3	1,183	747.88	3.1	2,896
746.86	1.3	1,221	747.90	3.1	2,913
746.88	1.3	1,258	747.92	3.1	2,929
746.90	1.4	1,296	747.94	3.1	2,943
746.92	1.4	1,333	747.96	3.1	2,955
746.94	1.5	1,371	747.98	3.1	2,964
746.96	1.5	1,409	748.00	3.1	2,969
746.98	1.5	1,447			
747.00	1.6	1,484			
747.02	1.6	1,522			

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1A: PROP 1A

Runoff = 0.61 cfs @ 12.43 hrs, Volume= 0.116 af, Depth= 0.35"

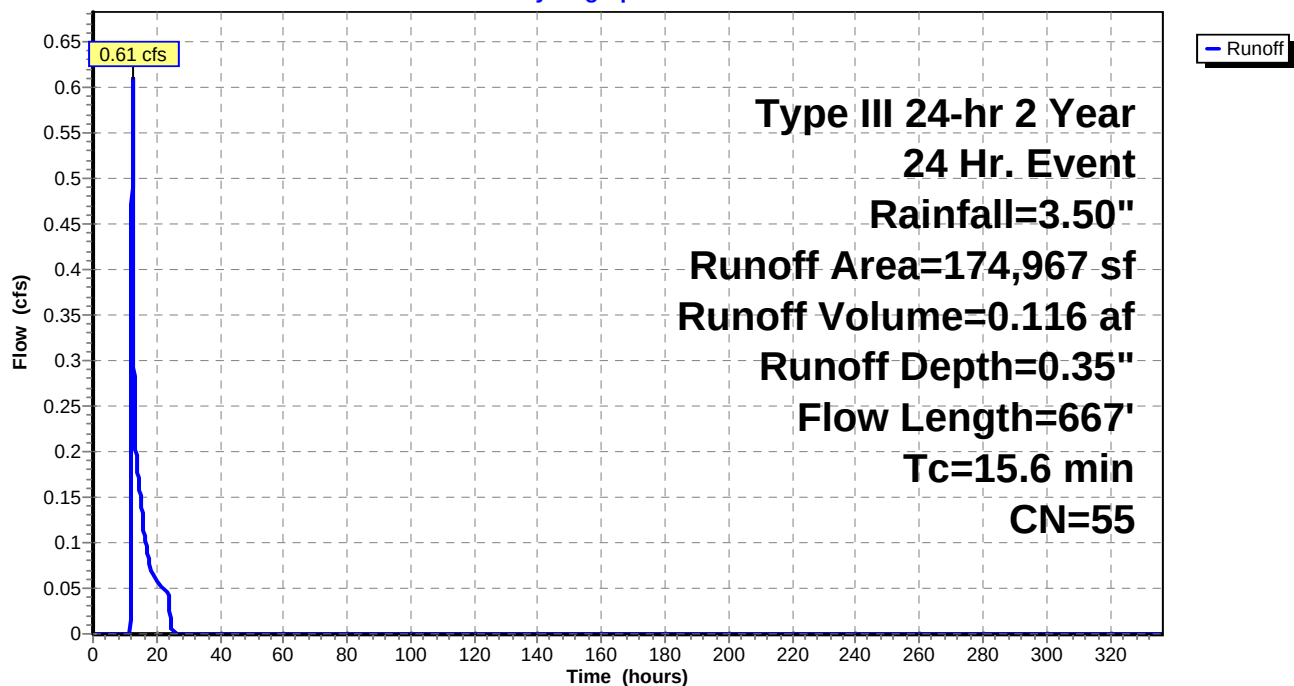
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
174,967	55	Woods, Good, HSG B
174,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	567	0.1790	6.81		Shallow Concentrated Flow, woods
					Unpaved Kv= 16.1 fps
15.6	667	Total			

Subcatchment 1A: PROP 1A

Hydrograph



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Hydrograph for Subcatchment 1A: PROP 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.35	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.35	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.35	0.00
15.00	2.99	0.19	0.15	275.00	3.50	0.35	0.00
20.00	3.35	0.30	0.06	280.00	3.50	0.35	0.00
25.00	3.50	0.35	0.00	285.00	3.50	0.35	0.00
30.00	3.50	0.35	0.00	290.00	3.50	0.35	0.00
35.00	3.50	0.35	0.00	295.00	3.50	0.35	0.00
40.00	3.50	0.35	0.00	300.00	3.50	0.35	0.00
45.00	3.50	0.35	0.00	305.00	3.50	0.35	0.00
50.00	3.50	0.35	0.00	310.00	3.50	0.35	0.00
55.00	3.50	0.35	0.00	315.00	3.50	0.35	0.00
60.00	3.50	0.35	0.00	320.00	3.50	0.35	0.00
65.00	3.50	0.35	0.00	325.00	3.50	0.35	0.00
70.00	3.50	0.35	0.00	330.00	3.50	0.35	0.00
75.00	3.50	0.35	0.00	335.00	3.50	0.35	0.00
80.00	3.50	0.35	0.00				
85.00	3.50	0.35	0.00				
90.00	3.50	0.35	0.00				
95.00	3.50	0.35	0.00				
100.00	3.50	0.35	0.00				
105.00	3.50	0.35	0.00				
110.00	3.50	0.35	0.00				
115.00	3.50	0.35	0.00				
120.00	3.50	0.35	0.00				
125.00	3.50	0.35	0.00				
130.00	3.50	0.35	0.00				
135.00	3.50	0.35	0.00				
140.00	3.50	0.35	0.00				
145.00	3.50	0.35	0.00				
150.00	3.50	0.35	0.00				
155.00	3.50	0.35	0.00				
160.00	3.50	0.35	0.00				
165.00	3.50	0.35	0.00				
170.00	3.50	0.35	0.00				
175.00	3.50	0.35	0.00				
180.00	3.50	0.35	0.00				
185.00	3.50	0.35	0.00				
190.00	3.50	0.35	0.00				
195.00	3.50	0.35	0.00				
200.00	3.50	0.35	0.00				
205.00	3.50	0.35	0.00				
210.00	3.50	0.35	0.00				
215.00	3.50	0.35	0.00				
220.00	3.50	0.35	0.00				
225.00	3.50	0.35	0.00				
230.00	3.50	0.35	0.00				
235.00	3.50	0.35	0.00				
240.00	3.50	0.35	0.00				
245.00	3.50	0.35	0.00				
250.00	3.50	0.35	0.00				
255.00	3.50	0.35	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1D: PROP ID

Runoff = 23.19 cfs @ 12.49 hrs, Volume= 3.167 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

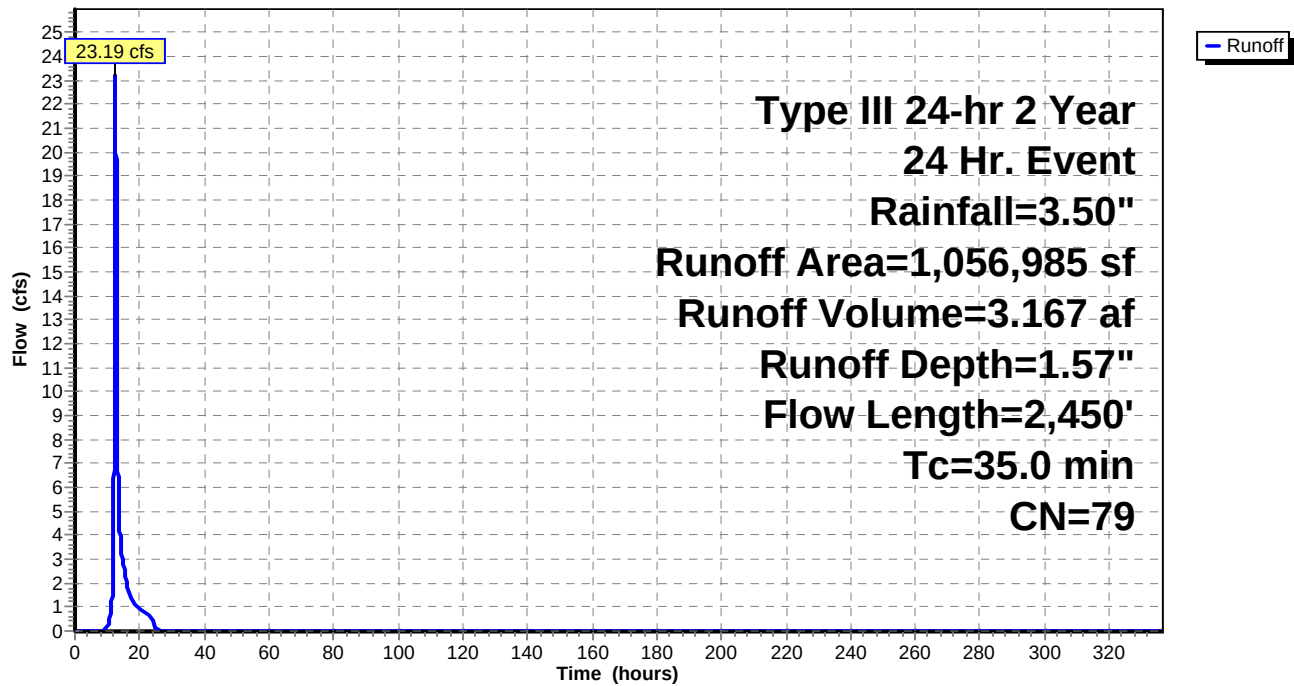
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
250,952	74	>75% Grass cover, Good, HSG C
1,056,985	79	Weighted Average
589,151		55.74% Pervious Area
467,834		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	800	0.1000	22.77	71.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
35.0	2,450	Total			

Subcatchment 1D: PROP ID

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1D: PROP ID

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.57	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.57	0.00
10.00	0.66	0.01	0.13	270.00	3.50	1.57	0.00
15.00	2.99	1.18	2.71	275.00	3.50	1.57	0.00
20.00	3.35	1.45	0.90	280.00	3.50	1.57	0.00
25.00	3.50	1.57	0.03	285.00	3.50	1.57	0.00
30.00	3.50	1.57	0.00	290.00	3.50	1.57	0.00
35.00	3.50	1.57	0.00	295.00	3.50	1.57	0.00
40.00	3.50	1.57	0.00	300.00	3.50	1.57	0.00
45.00	3.50	1.57	0.00	305.00	3.50	1.57	0.00
50.00	3.50	1.57	0.00	310.00	3.50	1.57	0.00
55.00	3.50	1.57	0.00	315.00	3.50	1.57	0.00
60.00	3.50	1.57	0.00	320.00	3.50	1.57	0.00
65.00	3.50	1.57	0.00	325.00	3.50	1.57	0.00
70.00	3.50	1.57	0.00	330.00	3.50	1.57	0.00
75.00	3.50	1.57	0.00	335.00	3.50	1.57	0.00
80.00	3.50	1.57	0.00				
85.00	3.50	1.57	0.00				
90.00	3.50	1.57	0.00				
95.00	3.50	1.57	0.00				
100.00	3.50	1.57	0.00				
105.00	3.50	1.57	0.00				
110.00	3.50	1.57	0.00				
115.00	3.50	1.57	0.00				
120.00	3.50	1.57	0.00				
125.00	3.50	1.57	0.00				
130.00	3.50	1.57	0.00				
135.00	3.50	1.57	0.00				
140.00	3.50	1.57	0.00				
145.00	3.50	1.57	0.00				
150.00	3.50	1.57	0.00				
155.00	3.50	1.57	0.00				
160.00	3.50	1.57	0.00				
165.00	3.50	1.57	0.00				
170.00	3.50	1.57	0.00				
175.00	3.50	1.57	0.00				
180.00	3.50	1.57	0.00				
185.00	3.50	1.57	0.00				
190.00	3.50	1.57	0.00				
195.00	3.50	1.57	0.00				
200.00	3.50	1.57	0.00				
205.00	3.50	1.57	0.00				
210.00	3.50	1.57	0.00				
215.00	3.50	1.57	0.00				
220.00	3.50	1.57	0.00				
225.00	3.50	1.57	0.00				
230.00	3.50	1.57	0.00				
235.00	3.50	1.57	0.00				
240.00	3.50	1.57	0.00				
245.00	3.50	1.57	0.00				
250.00	3.50	1.57	0.00				
255.00	3.50	1.57	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1K: PROP DA 1K

Runoff = 5.47 cfs @ 12.10 hrs, Volume= 0.402 af, Depth= 1.57"

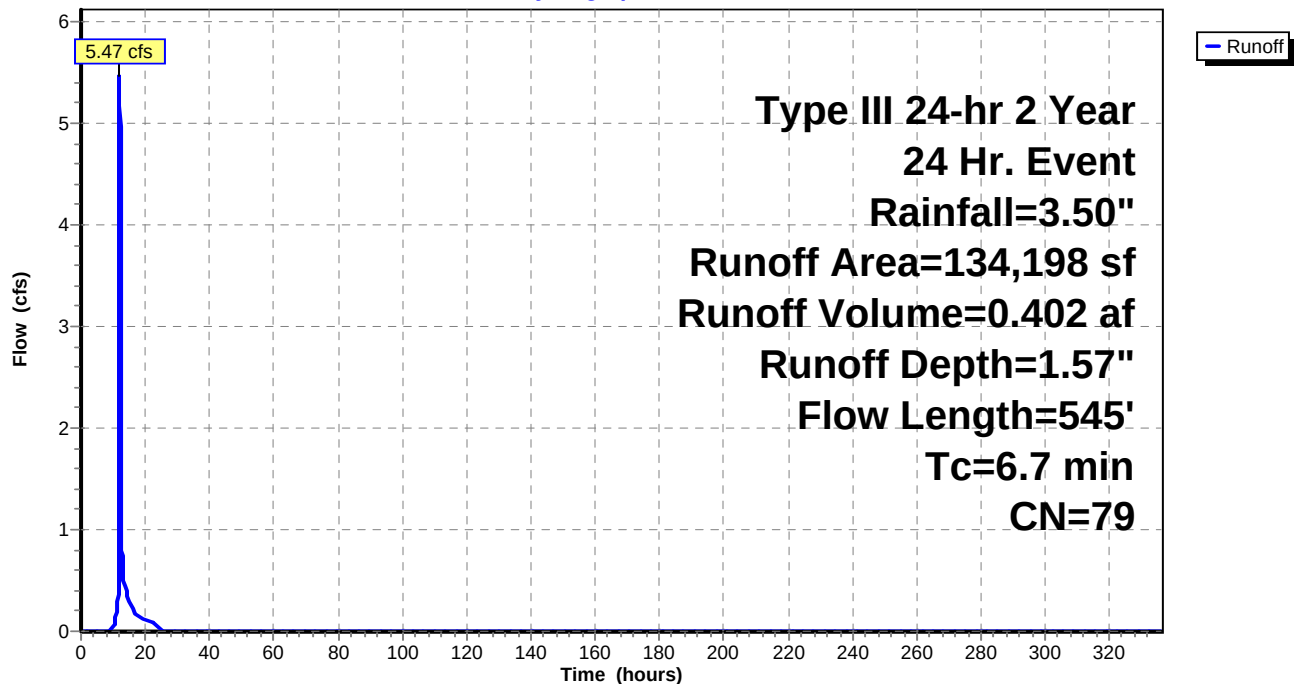
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
108,493	74	>75% Grass cover, Good, HSG C
9,729	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
134,198	79	Weighted Average
108,493		80.85% Pervious Area
25,705		19.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	80	0.1000	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	195	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	270	0.1850	22.86	228.55	Channel Flow, Area= 10.0 sf Perim= 9.0' r= 1.11' n= 0.030 Earth, grassed & winding
6.7	545	Total			

Subcatchment 1K: PROP DA 1K

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1K: PROP DA 1K

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.57	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.57	0.00
10.00	0.66	0.01	0.04	270.00	3.50	1.57	0.00
15.00	2.99	1.18	0.31	275.00	3.50	1.57	0.00
20.00	3.35	1.45	0.11	280.00	3.50	1.57	0.00
25.00	3.50	1.57	0.00	285.00	3.50	1.57	0.00
30.00	3.50	1.57	0.00	290.00	3.50	1.57	0.00
35.00	3.50	1.57	0.00	295.00	3.50	1.57	0.00
40.00	3.50	1.57	0.00	300.00	3.50	1.57	0.00
45.00	3.50	1.57	0.00	305.00	3.50	1.57	0.00
50.00	3.50	1.57	0.00	310.00	3.50	1.57	0.00
55.00	3.50	1.57	0.00	315.00	3.50	1.57	0.00
60.00	3.50	1.57	0.00	320.00	3.50	1.57	0.00
65.00	3.50	1.57	0.00	325.00	3.50	1.57	0.00
70.00	3.50	1.57	0.00	330.00	3.50	1.57	0.00
75.00	3.50	1.57	0.00	335.00	3.50	1.57	0.00
80.00	3.50	1.57	0.00				
85.00	3.50	1.57	0.00				
90.00	3.50	1.57	0.00				
95.00	3.50	1.57	0.00				
100.00	3.50	1.57	0.00				
105.00	3.50	1.57	0.00				
110.00	3.50	1.57	0.00				
115.00	3.50	1.57	0.00				
120.00	3.50	1.57	0.00				
125.00	3.50	1.57	0.00				
130.00	3.50	1.57	0.00				
135.00	3.50	1.57	0.00				
140.00	3.50	1.57	0.00				
145.00	3.50	1.57	0.00				
150.00	3.50	1.57	0.00				
155.00	3.50	1.57	0.00				
160.00	3.50	1.57	0.00				
165.00	3.50	1.57	0.00				
170.00	3.50	1.57	0.00				
175.00	3.50	1.57	0.00				
180.00	3.50	1.57	0.00				
185.00	3.50	1.57	0.00				
190.00	3.50	1.57	0.00				
195.00	3.50	1.57	0.00				
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215.00	3.50	1.57	0.00				
220.00	3.50	1.57	0.00				
225.00	3.50	1.57	0.00				
230.00	3.50	1.57	0.00				
235.00	3.50	1.57	0.00				
240.00	3.50	1.57	0.00				
245.00	3.50	1.57	0.00				
250.00	3.50	1.57	0.00				
255.00	3.50	1.57	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1L: PROP 1I

Runoff = 9.35 cfs @ 12.11 hrs, Volume= 0.715 af, Depth= 1.30"

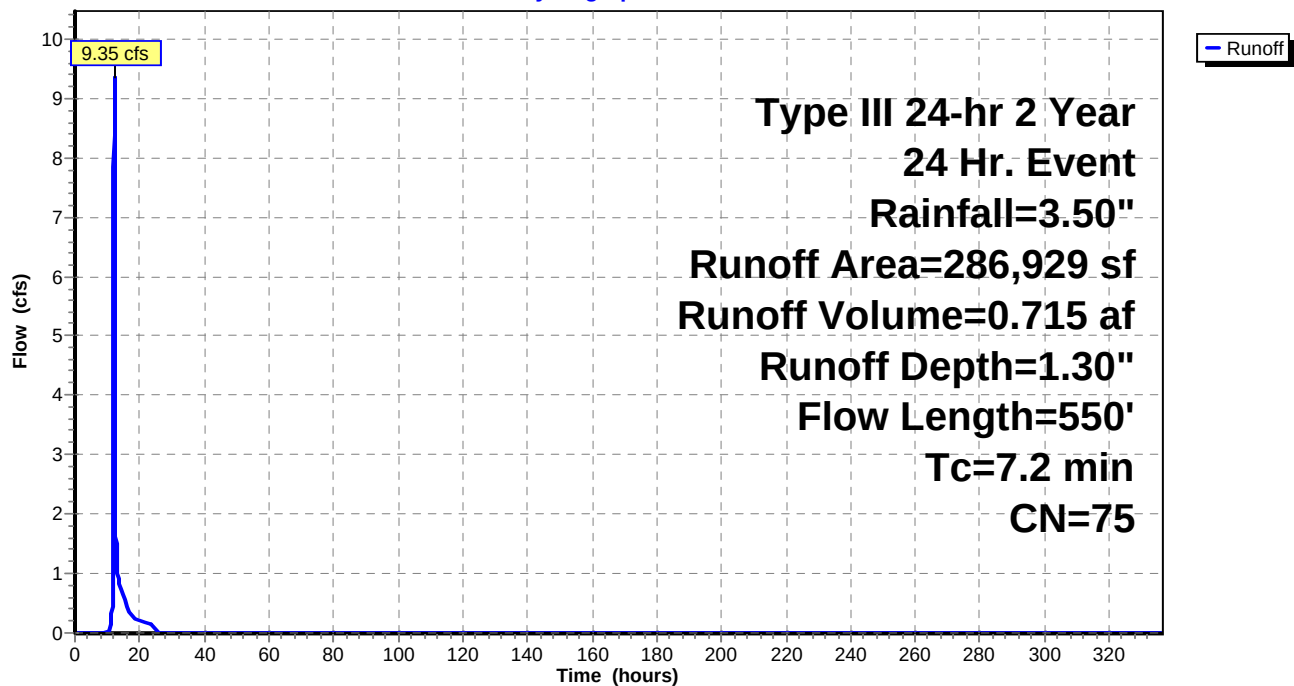
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
86,205	61	>75% Grass cover, Good, HSG B
145,054	74	>75% Grass cover, Good, HSG C
286,929	75	Weighted Average
231,259		80.60% Pervious Area
55,670		19.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	450	0.1640	2.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	550	Total			

Subcatchment 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.30	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.30	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.30	0.00
15.00	2.99	0.95	0.59	275.00	3.50	1.30	0.00
20.00	3.35	1.20	0.21	280.00	3.50	1.30	0.00
25.00	3.50	1.30	0.00	285.00	3.50	1.30	0.00
30.00	3.50	1.30	0.00	290.00	3.50	1.30	0.00
35.00	3.50	1.30	0.00	295.00	3.50	1.30	0.00
40.00	3.50	1.30	0.00	300.00	3.50	1.30	0.00
45.00	3.50	1.30	0.00	305.00	3.50	1.30	0.00
50.00	3.50	1.30	0.00	310.00	3.50	1.30	0.00
55.00	3.50	1.30	0.00	315.00	3.50	1.30	0.00
60.00	3.50	1.30	0.00	320.00	3.50	1.30	0.00
65.00	3.50	1.30	0.00	325.00	3.50	1.30	0.00
70.00	3.50	1.30	0.00	330.00	3.50	1.30	0.00
75.00	3.50	1.30	0.00	335.00	3.50	1.30	0.00
80.00	3.50	1.30	0.00				
85.00	3.50	1.30	0.00				
90.00	3.50	1.30	0.00				
95.00	3.50	1.30	0.00				
100.00	3.50	1.30	0.00				
105.00	3.50	1.30	0.00				
110.00	3.50	1.30	0.00				
115.00	3.50	1.30	0.00				
120.00	3.50	1.30	0.00				
125.00	3.50	1.30	0.00				
130.00	3.50	1.30	0.00				
135.00	3.50	1.30	0.00				
140.00	3.50	1.30	0.00				
145.00	3.50	1.30	0.00				
150.00	3.50	1.30	0.00				
155.00	3.50	1.30	0.00				
160.00	3.50	1.30	0.00				
165.00	3.50	1.30	0.00				
170.00	3.50	1.30	0.00				
175.00	3.50	1.30	0.00				
180.00	3.50	1.30	0.00				
185.00	3.50	1.30	0.00				
190.00	3.50	1.30	0.00				
195.00	3.50	1.30	0.00				
200.00	3.50	1.30	0.00				
205.00	3.50	1.30	0.00				
210.00	3.50	1.30	0.00				
215.00	3.50	1.30	0.00				
220.00	3.50	1.30	0.00				
225.00	3.50	1.30	0.00				
230.00	3.50	1.30	0.00				
235.00	3.50	1.30	0.00				
240.00	3.50	1.30	0.00				
245.00	3.50	1.30	0.00				
250.00	3.50	1.30	0.00				
255.00	3.50	1.30	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1D: EXIST 1D

Runoff = 2.32 cfs @ 12.34 hrs, Volume= 0.331 af, Depth= 0.57"

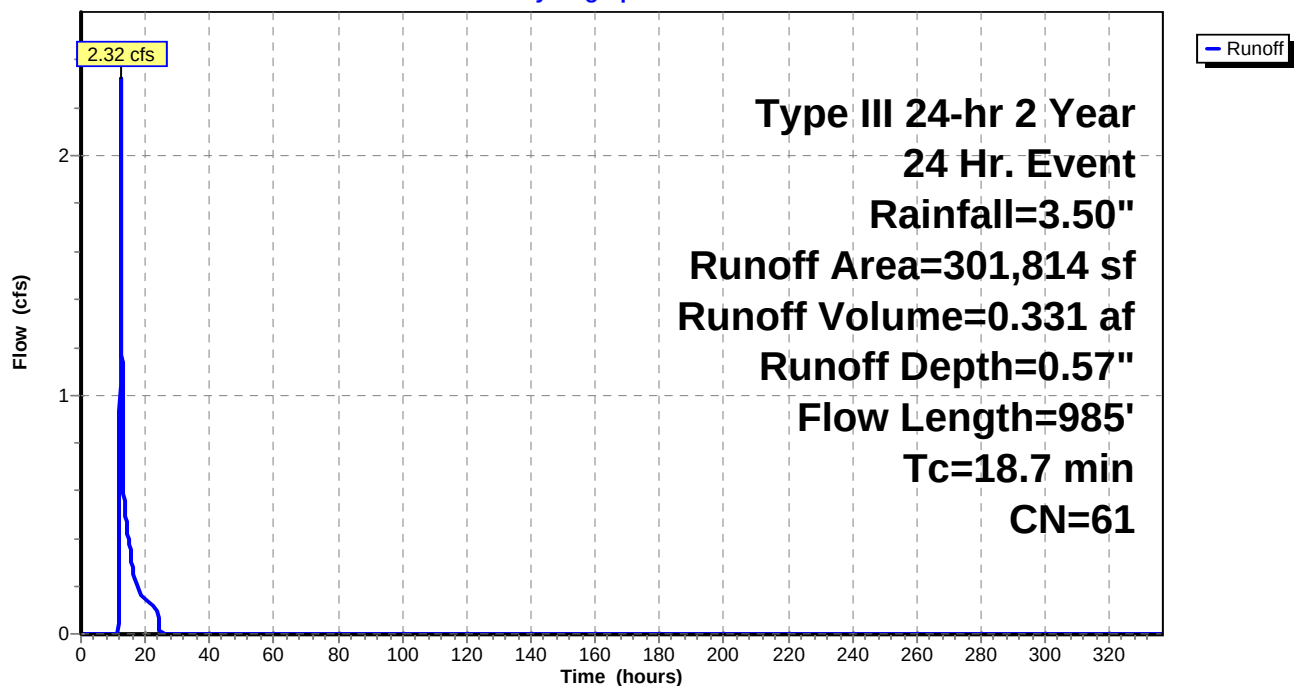
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
301,814	61	>75% Grass cover, Good, HSG B
301,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	115	0.0340	0.16		Sheet Flow, Orchard
					Grass: Dense n= 0.240 P2= 3.50"
6.4	870	0.1057	2.28		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
18.7	985	Total			

Subcatchment EX 1D: EXIST 1D

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1D: EXIST 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.57	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.57	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.57	0.00
15.00	2.99	0.36	0.37	275.00	3.50	0.57	0.00
20.00	3.35	0.51	0.14	280.00	3.50	0.57	0.00
25.00	3.50	0.57	0.00	285.00	3.50	0.57	0.00
30.00	3.50	0.57	0.00	290.00	3.50	0.57	0.00
35.00	3.50	0.57	0.00	295.00	3.50	0.57	0.00
40.00	3.50	0.57	0.00	300.00	3.50	0.57	0.00
45.00	3.50	0.57	0.00	305.00	3.50	0.57	0.00
50.00	3.50	0.57	0.00	310.00	3.50	0.57	0.00
55.00	3.50	0.57	0.00	315.00	3.50	0.57	0.00
60.00	3.50	0.57	0.00	320.00	3.50	0.57	0.00
65.00	3.50	0.57	0.00	325.00	3.50	0.57	0.00
70.00	3.50	0.57	0.00	330.00	3.50	0.57	0.00
75.00	3.50	0.57	0.00	335.00	3.50	0.57	0.00
80.00	3.50	0.57	0.00				
85.00	3.50	0.57	0.00				
90.00	3.50	0.57	0.00				
95.00	3.50	0.57	0.00				
100.00	3.50	0.57	0.00				
105.00	3.50	0.57	0.00				
110.00	3.50	0.57	0.00				
115.00	3.50	0.57	0.00				
120.00	3.50	0.57	0.00				
125.00	3.50	0.57	0.00				
130.00	3.50	0.57	0.00				
135.00	3.50	0.57	0.00				
140.00	3.50	0.57	0.00				
145.00	3.50	0.57	0.00				
150.00	3.50	0.57	0.00				
155.00	3.50	0.57	0.00				
160.00	3.50	0.57	0.00				
165.00	3.50	0.57	0.00				
170.00	3.50	0.57	0.00				
175.00	3.50	0.57	0.00				
180.00	3.50	0.57	0.00				
185.00	3.50	0.57	0.00				
190.00	3.50	0.57	0.00				
195.00	3.50	0.57	0.00				
200.00	3.50	0.57	0.00				
205.00	3.50	0.57	0.00				
210.00	3.50	0.57	0.00				
215.00	3.50	0.57	0.00				
220.00	3.50	0.57	0.00				
225.00	3.50	0.57	0.00				
230.00	3.50	0.57	0.00				
235.00	3.50	0.57	0.00				
240.00	3.50	0.57	0.00				
245.00	3.50	0.57	0.00				
250.00	3.50	0.57	0.00				
255.00	3.50	0.57	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1E: EXIST 1E

Runoff = 11.36 cfs @ 12.09 hrs, Volume= 0.814 af, Depth= 1.37"

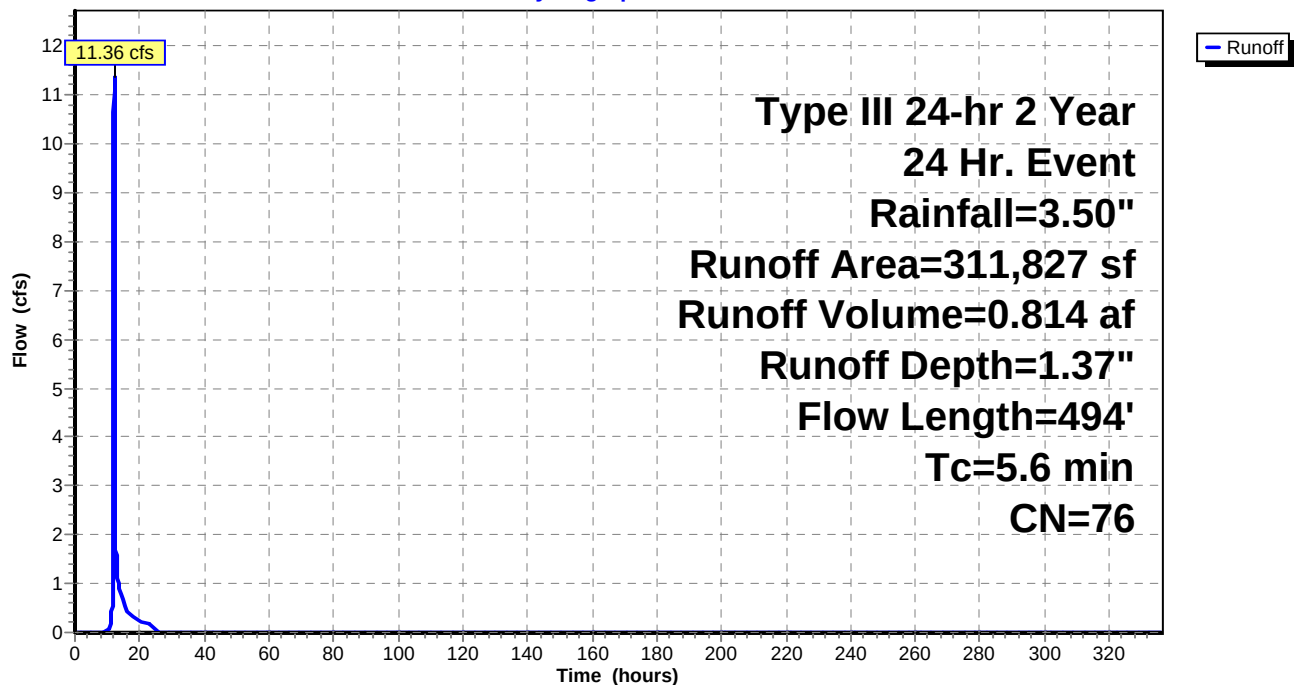
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
250,622	74	>75% Grass cover, Good, HSG C
26,824	61	>75% Grass cover, Good, HSG B
18,405	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
311,827	76	Weighted Average
277,446		88.97% Pervious Area
34,381		11.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	75	0.1600	0.39		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
2.4	419	0.1800	2.97		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
5.6	494	Total			

Subcatchment EX 1E: EXIST 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1E: EXIST 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.37	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.37	0.00
10.00	0.66	0.00	0.01	270.00	3.50	1.37	0.00
15.00	2.99	1.01	0.65	275.00	3.50	1.37	0.00
20.00	3.35	1.26	0.24	280.00	3.50	1.37	0.00
25.00	3.50	1.37	0.00	285.00	3.50	1.37	0.00
30.00	3.50	1.37	0.00	290.00	3.50	1.37	0.00
35.00	3.50	1.37	0.00	295.00	3.50	1.37	0.00
40.00	3.50	1.37	0.00	300.00	3.50	1.37	0.00
45.00	3.50	1.37	0.00	305.00	3.50	1.37	0.00
50.00	3.50	1.37	0.00	310.00	3.50	1.37	0.00
55.00	3.50	1.37	0.00	315.00	3.50	1.37	0.00
60.00	3.50	1.37	0.00	320.00	3.50	1.37	0.00
65.00	3.50	1.37	0.00	325.00	3.50	1.37	0.00
70.00	3.50	1.37	0.00	330.00	3.50	1.37	0.00
75.00	3.50	1.37	0.00	335.00	3.50	1.37	0.00
80.00	3.50	1.37	0.00				
85.00	3.50	1.37	0.00				
90.00	3.50	1.37	0.00				
95.00	3.50	1.37	0.00				
100.00	3.50	1.37	0.00				
105.00	3.50	1.37	0.00				
110.00	3.50	1.37	0.00				
115.00	3.50	1.37	0.00				
120.00	3.50	1.37	0.00				
125.00	3.50	1.37	0.00				
130.00	3.50	1.37	0.00				
135.00	3.50	1.37	0.00				
140.00	3.50	1.37	0.00				
145.00	3.50	1.37	0.00				
150.00	3.50	1.37	0.00				
155.00	3.50	1.37	0.00				
160.00	3.50	1.37	0.00				
165.00	3.50	1.37	0.00				
170.00	3.50	1.37	0.00				
175.00	3.50	1.37	0.00				
180.00	3.50	1.37	0.00				
185.00	3.50	1.37	0.00				
190.00	3.50	1.37	0.00				
195.00	3.50	1.37	0.00				
200.00	3.50	1.37	0.00				
205.00	3.50	1.37	0.00				
210.00	3.50	1.37	0.00				
215.00	3.50	1.37	0.00				
220.00	3.50	1.37	0.00				
225.00	3.50	1.37	0.00				
230.00	3.50	1.37	0.00				
235.00	3.50	1.37	0.00				
240.00	3.50	1.37	0.00				
245.00	3.50	1.37	0.00				
250.00	3.50	1.37	0.00				
255.00	3.50	1.37	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1F: EX IF

Runoff = 22.77 cfs @ 12.51 hrs, Volume= 3.119 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

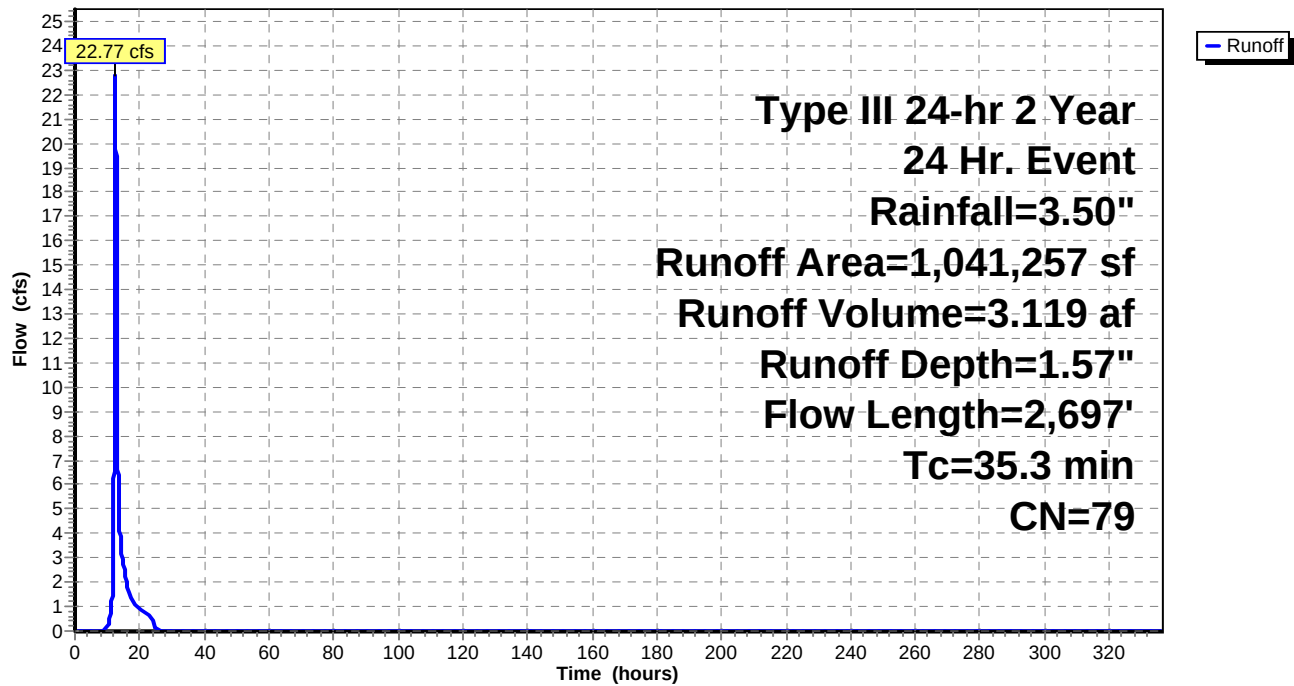
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
235,224	74	>75% Grass cover, Good, HSG C
1,041,257	79	Weighted Average
573,423		55.07% Pervious Area
467,834		44.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	1,047	0.1000	19.74	62.00	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
35.3	2,697	Total			

Subcatchment EX 1F: EX IF

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1F: EX IF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.57	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.57	0.00
10.00	0.66	0.01	0.13	270.00	3.50	1.57	0.00
15.00	2.99	1.18	2.67	275.00	3.50	1.57	0.00
20.00	3.35	1.45	0.89	280.00	3.50	1.57	0.00
25.00	3.50	1.57	0.04	285.00	3.50	1.57	0.00
30.00	3.50	1.57	0.00	290.00	3.50	1.57	0.00
35.00	3.50	1.57	0.00	295.00	3.50	1.57	0.00
40.00	3.50	1.57	0.00	300.00	3.50	1.57	0.00
45.00	3.50	1.57	0.00	305.00	3.50	1.57	0.00
50.00	3.50	1.57	0.00	310.00	3.50	1.57	0.00
55.00	3.50	1.57	0.00	315.00	3.50	1.57	0.00
60.00	3.50	1.57	0.00	320.00	3.50	1.57	0.00
65.00	3.50	1.57	0.00	325.00	3.50	1.57	0.00
70.00	3.50	1.57	0.00	330.00	3.50	1.57	0.00
75.00	3.50	1.57	0.00	335.00	3.50	1.57	0.00
80.00	3.50	1.57	0.00				
85.00	3.50	1.57	0.00				
90.00	3.50	1.57	0.00				
95.00	3.50	1.57	0.00				
100.00	3.50	1.57	0.00				
105.00	3.50	1.57	0.00				
110.00	3.50	1.57	0.00				
115.00	3.50	1.57	0.00				
120.00	3.50	1.57	0.00				
125.00	3.50	1.57	0.00				
130.00	3.50	1.57	0.00				
135.00	3.50	1.57	0.00				
140.00	3.50	1.57	0.00				
145.00	3.50	1.57	0.00				
150.00	3.50	1.57	0.00				
155.00	3.50	1.57	0.00				
160.00	3.50	1.57	0.00				
165.00	3.50	1.57	0.00				
170.00	3.50	1.57	0.00				
175.00	3.50	1.57	0.00				
180.00	3.50	1.57	0.00				
185.00	3.50	1.57	0.00				
190.00	3.50	1.57	0.00				
195.00	3.50	1.57	0.00				
200.00	3.50	1.57	0.00				
205.00	3.50	1.57	0.00				
210.00	3.50	1.57	0.00				
215.00	3.50	1.57	0.00				
220.00	3.50	1.57	0.00				
225.00	3.50	1.57	0.00				
230.00	3.50	1.57	0.00				
235.00	3.50	1.57	0.00				
240.00	3.50	1.57	0.00				
245.00	3.50	1.57	0.00				
250.00	3.50	1.57	0.00				
255.00	3.50	1.57	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1L: PROP 1I

Runoff = 9.40 cfs @ 12.05 hrs, Volume= 0.623 af, Depth= 1.18"

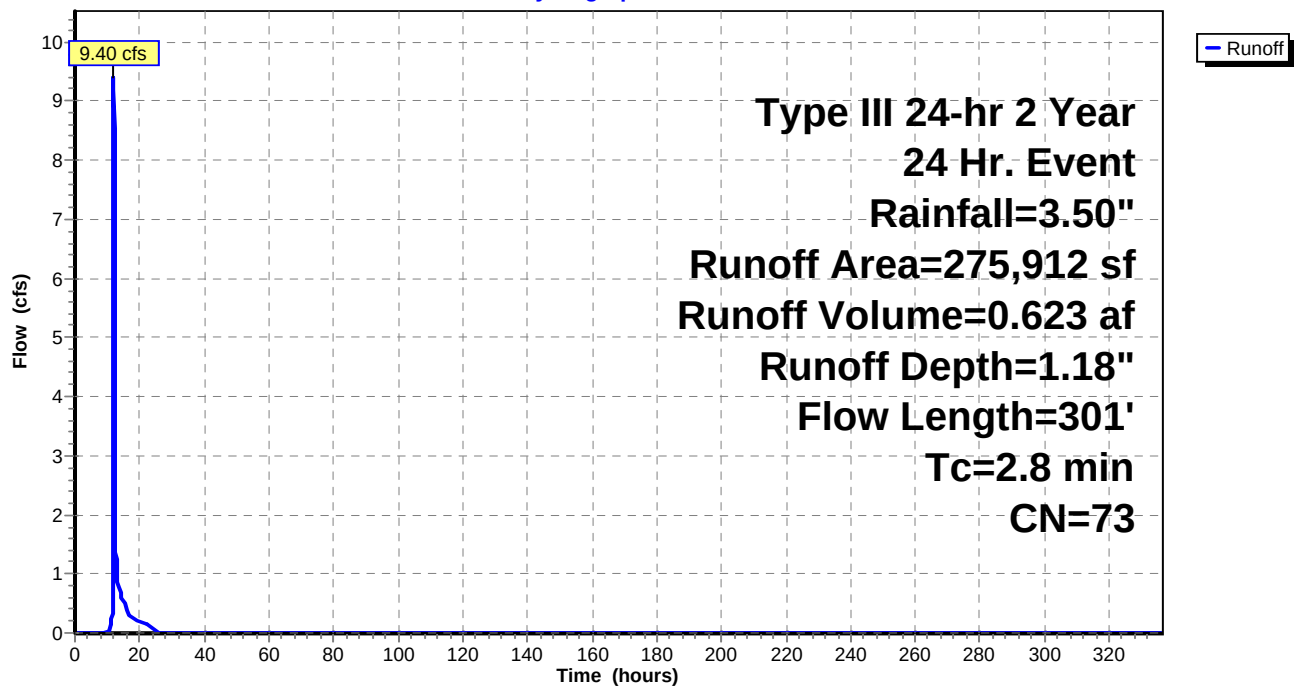
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
116,330	61	>75% Grass cover, Good, HSG B
103,912	74	>75% Grass cover, Good, HSG C
275,912	73	Weighted Average
220,242		79.82% Pervious Area
55,670		20.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.1800	0.37		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	251	0.1830	6.89		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	301	Total			

Subcatchment EX 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.18	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.18	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.18	0.00
15.00	2.99	0.85	0.52	275.00	3.50	1.18	0.00
20.00	3.35	1.08	0.19	280.00	3.50	1.18	0.00
25.00	3.50	1.18	0.00	285.00	3.50	1.18	0.00
30.00	3.50	1.18	0.00	290.00	3.50	1.18	0.00
35.00	3.50	1.18	0.00	295.00	3.50	1.18	0.00
40.00	3.50	1.18	0.00	300.00	3.50	1.18	0.00
45.00	3.50	1.18	0.00	305.00	3.50	1.18	0.00
50.00	3.50	1.18	0.00	310.00	3.50	1.18	0.00
55.00	3.50	1.18	0.00	315.00	3.50	1.18	0.00
60.00	3.50	1.18	0.00	320.00	3.50	1.18	0.00
65.00	3.50	1.18	0.00	325.00	3.50	1.18	0.00
70.00	3.50	1.18	0.00	330.00	3.50	1.18	0.00
75.00	3.50	1.18	0.00	335.00	3.50	1.18	0.00
80.00	3.50	1.18	0.00				
85.00	3.50	1.18	0.00				
90.00	3.50	1.18	0.00				
95.00	3.50	1.18	0.00				
100.00	3.50	1.18	0.00				
105.00	3.50	1.18	0.00				
110.00	3.50	1.18	0.00				
115.00	3.50	1.18	0.00				
120.00	3.50	1.18	0.00				
125.00	3.50	1.18	0.00				
130.00	3.50	1.18	0.00				
135.00	3.50	1.18	0.00				
140.00	3.50	1.18	0.00				
145.00	3.50	1.18	0.00				
150.00	3.50	1.18	0.00				
155.00	3.50	1.18	0.00				
160.00	3.50	1.18	0.00				
165.00	3.50	1.18	0.00				
170.00	3.50	1.18	0.00				
175.00	3.50	1.18	0.00				
180.00	3.50	1.18	0.00				
185.00	3.50	1.18	0.00				
190.00	3.50	1.18	0.00				
195.00	3.50	1.18	0.00				
200.00	3.50	1.18	0.00				
205.00	3.50	1.18	0.00				
210.00	3.50	1.18	0.00				
215.00	3.50	1.18	0.00				
220.00	3.50	1.18	0.00				
225.00	3.50	1.18	0.00				
230.00	3.50	1.18	0.00				
235.00	3.50	1.18	0.00				
240.00	3.50	1.18	0.00				
245.00	3.50	1.18	0.00				
250.00	3.50	1.18	0.00				
255.00	3.50	1.18	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX DA 1: EX 1A

Runoff = 0.98 cfs @ 12.52 hrs, Volume= 0.181 af, Depth= 0.45"

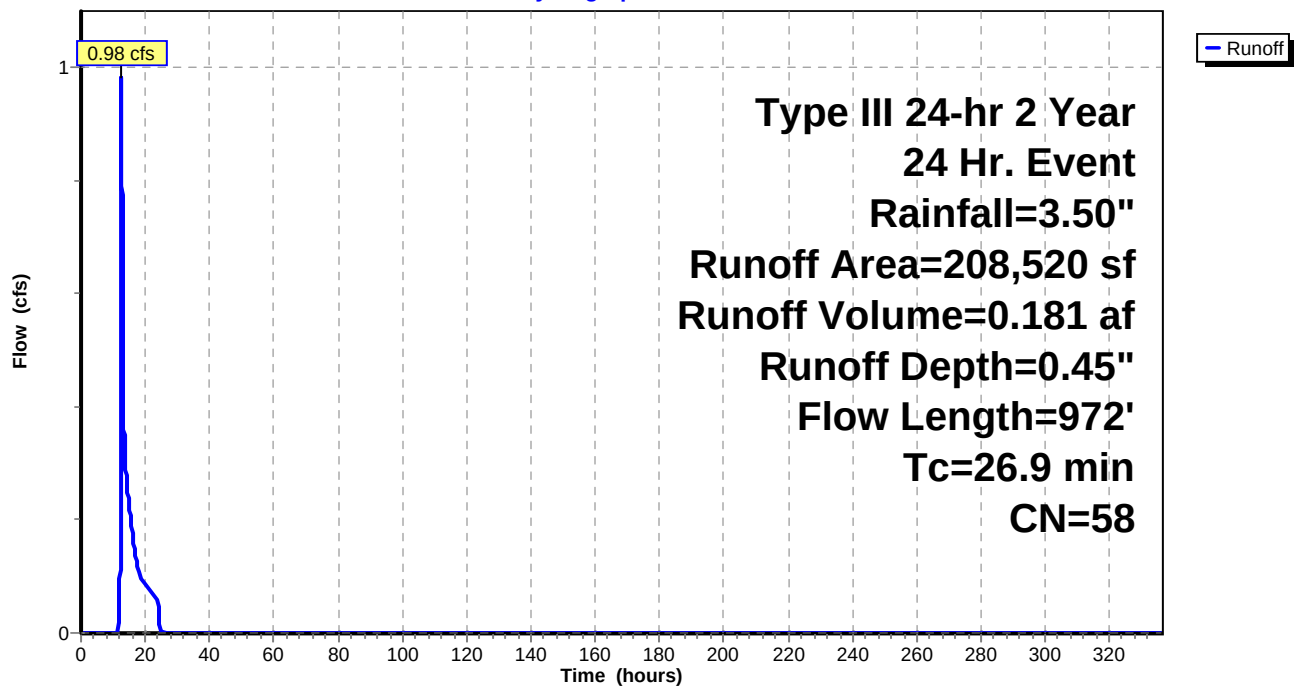
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
167,674	55	Woods, Good, HSG B
40,846	69	50-75% Grass cover, Fair, HSG B
208,520	58	Weighted Average
208,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	125	0.0320	0.10		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.50"
5.7	679	0.1560	1.97		Shallow Concentrated Flow, Wooded
					Woodland Kv= 5.0 fps
0.9	168	0.0230	3.08		Shallow Concentrated Flow, Gravel drive
					Paved Kv= 20.3 fps
26.9	972	Total			

Subcatchment EX DA 1: EX 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX DA 1: EX 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.45	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.45	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.45	0.00
15.00	2.99	0.27	0.22	275.00	3.50	0.45	0.00
20.00	3.35	0.40	0.09	280.00	3.50	0.45	0.00
25.00	3.50	0.45	0.00	285.00	3.50	0.45	0.00
30.00	3.50	0.45	0.00	290.00	3.50	0.45	0.00
35.00	3.50	0.45	0.00	295.00	3.50	0.45	0.00
40.00	3.50	0.45	0.00	300.00	3.50	0.45	0.00
45.00	3.50	0.45	0.00	305.00	3.50	0.45	0.00
50.00	3.50	0.45	0.00	310.00	3.50	0.45	0.00
55.00	3.50	0.45	0.00	315.00	3.50	0.45	0.00
60.00	3.50	0.45	0.00	320.00	3.50	0.45	0.00
65.00	3.50	0.45	0.00	325.00	3.50	0.45	0.00
70.00	3.50	0.45	0.00	330.00	3.50	0.45	0.00
75.00	3.50	0.45	0.00	335.00	3.50	0.45	0.00
80.00	3.50	0.45	0.00				
85.00	3.50	0.45	0.00				
90.00	3.50	0.45	0.00				
95.00	3.50	0.45	0.00				
100.00	3.50	0.45	0.00				
105.00	3.50	0.45	0.00				
110.00	3.50	0.45	0.00				
115.00	3.50	0.45	0.00				
120.00	3.50	0.45	0.00				
125.00	3.50	0.45	0.00				
130.00	3.50	0.45	0.00				
135.00	3.50	0.45	0.00				
140.00	3.50	0.45	0.00				
145.00	3.50	0.45	0.00				
150.00	3.50	0.45	0.00				
155.00	3.50	0.45	0.00				
160.00	3.50	0.45	0.00				
165.00	3.50	0.45	0.00				
170.00	3.50	0.45	0.00				
175.00	3.50	0.45	0.00				
180.00	3.50	0.45	0.00				
185.00	3.50	0.45	0.00				
190.00	3.50	0.45	0.00				
195.00	3.50	0.45	0.00				
200.00	3.50	0.45	0.00				
205.00	3.50	0.45	0.00				
210.00	3.50	0.45	0.00				
215.00	3.50	0.45	0.00				
220.00	3.50	0.45	0.00				
225.00	3.50	0.45	0.00				
230.00	3.50	0.45	0.00				
235.00	3.50	0.45	0.00				
240.00	3.50	0.45	0.00				
245.00	3.50	0.45	0.00				
250.00	3.50	0.45	0.00				
255.00	3.50	0.45	0.00				

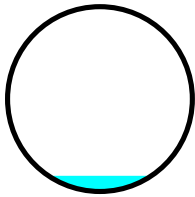
Summary for Reach 1R: Pipe

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 0.45" for 2 Year, 24 Hr. Event event
 Inflow = 0.98 cfs @ 12.52 hrs, Volume= 0.181 af
 Outflow = 0.97 cfs @ 12.56 hrs, Volume= 0.181 af, Atten= 1%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 7.69 fps, Min. Travel Time= 2.8 min
 Avg. Velocity= 4.09 fps, Avg. Travel Time= 5.2 min

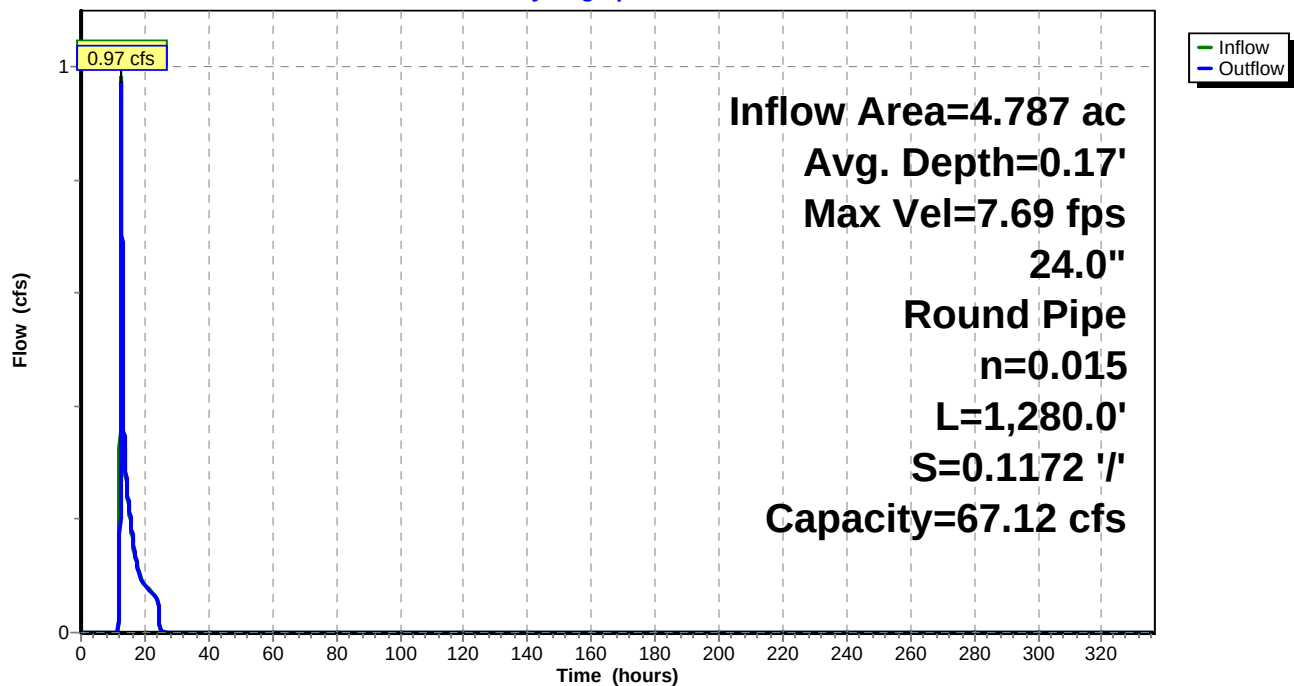
Peak Storage= 162 cf @ 12.56 hrs, Average Depth at Peak Storage= 0.17'
 Bank-Full Depth= 2.00', Capacity at Bank-Full= 67.12 cfs

24.0" Round Pipe
 n= 0.015 Concrete sewer w/manholes & inlets
 Length= 1,280.0' Slope= 0.1172 '/'
 Inlet Invert= 732.00', Outlet Invert= 582.00'



Reach 1R: Pipe

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Reach 1R: Pipe

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.00	0.00
10.00	0.00	0	732.00	0.00
20.00	0.09	30	732.05	0.09
30.00	0.00	0	732.00	0.00
40.00	0.00	0	732.00	0.00
50.00	0.00	0	732.00	0.00
60.00	0.00	0	732.00	0.00
70.00	0.00	0	732.00	0.00
80.00	0.00	0	732.00	0.00
90.00	0.00	0	732.00	0.00
100.00	0.00	0	732.00	0.00
110.00	0.00	0	732.00	0.00
120.00	0.00	0	732.00	0.00
130.00	0.00	0	732.00	0.00
140.00	0.00	0	732.00	0.00
150.00	0.00	0	732.00	0.00
160.00	0.00	0	732.00	0.00
170.00	0.00	0	732.00	0.00
180.00	0.00	0	732.00	0.00
190.00	0.00	0	732.00	0.00
200.00	0.00	0	732.00	0.00
210.00	0.00	0	732.00	0.00
220.00	0.00	0	732.00	0.00
230.00	0.00	0	732.00	0.00
240.00	0.00	0	732.00	0.00
250.00	0.00	0	732.00	0.00
260.00	0.00	0	732.00	0.00
270.00	0.00	0	732.00	0.00
280.00	0.00	0	732.00	0.00
290.00	0.00	0	732.00	0.00
300.00	0.00	0	732.00	0.00
310.00	0.00	0	732.00	0.00
320.00	0.00	0	732.00	0.00
330.00	0.00	0	732.00	0.00

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Stage-Area-Storage for Reach 1R: Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
732.00	0.0	0	733.04	1.7	2,113
732.02	0.0	7	733.06	1.7	2,164
732.04	0.0	19	733.08	1.7	2,215
732.06	0.0	35	733.10	1.8	2,266
732.08	0.0	54	733.12	1.8	2,317
732.10	0.1	75	733.14	1.8	2,368
732.12	0.1	99	733.16	1.9	2,418
732.14	0.1	124	733.18	1.9	2,469
732.16	0.1	151	733.20	2.0	2,519
732.18	0.1	179	733.22	2.0	2,569
732.20	0.2	209	733.24	2.0	2,619
732.22	0.2	241	733.26	2.1	2,669
732.24	0.2	273	733.28	2.1	2,718
732.26	0.2	307	733.30	2.2	2,767
732.28	0.3	342	733.32	2.2	2,816
732.30	0.3	378	733.34	2.2	2,864
732.32	0.3	415	733.36	2.3	2,912
732.34	0.4	453	733.38	2.3	2,959
732.36	0.4	492	733.40	2.3	3,007
732.38	0.4	532	733.42	2.4	3,053
732.40	0.4	573	733.44	2.4	3,100
732.42	0.5	614	733.46	2.5	3,145
732.44	0.5	656	733.48	2.5	3,190
732.46	0.5	699	733.50	2.5	3,235
732.48	0.6	742	733.52	2.6	3,279
732.50	0.6	786	733.54	2.6	3,323
732.52	0.6	831	733.56	2.6	3,365
732.54	0.7	876	733.58	2.7	3,407
732.56	0.7	922	733.60	2.7	3,449
732.58	0.8	968	733.62	2.7	3,489
732.60	0.8	1,015	733.64	2.8	3,529
732.62	0.8	1,062	733.66	2.8	3,568
732.64	0.9	1,109	733.68	2.8	3,606
732.66	0.9	1,157	733.70	2.8	3,643
732.68	0.9	1,206	733.72	2.9	3,679
732.70	1.0	1,254	733.74	2.9	3,714
732.72	1.0	1,303	733.76	2.9	3,748
732.74	1.1	1,353	733.78	3.0	3,781
732.76	1.1	1,402	733.80	3.0	3,812
732.78	1.1	1,452	733.82	3.0	3,842
732.80	1.2	1,502	733.84	3.0	3,871
732.82	1.2	1,552	733.86	3.0	3,897
732.84	1.3	1,603	733.88	3.1	3,923
732.86	1.3	1,653	733.90	3.1	3,946
732.88	1.3	1,704	733.92	3.1	3,967
732.90	1.4	1,755	733.94	3.1	3,986
732.92	1.4	1,806	733.96	3.1	4,002
732.94	1.5	1,857	733.98	3.1	4,014
732.96	1.5	1,908	734.00	3.1	4,021
732.98	1.5	1,959			
733.00	1.6	2,011			
733.02	1.6	2,062			

Summary for Reach 2R: Watercourse

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 0.45" for 2 Year, 24 Hr. Event event
Inflow = 0.97 cfs @ 12.56 hrs, Volume= 0.181 af
Outflow = 0.97 cfs @ 12.58 hrs, Volume= 0.181 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 4.37 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 2.25 fps, Avg. Travel Time= 2.5 min

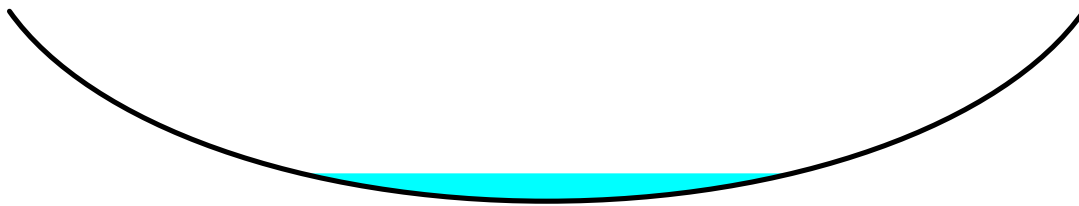
Peak Storage= 74 cf @ 12.58 hrs, Average Depth at Peak Storage= 0.15'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 60.85 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

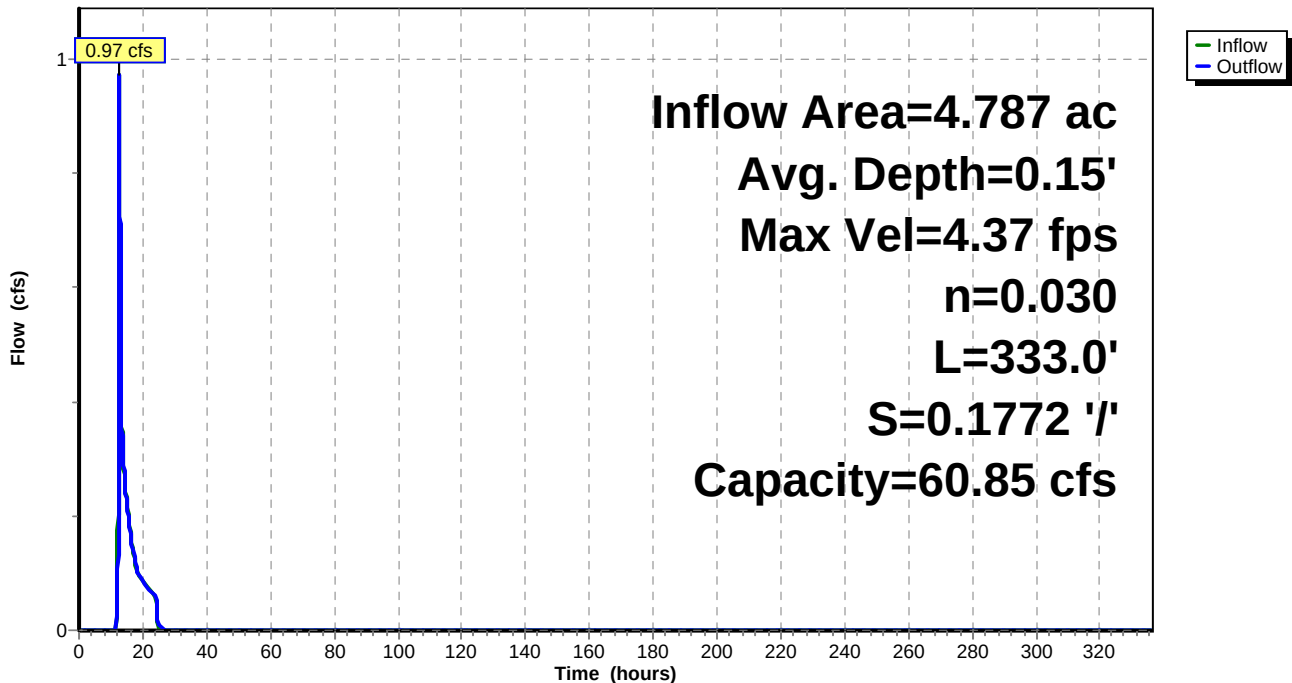
Length= 333.0' Slope= 0.1772 '/'

Inlet Invert= 581.00', Outlet Invert= 522.00'



Reach 2R: Watercourse

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Reach 2R: Watercourse

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	581.00	0.00
10.00	0.00	0	581.00	0.00
20.00	0.09	14	581.05	0.09
30.00	0.00	0	581.00	0.00
40.00	0.00	0	581.00	0.00
50.00	0.00	0	581.00	0.00
60.00	0.00	0	581.00	0.00
70.00	0.00	0	581.00	0.00
80.00	0.00	0	581.00	0.00
90.00	0.00	0	581.00	0.00
100.00	0.00	0	581.00	0.00
110.00	0.00	0	581.00	0.00
120.00	0.00	0	581.00	0.00
130.00	0.00	0	581.00	0.00
140.00	0.00	0	581.00	0.00
150.00	0.00	0	581.00	0.00
160.00	0.00	0	581.00	0.00
170.00	0.00	0	581.00	0.00
180.00	0.00	0	581.00	0.00
190.00	0.00	0	581.00	0.00
200.00	0.00	0	581.00	0.00
210.00	0.00	0	581.00	0.00
220.00	0.00	0	581.00	0.00
230.00	0.00	0	581.00	0.00
240.00	0.00	0	581.00	0.00
250.00	0.00	0	581.00	0.00
260.00	0.00	0	581.00	0.00
270.00	0.00	0	581.00	0.00
280.00	0.00	0	581.00	0.00
290.00	0.00	0	581.00	0.00
300.00	0.00	0	581.00	0.00
310.00	0.00	0	581.00	0.00
320.00	0.00	0	581.00	0.00
330.00	0.00	0	581.00	0.00

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Stage-Area-Storage for Reach 2R: Watercourse

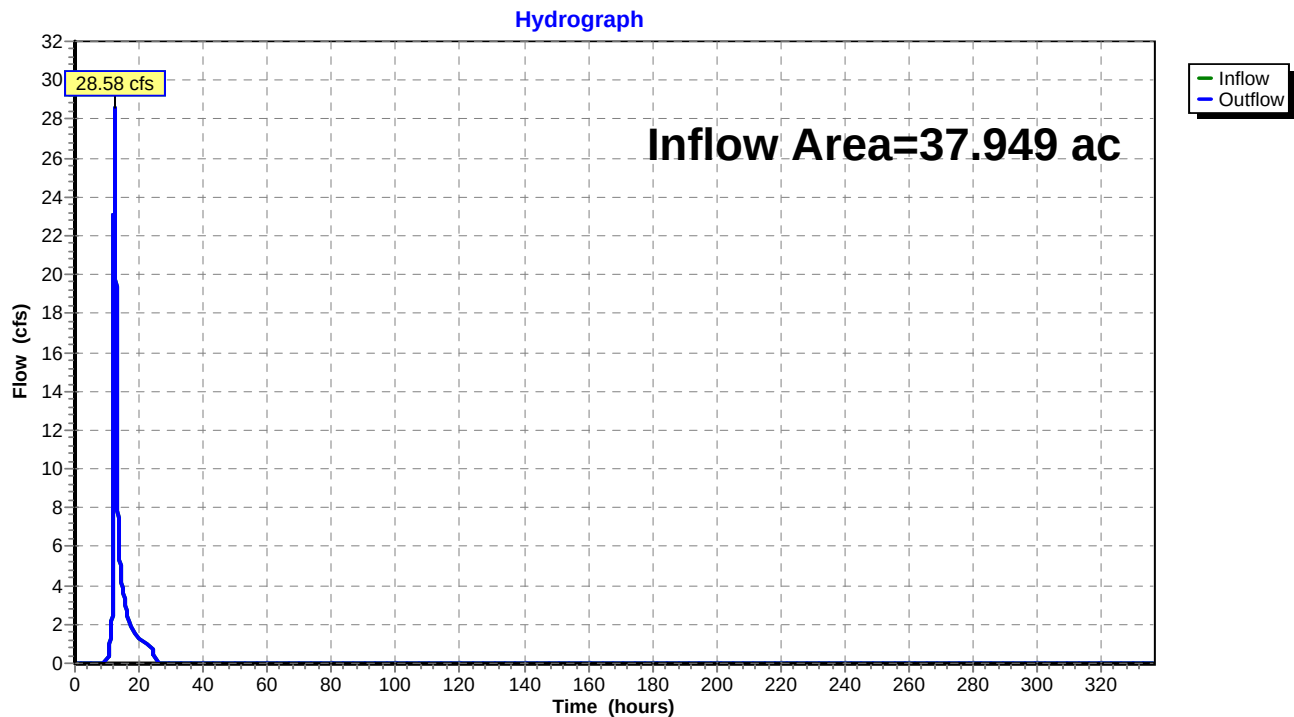
Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
581.00	0.0	0	581.52	1.5	499
581.01	0.0	1	581.53	1.5	514
581.02	0.0	4	581.54	1.6	529
581.03	0.0	7	581.55	1.6	543
581.04	0.0	11	581.56	1.7	558
581.05	0.0	15	581.57	1.7	573
581.06	0.1	20	581.58	1.8	588
581.07	0.1	25	581.59	1.8	604
581.08	0.1	30	581.60	1.9	619
581.09	0.1	36	581.61	1.9	635
581.10	0.1	42	581.62	2.0	650
581.11	0.1	49	581.63	2.0	666
581.12	0.2	55	581.64	2.0	682
581.13	0.2	62	581.65	2.1	698
581.14	0.2	70	581.66	2.1	714
581.15	0.2	77	581.67	2.2	730
581.16	0.3	85	581.68	2.2	747
581.17	0.3	93	581.69	2.3	763
581.18	0.3	102	581.70	2.3	780
581.19	0.3	110	581.71	2.4	797
581.20	0.4	119	581.72	2.4	814
581.21	0.4	128	581.73	2.5	831
581.22	0.4	137	581.74	2.5	848
581.23	0.4	147	581.75	2.6	865
581.24	0.5	157	581.76	2.7	883
581.25	0.5	167	581.77	2.7	900
581.26	0.5	177	581.78	2.8	918
581.27	0.6	187	581.79	2.8	935
581.28	0.6	197	581.80	2.9	953
581.29	0.6	208	581.81	2.9	971
581.30	0.7	219	581.82	3.0	989
581.31	0.7	230	581.83	3.0	1,007
581.32	0.7	241	581.84	3.1	1,025
581.33	0.8	253	581.85	3.1	1,044
581.34	0.8	264	581.86	3.2	1,062
581.35	0.8	276	581.87	3.2	1,081
581.36	0.9	288	581.88	3.3	1,100
581.37	0.9	300	581.89	3.4	1,118
581.38	0.9	312	581.90	3.4	1,137
581.39	1.0	324	581.91	3.5	1,156
581.40	1.0	337	581.92	3.5	1,175
581.41	1.1	350	581.93	3.6	1,195
581.42	1.1	363	581.94	3.6	1,214
581.43	1.1	376	581.95	3.7	1,233
581.44	1.2	389	581.96	3.8	1,253
581.45	1.2	402	581.97	3.8	1,273
581.46	1.2	416	581.98	3.9	1,292
581.47	1.3	429	581.99	3.9	1,312
581.48	1.3	443	582.00	4.0	1,332
581.49	1.4	457			
581.50	1.4	471			
581.51	1.5	485			

Summary for Reach DP 1B: PROP DP 1B

Inflow Area = 37.949 ac, 33.22% Impervious, Inflow Depth = 1.39" for 2 Year, 24 Hr. Event event
Inflow = 28.58 cfs @ 12.44 hrs, Volume= 4.399 af
Outflow = 28.58 cfs @ 12.44 hrs, Volume= 4.399 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1B: PROP DP 1B



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Hydrograph for Reach DP 1B: PROP DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.17		0.17	270.00	0.00		0.00
15.00	3.75		3.75	275.00	0.00		0.00
20.00	1.28		1.28	280.00	0.00		0.00
25.00	0.04		0.04	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

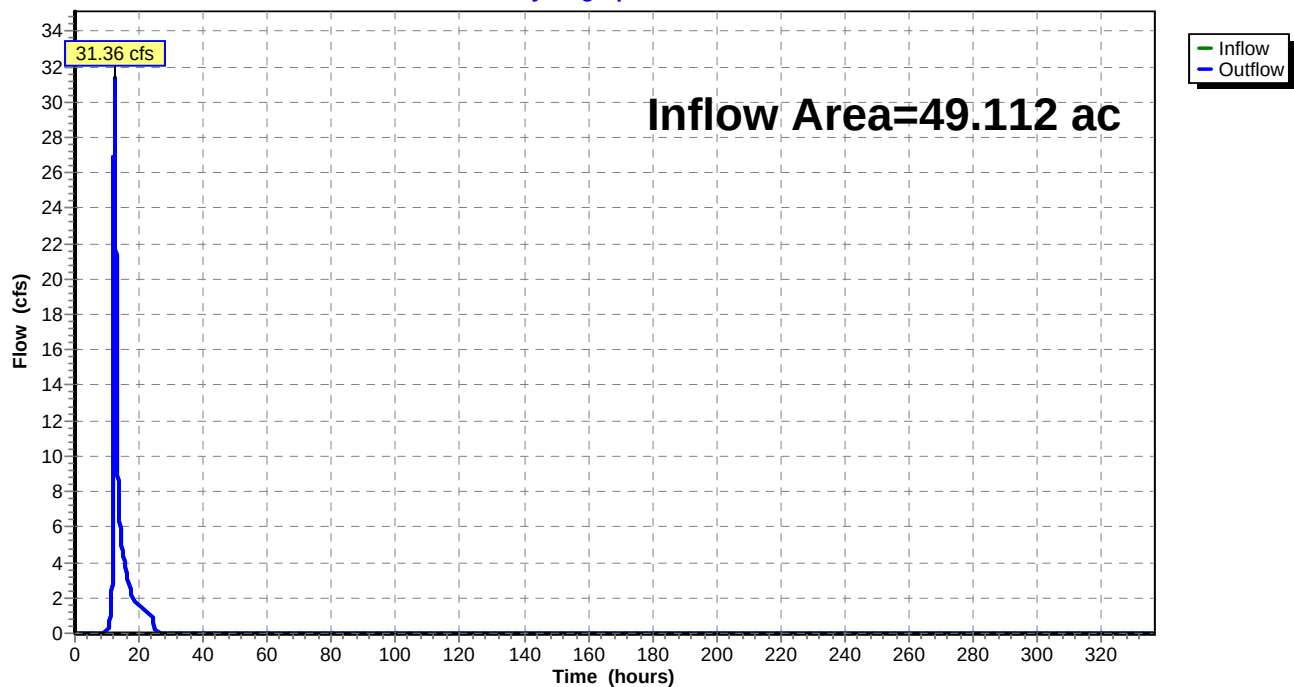
Summary for Reach EX DP !B: Existing DP 1B

Inflow Area = 49.112 ac, 26.08% Impervious, Inflow Depth = 1.24" for 2 Year, 24 Hr. Event event
Inflow = 31.36 cfs @ 12.43 hrs, Volume= 5.068 af
Outflow = 31.36 cfs @ 12.43 hrs, Volume= 5.068 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP !B: Existing DP 1B

Hydrograph



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Hydrograph for Reach EX DP 1B: Existing DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.14		0.14	270.00	0.00		0.00
15.00	4.44		4.44	275.00	0.00		0.00
20.00	1.54		1.54	280.00	0.00		0.00
25.00	0.04		0.04	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

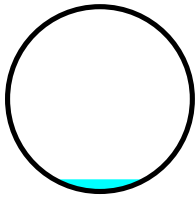
Summary for Reach R 1R: PROP 1R

Inflow Area = 4.017 ac, 0.00% Impervious, Inflow Depth = 0.35" for 2 Year, 24 Hr. Event event
Inflow = 0.61 cfs @ 12.43 hrs, Volume= 0.116 af
Outflow = 0.61 cfs @ 12.46 hrs, Volume= 0.116 af, Atten= 1%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.01 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 3.90 fps, Avg. Travel Time= 4.0 min

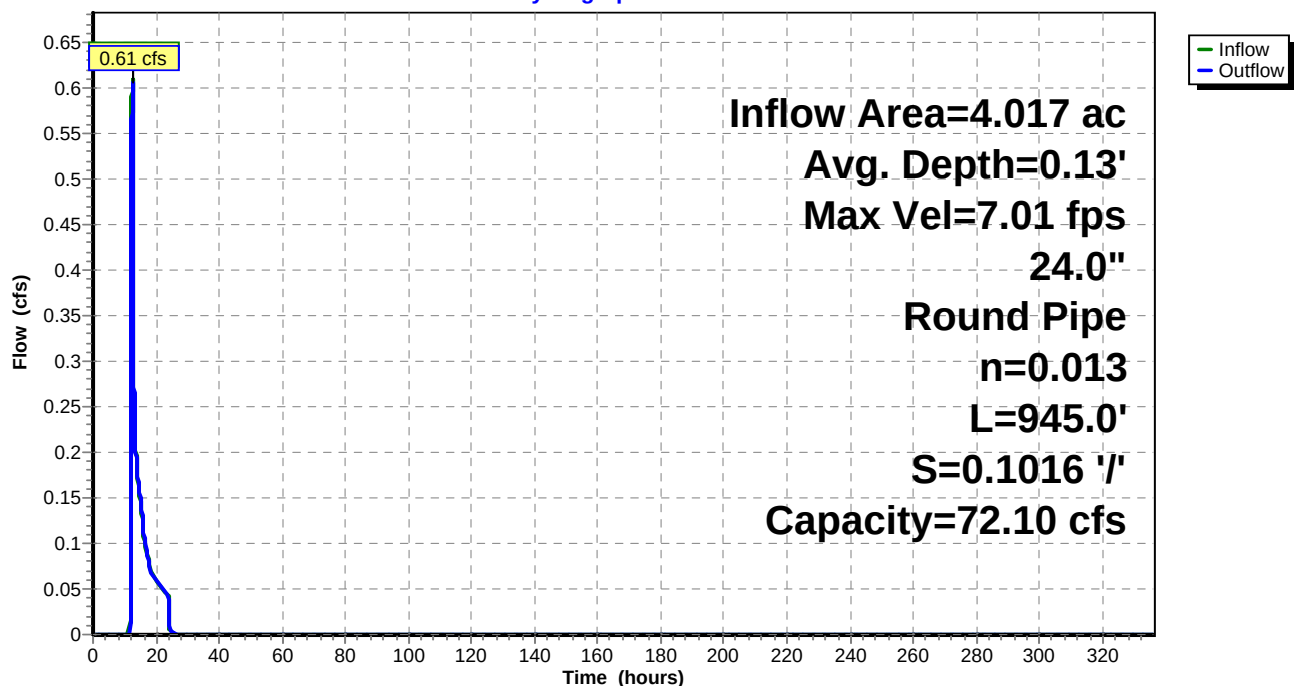
Peak Storage= 82 cf @ 12.46 hrs, Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 72.10 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 945.0' Slope= 0.1016 '/'
Inlet Invert= 746.00', Outlet Invert= 650.00'



Reach R 1R: PROP 1R

Hydrograph



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Hydrograph for Reach R 1R: PROP 1R

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	746.00	0.00
10.00	0.00	0	746.00	0.00
20.00	0.06	16	746.04	0.06
30.00	0.00	0	746.00	0.00
40.00	0.00	0	746.00	0.00
50.00	0.00	0	746.00	0.00
60.00	0.00	0	746.00	0.00
70.00	0.00	0	746.00	0.00
80.00	0.00	0	746.00	0.00
90.00	0.00	0	746.00	0.00
100.00	0.00	0	746.00	0.00
110.00	0.00	0	746.00	0.00
120.00	0.00	0	746.00	0.00
130.00	0.00	0	746.00	0.00
140.00	0.00	0	746.00	0.00
150.00	0.00	0	746.00	0.00
160.00	0.00	0	746.00	0.00
170.00	0.00	0	746.00	0.00
180.00	0.00	0	746.00	0.00
190.00	0.00	0	746.00	0.00
200.00	0.00	0	746.00	0.00
210.00	0.00	0	746.00	0.00
220.00	0.00	0	746.00	0.00
230.00	0.00	0	746.00	0.00
240.00	0.00	0	746.00	0.00
250.00	0.00	0	746.00	0.00
260.00	0.00	0	746.00	0.00
270.00	0.00	0	746.00	0.00
280.00	0.00	0	746.00	0.00
290.00	0.00	0	746.00	0.00
300.00	0.00	0	746.00	0.00
310.00	0.00	0	746.00	0.00
320.00	0.00	0	746.00	0.00
330.00	0.00	0	746.00	0.00

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Stage-Area-Storage for Reach R 1R: PROP 1R

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
746.00	0.0	0	747.04	1.7	1,560
746.02	0.0	5	747.06	1.7	1,598
746.04	0.0	14	747.08	1.7	1,635
746.06	0.0	26	747.10	1.8	1,673
746.08	0.0	40	747.12	1.8	1,711
746.10	0.1	55	747.14	1.8	1,748
746.12	0.1	73	747.16	1.9	1,786
746.14	0.1	91	747.18	1.9	1,823
746.16	0.1	111	747.20	2.0	1,860
746.18	0.1	132	747.22	2.0	1,897
746.20	0.2	155	747.24	2.0	1,934
746.22	0.2	178	747.26	2.1	1,970
746.24	0.2	202	747.28	2.1	2,007
746.26	0.2	227	747.30	2.2	2,043
746.28	0.3	253	747.32	2.2	2,079
746.30	0.3	279	747.34	2.2	2,114
746.32	0.3	307	747.36	2.3	2,150
746.34	0.4	335	747.38	2.3	2,185
746.36	0.4	363	747.40	2.3	2,220
746.38	0.4	393	747.42	2.4	2,254
746.40	0.4	423	747.44	2.4	2,288
746.42	0.5	453	747.46	2.5	2,322
746.44	0.5	484	747.48	2.5	2,355
746.46	0.5	516	747.50	2.5	2,388
746.48	0.6	548	747.52	2.6	2,421
746.50	0.6	580	747.54	2.6	2,453
746.52	0.6	613	747.56	2.6	2,485
746.54	0.7	647	747.58	2.7	2,516
746.56	0.7	680	747.60	2.7	2,546
746.58	0.8	715	747.62	2.7	2,576
746.60	0.8	749	747.64	2.8	2,605
746.62	0.8	784	747.66	2.8	2,634
746.64	0.9	819	747.68	2.8	2,662
746.66	0.9	854	747.70	2.8	2,690
746.68	0.9	890	747.72	2.9	2,716
746.70	1.0	926	747.74	2.9	2,742
746.72	1.0	962	747.76	2.9	2,767
746.74	1.1	999	747.78	3.0	2,791
746.76	1.1	1,035	747.80	3.0	2,814
746.78	1.1	1,072	747.82	3.0	2,836
746.80	1.2	1,109	747.84	3.0	2,858
746.82	1.2	1,146	747.86	3.0	2,877
746.84	1.3	1,183	747.88	3.1	2,896
746.86	1.3	1,221	747.90	3.1	2,913
746.88	1.3	1,258	747.92	3.1	2,929
746.90	1.4	1,296	747.94	3.1	2,943
746.92	1.4	1,333	747.96	3.1	2,955
746.94	1.5	1,371	747.98	3.1	2,964
746.96	1.5	1,409	748.00	3.1	2,969
746.98	1.5	1,447			
747.00	1.6	1,484			
747.02	1.6	1,522			

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1A: PROP 1A

Runoff = 3.66 cfs @ 12.25 hrs, Volume= 0.415 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

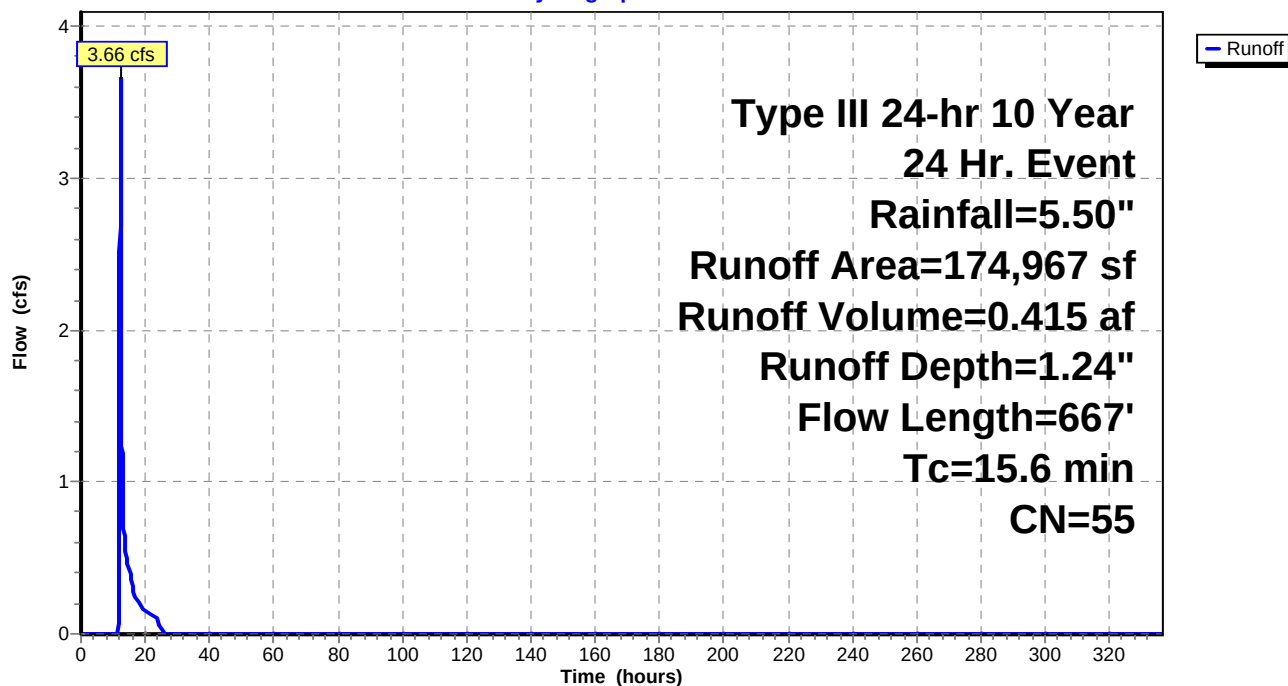
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
174,967	55	Woods, Good, HSG B
174,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	567	0.1790	6.81		Shallow Concentrated Flow, woods
					Unpaved Kv= 16.1 fps
15.6	667	Total			

Subcatchment 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1A: PROP 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.24	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.24	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.24	0.00
15.00	4.70	0.83	0.42	275.00	5.50	1.24	0.00
20.00	5.26	1.11	0.15	280.00	5.50	1.24	0.00
25.00	5.50	1.24	0.00	285.00	5.50	1.24	0.00
30.00	5.50	1.24	0.00	290.00	5.50	1.24	0.00
35.00	5.50	1.24	0.00	295.00	5.50	1.24	0.00
40.00	5.50	1.24	0.00	300.00	5.50	1.24	0.00
45.00	5.50	1.24	0.00	305.00	5.50	1.24	0.00
50.00	5.50	1.24	0.00	310.00	5.50	1.24	0.00
55.00	5.50	1.24	0.00	315.00	5.50	1.24	0.00
60.00	5.50	1.24	0.00	320.00	5.50	1.24	0.00
65.00	5.50	1.24	0.00	325.00	5.50	1.24	0.00
70.00	5.50	1.24	0.00	330.00	5.50	1.24	0.00
75.00	5.50	1.24	0.00	335.00	5.50	1.24	0.00
80.00	5.50	1.24	0.00				
85.00	5.50	1.24	0.00				
90.00	5.50	1.24	0.00				
95.00	5.50	1.24	0.00				
100.00	5.50	1.24	0.00				
105.00	5.50	1.24	0.00				
110.00	5.50	1.24	0.00				
115.00	5.50	1.24	0.00				
120.00	5.50	1.24	0.00				
125.00	5.50	1.24	0.00				
130.00	5.50	1.24	0.00				
135.00	5.50	1.24	0.00				
140.00	5.50	1.24	0.00				
145.00	5.50	1.24	0.00				
150.00	5.50	1.24	0.00				
155.00	5.50	1.24	0.00				
160.00	5.50	1.24	0.00				
165.00	5.50	1.24	0.00				
170.00	5.50	1.24	0.00				
175.00	5.50	1.24	0.00				
180.00	5.50	1.24	0.00				
185.00	5.50	1.24	0.00				
190.00	5.50	1.24	0.00				
195.00	5.50	1.24	0.00				
200.00	5.50	1.24	0.00				
205.00	5.50	1.24	0.00				
210.00	5.50	1.24	0.00				
215.00	5.50	1.24	0.00				
220.00	5.50	1.24	0.00				
225.00	5.50	1.24	0.00				
230.00	5.50	1.24	0.00				
235.00	5.50	1.24	0.00				
240.00	5.50	1.24	0.00				
245.00	5.50	1.24	0.00				
250.00	5.50	1.24	0.00				
255.00	5.50	1.24	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1D: PROP ID

Runoff = 48.54 cfs @ 12.48 hrs, Volume= 6.545 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

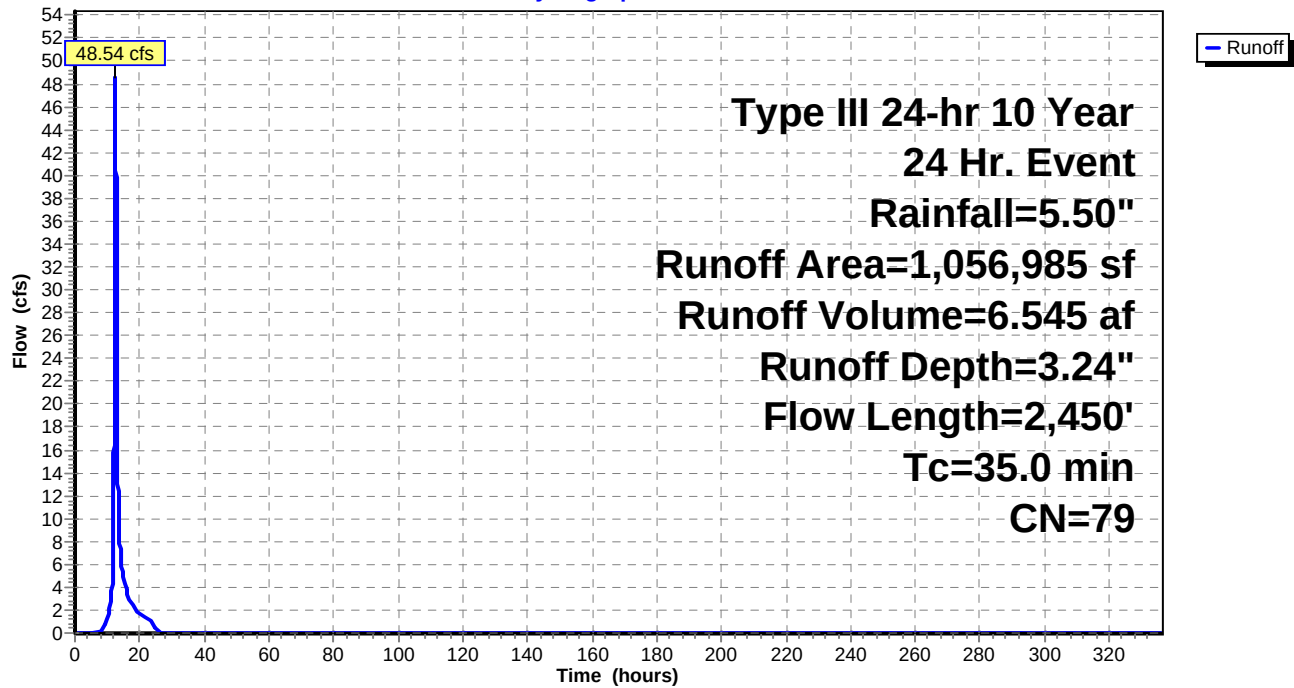
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
250,952	74	>75% Grass cover, Good, HSG C
1,056,985	79	Weighted Average
589,151		55.74% Pervious Area
467,834		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	800	0.1000	22.77	71.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
35.0	2,450	Total			

Subcatchment 1D: PROP ID

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1D: PROP ID

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.24	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.24	0.00
10.00	1.04	0.08	1.34	270.00	5.50	3.24	0.00
15.00	4.70	2.54	4.97	275.00	5.50	3.24	0.00
20.00	5.26	3.03	1.61	280.00	5.50	3.24	0.00
25.00	5.50	3.24	0.06	285.00	5.50	3.24	0.00
30.00	5.50	3.24	0.00	290.00	5.50	3.24	0.00
35.00	5.50	3.24	0.00	295.00	5.50	3.24	0.00
40.00	5.50	3.24	0.00	300.00	5.50	3.24	0.00
45.00	5.50	3.24	0.00	305.00	5.50	3.24	0.00
50.00	5.50	3.24	0.00	310.00	5.50	3.24	0.00
55.00	5.50	3.24	0.00	315.00	5.50	3.24	0.00
60.00	5.50	3.24	0.00	320.00	5.50	3.24	0.00
65.00	5.50	3.24	0.00	325.00	5.50	3.24	0.00
70.00	5.50	3.24	0.00	330.00	5.50	3.24	0.00
75.00	5.50	3.24	0.00	335.00	5.50	3.24	0.00
80.00	5.50	3.24	0.00				
85.00	5.50	3.24	0.00				
90.00	5.50	3.24	0.00				
95.00	5.50	3.24	0.00				
100.00	5.50	3.24	0.00				
105.00	5.50	3.24	0.00				
110.00	5.50	3.24	0.00				
115.00	5.50	3.24	0.00				
120.00	5.50	3.24	0.00				
125.00	5.50	3.24	0.00				
130.00	5.50	3.24	0.00				
135.00	5.50	3.24	0.00				
140.00	5.50	3.24	0.00				
145.00	5.50	3.24	0.00				
150.00	5.50	3.24	0.00				
155.00	5.50	3.24	0.00				
160.00	5.50	3.24	0.00				
165.00	5.50	3.24	0.00				
170.00	5.50	3.24	0.00				
175.00	5.50	3.24	0.00				
180.00	5.50	3.24	0.00				
185.00	5.50	3.24	0.00				
190.00	5.50	3.24	0.00				
195.00	5.50	3.24	0.00				
200.00	5.50	3.24	0.00				
205.00	5.50	3.24	0.00				
210.00	5.50	3.24	0.00				
215.00	5.50	3.24	0.00				
220.00	5.50	3.24	0.00				
225.00	5.50	3.24	0.00				
230.00	5.50	3.24	0.00				
235.00	5.50	3.24	0.00				
240.00	5.50	3.24	0.00				
245.00	5.50	3.24	0.00				
250.00	5.50	3.24	0.00				
255.00	5.50	3.24	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1K: PROP DA 1K

Runoff = 11.40 cfs @ 12.10 hrs, Volume= 0.831 af, Depth= 3.24"

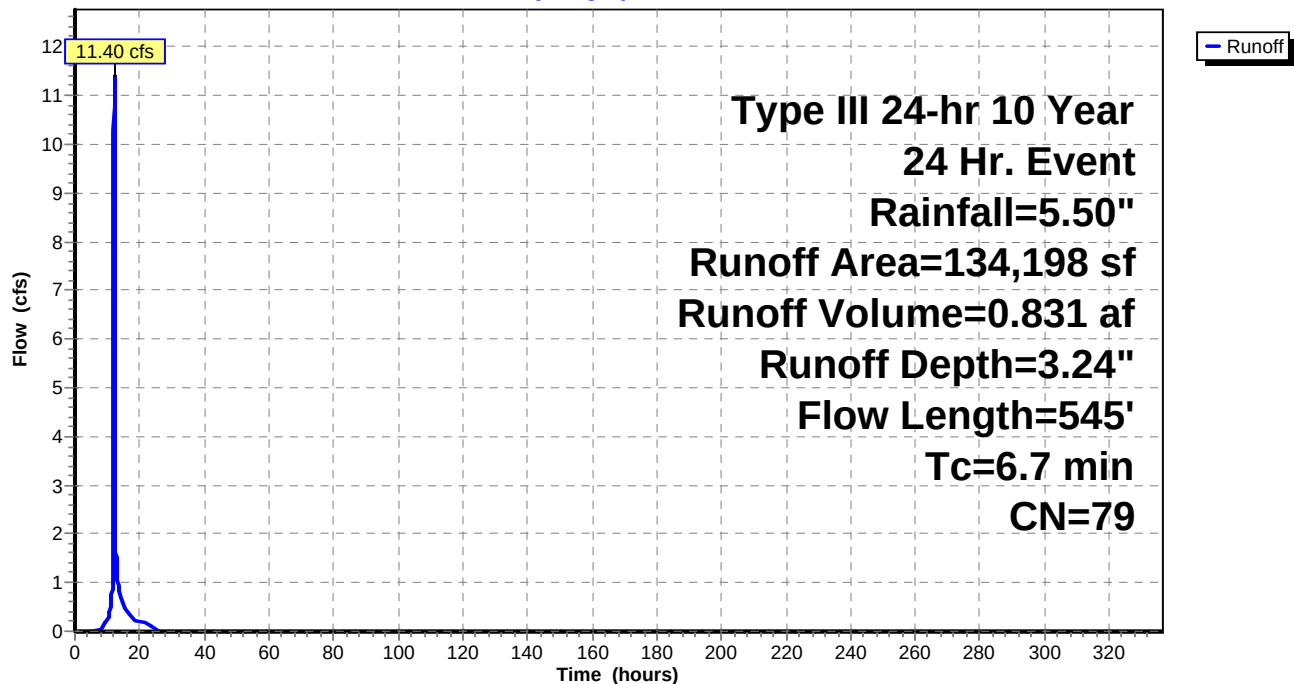
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
108,493	74	>75% Grass cover, Good, HSG C
9,729	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
134,198	79	Weighted Average
108,493		80.85% Pervious Area
25,705		19.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	80	0.1000	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	195	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	270	0.1850	22.86	228.55	Channel Flow, Area= 10.0 sf Perim= 9.0' r= 1.11' n= 0.030 Earth, grassed & winding
6.7	545	Total			

Subcatchment 1K: PROP DA 1K

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1K: PROP DA 1K

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.24	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.24	0.00
10.00	1.04	0.08	0.23	270.00	5.50	3.24	0.00
15.00	4.70	2.54	0.56	275.00	5.50	3.24	0.00
20.00	5.26	3.03	0.20	280.00	5.50	3.24	0.00
25.00	5.50	3.24	0.00	285.00	5.50	3.24	0.00
30.00	5.50	3.24	0.00	290.00	5.50	3.24	0.00
35.00	5.50	3.24	0.00	295.00	5.50	3.24	0.00
40.00	5.50	3.24	0.00	300.00	5.50	3.24	0.00
45.00	5.50	3.24	0.00	305.00	5.50	3.24	0.00
50.00	5.50	3.24	0.00	310.00	5.50	3.24	0.00
55.00	5.50	3.24	0.00	315.00	5.50	3.24	0.00
60.00	5.50	3.24	0.00	320.00	5.50	3.24	0.00
65.00	5.50	3.24	0.00	325.00	5.50	3.24	0.00
70.00	5.50	3.24	0.00	330.00	5.50	3.24	0.00
75.00	5.50	3.24	0.00	335.00	5.50	3.24	0.00
80.00	5.50	3.24	0.00				
85.00	5.50	3.24	0.00				
90.00	5.50	3.24	0.00				
95.00	5.50	3.24	0.00				
100.00	5.50	3.24	0.00				
105.00	5.50	3.24	0.00				
110.00	5.50	3.24	0.00				
115.00	5.50	3.24	0.00				
120.00	5.50	3.24	0.00				
125.00	5.50	3.24	0.00				
130.00	5.50	3.24	0.00				
135.00	5.50	3.24	0.00				
140.00	5.50	3.24	0.00				
145.00	5.50	3.24	0.00				
150.00	5.50	3.24	0.00				
155.00	5.50	3.24	0.00				
160.00	5.50	3.24	0.00				
165.00	5.50	3.24	0.00				
170.00	5.50	3.24	0.00				
175.00	5.50	3.24	0.00				
180.00	5.50	3.24	0.00				
185.00	5.50	3.24	0.00				
190.00	5.50	3.24	0.00				
195.00	5.50	3.24	0.00				
200.00	5.50	3.24	0.00				
205.00	5.50	3.24	0.00				
210.00	5.50	3.24	0.00				
215.00	5.50	3.24	0.00				
220.00	5.50	3.24	0.00				
225.00	5.50	3.24	0.00				
230.00	5.50	3.24	0.00				
235.00	5.50	3.24	0.00				
240.00	5.50	3.24	0.00				
245.00	5.50	3.24	0.00				
250.00	5.50	3.24	0.00				
255.00	5.50	3.24	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1L: PROP 1I

Runoff = 21.17 cfs @ 12.10 hrs, Volume= 1.570 af, Depth= 2.86"

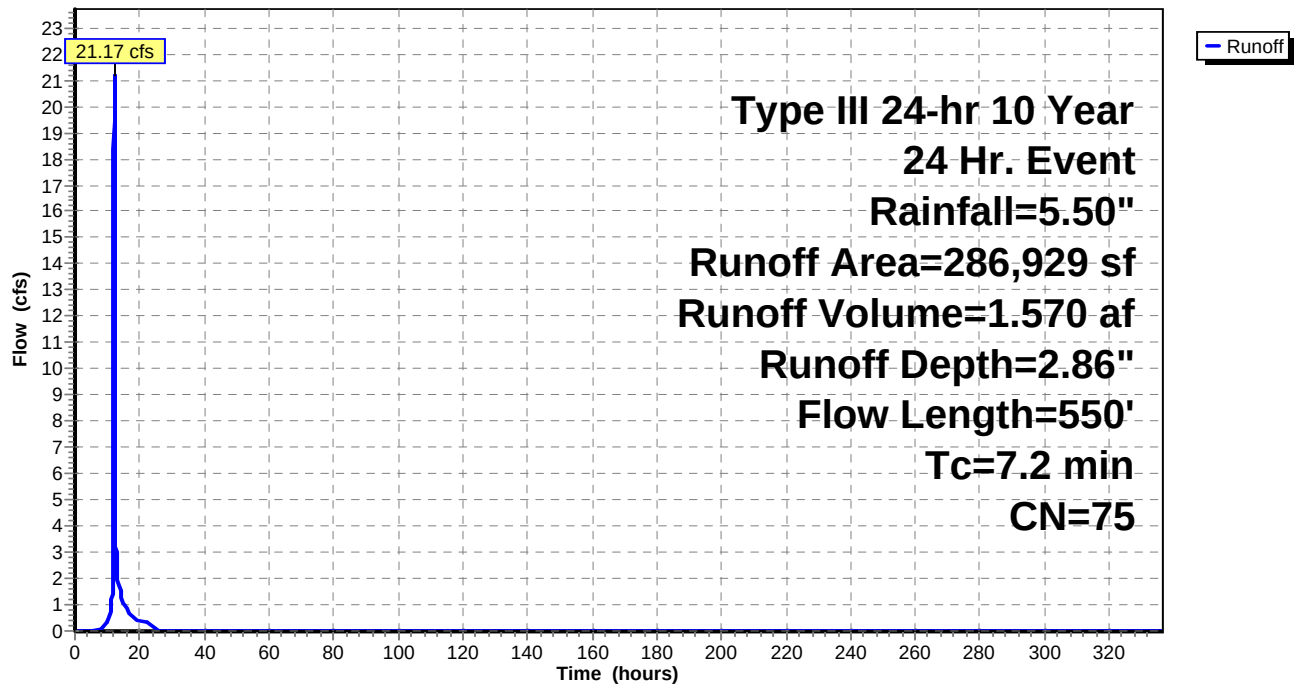
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
86,205	61	>75% Grass cover, Good, HSG B
145,054	74	>75% Grass cover, Good, HSG C
286,929	75	Weighted Average
231,259		80.60% Pervious Area
55,670		19.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	450	0.1640	2.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	550	Total			

Subcatchment 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.86	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.86	0.00
10.00	1.04	0.04	0.31	270.00	5.50	2.86	0.00
15.00	4.70	2.21	1.12	275.00	5.50	2.86	0.00
20.00	5.26	2.66	0.40	280.00	5.50	2.86	0.00
25.00	5.50	2.86	0.00	285.00	5.50	2.86	0.00
30.00	5.50	2.86	0.00	290.00	5.50	2.86	0.00
35.00	5.50	2.86	0.00	295.00	5.50	2.86	0.00
40.00	5.50	2.86	0.00	300.00	5.50	2.86	0.00
45.00	5.50	2.86	0.00	305.00	5.50	2.86	0.00
50.00	5.50	2.86	0.00	310.00	5.50	2.86	0.00
55.00	5.50	2.86	0.00	315.00	5.50	2.86	0.00
60.00	5.50	2.86	0.00	320.00	5.50	2.86	0.00
65.00	5.50	2.86	0.00	325.00	5.50	2.86	0.00
70.00	5.50	2.86	0.00	330.00	5.50	2.86	0.00
75.00	5.50	2.86	0.00	335.00	5.50	2.86	0.00
80.00	5.50	2.86	0.00				
85.00	5.50	2.86	0.00				
90.00	5.50	2.86	0.00				
95.00	5.50	2.86	0.00				
100.00	5.50	2.86	0.00				
105.00	5.50	2.86	0.00				
110.00	5.50	2.86	0.00				
115.00	5.50	2.86	0.00				
120.00	5.50	2.86	0.00				
125.00	5.50	2.86	0.00				
130.00	5.50	2.86	0.00				
135.00	5.50	2.86	0.00				
140.00	5.50	2.86	0.00				
145.00	5.50	2.86	0.00				
150.00	5.50	2.86	0.00				
155.00	5.50	2.86	0.00				
160.00	5.50	2.86	0.00				
165.00	5.50	2.86	0.00				
170.00	5.50	2.86	0.00				
175.00	5.50	2.86	0.00				
180.00	5.50	2.86	0.00				
185.00	5.50	2.86	0.00				
190.00	5.50	2.86	0.00				
195.00	5.50	2.86	0.00				
200.00	5.50	2.86	0.00				
205.00	5.50	2.86	0.00				
210.00	5.50	2.86	0.00				
215.00	5.50	2.86	0.00				
220.00	5.50	2.86	0.00				
225.00	5.50	2.86	0.00				
230.00	5.50	2.86	0.00				
235.00	5.50	2.86	0.00				
240.00	5.50	2.86	0.00				
245.00	5.50	2.86	0.00				
250.00	5.50	2.86	0.00				
255.00	5.50	2.86	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1D: EXIST 1D

Runoff = 8.78 cfs @ 12.28 hrs, Volume= 0.969 af, Depth= 1.68"

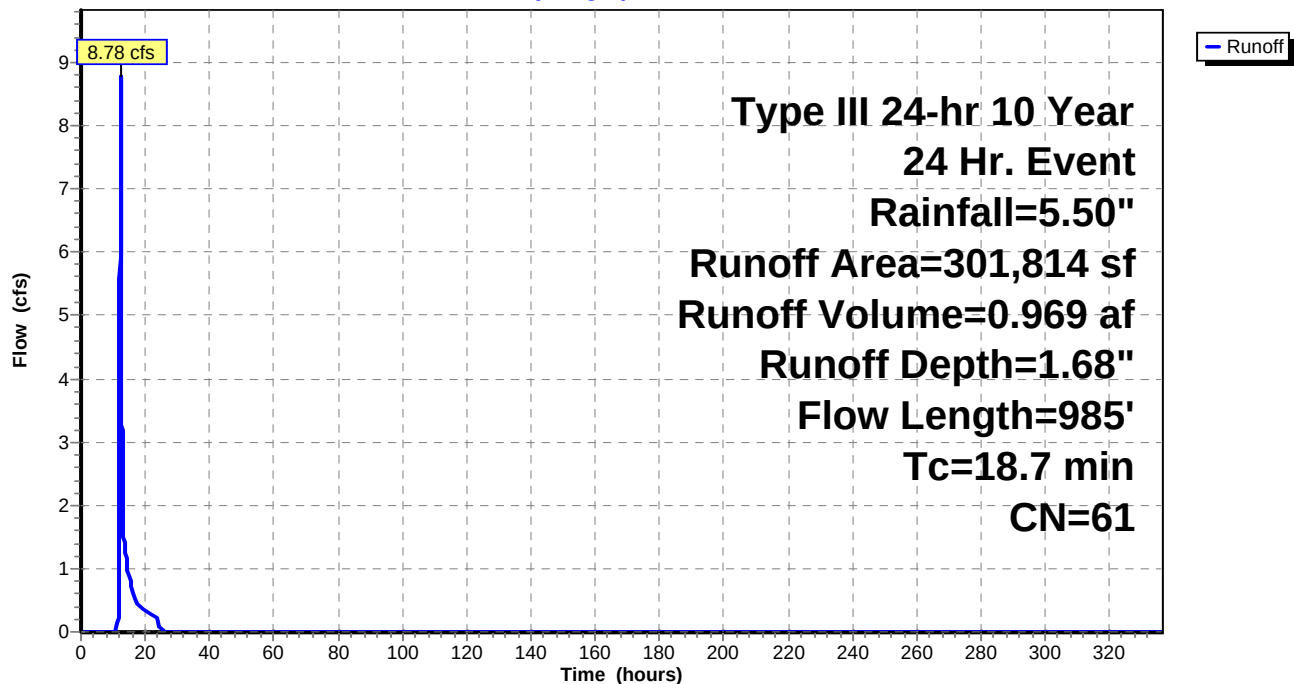
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
301,814	61	>75% Grass cover, Good, HSG B
301,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	115	0.0340	0.16		Sheet Flow, Orchard
					Grass: Dense n= 0.240 P2= 3.50"
6.4	870	0.1057	2.28		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
18.7	985	Total			

Subcatchment EX 1D: EXIST 1D

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1D: EXIST 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.68	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.68	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.68	0.00
15.00	4.70	1.19	0.89	275.00	5.50	1.68	0.00
20.00	5.26	1.53	0.32	280.00	5.50	1.68	0.00
25.00	5.50	1.68	0.00	285.00	5.50	1.68	0.00
30.00	5.50	1.68	0.00	290.00	5.50	1.68	0.00
35.00	5.50	1.68	0.00	295.00	5.50	1.68	0.00
40.00	5.50	1.68	0.00	300.00	5.50	1.68	0.00
45.00	5.50	1.68	0.00	305.00	5.50	1.68	0.00
50.00	5.50	1.68	0.00	310.00	5.50	1.68	0.00
55.00	5.50	1.68	0.00	315.00	5.50	1.68	0.00
60.00	5.50	1.68	0.00	320.00	5.50	1.68	0.00
65.00	5.50	1.68	0.00	325.00	5.50	1.68	0.00
70.00	5.50	1.68	0.00	330.00	5.50	1.68	0.00
75.00	5.50	1.68	0.00	335.00	5.50	1.68	0.00
80.00	5.50	1.68	0.00				
85.00	5.50	1.68	0.00				
90.00	5.50	1.68	0.00				
95.00	5.50	1.68	0.00				
100.00	5.50	1.68	0.00				
105.00	5.50	1.68	0.00				
110.00	5.50	1.68	0.00				
115.00	5.50	1.68	0.00				
120.00	5.50	1.68	0.00				
125.00	5.50	1.68	0.00				
130.00	5.50	1.68	0.00				
135.00	5.50	1.68	0.00				
140.00	5.50	1.68	0.00				
145.00	5.50	1.68	0.00				
150.00	5.50	1.68	0.00				
155.00	5.50	1.68	0.00				
160.00	5.50	1.68	0.00				
165.00	5.50	1.68	0.00				
170.00	5.50	1.68	0.00				
175.00	5.50	1.68	0.00				
180.00	5.50	1.68	0.00				
185.00	5.50	1.68	0.00				
190.00	5.50	1.68	0.00				
195.00	5.50	1.68	0.00				
200.00	5.50	1.68	0.00				
205.00	5.50	1.68	0.00				
210.00	5.50	1.68	0.00				
215.00	5.50	1.68	0.00				
220.00	5.50	1.68	0.00				
225.00	5.50	1.68	0.00				
230.00	5.50	1.68	0.00				
235.00	5.50	1.68	0.00				
240.00	5.50	1.68	0.00				
245.00	5.50	1.68	0.00				
250.00	5.50	1.68	0.00				
255.00	5.50	1.68	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1E: EXIST 1E

Runoff = 25.16 cfs @ 12.08 hrs, Volume= 1.762 af, Depth= 2.95"

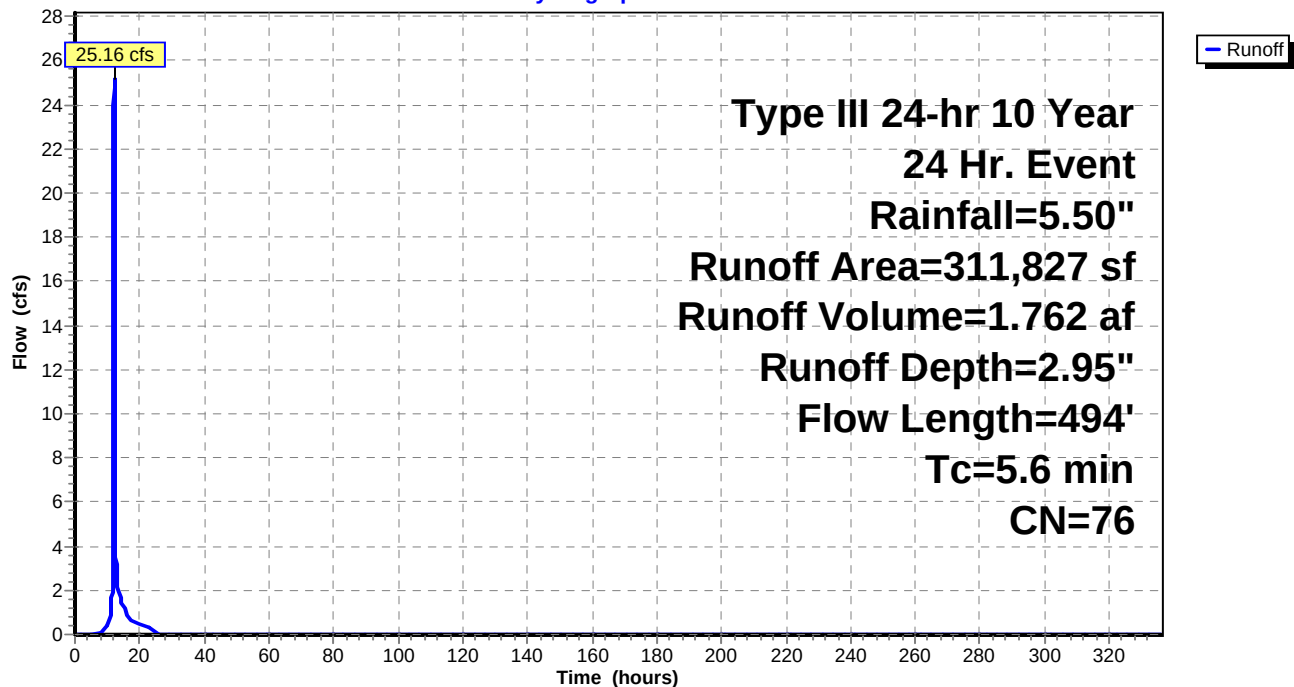
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
250,622	74	>75% Grass cover, Good, HSG C
26,824	61	>75% Grass cover, Good, HSG B
18,405	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
311,827	76	Weighted Average
277,446		88.97% Pervious Area
34,381		11.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	75	0.1600	0.39		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
2.4	419	0.1800	2.97		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
5.6	494	Total			

Subcatchment EX 1E: EXIST 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1E: EXIST 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.95	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.95	0.00
10.00	1.04	0.05	0.39	270.00	5.50	2.95	0.00
15.00	4.70	2.29	1.23	275.00	5.50	2.95	0.00
20.00	5.26	2.75	0.44	280.00	5.50	2.95	0.00
25.00	5.50	2.95	0.00	285.00	5.50	2.95	0.00
30.00	5.50	2.95	0.00	290.00	5.50	2.95	0.00
35.00	5.50	2.95	0.00	295.00	5.50	2.95	0.00
40.00	5.50	2.95	0.00	300.00	5.50	2.95	0.00
45.00	5.50	2.95	0.00	305.00	5.50	2.95	0.00
50.00	5.50	2.95	0.00	310.00	5.50	2.95	0.00
55.00	5.50	2.95	0.00	315.00	5.50	2.95	0.00
60.00	5.50	2.95	0.00	320.00	5.50	2.95	0.00
65.00	5.50	2.95	0.00	325.00	5.50	2.95	0.00
70.00	5.50	2.95	0.00	330.00	5.50	2.95	0.00
75.00	5.50	2.95	0.00	335.00	5.50	2.95	0.00
80.00	5.50	2.95	0.00				
85.00	5.50	2.95	0.00				
90.00	5.50	2.95	0.00				
95.00	5.50	2.95	0.00				
100.00	5.50	2.95	0.00				
105.00	5.50	2.95	0.00				
110.00	5.50	2.95	0.00				
115.00	5.50	2.95	0.00				
120.00	5.50	2.95	0.00				
125.00	5.50	2.95	0.00				
130.00	5.50	2.95	0.00				
135.00	5.50	2.95	0.00				
140.00	5.50	2.95	0.00				
145.00	5.50	2.95	0.00				
150.00	5.50	2.95	0.00				
155.00	5.50	2.95	0.00				
160.00	5.50	2.95	0.00				
165.00	5.50	2.95	0.00				
170.00	5.50	2.95	0.00				
175.00	5.50	2.95	0.00				
180.00	5.50	2.95	0.00				
185.00	5.50	2.95	0.00				
190.00	5.50	2.95	0.00				
195.00	5.50	2.95	0.00				
200.00	5.50	2.95	0.00				
205.00	5.50	2.95	0.00				
210.00	5.50	2.95	0.00				
215.00	5.50	2.95	0.00				
220.00	5.50	2.95	0.00				
225.00	5.50	2.95	0.00				
230.00	5.50	2.95	0.00				
235.00	5.50	2.95	0.00				
240.00	5.50	2.95	0.00				
245.00	5.50	2.95	0.00				
250.00	5.50	2.95	0.00				
255.00	5.50	2.95	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1F: EX IF

Runoff = 47.48 cfs @ 12.51 hrs, Volume= 6.447 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

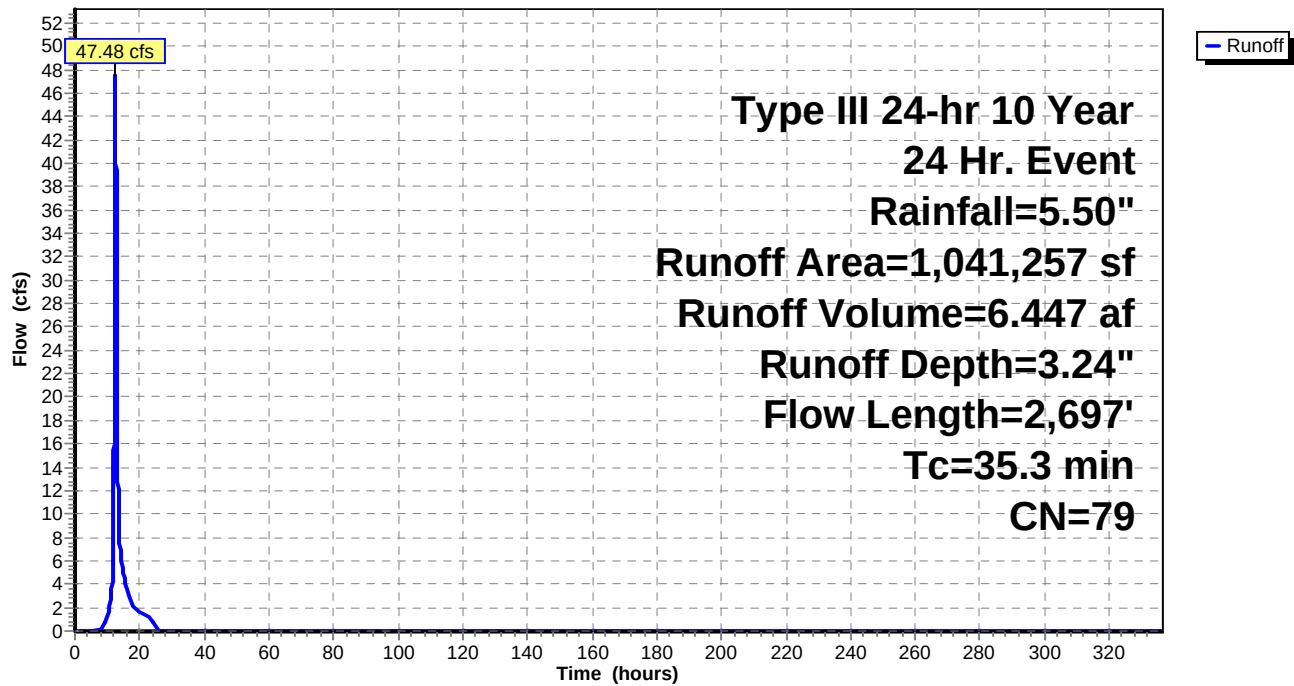
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
235,224	74	>75% Grass cover, Good, HSG C
1,041,257	79	Weighted Average
573,423		55.07% Pervious Area
467,834		44.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	1,047	0.1000	19.74	62.00	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
35.3	2,697	Total			

Subcatchment EX 1F: EX IF

Hydrograph



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Hydrograph for Subcatchment EX 1F: EX IF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.24	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.24	0.00
10.00	1.04	0.08	1.31	270.00	5.50	3.24	0.00
15.00	4.70	2.54	4.91	275.00	5.50	3.24	0.00
20.00	5.26	3.03	1.59	280.00	5.50	3.24	0.00
25.00	5.50	3.24	0.06	285.00	5.50	3.24	0.00
30.00	5.50	3.24	0.00	290.00	5.50	3.24	0.00
35.00	5.50	3.24	0.00	295.00	5.50	3.24	0.00
40.00	5.50	3.24	0.00	300.00	5.50	3.24	0.00
45.00	5.50	3.24	0.00	305.00	5.50	3.24	0.00
50.00	5.50	3.24	0.00	310.00	5.50	3.24	0.00
55.00	5.50	3.24	0.00	315.00	5.50	3.24	0.00
60.00	5.50	3.24	0.00	320.00	5.50	3.24	0.00
65.00	5.50	3.24	0.00	325.00	5.50	3.24	0.00
70.00	5.50	3.24	0.00	330.00	5.50	3.24	0.00
75.00	5.50	3.24	0.00	335.00	5.50	3.24	0.00
80.00	5.50	3.24	0.00				
85.00	5.50	3.24	0.00				
90.00	5.50	3.24	0.00				
95.00	5.50	3.24	0.00				
100.00	5.50	3.24	0.00				
105.00	5.50	3.24	0.00				
110.00	5.50	3.24	0.00				
115.00	5.50	3.24	0.00				
120.00	5.50	3.24	0.00				
125.00	5.50	3.24	0.00				
130.00	5.50	3.24	0.00				
135.00	5.50	3.24	0.00				
140.00	5.50	3.24	0.00				
145.00	5.50	3.24	0.00				
150.00	5.50	3.24	0.00				
155.00	5.50	3.24	0.00				
160.00	5.50	3.24	0.00				
165.00	5.50	3.24	0.00				
170.00	5.50	3.24	0.00				
175.00	5.50	3.24	0.00				
180.00	5.50	3.24	0.00				
185.00	5.50	3.24	0.00				
190.00	5.50	3.24	0.00				
195.00	5.50	3.24	0.00				
200.00	5.50	3.24	0.00				
205.00	5.50	3.24	0.00				
210.00	5.50	3.24	0.00				
215.00	5.50	3.24	0.00				
220.00	5.50	3.24	0.00				
225.00	5.50	3.24	0.00				
230.00	5.50	3.24	0.00				
235.00	5.50	3.24	0.00				
240.00	5.50	3.24	0.00				
245.00	5.50	3.24	0.00				
250.00	5.50	3.24	0.00				
255.00	5.50	3.24	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1L: PROP 1I

Runoff = 22.30 cfs @ 12.04 hrs, Volume= 1.414 af, Depth= 2.68"

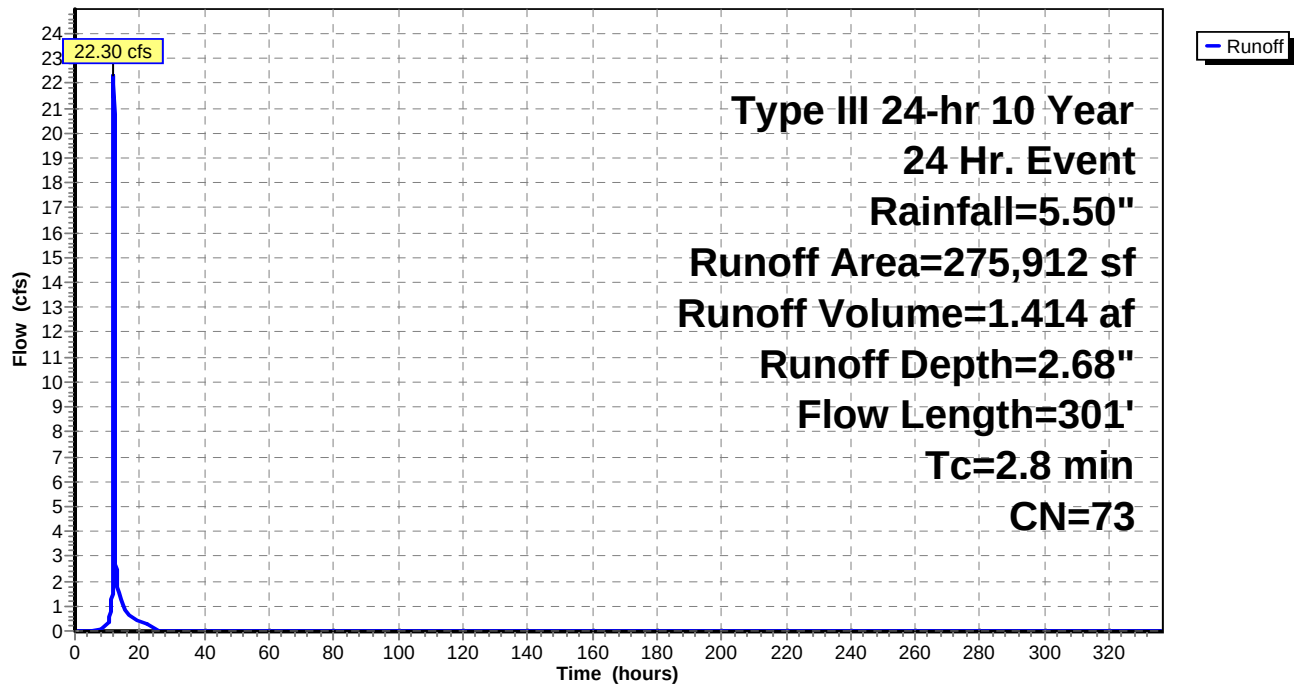
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
116,330	61	>75% Grass cover, Good, HSG B
103,912	74	>75% Grass cover, Good, HSG C
275,912	73	Weighted Average
220,242		79.82% Pervious Area
55,670		20.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.1800	0.37		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	251	0.1830	6.89		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	301	Total			

Subcatchment EX 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.68	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.68	0.00
10.00	1.04	0.02	0.24	270.00	5.50	2.68	0.00
15.00	4.70	2.05	1.02	275.00	5.50	2.68	0.00
20.00	5.26	2.49	0.37	280.00	5.50	2.68	0.00
25.00	5.50	2.68	0.00	285.00	5.50	2.68	0.00
30.00	5.50	2.68	0.00	290.00	5.50	2.68	0.00
35.00	5.50	2.68	0.00	295.00	5.50	2.68	0.00
40.00	5.50	2.68	0.00	300.00	5.50	2.68	0.00
45.00	5.50	2.68	0.00	305.00	5.50	2.68	0.00
50.00	5.50	2.68	0.00	310.00	5.50	2.68	0.00
55.00	5.50	2.68	0.00	315.00	5.50	2.68	0.00
60.00	5.50	2.68	0.00	320.00	5.50	2.68	0.00
65.00	5.50	2.68	0.00	325.00	5.50	2.68	0.00
70.00	5.50	2.68	0.00	330.00	5.50	2.68	0.00
75.00	5.50	2.68	0.00	335.00	5.50	2.68	0.00
80.00	5.50	2.68	0.00				
85.00	5.50	2.68	0.00				
90.00	5.50	2.68	0.00				
95.00	5.50	2.68	0.00				
100.00	5.50	2.68	0.00				
105.00	5.50	2.68	0.00				
110.00	5.50	2.68	0.00				
115.00	5.50	2.68	0.00				
120.00	5.50	2.68	0.00				
125.00	5.50	2.68	0.00				
130.00	5.50	2.68	0.00				
135.00	5.50	2.68	0.00				
140.00	5.50	2.68	0.00				
145.00	5.50	2.68	0.00				
150.00	5.50	2.68	0.00				
155.00	5.50	2.68	0.00				
160.00	5.50	2.68	0.00				
165.00	5.50	2.68	0.00				
170.00	5.50	2.68	0.00				
175.00	5.50	2.68	0.00				
180.00	5.50	2.68	0.00				
185.00	5.50	2.68	0.00				
190.00	5.50	2.68	0.00				
195.00	5.50	2.68	0.00				
200.00	5.50	2.68	0.00				
205.00	5.50	2.68	0.00				
210.00	5.50	2.68	0.00				
215.00	5.50	2.68	0.00				
220.00	5.50	2.68	0.00				
225.00	5.50	2.68	0.00				
230.00	5.50	2.68	0.00				
235.00	5.50	2.68	0.00				
240.00	5.50	2.68	0.00				
245.00	5.50	2.68	0.00				
250.00	5.50	2.68	0.00				
255.00	5.50	2.68	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX DA 1: EX 1A

Runoff = 4.35 cfs @ 12.42 hrs, Volume= 0.580 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

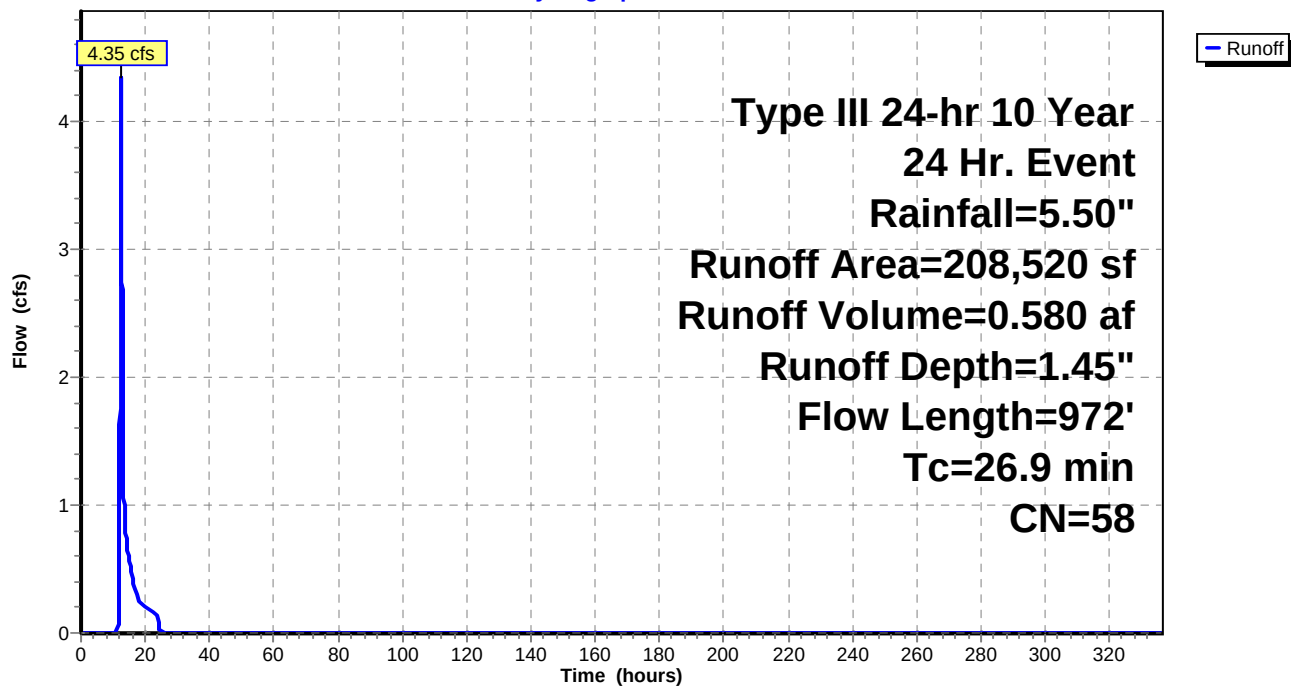
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
167,674	55	Woods, Good, HSG B
40,846	69	50-75% Grass cover, Fair, HSG B
208,520	58	Weighted Average
208,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	125	0.0320	0.10		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.50"
5.7	679	0.1560	1.97		Shallow Concentrated Flow, Wooded
					Woodland Kv= 5.0 fps
0.9	168	0.0230	3.08		Shallow Concentrated Flow, Gravel drive
					Paved Kv= 20.3 fps
26.9	972	Total			

Subcatchment EX DA 1: EX 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX DA 1: EX 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	1.45	0.00
5.00	0.31	0.00	0.00	265.00	5.50	1.45	0.00
10.00	1.04	0.00	0.00	270.00	5.50	1.45	0.00
15.00	4.70	1.01	0.58	275.00	5.50	1.45	0.00
20.00	5.26	1.32	0.21	280.00	5.50	1.45	0.00
25.00	5.50	1.45	0.00	285.00	5.50	1.45	0.00
30.00	5.50	1.45	0.00	290.00	5.50	1.45	0.00
35.00	5.50	1.45	0.00	295.00	5.50	1.45	0.00
40.00	5.50	1.45	0.00	300.00	5.50	1.45	0.00
45.00	5.50	1.45	0.00	305.00	5.50	1.45	0.00
50.00	5.50	1.45	0.00	310.00	5.50	1.45	0.00
55.00	5.50	1.45	0.00	315.00	5.50	1.45	0.00
60.00	5.50	1.45	0.00	320.00	5.50	1.45	0.00
65.00	5.50	1.45	0.00	325.00	5.50	1.45	0.00
70.00	5.50	1.45	0.00	330.00	5.50	1.45	0.00
75.00	5.50	1.45	0.00	335.00	5.50	1.45	0.00
80.00	5.50	1.45	0.00				
85.00	5.50	1.45	0.00				
90.00	5.50	1.45	0.00				
95.00	5.50	1.45	0.00				
100.00	5.50	1.45	0.00				
105.00	5.50	1.45	0.00				
110.00	5.50	1.45	0.00				
115.00	5.50	1.45	0.00				
120.00	5.50	1.45	0.00				
125.00	5.50	1.45	0.00				
130.00	5.50	1.45	0.00				
135.00	5.50	1.45	0.00				
140.00	5.50	1.45	0.00				
145.00	5.50	1.45	0.00				
150.00	5.50	1.45	0.00				
155.00	5.50	1.45	0.00				
160.00	5.50	1.45	0.00				
165.00	5.50	1.45	0.00				
170.00	5.50	1.45	0.00				
175.00	5.50	1.45	0.00				
180.00	5.50	1.45	0.00				
185.00	5.50	1.45	0.00				
190.00	5.50	1.45	0.00				
195.00	5.50	1.45	0.00				
200.00	5.50	1.45	0.00				
205.00	5.50	1.45	0.00				
210.00	5.50	1.45	0.00				
215.00	5.50	1.45	0.00				
220.00	5.50	1.45	0.00				
225.00	5.50	1.45	0.00				
230.00	5.50	1.45	0.00				
235.00	5.50	1.45	0.00				
240.00	5.50	1.45	0.00				
245.00	5.50	1.45	0.00				
250.00	5.50	1.45	0.00				
255.00	5.50	1.45	0.00				

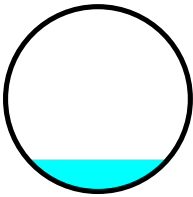
Summary for Reach 1R: Pipe

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 1.45" for 10 Year, 24 Hr. Event event
Inflow = 4.35 cfs @ 12.42 hrs, Volume= 0.580 af
Outflow = 4.34 cfs @ 12.44 hrs, Volume= 0.580 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 12.02 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 5.38 fps, Avg. Travel Time= 4.0 min

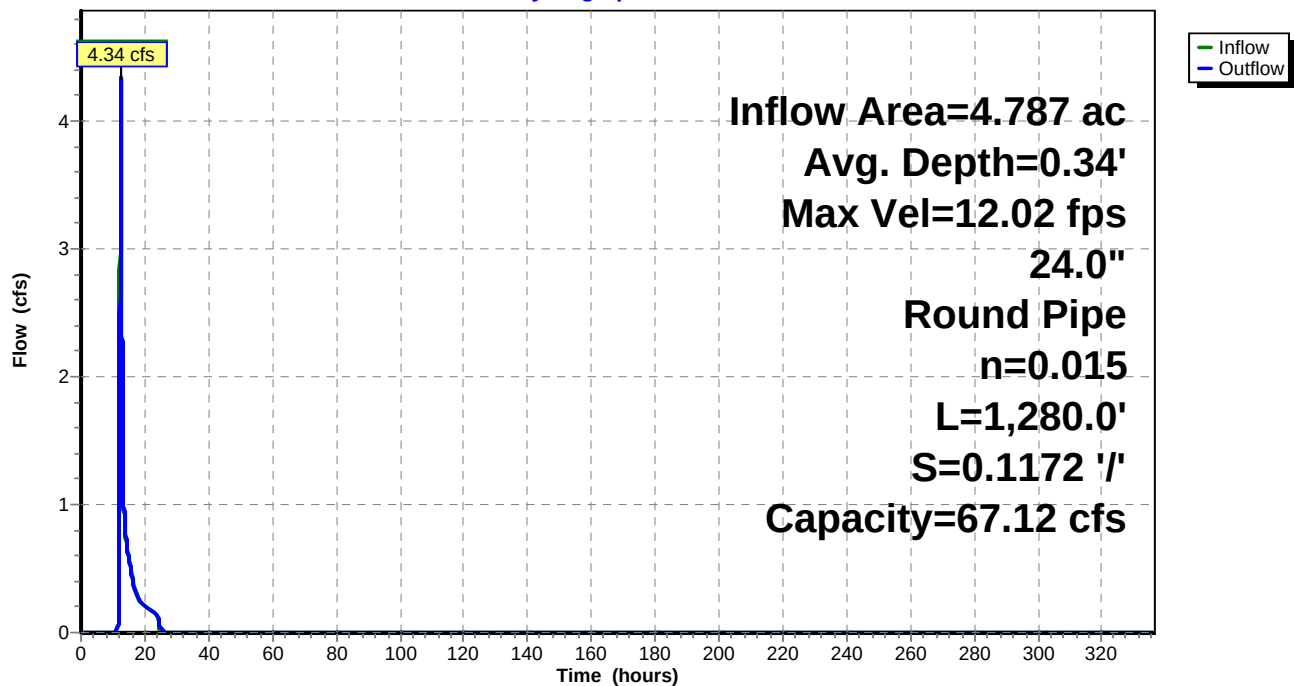
Peak Storage= 462 cf @ 12.44 hrs, Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 67.12 cfs

24.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 1,280.0' Slope= 0.1172 '/'
Inlet Invert= 732.00', Outlet Invert= 582.00'



Reach 1R: Pipe

Hydrograph



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Hydrograph for Reach 1R: Pipe

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.00	0.00
10.00	0.00	0	732.00	0.00
20.00	0.21	55	732.08	0.21
30.00	0.00	0	732.00	0.00
40.00	0.00	0	732.00	0.00
50.00	0.00	0	732.00	0.00
60.00	0.00	0	732.00	0.00
70.00	0.00	0	732.00	0.00
80.00	0.00	0	732.00	0.00
90.00	0.00	0	732.00	0.00
100.00	0.00	0	732.00	0.00
110.00	0.00	0	732.00	0.00
120.00	0.00	0	732.00	0.00
130.00	0.00	0	732.00	0.00
140.00	0.00	0	732.00	0.00
150.00	0.00	0	732.00	0.00
160.00	0.00	0	732.00	0.00
170.00	0.00	0	732.00	0.00
180.00	0.00	0	732.00	0.00
190.00	0.00	0	732.00	0.00
200.00	0.00	0	732.00	0.00
210.00	0.00	0	732.00	0.00
220.00	0.00	0	732.00	0.00
230.00	0.00	0	732.00	0.00
240.00	0.00	0	732.00	0.00
250.00	0.00	0	732.00	0.00
260.00	0.00	0	732.00	0.00
270.00	0.00	0	732.00	0.00
280.00	0.00	0	732.00	0.00
290.00	0.00	0	732.00	0.00
300.00	0.00	0	732.00	0.00
310.00	0.00	0	732.00	0.00
320.00	0.00	0	732.00	0.00
330.00	0.00	0	732.00	0.00

Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Stage-Area-Storage for Reach 1R: Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
732.00	0.0	0	733.04	1.7	2,113
732.02	0.0	7	733.06	1.7	2,164
732.04	0.0	19	733.08	1.7	2,215
732.06	0.0	35	733.10	1.8	2,266
732.08	0.0	54	733.12	1.8	2,317
732.10	0.1	75	733.14	1.8	2,368
732.12	0.1	99	733.16	1.9	2,418
732.14	0.1	124	733.18	1.9	2,469
732.16	0.1	151	733.20	2.0	2,519
732.18	0.1	179	733.22	2.0	2,569
732.20	0.2	209	733.24	2.0	2,619
732.22	0.2	241	733.26	2.1	2,669
732.24	0.2	273	733.28	2.1	2,718
732.26	0.2	307	733.30	2.2	2,767
732.28	0.3	342	733.32	2.2	2,816
732.30	0.3	378	733.34	2.2	2,864
732.32	0.3	415	733.36	2.3	2,912
732.34	0.4	453	733.38	2.3	2,959
732.36	0.4	492	733.40	2.3	3,007
732.38	0.4	532	733.42	2.4	3,053
732.40	0.4	573	733.44	2.4	3,100
732.42	0.5	614	733.46	2.5	3,145
732.44	0.5	656	733.48	2.5	3,190
732.46	0.5	699	733.50	2.5	3,235
732.48	0.6	742	733.52	2.6	3,279
732.50	0.6	786	733.54	2.6	3,323
732.52	0.6	831	733.56	2.6	3,365
732.54	0.7	876	733.58	2.7	3,407
732.56	0.7	922	733.60	2.7	3,449
732.58	0.8	968	733.62	2.7	3,489
732.60	0.8	1,015	733.64	2.8	3,529
732.62	0.8	1,062	733.66	2.8	3,568
732.64	0.9	1,109	733.68	2.8	3,606
732.66	0.9	1,157	733.70	2.8	3,643
732.68	0.9	1,206	733.72	2.9	3,679
732.70	1.0	1,254	733.74	2.9	3,714
732.72	1.0	1,303	733.76	2.9	3,748
732.74	1.1	1,353	733.78	3.0	3,781
732.76	1.1	1,402	733.80	3.0	3,812
732.78	1.1	1,452	733.82	3.0	3,842
732.80	1.2	1,502	733.84	3.0	3,871
732.82	1.2	1,552	733.86	3.0	3,897
732.84	1.3	1,603	733.88	3.1	3,923
732.86	1.3	1,653	733.90	3.1	3,946
732.88	1.3	1,704	733.92	3.1	3,967
732.90	1.4	1,755	733.94	3.1	3,986
732.92	1.4	1,806	733.96	3.1	4,002
732.94	1.5	1,857	733.98	3.1	4,014
732.96	1.5	1,908	734.00	3.1	4,021
732.98	1.5	1,959			
733.00	1.6	2,011			
733.02	1.6	2,062			

Summary for Reach 2R: Watercourse

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 1.45" for 10 Year, 24 Hr. Event event
Inflow = 4.34 cfs @ 12.44 hrs, Volume= 0.580 af
Outflow = 4.33 cfs @ 12.45 hrs, Volume= 0.580 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 6.89 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 2.98 fps, Avg. Travel Time= 1.9 min

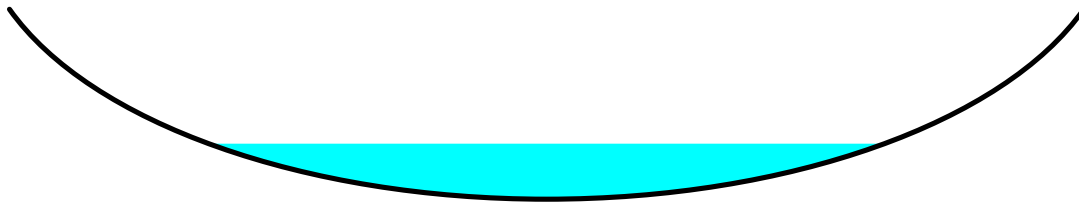
Peak Storage= 209 cf @ 12.45 hrs, Average Depth at Peak Storage= 0.29'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 60.85 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

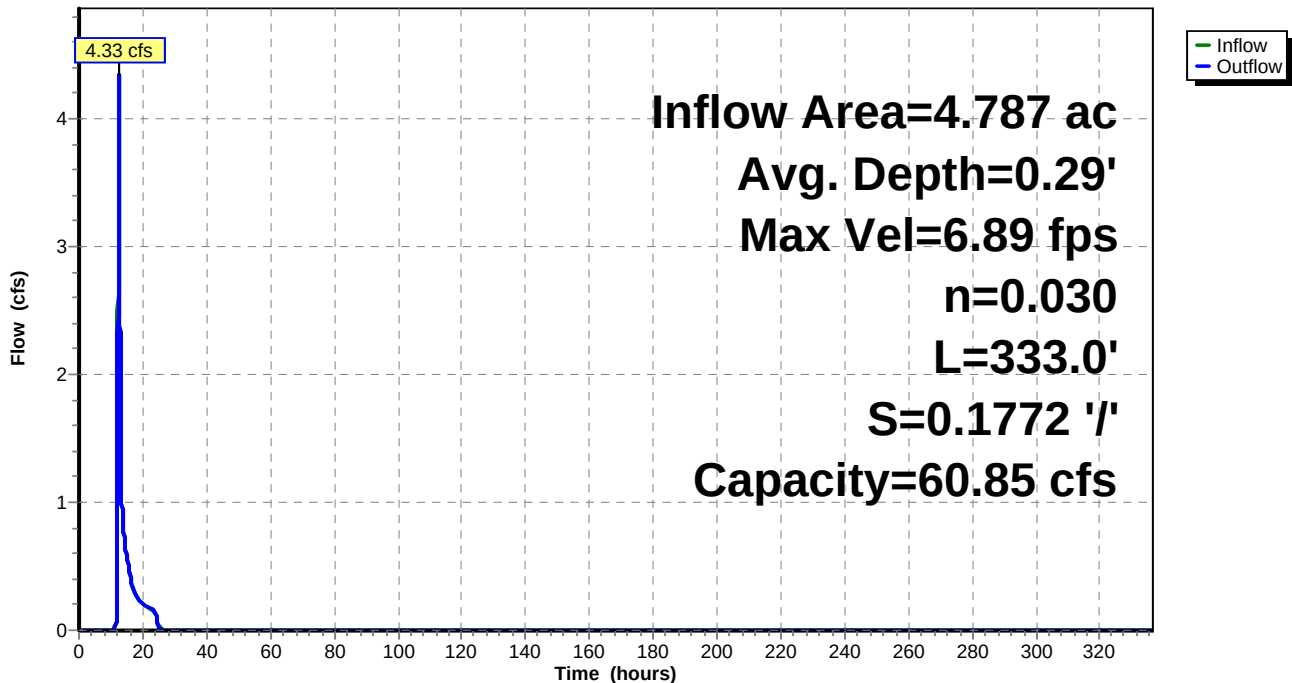
Length= 333.0' Slope= 0.1772 '/'

Inlet Invert= 581.00', Outlet Invert= 522.00'



Reach 2R: Watercourse

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach 2R: Watercourse

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	581.00	0.00
10.00	0.00	0	581.00	0.00
20.00	0.21	25	581.07	0.21
30.00	0.00	0	581.00	0.00
40.00	0.00	0	581.00	0.00
50.00	0.00	0	581.00	0.00
60.00	0.00	0	581.00	0.00
70.00	0.00	0	581.00	0.00
80.00	0.00	0	581.00	0.00
90.00	0.00	0	581.00	0.00
100.00	0.00	0	581.00	0.00
110.00	0.00	0	581.00	0.00
120.00	0.00	0	581.00	0.00
130.00	0.00	0	581.00	0.00
140.00	0.00	0	581.00	0.00
150.00	0.00	0	581.00	0.00
160.00	0.00	0	581.00	0.00
170.00	0.00	0	581.00	0.00
180.00	0.00	0	581.00	0.00
190.00	0.00	0	581.00	0.00
200.00	0.00	0	581.00	0.00
210.00	0.00	0	581.00	0.00
220.00	0.00	0	581.00	0.00
230.00	0.00	0	581.00	0.00
240.00	0.00	0	581.00	0.00
250.00	0.00	0	581.00	0.00
260.00	0.00	0	581.00	0.00
270.00	0.00	0	581.00	0.00
280.00	0.00	0	581.00	0.00
290.00	0.00	0	581.00	0.00
300.00	0.00	0	581.00	0.00
310.00	0.00	0	581.00	0.00
320.00	0.00	0	581.00	0.00
330.00	0.00	0	581.00	0.00

Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Stage-Area-Storage for Reach 2R: Watercourse

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
581.00	0.0	0	581.52	1.5	499
581.01	0.0	1	581.53	1.5	514
581.02	0.0	4	581.54	1.6	529
581.03	0.0	7	581.55	1.6	543
581.04	0.0	11	581.56	1.7	558
581.05	0.0	15	581.57	1.7	573
581.06	0.1	20	581.58	1.8	588
581.07	0.1	25	581.59	1.8	604
581.08	0.1	30	581.60	1.9	619
581.09	0.1	36	581.61	1.9	635
581.10	0.1	42	581.62	2.0	650
581.11	0.1	49	581.63	2.0	666
581.12	0.2	55	581.64	2.0	682
581.13	0.2	62	581.65	2.1	698
581.14	0.2	70	581.66	2.1	714
581.15	0.2	77	581.67	2.2	730
581.16	0.3	85	581.68	2.2	747
581.17	0.3	93	581.69	2.3	763
581.18	0.3	102	581.70	2.3	780
581.19	0.3	110	581.71	2.4	797
581.20	0.4	119	581.72	2.4	814
581.21	0.4	128	581.73	2.5	831
581.22	0.4	137	581.74	2.5	848
581.23	0.4	147	581.75	2.6	865
581.24	0.5	157	581.76	2.7	883
581.25	0.5	167	581.77	2.7	900
581.26	0.5	177	581.78	2.8	918
581.27	0.6	187	581.79	2.8	935
581.28	0.6	197	581.80	2.9	953
581.29	0.6	208	581.81	2.9	971
581.30	0.7	219	581.82	3.0	989
581.31	0.7	230	581.83	3.0	1,007
581.32	0.7	241	581.84	3.1	1,025
581.33	0.8	253	581.85	3.1	1,044
581.34	0.8	264	581.86	3.2	1,062
581.35	0.8	276	581.87	3.2	1,081
581.36	0.9	288	581.88	3.3	1,100
581.37	0.9	300	581.89	3.4	1,118
581.38	0.9	312	581.90	3.4	1,137
581.39	1.0	324	581.91	3.5	1,156
581.40	1.0	337	581.92	3.5	1,175
581.41	1.1	350	581.93	3.6	1,195
581.42	1.1	363	581.94	3.6	1,214
581.43	1.1	376	581.95	3.7	1,233
581.44	1.2	389	581.96	3.8	1,253
581.45	1.2	402	581.97	3.8	1,273
581.46	1.2	416	581.98	3.9	1,292
581.47	1.3	429	581.99	3.9	1,312
581.48	1.3	443	582.00	4.0	1,332
581.49	1.4	457			
581.50	1.4	471			
581.51	1.5	485			

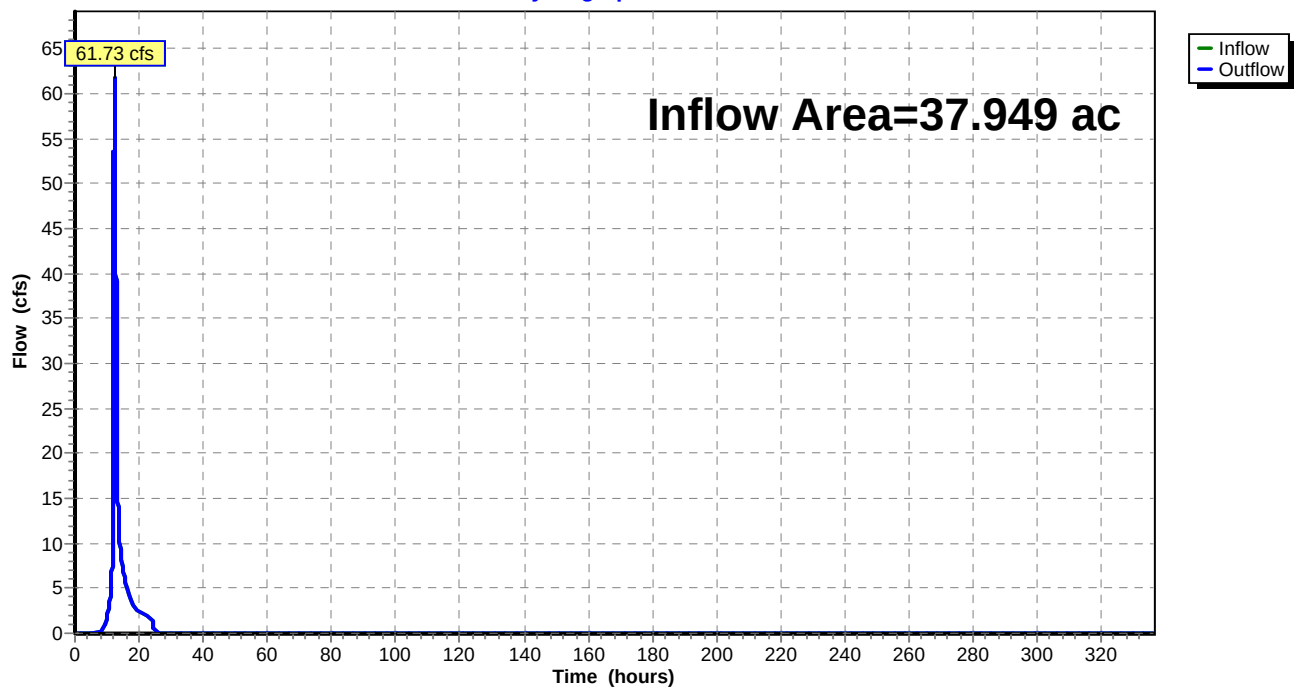
Summary for Reach DP 1B: PROP DP 1B

Inflow Area = 37.949 ac, 33.22% Impervious, Inflow Depth = 2.96" for 10 Year, 24 Hr. Event event
Inflow = 61.73 cfs @ 12.41 hrs, Volume= 9.361 af
Outflow = 61.73 cfs @ 12.41 hrs, Volume= 9.361 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1B: PROP DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach DP 1B: PROP DP 1B

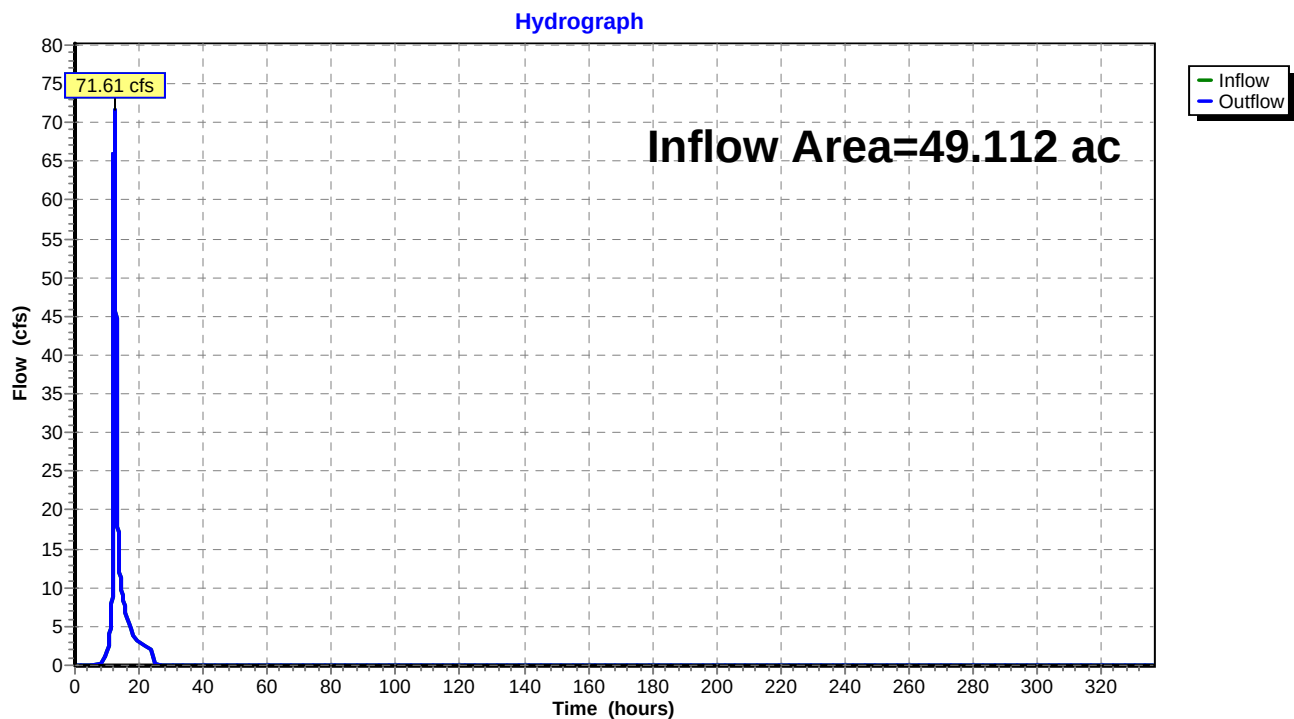
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	1.88		1.88	270.00	0.00		0.00
15.00	7.08		7.08	275.00	0.00		0.00
20.00	2.36		2.36	280.00	0.00		0.00
25.00	0.06		0.06	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Summary for Reach EX DP !B: Existing DP 1B

Inflow Area = 49.112 ac, 26.08% Impervious, Inflow Depth = 2.73" for 10 Year, 24 Hr. Event event
Inflow = 71.61 cfs @ 12.39 hrs, Volume= 11.172 af
Outflow = 71.61 cfs @ 12.39 hrs, Volume= 11.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP !B: Existing DP 1B



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Hydrograph for Reach EX DP 1B: Existing DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	1.94		1.94	270.00	0.00		0.00
15.00	8.64		8.64	275.00	0.00		0.00
20.00	2.92		2.92	280.00	0.00		0.00
25.00	0.07		0.07	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

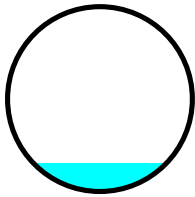
Summary for Reach R 1R: PROP 1R

Inflow Area = 4.017 ac, 0.00% Impervious, Inflow Depth = 1.24" for 10 Year, 24 Hr. Event event
 Inflow = 3.66 cfs @ 12.25 hrs, Volume= 0.415 af
 Outflow = 3.64 cfs @ 12.26 hrs, Volume= 0.415 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 12.00 fps, Min. Travel Time= 1.3 min
 Avg. Velocity = 5.33 fps, Avg. Travel Time= 3.0 min

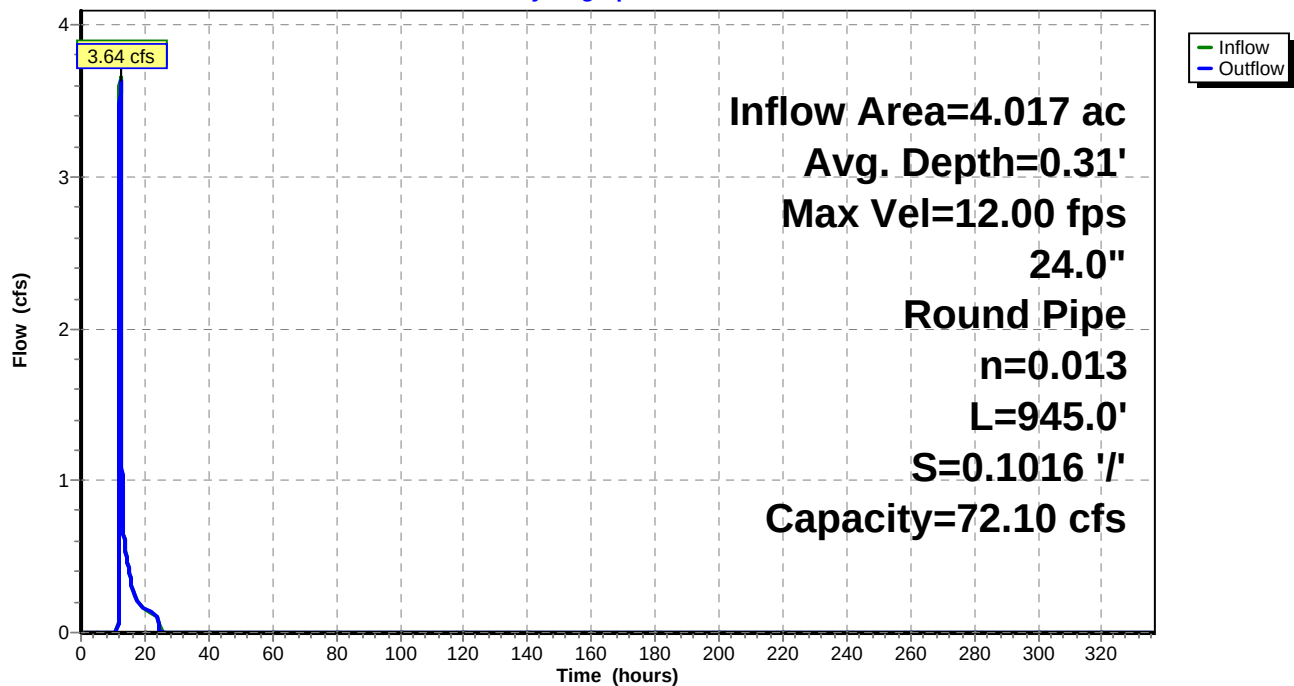
Peak Storage= 287 cf @ 12.26 hrs, Average Depth at Peak Storage= 0.31'
 Bank-Full Depth= 2.00', Capacity at Bank-Full= 72.10 cfs

24.0" Round Pipe
 n= 0.013 Corrugated PE, smooth interior
 Length= 945.0' Slope= 0.1016 '/'
 Inlet Invert= 746.00', Outlet Invert= 650.00'



Reach R 1R: PROP 1R

Hydrograph



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Hydrograph for Reach R 1R: PROP 1R

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	746.00	0.00
10.00	0.00	0	746.00	0.00
20.00	0.15	31	746.07	0.15
30.00	0.00	0	746.00	0.00
40.00	0.00	0	746.00	0.00
50.00	0.00	0	746.00	0.00
60.00	0.00	0	746.00	0.00
70.00	0.00	0	746.00	0.00
80.00	0.00	0	746.00	0.00
90.00	0.00	0	746.00	0.00
100.00	0.00	0	746.00	0.00
110.00	0.00	0	746.00	0.00
120.00	0.00	0	746.00	0.00
130.00	0.00	0	746.00	0.00
140.00	0.00	0	746.00	0.00
150.00	0.00	0	746.00	0.00
160.00	0.00	0	746.00	0.00
170.00	0.00	0	746.00	0.00
180.00	0.00	0	746.00	0.00
190.00	0.00	0	746.00	0.00
200.00	0.00	0	746.00	0.00
210.00	0.00	0	746.00	0.00
220.00	0.00	0	746.00	0.00
230.00	0.00	0	746.00	0.00
240.00	0.00	0	746.00	0.00
250.00	0.00	0	746.00	0.00
260.00	0.00	0	746.00	0.00
270.00	0.00	0	746.00	0.00
280.00	0.00	0	746.00	0.00
290.00	0.00	0	746.00	0.00
300.00	0.00	0	746.00	0.00
310.00	0.00	0	746.00	0.00
320.00	0.00	0	746.00	0.00
330.00	0.00	0	746.00	0.00

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Stage-Area-Storage for Reach R 1R: PROP 1R

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
746.00	0.0	0	747.04	1.7	1,560
746.02	0.0	5	747.06	1.7	1,598
746.04	0.0	14	747.08	1.7	1,635
746.06	0.0	26	747.10	1.8	1,673
746.08	0.0	40	747.12	1.8	1,711
746.10	0.1	55	747.14	1.8	1,748
746.12	0.1	73	747.16	1.9	1,786
746.14	0.1	91	747.18	1.9	1,823
746.16	0.1	111	747.20	2.0	1,860
746.18	0.1	132	747.22	2.0	1,897
746.20	0.2	155	747.24	2.0	1,934
746.22	0.2	178	747.26	2.1	1,970
746.24	0.2	202	747.28	2.1	2,007
746.26	0.2	227	747.30	2.2	2,043
746.28	0.3	253	747.32	2.2	2,079
746.30	0.3	279	747.34	2.2	2,114
746.32	0.3	307	747.36	2.3	2,150
746.34	0.4	335	747.38	2.3	2,185
746.36	0.4	363	747.40	2.3	2,220
746.38	0.4	393	747.42	2.4	2,254
746.40	0.4	423	747.44	2.4	2,288
746.42	0.5	453	747.46	2.5	2,322
746.44	0.5	484	747.48	2.5	2,355
746.46	0.5	516	747.50	2.5	2,388
746.48	0.6	548	747.52	2.6	2,421
746.50	0.6	580	747.54	2.6	2,453
746.52	0.6	613	747.56	2.6	2,485
746.54	0.7	647	747.58	2.7	2,516
746.56	0.7	680	747.60	2.7	2,546
746.58	0.8	715	747.62	2.7	2,576
746.60	0.8	749	747.64	2.8	2,605
746.62	0.8	784	747.66	2.8	2,634
746.64	0.9	819	747.68	2.8	2,662
746.66	0.9	854	747.70	2.8	2,690
746.68	0.9	890	747.72	2.9	2,716
746.70	1.0	926	747.74	2.9	2,742
746.72	1.0	962	747.76	2.9	2,767
746.74	1.1	999	747.78	3.0	2,791
746.76	1.1	1,035	747.80	3.0	2,814
746.78	1.1	1,072	747.82	3.0	2,836
746.80	1.2	1,109	747.84	3.0	2,858
746.82	1.2	1,146	747.86	3.0	2,877
746.84	1.3	1,183	747.88	3.1	2,896
746.86	1.3	1,221	747.90	3.1	2,913
746.88	1.3	1,258	747.92	3.1	2,929
746.90	1.4	1,296	747.94	3.1	2,943
746.92	1.4	1,333	747.96	3.1	2,955
746.94	1.5	1,371	747.98	3.1	2,964
746.96	1.5	1,409	748.00	3.1	2,969
746.98	1.5	1,447			
747.00	1.6	1,484			
747.02	1.6	1,522			

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1A: PROP 1A

Runoff = 4.67 cfs @ 12.24 hrs, Volume= 0.508 af, Depth= 1.52"

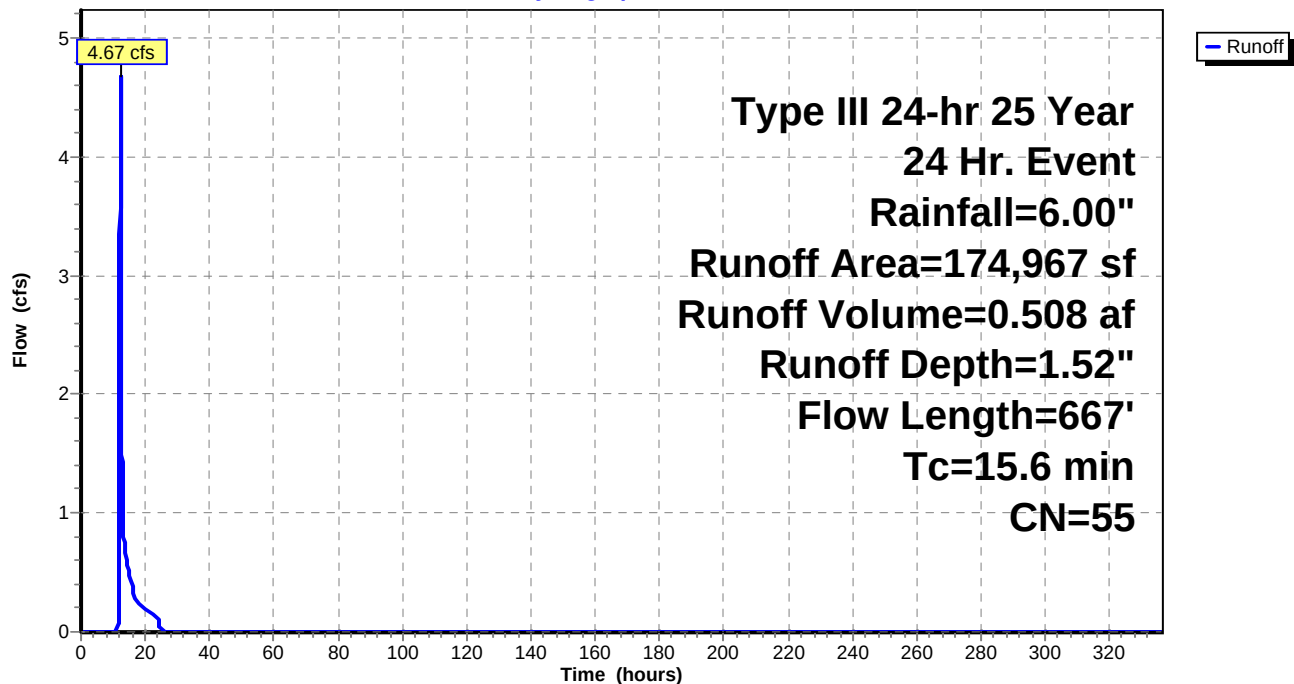
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
174,967	55	Woods, Good, HSG B
174,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	567	0.1790	6.81		Shallow Concentrated Flow, woods
					Unpaved Kv= 16.1 fps
15.6	667	Total			

Subcatchment 1A: PROP 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1A: PROP 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	1.52	0.00
5.00	0.34	0.00	0.00	265.00	6.00	1.52	0.00
10.00	1.13	0.00	0.00	270.00	6.00	1.52	0.00
15.00	5.13	1.04	0.49	275.00	6.00	1.52	0.00
20.00	5.74	1.37	0.18	280.00	6.00	1.52	0.00
25.00	6.00	1.52	0.00	285.00	6.00	1.52	0.00
30.00	6.00	1.52	0.00	290.00	6.00	1.52	0.00
35.00	6.00	1.52	0.00	295.00	6.00	1.52	0.00
40.00	6.00	1.52	0.00	300.00	6.00	1.52	0.00
45.00	6.00	1.52	0.00	305.00	6.00	1.52	0.00
50.00	6.00	1.52	0.00	310.00	6.00	1.52	0.00
55.00	6.00	1.52	0.00	315.00	6.00	1.52	0.00
60.00	6.00	1.52	0.00	320.00	6.00	1.52	0.00
65.00	6.00	1.52	0.00	325.00	6.00	1.52	0.00
70.00	6.00	1.52	0.00	330.00	6.00	1.52	0.00
75.00	6.00	1.52	0.00	335.00	6.00	1.52	0.00
80.00	6.00	1.52	0.00				
85.00	6.00	1.52	0.00				
90.00	6.00	1.52	0.00				
95.00	6.00	1.52	0.00				
100.00	6.00	1.52	0.00				
105.00	6.00	1.52	0.00				
110.00	6.00	1.52	0.00				
115.00	6.00	1.52	0.00				
120.00	6.00	1.52	0.00				
125.00	6.00	1.52	0.00				
130.00	6.00	1.52	0.00				
135.00	6.00	1.52	0.00				
140.00	6.00	1.52	0.00				
145.00	6.00	1.52	0.00				
150.00	6.00	1.52	0.00				
155.00	6.00	1.52	0.00				
160.00	6.00	1.52	0.00				
165.00	6.00	1.52	0.00				
170.00	6.00	1.52	0.00				
175.00	6.00	1.52	0.00				
180.00	6.00	1.52	0.00				
185.00	6.00	1.52	0.00				
190.00	6.00	1.52	0.00				
195.00	6.00	1.52	0.00				
200.00	6.00	1.52	0.00				
205.00	6.00	1.52	0.00				
210.00	6.00	1.52	0.00				
215.00	6.00	1.52	0.00				
220.00	6.00	1.52	0.00				
225.00	6.00	1.52	0.00				
230.00	6.00	1.52	0.00				
235.00	6.00	1.52	0.00				
240.00	6.00	1.52	0.00				
245.00	6.00	1.52	0.00				
250.00	6.00	1.52	0.00				
255.00	6.00	1.52	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1D: PROP ID

Runoff = 55.13 cfs @ 12.48 hrs, Volume= 7.441 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

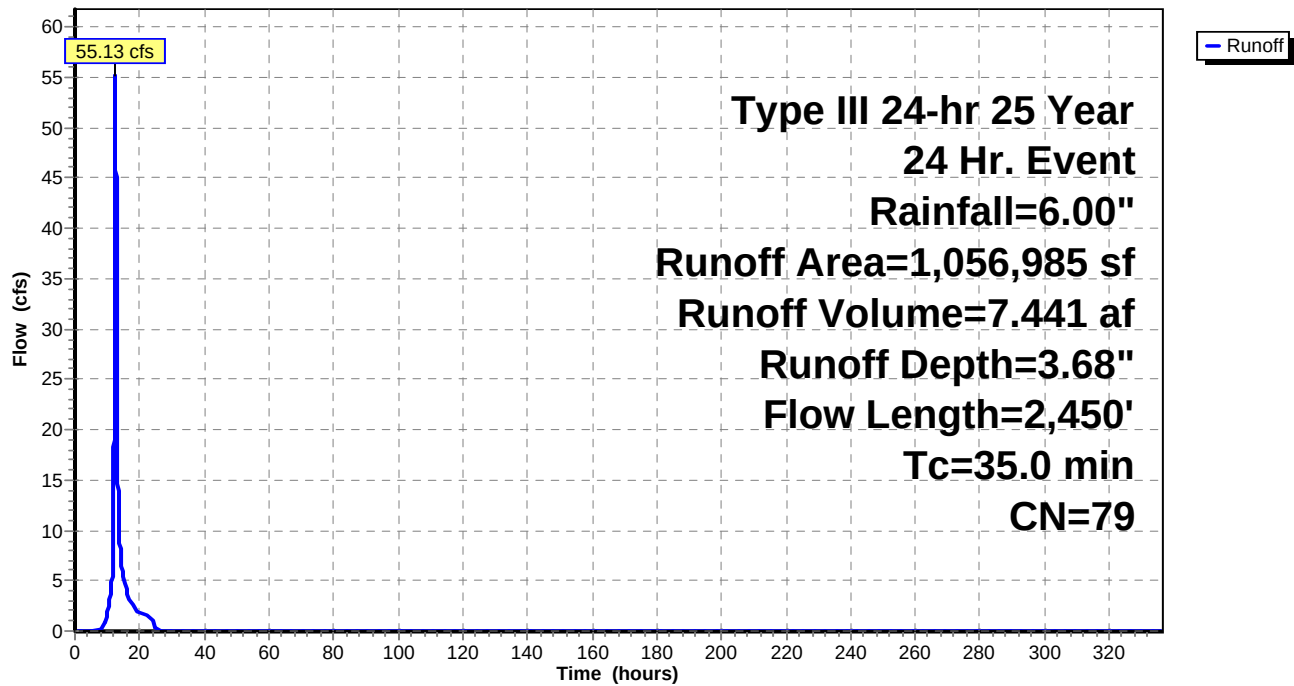
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
250,952	74	>75% Grass cover, Good, HSG C
1,056,985	79	Weighted Average
589,151		55.74% Pervious Area
467,834		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	800	0.1000	22.77	71.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
35.0	2,450	Total			

Subcatchment 1D: PROP ID

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1D: PROP ID

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.68	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.68	0.00
10.00	1.13	0.11	1.71	270.00	6.00	3.68	0.00
15.00	5.13	2.91	5.54	275.00	6.00	3.68	0.00
20.00	5.74	3.45	1.79	280.00	6.00	3.68	0.00
25.00	6.00	3.68	0.07	285.00	6.00	3.68	0.00
30.00	6.00	3.68	0.00	290.00	6.00	3.68	0.00
35.00	6.00	3.68	0.00	295.00	6.00	3.68	0.00
40.00	6.00	3.68	0.00	300.00	6.00	3.68	0.00
45.00	6.00	3.68	0.00	305.00	6.00	3.68	0.00
50.00	6.00	3.68	0.00	310.00	6.00	3.68	0.00
55.00	6.00	3.68	0.00	315.00	6.00	3.68	0.00
60.00	6.00	3.68	0.00	320.00	6.00	3.68	0.00
65.00	6.00	3.68	0.00	325.00	6.00	3.68	0.00
70.00	6.00	3.68	0.00	330.00	6.00	3.68	0.00
75.00	6.00	3.68	0.00	335.00	6.00	3.68	0.00
80.00	6.00	3.68	0.00				
85.00	6.00	3.68	0.00				
90.00	6.00	3.68	0.00				
95.00	6.00	3.68	0.00				
100.00	6.00	3.68	0.00				
105.00	6.00	3.68	0.00				
110.00	6.00	3.68	0.00				
115.00	6.00	3.68	0.00				
120.00	6.00	3.68	0.00				
125.00	6.00	3.68	0.00				
130.00	6.00	3.68	0.00				
135.00	6.00	3.68	0.00				
140.00	6.00	3.68	0.00				
145.00	6.00	3.68	0.00				
150.00	6.00	3.68	0.00				
155.00	6.00	3.68	0.00				
160.00	6.00	3.68	0.00				
165.00	6.00	3.68	0.00				
170.00	6.00	3.68	0.00				
175.00	6.00	3.68	0.00				
180.00	6.00	3.68	0.00				
185.00	6.00	3.68	0.00				
190.00	6.00	3.68	0.00				
195.00	6.00	3.68	0.00				
200.00	6.00	3.68	0.00				
205.00	6.00	3.68	0.00				
210.00	6.00	3.68	0.00				
215.00	6.00	3.68	0.00				
220.00	6.00	3.68	0.00				
225.00	6.00	3.68	0.00				
230.00	6.00	3.68	0.00				
235.00	6.00	3.68	0.00				
240.00	6.00	3.68	0.00				
245.00	6.00	3.68	0.00				
250.00	6.00	3.68	0.00				
255.00	6.00	3.68	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1K: PROP DA 1K

Runoff = 12.94 cfs @ 12.10 hrs, Volume= 0.945 af, Depth= 3.68"

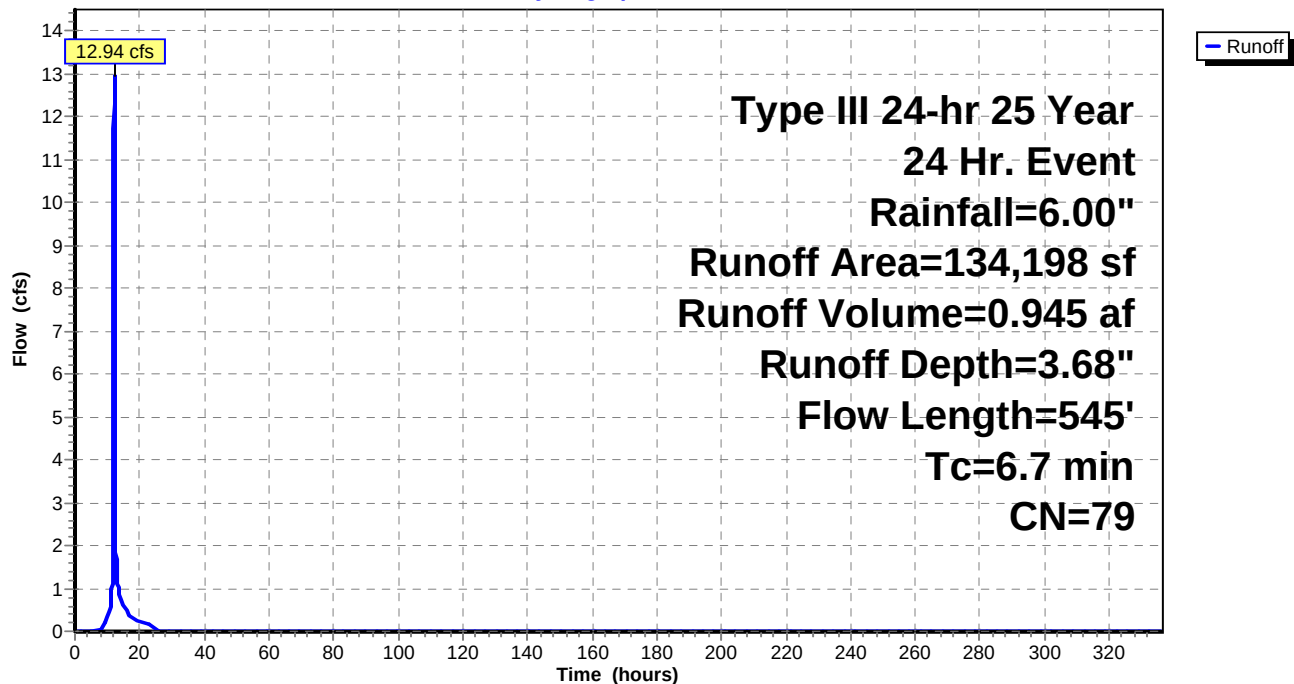
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
108,493	74	>75% Grass cover, Good, HSG C
9,729	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
134,198	79	Weighted Average
108,493		80.85% Pervious Area
25,705		19.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	80	0.1000	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	195	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	270	0.1850	22.86	228.55	Channel Flow, Area= 10.0 sf Perim= 9.0' r= 1.11' n= 0.030 Earth, grassed & winding
6.7	545	Total			

Subcatchment 1K: PROP DA 1K

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1K: PROP DA 1K

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.68	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.68	0.00
10.00	1.13	0.11	0.29	270.00	6.00	3.68	0.00
15.00	5.13	2.91	0.62	275.00	6.00	3.68	0.00
20.00	5.74	3.45	0.22	280.00	6.00	3.68	0.00
25.00	6.00	3.68	0.00	285.00	6.00	3.68	0.00
30.00	6.00	3.68	0.00	290.00	6.00	3.68	0.00
35.00	6.00	3.68	0.00	295.00	6.00	3.68	0.00
40.00	6.00	3.68	0.00	300.00	6.00	3.68	0.00
45.00	6.00	3.68	0.00	305.00	6.00	3.68	0.00
50.00	6.00	3.68	0.00	310.00	6.00	3.68	0.00
55.00	6.00	3.68	0.00	315.00	6.00	3.68	0.00
60.00	6.00	3.68	0.00	320.00	6.00	3.68	0.00
65.00	6.00	3.68	0.00	325.00	6.00	3.68	0.00
70.00	6.00	3.68	0.00	330.00	6.00	3.68	0.00
75.00	6.00	3.68	0.00	335.00	6.00	3.68	0.00
80.00	6.00	3.68	0.00				
85.00	6.00	3.68	0.00				
90.00	6.00	3.68	0.00				
95.00	6.00	3.68	0.00				
100.00	6.00	3.68	0.00				
105.00	6.00	3.68	0.00				
110.00	6.00	3.68	0.00				
115.00	6.00	3.68	0.00				
120.00	6.00	3.68	0.00				
125.00	6.00	3.68	0.00				
130.00	6.00	3.68	0.00				
135.00	6.00	3.68	0.00				
140.00	6.00	3.68	0.00				
145.00	6.00	3.68	0.00				
150.00	6.00	3.68	0.00				
155.00	6.00	3.68	0.00				
160.00	6.00	3.68	0.00				
165.00	6.00	3.68	0.00				
170.00	6.00	3.68	0.00				
175.00	6.00	3.68	0.00				
180.00	6.00	3.68	0.00				
185.00	6.00	3.68	0.00				
190.00	6.00	3.68	0.00				
195.00	6.00	3.68	0.00				
200.00	6.00	3.68	0.00				
205.00	6.00	3.68	0.00				
210.00	6.00	3.68	0.00				
215.00	6.00	3.68	0.00				
220.00	6.00	3.68	0.00				
225.00	6.00	3.68	0.00				
230.00	6.00	3.68	0.00				
235.00	6.00	3.68	0.00				
240.00	6.00	3.68	0.00				
245.00	6.00	3.68	0.00				
250.00	6.00	3.68	0.00				
255.00	6.00	3.68	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1L: PROP 1I

Runoff = 24.32 cfs @ 12.10 hrs, Volume= 1.802 af, Depth= 3.28"

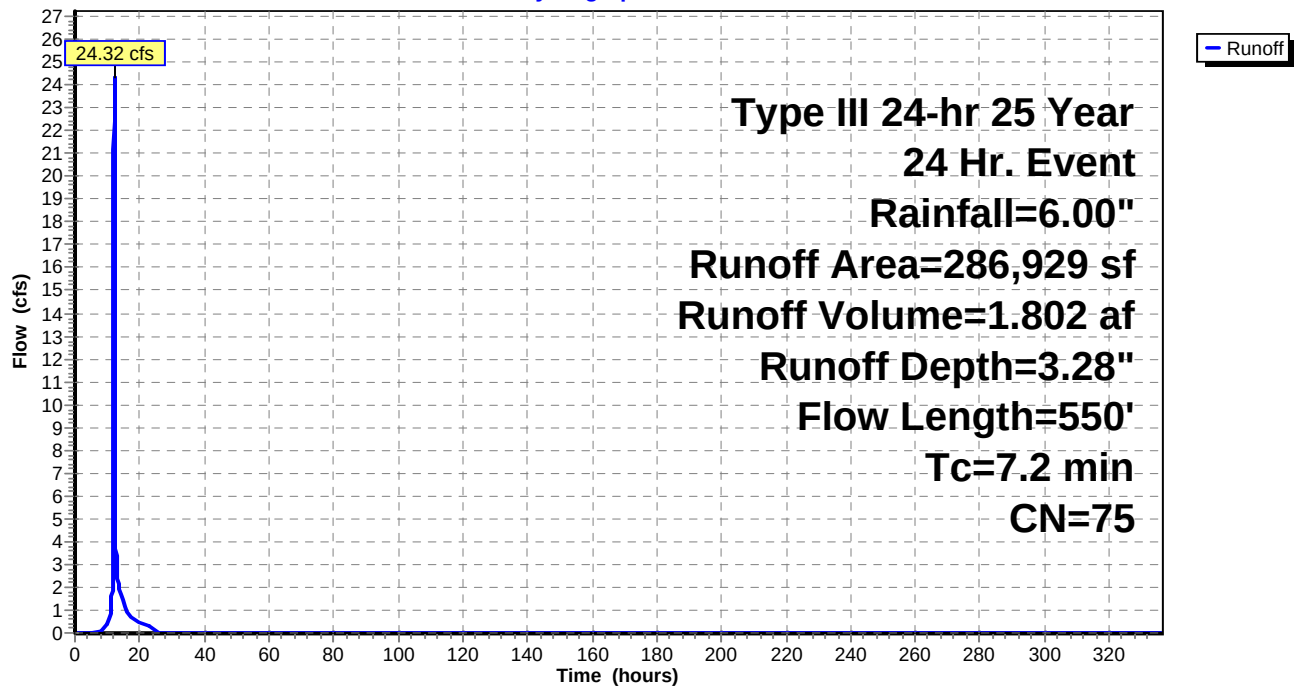
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
86,205	61	>75% Grass cover, Good, HSG B
145,054	74	>75% Grass cover, Good, HSG C
286,929	75	Weighted Average
231,259		80.60% Pervious Area
55,670		19.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	450	0.1640	2.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	550	Total			

Subcatchment 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.28	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.28	0.00
10.00	1.13	0.06	0.41	270.00	6.00	3.28	0.00
15.00	5.13	2.55	1.26	275.00	6.00	3.28	0.00
20.00	5.74	3.06	0.44	280.00	6.00	3.28	0.00
25.00	6.00	3.28	0.00	285.00	6.00	3.28	0.00
30.00	6.00	3.28	0.00	290.00	6.00	3.28	0.00
35.00	6.00	3.28	0.00	295.00	6.00	3.28	0.00
40.00	6.00	3.28	0.00	300.00	6.00	3.28	0.00
45.00	6.00	3.28	0.00	305.00	6.00	3.28	0.00
50.00	6.00	3.28	0.00	310.00	6.00	3.28	0.00
55.00	6.00	3.28	0.00	315.00	6.00	3.28	0.00
60.00	6.00	3.28	0.00	320.00	6.00	3.28	0.00
65.00	6.00	3.28	0.00	325.00	6.00	3.28	0.00
70.00	6.00	3.28	0.00	330.00	6.00	3.28	0.00
75.00	6.00	3.28	0.00	335.00	6.00	3.28	0.00
80.00	6.00	3.28	0.00				
85.00	6.00	3.28	0.00				
90.00	6.00	3.28	0.00				
95.00	6.00	3.28	0.00				
100.00	6.00	3.28	0.00				
105.00	6.00	3.28	0.00				
110.00	6.00	3.28	0.00				
115.00	6.00	3.28	0.00				
120.00	6.00	3.28	0.00				
125.00	6.00	3.28	0.00				
130.00	6.00	3.28	0.00				
135.00	6.00	3.28	0.00				
140.00	6.00	3.28	0.00				
145.00	6.00	3.28	0.00				
150.00	6.00	3.28	0.00				
155.00	6.00	3.28	0.00				
160.00	6.00	3.28	0.00				
165.00	6.00	3.28	0.00				
170.00	6.00	3.28	0.00				
175.00	6.00	3.28	0.00				
180.00	6.00	3.28	0.00				
185.00	6.00	3.28	0.00				
190.00	6.00	3.28	0.00				
195.00	6.00	3.28	0.00				
200.00	6.00	3.28	0.00				
205.00	6.00	3.28	0.00				
210.00	6.00	3.28	0.00				
215.00	6.00	3.28	0.00				
220.00	6.00	3.28	0.00				
225.00	6.00	3.28	0.00				
230.00	6.00	3.28	0.00				
235.00	6.00	3.28	0.00				
240.00	6.00	3.28	0.00				
245.00	6.00	3.28	0.00				
250.00	6.00	3.28	0.00				
255.00	6.00	3.28	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1D: EXIST 1D

Runoff = 10.69 cfs @ 12.28 hrs, Volume= 1.158 af, Depth= 2.01"

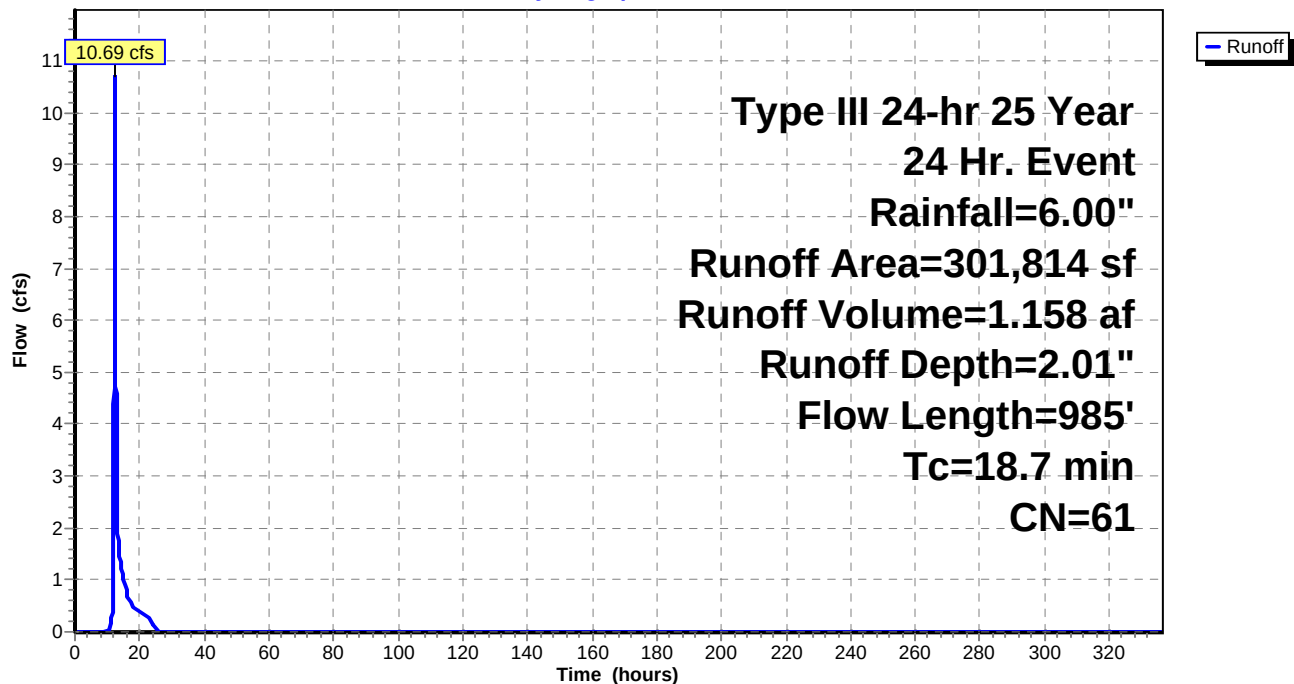
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
301,814	61	>75% Grass cover, Good, HSG B
301,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	115	0.0340	0.16		Sheet Flow, Orchard
					Grass: Dense n= 0.240 P2= 3.50"
6.4	870	0.1057	2.28		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
18.7	985	Total			

Subcatchment EX 1D: EXIST 1D

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1D: EXIST 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.01	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.01	0.00
10.00	1.13	0.00	0.00	270.00	6.00	2.01	0.00
15.00	5.13	1.45	1.03	275.00	6.00	2.01	0.00
20.00	5.74	1.83	0.37	280.00	6.00	2.01	0.00
25.00	6.00	2.01	0.00	285.00	6.00	2.01	0.00
30.00	6.00	2.01	0.00	290.00	6.00	2.01	0.00
35.00	6.00	2.01	0.00	295.00	6.00	2.01	0.00
40.00	6.00	2.01	0.00	300.00	6.00	2.01	0.00
45.00	6.00	2.01	0.00	305.00	6.00	2.01	0.00
50.00	6.00	2.01	0.00	310.00	6.00	2.01	0.00
55.00	6.00	2.01	0.00	315.00	6.00	2.01	0.00
60.00	6.00	2.01	0.00	320.00	6.00	2.01	0.00
65.00	6.00	2.01	0.00	325.00	6.00	2.01	0.00
70.00	6.00	2.01	0.00	330.00	6.00	2.01	0.00
75.00	6.00	2.01	0.00	335.00	6.00	2.01	0.00
80.00	6.00	2.01	0.00				
85.00	6.00	2.01	0.00				
90.00	6.00	2.01	0.00				
95.00	6.00	2.01	0.00				
100.00	6.00	2.01	0.00				
105.00	6.00	2.01	0.00				
110.00	6.00	2.01	0.00				
115.00	6.00	2.01	0.00				
120.00	6.00	2.01	0.00				
125.00	6.00	2.01	0.00				
130.00	6.00	2.01	0.00				
135.00	6.00	2.01	0.00				
140.00	6.00	2.01	0.00				
145.00	6.00	2.01	0.00				
150.00	6.00	2.01	0.00				
155.00	6.00	2.01	0.00				
160.00	6.00	2.01	0.00				
165.00	6.00	2.01	0.00				
170.00	6.00	2.01	0.00				
175.00	6.00	2.01	0.00				
180.00	6.00	2.01	0.00				
185.00	6.00	2.01	0.00				
190.00	6.00	2.01	0.00				
195.00	6.00	2.01	0.00				
200.00	6.00	2.01	0.00				
205.00	6.00	2.01	0.00				
210.00	6.00	2.01	0.00				
215.00	6.00	2.01	0.00				
220.00	6.00	2.01	0.00				
225.00	6.00	2.01	0.00				
230.00	6.00	2.01	0.00				
235.00	6.00	2.01	0.00				
240.00	6.00	2.01	0.00				
245.00	6.00	2.01	0.00				
250.00	6.00	2.01	0.00				
255.00	6.00	2.01	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1E: EXIST 1E

Runoff = 28.80 cfs @ 12.08 hrs, Volume= 2.016 af, Depth= 3.38"

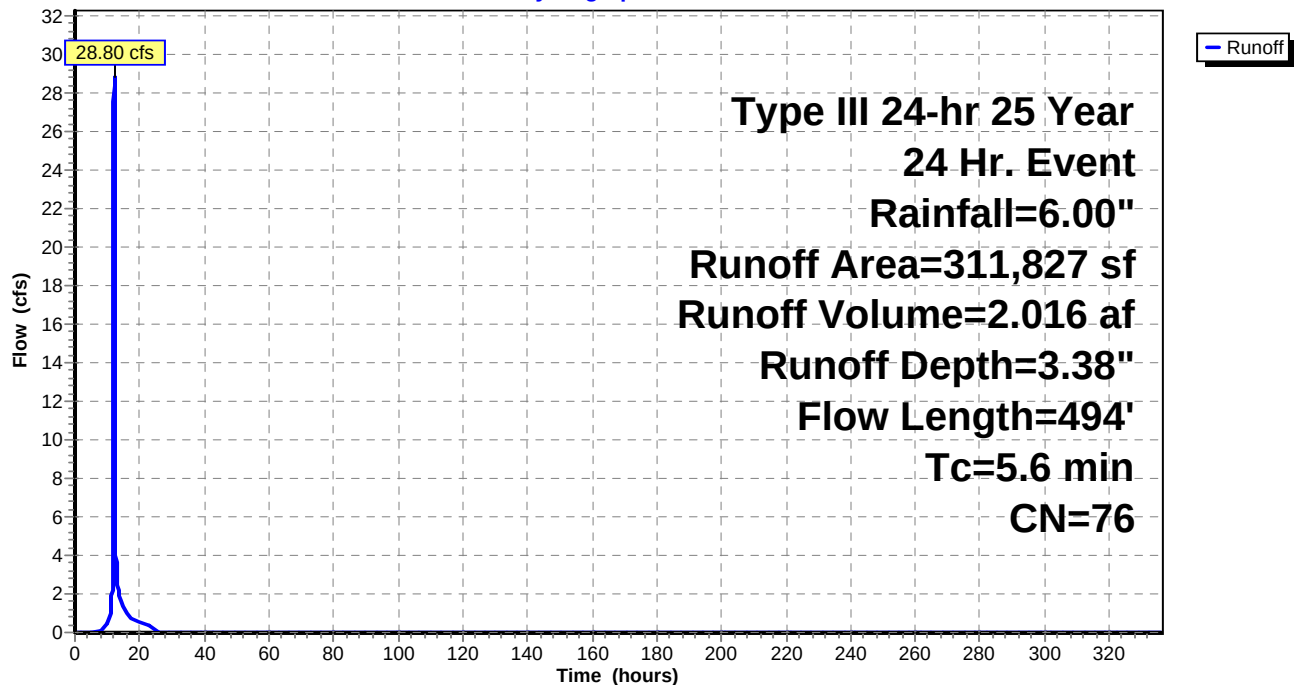
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
250,622	74	>75% Grass cover, Good, HSG C
26,824	61	>75% Grass cover, Good, HSG B
18,405	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
311,827	76	Weighted Average
277,446		88.97% Pervious Area
34,381		11.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	75	0.1600	0.39		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
2.4	419	0.1800	2.97		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
5.6	494	Total			

Subcatchment EX 1E: EXIST 1E

Hydrograph



Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Hydrograph for Subcatchment EX 1E: EXIST 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.38	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.38	0.00
10.00	1.13	0.07	0.51	270.00	6.00	3.38	0.00
15.00	5.13	2.64	1.38	275.00	6.00	3.38	0.00
20.00	5.74	3.16	0.49	280.00	6.00	3.38	0.00
25.00	6.00	3.38	0.00	285.00	6.00	3.38	0.00
30.00	6.00	3.38	0.00	290.00	6.00	3.38	0.00
35.00	6.00	3.38	0.00	295.00	6.00	3.38	0.00
40.00	6.00	3.38	0.00	300.00	6.00	3.38	0.00
45.00	6.00	3.38	0.00	305.00	6.00	3.38	0.00
50.00	6.00	3.38	0.00	310.00	6.00	3.38	0.00
55.00	6.00	3.38	0.00	315.00	6.00	3.38	0.00
60.00	6.00	3.38	0.00	320.00	6.00	3.38	0.00
65.00	6.00	3.38	0.00	325.00	6.00	3.38	0.00
70.00	6.00	3.38	0.00	330.00	6.00	3.38	0.00
75.00	6.00	3.38	0.00	335.00	6.00	3.38	0.00
80.00	6.00	3.38	0.00				
85.00	6.00	3.38	0.00				
90.00	6.00	3.38	0.00				
95.00	6.00	3.38	0.00				
100.00	6.00	3.38	0.00				
105.00	6.00	3.38	0.00				
110.00	6.00	3.38	0.00				
115.00	6.00	3.38	0.00				
120.00	6.00	3.38	0.00				
125.00	6.00	3.38	0.00				
130.00	6.00	3.38	0.00				
135.00	6.00	3.38	0.00				
140.00	6.00	3.38	0.00				
145.00	6.00	3.38	0.00				
150.00	6.00	3.38	0.00				
155.00	6.00	3.38	0.00				
160.00	6.00	3.38	0.00				
165.00	6.00	3.38	0.00				
170.00	6.00	3.38	0.00				
175.00	6.00	3.38	0.00				
180.00	6.00	3.38	0.00				
185.00	6.00	3.38	0.00				
190.00	6.00	3.38	0.00				
195.00	6.00	3.38	0.00				
200.00	6.00	3.38	0.00				
205.00	6.00	3.38	0.00				
210.00	6.00	3.38	0.00				
215.00	6.00	3.38	0.00				
220.00	6.00	3.38	0.00				
225.00	6.00	3.38	0.00				
230.00	6.00	3.38	0.00				
235.00	6.00	3.38	0.00				
240.00	6.00	3.38	0.00				
245.00	6.00	3.38	0.00				
250.00	6.00	3.38	0.00				
255.00	6.00	3.38	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1F: EX IF

Runoff = 53.91 cfs @ 12.50 hrs, Volume= 7.330 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

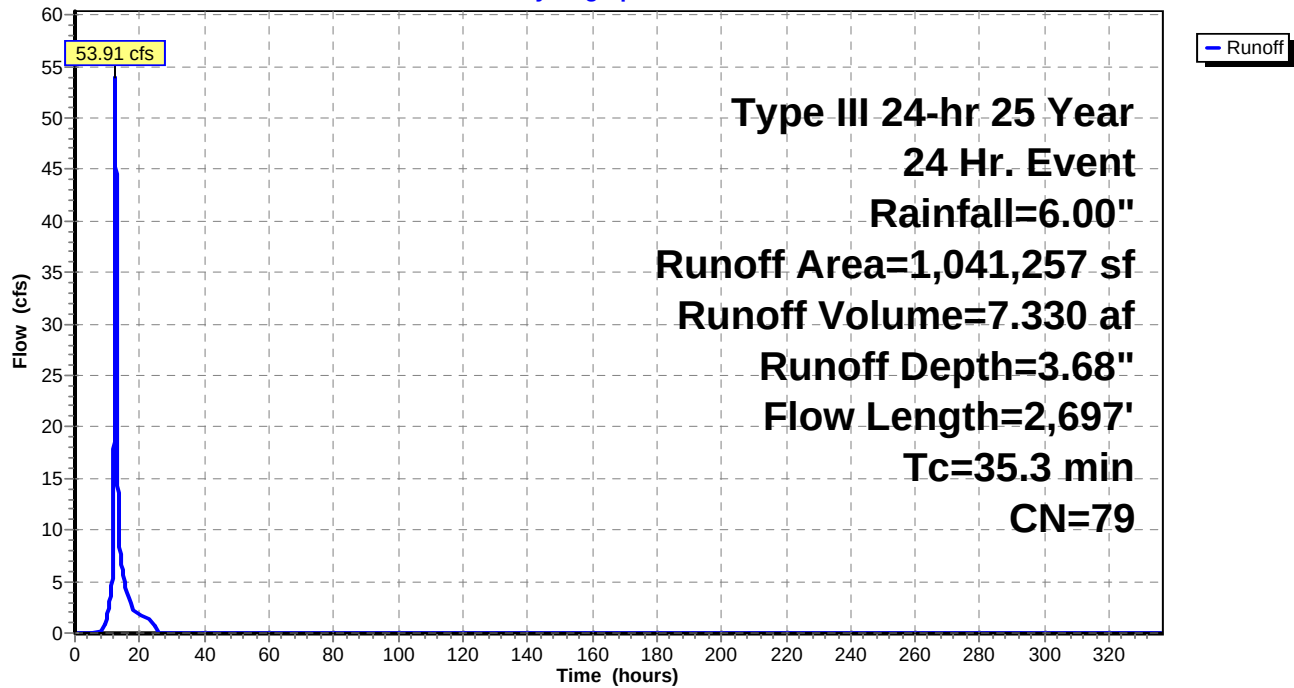
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
235,224	74	>75% Grass cover, Good, HSG C
1,041,257	79	Weighted Average
573,423		55.07% Pervious Area
467,834		44.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	1,047	0.1000	19.74	62.00	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
35.3	2,697	Total			

Subcatchment EX 1F: EX IF

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1F: EX IF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.68	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.68	0.00
10.00	1.13	0.11	1.68	270.00	6.00	3.68	0.00
15.00	5.13	2.91	5.47	275.00	6.00	3.68	0.00
20.00	5.74	3.45	1.77	280.00	6.00	3.68	0.00
25.00	6.00	3.68	0.07	285.00	6.00	3.68	0.00
30.00	6.00	3.68	0.00	290.00	6.00	3.68	0.00
35.00	6.00	3.68	0.00	295.00	6.00	3.68	0.00
40.00	6.00	3.68	0.00	300.00	6.00	3.68	0.00
45.00	6.00	3.68	0.00	305.00	6.00	3.68	0.00
50.00	6.00	3.68	0.00	310.00	6.00	3.68	0.00
55.00	6.00	3.68	0.00	315.00	6.00	3.68	0.00
60.00	6.00	3.68	0.00	320.00	6.00	3.68	0.00
65.00	6.00	3.68	0.00	325.00	6.00	3.68	0.00
70.00	6.00	3.68	0.00	330.00	6.00	3.68	0.00
75.00	6.00	3.68	0.00	335.00	6.00	3.68	0.00
80.00	6.00	3.68	0.00				
85.00	6.00	3.68	0.00				
90.00	6.00	3.68	0.00				
95.00	6.00	3.68	0.00				
100.00	6.00	3.68	0.00				
105.00	6.00	3.68	0.00				
110.00	6.00	3.68	0.00				
115.00	6.00	3.68	0.00				
120.00	6.00	3.68	0.00				
125.00	6.00	3.68	0.00				
130.00	6.00	3.68	0.00				
135.00	6.00	3.68	0.00				
140.00	6.00	3.68	0.00				
145.00	6.00	3.68	0.00				
150.00	6.00	3.68	0.00				
155.00	6.00	3.68	0.00				
160.00	6.00	3.68	0.00				
165.00	6.00	3.68	0.00				
170.00	6.00	3.68	0.00				
175.00	6.00	3.68	0.00				
180.00	6.00	3.68	0.00				
185.00	6.00	3.68	0.00				
190.00	6.00	3.68	0.00				
195.00	6.00	3.68	0.00				
200.00	6.00	3.68	0.00				
205.00	6.00	3.68	0.00				
210.00	6.00	3.68	0.00				
215.00	6.00	3.68	0.00				
220.00	6.00	3.68	0.00				
225.00	6.00	3.68	0.00				
230.00	6.00	3.68	0.00				
235.00	6.00	3.68	0.00				
240.00	6.00	3.68	0.00				
245.00	6.00	3.68	0.00				
250.00	6.00	3.68	0.00				
255.00	6.00	3.68	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1L: PROP 1I

Runoff = 25.77 cfs @ 12.04 hrs, Volume= 1.630 af, Depth= 3.09"

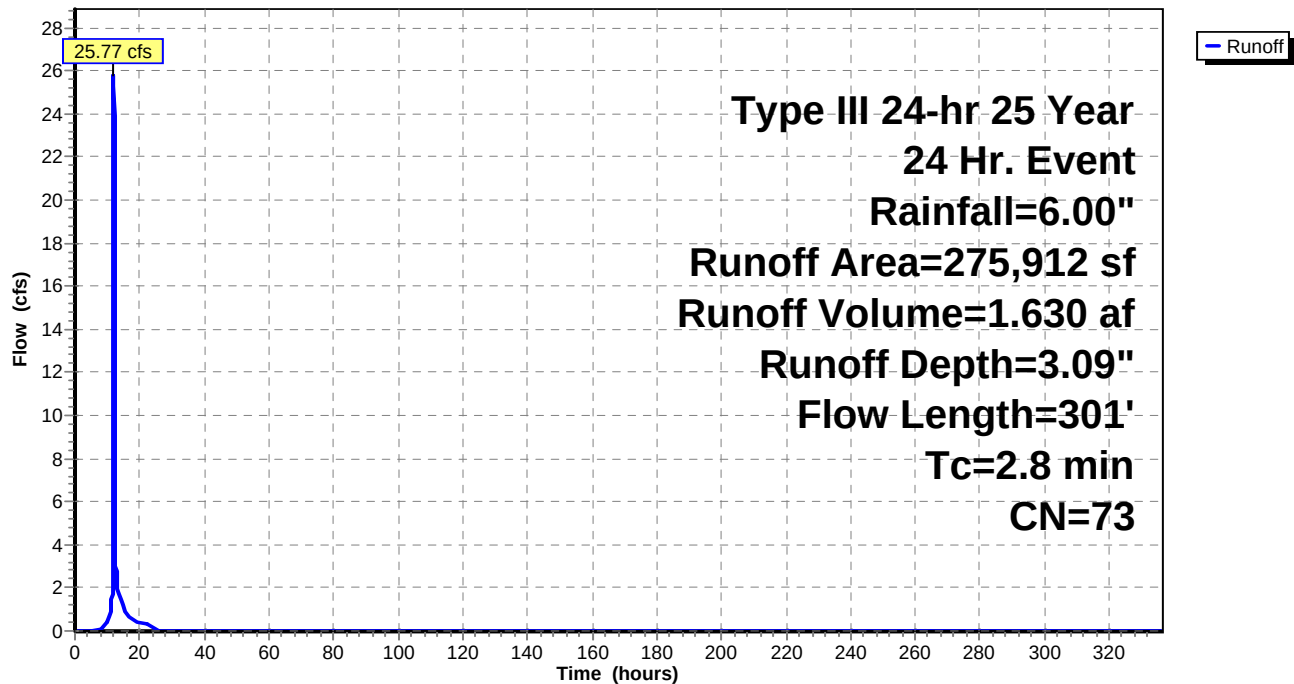
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
116,330	61	>75% Grass cover, Good, HSG B
103,912	74	>75% Grass cover, Good, HSG C
275,912	73	Weighted Average
220,242		79.82% Pervious Area
55,670		20.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.1800	0.37		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	251	0.1830	6.89		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	301	Total			

Subcatchment EX 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.09	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.09	0.00
10.00	1.13	0.04	0.33	270.00	6.00	3.09	0.00
15.00	5.13	2.38	1.15	275.00	6.00	3.09	0.00
20.00	5.74	2.88	0.41	280.00	6.00	3.09	0.00
25.00	6.00	3.09	0.00	285.00	6.00	3.09	0.00
30.00	6.00	3.09	0.00	290.00	6.00	3.09	0.00
35.00	6.00	3.09	0.00	295.00	6.00	3.09	0.00
40.00	6.00	3.09	0.00	300.00	6.00	3.09	0.00
45.00	6.00	3.09	0.00	305.00	6.00	3.09	0.00
50.00	6.00	3.09	0.00	310.00	6.00	3.09	0.00
55.00	6.00	3.09	0.00	315.00	6.00	3.09	0.00
60.00	6.00	3.09	0.00	320.00	6.00	3.09	0.00
65.00	6.00	3.09	0.00	325.00	6.00	3.09	0.00
70.00	6.00	3.09	0.00	330.00	6.00	3.09	0.00
75.00	6.00	3.09	0.00	335.00	6.00	3.09	0.00
80.00	6.00	3.09	0.00				
85.00	6.00	3.09	0.00				
90.00	6.00	3.09	0.00				
95.00	6.00	3.09	0.00				
100.00	6.00	3.09	0.00				
105.00	6.00	3.09	0.00				
110.00	6.00	3.09	0.00				
115.00	6.00	3.09	0.00				
120.00	6.00	3.09	0.00				
125.00	6.00	3.09	0.00				
130.00	6.00	3.09	0.00				
135.00	6.00	3.09	0.00				
140.00	6.00	3.09	0.00				
145.00	6.00	3.09	0.00				
150.00	6.00	3.09	0.00				
155.00	6.00	3.09	0.00				
160.00	6.00	3.09	0.00				
165.00	6.00	3.09	0.00				
170.00	6.00	3.09	0.00				
175.00	6.00	3.09	0.00				
180.00	6.00	3.09	0.00				
185.00	6.00	3.09	0.00				
190.00	6.00	3.09	0.00				
195.00	6.00	3.09	0.00				
200.00	6.00	3.09	0.00				
205.00	6.00	3.09	0.00				
210.00	6.00	3.09	0.00				
215.00	6.00	3.09	0.00				
220.00	6.00	3.09	0.00				
225.00	6.00	3.09	0.00				
230.00	6.00	3.09	0.00				
235.00	6.00	3.09	0.00				
240.00	6.00	3.09	0.00				
245.00	6.00	3.09	0.00				
250.00	6.00	3.09	0.00				
255.00	6.00	3.09	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX DA 1: EX 1A

Runoff = 5.40 cfs @ 12.41 hrs, Volume= 0.701 af, Depth= 1.76"

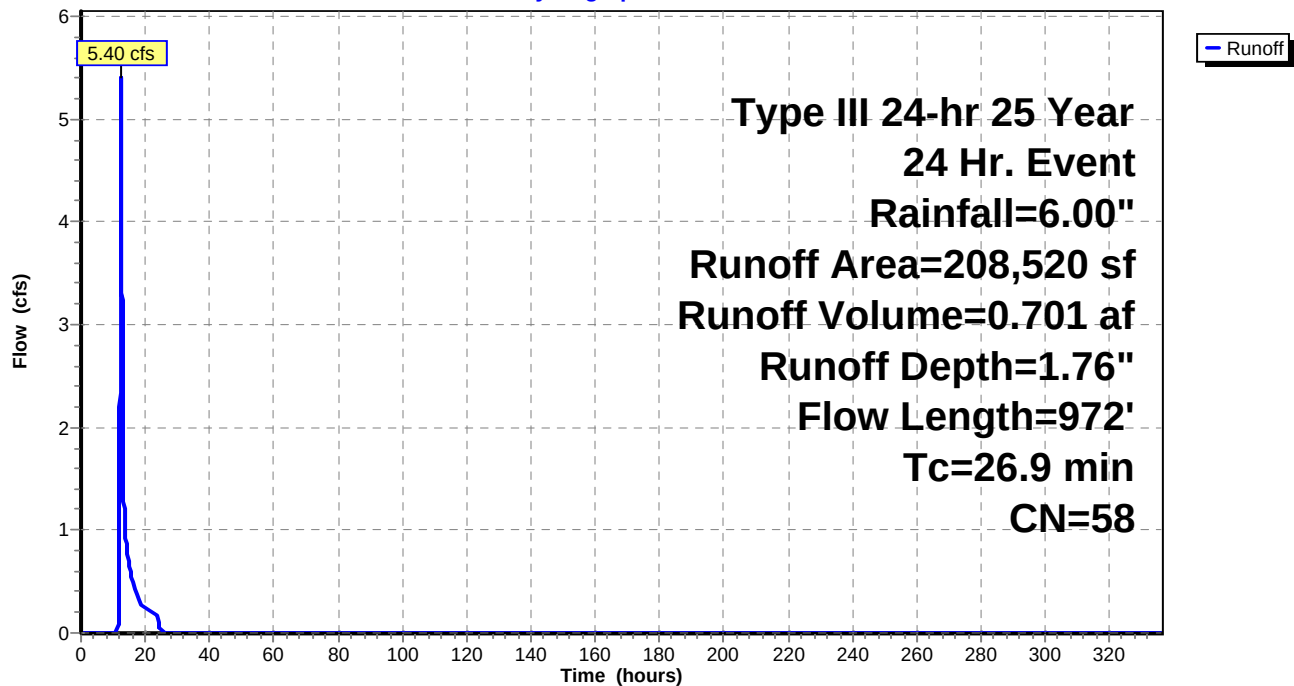
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
167,674	55	Woods, Good, HSG B
40,846	69	50-75% Grass cover, Fair, HSG B
208,520	58	Weighted Average
208,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	125	0.0320	0.10		Sheet Flow, Wooded Woods: Light underbrush n= 0.400 P2= 3.50"
5.7	679	0.1560	1.97		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
0.9	168	0.0230	3.08		Shallow Concentrated Flow, Gravel drive Paved Kv= 20.3 fps
26.9	972	Total			

Subcatchment EX DA 1: EX 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX DA 1: EX 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	1.76	0.00
5.00	0.34	0.00	0.00	265.00	6.00	1.76	0.00
10.00	1.13	0.00	0.00	270.00	6.00	1.76	0.00
15.00	5.13	1.24	0.68	275.00	6.00	1.76	0.00
20.00	5.74	1.60	0.24	280.00	6.00	1.76	0.00
25.00	6.00	1.76	0.00	285.00	6.00	1.76	0.00
30.00	6.00	1.76	0.00	290.00	6.00	1.76	0.00
35.00	6.00	1.76	0.00	295.00	6.00	1.76	0.00
40.00	6.00	1.76	0.00	300.00	6.00	1.76	0.00
45.00	6.00	1.76	0.00	305.00	6.00	1.76	0.00
50.00	6.00	1.76	0.00	310.00	6.00	1.76	0.00
55.00	6.00	1.76	0.00	315.00	6.00	1.76	0.00
60.00	6.00	1.76	0.00	320.00	6.00	1.76	0.00
65.00	6.00	1.76	0.00	325.00	6.00	1.76	0.00
70.00	6.00	1.76	0.00	330.00	6.00	1.76	0.00
75.00	6.00	1.76	0.00	335.00	6.00	1.76	0.00
80.00	6.00	1.76	0.00				
85.00	6.00	1.76	0.00				
90.00	6.00	1.76	0.00				
95.00	6.00	1.76	0.00				
100.00	6.00	1.76	0.00				
105.00	6.00	1.76	0.00				
110.00	6.00	1.76	0.00				
115.00	6.00	1.76	0.00				
120.00	6.00	1.76	0.00				
125.00	6.00	1.76	0.00				
130.00	6.00	1.76	0.00				
135.00	6.00	1.76	0.00				
140.00	6.00	1.76	0.00				
145.00	6.00	1.76	0.00				
150.00	6.00	1.76	0.00				
155.00	6.00	1.76	0.00				
160.00	6.00	1.76	0.00				
165.00	6.00	1.76	0.00				
170.00	6.00	1.76	0.00				
175.00	6.00	1.76	0.00				
180.00	6.00	1.76	0.00				
185.00	6.00	1.76	0.00				
190.00	6.00	1.76	0.00				
195.00	6.00	1.76	0.00				
200.00	6.00	1.76	0.00				
205.00	6.00	1.76	0.00				
210.00	6.00	1.76	0.00				
215.00	6.00	1.76	0.00				
220.00	6.00	1.76	0.00				
225.00	6.00	1.76	0.00				
230.00	6.00	1.76	0.00				
235.00	6.00	1.76	0.00				
240.00	6.00	1.76	0.00				
245.00	6.00	1.76	0.00				
250.00	6.00	1.76	0.00				
255.00	6.00	1.76	0.00				

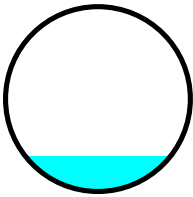
Summary for Reach 1R: Pipe

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 1.76" for 25 Year, 24 Hr. Event event
Inflow = 5.40 cfs @ 12.41 hrs, Volume= 0.701 af
Outflow = 5.38 cfs @ 12.43 hrs, Volume= 0.701 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 12.81 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 5.61 fps, Avg. Travel Time= 3.8 min

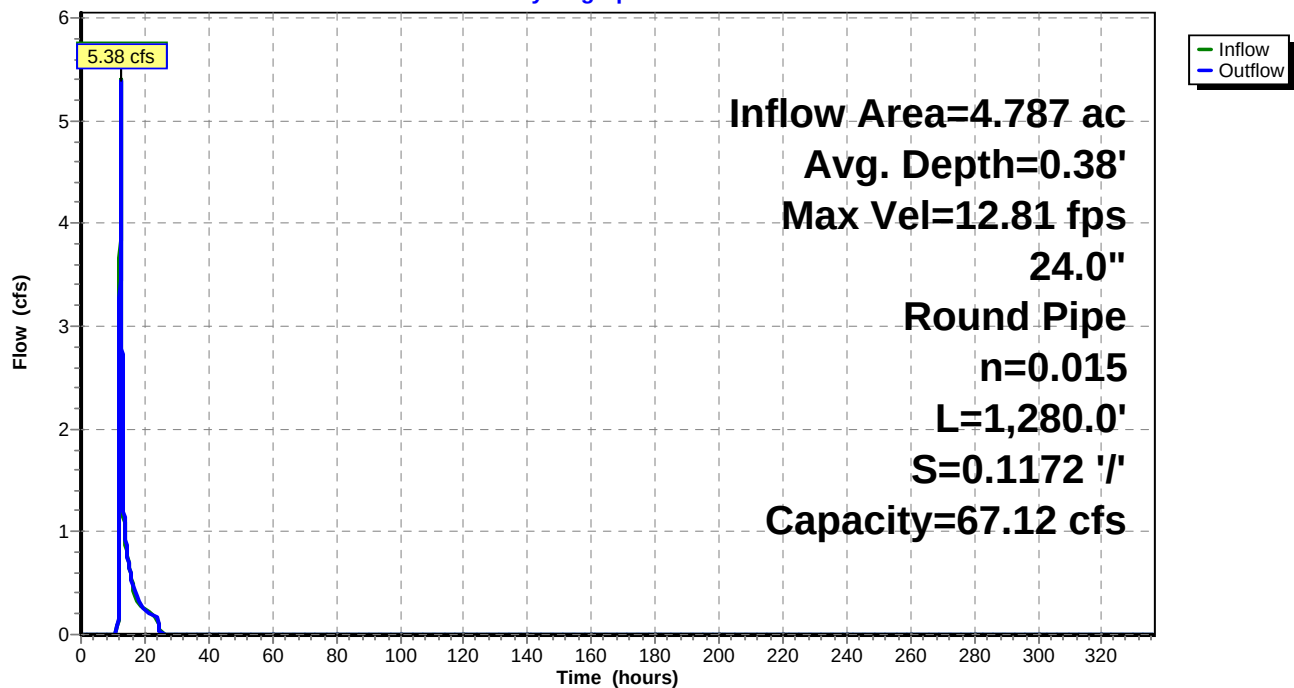
Peak Storage= 538 cf @ 12.43 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 67.12 cfs

24.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 1,280.0' Slope= 0.1172 '/'
Inlet Invert= 732.00', Outlet Invert= 582.00'



Reach 1R: Pipe

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach 1R: Pipe

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.00	0.00
10.00	0.00	0	732.00	0.00
20.00	0.24	61	732.09	0.24
30.00	0.00	0	732.00	0.00
40.00	0.00	0	732.00	0.00
50.00	0.00	0	732.00	0.00
60.00	0.00	0	732.00	0.00
70.00	0.00	0	732.00	0.00
80.00	0.00	0	732.00	0.00
90.00	0.00	0	732.00	0.00
100.00	0.00	0	732.00	0.00
110.00	0.00	0	732.00	0.00
120.00	0.00	0	732.00	0.00
130.00	0.00	0	732.00	0.00
140.00	0.00	0	732.00	0.00
150.00	0.00	0	732.00	0.00
160.00	0.00	0	732.00	0.00
170.00	0.00	0	732.00	0.00
180.00	0.00	0	732.00	0.00
190.00	0.00	0	732.00	0.00
200.00	0.00	0	732.00	0.00
210.00	0.00	0	732.00	0.00
220.00	0.00	0	732.00	0.00
230.00	0.00	0	732.00	0.00
240.00	0.00	0	732.00	0.00
250.00	0.00	0	732.00	0.00
260.00	0.00	0	732.00	0.00
270.00	0.00	0	732.00	0.00
280.00	0.00	0	732.00	0.00
290.00	0.00	0	732.00	0.00
300.00	0.00	0	732.00	0.00
310.00	0.00	0	732.00	0.00
320.00	0.00	0	732.00	0.00
330.00	0.00	0	732.00	0.00

Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Stage-Area-Storage for Reach 1R: Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
732.00	0.0	0	733.04	1.7	2,113
732.02	0.0	7	733.06	1.7	2,164
732.04	0.0	19	733.08	1.7	2,215
732.06	0.0	35	733.10	1.8	2,266
732.08	0.0	54	733.12	1.8	2,317
732.10	0.1	75	733.14	1.8	2,368
732.12	0.1	99	733.16	1.9	2,418
732.14	0.1	124	733.18	1.9	2,469
732.16	0.1	151	733.20	2.0	2,519
732.18	0.1	179	733.22	2.0	2,569
732.20	0.2	209	733.24	2.0	2,619
732.22	0.2	241	733.26	2.1	2,669
732.24	0.2	273	733.28	2.1	2,718
732.26	0.2	307	733.30	2.2	2,767
732.28	0.3	342	733.32	2.2	2,816
732.30	0.3	378	733.34	2.2	2,864
732.32	0.3	415	733.36	2.3	2,912
732.34	0.4	453	733.38	2.3	2,959
732.36	0.4	492	733.40	2.3	3,007
732.38	0.4	532	733.42	2.4	3,053
732.40	0.4	573	733.44	2.4	3,100
732.42	0.5	614	733.46	2.5	3,145
732.44	0.5	656	733.48	2.5	3,190
732.46	0.5	699	733.50	2.5	3,235
732.48	0.6	742	733.52	2.6	3,279
732.50	0.6	786	733.54	2.6	3,323
732.52	0.6	831	733.56	2.6	3,365
732.54	0.7	876	733.58	2.7	3,407
732.56	0.7	922	733.60	2.7	3,449
732.58	0.8	968	733.62	2.7	3,489
732.60	0.8	1,015	733.64	2.8	3,529
732.62	0.8	1,062	733.66	2.8	3,568
732.64	0.9	1,109	733.68	2.8	3,606
732.66	0.9	1,157	733.70	2.8	3,643
732.68	0.9	1,206	733.72	2.9	3,679
732.70	1.0	1,254	733.74	2.9	3,714
732.72	1.0	1,303	733.76	2.9	3,748
732.74	1.1	1,353	733.78	3.0	3,781
732.76	1.1	1,402	733.80	3.0	3,812
732.78	1.1	1,452	733.82	3.0	3,842
732.80	1.2	1,502	733.84	3.0	3,871
732.82	1.2	1,552	733.86	3.0	3,897
732.84	1.3	1,603	733.88	3.1	3,923
732.86	1.3	1,653	733.90	3.1	3,946
732.88	1.3	1,704	733.92	3.1	3,967
732.90	1.4	1,755	733.94	3.1	3,986
732.92	1.4	1,806	733.96	3.1	4,002
732.94	1.5	1,857	733.98	3.1	4,014
732.96	1.5	1,908	734.00	3.1	4,021
732.98	1.5	1,959			
733.00	1.6	2,011			
733.02	1.6	2,062			

Summary for Reach 2R: Watercourse

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 1.76" for 25 Year, 24 Hr. Event event
Inflow = 5.38 cfs @ 12.43 hrs, Volume= 0.701 af
Outflow = 5.38 cfs @ 12.44 hrs, Volume= 0.701 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 7.36 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 3.11 fps, Avg. Travel Time= 1.8 min

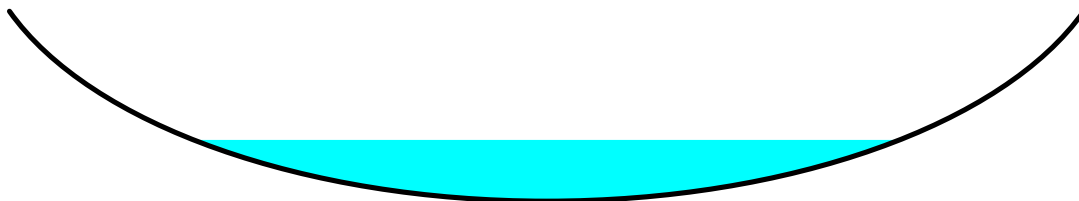
Peak Storage= 243 cf @ 12.44 hrs, Average Depth at Peak Storage= 0.32'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 60.85 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

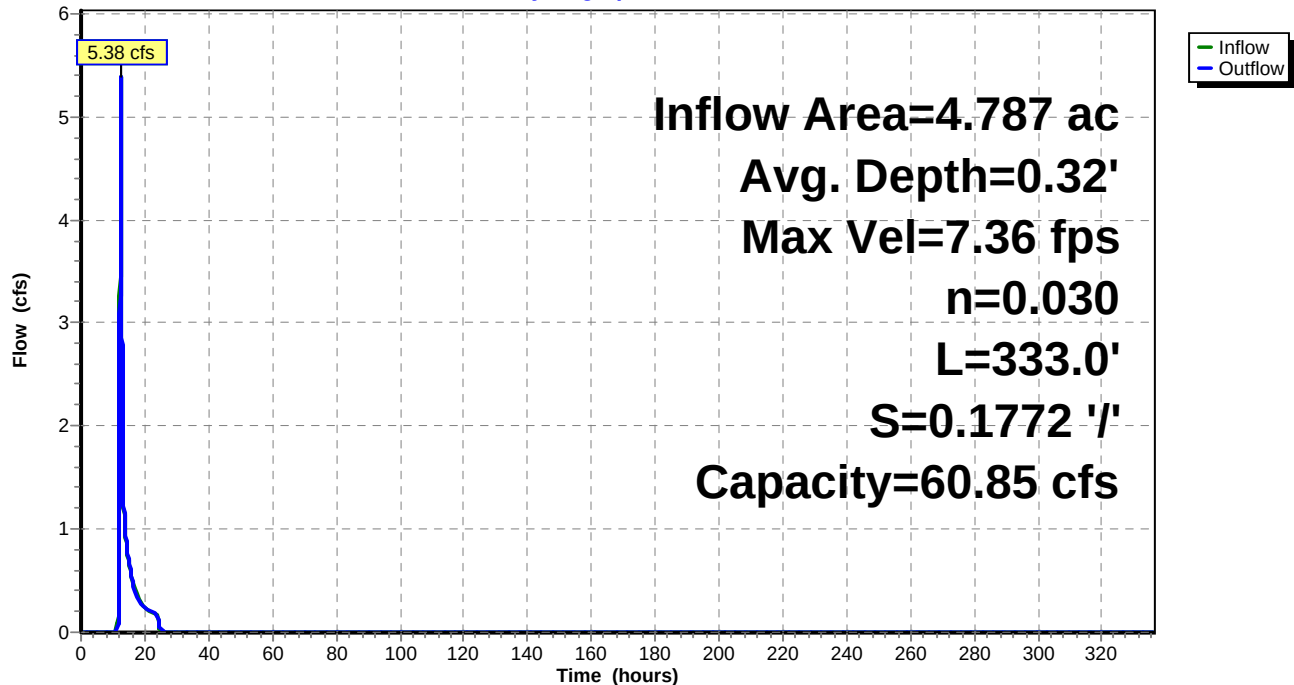
Length= 333.0' Slope= 0.1772 '/'

Inlet Invert= 581.00', Outlet Invert= 522.00'



Reach 2R: Watercourse

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

Prepared by AKRF Engineering, PC

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Hydrograph for Reach 2R: Watercourse

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	581.00	0.00
10.00	0.00	0	581.00	0.00
20.00	0.24	28	581.08	0.24
30.00	0.00	0	581.00	0.00
40.00	0.00	0	581.00	0.00
50.00	0.00	0	581.00	0.00
60.00	0.00	0	581.00	0.00
70.00	0.00	0	581.00	0.00
80.00	0.00	0	581.00	0.00
90.00	0.00	0	581.00	0.00
100.00	0.00	0	581.00	0.00
110.00	0.00	0	581.00	0.00
120.00	0.00	0	581.00	0.00
130.00	0.00	0	581.00	0.00
140.00	0.00	0	581.00	0.00
150.00	0.00	0	581.00	0.00
160.00	0.00	0	581.00	0.00
170.00	0.00	0	581.00	0.00
180.00	0.00	0	581.00	0.00
190.00	0.00	0	581.00	0.00
200.00	0.00	0	581.00	0.00
210.00	0.00	0	581.00	0.00
220.00	0.00	0	581.00	0.00
230.00	0.00	0	581.00	0.00
240.00	0.00	0	581.00	0.00
250.00	0.00	0	581.00	0.00
260.00	0.00	0	581.00	0.00
270.00	0.00	0	581.00	0.00
280.00	0.00	0	581.00	0.00
290.00	0.00	0	581.00	0.00
300.00	0.00	0	581.00	0.00
310.00	0.00	0	581.00	0.00
320.00	0.00	0	581.00	0.00
330.00	0.00	0	581.00	0.00

Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Stage-Area-Storage for Reach 2R: Watercourse

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
581.00	0.0	0	581.52	1.5	499
581.01	0.0	1	581.53	1.5	514
581.02	0.0	4	581.54	1.6	529
581.03	0.0	7	581.55	1.6	543
581.04	0.0	11	581.56	1.7	558
581.05	0.0	15	581.57	1.7	573
581.06	0.1	20	581.58	1.8	588
581.07	0.1	25	581.59	1.8	604
581.08	0.1	30	581.60	1.9	619
581.09	0.1	36	581.61	1.9	635
581.10	0.1	42	581.62	2.0	650
581.11	0.1	49	581.63	2.0	666
581.12	0.2	55	581.64	2.0	682
581.13	0.2	62	581.65	2.1	698
581.14	0.2	70	581.66	2.1	714
581.15	0.2	77	581.67	2.2	730
581.16	0.3	85	581.68	2.2	747
581.17	0.3	93	581.69	2.3	763
581.18	0.3	102	581.70	2.3	780
581.19	0.3	110	581.71	2.4	797
581.20	0.4	119	581.72	2.4	814
581.21	0.4	128	581.73	2.5	831
581.22	0.4	137	581.74	2.5	848
581.23	0.4	147	581.75	2.6	865
581.24	0.5	157	581.76	2.7	883
581.25	0.5	167	581.77	2.7	900
581.26	0.5	177	581.78	2.8	918
581.27	0.6	187	581.79	2.8	935
581.28	0.6	197	581.80	2.9	953
581.29	0.6	208	581.81	2.9	971
581.30	0.7	219	581.82	3.0	989
581.31	0.7	230	581.83	3.0	1,007
581.32	0.7	241	581.84	3.1	1,025
581.33	0.8	253	581.85	3.1	1,044
581.34	0.8	264	581.86	3.2	1,062
581.35	0.8	276	581.87	3.2	1,081
581.36	0.9	288	581.88	3.3	1,100
581.37	0.9	300	581.89	3.4	1,118
581.38	0.9	312	581.90	3.4	1,137
581.39	1.0	324	581.91	3.5	1,156
581.40	1.0	337	581.92	3.5	1,175
581.41	1.1	350	581.93	3.6	1,195
581.42	1.1	363	581.94	3.6	1,214
581.43	1.1	376	581.95	3.7	1,233
581.44	1.2	389	581.96	3.8	1,253
581.45	1.2	402	581.97	3.8	1,273
581.46	1.2	416	581.98	3.9	1,292
581.47	1.3	429	581.99	3.9	1,312
581.48	1.3	443	582.00	4.0	1,332
581.49	1.4	457			
581.50	1.4	471			
581.51	1.5	485			

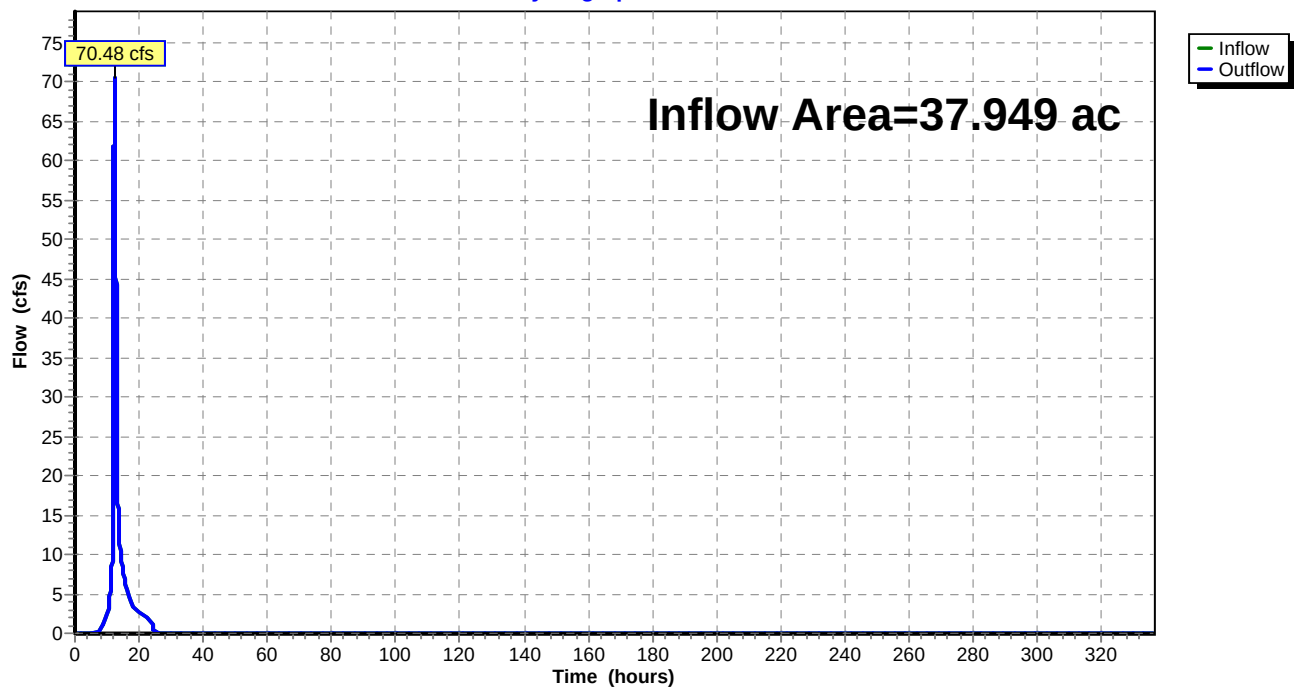
Summary for Reach DP 1B: PROP DP 1B

Inflow Area = 37.949 ac, 33.22% Impervious, Inflow Depth = 3.38" for 25 Year, 24 Hr. Event event
Inflow = 70.48 cfs @ 12.41 hrs, Volume= 10.695 af
Outflow = 70.48 cfs @ 12.41 hrs, Volume= 10.695 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1B: PROP DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach DP 1B: PROP DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	2.41		2.41	270.00	0.00		0.00
15.00	7.92		7.92	275.00	0.00		0.00
20.00	2.63		2.63	280.00	0.00		0.00
25.00	0.07		0.07	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

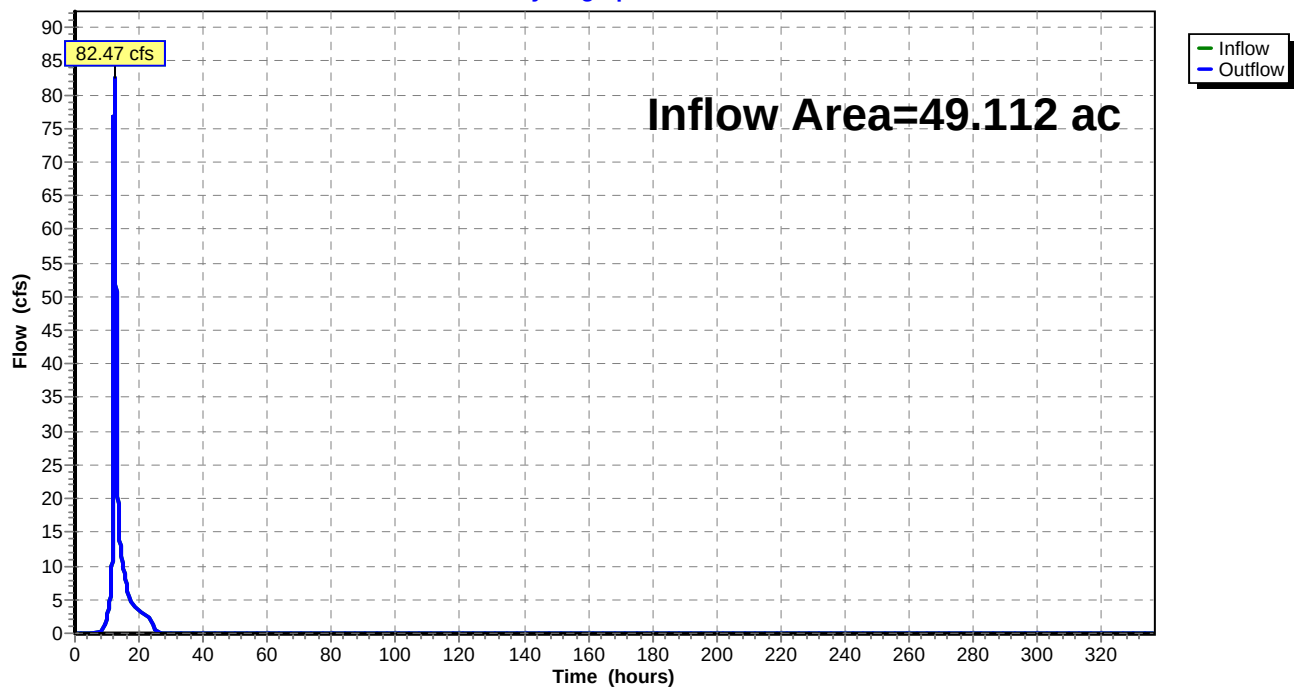
Summary for Reach EX DP !B: Existing DP 1B

Inflow Area = 49.112 ac, 26.08% Impervious, Inflow Depth = 3.14" for 25 Year, 24 Hr. Event event
Inflow = 82.47 cfs @ 12.39 hrs, Volume= 12.835 af
Outflow = 82.47 cfs @ 12.39 hrs, Volume= 12.835 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP !B: Existing DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach EX DP 1B: Existing DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	2.52		2.52	270.00	0.00		0.00
15.00	9.72		9.72	275.00	0.00		0.00
20.00	3.27		3.27	280.00	0.00		0.00
25.00	0.08		0.08	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

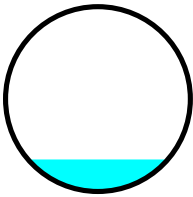
Summary for Reach R 1R: PROP 1R

Inflow Area = 4.017 ac, 0.00% Impervious, Inflow Depth = 1.52" for 25 Year, 24 Hr. Event event
Inflow = 4.67 cfs @ 12.24 hrs, Volume= 0.508 af
Outflow = 4.66 cfs @ 12.26 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 12.91 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 5.59 fps, Avg. Travel Time= 2.8 min

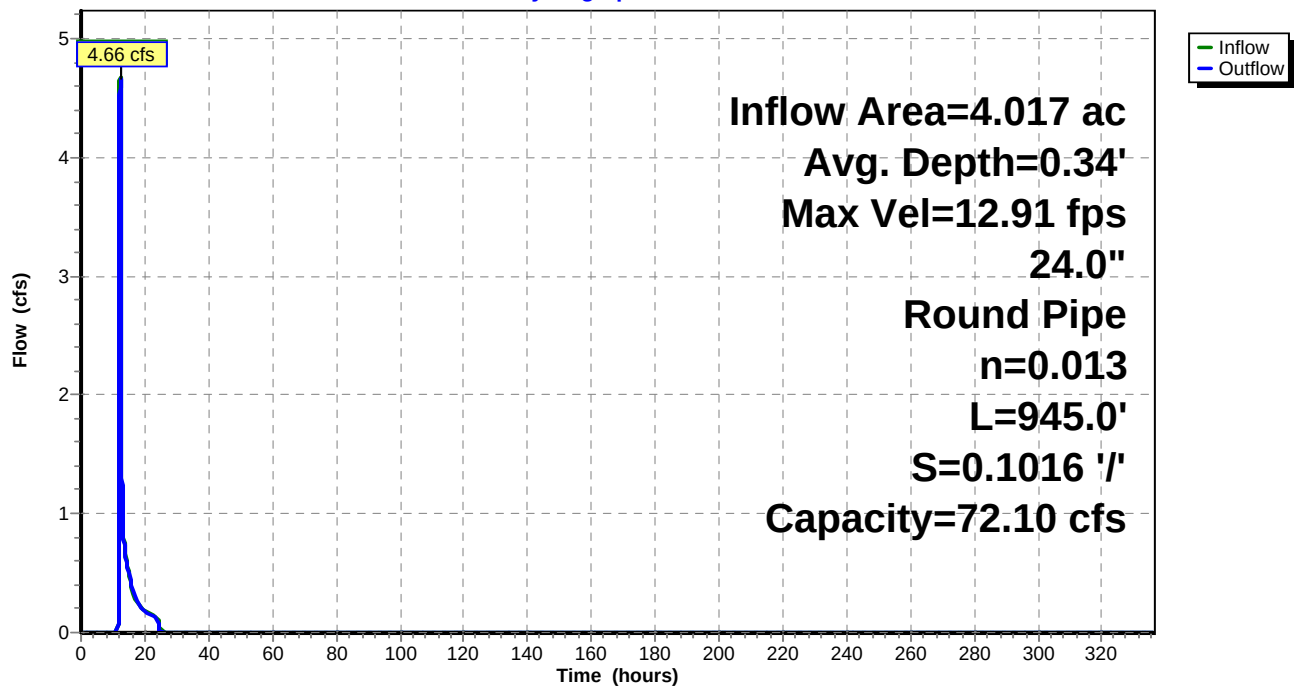
Peak Storage= 341 cf @ 12.26 hrs, Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 72.10 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 945.0' Slope= 0.1016 '/'
Inlet Invert= 746.00', Outlet Invert= 650.00'



Reach R 1R: PROP 1R

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach R 1R: PROP 1R

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	746.00	0.00
10.00	0.00	0	746.00	0.00
20.00	0.18	35	746.07	0.18
30.00	0.00	0	746.00	0.00
40.00	0.00	0	746.00	0.00
50.00	0.00	0	746.00	0.00
60.00	0.00	0	746.00	0.00
70.00	0.00	0	746.00	0.00
80.00	0.00	0	746.00	0.00
90.00	0.00	0	746.00	0.00
100.00	0.00	0	746.00	0.00
110.00	0.00	0	746.00	0.00
120.00	0.00	0	746.00	0.00
130.00	0.00	0	746.00	0.00
140.00	0.00	0	746.00	0.00
150.00	0.00	0	746.00	0.00
160.00	0.00	0	746.00	0.00
170.00	0.00	0	746.00	0.00
180.00	0.00	0	746.00	0.00
190.00	0.00	0	746.00	0.00
200.00	0.00	0	746.00	0.00
210.00	0.00	0	746.00	0.00
220.00	0.00	0	746.00	0.00
230.00	0.00	0	746.00	0.00
240.00	0.00	0	746.00	0.00
250.00	0.00	0	746.00	0.00
260.00	0.00	0	746.00	0.00
270.00	0.00	0	746.00	0.00
280.00	0.00	0	746.00	0.00
290.00	0.00	0	746.00	0.00
300.00	0.00	0	746.00	0.00
310.00	0.00	0	746.00	0.00
320.00	0.00	0	746.00	0.00
330.00	0.00	0	746.00	0.00

Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Stage-Area-Storage for Reach R 1R: PROP 1R

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
746.00	0.0	0	747.04	1.7	1,560
746.02	0.0	5	747.06	1.7	1,598
746.04	0.0	14	747.08	1.7	1,635
746.06	0.0	26	747.10	1.8	1,673
746.08	0.0	40	747.12	1.8	1,711
746.10	0.1	55	747.14	1.8	1,748
746.12	0.1	73	747.16	1.9	1,786
746.14	0.1	91	747.18	1.9	1,823
746.16	0.1	111	747.20	2.0	1,860
746.18	0.1	132	747.22	2.0	1,897
746.20	0.2	155	747.24	2.0	1,934
746.22	0.2	178	747.26	2.1	1,970
746.24	0.2	202	747.28	2.1	2,007
746.26	0.2	227	747.30	2.2	2,043
746.28	0.3	253	747.32	2.2	2,079
746.30	0.3	279	747.34	2.2	2,114
746.32	0.3	307	747.36	2.3	2,150
746.34	0.4	335	747.38	2.3	2,185
746.36	0.4	363	747.40	2.3	2,220
746.38	0.4	393	747.42	2.4	2,254
746.40	0.4	423	747.44	2.4	2,288
746.42	0.5	453	747.46	2.5	2,322
746.44	0.5	484	747.48	2.5	2,355
746.46	0.5	516	747.50	2.5	2,388
746.48	0.6	548	747.52	2.6	2,421
746.50	0.6	580	747.54	2.6	2,453
746.52	0.6	613	747.56	2.6	2,485
746.54	0.7	647	747.58	2.7	2,516
746.56	0.7	680	747.60	2.7	2,546
746.58	0.8	715	747.62	2.7	2,576
746.60	0.8	749	747.64	2.8	2,605
746.62	0.8	784	747.66	2.8	2,634
746.64	0.9	819	747.68	2.8	2,662
746.66	0.9	854	747.70	2.8	2,690
746.68	0.9	890	747.72	2.9	2,716
746.70	1.0	926	747.74	2.9	2,742
746.72	1.0	962	747.76	2.9	2,767
746.74	1.1	999	747.78	3.0	2,791
746.76	1.1	1,035	747.80	3.0	2,814
746.78	1.1	1,072	747.82	3.0	2,836
746.80	1.2	1,109	747.84	3.0	2,858
746.82	1.2	1,146	747.86	3.0	2,877
746.84	1.3	1,183	747.88	3.1	2,896
746.86	1.3	1,221	747.90	3.1	2,913
746.88	1.3	1,258	747.92	3.1	2,929
746.90	1.4	1,296	747.94	3.1	2,943
746.92	1.4	1,333	747.96	3.1	2,955
746.94	1.5	1,371	747.98	3.1	2,964
746.96	1.5	1,409	748.00	3.1	2,969
746.98	1.5	1,447			
747.00	1.6	1,484			
747.02	1.6	1,522			

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1A: PROP 1A

Runoff = 13.23 cfs @ 12.22 hrs, Volume= 1.290 af, Depth= 3.85"

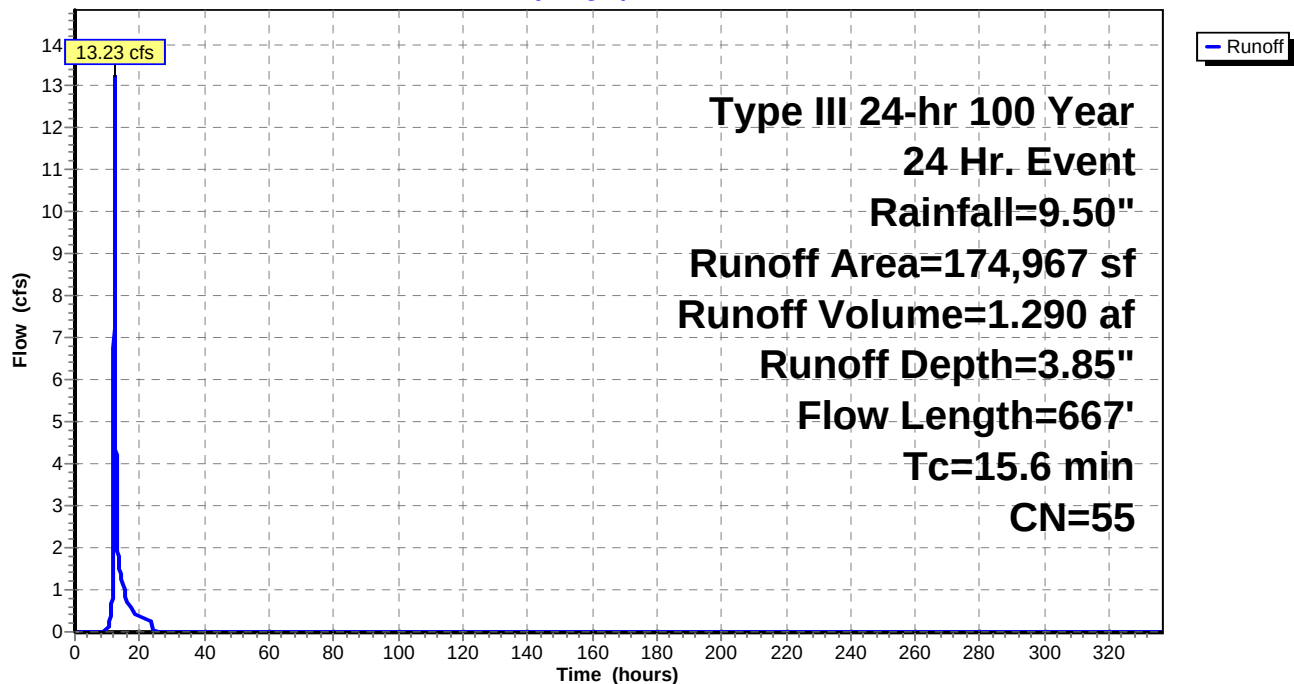
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
174,967	55	Woods, Good, HSG B
174,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0500	0.12		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	567	0.1790	6.81		Shallow Concentrated Flow, woods
					Unpaved Kv= 16.1 fps
15.6	667	Total			

Subcatchment 1A: PROP 1A

Hydrograph



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Hydrograph for Subcatchment 1A: PROP 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	3.85	0.00
5.00	0.54	0.00	0.00	265.00	9.50	3.85	0.00
10.00	1.80	0.00	0.02	270.00	9.50	3.85	0.00
15.00	8.12	2.86	1.06	275.00	9.50	3.85	0.00
20.00	9.09	3.55	0.37	280.00	9.50	3.85	0.00
25.00	9.50	3.85	0.00	285.00	9.50	3.85	0.00
30.00	9.50	3.85	0.00	290.00	9.50	3.85	0.00
35.00	9.50	3.85	0.00	295.00	9.50	3.85	0.00
40.00	9.50	3.85	0.00	300.00	9.50	3.85	0.00
45.00	9.50	3.85	0.00	305.00	9.50	3.85	0.00
50.00	9.50	3.85	0.00	310.00	9.50	3.85	0.00
55.00	9.50	3.85	0.00	315.00	9.50	3.85	0.00
60.00	9.50	3.85	0.00	320.00	9.50	3.85	0.00
65.00	9.50	3.85	0.00	325.00	9.50	3.85	0.00
70.00	9.50	3.85	0.00	330.00	9.50	3.85	0.00
75.00	9.50	3.85	0.00	335.00	9.50	3.85	0.00
80.00	9.50	3.85	0.00				
85.00	9.50	3.85	0.00				
90.00	9.50	3.85	0.00				
95.00	9.50	3.85	0.00				
100.00	9.50	3.85	0.00				
105.00	9.50	3.85	0.00				
110.00	9.50	3.85	0.00				
115.00	9.50	3.85	0.00				
120.00	9.50	3.85	0.00				
125.00	9.50	3.85	0.00				
130.00	9.50	3.85	0.00				
135.00	9.50	3.85	0.00				
140.00	9.50	3.85	0.00				
145.00	9.50	3.85	0.00				
150.00	9.50	3.85	0.00				
155.00	9.50	3.85	0.00				
160.00	9.50	3.85	0.00				
165.00	9.50	3.85	0.00				
170.00	9.50	3.85	0.00				
175.00	9.50	3.85	0.00				
180.00	9.50	3.85	0.00				
185.00	9.50	3.85	0.00				
190.00	9.50	3.85	0.00				
195.00	9.50	3.85	0.00				
200.00	9.50	3.85	0.00				
205.00	9.50	3.85	0.00				
210.00	9.50	3.85	0.00				
215.00	9.50	3.85	0.00				
220.00	9.50	3.85	0.00				
225.00	9.50	3.85	0.00				
230.00	9.50	3.85	0.00				
235.00	9.50	3.85	0.00				
240.00	9.50	3.85	0.00				
245.00	9.50	3.85	0.00				
250.00	9.50	3.85	0.00				
255.00	9.50	3.85	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1D: PROP ID

Runoff = 102.02 cfs @ 12.48 hrs, Volume= 13.989 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

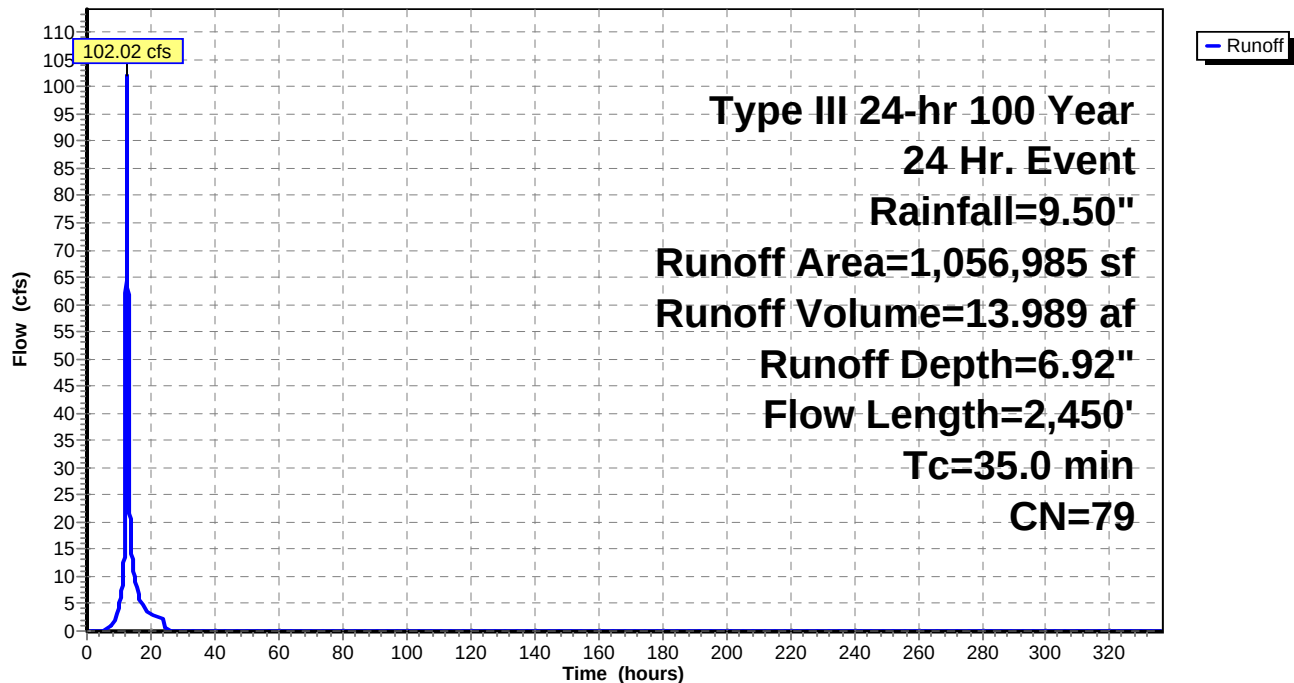
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
250,952	74	>75% Grass cover, Good, HSG C
1,056,985	79	Weighted Average
589,151		55.74% Pervious Area
467,834		44.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	800	0.1000	22.77	71.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
35.0	2,450	Total			

Subcatchment 1D: PROP ID

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1D: PROP ID

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.92	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.92	0.00
10.00	1.80	0.41	4.79	270.00	9.50	6.92	0.00
15.00	8.12	5.62	9.48	275.00	9.50	6.92	0.00
20.00	9.09	6.53	3.03	280.00	9.50	6.92	0.00
25.00	9.50	6.92	0.12	285.00	9.50	6.92	0.00
30.00	9.50	6.92	0.00	290.00	9.50	6.92	0.00
35.00	9.50	6.92	0.00	295.00	9.50	6.92	0.00
40.00	9.50	6.92	0.00	300.00	9.50	6.92	0.00
45.00	9.50	6.92	0.00	305.00	9.50	6.92	0.00
50.00	9.50	6.92	0.00	310.00	9.50	6.92	0.00
55.00	9.50	6.92	0.00	315.00	9.50	6.92	0.00
60.00	9.50	6.92	0.00	320.00	9.50	6.92	0.00
65.00	9.50	6.92	0.00	325.00	9.50	6.92	0.00
70.00	9.50	6.92	0.00	330.00	9.50	6.92	0.00
75.00	9.50	6.92	0.00	335.00	9.50	6.92	0.00
80.00	9.50	6.92	0.00				
85.00	9.50	6.92	0.00				
90.00	9.50	6.92	0.00				
95.00	9.50	6.92	0.00				
100.00	9.50	6.92	0.00				
105.00	9.50	6.92	0.00				
110.00	9.50	6.92	0.00				
115.00	9.50	6.92	0.00				
120.00	9.50	6.92	0.00				
125.00	9.50	6.92	0.00				
130.00	9.50	6.92	0.00				
135.00	9.50	6.92	0.00				
140.00	9.50	6.92	0.00				
145.00	9.50	6.92	0.00				
150.00	9.50	6.92	0.00				
155.00	9.50	6.92	0.00				
160.00	9.50	6.92	0.00				
165.00	9.50	6.92	0.00				
170.00	9.50	6.92	0.00				
175.00	9.50	6.92	0.00				
180.00	9.50	6.92	0.00				
185.00	9.50	6.92	0.00				
190.00	9.50	6.92	0.00				
195.00	9.50	6.92	0.00				
200.00	9.50	6.92	0.00				
205.00	9.50	6.92	0.00				
210.00	9.50	6.92	0.00				
215.00	9.50	6.92	0.00				
220.00	9.50	6.92	0.00				
225.00	9.50	6.92	0.00				
230.00	9.50	6.92	0.00				
235.00	9.50	6.92	0.00				
240.00	9.50	6.92	0.00				
245.00	9.50	6.92	0.00				
250.00	9.50	6.92	0.00				
255.00	9.50	6.92	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1K: PROP DA 1K

Runoff = 23.86 cfs @ 12.10 hrs, Volume= 1.776 af, Depth= 6.92"

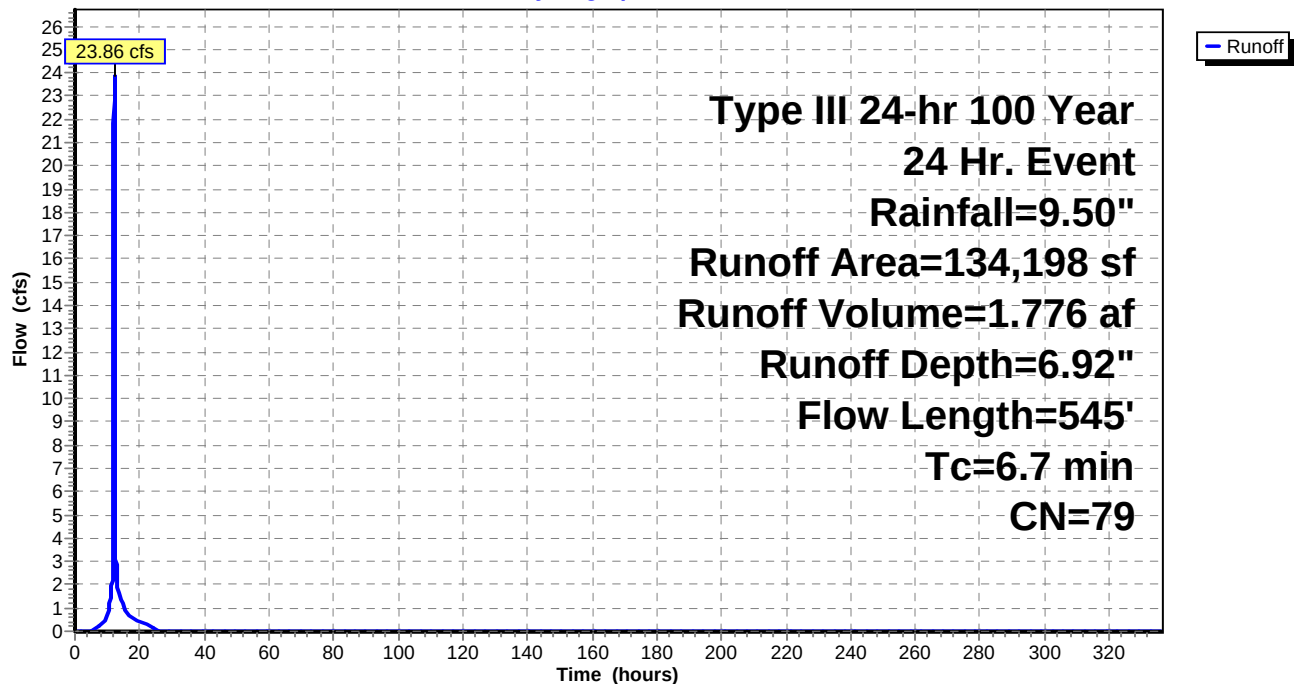
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
108,493	74	>75% Grass cover, Good, HSG C
9,729	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
134,198	79	Weighted Average
108,493		80.85% Pervious Area
25,705		19.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	80	0.1000	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	195	0.1500	6.24		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	270	0.1850	22.86	228.55	Channel Flow, Area= 10.0 sf Perim= 9.0' r= 1.11' n= 0.030 Earth, grassed & winding
6.7	545	Total			

Subcatchment 1K: PROP DA 1K

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1K: PROP DA 1K

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.92	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.92	0.00
10.00	1.80	0.41	0.75	270.00	9.50	6.92	0.00
15.00	8.12	5.62	1.06	275.00	9.50	6.92	0.00
20.00	9.09	6.53	0.37	280.00	9.50	6.92	0.00
25.00	9.50	6.92	0.00	285.00	9.50	6.92	0.00
30.00	9.50	6.92	0.00	290.00	9.50	6.92	0.00
35.00	9.50	6.92	0.00	295.00	9.50	6.92	0.00
40.00	9.50	6.92	0.00	300.00	9.50	6.92	0.00
45.00	9.50	6.92	0.00	305.00	9.50	6.92	0.00
50.00	9.50	6.92	0.00	310.00	9.50	6.92	0.00
55.00	9.50	6.92	0.00	315.00	9.50	6.92	0.00
60.00	9.50	6.92	0.00	320.00	9.50	6.92	0.00
65.00	9.50	6.92	0.00	325.00	9.50	6.92	0.00
70.00	9.50	6.92	0.00	330.00	9.50	6.92	0.00
75.00	9.50	6.92	0.00	335.00	9.50	6.92	0.00
80.00	9.50	6.92	0.00				
85.00	9.50	6.92	0.00				
90.00	9.50	6.92	0.00				
95.00	9.50	6.92	0.00				
100.00	9.50	6.92	0.00				
105.00	9.50	6.92	0.00				
110.00	9.50	6.92	0.00				
115.00	9.50	6.92	0.00				
120.00	9.50	6.92	0.00				
125.00	9.50	6.92	0.00				
130.00	9.50	6.92	0.00				
135.00	9.50	6.92	0.00				
140.00	9.50	6.92	0.00				
145.00	9.50	6.92	0.00				
150.00	9.50	6.92	0.00				
155.00	9.50	6.92	0.00				
160.00	9.50	6.92	0.00				
165.00	9.50	6.92	0.00				
170.00	9.50	6.92	0.00				
175.00	9.50	6.92	0.00				
180.00	9.50	6.92	0.00				
185.00	9.50	6.92	0.00				
190.00	9.50	6.92	0.00				
195.00	9.50	6.92	0.00				
200.00	9.50	6.92	0.00				
205.00	9.50	6.92	0.00				
210.00	9.50	6.92	0.00				
215.00	9.50	6.92	0.00				
220.00	9.50	6.92	0.00				
225.00	9.50	6.92	0.00				
230.00	9.50	6.92	0.00				
235.00	9.50	6.92	0.00				
240.00	9.50	6.92	0.00				
245.00	9.50	6.92	0.00				
250.00	9.50	6.92	0.00				
255.00	9.50	6.92	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1L: PROP 1I

Runoff = 47.03 cfs @ 12.10 hrs, Volume= 3.520 af, Depth= 6.41"

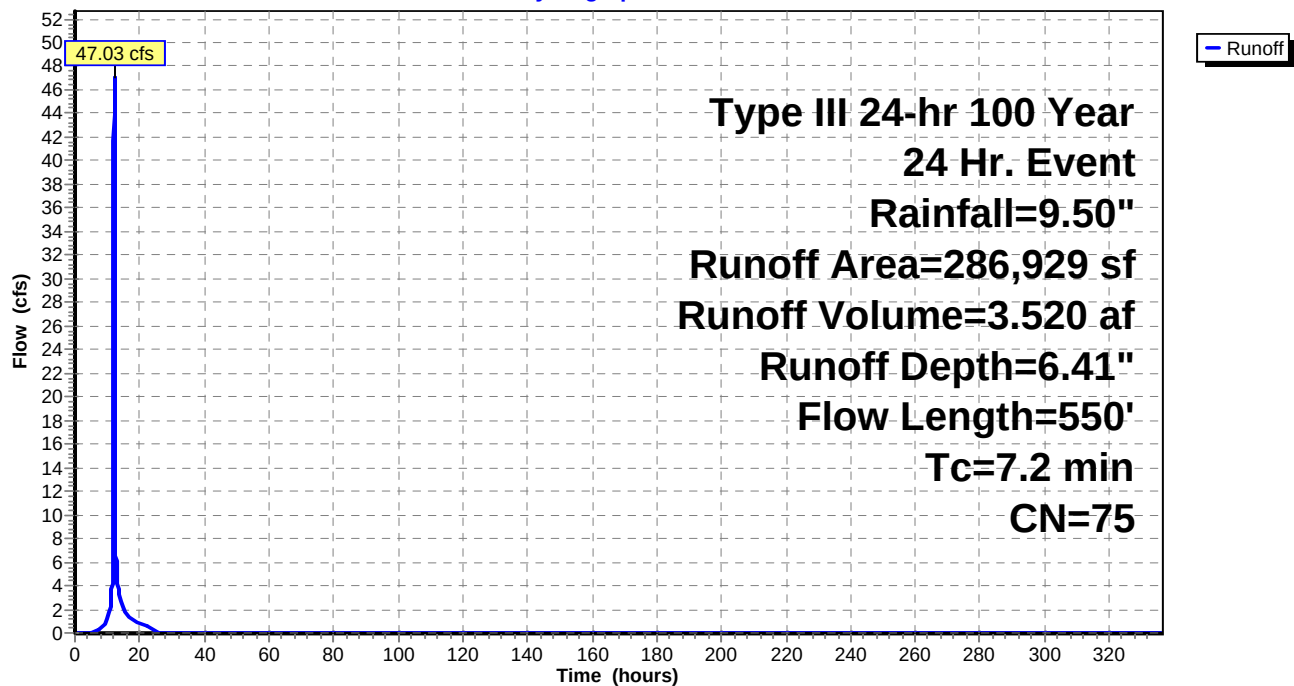
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
86,205	61	>75% Grass cover, Good, HSG B
145,054	74	>75% Grass cover, Good, HSG C
286,929	75	Weighted Average
231,259		80.60% Pervious Area
55,670		19.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	450	0.1640	2.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	550	Total			

Subcatchment 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.41	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.41	0.00
10.00	1.80	0.29	1.29	270.00	9.50	6.41	0.00
15.00	8.12	5.15	2.21	275.00	9.50	6.41	0.00
20.00	9.09	6.04	0.76	280.00	9.50	6.41	0.00
25.00	9.50	6.41	0.00	285.00	9.50	6.41	0.00
30.00	9.50	6.41	0.00	290.00	9.50	6.41	0.00
35.00	9.50	6.41	0.00	295.00	9.50	6.41	0.00
40.00	9.50	6.41	0.00	300.00	9.50	6.41	0.00
45.00	9.50	6.41	0.00	305.00	9.50	6.41	0.00
50.00	9.50	6.41	0.00	310.00	9.50	6.41	0.00
55.00	9.50	6.41	0.00	315.00	9.50	6.41	0.00
60.00	9.50	6.41	0.00	320.00	9.50	6.41	0.00
65.00	9.50	6.41	0.00	325.00	9.50	6.41	0.00
70.00	9.50	6.41	0.00	330.00	9.50	6.41	0.00
75.00	9.50	6.41	0.00	335.00	9.50	6.41	0.00
80.00	9.50	6.41	0.00				
85.00	9.50	6.41	0.00				
90.00	9.50	6.41	0.00				
95.00	9.50	6.41	0.00				
100.00	9.50	6.41	0.00				
105.00	9.50	6.41	0.00				
110.00	9.50	6.41	0.00				
115.00	9.50	6.41	0.00				
120.00	9.50	6.41	0.00				
125.00	9.50	6.41	0.00				
130.00	9.50	6.41	0.00				
135.00	9.50	6.41	0.00				
140.00	9.50	6.41	0.00				
145.00	9.50	6.41	0.00				
150.00	9.50	6.41	0.00				
155.00	9.50	6.41	0.00				
160.00	9.50	6.41	0.00				
165.00	9.50	6.41	0.00				
170.00	9.50	6.41	0.00				
175.00	9.50	6.41	0.00				
180.00	9.50	6.41	0.00				
185.00	9.50	6.41	0.00				
190.00	9.50	6.41	0.00				
195.00	9.50	6.41	0.00				
200.00	9.50	6.41	0.00				
205.00	9.50	6.41	0.00				
210.00	9.50	6.41	0.00				
215.00	9.50	6.41	0.00				
220.00	9.50	6.41	0.00				
225.00	9.50	6.41	0.00				
230.00	9.50	6.41	0.00				
235.00	9.50	6.41	0.00				
240.00	9.50	6.41	0.00				
245.00	9.50	6.41	0.00				
250.00	9.50	6.41	0.00				
255.00	9.50	6.41	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment EX 1D: EXIST 1D

Runoff = 25.88 cfs @ 12.26 hrs, Volume= 2.670 af, Depth= 4.62"

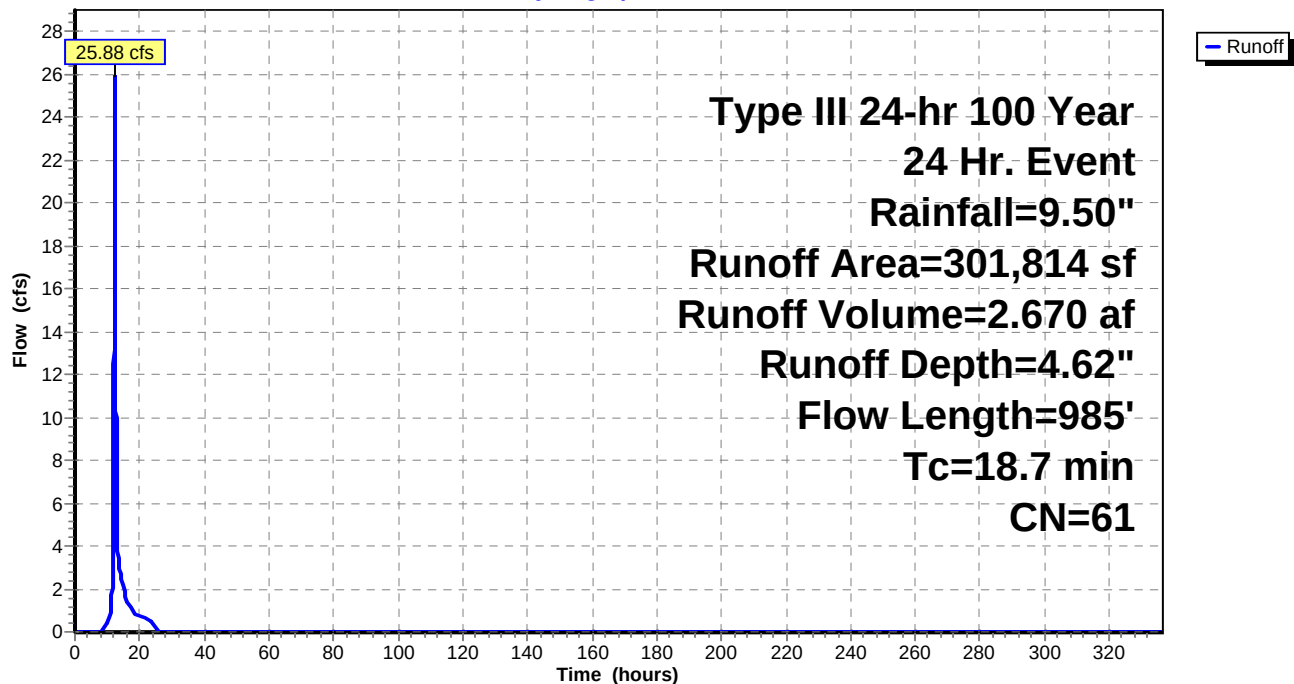
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
301,814	61	>75% Grass cover, Good, HSG B
301,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	115	0.0340	0.16		Sheet Flow, Orchard
					Grass: Dense n= 0.240 P2= 3.50"
6.4	870	0.1057	2.28		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
18.7	985	Total			

Subcatchment EX 1D: EXIST 1D

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1D: EXIST 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	4.62	0.00
5.00	0.54	0.00	0.00	265.00	9.50	4.62	0.00
10.00	1.80	0.04	0.34	270.00	9.50	4.62	0.00
15.00	8.12	3.53	2.06	275.00	9.50	4.62	0.00
20.00	9.09	4.30	0.71	280.00	9.50	4.62	0.00
25.00	9.50	4.62	0.00	285.00	9.50	4.62	0.00
30.00	9.50	4.62	0.00	290.00	9.50	4.62	0.00
35.00	9.50	4.62	0.00	295.00	9.50	4.62	0.00
40.00	9.50	4.62	0.00	300.00	9.50	4.62	0.00
45.00	9.50	4.62	0.00	305.00	9.50	4.62	0.00
50.00	9.50	4.62	0.00	310.00	9.50	4.62	0.00
55.00	9.50	4.62	0.00	315.00	9.50	4.62	0.00
60.00	9.50	4.62	0.00	320.00	9.50	4.62	0.00
65.00	9.50	4.62	0.00	325.00	9.50	4.62	0.00
70.00	9.50	4.62	0.00	330.00	9.50	4.62	0.00
75.00	9.50	4.62	0.00	335.00	9.50	4.62	0.00
80.00	9.50	4.62	0.00				
85.00	9.50	4.62	0.00				
90.00	9.50	4.62	0.00				
95.00	9.50	4.62	0.00				
100.00	9.50	4.62	0.00				
105.00	9.50	4.62	0.00				
110.00	9.50	4.62	0.00				
115.00	9.50	4.62	0.00				
120.00	9.50	4.62	0.00				
125.00	9.50	4.62	0.00				
130.00	9.50	4.62	0.00				
135.00	9.50	4.62	0.00				
140.00	9.50	4.62	0.00				
145.00	9.50	4.62	0.00				
150.00	9.50	4.62	0.00				
155.00	9.50	4.62	0.00				
160.00	9.50	4.62	0.00				
165.00	9.50	4.62	0.00				
170.00	9.50	4.62	0.00				
175.00	9.50	4.62	0.00				
180.00	9.50	4.62	0.00				
185.00	9.50	4.62	0.00				
190.00	9.50	4.62	0.00				
195.00	9.50	4.62	0.00				
200.00	9.50	4.62	0.00				
205.00	9.50	4.62	0.00				
210.00	9.50	4.62	0.00				
215.00	9.50	4.62	0.00				
220.00	9.50	4.62	0.00				
225.00	9.50	4.62	0.00				
230.00	9.50	4.62	0.00				
235.00	9.50	4.62	0.00				
240.00	9.50	4.62	0.00				
245.00	9.50	4.62	0.00				
250.00	9.50	4.62	0.00				
255.00	9.50	4.62	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1E: EXIST 1E

Runoff = 54.97 cfs @ 12.08 hrs, Volume= 3.901 af, Depth= 6.54"

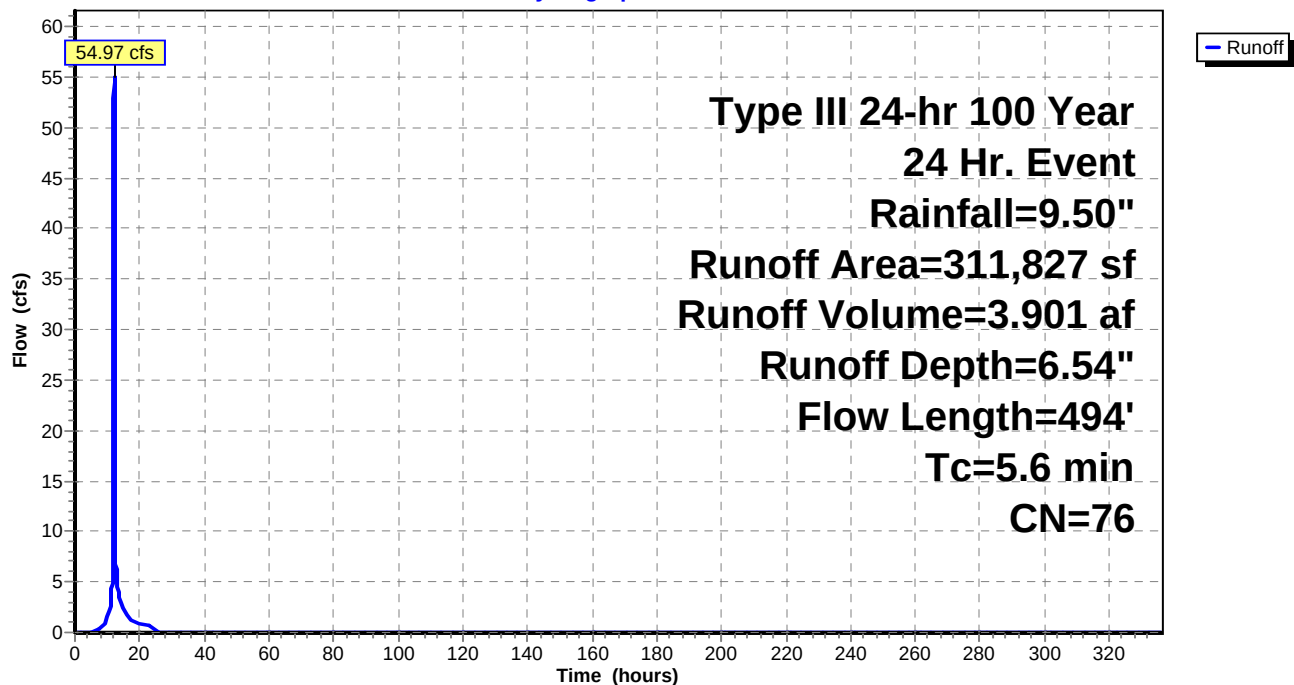
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
250,622	74	>75% Grass cover, Good, HSG C
26,824	61	>75% Grass cover, Good, HSG B
18,405	98	Paved roads w/curbs & sewers, HSG B
15,976	98	Water Surface, HSG B
311,827	76	Weighted Average
277,446		88.97% Pervious Area
34,381		11.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	75	0.1600	0.39		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
2.4	419	0.1800	2.97		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
5.6	494	Total			

Subcatchment EX 1E: EXIST 1E

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1E: EXIST 1E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.54	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.54	0.00
10.00	1.80	0.31	1.50	270.00	9.50	6.54	0.00
15.00	8.12	5.26	2.41	275.00	9.50	6.54	0.00
20.00	9.09	6.16	0.83	280.00	9.50	6.54	0.00
25.00	9.50	6.54	0.00	285.00	9.50	6.54	0.00
30.00	9.50	6.54	0.00	290.00	9.50	6.54	0.00
35.00	9.50	6.54	0.00	295.00	9.50	6.54	0.00
40.00	9.50	6.54	0.00	300.00	9.50	6.54	0.00
45.00	9.50	6.54	0.00	305.00	9.50	6.54	0.00
50.00	9.50	6.54	0.00	310.00	9.50	6.54	0.00
55.00	9.50	6.54	0.00	315.00	9.50	6.54	0.00
60.00	9.50	6.54	0.00	320.00	9.50	6.54	0.00
65.00	9.50	6.54	0.00	325.00	9.50	6.54	0.00
70.00	9.50	6.54	0.00	330.00	9.50	6.54	0.00
75.00	9.50	6.54	0.00	335.00	9.50	6.54	0.00
80.00	9.50	6.54	0.00				
85.00	9.50	6.54	0.00				
90.00	9.50	6.54	0.00				
95.00	9.50	6.54	0.00				
100.00	9.50	6.54	0.00				
105.00	9.50	6.54	0.00				
110.00	9.50	6.54	0.00				
115.00	9.50	6.54	0.00				
120.00	9.50	6.54	0.00				
125.00	9.50	6.54	0.00				
130.00	9.50	6.54	0.00				
135.00	9.50	6.54	0.00				
140.00	9.50	6.54	0.00				
145.00	9.50	6.54	0.00				
150.00	9.50	6.54	0.00				
155.00	9.50	6.54	0.00				
160.00	9.50	6.54	0.00				
165.00	9.50	6.54	0.00				
170.00	9.50	6.54	0.00				
175.00	9.50	6.54	0.00				
180.00	9.50	6.54	0.00				
185.00	9.50	6.54	0.00				
190.00	9.50	6.54	0.00				
195.00	9.50	6.54	0.00				
200.00	9.50	6.54	0.00				
205.00	9.50	6.54	0.00				
210.00	9.50	6.54	0.00				
215.00	9.50	6.54	0.00				
220.00	9.50	6.54	0.00				
225.00	9.50	6.54	0.00				
230.00	9.50	6.54	0.00				
235.00	9.50	6.54	0.00				
240.00	9.50	6.54	0.00				
245.00	9.50	6.54	0.00				
250.00	9.50	6.54	0.00				
255.00	9.50	6.54	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1F: EX IF

Runoff = 99.87 cfs @ 12.47 hrs, Volume= 13.780 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

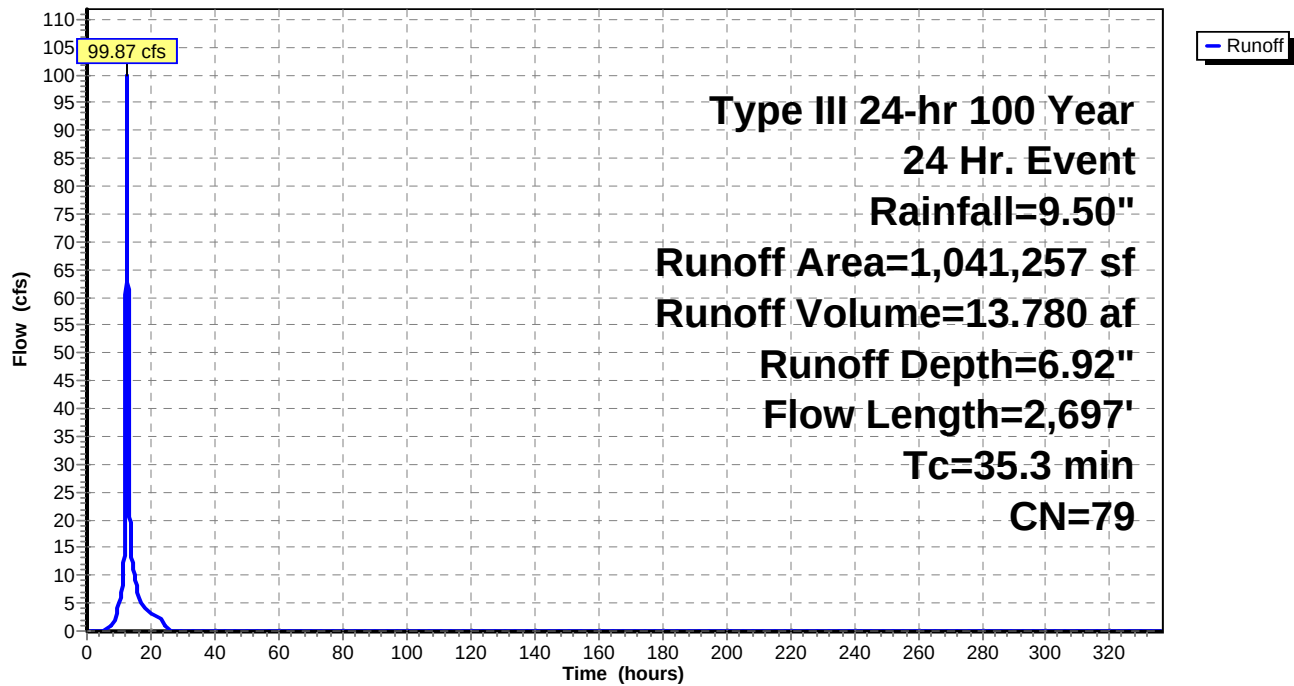
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
467,834	98	Paved parking, HSG B
338,199	55	Woods, Good, HSG B
235,224	74	>75% Grass cover, Good, HSG C
1,041,257	79	Weighted Average
573,423		55.07% Pervious Area
467,834		44.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0600	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.50"
10.5	1,350	0.1850	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	200	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	1,047	0.1000	19.74	62.00	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
35.3	2,697	Total			

Subcatchment EX 1F: EX IF

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1F: EX IF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.92	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.92	0.00
10.00	1.80	0.41	4.71	270.00	9.50	6.92	0.00
15.00	8.12	5.62	9.35	275.00	9.50	6.92	0.00
20.00	9.09	6.53	2.98	280.00	9.50	6.92	0.00
25.00	9.50	6.92	0.12	285.00	9.50	6.92	0.00
30.00	9.50	6.92	0.00	290.00	9.50	6.92	0.00
35.00	9.50	6.92	0.00	295.00	9.50	6.92	0.00
40.00	9.50	6.92	0.00	300.00	9.50	6.92	0.00
45.00	9.50	6.92	0.00	305.00	9.50	6.92	0.00
50.00	9.50	6.92	0.00	310.00	9.50	6.92	0.00
55.00	9.50	6.92	0.00	315.00	9.50	6.92	0.00
60.00	9.50	6.92	0.00	320.00	9.50	6.92	0.00
65.00	9.50	6.92	0.00	325.00	9.50	6.92	0.00
70.00	9.50	6.92	0.00	330.00	9.50	6.92	0.00
75.00	9.50	6.92	0.00	335.00	9.50	6.92	0.00
80.00	9.50	6.92	0.00				
85.00	9.50	6.92	0.00				
90.00	9.50	6.92	0.00				
95.00	9.50	6.92	0.00				
100.00	9.50	6.92	0.00				
105.00	9.50	6.92	0.00				
110.00	9.50	6.92	0.00				
115.00	9.50	6.92	0.00				
120.00	9.50	6.92	0.00				
125.00	9.50	6.92	0.00				
130.00	9.50	6.92	0.00				
135.00	9.50	6.92	0.00				
140.00	9.50	6.92	0.00				
145.00	9.50	6.92	0.00				
150.00	9.50	6.92	0.00				
155.00	9.50	6.92	0.00				
160.00	9.50	6.92	0.00				
165.00	9.50	6.92	0.00				
170.00	9.50	6.92	0.00				
175.00	9.50	6.92	0.00				
180.00	9.50	6.92	0.00				
185.00	9.50	6.92	0.00				
190.00	9.50	6.92	0.00				
195.00	9.50	6.92	0.00				
200.00	9.50	6.92	0.00				
205.00	9.50	6.92	0.00				
210.00	9.50	6.92	0.00				
215.00	9.50	6.92	0.00				
220.00	9.50	6.92	0.00				
225.00	9.50	6.92	0.00				
230.00	9.50	6.92	0.00				
235.00	9.50	6.92	0.00				
240.00	9.50	6.92	0.00				
245.00	9.50	6.92	0.00				
250.00	9.50	6.92	0.00				
255.00	9.50	6.92	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1L: PROP 1I

Runoff = 51.07 cfs @ 12.04 hrs, Volume= 3.251 af, Depth= 6.16"

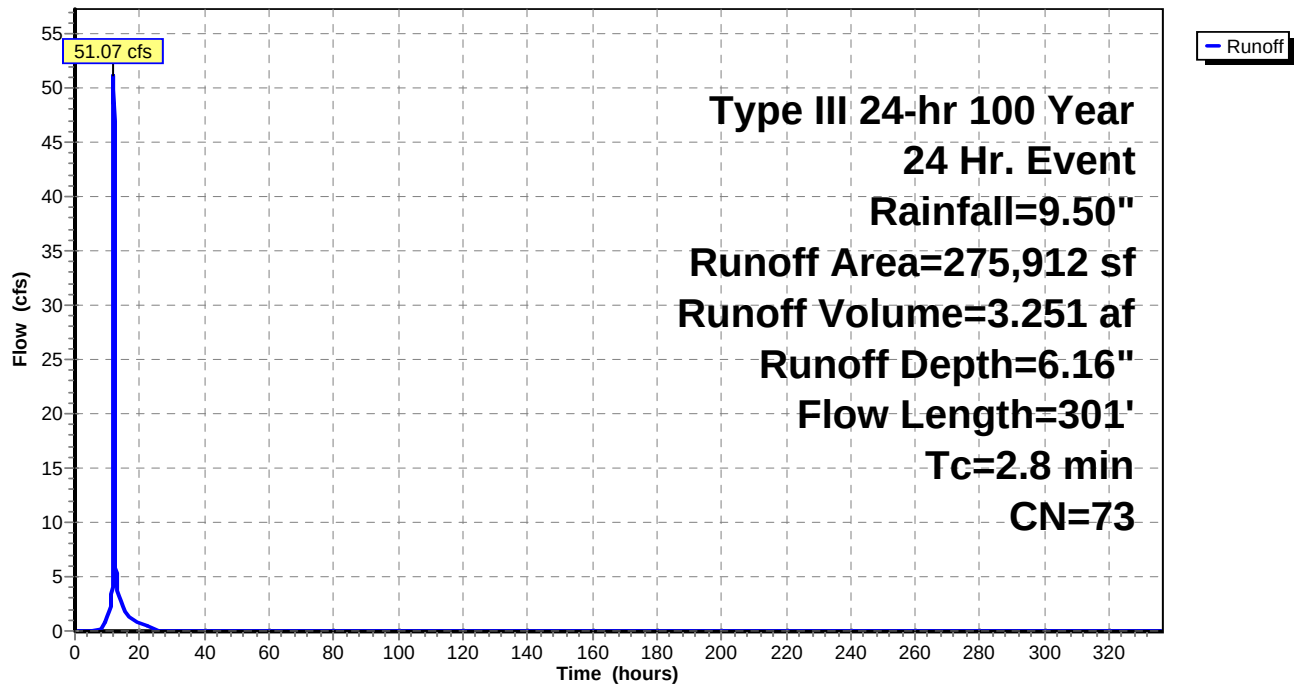
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
55,670	98	Paved parking, HSG B
116,330	61	>75% Grass cover, Good, HSG B
103,912	74	>75% Grass cover, Good, HSG C
275,912	73	Weighted Average
220,242		79.82% Pervious Area
55,670		20.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.1800	0.37		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	251	0.1830	6.89		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	301	Total			

Subcatchment EX 1L: PROP 1I

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1L: PROP 1I

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.16	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.16	0.00
10.00	1.80	0.23	1.15	270.00	9.50	6.16	0.00
15.00	8.12	4.91	2.05	275.00	9.50	6.16	0.00
20.00	9.09	5.79	0.72	280.00	9.50	6.16	0.00
25.00	9.50	6.16	0.00	285.00	9.50	6.16	0.00
30.00	9.50	6.16	0.00	290.00	9.50	6.16	0.00
35.00	9.50	6.16	0.00	295.00	9.50	6.16	0.00
40.00	9.50	6.16	0.00	300.00	9.50	6.16	0.00
45.00	9.50	6.16	0.00	305.00	9.50	6.16	0.00
50.00	9.50	6.16	0.00	310.00	9.50	6.16	0.00
55.00	9.50	6.16	0.00	315.00	9.50	6.16	0.00
60.00	9.50	6.16	0.00	320.00	9.50	6.16	0.00
65.00	9.50	6.16	0.00	325.00	9.50	6.16	0.00
70.00	9.50	6.16	0.00	330.00	9.50	6.16	0.00
75.00	9.50	6.16	0.00	335.00	9.50	6.16	0.00
80.00	9.50	6.16	0.00				
85.00	9.50	6.16	0.00				
90.00	9.50	6.16	0.00				
95.00	9.50	6.16	0.00				
100.00	9.50	6.16	0.00				
105.00	9.50	6.16	0.00				
110.00	9.50	6.16	0.00				
115.00	9.50	6.16	0.00				
120.00	9.50	6.16	0.00				
125.00	9.50	6.16	0.00				
130.00	9.50	6.16	0.00				
135.00	9.50	6.16	0.00				
140.00	9.50	6.16	0.00				
145.00	9.50	6.16	0.00				
150.00	9.50	6.16	0.00				
155.00	9.50	6.16	0.00				
160.00	9.50	6.16	0.00				
165.00	9.50	6.16	0.00				
170.00	9.50	6.16	0.00				
175.00	9.50	6.16	0.00				
180.00	9.50	6.16	0.00				
185.00	9.50	6.16	0.00				
190.00	9.50	6.16	0.00				
195.00	9.50	6.16	0.00				
200.00	9.50	6.16	0.00				
205.00	9.50	6.16	0.00				
210.00	9.50	6.16	0.00				
215.00	9.50	6.16	0.00				
220.00	9.50	6.16	0.00				
225.00	9.50	6.16	0.00				
230.00	9.50	6.16	0.00				
235.00	9.50	6.16	0.00				
240.00	9.50	6.16	0.00				
245.00	9.50	6.16	0.00				
250.00	9.50	6.16	0.00				
255.00	9.50	6.16	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX DA 1: EX 1A

Runoff = 13.95 cfs @ 12.40 hrs, Volume= 1.691 af, Depth= 4.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

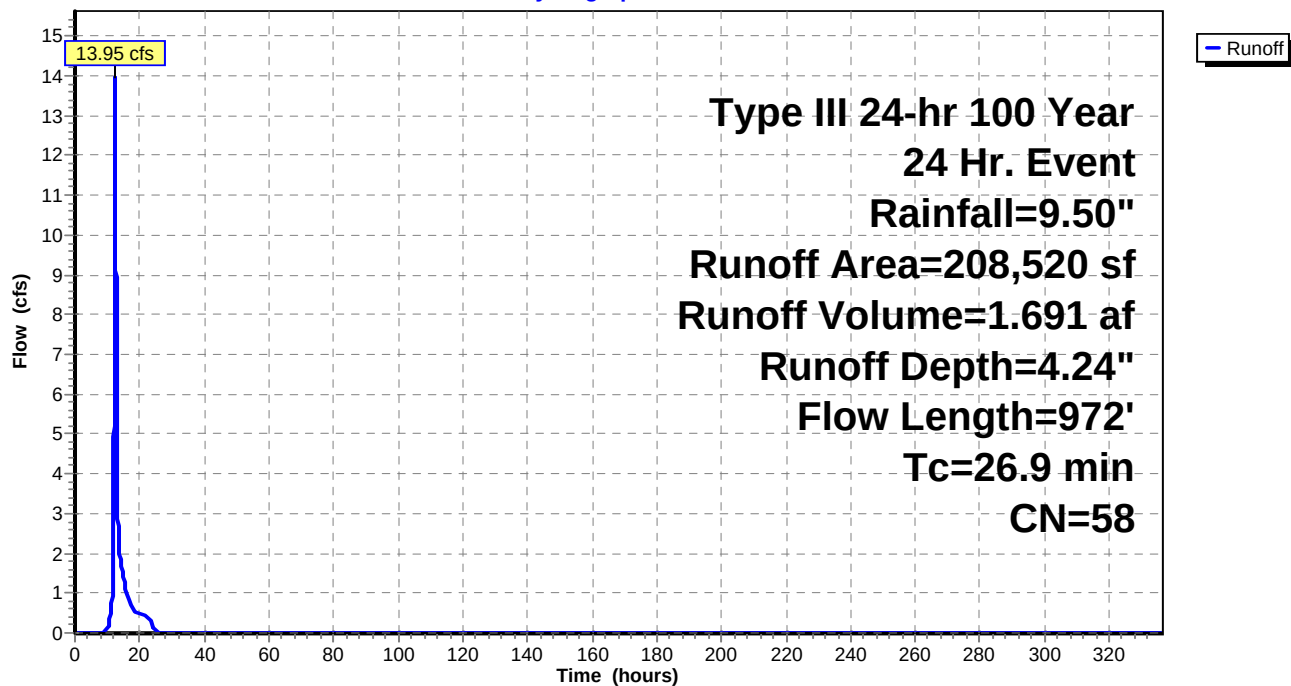
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
167,674	55	Woods, Good, HSG B
40,846	69	50-75% Grass cover, Fair, HSG B
208,520	58	Weighted Average
208,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	125	0.0320	0.10		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.50"
5.7	679	0.1560	1.97		Shallow Concentrated Flow, Wooded
					Woodland Kv= 5.0 fps
0.9	168	0.0230	3.08		Shallow Concentrated Flow, Gravel drive
					Paved Kv= 20.3 fps
26.9	972	Total			

Subcatchment EX DA 1: EX 1A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX DA 1: EX 1A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	4.24	0.00
5.00	0.54	0.00	0.00	265.00	9.50	4.24	0.00
10.00	1.80	0.02	0.09	270.00	9.50	4.24	0.00
15.00	8.12	3.20	1.40	275.00	9.50	4.24	0.00
20.00	9.09	3.92	0.48	280.00	9.50	4.24	0.00
25.00	9.50	4.24	0.00	285.00	9.50	4.24	0.00
30.00	9.50	4.24	0.00	290.00	9.50	4.24	0.00
35.00	9.50	4.24	0.00	295.00	9.50	4.24	0.00
40.00	9.50	4.24	0.00	300.00	9.50	4.24	0.00
45.00	9.50	4.24	0.00	305.00	9.50	4.24	0.00
50.00	9.50	4.24	0.00	310.00	9.50	4.24	0.00
55.00	9.50	4.24	0.00	315.00	9.50	4.24	0.00
60.00	9.50	4.24	0.00	320.00	9.50	4.24	0.00
65.00	9.50	4.24	0.00	325.00	9.50	4.24	0.00
70.00	9.50	4.24	0.00	330.00	9.50	4.24	0.00
75.00	9.50	4.24	0.00	335.00	9.50	4.24	0.00
80.00	9.50	4.24	0.00				
85.00	9.50	4.24	0.00				
90.00	9.50	4.24	0.00				
95.00	9.50	4.24	0.00				
100.00	9.50	4.24	0.00				
105.00	9.50	4.24	0.00				
110.00	9.50	4.24	0.00				
115.00	9.50	4.24	0.00				
120.00	9.50	4.24	0.00				
125.00	9.50	4.24	0.00				
130.00	9.50	4.24	0.00				
135.00	9.50	4.24	0.00				
140.00	9.50	4.24	0.00				
145.00	9.50	4.24	0.00				
150.00	9.50	4.24	0.00				
155.00	9.50	4.24	0.00				
160.00	9.50	4.24	0.00				
165.00	9.50	4.24	0.00				
170.00	9.50	4.24	0.00				
175.00	9.50	4.24	0.00				
180.00	9.50	4.24	0.00				
185.00	9.50	4.24	0.00				
190.00	9.50	4.24	0.00				
195.00	9.50	4.24	0.00				
200.00	9.50	4.24	0.00				
205.00	9.50	4.24	0.00				
210.00	9.50	4.24	0.00				
215.00	9.50	4.24	0.00				
220.00	9.50	4.24	0.00				
225.00	9.50	4.24	0.00				
230.00	9.50	4.24	0.00				
235.00	9.50	4.24	0.00				
240.00	9.50	4.24	0.00				
245.00	9.50	4.24	0.00				
250.00	9.50	4.24	0.00				
255.00	9.50	4.24	0.00				

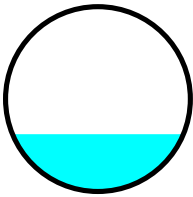
Summary for Reach 1R: Pipe

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 4.24" for 100 Year, 24 Hr. Event event
Inflow = 13.95 cfs @ 12.40 hrs, Volume= 1.691 af
Outflow = 13.93 cfs @ 12.41 hrs, Volume= 1.691 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 16.86 fps, Min. Travel Time= 1.3 min
Avg. Velocity= 6.84 fps, Avg. Travel Time= 3.1 min

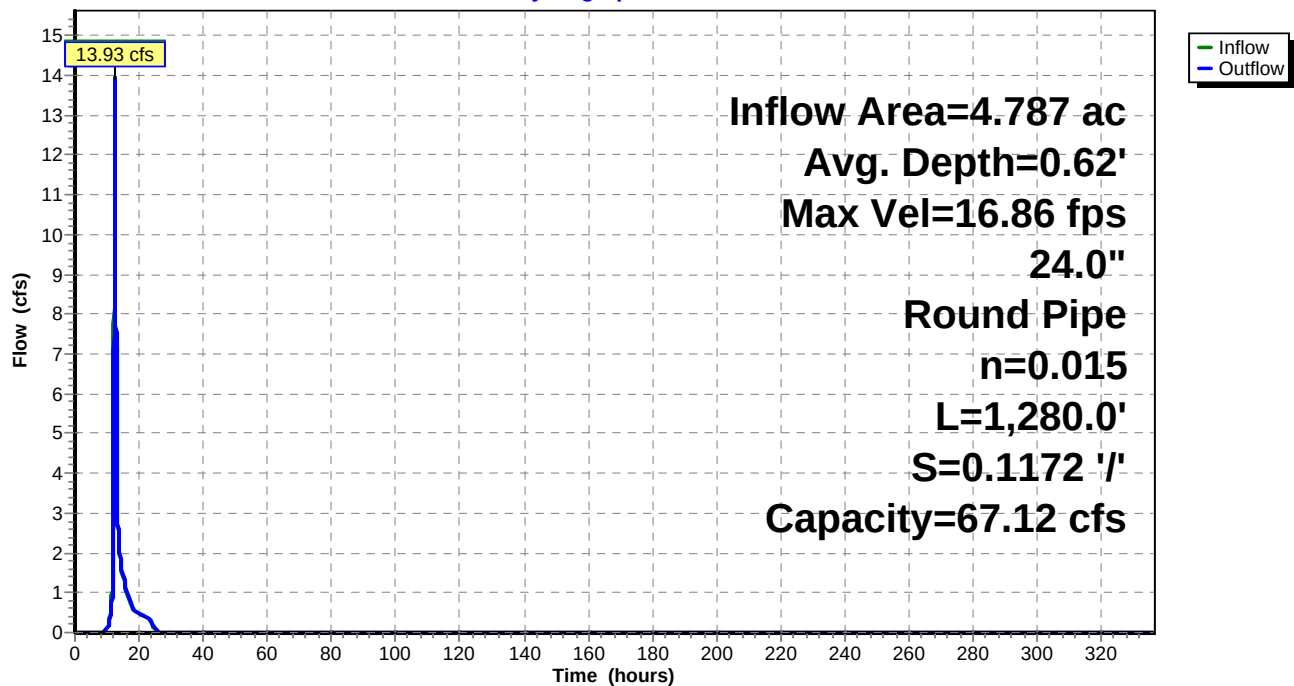
Peak Storage= 1,058 cf @ 12.41 hrs, Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 67.12 cfs

24.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 1,280.0' Slope= 0.1172 '/'
Inlet Invert= 732.00', Outlet Invert= 582.00'



Reach 1R: Pipe

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach 1R: Pipe

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.00	0.00
10.00	0.09	27	732.05	0.08
20.00	0.48	99	732.12	0.48
30.00	0.00	0	732.00	0.00
40.00	0.00	0	732.00	0.00
50.00	0.00	0	732.00	0.00
60.00	0.00	0	732.00	0.00
70.00	0.00	0	732.00	0.00
80.00	0.00	0	732.00	0.00
90.00	0.00	0	732.00	0.00
100.00	0.00	0	732.00	0.00
110.00	0.00	0	732.00	0.00
120.00	0.00	0	732.00	0.00
130.00	0.00	0	732.00	0.00
140.00	0.00	0	732.00	0.00
150.00	0.00	0	732.00	0.00
160.00	0.00	0	732.00	0.00
170.00	0.00	0	732.00	0.00
180.00	0.00	0	732.00	0.00
190.00	0.00	0	732.00	0.00
200.00	0.00	0	732.00	0.00
210.00	0.00	0	732.00	0.00
220.00	0.00	0	732.00	0.00
230.00	0.00	0	732.00	0.00
240.00	0.00	0	732.00	0.00
250.00	0.00	0	732.00	0.00
260.00	0.00	0	732.00	0.00
270.00	0.00	0	732.00	0.00
280.00	0.00	0	732.00	0.00
290.00	0.00	0	732.00	0.00
300.00	0.00	0	732.00	0.00
310.00	0.00	0	732.00	0.00
320.00	0.00	0	732.00	0.00
330.00	0.00	0	732.00	0.00

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Stage-Area-Storage for Reach 1R: Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
732.00	0.0	0	733.04	1.7	2,113
732.02	0.0	7	733.06	1.7	2,164
732.04	0.0	19	733.08	1.7	2,215
732.06	0.0	35	733.10	1.8	2,266
732.08	0.0	54	733.12	1.8	2,317
732.10	0.1	75	733.14	1.8	2,368
732.12	0.1	99	733.16	1.9	2,418
732.14	0.1	124	733.18	1.9	2,469
732.16	0.1	151	733.20	2.0	2,519
732.18	0.1	179	733.22	2.0	2,569
732.20	0.2	209	733.24	2.0	2,619
732.22	0.2	241	733.26	2.1	2,669
732.24	0.2	273	733.28	2.1	2,718
732.26	0.2	307	733.30	2.2	2,767
732.28	0.3	342	733.32	2.2	2,816
732.30	0.3	378	733.34	2.2	2,864
732.32	0.3	415	733.36	2.3	2,912
732.34	0.4	453	733.38	2.3	2,959
732.36	0.4	492	733.40	2.3	3,007
732.38	0.4	532	733.42	2.4	3,053
732.40	0.4	573	733.44	2.4	3,100
732.42	0.5	614	733.46	2.5	3,145
732.44	0.5	656	733.48	2.5	3,190
732.46	0.5	699	733.50	2.5	3,235
732.48	0.6	742	733.52	2.6	3,279
732.50	0.6	786	733.54	2.6	3,323
732.52	0.6	831	733.56	2.6	3,365
732.54	0.7	876	733.58	2.7	3,407
732.56	0.7	922	733.60	2.7	3,449
732.58	0.8	968	733.62	2.7	3,489
732.60	0.8	1,015	733.64	2.8	3,529
732.62	0.8	1,062	733.66	2.8	3,568
732.64	0.9	1,109	733.68	2.8	3,606
732.66	0.9	1,157	733.70	2.8	3,643
732.68	0.9	1,206	733.72	2.9	3,679
732.70	1.0	1,254	733.74	2.9	3,714
732.72	1.0	1,303	733.76	2.9	3,748
732.74	1.1	1,353	733.78	3.0	3,781
732.76	1.1	1,402	733.80	3.0	3,812
732.78	1.1	1,452	733.82	3.0	3,842
732.80	1.2	1,502	733.84	3.0	3,871
732.82	1.2	1,552	733.86	3.0	3,897
732.84	1.3	1,603	733.88	3.1	3,923
732.86	1.3	1,653	733.90	3.1	3,946
732.88	1.3	1,704	733.92	3.1	3,967
732.90	1.4	1,755	733.94	3.1	3,986
732.92	1.4	1,806	733.96	3.1	4,002
732.94	1.5	1,857	733.98	3.1	4,014
732.96	1.5	1,908	734.00	3.1	4,021
732.98	1.5	1,959			
733.00	1.6	2,011			
733.02	1.6	2,062			

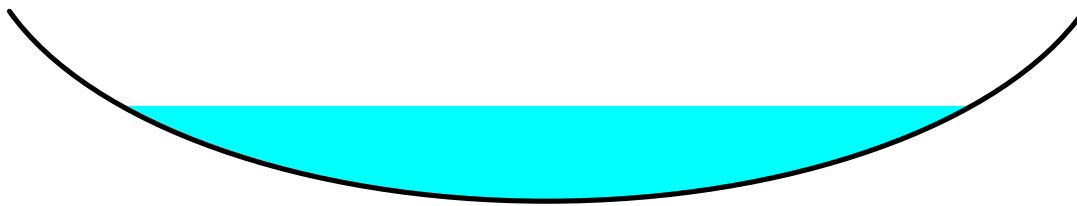
Summary for Reach 2R: Watercourse

Inflow Area = 4.787 ac, 0.00% Impervious, Inflow Depth = 4.24" for 100 Year, 24 Hr. Event event
 Inflow = 13.93 cfs @ 12.41 hrs, Volume= 1.691 af
 Outflow = 13.92 cfs @ 12.41 hrs, Volume= 1.691 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 9.81 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 3.82 fps, Avg. Travel Time= 1.5 min

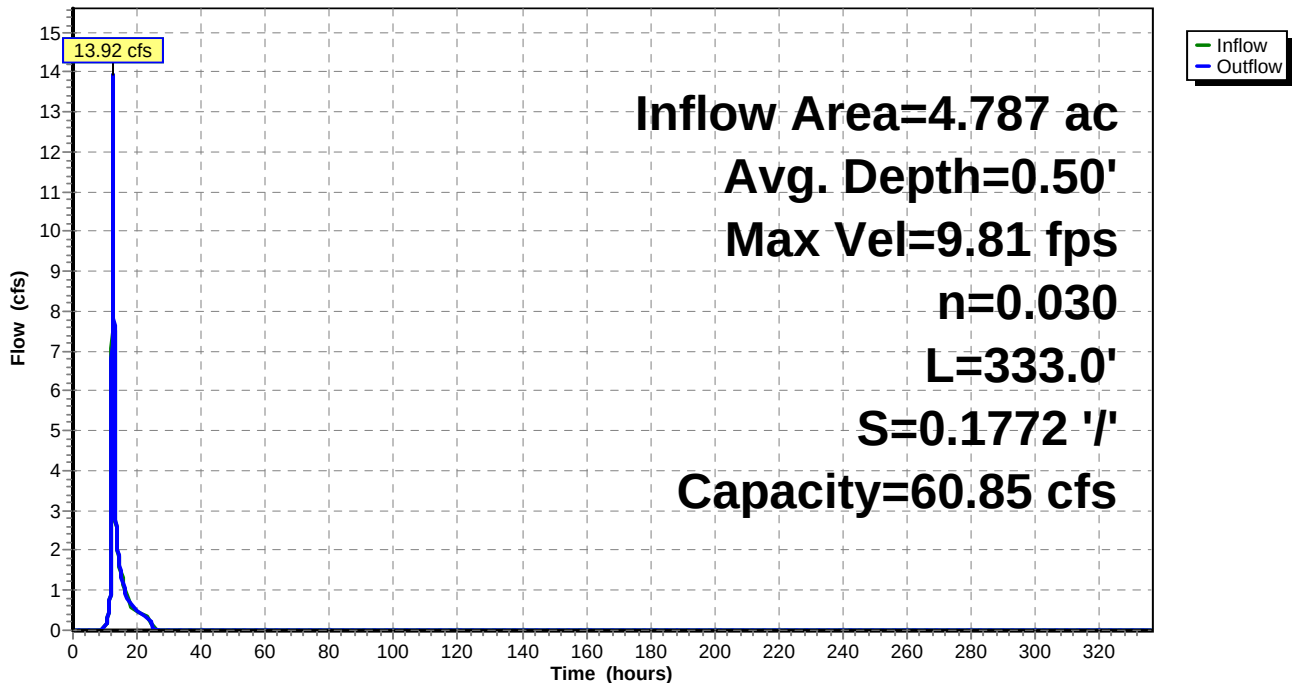
Peak Storage= 473 cf @ 12.41 hrs, Average Depth at Peak Storage= 0.50'
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 60.85 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 333.0' Slope= 0.1772 '/'
 Inlet Invert= 581.00', Outlet Invert= 522.00'



Reach 2R: Watercourse

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach 2R: Watercourse

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	581.00	0.00
10.00	0.08	12	581.04	0.07
20.00	0.48	45	581.10	0.48
30.00	0.00	0	581.00	0.00
40.00	0.00	0	581.00	0.00
50.00	0.00	0	581.00	0.00
60.00	0.00	0	581.00	0.00
70.00	0.00	0	581.00	0.00
80.00	0.00	0	581.00	0.00
90.00	0.00	0	581.00	0.00
100.00	0.00	0	581.00	0.00
110.00	0.00	0	581.00	0.00
120.00	0.00	0	581.00	0.00
130.00	0.00	0	581.00	0.00
140.00	0.00	0	581.00	0.00
150.00	0.00	0	581.00	0.00
160.00	0.00	0	581.00	0.00
170.00	0.00	0	581.00	0.00
180.00	0.00	0	581.00	0.00
190.00	0.00	0	581.00	0.00
200.00	0.00	0	581.00	0.00
210.00	0.00	0	581.00	0.00
220.00	0.00	0	581.00	0.00
230.00	0.00	0	581.00	0.00
240.00	0.00	0	581.00	0.00
250.00	0.00	0	581.00	0.00
260.00	0.00	0	581.00	0.00
270.00	0.00	0	581.00	0.00
280.00	0.00	0	581.00	0.00
290.00	0.00	0	581.00	0.00
300.00	0.00	0	581.00	0.00
310.00	0.00	0	581.00	0.00
320.00	0.00	0	581.00	0.00
330.00	0.00	0	581.00	0.00

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Stage-Area-Storage for Reach 2R: Watercourse

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
581.00	0.0	0	581.52	1.5	499
581.01	0.0	1	581.53	1.5	514
581.02	0.0	4	581.54	1.6	529
581.03	0.0	7	581.55	1.6	543
581.04	0.0	11	581.56	1.7	558
581.05	0.0	15	581.57	1.7	573
581.06	0.1	20	581.58	1.8	588
581.07	0.1	25	581.59	1.8	604
581.08	0.1	30	581.60	1.9	619
581.09	0.1	36	581.61	1.9	635
581.10	0.1	42	581.62	2.0	650
581.11	0.1	49	581.63	2.0	666
581.12	0.2	55	581.64	2.0	682
581.13	0.2	62	581.65	2.1	698
581.14	0.2	70	581.66	2.1	714
581.15	0.2	77	581.67	2.2	730
581.16	0.3	85	581.68	2.2	747
581.17	0.3	93	581.69	2.3	763
581.18	0.3	102	581.70	2.3	780
581.19	0.3	110	581.71	2.4	797
581.20	0.4	119	581.72	2.4	814
581.21	0.4	128	581.73	2.5	831
581.22	0.4	137	581.74	2.5	848
581.23	0.4	147	581.75	2.6	865
581.24	0.5	157	581.76	2.7	883
581.25	0.5	167	581.77	2.7	900
581.26	0.5	177	581.78	2.8	918
581.27	0.6	187	581.79	2.8	935
581.28	0.6	197	581.80	2.9	953
581.29	0.6	208	581.81	2.9	971
581.30	0.7	219	581.82	3.0	989
581.31	0.7	230	581.83	3.0	1,007
581.32	0.7	241	581.84	3.1	1,025
581.33	0.8	253	581.85	3.1	1,044
581.34	0.8	264	581.86	3.2	1,062
581.35	0.8	276	581.87	3.2	1,081
581.36	0.9	288	581.88	3.3	1,100
581.37	0.9	300	581.89	3.4	1,118
581.38	0.9	312	581.90	3.4	1,137
581.39	1.0	324	581.91	3.5	1,156
581.40	1.0	337	581.92	3.5	1,175
581.41	1.1	350	581.93	3.6	1,195
581.42	1.1	363	581.94	3.6	1,214
581.43	1.1	376	581.95	3.7	1,233
581.44	1.2	389	581.96	3.8	1,253
581.45	1.2	402	581.97	3.8	1,273
581.46	1.2	416	581.98	3.9	1,292
581.47	1.3	429	581.99	3.9	1,312
581.48	1.3	443	582.00	4.0	1,332
581.49	1.4	457			
581.50	1.4	471			
581.51	1.5	485			

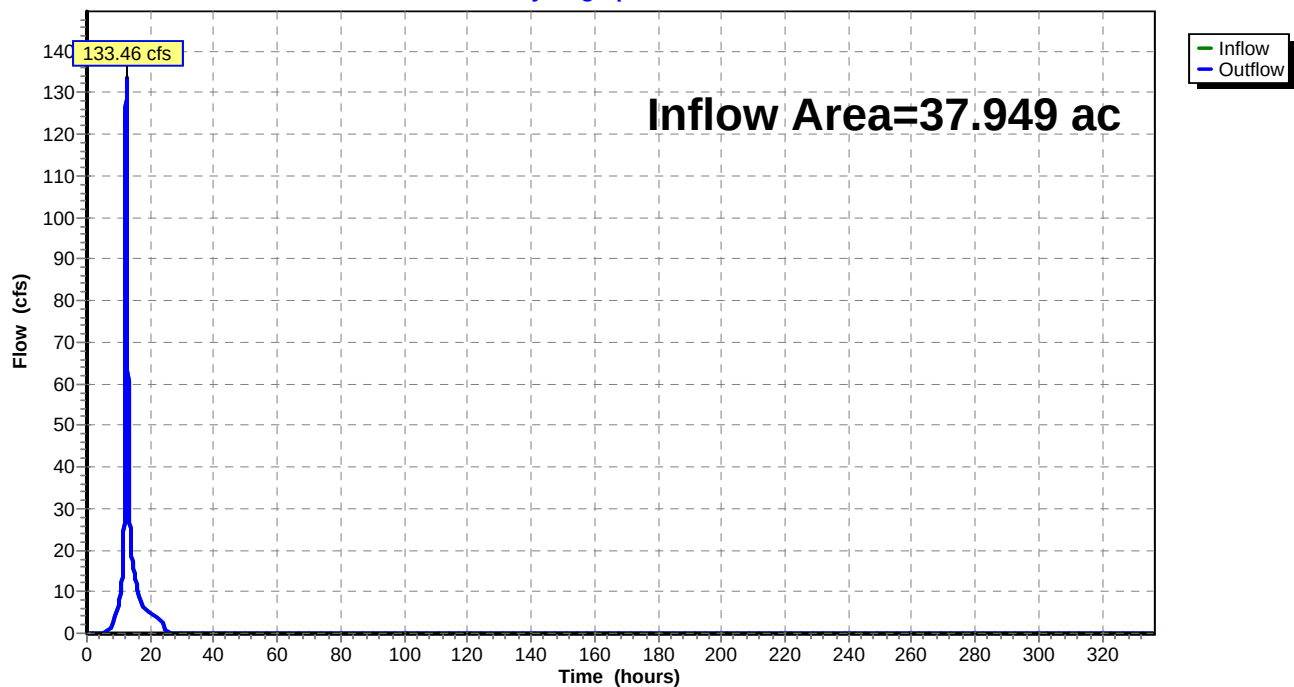
Summary for Reach DP 1B: PROP DP 1B

Inflow Area = 37.949 ac, 33.22% Impervious, Inflow Depth = 6.51" for 100 Year, 24 Hr. Event event
Inflow = 133.46 cfs @ 12.40 hrs, Volume= 20.575 af
Outflow = 133.46 cfs @ 12.40 hrs, Volume= 20.575 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1B: PROP DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach DP 1B: PROP DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	6.84		6.84	270.00	0.00		0.00
15.00	13.82		13.82	275.00	0.00		0.00
20.00	4.53		4.53	280.00	0.00		0.00
25.00	0.12		0.12	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

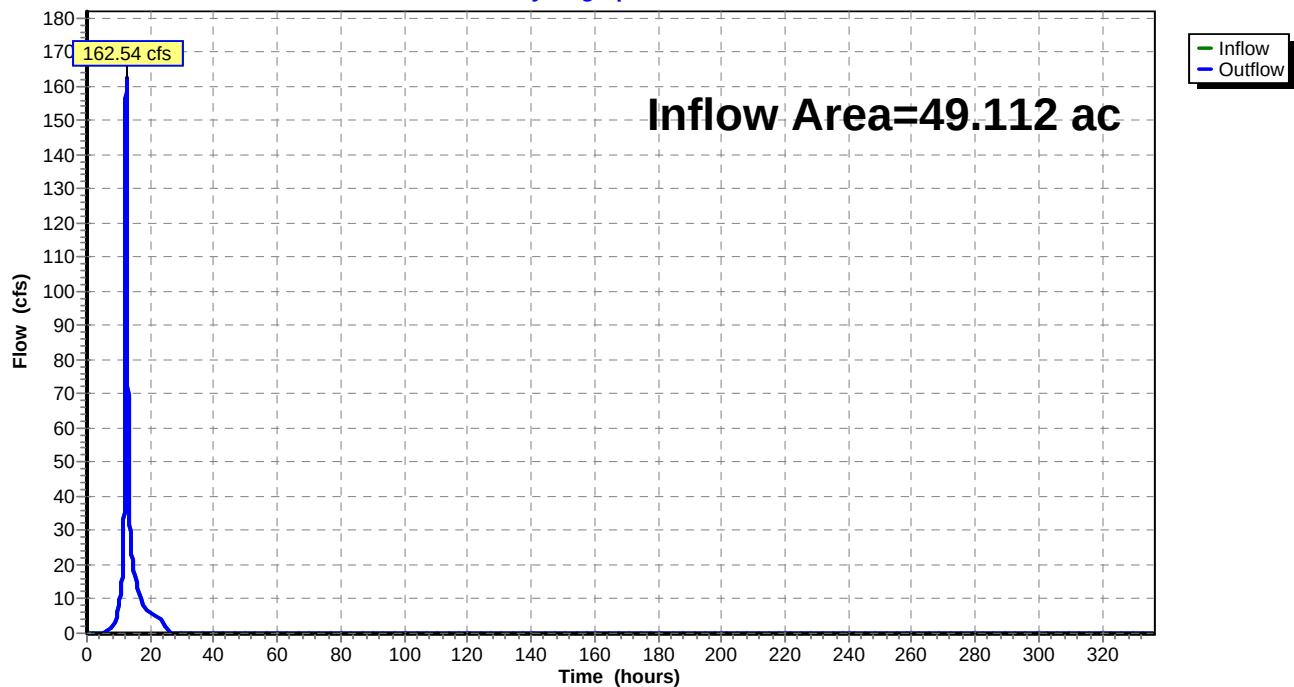
Summary for Reach EX DP !B: Existing DP 1B

Inflow Area = 49.112 ac, 26.08% Impervious, Inflow Depth = 6.18" for 100 Year, 24 Hr. Event event
Inflow = 162.54 cfs @ 12.36 hrs, Volume= 25.294 af
Outflow = 162.54 cfs @ 12.36 hrs, Volume= 25.294 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EX DP !B: Existing DP 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach EX DP 1B: Existing DP 1B

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	7.77		7.77	270.00	0.00		0.00
15.00	17.29		17.29	275.00	0.00		0.00
20.00	5.72		5.72	280.00	0.00		0.00
25.00	0.13		0.13	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

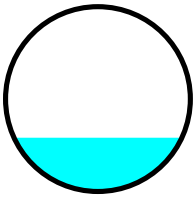
Summary for Reach R 1R: PROP 1R

Inflow Area = 4.017 ac, 0.00% Impervious, Inflow Depth = 3.85" for 100 Year, 24 Hr. Event event
Inflow = 13.23 cfs @ 12.22 hrs, Volume= 1.290 af
Outflow = 13.18 cfs @ 12.23 hrs, Volume= 1.290 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 17.47 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 6.90 fps, Avg. Travel Time= 2.3 min

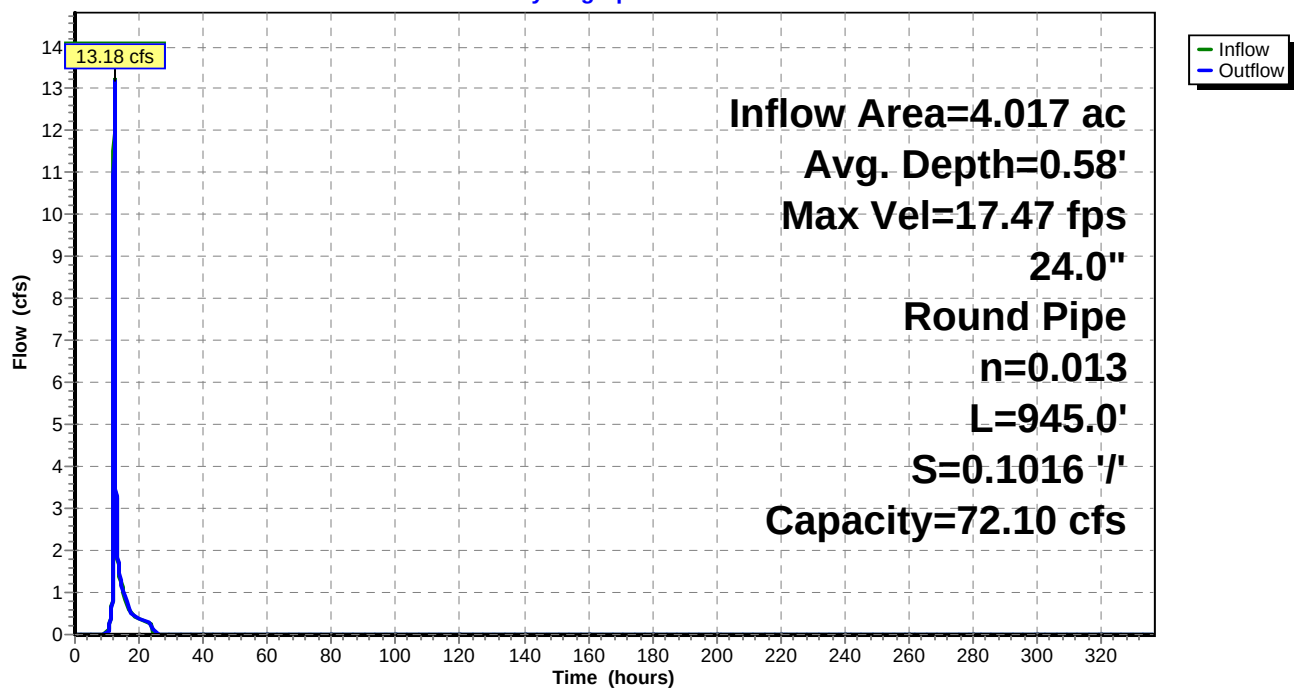
Peak Storage= 713 cf @ 12.23 hrs, Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 72.10 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 945.0' Slope= 0.1016 '/'
Inlet Invert= 746.00', Outlet Invert= 650.00'



Reach R 1R: PROP 1R

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach R 1R: PROP 1R

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	746.00	0.00
10.00	0.02	5	746.02	0.01
20.00	0.37	58	746.10	0.37
30.00	0.00	0	746.00	0.00
40.00	0.00	0	746.00	0.00
50.00	0.00	0	746.00	0.00
60.00	0.00	0	746.00	0.00
70.00	0.00	0	746.00	0.00
80.00	0.00	0	746.00	0.00
90.00	0.00	0	746.00	0.00
100.00	0.00	0	746.00	0.00
110.00	0.00	0	746.00	0.00
120.00	0.00	0	746.00	0.00
130.00	0.00	0	746.00	0.00
140.00	0.00	0	746.00	0.00
150.00	0.00	0	746.00	0.00
160.00	0.00	0	746.00	0.00
170.00	0.00	0	746.00	0.00
180.00	0.00	0	746.00	0.00
190.00	0.00	0	746.00	0.00
200.00	0.00	0	746.00	0.00
210.00	0.00	0	746.00	0.00
220.00	0.00	0	746.00	0.00
230.00	0.00	0	746.00	0.00
240.00	0.00	0	746.00	0.00
250.00	0.00	0	746.00	0.00
260.00	0.00	0	746.00	0.00
270.00	0.00	0	746.00	0.00
280.00	0.00	0	746.00	0.00
290.00	0.00	0	746.00	0.00
300.00	0.00	0	746.00	0.00
310.00	0.00	0	746.00	0.00
320.00	0.00	0	746.00	0.00
330.00	0.00	0	746.00	0.00

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

Prepared by AKRF Engineering, PC

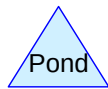
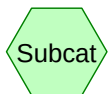
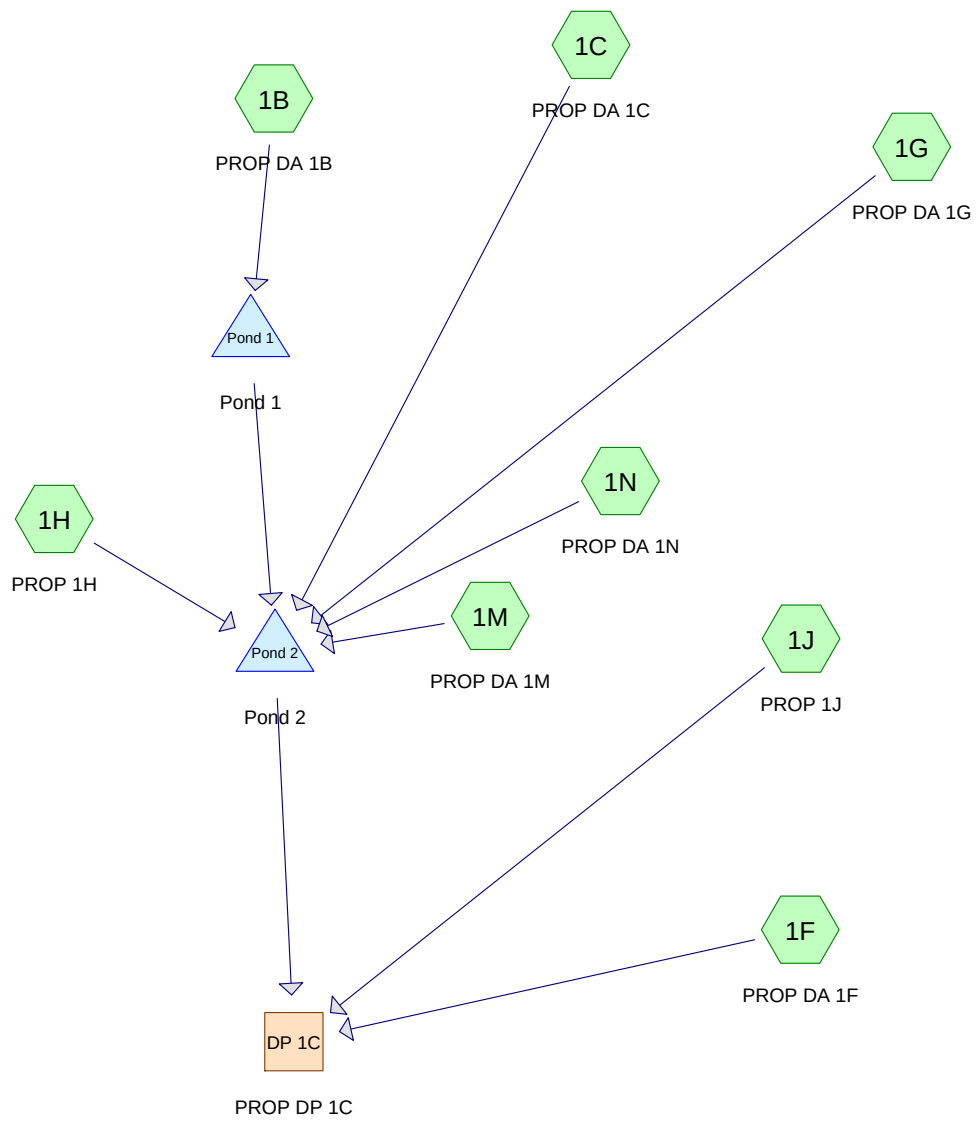
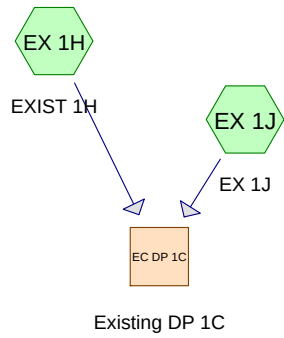
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Stage-Area-Storage for Reach R 1R: PROP 1R

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
746.00	0.0	0	747.04	1.7	1,560
746.02	0.0	5	747.06	1.7	1,598
746.04	0.0	14	747.08	1.7	1,635
746.06	0.0	26	747.10	1.8	1,673
746.08	0.0	40	747.12	1.8	1,711
746.10	0.1	55	747.14	1.8	1,748
746.12	0.1	73	747.16	1.9	1,786
746.14	0.1	91	747.18	1.9	1,823
746.16	0.1	111	747.20	2.0	1,860
746.18	0.1	132	747.22	2.0	1,897
746.20	0.2	155	747.24	2.0	1,934
746.22	0.2	178	747.26	2.1	1,970
746.24	0.2	202	747.28	2.1	2,007
746.26	0.2	227	747.30	2.2	2,043
746.28	0.3	253	747.32	2.2	2,079
746.30	0.3	279	747.34	2.2	2,114
746.32	0.3	307	747.36	2.3	2,150
746.34	0.4	335	747.38	2.3	2,185
746.36	0.4	363	747.40	2.3	2,220
746.38	0.4	393	747.42	2.4	2,254
746.40	0.4	423	747.44	2.4	2,288
746.42	0.5	453	747.46	2.5	2,322
746.44	0.5	484	747.48	2.5	2,355
746.46	0.5	516	747.50	2.5	2,388
746.48	0.6	548	747.52	2.6	2,421
746.50	0.6	580	747.54	2.6	2,453
746.52	0.6	613	747.56	2.6	2,485
746.54	0.7	647	747.58	2.7	2,516
746.56	0.7	680	747.60	2.7	2,546
746.58	0.8	715	747.62	2.7	2,576
746.60	0.8	749	747.64	2.8	2,605
746.62	0.8	784	747.66	2.8	2,634
746.64	0.9	819	747.68	2.8	2,662
746.66	0.9	854	747.70	2.8	2,690
746.68	0.9	890	747.72	2.9	2,716
746.70	1.0	926	747.74	2.9	2,742
746.72	1.0	962	747.76	2.9	2,767
746.74	1.1	999	747.78	3.0	2,791
746.76	1.1	1,035	747.80	3.0	2,814
746.78	1.1	1,072	747.82	3.0	2,836
746.80	1.2	1,109	747.84	3.0	2,858
746.82	1.2	1,146	747.86	3.0	2,877
746.84	1.3	1,183	747.88	3.1	2,896
746.86	1.3	1,221	747.90	3.1	2,913
746.88	1.3	1,258	747.92	3.1	2,929
746.90	1.4	1,296	747.94	3.1	2,943
746.92	1.4	1,333	747.96	3.1	2,955
746.94	1.5	1,371	747.98	3.1	2,964
746.96	1.5	1,409	748.00	3.1	2,969
746.98	1.5	1,447			
747.00	1.6	1,484			
747.02	1.6	1,522			



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1B: PROP DA 1B

Runoff = 19.52 cfs @ 12.08 hrs, Volume= 1.341 af, Depth= 1.53"

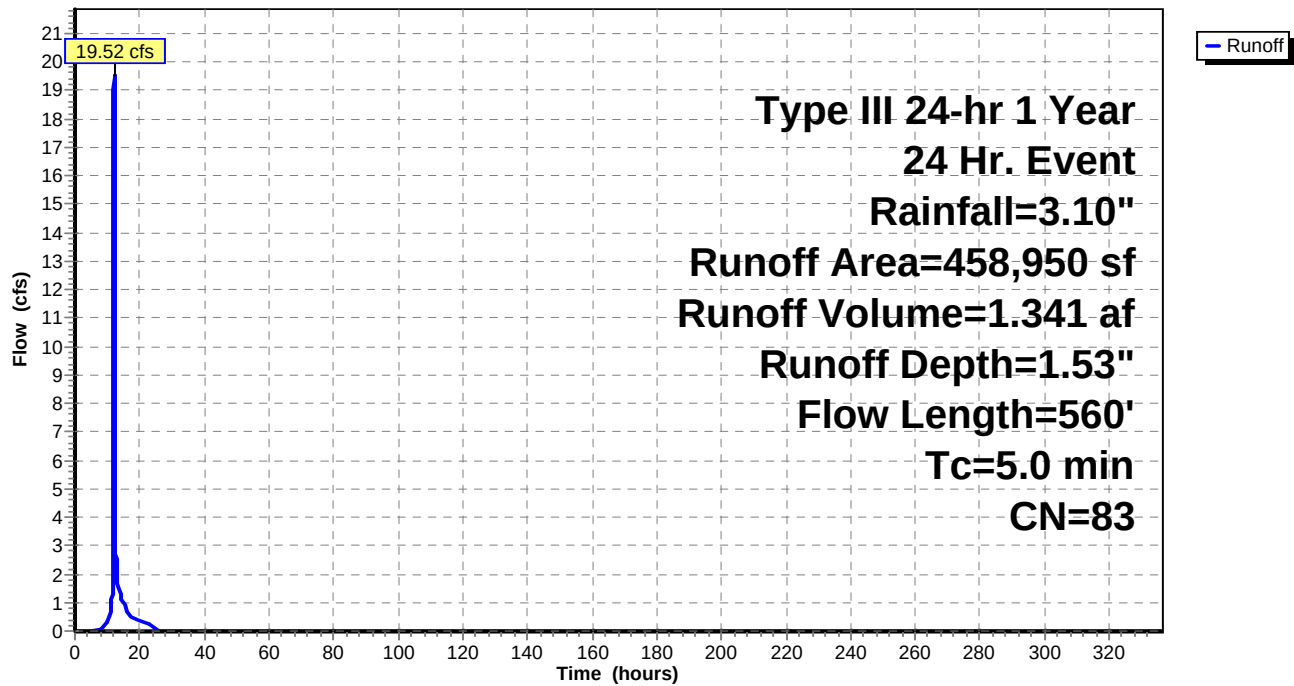
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
170,936	98	Paved parking & roofs
288,014	74	>75% Grass cover, Good, HSG C
458,950	83	Weighted Average
288,014		62.75% Pervious Area
170,936		37.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.1200	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.6	164	0.0850	4.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	150	0.0800	5.74		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	196	0.0410	14.58	45.81	Pipe Channel, Street System 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
5.0	560	Total			

Subcatchment 1B: PROP DA 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1B: PROP DA 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.53	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.53	0.00
10.00	0.59	0.01	0.23	270.00	3.10	1.53	0.00
15.00	2.65	1.17	0.97	275.00	3.10	1.53	0.00
20.00	2.97	1.42	0.35	280.00	3.10	1.53	0.00
25.00	3.10	1.53	0.00	285.00	3.10	1.53	0.00
30.00	3.10	1.53	0.00	290.00	3.10	1.53	0.00
35.00	3.10	1.53	0.00	295.00	3.10	1.53	0.00
40.00	3.10	1.53	0.00	300.00	3.10	1.53	0.00
45.00	3.10	1.53	0.00	305.00	3.10	1.53	0.00
50.00	3.10	1.53	0.00	310.00	3.10	1.53	0.00
55.00	3.10	1.53	0.00	315.00	3.10	1.53	0.00
60.00	3.10	1.53	0.00	320.00	3.10	1.53	0.00
65.00	3.10	1.53	0.00	325.00	3.10	1.53	0.00
70.00	3.10	1.53	0.00	330.00	3.10	1.53	0.00
75.00	3.10	1.53	0.00	335.00	3.10	1.53	0.00
80.00	3.10	1.53	0.00				
85.00	3.10	1.53	0.00				
90.00	3.10	1.53	0.00				
95.00	3.10	1.53	0.00				
100.00	3.10	1.53	0.00				
105.00	3.10	1.53	0.00				
110.00	3.10	1.53	0.00				
115.00	3.10	1.53	0.00				
120.00	3.10	1.53	0.00				
125.00	3.10	1.53	0.00				
130.00	3.10	1.53	0.00				
135.00	3.10	1.53	0.00				
140.00	3.10	1.53	0.00				
145.00	3.10	1.53	0.00				
150.00	3.10	1.53	0.00				
155.00	3.10	1.53	0.00				
160.00	3.10	1.53	0.00				
165.00	3.10	1.53	0.00				
170.00	3.10	1.53	0.00				
175.00	3.10	1.53	0.00				
180.00	3.10	1.53	0.00				
185.00	3.10	1.53	0.00				
190.00	3.10	1.53	0.00				
195.00	3.10	1.53	0.00				
200.00	3.10	1.53	0.00				
205.00	3.10	1.53	0.00				
210.00	3.10	1.53	0.00				
215.00	3.10	1.53	0.00				
220.00	3.10	1.53	0.00				
225.00	3.10	1.53	0.00				
230.00	3.10	1.53	0.00				
235.00	3.10	1.53	0.00				
240.00	3.10	1.53	0.00				
245.00	3.10	1.53	0.00				
250.00	3.10	1.53	0.00				
255.00	3.10	1.53	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1C: PROP DA 1C

Runoff = 10.51 cfs @ 12.03 hrs, Volume= 0.659 af, Depth= 1.20"

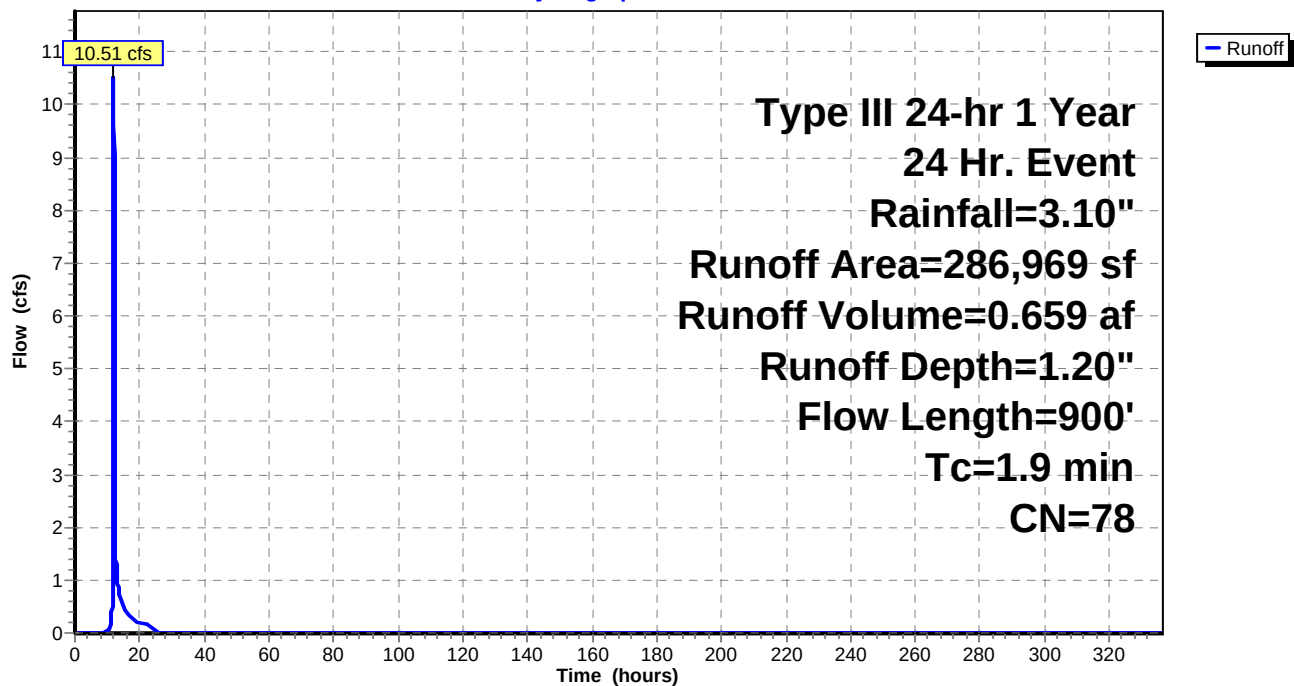
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
151,873	61	>75% Grass cover, Good, HSG B
135,096	98	Paved parking & roofs
286,969	78	Weighted Average
151,873		52.92% Pervious Area
135,096		47.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.44		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.50"
0.7	800	0.0750	19.72	61.95	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.9	900	Total			

Subcatchment 1C: PROP DA 1C

Hydrograph



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Hydrograph for Subcatchment 1C: PROP DA 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.20	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.20	0.00
10.00	0.59	0.00	0.01	270.00	3.10	1.20	0.00
15.00	2.65	0.89	0.52	275.00	3.10	1.20	0.00
20.00	2.97	1.11	0.19	280.00	3.10	1.20	0.00
25.00	3.10	1.20	0.00	285.00	3.10	1.20	0.00
30.00	3.10	1.20	0.00	290.00	3.10	1.20	0.00
35.00	3.10	1.20	0.00	295.00	3.10	1.20	0.00
40.00	3.10	1.20	0.00	300.00	3.10	1.20	0.00
45.00	3.10	1.20	0.00	305.00	3.10	1.20	0.00
50.00	3.10	1.20	0.00	310.00	3.10	1.20	0.00
55.00	3.10	1.20	0.00	315.00	3.10	1.20	0.00
60.00	3.10	1.20	0.00	320.00	3.10	1.20	0.00
65.00	3.10	1.20	0.00	325.00	3.10	1.20	0.00
70.00	3.10	1.20	0.00	330.00	3.10	1.20	0.00
75.00	3.10	1.20	0.00	335.00	3.10	1.20	0.00
80.00	3.10	1.20	0.00				
85.00	3.10	1.20	0.00				
90.00	3.10	1.20	0.00				
95.00	3.10	1.20	0.00				
100.00	3.10	1.20	0.00				
105.00	3.10	1.20	0.00				
110.00	3.10	1.20	0.00				
115.00	3.10	1.20	0.00				
120.00	3.10	1.20	0.00				
125.00	3.10	1.20	0.00				
130.00	3.10	1.20	0.00				
135.00	3.10	1.20	0.00				
140.00	3.10	1.20	0.00				
145.00	3.10	1.20	0.00				
150.00	3.10	1.20	0.00				
155.00	3.10	1.20	0.00				
160.00	3.10	1.20	0.00				
165.00	3.10	1.20	0.00				
170.00	3.10	1.20	0.00				
175.00	3.10	1.20	0.00				
180.00	3.10	1.20	0.00				
185.00	3.10	1.20	0.00				
190.00	3.10	1.20	0.00				
195.00	3.10	1.20	0.00				
200.00	3.10	1.20	0.00				
205.00	3.10	1.20	0.00				
210.00	3.10	1.20	0.00				
215.00	3.10	1.20	0.00				
220.00	3.10	1.20	0.00				
225.00	3.10	1.20	0.00				
230.00	3.10	1.20	0.00				
235.00	3.10	1.20	0.00				
240.00	3.10	1.20	0.00				
245.00	3.10	1.20	0.00				
250.00	3.10	1.20	0.00				
255.00	3.10	1.20	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1F: PROP DA 1F

Runoff = 5.67 cfs @ 12.14 hrs, Volume= 0.478 af, Depth= 0.97"

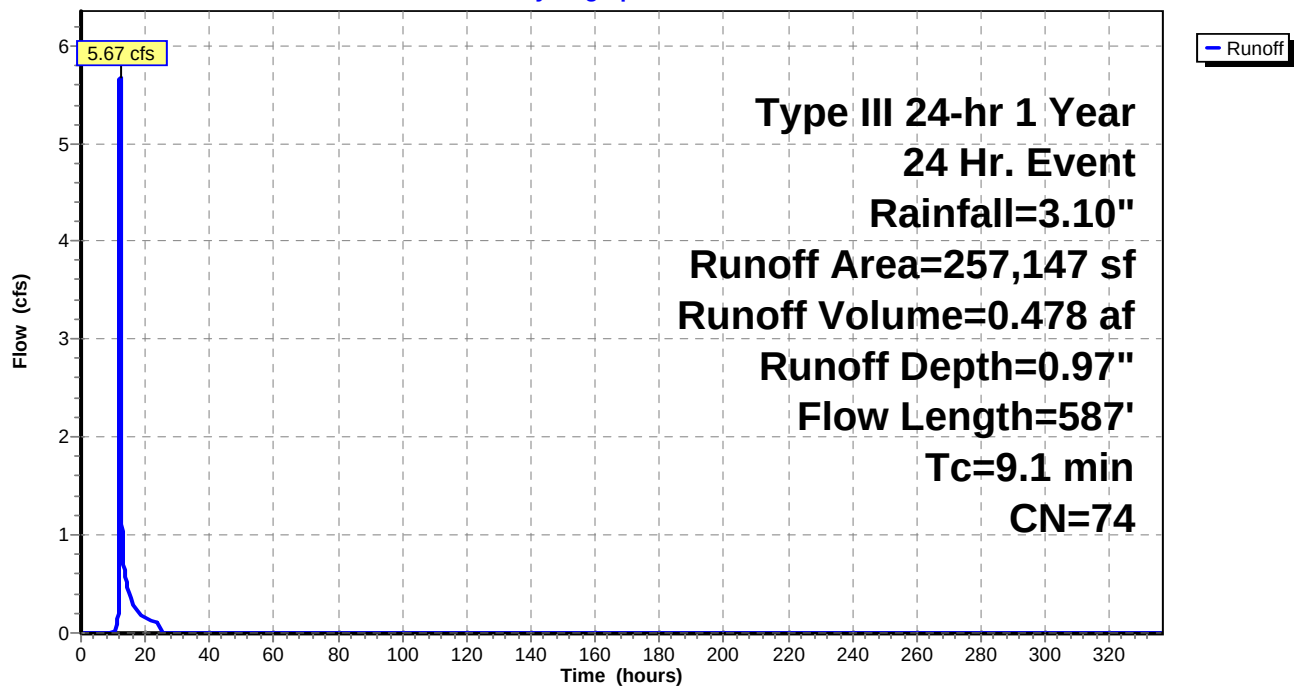
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
166,672	74	>75% Grass cover, Good, HSG C
31,625	98	Paved roads w/curbs & sewers, HSG B
58,850	61	>75% Grass cover, Good, HSG B
257,147	74	Weighted Average
225,522		87.70% Pervious Area
31,625		12.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	52	0.0220	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
1.3	535	0.1860	6.94		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.1	587	Total			

Subcatchment 1F: PROP DA 1F

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1F: PROP DA 1F

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.97	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.97	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.97	0.00
15.00	2.65	0.69	0.42	275.00	3.10	0.97	0.00
20.00	2.97	0.89	0.15	280.00	3.10	0.97	0.00
25.00	3.10	0.97	0.00	285.00	3.10	0.97	0.00
30.00	3.10	0.97	0.00	290.00	3.10	0.97	0.00
35.00	3.10	0.97	0.00	295.00	3.10	0.97	0.00
40.00	3.10	0.97	0.00	300.00	3.10	0.97	0.00
45.00	3.10	0.97	0.00	305.00	3.10	0.97	0.00
50.00	3.10	0.97	0.00	310.00	3.10	0.97	0.00
55.00	3.10	0.97	0.00	315.00	3.10	0.97	0.00
60.00	3.10	0.97	0.00	320.00	3.10	0.97	0.00
65.00	3.10	0.97	0.00	325.00	3.10	0.97	0.00
70.00	3.10	0.97	0.00	330.00	3.10	0.97	0.00
75.00	3.10	0.97	0.00	335.00	3.10	0.97	0.00
80.00	3.10	0.97	0.00				
85.00	3.10	0.97	0.00				
90.00	3.10	0.97	0.00				
95.00	3.10	0.97	0.00				
100.00	3.10	0.97	0.00				
105.00	3.10	0.97	0.00				
110.00	3.10	0.97	0.00				
115.00	3.10	0.97	0.00				
120.00	3.10	0.97	0.00				
125.00	3.10	0.97	0.00				
130.00	3.10	0.97	0.00				
135.00	3.10	0.97	0.00				
140.00	3.10	0.97	0.00				
145.00	3.10	0.97	0.00				
150.00	3.10	0.97	0.00				
155.00	3.10	0.97	0.00				
160.00	3.10	0.97	0.00				
165.00	3.10	0.97	0.00				
170.00	3.10	0.97	0.00				
175.00	3.10	0.97	0.00				
180.00	3.10	0.97	0.00				
185.00	3.10	0.97	0.00				
190.00	3.10	0.97	0.00				
195.00	3.10	0.97	0.00				
200.00	3.10	0.97	0.00				
205.00	3.10	0.97	0.00				
210.00	3.10	0.97	0.00				
215.00	3.10	0.97	0.00				
220.00	3.10	0.97	0.00				
225.00	3.10	0.97	0.00				
230.00	3.10	0.97	0.00				
235.00	3.10	0.97	0.00				
240.00	3.10	0.97	0.00				
245.00	3.10	0.97	0.00				
250.00	3.10	0.97	0.00				
255.00	3.10	0.97	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1G: PROP DA 1G

Runoff = 9.98 cfs @ 12.03 hrs, Volume= 0.635 af, Depth= 2.35"

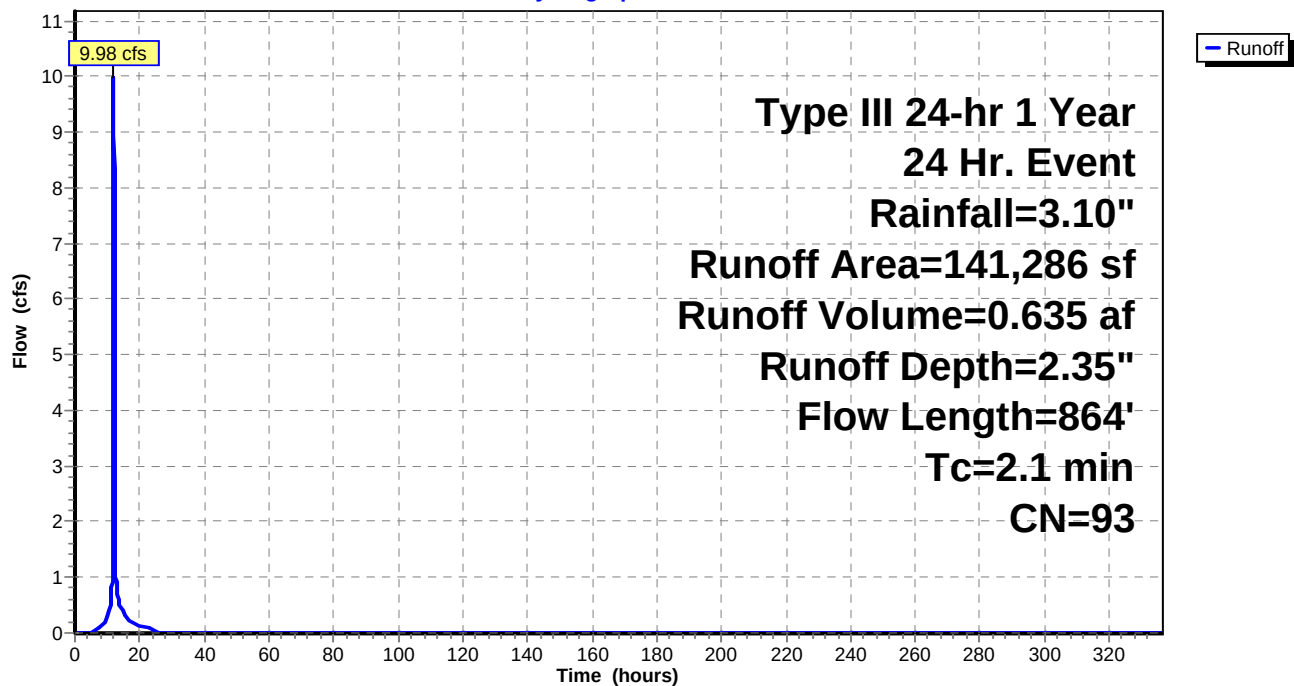
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
112,680	98	Paved parking & roofs
28,606	74	>75% Grass cover, Good, HSG C
141,286	93	Weighted Average
28,606		20.25% Pervious Area
112,680		79.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.08		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"
1.3	764	0.0180	9.66	30.35	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.1	864	Total			

Subcatchment 1G: PROP DA 1G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1G: PROP DA 1G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	2.35	0.00
5.00	0.18	0.00	0.01	265.00	3.10	2.35	0.00
10.00	0.59	0.16	0.29	270.00	3.10	2.35	0.00
15.00	2.65	1.92	0.36	275.00	3.10	2.35	0.00
20.00	2.97	2.22	0.13	280.00	3.10	2.35	0.00
25.00	3.10	2.35	0.00	285.00	3.10	2.35	0.00
30.00	3.10	2.35	0.00	290.00	3.10	2.35	0.00
35.00	3.10	2.35	0.00	295.00	3.10	2.35	0.00
40.00	3.10	2.35	0.00	300.00	3.10	2.35	0.00
45.00	3.10	2.35	0.00	305.00	3.10	2.35	0.00
50.00	3.10	2.35	0.00	310.00	3.10	2.35	0.00
55.00	3.10	2.35	0.00	315.00	3.10	2.35	0.00
60.00	3.10	2.35	0.00	320.00	3.10	2.35	0.00
65.00	3.10	2.35	0.00	325.00	3.10	2.35	0.00
70.00	3.10	2.35	0.00	330.00	3.10	2.35	0.00
75.00	3.10	2.35	0.00	335.00	3.10	2.35	0.00
80.00	3.10	2.35	0.00				
85.00	3.10	2.35	0.00				
90.00	3.10	2.35	0.00				
95.00	3.10	2.35	0.00				
100.00	3.10	2.35	0.00				
105.00	3.10	2.35	0.00				
110.00	3.10	2.35	0.00				
115.00	3.10	2.35	0.00				
120.00	3.10	2.35	0.00				
125.00	3.10	2.35	0.00				
130.00	3.10	2.35	0.00				
135.00	3.10	2.35	0.00				
140.00	3.10	2.35	0.00				
145.00	3.10	2.35	0.00				
150.00	3.10	2.35	0.00				
155.00	3.10	2.35	0.00				
160.00	3.10	2.35	0.00				
165.00	3.10	2.35	0.00				
170.00	3.10	2.35	0.00				
175.00	3.10	2.35	0.00				
180.00	3.10	2.35	0.00				
185.00	3.10	2.35	0.00				
190.00	3.10	2.35	0.00				
195.00	3.10	2.35	0.00				
200.00	3.10	2.35	0.00				
205.00	3.10	2.35	0.00				
210.00	3.10	2.35	0.00				
215.00	3.10	2.35	0.00				
220.00	3.10	2.35	0.00				
225.00	3.10	2.35	0.00				
230.00	3.10	2.35	0.00				
235.00	3.10	2.35	0.00				
240.00	3.10	2.35	0.00				
245.00	3.10	2.35	0.00				
250.00	3.10	2.35	0.00				
255.00	3.10	2.35	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1H: PROP 1H

Runoff = 4.65 cfs @ 12.10 hrs, Volume= 0.341 af, Depth= 1.39"

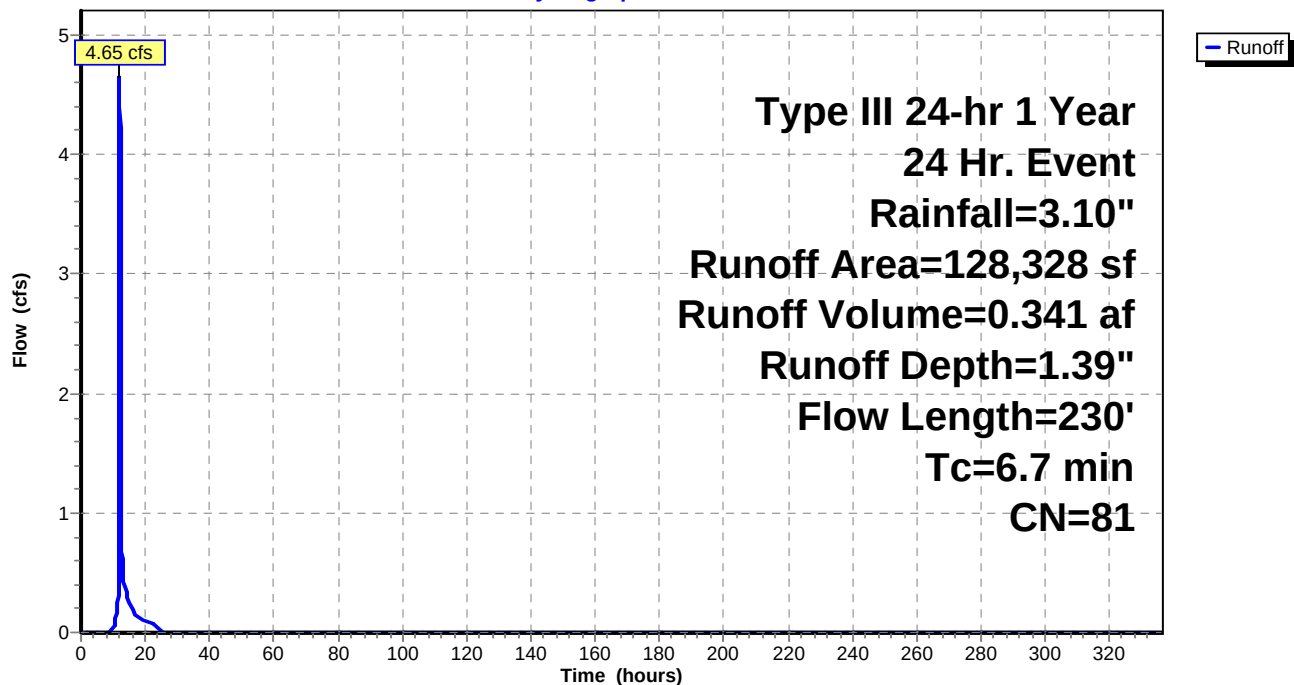
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
88,514	74	>75% Grass cover, Good, HSG C
39,814	98	Water Surface, HSG B
128,328	81	Weighted Average
88,514		68.97% Pervious Area
39,814		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.7	130	0.2000	3.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.7	230	Total			

Subcatchment 1H: PROP 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1H: PROP 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.39	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.39	0.00
10.00	0.59	0.01	0.04	270.00	3.10	1.39	0.00
15.00	2.65	1.05	0.26	275.00	3.10	1.39	0.00
20.00	2.97	1.29	0.09	280.00	3.10	1.39	0.00
25.00	3.10	1.39	0.00	285.00	3.10	1.39	0.00
30.00	3.10	1.39	0.00	290.00	3.10	1.39	0.00
35.00	3.10	1.39	0.00	295.00	3.10	1.39	0.00
40.00	3.10	1.39	0.00	300.00	3.10	1.39	0.00
45.00	3.10	1.39	0.00	305.00	3.10	1.39	0.00
50.00	3.10	1.39	0.00	310.00	3.10	1.39	0.00
55.00	3.10	1.39	0.00	315.00	3.10	1.39	0.00
60.00	3.10	1.39	0.00	320.00	3.10	1.39	0.00
65.00	3.10	1.39	0.00	325.00	3.10	1.39	0.00
70.00	3.10	1.39	0.00	330.00	3.10	1.39	0.00
75.00	3.10	1.39	0.00	335.00	3.10	1.39	0.00
80.00	3.10	1.39	0.00				
85.00	3.10	1.39	0.00				
90.00	3.10	1.39	0.00				
95.00	3.10	1.39	0.00				
100.00	3.10	1.39	0.00				
105.00	3.10	1.39	0.00				
110.00	3.10	1.39	0.00				
115.00	3.10	1.39	0.00				
120.00	3.10	1.39	0.00				
125.00	3.10	1.39	0.00				
130.00	3.10	1.39	0.00				
135.00	3.10	1.39	0.00				
140.00	3.10	1.39	0.00				
145.00	3.10	1.39	0.00				
150.00	3.10	1.39	0.00				
155.00	3.10	1.39	0.00				
160.00	3.10	1.39	0.00				
165.00	3.10	1.39	0.00				
170.00	3.10	1.39	0.00				
175.00	3.10	1.39	0.00				
180.00	3.10	1.39	0.00				
185.00	3.10	1.39	0.00				
190.00	3.10	1.39	0.00				
195.00	3.10	1.39	0.00				
200.00	3.10	1.39	0.00				
205.00	3.10	1.39	0.00				
210.00	3.10	1.39	0.00				
215.00	3.10	1.39	0.00				
220.00	3.10	1.39	0.00				
225.00	3.10	1.39	0.00				
230.00	3.10	1.39	0.00				
235.00	3.10	1.39	0.00				
240.00	3.10	1.39	0.00				
245.00	3.10	1.39	0.00				
250.00	3.10	1.39	0.00				
255.00	3.10	1.39	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment 1J: PROP 1J

Runoff = 7.00 cfs @ 12.16 hrs, Volume= 0.617 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

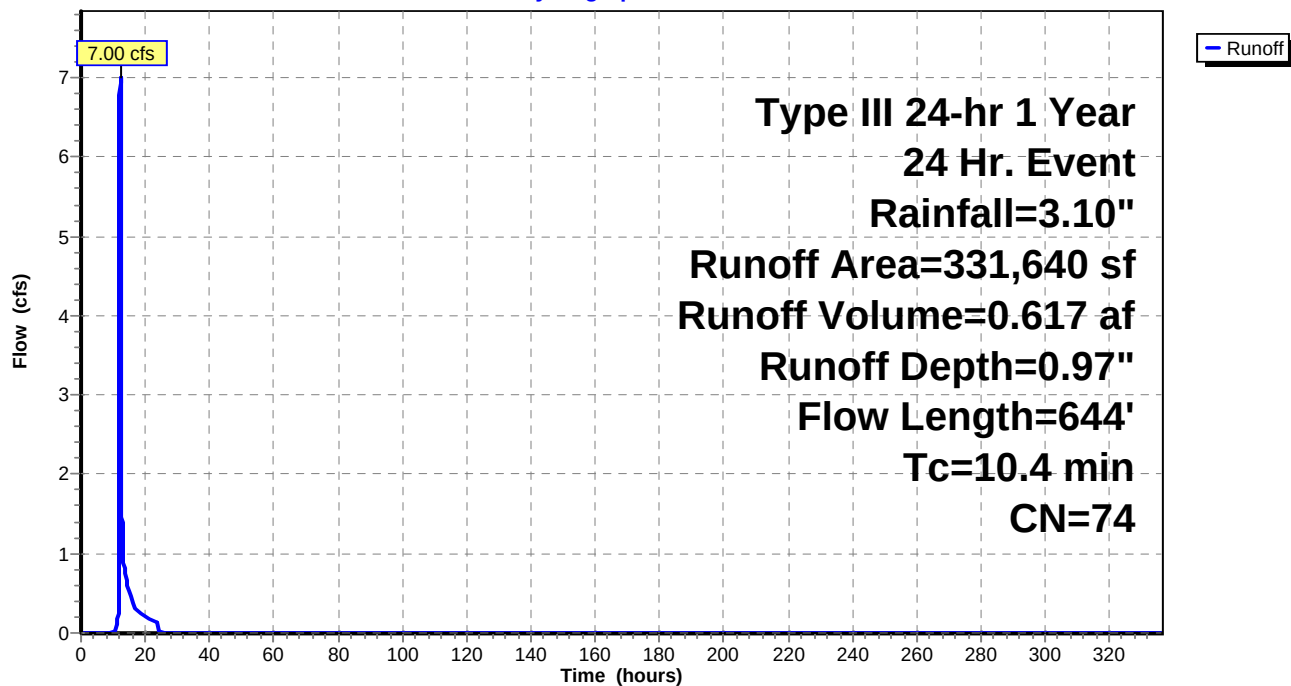
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
34,708	98	Paved parking, HSG B
241,872	74	>75% Grass cover, Good, HSG C
55,060	61	>75% Grass cover, Good, HSG B
331,640	74	Weighted Average
296,932		89.53% Pervious Area
34,708		10.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
3.2	544	0.1617	2.81		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.4	644	Total			

Subcatchment 1J: PROP 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1J: PROP 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.97	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.97	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.97	0.00
15.00	2.65	0.69	0.55	275.00	3.10	0.97	0.00
20.00	2.97	0.89	0.20	280.00	3.10	0.97	0.00
25.00	3.10	0.97	0.00	285.00	3.10	0.97	0.00
30.00	3.10	0.97	0.00	290.00	3.10	0.97	0.00
35.00	3.10	0.97	0.00	295.00	3.10	0.97	0.00
40.00	3.10	0.97	0.00	300.00	3.10	0.97	0.00
45.00	3.10	0.97	0.00	305.00	3.10	0.97	0.00
50.00	3.10	0.97	0.00	310.00	3.10	0.97	0.00
55.00	3.10	0.97	0.00	315.00	3.10	0.97	0.00
60.00	3.10	0.97	0.00	320.00	3.10	0.97	0.00
65.00	3.10	0.97	0.00	325.00	3.10	0.97	0.00
70.00	3.10	0.97	0.00	330.00	3.10	0.97	0.00
75.00	3.10	0.97	0.00	335.00	3.10	0.97	0.00
80.00	3.10	0.97	0.00				
85.00	3.10	0.97	0.00				
90.00	3.10	0.97	0.00				
95.00	3.10	0.97	0.00				
100.00	3.10	0.97	0.00				
105.00	3.10	0.97	0.00				
110.00	3.10	0.97	0.00				
115.00	3.10	0.97	0.00				
120.00	3.10	0.97	0.00				
125.00	3.10	0.97	0.00				
130.00	3.10	0.97	0.00				
135.00	3.10	0.97	0.00				
140.00	3.10	0.97	0.00				
145.00	3.10	0.97	0.00				
150.00	3.10	0.97	0.00				
155.00	3.10	0.97	0.00				
160.00	3.10	0.97	0.00				
165.00	3.10	0.97	0.00				
170.00	3.10	0.97	0.00				
175.00	3.10	0.97	0.00				
180.00	3.10	0.97	0.00				
185.00	3.10	0.97	0.00				
190.00	3.10	0.97	0.00				
195.00	3.10	0.97	0.00				
200.00	3.10	0.97	0.00				
205.00	3.10	0.97	0.00				
210.00	3.10	0.97	0.00				
215.00	3.10	0.97	0.00				
220.00	3.10	0.97	0.00				
225.00	3.10	0.97	0.00				
230.00	3.10	0.97	0.00				
235.00	3.10	0.97	0.00				
240.00	3.10	0.97	0.00				
245.00	3.10	0.97	0.00				
250.00	3.10	0.97	0.00				
255.00	3.10	0.97	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1M: PROP DA 1M

Runoff = 0.33 cfs @ 12.01 hrs, Volume= 0.022 af, Depth= 2.87"

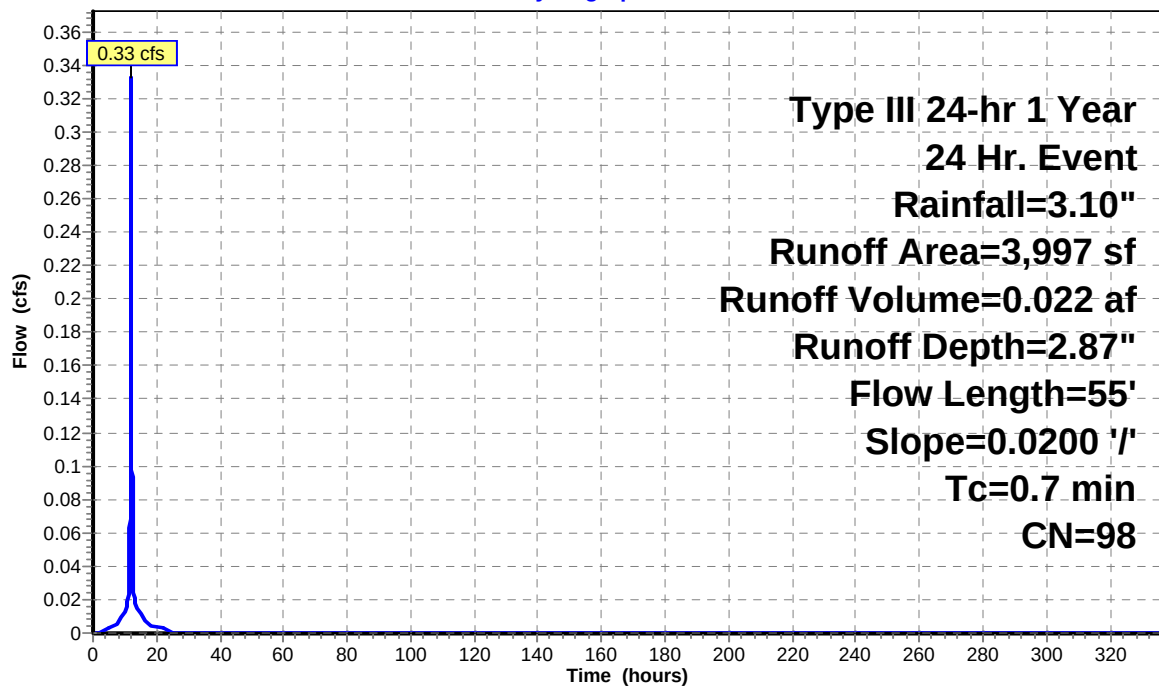
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
3,997	98	Roofs, HSG B
3,997		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.28		Sheet Flow, ROOF RUNOFF Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1M: PROP DA 1M

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1M: PROP DA 1M

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	2.87	0.00
5.00	0.18	0.05	0.00	265.00	3.10	2.87	0.00
10.00	0.59	0.40	0.01	270.00	3.10	2.87	0.00
15.00	2.65	2.42	0.01	275.00	3.10	2.87	0.00
20.00	2.97	2.74	0.00	280.00	3.10	2.87	0.00
25.00	3.10	2.87	0.00	285.00	3.10	2.87	0.00
30.00	3.10	2.87	0.00	290.00	3.10	2.87	0.00
35.00	3.10	2.87	0.00	295.00	3.10	2.87	0.00
40.00	3.10	2.87	0.00	300.00	3.10	2.87	0.00
45.00	3.10	2.87	0.00	305.00	3.10	2.87	0.00
50.00	3.10	2.87	0.00	310.00	3.10	2.87	0.00
55.00	3.10	2.87	0.00	315.00	3.10	2.87	0.00
60.00	3.10	2.87	0.00	320.00	3.10	2.87	0.00
65.00	3.10	2.87	0.00	325.00	3.10	2.87	0.00
70.00	3.10	2.87	0.00	330.00	3.10	2.87	0.00
75.00	3.10	2.87	0.00	335.00	3.10	2.87	0.00
80.00	3.10	2.87	0.00				
85.00	3.10	2.87	0.00				
90.00	3.10	2.87	0.00				
95.00	3.10	2.87	0.00				
100.00	3.10	2.87	0.00				
105.00	3.10	2.87	0.00				
110.00	3.10	2.87	0.00				
115.00	3.10	2.87	0.00				
120.00	3.10	2.87	0.00				
125.00	3.10	2.87	0.00				
130.00	3.10	2.87	0.00				
135.00	3.10	2.87	0.00				
140.00	3.10	2.87	0.00				
145.00	3.10	2.87	0.00				
150.00	3.10	2.87	0.00				
155.00	3.10	2.87	0.00				
160.00	3.10	2.87	0.00				
165.00	3.10	2.87	0.00				
170.00	3.10	2.87	0.00				
175.00	3.10	2.87	0.00				
180.00	3.10	2.87	0.00				
185.00	3.10	2.87	0.00				
190.00	3.10	2.87	0.00				
195.00	3.10	2.87	0.00				
200.00	3.10	2.87	0.00				
205.00	3.10	2.87	0.00				
210.00	3.10	2.87	0.00				
215.00	3.10	2.87	0.00				
220.00	3.10	2.87	0.00				
225.00	3.10	2.87	0.00				
230.00	3.10	2.87	0.00				
235.00	3.10	2.87	0.00				
240.00	3.10	2.87	0.00				
245.00	3.10	2.87	0.00				
250.00	3.10	2.87	0.00				
255.00	3.10	2.87	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1N: PROP DA 1N

Runoff = 0.35 cfs @ 12.01 hrs, Volume= 0.023 af, Depth= 2.87"

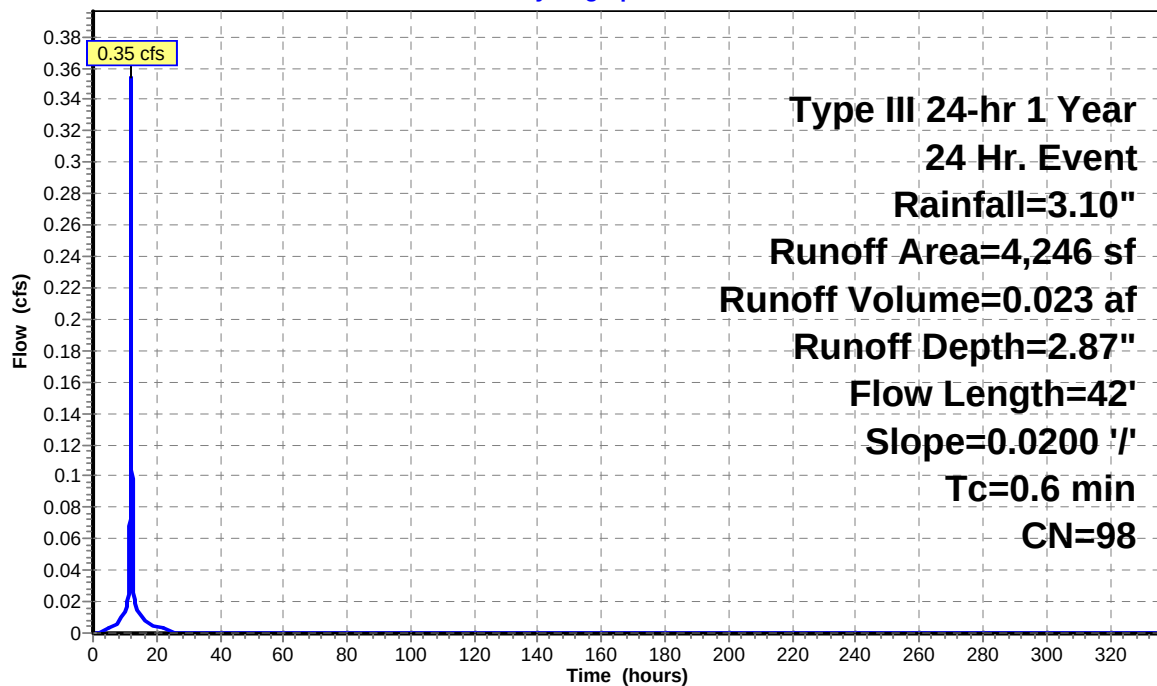
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
4,246	98	Roofs, HSG B
4,246		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	42	0.0200	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1N: PROP DA 1N

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment 1N: PROP DA 1N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	2.87	0.00
5.00	0.18	0.05	0.00	265.00	3.10	2.87	0.00
10.00	0.59	0.40	0.01	270.00	3.10	2.87	0.00
15.00	2.65	2.42	0.01	275.00	3.10	2.87	0.00
20.00	2.97	2.74	0.00	280.00	3.10	2.87	0.00
25.00	3.10	2.87	0.00	285.00	3.10	2.87	0.00
30.00	3.10	2.87	0.00	290.00	3.10	2.87	0.00
35.00	3.10	2.87	0.00	295.00	3.10	2.87	0.00
40.00	3.10	2.87	0.00	300.00	3.10	2.87	0.00
45.00	3.10	2.87	0.00	305.00	3.10	2.87	0.00
50.00	3.10	2.87	0.00	310.00	3.10	2.87	0.00
55.00	3.10	2.87	0.00	315.00	3.10	2.87	0.00
60.00	3.10	2.87	0.00	320.00	3.10	2.87	0.00
65.00	3.10	2.87	0.00	325.00	3.10	2.87	0.00
70.00	3.10	2.87	0.00	330.00	3.10	2.87	0.00
75.00	3.10	2.87	0.00	335.00	3.10	2.87	0.00
80.00	3.10	2.87	0.00				
85.00	3.10	2.87	0.00				
90.00	3.10	2.87	0.00				
95.00	3.10	2.87	0.00				
100.00	3.10	2.87	0.00				
105.00	3.10	2.87	0.00				
110.00	3.10	2.87	0.00				
115.00	3.10	2.87	0.00				
120.00	3.10	2.87	0.00				
125.00	3.10	2.87	0.00				
130.00	3.10	2.87	0.00				
135.00	3.10	2.87	0.00				
140.00	3.10	2.87	0.00				
145.00	3.10	2.87	0.00				
150.00	3.10	2.87	0.00				
155.00	3.10	2.87	0.00				
160.00	3.10	2.87	0.00				
165.00	3.10	2.87	0.00				
170.00	3.10	2.87	0.00				
175.00	3.10	2.87	0.00				
180.00	3.10	2.87	0.00				
185.00	3.10	2.87	0.00				
190.00	3.10	2.87	0.00				
195.00	3.10	2.87	0.00				
200.00	3.10	2.87	0.00				
205.00	3.10	2.87	0.00				
210.00	3.10	2.87	0.00				
215.00	3.10	2.87	0.00				
220.00	3.10	2.87	0.00				
225.00	3.10	2.87	0.00				
230.00	3.10	2.87	0.00				
235.00	3.10	2.87	0.00				
240.00	3.10	2.87	0.00				
245.00	3.10	2.87	0.00				
250.00	3.10	2.87	0.00				
255.00	3.10	2.87	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1H: EXIST 1H

Runoff = 4.68 cfs @ 12.21 hrs, Volume= 0.465 af, Depth= 0.92"

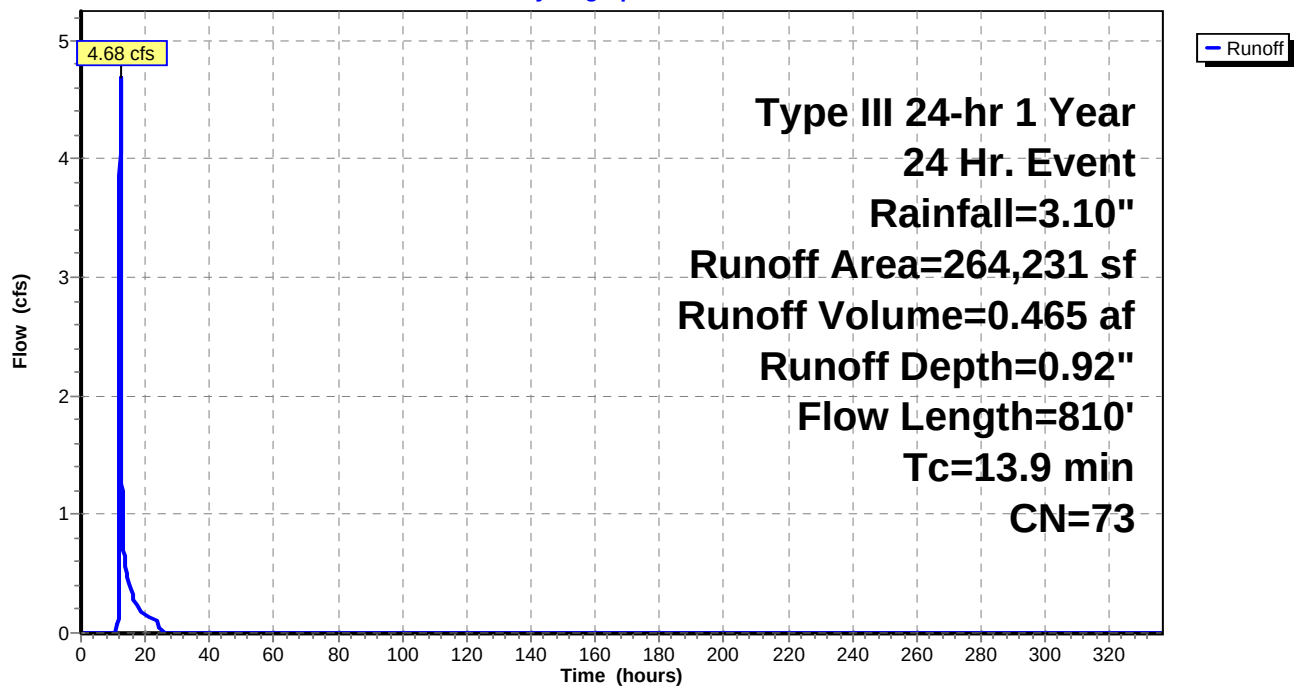
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
58,583	61	>75% Grass cover, Good, HSG B
188,543	74	>75% Grass cover, Good, HSG C
17,105	98	Paved parking, HSG B
264,231	73	Weighted Average
247,126		93.53% Pervious Area
17,105		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	150	0.0400	0.25		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
4.1	660	0.1480	2.69		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
13.9	810	Total			

Subcatchment EX 1H: EXIST 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1H: EXIST 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.92	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.92	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.92	0.00
15.00	2.65	0.65	0.43	275.00	3.10	0.92	0.00
20.00	2.97	0.84	0.15	280.00	3.10	0.92	0.00
25.00	3.10	0.92	0.00	285.00	3.10	0.92	0.00
30.00	3.10	0.92	0.00	290.00	3.10	0.92	0.00
35.00	3.10	0.92	0.00	295.00	3.10	0.92	0.00
40.00	3.10	0.92	0.00	300.00	3.10	0.92	0.00
45.00	3.10	0.92	0.00	305.00	3.10	0.92	0.00
50.00	3.10	0.92	0.00	310.00	3.10	0.92	0.00
55.00	3.10	0.92	0.00	315.00	3.10	0.92	0.00
60.00	3.10	0.92	0.00	320.00	3.10	0.92	0.00
65.00	3.10	0.92	0.00	325.00	3.10	0.92	0.00
70.00	3.10	0.92	0.00	330.00	3.10	0.92	0.00
75.00	3.10	0.92	0.00	335.00	3.10	0.92	0.00
80.00	3.10	0.92	0.00				
85.00	3.10	0.92	0.00				
90.00	3.10	0.92	0.00				
95.00	3.10	0.92	0.00				
100.00	3.10	0.92	0.00				
105.00	3.10	0.92	0.00				
110.00	3.10	0.92	0.00				
115.00	3.10	0.92	0.00				
120.00	3.10	0.92	0.00				
125.00	3.10	0.92	0.00				
130.00	3.10	0.92	0.00				
135.00	3.10	0.92	0.00				
140.00	3.10	0.92	0.00				
145.00	3.10	0.92	0.00				
150.00	3.10	0.92	0.00				
155.00	3.10	0.92	0.00				
160.00	3.10	0.92	0.00				
165.00	3.10	0.92	0.00				
170.00	3.10	0.92	0.00				
175.00	3.10	0.92	0.00				
180.00	3.10	0.92	0.00				
185.00	3.10	0.92	0.00				
190.00	3.10	0.92	0.00				
195.00	3.10	0.92	0.00				
200.00	3.10	0.92	0.00				
205.00	3.10	0.92	0.00				
210.00	3.10	0.92	0.00				
215.00	3.10	0.92	0.00				
220.00	3.10	0.92	0.00				
225.00	3.10	0.92	0.00				
230.00	3.10	0.92	0.00				
235.00	3.10	0.92	0.00				
240.00	3.10	0.92	0.00				
245.00	3.10	0.92	0.00				
250.00	3.10	0.92	0.00				
255.00	3.10	0.92	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX 1J: EX 1J

Runoff = 10.06 cfs @ 12.14 hrs, Volume= 0.852 af, Depth= 0.97"

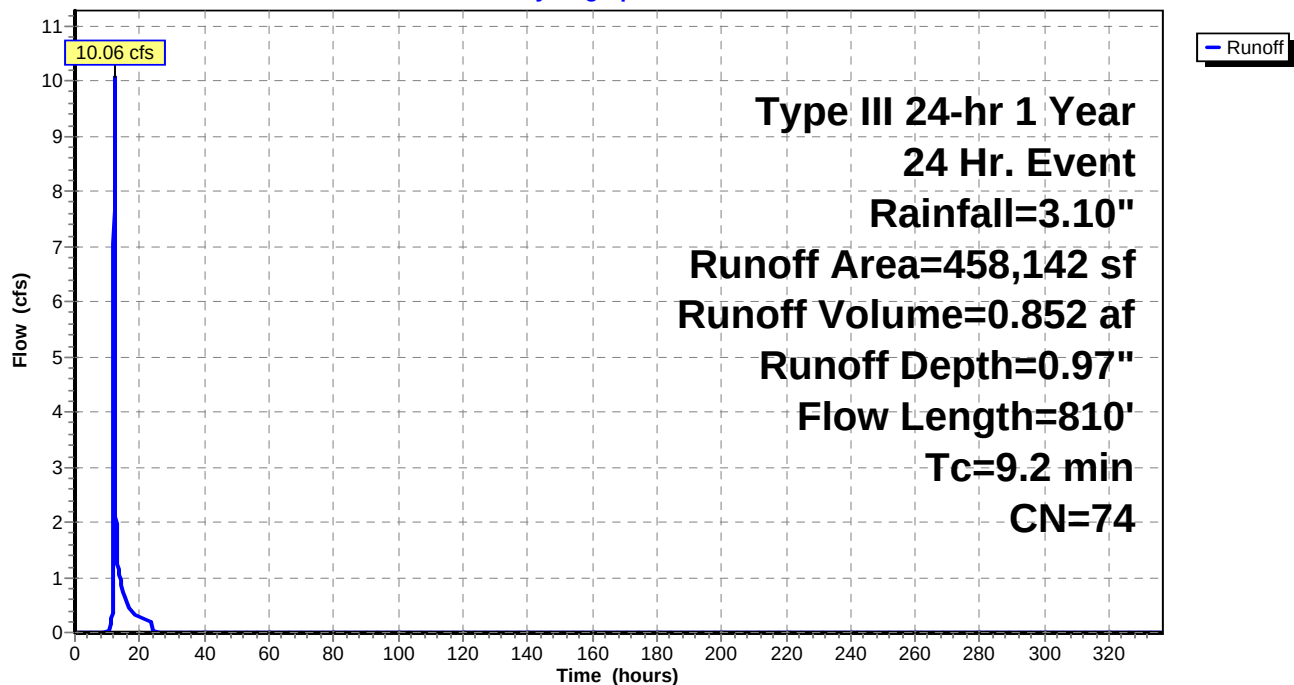
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
24,916	98	Paved parking, HSG B
392,231	74	>75% Grass cover, Good, HSG C
10,926	61	>75% Grass cover, Good, HSG B
30,069	60	Woods, Fair, HSG B
458,142	74	Weighted Average
433,226		94.56% Pervious Area
24,916		5.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
4.6	710	0.1380	2.60		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	810	Total			

Subcatchment EX 1J: EX 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 1J: EX 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.97	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.97	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.97	0.00
15.00	2.65	0.69	0.75	275.00	3.10	0.97	0.00
20.00	2.97	0.89	0.27	280.00	3.10	0.97	0.00
25.00	3.10	0.97	0.00	285.00	3.10	0.97	0.00
30.00	3.10	0.97	0.00	290.00	3.10	0.97	0.00
35.00	3.10	0.97	0.00	295.00	3.10	0.97	0.00
40.00	3.10	0.97	0.00	300.00	3.10	0.97	0.00
45.00	3.10	0.97	0.00	305.00	3.10	0.97	0.00
50.00	3.10	0.97	0.00	310.00	3.10	0.97	0.00
55.00	3.10	0.97	0.00	315.00	3.10	0.97	0.00
60.00	3.10	0.97	0.00	320.00	3.10	0.97	0.00
65.00	3.10	0.97	0.00	325.00	3.10	0.97	0.00
70.00	3.10	0.97	0.00	330.00	3.10	0.97	0.00
75.00	3.10	0.97	0.00	335.00	3.10	0.97	0.00
80.00	3.10	0.97	0.00				
85.00	3.10	0.97	0.00				
90.00	3.10	0.97	0.00				
95.00	3.10	0.97	0.00				
100.00	3.10	0.97	0.00				
105.00	3.10	0.97	0.00				
110.00	3.10	0.97	0.00				
115.00	3.10	0.97	0.00				
120.00	3.10	0.97	0.00				
125.00	3.10	0.97	0.00				
130.00	3.10	0.97	0.00				
135.00	3.10	0.97	0.00				
140.00	3.10	0.97	0.00				
145.00	3.10	0.97	0.00				
150.00	3.10	0.97	0.00				
155.00	3.10	0.97	0.00				
160.00	3.10	0.97	0.00				
165.00	3.10	0.97	0.00				
170.00	3.10	0.97	0.00				
175.00	3.10	0.97	0.00				
180.00	3.10	0.97	0.00				
185.00	3.10	0.97	0.00				
190.00	3.10	0.97	0.00				
195.00	3.10	0.97	0.00				
200.00	3.10	0.97	0.00				
205.00	3.10	0.97	0.00				
210.00	3.10	0.97	0.00				
215.00	3.10	0.97	0.00				
220.00	3.10	0.97	0.00				
225.00	3.10	0.97	0.00				
230.00	3.10	0.97	0.00				
235.00	3.10	0.97	0.00				
240.00	3.10	0.97	0.00				
245.00	3.10	0.97	0.00				
250.00	3.10	0.97	0.00				
255.00	3.10	0.97	0.00				

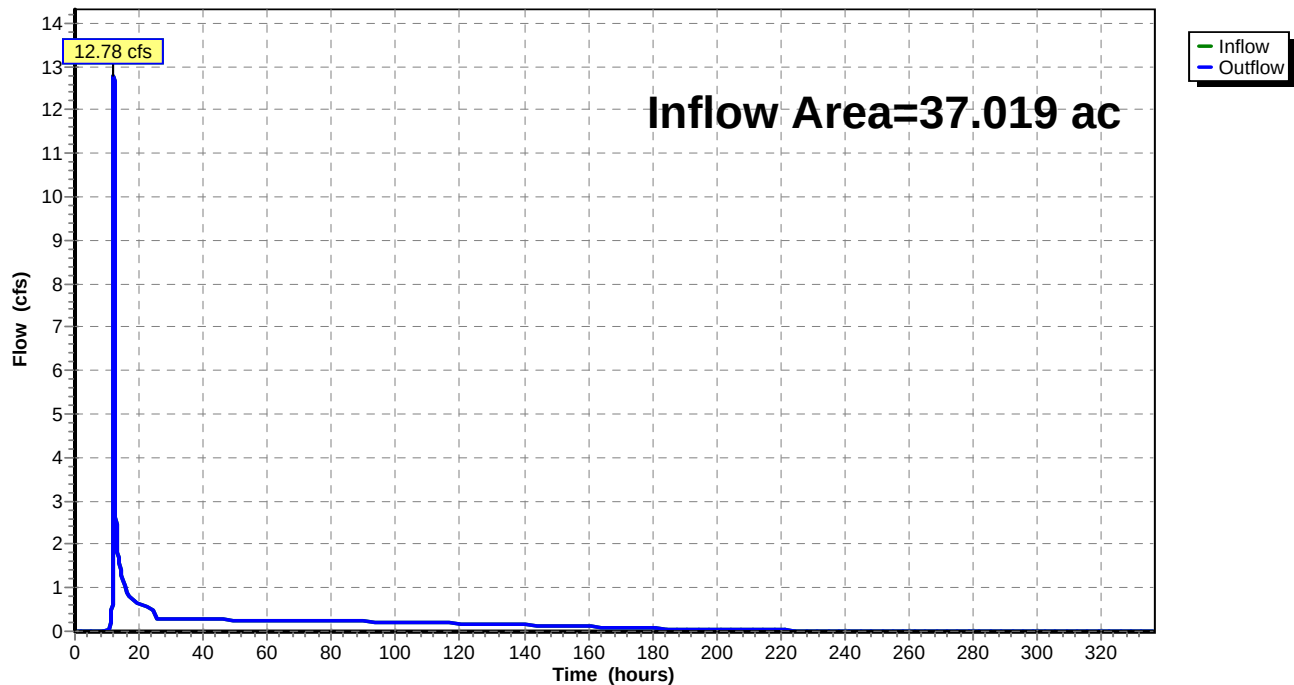
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 37.019 ac, 33.06% Impervious, Inflow Depth > 1.31" for 1 Year, 24 Hr. Event event
Inflow = 12.78 cfs @ 12.15 hrs, Volume= 4.054 af
Outflow = 12.78 cfs @ 12.15 hrs, Volume= 4.054 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.01		0.01
5.00	0.00		0.00	265.00	0.01		0.01
10.00	0.00		0.00	270.00	0.01		0.01
15.00	1.20		1.20	275.00	0.01		0.01
20.00	0.62		0.62	280.00	0.01		0.01
25.00	0.27		0.27	285.00	0.01		0.01
30.00	0.27		0.27	290.00	0.01		0.01
35.00	0.27		0.27	295.00	0.01		0.01
40.00	0.27		0.27	300.00	0.01		0.01
45.00	0.26		0.26	305.00	0.01		0.01
50.00	0.26		0.26	310.00	0.00		0.00
55.00	0.26		0.26	315.00	0.00		0.00
60.00	0.25		0.25	320.00	0.00		0.00
65.00	0.25		0.25	325.00	0.00		0.00
70.00	0.25		0.25	330.00	0.00		0.00
75.00	0.24		0.24	335.00	0.00		0.00
80.00	0.23		0.23				
85.00	0.23		0.23				
90.00	0.22		0.22				
95.00	0.22		0.22				
100.00	0.21		0.21				
105.00	0.20		0.20				
110.00	0.19		0.19				
115.00	0.19		0.19				
120.00	0.18		0.18				
125.00	0.17		0.17				
130.00	0.16		0.16				
135.00	0.15		0.15				
140.00	0.14		0.14				
145.00	0.13		0.13				
150.00	0.12		0.12				
155.00	0.12		0.12				
160.00	0.11		0.11				
165.00	0.10		0.10				
170.00	0.09		0.09				
175.00	0.08		0.08				
180.00	0.07		0.07				
185.00	0.06		0.06				
190.00	0.05		0.05				
195.00	0.04		0.04				
200.00	0.04		0.04				
205.00	0.03		0.03				
210.00	0.03		0.03				
215.00	0.02		0.02				
220.00	0.02		0.02				
225.00	0.02		0.02				
230.00	0.02		0.02				
235.00	0.02		0.02				
240.00	0.01		0.01				
245.00	0.01		0.01				
250.00	0.01		0.01				
255.00	0.01		0.01				

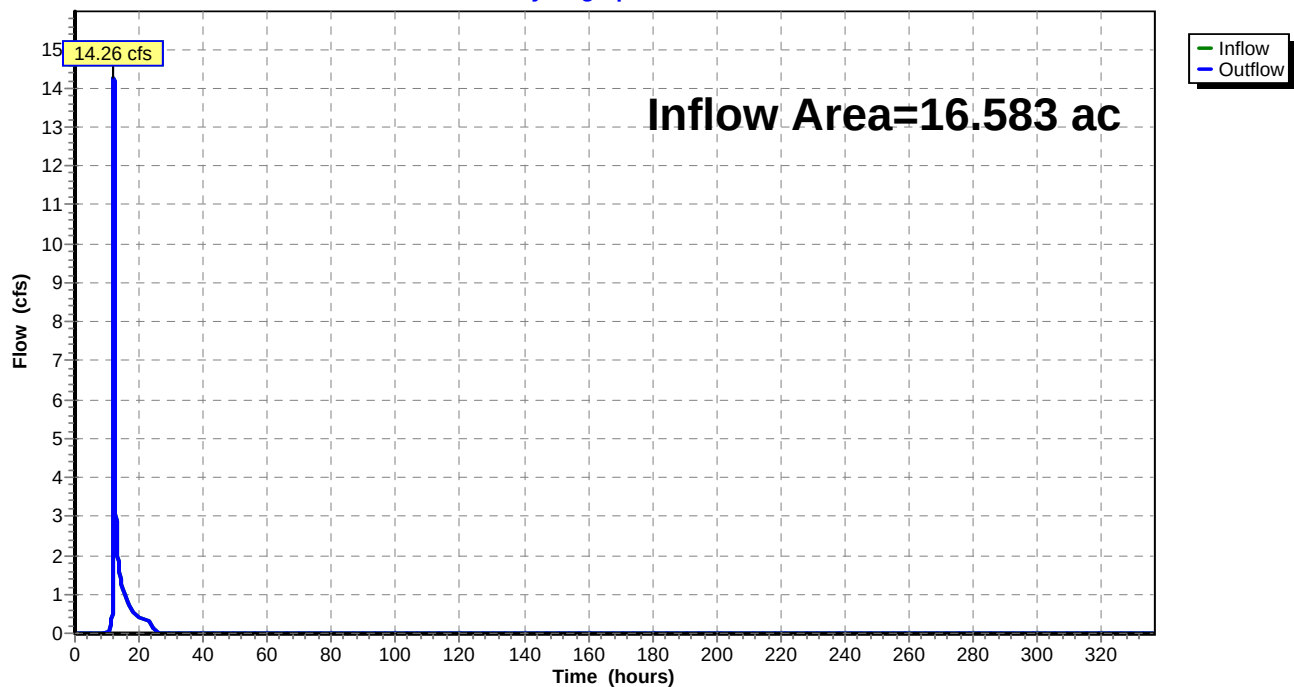
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 16.583 ac, 5.82% Impervious, Inflow Depth = 0.95" for 1 Year, 24 Hr. Event event
Inflow = 14.26 cfs @ 12.15 hrs, Volume= 1.317 af
Outflow = 14.26 cfs @ 12.15 hrs, Volume= 1.317 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	1.18		1.18	275.00	0.00		0.00
20.00	0.43		0.43	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Summary for Pond Pond 1: Pond 1

Inflow Area = 10.536 ac, 37.25% Impervious, Inflow Depth = 1.53" for 1 Year, 24 Hr. Event event
 Inflow = 19.52 cfs @ 12.08 hrs, Volume= 1.341 af
 Outflow = 0.60 cfs @ 16.63 hrs, Volume= 1.323 af, Atten= 97%, Lag= 273.0 min
 Primary = 0.60 cfs @ 16.63 hrs, Volume= 1.323 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 699.00' Surf.Area= 40,289 sf Storage= 141,809 cf

Peak Elev= 700.04' @ 16.63 hrs Surf.Area= 43,844 sf Storage= 185,599 cf (43,789 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 2,325.3 min (3,158.9 - 833.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	694.00'	278,293 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)
694.00	17,243	647.0	0	0	17,243
696.00	22,625	697.0	39,746	39,746	22,757
697.00	33,800	793.0	28,026	67,773	34,164
698.00	37,016	823.0	35,396	103,168	38,106
700.00	43,701	867.0	80,625	183,793	44,260
702.00	50,890	917.0	94,500	278,293	51,579

Device	Routing	Invert	Outlet Devices
#1	Primary	692.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 680.00' S= 0.1200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	700.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	699.00'	3.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.60 cfs @ 16.63 hrs HW=700.04' TW=588.20' (Dynamic Tailwater)

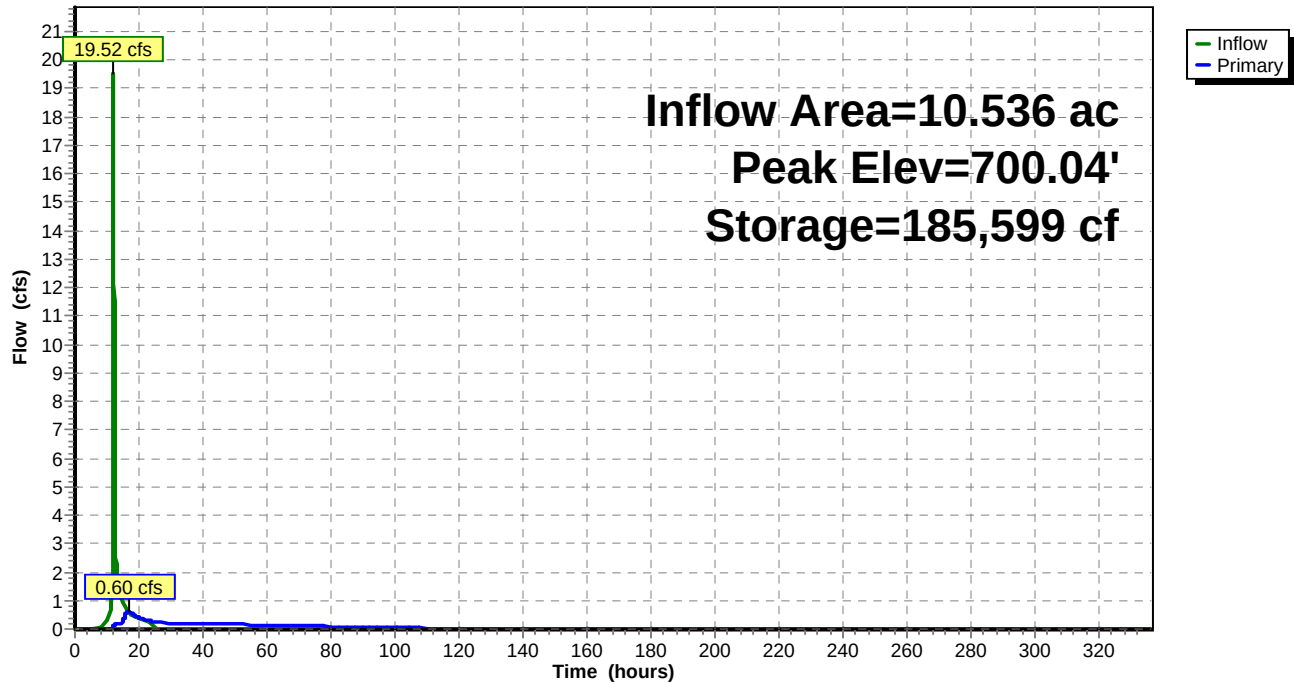
1=Culvert (Passes 0.60 cfs of 61.59 cfs potential flow)

2=Broad-Crested Rectangular Weir (Weir Controls 0.38 cfs @ 0.57 fps)

3=Orifice/Grate (Orifice Controls 0.23 cfs @ 4.61 fps)

Pond Pond 1: Pond 1

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Pond Pond 1: Pond 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	141,809	699.00	0.00
10.00	0.23	142,278	699.01	0.00
20.00	0.35	184,861	700.02	0.40
30.00	0.00	179,624	699.90	0.21
40.00	0.00	172,532	699.74	0.19
50.00	0.00	166,286	699.59	0.16
60.00	0.00	160,895	699.46	0.14
70.00	0.00	156,370	699.36	0.11
80.00	0.00	152,717	699.27	0.09
90.00	0.00	149,939	699.20	0.06
100.00	0.00	148,049	699.15	0.04
110.00	0.00	146,791	699.12	0.03
120.00	0.00	145,920	699.10	0.02
130.00	0.00	145,291	699.09	0.01
140.00	0.00	144,821	699.07	0.01
150.00	0.00	144,457	699.07	0.01
160.00	0.00	144,168	699.06	0.01
170.00	0.00	143,934	699.05	0.01
180.00	0.00	143,741	699.05	0.00
190.00	0.00	143,579	699.04	0.00
200.00	0.00	143,442	699.04	0.00
210.00	0.00	143,324	699.04	0.00
220.00	0.00	143,221	699.03	0.00
230.00	0.00	143,132	699.03	0.00
240.00	0.00	143,052	699.03	0.00
250.00	0.00	142,982	699.03	0.00
260.00	0.00	142,919	699.03	0.00
270.00	0.00	142,862	699.03	0.00
280.00	0.00	142,811	699.02	0.00
290.00	0.00	142,764	699.02	0.00
300.00	0.00	142,722	699.02	0.00
310.00	0.00	142,683	699.02	0.00
320.00	0.00	142,647	699.02	0.00
330.00	0.00	142,614	699.02	0.00

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Stage-Area-Storage for Pond Pond 1: Pond 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
694.00	17,243	0	699.20	40,960	149,934
694.10	17,495	1,737	699.30	41,298	154,047
694.20	17,748	3,499	699.40	41,637	158,194
694.30	18,004	5,287	699.50	41,978	162,375
694.40	18,261	7,100	699.60	42,320	166,590
694.50	18,520	8,939	699.70	42,663	170,839
694.60	18,781	10,804	699.80	43,008	175,122
694.70	19,044	12,695	699.90	43,354	179,440
694.80	19,308	14,613	700.00	43,701	183,793
694.90	19,575	16,557	700.10	44,047	188,180
695.00	19,843	18,528	700.20	44,395	192,602
695.10	20,113	20,525	700.30	44,744	197,059
695.20	20,385	22,550	700.40	45,095	201,551
695.30	20,658	24,602	700.50	45,447	206,079
695.40	20,934	26,682	700.60	45,800	210,641
695.50	21,211	28,789	700.70	46,155	215,239
695.60	21,490	30,924	700.80	46,511	219,872
695.70	21,771	33,087	700.90	46,868	224,541
695.80	22,054	35,279	701.00	47,227	229,246
695.90	22,339	37,498	701.10	47,587	233,986
696.00	22,625	39,746	701.20	47,949	238,763
696.10	23,642	42,060	701.30	48,312	243,576
696.20	24,681	44,475	701.40	48,676	248,425
696.30	25,743	46,996	701.50	49,041	253,311
696.40	26,827	49,625	701.60	49,408	258,234
696.50	27,933	52,363	701.70	49,777	263,193
696.60	29,062	55,212	701.80	50,146	268,189
696.70	30,213	58,176	701.90	50,518	273,222
696.80	31,386	61,255	702.00	50,890	278,293
696.90	32,582	64,454			
697.00	33,800	67,773			
697.10	34,115	71,168			
697.20	34,432	74,596			
697.30	34,749	78,055			
697.40	35,069	81,546			
697.50	35,390	85,068			
697.60	35,712	88,624			
697.70	36,036	92,211			
697.80	36,361	95,831			
697.90	36,688	99,483			
698.00	37,016	103,168			
698.10	37,337	106,886			
698.20	37,660	110,636			
698.30	37,983	114,418			
698.40	38,309	118,233			
698.50	38,635	122,080			
698.60	38,963	125,960			
698.70	39,293	129,872			
698.80	39,623	133,818			
698.90	39,956	137,797			
699.00	40,289	141,809			
699.10	40,624	145,855			

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Pond Pond 2: Pond 2

Inflow Area = 23.503 ac, 45.59% Impervious, Inflow Depth = 1.53" for 1 Year, 24 Hr. Event event
 Inflow = 24.52 cfs @ 12.04 hrs, Volume= 3.004 af
 Outflow = 0.27 cfs @ 24.14 hrs, Volume= 2.959 af, Atten= 99%, Lag= 726.1 min
 Primary = 0.27 cfs @ 24.14 hrs, Volume= 2.959 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 587.00' Surf.Area= 47,444 sf Storage= 230,092 cf

Peak Elev= 588.47' @ 24.14 hrs Surf.Area= 57,442 sf Storage= 308,369 cf (78,278 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 3,634.6 min (5,485.9 - 1,851.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	580.00'	534,329 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)
580.00	22,976	626.0	0	0	22,976
582.00	28,191	676.0	51,078	51,078	28,318
584.00	33,801	726.0	61,907	112,985	34,069
586.00	39,814	776.0	73,533	186,518	40,232
588.00	55,742	900.0	95,110	281,629	56,854
590.00	63,113	946.0	118,779	400,408	63,859
592.00	70,884	996.0	133,922	534,329	71,827

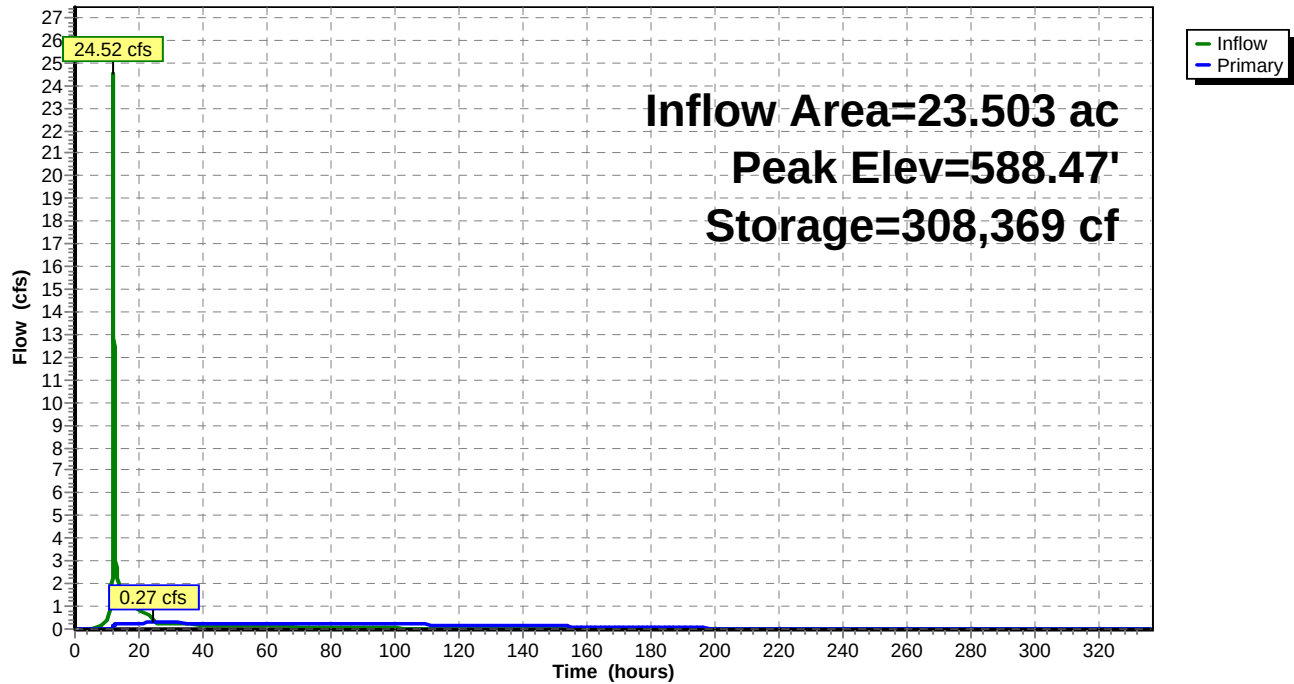
Device	Routing	Invert	Outlet Devices
#1	Primary	579.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 578.00' S= 0.0100 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	587.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	590.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.27 cfs @ 24.14 hrs HW=588.47' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.27 cfs of 67.77 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.27 cfs @ 5.59 fps)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pond 2: Pond 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Pond Pond 2: Pond 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	230,092	587.00	0.00
10.00	0.37	232,242	587.05	0.00
20.00	0.81	302,466	588.37	0.26
30.00	0.21	307,175	588.45	0.27
40.00	0.19	304,547	588.41	0.27
50.00	0.16	301,269	588.35	0.26
60.00	0.14	297,377	588.28	0.25
70.00	0.11	292,913	588.20	0.25
80.00	0.09	287,920	588.11	0.23
90.00	0.06	282,452	588.01	0.22
100.00	0.04	276,558	587.91	0.21
110.00	0.03	270,557	587.80	0.19
120.00	0.02	264,737	587.69	0.18
130.00	0.01	259,279	587.59	0.16
140.00	0.01	254,291	587.49	0.14
150.00	0.01	249,843	587.40	0.12
160.00	0.01	245,982	587.33	0.11
170.00	0.01	242,740	587.26	0.09
180.00	0.00	240,131	587.21	0.07
190.00	0.00	238,203	587.17	0.05
200.00	0.00	236,820	587.14	0.04
210.00	0.00	235,809	587.12	0.03
220.00	0.00	235,049	587.10	0.02
230.00	0.00	234,463	587.09	0.02
240.00	0.00	233,999	587.08	0.01
250.00	0.00	233,624	587.07	0.01
260.00	0.00	233,315	587.07	0.01
270.00	0.00	233,057	587.06	0.01
280.00	0.00	232,837	587.06	0.01
290.00	0.00	232,649	587.05	0.01
300.00	0.00	232,485	587.05	0.01
310.00	0.00	232,342	587.05	0.00
320.00	0.00	232,215	587.04	0.00
330.00	0.00	232,102	587.04	0.00

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Stage-Area-Storage for Pond Pond 2: Pond 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
580.00	22,976	0	587.80	54,029	270,652
580.15	23,349	3,474	587.95	55,311	278,852
580.30	23,724	7,005	588.10	56,100	287,221
580.45	24,103	10,592	588.25	56,638	295,676
580.60	24,485	14,236	588.40	57,180	304,212
580.75	24,869	17,937	588.55	57,723	312,830
580.90	25,257	21,697	588.70	58,270	321,530
581.05	25,647	25,514	588.85	58,819	330,311
581.20	26,041	29,391	589.00	59,370	339,175
581.35	26,438	33,327	589.15	59,924	348,122
581.50	26,837	37,322	589.30	60,481	357,153
581.65	27,240	41,378	589.45	61,040	366,267
581.80	27,646	45,495	589.60	61,602	375,465
581.95	28,054	49,672	589.75	62,167	384,748
582.10	28,459	53,911	589.90	62,734	394,115
582.25	28,864	58,210	590.05	63,302	403,568
582.40	29,272	62,570	590.20	63,870	413,106
582.55	29,683	66,992	590.35	64,440	422,729
582.70	30,097	71,475	590.50	65,013	432,438
582.85	30,513	76,021	590.65	65,589	442,233
583.00	30,932	80,629	590.80	66,167	452,115
583.15	31,355	85,301	590.95	66,748	462,083
583.30	31,780	90,036	591.10	67,331	472,139
583.45	32,208	94,835	591.25	67,917	482,283
583.60	32,638	99,698	591.40	68,505	492,515
583.75	33,072	104,626	591.55	69,096	502,835
583.90	33,508	109,620	591.70	69,690	513,244
584.05	33,945	114,679	591.85	70,286	523,742
584.20	34,380	119,803	592.00	70,884	534,329
584.35	34,818	124,993			
584.50	35,258	130,249			
584.65	35,701	135,571			
584.80	36,147	140,959			
584.95	36,596	146,415			
585.10	37,047	151,938			
585.25	37,501	157,529			
585.40	37,958	163,189			
585.55	38,418	168,917			
585.70	38,881	174,714			
585.85	39,346	180,581			
586.00	39,814	186,518			
586.15	40,916	192,573			
586.30	42,033	198,794			
586.45	43,165	205,184			
586.60	44,312	211,744			
586.75	45,474	218,478			
586.90	46,651	225,387			
587.05	47,843	232,474			
587.20	49,050	239,741			
587.35	50,272	247,189			
587.50	51,509	254,823			
587.65	52,762	262,643			

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1B: PROP DA 1B

Runoff = 23.80 cfs @ 12.08 hrs, Volume= 1.632 af, Depth= 1.86"

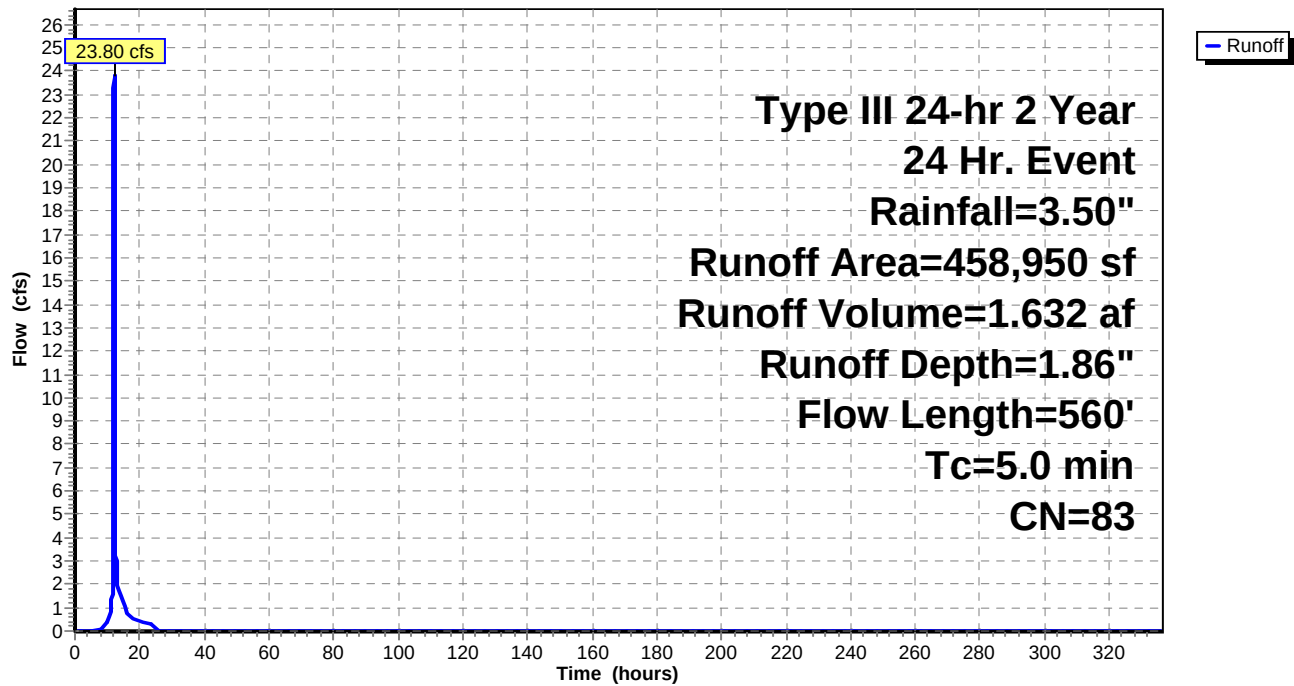
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
170,936	98	Paved parking & roofs
288,014	74	>75% Grass cover, Good, HSG C
458,950	83	Weighted Average
288,014		62.75% Pervious Area
170,936		37.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.1200	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.6	164	0.0850	4.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	150	0.0800	5.74		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	196	0.0410	14.58	45.81	Pipe Channel, Street System 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
5.0	560	Total			

Subcatchment 1B: PROP DA 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1B: PROP DA 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.86	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.86	0.00
10.00	0.66	0.03	0.35	270.00	3.50	1.86	0.00
15.00	2.99	1.44	1.15	275.00	3.50	1.86	0.00
20.00	3.35	1.73	0.41	280.00	3.50	1.86	0.00
25.00	3.50	1.86	0.00	285.00	3.50	1.86	0.00
30.00	3.50	1.86	0.00	290.00	3.50	1.86	0.00
35.00	3.50	1.86	0.00	295.00	3.50	1.86	0.00
40.00	3.50	1.86	0.00	300.00	3.50	1.86	0.00
45.00	3.50	1.86	0.00	305.00	3.50	1.86	0.00
50.00	3.50	1.86	0.00	310.00	3.50	1.86	0.00
55.00	3.50	1.86	0.00	315.00	3.50	1.86	0.00
60.00	3.50	1.86	0.00	320.00	3.50	1.86	0.00
65.00	3.50	1.86	0.00	325.00	3.50	1.86	0.00
70.00	3.50	1.86	0.00	330.00	3.50	1.86	0.00
75.00	3.50	1.86	0.00	335.00	3.50	1.86	0.00
80.00	3.50	1.86	0.00				
85.00	3.50	1.86	0.00				
90.00	3.50	1.86	0.00				
95.00	3.50	1.86	0.00				
100.00	3.50	1.86	0.00				
105.00	3.50	1.86	0.00				
110.00	3.50	1.86	0.00				
115.00	3.50	1.86	0.00				
120.00	3.50	1.86	0.00				
125.00	3.50	1.86	0.00				
130.00	3.50	1.86	0.00				
135.00	3.50	1.86	0.00				
140.00	3.50	1.86	0.00				
145.00	3.50	1.86	0.00				
150.00	3.50	1.86	0.00				
155.00	3.50	1.86	0.00				
160.00	3.50	1.86	0.00				
165.00	3.50	1.86	0.00				
170.00	3.50	1.86	0.00				
175.00	3.50	1.86	0.00				
180.00	3.50	1.86	0.00				
185.00	3.50	1.86	0.00				
190.00	3.50	1.86	0.00				
195.00	3.50	1.86	0.00				
200.00	3.50	1.86	0.00				
205.00	3.50	1.86	0.00				
210.00	3.50	1.86	0.00				
215.00	3.50	1.86	0.00				
220.00	3.50	1.86	0.00				
225.00	3.50	1.86	0.00				
230.00	3.50	1.86	0.00				
235.00	3.50	1.86	0.00				
240.00	3.50	1.86	0.00				
245.00	3.50	1.86	0.00				
250.00	3.50	1.86	0.00				
255.00	3.50	1.86	0.00				

Summary for Subcatchment 1C: PROP DA 1C

Runoff = 13.26 cfs @ 12.03 hrs, Volume= 0.822 af, Depth= 1.50"

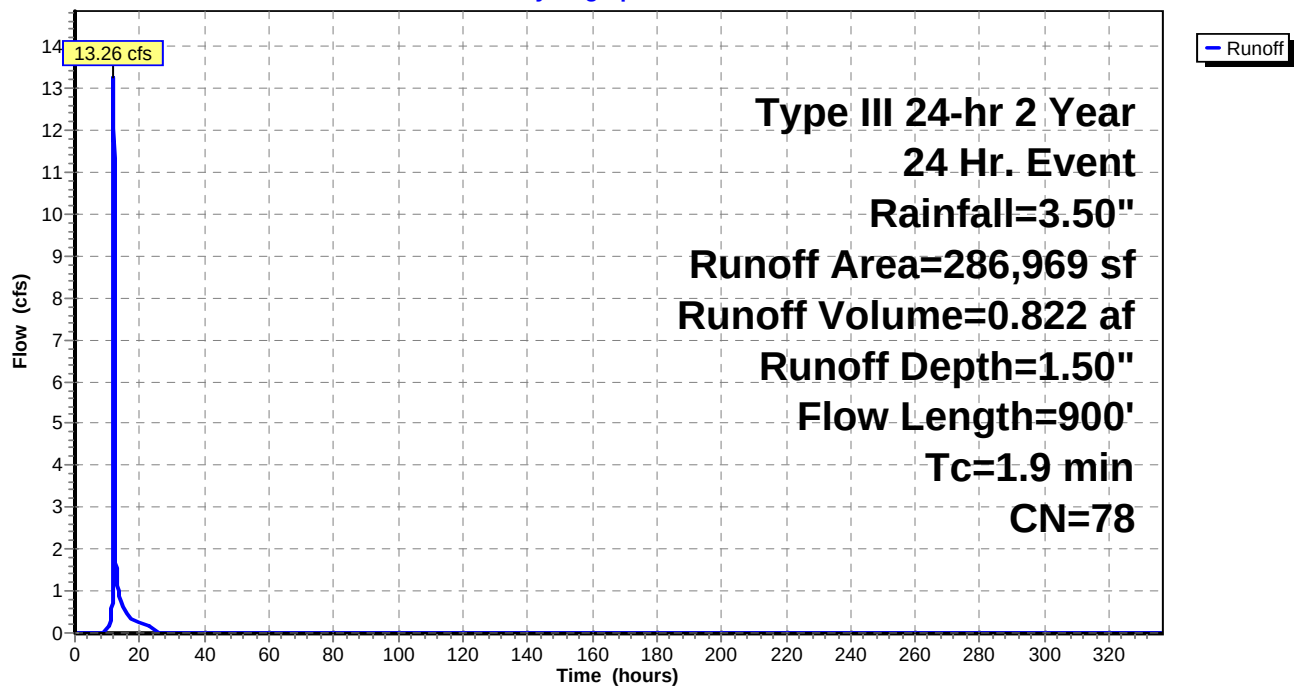
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
151,873	61	>75% Grass cover, Good, HSG B
135,096	98	Paved parking & roofs
286,969	78	Weighted Average
151,873		52.92% Pervious Area
135,096		47.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.44		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.50"
0.7	800	0.0750	19.72	61.95	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.9	900	Total			

Subcatchment 1C: PROP DA 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1C: PROP DA 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.50	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.50	0.00
10.00	0.66	0.00	0.07	270.00	3.50	1.50	0.00
15.00	2.99	1.12	0.63	275.00	3.50	1.50	0.00
20.00	3.35	1.38	0.23	280.00	3.50	1.50	0.00
25.00	3.50	1.50	0.00	285.00	3.50	1.50	0.00
30.00	3.50	1.50	0.00	290.00	3.50	1.50	0.00
35.00	3.50	1.50	0.00	295.00	3.50	1.50	0.00
40.00	3.50	1.50	0.00	300.00	3.50	1.50	0.00
45.00	3.50	1.50	0.00	305.00	3.50	1.50	0.00
50.00	3.50	1.50	0.00	310.00	3.50	1.50	0.00
55.00	3.50	1.50	0.00	315.00	3.50	1.50	0.00
60.00	3.50	1.50	0.00	320.00	3.50	1.50	0.00
65.00	3.50	1.50	0.00	325.00	3.50	1.50	0.00
70.00	3.50	1.50	0.00	330.00	3.50	1.50	0.00
75.00	3.50	1.50	0.00	335.00	3.50	1.50	0.00
80.00	3.50	1.50	0.00				
85.00	3.50	1.50	0.00				
90.00	3.50	1.50	0.00				
95.00	3.50	1.50	0.00				
100.00	3.50	1.50	0.00				
105.00	3.50	1.50	0.00				
110.00	3.50	1.50	0.00				
115.00	3.50	1.50	0.00				
120.00	3.50	1.50	0.00				
125.00	3.50	1.50	0.00				
130.00	3.50	1.50	0.00				
135.00	3.50	1.50	0.00				
140.00	3.50	1.50	0.00				
145.00	3.50	1.50	0.00				
150.00	3.50	1.50	0.00				
155.00	3.50	1.50	0.00				
160.00	3.50	1.50	0.00				
165.00	3.50	1.50	0.00				
170.00	3.50	1.50	0.00				
175.00	3.50	1.50	0.00				
180.00	3.50	1.50	0.00				
185.00	3.50	1.50	0.00				
190.00	3.50	1.50	0.00				
195.00	3.50	1.50	0.00				
200.00	3.50	1.50	0.00				
205.00	3.50	1.50	0.00				
210.00	3.50	1.50	0.00				
215.00	3.50	1.50	0.00				
220.00	3.50	1.50	0.00				
225.00	3.50	1.50	0.00				
230.00	3.50	1.50	0.00				
235.00	3.50	1.50	0.00				
240.00	3.50	1.50	0.00				
245.00	3.50	1.50	0.00				
250.00	3.50	1.50	0.00				
255.00	3.50	1.50	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1F: PROP DA 1F

Runoff = 7.41 cfs @ 12.14 hrs, Volume= 0.610 af, Depth= 1.24"

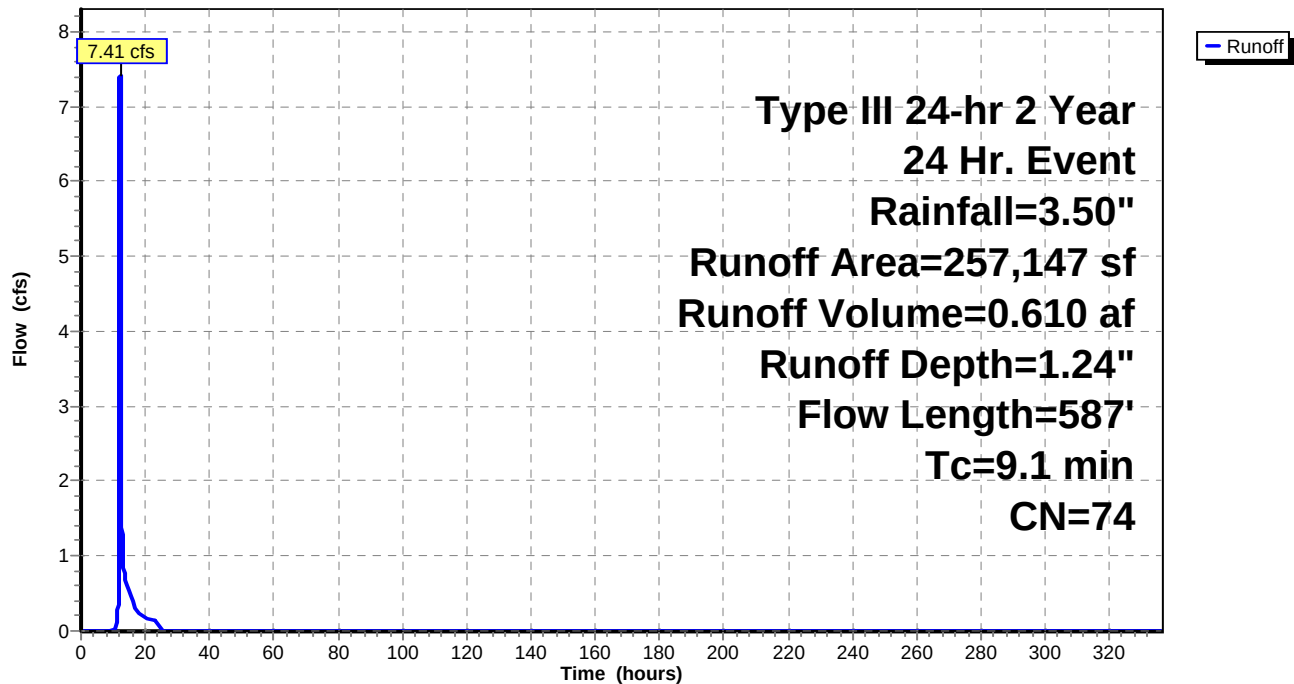
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
166,672	74	>75% Grass cover, Good, HSG C
31,625	98	Paved roads w/curbs & sewers, HSG B
58,850	61	>75% Grass cover, Good, HSG B
257,147	74	Weighted Average
225,522		87.70% Pervious Area
31,625		12.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	52	0.0220	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
1.3	535	0.1860	6.94		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.1	587	Total			

Subcatchment 1F: PROP DA 1F

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1F: PROP DA 1F

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.24	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.24	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.24	0.00
15.00	2.99	0.90	0.51	275.00	3.50	1.24	0.00
20.00	3.35	1.14	0.19	280.00	3.50	1.24	0.00
25.00	3.50	1.24	0.00	285.00	3.50	1.24	0.00
30.00	3.50	1.24	0.00	290.00	3.50	1.24	0.00
35.00	3.50	1.24	0.00	295.00	3.50	1.24	0.00
40.00	3.50	1.24	0.00	300.00	3.50	1.24	0.00
45.00	3.50	1.24	0.00	305.00	3.50	1.24	0.00
50.00	3.50	1.24	0.00	310.00	3.50	1.24	0.00
55.00	3.50	1.24	0.00	315.00	3.50	1.24	0.00
60.00	3.50	1.24	0.00	320.00	3.50	1.24	0.00
65.00	3.50	1.24	0.00	325.00	3.50	1.24	0.00
70.00	3.50	1.24	0.00	330.00	3.50	1.24	0.00
75.00	3.50	1.24	0.00	335.00	3.50	1.24	0.00
80.00	3.50	1.24	0.00				
85.00	3.50	1.24	0.00				
90.00	3.50	1.24	0.00				
95.00	3.50	1.24	0.00				
100.00	3.50	1.24	0.00				
105.00	3.50	1.24	0.00				
110.00	3.50	1.24	0.00				
115.00	3.50	1.24	0.00				
120.00	3.50	1.24	0.00				
125.00	3.50	1.24	0.00				
130.00	3.50	1.24	0.00				
135.00	3.50	1.24	0.00				
140.00	3.50	1.24	0.00				
145.00	3.50	1.24	0.00				
150.00	3.50	1.24	0.00				
155.00	3.50	1.24	0.00				
160.00	3.50	1.24	0.00				
165.00	3.50	1.24	0.00				
170.00	3.50	1.24	0.00				
175.00	3.50	1.24	0.00				
180.00	3.50	1.24	0.00				
185.00	3.50	1.24	0.00				
190.00	3.50	1.24	0.00				
195.00	3.50	1.24	0.00				
200.00	3.50	1.24	0.00				
205.00	3.50	1.24	0.00				
210.00	3.50	1.24	0.00				
215.00	3.50	1.24	0.00				
220.00	3.50	1.24	0.00				
225.00	3.50	1.24	0.00				
230.00	3.50	1.24	0.00				
235.00	3.50	1.24	0.00				
240.00	3.50	1.24	0.00				
245.00	3.50	1.24	0.00				
250.00	3.50	1.24	0.00				
255.00	3.50	1.24	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1G: PROP DA 1G

Runoff = 11.52 cfs @ 12.03 hrs, Volume= 0.739 af, Depth= 2.73"

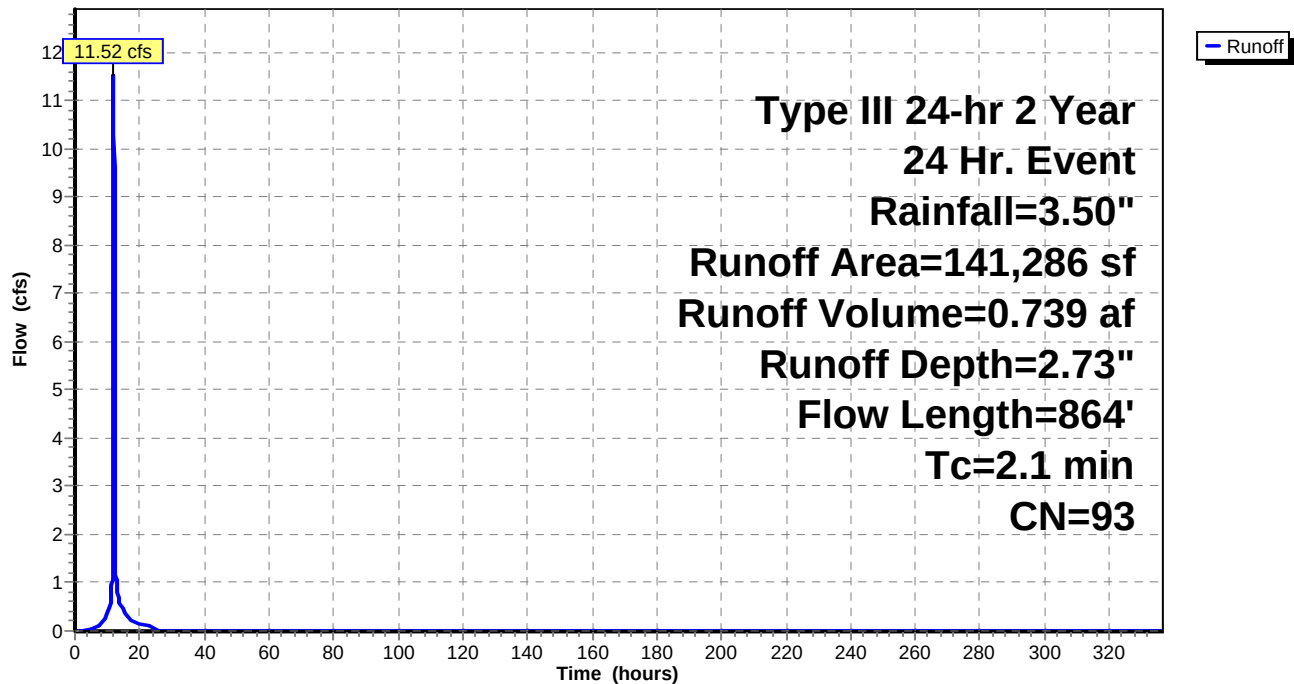
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
112,680	98	Paved parking & roofs
28,606	74	>75% Grass cover, Good, HSG C
141,286	93	Weighted Average
28,606		20.25% Pervious Area
112,680		79.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.08		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"
1.3	764	0.0180	9.66	30.35	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.1	864	Total			

Subcatchment 1G: PROP DA 1G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1G: PROP DA 1G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.73	0.00
5.00	0.20	0.00	0.02	265.00	3.50	2.73	0.00
10.00	0.66	0.21	0.36	270.00	3.50	2.73	0.00
15.00	2.99	2.24	0.41	275.00	3.50	2.73	0.00
20.00	3.35	2.59	0.14	280.00	3.50	2.73	0.00
25.00	3.50	2.73	0.00	285.00	3.50	2.73	0.00
30.00	3.50	2.73	0.00	290.00	3.50	2.73	0.00
35.00	3.50	2.73	0.00	295.00	3.50	2.73	0.00
40.00	3.50	2.73	0.00	300.00	3.50	2.73	0.00
45.00	3.50	2.73	0.00	305.00	3.50	2.73	0.00
50.00	3.50	2.73	0.00	310.00	3.50	2.73	0.00
55.00	3.50	2.73	0.00	315.00	3.50	2.73	0.00
60.00	3.50	2.73	0.00	320.00	3.50	2.73	0.00
65.00	3.50	2.73	0.00	325.00	3.50	2.73	0.00
70.00	3.50	2.73	0.00	330.00	3.50	2.73	0.00
75.00	3.50	2.73	0.00	335.00	3.50	2.73	0.00
80.00	3.50	2.73	0.00				
85.00	3.50	2.73	0.00				
90.00	3.50	2.73	0.00				
95.00	3.50	2.73	0.00				
100.00	3.50	2.73	0.00				
105.00	3.50	2.73	0.00				
110.00	3.50	2.73	0.00				
115.00	3.50	2.73	0.00				
120.00	3.50	2.73	0.00				
125.00	3.50	2.73	0.00				
130.00	3.50	2.73	0.00				
135.00	3.50	2.73	0.00				
140.00	3.50	2.73	0.00				
145.00	3.50	2.73	0.00				
150.00	3.50	2.73	0.00				
155.00	3.50	2.73	0.00				
160.00	3.50	2.73	0.00				
165.00	3.50	2.73	0.00				
170.00	3.50	2.73	0.00				
175.00	3.50	2.73	0.00				
180.00	3.50	2.73	0.00				
185.00	3.50	2.73	0.00				
190.00	3.50	2.73	0.00				
195.00	3.50	2.73	0.00				
200.00	3.50	2.73	0.00				
205.00	3.50	2.73	0.00				
210.00	3.50	2.73	0.00				
215.00	3.50	2.73	0.00				
220.00	3.50	2.73	0.00				
225.00	3.50	2.73	0.00				
230.00	3.50	2.73	0.00				
235.00	3.50	2.73	0.00				
240.00	3.50	2.73	0.00				
245.00	3.50	2.73	0.00				
250.00	3.50	2.73	0.00				
255.00	3.50	2.73	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1H: PROP 1H

Runoff = 5.74 cfs @ 12.10 hrs, Volume= 0.419 af, Depth= 1.71"

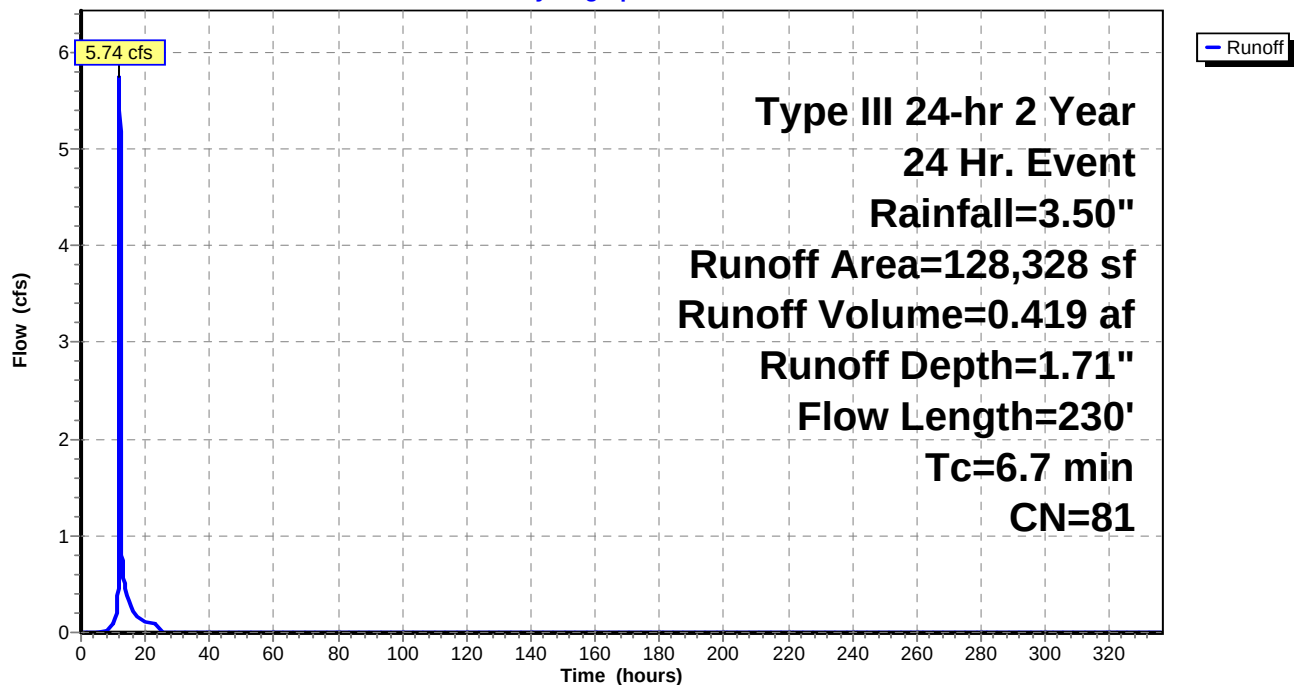
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
88,514	74	>75% Grass cover, Good, HSG C
39,814	98	Water Surface, HSG B
128,328	81	Weighted Average
88,514		68.97% Pervious Area
39,814		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.7	130	0.2000	3.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.7	230	Total			

Subcatchment 1H: PROP 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1H: PROP 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.71	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.71	0.00
10.00	0.66	0.01	0.07	270.00	3.50	1.71	0.00
15.00	2.99	1.31	0.31	275.00	3.50	1.71	0.00
20.00	3.35	1.59	0.11	280.00	3.50	1.71	0.00
25.00	3.50	1.71	0.00	285.00	3.50	1.71	0.00
30.00	3.50	1.71	0.00	290.00	3.50	1.71	0.00
35.00	3.50	1.71	0.00	295.00	3.50	1.71	0.00
40.00	3.50	1.71	0.00	300.00	3.50	1.71	0.00
45.00	3.50	1.71	0.00	305.00	3.50	1.71	0.00
50.00	3.50	1.71	0.00	310.00	3.50	1.71	0.00
55.00	3.50	1.71	0.00	315.00	3.50	1.71	0.00
60.00	3.50	1.71	0.00	320.00	3.50	1.71	0.00
65.00	3.50	1.71	0.00	325.00	3.50	1.71	0.00
70.00	3.50	1.71	0.00	330.00	3.50	1.71	0.00
75.00	3.50	1.71	0.00	335.00	3.50	1.71	0.00
80.00	3.50	1.71	0.00				
85.00	3.50	1.71	0.00				
90.00	3.50	1.71	0.00				
95.00	3.50	1.71	0.00				
100.00	3.50	1.71	0.00				
105.00	3.50	1.71	0.00				
110.00	3.50	1.71	0.00				
115.00	3.50	1.71	0.00				
120.00	3.50	1.71	0.00				
125.00	3.50	1.71	0.00				
130.00	3.50	1.71	0.00				
135.00	3.50	1.71	0.00				
140.00	3.50	1.71	0.00				
145.00	3.50	1.71	0.00				
150.00	3.50	1.71	0.00				
155.00	3.50	1.71	0.00				
160.00	3.50	1.71	0.00				
165.00	3.50	1.71	0.00				
170.00	3.50	1.71	0.00				
175.00	3.50	1.71	0.00				
180.00	3.50	1.71	0.00				
185.00	3.50	1.71	0.00				
190.00	3.50	1.71	0.00				
195.00	3.50	1.71	0.00				
200.00	3.50	1.71	0.00				
205.00	3.50	1.71	0.00				
210.00	3.50	1.71	0.00				
215.00	3.50	1.71	0.00				
220.00	3.50	1.71	0.00				
225.00	3.50	1.71	0.00				
230.00	3.50	1.71	0.00				
235.00	3.50	1.71	0.00				
240.00	3.50	1.71	0.00				
245.00	3.50	1.71	0.00				
250.00	3.50	1.71	0.00				
255.00	3.50	1.71	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1J: PROP 1J

Runoff = 9.15 cfs @ 12.15 hrs, Volume= 0.787 af, Depth= 1.24"

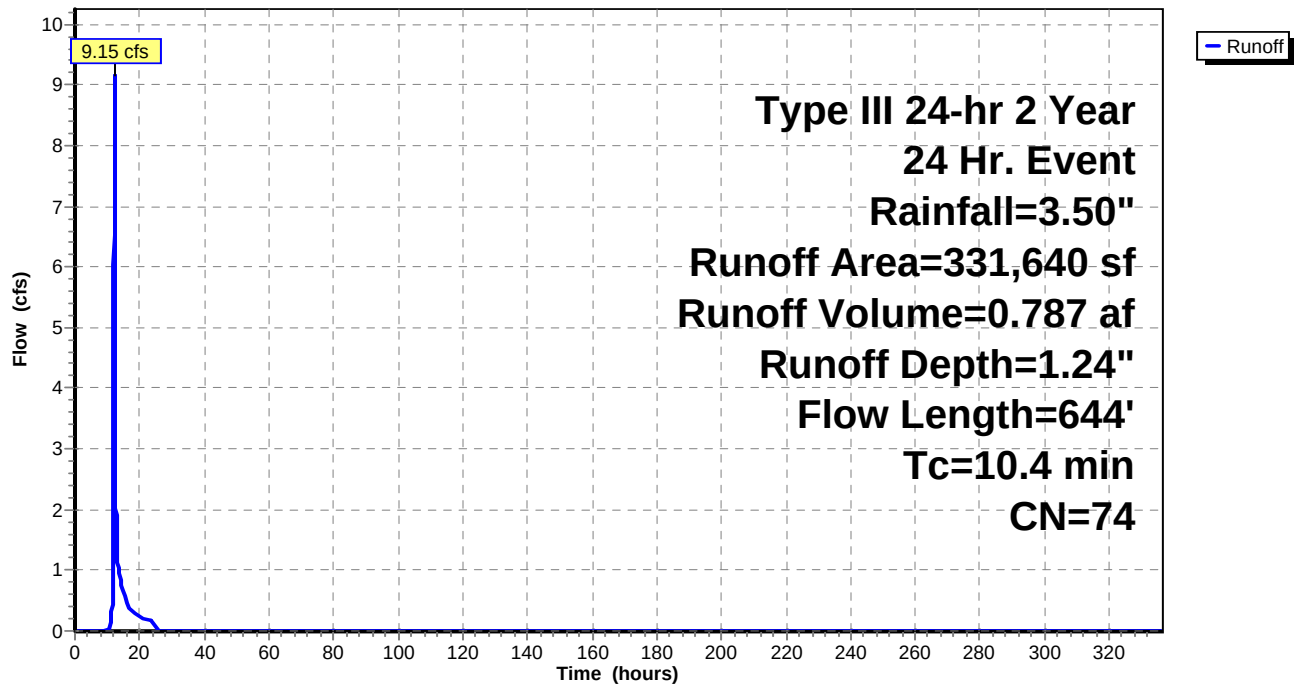
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
34,708	98	Paved parking, HSG B
241,872	74	>75% Grass cover, Good, HSG C
55,060	61	>75% Grass cover, Good, HSG B
331,640	74	Weighted Average
296,932		89.53% Pervious Area
34,708		10.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
3.2	544	0.1617	2.81		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.4	644	Total			

Subcatchment 1J: PROP 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1J: PROP 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.24	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.24	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.24	0.00
15.00	2.99	0.90	0.67	275.00	3.50	1.24	0.00
20.00	3.35	1.14	0.24	280.00	3.50	1.24	0.00
25.00	3.50	1.24	0.00	285.00	3.50	1.24	0.00
30.00	3.50	1.24	0.00	290.00	3.50	1.24	0.00
35.00	3.50	1.24	0.00	295.00	3.50	1.24	0.00
40.00	3.50	1.24	0.00	300.00	3.50	1.24	0.00
45.00	3.50	1.24	0.00	305.00	3.50	1.24	0.00
50.00	3.50	1.24	0.00	310.00	3.50	1.24	0.00
55.00	3.50	1.24	0.00	315.00	3.50	1.24	0.00
60.00	3.50	1.24	0.00	320.00	3.50	1.24	0.00
65.00	3.50	1.24	0.00	325.00	3.50	1.24	0.00
70.00	3.50	1.24	0.00	330.00	3.50	1.24	0.00
75.00	3.50	1.24	0.00	335.00	3.50	1.24	0.00
80.00	3.50	1.24	0.00				
85.00	3.50	1.24	0.00				
90.00	3.50	1.24	0.00				
95.00	3.50	1.24	0.00				
100.00	3.50	1.24	0.00				
105.00	3.50	1.24	0.00				
110.00	3.50	1.24	0.00				
115.00	3.50	1.24	0.00				
120.00	3.50	1.24	0.00				
125.00	3.50	1.24	0.00				
130.00	3.50	1.24	0.00				
135.00	3.50	1.24	0.00				
140.00	3.50	1.24	0.00				
145.00	3.50	1.24	0.00				
150.00	3.50	1.24	0.00				
155.00	3.50	1.24	0.00				
160.00	3.50	1.24	0.00				
165.00	3.50	1.24	0.00				
170.00	3.50	1.24	0.00				
175.00	3.50	1.24	0.00				
180.00	3.50	1.24	0.00				
185.00	3.50	1.24	0.00				
190.00	3.50	1.24	0.00				
195.00	3.50	1.24	0.00				
200.00	3.50	1.24	0.00				
205.00	3.50	1.24	0.00				
210.00	3.50	1.24	0.00				
215.00	3.50	1.24	0.00				
220.00	3.50	1.24	0.00				
225.00	3.50	1.24	0.00				
230.00	3.50	1.24	0.00				
235.00	3.50	1.24	0.00				
240.00	3.50	1.24	0.00				
245.00	3.50	1.24	0.00				
250.00	3.50	1.24	0.00				
255.00	3.50	1.24	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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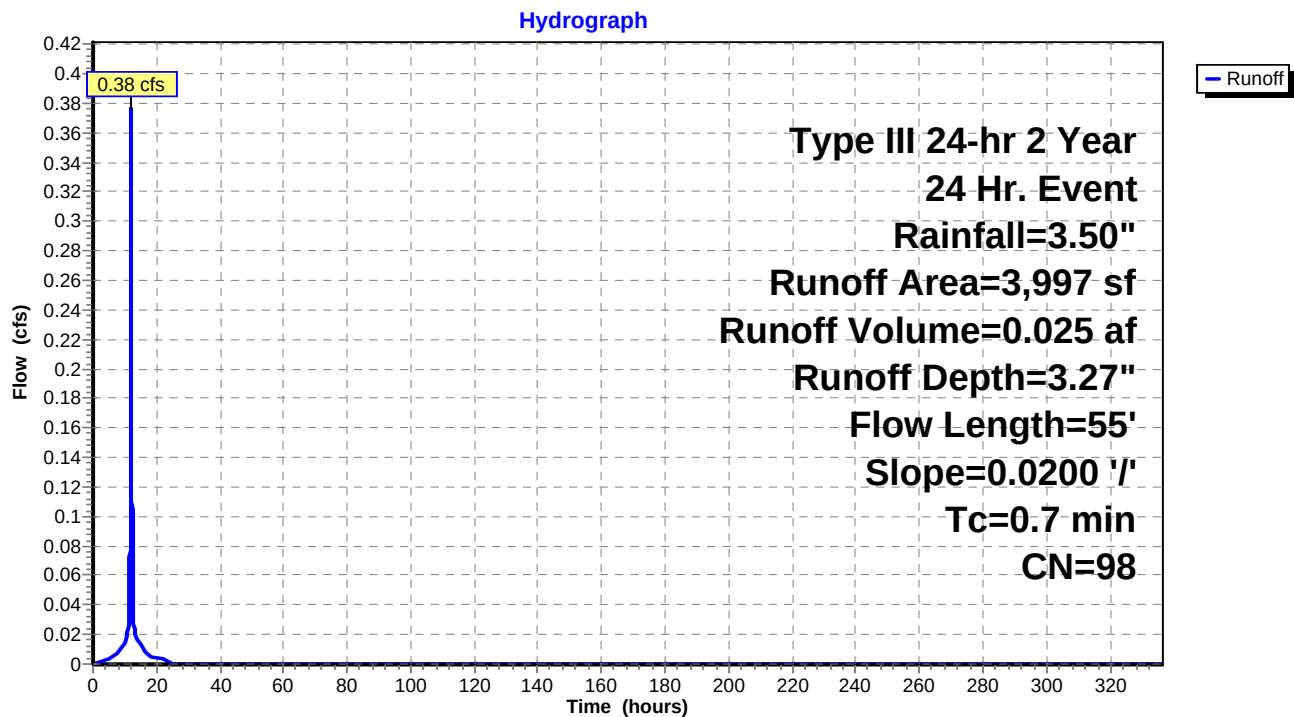
Summary for Subcatchment 1M: PROP DA 1M

Runoff = 0.38 cfs @ 12.01 hrs, Volume= 0.025 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
3,997	98	Roofs, HSG B
3,997		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.28		Sheet Flow, ROOF RUNOFF Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1M: PROP DA 1M

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1M: PROP DA 1M

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	3.27	0.00
5.00	0.20	0.07	0.00	265.00	3.50	3.27	0.00
10.00	0.66	0.47	0.01	270.00	3.50	3.27	0.00
15.00	2.99	2.76	0.01	275.00	3.50	3.27	0.00
20.00	3.35	3.12	0.00	280.00	3.50	3.27	0.00
25.00	3.50	3.27	0.00	285.00	3.50	3.27	0.00
30.00	3.50	3.27	0.00	290.00	3.50	3.27	0.00
35.00	3.50	3.27	0.00	295.00	3.50	3.27	0.00
40.00	3.50	3.27	0.00	300.00	3.50	3.27	0.00
45.00	3.50	3.27	0.00	305.00	3.50	3.27	0.00
50.00	3.50	3.27	0.00	310.00	3.50	3.27	0.00
55.00	3.50	3.27	0.00	315.00	3.50	3.27	0.00
60.00	3.50	3.27	0.00	320.00	3.50	3.27	0.00
65.00	3.50	3.27	0.00	325.00	3.50	3.27	0.00
70.00	3.50	3.27	0.00	330.00	3.50	3.27	0.00
75.00	3.50	3.27	0.00	335.00	3.50	3.27	0.00
80.00	3.50	3.27	0.00				
85.00	3.50	3.27	0.00				
90.00	3.50	3.27	0.00				
95.00	3.50	3.27	0.00				
100.00	3.50	3.27	0.00				
105.00	3.50	3.27	0.00				
110.00	3.50	3.27	0.00				
115.00	3.50	3.27	0.00				
120.00	3.50	3.27	0.00				
125.00	3.50	3.27	0.00				
130.00	3.50	3.27	0.00				
135.00	3.50	3.27	0.00				
140.00	3.50	3.27	0.00				
145.00	3.50	3.27	0.00				
150.00	3.50	3.27	0.00				
155.00	3.50	3.27	0.00				
160.00	3.50	3.27	0.00				
165.00	3.50	3.27	0.00				
170.00	3.50	3.27	0.00				
175.00	3.50	3.27	0.00				
180.00	3.50	3.27	0.00				
185.00	3.50	3.27	0.00				
190.00	3.50	3.27	0.00				
195.00	3.50	3.27	0.00				
200.00	3.50	3.27	0.00				
205.00	3.50	3.27	0.00				
210.00	3.50	3.27	0.00				
215.00	3.50	3.27	0.00				
220.00	3.50	3.27	0.00				
225.00	3.50	3.27	0.00				
230.00	3.50	3.27	0.00				
235.00	3.50	3.27	0.00				
240.00	3.50	3.27	0.00				
245.00	3.50	3.27	0.00				
250.00	3.50	3.27	0.00				
255.00	3.50	3.27	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment 1N: PROP DA 1N

Runoff = 0.40 cfs @ 12.01 hrs, Volume= 0.027 af, Depth= 3.27"

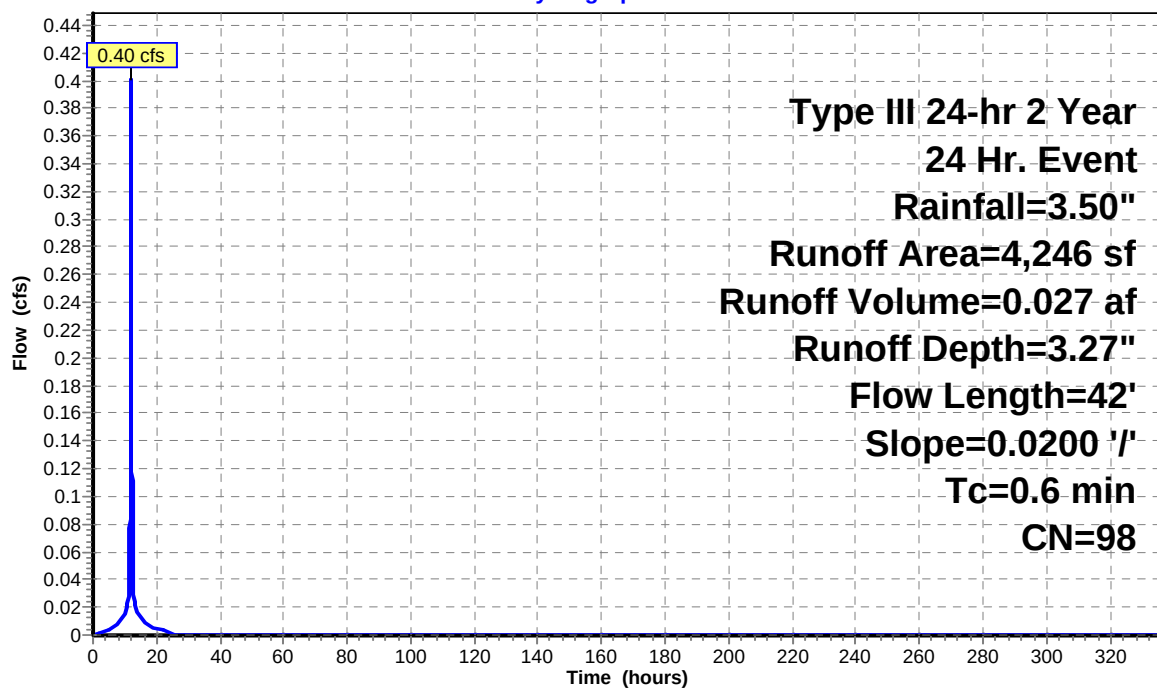
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
4,246	98	Roofs, HSG B
4,246		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	42	0.0200	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1N: PROP DA 1N

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment 1N: PROP DA 1N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	3.27	0.00
5.00	0.20	0.07	0.00	265.00	3.50	3.27	0.00
10.00	0.66	0.47	0.02	270.00	3.50	3.27	0.00
15.00	2.99	2.76	0.01	275.00	3.50	3.27	0.00
20.00	3.35	3.12	0.00	280.00	3.50	3.27	0.00
25.00	3.50	3.27	0.00	285.00	3.50	3.27	0.00
30.00	3.50	3.27	0.00	290.00	3.50	3.27	0.00
35.00	3.50	3.27	0.00	295.00	3.50	3.27	0.00
40.00	3.50	3.27	0.00	300.00	3.50	3.27	0.00
45.00	3.50	3.27	0.00	305.00	3.50	3.27	0.00
50.00	3.50	3.27	0.00	310.00	3.50	3.27	0.00
55.00	3.50	3.27	0.00	315.00	3.50	3.27	0.00
60.00	3.50	3.27	0.00	320.00	3.50	3.27	0.00
65.00	3.50	3.27	0.00	325.00	3.50	3.27	0.00
70.00	3.50	3.27	0.00	330.00	3.50	3.27	0.00
75.00	3.50	3.27	0.00	335.00	3.50	3.27	0.00
80.00	3.50	3.27	0.00				
85.00	3.50	3.27	0.00				
90.00	3.50	3.27	0.00				
95.00	3.50	3.27	0.00				
100.00	3.50	3.27	0.00				
105.00	3.50	3.27	0.00				
110.00	3.50	3.27	0.00				
115.00	3.50	3.27	0.00				
120.00	3.50	3.27	0.00				
125.00	3.50	3.27	0.00				
130.00	3.50	3.27	0.00				
135.00	3.50	3.27	0.00				
140.00	3.50	3.27	0.00				
145.00	3.50	3.27	0.00				
150.00	3.50	3.27	0.00				
155.00	3.50	3.27	0.00				
160.00	3.50	3.27	0.00				
165.00	3.50	3.27	0.00				
170.00	3.50	3.27	0.00				
175.00	3.50	3.27	0.00				
180.00	3.50	3.27	0.00				
185.00	3.50	3.27	0.00				
190.00	3.50	3.27	0.00				
195.00	3.50	3.27	0.00				
200.00	3.50	3.27	0.00				
205.00	3.50	3.27	0.00				
210.00	3.50	3.27	0.00				
215.00	3.50	3.27	0.00				
220.00	3.50	3.27	0.00				
225.00	3.50	3.27	0.00				
230.00	3.50	3.27	0.00				
235.00	3.50	3.27	0.00				
240.00	3.50	3.27	0.00				
245.00	3.50	3.27	0.00				
250.00	3.50	3.27	0.00				
255.00	3.50	3.27	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1H: EXIST 1H

Runoff = 6.19 cfs @ 12.20 hrs, Volume= 0.596 af, Depth= 1.18"

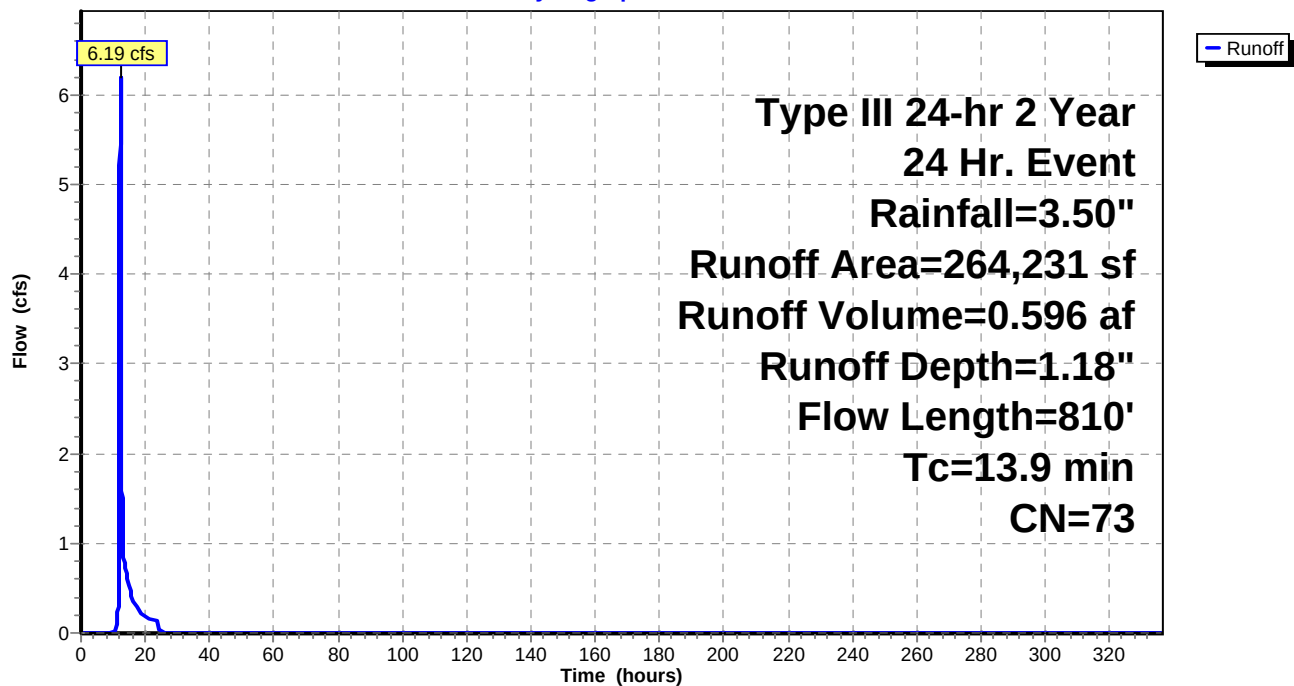
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
58,583	61	>75% Grass cover, Good, HSG B
188,543	74	>75% Grass cover, Good, HSG C
17,105	98	Paved parking, HSG B
264,231	73	Weighted Average
247,126		93.53% Pervious Area
17,105		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	150	0.0400	0.25		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
4.1	660	0.1480	2.69		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
13.9	810	Total			

Subcatchment EX 1H: EXIST 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1H: EXIST 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.18	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.18	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.18	0.00
15.00	2.99	0.85	0.52	275.00	3.50	1.18	0.00
20.00	3.35	1.08	0.19	280.00	3.50	1.18	0.00
25.00	3.50	1.18	0.00	285.00	3.50	1.18	0.00
30.00	3.50	1.18	0.00	290.00	3.50	1.18	0.00
35.00	3.50	1.18	0.00	295.00	3.50	1.18	0.00
40.00	3.50	1.18	0.00	300.00	3.50	1.18	0.00
45.00	3.50	1.18	0.00	305.00	3.50	1.18	0.00
50.00	3.50	1.18	0.00	310.00	3.50	1.18	0.00
55.00	3.50	1.18	0.00	315.00	3.50	1.18	0.00
60.00	3.50	1.18	0.00	320.00	3.50	1.18	0.00
65.00	3.50	1.18	0.00	325.00	3.50	1.18	0.00
70.00	3.50	1.18	0.00	330.00	3.50	1.18	0.00
75.00	3.50	1.18	0.00	335.00	3.50	1.18	0.00
80.00	3.50	1.18	0.00				
85.00	3.50	1.18	0.00				
90.00	3.50	1.18	0.00				
95.00	3.50	1.18	0.00				
100.00	3.50	1.18	0.00				
105.00	3.50	1.18	0.00				
110.00	3.50	1.18	0.00				
115.00	3.50	1.18	0.00				
120.00	3.50	1.18	0.00				
125.00	3.50	1.18	0.00				
130.00	3.50	1.18	0.00				
135.00	3.50	1.18	0.00				
140.00	3.50	1.18	0.00				
145.00	3.50	1.18	0.00				
150.00	3.50	1.18	0.00				
155.00	3.50	1.18	0.00				
160.00	3.50	1.18	0.00				
165.00	3.50	1.18	0.00				
170.00	3.50	1.18	0.00				
175.00	3.50	1.18	0.00				
180.00	3.50	1.18	0.00				
185.00	3.50	1.18	0.00				
190.00	3.50	1.18	0.00				
195.00	3.50	1.18	0.00				
200.00	3.50	1.18	0.00				
205.00	3.50	1.18	0.00				
210.00	3.50	1.18	0.00				
215.00	3.50	1.18	0.00				
220.00	3.50	1.18	0.00				
225.00	3.50	1.18	0.00				
230.00	3.50	1.18	0.00				
235.00	3.50	1.18	0.00				
240.00	3.50	1.18	0.00				
245.00	3.50	1.18	0.00				
250.00	3.50	1.18	0.00				
255.00	3.50	1.18	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX 1J: EX 1J

Runoff = 13.15 cfs @ 12.14 hrs, Volume= 1.087 af, Depth= 1.24"

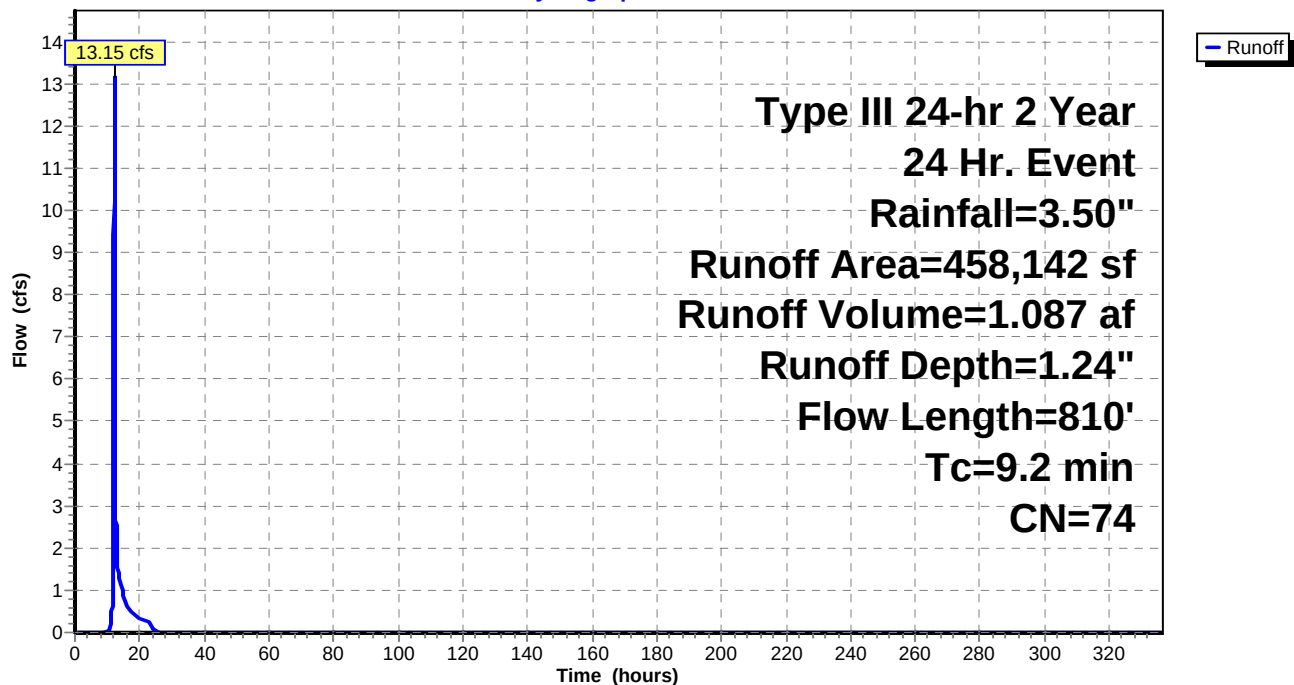
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
24,916	98	Paved parking, HSG B
392,231	74	>75% Grass cover, Good, HSG C
10,926	61	>75% Grass cover, Good, HSG B
30,069	60	Woods, Fair, HSG B
458,142	74	Weighted Average
433,226		94.56% Pervious Area
24,916		5.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
4.6	710	0.1380	2.60		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	810	Total			

Subcatchment EX 1J: EX 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 1J: EX 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.24	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.24	0.00
10.00	0.66	0.00	0.00	270.00	3.50	1.24	0.00
15.00	2.99	0.90	0.92	275.00	3.50	1.24	0.00
20.00	3.35	1.14	0.33	280.00	3.50	1.24	0.00
25.00	3.50	1.24	0.00	285.00	3.50	1.24	0.00
30.00	3.50	1.24	0.00	290.00	3.50	1.24	0.00
35.00	3.50	1.24	0.00	295.00	3.50	1.24	0.00
40.00	3.50	1.24	0.00	300.00	3.50	1.24	0.00
45.00	3.50	1.24	0.00	305.00	3.50	1.24	0.00
50.00	3.50	1.24	0.00	310.00	3.50	1.24	0.00
55.00	3.50	1.24	0.00	315.00	3.50	1.24	0.00
60.00	3.50	1.24	0.00	320.00	3.50	1.24	0.00
65.00	3.50	1.24	0.00	325.00	3.50	1.24	0.00
70.00	3.50	1.24	0.00	330.00	3.50	1.24	0.00
75.00	3.50	1.24	0.00	335.00	3.50	1.24	0.00
80.00	3.50	1.24	0.00				
85.00	3.50	1.24	0.00				
90.00	3.50	1.24	0.00				
95.00	3.50	1.24	0.00				
100.00	3.50	1.24	0.00				
105.00	3.50	1.24	0.00				
110.00	3.50	1.24	0.00				
115.00	3.50	1.24	0.00				
120.00	3.50	1.24	0.00				
125.00	3.50	1.24	0.00				
130.00	3.50	1.24	0.00				
135.00	3.50	1.24	0.00				
140.00	3.50	1.24	0.00				
145.00	3.50	1.24	0.00				
150.00	3.50	1.24	0.00				
155.00	3.50	1.24	0.00				
160.00	3.50	1.24	0.00				
165.00	3.50	1.24	0.00				
170.00	3.50	1.24	0.00				
175.00	3.50	1.24	0.00				
180.00	3.50	1.24	0.00				
185.00	3.50	1.24	0.00				
190.00	3.50	1.24	0.00				
195.00	3.50	1.24	0.00				
200.00	3.50	1.24	0.00				
205.00	3.50	1.24	0.00				
210.00	3.50	1.24	0.00				
215.00	3.50	1.24	0.00				
220.00	3.50	1.24	0.00				
225.00	3.50	1.24	0.00				
230.00	3.50	1.24	0.00				
235.00	3.50	1.24	0.00				
240.00	3.50	1.24	0.00				
245.00	3.50	1.24	0.00				
250.00	3.50	1.24	0.00				
255.00	3.50	1.24	0.00				

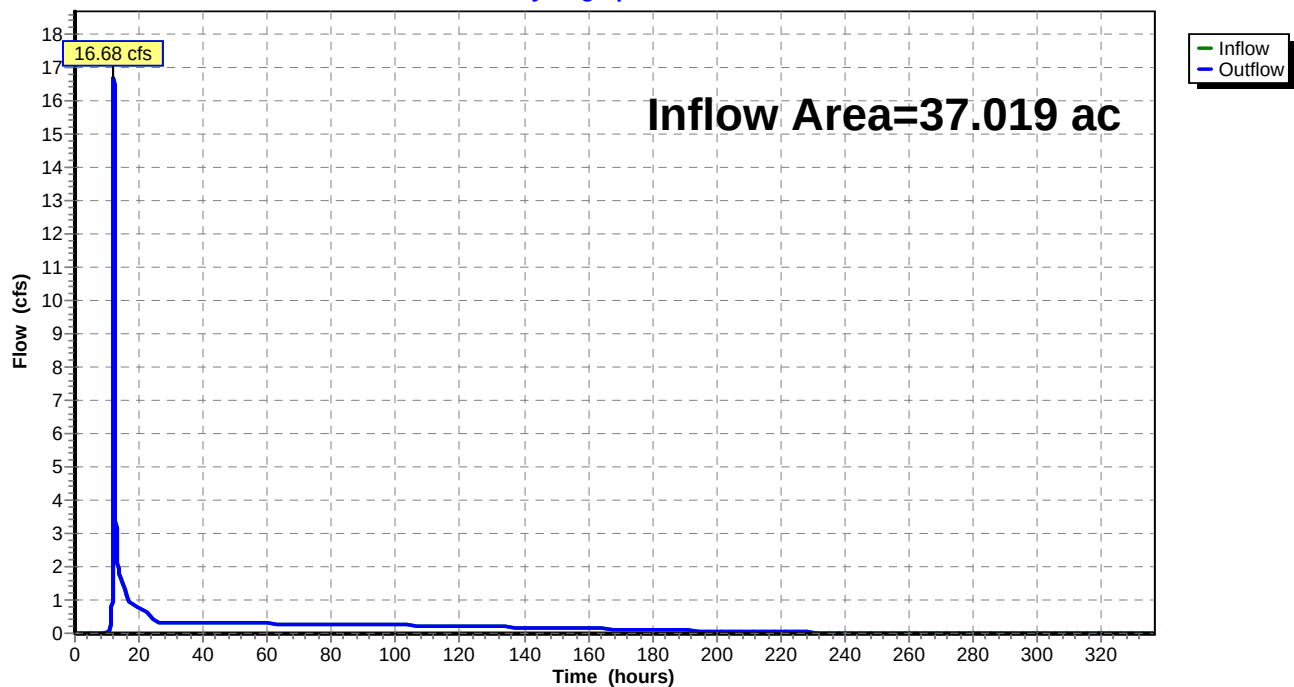
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 37.019 ac, 33.06% Impervious, Inflow Depth > 1.62" for 2 Year, 24 Hr. Event event
Inflow = 16.68 cfs @ 12.14 hrs, Volume= 4.994 af
Outflow = 16.68 cfs @ 12.14 hrs, Volume= 4.994 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.01		0.01
5.00	0.00		0.00	265.00	0.01		0.01
10.00	0.01		0.01	270.00	0.01		0.01
15.00	1.45		1.45	275.00	0.01		0.01
20.00	0.73		0.73	280.00	0.01		0.01
25.00	0.32		0.32	285.00	0.01		0.01
30.00	0.31		0.31	290.00	0.01		0.01
35.00	0.31		0.31	295.00	0.01		0.01
40.00	0.31		0.31	300.00	0.01		0.01
45.00	0.30		0.30	305.00	0.01		0.01
50.00	0.30		0.30	310.00	0.01		0.01
55.00	0.30		0.30	315.00	0.01		0.01
60.00	0.29		0.29	320.00	0.01		0.01
65.00	0.29		0.29	325.00	0.00		0.00
70.00	0.28		0.28	330.00	0.00		0.00
75.00	0.28		0.28	335.00	0.00		0.00
80.00	0.27		0.27				
85.00	0.26		0.26				
90.00	0.26		0.26				
95.00	0.25		0.25				
100.00	0.24		0.24				
105.00	0.24		0.24				
110.00	0.23		0.23				
115.00	0.22		0.22				
120.00	0.21		0.21				
125.00	0.20		0.20				
130.00	0.20		0.20				
135.00	0.19		0.19				
140.00	0.18		0.18				
145.00	0.17		0.17				
150.00	0.16		0.16				
155.00	0.15		0.15				
160.00	0.14		0.14				
165.00	0.13		0.13				
170.00	0.12		0.12				
175.00	0.11		0.11				
180.00	0.10		0.10				
185.00	0.09		0.09				
190.00	0.09		0.09				
195.00	0.08		0.08				
200.00	0.07		0.07				
205.00	0.06		0.06				
210.00	0.05		0.05				
215.00	0.04		0.04				
220.00	0.03		0.03				
225.00	0.03		0.03				
230.00	0.03		0.03				
235.00	0.02		0.02				
240.00	0.02		0.02				
245.00	0.02		0.02				
250.00	0.02		0.02				
255.00	0.01		0.01				

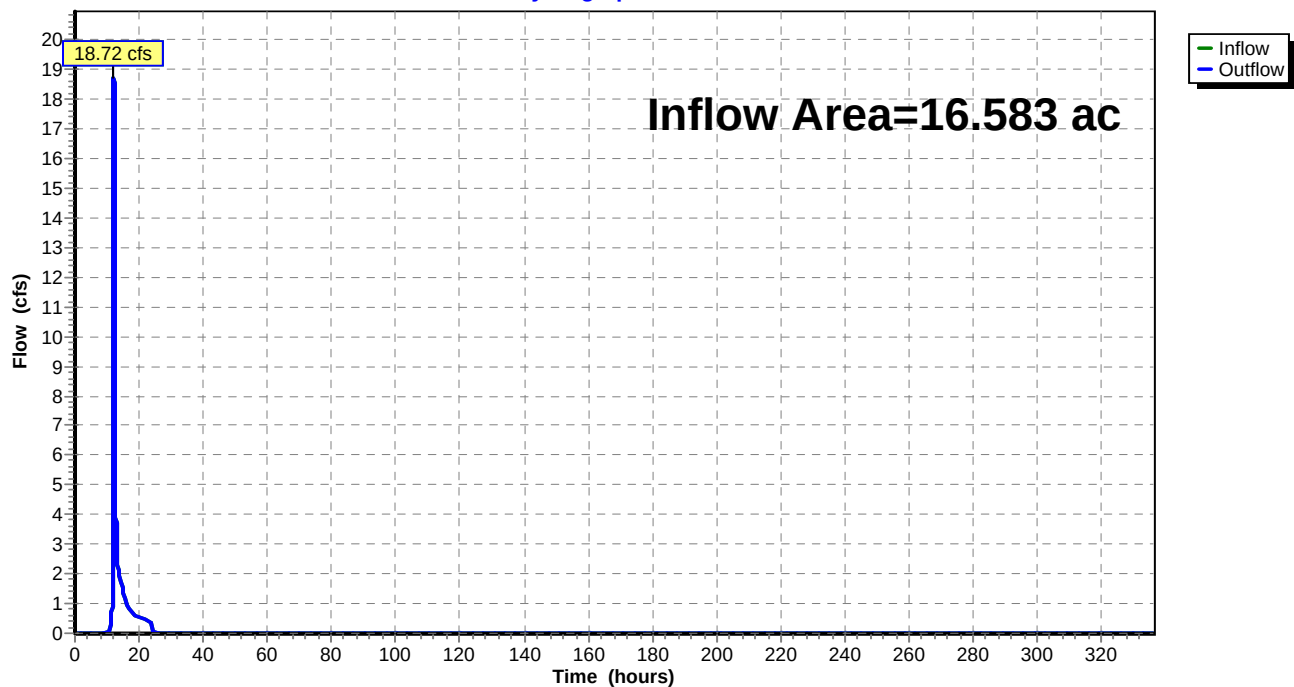
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 16.583 ac, 5.82% Impervious, Inflow Depth = 1.22" for 2 Year, 24 Hr. Event event
Inflow = 18.72 cfs @ 12.15 hrs, Volume= 1.683 af
Outflow = 18.72 cfs @ 12.15 hrs, Volume= 1.683 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.00		0.00	270.00	0.00		0.00
15.00	1.44		1.44	275.00	0.00		0.00
20.00	0.52		0.52	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Pond Pond 1: Pond 1

Inflow Area = 10.536 ac, 37.25% Impervious, Inflow Depth = 1.86" for 2 Year, 24 Hr. Event event
 Inflow = 23.80 cfs @ 12.08 hrs, Volume= 1.632 af
 Outflow = 1.38 cfs @ 14.29 hrs, Volume= 1.614 af, Atten= 94%, Lag= 132.7 min
 Primary = 1.38 cfs @ 14.29 hrs, Volume= 1.614 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 699.00' Surf.Area= 40,289 sf Storage= 141,809 cf

Peak Elev= 700.09' @ 14.29 hrs Surf.Area= 44,001 sf Storage= 187,594 cf (45,784 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 1,937.6 min (2,765.4 - 827.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	694.00'	278,293 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)
694.00	17,243	647.0	0	0	17,243
696.00	22,625	697.0	39,746	39,746	22,757
697.00	33,800	793.0	28,026	67,773	34,164
698.00	37,016	823.0	35,396	103,168	38,106
700.00	43,701	867.0	80,625	183,793	44,260
702.00	50,890	917.0	94,500	278,293	51,579

Device	Routing	Invert	Outlet Devices
#1	Primary	692.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 680.00' S= 0.1200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	700.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	699.00'	3.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.38 cfs @ 14.29 hrs HW=700.09' TW=588.30' (Dynamic Tailwater)

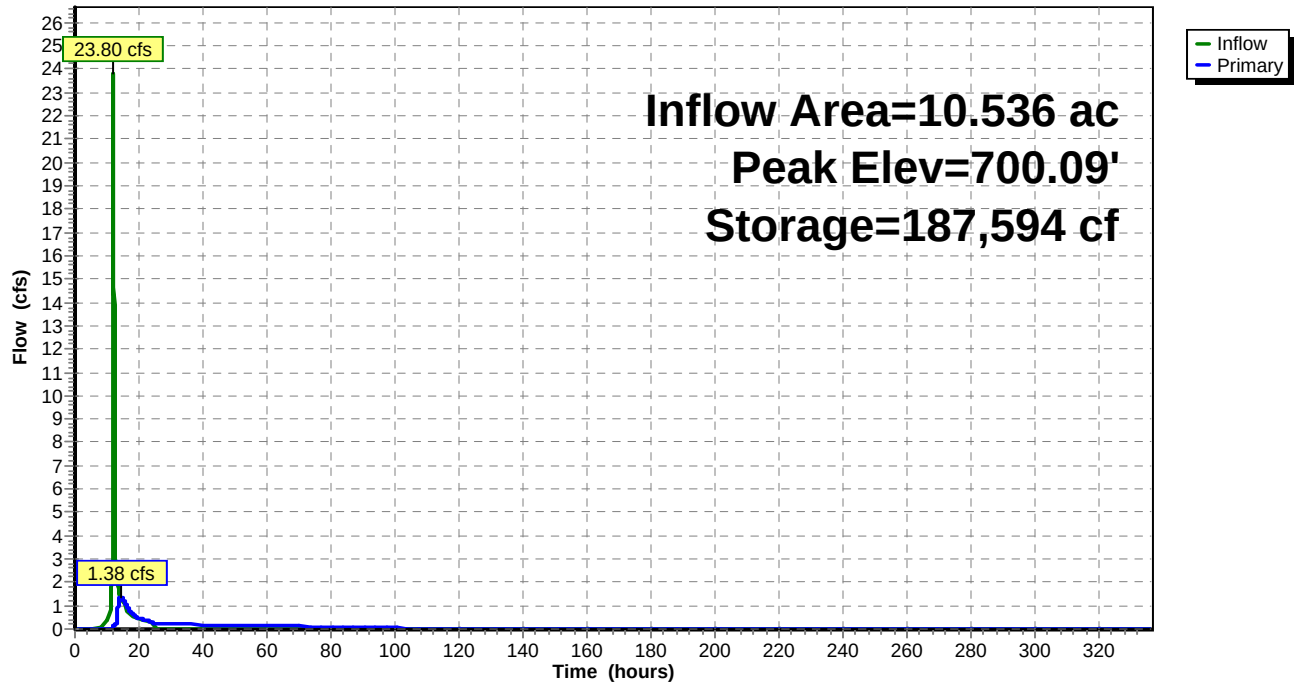
1=Culvert (Passes 1.38 cfs of 61.80 cfs potential flow)

2=Broad-Crested Rectangular Weir (Weir Controls 1.14 cfs @ 0.82 fps)

3=Orifice/Grate (Orifice Controls 0.23 cfs @ 4.72 fps)

Pond Pond 1: Pond 1

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Pond Pond 1: Pond 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	141,809	699.00	0.00
10.00	0.35	142,762	699.02	0.00
20.00	0.41	185,113	700.03	0.46
30.00	0.00	179,781	699.91	0.21
40.00	0.00	172,672	699.74	0.19
50.00	0.00	166,408	699.60	0.16
60.00	0.00	161,000	699.47	0.14
70.00	0.00	156,456	699.36	0.11
80.00	0.00	152,784	699.27	0.09
90.00	0.00	149,988	699.20	0.06
100.00	0.00	148,082	699.15	0.04
110.00	0.00	146,812	699.12	0.03
120.00	0.00	145,935	699.10	0.02
130.00	0.00	145,303	699.09	0.02
140.00	0.00	144,829	699.07	0.01
150.00	0.00	144,464	699.07	0.01
160.00	0.00	144,174	699.06	0.01
170.00	0.00	143,939	699.05	0.01
180.00	0.00	143,745	699.05	0.00
190.00	0.00	143,583	699.04	0.00
200.00	0.00	143,445	699.04	0.00
210.00	0.00	143,326	699.04	0.00
220.00	0.00	143,223	699.04	0.00
230.00	0.00	143,133	699.03	0.00
240.00	0.00	143,054	699.03	0.00
250.00	0.00	142,983	699.03	0.00
260.00	0.00	142,920	699.03	0.00
270.00	0.00	142,863	699.03	0.00
280.00	0.00	142,812	699.02	0.00
290.00	0.00	142,765	699.02	0.00
300.00	0.00	142,722	699.02	0.00
310.00	0.00	142,683	699.02	0.00
320.00	0.00	142,647	699.02	0.00
330.00	0.00	142,614	699.02	0.00

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Stage-Area-Storage for Pond Pond 1: Pond 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
694.00	17,243	0	699.20	40,960	149,934
694.10	17,495	1,737	699.30	41,298	154,047
694.20	17,748	3,499	699.40	41,637	158,194
694.30	18,004	5,287	699.50	41,978	162,375
694.40	18,261	7,100	699.60	42,320	166,590
694.50	18,520	8,939	699.70	42,663	170,839
694.60	18,781	10,804	699.80	43,008	175,122
694.70	19,044	12,695	699.90	43,354	179,440
694.80	19,308	14,613	700.00	43,701	183,793
694.90	19,575	16,557	700.10	44,047	188,180
695.00	19,843	18,528	700.20	44,395	192,602
695.10	20,113	20,525	700.30	44,744	197,059
695.20	20,385	22,550	700.40	45,095	201,551
695.30	20,658	24,602	700.50	45,447	206,079
695.40	20,934	26,682	700.60	45,800	210,641
695.50	21,211	28,789	700.70	46,155	215,239
695.60	21,490	30,924	700.80	46,511	219,872
695.70	21,771	33,087	700.90	46,868	224,541
695.80	22,054	35,279	701.00	47,227	229,246
695.90	22,339	37,498	701.10	47,587	233,986
696.00	22,625	39,746	701.20	47,949	238,763
696.10	23,642	42,060	701.30	48,312	243,576
696.20	24,681	44,475	701.40	48,676	248,425
696.30	25,743	46,996	701.50	49,041	253,311
696.40	26,827	49,625	701.60	49,408	258,234
696.50	27,933	52,363	701.70	49,777	263,193
696.60	29,062	55,212	701.80	50,146	268,189
696.70	30,213	58,176	701.90	50,518	273,222
696.80	31,386	61,255	702.00	50,890	278,293
696.90	32,582	64,454			
697.00	33,800	67,773			
697.10	34,115	71,168			
697.20	34,432	74,596			
697.30	34,749	78,055			
697.40	35,069	81,546			
697.50	35,390	85,068			
697.60	35,712	88,624			
697.70	36,036	92,211			
697.80	36,361	95,831			
697.90	36,688	99,483			
698.00	37,016	103,168			
698.10	37,337	106,886			
698.20	37,660	110,636			
698.30	37,983	114,418			
698.40	38,309	118,233			
698.50	38,635	122,080			
698.60	38,963	125,960			
698.70	39,293	129,872			
698.80	39,623	133,818			
698.90	39,956	137,797			
699.00	40,289	141,809			
699.10	40,624	145,855			

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Pond Pond 2: Pond 2

Inflow Area = 23.503 ac, 45.59% Impervious, Inflow Depth = 1.86" for 2 Year, 24 Hr. Event event
 Inflow = 29.73 cfs @ 12.04 hrs, Volume= 3.646 af
 Outflow = 0.32 cfs @ 24.13 hrs, Volume= 3.598 af, Atten= 99%, Lag= 725.6 min
 Primary = 0.32 cfs @ 24.13 hrs, Volume= 3.598 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 587.00' Surf.Area= 47,444 sf Storage= 230,092 cf

Peak Elev= 588.92' @ 24.13 hrs Surf.Area= 59,070 sf Storage= 334,341 cf (104,250 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 4,076.8 min (5,756.5 - 1,679.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	580.00'	534,329 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)
580.00	22,976	626.0	0	0	22,976
582.00	28,191	676.0	51,078	51,078	28,318
584.00	33,801	726.0	61,907	112,985	34,069
586.00	39,814	776.0	73,533	186,518	40,232
588.00	55,742	900.0	95,110	281,629	56,854
590.00	63,113	946.0	118,779	400,408	63,859
592.00	70,884	996.0	133,922	534,329	71,827

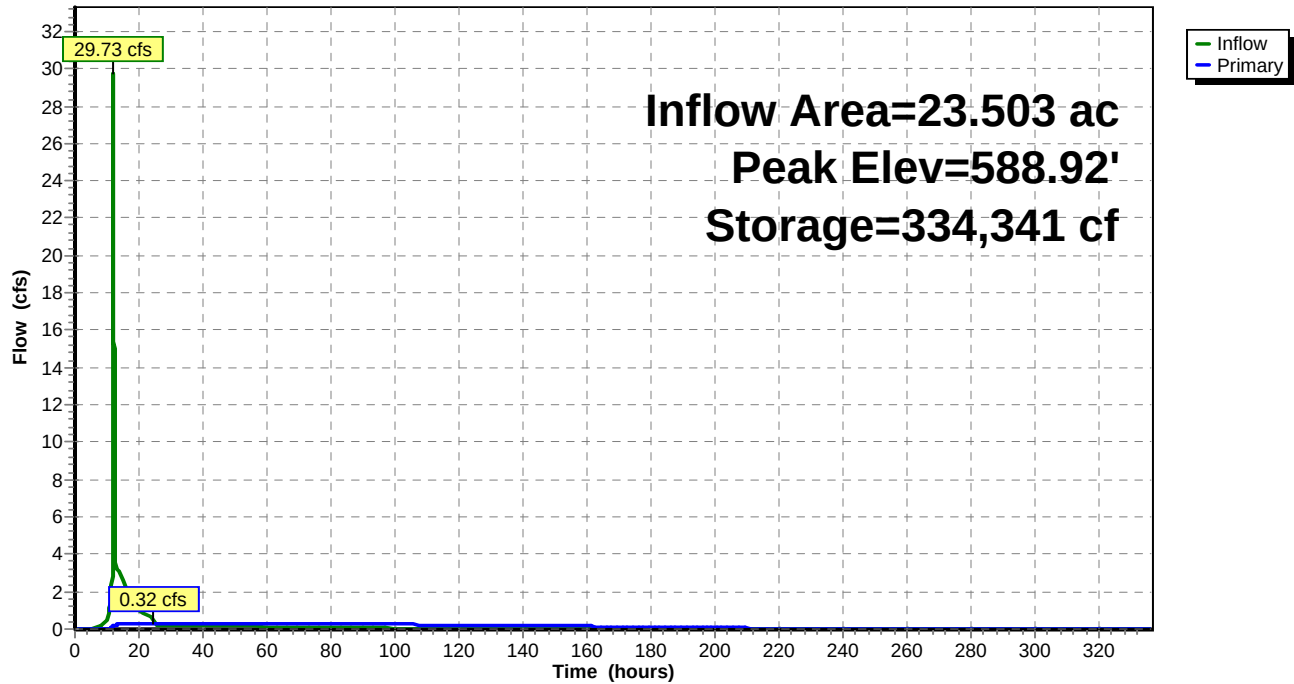
Device	Routing	Invert	Outlet Devices
#1	Primary	579.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 578.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	587.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	590.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.32 cfs @ 24.13 hrs HW=588.92' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.32 cfs of 69.59 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.32 cfs @ 6.45 fps)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pond 2: Pond 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Pond Pond 2: Pond 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	230,092	587.00	0.00
10.00	0.53	232,980	587.06	0.01
20.00	0.95	327,458	588.80	0.31
30.00	0.21	332,320	588.88	0.31
40.00	0.19	328,252	588.81	0.31
50.00	0.16	323,584	588.74	0.30
60.00	0.14	318,344	588.65	0.29
70.00	0.11	312,568	588.55	0.28
80.00	0.09	306,293	588.44	0.27
90.00	0.06	299,566	588.32	0.26
100.00	0.04	292,424	588.19	0.24
110.00	0.03	285,173	588.06	0.23
120.00	0.02	278,095	587.94	0.21
130.00	0.02	271,364	587.81	0.20
140.00	0.01	265,091	587.70	0.18
150.00	0.01	259,348	587.59	0.16
160.00	0.01	254,182	587.49	0.14
170.00	0.01	249,630	587.40	0.12
180.00	0.00	245,717	587.32	0.10
190.00	0.00	242,462	587.26	0.09
200.00	0.00	239,872	587.20	0.07
210.00	0.00	237,984	587.16	0.05
220.00	0.00	236,634	587.14	0.03
230.00	0.00	235,649	587.12	0.03
240.00	0.00	234,910	587.10	0.02
250.00	0.00	234,339	587.09	0.02
260.00	0.00	233,887	587.08	0.01
270.00	0.00	233,522	587.07	0.01
280.00	0.00	233,222	587.07	0.01
290.00	0.00	232,971	587.06	0.01
300.00	0.00	232,757	587.06	0.01
310.00	0.00	232,574	587.05	0.01
320.00	0.00	232,415	587.05	0.01
330.00	0.00	232,276	587.05	0.00

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Stage-Area-Storage for Pond Pond 2: Pond 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
580.00	22,976	0	587.80	54,029	270,652
580.15	23,349	3,474	587.95	55,311	278,852
580.30	23,724	7,005	588.10	56,100	287,221
580.45	24,103	10,592	588.25	56,638	295,676
580.60	24,485	14,236	588.40	57,180	304,212
580.75	24,869	17,937	588.55	57,723	312,830
580.90	25,257	21,697	588.70	58,270	321,530
581.05	25,647	25,514	588.85	58,819	330,311
581.20	26,041	29,391	589.00	59,370	339,175
581.35	26,438	33,327	589.15	59,924	348,122
581.50	26,837	37,322	589.30	60,481	357,153
581.65	27,240	41,378	589.45	61,040	366,267
581.80	27,646	45,495	589.60	61,602	375,465
581.95	28,054	49,672	589.75	62,167	384,748
582.10	28,459	53,911	589.90	62,734	394,115
582.25	28,864	58,210	590.05	63,302	403,568
582.40	29,272	62,570	590.20	63,870	413,106
582.55	29,683	66,992	590.35	64,440	422,729
582.70	30,097	71,475	590.50	65,013	432,438
582.85	30,513	76,021	590.65	65,589	442,233
583.00	30,932	80,629	590.80	66,167	452,115
583.15	31,355	85,301	590.95	66,748	462,083
583.30	31,780	90,036	591.10	67,331	472,139
583.45	32,208	94,835	591.25	67,917	482,283
583.60	32,638	99,698	591.40	68,505	492,515
583.75	33,072	104,626	591.55	69,096	502,835
583.90	33,508	109,620	591.70	69,690	513,244
584.05	33,945	114,679	591.85	70,286	523,742
584.20	34,380	119,803	592.00	70,884	534,329
584.35	34,818	124,993			
584.50	35,258	130,249			
584.65	35,701	135,571			
584.80	36,147	140,959			
584.95	36,596	146,415			
585.10	37,047	151,938			
585.25	37,501	157,529			
585.40	37,958	163,189			
585.55	38,418	168,917			
585.70	38,881	174,714			
585.85	39,346	180,581			
586.00	39,814	186,518			
586.15	40,916	192,573			
586.30	42,033	198,794			
586.45	43,165	205,184			
586.60	44,312	211,744			
586.75	45,474	218,478			
586.90	46,651	225,387			
587.05	47,843	232,474			
587.20	49,050	239,741			
587.35	50,272	247,189			
587.50	51,509	254,823			
587.65	52,762	262,643			

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1B: PROP DA 1B

Runoff = 46.11 cfs @ 12.07 hrs, Volume= 3.187 af, Depth= 3.63"

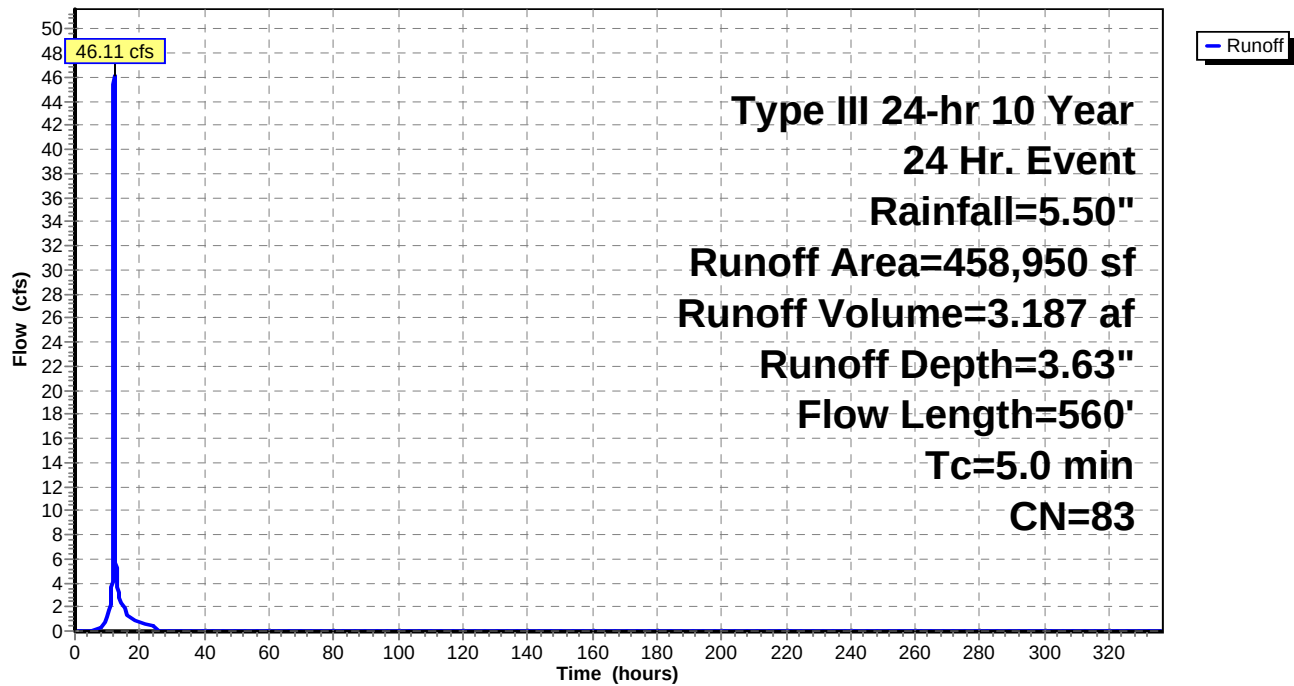
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
170,936	98	Paved parking & roofs
288,014	74	>75% Grass cover, Good, HSG C
458,950	83	Weighted Average
288,014		62.75% Pervious Area
170,936		37.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.1200	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.6	164	0.0850	4.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	150	0.0800	5.74		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	196	0.0410	14.58	45.81	Pipe Channel, Street System 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
5.0	560	Total			

Subcatchment 1B: PROP DA 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1B: PROP DA 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.63	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.63	0.00
10.00	1.04	0.15	1.14	270.00	5.50	3.63	0.00
15.00	4.70	2.90	2.01	275.00	5.50	3.63	0.00
20.00	5.26	3.41	0.70	280.00	5.50	3.63	0.00
25.00	5.50	3.63	0.00	285.00	5.50	3.63	0.00
30.00	5.50	3.63	0.00	290.00	5.50	3.63	0.00
35.00	5.50	3.63	0.00	295.00	5.50	3.63	0.00
40.00	5.50	3.63	0.00	300.00	5.50	3.63	0.00
45.00	5.50	3.63	0.00	305.00	5.50	3.63	0.00
50.00	5.50	3.63	0.00	310.00	5.50	3.63	0.00
55.00	5.50	3.63	0.00	315.00	5.50	3.63	0.00
60.00	5.50	3.63	0.00	320.00	5.50	3.63	0.00
65.00	5.50	3.63	0.00	325.00	5.50	3.63	0.00
70.00	5.50	3.63	0.00	330.00	5.50	3.63	0.00
75.00	5.50	3.63	0.00	335.00	5.50	3.63	0.00
80.00	5.50	3.63	0.00				
85.00	5.50	3.63	0.00				
90.00	5.50	3.63	0.00				
95.00	5.50	3.63	0.00				
100.00	5.50	3.63	0.00				
105.00	5.50	3.63	0.00				
110.00	5.50	3.63	0.00				
115.00	5.50	3.63	0.00				
120.00	5.50	3.63	0.00				
125.00	5.50	3.63	0.00				
130.00	5.50	3.63	0.00				
135.00	5.50	3.63	0.00				
140.00	5.50	3.63	0.00				
145.00	5.50	3.63	0.00				
150.00	5.50	3.63	0.00				
155.00	5.50	3.63	0.00				
160.00	5.50	3.63	0.00				
165.00	5.50	3.63	0.00				
170.00	5.50	3.63	0.00				
175.00	5.50	3.63	0.00				
180.00	5.50	3.63	0.00				
185.00	5.50	3.63	0.00				
190.00	5.50	3.63	0.00				
195.00	5.50	3.63	0.00				
200.00	5.50	3.63	0.00				
205.00	5.50	3.63	0.00				
210.00	5.50	3.63	0.00				
215.00	5.50	3.63	0.00				
220.00	5.50	3.63	0.00				
225.00	5.50	3.63	0.00				
230.00	5.50	3.63	0.00				
235.00	5.50	3.63	0.00				
240.00	5.50	3.63	0.00				
245.00	5.50	3.63	0.00				
250.00	5.50	3.63	0.00				
255.00	5.50	3.63	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1C: PROP DA 1C

Runoff = 28.16 cfs @ 12.03 hrs, Volume= 1.724 af, Depth= 3.14"

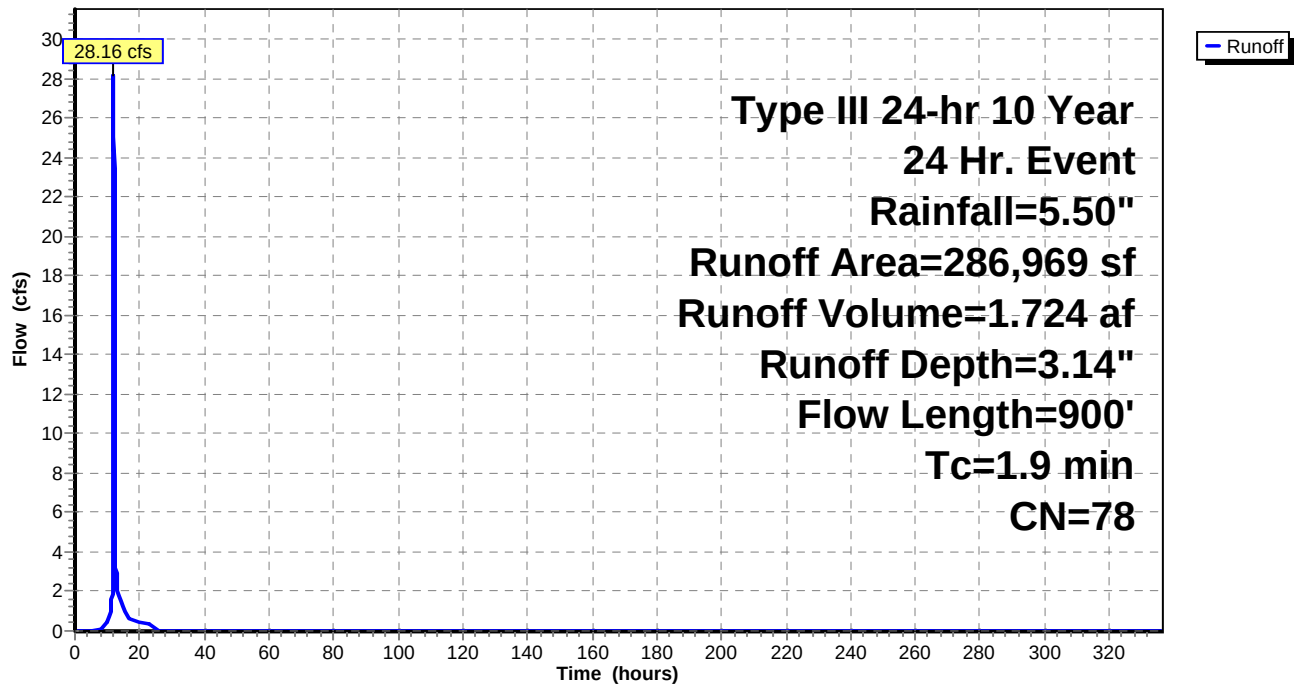
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
151,873	61	>75% Grass cover, Good, HSG B
135,096	98	Paved parking & roofs
286,969	78	Weighted Average
151,873		52.92% Pervious Area
135,096		47.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.44		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.50"
0.7	800	0.0750	19.72	61.95	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.9	900	Total			

Subcatchment 1C: PROP DA 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1C: PROP DA 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.14	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.14	0.00
10.00	1.04	0.07	0.47	270.00	5.50	3.14	0.00
15.00	4.70	2.46	1.15	275.00	5.50	3.14	0.00
20.00	5.26	2.94	0.41	280.00	5.50	3.14	0.00
25.00	5.50	3.14	0.00	285.00	5.50	3.14	0.00
30.00	5.50	3.14	0.00	290.00	5.50	3.14	0.00
35.00	5.50	3.14	0.00	295.00	5.50	3.14	0.00
40.00	5.50	3.14	0.00	300.00	5.50	3.14	0.00
45.00	5.50	3.14	0.00	305.00	5.50	3.14	0.00
50.00	5.50	3.14	0.00	310.00	5.50	3.14	0.00
55.00	5.50	3.14	0.00	315.00	5.50	3.14	0.00
60.00	5.50	3.14	0.00	320.00	5.50	3.14	0.00
65.00	5.50	3.14	0.00	325.00	5.50	3.14	0.00
70.00	5.50	3.14	0.00	330.00	5.50	3.14	0.00
75.00	5.50	3.14	0.00	335.00	5.50	3.14	0.00
80.00	5.50	3.14	0.00				
85.00	5.50	3.14	0.00				
90.00	5.50	3.14	0.00				
95.00	5.50	3.14	0.00				
100.00	5.50	3.14	0.00				
105.00	5.50	3.14	0.00				
110.00	5.50	3.14	0.00				
115.00	5.50	3.14	0.00				
120.00	5.50	3.14	0.00				
125.00	5.50	3.14	0.00				
130.00	5.50	3.14	0.00				
135.00	5.50	3.14	0.00				
140.00	5.50	3.14	0.00				
145.00	5.50	3.14	0.00				
150.00	5.50	3.14	0.00				
155.00	5.50	3.14	0.00				
160.00	5.50	3.14	0.00				
165.00	5.50	3.14	0.00				
170.00	5.50	3.14	0.00				
175.00	5.50	3.14	0.00				
180.00	5.50	3.14	0.00				
185.00	5.50	3.14	0.00				
190.00	5.50	3.14	0.00				
195.00	5.50	3.14	0.00				
200.00	5.50	3.14	0.00				
205.00	5.50	3.14	0.00				
210.00	5.50	3.14	0.00				
215.00	5.50	3.14	0.00				
220.00	5.50	3.14	0.00				
225.00	5.50	3.14	0.00				
230.00	5.50	3.14	0.00				
235.00	5.50	3.14	0.00				
240.00	5.50	3.14	0.00				
245.00	5.50	3.14	0.00				
250.00	5.50	3.14	0.00				
255.00	5.50	3.14	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1F: PROP DA 1F

Runoff = 17.19 cfs @ 12.13 hrs, Volume= 1.362 af, Depth= 2.77"

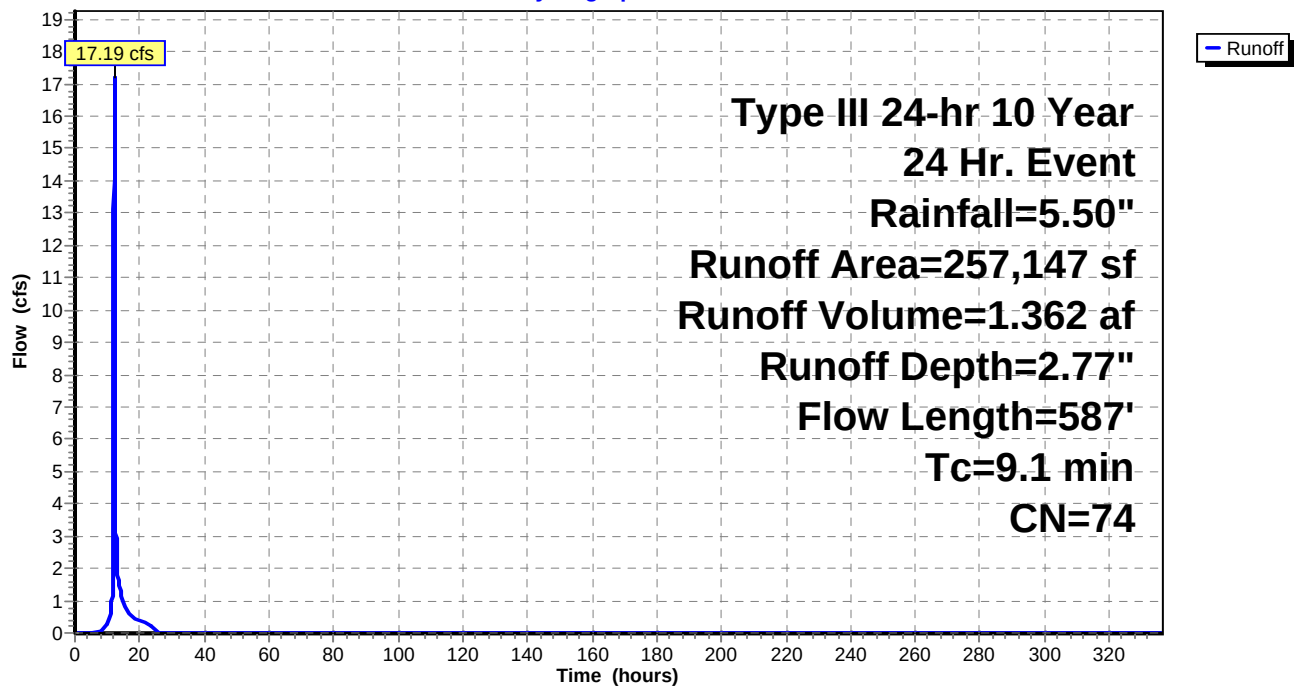
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
166,672	74	>75% Grass cover, Good, HSG C
31,625	98	Paved roads w/curbs & sewers, HSG B
58,850	61	>75% Grass cover, Good, HSG B
257,147	74	Weighted Average
225,522		87.70% Pervious Area
31,625		12.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	52	0.0220	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
1.3	535	0.1860	6.94		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.1	587	Total			

Subcatchment 1F: PROP DA 1F

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1F: PROP DA 1F

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.77	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.77	0.00
10.00	1.04	0.03	0.23	270.00	5.50	2.77	0.00
15.00	4.70	2.13	1.00	275.00	5.50	2.77	0.00
20.00	5.26	2.58	0.35	280.00	5.50	2.77	0.00
25.00	5.50	2.77	0.00	285.00	5.50	2.77	0.00
30.00	5.50	2.77	0.00	290.00	5.50	2.77	0.00
35.00	5.50	2.77	0.00	295.00	5.50	2.77	0.00
40.00	5.50	2.77	0.00	300.00	5.50	2.77	0.00
45.00	5.50	2.77	0.00	305.00	5.50	2.77	0.00
50.00	5.50	2.77	0.00	310.00	5.50	2.77	0.00
55.00	5.50	2.77	0.00	315.00	5.50	2.77	0.00
60.00	5.50	2.77	0.00	320.00	5.50	2.77	0.00
65.00	5.50	2.77	0.00	325.00	5.50	2.77	0.00
70.00	5.50	2.77	0.00	330.00	5.50	2.77	0.00
75.00	5.50	2.77	0.00	335.00	5.50	2.77	0.00
80.00	5.50	2.77	0.00				
85.00	5.50	2.77	0.00				
90.00	5.50	2.77	0.00				
95.00	5.50	2.77	0.00				
100.00	5.50	2.77	0.00				
105.00	5.50	2.77	0.00				
110.00	5.50	2.77	0.00				
115.00	5.50	2.77	0.00				
120.00	5.50	2.77	0.00				
125.00	5.50	2.77	0.00				
130.00	5.50	2.77	0.00				
135.00	5.50	2.77	0.00				
140.00	5.50	2.77	0.00				
145.00	5.50	2.77	0.00				
150.00	5.50	2.77	0.00				
155.00	5.50	2.77	0.00				
160.00	5.50	2.77	0.00				
165.00	5.50	2.77	0.00				
170.00	5.50	2.77	0.00				
175.00	5.50	2.77	0.00				
180.00	5.50	2.77	0.00				
185.00	5.50	2.77	0.00				
190.00	5.50	2.77	0.00				
195.00	5.50	2.77	0.00				
200.00	5.50	2.77	0.00				
205.00	5.50	2.77	0.00				
210.00	5.50	2.77	0.00				
215.00	5.50	2.77	0.00				
220.00	5.50	2.77	0.00				
225.00	5.50	2.77	0.00				
230.00	5.50	2.77	0.00				
235.00	5.50	2.77	0.00				
240.00	5.50	2.77	0.00				
245.00	5.50	2.77	0.00				
250.00	5.50	2.77	0.00				
255.00	5.50	2.77	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1G: PROP DA 1G

Runoff = 19.16 cfs @ 12.03 hrs, Volume= 1.268 af, Depth= 4.69"

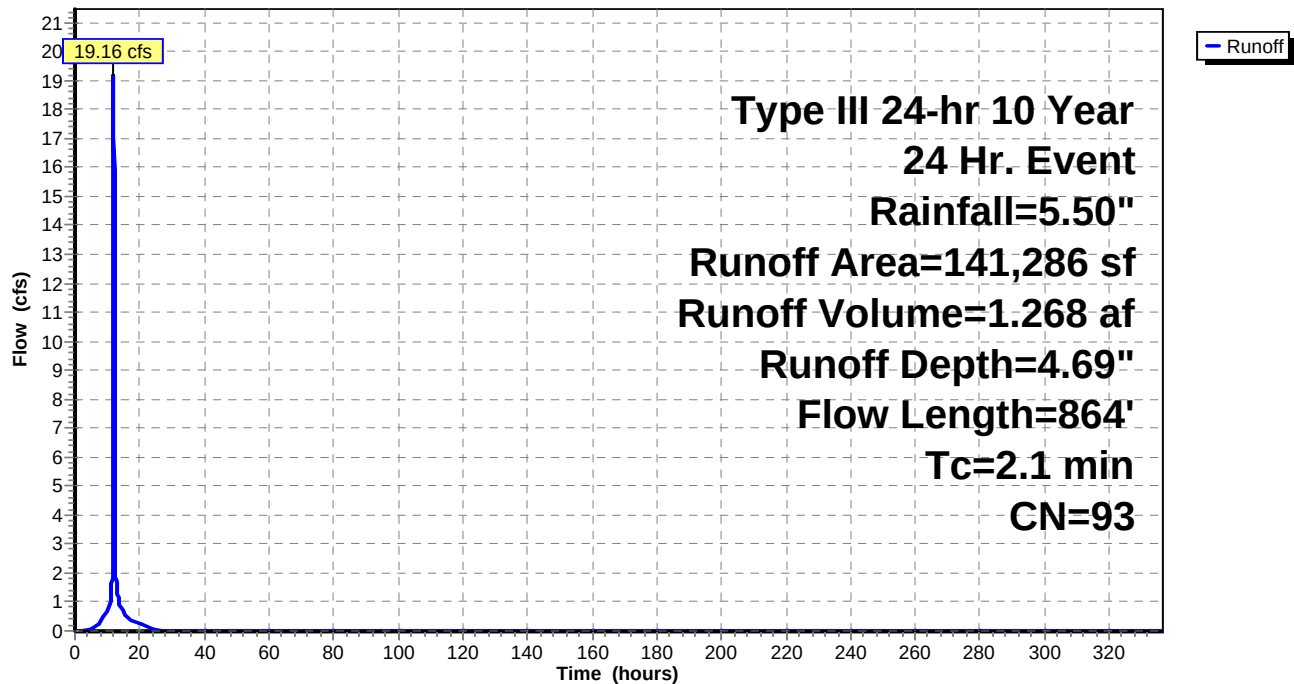
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
112,680	98	Paved parking & roofs
28,606	74	>75% Grass cover, Good, HSG C
141,286	93	Weighted Average
28,606		20.25% Pervious Area
112,680		79.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.08		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"
1.3	764	0.0180	9.66	30.35	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.1	864	Total			

Subcatchment 1G: PROP DA 1G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1G: PROP DA 1G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.69	0.00
5.00	0.31	0.03	0.08	265.00	5.50	4.69	0.00
10.00	1.04	0.48	0.69	270.00	5.50	4.69	0.00
15.00	4.70	3.90	0.67	275.00	5.50	4.69	0.00
20.00	5.26	4.46	0.23	280.00	5.50	4.69	0.00
25.00	5.50	4.69	0.00	285.00	5.50	4.69	0.00
30.00	5.50	4.69	0.00	290.00	5.50	4.69	0.00
35.00	5.50	4.69	0.00	295.00	5.50	4.69	0.00
40.00	5.50	4.69	0.00	300.00	5.50	4.69	0.00
45.00	5.50	4.69	0.00	305.00	5.50	4.69	0.00
50.00	5.50	4.69	0.00	310.00	5.50	4.69	0.00
55.00	5.50	4.69	0.00	315.00	5.50	4.69	0.00
60.00	5.50	4.69	0.00	320.00	5.50	4.69	0.00
65.00	5.50	4.69	0.00	325.00	5.50	4.69	0.00
70.00	5.50	4.69	0.00	330.00	5.50	4.69	0.00
75.00	5.50	4.69	0.00	335.00	5.50	4.69	0.00
80.00	5.50	4.69	0.00				
85.00	5.50	4.69	0.00				
90.00	5.50	4.69	0.00				
95.00	5.50	4.69	0.00				
100.00	5.50	4.69	0.00				
105.00	5.50	4.69	0.00				
110.00	5.50	4.69	0.00				
115.00	5.50	4.69	0.00				
120.00	5.50	4.69	0.00				
125.00	5.50	4.69	0.00				
130.00	5.50	4.69	0.00				
135.00	5.50	4.69	0.00				
140.00	5.50	4.69	0.00				
145.00	5.50	4.69	0.00				
150.00	5.50	4.69	0.00				
155.00	5.50	4.69	0.00				
160.00	5.50	4.69	0.00				
165.00	5.50	4.69	0.00				
170.00	5.50	4.69	0.00				
175.00	5.50	4.69	0.00				
180.00	5.50	4.69	0.00				
185.00	5.50	4.69	0.00				
190.00	5.50	4.69	0.00				
195.00	5.50	4.69	0.00				
200.00	5.50	4.69	0.00				
205.00	5.50	4.69	0.00				
210.00	5.50	4.69	0.00				
215.00	5.50	4.69	0.00				
220.00	5.50	4.69	0.00				
225.00	5.50	4.69	0.00				
230.00	5.50	4.69	0.00				
235.00	5.50	4.69	0.00				
240.00	5.50	4.69	0.00				
245.00	5.50	4.69	0.00				
250.00	5.50	4.69	0.00				
255.00	5.50	4.69	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1H: PROP 1H

Runoff = 11.53 cfs @ 12.10 hrs, Volume= 0.842 af, Depth= 3.43"

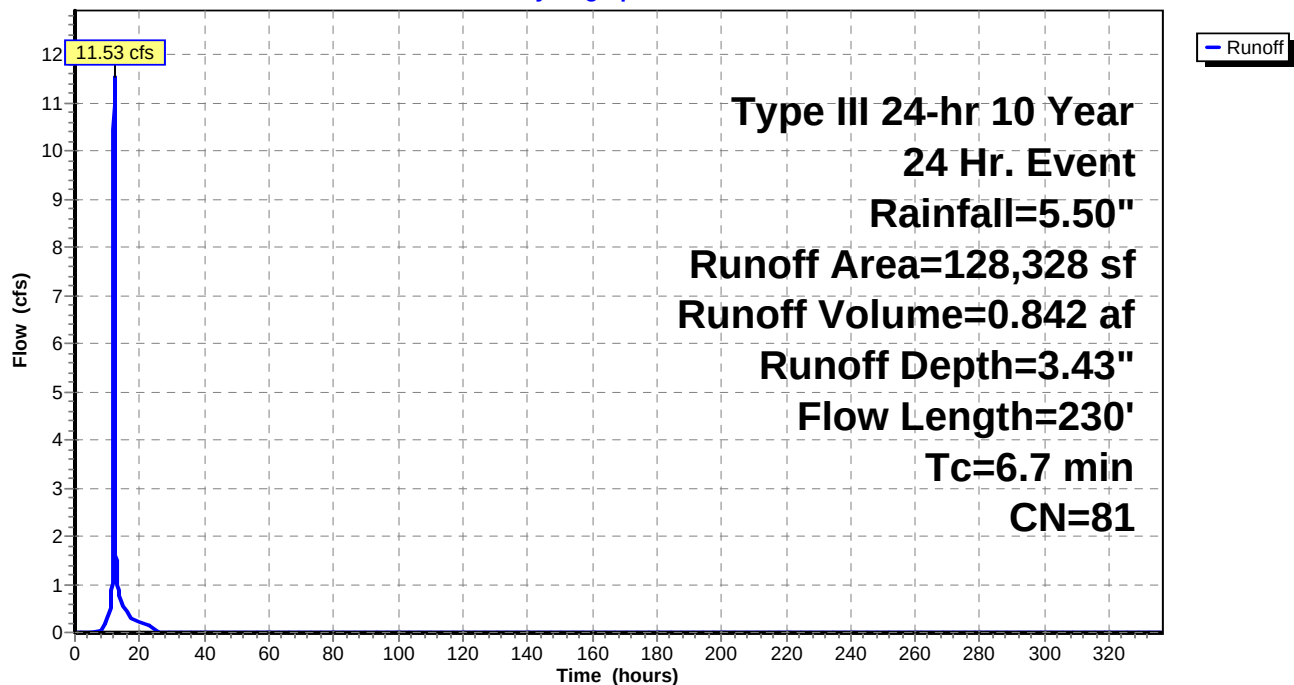
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
88,514	74	>75% Grass cover, Good, HSG C
39,814	98	Water Surface, HSG B
128,328	81	Weighted Average
88,514		68.97% Pervious Area
39,814		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.7	130	0.2000	3.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.7	230	Total			

Subcatchment 1H: PROP 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1H: PROP 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.43	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.43	0.00
10.00	1.04	0.11	0.27	270.00	5.50	3.43	0.00
15.00	4.70	2.72	0.55	275.00	5.50	3.43	0.00
20.00	5.26	3.22	0.19	280.00	5.50	3.43	0.00
25.00	5.50	3.43	0.00	285.00	5.50	3.43	0.00
30.00	5.50	3.43	0.00	290.00	5.50	3.43	0.00
35.00	5.50	3.43	0.00	295.00	5.50	3.43	0.00
40.00	5.50	3.43	0.00	300.00	5.50	3.43	0.00
45.00	5.50	3.43	0.00	305.00	5.50	3.43	0.00
50.00	5.50	3.43	0.00	310.00	5.50	3.43	0.00
55.00	5.50	3.43	0.00	315.00	5.50	3.43	0.00
60.00	5.50	3.43	0.00	320.00	5.50	3.43	0.00
65.00	5.50	3.43	0.00	325.00	5.50	3.43	0.00
70.00	5.50	3.43	0.00	330.00	5.50	3.43	0.00
75.00	5.50	3.43	0.00	335.00	5.50	3.43	0.00
80.00	5.50	3.43	0.00				
85.00	5.50	3.43	0.00				
90.00	5.50	3.43	0.00				
95.00	5.50	3.43	0.00				
100.00	5.50	3.43	0.00				
105.00	5.50	3.43	0.00				
110.00	5.50	3.43	0.00				
115.00	5.50	3.43	0.00				
120.00	5.50	3.43	0.00				
125.00	5.50	3.43	0.00				
130.00	5.50	3.43	0.00				
135.00	5.50	3.43	0.00				
140.00	5.50	3.43	0.00				
145.00	5.50	3.43	0.00				
150.00	5.50	3.43	0.00				
155.00	5.50	3.43	0.00				
160.00	5.50	3.43	0.00				
165.00	5.50	3.43	0.00				
170.00	5.50	3.43	0.00				
175.00	5.50	3.43	0.00				
180.00	5.50	3.43	0.00				
185.00	5.50	3.43	0.00				
190.00	5.50	3.43	0.00				
195.00	5.50	3.43	0.00				
200.00	5.50	3.43	0.00				
205.00	5.50	3.43	0.00				
210.00	5.50	3.43	0.00				
215.00	5.50	3.43	0.00				
220.00	5.50	3.43	0.00				
225.00	5.50	3.43	0.00				
230.00	5.50	3.43	0.00				
235.00	5.50	3.43	0.00				
240.00	5.50	3.43	0.00				
245.00	5.50	3.43	0.00				
250.00	5.50	3.43	0.00				
255.00	5.50	3.43	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1J: PROP 1J

Runoff = 21.27 cfs @ 12.15 hrs, Volume= 1.757 af, Depth= 2.77"

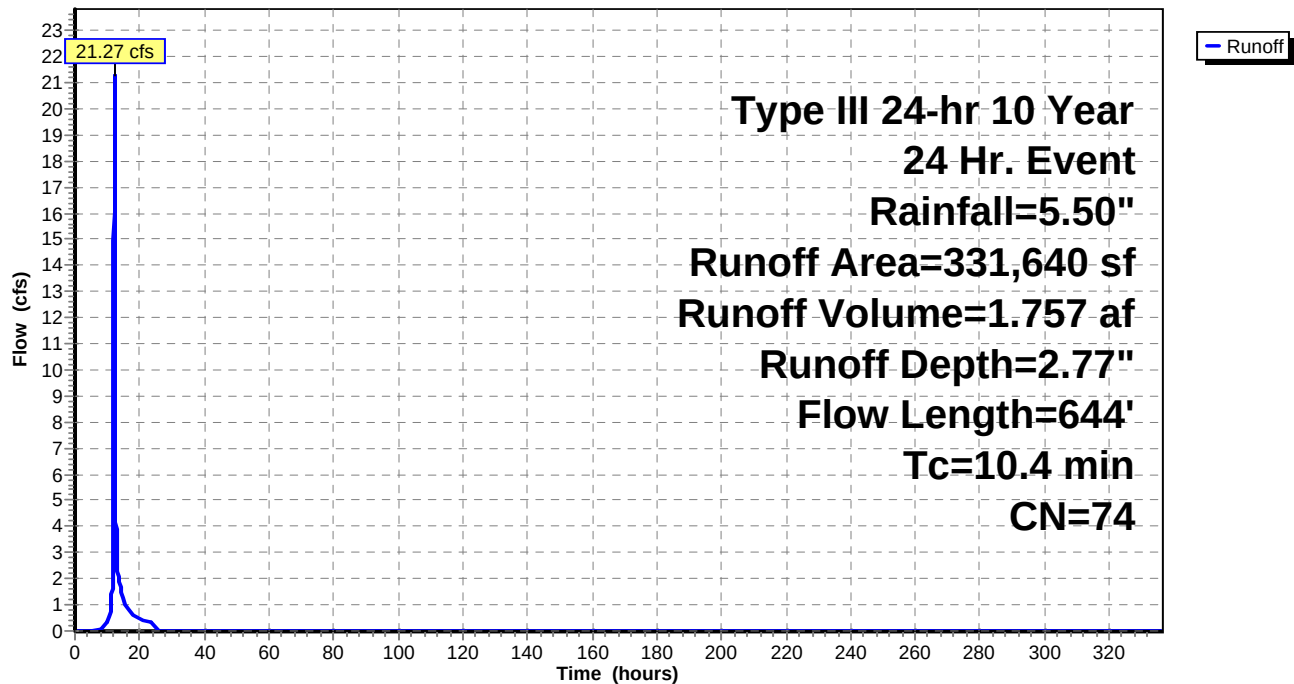
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
34,708	98	Paved parking, HSG B
241,872	74	>75% Grass cover, Good, HSG C
55,060	61	>75% Grass cover, Good, HSG B
331,640	74	Weighted Average
296,932		89.53% Pervious Area
34,708		10.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
3.2	544	0.1617	2.81		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.4	644	Total			

Subcatchment 1J: PROP 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1J: PROP 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.77	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.77	0.00
10.00	1.04	0.03	0.30	270.00	5.50	2.77	0.00
15.00	4.70	2.13	1.29	275.00	5.50	2.77	0.00
20.00	5.26	2.58	0.45	280.00	5.50	2.77	0.00
25.00	5.50	2.77	0.00	285.00	5.50	2.77	0.00
30.00	5.50	2.77	0.00	290.00	5.50	2.77	0.00
35.00	5.50	2.77	0.00	295.00	5.50	2.77	0.00
40.00	5.50	2.77	0.00	300.00	5.50	2.77	0.00
45.00	5.50	2.77	0.00	305.00	5.50	2.77	0.00
50.00	5.50	2.77	0.00	310.00	5.50	2.77	0.00
55.00	5.50	2.77	0.00	315.00	5.50	2.77	0.00
60.00	5.50	2.77	0.00	320.00	5.50	2.77	0.00
65.00	5.50	2.77	0.00	325.00	5.50	2.77	0.00
70.00	5.50	2.77	0.00	330.00	5.50	2.77	0.00
75.00	5.50	2.77	0.00	335.00	5.50	2.77	0.00
80.00	5.50	2.77	0.00				
85.00	5.50	2.77	0.00				
90.00	5.50	2.77	0.00				
95.00	5.50	2.77	0.00				
100.00	5.50	2.77	0.00				
105.00	5.50	2.77	0.00				
110.00	5.50	2.77	0.00				
115.00	5.50	2.77	0.00				
120.00	5.50	2.77	0.00				
125.00	5.50	2.77	0.00				
130.00	5.50	2.77	0.00				
135.00	5.50	2.77	0.00				
140.00	5.50	2.77	0.00				
145.00	5.50	2.77	0.00				
150.00	5.50	2.77	0.00				
155.00	5.50	2.77	0.00				
160.00	5.50	2.77	0.00				
165.00	5.50	2.77	0.00				
170.00	5.50	2.77	0.00				
175.00	5.50	2.77	0.00				
180.00	5.50	2.77	0.00				
185.00	5.50	2.77	0.00				
190.00	5.50	2.77	0.00				
195.00	5.50	2.77	0.00				
200.00	5.50	2.77	0.00				
205.00	5.50	2.77	0.00				
210.00	5.50	2.77	0.00				
215.00	5.50	2.77	0.00				
220.00	5.50	2.77	0.00				
225.00	5.50	2.77	0.00				
230.00	5.50	2.77	0.00				
235.00	5.50	2.77	0.00				
240.00	5.50	2.77	0.00				
245.00	5.50	2.77	0.00				
250.00	5.50	2.77	0.00				
255.00	5.50	2.77	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1M: PROP DA 1M

Runoff = 0.60 cfs @ 12.01 hrs, Volume= 0.040 af, Depth= 5.26"

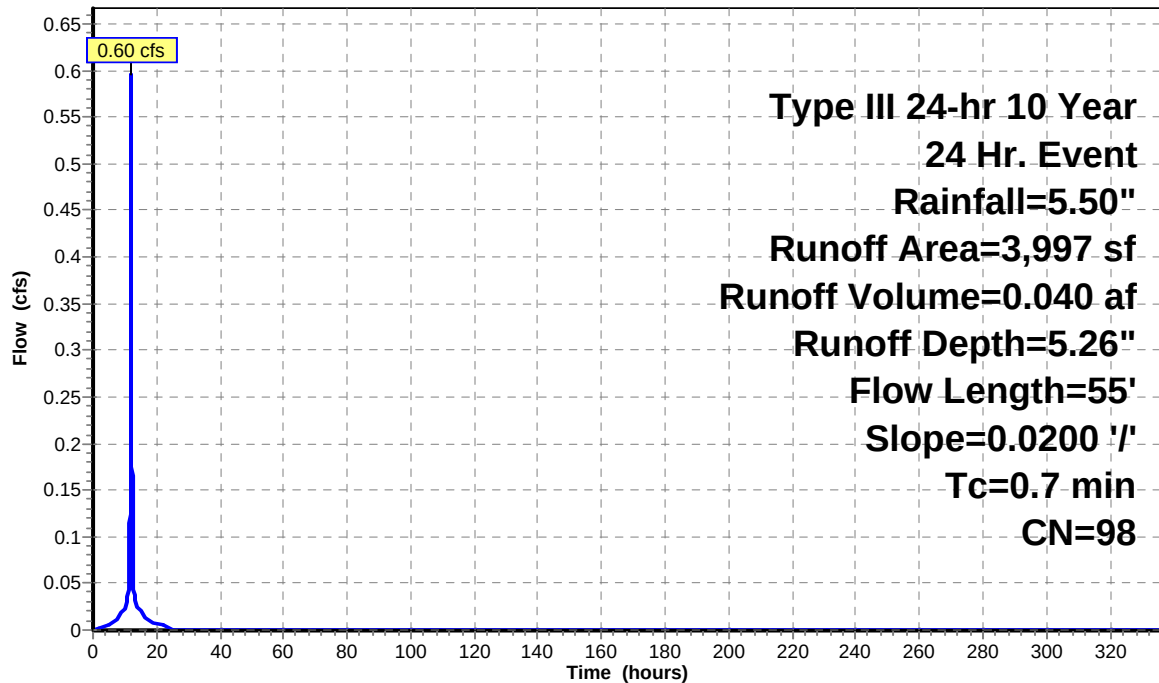
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
3,997	98	Roofs, HSG B
3,997		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.28		Sheet Flow, ROOF RUNOFF Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1M: PROP DA 1M

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1M: PROP DA 1M

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	5.26	0.00
5.00	0.31	0.15	0.01	265.00	5.50	5.26	0.00
10.00	1.04	0.83	0.02	270.00	5.50	5.26	0.00
15.00	4.70	4.46	0.02	275.00	5.50	5.26	0.00
20.00	5.26	5.03	0.01	280.00	5.50	5.26	0.00
25.00	5.50	5.26	0.00	285.00	5.50	5.26	0.00
30.00	5.50	5.26	0.00	290.00	5.50	5.26	0.00
35.00	5.50	5.26	0.00	295.00	5.50	5.26	0.00
40.00	5.50	5.26	0.00	300.00	5.50	5.26	0.00
45.00	5.50	5.26	0.00	305.00	5.50	5.26	0.00
50.00	5.50	5.26	0.00	310.00	5.50	5.26	0.00
55.00	5.50	5.26	0.00	315.00	5.50	5.26	0.00
60.00	5.50	5.26	0.00	320.00	5.50	5.26	0.00
65.00	5.50	5.26	0.00	325.00	5.50	5.26	0.00
70.00	5.50	5.26	0.00	330.00	5.50	5.26	0.00
75.00	5.50	5.26	0.00	335.00	5.50	5.26	0.00
80.00	5.50	5.26	0.00				
85.00	5.50	5.26	0.00				
90.00	5.50	5.26	0.00				
95.00	5.50	5.26	0.00				
100.00	5.50	5.26	0.00				
105.00	5.50	5.26	0.00				
110.00	5.50	5.26	0.00				
115.00	5.50	5.26	0.00				
120.00	5.50	5.26	0.00				
125.00	5.50	5.26	0.00				
130.00	5.50	5.26	0.00				
135.00	5.50	5.26	0.00				
140.00	5.50	5.26	0.00				
145.00	5.50	5.26	0.00				
150.00	5.50	5.26	0.00				
155.00	5.50	5.26	0.00				
160.00	5.50	5.26	0.00				
165.00	5.50	5.26	0.00				
170.00	5.50	5.26	0.00				
175.00	5.50	5.26	0.00				
180.00	5.50	5.26	0.00				
185.00	5.50	5.26	0.00				
190.00	5.50	5.26	0.00				
195.00	5.50	5.26	0.00				
200.00	5.50	5.26	0.00				
205.00	5.50	5.26	0.00				
210.00	5.50	5.26	0.00				
215.00	5.50	5.26	0.00				
220.00	5.50	5.26	0.00				
225.00	5.50	5.26	0.00				
230.00	5.50	5.26	0.00				
235.00	5.50	5.26	0.00				
240.00	5.50	5.26	0.00				
245.00	5.50	5.26	0.00				
250.00	5.50	5.26	0.00				
255.00	5.50	5.26	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment 1N: PROP DA 1N

Runoff = 0.63 cfs @ 12.01 hrs, Volume= 0.043 af, Depth= 5.26"

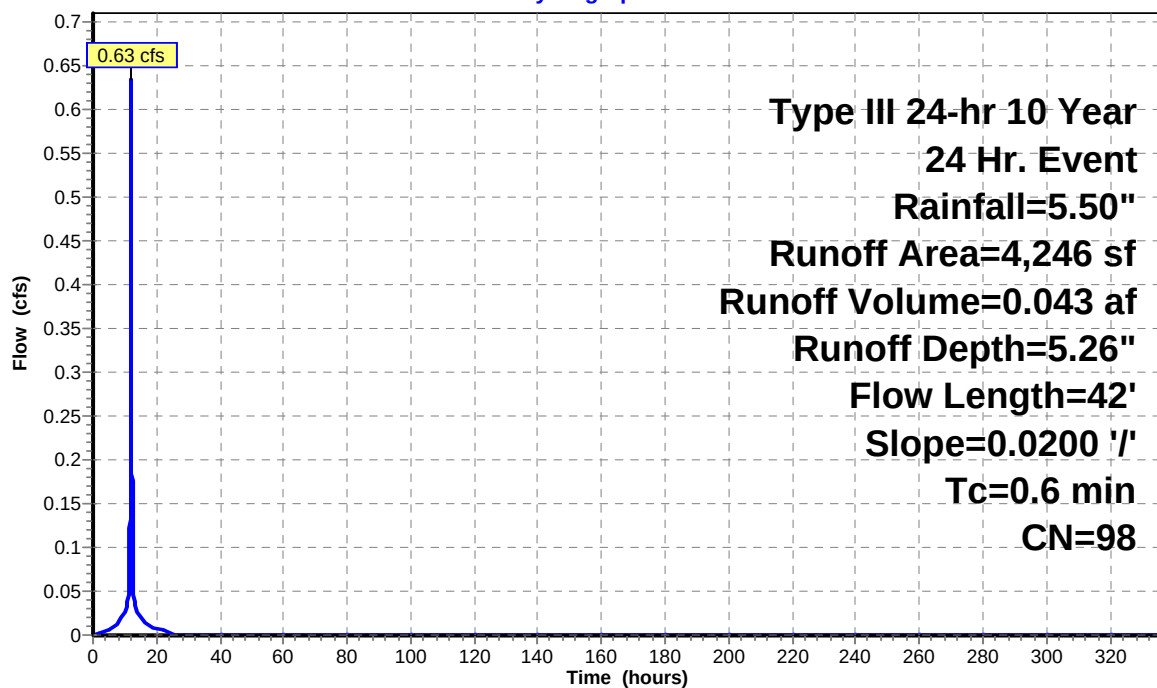
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
4,246	98	Roofs, HSG B
4,246		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	42	0.0200	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1N: PROP DA 1N

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment 1N: PROP DA 1N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	5.26	0.00
5.00	0.31	0.15	0.01	265.00	5.50	5.26	0.00
10.00	1.04	0.83	0.03	270.00	5.50	5.26	0.00
15.00	4.70	4.46	0.02	275.00	5.50	5.26	0.00
20.00	5.26	5.03	0.01	280.00	5.50	5.26	0.00
25.00	5.50	5.26	0.00	285.00	5.50	5.26	0.00
30.00	5.50	5.26	0.00	290.00	5.50	5.26	0.00
35.00	5.50	5.26	0.00	295.00	5.50	5.26	0.00
40.00	5.50	5.26	0.00	300.00	5.50	5.26	0.00
45.00	5.50	5.26	0.00	305.00	5.50	5.26	0.00
50.00	5.50	5.26	0.00	310.00	5.50	5.26	0.00
55.00	5.50	5.26	0.00	315.00	5.50	5.26	0.00
60.00	5.50	5.26	0.00	320.00	5.50	5.26	0.00
65.00	5.50	5.26	0.00	325.00	5.50	5.26	0.00
70.00	5.50	5.26	0.00	330.00	5.50	5.26	0.00
75.00	5.50	5.26	0.00	335.00	5.50	5.26	0.00
80.00	5.50	5.26	0.00				
85.00	5.50	5.26	0.00				
90.00	5.50	5.26	0.00				
95.00	5.50	5.26	0.00				
100.00	5.50	5.26	0.00				
105.00	5.50	5.26	0.00				
110.00	5.50	5.26	0.00				
115.00	5.50	5.26	0.00				
120.00	5.50	5.26	0.00				
125.00	5.50	5.26	0.00				
130.00	5.50	5.26	0.00				
135.00	5.50	5.26	0.00				
140.00	5.50	5.26	0.00				
145.00	5.50	5.26	0.00				
150.00	5.50	5.26	0.00				
155.00	5.50	5.26	0.00				
160.00	5.50	5.26	0.00				
165.00	5.50	5.26	0.00				
170.00	5.50	5.26	0.00				
175.00	5.50	5.26	0.00				
180.00	5.50	5.26	0.00				
185.00	5.50	5.26	0.00				
190.00	5.50	5.26	0.00				
195.00	5.50	5.26	0.00				
200.00	5.50	5.26	0.00				
205.00	5.50	5.26	0.00				
210.00	5.50	5.26	0.00				
215.00	5.50	5.26	0.00				
220.00	5.50	5.26	0.00				
225.00	5.50	5.26	0.00				
230.00	5.50	5.26	0.00				
235.00	5.50	5.26	0.00				
240.00	5.50	5.26	0.00				
245.00	5.50	5.26	0.00				
250.00	5.50	5.26	0.00				
255.00	5.50	5.26	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1H: EXIST 1H

Runoff = 14.77 cfs @ 12.19 hrs, Volume= 1.354 af, Depth= 2.68"

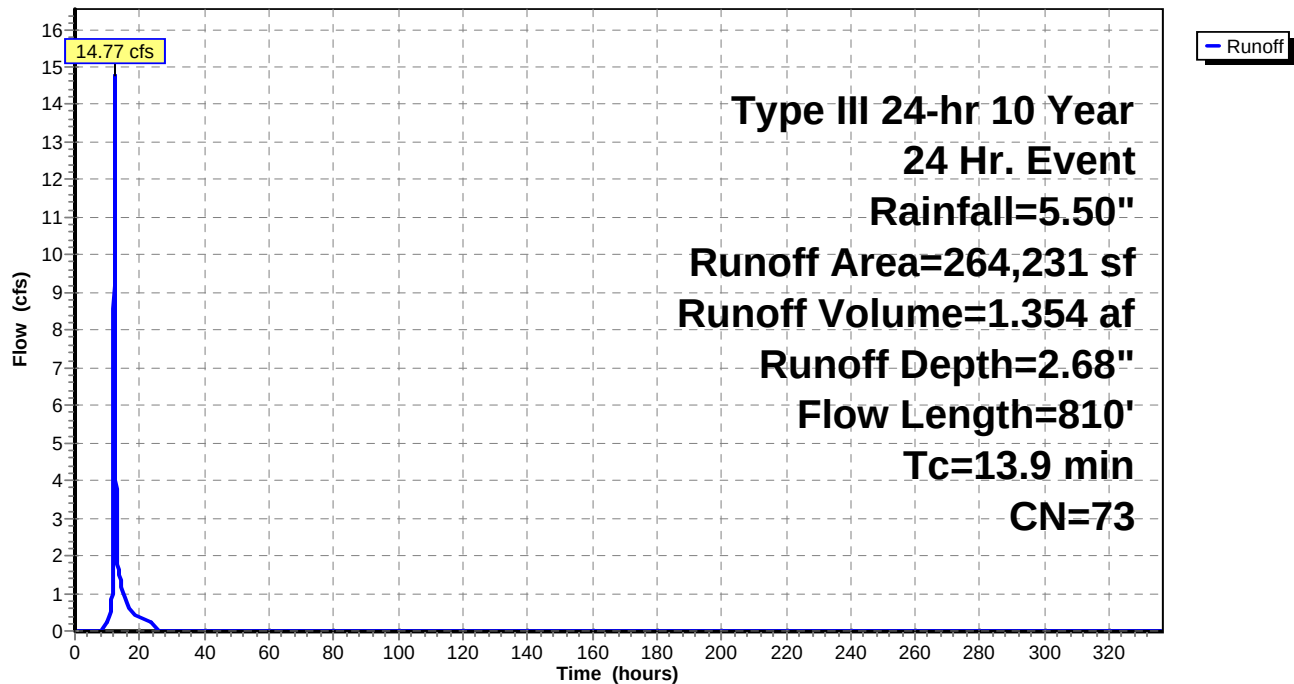
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
58,583	61	>75% Grass cover, Good, HSG B
188,543	74	>75% Grass cover, Good, HSG C
17,105	98	Paved parking, HSG B
264,231	73	Weighted Average
247,126		93.53% Pervious Area
17,105		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	150	0.0400	0.25		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
4.1	660	0.1480	2.69		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
13.9	810	Total			

Subcatchment EX 1H: EXIST 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1H: EXIST 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.68	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.68	0.00
10.00	1.04	0.02	0.19	270.00	5.50	2.68	0.00
15.00	4.70	2.05	1.03	275.00	5.50	2.68	0.00
20.00	5.26	2.49	0.36	280.00	5.50	2.68	0.00
25.00	5.50	2.68	0.00	285.00	5.50	2.68	0.00
30.00	5.50	2.68	0.00	290.00	5.50	2.68	0.00
35.00	5.50	2.68	0.00	295.00	5.50	2.68	0.00
40.00	5.50	2.68	0.00	300.00	5.50	2.68	0.00
45.00	5.50	2.68	0.00	305.00	5.50	2.68	0.00
50.00	5.50	2.68	0.00	310.00	5.50	2.68	0.00
55.00	5.50	2.68	0.00	315.00	5.50	2.68	0.00
60.00	5.50	2.68	0.00	320.00	5.50	2.68	0.00
65.00	5.50	2.68	0.00	325.00	5.50	2.68	0.00
70.00	5.50	2.68	0.00	330.00	5.50	2.68	0.00
75.00	5.50	2.68	0.00	335.00	5.50	2.68	0.00
80.00	5.50	2.68	0.00				
85.00	5.50	2.68	0.00				
90.00	5.50	2.68	0.00				
95.00	5.50	2.68	0.00				
100.00	5.50	2.68	0.00				
105.00	5.50	2.68	0.00				
110.00	5.50	2.68	0.00				
115.00	5.50	2.68	0.00				
120.00	5.50	2.68	0.00				
125.00	5.50	2.68	0.00				
130.00	5.50	2.68	0.00				
135.00	5.50	2.68	0.00				
140.00	5.50	2.68	0.00				
145.00	5.50	2.68	0.00				
150.00	5.50	2.68	0.00				
155.00	5.50	2.68	0.00				
160.00	5.50	2.68	0.00				
165.00	5.50	2.68	0.00				
170.00	5.50	2.68	0.00				
175.00	5.50	2.68	0.00				
180.00	5.50	2.68	0.00				
185.00	5.50	2.68	0.00				
190.00	5.50	2.68	0.00				
195.00	5.50	2.68	0.00				
200.00	5.50	2.68	0.00				
205.00	5.50	2.68	0.00				
210.00	5.50	2.68	0.00				
215.00	5.50	2.68	0.00				
220.00	5.50	2.68	0.00				
225.00	5.50	2.68	0.00				
230.00	5.50	2.68	0.00				
235.00	5.50	2.68	0.00				
240.00	5.50	2.68	0.00				
245.00	5.50	2.68	0.00				
250.00	5.50	2.68	0.00				
255.00	5.50	2.68	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 1J: EX 1J

Runoff = 30.55 cfs @ 12.13 hrs, Volume= 2.427 af, Depth= 2.77"

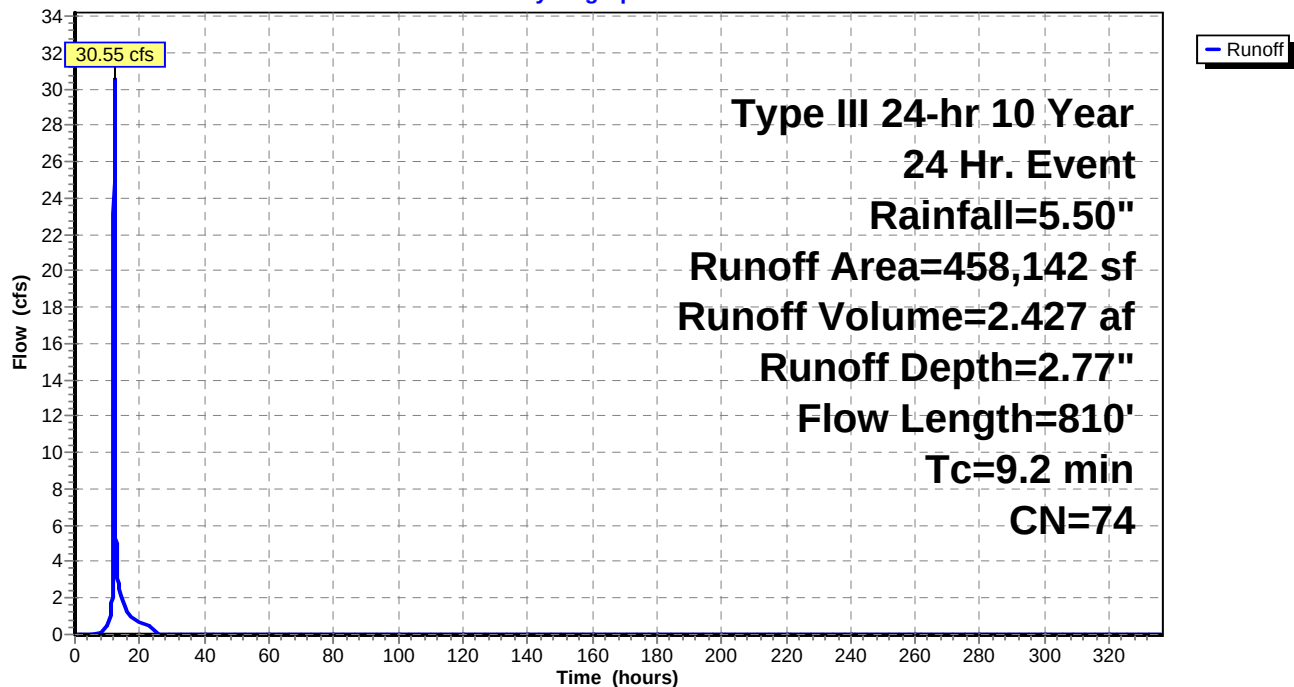
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
24,916	98	Paved parking, HSG B
392,231	74	>75% Grass cover, Good, HSG C
10,926	61	>75% Grass cover, Good, HSG B
30,069	60	Woods, Fair, HSG B
458,142	74	Weighted Average
433,226		94.56% Pervious Area
24,916		5.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
4.6	710	0.1380	2.60		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	810	Total			

Subcatchment EX 1J: EX 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 1J: EX 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.77	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.77	0.00
10.00	1.04	0.03	0.42	270.00	5.50	2.77	0.00
15.00	4.70	2.13	1.78	275.00	5.50	2.77	0.00
20.00	5.26	2.58	0.62	280.00	5.50	2.77	0.00
25.00	5.50	2.77	0.00	285.00	5.50	2.77	0.00
30.00	5.50	2.77	0.00	290.00	5.50	2.77	0.00
35.00	5.50	2.77	0.00	295.00	5.50	2.77	0.00
40.00	5.50	2.77	0.00	300.00	5.50	2.77	0.00
45.00	5.50	2.77	0.00	305.00	5.50	2.77	0.00
50.00	5.50	2.77	0.00	310.00	5.50	2.77	0.00
55.00	5.50	2.77	0.00	315.00	5.50	2.77	0.00
60.00	5.50	2.77	0.00	320.00	5.50	2.77	0.00
65.00	5.50	2.77	0.00	325.00	5.50	2.77	0.00
70.00	5.50	2.77	0.00	330.00	5.50	2.77	0.00
75.00	5.50	2.77	0.00	335.00	5.50	2.77	0.00
80.00	5.50	2.77	0.00				
85.00	5.50	2.77	0.00				
90.00	5.50	2.77	0.00				
95.00	5.50	2.77	0.00				
100.00	5.50	2.77	0.00				
105.00	5.50	2.77	0.00				
110.00	5.50	2.77	0.00				
115.00	5.50	2.77	0.00				
120.00	5.50	2.77	0.00				
125.00	5.50	2.77	0.00				
130.00	5.50	2.77	0.00				
135.00	5.50	2.77	0.00				
140.00	5.50	2.77	0.00				
145.00	5.50	2.77	0.00				
150.00	5.50	2.77	0.00				
155.00	5.50	2.77	0.00				
160.00	5.50	2.77	0.00				
165.00	5.50	2.77	0.00				
170.00	5.50	2.77	0.00				
175.00	5.50	2.77	0.00				
180.00	5.50	2.77	0.00				
185.00	5.50	2.77	0.00				
190.00	5.50	2.77	0.00				
195.00	5.50	2.77	0.00				
200.00	5.50	2.77	0.00				
205.00	5.50	2.77	0.00				
210.00	5.50	2.77	0.00				
215.00	5.50	2.77	0.00				
220.00	5.50	2.77	0.00				
225.00	5.50	2.77	0.00				
230.00	5.50	2.77	0.00				
235.00	5.50	2.77	0.00				
240.00	5.50	2.77	0.00				
245.00	5.50	2.77	0.00				
250.00	5.50	2.77	0.00				
255.00	5.50	2.77	0.00				

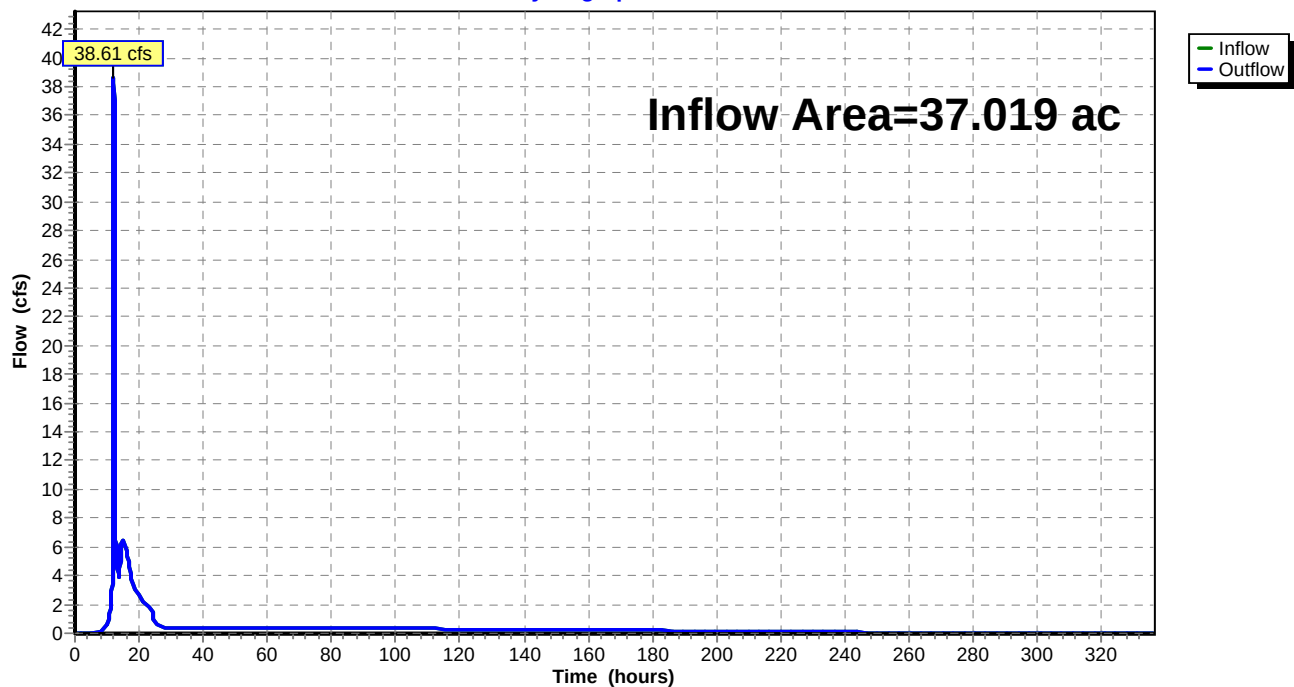
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 37.019 ac, 33.06% Impervious, Inflow Depth > 3.29" for 10 Year, 24 Hr. Event event
Inflow = 38.61 cfs @ 12.14 hrs, Volume= 10.142 af
Outflow = 38.61 cfs @ 12.14 hrs, Volume= 10.142 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.04		0.04
5.00	0.00		0.00	265.00	0.03		0.03
10.00	0.59		0.59	270.00	0.03		0.03
15.00	6.73		6.73	275.00	0.02		0.02
20.00	2.60		2.60	280.00	0.02		0.02
25.00	0.72		0.72	285.00	0.02		0.02
30.00	0.40		0.40	290.00	0.02		0.02
35.00	0.39		0.39	295.00	0.01		0.01
40.00	0.39		0.39	300.00	0.01		0.01
45.00	0.39		0.39	305.00	0.01		0.01
50.00	0.38		0.38	310.00	0.01		0.01
55.00	0.38		0.38	315.00	0.01		0.01
60.00	0.37		0.37	320.00	0.01		0.01
65.00	0.37		0.37	325.00	0.01		0.01
70.00	0.36		0.36	330.00	0.01		0.01
75.00	0.36		0.36	335.00	0.01		0.01
80.00	0.35		0.35				
85.00	0.34		0.34				
90.00	0.34		0.34				
95.00	0.33		0.33				
100.00	0.32		0.32				
105.00	0.32		0.32				
110.00	0.31		0.31				
115.00	0.30		0.30				
120.00	0.29		0.29				
125.00	0.28		0.28				
130.00	0.28		0.28				
135.00	0.27		0.27				
140.00	0.26		0.26				
145.00	0.25		0.25				
150.00	0.24		0.24				
155.00	0.23		0.23				
160.00	0.22		0.22				
165.00	0.22		0.22				
170.00	0.21		0.21				
175.00	0.20		0.20				
180.00	0.19		0.19				
185.00	0.18		0.18				
190.00	0.17		0.17				
195.00	0.16		0.16				
200.00	0.15		0.15				
205.00	0.14		0.14				
210.00	0.13		0.13				
215.00	0.12		0.12				
220.00	0.11		0.11				
225.00	0.10		0.10				
230.00	0.09		0.09				
235.00	0.08		0.08				
240.00	0.07		0.07				
245.00	0.06		0.06				
250.00	0.05		0.05				
255.00	0.05		0.05				

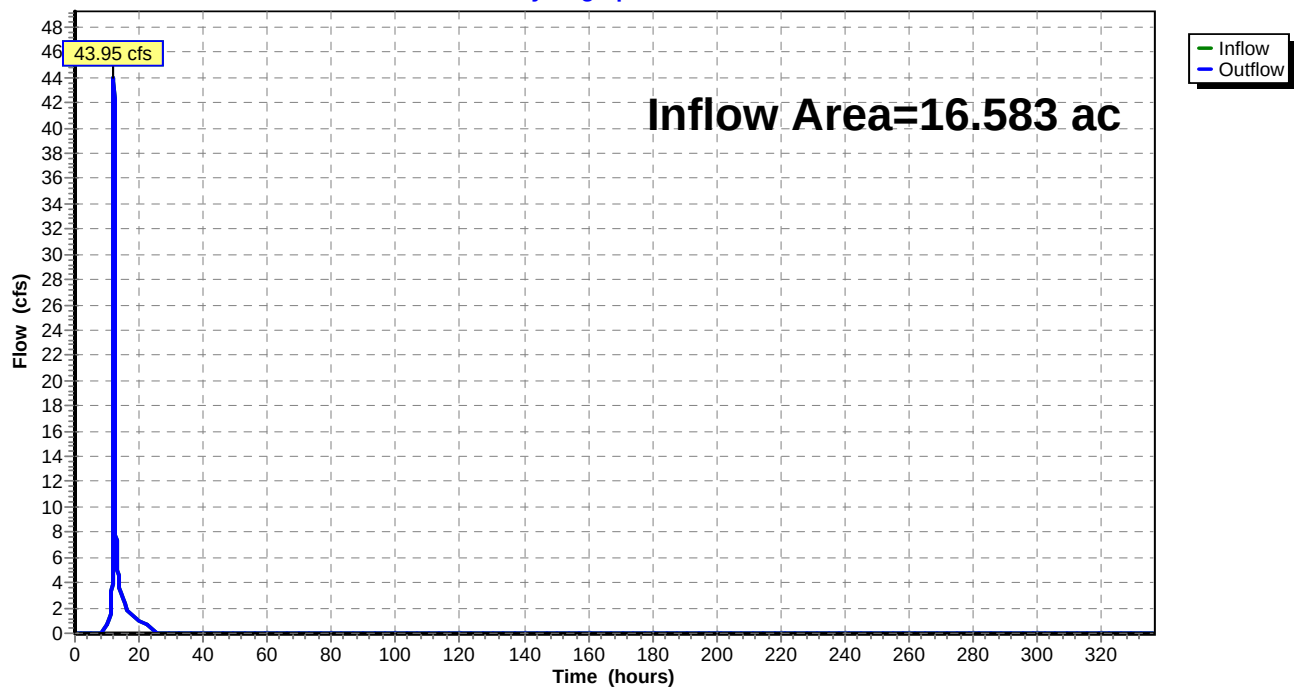
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 16.583 ac, 5.82% Impervious, Inflow Depth = 2.74" for 10 Year, 24 Hr. Event event
Inflow = 43.95 cfs @ 12.15 hrs, Volume= 3.781 af
Outflow = 43.95 cfs @ 12.15 hrs, Volume= 3.781 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.60		0.60	270.00	0.00		0.00
15.00	2.81		2.81	275.00	0.00		0.00
20.00	0.98		0.98	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Pond Pond 1: Pond 1

Inflow Area = 10.536 ac, 37.25% Impervious, Inflow Depth = 3.63" for 10 Year, 24 Hr. Event event
 Inflow = 46.11 cfs @ 12.07 hrs, Volume= 3.187 af
 Outflow = 14.88 cfs @ 12.37 hrs, Volume= 3.169 af, Atten= 68%, Lag= 17.9 min
 Primary = 14.88 cfs @ 12.37 hrs, Volume= 3.169 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 699.00' Surf.Area= 40,289 sf Storage= 141,809 cf

Peak Elev= 700.46' @ 12.37 hrs Surf.Area= 45,292 sf Storage= 204,079 cf (62,270 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 1,025.0 min (1,833.7 - 808.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	694.00'	278,293 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)
694.00	17,243	647.0	0	0	17,243
696.00	22,625	697.0	39,746	39,746	22,757
697.00	33,800	793.0	28,026	67,773	34,164
698.00	37,016	823.0	35,396	103,168	38,106
700.00	43,701	867.0	80,625	183,793	44,260
702.00	50,890	917.0	94,500	278,293	51,579

Device	Routing	Invert	Outlet Devices
#1	Primary	692.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 680.00' S= 0.1200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	700.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	699.00'	3.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=14.88 cfs @ 12.37 hrs HW=700.46' TW=588.96' (Dynamic Tailwater)

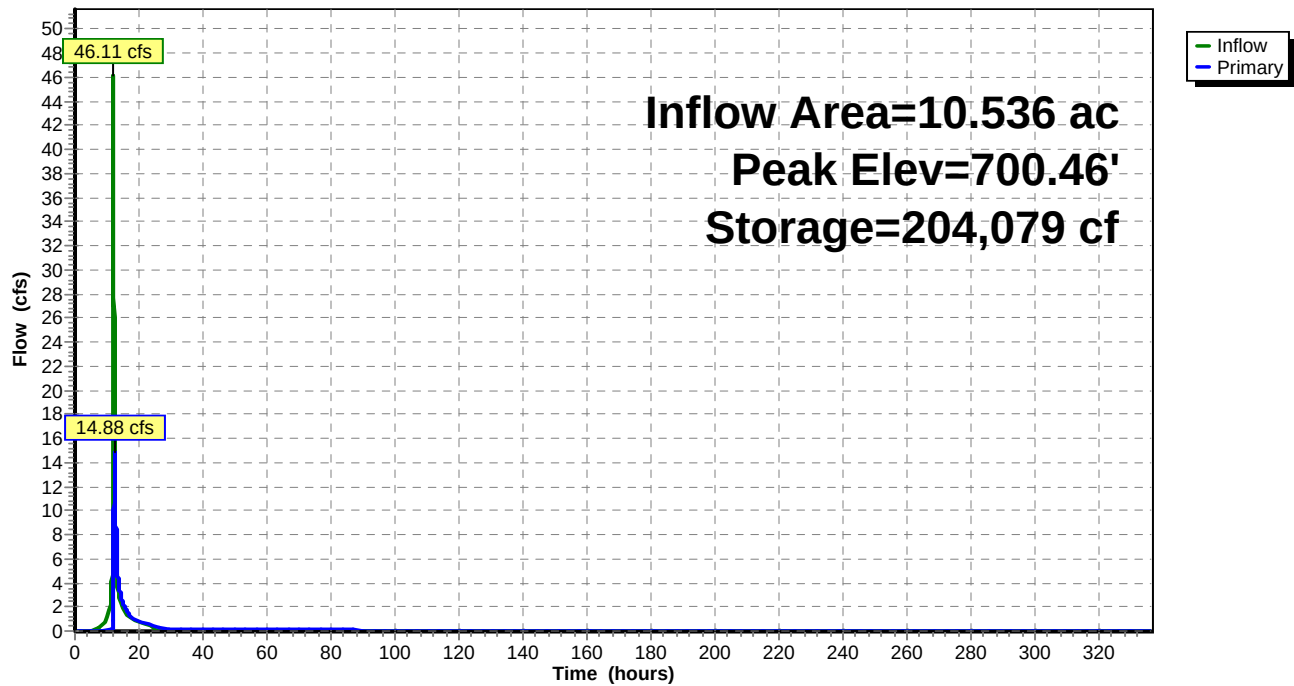
1=Culvert (Passes 14.88 cfs of 63.45 cfs potential flow)

2=Broad-Crested Rectangular Weir (Weir Controls 14.60 cfs @ 2.00 fps)

3=Orifice/Grate (Orifice Controls 0.27 cfs @ 5.55 fps)

Pond Pond 1: Pond 1

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Pond Pond 1: Pond 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	141,809	699.00	0.00
10.00	1.14	147,082	699.13	0.03
20.00	0.70	186,093	700.05	0.77
30.00	0.00	180,217	699.92	0.21
40.00	0.00	173,060	699.75	0.19
50.00	0.00	166,746	699.60	0.16
60.00	0.00	161,289	699.47	0.14
70.00	0.00	156,695	699.36	0.12
80.00	0.00	152,973	699.27	0.09
90.00	0.00	150,124	699.20	0.07
100.00	0.00	148,171	699.16	0.04
110.00	0.00	146,873	699.13	0.03
120.00	0.00	145,978	699.10	0.02
130.00	0.00	145,334	699.09	0.02
140.00	0.00	144,853	699.08	0.01
150.00	0.00	144,482	699.07	0.01
160.00	0.00	144,189	699.06	0.01
170.00	0.00	143,951	699.05	0.01
180.00	0.00	143,755	699.05	0.00
190.00	0.00	143,591	699.04	0.00
200.00	0.00	143,452	699.04	0.00
210.00	0.00	143,333	699.04	0.00
220.00	0.00	143,229	699.04	0.00
230.00	0.00	143,138	699.03	0.00
240.00	0.00	143,058	699.03	0.00
250.00	0.00	142,987	699.03	0.00
260.00	0.00	142,923	699.03	0.00
270.00	0.00	142,866	699.03	0.00
280.00	0.00	142,815	699.02	0.00
290.00	0.00	142,768	699.02	0.00
300.00	0.00	142,725	699.02	0.00
310.00	0.00	142,685	699.02	0.00
320.00	0.00	142,649	699.02	0.00
330.00	0.00	142,616	699.02	0.00

Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Stage-Area-Storage for Pond Pond 1: Pond 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
694.00	17,243	0	699.20	40,960	149,934
694.10	17,495	1,737	699.30	41,298	154,047
694.20	17,748	3,499	699.40	41,637	158,194
694.30	18,004	5,287	699.50	41,978	162,375
694.40	18,261	7,100	699.60	42,320	166,590
694.50	18,520	8,939	699.70	42,663	170,839
694.60	18,781	10,804	699.80	43,008	175,122
694.70	19,044	12,695	699.90	43,354	179,440
694.80	19,308	14,613	700.00	43,701	183,793
694.90	19,575	16,557	700.10	44,047	188,180
695.00	19,843	18,528	700.20	44,395	192,602
695.10	20,113	20,525	700.30	44,744	197,059
695.20	20,385	22,550	700.40	45,095	201,551
695.30	20,658	24,602	700.50	45,447	206,079
695.40	20,934	26,682	700.60	45,800	210,641
695.50	21,211	28,789	700.70	46,155	215,239
695.60	21,490	30,924	700.80	46,511	219,872
695.70	21,771	33,087	700.90	46,868	224,541
695.80	22,054	35,279	701.00	47,227	229,246
695.90	22,339	37,498	701.10	47,587	233,986
696.00	22,625	39,746	701.20	47,949	238,763
696.10	23,642	42,060	701.30	48,312	243,576
696.20	24,681	44,475	701.40	48,676	248,425
696.30	25,743	46,996	701.50	49,041	253,311
696.40	26,827	49,625	701.60	49,408	258,234
696.50	27,933	52,363	701.70	49,777	263,193
696.60	29,062	55,212	701.80	50,146	268,189
696.70	30,213	58,176	701.90	50,518	273,222
696.80	31,386	61,255	702.00	50,890	278,293
696.90	32,582	64,454			
697.00	33,800	67,773			
697.10	34,115	71,168			
697.20	34,432	74,596			
697.30	34,749	78,055			
697.40	35,069	81,546			
697.50	35,390	85,068			
697.60	35,712	88,624			
697.70	36,036	92,211			
697.80	36,361	95,831			
697.90	36,688	99,483			
698.00	37,016	103,168			
698.10	37,337	106,886			
698.20	37,660	110,636			
698.30	37,983	114,418			
698.40	38,309	118,233			
698.50	38,635	122,080			
698.60	38,963	125,960			
698.70	39,293	129,872			
698.80	39,623	133,818			
698.90	39,956	137,797			
699.00	40,289	141,809			
699.10	40,624	145,855			

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Pond Pond 2: Pond 2

Inflow Area = 23.503 ac, 45.59% Impervious, Inflow Depth = 3.62" for 10 Year, 24 Hr. Event event
 Inflow = 57.21 cfs @ 12.03 hrs, Volume= 7.086 af
 Outflow = 4.49 cfs @ 15.19 hrs, Volume= 7.023 af, Atten= 92%, Lag= 189.7 min
 Primary = 4.49 cfs @ 15.19 hrs, Volume= 7.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 587.00' Surf.Area= 47,444 sf Storage= 230,092 cf

Peak Elev= 590.20' @ 15.19 hrs Surf.Area= 63,878 sf Storage= 413,250 cf (183,159 cf above start)

Plug-Flow detention time= 10,543.3 min calculated for 1.741 af (25% of inflow)

Center-of-Mass det. time= 3,854.5 min (5,117.6 - 1,263.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	580.00'	534,329 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)
580.00	22,976	626.0	0	0	22,976
582.00	28,191	676.0	51,078	51,078	28,318
584.00	33,801	726.0	61,907	112,985	34,069
586.00	39,814	776.0	73,533	186,518	40,232
588.00	55,742	900.0	95,110	281,629	56,854
590.00	63,113	946.0	118,779	400,408	63,859
592.00	70,884	996.0	133,922	534,329	71,827

Device	Routing	Invert	Outlet Devices
#1	Primary	579.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 578.00' S= 0.0100 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	587.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	590.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.49 cfs @ 15.19 hrs HW=590.20' TW=0.00' (Dynamic Tailwater)

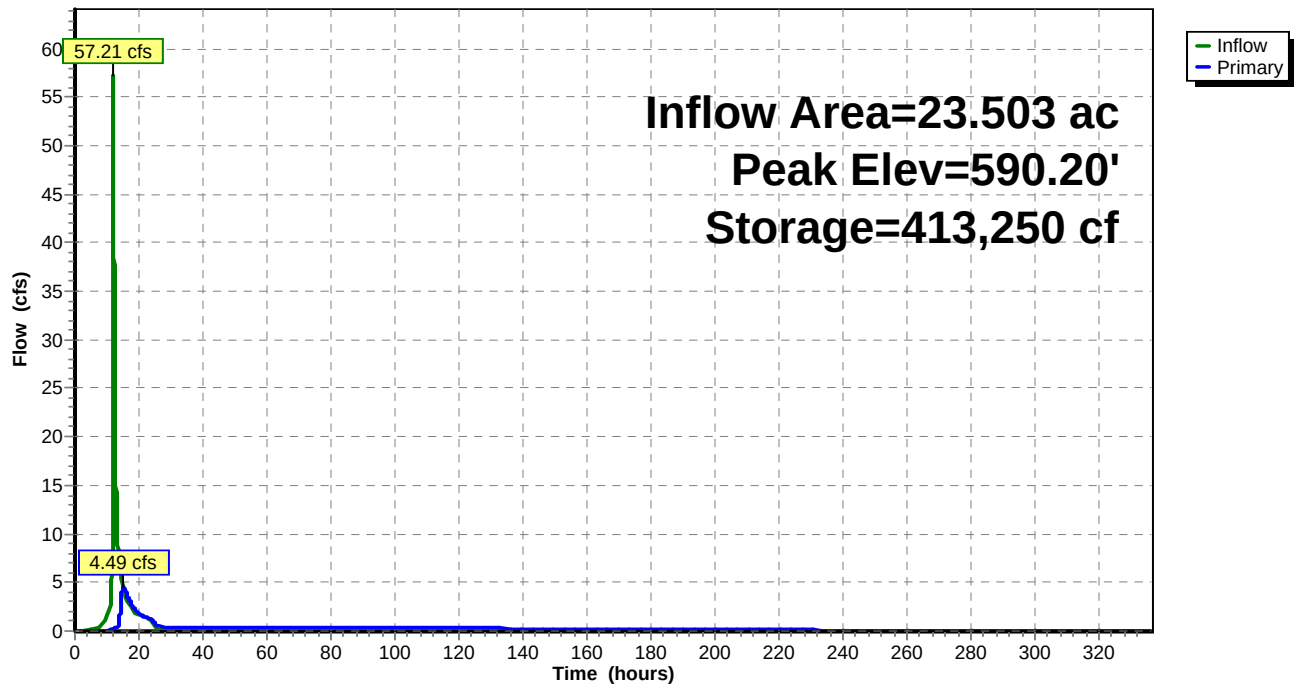
1=Culvert (Passes 4.49 cfs of 74.56 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.41 cfs @ 8.45 fps)

3=Broad-Crested Rectangular Weir (Weir Controls 4.08 cfs @ 1.26 fps)

Pond Pond 2: Pond 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Pond Pond 2: Pond 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	230,092	587.00	0.00
10.00	1.51	238,813	587.18	0.06
20.00	1.61	406,662	590.10	1.80
30.00	0.21	398,595	589.97	0.40
40.00	0.19	391,539	589.86	0.39
50.00	0.16	383,939	589.74	0.38
60.00	0.14	375,818	589.61	0.37
70.00	0.12	367,199	589.47	0.36
80.00	0.09	358,113	589.32	0.35
90.00	0.07	348,595	589.16	0.34
100.00	0.04	338,666	588.99	0.32
110.00	0.03	328,609	588.82	0.31
120.00	0.02	318,705	588.65	0.29
130.00	0.02	309,129	588.49	0.28
140.00	0.01	299,984	588.33	0.26
150.00	0.01	291,336	588.17	0.24
160.00	0.01	283,229	588.03	0.22
170.00	0.01	275,693	587.89	0.21
180.00	0.00	268,758	587.76	0.19
190.00	0.00	262,446	587.65	0.17
200.00	0.00	256,779	587.54	0.15
210.00	0.00	251,774	587.44	0.13
220.00	0.00	247,446	587.36	0.11
230.00	0.00	243,808	587.28	0.09
240.00	0.00	240,860	587.22	0.07
250.00	0.00	238,645	587.18	0.05
260.00	0.00	237,071	587.15	0.04
270.00	0.00	235,939	587.12	0.03
280.00	0.00	235,103	587.10	0.02
290.00	0.00	234,467	587.09	0.02
300.00	0.00	233,970	587.08	0.01
310.00	0.00	233,573	587.07	0.01
320.00	0.00	233,249	587.07	0.01
330.00	0.00	232,981	587.06	0.01

Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Stage-Area-Storage for Pond Pond 2: Pond 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
580.00	22,976	0	587.80	54,029	270,652
580.15	23,349	3,474	587.95	55,311	278,852
580.30	23,724	7,005	588.10	56,100	287,221
580.45	24,103	10,592	588.25	56,638	295,676
580.60	24,485	14,236	588.40	57,180	304,212
580.75	24,869	17,937	588.55	57,723	312,830
580.90	25,257	21,697	588.70	58,270	321,530
581.05	25,647	25,514	588.85	58,819	330,311
581.20	26,041	29,391	589.00	59,370	339,175
581.35	26,438	33,327	589.15	59,924	348,122
581.50	26,837	37,322	589.30	60,481	357,153
581.65	27,240	41,378	589.45	61,040	366,267
581.80	27,646	45,495	589.60	61,602	375,465
581.95	28,054	49,672	589.75	62,167	384,748
582.10	28,459	53,911	589.90	62,734	394,115
582.25	28,864	58,210	590.05	63,302	403,568
582.40	29,272	62,570	590.20	63,870	413,106
582.55	29,683	66,992	590.35	64,440	422,729
582.70	30,097	71,475	590.50	65,013	432,438
582.85	30,513	76,021	590.65	65,589	442,233
583.00	30,932	80,629	590.80	66,167	452,115
583.15	31,355	85,301	590.95	66,748	462,083
583.30	31,780	90,036	591.10	67,331	472,139
583.45	32,208	94,835	591.25	67,917	482,283
583.60	32,638	99,698	591.40	68,505	492,515
583.75	33,072	104,626	591.55	69,096	502,835
583.90	33,508	109,620	591.70	69,690	513,244
584.05	33,945	114,679	591.85	70,286	523,742
584.20	34,380	119,803	592.00	70,884	534,329
584.35	34,818	124,993			
584.50	35,258	130,249			
584.65	35,701	135,571			
584.80	36,147	140,959			
584.95	36,596	146,415			
585.10	37,047	151,938			
585.25	37,501	157,529			
585.40	37,958	163,189			
585.55	38,418	168,917			
585.70	38,881	174,714			
585.85	39,346	180,581			
586.00	39,814	186,518			
586.15	40,916	192,573			
586.30	42,033	198,794			
586.45	43,165	205,184			
586.60	44,312	211,744			
586.75	45,474	218,478			
586.90	46,651	225,387			
587.05	47,843	232,474			
587.20	49,050	239,741			
587.35	50,272	247,189			
587.50	51,509	254,823			
587.65	52,762	262,643			

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1B: PROP DA 1B

Runoff = 51.78 cfs @ 12.07 hrs, Volume= 3.592 af, Depth= 4.09"

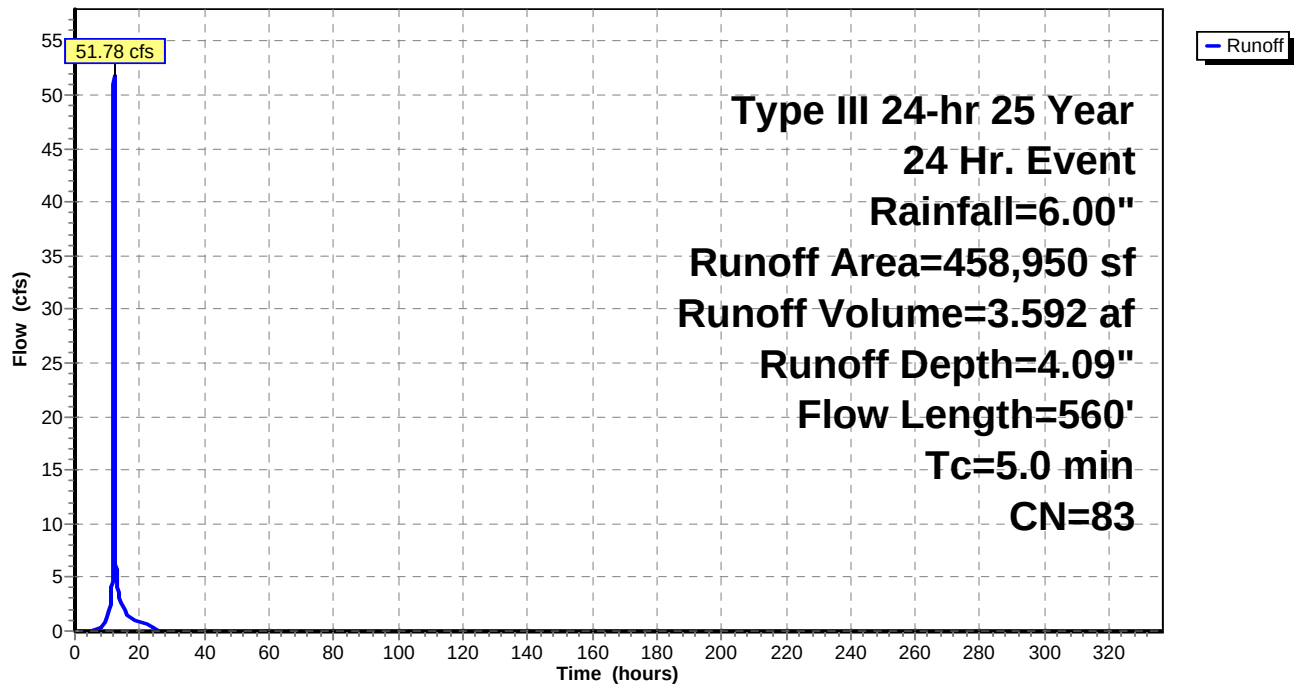
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
170,936	98	Paved parking & roofs
288,014	74	>75% Grass cover, Good, HSG C
458,950	83	Weighted Average
288,014		62.75% Pervious Area
170,936		37.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.1200	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.6	164	0.0850	4.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	150	0.0800	5.74		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	196	0.0410	14.58	45.81	Pipe Channel, Street System 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
5.0	560	Total			

Subcatchment 1B: PROP DA 1B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1B: PROP DA 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.09	0.00
5.00	0.34	0.00	0.00	265.00	6.00	4.09	0.00
10.00	1.13	0.19	1.37	270.00	6.00	4.09	0.00
15.00	5.13	3.29	2.22	275.00	6.00	4.09	0.00
20.00	5.74	3.85	0.77	280.00	6.00	4.09	0.00
25.00	6.00	4.09	0.00	285.00	6.00	4.09	0.00
30.00	6.00	4.09	0.00	290.00	6.00	4.09	0.00
35.00	6.00	4.09	0.00	295.00	6.00	4.09	0.00
40.00	6.00	4.09	0.00	300.00	6.00	4.09	0.00
45.00	6.00	4.09	0.00	305.00	6.00	4.09	0.00
50.00	6.00	4.09	0.00	310.00	6.00	4.09	0.00
55.00	6.00	4.09	0.00	315.00	6.00	4.09	0.00
60.00	6.00	4.09	0.00	320.00	6.00	4.09	0.00
65.00	6.00	4.09	0.00	325.00	6.00	4.09	0.00
70.00	6.00	4.09	0.00	330.00	6.00	4.09	0.00
75.00	6.00	4.09	0.00	335.00	6.00	4.09	0.00
80.00	6.00	4.09	0.00				
85.00	6.00	4.09	0.00				
90.00	6.00	4.09	0.00				
95.00	6.00	4.09	0.00				
100.00	6.00	4.09	0.00				
105.00	6.00	4.09	0.00				
110.00	6.00	4.09	0.00				
115.00	6.00	4.09	0.00				
120.00	6.00	4.09	0.00				
125.00	6.00	4.09	0.00				
130.00	6.00	4.09	0.00				
135.00	6.00	4.09	0.00				
140.00	6.00	4.09	0.00				
145.00	6.00	4.09	0.00				
150.00	6.00	4.09	0.00				
155.00	6.00	4.09	0.00				
160.00	6.00	4.09	0.00				
165.00	6.00	4.09	0.00				
170.00	6.00	4.09	0.00				
175.00	6.00	4.09	0.00				
180.00	6.00	4.09	0.00				
185.00	6.00	4.09	0.00				
190.00	6.00	4.09	0.00				
195.00	6.00	4.09	0.00				
200.00	6.00	4.09	0.00				
205.00	6.00	4.09	0.00				
210.00	6.00	4.09	0.00				
215.00	6.00	4.09	0.00				
220.00	6.00	4.09	0.00				
225.00	6.00	4.09	0.00				
230.00	6.00	4.09	0.00				
235.00	6.00	4.09	0.00				
240.00	6.00	4.09	0.00				
245.00	6.00	4.09	0.00				
250.00	6.00	4.09	0.00				
255.00	6.00	4.09	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1C: PROP DA 1C

Runoff = 32.04 cfs @ 12.03 hrs, Volume= 1.965 af, Depth= 3.58"

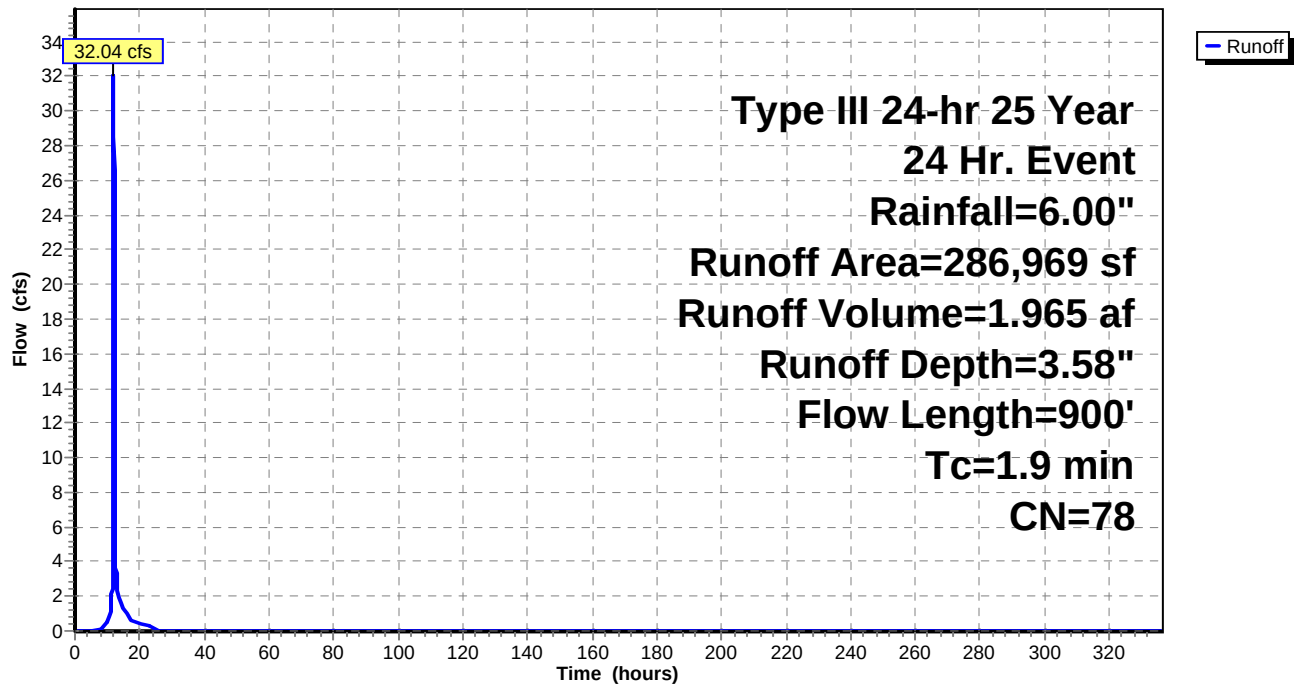
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
151,873	61	>75% Grass cover, Good, HSG B
135,096	98	Paved parking & roofs
286,969	78	Weighted Average
151,873		52.92% Pervious Area
135,096		47.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.44		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.50"
0.7	800	0.0750	19.72	61.95	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.9	900	Total			

Subcatchment 1C: PROP DA 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1C: PROP DA 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.58	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.58	0.00
10.00	1.13	0.10	0.59	270.00	6.00	3.58	0.00
15.00	5.13	2.82	1.29	275.00	6.00	3.58	0.00
20.00	5.74	3.35	0.46	280.00	6.00	3.58	0.00
25.00	6.00	3.58	0.00	285.00	6.00	3.58	0.00
30.00	6.00	3.58	0.00	290.00	6.00	3.58	0.00
35.00	6.00	3.58	0.00	295.00	6.00	3.58	0.00
40.00	6.00	3.58	0.00	300.00	6.00	3.58	0.00
45.00	6.00	3.58	0.00	305.00	6.00	3.58	0.00
50.00	6.00	3.58	0.00	310.00	6.00	3.58	0.00
55.00	6.00	3.58	0.00	315.00	6.00	3.58	0.00
60.00	6.00	3.58	0.00	320.00	6.00	3.58	0.00
65.00	6.00	3.58	0.00	325.00	6.00	3.58	0.00
70.00	6.00	3.58	0.00	330.00	6.00	3.58	0.00
75.00	6.00	3.58	0.00	335.00	6.00	3.58	0.00
80.00	6.00	3.58	0.00				
85.00	6.00	3.58	0.00				
90.00	6.00	3.58	0.00				
95.00	6.00	3.58	0.00				
100.00	6.00	3.58	0.00				
105.00	6.00	3.58	0.00				
110.00	6.00	3.58	0.00				
115.00	6.00	3.58	0.00				
120.00	6.00	3.58	0.00				
125.00	6.00	3.58	0.00				
130.00	6.00	3.58	0.00				
135.00	6.00	3.58	0.00				
140.00	6.00	3.58	0.00				
145.00	6.00	3.58	0.00				
150.00	6.00	3.58	0.00				
155.00	6.00	3.58	0.00				
160.00	6.00	3.58	0.00				
165.00	6.00	3.58	0.00				
170.00	6.00	3.58	0.00				
175.00	6.00	3.58	0.00				
180.00	6.00	3.58	0.00				
185.00	6.00	3.58	0.00				
190.00	6.00	3.58	0.00				
195.00	6.00	3.58	0.00				
200.00	6.00	3.58	0.00				
205.00	6.00	3.58	0.00				
210.00	6.00	3.58	0.00				
215.00	6.00	3.58	0.00				
220.00	6.00	3.58	0.00				
225.00	6.00	3.58	0.00				
230.00	6.00	3.58	0.00				
235.00	6.00	3.58	0.00				
240.00	6.00	3.58	0.00				
245.00	6.00	3.58	0.00				
250.00	6.00	3.58	0.00				
255.00	6.00	3.58	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1F: PROP DA 1F

Runoff = 19.81 cfs @ 12.13 hrs, Volume= 1.567 af, Depth= 3.18"

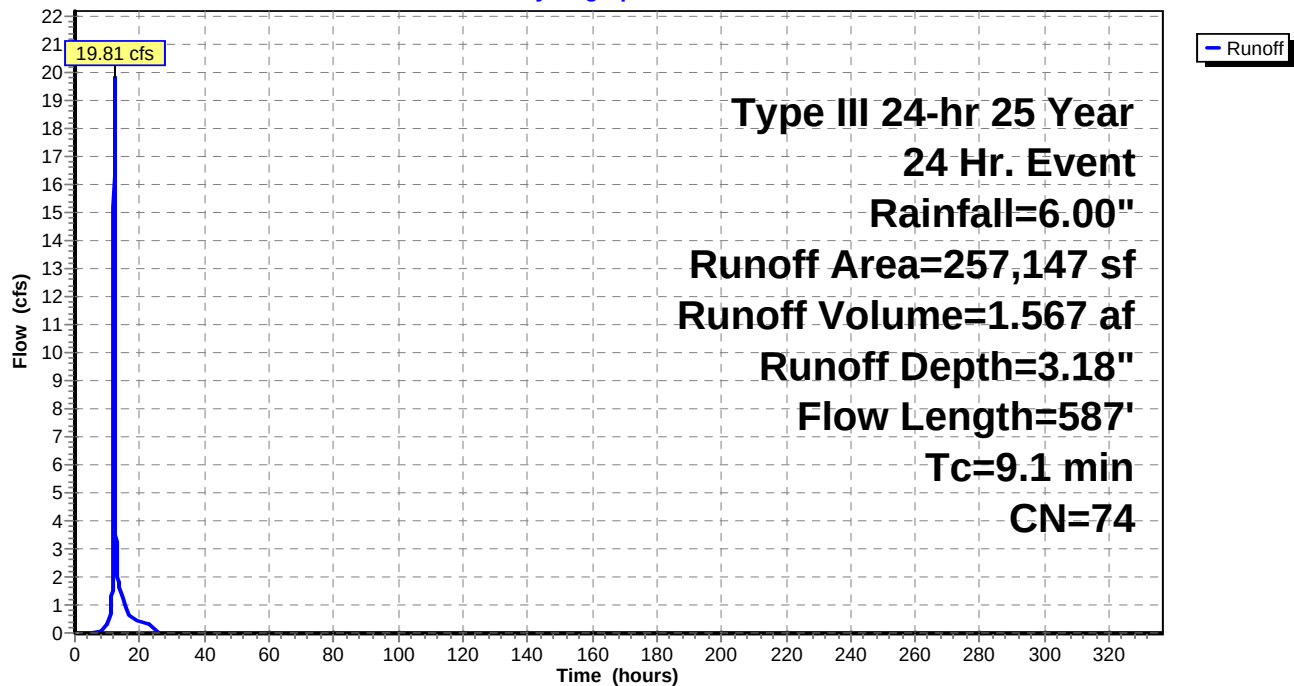
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
166,672	74	>75% Grass cover, Good, HSG C
31,625	98	Paved roads w/curbs & sewers, HSG B
58,850	61	>75% Grass cover, Good, HSG B
257,147	74	Weighted Average
225,522		87.70% Pervious Area
31,625		12.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	52	0.0220	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
1.3	535	0.1860	6.94		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.1	587	Total			

Subcatchment 1F: PROP DA 1F

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1F: PROP DA 1F

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.18	0.00
10.00	1.13	0.05	0.32	270.00	6.00	3.18	0.00
15.00	5.13	2.46	1.12	275.00	6.00	3.18	0.00
20.00	5.74	2.97	0.39	280.00	6.00	3.18	0.00
25.00	6.00	3.18	0.00	285.00	6.00	3.18	0.00
30.00	6.00	3.18	0.00	290.00	6.00	3.18	0.00
35.00	6.00	3.18	0.00	295.00	6.00	3.18	0.00
40.00	6.00	3.18	0.00	300.00	6.00	3.18	0.00
45.00	6.00	3.18	0.00	305.00	6.00	3.18	0.00
50.00	6.00	3.18	0.00	310.00	6.00	3.18	0.00
55.00	6.00	3.18	0.00	315.00	6.00	3.18	0.00
60.00	6.00	3.18	0.00	320.00	6.00	3.18	0.00
65.00	6.00	3.18	0.00	325.00	6.00	3.18	0.00
70.00	6.00	3.18	0.00	330.00	6.00	3.18	0.00
75.00	6.00	3.18	0.00	335.00	6.00	3.18	0.00
80.00	6.00	3.18	0.00				
85.00	6.00	3.18	0.00				
90.00	6.00	3.18	0.00				
95.00	6.00	3.18	0.00				
100.00	6.00	3.18	0.00				
105.00	6.00	3.18	0.00				
110.00	6.00	3.18	0.00				
115.00	6.00	3.18	0.00				
120.00	6.00	3.18	0.00				
125.00	6.00	3.18	0.00				
130.00	6.00	3.18	0.00				
135.00	6.00	3.18	0.00				
140.00	6.00	3.18	0.00				
145.00	6.00	3.18	0.00				
150.00	6.00	3.18	0.00				
155.00	6.00	3.18	0.00				
160.00	6.00	3.18	0.00				
165.00	6.00	3.18	0.00				
170.00	6.00	3.18	0.00				
175.00	6.00	3.18	0.00				
180.00	6.00	3.18	0.00				
185.00	6.00	3.18	0.00				
190.00	6.00	3.18	0.00				
195.00	6.00	3.18	0.00				
200.00	6.00	3.18	0.00				
205.00	6.00	3.18	0.00				
210.00	6.00	3.18	0.00				
215.00	6.00	3.18	0.00				
220.00	6.00	3.18	0.00				
225.00	6.00	3.18	0.00				
230.00	6.00	3.18	0.00				
235.00	6.00	3.18	0.00				
240.00	6.00	3.18	0.00				
245.00	6.00	3.18	0.00				
250.00	6.00	3.18	0.00				
255.00	6.00	3.18	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1G: PROP DA 1G

Runoff = 21.05 cfs @ 12.03 hrs, Volume= 1.401 af, Depth= 5.18"

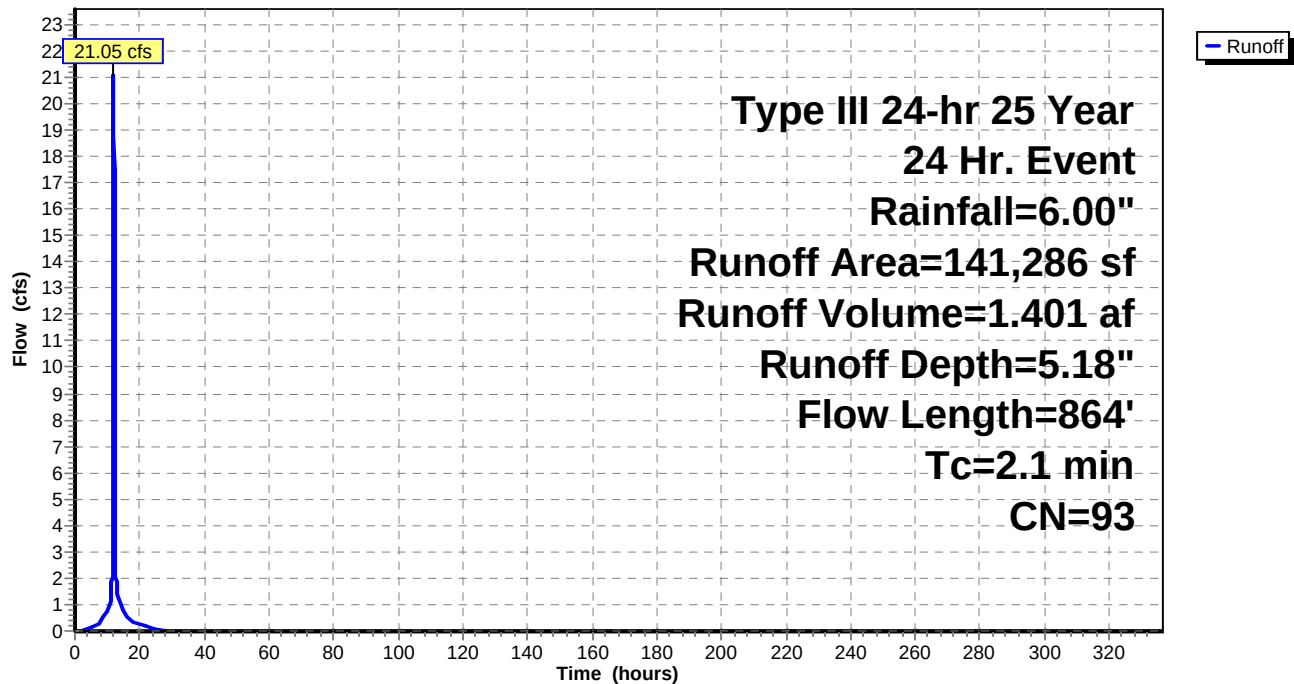
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
112,680	98	Paved parking & roofs
28,606	74	>75% Grass cover, Good, HSG C
141,286	93	Weighted Average
28,606		20.25% Pervious Area
112,680		79.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.08		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"
1.3	764	0.0180	9.66	30.35	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.1	864	Total			

Subcatchment 1G: PROP DA 1G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1G: PROP DA 1G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	5.18	0.00
5.00	0.34	0.04	0.10	265.00	6.00	5.18	0.00
10.00	1.13	0.56	0.77	270.00	6.00	5.18	0.00
15.00	5.13	4.32	0.73	275.00	6.00	5.18	0.00
20.00	5.74	4.93	0.25	280.00	6.00	5.18	0.00
25.00	6.00	5.18	0.00	285.00	6.00	5.18	0.00
30.00	6.00	5.18	0.00	290.00	6.00	5.18	0.00
35.00	6.00	5.18	0.00	295.00	6.00	5.18	0.00
40.00	6.00	5.18	0.00	300.00	6.00	5.18	0.00
45.00	6.00	5.18	0.00	305.00	6.00	5.18	0.00
50.00	6.00	5.18	0.00	310.00	6.00	5.18	0.00
55.00	6.00	5.18	0.00	315.00	6.00	5.18	0.00
60.00	6.00	5.18	0.00	320.00	6.00	5.18	0.00
65.00	6.00	5.18	0.00	325.00	6.00	5.18	0.00
70.00	6.00	5.18	0.00	330.00	6.00	5.18	0.00
75.00	6.00	5.18	0.00	335.00	6.00	5.18	0.00
80.00	6.00	5.18	0.00				
85.00	6.00	5.18	0.00				
90.00	6.00	5.18	0.00				
95.00	6.00	5.18	0.00				
100.00	6.00	5.18	0.00				
105.00	6.00	5.18	0.00				
110.00	6.00	5.18	0.00				
115.00	6.00	5.18	0.00				
120.00	6.00	5.18	0.00				
125.00	6.00	5.18	0.00				
130.00	6.00	5.18	0.00				
135.00	6.00	5.18	0.00				
140.00	6.00	5.18	0.00				
145.00	6.00	5.18	0.00				
150.00	6.00	5.18	0.00				
155.00	6.00	5.18	0.00				
160.00	6.00	5.18	0.00				
165.00	6.00	5.18	0.00				
170.00	6.00	5.18	0.00				
175.00	6.00	5.18	0.00				
180.00	6.00	5.18	0.00				
185.00	6.00	5.18	0.00				
190.00	6.00	5.18	0.00				
195.00	6.00	5.18	0.00				
200.00	6.00	5.18	0.00				
205.00	6.00	5.18	0.00				
210.00	6.00	5.18	0.00				
215.00	6.00	5.18	0.00				
220.00	6.00	5.18	0.00				
225.00	6.00	5.18	0.00				
230.00	6.00	5.18	0.00				
235.00	6.00	5.18	0.00				
240.00	6.00	5.18	0.00				
245.00	6.00	5.18	0.00				
250.00	6.00	5.18	0.00				
255.00	6.00	5.18	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1H: PROP 1H

Runoff = 13.01 cfs @ 12.10 hrs, Volume= 0.953 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

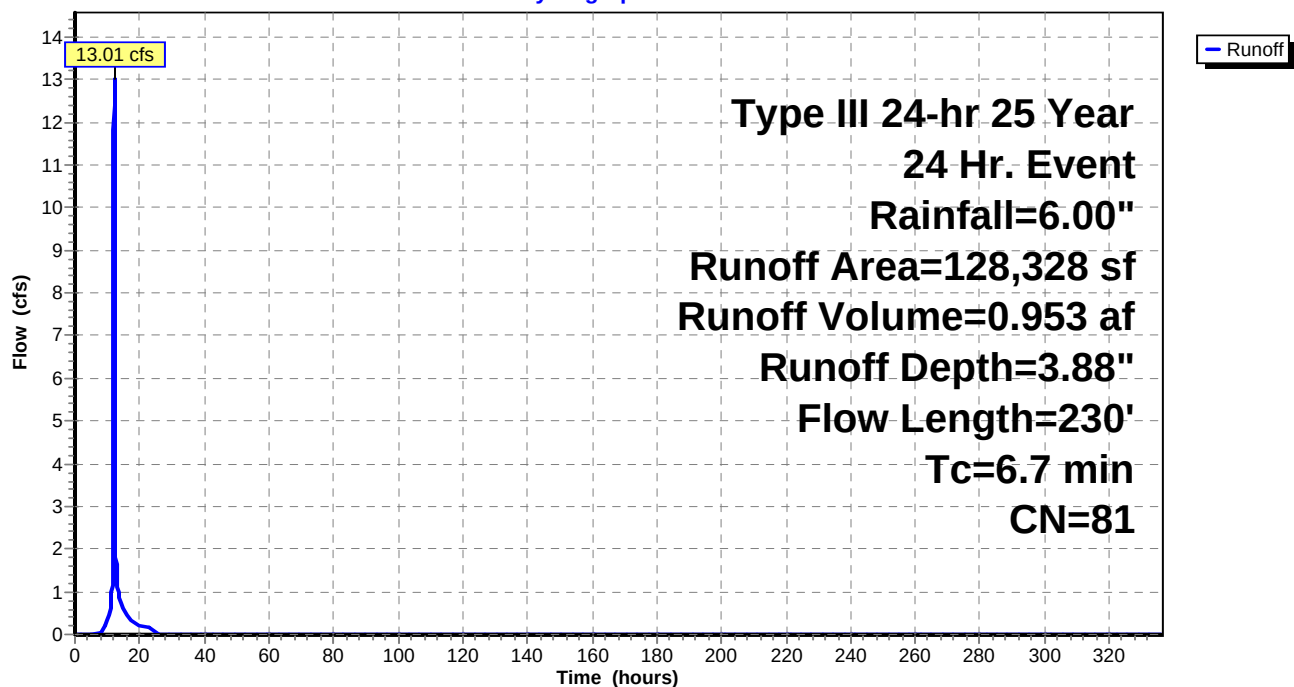
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
88,514	74	>75% Grass cover, Good, HSG C
39,814	98	Water Surface, HSG B
128,328	81	Weighted Average
88,514		68.97% Pervious Area
39,814		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.7	130	0.2000	3.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.7	230	Total			

Subcatchment 1H: PROP 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1H: PROP 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.88	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.88	0.00
10.00	1.13	0.15	0.32	270.00	6.00	3.88	0.00
15.00	5.13	3.10	0.61	275.00	6.00	3.88	0.00
20.00	5.74	3.65	0.21	280.00	6.00	3.88	0.00
25.00	6.00	3.88	0.00	285.00	6.00	3.88	0.00
30.00	6.00	3.88	0.00	290.00	6.00	3.88	0.00
35.00	6.00	3.88	0.00	295.00	6.00	3.88	0.00
40.00	6.00	3.88	0.00	300.00	6.00	3.88	0.00
45.00	6.00	3.88	0.00	305.00	6.00	3.88	0.00
50.00	6.00	3.88	0.00	310.00	6.00	3.88	0.00
55.00	6.00	3.88	0.00	315.00	6.00	3.88	0.00
60.00	6.00	3.88	0.00	320.00	6.00	3.88	0.00
65.00	6.00	3.88	0.00	325.00	6.00	3.88	0.00
70.00	6.00	3.88	0.00	330.00	6.00	3.88	0.00
75.00	6.00	3.88	0.00	335.00	6.00	3.88	0.00
80.00	6.00	3.88	0.00				
85.00	6.00	3.88	0.00				
90.00	6.00	3.88	0.00				
95.00	6.00	3.88	0.00				
100.00	6.00	3.88	0.00				
105.00	6.00	3.88	0.00				
110.00	6.00	3.88	0.00				
115.00	6.00	3.88	0.00				
120.00	6.00	3.88	0.00				
125.00	6.00	3.88	0.00				
130.00	6.00	3.88	0.00				
135.00	6.00	3.88	0.00				
140.00	6.00	3.88	0.00				
145.00	6.00	3.88	0.00				
150.00	6.00	3.88	0.00				
155.00	6.00	3.88	0.00				
160.00	6.00	3.88	0.00				
165.00	6.00	3.88	0.00				
170.00	6.00	3.88	0.00				
175.00	6.00	3.88	0.00				
180.00	6.00	3.88	0.00				
185.00	6.00	3.88	0.00				
190.00	6.00	3.88	0.00				
195.00	6.00	3.88	0.00				
200.00	6.00	3.88	0.00				
205.00	6.00	3.88	0.00				
210.00	6.00	3.88	0.00				
215.00	6.00	3.88	0.00				
220.00	6.00	3.88	0.00				
225.00	6.00	3.88	0.00				
230.00	6.00	3.88	0.00				
235.00	6.00	3.88	0.00				
240.00	6.00	3.88	0.00				
245.00	6.00	3.88	0.00				
250.00	6.00	3.88	0.00				
255.00	6.00	3.88	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment 1J: PROP 1J

Runoff = 24.51 cfs @ 12.15 hrs, Volume= 2.021 af, Depth= 3.18"

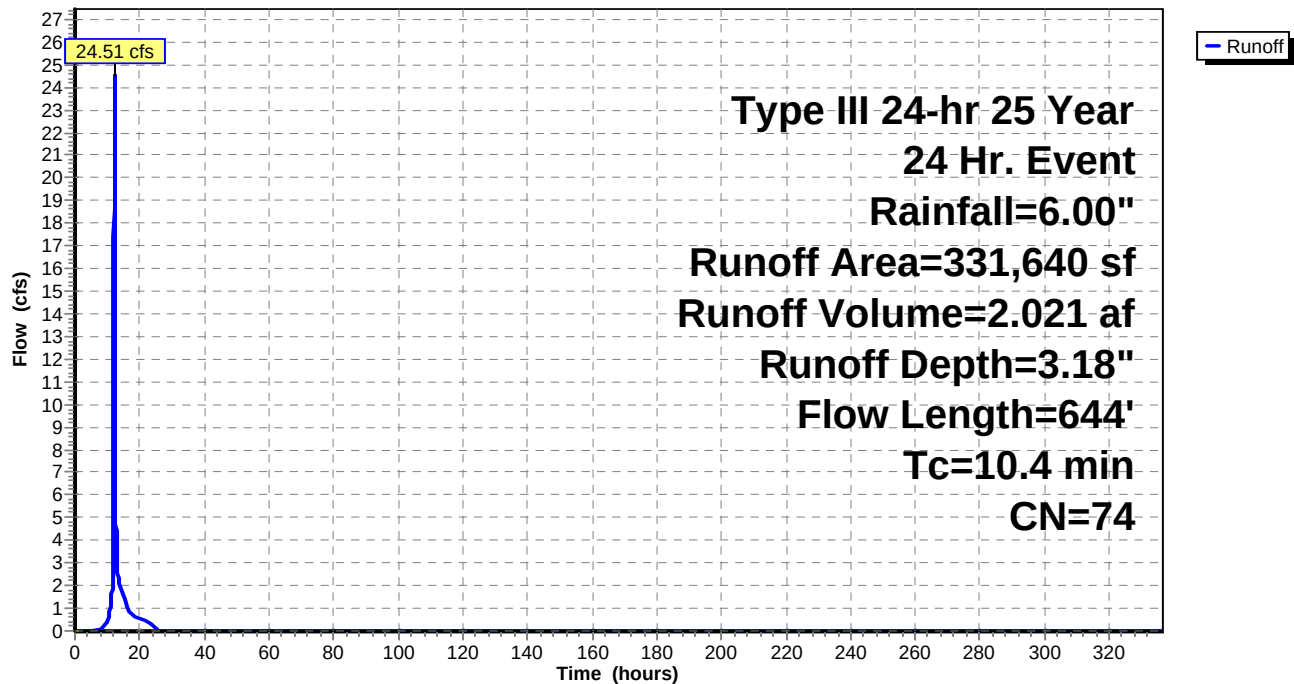
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
34,708	98	Paved parking, HSG B
241,872	74	>75% Grass cover, Good, HSG C
55,060	61	>75% Grass cover, Good, HSG B
331,640	74	Weighted Average
296,932		89.53% Pervious Area
34,708		10.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
3.2	544	0.1617	2.81		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.4	644	Total			

Subcatchment 1J: PROP 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1J: PROP 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.18	0.00
10.00	1.13	0.05	0.41	270.00	6.00	3.18	0.00
15.00	5.13	2.46	1.45	275.00	6.00	3.18	0.00
20.00	5.74	2.97	0.51	280.00	6.00	3.18	0.00
25.00	6.00	3.18	0.00	285.00	6.00	3.18	0.00
30.00	6.00	3.18	0.00	290.00	6.00	3.18	0.00
35.00	6.00	3.18	0.00	295.00	6.00	3.18	0.00
40.00	6.00	3.18	0.00	300.00	6.00	3.18	0.00
45.00	6.00	3.18	0.00	305.00	6.00	3.18	0.00
50.00	6.00	3.18	0.00	310.00	6.00	3.18	0.00
55.00	6.00	3.18	0.00	315.00	6.00	3.18	0.00
60.00	6.00	3.18	0.00	320.00	6.00	3.18	0.00
65.00	6.00	3.18	0.00	325.00	6.00	3.18	0.00
70.00	6.00	3.18	0.00	330.00	6.00	3.18	0.00
75.00	6.00	3.18	0.00	335.00	6.00	3.18	0.00
80.00	6.00	3.18	0.00				
85.00	6.00	3.18	0.00				
90.00	6.00	3.18	0.00				
95.00	6.00	3.18	0.00				
100.00	6.00	3.18	0.00				
105.00	6.00	3.18	0.00				
110.00	6.00	3.18	0.00				
115.00	6.00	3.18	0.00				
120.00	6.00	3.18	0.00				
125.00	6.00	3.18	0.00				
130.00	6.00	3.18	0.00				
135.00	6.00	3.18	0.00				
140.00	6.00	3.18	0.00				
145.00	6.00	3.18	0.00				
150.00	6.00	3.18	0.00				
155.00	6.00	3.18	0.00				
160.00	6.00	3.18	0.00				
165.00	6.00	3.18	0.00				
170.00	6.00	3.18	0.00				
175.00	6.00	3.18	0.00				
180.00	6.00	3.18	0.00				
185.00	6.00	3.18	0.00				
190.00	6.00	3.18	0.00				
195.00	6.00	3.18	0.00				
200.00	6.00	3.18	0.00				
205.00	6.00	3.18	0.00				
210.00	6.00	3.18	0.00				
215.00	6.00	3.18	0.00				
220.00	6.00	3.18	0.00				
225.00	6.00	3.18	0.00				
230.00	6.00	3.18	0.00				
235.00	6.00	3.18	0.00				
240.00	6.00	3.18	0.00				
245.00	6.00	3.18	0.00				
250.00	6.00	3.18	0.00				
255.00	6.00	3.18	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

Printed 2/12/2010

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Summary for Subcatchment 1M: PROP DA 1M

Runoff = 0.65 cfs @ 12.01 hrs, Volume= 0.044 af, Depth= 5.76"

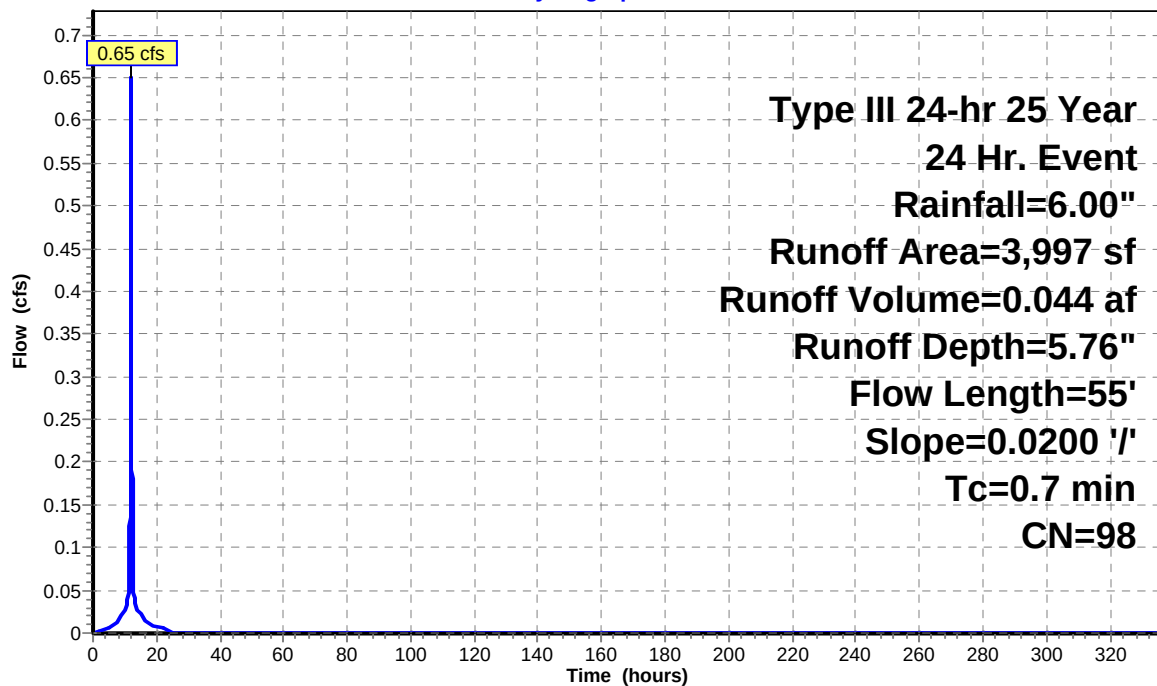
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
3,997	98	Roofs, HSG B
3,997		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.28		Sheet Flow, ROOF RUNOFF Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1M: PROP DA 1M

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1M: PROP DA 1M

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	5.76	0.00
5.00	0.34	0.18	0.01	265.00	6.00	5.76	0.00
10.00	1.13	0.92	0.03	270.00	6.00	5.76	0.00
15.00	5.13	4.89	0.02	275.00	6.00	5.76	0.00
20.00	5.74	5.50	0.01	280.00	6.00	5.76	0.00
25.00	6.00	5.76	0.00	285.00	6.00	5.76	0.00
30.00	6.00	5.76	0.00	290.00	6.00	5.76	0.00
35.00	6.00	5.76	0.00	295.00	6.00	5.76	0.00
40.00	6.00	5.76	0.00	300.00	6.00	5.76	0.00
45.00	6.00	5.76	0.00	305.00	6.00	5.76	0.00
50.00	6.00	5.76	0.00	310.00	6.00	5.76	0.00
55.00	6.00	5.76	0.00	315.00	6.00	5.76	0.00
60.00	6.00	5.76	0.00	320.00	6.00	5.76	0.00
65.00	6.00	5.76	0.00	325.00	6.00	5.76	0.00
70.00	6.00	5.76	0.00	330.00	6.00	5.76	0.00
75.00	6.00	5.76	0.00	335.00	6.00	5.76	0.00
80.00	6.00	5.76	0.00				
85.00	6.00	5.76	0.00				
90.00	6.00	5.76	0.00				
95.00	6.00	5.76	0.00				
100.00	6.00	5.76	0.00				
105.00	6.00	5.76	0.00				
110.00	6.00	5.76	0.00				
115.00	6.00	5.76	0.00				
120.00	6.00	5.76	0.00				
125.00	6.00	5.76	0.00				
130.00	6.00	5.76	0.00				
135.00	6.00	5.76	0.00				
140.00	6.00	5.76	0.00				
145.00	6.00	5.76	0.00				
150.00	6.00	5.76	0.00				
155.00	6.00	5.76	0.00				
160.00	6.00	5.76	0.00				
165.00	6.00	5.76	0.00				
170.00	6.00	5.76	0.00				
175.00	6.00	5.76	0.00				
180.00	6.00	5.76	0.00				
185.00	6.00	5.76	0.00				
190.00	6.00	5.76	0.00				
195.00	6.00	5.76	0.00				
200.00	6.00	5.76	0.00				
205.00	6.00	5.76	0.00				
210.00	6.00	5.76	0.00				
215.00	6.00	5.76	0.00				
220.00	6.00	5.76	0.00				
225.00	6.00	5.76	0.00				
230.00	6.00	5.76	0.00				
235.00	6.00	5.76	0.00				
240.00	6.00	5.76	0.00				
245.00	6.00	5.76	0.00				
250.00	6.00	5.76	0.00				
255.00	6.00	5.76	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1N: PROP DA 1N

Runoff = 0.69 cfs @ 12.01 hrs, Volume= 0.047 af, Depth= 5.76"

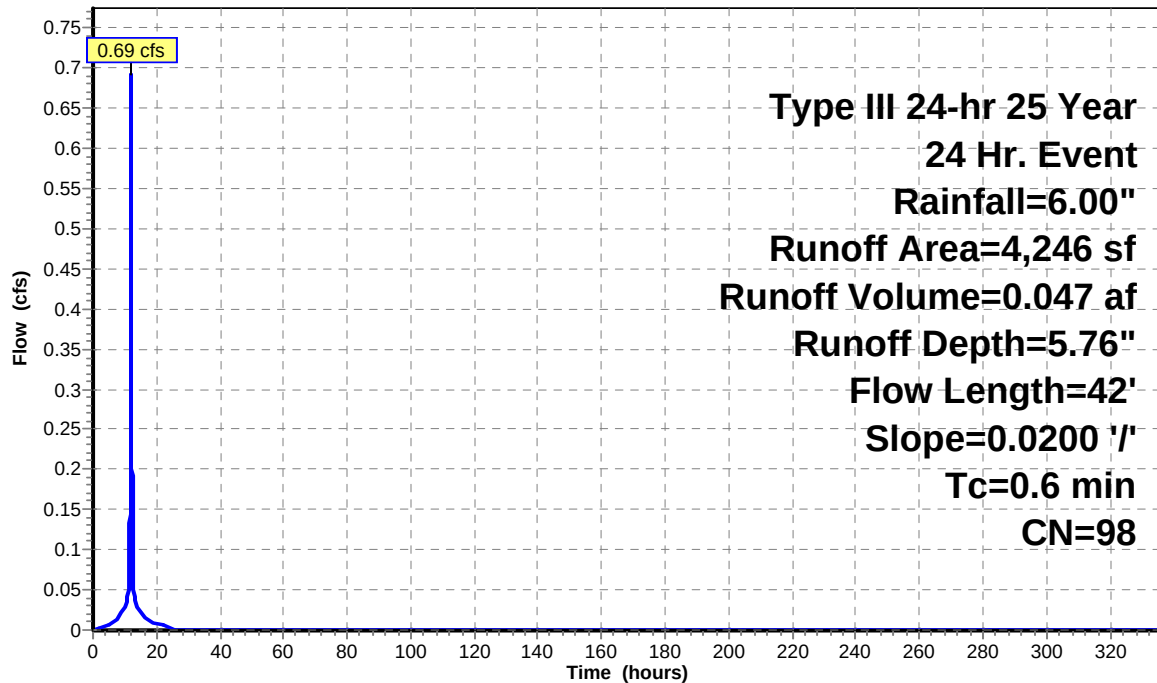
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
4,246	98	Roofs, HSG B
4,246		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	42	0.0200	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1N: PROP DA 1N

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment 1N: PROP DA 1N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	5.76	0.00
5.00	0.34	0.18	0.01	265.00	6.00	5.76	0.00
10.00	1.13	0.92	0.03	270.00	6.00	5.76	0.00
15.00	5.13	4.89	0.02	275.00	6.00	5.76	0.00
20.00	5.74	5.50	0.01	280.00	6.00	5.76	0.00
25.00	6.00	5.76	0.00	285.00	6.00	5.76	0.00
30.00	6.00	5.76	0.00	290.00	6.00	5.76	0.00
35.00	6.00	5.76	0.00	295.00	6.00	5.76	0.00
40.00	6.00	5.76	0.00	300.00	6.00	5.76	0.00
45.00	6.00	5.76	0.00	305.00	6.00	5.76	0.00
50.00	6.00	5.76	0.00	310.00	6.00	5.76	0.00
55.00	6.00	5.76	0.00	315.00	6.00	5.76	0.00
60.00	6.00	5.76	0.00	320.00	6.00	5.76	0.00
65.00	6.00	5.76	0.00	325.00	6.00	5.76	0.00
70.00	6.00	5.76	0.00	330.00	6.00	5.76	0.00
75.00	6.00	5.76	0.00	335.00	6.00	5.76	0.00
80.00	6.00	5.76	0.00				
85.00	6.00	5.76	0.00				
90.00	6.00	5.76	0.00				
95.00	6.00	5.76	0.00				
100.00	6.00	5.76	0.00				
105.00	6.00	5.76	0.00				
110.00	6.00	5.76	0.00				
115.00	6.00	5.76	0.00				
120.00	6.00	5.76	0.00				
125.00	6.00	5.76	0.00				
130.00	6.00	5.76	0.00				
135.00	6.00	5.76	0.00				
140.00	6.00	5.76	0.00				
145.00	6.00	5.76	0.00				
150.00	6.00	5.76	0.00				
155.00	6.00	5.76	0.00				
160.00	6.00	5.76	0.00				
165.00	6.00	5.76	0.00				
170.00	6.00	5.76	0.00				
175.00	6.00	5.76	0.00				
180.00	6.00	5.76	0.00				
185.00	6.00	5.76	0.00				
190.00	6.00	5.76	0.00				
195.00	6.00	5.76	0.00				
200.00	6.00	5.76	0.00				
205.00	6.00	5.76	0.00				
210.00	6.00	5.76	0.00				
215.00	6.00	5.76	0.00				
220.00	6.00	5.76	0.00				
225.00	6.00	5.76	0.00				
230.00	6.00	5.76	0.00				
235.00	6.00	5.76	0.00				
240.00	6.00	5.76	0.00				
245.00	6.00	5.76	0.00				
250.00	6.00	5.76	0.00				
255.00	6.00	5.76	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1H: EXIST 1H

Runoff = 17.08 cfs @ 12.19 hrs, Volume= 1.561 af, Depth= 3.09"

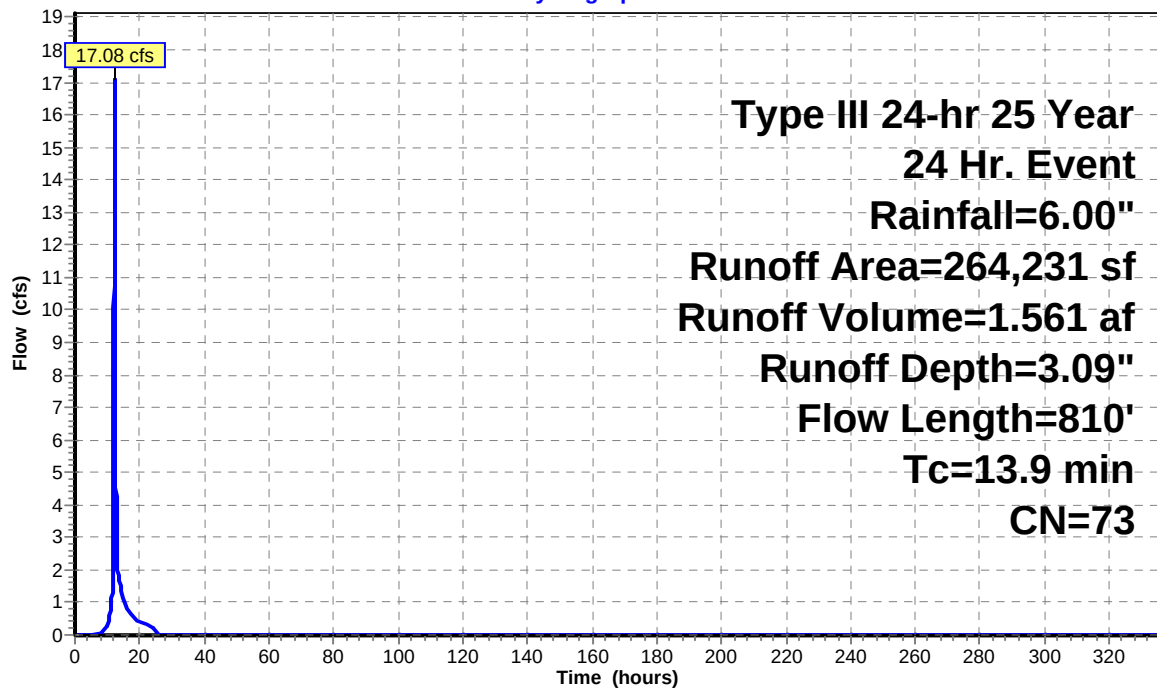
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
58,583	61	>75% Grass cover, Good, HSG B
188,543	74	>75% Grass cover, Good, HSG C
17,105	98	Paved parking, HSG B
264,231	73	Weighted Average
247,126		93.53% Pervious Area
17,105		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	150	0.0400	0.25		Sheet Flow, Orchard
					Grass: Short n= 0.150 P2= 3.50"
4.1	660	0.1480	2.69		Shallow Concentrated Flow, Orchard
					Short Grass Pasture Kv= 7.0 fps
13.9	810	Total			

Subcatchment EX 1H: EXIST 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1H: EXIST 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.09	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.09	0.00
10.00	1.13	0.04	0.27	270.00	6.00	3.09	0.00
15.00	5.13	2.38	1.16	275.00	6.00	3.09	0.00
20.00	5.74	2.88	0.40	280.00	6.00	3.09	0.00
25.00	6.00	3.09	0.00	285.00	6.00	3.09	0.00
30.00	6.00	3.09	0.00	290.00	6.00	3.09	0.00
35.00	6.00	3.09	0.00	295.00	6.00	3.09	0.00
40.00	6.00	3.09	0.00	300.00	6.00	3.09	0.00
45.00	6.00	3.09	0.00	305.00	6.00	3.09	0.00
50.00	6.00	3.09	0.00	310.00	6.00	3.09	0.00
55.00	6.00	3.09	0.00	315.00	6.00	3.09	0.00
60.00	6.00	3.09	0.00	320.00	6.00	3.09	0.00
65.00	6.00	3.09	0.00	325.00	6.00	3.09	0.00
70.00	6.00	3.09	0.00	330.00	6.00	3.09	0.00
75.00	6.00	3.09	0.00	335.00	6.00	3.09	0.00
80.00	6.00	3.09	0.00				
85.00	6.00	3.09	0.00				
90.00	6.00	3.09	0.00				
95.00	6.00	3.09	0.00				
100.00	6.00	3.09	0.00				
105.00	6.00	3.09	0.00				
110.00	6.00	3.09	0.00				
115.00	6.00	3.09	0.00				
120.00	6.00	3.09	0.00				
125.00	6.00	3.09	0.00				
130.00	6.00	3.09	0.00				
135.00	6.00	3.09	0.00				
140.00	6.00	3.09	0.00				
145.00	6.00	3.09	0.00				
150.00	6.00	3.09	0.00				
155.00	6.00	3.09	0.00				
160.00	6.00	3.09	0.00				
165.00	6.00	3.09	0.00				
170.00	6.00	3.09	0.00				
175.00	6.00	3.09	0.00				
180.00	6.00	3.09	0.00				
185.00	6.00	3.09	0.00				
190.00	6.00	3.09	0.00				
195.00	6.00	3.09	0.00				
200.00	6.00	3.09	0.00				
205.00	6.00	3.09	0.00				
210.00	6.00	3.09	0.00				
215.00	6.00	3.09	0.00				
220.00	6.00	3.09	0.00				
225.00	6.00	3.09	0.00				
230.00	6.00	3.09	0.00				
235.00	6.00	3.09	0.00				
240.00	6.00	3.09	0.00				
245.00	6.00	3.09	0.00				
250.00	6.00	3.09	0.00				
255.00	6.00	3.09	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 1J: EX 1J

Runoff = 35.20 cfs @ 12.13 hrs, Volume= 2.791 af, Depth= 3.18"

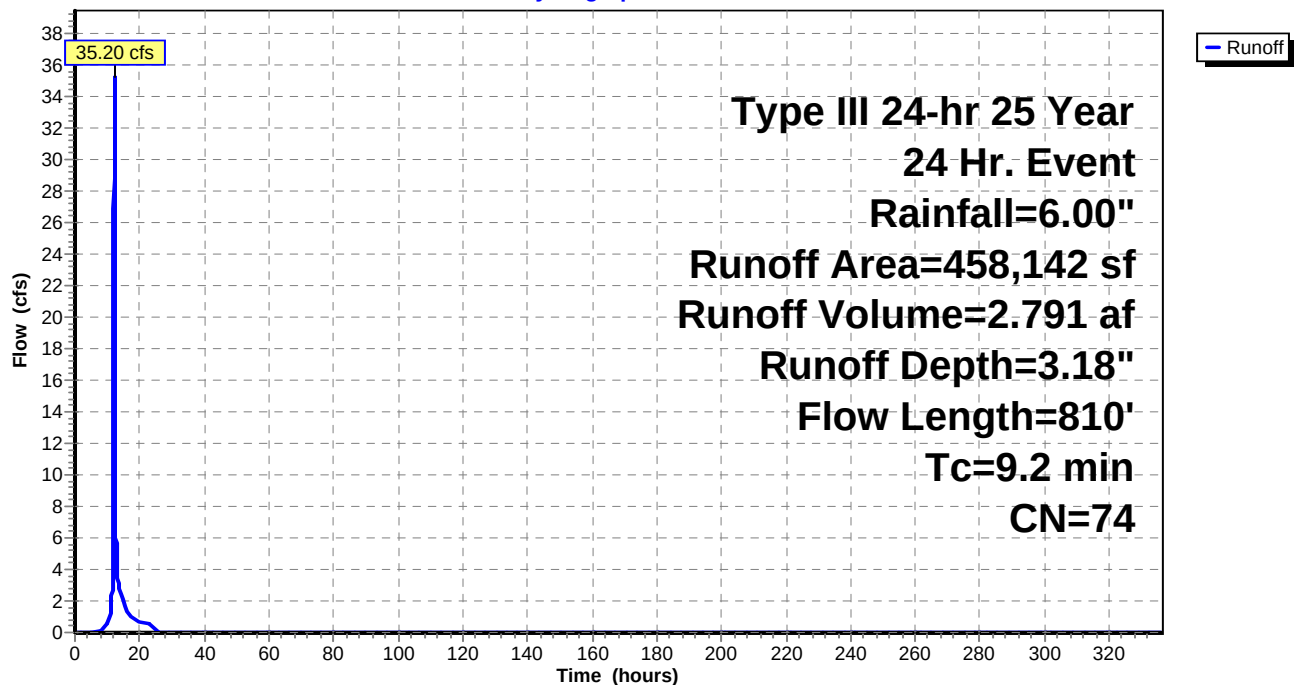
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
24,916	98	Paved parking, HSG B
392,231	74	>75% Grass cover, Good, HSG C
10,926	61	>75% Grass cover, Good, HSG B
30,069	60	Woods, Fair, HSG B
458,142	74	Weighted Average
433,226		94.56% Pervious Area
24,916		5.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
4.6	710	0.1380	2.60		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	810	Total			

Subcatchment EX 1J: EX 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 1J: EX 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.18	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.18	0.00
10.00	1.13	0.05	0.57	270.00	6.00	3.18	0.00
15.00	5.13	2.46	2.00	275.00	6.00	3.18	0.00
20.00	5.74	2.97	0.70	280.00	6.00	3.18	0.00
25.00	6.00	3.18	0.00	285.00	6.00	3.18	0.00
30.00	6.00	3.18	0.00	290.00	6.00	3.18	0.00
35.00	6.00	3.18	0.00	295.00	6.00	3.18	0.00
40.00	6.00	3.18	0.00	300.00	6.00	3.18	0.00
45.00	6.00	3.18	0.00	305.00	6.00	3.18	0.00
50.00	6.00	3.18	0.00	310.00	6.00	3.18	0.00
55.00	6.00	3.18	0.00	315.00	6.00	3.18	0.00
60.00	6.00	3.18	0.00	320.00	6.00	3.18	0.00
65.00	6.00	3.18	0.00	325.00	6.00	3.18	0.00
70.00	6.00	3.18	0.00	330.00	6.00	3.18	0.00
75.00	6.00	3.18	0.00	335.00	6.00	3.18	0.00
80.00	6.00	3.18	0.00				
85.00	6.00	3.18	0.00				
90.00	6.00	3.18	0.00				
95.00	6.00	3.18	0.00				
100.00	6.00	3.18	0.00				
105.00	6.00	3.18	0.00				
110.00	6.00	3.18	0.00				
115.00	6.00	3.18	0.00				
120.00	6.00	3.18	0.00				
125.00	6.00	3.18	0.00				
130.00	6.00	3.18	0.00				
135.00	6.00	3.18	0.00				
140.00	6.00	3.18	0.00				
145.00	6.00	3.18	0.00				
150.00	6.00	3.18	0.00				
155.00	6.00	3.18	0.00				
160.00	6.00	3.18	0.00				
165.00	6.00	3.18	0.00				
170.00	6.00	3.18	0.00				
175.00	6.00	3.18	0.00				
180.00	6.00	3.18	0.00				
185.00	6.00	3.18	0.00				
190.00	6.00	3.18	0.00				
195.00	6.00	3.18	0.00				
200.00	6.00	3.18	0.00				
205.00	6.00	3.18	0.00				
210.00	6.00	3.18	0.00				
215.00	6.00	3.18	0.00				
220.00	6.00	3.18	0.00				
225.00	6.00	3.18	0.00				
230.00	6.00	3.18	0.00				
235.00	6.00	3.18	0.00				
240.00	6.00	3.18	0.00				
245.00	6.00	3.18	0.00				
250.00	6.00	3.18	0.00				
255.00	6.00	3.18	0.00				

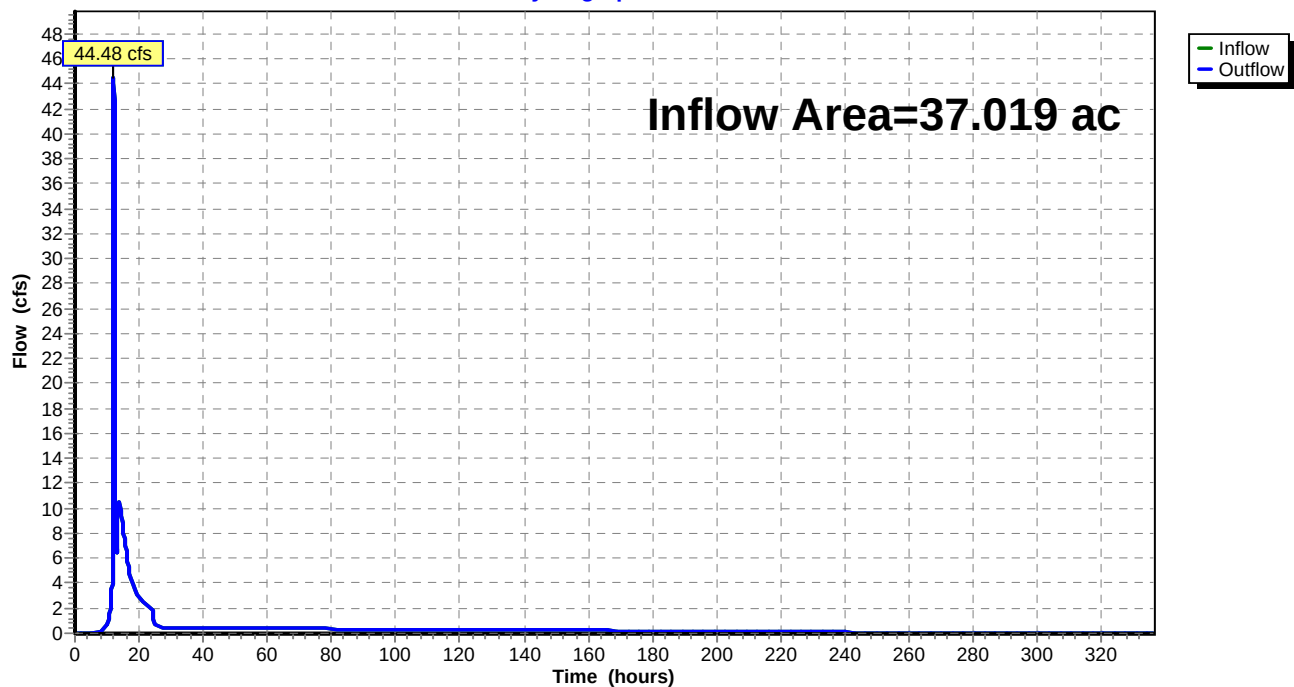
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 37.019 ac, 33.06% Impervious, Inflow Depth > 3.73" for 25 Year, 24 Hr. Event event
Inflow = 44.48 cfs @ 12.14 hrs, Volume= 11.508 af
Outflow = 44.48 cfs @ 12.14 hrs, Volume= 11.508 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.04		0.04
5.00	0.00		0.00	265.00	0.03		0.03
10.00	0.80		0.80	270.00	0.03		0.03
15.00	8.57		8.57	275.00	0.02		0.02
20.00	2.87		2.87	280.00	0.02		0.02
25.00	0.77		0.77	285.00	0.02		0.02
30.00	0.40		0.40	290.00	0.02		0.02
35.00	0.39		0.39	295.00	0.01		0.01
40.00	0.39		0.39	300.00	0.01		0.01
45.00	0.39		0.39	305.00	0.01		0.01
50.00	0.38		0.38	310.00	0.01		0.01
55.00	0.38		0.38	315.00	0.01		0.01
60.00	0.37		0.37	320.00	0.01		0.01
65.00	0.37		0.37	325.00	0.01		0.01
70.00	0.36		0.36	330.00	0.01		0.01
75.00	0.36		0.36	335.00	0.01		0.01
80.00	0.35		0.35				
85.00	0.34		0.34				
90.00	0.34		0.34				
95.00	0.33		0.33				
100.00	0.32		0.32				
105.00	0.32		0.32				
110.00	0.31		0.31				
115.00	0.30		0.30				
120.00	0.29		0.29				
125.00	0.28		0.28				
130.00	0.28		0.28				
135.00	0.27		0.27				
140.00	0.26		0.26				
145.00	0.25		0.25				
150.00	0.24		0.24				
155.00	0.23		0.23				
160.00	0.22		0.22				
165.00	0.22		0.22				
170.00	0.21		0.21				
175.00	0.20		0.20				
180.00	0.19		0.19				
185.00	0.18		0.18				
190.00	0.17		0.17				
195.00	0.16		0.16				
200.00	0.15		0.15				
205.00	0.14		0.14				
210.00	0.13		0.13				
215.00	0.12		0.12				
220.00	0.11		0.11				
225.00	0.10		0.10				
230.00	0.09		0.09				
235.00	0.08		0.08				
240.00	0.07		0.07				
245.00	0.06		0.06				
250.00	0.05		0.05				
255.00	0.05		0.05				

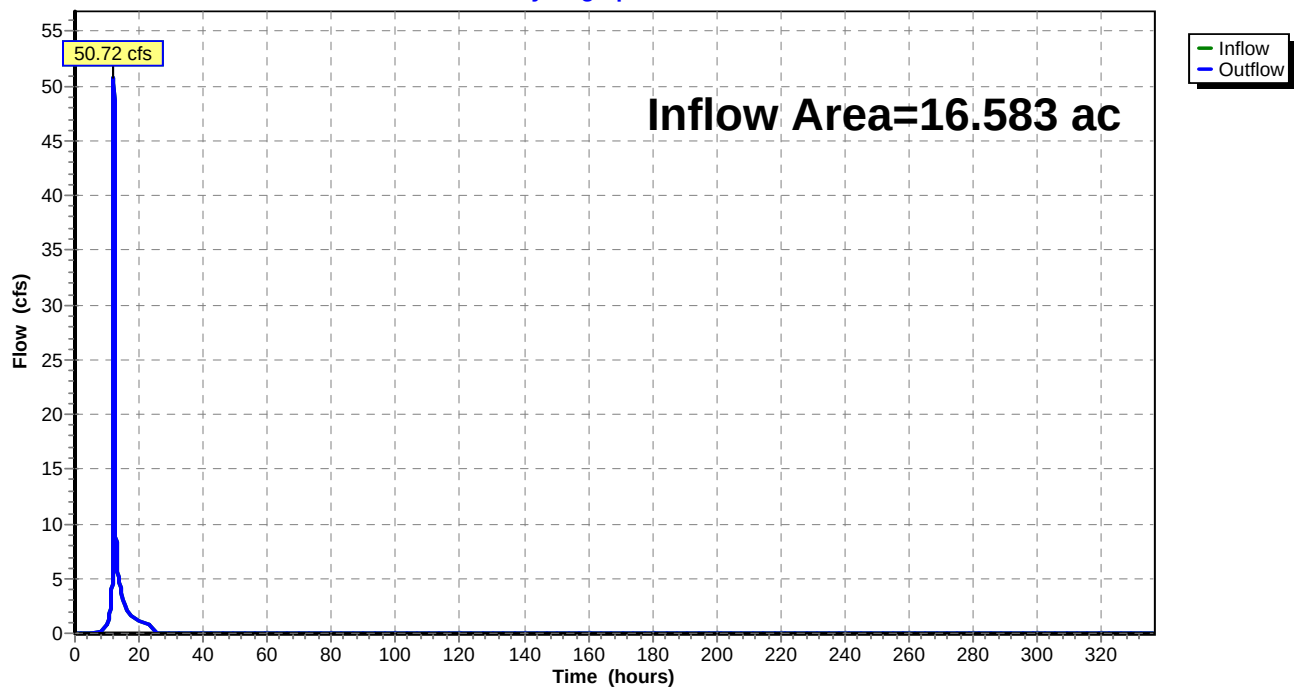
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 16.583 ac, 5.82% Impervious, Inflow Depth = 3.15" for 25 Year, 24 Hr. Event event
Inflow = 50.72 cfs @ 12.15 hrs, Volume= 4.353 af
Outflow = 50.72 cfs @ 12.15 hrs, Volume= 4.353 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.84		0.84	270.00	0.00		0.00
15.00	3.15		3.15	275.00	0.00		0.00
20.00	1.10		1.10	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Pond Pond 1: Pond 1

Inflow Area = 10.536 ac, 37.25% Impervious, Inflow Depth = 4.09" for 25 Year, 24 Hr. Event event
 Inflow = 51.78 cfs @ 12.07 hrs, Volume= 3.592 af
 Outflow = 19.88 cfs @ 12.30 hrs, Volume= 3.574 af, Atten= 62%, Lag= 13.7 min
 Primary = 19.88 cfs @ 12.30 hrs, Volume= 3.574 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 699.00' Surf.Area= 40,289 sf Storage= 141,809 cf

Peak Elev= 700.55' @ 12.30 hrs Surf.Area= 45,609 sf Storage= 208,169 cf (66,360 cf above start)

Plug-Flow detention time= 5,983.7 min calculated for 0.319 af (9% of inflow)

Center-of-Mass det. time= 915.6 min (1,720.9 - 805.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	694.00'	278,293 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)
694.00	17,243	647.0	0	0	17,243
696.00	22,625	697.0	39,746	39,746	22,757
697.00	33,800	793.0	28,026	67,773	34,164
698.00	37,016	823.0	35,396	103,168	38,106
700.00	43,701	867.0	80,625	183,793	44,260
702.00	50,890	917.0	94,500	278,293	51,579

Device	Routing	Invert	Outlet Devices
#1	Primary	692.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 680.00' S= 0.1200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	700.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	699.00'	3.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=19.88 cfs @ 12.30 hrs HW=700.55' TW=589.13' (Dynamic Tailwater)

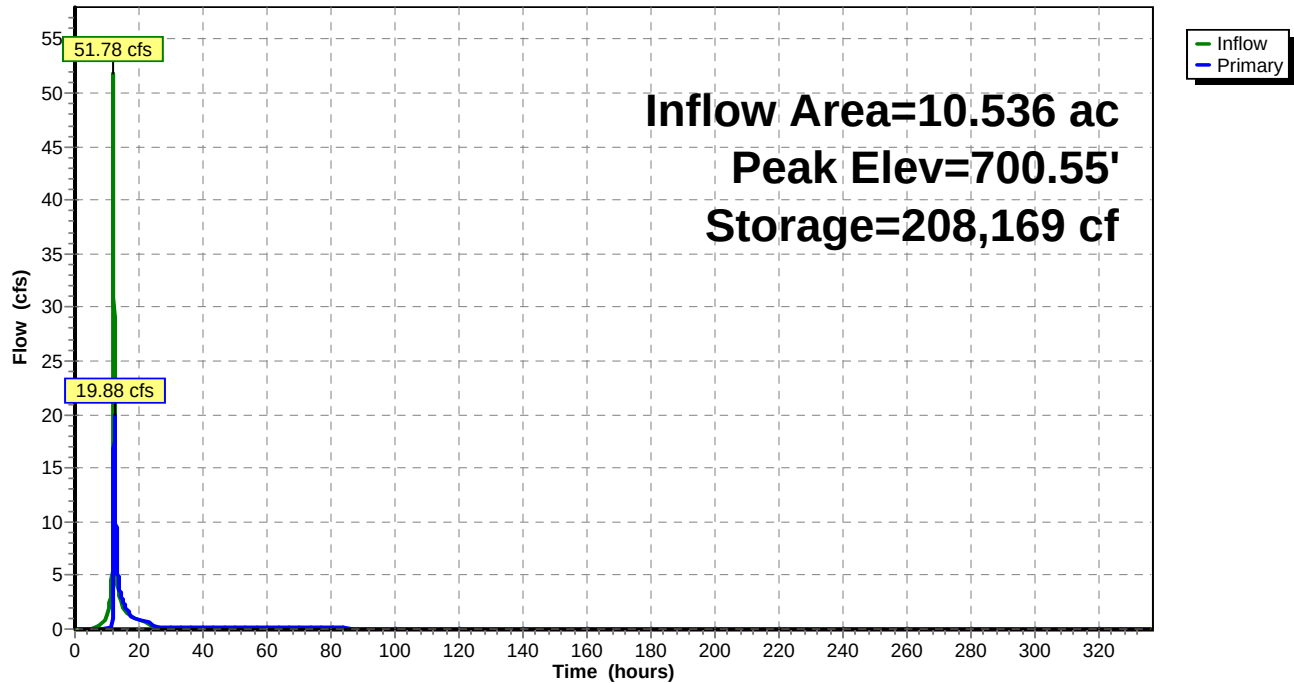
1=Culvert (Passes 19.88 cfs of 63.84 cfs potential flow)

2=Broad-Crested Rectangular Weir (Weir Controls 19.60 cfs @ 2.24 fps)

3=Orifice/Grate (Orifice Controls 0.28 cfs @ 5.74 fps)

Pond Pond 1: Pond 1

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Pond Pond 1: Pond 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	141,809	699.00	0.00
10.00	1.37	148,543	699.17	0.05
20.00	0.77	186,303	700.06	0.84
30.00	0.00	180,284	699.92	0.21
40.00	0.00	173,119	699.75	0.19
50.00	0.00	166,798	699.60	0.16
60.00	0.00	161,333	699.48	0.14
70.00	0.00	156,731	699.36	0.12
80.00	0.00	153,002	699.27	0.09
90.00	0.00	150,145	699.21	0.07
100.00	0.00	148,185	699.16	0.04
110.00	0.00	146,883	699.13	0.03
120.00	0.00	145,985	699.10	0.02
130.00	0.00	145,339	699.09	0.02
140.00	0.00	144,857	699.08	0.01
150.00	0.00	144,485	699.07	0.01
160.00	0.00	144,191	699.06	0.01
170.00	0.00	143,953	699.05	0.01
180.00	0.00	143,757	699.05	0.00
190.00	0.00	143,593	699.04	0.00
200.00	0.00	143,453	699.04	0.00
210.00	0.00	143,334	699.04	0.00
220.00	0.00	143,230	699.04	0.00
230.00	0.00	143,139	699.03	0.00
240.00	0.00	143,059	699.03	0.00
250.00	0.00	142,988	699.03	0.00
260.00	0.00	142,924	699.03	0.00
270.00	0.00	142,867	699.03	0.00
280.00	0.00	142,815	699.02	0.00
290.00	0.00	142,768	699.02	0.00
300.00	0.00	142,725	699.02	0.00
310.00	0.00	142,686	699.02	0.00
320.00	0.00	142,650	699.02	0.00
330.00	0.00	142,616	699.02	0.00

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Stage-Area-Storage for Pond Pond 1: Pond 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
694.00	17,243	0	699.20	40,960	149,934
694.10	17,495	1,737	699.30	41,298	154,047
694.20	17,748	3,499	699.40	41,637	158,194
694.30	18,004	5,287	699.50	41,978	162,375
694.40	18,261	7,100	699.60	42,320	166,590
694.50	18,520	8,939	699.70	42,663	170,839
694.60	18,781	10,804	699.80	43,008	175,122
694.70	19,044	12,695	699.90	43,354	179,440
694.80	19,308	14,613	700.00	43,701	183,793
694.90	19,575	16,557	700.10	44,047	188,180
695.00	19,843	18,528	700.20	44,395	192,602
695.10	20,113	20,525	700.30	44,744	197,059
695.20	20,385	22,550	700.40	45,095	201,551
695.30	20,658	24,602	700.50	45,447	206,079
695.40	20,934	26,682	700.60	45,800	210,641
695.50	21,211	28,789	700.70	46,155	215,239
695.60	21,490	30,924	700.80	46,511	219,872
695.70	21,771	33,087	700.90	46,868	224,541
695.80	22,054	35,279	701.00	47,227	229,246
695.90	22,339	37,498	701.10	47,587	233,986
696.00	22,625	39,746	701.20	47,949	238,763
696.10	23,642	42,060	701.30	48,312	243,576
696.20	24,681	44,475	701.40	48,676	248,425
696.30	25,743	46,996	701.50	49,041	253,311
696.40	26,827	49,625	701.60	49,408	258,234
696.50	27,933	52,363	701.70	49,777	263,193
696.60	29,062	55,212	701.80	50,146	268,189
696.70	30,213	58,176	701.90	50,518	273,222
696.80	31,386	61,255	702.00	50,890	278,293
696.90	32,582	64,454			
697.00	33,800	67,773			
697.10	34,115	71,168			
697.20	34,432	74,596			
697.30	34,749	78,055			
697.40	35,069	81,546			
697.50	35,390	85,068			
697.60	35,712	88,624			
697.70	36,036	92,211			
697.80	36,361	95,831			
697.90	36,688	99,483			
698.00	37,016	103,168			
698.10	37,337	106,886			
698.20	37,660	110,636			
698.30	37,983	114,418			
698.40	38,309	118,233			
698.50	38,635	122,080			
698.60	38,963	125,960			
698.70	39,293	129,872			
698.80	39,623	133,818			
698.90	39,956	137,797			
699.00	40,289	141,809			
699.10	40,624	145,855			

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Pond Pond 2: Pond 2

Inflow Area = 23.503 ac, 45.59% Impervious, Inflow Depth = 4.08" for 25 Year, 24 Hr. Event event
 Inflow = 66.05 cfs @ 12.04 hrs, Volume= 7.984 af
 Outflow = 7.16 cfs @ 13.99 hrs, Volume= 7.921 af, Atten= 89%, Lag= 117.1 min
 Primary = 7.16 cfs @ 13.99 hrs, Volume= 7.921 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 587.00' Surf.Area= 47,444 sf Storage= 230,092 cf

Peak Elev= 590.28' @ 13.99 hrs Surf.Area= 64,173 sf Storage= 418,210 cf (188,118 cf above start)

Plug-Flow detention time= 9,057.7 min calculated for 2.639 af (33% of inflow)

Center-of-Mass det. time= 3,431.8 min (4,643.2 - 1,211.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	580.00'	534,329 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)
580.00	22,976	626.0	0	0	22,976
582.00	28,191	676.0	51,078	51,078	28,318
584.00	33,801	726.0	61,907	112,985	34,069
586.00	39,814	776.0	73,533	186,518	40,232
588.00	55,742	900.0	95,110	281,629	56,854
590.00	63,113	946.0	118,779	400,408	63,859
592.00	70,884	996.0	133,922	534,329	71,827

Device	Routing	Invert	Outlet Devices
#1	Primary	579.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 578.00' S= 0.0100 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	587.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	590.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.16 cfs @ 13.99 hrs HW=590.28' TW=0.00' (Dynamic Tailwater)

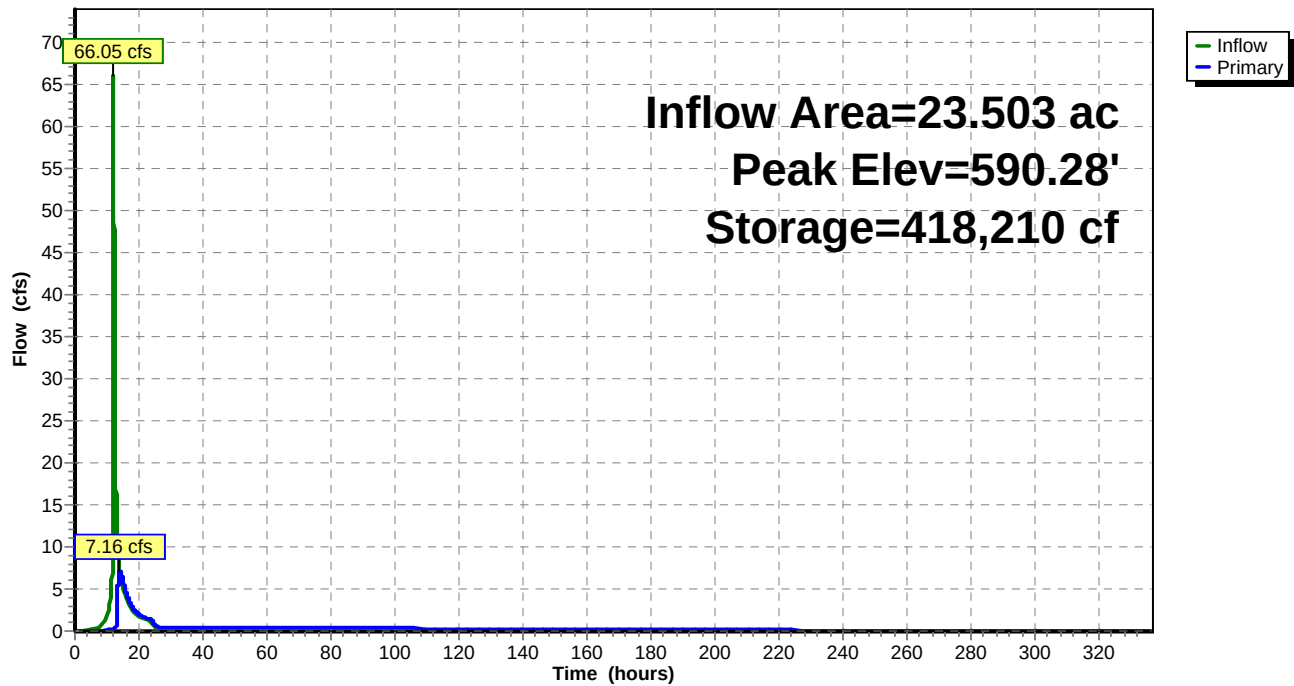
1=Culvert (Passes 7.16 cfs of 74.85 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.55 fps)

3=Broad-Crested Rectangular Weir (Weir Controls 6.74 cfs @ 1.51 fps)

Pond Pond 2: Pond 2

Hydrograph



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Hydrograph for Pond Pond 2: Pond 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	230,092	587.00	0.00
10.00	1.79	240,720	587.22	0.07
20.00	1.78	407,173	590.11	1.97
30.00	0.21	398,683	589.97	0.40
40.00	0.19	391,630	589.86	0.39
50.00	0.16	384,034	589.74	0.38
60.00	0.14	375,916	589.61	0.37
70.00	0.12	367,301	589.47	0.36
80.00	0.09	358,217	589.32	0.35
90.00	0.07	348,702	589.16	0.34
100.00	0.04	338,774	588.99	0.32
110.00	0.03	328,716	588.82	0.31
120.00	0.02	318,809	588.65	0.29
130.00	0.02	309,228	588.49	0.28
140.00	0.01	300,078	588.33	0.26
150.00	0.01	291,424	588.17	0.24
160.00	0.01	283,311	588.03	0.22
170.00	0.01	275,770	587.89	0.21
180.00	0.00	268,827	587.77	0.19
190.00	0.00	262,509	587.65	0.17
200.00	0.00	256,835	587.54	0.15
210.00	0.00	251,823	587.44	0.13
220.00	0.00	247,488	587.36	0.11
230.00	0.00	243,843	587.28	0.09
240.00	0.00	240,888	587.22	0.07
250.00	0.00	238,664	587.18	0.05
260.00	0.00	237,085	587.15	0.04
270.00	0.00	235,949	587.12	0.03
280.00	0.00	235,111	587.10	0.02
290.00	0.00	234,473	587.09	0.02
300.00	0.00	233,974	587.08	0.01
310.00	0.00	233,576	587.07	0.01
320.00	0.00	233,252	587.07	0.01
330.00	0.00	232,983	587.06	0.01

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Stage-Area-Storage for Pond Pond 2: Pond 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
580.00	22,976	0	587.80	54,029	270,652
580.15	23,349	3,474	587.95	55,311	278,852
580.30	23,724	7,005	588.10	56,100	287,221
580.45	24,103	10,592	588.25	56,638	295,676
580.60	24,485	14,236	588.40	57,180	304,212
580.75	24,869	17,937	588.55	57,723	312,830
580.90	25,257	21,697	588.70	58,270	321,530
581.05	25,647	25,514	588.85	58,819	330,311
581.20	26,041	29,391	589.00	59,370	339,175
581.35	26,438	33,327	589.15	59,924	348,122
581.50	26,837	37,322	589.30	60,481	357,153
581.65	27,240	41,378	589.45	61,040	366,267
581.80	27,646	45,495	589.60	61,602	375,465
581.95	28,054	49,672	589.75	62,167	384,748
582.10	28,459	53,911	589.90	62,734	394,115
582.25	28,864	58,210	590.05	63,302	403,568
582.40	29,272	62,570	590.20	63,870	413,106
582.55	29,683	66,992	590.35	64,440	422,729
582.70	30,097	71,475	590.50	65,013	432,438
582.85	30,513	76,021	590.65	65,589	442,233
583.00	30,932	80,629	590.80	66,167	452,115
583.15	31,355	85,301	590.95	66,748	462,083
583.30	31,780	90,036	591.10	67,331	472,139
583.45	32,208	94,835	591.25	67,917	482,283
583.60	32,638	99,698	591.40	68,505	492,515
583.75	33,072	104,626	591.55	69,096	502,835
583.90	33,508	109,620	591.70	69,690	513,244
584.05	33,945	114,679	591.85	70,286	523,742
584.20	34,380	119,803	592.00	70,884	534,329
584.35	34,818	124,993			
584.50	35,258	130,249			
584.65	35,701	135,571			
584.80	36,147	140,959			
584.95	36,596	146,415			
585.10	37,047	151,938			
585.25	37,501	157,529			
585.40	37,958	163,189			
585.55	38,418	168,917			
585.70	38,881	174,714			
585.85	39,346	180,581			
586.00	39,814	186,518			
586.15	40,916	192,573			
586.30	42,033	198,794			
586.45	43,165	205,184			
586.60	44,312	211,744			
586.75	45,474	218,478			
586.90	46,651	225,387			
587.05	47,843	232,474			
587.20	49,050	239,741			
587.35	50,272	247,189			
587.50	51,509	254,823			
587.65	52,762	262,643			

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1B: PROP DA 1B

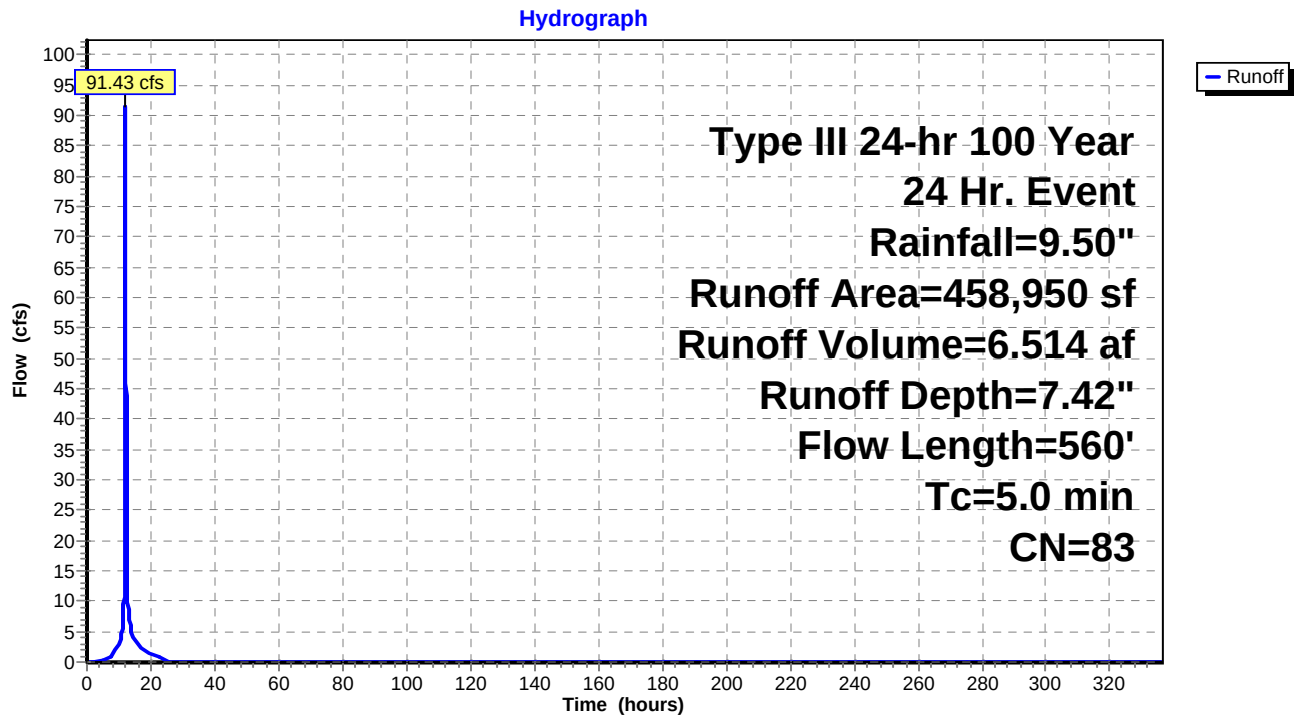
Runoff = 91.43 cfs @ 12.07 hrs, Volume= 6.514 af, Depth= 7.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
170,936	98	Paved parking & roofs
288,014	74	>75% Grass cover, Good, HSG C
458,950	83	Weighted Average
288,014		62.75% Pervious Area
170,936		37.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.1200	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.6	164	0.0850	4.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	150	0.0800	5.74		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	196	0.0410	14.58	45.81	Pipe Channel, Street System 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
5.0	560	Total			

Subcatchment 1B: PROP DA 1B



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1B: PROP DA 1B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.42	0.00
5.00	0.54	0.01	0.15	265.00	9.50	7.42	0.00
10.00	1.80	0.56	3.09	270.00	9.50	7.42	0.00
15.00	8.12	6.09	3.70	275.00	9.50	7.42	0.00
20.00	9.09	7.02	1.28	280.00	9.50	7.42	0.00
25.00	9.50	7.42	0.00	285.00	9.50	7.42	0.00
30.00	9.50	7.42	0.00	290.00	9.50	7.42	0.00
35.00	9.50	7.42	0.00	295.00	9.50	7.42	0.00
40.00	9.50	7.42	0.00	300.00	9.50	7.42	0.00
45.00	9.50	7.42	0.00	305.00	9.50	7.42	0.00
50.00	9.50	7.42	0.00	310.00	9.50	7.42	0.00
55.00	9.50	7.42	0.00	315.00	9.50	7.42	0.00
60.00	9.50	7.42	0.00	320.00	9.50	7.42	0.00
65.00	9.50	7.42	0.00	325.00	9.50	7.42	0.00
70.00	9.50	7.42	0.00	330.00	9.50	7.42	0.00
75.00	9.50	7.42	0.00	335.00	9.50	7.42	0.00
80.00	9.50	7.42	0.00				
85.00	9.50	7.42	0.00				
90.00	9.50	7.42	0.00				
95.00	9.50	7.42	0.00				
100.00	9.50	7.42	0.00				
105.00	9.50	7.42	0.00				
110.00	9.50	7.42	0.00				
115.00	9.50	7.42	0.00				
120.00	9.50	7.42	0.00				
125.00	9.50	7.42	0.00				
130.00	9.50	7.42	0.00				
135.00	9.50	7.42	0.00				
140.00	9.50	7.42	0.00				
145.00	9.50	7.42	0.00				
150.00	9.50	7.42	0.00				
155.00	9.50	7.42	0.00				
160.00	9.50	7.42	0.00				
165.00	9.50	7.42	0.00				
170.00	9.50	7.42	0.00				
175.00	9.50	7.42	0.00				
180.00	9.50	7.42	0.00				
185.00	9.50	7.42	0.00				
190.00	9.50	7.42	0.00				
195.00	9.50	7.42	0.00				
200.00	9.50	7.42	0.00				
205.00	9.50	7.42	0.00				
210.00	9.50	7.42	0.00				
215.00	9.50	7.42	0.00				
220.00	9.50	7.42	0.00				
225.00	9.50	7.42	0.00				
230.00	9.50	7.42	0.00				
235.00	9.50	7.42	0.00				
240.00	9.50	7.42	0.00				
245.00	9.50	7.42	0.00				
250.00	9.50	7.42	0.00				
255.00	9.50	7.42	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment 1C: PROP DA 1C

Runoff = 59.69 cfs @ 12.03 hrs, Volume= 3.729 af, Depth= 6.79"

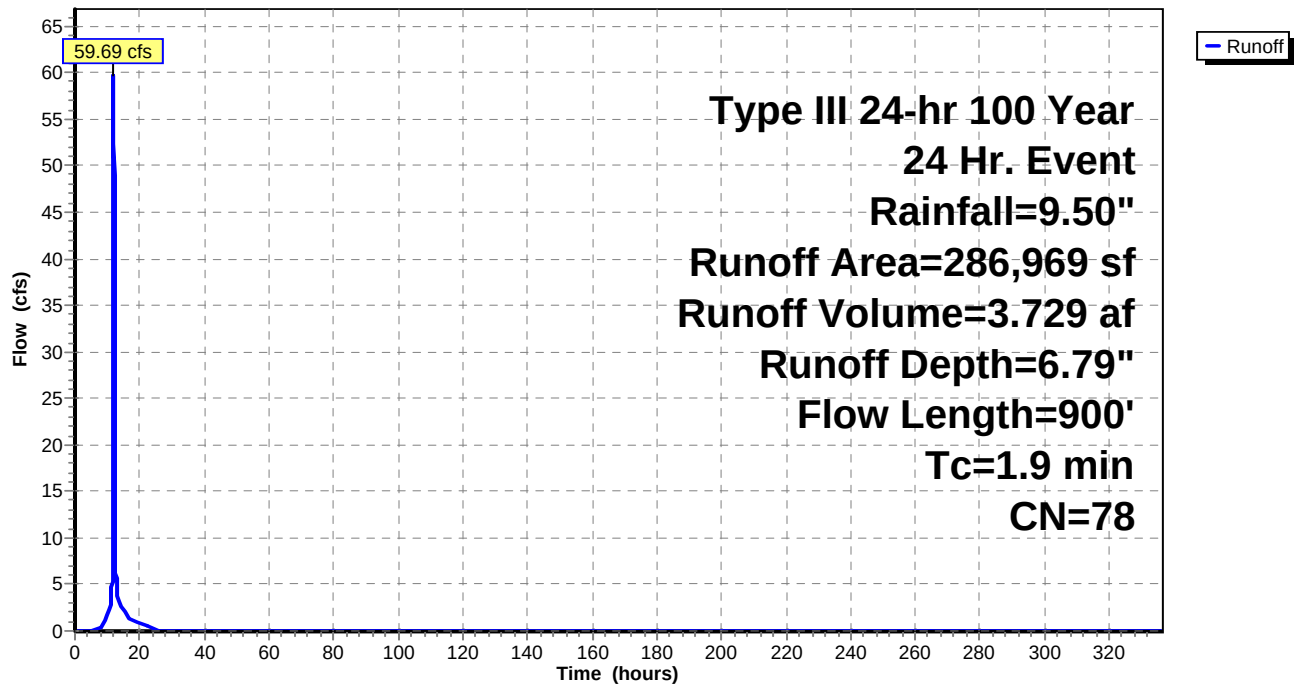
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
151,873	61	>75% Grass cover, Good, HSG B
135,096	98	Paved parking & roofs
286,969	78	Weighted Average
151,873		52.92% Pervious Area
135,096		47.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.44		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.50"
0.7	800	0.0750	19.72	61.95	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.9	900	Total			

Subcatchment 1C: PROP DA 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1C: PROP DA 1C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.79	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.79	0.00
10.00	1.80	0.37	1.57	270.00	9.50	6.79	0.00
15.00	8.12	5.50	2.21	275.00	9.50	6.79	0.00
20.00	9.09	6.41	0.77	280.00	9.50	6.79	0.00
25.00	9.50	6.79	0.00	285.00	9.50	6.79	0.00
30.00	9.50	6.79	0.00	290.00	9.50	6.79	0.00
35.00	9.50	6.79	0.00	295.00	9.50	6.79	0.00
40.00	9.50	6.79	0.00	300.00	9.50	6.79	0.00
45.00	9.50	6.79	0.00	305.00	9.50	6.79	0.00
50.00	9.50	6.79	0.00	310.00	9.50	6.79	0.00
55.00	9.50	6.79	0.00	315.00	9.50	6.79	0.00
60.00	9.50	6.79	0.00	320.00	9.50	6.79	0.00
65.00	9.50	6.79	0.00	325.00	9.50	6.79	0.00
70.00	9.50	6.79	0.00	330.00	9.50	6.79	0.00
75.00	9.50	6.79	0.00	335.00	9.50	6.79	0.00
80.00	9.50	6.79	0.00				
85.00	9.50	6.79	0.00				
90.00	9.50	6.79	0.00				
95.00	9.50	6.79	0.00				
100.00	9.50	6.79	0.00				
105.00	9.50	6.79	0.00				
110.00	9.50	6.79	0.00				
115.00	9.50	6.79	0.00				
120.00	9.50	6.79	0.00				
125.00	9.50	6.79	0.00				
130.00	9.50	6.79	0.00				
135.00	9.50	6.79	0.00				
140.00	9.50	6.79	0.00				
145.00	9.50	6.79	0.00				
150.00	9.50	6.79	0.00				
155.00	9.50	6.79	0.00				
160.00	9.50	6.79	0.00				
165.00	9.50	6.79	0.00				
170.00	9.50	6.79	0.00				
175.00	9.50	6.79	0.00				
180.00	9.50	6.79	0.00				
185.00	9.50	6.79	0.00				
190.00	9.50	6.79	0.00				
195.00	9.50	6.79	0.00				
200.00	9.50	6.79	0.00				
205.00	9.50	6.79	0.00				
210.00	9.50	6.79	0.00				
215.00	9.50	6.79	0.00				
220.00	9.50	6.79	0.00				
225.00	9.50	6.79	0.00				
230.00	9.50	6.79	0.00				
235.00	9.50	6.79	0.00				
240.00	9.50	6.79	0.00				
245.00	9.50	6.79	0.00				
250.00	9.50	6.79	0.00				
255.00	9.50	6.79	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1F: PROP DA 1F

Runoff = 38.85 cfs @ 12.13 hrs, Volume= 3.093 af, Depth= 6.29"

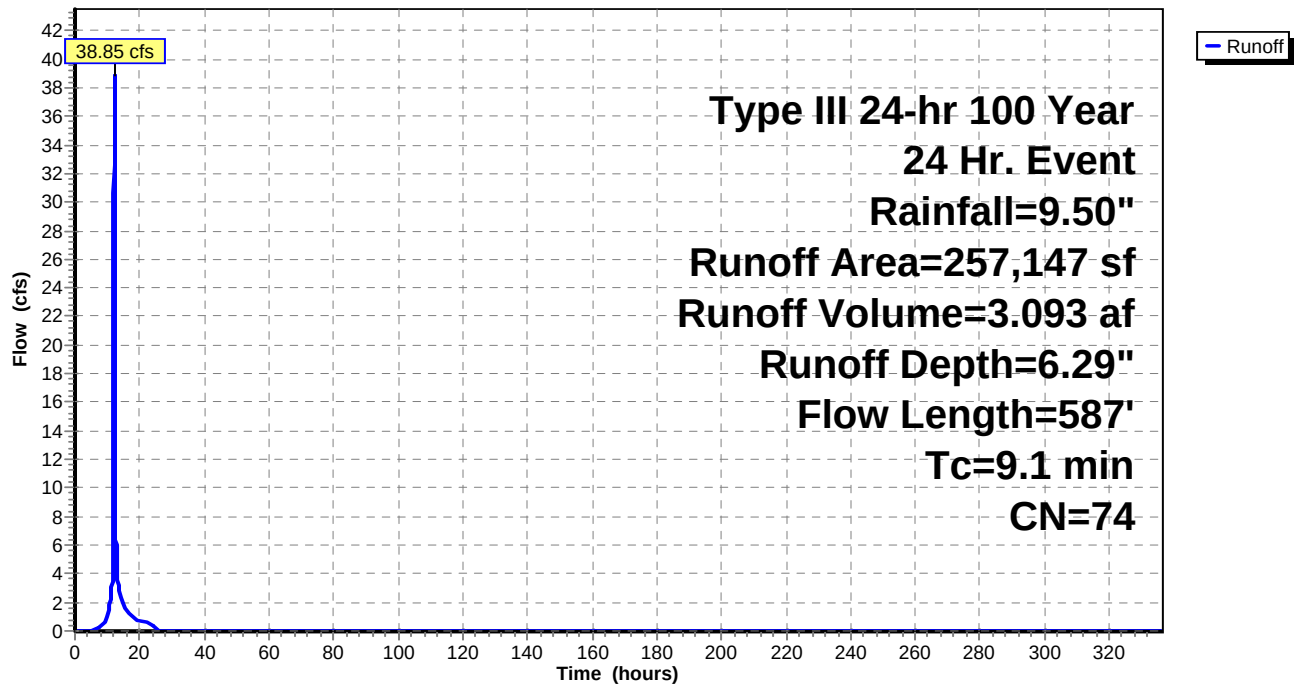
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
166,672	74	>75% Grass cover, Good, HSG C
31,625	98	Paved roads w/curbs & sewers, HSG B
58,850	61	>75% Grass cover, Good, HSG B
257,147	74	Weighted Average
225,522		87.70% Pervious Area
31,625		12.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	52	0.0220	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
1.3	535	0.1860	6.94		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.1	587	Total			

Subcatchment 1F: PROP DA 1F

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1F: PROP DA 1F

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.29	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.29	0.00
10.00	1.80	0.26	1.08	270.00	9.50	6.29	0.00
15.00	8.12	5.03	1.98	275.00	9.50	6.29	0.00
20.00	9.09	5.91	0.68	280.00	9.50	6.29	0.00
25.00	9.50	6.29	0.00	285.00	9.50	6.29	0.00
30.00	9.50	6.29	0.00	290.00	9.50	6.29	0.00
35.00	9.50	6.29	0.00	295.00	9.50	6.29	0.00
40.00	9.50	6.29	0.00	300.00	9.50	6.29	0.00
45.00	9.50	6.29	0.00	305.00	9.50	6.29	0.00
50.00	9.50	6.29	0.00	310.00	9.50	6.29	0.00
55.00	9.50	6.29	0.00	315.00	9.50	6.29	0.00
60.00	9.50	6.29	0.00	320.00	9.50	6.29	0.00
65.00	9.50	6.29	0.00	325.00	9.50	6.29	0.00
70.00	9.50	6.29	0.00	330.00	9.50	6.29	0.00
75.00	9.50	6.29	0.00	335.00	9.50	6.29	0.00
80.00	9.50	6.29	0.00				
85.00	9.50	6.29	0.00				
90.00	9.50	6.29	0.00				
95.00	9.50	6.29	0.00				
100.00	9.50	6.29	0.00				
105.00	9.50	6.29	0.00				
110.00	9.50	6.29	0.00				
115.00	9.50	6.29	0.00				
120.00	9.50	6.29	0.00				
125.00	9.50	6.29	0.00				
130.00	9.50	6.29	0.00				
135.00	9.50	6.29	0.00				
140.00	9.50	6.29	0.00				
145.00	9.50	6.29	0.00				
150.00	9.50	6.29	0.00				
155.00	9.50	6.29	0.00				
160.00	9.50	6.29	0.00				
165.00	9.50	6.29	0.00				
170.00	9.50	6.29	0.00				
175.00	9.50	6.29	0.00				
180.00	9.50	6.29	0.00				
185.00	9.50	6.29	0.00				
190.00	9.50	6.29	0.00				
195.00	9.50	6.29	0.00				
200.00	9.50	6.29	0.00				
205.00	9.50	6.29	0.00				
210.00	9.50	6.29	0.00				
215.00	9.50	6.29	0.00				
220.00	9.50	6.29	0.00				
225.00	9.50	6.29	0.00				
230.00	9.50	6.29	0.00				
235.00	9.50	6.29	0.00				
240.00	9.50	6.29	0.00				
245.00	9.50	6.29	0.00				
250.00	9.50	6.29	0.00				
255.00	9.50	6.29	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1G: PROP DA 1G

Runoff = 34.17 cfs @ 12.03 hrs, Volume= 2.339 af, Depth= 8.65"

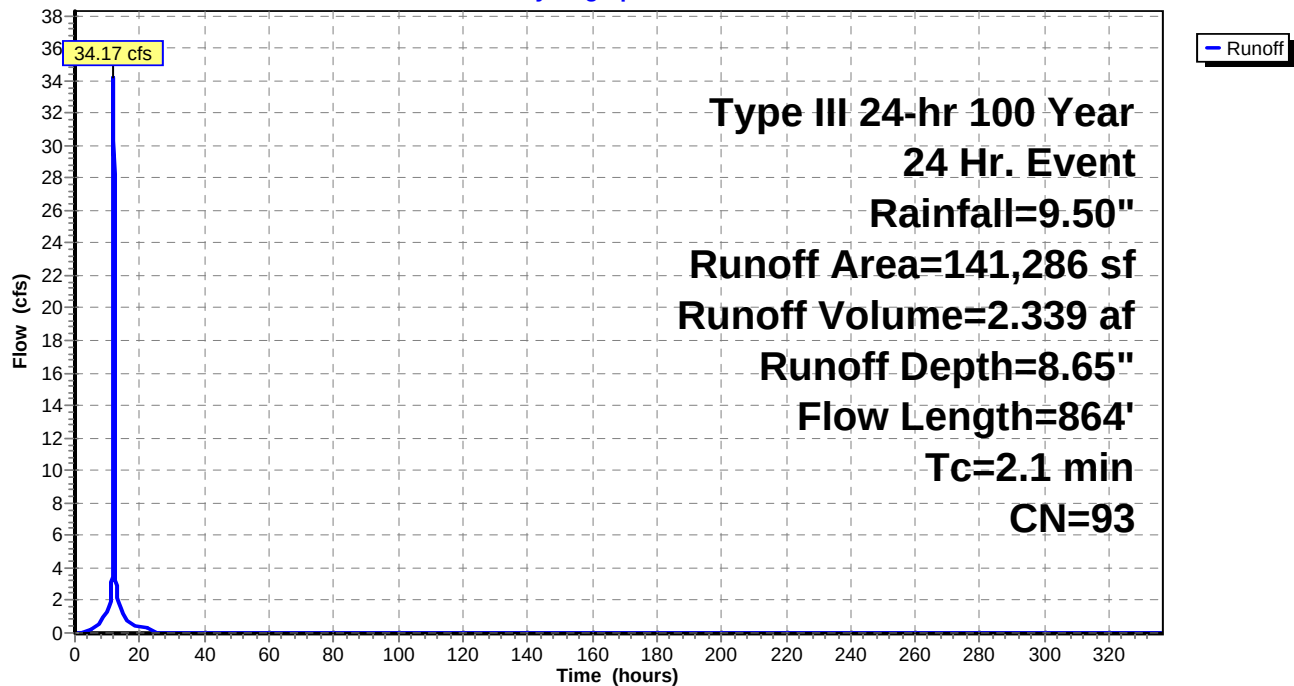
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
112,680	98	Paved parking & roofs
28,606	74	>75% Grass cover, Good, HSG C
141,286	93	Weighted Average
28,606		20.25% Pervious Area
112,680		79.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.08		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"
1.3	764	0.0180	9.66	30.35	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.1	864	Total			

Subcatchment 1G: PROP DA 1G

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1G: PROP DA 1G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.65	0.00
5.00	0.54	0.13	0.25	265.00	9.50	8.65	0.00
10.00	1.80	1.13	1.36	270.00	9.50	8.65	0.00
15.00	8.12	7.28	1.17	275.00	9.50	8.65	0.00
20.00	9.09	8.25	0.40	280.00	9.50	8.65	0.00
25.00	9.50	8.65	0.00	285.00	9.50	8.65	0.00
30.00	9.50	8.65	0.00	290.00	9.50	8.65	0.00
35.00	9.50	8.65	0.00	295.00	9.50	8.65	0.00
40.00	9.50	8.65	0.00	300.00	9.50	8.65	0.00
45.00	9.50	8.65	0.00	305.00	9.50	8.65	0.00
50.00	9.50	8.65	0.00	310.00	9.50	8.65	0.00
55.00	9.50	8.65	0.00	315.00	9.50	8.65	0.00
60.00	9.50	8.65	0.00	320.00	9.50	8.65	0.00
65.00	9.50	8.65	0.00	325.00	9.50	8.65	0.00
70.00	9.50	8.65	0.00	330.00	9.50	8.65	0.00
75.00	9.50	8.65	0.00	335.00	9.50	8.65	0.00
80.00	9.50	8.65	0.00				
85.00	9.50	8.65	0.00				
90.00	9.50	8.65	0.00				
95.00	9.50	8.65	0.00				
100.00	9.50	8.65	0.00				
105.00	9.50	8.65	0.00				
110.00	9.50	8.65	0.00				
115.00	9.50	8.65	0.00				
120.00	9.50	8.65	0.00				
125.00	9.50	8.65	0.00				
130.00	9.50	8.65	0.00				
135.00	9.50	8.65	0.00				
140.00	9.50	8.65	0.00				
145.00	9.50	8.65	0.00				
150.00	9.50	8.65	0.00				
155.00	9.50	8.65	0.00				
160.00	9.50	8.65	0.00				
165.00	9.50	8.65	0.00				
170.00	9.50	8.65	0.00				
175.00	9.50	8.65	0.00				
180.00	9.50	8.65	0.00				
185.00	9.50	8.65	0.00				
190.00	9.50	8.65	0.00				
195.00	9.50	8.65	0.00				
200.00	9.50	8.65	0.00				
205.00	9.50	8.65	0.00				
210.00	9.50	8.65	0.00				
215.00	9.50	8.65	0.00				
220.00	9.50	8.65	0.00				
225.00	9.50	8.65	0.00				
230.00	9.50	8.65	0.00				
235.00	9.50	8.65	0.00				
240.00	9.50	8.65	0.00				
245.00	9.50	8.65	0.00				
250.00	9.50	8.65	0.00				
255.00	9.50	8.65	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1H: PROP 1H

Runoff = 23.47 cfs @ 12.09 hrs, Volume= 1.760 af, Depth= 7.17"

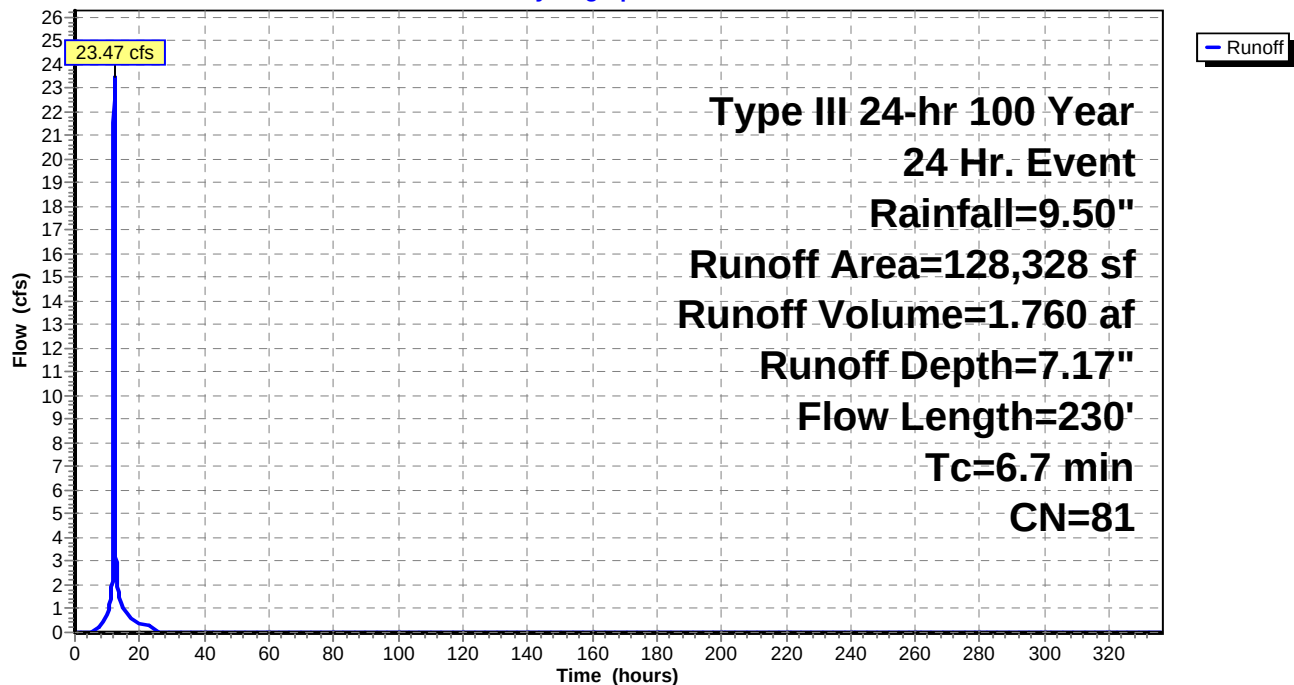
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
88,514	74	>75% Grass cover, Good, HSG C
39,814	98	Water Surface, HSG B
128,328	81	Weighted Average
88,514		68.97% Pervious Area
39,814		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.7	130	0.2000	3.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.7	230	Total			

Subcatchment 1H: PROP 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1H: PROP 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.17	0.00
5.00	0.54	0.00	0.02	265.00	9.50	7.17	0.00
10.00	1.80	0.48	0.78	270.00	9.50	7.17	0.00
15.00	8.12	5.85	1.03	275.00	9.50	7.17	0.00
20.00	9.09	6.78	0.35	280.00	9.50	7.17	0.00
25.00	9.50	7.17	0.00	285.00	9.50	7.17	0.00
30.00	9.50	7.17	0.00	290.00	9.50	7.17	0.00
35.00	9.50	7.17	0.00	295.00	9.50	7.17	0.00
40.00	9.50	7.17	0.00	300.00	9.50	7.17	0.00
45.00	9.50	7.17	0.00	305.00	9.50	7.17	0.00
50.00	9.50	7.17	0.00	310.00	9.50	7.17	0.00
55.00	9.50	7.17	0.00	315.00	9.50	7.17	0.00
60.00	9.50	7.17	0.00	320.00	9.50	7.17	0.00
65.00	9.50	7.17	0.00	325.00	9.50	7.17	0.00
70.00	9.50	7.17	0.00	330.00	9.50	7.17	0.00
75.00	9.50	7.17	0.00	335.00	9.50	7.17	0.00
80.00	9.50	7.17	0.00				
85.00	9.50	7.17	0.00				
90.00	9.50	7.17	0.00				
95.00	9.50	7.17	0.00				
100.00	9.50	7.17	0.00				
105.00	9.50	7.17	0.00				
110.00	9.50	7.17	0.00				
115.00	9.50	7.17	0.00				
120.00	9.50	7.17	0.00				
125.00	9.50	7.17	0.00				
130.00	9.50	7.17	0.00				
135.00	9.50	7.17	0.00				
140.00	9.50	7.17	0.00				
145.00	9.50	7.17	0.00				
150.00	9.50	7.17	0.00				
155.00	9.50	7.17	0.00				
160.00	9.50	7.17	0.00				
165.00	9.50	7.17	0.00				
170.00	9.50	7.17	0.00				
175.00	9.50	7.17	0.00				
180.00	9.50	7.17	0.00				
185.00	9.50	7.17	0.00				
190.00	9.50	7.17	0.00				
195.00	9.50	7.17	0.00				
200.00	9.50	7.17	0.00				
205.00	9.50	7.17	0.00				
210.00	9.50	7.17	0.00				
215.00	9.50	7.17	0.00				
220.00	9.50	7.17	0.00				
225.00	9.50	7.17	0.00				
230.00	9.50	7.17	0.00				
235.00	9.50	7.17	0.00				
240.00	9.50	7.17	0.00				
245.00	9.50	7.17	0.00				
250.00	9.50	7.17	0.00				
255.00	9.50	7.17	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1J: PROP 1J

Runoff = 48.09 cfs @ 12.14 hrs, Volume= 3.989 af, Depth= 6.29"

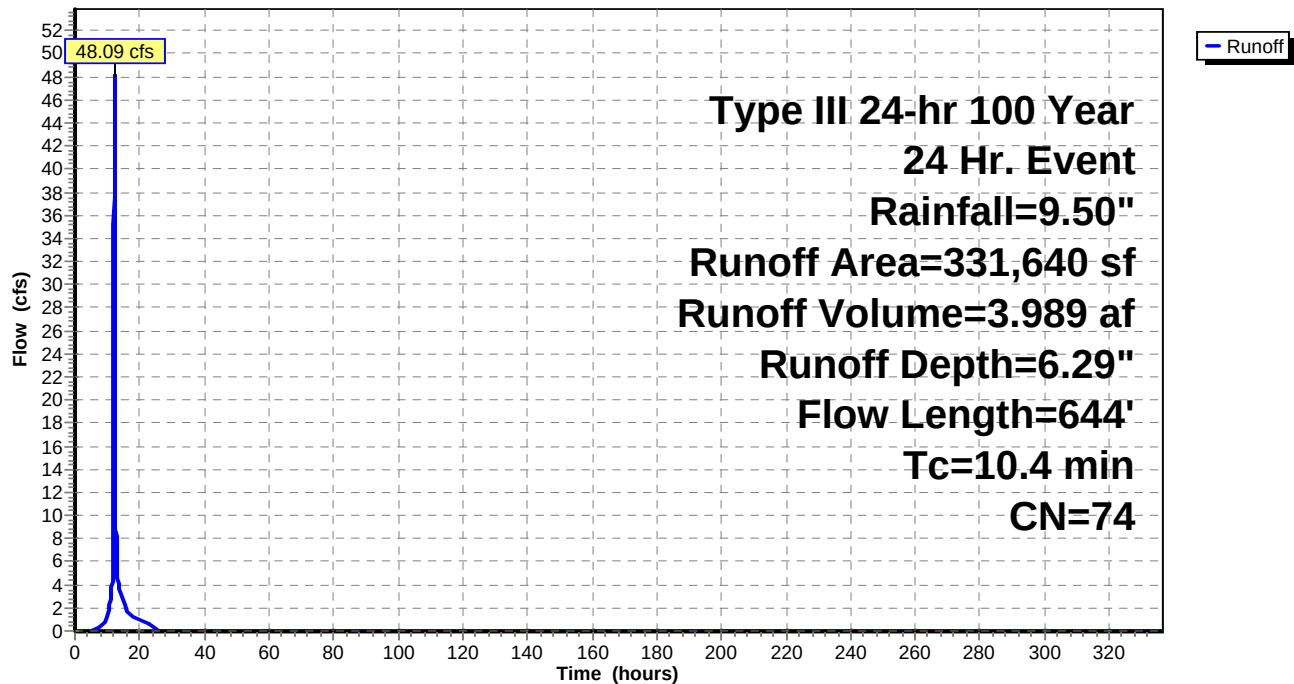
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
34,708	98	Paved parking, HSG B
241,872	74	>75% Grass cover, Good, HSG C
55,060	61	>75% Grass cover, Good, HSG B
331,640	74	Weighted Average
296,932		89.53% Pervious Area
34,708		10.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
3.2	544	0.1617	2.81		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.4	644	Total			

Subcatchment 1J: PROP 1J

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1J: PROP 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.29	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.29	0.00
10.00	1.80	0.26	1.37	270.00	9.50	6.29	0.00
15.00	8.12	5.03	2.57	275.00	9.50	6.29	0.00
20.00	9.09	5.91	0.88	280.00	9.50	6.29	0.00
25.00	9.50	6.29	0.00	285.00	9.50	6.29	0.00
30.00	9.50	6.29	0.00	290.00	9.50	6.29	0.00
35.00	9.50	6.29	0.00	295.00	9.50	6.29	0.00
40.00	9.50	6.29	0.00	300.00	9.50	6.29	0.00
45.00	9.50	6.29	0.00	305.00	9.50	6.29	0.00
50.00	9.50	6.29	0.00	310.00	9.50	6.29	0.00
55.00	9.50	6.29	0.00	315.00	9.50	6.29	0.00
60.00	9.50	6.29	0.00	320.00	9.50	6.29	0.00
65.00	9.50	6.29	0.00	325.00	9.50	6.29	0.00
70.00	9.50	6.29	0.00	330.00	9.50	6.29	0.00
75.00	9.50	6.29	0.00	335.00	9.50	6.29	0.00
80.00	9.50	6.29	0.00				
85.00	9.50	6.29	0.00				
90.00	9.50	6.29	0.00				
95.00	9.50	6.29	0.00				
100.00	9.50	6.29	0.00				
105.00	9.50	6.29	0.00				
110.00	9.50	6.29	0.00				
115.00	9.50	6.29	0.00				
120.00	9.50	6.29	0.00				
125.00	9.50	6.29	0.00				
130.00	9.50	6.29	0.00				
135.00	9.50	6.29	0.00				
140.00	9.50	6.29	0.00				
145.00	9.50	6.29	0.00				
150.00	9.50	6.29	0.00				
155.00	9.50	6.29	0.00				
160.00	9.50	6.29	0.00				
165.00	9.50	6.29	0.00				
170.00	9.50	6.29	0.00				
175.00	9.50	6.29	0.00				
180.00	9.50	6.29	0.00				
185.00	9.50	6.29	0.00				
190.00	9.50	6.29	0.00				
195.00	9.50	6.29	0.00				
200.00	9.50	6.29	0.00				
205.00	9.50	6.29	0.00				
210.00	9.50	6.29	0.00				
215.00	9.50	6.29	0.00				
220.00	9.50	6.29	0.00				
225.00	9.50	6.29	0.00				
230.00	9.50	6.29	0.00				
235.00	9.50	6.29	0.00				
240.00	9.50	6.29	0.00				
245.00	9.50	6.29	0.00				
250.00	9.50	6.29	0.00				
255.00	9.50	6.29	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment 1M: PROP DA 1M

Runoff = 1.03 cfs @ 12.01 hrs, Volume= 0.071 af, Depth= 9.26"

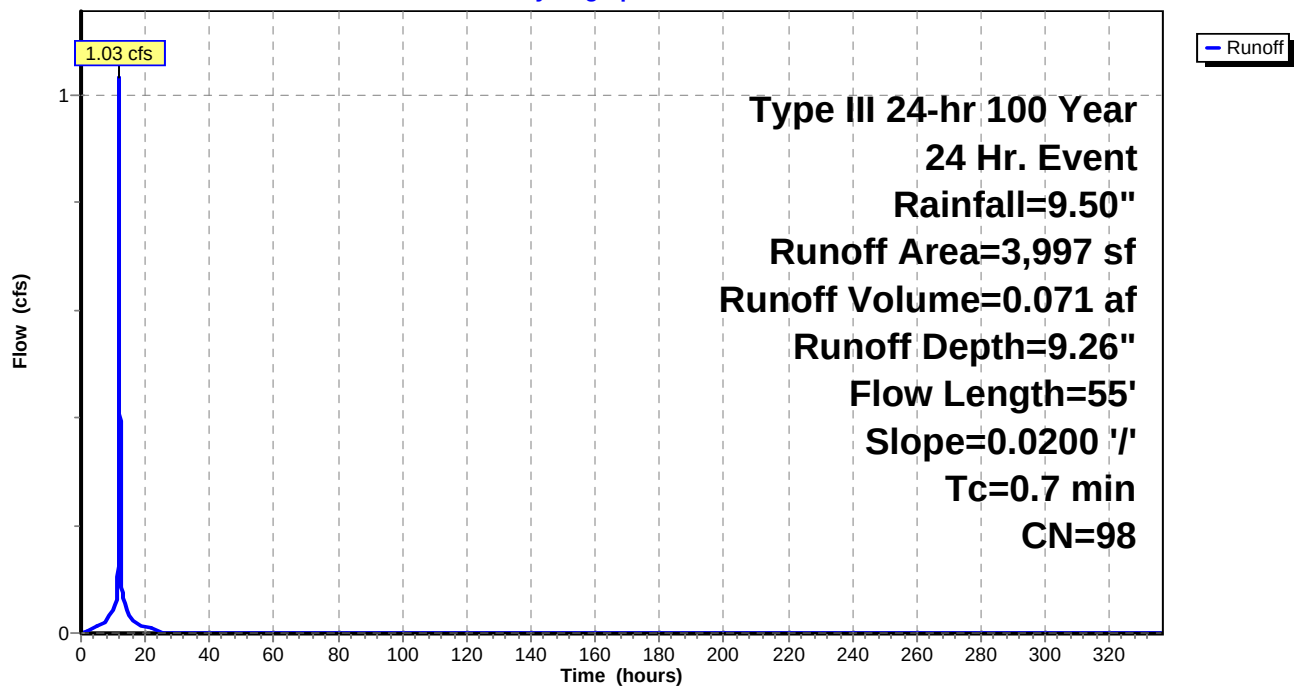
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
3,997	98	Roofs, HSG B
3,997		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.28		Sheet Flow, ROOF RUNOFF Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1M: PROP DA 1M

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1M: PROP DA 1M

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	9.26	0.00
5.00	0.54	0.35	0.01	265.00	9.50	9.26	0.00
10.00	1.80	1.57	0.04	270.00	9.50	9.26	0.00
15.00	8.12	7.88	0.03	275.00	9.50	9.26	0.00
20.00	9.09	8.85	0.01	280.00	9.50	9.26	0.00
25.00	9.50	9.26	0.00	285.00	9.50	9.26	0.00
30.00	9.50	9.26	0.00	290.00	9.50	9.26	0.00
35.00	9.50	9.26	0.00	295.00	9.50	9.26	0.00
40.00	9.50	9.26	0.00	300.00	9.50	9.26	0.00
45.00	9.50	9.26	0.00	305.00	9.50	9.26	0.00
50.00	9.50	9.26	0.00	310.00	9.50	9.26	0.00
55.00	9.50	9.26	0.00	315.00	9.50	9.26	0.00
60.00	9.50	9.26	0.00	320.00	9.50	9.26	0.00
65.00	9.50	9.26	0.00	325.00	9.50	9.26	0.00
70.00	9.50	9.26	0.00	330.00	9.50	9.26	0.00
75.00	9.50	9.26	0.00	335.00	9.50	9.26	0.00
80.00	9.50	9.26	0.00				
85.00	9.50	9.26	0.00				
90.00	9.50	9.26	0.00				
95.00	9.50	9.26	0.00				
100.00	9.50	9.26	0.00				
105.00	9.50	9.26	0.00				
110.00	9.50	9.26	0.00				
115.00	9.50	9.26	0.00				
120.00	9.50	9.26	0.00				
125.00	9.50	9.26	0.00				
130.00	9.50	9.26	0.00				
135.00	9.50	9.26	0.00				
140.00	9.50	9.26	0.00				
145.00	9.50	9.26	0.00				
150.00	9.50	9.26	0.00				
155.00	9.50	9.26	0.00				
160.00	9.50	9.26	0.00				
165.00	9.50	9.26	0.00				
170.00	9.50	9.26	0.00				
175.00	9.50	9.26	0.00				
180.00	9.50	9.26	0.00				
185.00	9.50	9.26	0.00				
190.00	9.50	9.26	0.00				
195.00	9.50	9.26	0.00				
200.00	9.50	9.26	0.00				
205.00	9.50	9.26	0.00				
210.00	9.50	9.26	0.00				
215.00	9.50	9.26	0.00				
220.00	9.50	9.26	0.00				
225.00	9.50	9.26	0.00				
230.00	9.50	9.26	0.00				
235.00	9.50	9.26	0.00				
240.00	9.50	9.26	0.00				
245.00	9.50	9.26	0.00				
250.00	9.50	9.26	0.00				
255.00	9.50	9.26	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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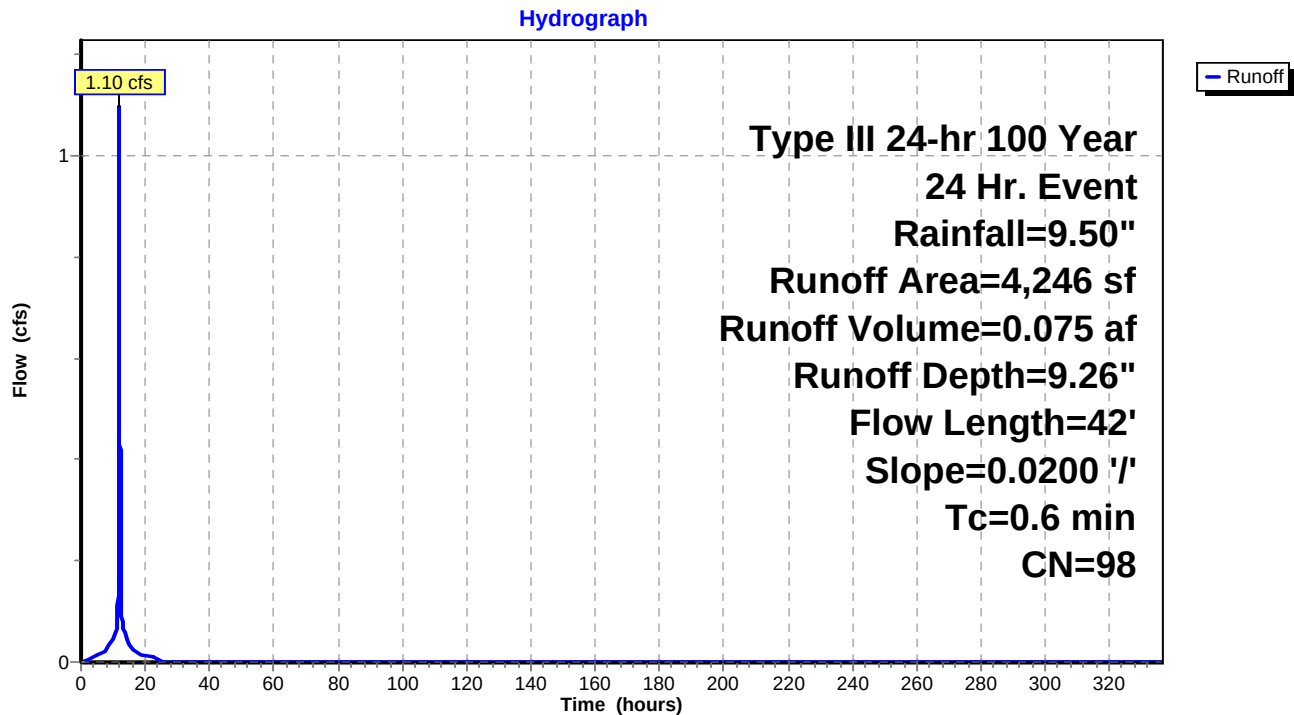
Summary for Subcatchment 1N: PROP DA 1N

Runoff = 1.10 cfs @ 12.01 hrs, Volume= 0.075 af, Depth= 9.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
4,246	98	Roofs, HSG B
4,246		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	42	0.0200	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.50"

Subcatchment 1N: PROP DA 1N

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment 1N: PROP DA 1N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	9.26	0.00
5.00	0.54	0.35	0.01	265.00	9.50	9.26	0.00
10.00	1.80	1.57	0.05	270.00	9.50	9.26	0.00
15.00	8.12	7.88	0.04	275.00	9.50	9.26	0.00
20.00	9.09	8.85	0.01	280.00	9.50	9.26	0.00
25.00	9.50	9.26	0.00	285.00	9.50	9.26	0.00
30.00	9.50	9.26	0.00	290.00	9.50	9.26	0.00
35.00	9.50	9.26	0.00	295.00	9.50	9.26	0.00
40.00	9.50	9.26	0.00	300.00	9.50	9.26	0.00
45.00	9.50	9.26	0.00	305.00	9.50	9.26	0.00
50.00	9.50	9.26	0.00	310.00	9.50	9.26	0.00
55.00	9.50	9.26	0.00	315.00	9.50	9.26	0.00
60.00	9.50	9.26	0.00	320.00	9.50	9.26	0.00
65.00	9.50	9.26	0.00	325.00	9.50	9.26	0.00
70.00	9.50	9.26	0.00	330.00	9.50	9.26	0.00
75.00	9.50	9.26	0.00	335.00	9.50	9.26	0.00
80.00	9.50	9.26	0.00				
85.00	9.50	9.26	0.00				
90.00	9.50	9.26	0.00				
95.00	9.50	9.26	0.00				
100.00	9.50	9.26	0.00				
105.00	9.50	9.26	0.00				
110.00	9.50	9.26	0.00				
115.00	9.50	9.26	0.00				
120.00	9.50	9.26	0.00				
125.00	9.50	9.26	0.00				
130.00	9.50	9.26	0.00				
135.00	9.50	9.26	0.00				
140.00	9.50	9.26	0.00				
145.00	9.50	9.26	0.00				
150.00	9.50	9.26	0.00				
155.00	9.50	9.26	0.00				
160.00	9.50	9.26	0.00				
165.00	9.50	9.26	0.00				
170.00	9.50	9.26	0.00				
175.00	9.50	9.26	0.00				
180.00	9.50	9.26	0.00				
185.00	9.50	9.26	0.00				
190.00	9.50	9.26	0.00				
195.00	9.50	9.26	0.00				
200.00	9.50	9.26	0.00				
205.00	9.50	9.26	0.00				
210.00	9.50	9.26	0.00				
215.00	9.50	9.26	0.00				
220.00	9.50	9.26	0.00				
225.00	9.50	9.26	0.00				
230.00	9.50	9.26	0.00				
235.00	9.50	9.26	0.00				
240.00	9.50	9.26	0.00				
245.00	9.50	9.26	0.00				
250.00	9.50	9.26	0.00				
255.00	9.50	9.26	0.00				

Summary for Subcatchment EX 1H: EXIST 1H

Runoff = 34.00 cfs @ 12.19 hrs, Volume= 3.114 af, Depth= 6.16"

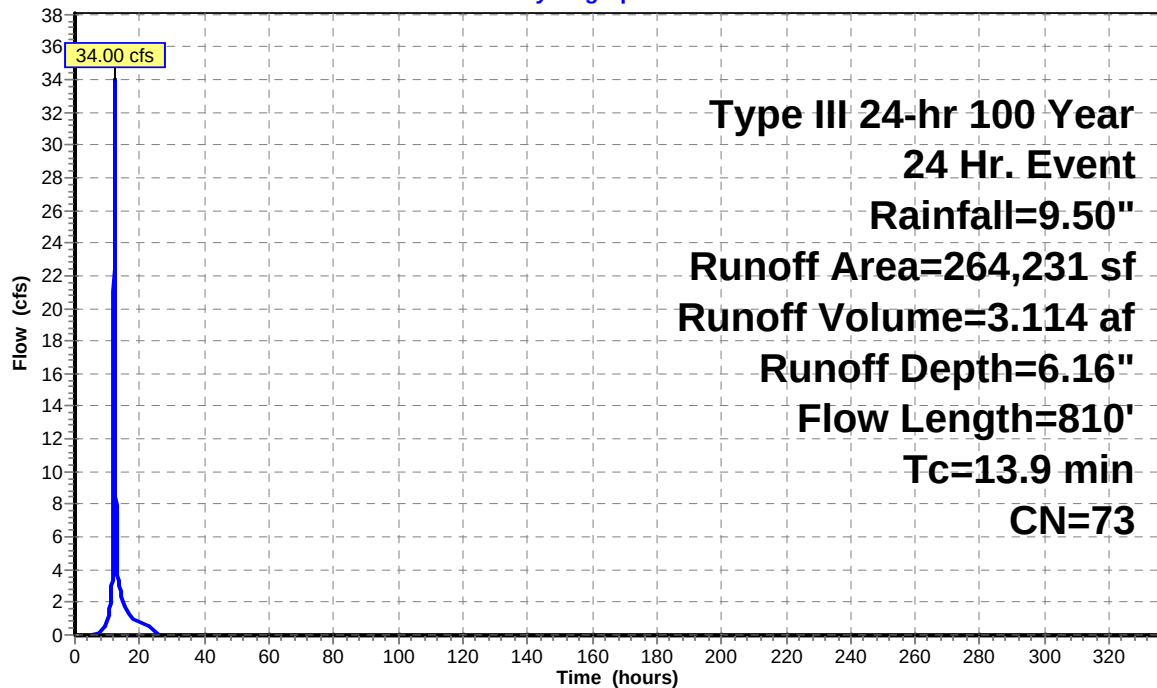
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
58,583	61	>75% Grass cover, Good, HSG B
188,543	74	>75% Grass cover, Good, HSG C
17,105	98	Paved parking, HSG B
264,231	73	Weighted Average
247,126		93.53% Pervious Area
17,105		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	150	0.0400	0.25		Sheet Flow, Orchard Grass: Short n= 0.150 P2= 3.50"
4.1	660	0.1480	2.69		Shallow Concentrated Flow, Orchard Short Grass Pasture Kv= 7.0 fps
13.9	810	Total			

Subcatchment EX 1H: EXIST 1H

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 1H: EXIST 1H

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.16	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.16	0.00
10.00	1.80	0.23	1.00	270.00	9.50	6.16	0.00
15.00	8.12	4.91	2.06	275.00	9.50	6.16	0.00
20.00	9.09	5.79	0.70	280.00	9.50	6.16	0.00
25.00	9.50	6.16	0.00	285.00	9.50	6.16	0.00
30.00	9.50	6.16	0.00	290.00	9.50	6.16	0.00
35.00	9.50	6.16	0.00	295.00	9.50	6.16	0.00
40.00	9.50	6.16	0.00	300.00	9.50	6.16	0.00
45.00	9.50	6.16	0.00	305.00	9.50	6.16	0.00
50.00	9.50	6.16	0.00	310.00	9.50	6.16	0.00
55.00	9.50	6.16	0.00	315.00	9.50	6.16	0.00
60.00	9.50	6.16	0.00	320.00	9.50	6.16	0.00
65.00	9.50	6.16	0.00	325.00	9.50	6.16	0.00
70.00	9.50	6.16	0.00	330.00	9.50	6.16	0.00
75.00	9.50	6.16	0.00	335.00	9.50	6.16	0.00
80.00	9.50	6.16	0.00				
85.00	9.50	6.16	0.00				
90.00	9.50	6.16	0.00				
95.00	9.50	6.16	0.00				
100.00	9.50	6.16	0.00				
105.00	9.50	6.16	0.00				
110.00	9.50	6.16	0.00				
115.00	9.50	6.16	0.00				
120.00	9.50	6.16	0.00				
125.00	9.50	6.16	0.00				
130.00	9.50	6.16	0.00				
135.00	9.50	6.16	0.00				
140.00	9.50	6.16	0.00				
145.00	9.50	6.16	0.00				
150.00	9.50	6.16	0.00				
155.00	9.50	6.16	0.00				
160.00	9.50	6.16	0.00				
165.00	9.50	6.16	0.00				
170.00	9.50	6.16	0.00				
175.00	9.50	6.16	0.00				
180.00	9.50	6.16	0.00				
185.00	9.50	6.16	0.00				
190.00	9.50	6.16	0.00				
195.00	9.50	6.16	0.00				
200.00	9.50	6.16	0.00				
205.00	9.50	6.16	0.00				
210.00	9.50	6.16	0.00				
215.00	9.50	6.16	0.00				
220.00	9.50	6.16	0.00				
225.00	9.50	6.16	0.00				
230.00	9.50	6.16	0.00				
235.00	9.50	6.16	0.00				
240.00	9.50	6.16	0.00				
245.00	9.50	6.16	0.00				
250.00	9.50	6.16	0.00				
255.00	9.50	6.16	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 1J: EX 1J

Runoff = 69.00 cfs @ 12.13 hrs, Volume= 5.510 af, Depth= 6.29"

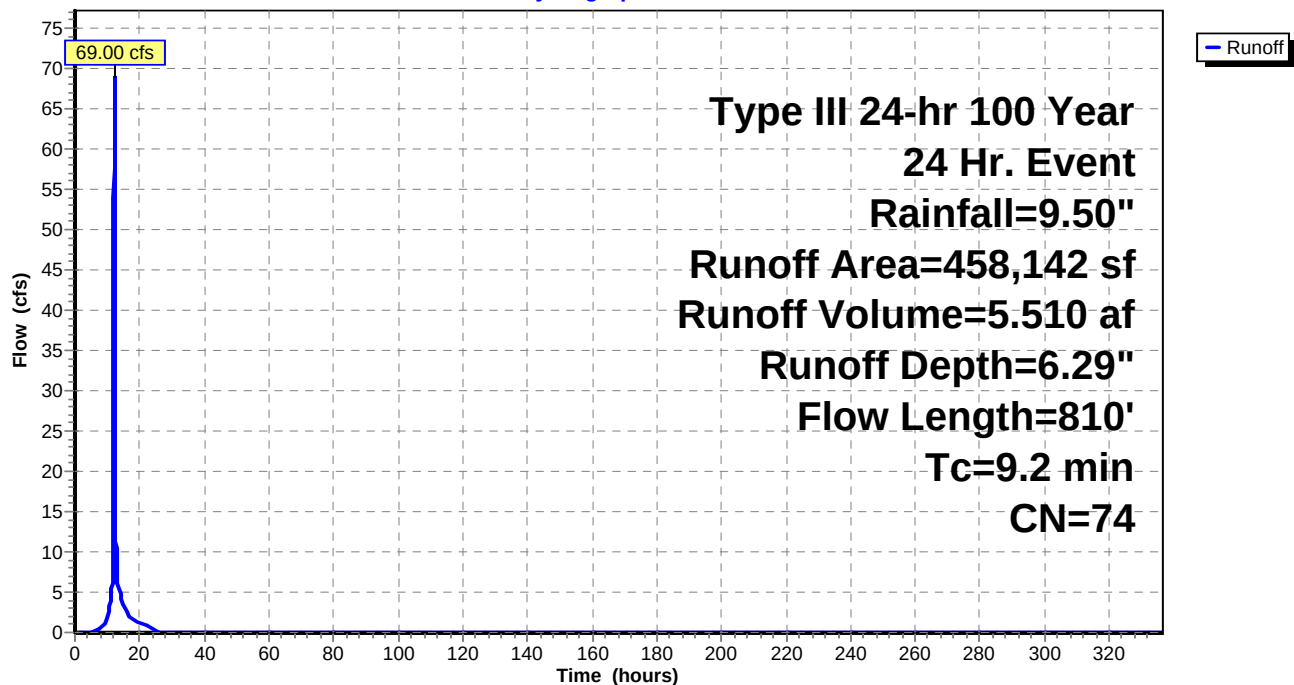
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
24,916	98	Paved parking, HSG B
392,231	74	>75% Grass cover, Good, HSG C
10,926	61	>75% Grass cover, Good, HSG B
30,069	60	Woods, Fair, HSG B
458,142	74	Weighted Average
433,226		94.56% Pervious Area
24,916		5.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1200	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
4.6	710	0.1380	2.60		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	810	Total			

Subcatchment EX 1J: EX 1J

Hydrograph



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Hydrograph for Subcatchment EX 1J: EX 1J

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	6.29	0.00
5.00	0.54	0.00	0.00	265.00	9.50	6.29	0.00
10.00	1.80	0.26	1.92	270.00	9.50	6.29	0.00
15.00	8.12	5.03	3.53	275.00	9.50	6.29	0.00
20.00	9.09	5.91	1.21	280.00	9.50	6.29	0.00
25.00	9.50	6.29	0.00	285.00	9.50	6.29	0.00
30.00	9.50	6.29	0.00	290.00	9.50	6.29	0.00
35.00	9.50	6.29	0.00	295.00	9.50	6.29	0.00
40.00	9.50	6.29	0.00	300.00	9.50	6.29	0.00
45.00	9.50	6.29	0.00	305.00	9.50	6.29	0.00
50.00	9.50	6.29	0.00	310.00	9.50	6.29	0.00
55.00	9.50	6.29	0.00	315.00	9.50	6.29	0.00
60.00	9.50	6.29	0.00	320.00	9.50	6.29	0.00
65.00	9.50	6.29	0.00	325.00	9.50	6.29	0.00
70.00	9.50	6.29	0.00	330.00	9.50	6.29	0.00
75.00	9.50	6.29	0.00	335.00	9.50	6.29	0.00
80.00	9.50	6.29	0.00				
85.00	9.50	6.29	0.00				
90.00	9.50	6.29	0.00				
95.00	9.50	6.29	0.00				
100.00	9.50	6.29	0.00				
105.00	9.50	6.29	0.00				
110.00	9.50	6.29	0.00				
115.00	9.50	6.29	0.00				
120.00	9.50	6.29	0.00				
125.00	9.50	6.29	0.00				
130.00	9.50	6.29	0.00				
135.00	9.50	6.29	0.00				
140.00	9.50	6.29	0.00				
145.00	9.50	6.29	0.00				
150.00	9.50	6.29	0.00				
155.00	9.50	6.29	0.00				
160.00	9.50	6.29	0.00				
165.00	9.50	6.29	0.00				
170.00	9.50	6.29	0.00				
175.00	9.50	6.29	0.00				
180.00	9.50	6.29	0.00				
185.00	9.50	6.29	0.00				
190.00	9.50	6.29	0.00				
195.00	9.50	6.29	0.00				
200.00	9.50	6.29	0.00				
205.00	9.50	6.29	0.00				
210.00	9.50	6.29	0.00				
215.00	9.50	6.29	0.00				
220.00	9.50	6.29	0.00				
225.00	9.50	6.29	0.00				
230.00	9.50	6.29	0.00				
235.00	9.50	6.29	0.00				
240.00	9.50	6.29	0.00				
245.00	9.50	6.29	0.00				
250.00	9.50	6.29	0.00				
255.00	9.50	6.29	0.00				

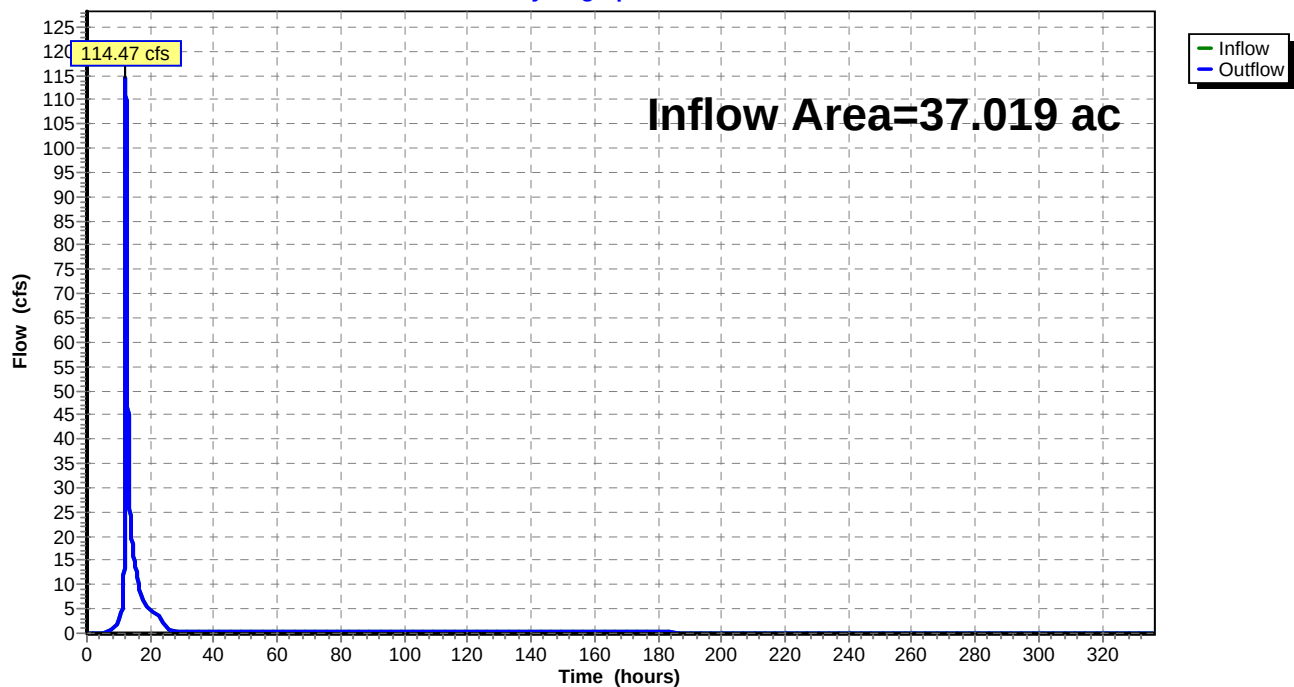
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 37.019 ac, 33.06% Impervious, Inflow Depth = 6.97" for 100 Year, 24 Hr. Event event
Inflow = 114.47 cfs @ 12.19 hrs, Volume= 21.487 af
Outflow = 114.47 cfs @ 12.19 hrs, Volume= 21.487 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.04		0.04
5.00	0.00		0.00	265.00	0.03		0.03
10.00	2.61		2.61	270.00	0.03		0.03
15.00	14.40		14.40	275.00	0.02		0.02
20.00	4.73		4.73	280.00	0.02		0.02
25.00	1.08		1.08	285.00	0.02		0.02
30.00	0.40		0.40	290.00	0.02		0.02
35.00	0.40		0.40	295.00	0.02		0.02
40.00	0.39		0.39	300.00	0.01		0.01
45.00	0.39		0.39	305.00	0.01		0.01
50.00	0.38		0.38	310.00	0.01		0.01
55.00	0.38		0.38	315.00	0.01		0.01
60.00	0.37		0.37	320.00	0.01		0.01
65.00	0.37		0.37	325.00	0.01		0.01
70.00	0.36		0.36	330.00	0.01		0.01
75.00	0.36		0.36	335.00	0.01		0.01
80.00	0.35		0.35				
85.00	0.34		0.34				
90.00	0.34		0.34				
95.00	0.33		0.33				
100.00	0.32		0.32				
105.00	0.32		0.32				
110.00	0.31		0.31				
115.00	0.30		0.30				
120.00	0.29		0.29				
125.00	0.28		0.28				
130.00	0.28		0.28				
135.00	0.27		0.27				
140.00	0.26		0.26				
145.00	0.25		0.25				
150.00	0.24		0.24				
155.00	0.23		0.23				
160.00	0.23		0.23				
165.00	0.22		0.22				
170.00	0.21		0.21				
175.00	0.20		0.20				
180.00	0.19		0.19				
185.00	0.18		0.18				
190.00	0.17		0.17				
195.00	0.16		0.16				
200.00	0.15		0.15				
205.00	0.14		0.14				
210.00	0.13		0.13				
215.00	0.12		0.12				
220.00	0.11		0.11				
225.00	0.10		0.10				
230.00	0.09		0.09				
235.00	0.09		0.09				
240.00	0.08		0.08				
245.00	0.06		0.06				
250.00	0.05		0.05				
255.00	0.05		0.05				

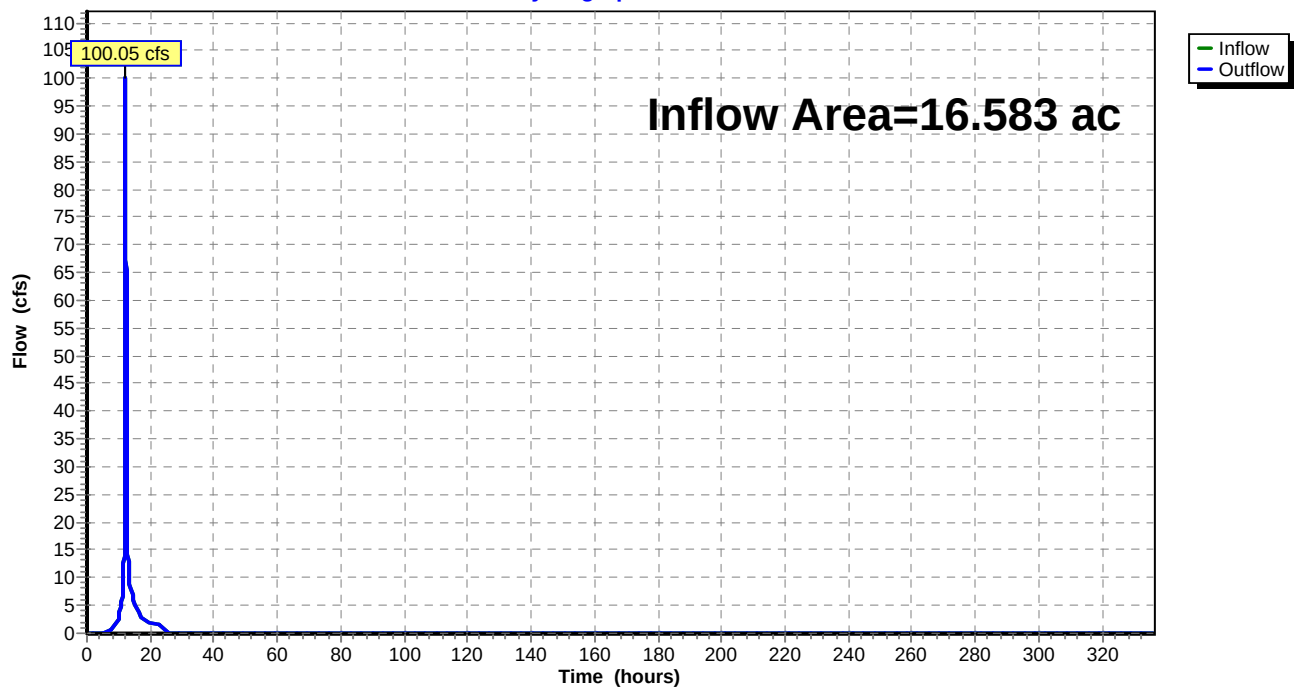
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 16.583 ac, 5.82% Impervious, Inflow Depth = 6.24" for 100 Year, 24 Hr. Event event
Inflow = 100.05 cfs @ 12.14 hrs, Volume= 8.624 af
Outflow = 100.05 cfs @ 12.14 hrs, Volume= 8.624 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	2.91		2.91	270.00	0.00		0.00
15.00	5.59		5.59	275.00	0.00		0.00
20.00	1.92		1.92	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Summary for Pond Pond 1: Pond 1

Inflow Area = 10.536 ac, 37.25% Impervious, Inflow Depth = 7.42" for 100 Year, 24 Hr. Event event
 Inflow = 91.43 cfs @ 12.07 hrs, Volume= 6.514 af
 Outflow = 58.19 cfs @ 12.16 hrs, Volume= 6.496 af, Atten= 36%, Lag= 5.2 min
 Primary = 58.19 cfs @ 12.16 hrs, Volume= 6.496 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 699.00' Surf.Area= 40,289 sf Storage= 141,809 cf

Peak Elev= 701.06' @ 12.16 hrs Surf.Area= 47,438 sf Storage= 232,021 cf (90,212 cf above start)

Plug-Flow detention time= 1,223.0 min calculated for 3.240 af (50% of inflow)

Center-of-Mass det. time= 528.2 min (1,317.0 - 788.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	694.00'	278,293 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)
694.00	17,243	647.0	0	0	17,243
696.00	22,625	697.0	39,746	39,746	22,757
697.00	33,800	793.0	28,026	67,773	34,164
698.00	37,016	823.0	35,396	103,168	38,106
700.00	43,701	867.0	80,625	183,793	44,260
702.00	50,890	917.0	94,500	278,293	51,579

Device	Routing	Invert	Outlet Devices
#1	Primary	692.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 680.00' S= 0.1200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	700.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	699.00'	3.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=58.17 cfs @ 12.16 hrs HW=701.06' TW=590.65' (Dynamic Tailwater)

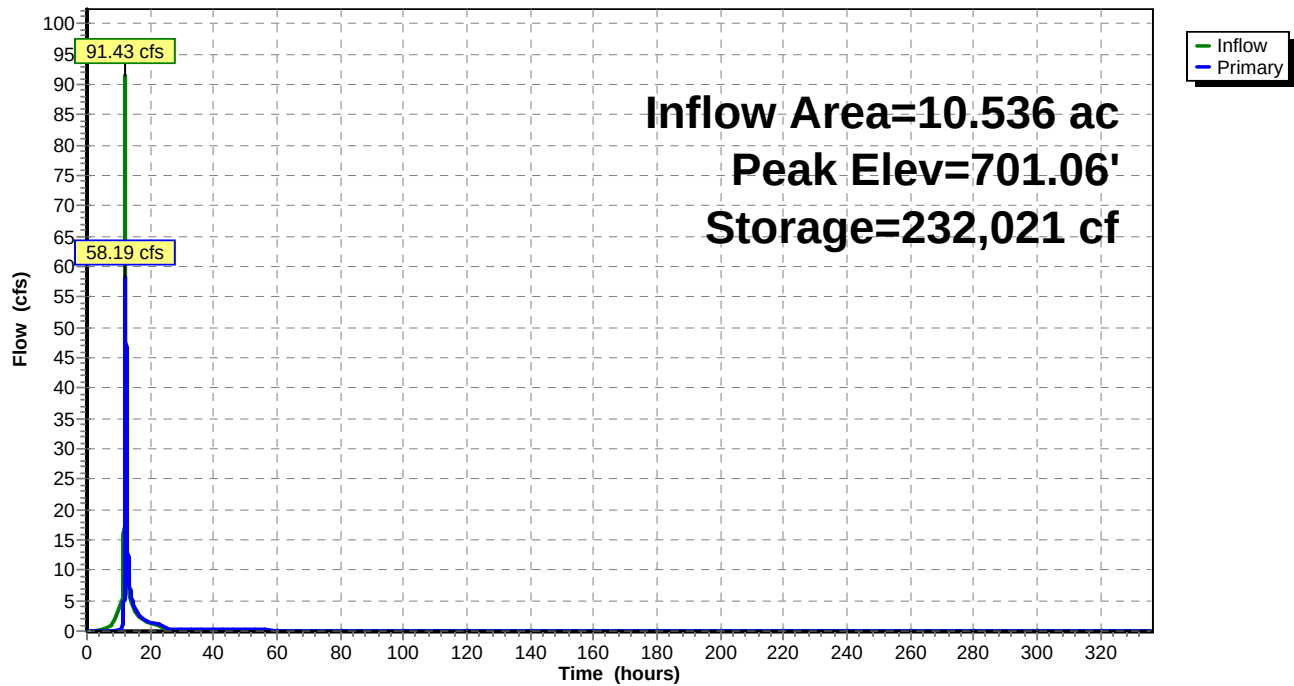
1=Culvert (Passes 58.17 cfs of 66.05 cfs potential flow)

2=Broad-Crested Rectangular Weir (Weir Controls 57.84 cfs @ 3.42 fps)

3=Orifice/Grate (Orifice Controls 0.33 cfs @ 6.70 fps)

Pond Pond 1: Pond 1

Hydrograph



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Hydrograph for Pond Pond 1: Pond 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	141,809	699.00	0.00
10.00	3.09	161,576	699.48	0.14
20.00	1.28	187,580	700.09	1.37
30.00	0.00	180,582	699.93	0.21
40.00	0.00	173,384	699.76	0.19
50.00	0.00	167,030	699.61	0.16
60.00	0.00	161,531	699.48	0.14
70.00	0.00	156,895	699.37	0.12
80.00	0.00	153,131	699.28	0.09
90.00	0.00	150,239	699.21	0.07
100.00	0.00	148,248	699.16	0.04
110.00	0.00	146,925	699.13	0.03
120.00	0.00	146,014	699.10	0.02
130.00	0.00	145,361	699.09	0.02
140.00	0.00	144,873	699.08	0.01
150.00	0.00	144,498	699.07	0.01
160.00	0.00	144,201	699.06	0.01
170.00	0.00	143,961	699.05	0.01
180.00	0.00	143,764	699.05	0.01
190.00	0.00	143,599	699.04	0.00
200.00	0.00	143,458	699.04	0.00
210.00	0.00	143,338	699.04	0.00
220.00	0.00	143,234	699.04	0.00
230.00	0.00	143,142	699.03	0.00
240.00	0.00	143,062	699.03	0.00
250.00	0.00	142,990	699.03	0.00
260.00	0.00	142,926	699.03	0.00
270.00	0.00	142,869	699.03	0.00
280.00	0.00	142,817	699.02	0.00
290.00	0.00	142,770	699.02	0.00
300.00	0.00	142,727	699.02	0.00
310.00	0.00	142,687	699.02	0.00
320.00	0.00	142,651	699.02	0.00
330.00	0.00	142,618	699.02	0.00

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Stage-Area-Storage for Pond Pond 1: Pond 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
694.00	17,243	0	699.20	40,960	149,934
694.10	17,495	1,737	699.30	41,298	154,047
694.20	17,748	3,499	699.40	41,637	158,194
694.30	18,004	5,287	699.50	41,978	162,375
694.40	18,261	7,100	699.60	42,320	166,590
694.50	18,520	8,939	699.70	42,663	170,839
694.60	18,781	10,804	699.80	43,008	175,122
694.70	19,044	12,695	699.90	43,354	179,440
694.80	19,308	14,613	700.00	43,701	183,793
694.90	19,575	16,557	700.10	44,047	188,180
695.00	19,843	18,528	700.20	44,395	192,602
695.10	20,113	20,525	700.30	44,744	197,059
695.20	20,385	22,550	700.40	45,095	201,551
695.30	20,658	24,602	700.50	45,447	206,079
695.40	20,934	26,682	700.60	45,800	210,641
695.50	21,211	28,789	700.70	46,155	215,239
695.60	21,490	30,924	700.80	46,511	219,872
695.70	21,771	33,087	700.90	46,868	224,541
695.80	22,054	35,279	701.00	47,227	229,246
695.90	22,339	37,498	701.10	47,587	233,986
696.00	22,625	39,746	701.20	47,949	238,763
696.10	23,642	42,060	701.30	48,312	243,576
696.20	24,681	44,475	701.40	48,676	248,425
696.30	25,743	46,996	701.50	49,041	253,311
696.40	26,827	49,625	701.60	49,408	258,234
696.50	27,933	52,363	701.70	49,777	263,193
696.60	29,062	55,212	701.80	50,146	268,189
696.70	30,213	58,176	701.90	50,518	273,222
696.80	31,386	61,255	702.00	50,890	278,293
696.90	32,582	64,454			
697.00	33,800	67,773			
697.10	34,115	71,168			
697.20	34,432	74,596			
697.30	34,749	78,055			
697.40	35,069	81,546			
697.50	35,390	85,068			
697.60	35,712	88,624			
697.70	36,036	92,211			
697.80	36,361	95,831			
697.90	36,688	99,483			
698.00	37,016	103,168			
698.10	37,337	106,886			
698.20	37,660	110,636			
698.30	37,983	114,418			
698.40	38,309	118,233			
698.50	38,635	122,080			
698.60	38,963	125,960			
698.70	39,293	129,872			
698.80	39,623	133,818			
698.90	39,956	137,797			
699.00	40,289	141,809			
699.10	40,624	145,855			

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Pond Pond 2: Pond 2

Inflow Area = 23.503 ac, 45.59% Impervious, Inflow Depth = 7.39" for 100 Year, 24 Hr. Event event
 Inflow = 149.98 cfs @ 12.04 hrs, Volume= 14.469 af
 Outflow = 66.04 cfs @ 12.41 hrs, Volume= 14.406 af, Atten= 56%, Lag= 22.2 min
 Primary = 66.04 cfs @ 12.41 hrs, Volume= 14.406 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Starting Elev= 587.00' Surf.Area= 47,444 sf Storage= 230,092 cf

Peak Elev= 591.15' @ 12.41 hrs Surf.Area= 67,529 sf Storage= 475,556 cf (245,465 cf above start)

Plug-Flow detention time= 3,487.8 min calculated for 9.124 af (63% of inflow)

Center-of-Mass det. time= 1,917.3 min (2,940.6 - 1,023.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	580.00'	534,329 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)
580.00	22,976	626.0	0	0	22,976
582.00	28,191	676.0	51,078	51,078	28,318
584.00	33,801	726.0	61,907	112,985	34,069
586.00	39,814	776.0	73,533	186,518	40,232
588.00	55,742	900.0	95,110	281,629	56,854
590.00	63,113	946.0	118,779	400,408	63,859
592.00	70,884	996.0	133,922	534,329	71,827

Device	Routing	Invert	Outlet Devices
#1	Primary	579.00'	30.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Outlet Invert= 578.00' S= 0.0100 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	587.00'	3.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	590.00'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=66.03 cfs @ 12.41 hrs HW=591.15' TW=0.00' (Dynamic Tailwater)

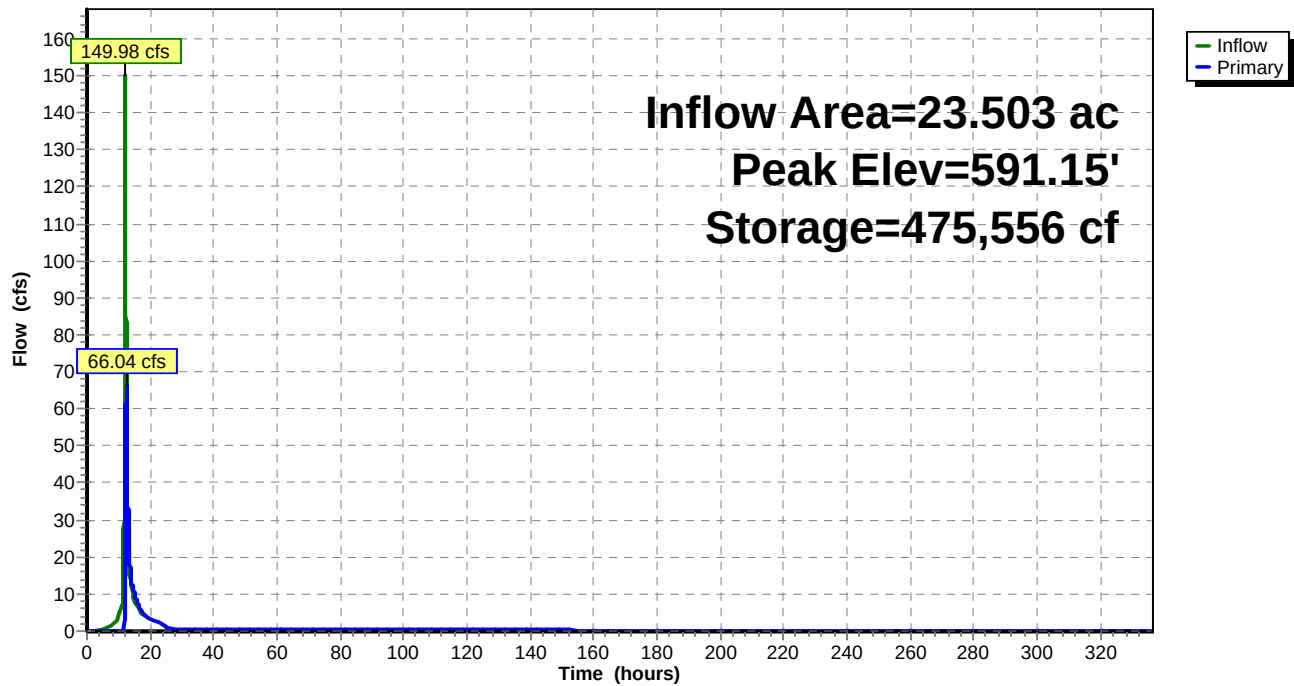
1=Culvert (Passes 66.03 cfs of 78.03 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.47 cfs @ 9.66 fps)

3=Broad-Crested Rectangular Weir (Weir Controls 65.56 cfs @ 3.56 fps)

Pond Pond 2: Pond 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Pond Pond 2: Pond 2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	230,092	587.00	0.00
10.00	3.95	257,633	587.55	0.15
20.00	2.92	410,298	590.16	3.17
30.00	0.21	399,061	589.98	0.40
40.00	0.19	392,025	589.87	0.39
50.00	0.16	384,446	589.75	0.38
60.00	0.14	376,343	589.61	0.37
70.00	0.12	367,743	589.47	0.36
80.00	0.09	358,673	589.33	0.35
90.00	0.07	349,171	589.17	0.34
100.00	0.04	339,251	589.00	0.32
110.00	0.03	329,187	588.83	0.31
120.00	0.02	319,266	588.66	0.29
130.00	0.02	309,666	588.50	0.28
140.00	0.01	300,493	588.33	0.26
150.00	0.01	291,814	588.18	0.24
160.00	0.01	283,675	588.04	0.23
170.00	0.01	276,106	587.90	0.21
180.00	0.01	269,135	587.77	0.19
190.00	0.00	262,787	587.65	0.17
200.00	0.00	257,083	587.54	0.15
210.00	0.00	252,040	587.45	0.13
220.00	0.00	247,673	587.36	0.11
230.00	0.00	243,995	587.29	0.09
240.00	0.00	241,009	587.23	0.08
250.00	0.00	238,751	587.18	0.05
260.00	0.00	237,146	587.15	0.04
270.00	0.00	235,994	587.12	0.03
280.00	0.00	235,144	587.11	0.02
290.00	0.00	234,498	587.09	0.02
300.00	0.00	233,995	587.08	0.01
310.00	0.00	233,593	587.07	0.01
320.00	0.00	233,266	587.07	0.01
330.00	0.00	232,994	587.06	0.01

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

Prepared by AKRF Engineering, PC

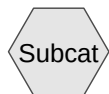
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Stage-Area-Storage for Pond Pond 2: Pond 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
580.00	22,976	0	587.80	54,029	270,652
580.15	23,349	3,474	587.95	55,311	278,852
580.30	23,724	7,005	588.10	56,100	287,221
580.45	24,103	10,592	588.25	56,638	295,676
580.60	24,485	14,236	588.40	57,180	304,212
580.75	24,869	17,937	588.55	57,723	312,830
580.90	25,257	21,697	588.70	58,270	321,530
581.05	25,647	25,514	588.85	58,819	330,311
581.20	26,041	29,391	589.00	59,370	339,175
581.35	26,438	33,327	589.15	59,924	348,122
581.50	26,837	37,322	589.30	60,481	357,153
581.65	27,240	41,378	589.45	61,040	366,267
581.80	27,646	45,495	589.60	61,602	375,465
581.95	28,054	49,672	589.75	62,167	384,748
582.10	28,459	53,911	589.90	62,734	394,115
582.25	28,864	58,210	590.05	63,302	403,568
582.40	29,272	62,570	590.20	63,870	413,106
582.55	29,683	66,992	590.35	64,440	422,729
582.70	30,097	71,475	590.50	65,013	432,438
582.85	30,513	76,021	590.65	65,589	442,233
583.00	30,932	80,629	590.80	66,167	452,115
583.15	31,355	85,301	590.95	66,748	462,083
583.30	31,780	90,036	591.10	67,331	472,139
583.45	32,208	94,835	591.25	67,917	482,283
583.60	32,638	99,698	591.40	68,505	492,515
583.75	33,072	104,626	591.55	69,096	502,835
583.90	33,508	109,620	591.70	69,690	513,244
584.05	33,945	114,679	591.85	70,286	523,742
584.20	34,380	119,803	592.00	70,884	534,329
584.35	34,818	124,993			
584.50	35,258	130,249			
584.65	35,701	135,571			
584.80	36,147	140,959			
584.95	36,596	146,415			
585.10	37,047	151,938			
585.25	37,501	157,529			
585.40	37,958	163,189			
585.55	38,418	168,917			
585.70	38,881	174,714			
585.85	39,346	180,581			
586.00	39,814	186,518			
586.15	40,916	192,573			
586.30	42,033	198,794			
586.45	43,165	205,184			
586.60	44,312	211,744			
586.75	45,474	218,478			
586.90	46,651	225,387			
587.05	47,843	232,474			
587.20	49,050	239,741			
587.35	50,272	247,189			
587.50	51,509	254,823			
587.65	52,762	262,643			



Reach



Link

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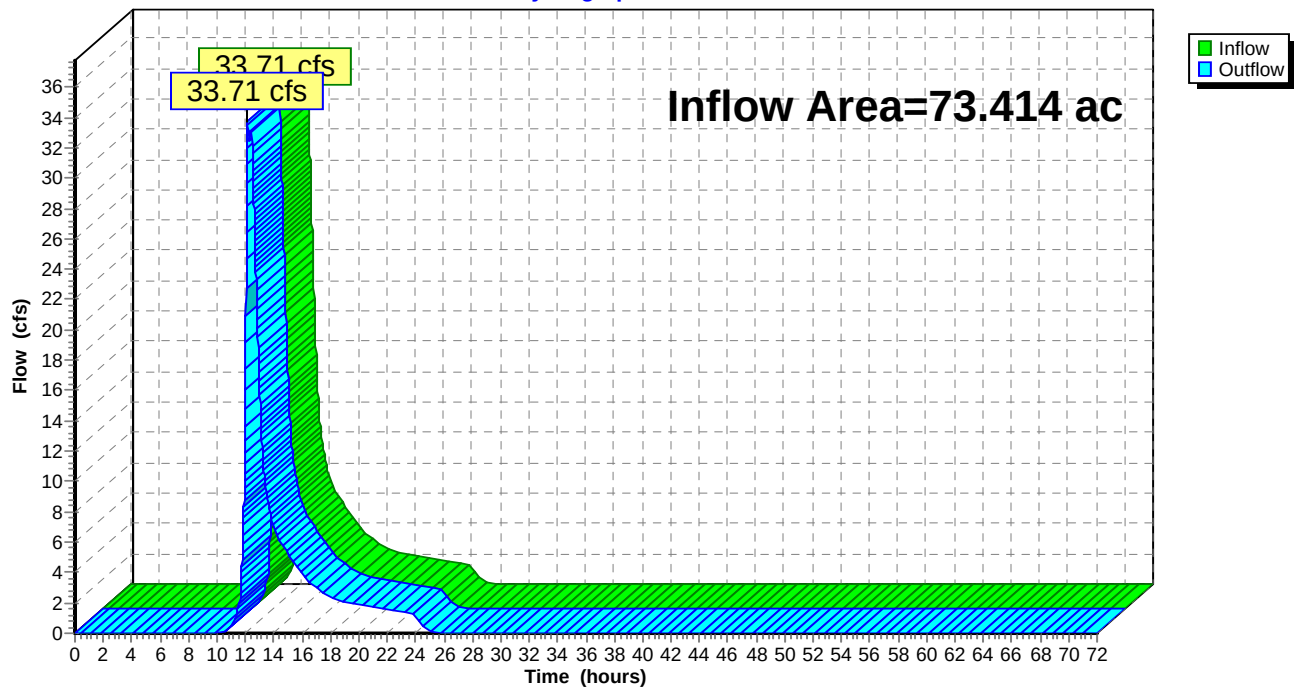
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 73.414 ac, 18.77% Impervious, Inflow Depth = 0.92" for 1 Year, 24 Hr. Event event
Inflow = 33.71 cfs @ 12.15 hrs, Volume= 5.632 af
Outflow = 33.71 cfs @ 12.15 hrs, Volume= 5.632 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



Watchtower 2010_02_1A_1B_1C*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.00		0.00	58.00	0.00		0.00
7.00	0.00		0.00	59.00	0.00		0.00
8.00	0.00		0.00	60.00	0.00		0.00
9.00	0.00		0.00	61.00	0.00		0.00
10.00	0.00		0.00	62.00	0.00		0.00
11.00	0.48		0.48	63.00	0.00		0.00
12.00	14.73		14.73	64.00	0.00		0.00
13.00	16.02		16.02	65.00	0.00		0.00
14.00	7.08		7.08	66.00	0.00		0.00
15.00	5.26		5.26	67.00	0.00		0.00
16.00	3.94		3.94	68.00	0.00		0.00
17.00	3.04		3.04	69.00	0.00		0.00
18.00	2.41		2.41	70.00	0.00		0.00
19.00	2.05		2.05	71.00	0.00		0.00
20.00	1.86		1.86	72.00	0.00		0.00
21.00	1.70		1.70				
22.00	1.55		1.55				
23.00	1.41		1.41				
24.00	1.26		1.26				
25.00	0.13		0.13				
26.00	0.02		0.02				
27.00	0.01		0.01				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				

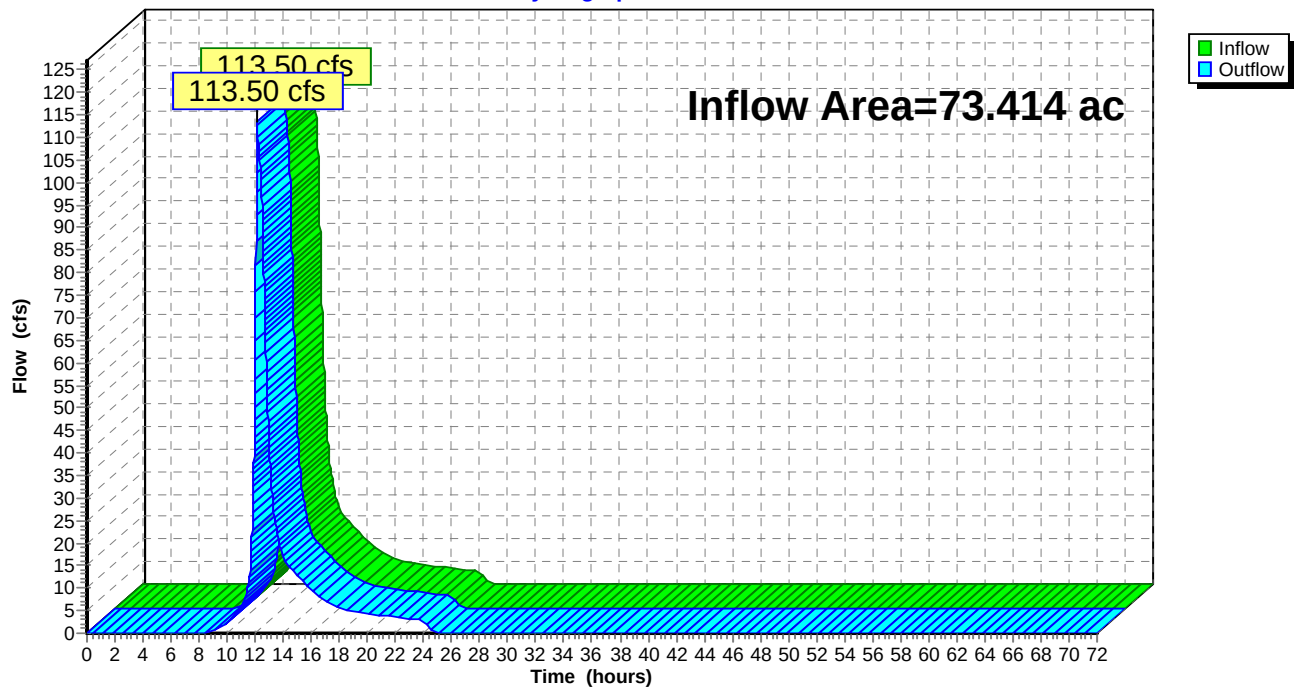
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 73.414 ac, 18.77% Impervious, Inflow Depth = 2.64" for 10 Year, 24 Hr. Event event
Inflow = 113.50 cfs @ 12.14 hrs, Volume= 16.151 af
Outflow = 113.50 cfs @ 12.14 hrs, Volume= 16.151 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.00		0.00	58.00	0.00		0.00
7.00	0.00		0.00	59.00	0.00		0.00
8.00	0.02		0.02	60.00	0.00		0.00
9.00	0.62		0.62	61.00	0.00		0.00
10.00	2.40		2.40	62.00	0.00		0.00
11.00	5.91		5.91	63.00	0.00		0.00
12.00	60.52		60.52	64.00	0.00		0.00
13.00	40.82		40.82	65.00	0.00		0.00
14.00	17.36		17.36	66.00	0.00		0.00
15.00	12.68		12.68	67.00	0.00		0.00
16.00	9.33		9.33	68.00	0.00		0.00
17.00	7.15		7.15	69.00	0.00		0.00
18.00	5.63		5.63	70.00	0.00		0.00
19.00	4.77		4.77	71.00	0.00		0.00
20.00	4.31		4.31	72.00	0.00		0.00
21.00	3.93		3.93				
22.00	3.58		3.58				
23.00	3.24		3.24				
24.00	2.88		2.88				
25.00	0.23		0.23				
26.00	0.03		0.03				
27.00	0.01		0.01				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
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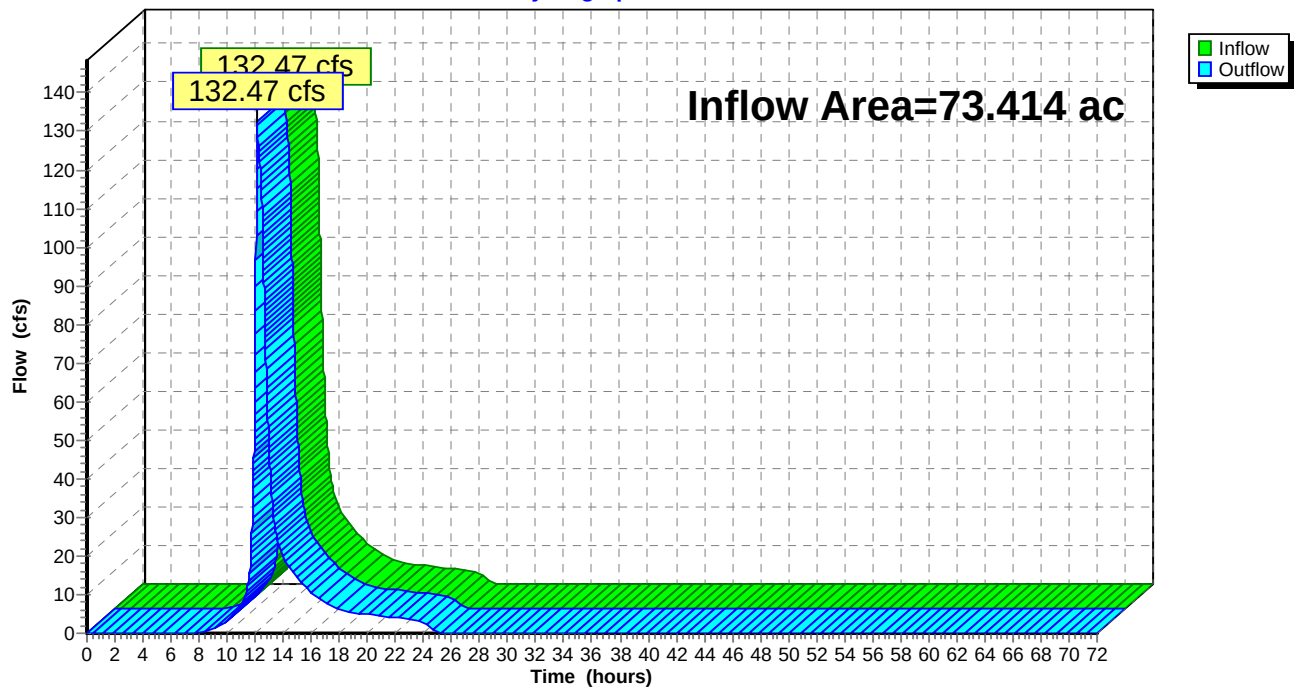
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 73.414 ac, 18.77% Impervious, Inflow Depth = 3.04" for 25 Year, 24 Hr. Event event
Inflow = 132.47 cfs @ 12.13 hrs, Volume= 18.607 af
Outflow = 132.47 cfs @ 12.13 hrs, Volume= 18.607 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach EC DP 1C: Existing DP 1C

Hydrograph



Hydrograph for Reach EC DP 1C: Existing DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.00		0.00	58.00	0.00		0.00
7.00	0.00		0.00	59.00	0.00		0.00
8.00	0.12		0.12	60.00	0.00		0.00
9.00	1.10		1.10	61.00	0.00		0.00
10.00	3.21		3.21	62.00	0.00		0.00
11.00	7.45		7.45	63.00	0.00		0.00
12.00	72.09		72.09	64.00	0.00		0.00
13.00	46.19		46.19	65.00	0.00		0.00
14.00	19.58		19.58	66.00	0.00		0.00
15.00	14.28		14.28	67.00	0.00		0.00
16.00	10.49		10.49	68.00	0.00		0.00
17.00	8.03		8.03	69.00	0.00		0.00
18.00	6.31		6.31	70.00	0.00		0.00
19.00	5.36		5.36	71.00	0.00		0.00
20.00	4.84		4.84	72.00	0.00		0.00
21.00	4.40		4.40				
22.00	4.02		4.02				
23.00	3.62		3.62				
24.00	3.23		3.23				
25.00	0.25		0.25				
26.00	0.03		0.03				
27.00	0.01		0.01				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
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50.00	0.00		0.00				
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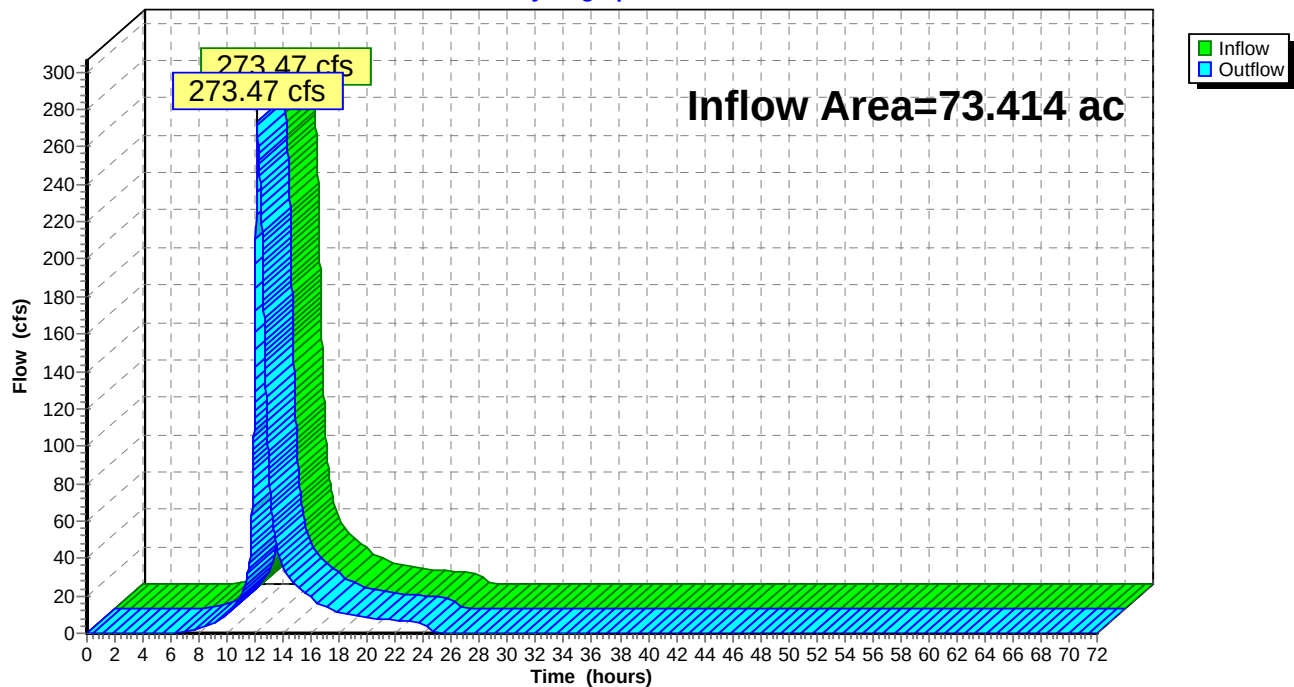
Summary for Reach EC DP 1C: Existing DP 1C

Inflow Area = 73.414 ac, 18.77% Impervious, Inflow Depth = 6.06" for 100 Year, 24 Hr. Event event
Inflow = 273.47 cfs @ 12.13 hrs, Volume= 37.087 af
Outflow = 273.47 cfs @ 12.13 hrs, Volume= 37.087 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

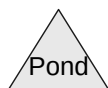
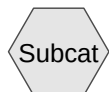
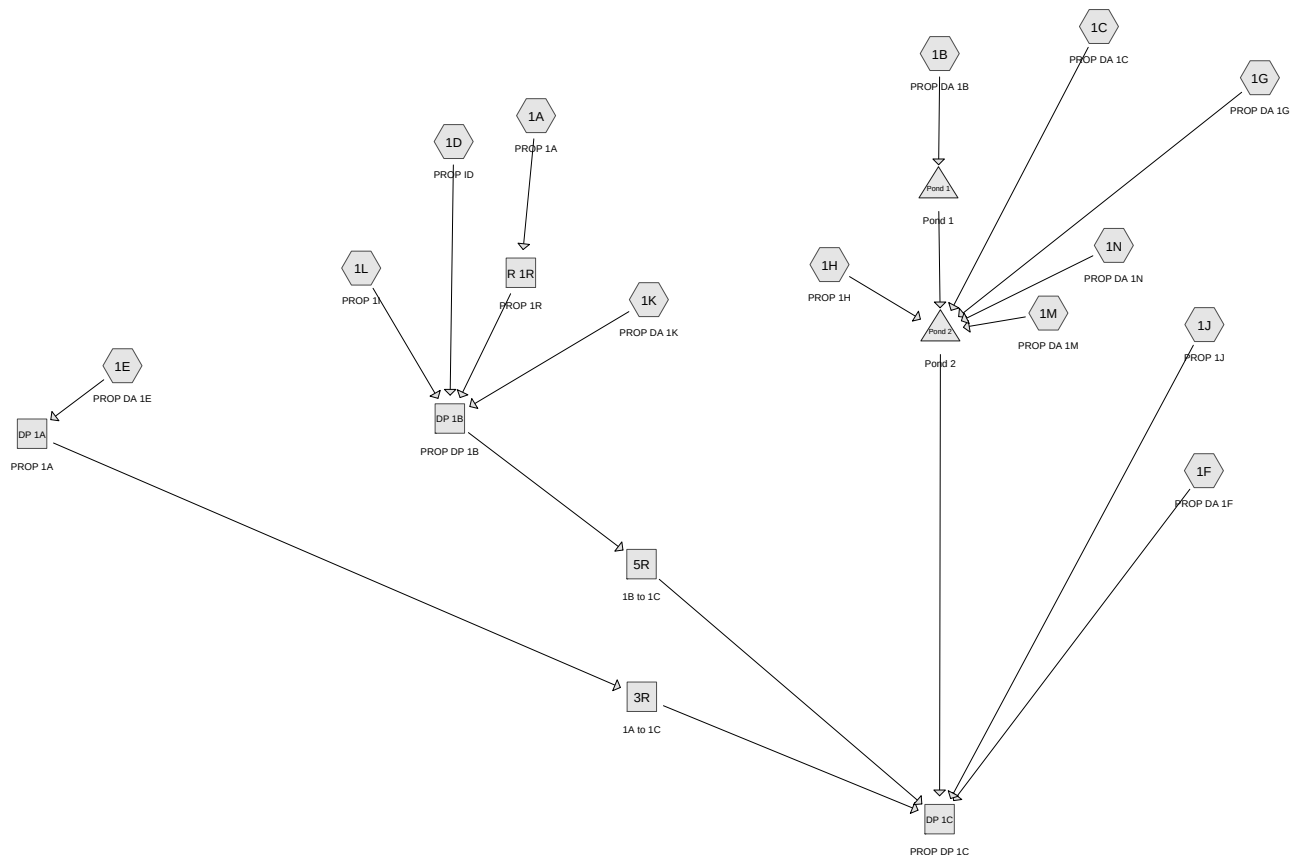
Reach EC DP 1C: Existing DP 1C

Hydrograph

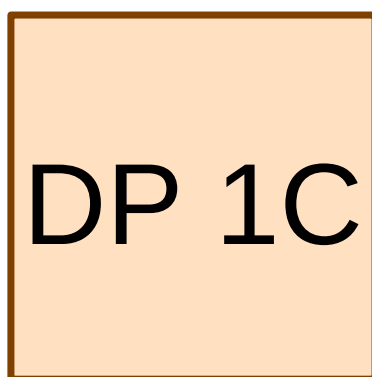


Hydrograph for Reach EC DP 1C: Existing DP 1C

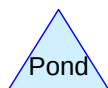
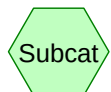
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.00		0.00
1.00	0.00		0.00	53.00	0.00		0.00
2.00	0.00		0.00	54.00	0.00		0.00
3.00	0.00		0.00	55.00	0.00		0.00
4.00	0.00		0.00	56.00	0.00		0.00
5.00	0.00		0.00	57.00	0.00		0.00
6.00	0.12		0.12	58.00	0.00		0.00
7.00	0.97		0.97	59.00	0.00		0.00
8.00	2.53		2.53	60.00	0.00		0.00
9.00	5.46		5.46	61.00	0.00		0.00
10.00	10.82		10.82	62.00	0.00		0.00
11.00	21.07		21.07	63.00	0.00		0.00
12.00	161.27		161.27	64.00	0.00		0.00
13.00	84.12		84.12	65.00	0.00		0.00
14.00	35.26		35.26	66.00	0.00		0.00
15.00	25.53		25.53	67.00	0.00		0.00
16.00	18.62		18.62	68.00	0.00		0.00
17.00	14.21		14.21	69.00	0.00		0.00
18.00	11.13		11.13	70.00	0.00		0.00
19.00	9.44		9.44	71.00	0.00		0.00
20.00	8.51		8.51	72.00	0.00		0.00
21.00	7.74		7.74				
22.00	7.04		7.04				
23.00	6.35		6.35				
24.00	5.65		5.65				
25.00	0.37		0.37				
26.00	0.04		0.04				
27.00	0.01		0.01				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				



Drainage Diagram for Watchtower_2010_02_1A_1B_1C
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PROP DP 1C



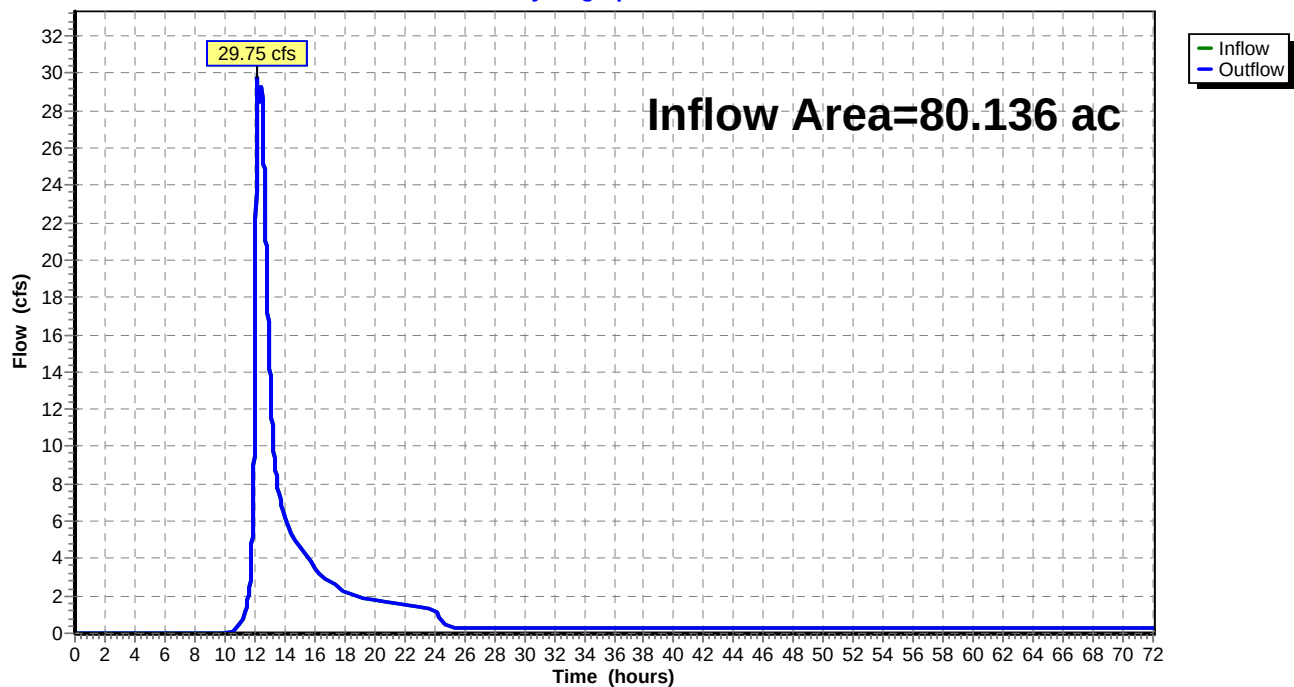
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 80.136 ac, 31.01% Impervious, Inflow Depth > 0.91" for 1 Year, 24 Hr. Event event
Inflow = 29.75 cfs @ 12.17 hrs, Volume= 6.074 af
Outflow = 29.75 cfs @ 12.17 hrs, Volume= 6.074 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.26		0.26
1.00	0.00		0.00	53.00	0.26		0.26
2.00	0.00		0.00	54.00	0.25		0.25
3.00	0.00		0.00	55.00	0.25		0.25
4.00	0.00		0.00	56.00	0.25		0.25
5.00	0.00		0.00	57.00	0.25		0.25
6.00	0.00		0.00	58.00	0.25		0.25
7.00	0.00		0.00	59.00	0.25		0.25
8.00	0.00		0.00	60.00	0.25		0.25
9.00	0.00		0.00	61.00	0.25		0.25
10.00	0.01		0.01	62.00	0.25		0.25
11.00	0.55		0.55	63.00	0.25		0.25
12.00	11.85		11.85	64.00	0.25		0.25
13.00	14.32		14.32	65.00	0.25		0.25
14.00	6.18		6.18	66.00	0.25		0.25
15.00	4.62		4.62	67.00	0.25		0.25
16.00	3.51		3.51	68.00	0.25		0.25
17.00	2.76		2.76	69.00	0.24		0.24
18.00	2.24		2.24	70.00	0.24		0.24
19.00	1.94		1.94	71.00	0.24		0.24
20.00	1.78		1.78	72.00	0.24		0.24
21.00	1.65		1.65				
22.00	1.54		1.54				
23.00	1.42		1.42				
24.00	1.30		1.30				
25.00	0.37		0.37				
26.00	0.28		0.28				
27.00	0.27		0.27				
28.00	0.27		0.27				
29.00	0.26		0.26				
30.00	0.26		0.26				
31.00	0.26		0.26				
32.00	0.26		0.26				
33.00	0.26		0.26				
34.00	0.26		0.26				
35.00	0.26		0.26				
36.00	0.26		0.26				
37.00	0.26		0.26				
38.00	0.26		0.26				
39.00	0.26		0.26				
40.00	0.26		0.26				
41.00	0.26		0.26				
42.00	0.26		0.26				
43.00	0.26		0.26				
44.00	0.26		0.26				
45.00	0.26		0.26				
46.00	0.26		0.26				
47.00	0.26		0.26				
48.00	0.26		0.26				
49.00	0.26		0.26				
50.00	0.26		0.26				
51.00	0.26		0.26				

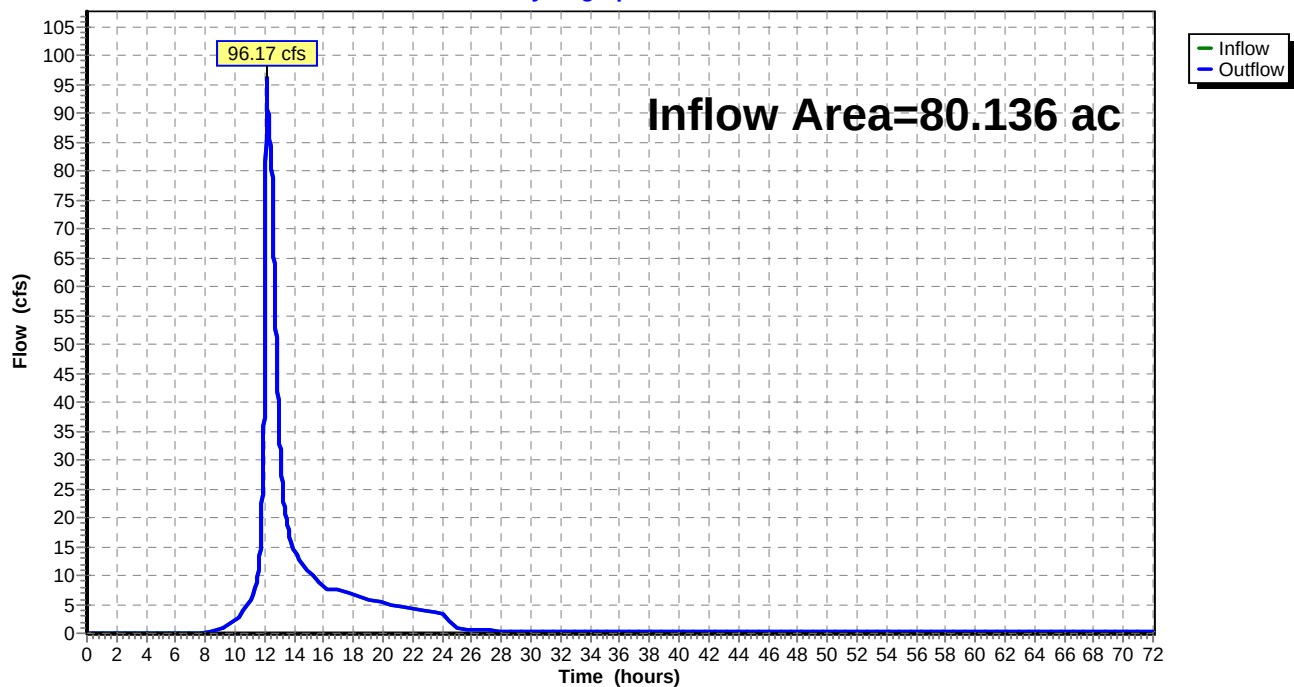
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 80.136 ac, 31.01% Impervious, Inflow Depth > 2.41" for 10 Year, 24 Hr. Event event
Inflow = 96.17 cfs @ 12.16 hrs, Volume= 16.111 af
Outflow = 96.17 cfs @ 12.16 hrs, Volume= 16.111 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.39		0.39
1.00	0.00		0.00	53.00	0.39		0.39
2.00	0.00		0.00	54.00	0.39		0.39
3.00	0.00		0.00	55.00	0.39		0.39
4.00	0.00		0.00	56.00	0.39		0.39
5.00	0.00		0.00	57.00	0.39		0.39
6.00	0.00		0.00	58.00	0.39		0.39
7.00	0.00		0.00	59.00	0.39		0.39
8.00	0.04		0.04	60.00	0.39		0.39
9.00	0.69		0.69	61.00	0.39		0.39
10.00	2.33		2.33	62.00	0.38		0.38
11.00	5.49		5.49	63.00	0.38		0.38
12.00	45.08		45.08	64.00	0.38		0.38
13.00	34.88		34.88	65.00	0.38		0.38
14.00	14.46		14.46	66.00	0.38		0.38
15.00	10.60		10.60	67.00	0.38		0.38
16.00	7.92		7.92	68.00	0.38		0.38
17.00	7.53		7.53	69.00	0.38		0.38
18.00	6.69		6.69	70.00	0.38		0.38
19.00	5.80		5.80	71.00	0.38		0.38
20.00	5.22		5.22	72.00	0.38		0.38
21.00	4.74		4.74				
22.00	4.32		4.32				
23.00	3.91		3.91				
24.00	3.50		3.50				
25.00	0.94		0.94				
26.00	0.56		0.56				
27.00	0.46		0.46				
28.00	0.42		0.42				
29.00	0.40		0.40				
30.00	0.40		0.40				
31.00	0.40		0.40				
32.00	0.40		0.40				
33.00	0.40		0.40				
34.00	0.40		0.40				
35.00	0.40		0.40				
36.00	0.40		0.40				
37.00	0.40		0.40				
38.00	0.40		0.40				
39.00	0.40		0.40				
40.00	0.40		0.40				
41.00	0.40		0.40				
42.00	0.40		0.40				
43.00	0.40		0.40				
44.00	0.39		0.39				
45.00	0.39		0.39				
46.00	0.39		0.39				
47.00	0.39		0.39				
48.00	0.39		0.39				
49.00	0.39		0.39				
50.00	0.39		0.39				
51.00	0.39		0.39				

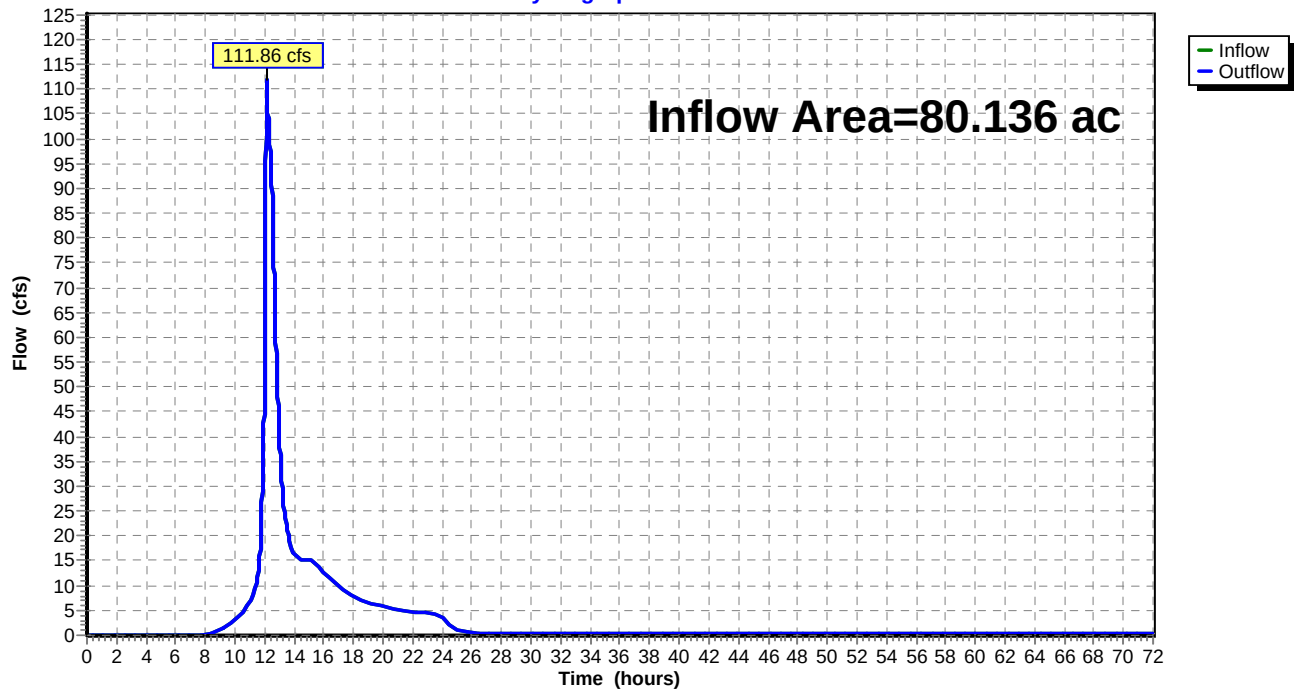
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 80.136 ac, 31.01% Impervious, Inflow Depth > 2.84" for 25 Year, 24 Hr. Event event
Inflow = 111.86 cfs @ 12.16 hrs, Volume= 18.955 af
Outflow = 111.86 cfs @ 12.16 hrs, Volume= 18.955 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower 2010_02_1A_1B_1C

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Hydrograph for Reach DP 1C: PROP DP 1C

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.39		0.39
1.00	0.00		0.00	53.00	0.39		0.39
2.00	0.00		0.00	54.00	0.39		0.39
3.00	0.00		0.00	55.00	0.39		0.39
4.00	0.00		0.00	56.00	0.39		0.39
5.00	0.00		0.00	57.00	0.39		0.39
6.00	0.00		0.00	58.00	0.39		0.39
7.00	0.00		0.00	59.00	0.39		0.39
8.00	0.16		0.16	60.00	0.39		0.39
9.00	1.13		1.13	61.00	0.39		0.39
10.00	3.07		3.07	62.00	0.38		0.38
11.00	6.79		6.79	63.00	0.38		0.38
12.00	53.36		53.36	64.00	0.38		0.38
13.00	39.29		39.29	65.00	0.38		0.38
14.00	16.23		16.23	66.00	0.38		0.38
15.00	15.35		15.35	67.00	0.38		0.38
16.00	12.66		12.66	68.00	0.38		0.38
17.00	9.86		9.86	69.00	0.38		0.38
18.00	7.80		7.80	70.00	0.38		0.38
19.00	6.53		6.53	71.00	0.38		0.38
20.00	5.83		5.83	72.00	0.38		0.38
21.00	5.27		5.27				
22.00	4.80		4.80				
23.00	4.34		4.34				
24.00	3.89		3.89				
25.00	1.00		1.00				
26.00	0.58		0.58				
27.00	0.47		0.47				
28.00	0.42		0.42				
29.00	0.40		0.40				
30.00	0.40		0.40				
31.00	0.40		0.40				
32.00	0.40		0.40				
33.00	0.40		0.40				
34.00	0.40		0.40				
35.00	0.40		0.40				
36.00	0.40		0.40				
37.00	0.40		0.40				
38.00	0.40		0.40				
39.00	0.40		0.40				
40.00	0.40		0.40				
41.00	0.40		0.40				
42.00	0.40		0.40				
43.00	0.40		0.40				
44.00	0.39		0.39				
45.00	0.39		0.39				
46.00	0.39		0.39				
47.00	0.39		0.39				
48.00	0.39		0.39				
49.00	0.39		0.39				
50.00	0.39		0.39				
51.00	0.39		0.39				

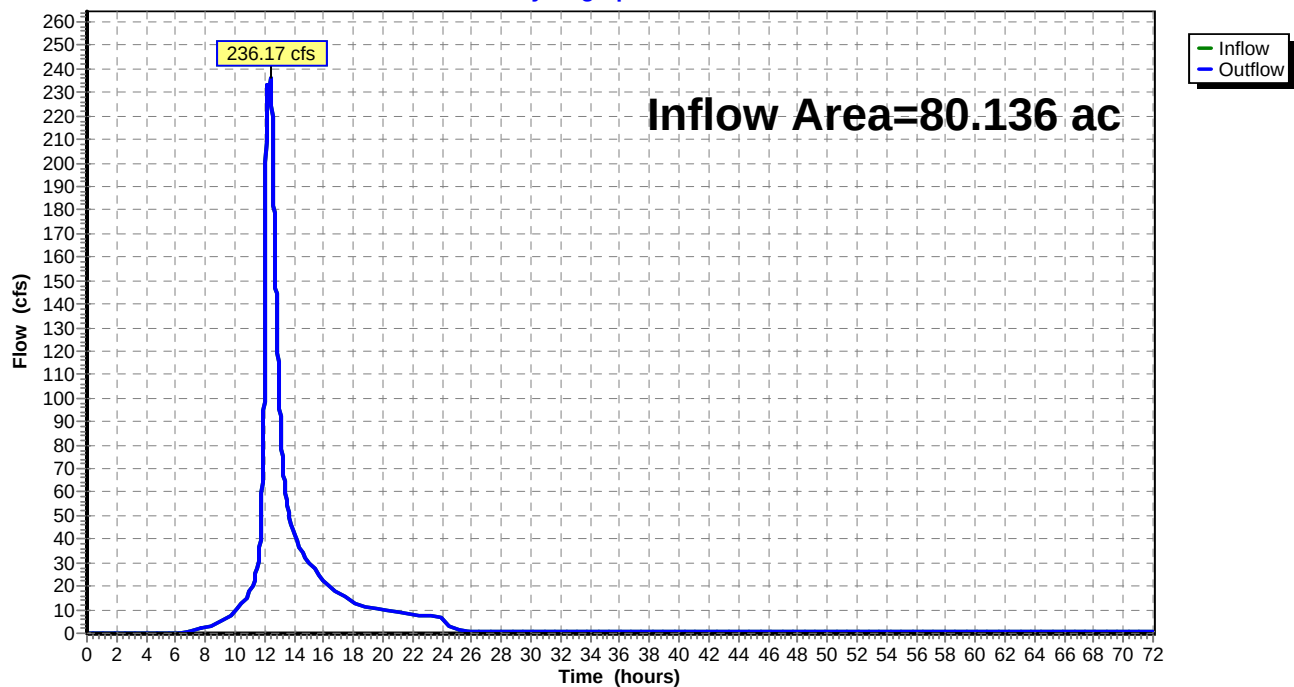
Summary for Reach DP 1C: PROP DP 1C

Inflow Area = 80.136 ac, 31.01% Impervious, Inflow Depth > 5.98" for 100 Year, 24 Hr. Event event
Inflow = 236.17 cfs @ 12.37 hrs, Volume= 39.965 af
Outflow = 236.17 cfs @ 12.37 hrs, Volume= 39.965 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2

Reach DP 1C: PROP DP 1C

Hydrograph



Watchtower 2010_02_1A_1B_1C

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Hydrograph for Reach DP 1C: PROP DP 1C

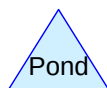
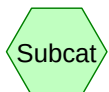
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	52.00	0.39		0.39
1.00	0.00		0.00	53.00	0.39		0.39
2.00	0.00		0.00	54.00	0.39		0.39
3.00	0.00		0.00	55.00	0.39		0.39
4.00	0.00		0.00	56.00	0.39		0.39
5.00	0.00		0.00	57.00	0.39		0.39
6.00	0.16		0.16	58.00	0.39		0.39
7.00	1.00		1.00	59.00	0.39		0.39
8.00	2.45		2.45	60.00	0.39		0.39
9.00	5.07		5.07	61.00	0.39		0.39
10.00	9.48		9.48	62.00	0.39		0.39
11.00	17.73		17.73	63.00	0.38		0.38
12.00	116.41		116.41	64.00	0.38		0.38
13.00	99.04		99.04	65.00	0.38		0.38
14.00	42.16		42.16	66.00	0.38		0.38
15.00	30.03		30.03	67.00	0.38		0.38
16.00	22.05		22.05	68.00	0.38		0.38
17.00	16.76		16.76	69.00	0.38		0.38
18.00	13.17		13.17	70.00	0.38		0.38
19.00	11.04		11.04	71.00	0.38		0.38
20.00	9.86		9.86	72.00	0.38		0.38
21.00	8.93		8.93				
22.00	8.12		8.12				
23.00	7.33		7.33				
24.00	6.55		6.55				
25.00	1.41		1.41				
26.00	0.70		0.70				
27.00	0.52		0.52				
28.00	0.45		0.45				
29.00	0.41		0.41				
30.00	0.40		0.40				
31.00	0.40		0.40				
32.00	0.40		0.40				
33.00	0.40		0.40				
34.00	0.40		0.40				
35.00	0.40		0.40				
36.00	0.40		0.40				
37.00	0.40		0.40				
38.00	0.40		0.40				
39.00	0.40		0.40				
40.00	0.40		0.40				
41.00	0.40		0.40				
42.00	0.40		0.40				
43.00	0.40		0.40				
44.00	0.39		0.39				
45.00	0.39		0.39				
46.00	0.39		0.39				
47.00	0.39		0.39				
48.00	0.39		0.39				
49.00	0.39		0.39				
50.00	0.39		0.39				
51.00	0.39		0.39				



EX DP 2



PROP DP 2



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Printed 2/12/2010

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Summary for Subcatchment EX DP 2: EX DP 2

Runoff = 1.57 cfs @ 12.10 hrs, Volume= 0.113 af, Depth= 1.46"

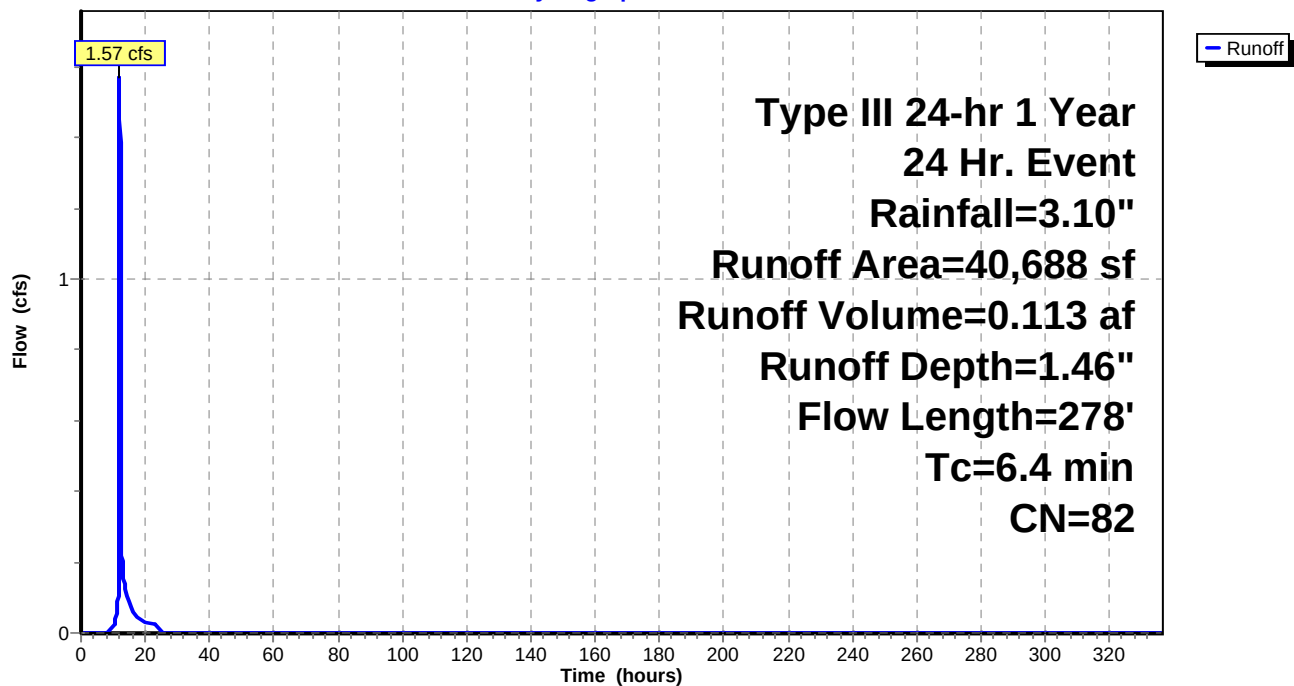
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
23,008	98	Paved parking & roofs
17,680	61	>75% Grass cover, Good, HSG B
40,688	82	Weighted Average
17,680		43.45% Pervious Area
23,008		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment EX DP 2: EX DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX DP 2: EX DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.46	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.46	0.00
10.00	0.59	0.01	0.02	270.00	3.10	1.46	0.00
15.00	2.65	1.11	0.08	275.00	3.10	1.46	0.00
20.00	2.97	1.35	0.03	280.00	3.10	1.46	0.00
25.00	3.10	1.46	0.00	285.00	3.10	1.46	0.00
30.00	3.10	1.46	0.00	290.00	3.10	1.46	0.00
35.00	3.10	1.46	0.00	295.00	3.10	1.46	0.00
40.00	3.10	1.46	0.00	300.00	3.10	1.46	0.00
45.00	3.10	1.46	0.00	305.00	3.10	1.46	0.00
50.00	3.10	1.46	0.00	310.00	3.10	1.46	0.00
55.00	3.10	1.46	0.00	315.00	3.10	1.46	0.00
60.00	3.10	1.46	0.00	320.00	3.10	1.46	0.00
65.00	3.10	1.46	0.00	325.00	3.10	1.46	0.00
70.00	3.10	1.46	0.00	330.00	3.10	1.46	0.00
75.00	3.10	1.46	0.00	335.00	3.10	1.46	0.00
80.00	3.10	1.46	0.00				
85.00	3.10	1.46	0.00				
90.00	3.10	1.46	0.00				
95.00	3.10	1.46	0.00				
100.00	3.10	1.46	0.00				
105.00	3.10	1.46	0.00				
110.00	3.10	1.46	0.00				
115.00	3.10	1.46	0.00				
120.00	3.10	1.46	0.00				
125.00	3.10	1.46	0.00				
130.00	3.10	1.46	0.00				
135.00	3.10	1.46	0.00				
140.00	3.10	1.46	0.00				
145.00	3.10	1.46	0.00				
150.00	3.10	1.46	0.00				
155.00	3.10	1.46	0.00				
160.00	3.10	1.46	0.00				
165.00	3.10	1.46	0.00				
170.00	3.10	1.46	0.00				
175.00	3.10	1.46	0.00				
180.00	3.10	1.46	0.00				
185.00	3.10	1.46	0.00				
190.00	3.10	1.46	0.00				
195.00	3.10	1.46	0.00				
200.00	3.10	1.46	0.00				
205.00	3.10	1.46	0.00				
210.00	3.10	1.46	0.00				
215.00	3.10	1.46	0.00				
220.00	3.10	1.46	0.00				
225.00	3.10	1.46	0.00				
230.00	3.10	1.46	0.00				
235.00	3.10	1.46	0.00				
240.00	3.10	1.46	0.00				
245.00	3.10	1.46	0.00				
250.00	3.10	1.46	0.00				
255.00	3.10	1.46	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment PROP DP 2: PROP DP 2

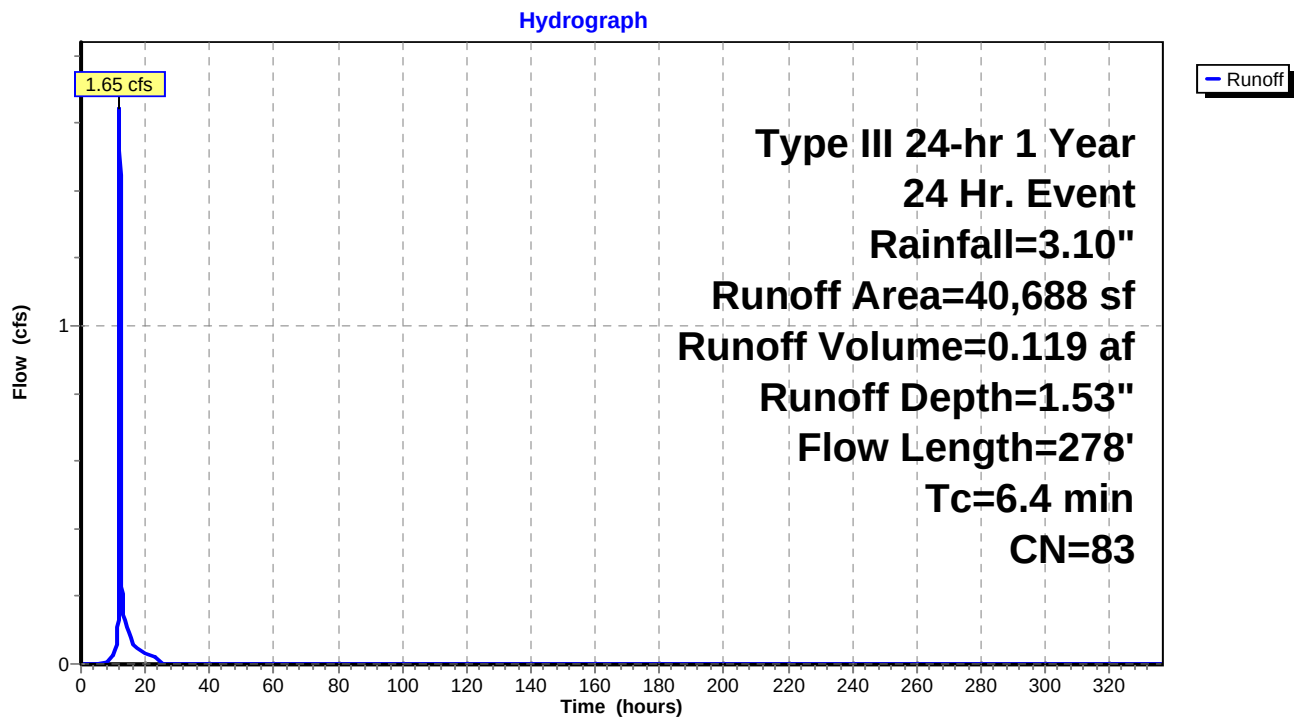
Runoff = 1.65 cfs @ 12.10 hrs, Volume= 0.119 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
24,662	98	Paved parking & roofs
16,026	61	>75% Grass cover, Good, HSG B
40,688	83	Weighted Average
16,026		39.39% Pervious Area
24,662		60.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment PROP DP 2: PROP DP 2

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment PROP DP 2: PROP DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.53	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.53	0.00
10.00	0.59	0.01	0.02	270.00	3.10	1.53	0.00
15.00	2.65	1.17	0.09	275.00	3.10	1.53	0.00
20.00	2.97	1.42	0.03	280.00	3.10	1.53	0.00
25.00	3.10	1.53	0.00	285.00	3.10	1.53	0.00
30.00	3.10	1.53	0.00	290.00	3.10	1.53	0.00
35.00	3.10	1.53	0.00	295.00	3.10	1.53	0.00
40.00	3.10	1.53	0.00	300.00	3.10	1.53	0.00
45.00	3.10	1.53	0.00	305.00	3.10	1.53	0.00
50.00	3.10	1.53	0.00	310.00	3.10	1.53	0.00
55.00	3.10	1.53	0.00	315.00	3.10	1.53	0.00
60.00	3.10	1.53	0.00	320.00	3.10	1.53	0.00
65.00	3.10	1.53	0.00	325.00	3.10	1.53	0.00
70.00	3.10	1.53	0.00	330.00	3.10	1.53	0.00
75.00	3.10	1.53	0.00	335.00	3.10	1.53	0.00
80.00	3.10	1.53	0.00				
85.00	3.10	1.53	0.00				
90.00	3.10	1.53	0.00				
95.00	3.10	1.53	0.00				
100.00	3.10	1.53	0.00				
105.00	3.10	1.53	0.00				
110.00	3.10	1.53	0.00				
115.00	3.10	1.53	0.00				
120.00	3.10	1.53	0.00				
125.00	3.10	1.53	0.00				
130.00	3.10	1.53	0.00				
135.00	3.10	1.53	0.00				
140.00	3.10	1.53	0.00				
145.00	3.10	1.53	0.00				
150.00	3.10	1.53	0.00				
155.00	3.10	1.53	0.00				
160.00	3.10	1.53	0.00				
165.00	3.10	1.53	0.00				
170.00	3.10	1.53	0.00				
175.00	3.10	1.53	0.00				
180.00	3.10	1.53	0.00				
185.00	3.10	1.53	0.00				
190.00	3.10	1.53	0.00				
195.00	3.10	1.53	0.00				
200.00	3.10	1.53	0.00				
205.00	3.10	1.53	0.00				
210.00	3.10	1.53	0.00				
215.00	3.10	1.53	0.00				
220.00	3.10	1.53	0.00				
225.00	3.10	1.53	0.00				
230.00	3.10	1.53	0.00				
235.00	3.10	1.53	0.00				
240.00	3.10	1.53	0.00				
245.00	3.10	1.53	0.00				
250.00	3.10	1.53	0.00				
255.00	3.10	1.53	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment EX DP 2: EX DP 2

Runoff = 1.92 cfs @ 12.10 hrs, Volume= 0.139 af, Depth= 1.78"

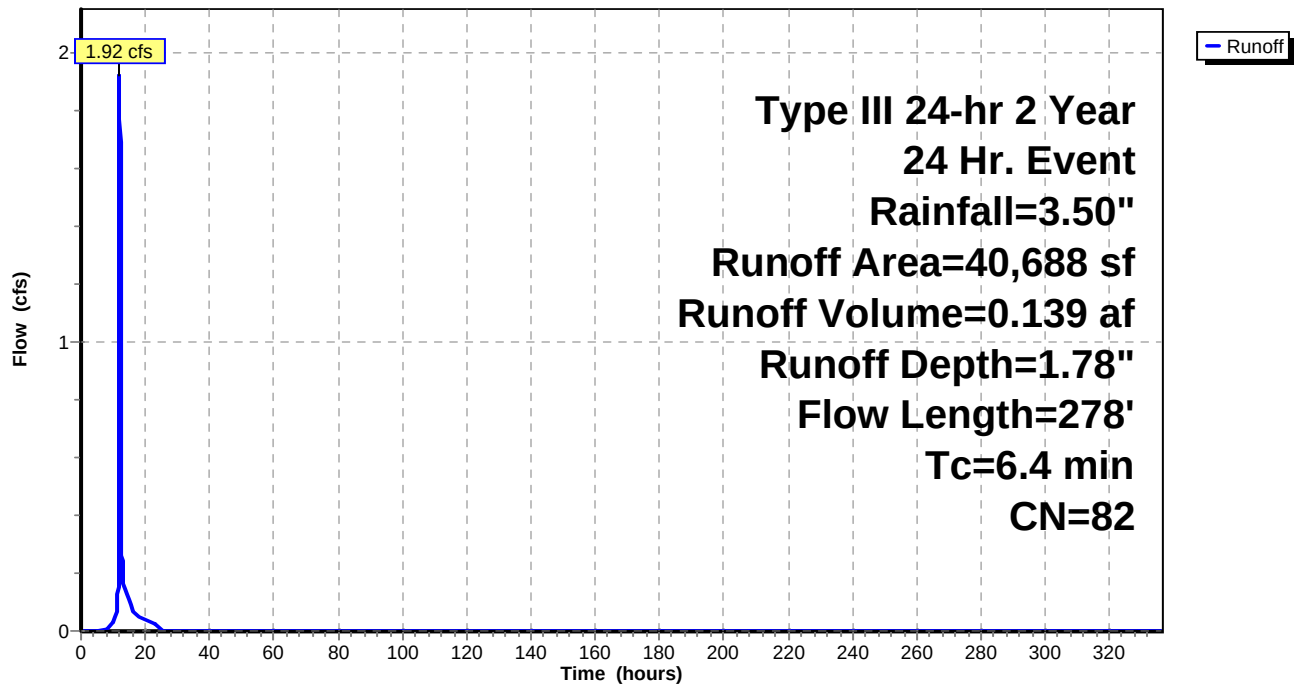
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
23,008	98	Paved parking & roofs
17,680	61	>75% Grass cover, Good, HSG B
40,688	82	Weighted Average
17,680		43.45% Pervious Area
23,008		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment EX DP 2: EX DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX DP 2: EX DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.78	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.78	0.00
10.00	0.66	0.02	0.03	270.00	3.50	1.78	0.00
15.00	2.99	1.37	0.10	275.00	3.50	1.78	0.00
20.00	3.35	1.66	0.04	280.00	3.50	1.78	0.00
25.00	3.50	1.78	0.00	285.00	3.50	1.78	0.00
30.00	3.50	1.78	0.00	290.00	3.50	1.78	0.00
35.00	3.50	1.78	0.00	295.00	3.50	1.78	0.00
40.00	3.50	1.78	0.00	300.00	3.50	1.78	0.00
45.00	3.50	1.78	0.00	305.00	3.50	1.78	0.00
50.00	3.50	1.78	0.00	310.00	3.50	1.78	0.00
55.00	3.50	1.78	0.00	315.00	3.50	1.78	0.00
60.00	3.50	1.78	0.00	320.00	3.50	1.78	0.00
65.00	3.50	1.78	0.00	325.00	3.50	1.78	0.00
70.00	3.50	1.78	0.00	330.00	3.50	1.78	0.00
75.00	3.50	1.78	0.00	335.00	3.50	1.78	0.00
80.00	3.50	1.78	0.00				
85.00	3.50	1.78	0.00				
90.00	3.50	1.78	0.00				
95.00	3.50	1.78	0.00				
100.00	3.50	1.78	0.00				
105.00	3.50	1.78	0.00				
110.00	3.50	1.78	0.00				
115.00	3.50	1.78	0.00				
120.00	3.50	1.78	0.00				
125.00	3.50	1.78	0.00				
130.00	3.50	1.78	0.00				
135.00	3.50	1.78	0.00				
140.00	3.50	1.78	0.00				
145.00	3.50	1.78	0.00				
150.00	3.50	1.78	0.00				
155.00	3.50	1.78	0.00				
160.00	3.50	1.78	0.00				
165.00	3.50	1.78	0.00				
170.00	3.50	1.78	0.00				
175.00	3.50	1.78	0.00				
180.00	3.50	1.78	0.00				
185.00	3.50	1.78	0.00				
190.00	3.50	1.78	0.00				
195.00	3.50	1.78	0.00				
200.00	3.50	1.78	0.00				
205.00	3.50	1.78	0.00				
210.00	3.50	1.78	0.00				
215.00	3.50	1.78	0.00				
220.00	3.50	1.78	0.00				
225.00	3.50	1.78	0.00				
230.00	3.50	1.78	0.00				
235.00	3.50	1.78	0.00				
240.00	3.50	1.78	0.00				
245.00	3.50	1.78	0.00				
250.00	3.50	1.78	0.00				
255.00	3.50	1.78	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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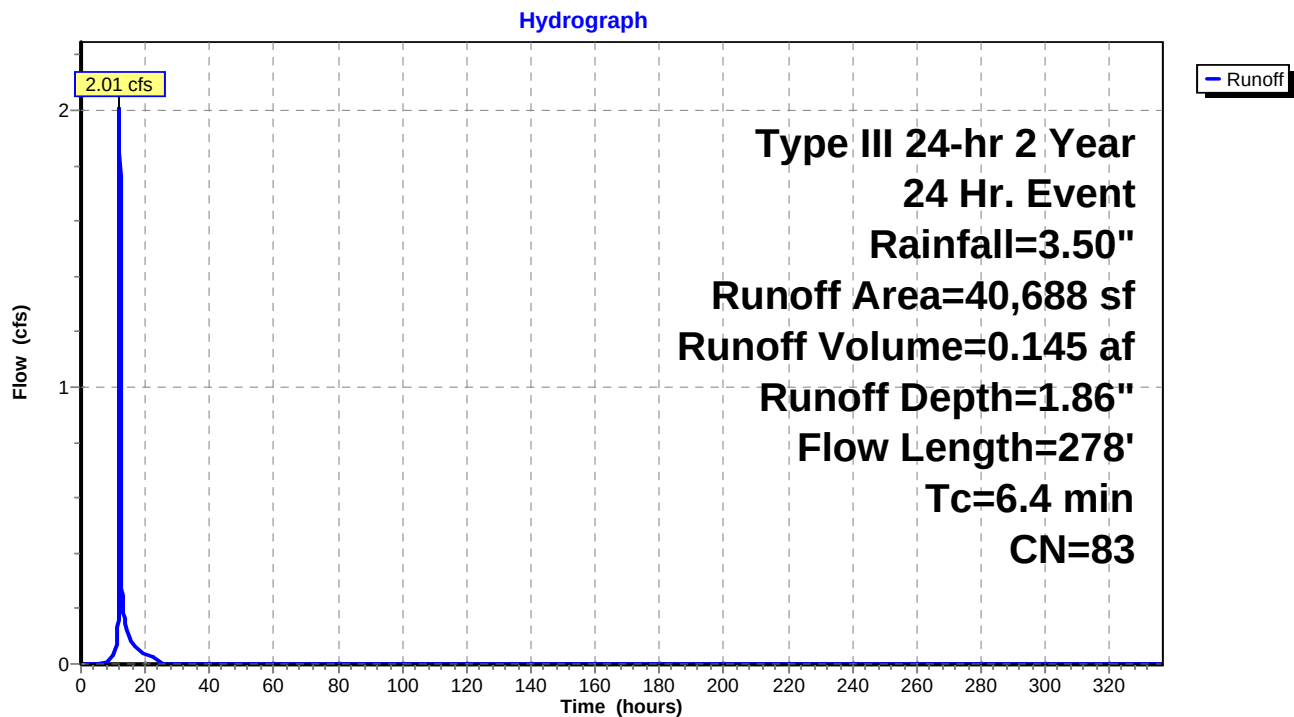
Summary for Subcatchment PROP DP 2: PROP DP 2

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 0.145 af, Depth= 1.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
24,662	98	Paved parking & roofs
16,026	61	>75% Grass cover, Good, HSG B
40,688	83	Weighted Average
16,026		39.39% Pervious Area
24,662		60.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment PROP DP 2: PROP DP 2

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment PROP DP 2: PROP DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.86	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.86	0.00
10.00	0.66	0.03	0.03	270.00	3.50	1.86	0.00
15.00	2.99	1.44	0.10	275.00	3.50	1.86	0.00
20.00	3.35	1.73	0.04	280.00	3.50	1.86	0.00
25.00	3.50	1.86	0.00	285.00	3.50	1.86	0.00
30.00	3.50	1.86	0.00	290.00	3.50	1.86	0.00
35.00	3.50	1.86	0.00	295.00	3.50	1.86	0.00
40.00	3.50	1.86	0.00	300.00	3.50	1.86	0.00
45.00	3.50	1.86	0.00	305.00	3.50	1.86	0.00
50.00	3.50	1.86	0.00	310.00	3.50	1.86	0.00
55.00	3.50	1.86	0.00	315.00	3.50	1.86	0.00
60.00	3.50	1.86	0.00	320.00	3.50	1.86	0.00
65.00	3.50	1.86	0.00	325.00	3.50	1.86	0.00
70.00	3.50	1.86	0.00	330.00	3.50	1.86	0.00
75.00	3.50	1.86	0.00	335.00	3.50	1.86	0.00
80.00	3.50	1.86	0.00				
85.00	3.50	1.86	0.00				
90.00	3.50	1.86	0.00				
95.00	3.50	1.86	0.00				
100.00	3.50	1.86	0.00				
105.00	3.50	1.86	0.00				
110.00	3.50	1.86	0.00				
115.00	3.50	1.86	0.00				
120.00	3.50	1.86	0.00				
125.00	3.50	1.86	0.00				
130.00	3.50	1.86	0.00				
135.00	3.50	1.86	0.00				
140.00	3.50	1.86	0.00				
145.00	3.50	1.86	0.00				
150.00	3.50	1.86	0.00				
155.00	3.50	1.86	0.00				
160.00	3.50	1.86	0.00				
165.00	3.50	1.86	0.00				
170.00	3.50	1.86	0.00				
175.00	3.50	1.86	0.00				
180.00	3.50	1.86	0.00				
185.00	3.50	1.86	0.00				
190.00	3.50	1.86	0.00				
195.00	3.50	1.86	0.00				
200.00	3.50	1.86	0.00				
205.00	3.50	1.86	0.00				
210.00	3.50	1.86	0.00				
215.00	3.50	1.86	0.00				
220.00	3.50	1.86	0.00				
225.00	3.50	1.86	0.00				
230.00	3.50	1.86	0.00				
235.00	3.50	1.86	0.00				
240.00	3.50	1.86	0.00				
245.00	3.50	1.86	0.00				
250.00	3.50	1.86	0.00				
255.00	3.50	1.86	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX DP 2: EX DP 2

Runoff = 3.79 cfs @ 12.09 hrs, Volume= 0.275 af, Depth= 3.53"

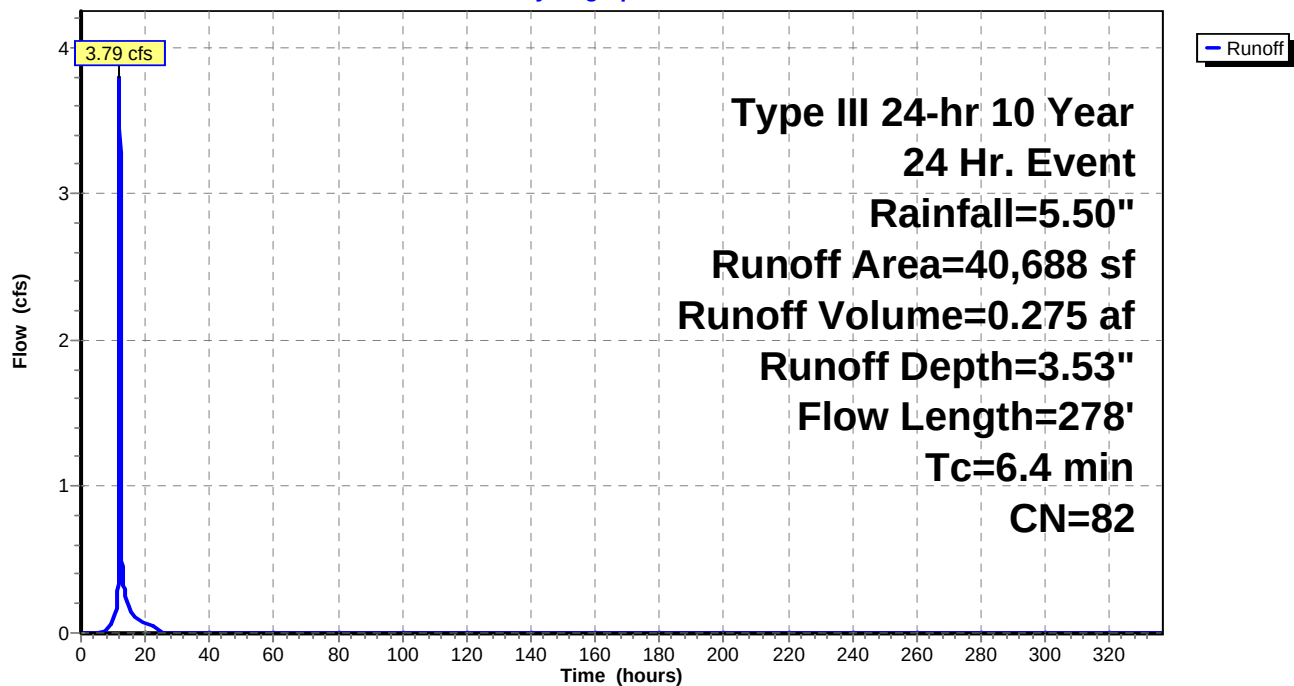
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
23,008	98	Paved parking & roofs
17,680	61	>75% Grass cover, Good, HSG B
40,688	82	Weighted Average
17,680		43.45% Pervious Area
23,008		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment EX DP 2: EX DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX DP 2: EX DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.53	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.53	0.00
10.00	1.04	0.13	0.09	270.00	5.50	3.53	0.00
15.00	4.70	2.81	0.18	275.00	5.50	3.53	0.00
20.00	5.26	3.32	0.06	280.00	5.50	3.53	0.00
25.00	5.50	3.53	0.00	285.00	5.50	3.53	0.00
30.00	5.50	3.53	0.00	290.00	5.50	3.53	0.00
35.00	5.50	3.53	0.00	295.00	5.50	3.53	0.00
40.00	5.50	3.53	0.00	300.00	5.50	3.53	0.00
45.00	5.50	3.53	0.00	305.00	5.50	3.53	0.00
50.00	5.50	3.53	0.00	310.00	5.50	3.53	0.00
55.00	5.50	3.53	0.00	315.00	5.50	3.53	0.00
60.00	5.50	3.53	0.00	320.00	5.50	3.53	0.00
65.00	5.50	3.53	0.00	325.00	5.50	3.53	0.00
70.00	5.50	3.53	0.00	330.00	5.50	3.53	0.00
75.00	5.50	3.53	0.00	335.00	5.50	3.53	0.00
80.00	5.50	3.53	0.00				
85.00	5.50	3.53	0.00				
90.00	5.50	3.53	0.00				
95.00	5.50	3.53	0.00				
100.00	5.50	3.53	0.00				
105.00	5.50	3.53	0.00				
110.00	5.50	3.53	0.00				
115.00	5.50	3.53	0.00				
120.00	5.50	3.53	0.00				
125.00	5.50	3.53	0.00				
130.00	5.50	3.53	0.00				
135.00	5.50	3.53	0.00				
140.00	5.50	3.53	0.00				
145.00	5.50	3.53	0.00				
150.00	5.50	3.53	0.00				
155.00	5.50	3.53	0.00				
160.00	5.50	3.53	0.00				
165.00	5.50	3.53	0.00				
170.00	5.50	3.53	0.00				
175.00	5.50	3.53	0.00				
180.00	5.50	3.53	0.00				
185.00	5.50	3.53	0.00				
190.00	5.50	3.53	0.00				
195.00	5.50	3.53	0.00				
200.00	5.50	3.53	0.00				
205.00	5.50	3.53	0.00				
210.00	5.50	3.53	0.00				
215.00	5.50	3.53	0.00				
220.00	5.50	3.53	0.00				
225.00	5.50	3.53	0.00				
230.00	5.50	3.53	0.00				
235.00	5.50	3.53	0.00				
240.00	5.50	3.53	0.00				
245.00	5.50	3.53	0.00				
250.00	5.50	3.53	0.00				
255.00	5.50	3.53	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment PROP DP 2: PROP DP 2

Runoff = 3.89 cfs @ 12.09 hrs, Volume= 0.283 af, Depth= 3.63"

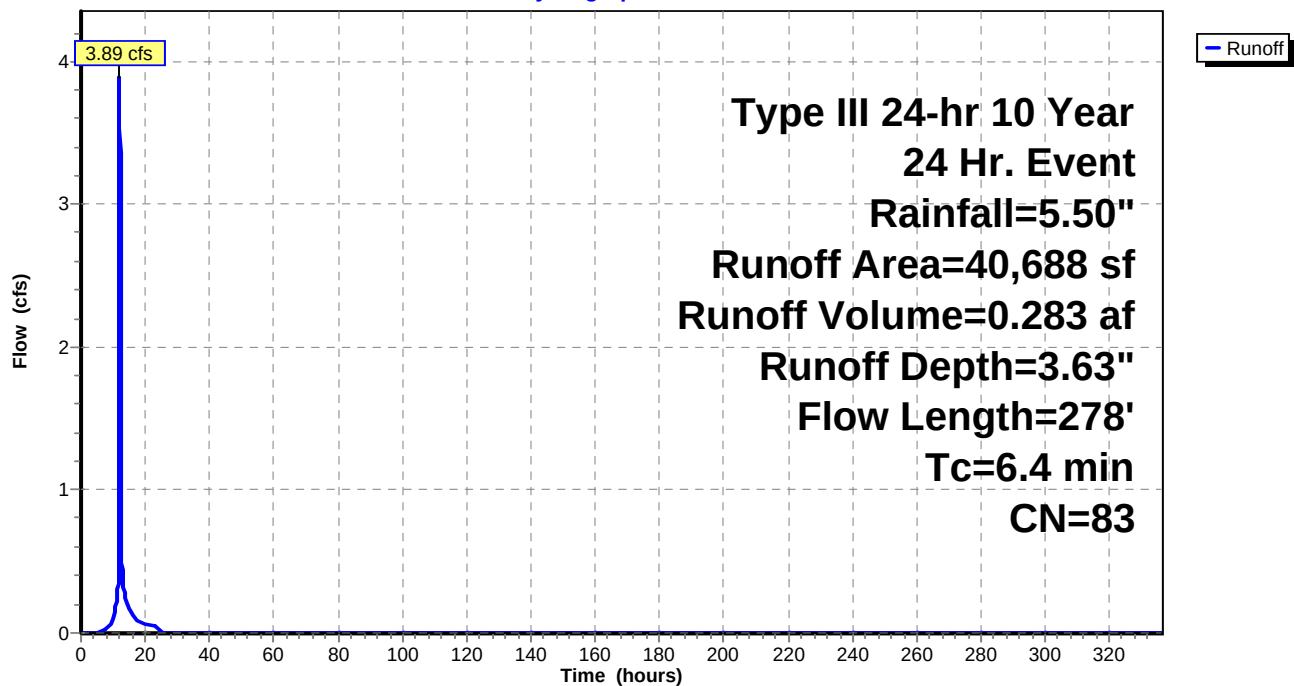
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
24,662	98	Paved parking & roofs
16,026	61	>75% Grass cover, Good, HSG B
40,688	83	Weighted Average
16,026		39.39% Pervious Area
24,662		60.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment PROP DP 2: PROP DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment PROP DP 2: PROP DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.63	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.63	0.00
10.00	1.04	0.15	0.10	270.00	5.50	3.63	0.00
15.00	4.70	2.90	0.18	275.00	5.50	3.63	0.00
20.00	5.26	3.41	0.06	280.00	5.50	3.63	0.00
25.00	5.50	3.63	0.00	285.00	5.50	3.63	0.00
30.00	5.50	3.63	0.00	290.00	5.50	3.63	0.00
35.00	5.50	3.63	0.00	295.00	5.50	3.63	0.00
40.00	5.50	3.63	0.00	300.00	5.50	3.63	0.00
45.00	5.50	3.63	0.00	305.00	5.50	3.63	0.00
50.00	5.50	3.63	0.00	310.00	5.50	3.63	0.00
55.00	5.50	3.63	0.00	315.00	5.50	3.63	0.00
60.00	5.50	3.63	0.00	320.00	5.50	3.63	0.00
65.00	5.50	3.63	0.00	325.00	5.50	3.63	0.00
70.00	5.50	3.63	0.00	330.00	5.50	3.63	0.00
75.00	5.50	3.63	0.00	335.00	5.50	3.63	0.00
80.00	5.50	3.63	0.00				
85.00	5.50	3.63	0.00				
90.00	5.50	3.63	0.00				
95.00	5.50	3.63	0.00				
100.00	5.50	3.63	0.00				
105.00	5.50	3.63	0.00				
110.00	5.50	3.63	0.00				
115.00	5.50	3.63	0.00				
120.00	5.50	3.63	0.00				
125.00	5.50	3.63	0.00				
130.00	5.50	3.63	0.00				
135.00	5.50	3.63	0.00				
140.00	5.50	3.63	0.00				
145.00	5.50	3.63	0.00				
150.00	5.50	3.63	0.00				
155.00	5.50	3.63	0.00				
160.00	5.50	3.63	0.00				
165.00	5.50	3.63	0.00				
170.00	5.50	3.63	0.00				
175.00	5.50	3.63	0.00				
180.00	5.50	3.63	0.00				
185.00	5.50	3.63	0.00				
190.00	5.50	3.63	0.00				
195.00	5.50	3.63	0.00				
200.00	5.50	3.63	0.00				
205.00	5.50	3.63	0.00				
210.00	5.50	3.63	0.00				
215.00	5.50	3.63	0.00				
220.00	5.50	3.63	0.00				
225.00	5.50	3.63	0.00				
230.00	5.50	3.63	0.00				
235.00	5.50	3.63	0.00				
240.00	5.50	3.63	0.00				
245.00	5.50	3.63	0.00				
250.00	5.50	3.63	0.00				
255.00	5.50	3.63	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX DP 2: EX DP 2

Runoff = 4.27 cfs @ 12.09 hrs, Volume= 0.310 af, Depth= 3.99"

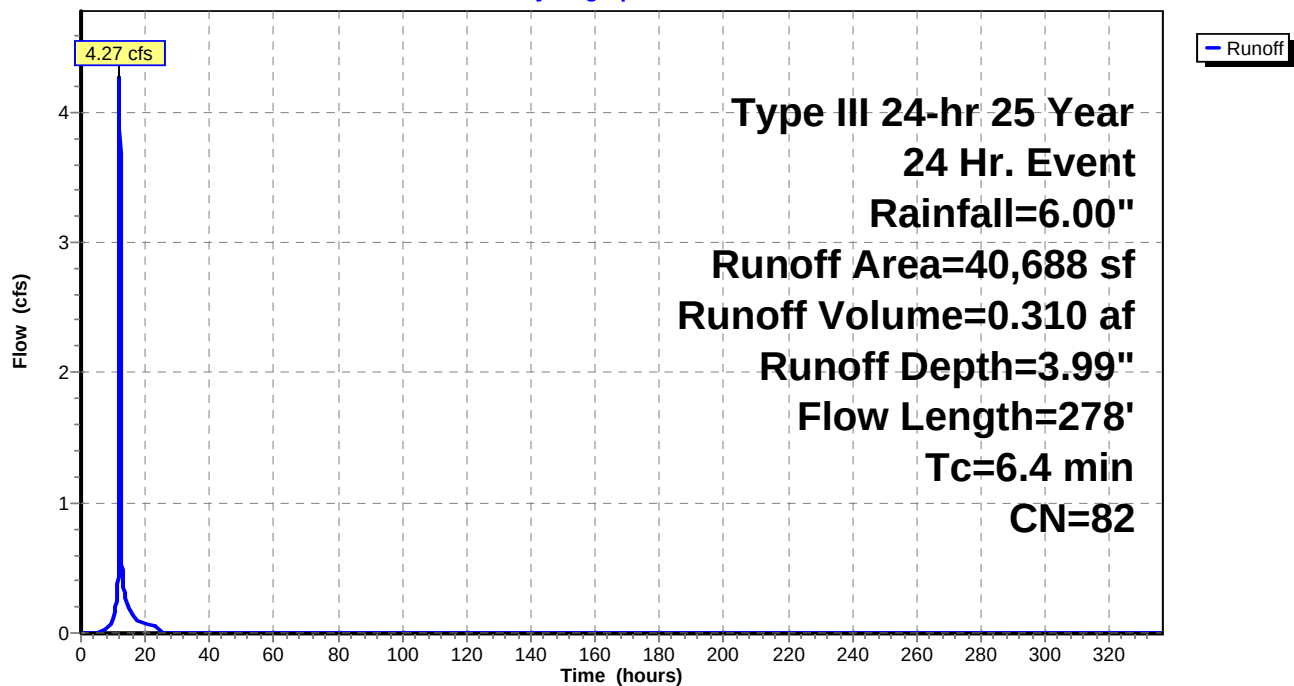
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
23,008	98	Paved parking & roofs
17,680	61	>75% Grass cover, Good, HSG B
40,688	82	Weighted Average
17,680		43.45% Pervious Area
23,008		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment EX DP 2: EX DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX DP 2: EX DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.99	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.99	0.00
10.00	1.13	0.17	0.11	270.00	6.00	3.99	0.00
15.00	5.13	3.19	0.20	275.00	6.00	3.99	0.00
20.00	5.74	3.75	0.07	280.00	6.00	3.99	0.00
25.00	6.00	3.99	0.00	285.00	6.00	3.99	0.00
30.00	6.00	3.99	0.00	290.00	6.00	3.99	0.00
35.00	6.00	3.99	0.00	295.00	6.00	3.99	0.00
40.00	6.00	3.99	0.00	300.00	6.00	3.99	0.00
45.00	6.00	3.99	0.00	305.00	6.00	3.99	0.00
50.00	6.00	3.99	0.00	310.00	6.00	3.99	0.00
55.00	6.00	3.99	0.00	315.00	6.00	3.99	0.00
60.00	6.00	3.99	0.00	320.00	6.00	3.99	0.00
65.00	6.00	3.99	0.00	325.00	6.00	3.99	0.00
70.00	6.00	3.99	0.00	330.00	6.00	3.99	0.00
75.00	6.00	3.99	0.00	335.00	6.00	3.99	0.00
80.00	6.00	3.99	0.00				
85.00	6.00	3.99	0.00				
90.00	6.00	3.99	0.00				
95.00	6.00	3.99	0.00				
100.00	6.00	3.99	0.00				
105.00	6.00	3.99	0.00				
110.00	6.00	3.99	0.00				
115.00	6.00	3.99	0.00				
120.00	6.00	3.99	0.00				
125.00	6.00	3.99	0.00				
130.00	6.00	3.99	0.00				
135.00	6.00	3.99	0.00				
140.00	6.00	3.99	0.00				
145.00	6.00	3.99	0.00				
150.00	6.00	3.99	0.00				
155.00	6.00	3.99	0.00				
160.00	6.00	3.99	0.00				
165.00	6.00	3.99	0.00				
170.00	6.00	3.99	0.00				
175.00	6.00	3.99	0.00				
180.00	6.00	3.99	0.00				
185.00	6.00	3.99	0.00				
190.00	6.00	3.99	0.00				
195.00	6.00	3.99	0.00				
200.00	6.00	3.99	0.00				
205.00	6.00	3.99	0.00				
210.00	6.00	3.99	0.00				
215.00	6.00	3.99	0.00				
220.00	6.00	3.99	0.00				
225.00	6.00	3.99	0.00				
230.00	6.00	3.99	0.00				
235.00	6.00	3.99	0.00				
240.00	6.00	3.99	0.00				
245.00	6.00	3.99	0.00				
250.00	6.00	3.99	0.00				
255.00	6.00	3.99	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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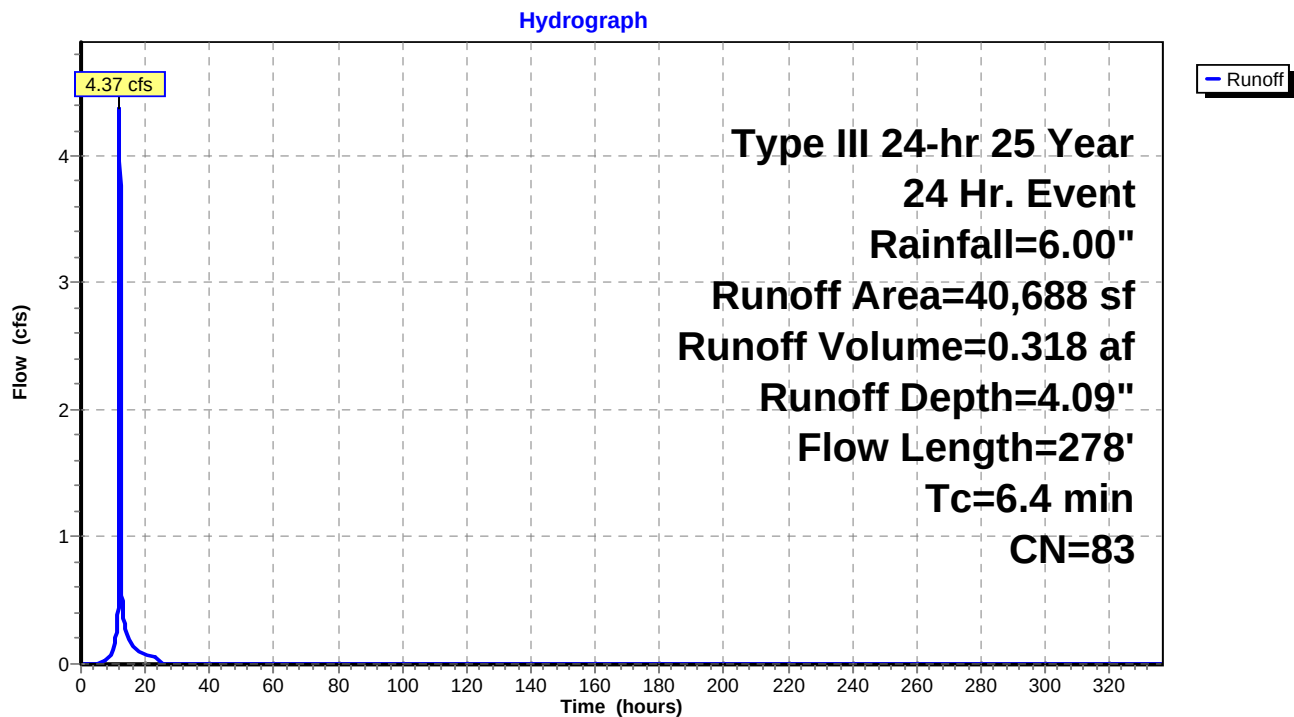
Summary for Subcatchment PROP DP 2: PROP DP 2

Runoff = 4.37 cfs @ 12.09 hrs, Volume= 0.318 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
24,662	98	Paved parking & roofs
16,026	61	>75% Grass cover, Good, HSG B
40,688	83	Weighted Average
16,026		39.39% Pervious Area
24,662		60.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment PROP DP 2: PROP DP 2

Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment PROP DP 2: PROP DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.09	0.00
5.00	0.34	0.00	0.00	265.00	6.00	4.09	0.00
10.00	1.13	0.19	0.12	270.00	6.00	4.09	0.00
15.00	5.13	3.29	0.20	275.00	6.00	4.09	0.00
20.00	5.74	3.85	0.07	280.00	6.00	4.09	0.00
25.00	6.00	4.09	0.00	285.00	6.00	4.09	0.00
30.00	6.00	4.09	0.00	290.00	6.00	4.09	0.00
35.00	6.00	4.09	0.00	295.00	6.00	4.09	0.00
40.00	6.00	4.09	0.00	300.00	6.00	4.09	0.00
45.00	6.00	4.09	0.00	305.00	6.00	4.09	0.00
50.00	6.00	4.09	0.00	310.00	6.00	4.09	0.00
55.00	6.00	4.09	0.00	315.00	6.00	4.09	0.00
60.00	6.00	4.09	0.00	320.00	6.00	4.09	0.00
65.00	6.00	4.09	0.00	325.00	6.00	4.09	0.00
70.00	6.00	4.09	0.00	330.00	6.00	4.09	0.00
75.00	6.00	4.09	0.00	335.00	6.00	4.09	0.00
80.00	6.00	4.09	0.00				
85.00	6.00	4.09	0.00				
90.00	6.00	4.09	0.00				
95.00	6.00	4.09	0.00				
100.00	6.00	4.09	0.00				
105.00	6.00	4.09	0.00				
110.00	6.00	4.09	0.00				
115.00	6.00	4.09	0.00				
120.00	6.00	4.09	0.00				
125.00	6.00	4.09	0.00				
130.00	6.00	4.09	0.00				
135.00	6.00	4.09	0.00				
140.00	6.00	4.09	0.00				
145.00	6.00	4.09	0.00				
150.00	6.00	4.09	0.00				
155.00	6.00	4.09	0.00				
160.00	6.00	4.09	0.00				
165.00	6.00	4.09	0.00				
170.00	6.00	4.09	0.00				
175.00	6.00	4.09	0.00				
180.00	6.00	4.09	0.00				
185.00	6.00	4.09	0.00				
190.00	6.00	4.09	0.00				
195.00	6.00	4.09	0.00				
200.00	6.00	4.09	0.00				
205.00	6.00	4.09	0.00				
210.00	6.00	4.09	0.00				
215.00	6.00	4.09	0.00				
220.00	6.00	4.09	0.00				
225.00	6.00	4.09	0.00				
230.00	6.00	4.09	0.00				
235.00	6.00	4.09	0.00				
240.00	6.00	4.09	0.00				
245.00	6.00	4.09	0.00				
250.00	6.00	4.09	0.00				
255.00	6.00	4.09	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX DP 2: EX DP 2

Runoff = 7.62 cfs @ 12.09 hrs, Volume= 0.568 af, Depth= 7.29"

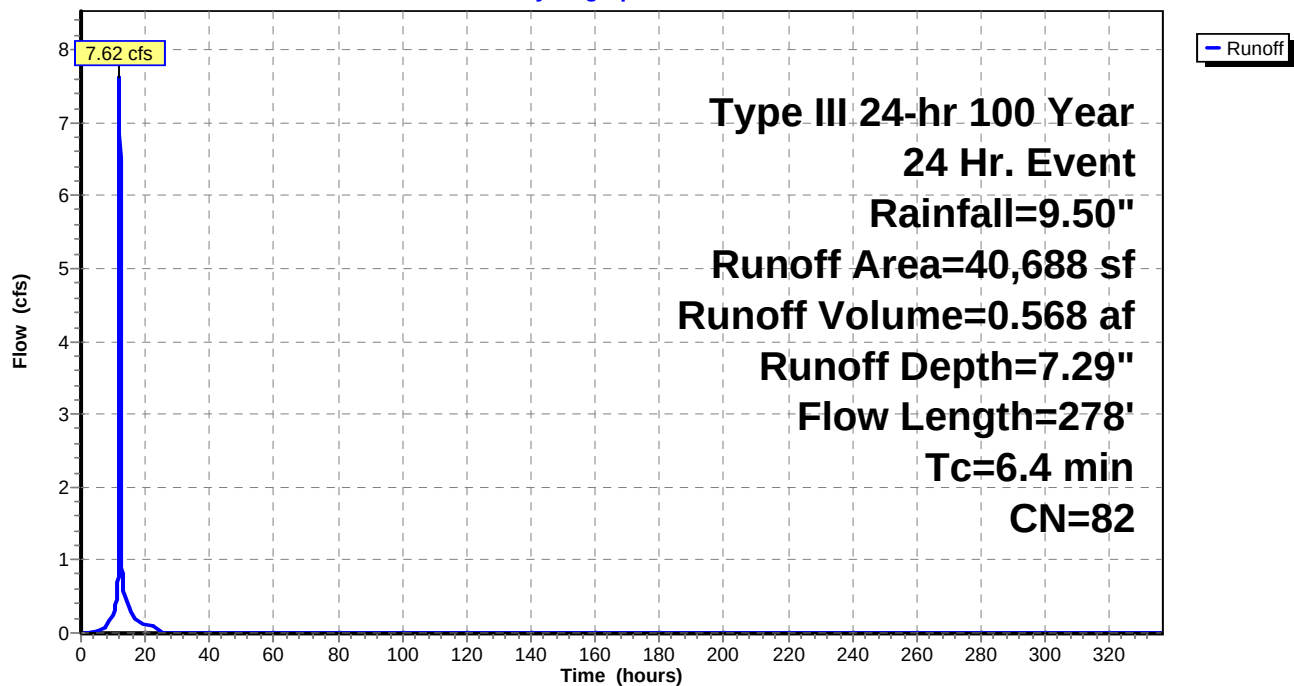
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
23,008	98	Paved parking & roofs
17,680	61	>75% Grass cover, Good, HSG B
40,688	82	Weighted Average
17,680		43.45% Pervious Area
23,008		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment EX DP 2: EX DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX DP 2: EX DP 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.29	0.00
5.00	0.54	0.00	0.01	265.00	9.50	7.29	0.00
10.00	1.80	0.52	0.26	270.00	9.50	7.29	0.00
15.00	8.12	5.97	0.33	275.00	9.50	7.29	0.00
20.00	9.09	6.90	0.11	280.00	9.50	7.29	0.00
25.00	9.50	7.29	0.00	285.00	9.50	7.29	0.00
30.00	9.50	7.29	0.00	290.00	9.50	7.29	0.00
35.00	9.50	7.29	0.00	295.00	9.50	7.29	0.00
40.00	9.50	7.29	0.00	300.00	9.50	7.29	0.00
45.00	9.50	7.29	0.00	305.00	9.50	7.29	0.00
50.00	9.50	7.29	0.00	310.00	9.50	7.29	0.00
55.00	9.50	7.29	0.00	315.00	9.50	7.29	0.00
60.00	9.50	7.29	0.00	320.00	9.50	7.29	0.00
65.00	9.50	7.29	0.00	325.00	9.50	7.29	0.00
70.00	9.50	7.29	0.00	330.00	9.50	7.29	0.00
75.00	9.50	7.29	0.00	335.00	9.50	7.29	0.00
80.00	9.50	7.29	0.00				
85.00	9.50	7.29	0.00				
90.00	9.50	7.29	0.00				
95.00	9.50	7.29	0.00				
100.00	9.50	7.29	0.00				
105.00	9.50	7.29	0.00				
110.00	9.50	7.29	0.00				
115.00	9.50	7.29	0.00				
120.00	9.50	7.29	0.00				
125.00	9.50	7.29	0.00				
130.00	9.50	7.29	0.00				
135.00	9.50	7.29	0.00				
140.00	9.50	7.29	0.00				
145.00	9.50	7.29	0.00				
150.00	9.50	7.29	0.00				
155.00	9.50	7.29	0.00				
160.00	9.50	7.29	0.00				
165.00	9.50	7.29	0.00				
170.00	9.50	7.29	0.00				
175.00	9.50	7.29	0.00				
180.00	9.50	7.29	0.00				
185.00	9.50	7.29	0.00				
190.00	9.50	7.29	0.00				
195.00	9.50	7.29	0.00				
200.00	9.50	7.29	0.00				
205.00	9.50	7.29	0.00				
210.00	9.50	7.29	0.00				
215.00	9.50	7.29	0.00				
220.00	9.50	7.29	0.00				
225.00	9.50	7.29	0.00				
230.00	9.50	7.29	0.00				
235.00	9.50	7.29	0.00				
240.00	9.50	7.29	0.00				
245.00	9.50	7.29	0.00				
250.00	9.50	7.29	0.00				
255.00	9.50	7.29	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment PROP DP 2: PROP DP 2

Runoff = 7.71 cfs @ 12.09 hrs, Volume= 0.577 af, Depth= 7.42"

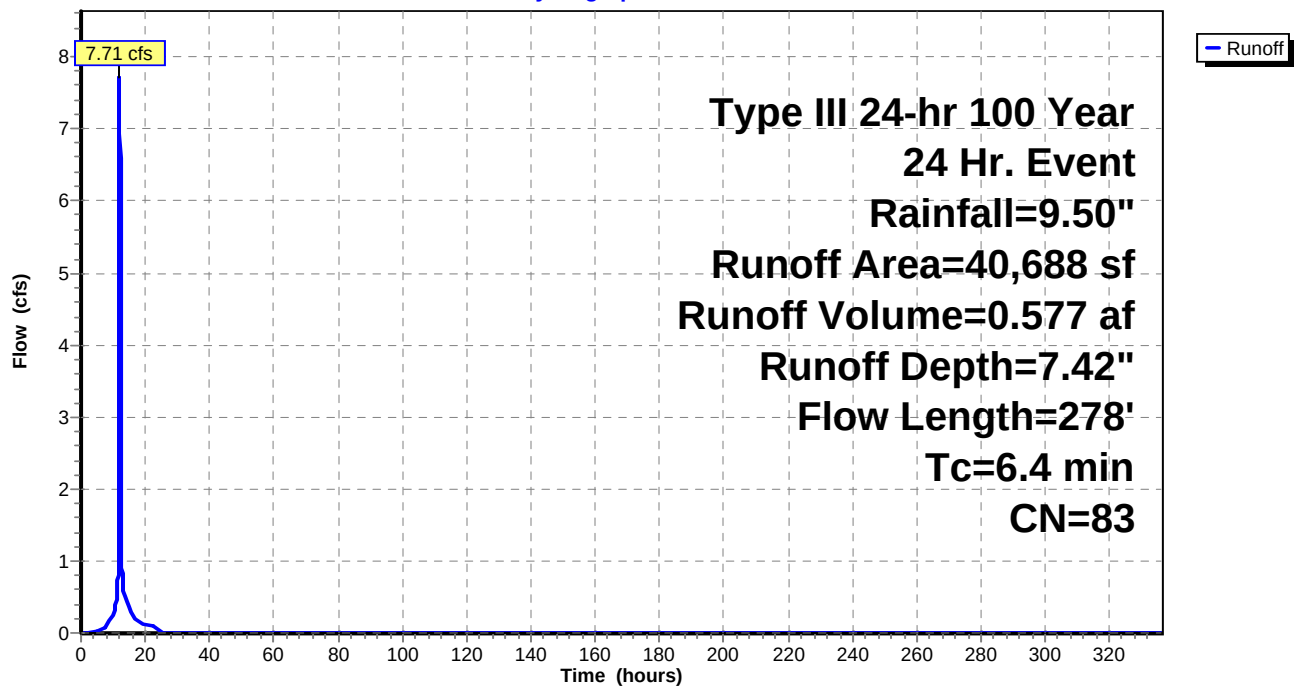
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
24,662	98	Paved parking & roofs
16,026	61	>75% Grass cover, Good, HSG B
40,688	83	Weighted Average
16,026		39.39% Pervious Area
24,662		60.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	74	0.0810	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	204	0.0580	12.68	15.56	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.4	278	Total			

Subcatchment PROP DP 2: PROP DP 2

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

Prepared by AKRF Engineering, PC

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Hydrograph for Subcatchment PROP DP 2: PROP DP 2

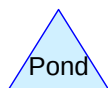
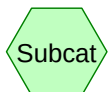
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.42	0.00
5.00	0.54	0.01	0.01	265.00	9.50	7.42	0.00
10.00	1.80	0.56	0.27	270.00	9.50	7.42	0.00
15.00	8.12	6.09	0.33	275.00	9.50	7.42	0.00
20.00	9.09	7.02	0.11	280.00	9.50	7.42	0.00
25.00	9.50	7.42	0.00	285.00	9.50	7.42	0.00
30.00	9.50	7.42	0.00	290.00	9.50	7.42	0.00
35.00	9.50	7.42	0.00	295.00	9.50	7.42	0.00
40.00	9.50	7.42	0.00	300.00	9.50	7.42	0.00
45.00	9.50	7.42	0.00	305.00	9.50	7.42	0.00
50.00	9.50	7.42	0.00	310.00	9.50	7.42	0.00
55.00	9.50	7.42	0.00	315.00	9.50	7.42	0.00
60.00	9.50	7.42	0.00	320.00	9.50	7.42	0.00
65.00	9.50	7.42	0.00	325.00	9.50	7.42	0.00
70.00	9.50	7.42	0.00	330.00	9.50	7.42	0.00
75.00	9.50	7.42	0.00	335.00	9.50	7.42	0.00
80.00	9.50	7.42	0.00				
85.00	9.50	7.42	0.00				
90.00	9.50	7.42	0.00				
95.00	9.50	7.42	0.00				
100.00	9.50	7.42	0.00				
105.00	9.50	7.42	0.00				
110.00	9.50	7.42	0.00				
115.00	9.50	7.42	0.00				
120.00	9.50	7.42	0.00				
125.00	9.50	7.42	0.00				
130.00	9.50	7.42	0.00				
135.00	9.50	7.42	0.00				
140.00	9.50	7.42	0.00				
145.00	9.50	7.42	0.00				
150.00	9.50	7.42	0.00				
155.00	9.50	7.42	0.00				
160.00	9.50	7.42	0.00				
165.00	9.50	7.42	0.00				
170.00	9.50	7.42	0.00				
175.00	9.50	7.42	0.00				
180.00	9.50	7.42	0.00				
185.00	9.50	7.42	0.00				
190.00	9.50	7.42	0.00				
195.00	9.50	7.42	0.00				
200.00	9.50	7.42	0.00				
205.00	9.50	7.42	0.00				
210.00	9.50	7.42	0.00				
215.00	9.50	7.42	0.00				
220.00	9.50	7.42	0.00				
225.00	9.50	7.42	0.00				
230.00	9.50	7.42	0.00				
235.00	9.50	7.42	0.00				
240.00	9.50	7.42	0.00				
245.00	9.50	7.42	0.00				
250.00	9.50	7.42	0.00				
255.00	9.50	7.42	0.00				



EX DP 3



PROP DP 3



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX DP 3: EX DP 3

Runoff = 14.27 cfs @ 12.09 hrs, Volume= 1.127 af, Depth= 0.72"

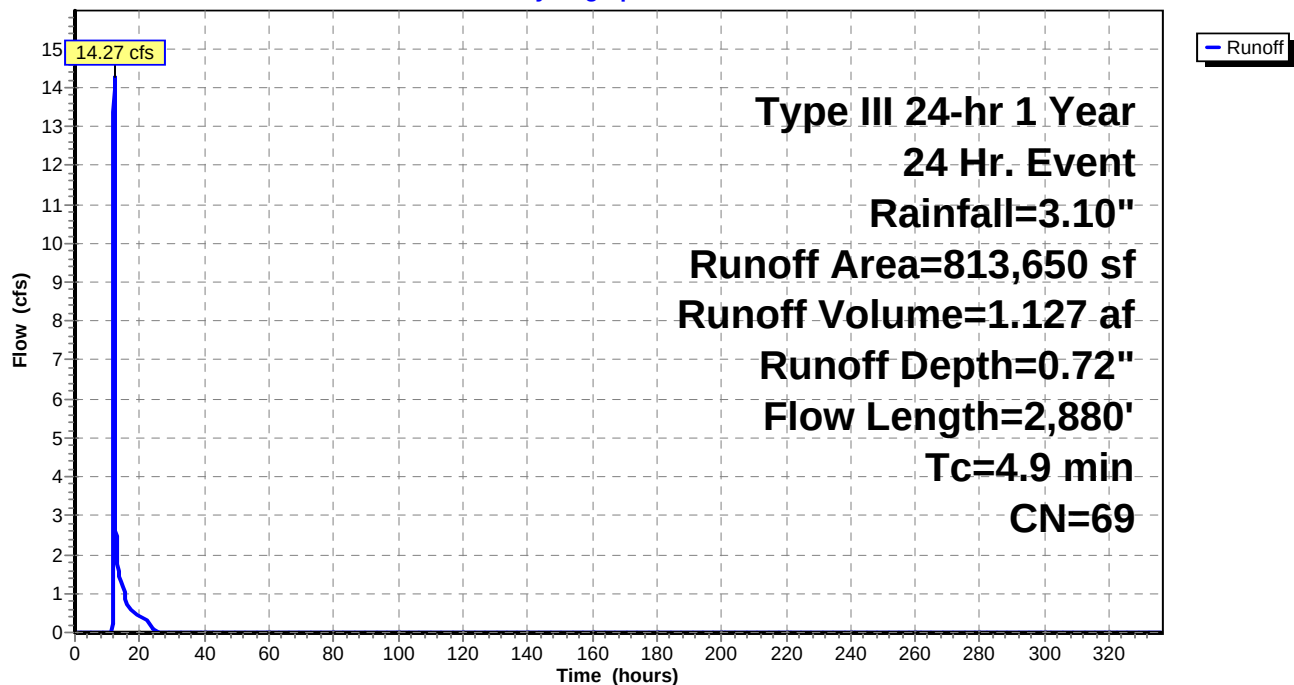
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 187,492	98	Roofs & Roads, HSG B
161,790	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
626,158		76.96% Pervious Area
187,492		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment EX DP 3: EX DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX DP 3: EX DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.72	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.72	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.72	0.00
15.00	2.65	0.49	1.08	275.00	3.10	0.72	0.00
20.00	2.97	0.65	0.41	280.00	3.10	0.72	0.00
25.00	3.10	0.72	0.00	285.00	3.10	0.72	0.00
30.00	3.10	0.72	0.00	290.00	3.10	0.72	0.00
35.00	3.10	0.72	0.00	295.00	3.10	0.72	0.00
40.00	3.10	0.72	0.00	300.00	3.10	0.72	0.00
45.00	3.10	0.72	0.00	305.00	3.10	0.72	0.00
50.00	3.10	0.72	0.00	310.00	3.10	0.72	0.00
55.00	3.10	0.72	0.00	315.00	3.10	0.72	0.00
60.00	3.10	0.72	0.00	320.00	3.10	0.72	0.00
65.00	3.10	0.72	0.00	325.00	3.10	0.72	0.00
70.00	3.10	0.72	0.00	330.00	3.10	0.72	0.00
75.00	3.10	0.72	0.00	335.00	3.10	0.72	0.00
80.00	3.10	0.72	0.00				
85.00	3.10	0.72	0.00				
90.00	3.10	0.72	0.00				
95.00	3.10	0.72	0.00				
100.00	3.10	0.72	0.00				
105.00	3.10	0.72	0.00				
110.00	3.10	0.72	0.00				
115.00	3.10	0.72	0.00				
120.00	3.10	0.72	0.00				
125.00	3.10	0.72	0.00				
130.00	3.10	0.72	0.00				
135.00	3.10	0.72	0.00				
140.00	3.10	0.72	0.00				
145.00	3.10	0.72	0.00				
150.00	3.10	0.72	0.00				
155.00	3.10	0.72	0.00				
160.00	3.10	0.72	0.00				
165.00	3.10	0.72	0.00				
170.00	3.10	0.72	0.00				
175.00	3.10	0.72	0.00				
180.00	3.10	0.72	0.00				
185.00	3.10	0.72	0.00				
190.00	3.10	0.72	0.00				
195.00	3.10	0.72	0.00				
200.00	3.10	0.72	0.00				
205.00	3.10	0.72	0.00				
210.00	3.10	0.72	0.00				
215.00	3.10	0.72	0.00				
220.00	3.10	0.72	0.00				
225.00	3.10	0.72	0.00				
230.00	3.10	0.72	0.00				
235.00	3.10	0.72	0.00				
240.00	3.10	0.72	0.00				
245.00	3.10	0.72	0.00				
250.00	3.10	0.72	0.00				
255.00	3.10	0.72	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment PROP DP 3: PROP DP 3

Runoff = 14.27 cfs @ 12.09 hrs, Volume= 1.127 af, Depth= 0.72"

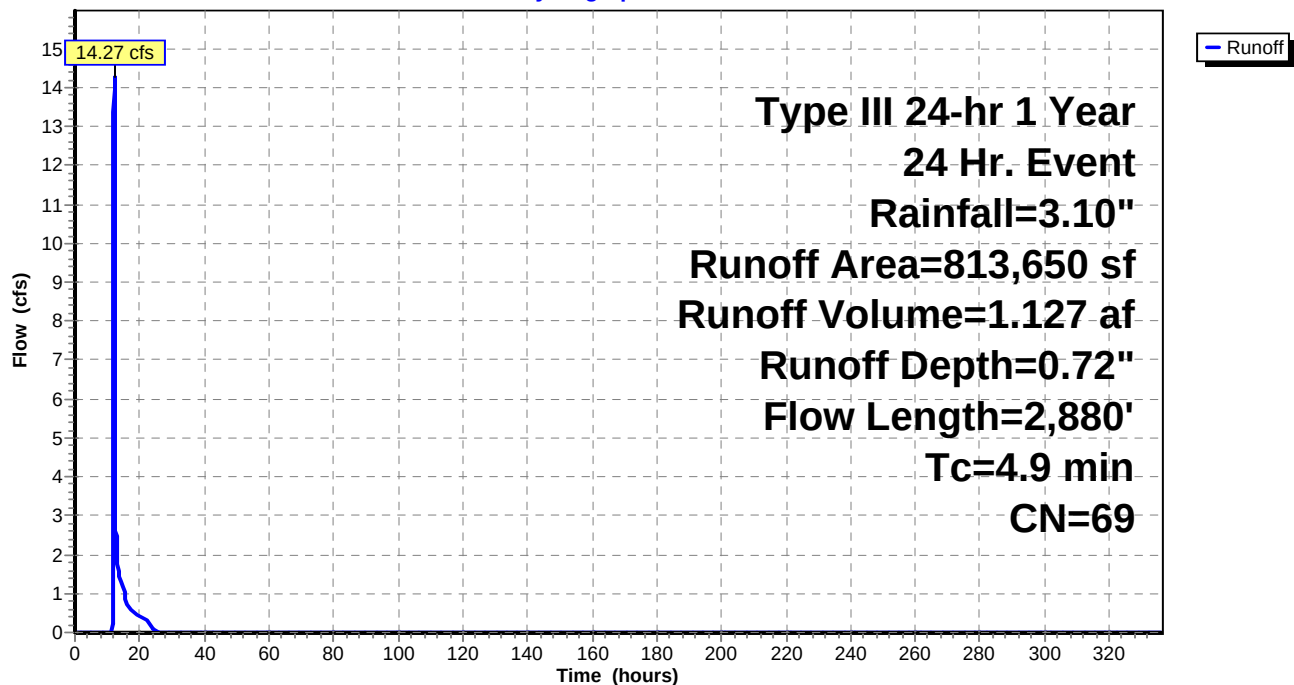
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 193,368	98	Roofs & Roads, HSG B
155,914	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
620,282		76.23% Pervious Area
193,368		23.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment PROP DP 3: PROP DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment PROP DP 3: PROP DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	0.72	0.00
5.00	0.18	0.00	0.00	265.00	3.10	0.72	0.00
10.00	0.59	0.00	0.00	270.00	3.10	0.72	0.00
15.00	2.65	0.49	1.08	275.00	3.10	0.72	0.00
20.00	2.97	0.65	0.41	280.00	3.10	0.72	0.00
25.00	3.10	0.72	0.00	285.00	3.10	0.72	0.00
30.00	3.10	0.72	0.00	290.00	3.10	0.72	0.00
35.00	3.10	0.72	0.00	295.00	3.10	0.72	0.00
40.00	3.10	0.72	0.00	300.00	3.10	0.72	0.00
45.00	3.10	0.72	0.00	305.00	3.10	0.72	0.00
50.00	3.10	0.72	0.00	310.00	3.10	0.72	0.00
55.00	3.10	0.72	0.00	315.00	3.10	0.72	0.00
60.00	3.10	0.72	0.00	320.00	3.10	0.72	0.00
65.00	3.10	0.72	0.00	325.00	3.10	0.72	0.00
70.00	3.10	0.72	0.00	330.00	3.10	0.72	0.00
75.00	3.10	0.72	0.00	335.00	3.10	0.72	0.00
80.00	3.10	0.72	0.00				
85.00	3.10	0.72	0.00				
90.00	3.10	0.72	0.00				
95.00	3.10	0.72	0.00				
100.00	3.10	0.72	0.00				
105.00	3.10	0.72	0.00				
110.00	3.10	0.72	0.00				
115.00	3.10	0.72	0.00				
120.00	3.10	0.72	0.00				
125.00	3.10	0.72	0.00				
130.00	3.10	0.72	0.00				
135.00	3.10	0.72	0.00				
140.00	3.10	0.72	0.00				
145.00	3.10	0.72	0.00				
150.00	3.10	0.72	0.00				
155.00	3.10	0.72	0.00				
160.00	3.10	0.72	0.00				
165.00	3.10	0.72	0.00				
170.00	3.10	0.72	0.00				
175.00	3.10	0.72	0.00				
180.00	3.10	0.72	0.00				
185.00	3.10	0.72	0.00				
190.00	3.10	0.72	0.00				
195.00	3.10	0.72	0.00				
200.00	3.10	0.72	0.00				
205.00	3.10	0.72	0.00				
210.00	3.10	0.72	0.00				
215.00	3.10	0.72	0.00				
220.00	3.10	0.72	0.00				
225.00	3.10	0.72	0.00				
230.00	3.10	0.72	0.00				
235.00	3.10	0.72	0.00				
240.00	3.10	0.72	0.00				
245.00	3.10	0.72	0.00				
250.00	3.10	0.72	0.00				
255.00	3.10	0.72	0.00				

Summary for Subcatchment EX DP 3: EX DP 3

Runoff = 19.77 cfs @ 12.08 hrs, Volume= 1.485 af, Depth= 0.95"

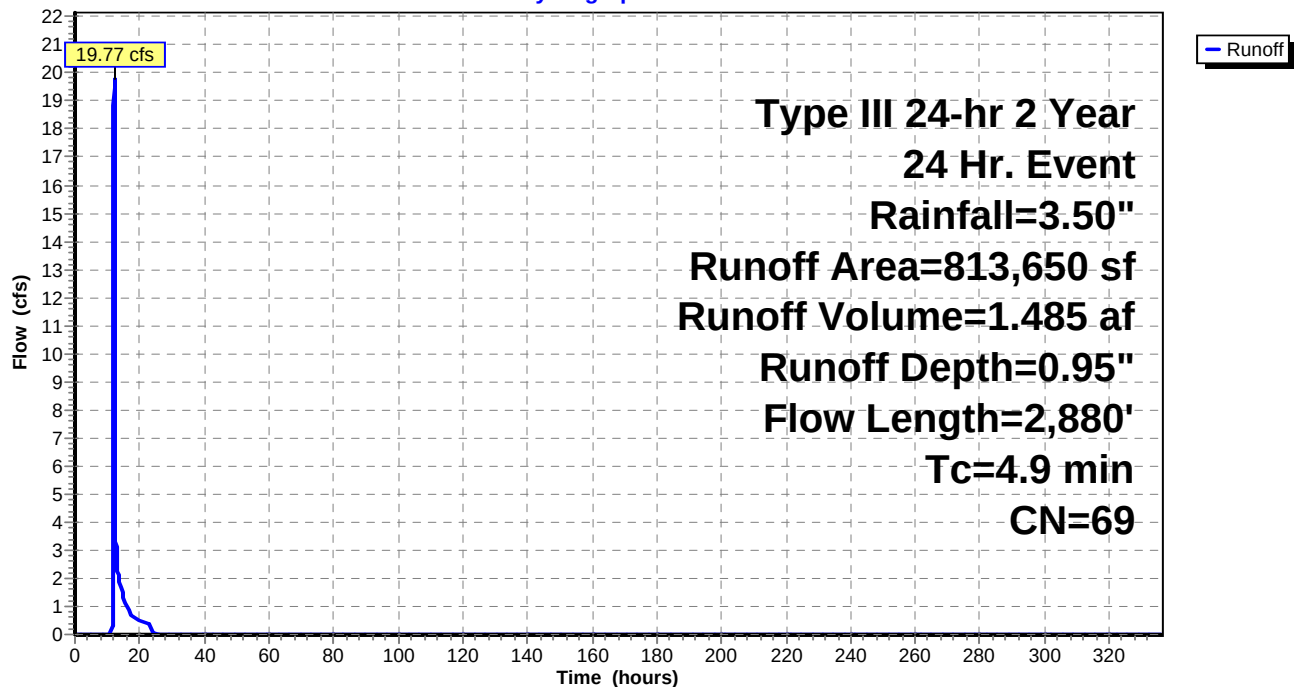
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 187,492	98	Roofs & Roads, HSG B
161,790	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
626,158		76.96% Pervious Area
187,492		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment EX DP 3: EX DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX DP 3: EX DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.95	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.95	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.95	0.00
15.00	2.99	0.66	1.35	275.00	3.50	0.95	0.00
20.00	3.35	0.87	0.50	280.00	3.50	0.95	0.00
25.00	3.50	0.95	0.00	285.00	3.50	0.95	0.00
30.00	3.50	0.95	0.00	290.00	3.50	0.95	0.00
35.00	3.50	0.95	0.00	295.00	3.50	0.95	0.00
40.00	3.50	0.95	0.00	300.00	3.50	0.95	0.00
45.00	3.50	0.95	0.00	305.00	3.50	0.95	0.00
50.00	3.50	0.95	0.00	310.00	3.50	0.95	0.00
55.00	3.50	0.95	0.00	315.00	3.50	0.95	0.00
60.00	3.50	0.95	0.00	320.00	3.50	0.95	0.00
65.00	3.50	0.95	0.00	325.00	3.50	0.95	0.00
70.00	3.50	0.95	0.00	330.00	3.50	0.95	0.00
75.00	3.50	0.95	0.00	335.00	3.50	0.95	0.00
80.00	3.50	0.95	0.00				
85.00	3.50	0.95	0.00				
90.00	3.50	0.95	0.00				
95.00	3.50	0.95	0.00				
100.00	3.50	0.95	0.00				
105.00	3.50	0.95	0.00				
110.00	3.50	0.95	0.00				
115.00	3.50	0.95	0.00				
120.00	3.50	0.95	0.00				
125.00	3.50	0.95	0.00				
130.00	3.50	0.95	0.00				
135.00	3.50	0.95	0.00				
140.00	3.50	0.95	0.00				
145.00	3.50	0.95	0.00				
150.00	3.50	0.95	0.00				
155.00	3.50	0.95	0.00				
160.00	3.50	0.95	0.00				
165.00	3.50	0.95	0.00				
170.00	3.50	0.95	0.00				
175.00	3.50	0.95	0.00				
180.00	3.50	0.95	0.00				
185.00	3.50	0.95	0.00				
190.00	3.50	0.95	0.00				
195.00	3.50	0.95	0.00				
200.00	3.50	0.95	0.00				
205.00	3.50	0.95	0.00				
210.00	3.50	0.95	0.00				
215.00	3.50	0.95	0.00				
220.00	3.50	0.95	0.00				
225.00	3.50	0.95	0.00				
230.00	3.50	0.95	0.00				
235.00	3.50	0.95	0.00				
240.00	3.50	0.95	0.00				
245.00	3.50	0.95	0.00				
250.00	3.50	0.95	0.00				
255.00	3.50	0.95	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Prepared by AKRF Engineering, PC

Printed 2/12/2010

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Summary for Subcatchment PROP DP 3: PROP DP 3

Runoff = 19.77 cfs @ 12.08 hrs, Volume= 1.485 af, Depth= 0.95"

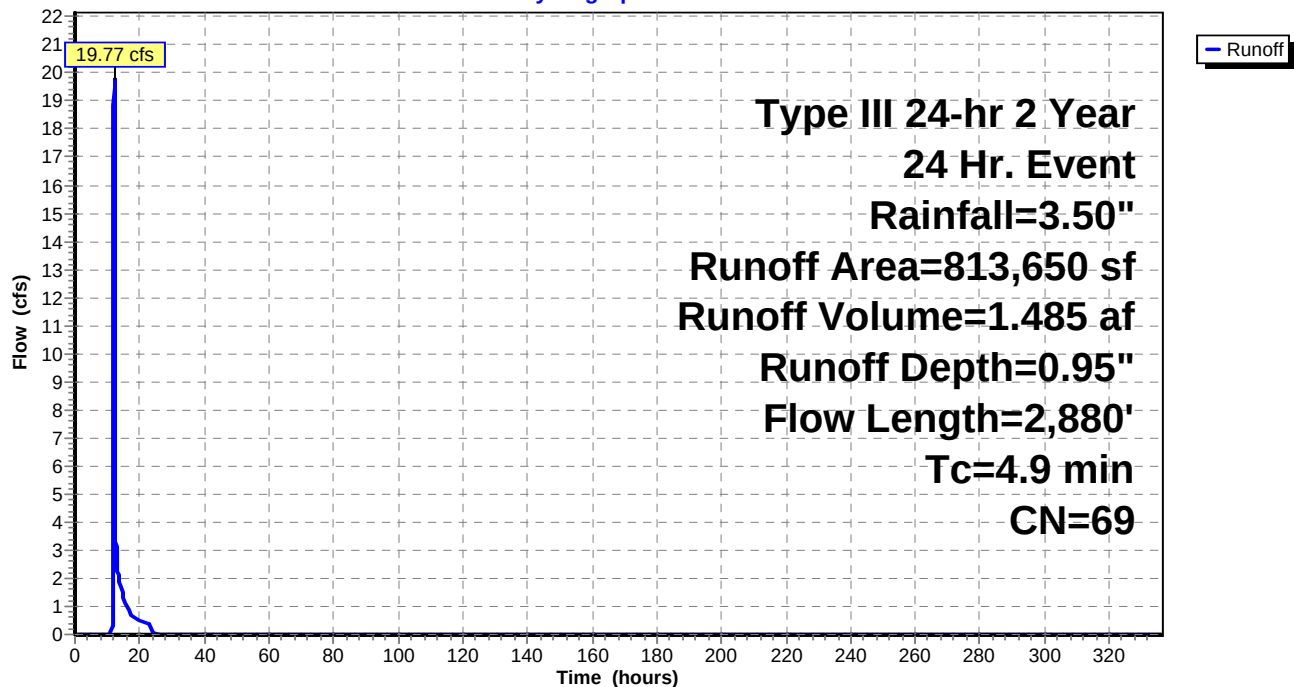
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 193,368	98	Roofs & Roads, HSG B
155,914	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
620,282		76.23% Pervious Area
193,368		23.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment PROP DP 3: PROP DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment PROP DP 3: PROP DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	0.95	0.00
5.00	0.20	0.00	0.00	265.00	3.50	0.95	0.00
10.00	0.66	0.00	0.00	270.00	3.50	0.95	0.00
15.00	2.99	0.66	1.35	275.00	3.50	0.95	0.00
20.00	3.35	0.87	0.50	280.00	3.50	0.95	0.00
25.00	3.50	0.95	0.00	285.00	3.50	0.95	0.00
30.00	3.50	0.95	0.00	290.00	3.50	0.95	0.00
35.00	3.50	0.95	0.00	295.00	3.50	0.95	0.00
40.00	3.50	0.95	0.00	300.00	3.50	0.95	0.00
45.00	3.50	0.95	0.00	305.00	3.50	0.95	0.00
50.00	3.50	0.95	0.00	310.00	3.50	0.95	0.00
55.00	3.50	0.95	0.00	315.00	3.50	0.95	0.00
60.00	3.50	0.95	0.00	320.00	3.50	0.95	0.00
65.00	3.50	0.95	0.00	325.00	3.50	0.95	0.00
70.00	3.50	0.95	0.00	330.00	3.50	0.95	0.00
75.00	3.50	0.95	0.00	335.00	3.50	0.95	0.00
80.00	3.50	0.95	0.00				
85.00	3.50	0.95	0.00				
90.00	3.50	0.95	0.00				
95.00	3.50	0.95	0.00				
100.00	3.50	0.95	0.00				
105.00	3.50	0.95	0.00				
110.00	3.50	0.95	0.00				
115.00	3.50	0.95	0.00				
120.00	3.50	0.95	0.00				
125.00	3.50	0.95	0.00				
130.00	3.50	0.95	0.00				
135.00	3.50	0.95	0.00				
140.00	3.50	0.95	0.00				
145.00	3.50	0.95	0.00				
150.00	3.50	0.95	0.00				
155.00	3.50	0.95	0.00				
160.00	3.50	0.95	0.00				
165.00	3.50	0.95	0.00				
170.00	3.50	0.95	0.00				
175.00	3.50	0.95	0.00				
180.00	3.50	0.95	0.00				
185.00	3.50	0.95	0.00				
190.00	3.50	0.95	0.00				
195.00	3.50	0.95	0.00				
200.00	3.50	0.95	0.00				
205.00	3.50	0.95	0.00				
210.00	3.50	0.95	0.00				
215.00	3.50	0.95	0.00				
220.00	3.50	0.95	0.00				
225.00	3.50	0.95	0.00				
230.00	3.50	0.95	0.00				
235.00	3.50	0.95	0.00				
240.00	3.50	0.95	0.00				
245.00	3.50	0.95	0.00				
250.00	3.50	0.95	0.00				
255.00	3.50	0.95	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment EX DP 3: EX DP 3

Runoff = 52.35 cfs @ 12.08 hrs, Volume= 3.624 af, Depth= 2.33"

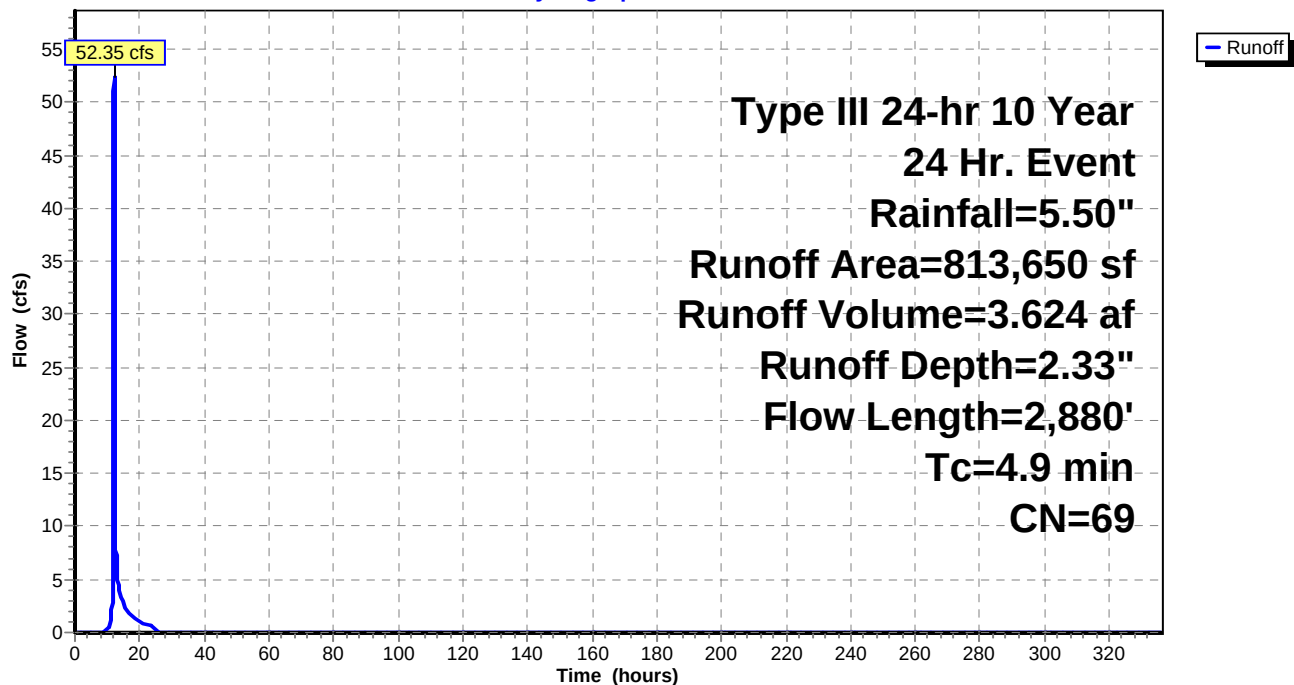
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 187,492	98	Roofs & Roads, HSG B
161,790	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
626,158		76.96% Pervious Area
187,492		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment EX DP 3: EX DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX DP 3: EX DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.33	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.33	0.00
10.00	1.04	0.00	0.26	270.00	5.50	2.33	0.00
15.00	4.70	1.74	2.80	275.00	5.50	2.33	0.00
20.00	5.26	2.15	1.01	280.00	5.50	2.33	0.00
25.00	5.50	2.33	0.00	285.00	5.50	2.33	0.00
30.00	5.50	2.33	0.00	290.00	5.50	2.33	0.00
35.00	5.50	2.33	0.00	295.00	5.50	2.33	0.00
40.00	5.50	2.33	0.00	300.00	5.50	2.33	0.00
45.00	5.50	2.33	0.00	305.00	5.50	2.33	0.00
50.00	5.50	2.33	0.00	310.00	5.50	2.33	0.00
55.00	5.50	2.33	0.00	315.00	5.50	2.33	0.00
60.00	5.50	2.33	0.00	320.00	5.50	2.33	0.00
65.00	5.50	2.33	0.00	325.00	5.50	2.33	0.00
70.00	5.50	2.33	0.00	330.00	5.50	2.33	0.00
75.00	5.50	2.33	0.00	335.00	5.50	2.33	0.00
80.00	5.50	2.33	0.00				
85.00	5.50	2.33	0.00				
90.00	5.50	2.33	0.00				
95.00	5.50	2.33	0.00				
100.00	5.50	2.33	0.00				
105.00	5.50	2.33	0.00				
110.00	5.50	2.33	0.00				
115.00	5.50	2.33	0.00				
120.00	5.50	2.33	0.00				
125.00	5.50	2.33	0.00				
130.00	5.50	2.33	0.00				
135.00	5.50	2.33	0.00				
140.00	5.50	2.33	0.00				
145.00	5.50	2.33	0.00				
150.00	5.50	2.33	0.00				
155.00	5.50	2.33	0.00				
160.00	5.50	2.33	0.00				
165.00	5.50	2.33	0.00				
170.00	5.50	2.33	0.00				
175.00	5.50	2.33	0.00				
180.00	5.50	2.33	0.00				
185.00	5.50	2.33	0.00				
190.00	5.50	2.33	0.00				
195.00	5.50	2.33	0.00				
200.00	5.50	2.33	0.00				
205.00	5.50	2.33	0.00				
210.00	5.50	2.33	0.00				
215.00	5.50	2.33	0.00				
220.00	5.50	2.33	0.00				
225.00	5.50	2.33	0.00				
230.00	5.50	2.33	0.00				
235.00	5.50	2.33	0.00				
240.00	5.50	2.33	0.00				
245.00	5.50	2.33	0.00				
250.00	5.50	2.33	0.00				
255.00	5.50	2.33	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment PROP DP 3: PROP DP 3

Runoff = 52.35 cfs @ 12.08 hrs, Volume= 3.624 af, Depth= 2.33"

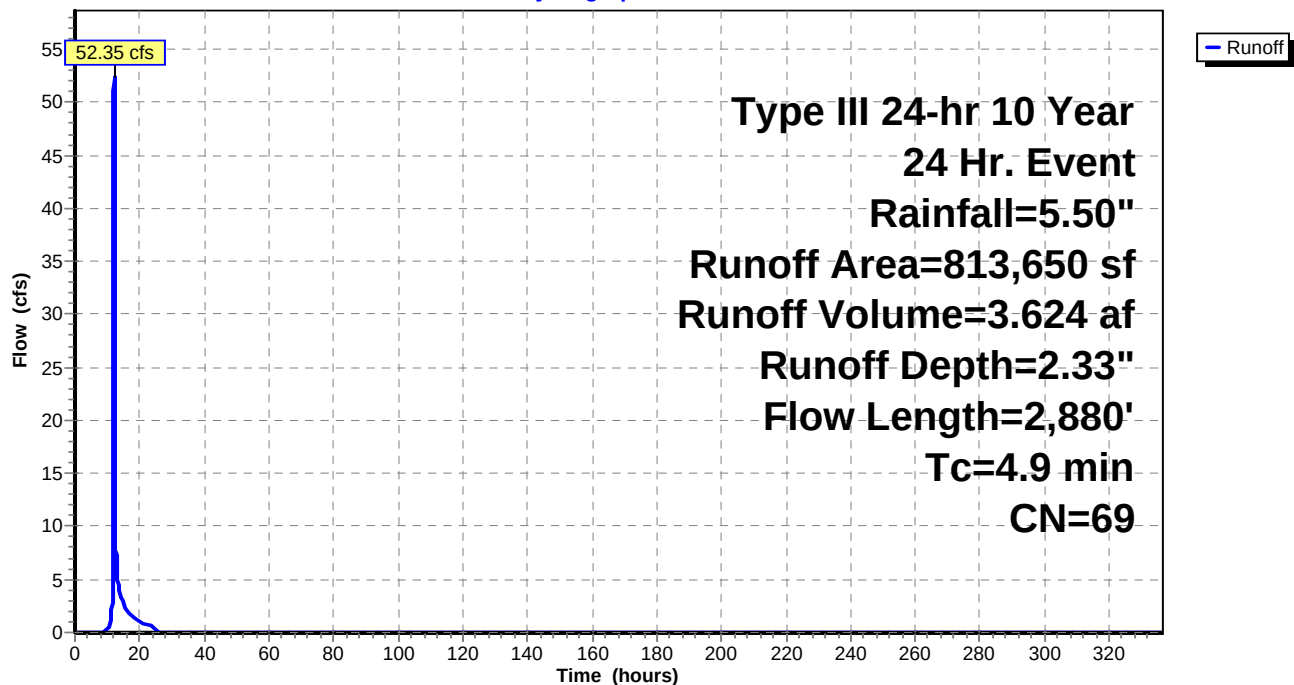
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 193,368	98	Roofs & Roads, HSG B
155,914	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
620,282		76.23% Pervious Area
193,368		23.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment PROP DP 3: PROP DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment PROP DP 3: PROP DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	2.33	0.00
5.00	0.31	0.00	0.00	265.00	5.50	2.33	0.00
10.00	1.04	0.00	0.26	270.00	5.50	2.33	0.00
15.00	4.70	1.74	2.80	275.00	5.50	2.33	0.00
20.00	5.26	2.15	1.01	280.00	5.50	2.33	0.00
25.00	5.50	2.33	0.00	285.00	5.50	2.33	0.00
30.00	5.50	2.33	0.00	290.00	5.50	2.33	0.00
35.00	5.50	2.33	0.00	295.00	5.50	2.33	0.00
40.00	5.50	2.33	0.00	300.00	5.50	2.33	0.00
45.00	5.50	2.33	0.00	305.00	5.50	2.33	0.00
50.00	5.50	2.33	0.00	310.00	5.50	2.33	0.00
55.00	5.50	2.33	0.00	315.00	5.50	2.33	0.00
60.00	5.50	2.33	0.00	320.00	5.50	2.33	0.00
65.00	5.50	2.33	0.00	325.00	5.50	2.33	0.00
70.00	5.50	2.33	0.00	330.00	5.50	2.33	0.00
75.00	5.50	2.33	0.00	335.00	5.50	2.33	0.00
80.00	5.50	2.33	0.00				
85.00	5.50	2.33	0.00				
90.00	5.50	2.33	0.00				
95.00	5.50	2.33	0.00				
100.00	5.50	2.33	0.00				
105.00	5.50	2.33	0.00				
110.00	5.50	2.33	0.00				
115.00	5.50	2.33	0.00				
120.00	5.50	2.33	0.00				
125.00	5.50	2.33	0.00				
130.00	5.50	2.33	0.00				
135.00	5.50	2.33	0.00				
140.00	5.50	2.33	0.00				
145.00	5.50	2.33	0.00				
150.00	5.50	2.33	0.00				
155.00	5.50	2.33	0.00				
160.00	5.50	2.33	0.00				
165.00	5.50	2.33	0.00				
170.00	5.50	2.33	0.00				
175.00	5.50	2.33	0.00				
180.00	5.50	2.33	0.00				
185.00	5.50	2.33	0.00				
190.00	5.50	2.33	0.00				
195.00	5.50	2.33	0.00				
200.00	5.50	2.33	0.00				
205.00	5.50	2.33	0.00				
210.00	5.50	2.33	0.00				
215.00	5.50	2.33	0.00				
220.00	5.50	2.33	0.00				
225.00	5.50	2.33	0.00				
230.00	5.50	2.33	0.00				
235.00	5.50	2.33	0.00				
240.00	5.50	2.33	0.00				
245.00	5.50	2.33	0.00				
250.00	5.50	2.33	0.00				
255.00	5.50	2.33	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment EX DP 3: EX DP 3

Runoff = 61.34 cfs @ 12.08 hrs, Volume= 4.222 af, Depth= 2.71"

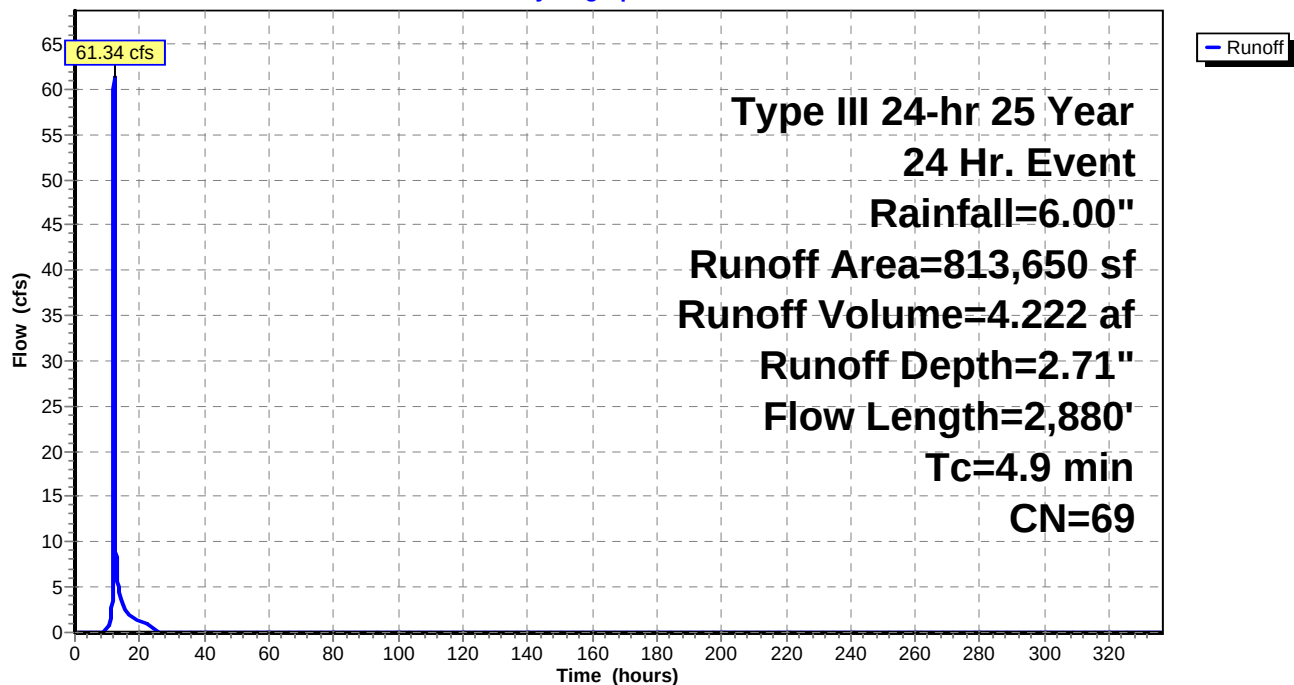
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 187,492	98	Roofs & Roads, HSG B
161,790	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
626,158		76.96% Pervious Area
187,492		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment EX DP 3: EX DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX DP 3: EX DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.71	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.71	0.00
10.00	1.13	0.01	0.48	270.00	6.00	2.71	0.00
15.00	5.13	2.05	3.18	275.00	6.00	2.71	0.00
20.00	5.74	2.51	1.14	280.00	6.00	2.71	0.00
25.00	6.00	2.71	0.00	285.00	6.00	2.71	0.00
30.00	6.00	2.71	0.00	290.00	6.00	2.71	0.00
35.00	6.00	2.71	0.00	295.00	6.00	2.71	0.00
40.00	6.00	2.71	0.00	300.00	6.00	2.71	0.00
45.00	6.00	2.71	0.00	305.00	6.00	2.71	0.00
50.00	6.00	2.71	0.00	310.00	6.00	2.71	0.00
55.00	6.00	2.71	0.00	315.00	6.00	2.71	0.00
60.00	6.00	2.71	0.00	320.00	6.00	2.71	0.00
65.00	6.00	2.71	0.00	325.00	6.00	2.71	0.00
70.00	6.00	2.71	0.00	330.00	6.00	2.71	0.00
75.00	6.00	2.71	0.00	335.00	6.00	2.71	0.00
80.00	6.00	2.71	0.00				
85.00	6.00	2.71	0.00				
90.00	6.00	2.71	0.00				
95.00	6.00	2.71	0.00				
100.00	6.00	2.71	0.00				
105.00	6.00	2.71	0.00				
110.00	6.00	2.71	0.00				
115.00	6.00	2.71	0.00				
120.00	6.00	2.71	0.00				
125.00	6.00	2.71	0.00				
130.00	6.00	2.71	0.00				
135.00	6.00	2.71	0.00				
140.00	6.00	2.71	0.00				
145.00	6.00	2.71	0.00				
150.00	6.00	2.71	0.00				
155.00	6.00	2.71	0.00				
160.00	6.00	2.71	0.00				
165.00	6.00	2.71	0.00				
170.00	6.00	2.71	0.00				
175.00	6.00	2.71	0.00				
180.00	6.00	2.71	0.00				
185.00	6.00	2.71	0.00				
190.00	6.00	2.71	0.00				
195.00	6.00	2.71	0.00				
200.00	6.00	2.71	0.00				
205.00	6.00	2.71	0.00				
210.00	6.00	2.71	0.00				
215.00	6.00	2.71	0.00				
220.00	6.00	2.71	0.00				
225.00	6.00	2.71	0.00				
230.00	6.00	2.71	0.00				
235.00	6.00	2.71	0.00				
240.00	6.00	2.71	0.00				
245.00	6.00	2.71	0.00				
250.00	6.00	2.71	0.00				
255.00	6.00	2.71	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment PROP DP 3: PROP DP 3

Runoff = 61.34 cfs @ 12.08 hrs, Volume= 4.222 af, Depth= 2.71"

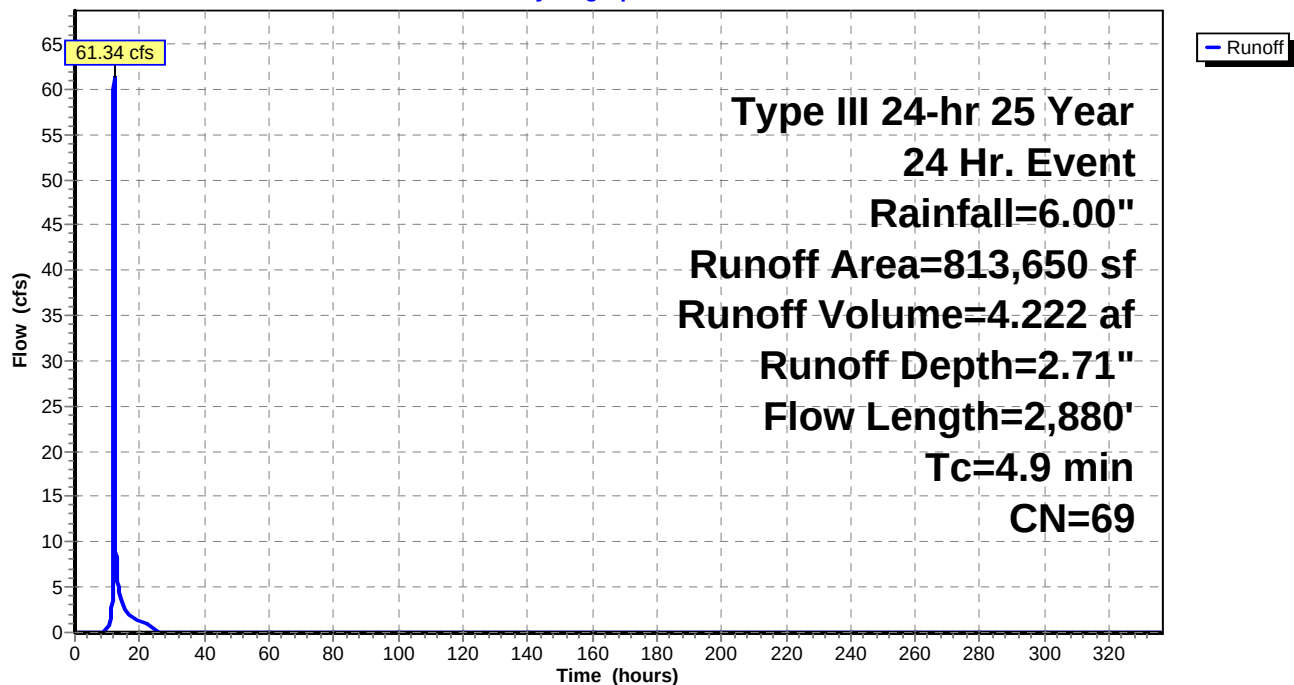
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 193,368	98	Roofs & Roads, HSG B
155,914	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
620,282		76.23% Pervious Area
193,368		23.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment PROP DP 3: PROP DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

Prepared by AKRF Engineering, PC

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Hydrograph for Subcatchment PROP DP 3: PROP DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	2.71	0.00
5.00	0.34	0.00	0.00	265.00	6.00	2.71	0.00
10.00	1.13	0.01	0.48	270.00	6.00	2.71	0.00
15.00	5.13	2.05	3.18	275.00	6.00	2.71	0.00
20.00	5.74	2.51	1.14	280.00	6.00	2.71	0.00
25.00	6.00	2.71	0.00	285.00	6.00	2.71	0.00
30.00	6.00	2.71	0.00	290.00	6.00	2.71	0.00
35.00	6.00	2.71	0.00	295.00	6.00	2.71	0.00
40.00	6.00	2.71	0.00	300.00	6.00	2.71	0.00
45.00	6.00	2.71	0.00	305.00	6.00	2.71	0.00
50.00	6.00	2.71	0.00	310.00	6.00	2.71	0.00
55.00	6.00	2.71	0.00	315.00	6.00	2.71	0.00
60.00	6.00	2.71	0.00	320.00	6.00	2.71	0.00
65.00	6.00	2.71	0.00	325.00	6.00	2.71	0.00
70.00	6.00	2.71	0.00	330.00	6.00	2.71	0.00
75.00	6.00	2.71	0.00	335.00	6.00	2.71	0.00
80.00	6.00	2.71	0.00				
85.00	6.00	2.71	0.00				
90.00	6.00	2.71	0.00				
95.00	6.00	2.71	0.00				
100.00	6.00	2.71	0.00				
105.00	6.00	2.71	0.00				
110.00	6.00	2.71	0.00				
115.00	6.00	2.71	0.00				
120.00	6.00	2.71	0.00				
125.00	6.00	2.71	0.00				
130.00	6.00	2.71	0.00				
135.00	6.00	2.71	0.00				
140.00	6.00	2.71	0.00				
145.00	6.00	2.71	0.00				
150.00	6.00	2.71	0.00				
155.00	6.00	2.71	0.00				
160.00	6.00	2.71	0.00				
165.00	6.00	2.71	0.00				
170.00	6.00	2.71	0.00				
175.00	6.00	2.71	0.00				
180.00	6.00	2.71	0.00				
185.00	6.00	2.71	0.00				
190.00	6.00	2.71	0.00				
195.00	6.00	2.71	0.00				
200.00	6.00	2.71	0.00				
205.00	6.00	2.71	0.00				
210.00	6.00	2.71	0.00				
215.00	6.00	2.71	0.00				
220.00	6.00	2.71	0.00				
225.00	6.00	2.71	0.00				
230.00	6.00	2.71	0.00				
235.00	6.00	2.71	0.00				
240.00	6.00	2.71	0.00				
245.00	6.00	2.71	0.00				
250.00	6.00	2.71	0.00				
255.00	6.00	2.71	0.00				

Summary for Subcatchment EX DP 3: EX DP 3

Runoff = 128.63 cfs @ 12.07 hrs, Volume= 8.795 af, Depth= 5.65"

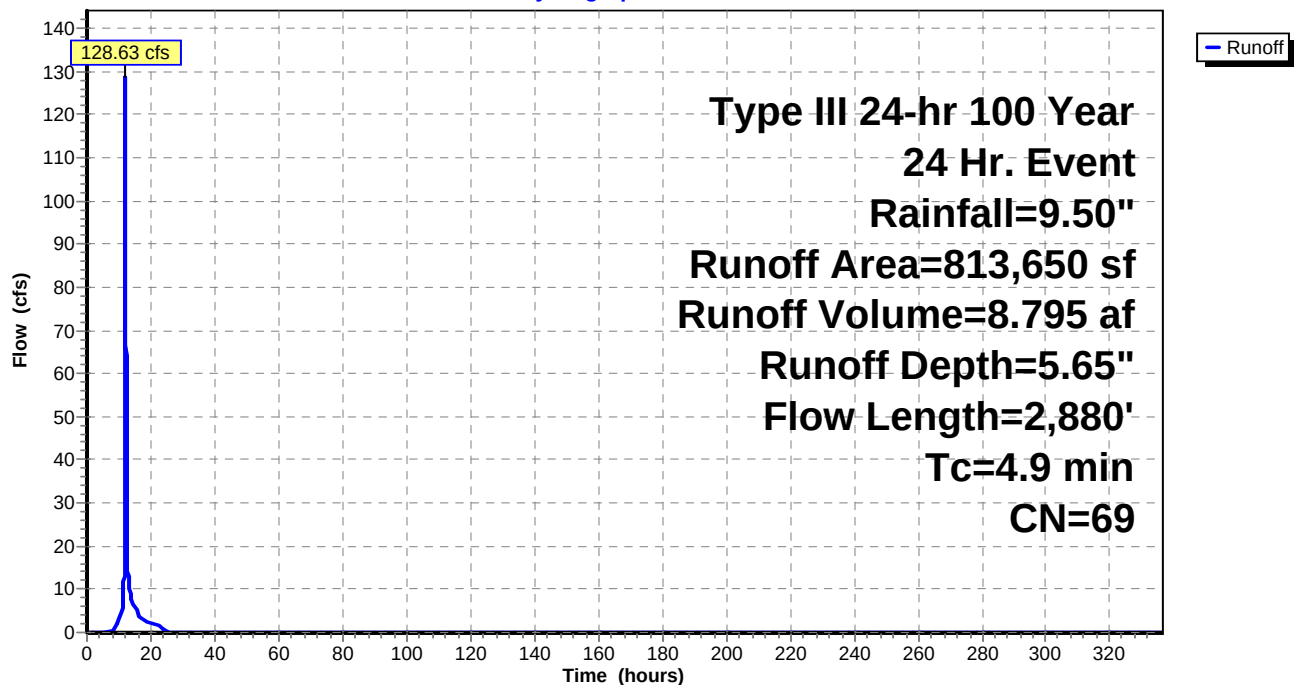
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 187,492	98	Roofs & Roads, HSG B
161,790	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
626,158		76.96% Pervious Area
187,492		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment EX DP 3: EX DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX DP 3: EX DP 3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	5.65	0.00
5.00	0.54	0.00	0.00	265.00	9.50	5.65	0.00
10.00	1.80	0.15	2.55	270.00	9.50	5.65	0.00
15.00	8.12	4.45	5.85	275.00	9.50	5.65	0.00
20.00	9.09	5.29	2.05	280.00	9.50	5.65	0.00
25.00	9.50	5.65	0.00	285.00	9.50	5.65	0.00
30.00	9.50	5.65	0.00	290.00	9.50	5.65	0.00
35.00	9.50	5.65	0.00	295.00	9.50	5.65	0.00
40.00	9.50	5.65	0.00	300.00	9.50	5.65	0.00
45.00	9.50	5.65	0.00	305.00	9.50	5.65	0.00
50.00	9.50	5.65	0.00	310.00	9.50	5.65	0.00
55.00	9.50	5.65	0.00	315.00	9.50	5.65	0.00
60.00	9.50	5.65	0.00	320.00	9.50	5.65	0.00
65.00	9.50	5.65	0.00	325.00	9.50	5.65	0.00
70.00	9.50	5.65	0.00	330.00	9.50	5.65	0.00
75.00	9.50	5.65	0.00	335.00	9.50	5.65	0.00
80.00	9.50	5.65	0.00				
85.00	9.50	5.65	0.00				
90.00	9.50	5.65	0.00				
95.00	9.50	5.65	0.00				
100.00	9.50	5.65	0.00				
105.00	9.50	5.65	0.00				
110.00	9.50	5.65	0.00				
115.00	9.50	5.65	0.00				
120.00	9.50	5.65	0.00				
125.00	9.50	5.65	0.00				
130.00	9.50	5.65	0.00				
135.00	9.50	5.65	0.00				
140.00	9.50	5.65	0.00				
145.00	9.50	5.65	0.00				
150.00	9.50	5.65	0.00				
155.00	9.50	5.65	0.00				
160.00	9.50	5.65	0.00				
165.00	9.50	5.65	0.00				
170.00	9.50	5.65	0.00				
175.00	9.50	5.65	0.00				
180.00	9.50	5.65	0.00				
185.00	9.50	5.65	0.00				
190.00	9.50	5.65	0.00				
195.00	9.50	5.65	0.00				
200.00	9.50	5.65	0.00				
205.00	9.50	5.65	0.00				
210.00	9.50	5.65	0.00				
215.00	9.50	5.65	0.00				
220.00	9.50	5.65	0.00				
225.00	9.50	5.65	0.00				
230.00	9.50	5.65	0.00				
235.00	9.50	5.65	0.00				
240.00	9.50	5.65	0.00				
245.00	9.50	5.65	0.00				
250.00	9.50	5.65	0.00				
255.00	9.50	5.65	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment PROP DP 3: PROP DP 3

Runoff = 128.63 cfs @ 12.07 hrs, Volume= 8.795 af, Depth= 5.65"

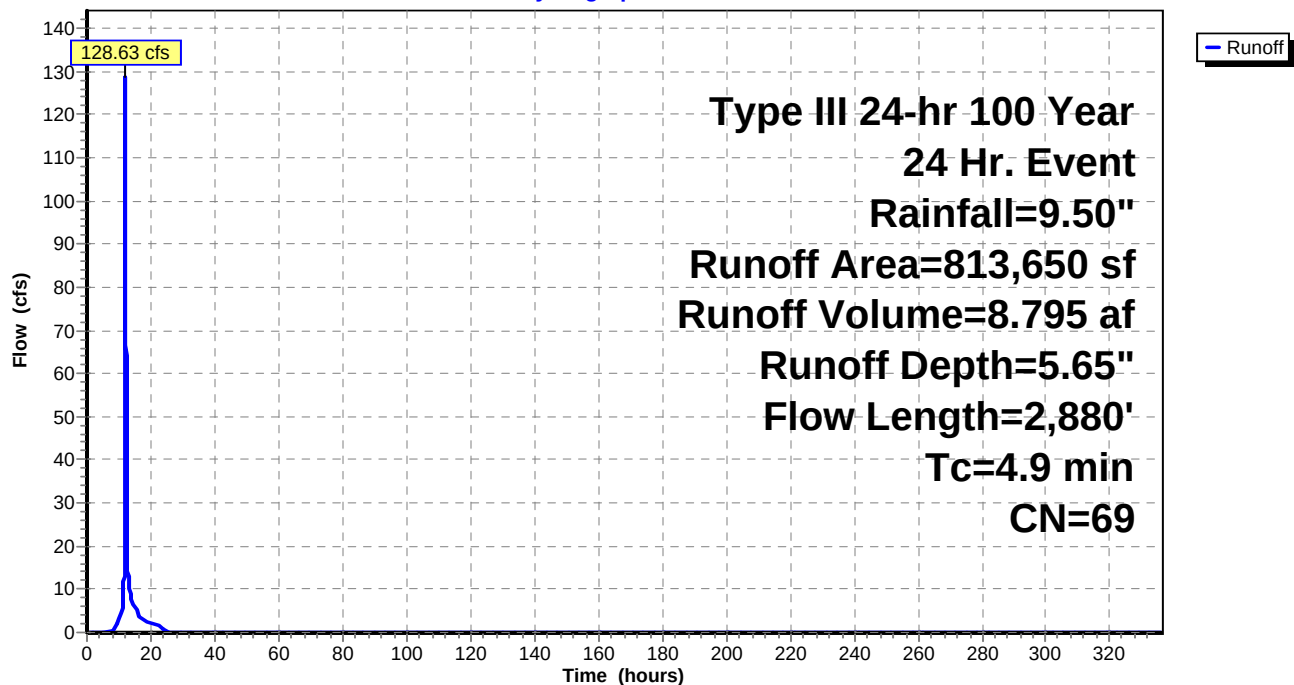
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
464,368	55	Woods, Good, HSG B
* 193,368	98	Roofs & Roads, HSG B
155,914	74	>75% Grass cover, Good, HSG C
813,650	69	Weighted Average
620,282		76.23% Pervious Area
193,368		23.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	1,354	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.4	1,526	0.0680	18.78	58.99	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.9	2,880	Total			

Subcatchment PROP DP 3: PROP DP 3

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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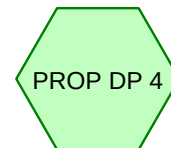
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Hydrograph for Subcatchment PROP DP 3: PROP DP 3

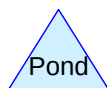
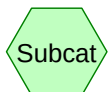
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	5.65	0.00
5.00	0.54	0.00	0.00	265.00	9.50	5.65	0.00
10.00	1.80	0.15	2.55	270.00	9.50	5.65	0.00
15.00	8.12	4.45	5.85	275.00	9.50	5.65	0.00
20.00	9.09	5.29	2.05	280.00	9.50	5.65	0.00
25.00	9.50	5.65	0.00	285.00	9.50	5.65	0.00
30.00	9.50	5.65	0.00	290.00	9.50	5.65	0.00
35.00	9.50	5.65	0.00	295.00	9.50	5.65	0.00
40.00	9.50	5.65	0.00	300.00	9.50	5.65	0.00
45.00	9.50	5.65	0.00	305.00	9.50	5.65	0.00
50.00	9.50	5.65	0.00	310.00	9.50	5.65	0.00
55.00	9.50	5.65	0.00	315.00	9.50	5.65	0.00
60.00	9.50	5.65	0.00	320.00	9.50	5.65	0.00
65.00	9.50	5.65	0.00	325.00	9.50	5.65	0.00
70.00	9.50	5.65	0.00	330.00	9.50	5.65	0.00
75.00	9.50	5.65	0.00	335.00	9.50	5.65	0.00
80.00	9.50	5.65	0.00				
85.00	9.50	5.65	0.00				
90.00	9.50	5.65	0.00				
95.00	9.50	5.65	0.00				
100.00	9.50	5.65	0.00				
105.00	9.50	5.65	0.00				
110.00	9.50	5.65	0.00				
115.00	9.50	5.65	0.00				
120.00	9.50	5.65	0.00				
125.00	9.50	5.65	0.00				
130.00	9.50	5.65	0.00				
135.00	9.50	5.65	0.00				
140.00	9.50	5.65	0.00				
145.00	9.50	5.65	0.00				
150.00	9.50	5.65	0.00				
155.00	9.50	5.65	0.00				
160.00	9.50	5.65	0.00				
165.00	9.50	5.65	0.00				
170.00	9.50	5.65	0.00				
175.00	9.50	5.65	0.00				
180.00	9.50	5.65	0.00				
185.00	9.50	5.65	0.00				
190.00	9.50	5.65	0.00				
195.00	9.50	5.65	0.00				
200.00	9.50	5.65	0.00				
205.00	9.50	5.65	0.00				
210.00	9.50	5.65	0.00				
215.00	9.50	5.65	0.00				
220.00	9.50	5.65	0.00				
225.00	9.50	5.65	0.00				
230.00	9.50	5.65	0.00				
235.00	9.50	5.65	0.00				
240.00	9.50	5.65	0.00				
245.00	9.50	5.65	0.00				
250.00	9.50	5.65	0.00				
255.00	9.50	5.65	0.00				



EX DP 4



PROP DP 4



Summary for Subcatchment EX DP 4: EX DP 4

Runoff = 2.09 cfs @ 12.11 hrs, Volume= 0.159 af, Depth= 1.75"

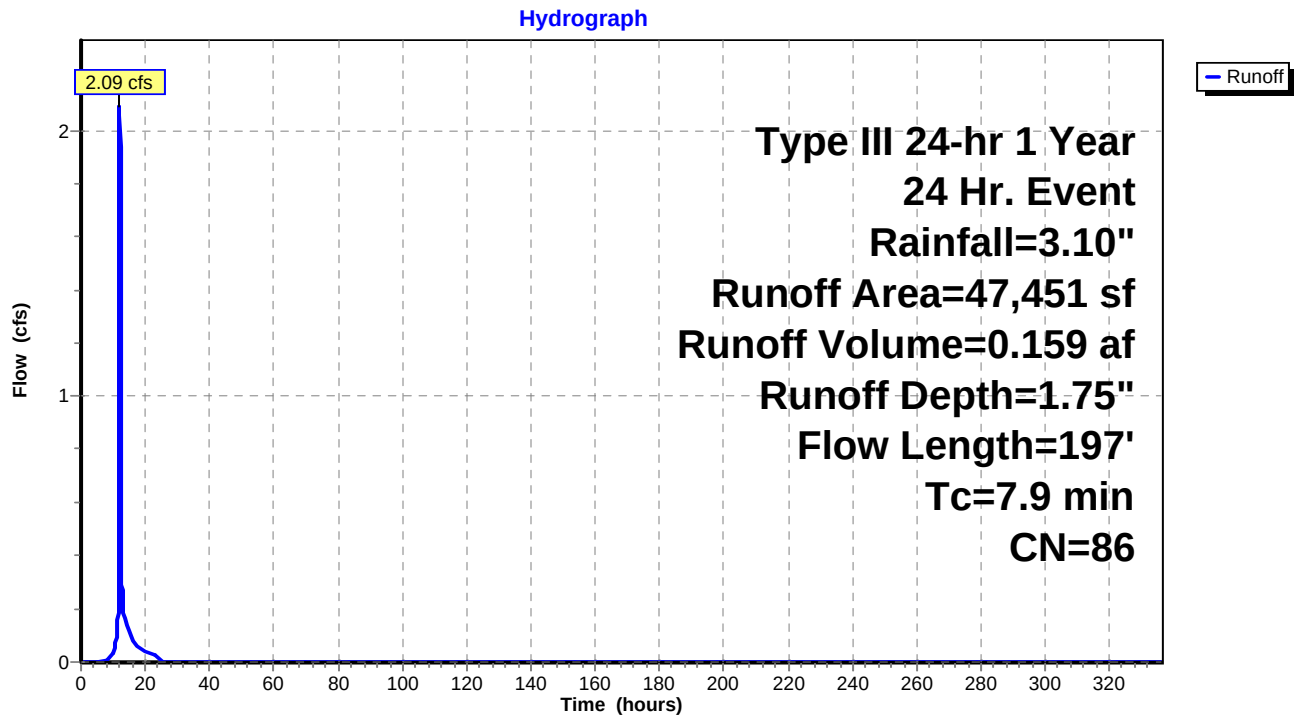
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
23,470	74	>75% Grass cover, Good, HSG C
47,451	86	Weighted Average
23,470		49.46% Pervious Area
23,981		50.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	50	0.1200	24.94	78.37	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
7.9	197	Total			

Subcatchment EX DP 4: EX DP 4



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX DP 4: EX DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.75	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.75	0.00
10.00	0.59	0.04	0.04	270.00	3.10	1.75	0.00
15.00	2.65	1.37	0.11	275.00	3.10	1.75	0.00
20.00	2.97	1.63	0.04	280.00	3.10	1.75	0.00
25.00	3.10	1.75	0.00	285.00	3.10	1.75	0.00
30.00	3.10	1.75	0.00	290.00	3.10	1.75	0.00
35.00	3.10	1.75	0.00	295.00	3.10	1.75	0.00
40.00	3.10	1.75	0.00	300.00	3.10	1.75	0.00
45.00	3.10	1.75	0.00	305.00	3.10	1.75	0.00
50.00	3.10	1.75	0.00	310.00	3.10	1.75	0.00
55.00	3.10	1.75	0.00	315.00	3.10	1.75	0.00
60.00	3.10	1.75	0.00	320.00	3.10	1.75	0.00
65.00	3.10	1.75	0.00	325.00	3.10	1.75	0.00
70.00	3.10	1.75	0.00	330.00	3.10	1.75	0.00
75.00	3.10	1.75	0.00	335.00	3.10	1.75	0.00
80.00	3.10	1.75	0.00				
85.00	3.10	1.75	0.00				
90.00	3.10	1.75	0.00				
95.00	3.10	1.75	0.00				
100.00	3.10	1.75	0.00				
105.00	3.10	1.75	0.00				
110.00	3.10	1.75	0.00				
115.00	3.10	1.75	0.00				
120.00	3.10	1.75	0.00				
125.00	3.10	1.75	0.00				
130.00	3.10	1.75	0.00				
135.00	3.10	1.75	0.00				
140.00	3.10	1.75	0.00				
145.00	3.10	1.75	0.00				
150.00	3.10	1.75	0.00				
155.00	3.10	1.75	0.00				
160.00	3.10	1.75	0.00				
165.00	3.10	1.75	0.00				
170.00	3.10	1.75	0.00				
175.00	3.10	1.75	0.00				
180.00	3.10	1.75	0.00				
185.00	3.10	1.75	0.00				
190.00	3.10	1.75	0.00				
195.00	3.10	1.75	0.00				
200.00	3.10	1.75	0.00				
205.00	3.10	1.75	0.00				
210.00	3.10	1.75	0.00				
215.00	3.10	1.75	0.00				
220.00	3.10	1.75	0.00				
225.00	3.10	1.75	0.00				
230.00	3.10	1.75	0.00				
235.00	3.10	1.75	0.00				
240.00	3.10	1.75	0.00				
245.00	3.10	1.75	0.00				
250.00	3.10	1.75	0.00				
255.00	3.10	1.75	0.00				

Summary for Subcatchment PROP DP 4: PROP DP 4

Runoff = 1.97 cfs @ 12.11 hrs, Volume= 0.150 af, Depth= 1.91"

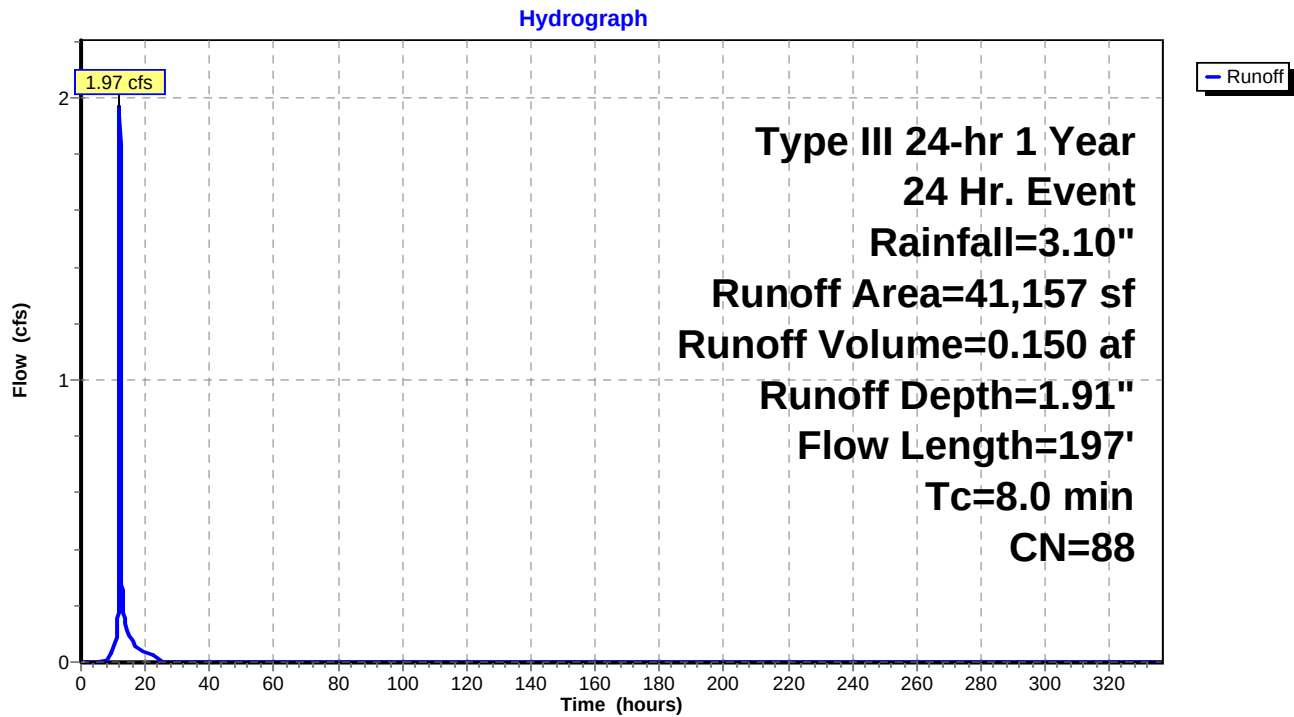
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
17,176	74	>75% Grass cover, Good, HSG C
41,157	88	Weighted Average
17,176		41.73% Pervious Area
23,981		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	50	0.0120	7.89	24.78	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
8.0	197	Total			

Subcatchment PROP DP 4: PROP DP 4



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment PROP DP 4: PROP DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.91	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.91	0.00
10.00	0.59	0.06	0.05	270.00	3.10	1.91	0.00
15.00	2.65	1.51	0.10	275.00	3.10	1.91	0.00
20.00	2.97	1.79	0.03	280.00	3.10	1.91	0.00
25.00	3.10	1.91	0.00	285.00	3.10	1.91	0.00
30.00	3.10	1.91	0.00	290.00	3.10	1.91	0.00
35.00	3.10	1.91	0.00	295.00	3.10	1.91	0.00
40.00	3.10	1.91	0.00	300.00	3.10	1.91	0.00
45.00	3.10	1.91	0.00	305.00	3.10	1.91	0.00
50.00	3.10	1.91	0.00	310.00	3.10	1.91	0.00
55.00	3.10	1.91	0.00	315.00	3.10	1.91	0.00
60.00	3.10	1.91	0.00	320.00	3.10	1.91	0.00
65.00	3.10	1.91	0.00	325.00	3.10	1.91	0.00
70.00	3.10	1.91	0.00	330.00	3.10	1.91	0.00
75.00	3.10	1.91	0.00	335.00	3.10	1.91	0.00
80.00	3.10	1.91	0.00				
85.00	3.10	1.91	0.00				
90.00	3.10	1.91	0.00				
95.00	3.10	1.91	0.00				
100.00	3.10	1.91	0.00				
105.00	3.10	1.91	0.00				
110.00	3.10	1.91	0.00				
115.00	3.10	1.91	0.00				
120.00	3.10	1.91	0.00				
125.00	3.10	1.91	0.00				
130.00	3.10	1.91	0.00				
135.00	3.10	1.91	0.00				
140.00	3.10	1.91	0.00				
145.00	3.10	1.91	0.00				
150.00	3.10	1.91	0.00				
155.00	3.10	1.91	0.00				
160.00	3.10	1.91	0.00				
165.00	3.10	1.91	0.00				
170.00	3.10	1.91	0.00				
175.00	3.10	1.91	0.00				
180.00	3.10	1.91	0.00				
185.00	3.10	1.91	0.00				
190.00	3.10	1.91	0.00				
195.00	3.10	1.91	0.00				
200.00	3.10	1.91	0.00				
205.00	3.10	1.91	0.00				
210.00	3.10	1.91	0.00				
215.00	3.10	1.91	0.00				
220.00	3.10	1.91	0.00				
225.00	3.10	1.91	0.00				
230.00	3.10	1.91	0.00				
235.00	3.10	1.91	0.00				
240.00	3.10	1.91	0.00				
245.00	3.10	1.91	0.00				
250.00	3.10	1.91	0.00				
255.00	3.10	1.91	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX DP 4: EX DP 4

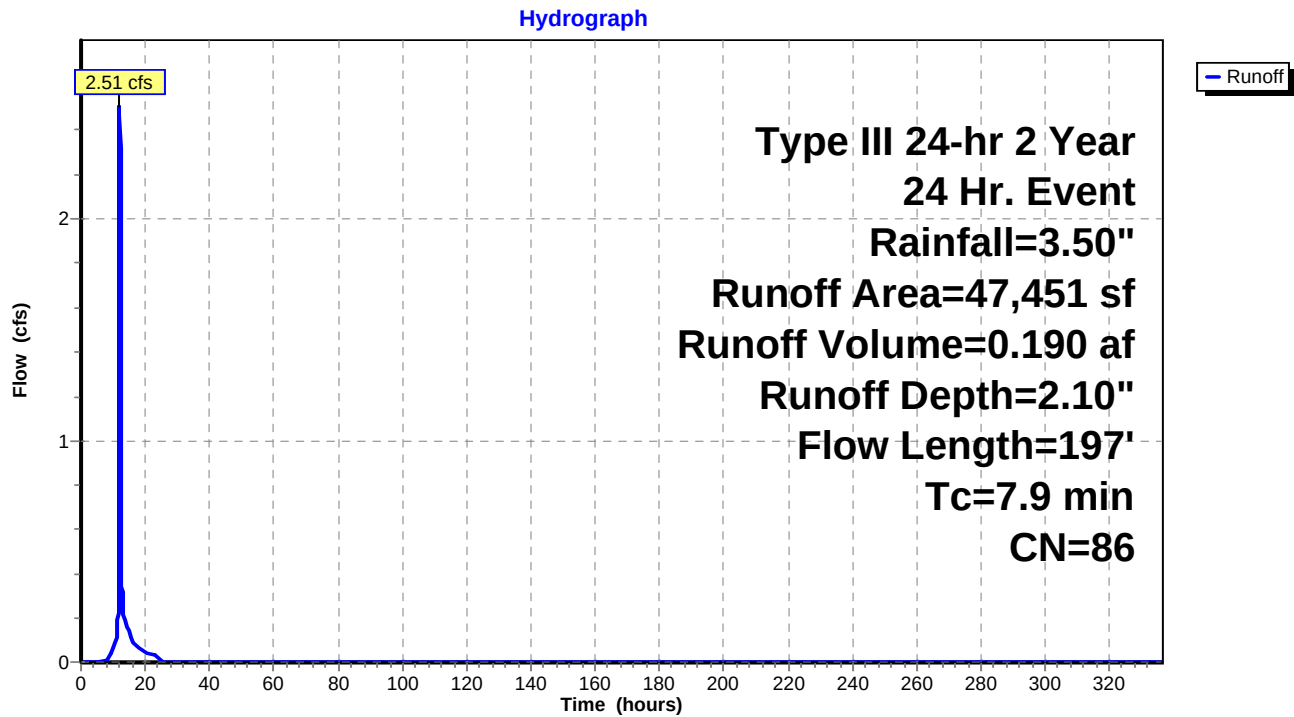
Runoff = 2.51 cfs @ 12.11 hrs, Volume= 0.190 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
23,470	74	>75% Grass cover, Good, HSG C
47,451	86	Weighted Average
23,470		49.46% Pervious Area
23,981		50.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	50	0.1200	24.94	78.37	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
7.9	197	Total			

Subcatchment EX DP 4: EX DP 4



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX DP 4: EX DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.10	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.10	0.00
10.00	0.66	0.06	0.05	270.00	3.50	2.10	0.00
15.00	2.99	1.65	0.13	275.00	3.50	2.10	0.00
20.00	3.35	1.97	0.04	280.00	3.50	2.10	0.00
25.00	3.50	2.10	0.00	285.00	3.50	2.10	0.00
30.00	3.50	2.10	0.00	290.00	3.50	2.10	0.00
35.00	3.50	2.10	0.00	295.00	3.50	2.10	0.00
40.00	3.50	2.10	0.00	300.00	3.50	2.10	0.00
45.00	3.50	2.10	0.00	305.00	3.50	2.10	0.00
50.00	3.50	2.10	0.00	310.00	3.50	2.10	0.00
55.00	3.50	2.10	0.00	315.00	3.50	2.10	0.00
60.00	3.50	2.10	0.00	320.00	3.50	2.10	0.00
65.00	3.50	2.10	0.00	325.00	3.50	2.10	0.00
70.00	3.50	2.10	0.00	330.00	3.50	2.10	0.00
75.00	3.50	2.10	0.00	335.00	3.50	2.10	0.00
80.00	3.50	2.10	0.00				
85.00	3.50	2.10	0.00				
90.00	3.50	2.10	0.00				
95.00	3.50	2.10	0.00				
100.00	3.50	2.10	0.00				
105.00	3.50	2.10	0.00				
110.00	3.50	2.10	0.00				
115.00	3.50	2.10	0.00				
120.00	3.50	2.10	0.00				
125.00	3.50	2.10	0.00				
130.00	3.50	2.10	0.00				
135.00	3.50	2.10	0.00				
140.00	3.50	2.10	0.00				
145.00	3.50	2.10	0.00				
150.00	3.50	2.10	0.00				
155.00	3.50	2.10	0.00				
160.00	3.50	2.10	0.00				
165.00	3.50	2.10	0.00				
170.00	3.50	2.10	0.00				
175.00	3.50	2.10	0.00				
180.00	3.50	2.10	0.00				
185.00	3.50	2.10	0.00				
190.00	3.50	2.10	0.00				
195.00	3.50	2.10	0.00				
200.00	3.50	2.10	0.00				
205.00	3.50	2.10	0.00				
210.00	3.50	2.10	0.00				
215.00	3.50	2.10	0.00				
220.00	3.50	2.10	0.00				
225.00	3.50	2.10	0.00				
230.00	3.50	2.10	0.00				
235.00	3.50	2.10	0.00				
240.00	3.50	2.10	0.00				
245.00	3.50	2.10	0.00				
250.00	3.50	2.10	0.00				
255.00	3.50	2.10	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment PROP DP 4: PROP DP 4

Runoff = 2.33 cfs @ 12.11 hrs, Volume= 0.179 af, Depth= 2.27"

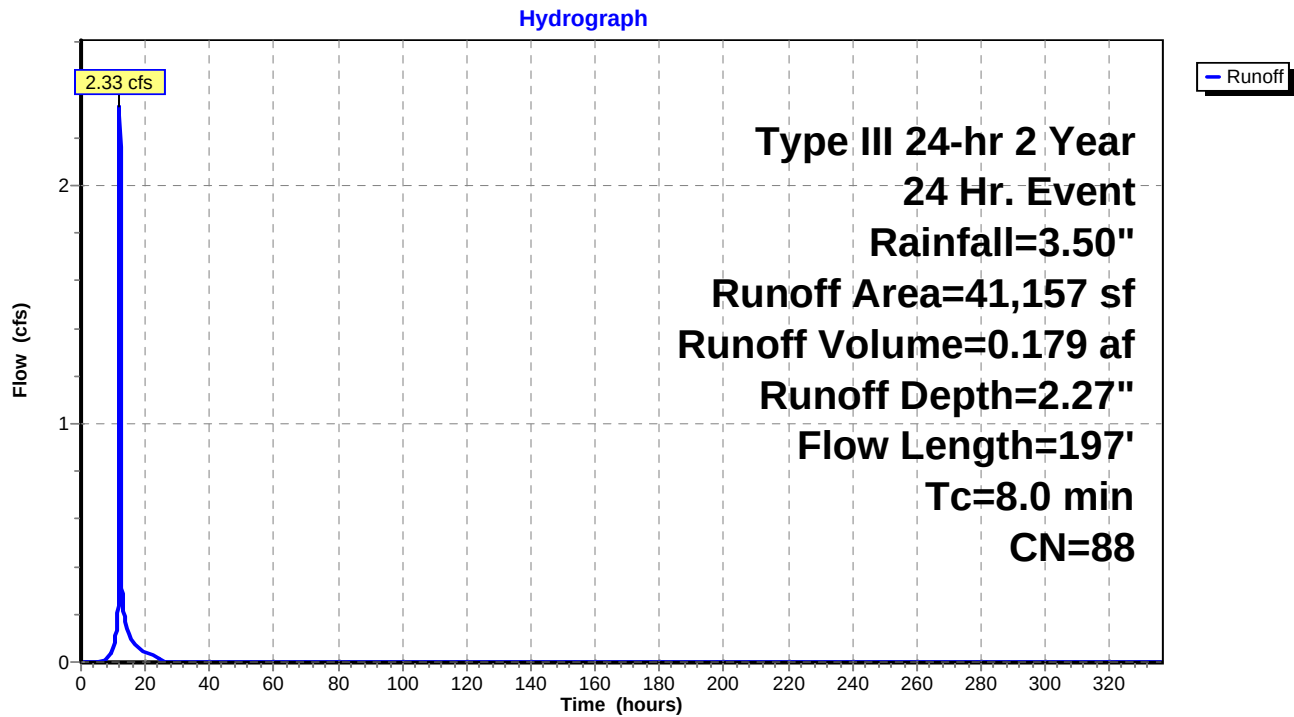
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
17,176	74	>75% Grass cover, Good, HSG C
41,157	88	Weighted Average
17,176		41.73% Pervious Area
23,981		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	50	0.0120	7.89	24.78	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
8.0	197	Total			

Subcatchment PROP DP 4: PROP DP 4



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment PROP DP 4: PROP DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.27	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.27	0.00
10.00	0.66	0.09	0.06	270.00	3.50	2.27	0.00
15.00	2.99	1.81	0.12	275.00	3.50	2.27	0.00
20.00	3.35	2.13	0.04	280.00	3.50	2.27	0.00
25.00	3.50	2.27	0.00	285.00	3.50	2.27	0.00
30.00	3.50	2.27	0.00	290.00	3.50	2.27	0.00
35.00	3.50	2.27	0.00	295.00	3.50	2.27	0.00
40.00	3.50	2.27	0.00	300.00	3.50	2.27	0.00
45.00	3.50	2.27	0.00	305.00	3.50	2.27	0.00
50.00	3.50	2.27	0.00	310.00	3.50	2.27	0.00
55.00	3.50	2.27	0.00	315.00	3.50	2.27	0.00
60.00	3.50	2.27	0.00	320.00	3.50	2.27	0.00
65.00	3.50	2.27	0.00	325.00	3.50	2.27	0.00
70.00	3.50	2.27	0.00	330.00	3.50	2.27	0.00
75.00	3.50	2.27	0.00	335.00	3.50	2.27	0.00
80.00	3.50	2.27	0.00				
85.00	3.50	2.27	0.00				
90.00	3.50	2.27	0.00				
95.00	3.50	2.27	0.00				
100.00	3.50	2.27	0.00				
105.00	3.50	2.27	0.00				
110.00	3.50	2.27	0.00				
115.00	3.50	2.27	0.00				
120.00	3.50	2.27	0.00				
125.00	3.50	2.27	0.00				
130.00	3.50	2.27	0.00				
135.00	3.50	2.27	0.00				
140.00	3.50	2.27	0.00				
145.00	3.50	2.27	0.00				
150.00	3.50	2.27	0.00				
155.00	3.50	2.27	0.00				
160.00	3.50	2.27	0.00				
165.00	3.50	2.27	0.00				
170.00	3.50	2.27	0.00				
175.00	3.50	2.27	0.00				
180.00	3.50	2.27	0.00				
185.00	3.50	2.27	0.00				
190.00	3.50	2.27	0.00				
195.00	3.50	2.27	0.00				
200.00	3.50	2.27	0.00				
205.00	3.50	2.27	0.00				
210.00	3.50	2.27	0.00				
215.00	3.50	2.27	0.00				
220.00	3.50	2.27	0.00				
225.00	3.50	2.27	0.00				
230.00	3.50	2.27	0.00				
235.00	3.50	2.27	0.00				
240.00	3.50	2.27	0.00				
245.00	3.50	2.27	0.00				
250.00	3.50	2.27	0.00				
255.00	3.50	2.27	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX DP 4: EX DP 4

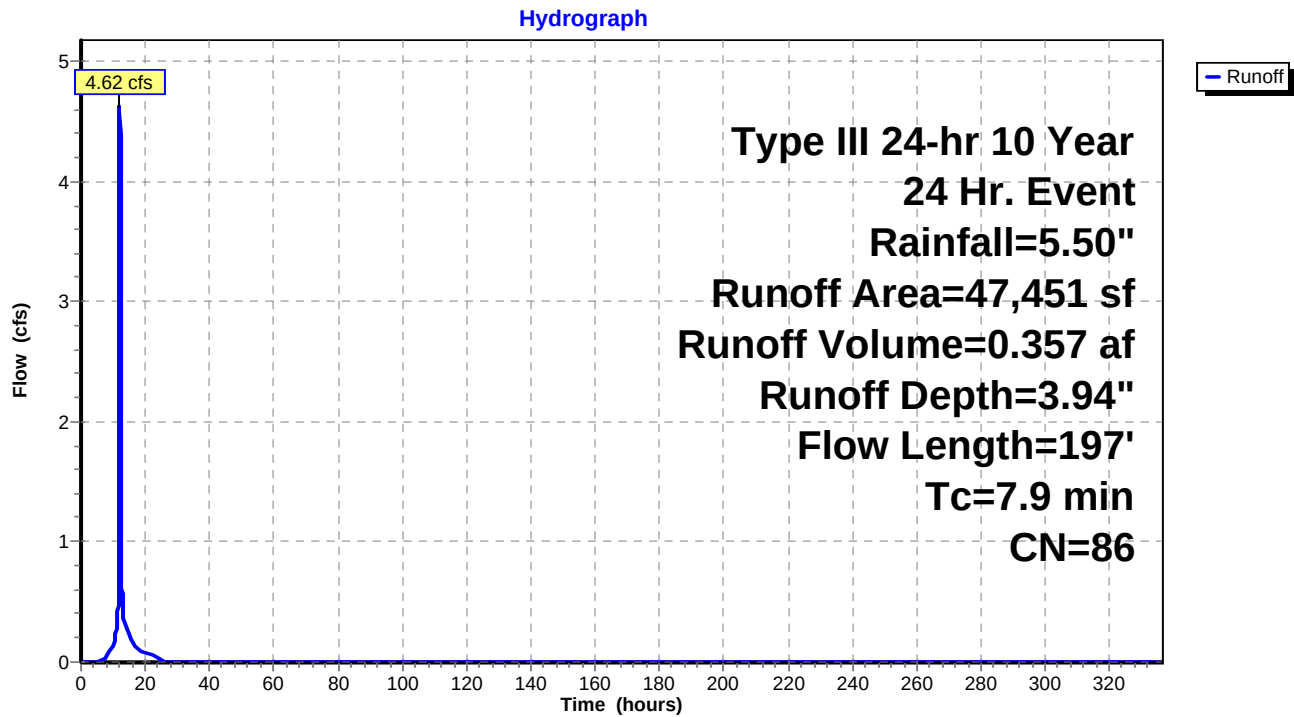
Runoff = 4.62 cfs @ 12.11 hrs, Volume= 0.357 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
23,470	74	>75% Grass cover, Good, HSG C
47,451	86	Weighted Average
23,470		49.46% Pervious Area
23,981		50.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	50	0.1200	24.94	78.37	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
7.9	197	Total			

Subcatchment EX DP 4: EX DP 4



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX DP 4: EX DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.94	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.94	0.00
10.00	1.04	0.22	0.14	270.00	5.50	3.94	0.00
15.00	4.70	3.19	0.22	275.00	5.50	3.94	0.00
20.00	5.26	3.71	0.07	280.00	5.50	3.94	0.00
25.00	5.50	3.94	0.00	285.00	5.50	3.94	0.00
30.00	5.50	3.94	0.00	290.00	5.50	3.94	0.00
35.00	5.50	3.94	0.00	295.00	5.50	3.94	0.00
40.00	5.50	3.94	0.00	300.00	5.50	3.94	0.00
45.00	5.50	3.94	0.00	305.00	5.50	3.94	0.00
50.00	5.50	3.94	0.00	310.00	5.50	3.94	0.00
55.00	5.50	3.94	0.00	315.00	5.50	3.94	0.00
60.00	5.50	3.94	0.00	320.00	5.50	3.94	0.00
65.00	5.50	3.94	0.00	325.00	5.50	3.94	0.00
70.00	5.50	3.94	0.00	330.00	5.50	3.94	0.00
75.00	5.50	3.94	0.00	335.00	5.50	3.94	0.00
80.00	5.50	3.94	0.00				
85.00	5.50	3.94	0.00				
90.00	5.50	3.94	0.00				
95.00	5.50	3.94	0.00				
100.00	5.50	3.94	0.00				
105.00	5.50	3.94	0.00				
110.00	5.50	3.94	0.00				
115.00	5.50	3.94	0.00				
120.00	5.50	3.94	0.00				
125.00	5.50	3.94	0.00				
130.00	5.50	3.94	0.00				
135.00	5.50	3.94	0.00				
140.00	5.50	3.94	0.00				
145.00	5.50	3.94	0.00				
150.00	5.50	3.94	0.00				
155.00	5.50	3.94	0.00				
160.00	5.50	3.94	0.00				
165.00	5.50	3.94	0.00				
170.00	5.50	3.94	0.00				
175.00	5.50	3.94	0.00				
180.00	5.50	3.94	0.00				
185.00	5.50	3.94	0.00				
190.00	5.50	3.94	0.00				
195.00	5.50	3.94	0.00				
200.00	5.50	3.94	0.00				
205.00	5.50	3.94	0.00				
210.00	5.50	3.94	0.00				
215.00	5.50	3.94	0.00				
220.00	5.50	3.94	0.00				
225.00	5.50	3.94	0.00				
230.00	5.50	3.94	0.00				
235.00	5.50	3.94	0.00				
240.00	5.50	3.94	0.00				
245.00	5.50	3.94	0.00				
250.00	5.50	3.94	0.00				
255.00	5.50	3.94	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Prepared by AKRF Engineering, PC

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Summary for Subcatchment PROP DP 4: PROP DP 4

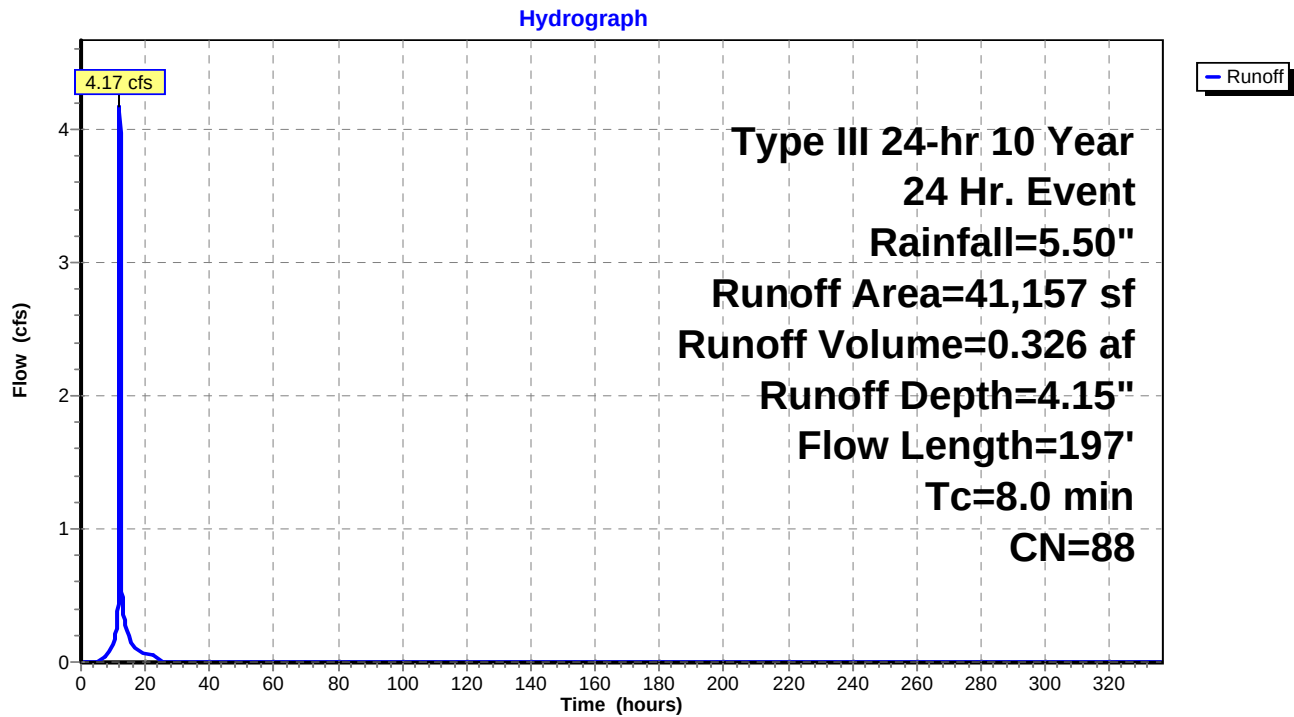
Runoff = 4.17 cfs @ 12.11 hrs, Volume= 0.326 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
17,176	74	>75% Grass cover, Good, HSG C
41,157	88	Weighted Average
17,176		41.73% Pervious Area
23,981		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	50	0.0120	7.89	24.78	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
8.0	197	Total			

Subcatchment PROP DP 4: PROP DP 4



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment PROP DP 4: PROP DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.15	0.00
5.00	0.31	0.00	0.00	265.00	5.50	4.15	0.00
10.00	1.04	0.28	0.14	270.00	5.50	4.15	0.00
15.00	4.70	3.38	0.19	275.00	5.50	4.15	0.00
20.00	5.26	3.92	0.07	280.00	5.50	4.15	0.00
25.00	5.50	4.15	0.00	285.00	5.50	4.15	0.00
30.00	5.50	4.15	0.00	290.00	5.50	4.15	0.00
35.00	5.50	4.15	0.00	295.00	5.50	4.15	0.00
40.00	5.50	4.15	0.00	300.00	5.50	4.15	0.00
45.00	5.50	4.15	0.00	305.00	5.50	4.15	0.00
50.00	5.50	4.15	0.00	310.00	5.50	4.15	0.00
55.00	5.50	4.15	0.00	315.00	5.50	4.15	0.00
60.00	5.50	4.15	0.00	320.00	5.50	4.15	0.00
65.00	5.50	4.15	0.00	325.00	5.50	4.15	0.00
70.00	5.50	4.15	0.00	330.00	5.50	4.15	0.00
75.00	5.50	4.15	0.00	335.00	5.50	4.15	0.00
80.00	5.50	4.15	0.00				
85.00	5.50	4.15	0.00				
90.00	5.50	4.15	0.00				
95.00	5.50	4.15	0.00				
100.00	5.50	4.15	0.00				
105.00	5.50	4.15	0.00				
110.00	5.50	4.15	0.00				
115.00	5.50	4.15	0.00				
120.00	5.50	4.15	0.00				
125.00	5.50	4.15	0.00				
130.00	5.50	4.15	0.00				
135.00	5.50	4.15	0.00				
140.00	5.50	4.15	0.00				
145.00	5.50	4.15	0.00				
150.00	5.50	4.15	0.00				
155.00	5.50	4.15	0.00				
160.00	5.50	4.15	0.00				
165.00	5.50	4.15	0.00				
170.00	5.50	4.15	0.00				
175.00	5.50	4.15	0.00				
180.00	5.50	4.15	0.00				
185.00	5.50	4.15	0.00				
190.00	5.50	4.15	0.00				
195.00	5.50	4.15	0.00				
200.00	5.50	4.15	0.00				
205.00	5.50	4.15	0.00				
210.00	5.50	4.15	0.00				
215.00	5.50	4.15	0.00				
220.00	5.50	4.15	0.00				
225.00	5.50	4.15	0.00				
230.00	5.50	4.15	0.00				
235.00	5.50	4.15	0.00				
240.00	5.50	4.15	0.00				
245.00	5.50	4.15	0.00				
250.00	5.50	4.15	0.00				
255.00	5.50	4.15	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX DP 4: EX DP 4

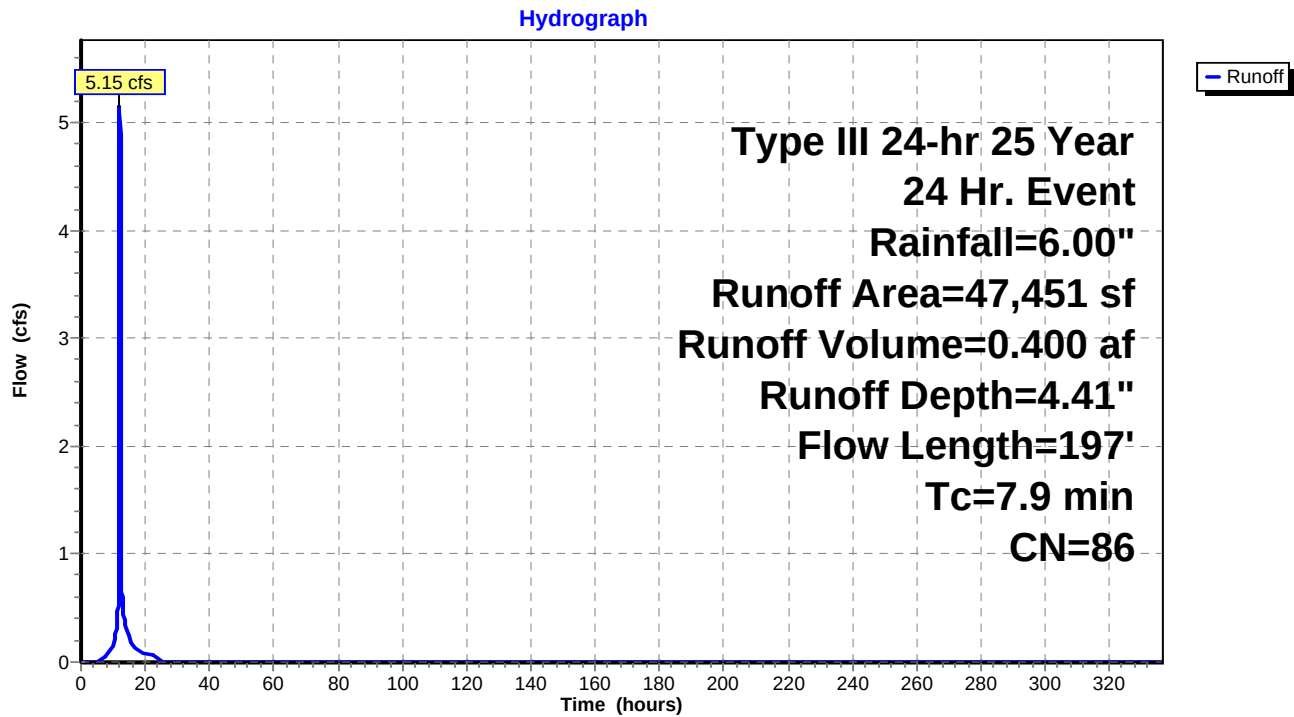
Runoff = 5.15 cfs @ 12.11 hrs, Volume= 0.400 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
23,470	74	>75% Grass cover, Good, HSG C
47,451	86	Weighted Average
23,470		49.46% Pervious Area
23,981		50.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	50	0.1200	24.94	78.37	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
7.9	197	Total			

Subcatchment EX DP 4: EX DP 4



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX DP 4: EX DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.41	0.00
5.00	0.34	0.00	0.00	265.00	6.00	4.41	0.00
10.00	1.13	0.27	0.17	270.00	6.00	4.41	0.00
15.00	5.13	3.58	0.24	275.00	6.00	4.41	0.00
20.00	5.74	4.16	0.08	280.00	6.00	4.41	0.00
25.00	6.00	4.41	0.00	285.00	6.00	4.41	0.00
30.00	6.00	4.41	0.00	290.00	6.00	4.41	0.00
35.00	6.00	4.41	0.00	295.00	6.00	4.41	0.00
40.00	6.00	4.41	0.00	300.00	6.00	4.41	0.00
45.00	6.00	4.41	0.00	305.00	6.00	4.41	0.00
50.00	6.00	4.41	0.00	310.00	6.00	4.41	0.00
55.00	6.00	4.41	0.00	315.00	6.00	4.41	0.00
60.00	6.00	4.41	0.00	320.00	6.00	4.41	0.00
65.00	6.00	4.41	0.00	325.00	6.00	4.41	0.00
70.00	6.00	4.41	0.00	330.00	6.00	4.41	0.00
75.00	6.00	4.41	0.00	335.00	6.00	4.41	0.00
80.00	6.00	4.41	0.00				
85.00	6.00	4.41	0.00				
90.00	6.00	4.41	0.00				
95.00	6.00	4.41	0.00				
100.00	6.00	4.41	0.00				
105.00	6.00	4.41	0.00				
110.00	6.00	4.41	0.00				
115.00	6.00	4.41	0.00				
120.00	6.00	4.41	0.00				
125.00	6.00	4.41	0.00				
130.00	6.00	4.41	0.00				
135.00	6.00	4.41	0.00				
140.00	6.00	4.41	0.00				
145.00	6.00	4.41	0.00				
150.00	6.00	4.41	0.00				
155.00	6.00	4.41	0.00				
160.00	6.00	4.41	0.00				
165.00	6.00	4.41	0.00				
170.00	6.00	4.41	0.00				
175.00	6.00	4.41	0.00				
180.00	6.00	4.41	0.00				
185.00	6.00	4.41	0.00				
190.00	6.00	4.41	0.00				
195.00	6.00	4.41	0.00				
200.00	6.00	4.41	0.00				
205.00	6.00	4.41	0.00				
210.00	6.00	4.41	0.00				
215.00	6.00	4.41	0.00				
220.00	6.00	4.41	0.00				
225.00	6.00	4.41	0.00				
230.00	6.00	4.41	0.00				
235.00	6.00	4.41	0.00				
240.00	6.00	4.41	0.00				
245.00	6.00	4.41	0.00				
250.00	6.00	4.41	0.00				
255.00	6.00	4.41	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment PROP DP 4: PROP DP 4

Runoff = 4.62 cfs @ 12.11 hrs, Volume= 0.364 af, Depth= 4.63"

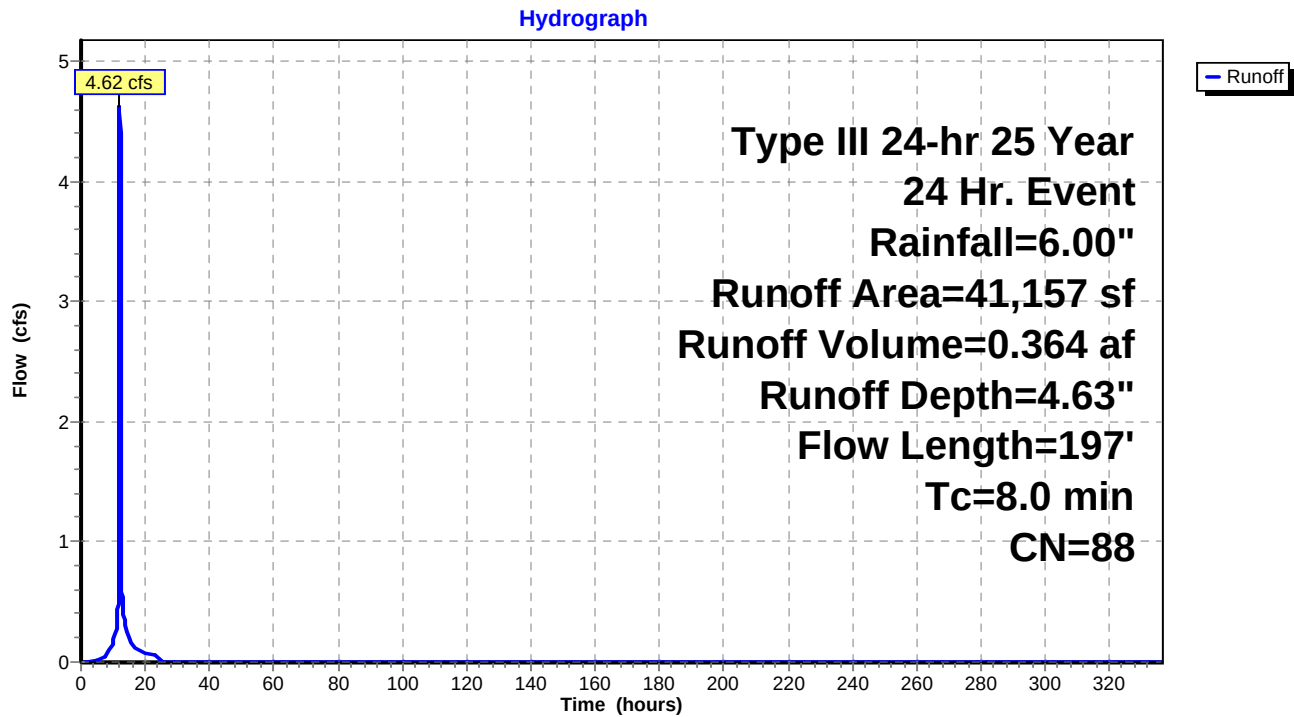
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
17,176	74	>75% Grass cover, Good, HSG C
41,157	88	Weighted Average
17,176		41.73% Pervious Area
23,981		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	50	0.0120	7.89	24.78	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
8.0	197	Total			

Subcatchment PROP DP 4: PROP DP 4



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment PROP DP 4: PROP DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.63	0.00
5.00	0.34	0.00	0.01	265.00	6.00	4.63	0.00
10.00	1.13	0.33	0.17	270.00	6.00	4.63	0.00
15.00	5.13	3.79	0.21	275.00	6.00	4.63	0.00
20.00	5.74	4.38	0.07	280.00	6.00	4.63	0.00
25.00	6.00	4.63	0.00	285.00	6.00	4.63	0.00
30.00	6.00	4.63	0.00	290.00	6.00	4.63	0.00
35.00	6.00	4.63	0.00	295.00	6.00	4.63	0.00
40.00	6.00	4.63	0.00	300.00	6.00	4.63	0.00
45.00	6.00	4.63	0.00	305.00	6.00	4.63	0.00
50.00	6.00	4.63	0.00	310.00	6.00	4.63	0.00
55.00	6.00	4.63	0.00	315.00	6.00	4.63	0.00
60.00	6.00	4.63	0.00	320.00	6.00	4.63	0.00
65.00	6.00	4.63	0.00	325.00	6.00	4.63	0.00
70.00	6.00	4.63	0.00	330.00	6.00	4.63	0.00
75.00	6.00	4.63	0.00	335.00	6.00	4.63	0.00
80.00	6.00	4.63	0.00				
85.00	6.00	4.63	0.00				
90.00	6.00	4.63	0.00				
95.00	6.00	4.63	0.00				
100.00	6.00	4.63	0.00				
105.00	6.00	4.63	0.00				
110.00	6.00	4.63	0.00				
115.00	6.00	4.63	0.00				
120.00	6.00	4.63	0.00				
125.00	6.00	4.63	0.00				
130.00	6.00	4.63	0.00				
135.00	6.00	4.63	0.00				
140.00	6.00	4.63	0.00				
145.00	6.00	4.63	0.00				
150.00	6.00	4.63	0.00				
155.00	6.00	4.63	0.00				
160.00	6.00	4.63	0.00				
165.00	6.00	4.63	0.00				
170.00	6.00	4.63	0.00				
175.00	6.00	4.63	0.00				
180.00	6.00	4.63	0.00				
185.00	6.00	4.63	0.00				
190.00	6.00	4.63	0.00				
195.00	6.00	4.63	0.00				
200.00	6.00	4.63	0.00				
205.00	6.00	4.63	0.00				
210.00	6.00	4.63	0.00				
215.00	6.00	4.63	0.00				
220.00	6.00	4.63	0.00				
225.00	6.00	4.63	0.00				
230.00	6.00	4.63	0.00				
235.00	6.00	4.63	0.00				
240.00	6.00	4.63	0.00				
245.00	6.00	4.63	0.00				
250.00	6.00	4.63	0.00				
255.00	6.00	4.63	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX DP 4: EX DP 4

Runoff = 8.85 cfs @ 12.11 hrs, Volume= 0.707 af, Depth= 7.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

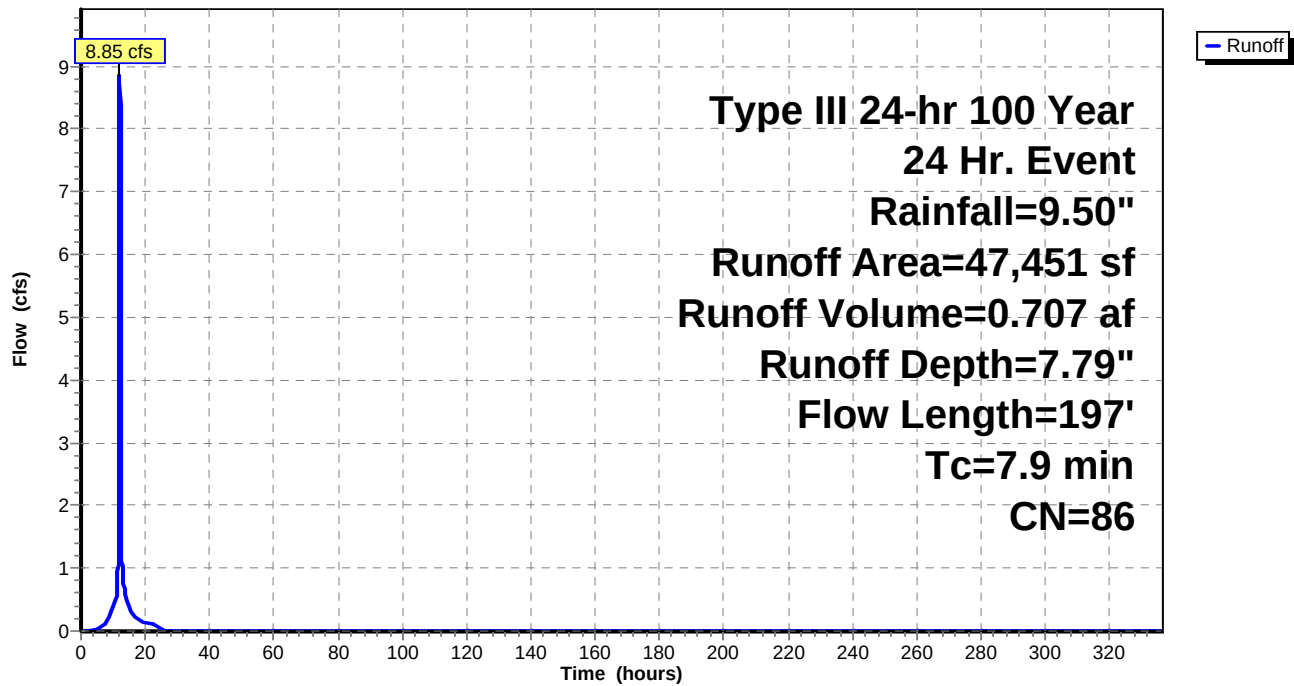
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
23,470	74	>75% Grass cover, Good, HSG C
47,451	86	Weighted Average
23,470		49.46% Pervious Area
23,981		50.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	50	0.1200	24.94	78.37	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
7.9	197	Total			

Subcatchment EX DP 4: EX DP 4

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX DP 4: EX DP 4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.79	0.00
5.00	0.54	0.02	0.03	265.00	9.50	7.79	0.00
10.00	1.80	0.70	0.35	270.00	9.50	7.79	0.00
15.00	8.12	6.44	0.39	275.00	9.50	7.79	0.00
20.00	9.09	7.39	0.13	280.00	9.50	7.79	0.00
25.00	9.50	7.79	0.00	285.00	9.50	7.79	0.00
30.00	9.50	7.79	0.00	290.00	9.50	7.79	0.00
35.00	9.50	7.79	0.00	295.00	9.50	7.79	0.00
40.00	9.50	7.79	0.00	300.00	9.50	7.79	0.00
45.00	9.50	7.79	0.00	305.00	9.50	7.79	0.00
50.00	9.50	7.79	0.00	310.00	9.50	7.79	0.00
55.00	9.50	7.79	0.00	315.00	9.50	7.79	0.00
60.00	9.50	7.79	0.00	320.00	9.50	7.79	0.00
65.00	9.50	7.79	0.00	325.00	9.50	7.79	0.00
70.00	9.50	7.79	0.00	330.00	9.50	7.79	0.00
75.00	9.50	7.79	0.00	335.00	9.50	7.79	0.00
80.00	9.50	7.79	0.00				
85.00	9.50	7.79	0.00				
90.00	9.50	7.79	0.00				
95.00	9.50	7.79	0.00				
100.00	9.50	7.79	0.00				
105.00	9.50	7.79	0.00				
110.00	9.50	7.79	0.00				
115.00	9.50	7.79	0.00				
120.00	9.50	7.79	0.00				
125.00	9.50	7.79	0.00				
130.00	9.50	7.79	0.00				
135.00	9.50	7.79	0.00				
140.00	9.50	7.79	0.00				
145.00	9.50	7.79	0.00				
150.00	9.50	7.79	0.00				
155.00	9.50	7.79	0.00				
160.00	9.50	7.79	0.00				
165.00	9.50	7.79	0.00				
170.00	9.50	7.79	0.00				
175.00	9.50	7.79	0.00				
180.00	9.50	7.79	0.00				
185.00	9.50	7.79	0.00				
190.00	9.50	7.79	0.00				
195.00	9.50	7.79	0.00				
200.00	9.50	7.79	0.00				
205.00	9.50	7.79	0.00				
210.00	9.50	7.79	0.00				
215.00	9.50	7.79	0.00				
220.00	9.50	7.79	0.00				
225.00	9.50	7.79	0.00				
230.00	9.50	7.79	0.00				
235.00	9.50	7.79	0.00				
240.00	9.50	7.79	0.00				
245.00	9.50	7.79	0.00				
250.00	9.50	7.79	0.00				
255.00	9.50	7.79	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment PROP DP 4: PROP DP 4

Runoff = 7.80 cfs @ 12.11 hrs, Volume= 0.633 af, Depth= 8.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

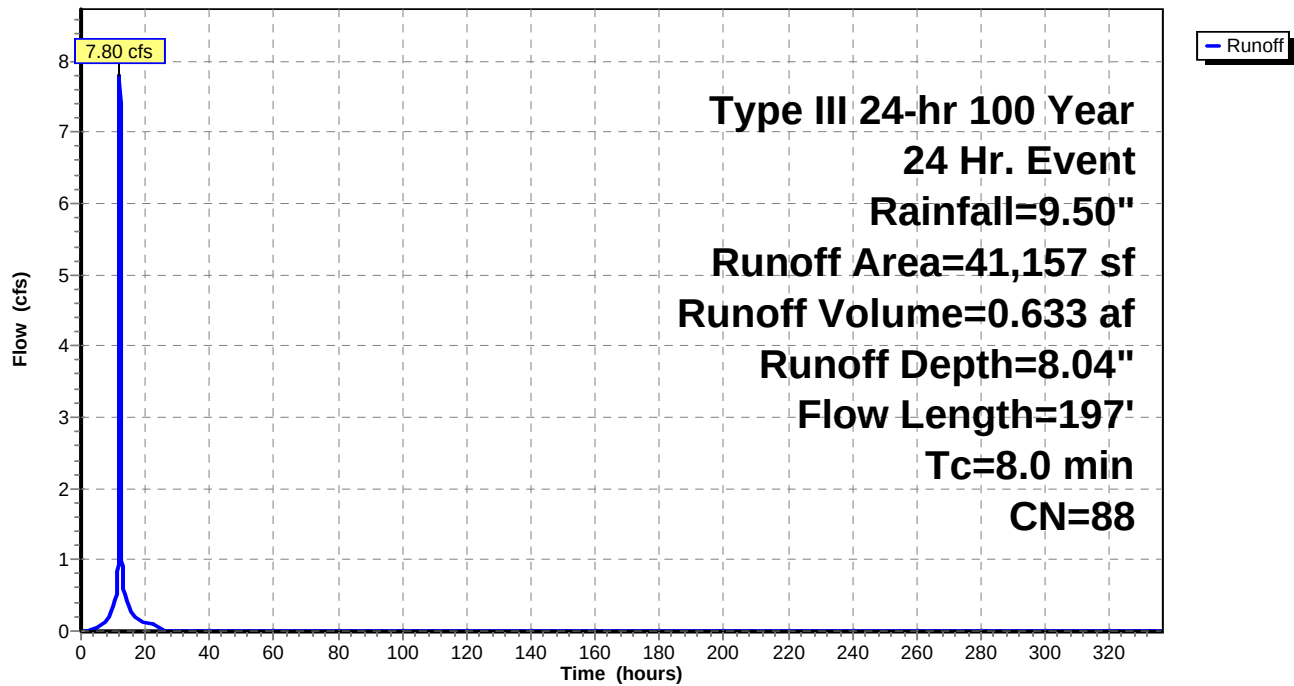
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
23,981	98	Paved parking & roofs
17,176	74	>75% Grass cover, Good, HSG C
41,157	88	Weighted Average
17,176		41.73% Pervious Area
23,981		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0800	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.1	34	0.0580	3.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	50	0.0120	7.89	24.78	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
8.0	197	Total			

Subcatchment PROP DP 4: PROP DP 4

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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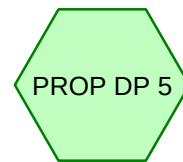
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Hydrograph for Subcatchment PROP DP 4: PROP DP 4

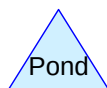
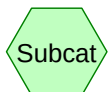
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.04	0.00
5.00	0.54	0.04	0.04	265.00	9.50	8.04	0.00
10.00	1.80	0.80	0.33	270.00	9.50	8.04	0.00
15.00	8.12	6.68	0.34	275.00	9.50	8.04	0.00
20.00	9.09	7.64	0.12	280.00	9.50	8.04	0.00
25.00	9.50	8.04	0.00	285.00	9.50	8.04	0.00
30.00	9.50	8.04	0.00	290.00	9.50	8.04	0.00
35.00	9.50	8.04	0.00	295.00	9.50	8.04	0.00
40.00	9.50	8.04	0.00	300.00	9.50	8.04	0.00
45.00	9.50	8.04	0.00	305.00	9.50	8.04	0.00
50.00	9.50	8.04	0.00	310.00	9.50	8.04	0.00
55.00	9.50	8.04	0.00	315.00	9.50	8.04	0.00
60.00	9.50	8.04	0.00	320.00	9.50	8.04	0.00
65.00	9.50	8.04	0.00	325.00	9.50	8.04	0.00
70.00	9.50	8.04	0.00	330.00	9.50	8.04	0.00
75.00	9.50	8.04	0.00	335.00	9.50	8.04	0.00
80.00	9.50	8.04	0.00				
85.00	9.50	8.04	0.00				
90.00	9.50	8.04	0.00				
95.00	9.50	8.04	0.00				
100.00	9.50	8.04	0.00				
105.00	9.50	8.04	0.00				
110.00	9.50	8.04	0.00				
115.00	9.50	8.04	0.00				
120.00	9.50	8.04	0.00				
125.00	9.50	8.04	0.00				
130.00	9.50	8.04	0.00				
135.00	9.50	8.04	0.00				
140.00	9.50	8.04	0.00				
145.00	9.50	8.04	0.00				
150.00	9.50	8.04	0.00				
155.00	9.50	8.04	0.00				
160.00	9.50	8.04	0.00				
165.00	9.50	8.04	0.00				
170.00	9.50	8.04	0.00				
175.00	9.50	8.04	0.00				
180.00	9.50	8.04	0.00				
185.00	9.50	8.04	0.00				
190.00	9.50	8.04	0.00				
195.00	9.50	8.04	0.00				
200.00	9.50	8.04	0.00				
205.00	9.50	8.04	0.00				
210.00	9.50	8.04	0.00				
215.00	9.50	8.04	0.00				
220.00	9.50	8.04	0.00				
225.00	9.50	8.04	0.00				
230.00	9.50	8.04	0.00				
235.00	9.50	8.04	0.00				
240.00	9.50	8.04	0.00				
245.00	9.50	8.04	0.00				
250.00	9.50	8.04	0.00				
255.00	9.50	8.04	0.00				



EX DP 5



PROP DP 5



Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment EX DP 5: EX DP 5

Runoff = 1.89 cfs @ 12.08 hrs, Volume= 0.134 af, Depth= 1.91"

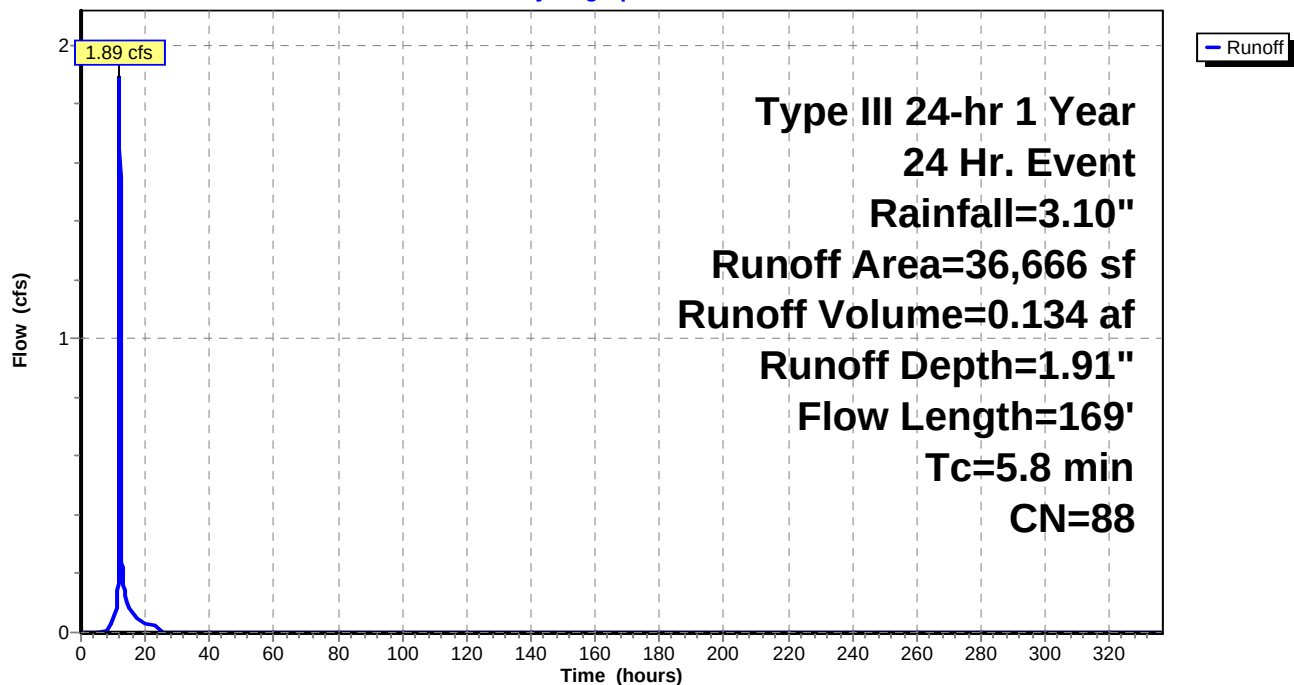
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
27,116	98	Paved parking & roofs
9,550	61	>75% Grass cover, Good, HSG B
36,666	88	Weighted Average
9,550		26.05% Pervious Area
27,116		73.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	110	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	169	Total			

Subcatchment EX DP 5: EX DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX DP 5: EX DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.91	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.91	0.00
10.00	0.59	0.06	0.04	270.00	3.10	1.91	0.00
15.00	2.65	1.51	0.09	275.00	3.10	1.91	0.00
20.00	2.97	1.79	0.03	280.00	3.10	1.91	0.00
25.00	3.10	1.91	0.00	285.00	3.10	1.91	0.00
30.00	3.10	1.91	0.00	290.00	3.10	1.91	0.00
35.00	3.10	1.91	0.00	295.00	3.10	1.91	0.00
40.00	3.10	1.91	0.00	300.00	3.10	1.91	0.00
45.00	3.10	1.91	0.00	305.00	3.10	1.91	0.00
50.00	3.10	1.91	0.00	310.00	3.10	1.91	0.00
55.00	3.10	1.91	0.00	315.00	3.10	1.91	0.00
60.00	3.10	1.91	0.00	320.00	3.10	1.91	0.00
65.00	3.10	1.91	0.00	325.00	3.10	1.91	0.00
70.00	3.10	1.91	0.00	330.00	3.10	1.91	0.00
75.00	3.10	1.91	0.00	335.00	3.10	1.91	0.00
80.00	3.10	1.91	0.00				
85.00	3.10	1.91	0.00				
90.00	3.10	1.91	0.00				
95.00	3.10	1.91	0.00				
100.00	3.10	1.91	0.00				
105.00	3.10	1.91	0.00				
110.00	3.10	1.91	0.00				
115.00	3.10	1.91	0.00				
120.00	3.10	1.91	0.00				
125.00	3.10	1.91	0.00				
130.00	3.10	1.91	0.00				
135.00	3.10	1.91	0.00				
140.00	3.10	1.91	0.00				
145.00	3.10	1.91	0.00				
150.00	3.10	1.91	0.00				
155.00	3.10	1.91	0.00				
160.00	3.10	1.91	0.00				
165.00	3.10	1.91	0.00				
170.00	3.10	1.91	0.00				
175.00	3.10	1.91	0.00				
180.00	3.10	1.91	0.00				
185.00	3.10	1.91	0.00				
190.00	3.10	1.91	0.00				
195.00	3.10	1.91	0.00				
200.00	3.10	1.91	0.00				
205.00	3.10	1.91	0.00				
210.00	3.10	1.91	0.00				
215.00	3.10	1.91	0.00				
220.00	3.10	1.91	0.00				
225.00	3.10	1.91	0.00				
230.00	3.10	1.91	0.00				
235.00	3.10	1.91	0.00				
240.00	3.10	1.91	0.00				
245.00	3.10	1.91	0.00				
250.00	3.10	1.91	0.00				
255.00	3.10	1.91	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Page 4

Summary for Subcatchment PROP DP 5: PROP DP 5

Runoff = 2.10 cfs @ 12.08 hrs, Volume= 0.149 af, Depth= 1.99"

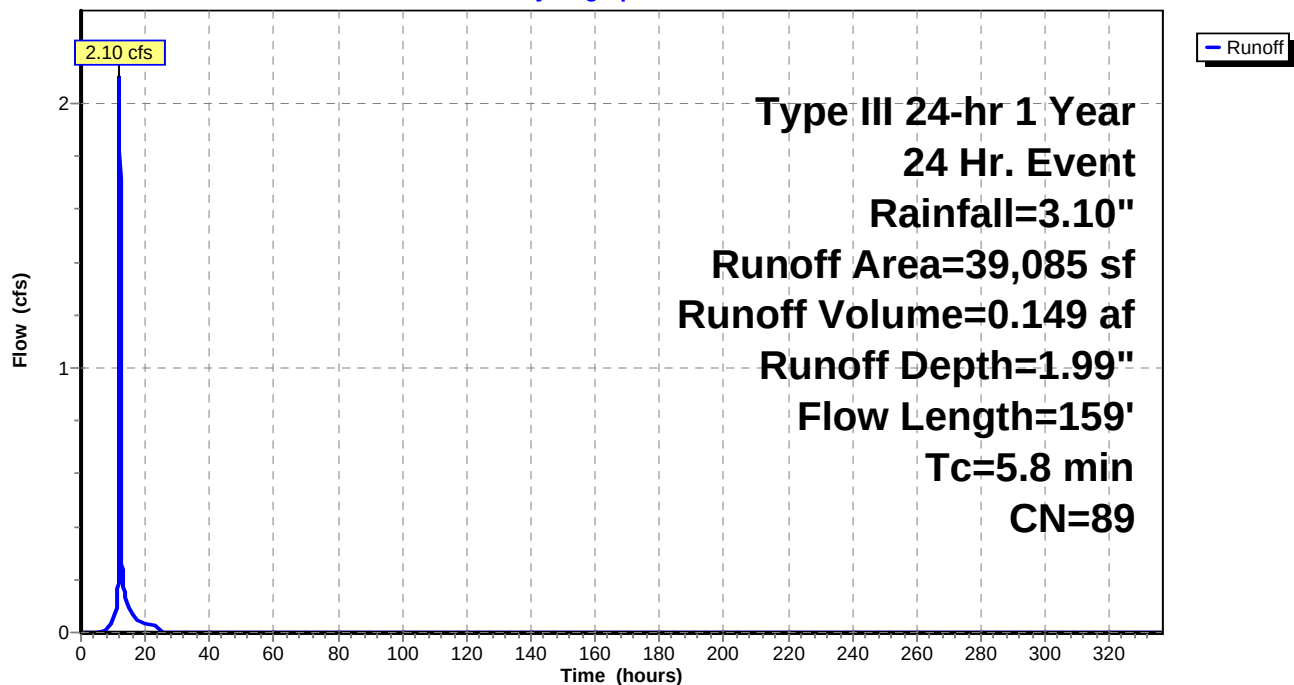
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
29,670	98	Paved parking & roofs
9,415	61	>75% Grass cover, Good, HSG B
39,085	89	Weighted Average
9,415		24.09% Pervious Area
29,670		75.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	100	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	159	Total			

Subcatchment PROP DP 5: PROP DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment PROP DP 5: PROP DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.99	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.99	0.00
10.00	0.59	0.07	0.05	270.00	3.10	1.99	0.00
15.00	2.65	1.59	0.10	275.00	3.10	1.99	0.00
20.00	2.97	1.87	0.03	280.00	3.10	1.99	0.00
25.00	3.10	1.99	0.00	285.00	3.10	1.99	0.00
30.00	3.10	1.99	0.00	290.00	3.10	1.99	0.00
35.00	3.10	1.99	0.00	295.00	3.10	1.99	0.00
40.00	3.10	1.99	0.00	300.00	3.10	1.99	0.00
45.00	3.10	1.99	0.00	305.00	3.10	1.99	0.00
50.00	3.10	1.99	0.00	310.00	3.10	1.99	0.00
55.00	3.10	1.99	0.00	315.00	3.10	1.99	0.00
60.00	3.10	1.99	0.00	320.00	3.10	1.99	0.00
65.00	3.10	1.99	0.00	325.00	3.10	1.99	0.00
70.00	3.10	1.99	0.00	330.00	3.10	1.99	0.00
75.00	3.10	1.99	0.00	335.00	3.10	1.99	0.00
80.00	3.10	1.99	0.00				
85.00	3.10	1.99	0.00				
90.00	3.10	1.99	0.00				
95.00	3.10	1.99	0.00				
100.00	3.10	1.99	0.00				
105.00	3.10	1.99	0.00				
110.00	3.10	1.99	0.00				
115.00	3.10	1.99	0.00				
120.00	3.10	1.99	0.00				
125.00	3.10	1.99	0.00				
130.00	3.10	1.99	0.00				
135.00	3.10	1.99	0.00				
140.00	3.10	1.99	0.00				
145.00	3.10	1.99	0.00				
150.00	3.10	1.99	0.00				
155.00	3.10	1.99	0.00				
160.00	3.10	1.99	0.00				
165.00	3.10	1.99	0.00				
170.00	3.10	1.99	0.00				
175.00	3.10	1.99	0.00				
180.00	3.10	1.99	0.00				
185.00	3.10	1.99	0.00				
190.00	3.10	1.99	0.00				
195.00	3.10	1.99	0.00				
200.00	3.10	1.99	0.00				
205.00	3.10	1.99	0.00				
210.00	3.10	1.99	0.00				
215.00	3.10	1.99	0.00				
220.00	3.10	1.99	0.00				
225.00	3.10	1.99	0.00				
230.00	3.10	1.99	0.00				
235.00	3.10	1.99	0.00				
240.00	3.10	1.99	0.00				
245.00	3.10	1.99	0.00				
250.00	3.10	1.99	0.00				
255.00	3.10	1.99	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment EX DP 5: EX DP 5

Runoff = 2.24 cfs @ 12.08 hrs, Volume= 0.159 af, Depth= 2.27"

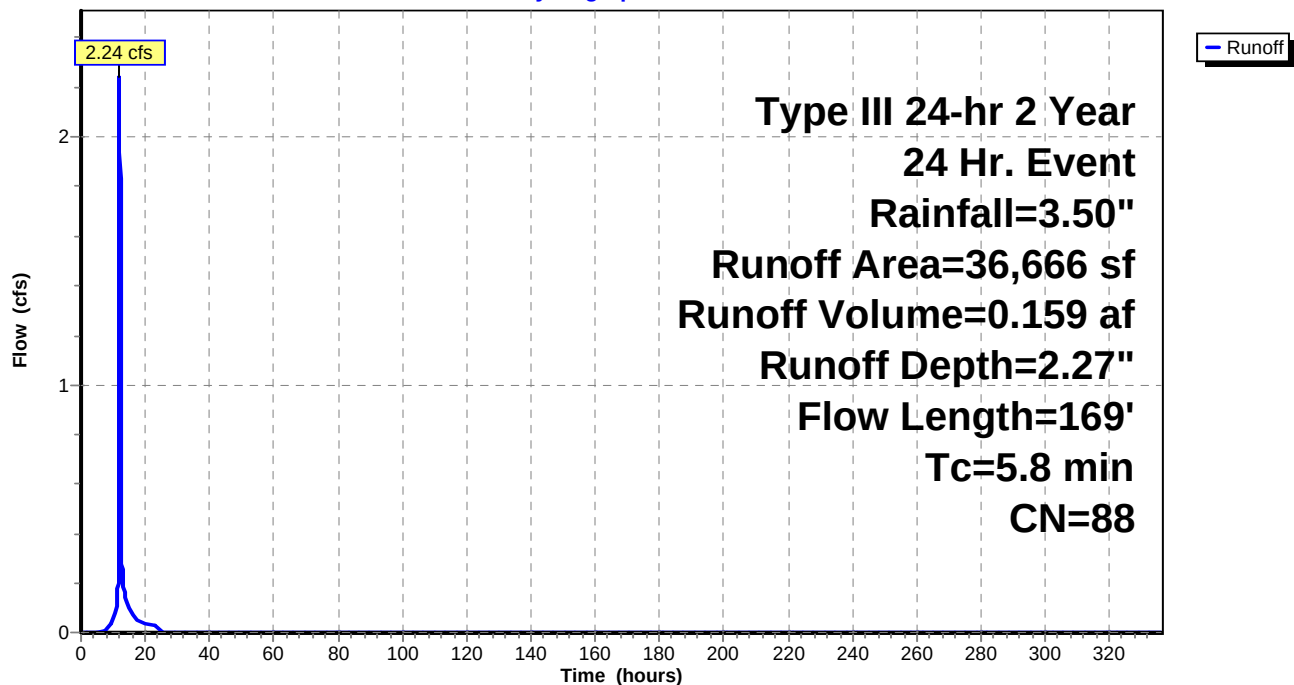
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
27,116	98	Paved parking & roofs
9,550	61	>75% Grass cover, Good, HSG B
36,666	88	Weighted Average
9,550		26.05% Pervious Area
27,116		73.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	110	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	169	Total			

Subcatchment EX DP 5: EX DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX DP 5: EX DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.27	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.27	0.00
10.00	0.66	0.09	0.05	270.00	3.50	2.27	0.00
15.00	2.99	1.81	0.10	275.00	3.50	2.27	0.00
20.00	3.35	2.13	0.04	280.00	3.50	2.27	0.00
25.00	3.50	2.27	0.00	285.00	3.50	2.27	0.00
30.00	3.50	2.27	0.00	290.00	3.50	2.27	0.00
35.00	3.50	2.27	0.00	295.00	3.50	2.27	0.00
40.00	3.50	2.27	0.00	300.00	3.50	2.27	0.00
45.00	3.50	2.27	0.00	305.00	3.50	2.27	0.00
50.00	3.50	2.27	0.00	310.00	3.50	2.27	0.00
55.00	3.50	2.27	0.00	315.00	3.50	2.27	0.00
60.00	3.50	2.27	0.00	320.00	3.50	2.27	0.00
65.00	3.50	2.27	0.00	325.00	3.50	2.27	0.00
70.00	3.50	2.27	0.00	330.00	3.50	2.27	0.00
75.00	3.50	2.27	0.00	335.00	3.50	2.27	0.00
80.00	3.50	2.27	0.00				
85.00	3.50	2.27	0.00				
90.00	3.50	2.27	0.00				
95.00	3.50	2.27	0.00				
100.00	3.50	2.27	0.00				
105.00	3.50	2.27	0.00				
110.00	3.50	2.27	0.00				
115.00	3.50	2.27	0.00				
120.00	3.50	2.27	0.00				
125.00	3.50	2.27	0.00				
130.00	3.50	2.27	0.00				
135.00	3.50	2.27	0.00				
140.00	3.50	2.27	0.00				
145.00	3.50	2.27	0.00				
150.00	3.50	2.27	0.00				
155.00	3.50	2.27	0.00				
160.00	3.50	2.27	0.00				
165.00	3.50	2.27	0.00				
170.00	3.50	2.27	0.00				
175.00	3.50	2.27	0.00				
180.00	3.50	2.27	0.00				
185.00	3.50	2.27	0.00				
190.00	3.50	2.27	0.00				
195.00	3.50	2.27	0.00				
200.00	3.50	2.27	0.00				
205.00	3.50	2.27	0.00				
210.00	3.50	2.27	0.00				
215.00	3.50	2.27	0.00				
220.00	3.50	2.27	0.00				
225.00	3.50	2.27	0.00				
230.00	3.50	2.27	0.00				
235.00	3.50	2.27	0.00				
240.00	3.50	2.27	0.00				
245.00	3.50	2.27	0.00				
250.00	3.50	2.27	0.00				
255.00	3.50	2.27	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment PROP DP 5: PROP DP 5

Runoff = 2.47 cfs @ 12.08 hrs, Volume= 0.176 af, Depth= 2.36"

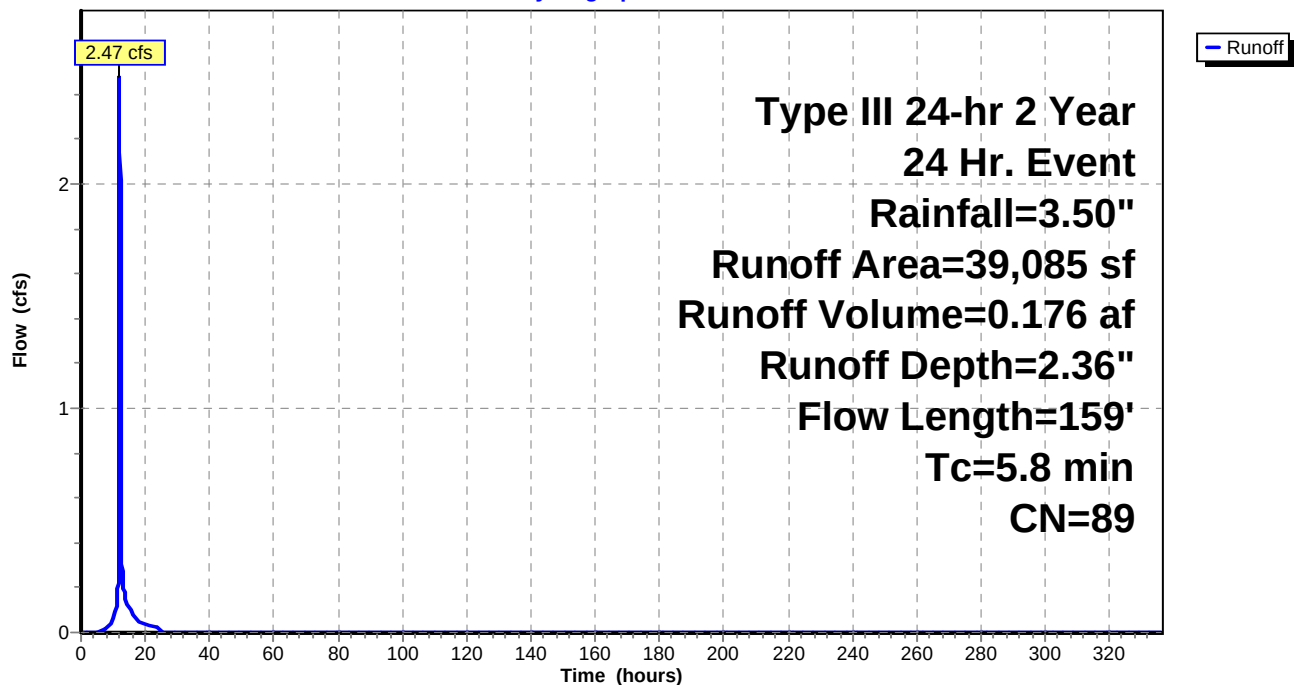
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
29,670	98	Paved parking & roofs
9,415	61	>75% Grass cover, Good, HSG B
39,085	89	Weighted Average
9,415		24.09% Pervious Area
29,670		75.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	100	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	159	Total			

Subcatchment PROP DP 5: PROP DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment PROP DP 5: PROP DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.36	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.36	0.00
10.00	0.66	0.10	0.07	270.00	3.50	2.36	0.00
15.00	2.99	1.89	0.11	275.00	3.50	2.36	0.00
20.00	3.35	2.22	0.04	280.00	3.50	2.36	0.00
25.00	3.50	2.36	0.00	285.00	3.50	2.36	0.00
30.00	3.50	2.36	0.00	290.00	3.50	2.36	0.00
35.00	3.50	2.36	0.00	295.00	3.50	2.36	0.00
40.00	3.50	2.36	0.00	300.00	3.50	2.36	0.00
45.00	3.50	2.36	0.00	305.00	3.50	2.36	0.00
50.00	3.50	2.36	0.00	310.00	3.50	2.36	0.00
55.00	3.50	2.36	0.00	315.00	3.50	2.36	0.00
60.00	3.50	2.36	0.00	320.00	3.50	2.36	0.00
65.00	3.50	2.36	0.00	325.00	3.50	2.36	0.00
70.00	3.50	2.36	0.00	330.00	3.50	2.36	0.00
75.00	3.50	2.36	0.00	335.00	3.50	2.36	0.00
80.00	3.50	2.36	0.00				
85.00	3.50	2.36	0.00				
90.00	3.50	2.36	0.00				
95.00	3.50	2.36	0.00				
100.00	3.50	2.36	0.00				
105.00	3.50	2.36	0.00				
110.00	3.50	2.36	0.00				
115.00	3.50	2.36	0.00				
120.00	3.50	2.36	0.00				
125.00	3.50	2.36	0.00				
130.00	3.50	2.36	0.00				
135.00	3.50	2.36	0.00				
140.00	3.50	2.36	0.00				
145.00	3.50	2.36	0.00				
150.00	3.50	2.36	0.00				
155.00	3.50	2.36	0.00				
160.00	3.50	2.36	0.00				
165.00	3.50	2.36	0.00				
170.00	3.50	2.36	0.00				
175.00	3.50	2.36	0.00				
180.00	3.50	2.36	0.00				
185.00	3.50	2.36	0.00				
190.00	3.50	2.36	0.00				
195.00	3.50	2.36	0.00				
200.00	3.50	2.36	0.00				
205.00	3.50	2.36	0.00				
210.00	3.50	2.36	0.00				
215.00	3.50	2.36	0.00				
220.00	3.50	2.36	0.00				
225.00	3.50	2.36	0.00				
230.00	3.50	2.36	0.00				
235.00	3.50	2.36	0.00				
240.00	3.50	2.36	0.00				
245.00	3.50	2.36	0.00				
250.00	3.50	2.36	0.00				
255.00	3.50	2.36	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX DP 5: EX DP 5

Runoff = 4.00 cfs @ 12.08 hrs, Volume= 0.291 af, Depth= 4.15"

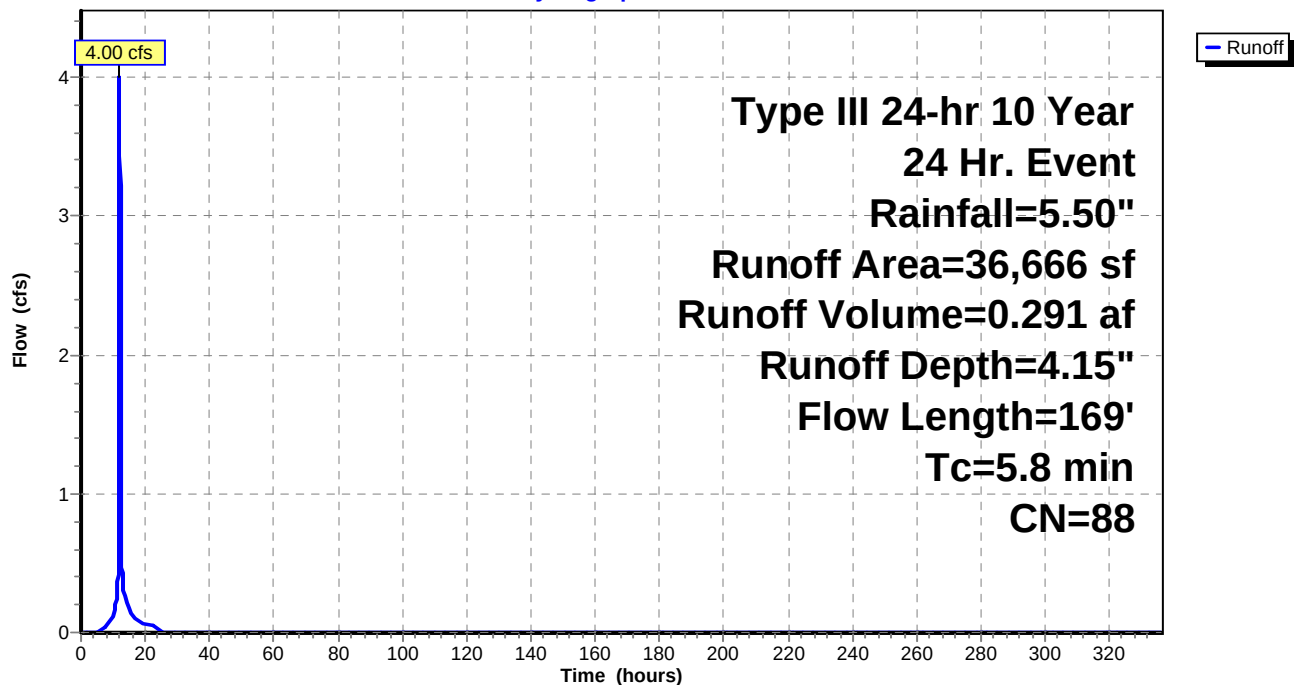
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
27,116	98	Paved parking & roofs
9,550	61	>75% Grass cover, Good, HSG B
36,666	88	Weighted Average
9,550		26.05% Pervious Area
27,116		73.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	110	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	169	Total			

Subcatchment EX DP 5: EX DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX DP 5: EX DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.15	0.00
5.00	0.31	0.00	0.00	265.00	5.50	4.15	0.00
10.00	1.04	0.28	0.13	270.00	5.50	4.15	0.00
15.00	4.70	3.38	0.17	275.00	5.50	4.15	0.00
20.00	5.26	3.92	0.06	280.00	5.50	4.15	0.00
25.00	5.50	4.15	0.00	285.00	5.50	4.15	0.00
30.00	5.50	4.15	0.00	290.00	5.50	4.15	0.00
35.00	5.50	4.15	0.00	295.00	5.50	4.15	0.00
40.00	5.50	4.15	0.00	300.00	5.50	4.15	0.00
45.00	5.50	4.15	0.00	305.00	5.50	4.15	0.00
50.00	5.50	4.15	0.00	310.00	5.50	4.15	0.00
55.00	5.50	4.15	0.00	315.00	5.50	4.15	0.00
60.00	5.50	4.15	0.00	320.00	5.50	4.15	0.00
65.00	5.50	4.15	0.00	325.00	5.50	4.15	0.00
70.00	5.50	4.15	0.00	330.00	5.50	4.15	0.00
75.00	5.50	4.15	0.00	335.00	5.50	4.15	0.00
80.00	5.50	4.15	0.00				
85.00	5.50	4.15	0.00				
90.00	5.50	4.15	0.00				
95.00	5.50	4.15	0.00				
100.00	5.50	4.15	0.00				
105.00	5.50	4.15	0.00				
110.00	5.50	4.15	0.00				
115.00	5.50	4.15	0.00				
120.00	5.50	4.15	0.00				
125.00	5.50	4.15	0.00				
130.00	5.50	4.15	0.00				
135.00	5.50	4.15	0.00				
140.00	5.50	4.15	0.00				
145.00	5.50	4.15	0.00				
150.00	5.50	4.15	0.00				
155.00	5.50	4.15	0.00				
160.00	5.50	4.15	0.00				
165.00	5.50	4.15	0.00				
170.00	5.50	4.15	0.00				
175.00	5.50	4.15	0.00				
180.00	5.50	4.15	0.00				
185.00	5.50	4.15	0.00				
190.00	5.50	4.15	0.00				
195.00	5.50	4.15	0.00				
200.00	5.50	4.15	0.00				
205.00	5.50	4.15	0.00				
210.00	5.50	4.15	0.00				
215.00	5.50	4.15	0.00				
220.00	5.50	4.15	0.00				
225.00	5.50	4.15	0.00				
230.00	5.50	4.15	0.00				
235.00	5.50	4.15	0.00				
240.00	5.50	4.15	0.00				
245.00	5.50	4.15	0.00				
250.00	5.50	4.15	0.00				
255.00	5.50	4.15	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment PROP DP 5: PROP DP 5

Runoff = 4.35 cfs @ 12.08 hrs, Volume= 0.318 af, Depth= 4.25"

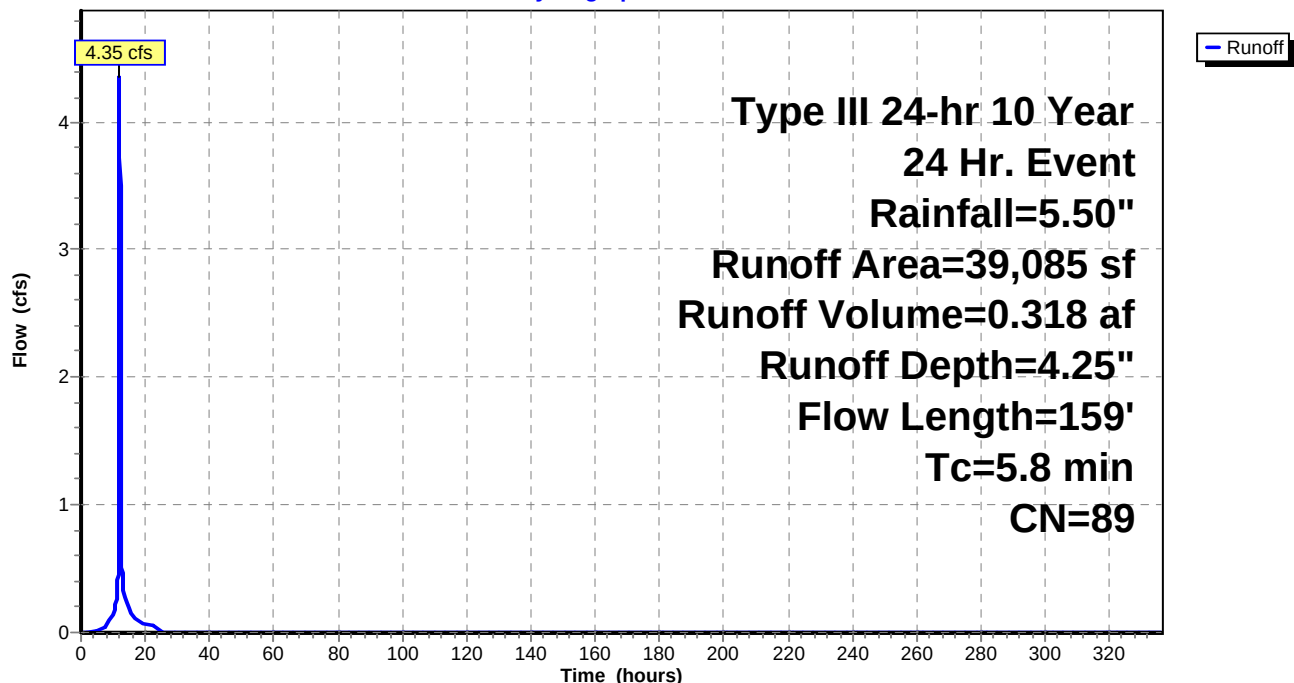
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
29,670	98	Paved parking & roofs
9,415	61	>75% Grass cover, Good, HSG B
39,085	89	Weighted Average
9,415		24.09% Pervious Area
29,670		75.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	100	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	159	Total			

Subcatchment PROP DP 5: PROP DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

Prepared by AKRF Engineering, PC

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Hydrograph for Subcatchment PROP DP 5: PROP DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.25	0.00
5.00	0.31	0.00	0.01	265.00	5.50	4.25	0.00
10.00	1.04	0.31	0.15	270.00	5.50	4.25	0.00
15.00	4.70	3.48	0.18	275.00	5.50	4.25	0.00
20.00	5.26	4.02	0.06	280.00	5.50	4.25	0.00
25.00	5.50	4.25	0.00	285.00	5.50	4.25	0.00
30.00	5.50	4.25	0.00	290.00	5.50	4.25	0.00
35.00	5.50	4.25	0.00	295.00	5.50	4.25	0.00
40.00	5.50	4.25	0.00	300.00	5.50	4.25	0.00
45.00	5.50	4.25	0.00	305.00	5.50	4.25	0.00
50.00	5.50	4.25	0.00	310.00	5.50	4.25	0.00
55.00	5.50	4.25	0.00	315.00	5.50	4.25	0.00
60.00	5.50	4.25	0.00	320.00	5.50	4.25	0.00
65.00	5.50	4.25	0.00	325.00	5.50	4.25	0.00
70.00	5.50	4.25	0.00	330.00	5.50	4.25	0.00
75.00	5.50	4.25	0.00	335.00	5.50	4.25	0.00
80.00	5.50	4.25	0.00				
85.00	5.50	4.25	0.00				
90.00	5.50	4.25	0.00				
95.00	5.50	4.25	0.00				
100.00	5.50	4.25	0.00				
105.00	5.50	4.25	0.00				
110.00	5.50	4.25	0.00				
115.00	5.50	4.25	0.00				
120.00	5.50	4.25	0.00				
125.00	5.50	4.25	0.00				
130.00	5.50	4.25	0.00				
135.00	5.50	4.25	0.00				
140.00	5.50	4.25	0.00				
145.00	5.50	4.25	0.00				
150.00	5.50	4.25	0.00				
155.00	5.50	4.25	0.00				
160.00	5.50	4.25	0.00				
165.00	5.50	4.25	0.00				
170.00	5.50	4.25	0.00				
175.00	5.50	4.25	0.00				
180.00	5.50	4.25	0.00				
185.00	5.50	4.25	0.00				
190.00	5.50	4.25	0.00				
195.00	5.50	4.25	0.00				
200.00	5.50	4.25	0.00				
205.00	5.50	4.25	0.00				
210.00	5.50	4.25	0.00				
215.00	5.50	4.25	0.00				
220.00	5.50	4.25	0.00				
225.00	5.50	4.25	0.00				
230.00	5.50	4.25	0.00				
235.00	5.50	4.25	0.00				
240.00	5.50	4.25	0.00				
245.00	5.50	4.25	0.00				
250.00	5.50	4.25	0.00				
255.00	5.50	4.25	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX DP 5: EX DP 5

Runoff = 4.44 cfs @ 12.08 hrs, Volume= 0.324 af, Depth= 4.63"

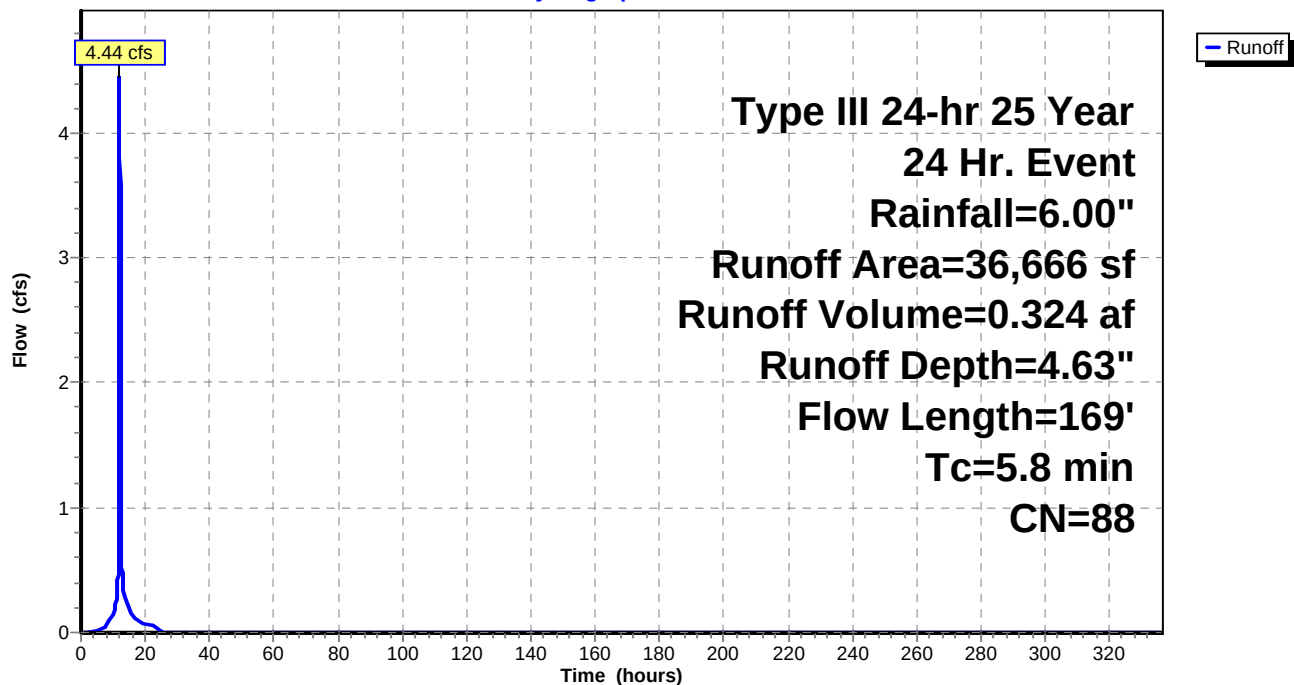
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
27,116	98	Paved parking & roofs
9,550	61	>75% Grass cover, Good, HSG B
36,666	88	Weighted Average
9,550		26.05% Pervious Area
27,116		73.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	110	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	169	Total			

Subcatchment EX DP 5: EX DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX DP 5: EX DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.63	0.00
5.00	0.34	0.00	0.01	265.00	6.00	4.63	0.00
10.00	1.13	0.33	0.15	270.00	6.00	4.63	0.00
15.00	5.13	3.79	0.19	275.00	6.00	4.63	0.00
20.00	5.74	4.38	0.06	280.00	6.00	4.63	0.00
25.00	6.00	4.63	0.00	285.00	6.00	4.63	0.00
30.00	6.00	4.63	0.00	290.00	6.00	4.63	0.00
35.00	6.00	4.63	0.00	295.00	6.00	4.63	0.00
40.00	6.00	4.63	0.00	300.00	6.00	4.63	0.00
45.00	6.00	4.63	0.00	305.00	6.00	4.63	0.00
50.00	6.00	4.63	0.00	310.00	6.00	4.63	0.00
55.00	6.00	4.63	0.00	315.00	6.00	4.63	0.00
60.00	6.00	4.63	0.00	320.00	6.00	4.63	0.00
65.00	6.00	4.63	0.00	325.00	6.00	4.63	0.00
70.00	6.00	4.63	0.00	330.00	6.00	4.63	0.00
75.00	6.00	4.63	0.00	335.00	6.00	4.63	0.00
80.00	6.00	4.63	0.00				
85.00	6.00	4.63	0.00				
90.00	6.00	4.63	0.00				
95.00	6.00	4.63	0.00				
100.00	6.00	4.63	0.00				
105.00	6.00	4.63	0.00				
110.00	6.00	4.63	0.00				
115.00	6.00	4.63	0.00				
120.00	6.00	4.63	0.00				
125.00	6.00	4.63	0.00				
130.00	6.00	4.63	0.00				
135.00	6.00	4.63	0.00				
140.00	6.00	4.63	0.00				
145.00	6.00	4.63	0.00				
150.00	6.00	4.63	0.00				
155.00	6.00	4.63	0.00				
160.00	6.00	4.63	0.00				
165.00	6.00	4.63	0.00				
170.00	6.00	4.63	0.00				
175.00	6.00	4.63	0.00				
180.00	6.00	4.63	0.00				
185.00	6.00	4.63	0.00				
190.00	6.00	4.63	0.00				
195.00	6.00	4.63	0.00				
200.00	6.00	4.63	0.00				
205.00	6.00	4.63	0.00				
210.00	6.00	4.63	0.00				
215.00	6.00	4.63	0.00				
220.00	6.00	4.63	0.00				
225.00	6.00	4.63	0.00				
230.00	6.00	4.63	0.00				
235.00	6.00	4.63	0.00				
240.00	6.00	4.63	0.00				
245.00	6.00	4.63	0.00				
250.00	6.00	4.63	0.00				
255.00	6.00	4.63	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment PROP DP 5: PROP DP 5

Runoff = 4.82 cfs @ 12.08 hrs, Volume= 0.354 af, Depth= 4.74"

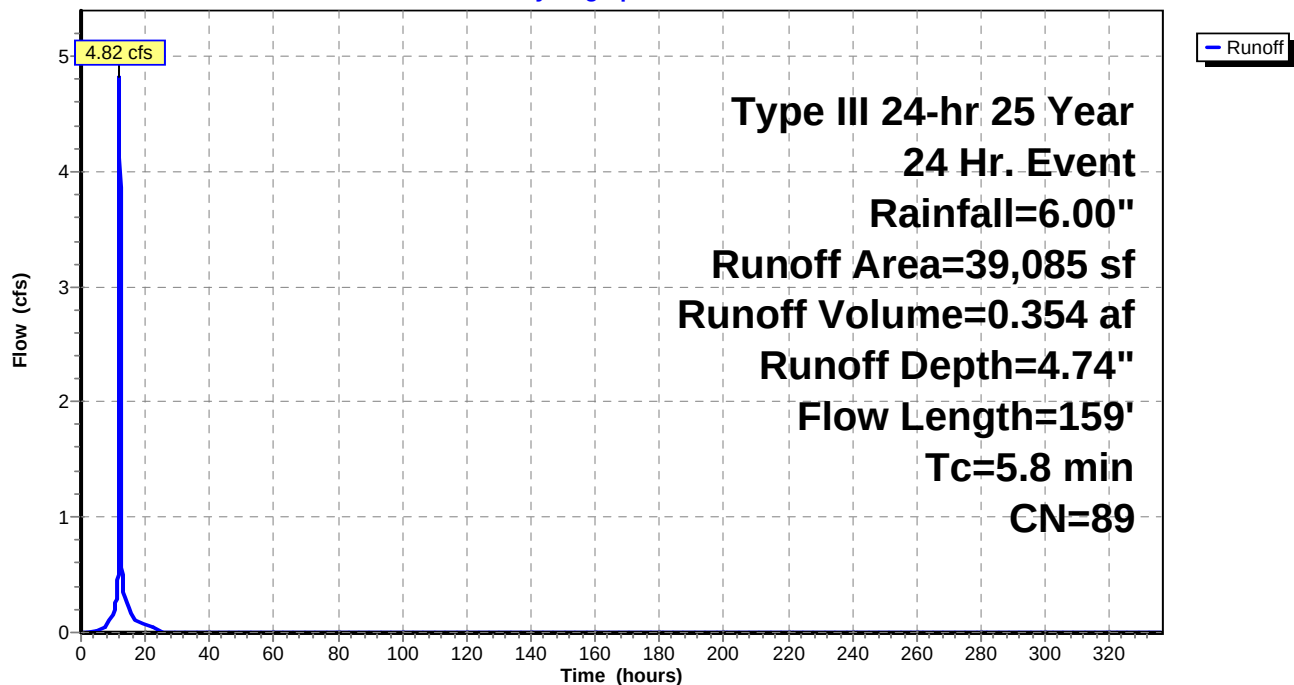
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
29,670	98	Paved parking & roofs
9,415	61	>75% Grass cover, Good, HSG B
39,085	89	Weighted Average
9,415		24.09% Pervious Area
29,670		75.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	100	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	159	Total			

Subcatchment PROP DP 5: PROP DP 5

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment PROP DP 5: PROP DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.74	0.00
5.00	0.34	0.01	0.01	265.00	6.00	4.74	0.00
10.00	1.13	0.37	0.17	270.00	6.00	4.74	0.00
15.00	5.13	3.89	0.20	275.00	6.00	4.74	0.00
20.00	5.74	4.49	0.07	280.00	6.00	4.74	0.00
25.00	6.00	4.74	0.00	285.00	6.00	4.74	0.00
30.00	6.00	4.74	0.00	290.00	6.00	4.74	0.00
35.00	6.00	4.74	0.00	295.00	6.00	4.74	0.00
40.00	6.00	4.74	0.00	300.00	6.00	4.74	0.00
45.00	6.00	4.74	0.00	305.00	6.00	4.74	0.00
50.00	6.00	4.74	0.00	310.00	6.00	4.74	0.00
55.00	6.00	4.74	0.00	315.00	6.00	4.74	0.00
60.00	6.00	4.74	0.00	320.00	6.00	4.74	0.00
65.00	6.00	4.74	0.00	325.00	6.00	4.74	0.00
70.00	6.00	4.74	0.00	330.00	6.00	4.74	0.00
75.00	6.00	4.74	0.00	335.00	6.00	4.74	0.00
80.00	6.00	4.74	0.00				
85.00	6.00	4.74	0.00				
90.00	6.00	4.74	0.00				
95.00	6.00	4.74	0.00				
100.00	6.00	4.74	0.00				
105.00	6.00	4.74	0.00				
110.00	6.00	4.74	0.00				
115.00	6.00	4.74	0.00				
120.00	6.00	4.74	0.00				
125.00	6.00	4.74	0.00				
130.00	6.00	4.74	0.00				
135.00	6.00	4.74	0.00				
140.00	6.00	4.74	0.00				
145.00	6.00	4.74	0.00				
150.00	6.00	4.74	0.00				
155.00	6.00	4.74	0.00				
160.00	6.00	4.74	0.00				
165.00	6.00	4.74	0.00				
170.00	6.00	4.74	0.00				
175.00	6.00	4.74	0.00				
180.00	6.00	4.74	0.00				
185.00	6.00	4.74	0.00				
190.00	6.00	4.74	0.00				
195.00	6.00	4.74	0.00				
200.00	6.00	4.74	0.00				
205.00	6.00	4.74	0.00				
210.00	6.00	4.74	0.00				
215.00	6.00	4.74	0.00				
220.00	6.00	4.74	0.00				
225.00	6.00	4.74	0.00				
230.00	6.00	4.74	0.00				
235.00	6.00	4.74	0.00				
240.00	6.00	4.74	0.00				
245.00	6.00	4.74	0.00				
250.00	6.00	4.74	0.00				
255.00	6.00	4.74	0.00				

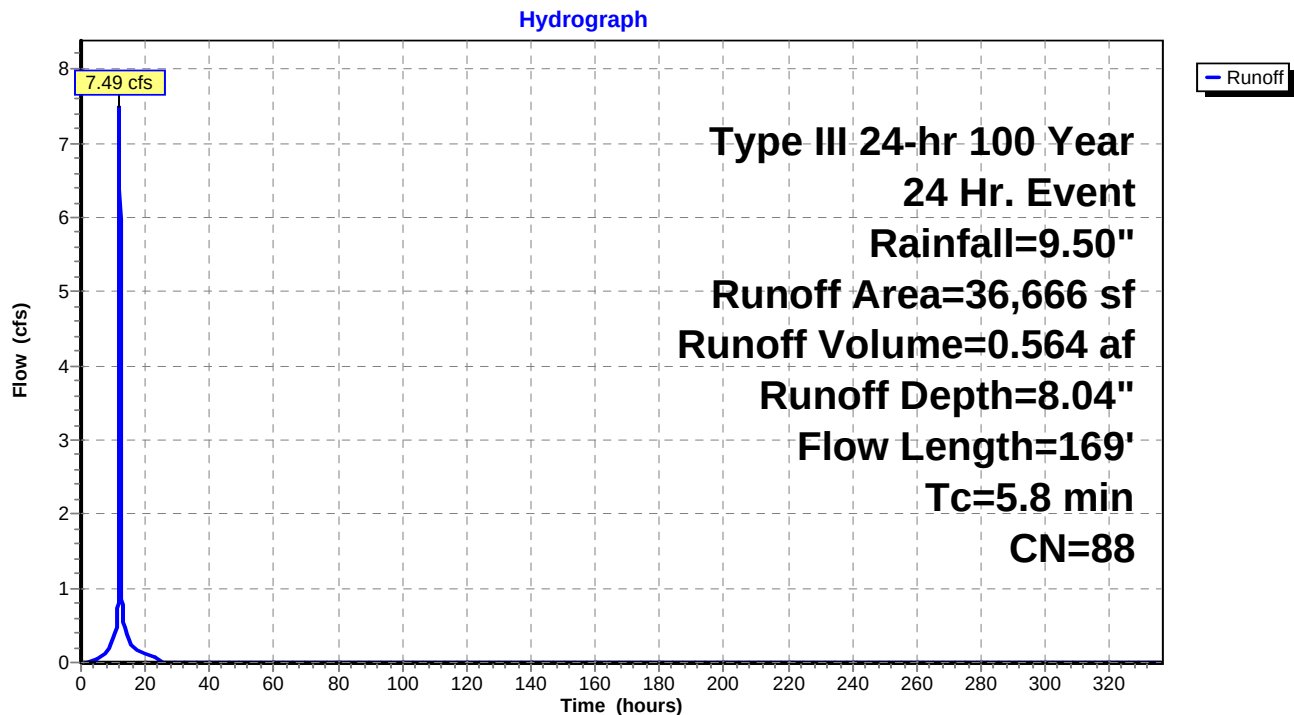
Summary for Subcatchment EX DP 5: EX DP 5

Runoff = 7.49 cfs @ 12.08 hrs, Volume= 0.564 af, Depth= 8.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
27,116	98	Paved parking & roofs
9,550	61	>75% Grass cover, Good, HSG B
36,666	88	Weighted Average
9,550		26.05% Pervious Area
27,116		73.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	110	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	169	Total			

Subcatchment EX DP 5: EX DP 5

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX DP 5: EX DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.04	0.00
5.00	0.54	0.04	0.03	265.00	9.50	8.04	0.00
10.00	1.80	0.80	0.30	270.00	9.50	8.04	0.00
15.00	8.12	6.68	0.30	275.00	9.50	8.04	0.00
20.00	9.09	7.64	0.10	280.00	9.50	8.04	0.00
25.00	9.50	8.04	0.00	285.00	9.50	8.04	0.00
30.00	9.50	8.04	0.00	290.00	9.50	8.04	0.00
35.00	9.50	8.04	0.00	295.00	9.50	8.04	0.00
40.00	9.50	8.04	0.00	300.00	9.50	8.04	0.00
45.00	9.50	8.04	0.00	305.00	9.50	8.04	0.00
50.00	9.50	8.04	0.00	310.00	9.50	8.04	0.00
55.00	9.50	8.04	0.00	315.00	9.50	8.04	0.00
60.00	9.50	8.04	0.00	320.00	9.50	8.04	0.00
65.00	9.50	8.04	0.00	325.00	9.50	8.04	0.00
70.00	9.50	8.04	0.00	330.00	9.50	8.04	0.00
75.00	9.50	8.04	0.00	335.00	9.50	8.04	0.00
80.00	9.50	8.04	0.00				
85.00	9.50	8.04	0.00				
90.00	9.50	8.04	0.00				
95.00	9.50	8.04	0.00				
100.00	9.50	8.04	0.00				
105.00	9.50	8.04	0.00				
110.00	9.50	8.04	0.00				
115.00	9.50	8.04	0.00				
120.00	9.50	8.04	0.00				
125.00	9.50	8.04	0.00				
130.00	9.50	8.04	0.00				
135.00	9.50	8.04	0.00				
140.00	9.50	8.04	0.00				
145.00	9.50	8.04	0.00				
150.00	9.50	8.04	0.00				
155.00	9.50	8.04	0.00				
160.00	9.50	8.04	0.00				
165.00	9.50	8.04	0.00				
170.00	9.50	8.04	0.00				
175.00	9.50	8.04	0.00				
180.00	9.50	8.04	0.00				
185.00	9.50	8.04	0.00				
190.00	9.50	8.04	0.00				
195.00	9.50	8.04	0.00				
200.00	9.50	8.04	0.00				
205.00	9.50	8.04	0.00				
210.00	9.50	8.04	0.00				
215.00	9.50	8.04	0.00				
220.00	9.50	8.04	0.00				
225.00	9.50	8.04	0.00				
230.00	9.50	8.04	0.00				
235.00	9.50	8.04	0.00				
240.00	9.50	8.04	0.00				
245.00	9.50	8.04	0.00				
250.00	9.50	8.04	0.00				
255.00	9.50	8.04	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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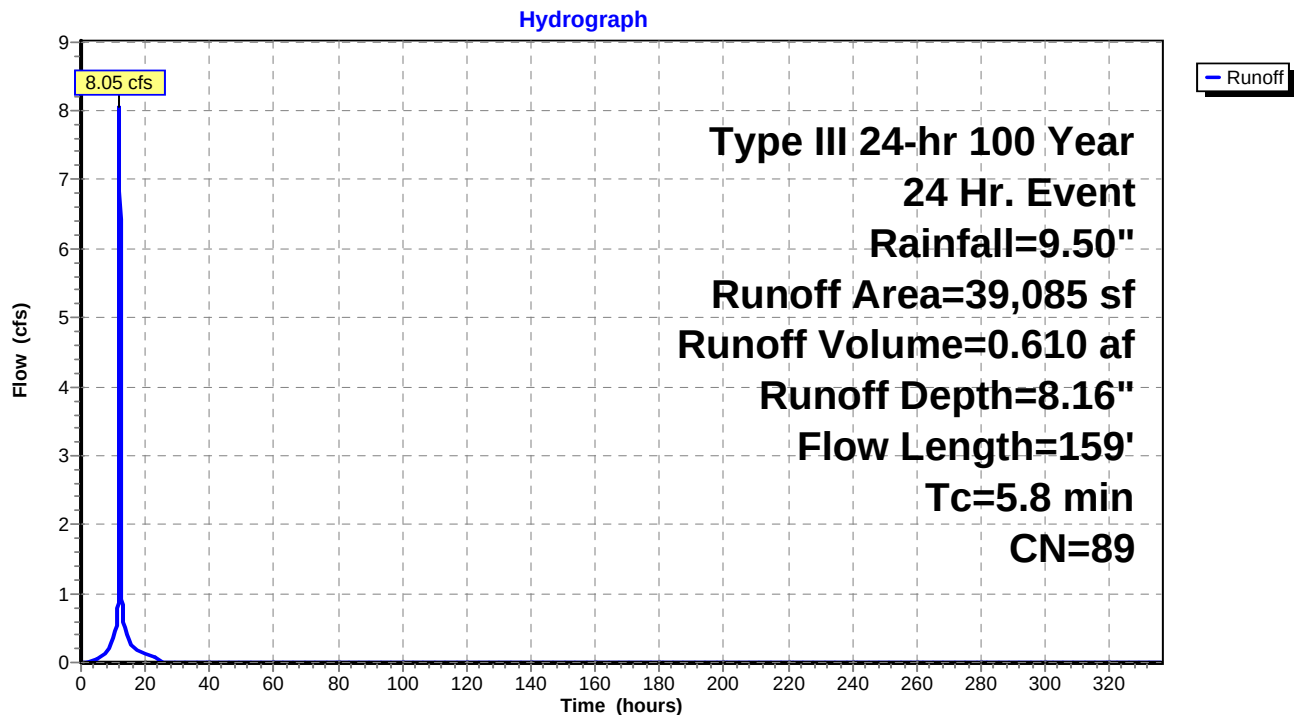
Summary for Subcatchment PROP DP 5: PROP DP 5

Runoff = 8.05 cfs @ 12.08 hrs, Volume= 0.610 af, Depth= 8.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
29,670	98	Paved parking & roofs
9,415	61	>75% Grass cover, Good, HSG B
39,085	89	Weighted Average
9,415		24.09% Pervious Area
29,670		75.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	22	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.3	100	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	37	0.1620	6.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.8	159	Total			

Subcatchment PROP DP 5: PROP DP 5

Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment PROP DP 5: PROP DP 5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.16	0.00
5.00	0.54	0.06	0.04	265.00	9.50	8.16	0.00
10.00	1.80	0.86	0.33	270.00	9.50	8.16	0.00
15.00	8.12	6.80	0.33	275.00	9.50	8.16	0.00
20.00	9.09	7.76	0.11	280.00	9.50	8.16	0.00
25.00	9.50	8.16	0.00	285.00	9.50	8.16	0.00
30.00	9.50	8.16	0.00	290.00	9.50	8.16	0.00
35.00	9.50	8.16	0.00	295.00	9.50	8.16	0.00
40.00	9.50	8.16	0.00	300.00	9.50	8.16	0.00
45.00	9.50	8.16	0.00	305.00	9.50	8.16	0.00
50.00	9.50	8.16	0.00	310.00	9.50	8.16	0.00
55.00	9.50	8.16	0.00	315.00	9.50	8.16	0.00
60.00	9.50	8.16	0.00	320.00	9.50	8.16	0.00
65.00	9.50	8.16	0.00	325.00	9.50	8.16	0.00
70.00	9.50	8.16	0.00	330.00	9.50	8.16	0.00
75.00	9.50	8.16	0.00	335.00	9.50	8.16	0.00
80.00	9.50	8.16	0.00				
85.00	9.50	8.16	0.00				
90.00	9.50	8.16	0.00				
95.00	9.50	8.16	0.00				
100.00	9.50	8.16	0.00				
105.00	9.50	8.16	0.00				
110.00	9.50	8.16	0.00				
115.00	9.50	8.16	0.00				
120.00	9.50	8.16	0.00				
125.00	9.50	8.16	0.00				
130.00	9.50	8.16	0.00				
135.00	9.50	8.16	0.00				
140.00	9.50	8.16	0.00				
145.00	9.50	8.16	0.00				
150.00	9.50	8.16	0.00				
155.00	9.50	8.16	0.00				
160.00	9.50	8.16	0.00				
165.00	9.50	8.16	0.00				
170.00	9.50	8.16	0.00				
175.00	9.50	8.16	0.00				
180.00	9.50	8.16	0.00				
185.00	9.50	8.16	0.00				
190.00	9.50	8.16	0.00				
195.00	9.50	8.16	0.00				
200.00	9.50	8.16	0.00				
205.00	9.50	8.16	0.00				
210.00	9.50	8.16	0.00				
215.00	9.50	8.16	0.00				
220.00	9.50	8.16	0.00				
225.00	9.50	8.16	0.00				
230.00	9.50	8.16	0.00				
235.00	9.50	8.16	0.00				
240.00	9.50	8.16	0.00				
245.00	9.50	8.16	0.00				
250.00	9.50	8.16	0.00				
255.00	9.50	8.16	0.00				



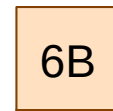
EX 6A



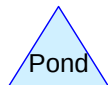
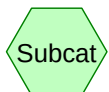
PROP 6A



Post 6B



Post DP 6



Drainage Diagram for Watchtower_2010 JM

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Summary for Subcatchment EX 6A: EX 6A

Runoff = 21.60 cfs @ 12.00 hrs, Volume= 1.267 af, Depth= 2.08"

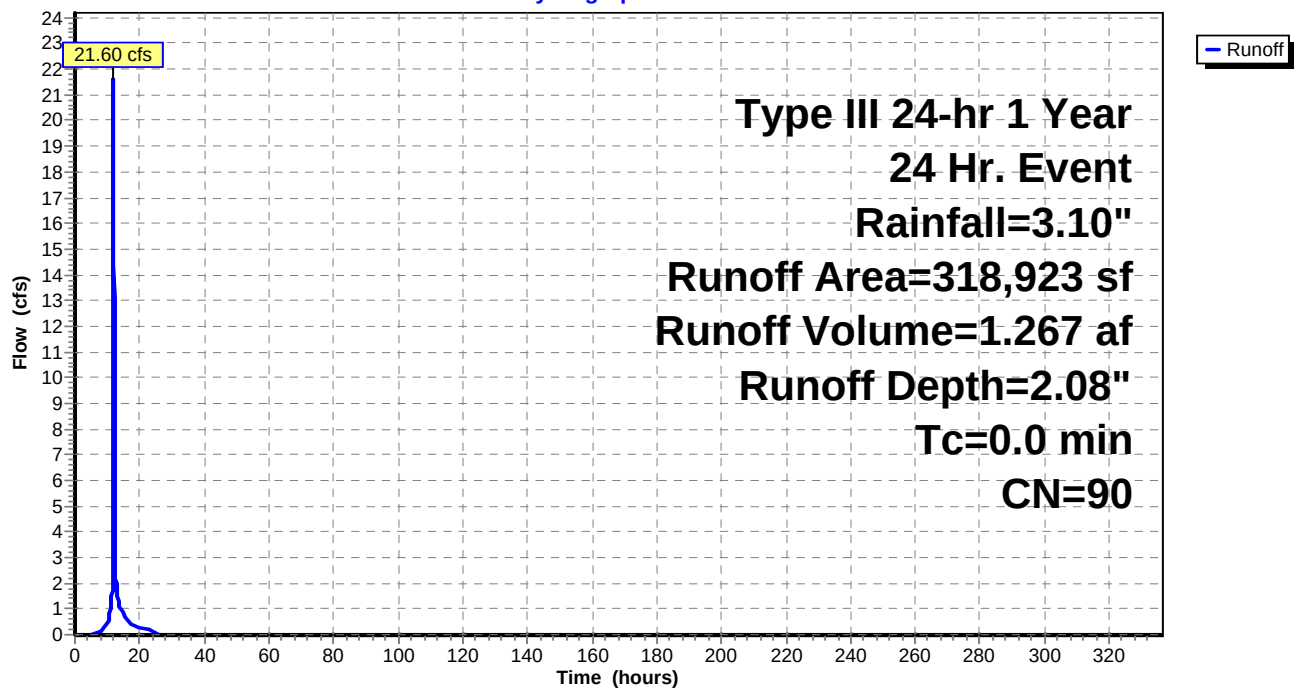
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
206,719	98	Paved roads w/curbs & sewers, HSG B
112,204	74	>75% Grass cover, Good, HSG C
318,923	90	Weighted Average
112,204		35.18% Pervious Area
206,719		64.82% Impervious Area

Subcatchment EX 6A: EX 6A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment EX 6A: EX 6A

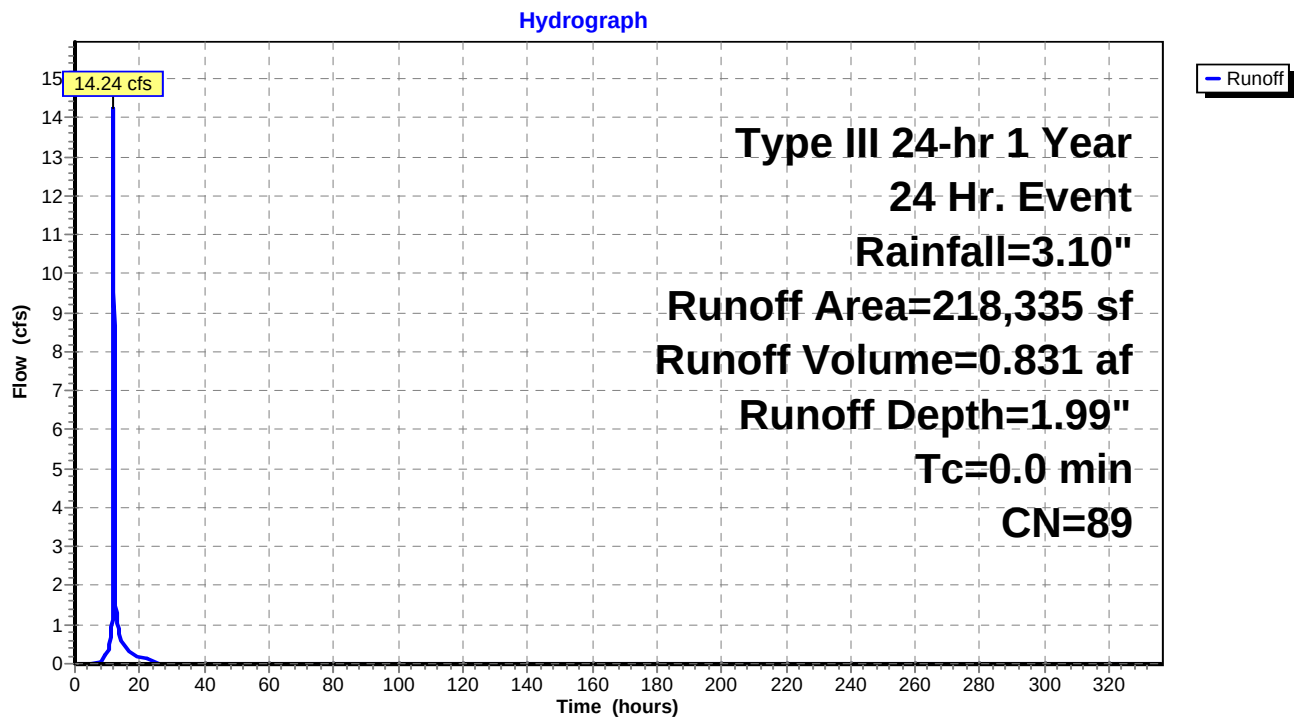
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	2.08	0.00
5.00	0.18	0.00	0.00	265.00	3.10	2.08	0.00
10.00	0.59	0.09	0.49	270.00	3.10	2.08	0.00
15.00	2.65	1.66	0.77	275.00	3.10	2.08	0.00
20.00	2.97	1.95	0.27	280.00	3.10	2.08	0.00
25.00	3.10	2.08	0.00	285.00	3.10	2.08	0.00
30.00	3.10	2.08	0.00	290.00	3.10	2.08	0.00
35.00	3.10	2.08	0.00	295.00	3.10	2.08	0.00
40.00	3.10	2.08	0.00	300.00	3.10	2.08	0.00
45.00	3.10	2.08	0.00	305.00	3.10	2.08	0.00
50.00	3.10	2.08	0.00	310.00	3.10	2.08	0.00
55.00	3.10	2.08	0.00	315.00	3.10	2.08	0.00
60.00	3.10	2.08	0.00	320.00	3.10	2.08	0.00
65.00	3.10	2.08	0.00	325.00	3.10	2.08	0.00
70.00	3.10	2.08	0.00	330.00	3.10	2.08	0.00
75.00	3.10	2.08	0.00	335.00	3.10	2.08	0.00
80.00	3.10	2.08	0.00				
85.00	3.10	2.08	0.00				
90.00	3.10	2.08	0.00				
95.00	3.10	2.08	0.00				
100.00	3.10	2.08	0.00				
105.00	3.10	2.08	0.00				
110.00	3.10	2.08	0.00				
115.00	3.10	2.08	0.00				
120.00	3.10	2.08	0.00				
125.00	3.10	2.08	0.00				
130.00	3.10	2.08	0.00				
135.00	3.10	2.08	0.00				
140.00	3.10	2.08	0.00				
145.00	3.10	2.08	0.00				
150.00	3.10	2.08	0.00				
155.00	3.10	2.08	0.00				
160.00	3.10	2.08	0.00				
165.00	3.10	2.08	0.00				
170.00	3.10	2.08	0.00				
175.00	3.10	2.08	0.00				
180.00	3.10	2.08	0.00				
185.00	3.10	2.08	0.00				
190.00	3.10	2.08	0.00				
195.00	3.10	2.08	0.00				
200.00	3.10	2.08	0.00				
205.00	3.10	2.08	0.00				
210.00	3.10	2.08	0.00				
215.00	3.10	2.08	0.00				
220.00	3.10	2.08	0.00				
225.00	3.10	2.08	0.00				
230.00	3.10	2.08	0.00				
235.00	3.10	2.08	0.00				
240.00	3.10	2.08	0.00				
245.00	3.10	2.08	0.00				
250.00	3.10	2.08	0.00				
255.00	3.10	2.08	0.00				

Summary for Subcatchment Prop 6A: PROP 6A

Runoff = 14.24 cfs @ 12.00 hrs, Volume= 0.831 af, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
133,419	98	Paved roads w/curbs & sewers, HSG B
84,916	74	>75% Grass cover, Good, HSG C
218,335	89	Weighted Average
84,916		38.89% Pervious Area
133,419		61.11% Impervious Area

Subcatchment Prop 6A: PROP 6A

Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment Prop 6A: PROP 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.99	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.99	0.00
10.00	0.59	0.07	0.29	270.00	3.10	1.99	0.00
15.00	2.65	1.59	0.52	275.00	3.10	1.99	0.00
20.00	2.97	1.87	0.18	280.00	3.10	1.99	0.00
25.00	3.10	1.99	0.00	285.00	3.10	1.99	0.00
30.00	3.10	1.99	0.00	290.00	3.10	1.99	0.00
35.00	3.10	1.99	0.00	295.00	3.10	1.99	0.00
40.00	3.10	1.99	0.00	300.00	3.10	1.99	0.00
45.00	3.10	1.99	0.00	305.00	3.10	1.99	0.00
50.00	3.10	1.99	0.00	310.00	3.10	1.99	0.00
55.00	3.10	1.99	0.00	315.00	3.10	1.99	0.00
60.00	3.10	1.99	0.00	320.00	3.10	1.99	0.00
65.00	3.10	1.99	0.00	325.00	3.10	1.99	0.00
70.00	3.10	1.99	0.00	330.00	3.10	1.99	0.00
75.00	3.10	1.99	0.00	335.00	3.10	1.99	0.00
80.00	3.10	1.99	0.00				
85.00	3.10	1.99	0.00				
90.00	3.10	1.99	0.00				
95.00	3.10	1.99	0.00				
100.00	3.10	1.99	0.00				
105.00	3.10	1.99	0.00				
110.00	3.10	1.99	0.00				
115.00	3.10	1.99	0.00				
120.00	3.10	1.99	0.00				
125.00	3.10	1.99	0.00				
130.00	3.10	1.99	0.00				
135.00	3.10	1.99	0.00				
140.00	3.10	1.99	0.00				
145.00	3.10	1.99	0.00				
150.00	3.10	1.99	0.00				
155.00	3.10	1.99	0.00				
160.00	3.10	1.99	0.00				
165.00	3.10	1.99	0.00				
170.00	3.10	1.99	0.00				
175.00	3.10	1.99	0.00				
180.00	3.10	1.99	0.00				
185.00	3.10	1.99	0.00				
190.00	3.10	1.99	0.00				
195.00	3.10	1.99	0.00				
200.00	3.10	1.99	0.00				
205.00	3.10	1.99	0.00				
210.00	3.10	1.99	0.00				
215.00	3.10	1.99	0.00				
220.00	3.10	1.99	0.00				
225.00	3.10	1.99	0.00				
230.00	3.10	1.99	0.00				
235.00	3.10	1.99	0.00				
240.00	3.10	1.99	0.00				
245.00	3.10	1.99	0.00				
250.00	3.10	1.99	0.00				
255.00	3.10	1.99	0.00				

Watchtower_2010 JM

Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

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Summary for Subcatchment PROP 6B: Post 6B

Runoff = 0.33 cfs @ 12.14 hrs, Volume= 0.027 af, Depth= 1.39"

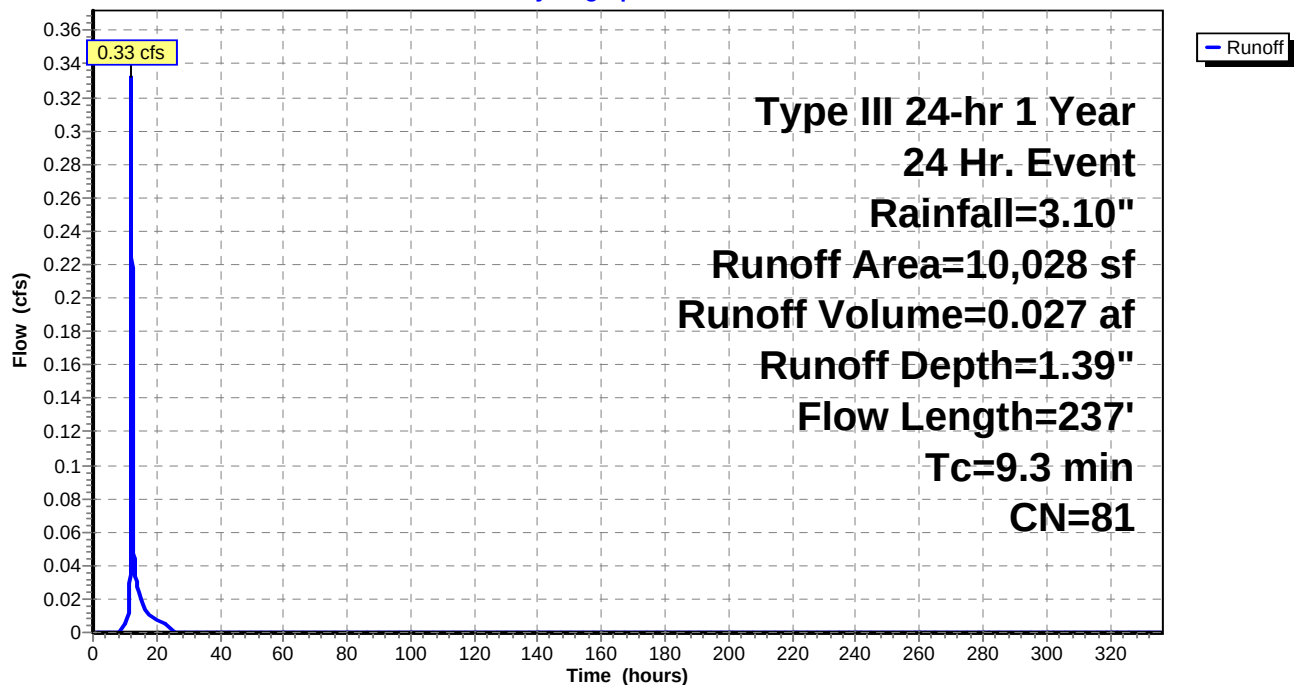
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"

Area (sf)	CN	Description
3,037	98	Paved roads w/curbs & sewers, HSG B
6,991	74	>75% Grass cover, Good, HSG C
10,028	81	Weighted Average
6,991		69.71% Pervious Area
3,037		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	137	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.3	237	Total			

Subcatchment PROP 6B: Post 6B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Subcatchment PROP 6B: Post 6B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.10	1.39	0.00
5.00	0.18	0.00	0.00	265.00	3.10	1.39	0.00
10.00	0.59	0.01	0.00	270.00	3.10	1.39	0.00
15.00	2.65	1.05	0.02	275.00	3.10	1.39	0.00
20.00	2.97	1.29	0.01	280.00	3.10	1.39	0.00
25.00	3.10	1.39	0.00	285.00	3.10	1.39	0.00
30.00	3.10	1.39	0.00	290.00	3.10	1.39	0.00
35.00	3.10	1.39	0.00	295.00	3.10	1.39	0.00
40.00	3.10	1.39	0.00	300.00	3.10	1.39	0.00
45.00	3.10	1.39	0.00	305.00	3.10	1.39	0.00
50.00	3.10	1.39	0.00	310.00	3.10	1.39	0.00
55.00	3.10	1.39	0.00	315.00	3.10	1.39	0.00
60.00	3.10	1.39	0.00	320.00	3.10	1.39	0.00
65.00	3.10	1.39	0.00	325.00	3.10	1.39	0.00
70.00	3.10	1.39	0.00	330.00	3.10	1.39	0.00
75.00	3.10	1.39	0.00	335.00	3.10	1.39	0.00
80.00	3.10	1.39	0.00				
85.00	3.10	1.39	0.00				
90.00	3.10	1.39	0.00				
95.00	3.10	1.39	0.00				
100.00	3.10	1.39	0.00				
105.00	3.10	1.39	0.00				
110.00	3.10	1.39	0.00				
115.00	3.10	1.39	0.00				
120.00	3.10	1.39	0.00				
125.00	3.10	1.39	0.00				
130.00	3.10	1.39	0.00				
135.00	3.10	1.39	0.00				
140.00	3.10	1.39	0.00				
145.00	3.10	1.39	0.00				
150.00	3.10	1.39	0.00				
155.00	3.10	1.39	0.00				
160.00	3.10	1.39	0.00				
165.00	3.10	1.39	0.00				
170.00	3.10	1.39	0.00				
175.00	3.10	1.39	0.00				
180.00	3.10	1.39	0.00				
185.00	3.10	1.39	0.00				
190.00	3.10	1.39	0.00				
195.00	3.10	1.39	0.00				
200.00	3.10	1.39	0.00				
205.00	3.10	1.39	0.00				
210.00	3.10	1.39	0.00				
215.00	3.10	1.39	0.00				
220.00	3.10	1.39	0.00				
225.00	3.10	1.39	0.00				
230.00	3.10	1.39	0.00				
235.00	3.10	1.39	0.00				
240.00	3.10	1.39	0.00				
245.00	3.10	1.39	0.00				
250.00	3.10	1.39	0.00				
255.00	3.10	1.39	0.00				

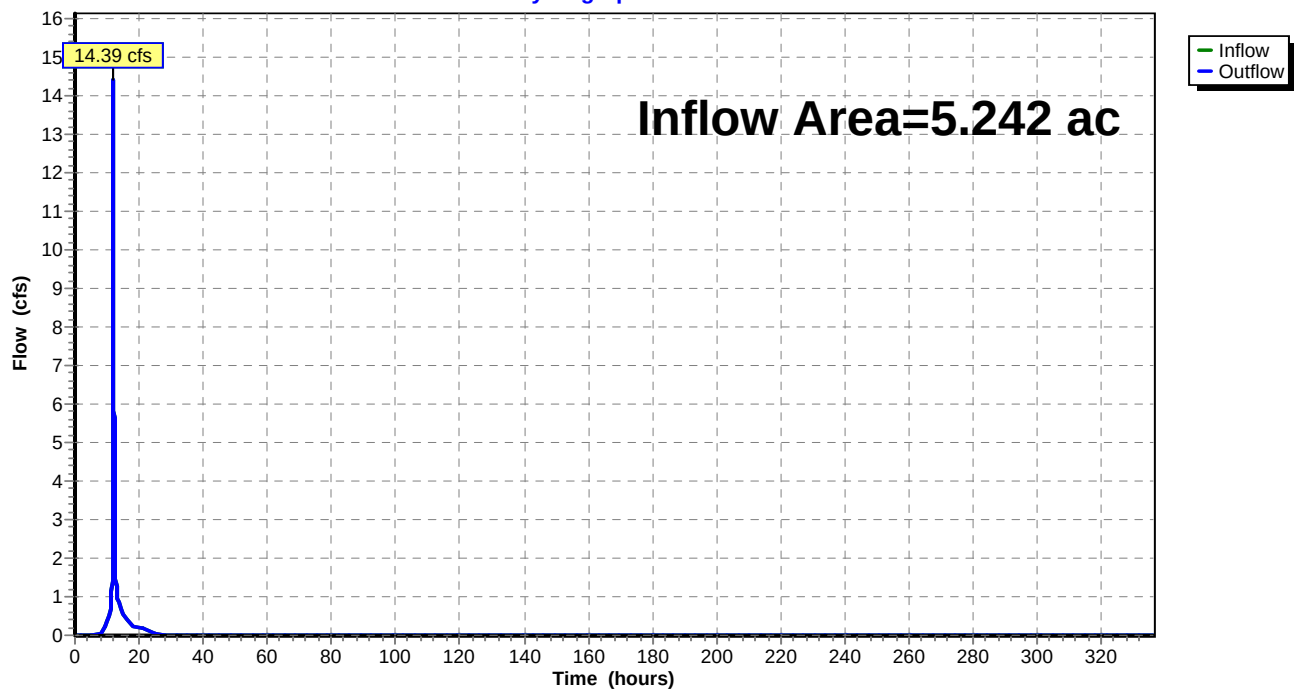
Summary for Reach 6B: Post DP 6

Inflow Area = 5.242 ac, 59.75% Impervious, Inflow Depth = 1.96" for 1 Year, 24 Hr. Event event
Inflow = 14.39 cfs @ 12.00 hrs, Volume= 0.858 af
Outflow = 14.39 cfs @ 12.00 hrs, Volume= 0.858 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach 6B: Post DP 6

Hydrograph



Watchtower_2010 JM*Type III 24-hr 1 Year, 24 Hr. Event Rainfall=3.10"*

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Hydrograph for Reach 6B: Post DP 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.30		0.30	270.00	0.00		0.00
15.00	0.54		0.54	275.00	0.00		0.00
20.00	0.19		0.19	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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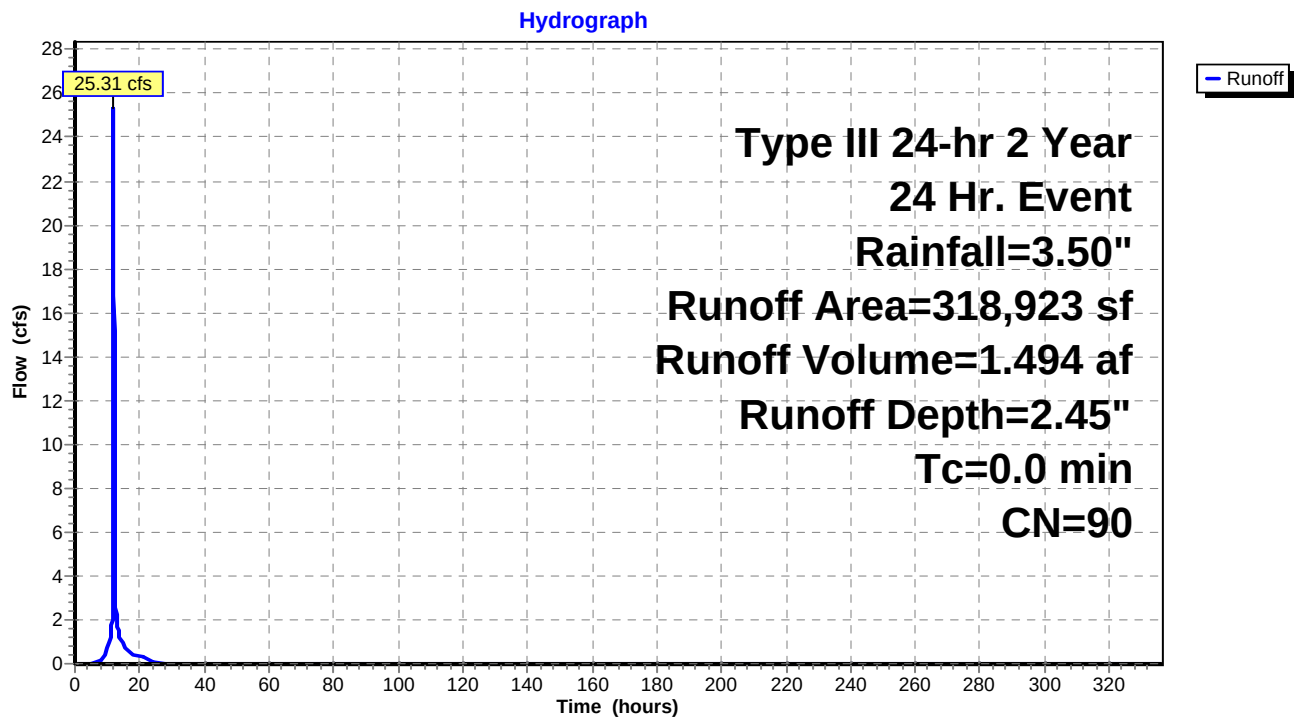
Summary for Subcatchment EX 6A: EX 6A

Runoff = 25.31 cfs @ 12.00 hrs, Volume= 1.494 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
206,719	98	Paved roads w/curbs & sewers, HSG B
112,204	74	>75% Grass cover, Good, HSG C
318,923	90	Weighted Average
112,204		35.18% Pervious Area
206,719		64.82% Impervious Area

Subcatchment EX 6A: EX 6A

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment EX 6A: EX 6A

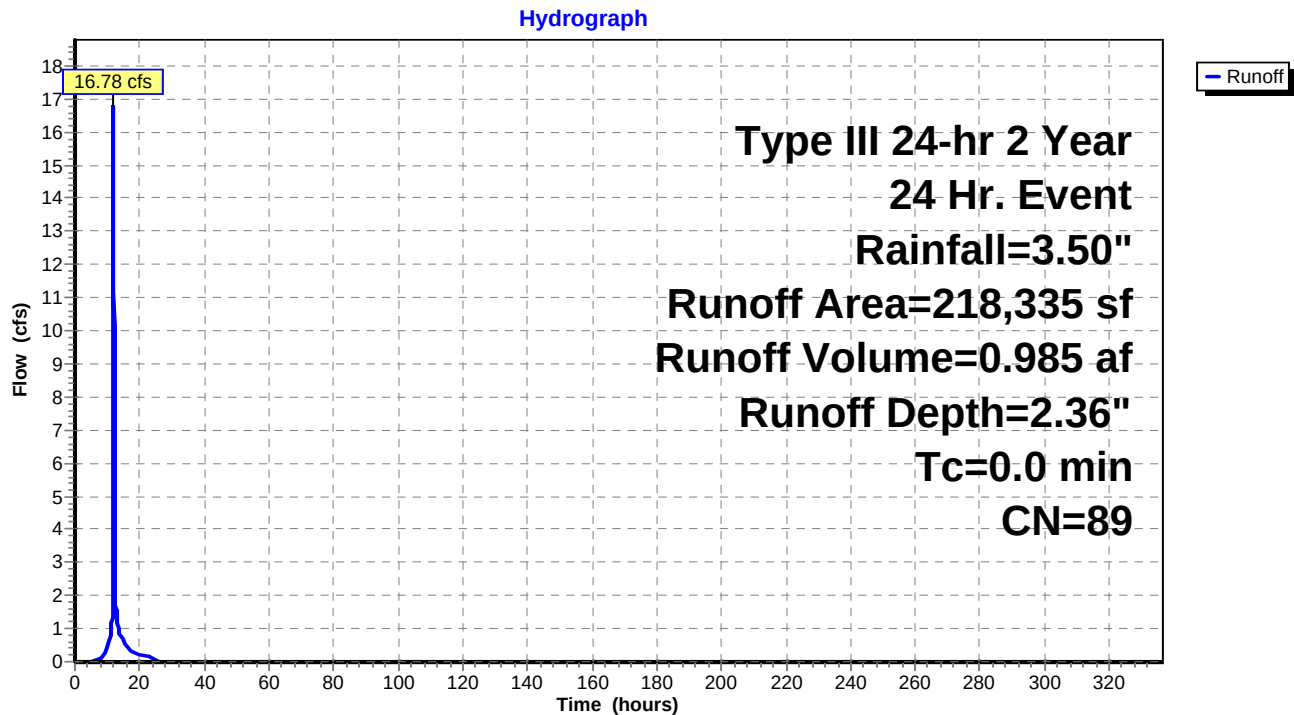
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.45	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.45	0.00
10.00	0.66	0.12	0.62	270.00	3.50	2.45	0.00
15.00	2.99	1.97	0.89	275.00	3.50	2.45	0.00
20.00	3.35	2.31	0.31	280.00	3.50	2.45	0.00
25.00	3.50	2.45	0.00	285.00	3.50	2.45	0.00
30.00	3.50	2.45	0.00	290.00	3.50	2.45	0.00
35.00	3.50	2.45	0.00	295.00	3.50	2.45	0.00
40.00	3.50	2.45	0.00	300.00	3.50	2.45	0.00
45.00	3.50	2.45	0.00	305.00	3.50	2.45	0.00
50.00	3.50	2.45	0.00	310.00	3.50	2.45	0.00
55.00	3.50	2.45	0.00	315.00	3.50	2.45	0.00
60.00	3.50	2.45	0.00	320.00	3.50	2.45	0.00
65.00	3.50	2.45	0.00	325.00	3.50	2.45	0.00
70.00	3.50	2.45	0.00	330.00	3.50	2.45	0.00
75.00	3.50	2.45	0.00	335.00	3.50	2.45	0.00
80.00	3.50	2.45	0.00				
85.00	3.50	2.45	0.00				
90.00	3.50	2.45	0.00				
95.00	3.50	2.45	0.00				
100.00	3.50	2.45	0.00				
105.00	3.50	2.45	0.00				
110.00	3.50	2.45	0.00				
115.00	3.50	2.45	0.00				
120.00	3.50	2.45	0.00				
125.00	3.50	2.45	0.00				
130.00	3.50	2.45	0.00				
135.00	3.50	2.45	0.00				
140.00	3.50	2.45	0.00				
145.00	3.50	2.45	0.00				
150.00	3.50	2.45	0.00				
155.00	3.50	2.45	0.00				
160.00	3.50	2.45	0.00				
165.00	3.50	2.45	0.00				
170.00	3.50	2.45	0.00				
175.00	3.50	2.45	0.00				
180.00	3.50	2.45	0.00				
185.00	3.50	2.45	0.00				
190.00	3.50	2.45	0.00				
195.00	3.50	2.45	0.00				
200.00	3.50	2.45	0.00				
205.00	3.50	2.45	0.00				
210.00	3.50	2.45	0.00				
215.00	3.50	2.45	0.00				
220.00	3.50	2.45	0.00				
225.00	3.50	2.45	0.00				
230.00	3.50	2.45	0.00				
235.00	3.50	2.45	0.00				
240.00	3.50	2.45	0.00				
245.00	3.50	2.45	0.00				
250.00	3.50	2.45	0.00				
255.00	3.50	2.45	0.00				

Summary for Subcatchment Prop 6A: PROP 6A

Runoff = 16.78 cfs @ 12.00 hrs, Volume= 0.985 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
133,419	98	Paved roads w/curbs & sewers, HSG B
84,916	74	>75% Grass cover, Good, HSG C
218,335	89	Weighted Average
84,916		38.89% Pervious Area
133,419		61.11% Impervious Area

Subcatchment Prop 6A: PROP 6A

Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment Prop 6A: PROP 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	2.36	0.00
5.00	0.20	0.00	0.00	265.00	3.50	2.36	0.00
10.00	0.66	0.10	0.38	270.00	3.50	2.36	0.00
15.00	2.99	1.89	0.60	275.00	3.50	2.36	0.00
20.00	3.35	2.22	0.21	280.00	3.50	2.36	0.00
25.00	3.50	2.36	0.00	285.00	3.50	2.36	0.00
30.00	3.50	2.36	0.00	290.00	3.50	2.36	0.00
35.00	3.50	2.36	0.00	295.00	3.50	2.36	0.00
40.00	3.50	2.36	0.00	300.00	3.50	2.36	0.00
45.00	3.50	2.36	0.00	305.00	3.50	2.36	0.00
50.00	3.50	2.36	0.00	310.00	3.50	2.36	0.00
55.00	3.50	2.36	0.00	315.00	3.50	2.36	0.00
60.00	3.50	2.36	0.00	320.00	3.50	2.36	0.00
65.00	3.50	2.36	0.00	325.00	3.50	2.36	0.00
70.00	3.50	2.36	0.00	330.00	3.50	2.36	0.00
75.00	3.50	2.36	0.00	335.00	3.50	2.36	0.00
80.00	3.50	2.36	0.00				
85.00	3.50	2.36	0.00				
90.00	3.50	2.36	0.00				
95.00	3.50	2.36	0.00				
100.00	3.50	2.36	0.00				
105.00	3.50	2.36	0.00				
110.00	3.50	2.36	0.00				
115.00	3.50	2.36	0.00				
120.00	3.50	2.36	0.00				
125.00	3.50	2.36	0.00				
130.00	3.50	2.36	0.00				
135.00	3.50	2.36	0.00				
140.00	3.50	2.36	0.00				
145.00	3.50	2.36	0.00				
150.00	3.50	2.36	0.00				
155.00	3.50	2.36	0.00				
160.00	3.50	2.36	0.00				
165.00	3.50	2.36	0.00				
170.00	3.50	2.36	0.00				
175.00	3.50	2.36	0.00				
180.00	3.50	2.36	0.00				
185.00	3.50	2.36	0.00				
190.00	3.50	2.36	0.00				
195.00	3.50	2.36	0.00				
200.00	3.50	2.36	0.00				
205.00	3.50	2.36	0.00				
210.00	3.50	2.36	0.00				
215.00	3.50	2.36	0.00				
220.00	3.50	2.36	0.00				
225.00	3.50	2.36	0.00				
230.00	3.50	2.36	0.00				
235.00	3.50	2.36	0.00				
240.00	3.50	2.36	0.00				
245.00	3.50	2.36	0.00				
250.00	3.50	2.36	0.00				
255.00	3.50	2.36	0.00				

Watchtower_2010 JM

Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

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Summary for Subcatchment PROP 6B: Post 6B

Runoff = 0.41 cfs @ 12.13 hrs, Volume= 0.033 af, Depth= 1.71"

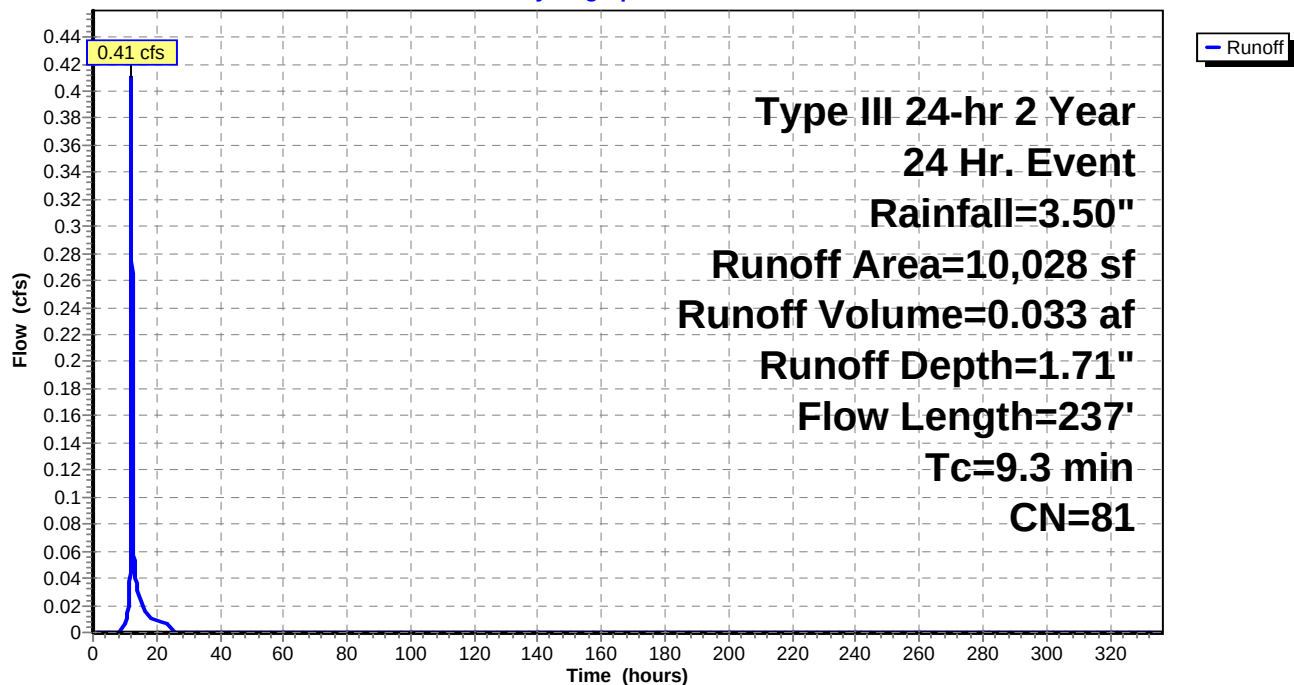
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"

Area (sf)	CN	Description
3,037	98	Paved roads w/curbs & sewers, HSG B
6,991	74	>75% Grass cover, Good, HSG C
10,028	81	Weighted Average
6,991		69.71% Pervious Area
3,037		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	137	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.3	237	Total			

Subcatchment PROP 6B: Post 6B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 2 Year, 24 Hr. Event Rainfall=3.50"*

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Hydrograph for Subcatchment PROP 6B: Post 6B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	3.50	1.71	0.00
5.00	0.20	0.00	0.00	265.00	3.50	1.71	0.00
10.00	0.66	0.01	0.00	270.00	3.50	1.71	0.00
15.00	2.99	1.31	0.02	275.00	3.50	1.71	0.00
20.00	3.35	1.59	0.01	280.00	3.50	1.71	0.00
25.00	3.50	1.71	0.00	285.00	3.50	1.71	0.00
30.00	3.50	1.71	0.00	290.00	3.50	1.71	0.00
35.00	3.50	1.71	0.00	295.00	3.50	1.71	0.00
40.00	3.50	1.71	0.00	300.00	3.50	1.71	0.00
45.00	3.50	1.71	0.00	305.00	3.50	1.71	0.00
50.00	3.50	1.71	0.00	310.00	3.50	1.71	0.00
55.00	3.50	1.71	0.00	315.00	3.50	1.71	0.00
60.00	3.50	1.71	0.00	320.00	3.50	1.71	0.00
65.00	3.50	1.71	0.00	325.00	3.50	1.71	0.00
70.00	3.50	1.71	0.00	330.00	3.50	1.71	0.00
75.00	3.50	1.71	0.00	335.00	3.50	1.71	0.00
80.00	3.50	1.71	0.00				
85.00	3.50	1.71	0.00				
90.00	3.50	1.71	0.00				
95.00	3.50	1.71	0.00				
100.00	3.50	1.71	0.00				
105.00	3.50	1.71	0.00				
110.00	3.50	1.71	0.00				
115.00	3.50	1.71	0.00				
120.00	3.50	1.71	0.00				
125.00	3.50	1.71	0.00				
130.00	3.50	1.71	0.00				
135.00	3.50	1.71	0.00				
140.00	3.50	1.71	0.00				
145.00	3.50	1.71	0.00				
150.00	3.50	1.71	0.00				
155.00	3.50	1.71	0.00				
160.00	3.50	1.71	0.00				
165.00	3.50	1.71	0.00				
170.00	3.50	1.71	0.00				
175.00	3.50	1.71	0.00				
180.00	3.50	1.71	0.00				
185.00	3.50	1.71	0.00				
190.00	3.50	1.71	0.00				
195.00	3.50	1.71	0.00				
200.00	3.50	1.71	0.00				
205.00	3.50	1.71	0.00				
210.00	3.50	1.71	0.00				
215.00	3.50	1.71	0.00				
220.00	3.50	1.71	0.00				
225.00	3.50	1.71	0.00				
230.00	3.50	1.71	0.00				
235.00	3.50	1.71	0.00				
240.00	3.50	1.71	0.00				
245.00	3.50	1.71	0.00				
250.00	3.50	1.71	0.00				
255.00	3.50	1.71	0.00				

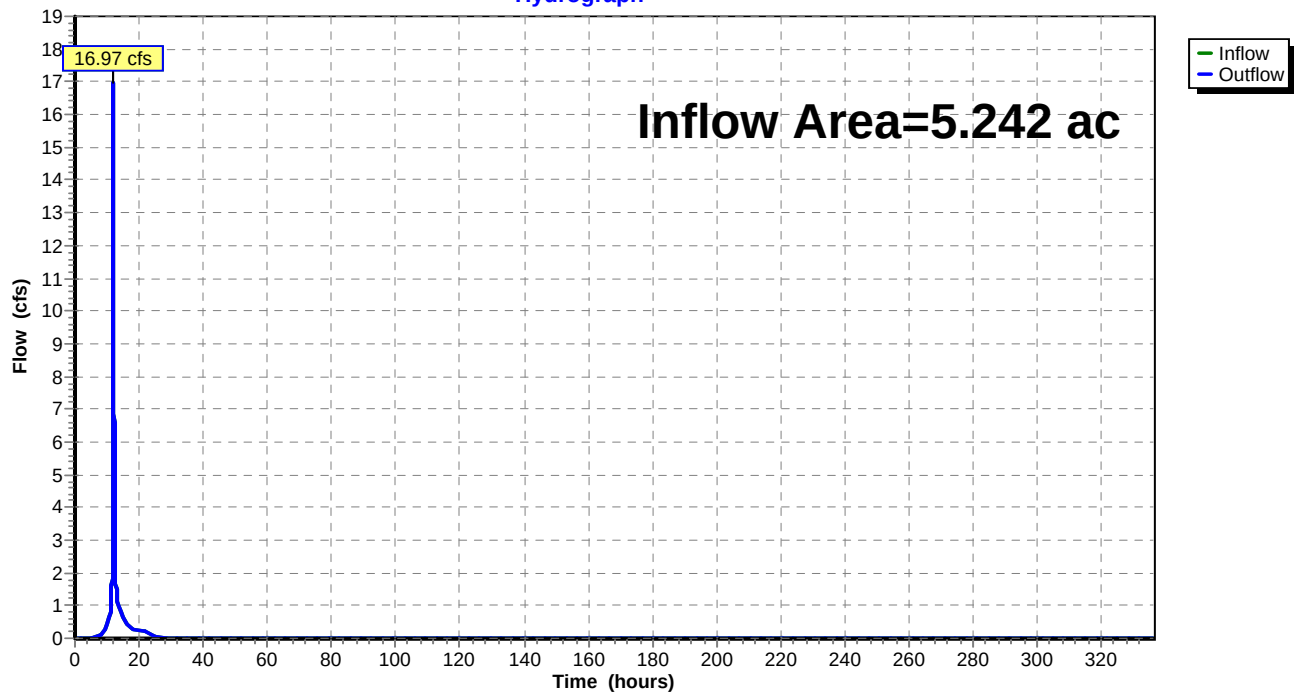
Summary for Reach 6B: Post DP 6

Inflow Area = 5.242 ac, 59.75% Impervious, Inflow Depth = 2.33" for 2 Year, 24 Hr. Event event
Inflow = 16.97 cfs @ 12.00 hrs, Volume= 1.017 af
Outflow = 16.97 cfs @ 12.00 hrs, Volume= 1.017 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach 6B: Post DP 6

Hydrograph



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Hydrograph for Reach 6B: Post DP 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.00		0.00	265.00	0.00		0.00
10.00	0.39		0.39	270.00	0.00		0.00
15.00	0.62		0.62	275.00	0.00		0.00
20.00	0.22		0.22	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment EX 6A: EX 6A

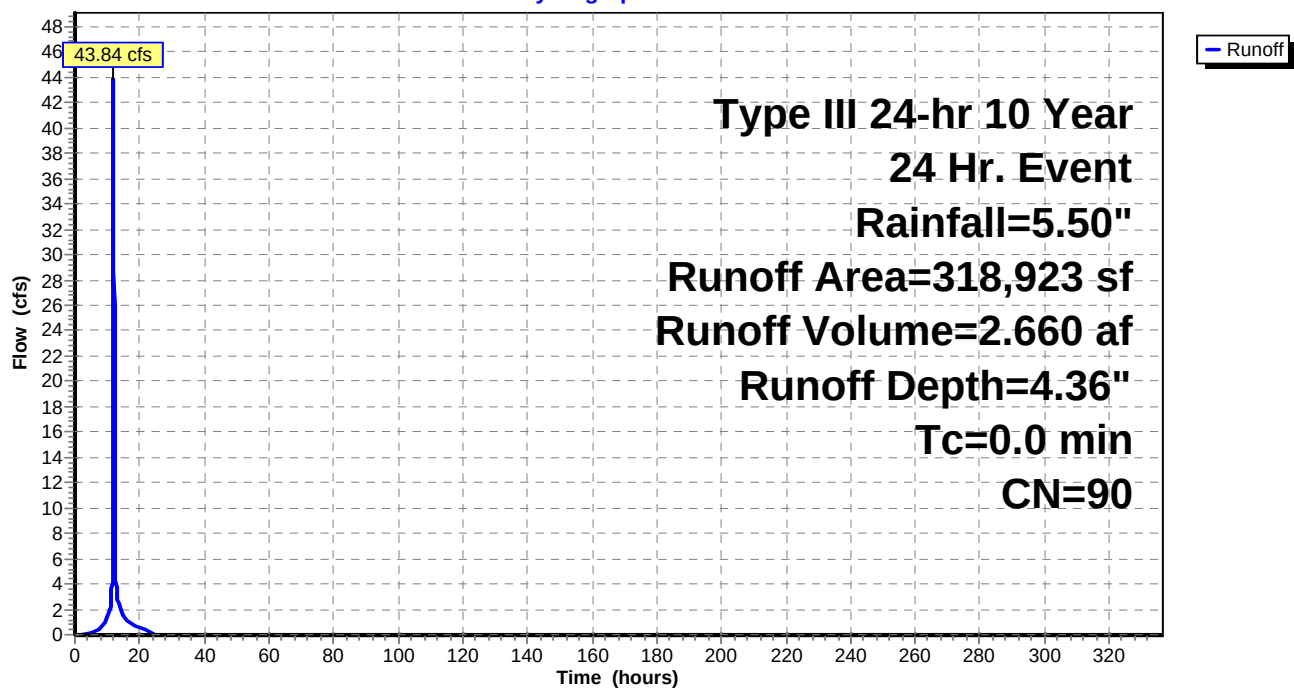
Runoff = 43.84 cfs @ 12.00 hrs, Volume= 2.660 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
206,719	98	Paved roads w/curbs & sewers, HSG B
112,204	74	>75% Grass cover, Good, HSG C
318,923	90	Weighted Average
112,204		35.18% Pervious Area
206,719		64.82% Impervious Area

Subcatchment EX 6A: EX 6A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment EX 6A: EX 6A

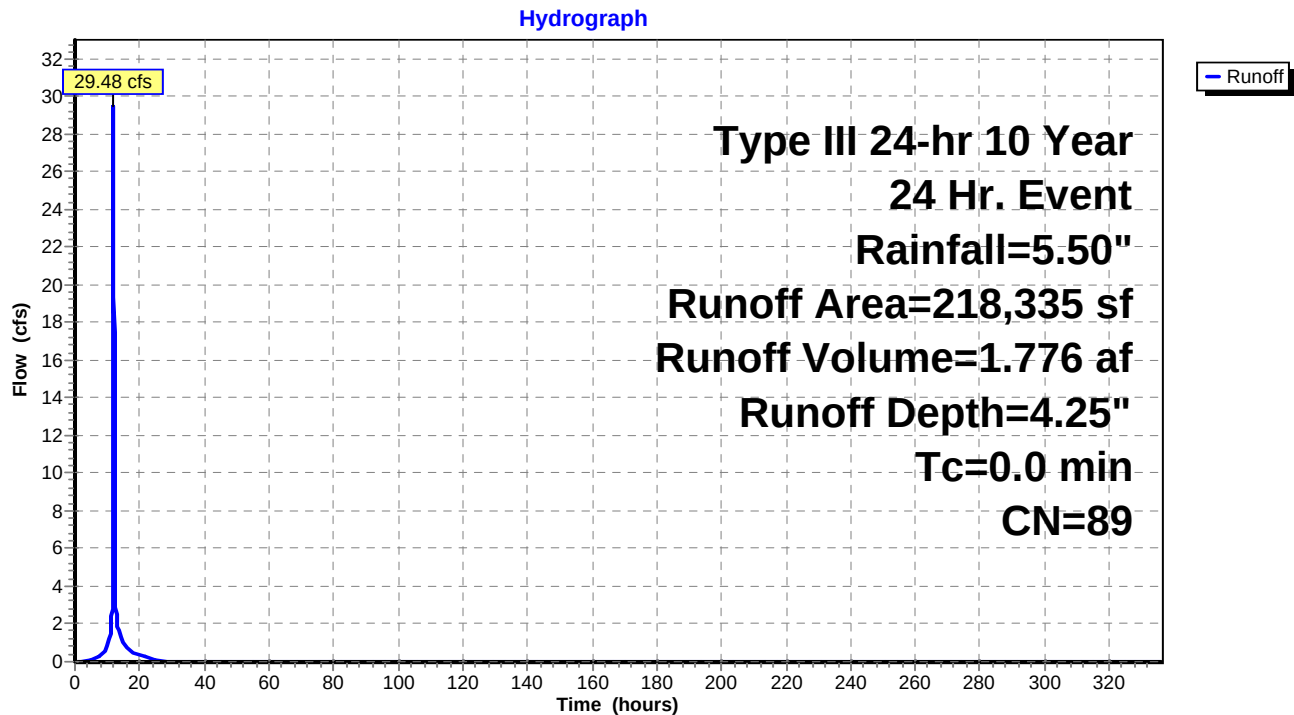
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.36	0.00
5.00	0.31	0.01	0.08	265.00	5.50	4.36	0.00
10.00	1.04	0.35	1.33	270.00	5.50	4.36	0.00
15.00	4.70	3.59	1.46	275.00	5.50	4.36	0.00
20.00	5.26	4.13	0.51	280.00	5.50	4.36	0.00
25.00	5.50	4.36	0.00	285.00	5.50	4.36	0.00
30.00	5.50	4.36	0.00	290.00	5.50	4.36	0.00
35.00	5.50	4.36	0.00	295.00	5.50	4.36	0.00
40.00	5.50	4.36	0.00	300.00	5.50	4.36	0.00
45.00	5.50	4.36	0.00	305.00	5.50	4.36	0.00
50.00	5.50	4.36	0.00	310.00	5.50	4.36	0.00
55.00	5.50	4.36	0.00	315.00	5.50	4.36	0.00
60.00	5.50	4.36	0.00	320.00	5.50	4.36	0.00
65.00	5.50	4.36	0.00	325.00	5.50	4.36	0.00
70.00	5.50	4.36	0.00	330.00	5.50	4.36	0.00
75.00	5.50	4.36	0.00	335.00	5.50	4.36	0.00
80.00	5.50	4.36	0.00				
85.00	5.50	4.36	0.00				
90.00	5.50	4.36	0.00				
95.00	5.50	4.36	0.00				
100.00	5.50	4.36	0.00				
105.00	5.50	4.36	0.00				
110.00	5.50	4.36	0.00				
115.00	5.50	4.36	0.00				
120.00	5.50	4.36	0.00				
125.00	5.50	4.36	0.00				
130.00	5.50	4.36	0.00				
135.00	5.50	4.36	0.00				
140.00	5.50	4.36	0.00				
145.00	5.50	4.36	0.00				
150.00	5.50	4.36	0.00				
155.00	5.50	4.36	0.00				
160.00	5.50	4.36	0.00				
165.00	5.50	4.36	0.00				
170.00	5.50	4.36	0.00				
175.00	5.50	4.36	0.00				
180.00	5.50	4.36	0.00				
185.00	5.50	4.36	0.00				
190.00	5.50	4.36	0.00				
195.00	5.50	4.36	0.00				
200.00	5.50	4.36	0.00				
205.00	5.50	4.36	0.00				
210.00	5.50	4.36	0.00				
215.00	5.50	4.36	0.00				
220.00	5.50	4.36	0.00				
225.00	5.50	4.36	0.00				
230.00	5.50	4.36	0.00				
235.00	5.50	4.36	0.00				
240.00	5.50	4.36	0.00				
245.00	5.50	4.36	0.00				
250.00	5.50	4.36	0.00				
255.00	5.50	4.36	0.00				

Summary for Subcatchment Prop 6A: PROP 6A

Runoff = 29.48 cfs @ 12.00 hrs, Volume= 1.776 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
133,419	98	Paved roads w/curbs & sewers, HSG B
84,916	74	>75% Grass cover, Good, HSG C
218,335	89	Weighted Average
84,916		38.89% Pervious Area
133,419		61.11% Impervious Area

Subcatchment Prop 6A: PROP 6A

Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment Prop 6A: PROP 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	4.25	0.00
5.00	0.31	0.00	0.04	265.00	5.50	4.25	0.00
10.00	1.04	0.31	0.86	270.00	5.50	4.25	0.00
15.00	4.70	3.48	0.99	275.00	5.50	4.25	0.00
20.00	5.26	4.02	0.35	280.00	5.50	4.25	0.00
25.00	5.50	4.25	0.00	285.00	5.50	4.25	0.00
30.00	5.50	4.25	0.00	290.00	5.50	4.25	0.00
35.00	5.50	4.25	0.00	295.00	5.50	4.25	0.00
40.00	5.50	4.25	0.00	300.00	5.50	4.25	0.00
45.00	5.50	4.25	0.00	305.00	5.50	4.25	0.00
50.00	5.50	4.25	0.00	310.00	5.50	4.25	0.00
55.00	5.50	4.25	0.00	315.00	5.50	4.25	0.00
60.00	5.50	4.25	0.00	320.00	5.50	4.25	0.00
65.00	5.50	4.25	0.00	325.00	5.50	4.25	0.00
70.00	5.50	4.25	0.00	330.00	5.50	4.25	0.00
75.00	5.50	4.25	0.00	335.00	5.50	4.25	0.00
80.00	5.50	4.25	0.00				
85.00	5.50	4.25	0.00				
90.00	5.50	4.25	0.00				
95.00	5.50	4.25	0.00				
100.00	5.50	4.25	0.00				
105.00	5.50	4.25	0.00				
110.00	5.50	4.25	0.00				
115.00	5.50	4.25	0.00				
120.00	5.50	4.25	0.00				
125.00	5.50	4.25	0.00				
130.00	5.50	4.25	0.00				
135.00	5.50	4.25	0.00				
140.00	5.50	4.25	0.00				
145.00	5.50	4.25	0.00				
150.00	5.50	4.25	0.00				
155.00	5.50	4.25	0.00				
160.00	5.50	4.25	0.00				
165.00	5.50	4.25	0.00				
170.00	5.50	4.25	0.00				
175.00	5.50	4.25	0.00				
180.00	5.50	4.25	0.00				
185.00	5.50	4.25	0.00				
190.00	5.50	4.25	0.00				
195.00	5.50	4.25	0.00				
200.00	5.50	4.25	0.00				
205.00	5.50	4.25	0.00				
210.00	5.50	4.25	0.00				
215.00	5.50	4.25	0.00				
220.00	5.50	4.25	0.00				
225.00	5.50	4.25	0.00				
230.00	5.50	4.25	0.00				
235.00	5.50	4.25	0.00				
240.00	5.50	4.25	0.00				
245.00	5.50	4.25	0.00				
250.00	5.50	4.25	0.00				
255.00	5.50	4.25	0.00				

Watchtower_2010 JM

Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

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Summary for Subcatchment PROP 6B: Post 6B

Runoff = 0.82 cfs @ 12.13 hrs, Volume= 0.066 af, Depth= 3.43"

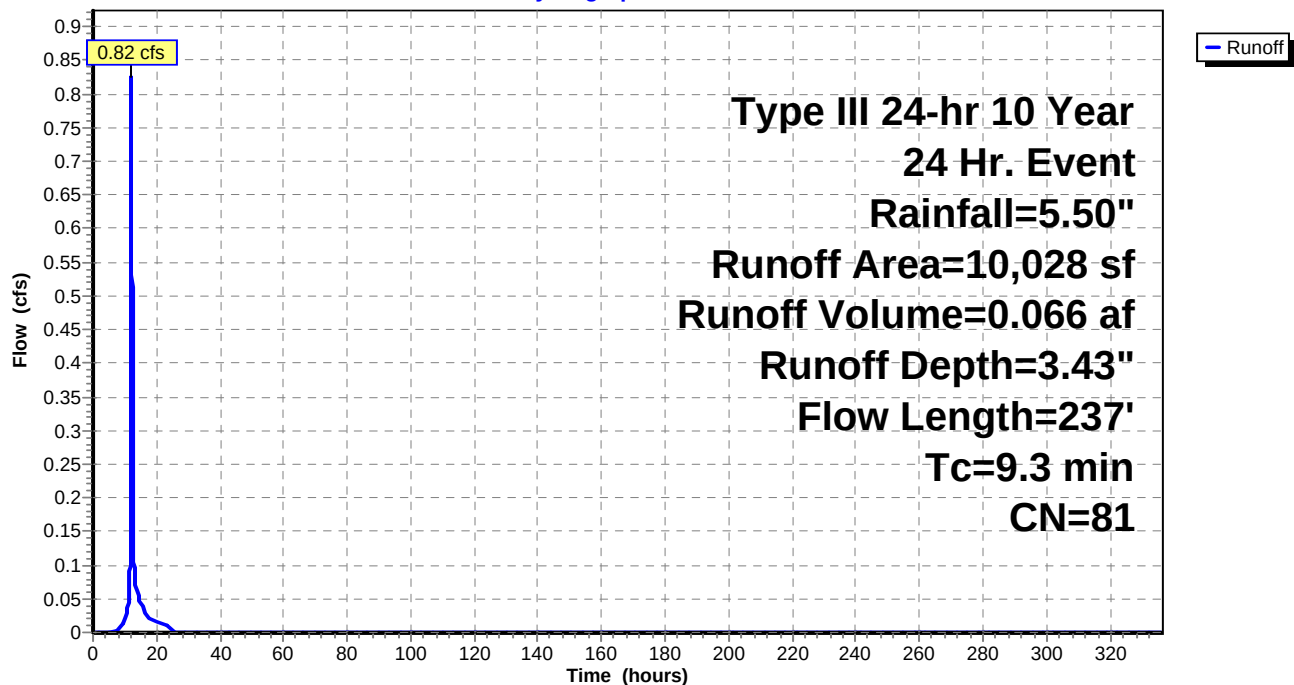
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"

Area (sf)	CN	Description
3,037	98	Paved roads w/curbs & sewers, HSG B
6,991	74	>75% Grass cover, Good, HSG C
10,028	81	Weighted Average
6,991		69.71% Pervious Area
3,037		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	137	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.3	237	Total			

Subcatchment PROP 6B: Post 6B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Subcatchment PROP 6B: Post 6B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	5.50	3.43	0.00
5.00	0.31	0.00	0.00	265.00	5.50	3.43	0.00
10.00	1.04	0.11	0.02	270.00	5.50	3.43	0.00
15.00	4.70	2.72	0.04	275.00	5.50	3.43	0.00
20.00	5.26	3.22	0.02	280.00	5.50	3.43	0.00
25.00	5.50	3.43	0.00	285.00	5.50	3.43	0.00
30.00	5.50	3.43	0.00	290.00	5.50	3.43	0.00
35.00	5.50	3.43	0.00	295.00	5.50	3.43	0.00
40.00	5.50	3.43	0.00	300.00	5.50	3.43	0.00
45.00	5.50	3.43	0.00	305.00	5.50	3.43	0.00
50.00	5.50	3.43	0.00	310.00	5.50	3.43	0.00
55.00	5.50	3.43	0.00	315.00	5.50	3.43	0.00
60.00	5.50	3.43	0.00	320.00	5.50	3.43	0.00
65.00	5.50	3.43	0.00	325.00	5.50	3.43	0.00
70.00	5.50	3.43	0.00	330.00	5.50	3.43	0.00
75.00	5.50	3.43	0.00	335.00	5.50	3.43	0.00
80.00	5.50	3.43	0.00				
85.00	5.50	3.43	0.00				
90.00	5.50	3.43	0.00				
95.00	5.50	3.43	0.00				
100.00	5.50	3.43	0.00				
105.00	5.50	3.43	0.00				
110.00	5.50	3.43	0.00				
115.00	5.50	3.43	0.00				
120.00	5.50	3.43	0.00				
125.00	5.50	3.43	0.00				
130.00	5.50	3.43	0.00				
135.00	5.50	3.43	0.00				
140.00	5.50	3.43	0.00				
145.00	5.50	3.43	0.00				
150.00	5.50	3.43	0.00				
155.00	5.50	3.43	0.00				
160.00	5.50	3.43	0.00				
165.00	5.50	3.43	0.00				
170.00	5.50	3.43	0.00				
175.00	5.50	3.43	0.00				
180.00	5.50	3.43	0.00				
185.00	5.50	3.43	0.00				
190.00	5.50	3.43	0.00				
195.00	5.50	3.43	0.00				
200.00	5.50	3.43	0.00				
205.00	5.50	3.43	0.00				
210.00	5.50	3.43	0.00				
215.00	5.50	3.43	0.00				
220.00	5.50	3.43	0.00				
225.00	5.50	3.43	0.00				
230.00	5.50	3.43	0.00				
235.00	5.50	3.43	0.00				
240.00	5.50	3.43	0.00				
245.00	5.50	3.43	0.00				
250.00	5.50	3.43	0.00				
255.00	5.50	3.43	0.00				

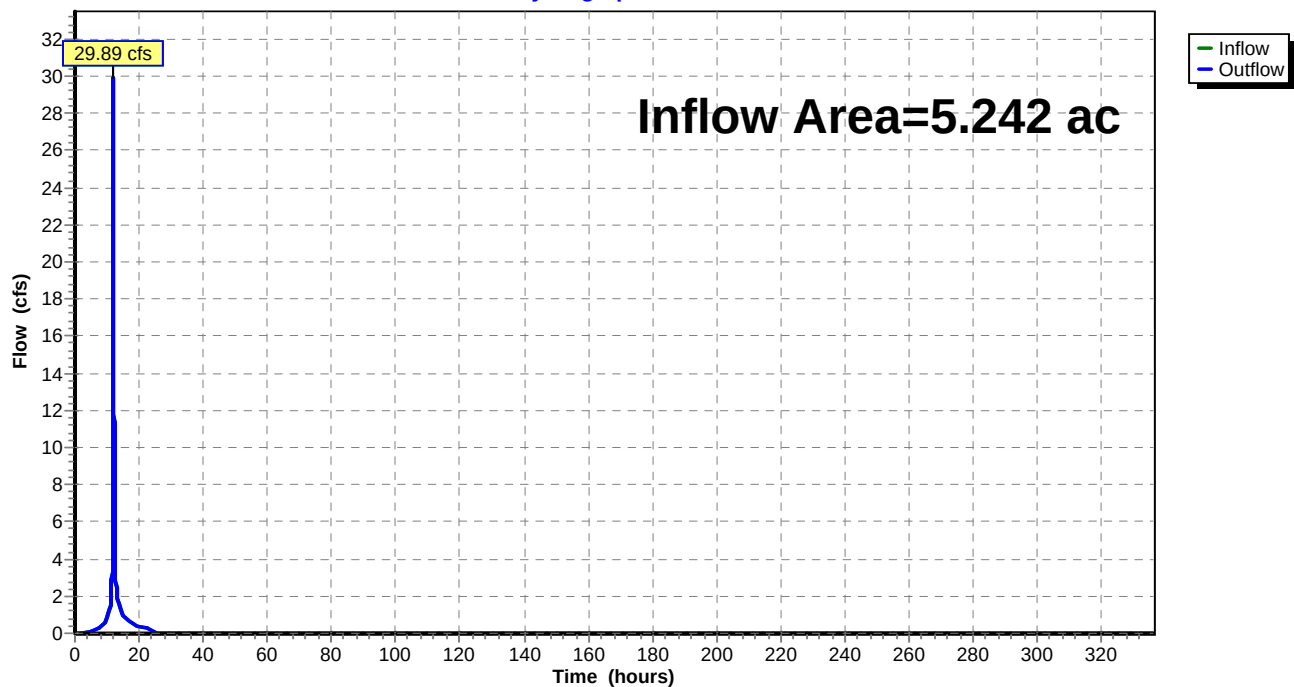
Summary for Reach 6B: Post DP 6

Inflow Area = 5.242 ac, 59.75% Impervious, Inflow Depth = 4.22" for 10 Year, 24 Hr. Event event
Inflow = 29.89 cfs @ 12.00 hrs, Volume= 1.842 af
Outflow = 29.89 cfs @ 12.00 hrs, Volume= 1.842 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach 6B: Post DP 6

Hydrograph



Watchtower_2010 JM*Type III 24-hr 10 Year, 24 Hr. Event Rainfall=5.50"*

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Hydrograph for Reach 6B: Post DP 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.04		0.04	265.00	0.00		0.00
10.00	0.88		0.88	270.00	0.00		0.00
15.00	1.04		1.04	275.00	0.00		0.00
20.00	0.36		0.36	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment EX 6A: EX 6A

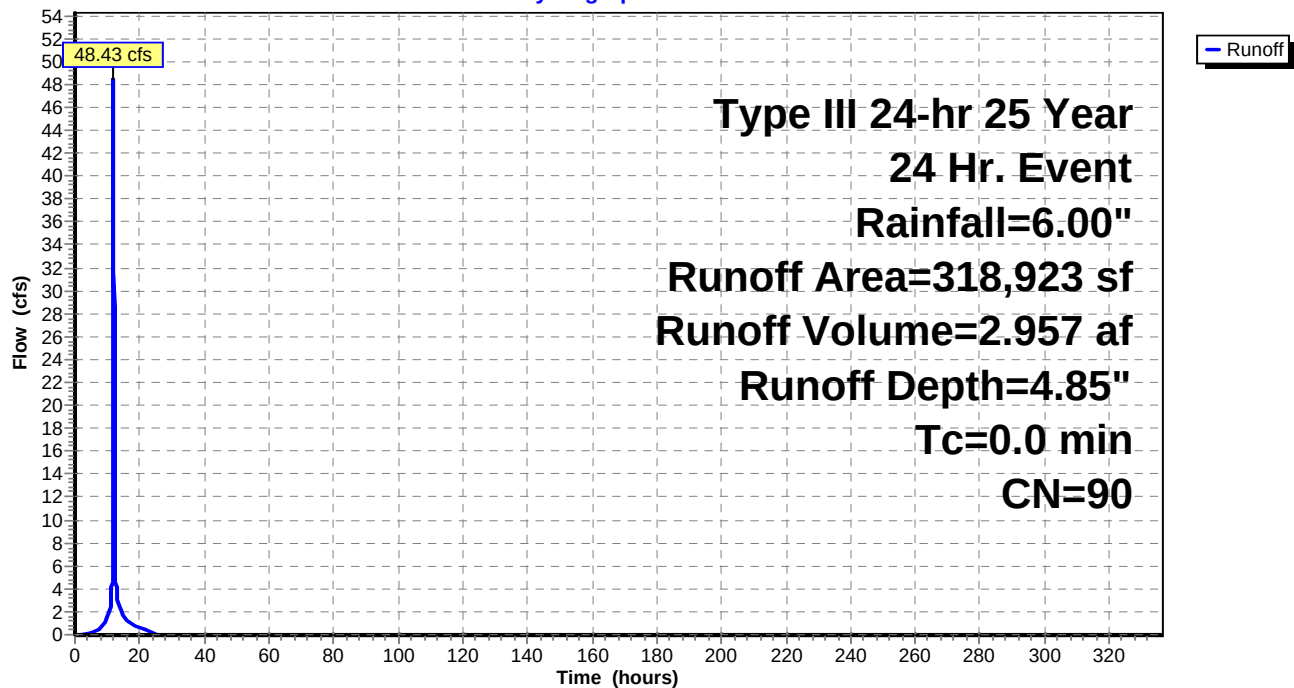
Runoff = 48.43 cfs @ 12.00 hrs, Volume= 2.957 af, Depth= 4.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
206,719	98	Paved roads w/curbs & sewers, HSG B
112,204	74	>75% Grass cover, Good, HSG C
318,923	90	Weighted Average
112,204		35.18% Pervious Area
206,719		64.82% Impervious Area

Subcatchment EX 6A: EX 6A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment EX 6A: EX 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.85	0.00
5.00	0.34	0.01	0.12	265.00	6.00	4.85	0.00
10.00	1.13	0.41	1.52	270.00	6.00	4.85	0.00
15.00	5.13	4.00	1.60	275.00	6.00	4.85	0.00
20.00	5.74	4.59	0.56	280.00	6.00	4.85	0.00
25.00	6.00	4.85	0.00	285.00	6.00	4.85	0.00
30.00	6.00	4.85	0.00	290.00	6.00	4.85	0.00
35.00	6.00	4.85	0.00	295.00	6.00	4.85	0.00
40.00	6.00	4.85	0.00	300.00	6.00	4.85	0.00
45.00	6.00	4.85	0.00	305.00	6.00	4.85	0.00
50.00	6.00	4.85	0.00	310.00	6.00	4.85	0.00
55.00	6.00	4.85	0.00	315.00	6.00	4.85	0.00
60.00	6.00	4.85	0.00	320.00	6.00	4.85	0.00
65.00	6.00	4.85	0.00	325.00	6.00	4.85	0.00
70.00	6.00	4.85	0.00	330.00	6.00	4.85	0.00
75.00	6.00	4.85	0.00	335.00	6.00	4.85	0.00
80.00	6.00	4.85	0.00				
85.00	6.00	4.85	0.00				
90.00	6.00	4.85	0.00				
95.00	6.00	4.85	0.00				
100.00	6.00	4.85	0.00				
105.00	6.00	4.85	0.00				
110.00	6.00	4.85	0.00				
115.00	6.00	4.85	0.00				
120.00	6.00	4.85	0.00				
125.00	6.00	4.85	0.00				
130.00	6.00	4.85	0.00				
135.00	6.00	4.85	0.00				
140.00	6.00	4.85	0.00				
145.00	6.00	4.85	0.00				
150.00	6.00	4.85	0.00				
155.00	6.00	4.85	0.00				
160.00	6.00	4.85	0.00				
165.00	6.00	4.85	0.00				
170.00	6.00	4.85	0.00				
175.00	6.00	4.85	0.00				
180.00	6.00	4.85	0.00				
185.00	6.00	4.85	0.00				
190.00	6.00	4.85	0.00				
195.00	6.00	4.85	0.00				
200.00	6.00	4.85	0.00				
205.00	6.00	4.85	0.00				
210.00	6.00	4.85	0.00				
215.00	6.00	4.85	0.00				
220.00	6.00	4.85	0.00				
225.00	6.00	4.85	0.00				
230.00	6.00	4.85	0.00				
235.00	6.00	4.85	0.00				
240.00	6.00	4.85	0.00				
245.00	6.00	4.85	0.00				
250.00	6.00	4.85	0.00				
255.00	6.00	4.85	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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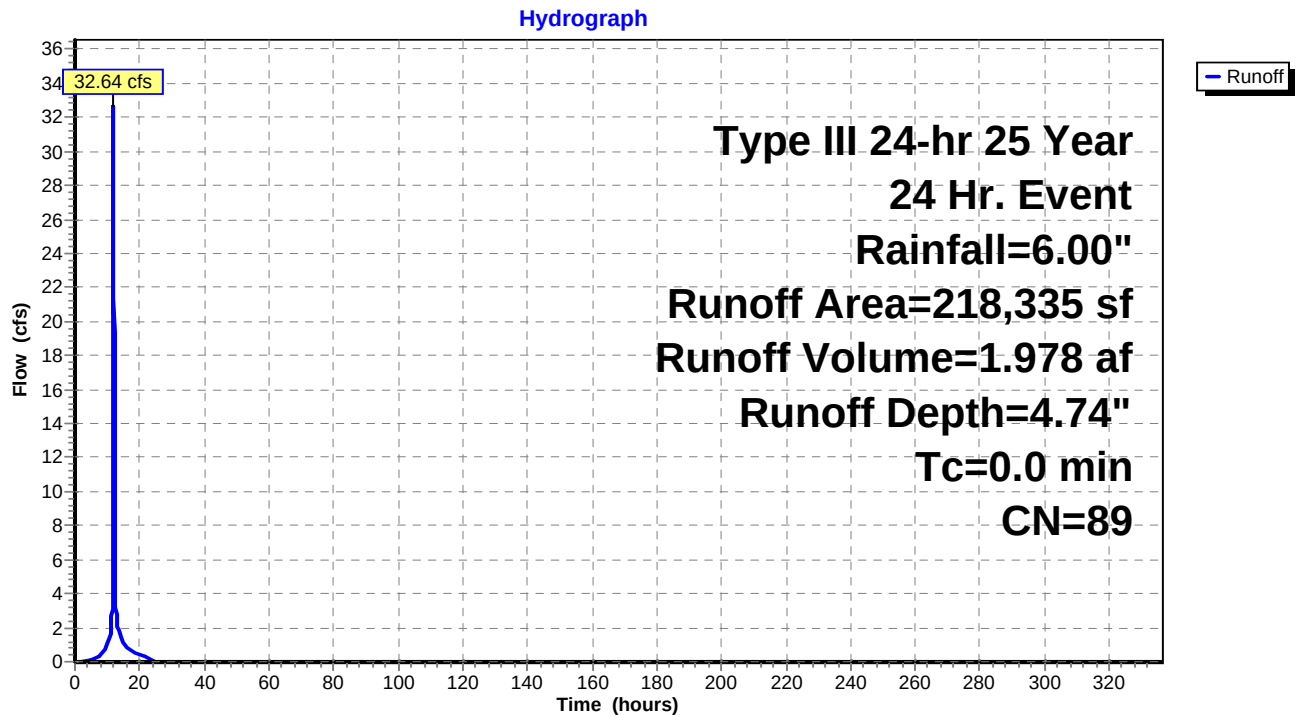
Summary for Subcatchment Prop 6A: PROP 6A

Runoff = 32.64 cfs @ 12.00 hrs, Volume= 1.978 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
133,419	98	Paved roads w/curbs & sewers, HSG B
84,916	74	>75% Grass cover, Good, HSG C
218,335	89	Weighted Average
84,916		38.89% Pervious Area
133,419		61.11% Impervious Area

Subcatchment Prop 6A: PROP 6A



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment Prop 6A: PROP 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	4.74	0.00
5.00	0.34	0.01	0.06	265.00	6.00	4.74	0.00
10.00	1.13	0.37	0.98	270.00	6.00	4.74	0.00
15.00	5.13	3.89	1.09	275.00	6.00	4.74	0.00
20.00	5.74	4.49	0.38	280.00	6.00	4.74	0.00
25.00	6.00	4.74	0.00	285.00	6.00	4.74	0.00
30.00	6.00	4.74	0.00	290.00	6.00	4.74	0.00
35.00	6.00	4.74	0.00	295.00	6.00	4.74	0.00
40.00	6.00	4.74	0.00	300.00	6.00	4.74	0.00
45.00	6.00	4.74	0.00	305.00	6.00	4.74	0.00
50.00	6.00	4.74	0.00	310.00	6.00	4.74	0.00
55.00	6.00	4.74	0.00	315.00	6.00	4.74	0.00
60.00	6.00	4.74	0.00	320.00	6.00	4.74	0.00
65.00	6.00	4.74	0.00	325.00	6.00	4.74	0.00
70.00	6.00	4.74	0.00	330.00	6.00	4.74	0.00
75.00	6.00	4.74	0.00	335.00	6.00	4.74	0.00
80.00	6.00	4.74	0.00				
85.00	6.00	4.74	0.00				
90.00	6.00	4.74	0.00				
95.00	6.00	4.74	0.00				
100.00	6.00	4.74	0.00				
105.00	6.00	4.74	0.00				
110.00	6.00	4.74	0.00				
115.00	6.00	4.74	0.00				
120.00	6.00	4.74	0.00				
125.00	6.00	4.74	0.00				
130.00	6.00	4.74	0.00				
135.00	6.00	4.74	0.00				
140.00	6.00	4.74	0.00				
145.00	6.00	4.74	0.00				
150.00	6.00	4.74	0.00				
155.00	6.00	4.74	0.00				
160.00	6.00	4.74	0.00				
165.00	6.00	4.74	0.00				
170.00	6.00	4.74	0.00				
175.00	6.00	4.74	0.00				
180.00	6.00	4.74	0.00				
185.00	6.00	4.74	0.00				
190.00	6.00	4.74	0.00				
195.00	6.00	4.74	0.00				
200.00	6.00	4.74	0.00				
205.00	6.00	4.74	0.00				
210.00	6.00	4.74	0.00				
215.00	6.00	4.74	0.00				
220.00	6.00	4.74	0.00				
225.00	6.00	4.74	0.00				
230.00	6.00	4.74	0.00				
235.00	6.00	4.74	0.00				
240.00	6.00	4.74	0.00				
245.00	6.00	4.74	0.00				
250.00	6.00	4.74	0.00				
255.00	6.00	4.74	0.00				

Watchtower_2010 JM

Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

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Summary for Subcatchment PROP 6B: Post 6B

Runoff = 0.93 cfs @ 12.13 hrs, Volume= 0.075 af, Depth= 3.88"

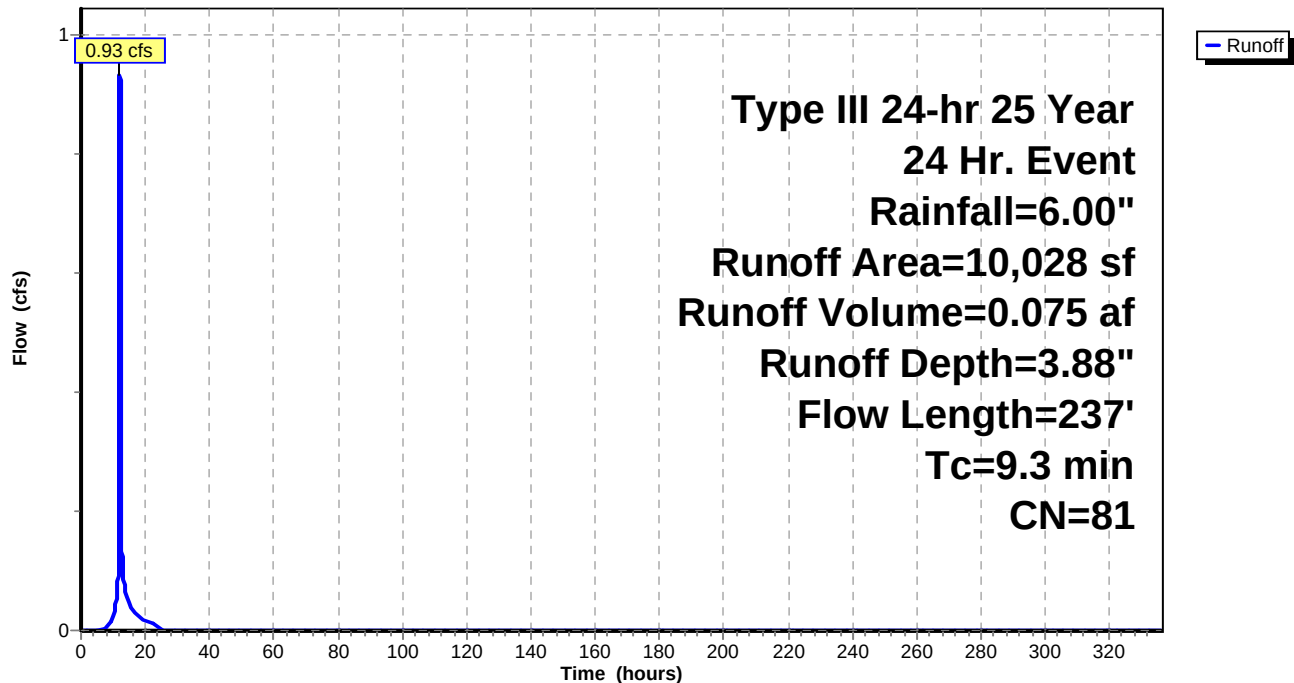
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"

Area (sf)	CN	Description
3,037	98	Paved roads w/curbs & sewers, HSG B
6,991	74	>75% Grass cover, Good, HSG C
10,028	81	Weighted Average
6,991		69.71% Pervious Area
3,037		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	137	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.3	237	Total			

Subcatchment PROP 6B: Post 6B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Subcatchment PROP 6B: Post 6B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	6.00	3.88	0.00
5.00	0.34	0.00	0.00	265.00	6.00	3.88	0.00
10.00	1.13	0.15	0.02	270.00	6.00	3.88	0.00
15.00	5.13	3.10	0.05	275.00	6.00	3.88	0.00
20.00	5.74	3.65	0.02	280.00	6.00	3.88	0.00
25.00	6.00	3.88	0.00	285.00	6.00	3.88	0.00
30.00	6.00	3.88	0.00	290.00	6.00	3.88	0.00
35.00	6.00	3.88	0.00	295.00	6.00	3.88	0.00
40.00	6.00	3.88	0.00	300.00	6.00	3.88	0.00
45.00	6.00	3.88	0.00	305.00	6.00	3.88	0.00
50.00	6.00	3.88	0.00	310.00	6.00	3.88	0.00
55.00	6.00	3.88	0.00	315.00	6.00	3.88	0.00
60.00	6.00	3.88	0.00	320.00	6.00	3.88	0.00
65.00	6.00	3.88	0.00	325.00	6.00	3.88	0.00
70.00	6.00	3.88	0.00	330.00	6.00	3.88	0.00
75.00	6.00	3.88	0.00	335.00	6.00	3.88	0.00
80.00	6.00	3.88	0.00				
85.00	6.00	3.88	0.00				
90.00	6.00	3.88	0.00				
95.00	6.00	3.88	0.00				
100.00	6.00	3.88	0.00				
105.00	6.00	3.88	0.00				
110.00	6.00	3.88	0.00				
115.00	6.00	3.88	0.00				
120.00	6.00	3.88	0.00				
125.00	6.00	3.88	0.00				
130.00	6.00	3.88	0.00				
135.00	6.00	3.88	0.00				
140.00	6.00	3.88	0.00				
145.00	6.00	3.88	0.00				
150.00	6.00	3.88	0.00				
155.00	6.00	3.88	0.00				
160.00	6.00	3.88	0.00				
165.00	6.00	3.88	0.00				
170.00	6.00	3.88	0.00				
175.00	6.00	3.88	0.00				
180.00	6.00	3.88	0.00				
185.00	6.00	3.88	0.00				
190.00	6.00	3.88	0.00				
195.00	6.00	3.88	0.00				
200.00	6.00	3.88	0.00				
205.00	6.00	3.88	0.00				
210.00	6.00	3.88	0.00				
215.00	6.00	3.88	0.00				
220.00	6.00	3.88	0.00				
225.00	6.00	3.88	0.00				
230.00	6.00	3.88	0.00				
235.00	6.00	3.88	0.00				
240.00	6.00	3.88	0.00				
245.00	6.00	3.88	0.00				
250.00	6.00	3.88	0.00				
255.00	6.00	3.88	0.00				

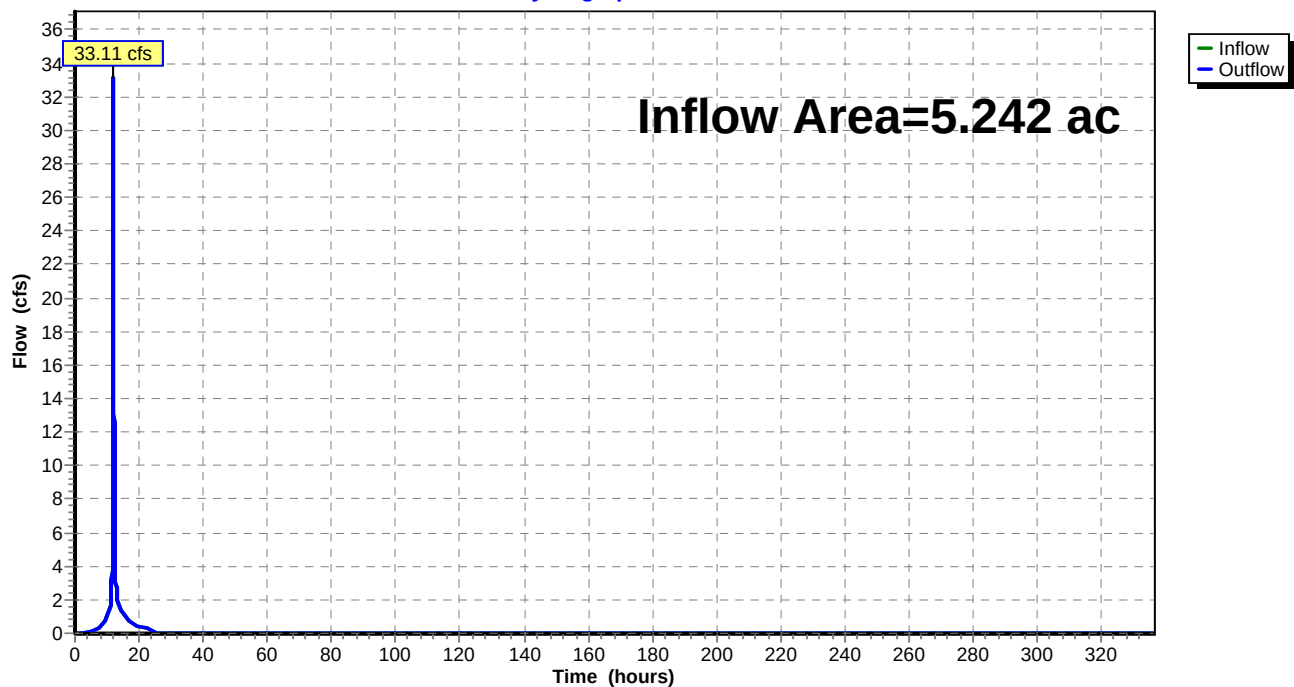
Summary for Reach 6B: Post DP 6

Inflow Area = 5.242 ac, 59.75% Impervious, Inflow Depth = 4.70" for 25 Year, 24 Hr. Event event
Inflow = 33.11 cfs @ 12.00 hrs, Volume= 2.052 af
Outflow = 33.11 cfs @ 12.00 hrs, Volume= 2.052 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach 6B: Post DP 6

Hydrograph



Watchtower_2010 JM*Type III 24-hr 25 Year, 24 Hr. Event Rainfall=6.00"*

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Hydrograph for Reach 6B: Post DP 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.06		0.06	265.00	0.00		0.00
10.00	1.01		1.01	270.00	0.00		0.00
15.00	1.14		1.14	275.00	0.00		0.00
20.00	0.40		0.40	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment EX 6A: EX 6A

Runoff = 80.26 cfs @ 12.00 hrs, Volume= 5.055 af, Depth= 8.29"

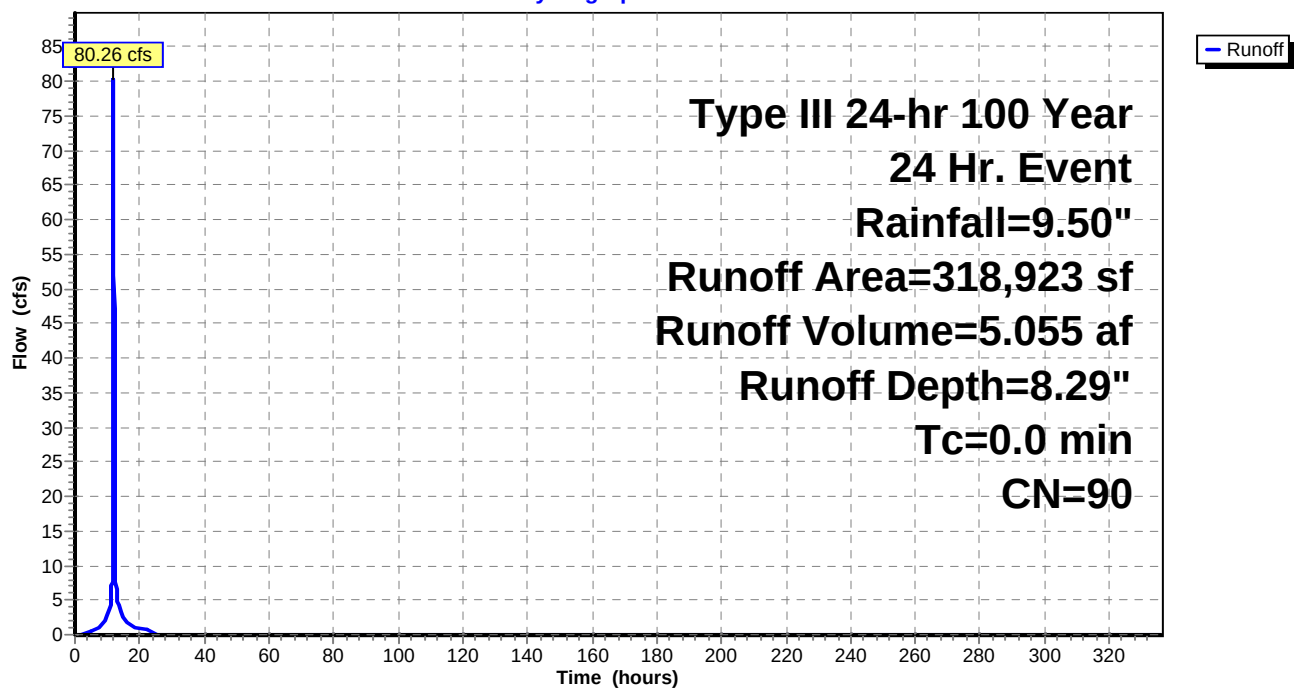
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
206,719	98	Paved roads w/curbs & sewers, HSG B
112,204	74	>75% Grass cover, Good, HSG C
318,923	90	Weighted Average
112,204		35.18% Pervious Area
206,719		64.82% Impervious Area

Subcatchment EX 6A: EX 6A

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment EX 6A: EX 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.29	0.00
5.00	0.54	0.07	0.40	265.00	9.50	8.29	0.00
10.00	1.80	0.92	2.85	270.00	9.50	8.29	0.00
15.00	8.12	6.92	2.59	275.00	9.50	8.29	0.00
20.00	9.09	7.88	0.90	280.00	9.50	8.29	0.00
25.00	9.50	8.29	0.00	285.00	9.50	8.29	0.00
30.00	9.50	8.29	0.00	290.00	9.50	8.29	0.00
35.00	9.50	8.29	0.00	295.00	9.50	8.29	0.00
40.00	9.50	8.29	0.00	300.00	9.50	8.29	0.00
45.00	9.50	8.29	0.00	305.00	9.50	8.29	0.00
50.00	9.50	8.29	0.00	310.00	9.50	8.29	0.00
55.00	9.50	8.29	0.00	315.00	9.50	8.29	0.00
60.00	9.50	8.29	0.00	320.00	9.50	8.29	0.00
65.00	9.50	8.29	0.00	325.00	9.50	8.29	0.00
70.00	9.50	8.29	0.00	330.00	9.50	8.29	0.00
75.00	9.50	8.29	0.00	335.00	9.50	8.29	0.00
80.00	9.50	8.29	0.00				
85.00	9.50	8.29	0.00				
90.00	9.50	8.29	0.00				
95.00	9.50	8.29	0.00				
100.00	9.50	8.29	0.00				
105.00	9.50	8.29	0.00				
110.00	9.50	8.29	0.00				
115.00	9.50	8.29	0.00				
120.00	9.50	8.29	0.00				
125.00	9.50	8.29	0.00				
130.00	9.50	8.29	0.00				
135.00	9.50	8.29	0.00				
140.00	9.50	8.29	0.00				
145.00	9.50	8.29	0.00				
150.00	9.50	8.29	0.00				
155.00	9.50	8.29	0.00				
160.00	9.50	8.29	0.00				
165.00	9.50	8.29	0.00				
170.00	9.50	8.29	0.00				
175.00	9.50	8.29	0.00				
180.00	9.50	8.29	0.00				
185.00	9.50	8.29	0.00				
190.00	9.50	8.29	0.00				
195.00	9.50	8.29	0.00				
200.00	9.50	8.29	0.00				
205.00	9.50	8.29	0.00				
210.00	9.50	8.29	0.00				
215.00	9.50	8.29	0.00				
220.00	9.50	8.29	0.00				
225.00	9.50	8.29	0.00				
230.00	9.50	8.29	0.00				
235.00	9.50	8.29	0.00				
240.00	9.50	8.29	0.00				
245.00	9.50	8.29	0.00				
250.00	9.50	8.29	0.00				
255.00	9.50	8.29	0.00				

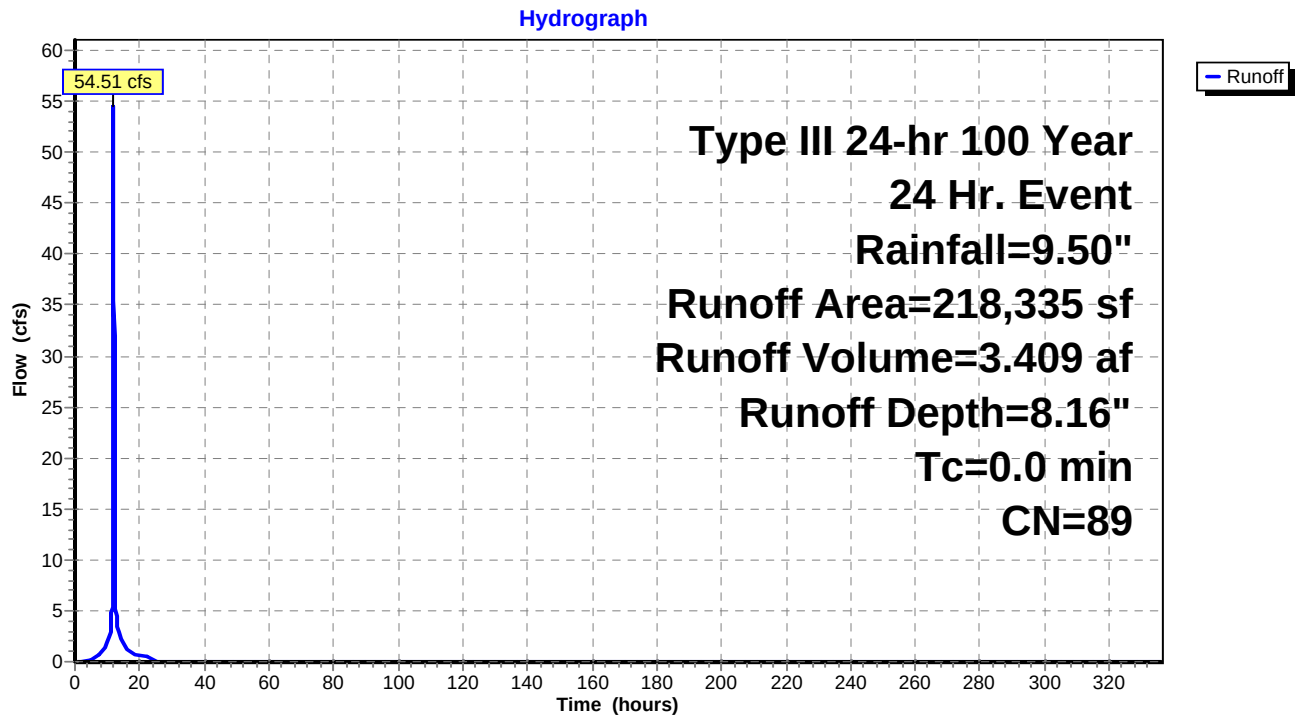
Summary for Subcatchment Prop 6A: PROP 6A

Runoff = 54.51 cfs @ 12.00 hrs, Volume= 3.409 af, Depth= 8.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
133,419	98	Paved roads w/curbs & sewers, HSG B
84,916	74	>75% Grass cover, Good, HSG C
218,335	89	Weighted Average
84,916		38.89% Pervious Area
133,419		61.11% Impervious Area

Subcatchment Prop 6A: PROP 6A



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Hydrograph for Subcatchment Prop 6A: PROP 6A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	8.16	0.00
5.00	0.54	0.06	0.24	265.00	9.50	8.16	0.00
10.00	1.80	0.86	1.89	270.00	9.50	8.16	0.00
15.00	8.12	6.80	1.77	275.00	9.50	8.16	0.00
20.00	9.09	7.76	0.61	280.00	9.50	8.16	0.00
25.00	9.50	8.16	0.00	285.00	9.50	8.16	0.00
30.00	9.50	8.16	0.00	290.00	9.50	8.16	0.00
35.00	9.50	8.16	0.00	295.00	9.50	8.16	0.00
40.00	9.50	8.16	0.00	300.00	9.50	8.16	0.00
45.00	9.50	8.16	0.00	305.00	9.50	8.16	0.00
50.00	9.50	8.16	0.00	310.00	9.50	8.16	0.00
55.00	9.50	8.16	0.00	315.00	9.50	8.16	0.00
60.00	9.50	8.16	0.00	320.00	9.50	8.16	0.00
65.00	9.50	8.16	0.00	325.00	9.50	8.16	0.00
70.00	9.50	8.16	0.00	330.00	9.50	8.16	0.00
75.00	9.50	8.16	0.00	335.00	9.50	8.16	0.00
80.00	9.50	8.16	0.00				
85.00	9.50	8.16	0.00				
90.00	9.50	8.16	0.00				
95.00	9.50	8.16	0.00				
100.00	9.50	8.16	0.00				
105.00	9.50	8.16	0.00				
110.00	9.50	8.16	0.00				
115.00	9.50	8.16	0.00				
120.00	9.50	8.16	0.00				
125.00	9.50	8.16	0.00				
130.00	9.50	8.16	0.00				
135.00	9.50	8.16	0.00				
140.00	9.50	8.16	0.00				
145.00	9.50	8.16	0.00				
150.00	9.50	8.16	0.00				
155.00	9.50	8.16	0.00				
160.00	9.50	8.16	0.00				
165.00	9.50	8.16	0.00				
170.00	9.50	8.16	0.00				
175.00	9.50	8.16	0.00				
180.00	9.50	8.16	0.00				
185.00	9.50	8.16	0.00				
190.00	9.50	8.16	0.00				
195.00	9.50	8.16	0.00				
200.00	9.50	8.16	0.00				
205.00	9.50	8.16	0.00				
210.00	9.50	8.16	0.00				
215.00	9.50	8.16	0.00				
220.00	9.50	8.16	0.00				
225.00	9.50	8.16	0.00				
230.00	9.50	8.16	0.00				
235.00	9.50	8.16	0.00				
240.00	9.50	8.16	0.00				
245.00	9.50	8.16	0.00				
250.00	9.50	8.16	0.00				
255.00	9.50	8.16	0.00				

Watchtower_2010 JM

Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

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Summary for Subcatchment PROP 6B: Post 6B

Runoff = 1.68 cfs @ 12.13 hrs, Volume= 0.138 af, Depth= 7.17"

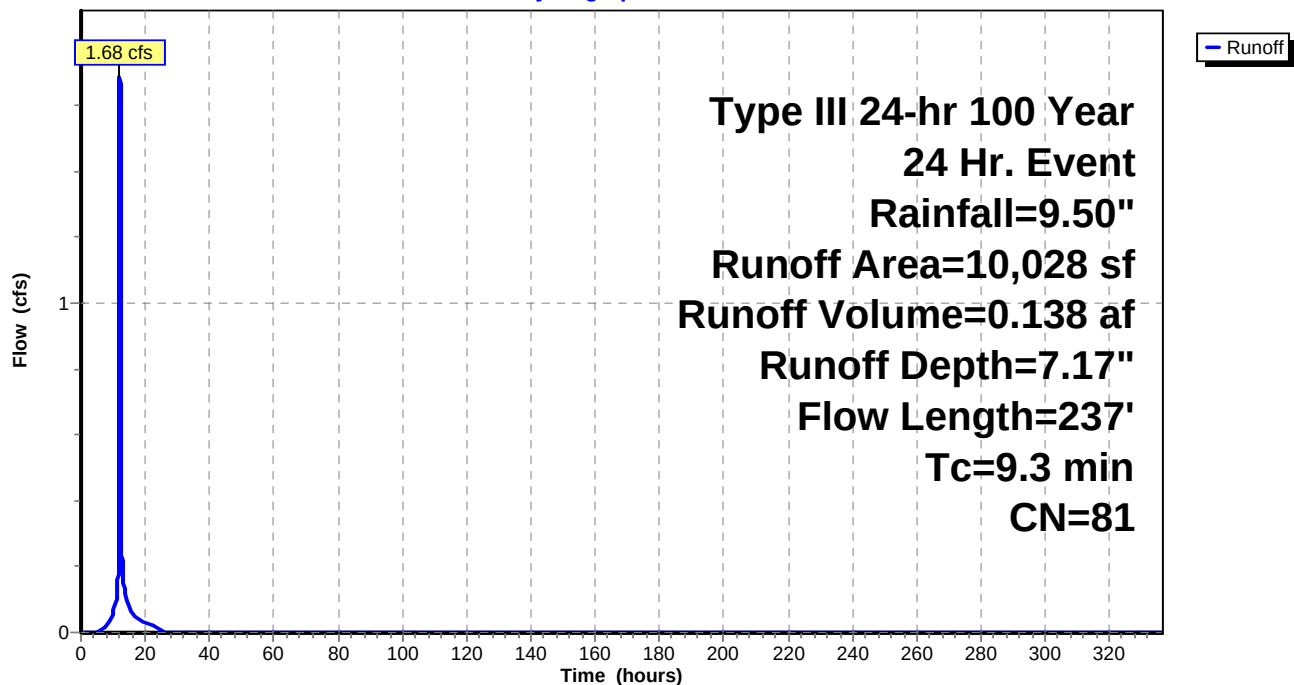
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"

Area (sf)	CN	Description
3,037	98	Paved roads w/curbs & sewers, HSG B
6,991	74	>75% Grass cover, Good, HSG C
10,028	81	Weighted Average
6,991		69.71% Pervious Area
3,037		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.50"
0.5	137	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.3	237	Total			

Subcatchment PROP 6B: Post 6B

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Subcatchment PROP 6B: Post 6B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	9.50	7.17	0.00
5.00	0.54	0.00	0.00	265.00	9.50	7.17	0.00
10.00	1.80	0.48	0.06	270.00	9.50	7.17	0.00
15.00	8.12	5.85	0.08	275.00	9.50	7.17	0.00
20.00	9.09	6.78	0.03	280.00	9.50	7.17	0.00
25.00	9.50	7.17	0.00	285.00	9.50	7.17	0.00
30.00	9.50	7.17	0.00	290.00	9.50	7.17	0.00
35.00	9.50	7.17	0.00	295.00	9.50	7.17	0.00
40.00	9.50	7.17	0.00	300.00	9.50	7.17	0.00
45.00	9.50	7.17	0.00	305.00	9.50	7.17	0.00
50.00	9.50	7.17	0.00	310.00	9.50	7.17	0.00
55.00	9.50	7.17	0.00	315.00	9.50	7.17	0.00
60.00	9.50	7.17	0.00	320.00	9.50	7.17	0.00
65.00	9.50	7.17	0.00	325.00	9.50	7.17	0.00
70.00	9.50	7.17	0.00	330.00	9.50	7.17	0.00
75.00	9.50	7.17	0.00	335.00	9.50	7.17	0.00
80.00	9.50	7.17	0.00				
85.00	9.50	7.17	0.00				
90.00	9.50	7.17	0.00				
95.00	9.50	7.17	0.00				
100.00	9.50	7.17	0.00				
105.00	9.50	7.17	0.00				
110.00	9.50	7.17	0.00				
115.00	9.50	7.17	0.00				
120.00	9.50	7.17	0.00				
125.00	9.50	7.17	0.00				
130.00	9.50	7.17	0.00				
135.00	9.50	7.17	0.00				
140.00	9.50	7.17	0.00				
145.00	9.50	7.17	0.00				
150.00	9.50	7.17	0.00				
155.00	9.50	7.17	0.00				
160.00	9.50	7.17	0.00				
165.00	9.50	7.17	0.00				
170.00	9.50	7.17	0.00				
175.00	9.50	7.17	0.00				
180.00	9.50	7.17	0.00				
185.00	9.50	7.17	0.00				
190.00	9.50	7.17	0.00				
195.00	9.50	7.17	0.00				
200.00	9.50	7.17	0.00				
205.00	9.50	7.17	0.00				
210.00	9.50	7.17	0.00				
215.00	9.50	7.17	0.00				
220.00	9.50	7.17	0.00				
225.00	9.50	7.17	0.00				
230.00	9.50	7.17	0.00				
235.00	9.50	7.17	0.00				
240.00	9.50	7.17	0.00				
245.00	9.50	7.17	0.00				
250.00	9.50	7.17	0.00				
255.00	9.50	7.17	0.00				

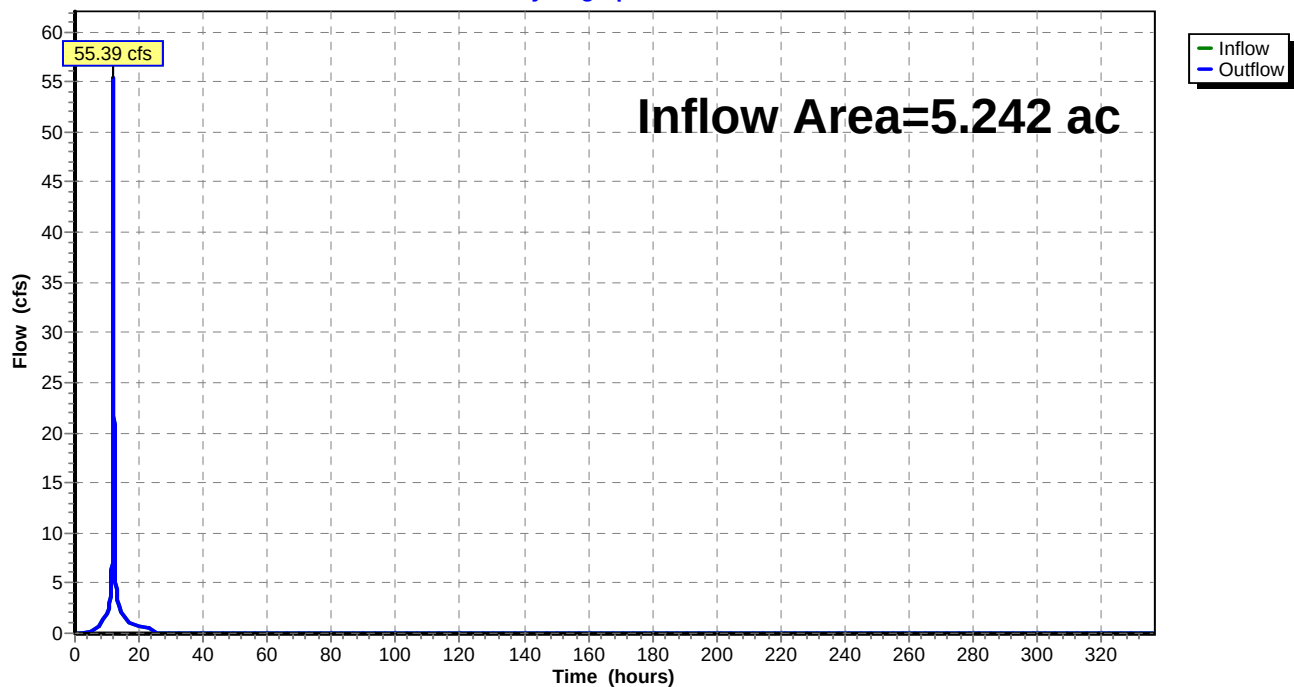
Summary for Reach 6B: Post DP 6

Inflow Area = 5.242 ac, 59.75% Impervious, Inflow Depth = 8.12" for 100 Year, 24 Hr. Event event
Inflow = 55.39 cfs @ 12.00 hrs, Volume= 3.547 af
Outflow = 55.39 cfs @ 12.00 hrs, Volume= 3.547 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-336.00 hrs, dt= 0.01 hrs / 2

Reach 6B: Post DP 6

Hydrograph



Watchtower_2010 JM*Type III 24-hr 100 Year, 24 Hr. Event Rainfall=9.50"*

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Hydrograph for Reach 6B: Post DP 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	260.00	0.00		0.00
5.00	0.24		0.24	265.00	0.00		0.00
10.00	1.95		1.95	270.00	0.00		0.00
15.00	1.85		1.85	275.00	0.00		0.00
20.00	0.64		0.64	280.00	0.00		0.00
25.00	0.00		0.00	285.00	0.00		0.00
30.00	0.00		0.00	290.00	0.00		0.00
35.00	0.00		0.00	295.00	0.00		0.00
40.00	0.00		0.00	300.00	0.00		0.00
45.00	0.00		0.00	305.00	0.00		0.00
50.00	0.00		0.00	310.00	0.00		0.00
55.00	0.00		0.00	315.00	0.00		0.00
60.00	0.00		0.00	320.00	0.00		0.00
65.00	0.00		0.00	325.00	0.00		0.00
70.00	0.00		0.00	330.00	0.00		0.00
75.00	0.00		0.00	335.00	0.00		0.00
80.00	0.00		0.00				
85.00	0.00		0.00				
90.00	0.00		0.00				
95.00	0.00		0.00				
100.00	0.00		0.00				
105.00	0.00		0.00				
110.00	0.00		0.00				
115.00	0.00		0.00				
120.00	0.00		0.00				
125.00	0.00		0.00				
130.00	0.00		0.00				
135.00	0.00		0.00				
140.00	0.00		0.00				
145.00	0.00		0.00				
150.00	0.00		0.00				
155.00	0.00		0.00				
160.00	0.00		0.00				
165.00	0.00		0.00				
170.00	0.00		0.00				
175.00	0.00		0.00				
180.00	0.00		0.00				
185.00	0.00		0.00				
190.00	0.00		0.00				
195.00	0.00		0.00				
200.00	0.00		0.00				
205.00	0.00		0.00				
210.00	0.00		0.00				
215.00	0.00		0.00				
220.00	0.00		0.00				
225.00	0.00		0.00				
230.00	0.00		0.00				
235.00	0.00		0.00				
240.00	0.00		0.00				
245.00	0.00		0.00				
250.00	0.00		0.00				
255.00	0.00		0.00				

SPPP APPENDIX E
POLLUTANT LOADING CALCULATIONS

Pollutant Loading Calculations
Preliminary Stormwater Pollution Prevention Plan
Watchtower Bible and Tract Society of New York, Inc.

Watershed	Drainage Area (SF)	Drainage Area (Acres)	Land Use	Loading Rate (lbs/acre/year)				Total Loading			
				TP ¹	TN ¹	BOD ²	TSS ¹	TP	TN	BOD	TSS
EXISTING Design Point 1											
Design Point 1A											
EX 1B	104,956	2.41	Agricultural/orchard	0.1157	3.74	6	307.94	0.3	9.0	14.5	742.0
EX 1B	12,733	0.29	Impervious	0.712	4.63	111	716.45	0.2	1.4	32.4	209.4
EX 1C	77,817	1.79	Agricultural/orchard	0.1157	3.74	6	307.94	0.2	6.7	10.7	550.1
EX 1C	5,353	0.12	Impervious	0.712	4.63	111	716.45	0.1	0.6	13.6	88.0
EX 1G	121,243	2.78	Grass/Landscaped	0.1157	3.74	19	307.94	0.3	10.4	52.9	857.1
EX 1G	14,111	0.32	Impervious	0.712	4.63	111	716.45	0.2	1.5	36.0	232.1
Total Area	336,213	7.72				Total Design Point 1A		1.3	29.5	160.1	2,678.7
Design Point 1B											
EX 1A	167,674	3.85	Woods	0.0979	1.78	6	76.54	0.4	6.9	23.1	294.6
EX 1A	40,846	0.94	Impervious	0.712	4.63	111	716.45	0.7	4.3	104.1	671.8
EX 1D	301,814	6.93	Agricultural/orchard	0.1157	3.74	6	307.94	0.8	25.9	41.6	2,133.6
EX 1E	293,422	6.74	Grass/Landscaped	0.1157	3.74	19	307.94	0.8	25.2	128.0	2,074.3
EX 1E	18,405	0.42	Impervious	0.712	4.63	111	716.45	0.3	2.0	46.9	302.7
EX 1F	467,834	10.74	Impervious	0.712	4.63	111	716.45	7.6	49.7	1,192.1	7,694.7
EX 1F	338,199	7.76	Woods	0.0979	1.78	6	76.54	0.8	13.8	46.6	594.3
EX 1F	243,229	5.58	Grass/Landscaped	0.1157	3.74	19	307.94	0.6	20.9	106.1	1,719.5
EX 1L	55,670	1.28	Impervious	0.712	4.63	111	716.45	0.9	5.9	141.9	915.6
EX 1L	220,242	5.06	Grass/Landscaped	0.1157	3.74	19	307.94	0.6	18.9	96.1	1,557.0
Total Area	2,147,335	49.30				Total Design Point 1B		13.5	173.4	1,926.4	17,958.0
Design Point 1C											
EX 1H	247,126	5.67	Grass/Landscaped	0.1157	3.74	19	307.94	0.7	21.2	107.8	1,747.0
EX 1H	17,105	0.39	Impervious	0.712	4.63	111	716.45	0.3	1.8	43.6	281.3
EX 1J	24,916	0.57	Impervious	0.712	4.63	112	716.45	0.4	1.8	44.0	281.3
EX 1J	403,157	9.26	Grass/Landscaped	0.1157	3.74	19	307.94	1.1	34.6	175.8	2,850.0
EX 1J	30,069	0.69	Woods	0.0979	1.78	6	76.54	0.1	1.2	4.1	52.8
Total Area	722,373	16.58				Total Design Point 1C		2.5	60.7	375.3	5,212.6
Total Area for DP 1	3,205,921	73.60				Total Design Point 1		17.3	263.6	2,461.8	25,849.4
EXISTING Design Point 2											
EX DA 2A	23,008	0.53	Impervious	0.712	4.63	111	716.45	0.4	2.4	58.6	378.4
EX DA 2A	17,680	0.41	Grass/Landscaped	0.1157	3.74	19	307.94	0.0	1.5	7.7	125.0
Total Area	40,688	0.93				Total Design Point 2		0.4	4.0	66.3	503.4
EXISTING Design Point 3											
EX DA 3A	187,492	4.30	Impervious	0.712	4.63	111	716.45	3.1	19.9	477.8	3,083.8
EX DA 3A	161,790	3.71	Grass/Landscaped	0.1157	3.74	19	307.94	0.4	13.9	70.6	1,143.7
EX DA 3A	464,368	10.66	Woods	0.0979	1.78	6	76.54	1.0	19.0	64.0	815.9
Total Area	813,650	18.68				Total Design Point 3		4.5	33.8	548.3	4,227.5
EXISTING Design Point 4											
EX 4A	23,470	0.54	Grass/Landscaped	0.1157	3.74	19	307.94	0.1	2.0	10.2	165.9
EX 4A	23,981	0.55	Impervious	0.712	4.63	111	716.45	0.4	2.5	61.1	394.4
Total Area	47,451	1.09				Total Design Point 4		0.5	4.6	71.3	560.3
EXISTING Design Point 5											
EX 5A	27,116	0.62	Impervious	0.712	4.63	111	716.45	0.4	2.9	69.1	446.0
EX 5A	9,550	0.22	Grass/Landscaped	0.1157	3.74	19	307.94	0.0	0.8	4.2	67.5
Total Area	36,666	0.84				Total Design Point 5		0.5	3.7	73.3	513.5
EXISTING Design Point 6											
EX DA 6A	206,719	4.75	Impervious	0.712	4.63	111	716.45	3.4	22.0	526.8	3,400.0
EX DA 6A	112,204	2.58	Grass/Landscaped	0.1157	3.74	19	307.94	0.3	9.6	48.9	793.2
Total Area	318,923	7.32				Total Design Point 6		3.7	31.6	575.7	4,193.2

Pollutant Loading Calculations
Preliminary Stormwater Pollution Prevention Plan
Watchtower Bible and Tract Society of New York, Inc.

Watershed	Drainage Area (SF)	Drainage Area (Acres)	Land Use	Loading Rate (lbs/acre/year)				Total Loading				Pollutant Removal Rates								Total Loading w/Pollutant Removal									
				TP ¹	TN ¹	BOD ²	TSS ¹	TP	TN	BOD	TSS	TP		TN		BOD		TSS		TP		TN		BOD		TSS			
												Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High				
Proposed Design Point 1																													
Design Point 1A																													
PROP 1E	14,200	0.33	Impervious	0.712	4.63	111	716.45	0.4	2.4	58.6	378.4																		
PROP 1E	210,868	4.84	Grass/Landscaped	0.1157	3.74	19	307.94	0.0	1.5	7.7	125.0																		
Total Area	225,068	5.17				Total Design Point 1A		0.4	4.0	66.3	503.4																		
Design Point 1B																													
PROP 1A	174,967	4.02	Woods	0.0979	1.78	6	76.54	0.4	7.1	24.1	307.4																		
PROP DA 1D	467,834	10.74	Impervious	0.712	4.63	111	716.45	7.6	49.7	1,192.1	7,694.7																		
PROP DA 1D	250,952	5.76	Grass	0.1157	3.74	19	307.94	0.7	21.5	109.5	1,774.1																		
PROP DA 1D	338,199	7.76	Woods	0.0979	1.78	6	76.54	0.8	13.8	46.6	594.3																		
PROP DA 1L	55,670	1.28	Impervious	0.712	4.63	111	716.45	0.9	5.9	141.9	915.6																		
PROP DA 1L	231,259	5.31	Grass	0.1157	3.74	19	307.94	0.6	19.8	100.9	1,634.8																		
PROP DA 1K	9,729	0.22	Impervious	0.712	4.63	111	716.45	0.2	1.0	24.8	160.0																		
PROP DA 1K	124,469	2.86	Grass	0.1157	3.74	19	307.94	0.3	10.7	54.3	879.9																		
Total Area	1,653,079	37.95				Total Design Point 1B		11.5	129.7	1,694.1	13,960.8																		
Design Point 1C																													
PROP DA 1B	170,936	3.92	Commercial	0.712	4.63	111	716.45	2.8	18.2	435.6	2,811.5																		
PROP DA 1B	288,014	6.61	Grass	0.1157	3.74	19	307.94	0.8	24.7	125.6	2,036.1																		
						Subtotal Upper Pond		3.6	42.9	561.2	4,847.5	60	80	40	60	40	60	80	95	1.42	0.71	25.73	17.15	336.72	224.48	969.50	242.38		
PROP DA 1C	135,096	3.10	Commercial	0.712	4.63	111	716.45	2.2	14.4	344.3	2,222.0					Subtotal 1B after second pond			0.57	0.14	15.44	6.86	202.03	89.79	193.90	12.12			
PROP DA 1C	151,873	3.49	Grass	0.1157	3.74	19	307.94	0.4	13.0	66.2	1,073.6																		
PROP DA 1G	112,680	2.59	Commercial	0.712	4.63	111	716.45	1.8	12.0	287.1	1,853.3																		
PROP DA 1G	28,608	0.66	Grass	0.1157	3.74	19	307.94	0.1	2.5	12.5	202.2																		
PROP DA 1N	4,246	0.10	Commercial	0.712	4.63	111.00	716.45	0.1	0.5	10.8	69.8																		
PROP DA 1M	3,997	0.09	Woods	0.0979	1.78	6	76.54	0.0	0.2	0.6	7.0																		
PROP DA 1H	128,328	2.95	Grass/Landscaped	0.1157	3.74	19	307.94	0.3	11.0	56.0	907.2																		
						Subtotal Upper & Lower Pond		4.9	53.4	777.5	6,335.2	60	80	40	60	40	60	80	95	1.98	0.99	32.06	21.38	466.47	310.98	1267.04	316.76		
PROP DA 1J	22,667	0.52	Impervious	0.712	4.63	111.00	716.45	0.4	2.4	57.8	372.8																		
PROP DA 1J	12,033	0.28	Impervious/Paver	0.712	4.63	112.00	716.45	0.2	1.3	30.9	197.9	60	80	60	80	80	95	80	95	0.08	0.04	0.51	0.26	6.19	1.55	39.58	9.90		
PROP DA 1J	296,932	6.82	Grass	0.1157	3.74	19	307.94	0.8	25.5	129.5	2,099.1																		
						Subtotal 1J with Treatment		1.2	28.1	188.8	2,481.8																		
PROP DA 1F	16,625	0.38	Commercial	0.712	4.63	111.00	716.45	0.3	1.8	42.4	273.4																		
PROP DA 1F	15,000	0.34	Commercial	0.712	4.63	112.00	716.45	0.2	1.6	38.6	246.7	60	80	60	80	80	95	80	95	0.10	0.05	0.64	0.32	7.71	1.93	49.34	12.34		
PROP DA 1F	225,522	5.18	Grass	0.1157	3.74	19	307.94	0.6	19.4	98.4	1,594.3																		
Total Area	1,612,557	37.02				Subtotal1F with Treatment		0.9	21.4	142.7	1,880.1																		
						Total DP 1C w/o treatment		10.5	145.3	1,666.7	15,522.4					Total Design Point 1C w/ Treatment				4.67	3.25	97.08	77.82	999.99	732.26	5,822.83	4,690.76		
Total Design Point 1	3,490,704.00	80.14				Total Design Point 1		15.2	211.5	2,492.7	19,155.0																		
						% Change		-12%	-20%	1%	-26%																		

Pollutant Loading Calculations
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SPPP APPENDIX F
DRAWINGS