

# "THE BIRCHES"

A 40B RESIDENTIAL PROJECT  
OFF LONG RIDGE ROAD, CARLISLE, MASSACHUSETTS

FINAL  
**STORMWATER  
MANAGEMENT REPORT**

**VOLUME 2 OF 2**

**STORMWATER MANAGEMENT DESIGN**

July 1, 2014

PREPARED FOR:

**LIFETIME GREEN HOMES, LLC**  
142 LITTLETON ROAD, WESTFORD, MA 01886

PREPARED BY:

**MEISNER BREM CORPORATION**  
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MBC JOB NUMBER: 2066

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**MEISNER BREM CORPORATION**

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STORMWATER MANAGEMENT REPORT – VOLUME 2 OF 2

A 40B RESIDENTIAL PROJECT OFF LONG RIDGE ROAD, CARLISLE, MA

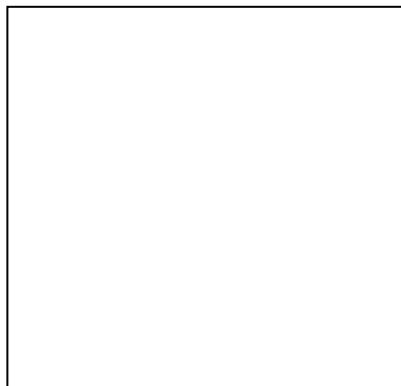
**THE FOLLOWING REPORT HAS BEEN PREPARED UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS.**

*"THE BIRCHES"*

*OFF LONG RIDGE ROAD  
CARLISLE, MASSACHUSETTS*

**Volume 2**

**STORMWATER MANAGEMENT DESIGN**



# MEISNER BREM CORPORATION

142 LITTLETON ROAD, STE. 16, WESTFORD, MA 01886

## *THE BIRCHES*

*STORMWATER MANAGEMENT REPORT – VOLUME 2 OF 2  
A 40B RESIDENTIAL PROJECT OFF LONG RIDGE ROAD, CARLISLE, MA*

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STORMWATER CHECKLIST

HYDROCAD WORKSHEETS - 2, 10, 25 & 100 YEAR STORM EVENTS

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*STORMWATER MANAGEMENT REPORT – VOLUME 2 OF 2  
A 40B RESIDENTIAL PROJECT OFF LONG RIDGE ROAD, CARLISLE, MA*

**STORMWATER CHECKLIST**

SEE FOLLOWING PAGES FOR MASS DEP STORMWATER CHECKLIST



# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



# Checklist for Stormwater Report

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## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

---

### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

---

Signature and Date

---

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



# Checklist for Stormwater Report

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## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): \_\_\_\_\_

### Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - Static
  - Simple Dynamic
  - Dynamic Field<sup>1</sup>
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
  - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
    - is within the Zone II or Interim Wellhead Protection Area
    - is near or to other critical areas
    - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
    - involves runoff from land uses with higher potential pollutant loads.
  - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
  - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - Limited Project
  - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
  - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
  - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
  - Bike Path and/or Foot Path
  - Redevelopment Project
  - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

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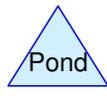
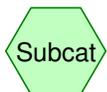
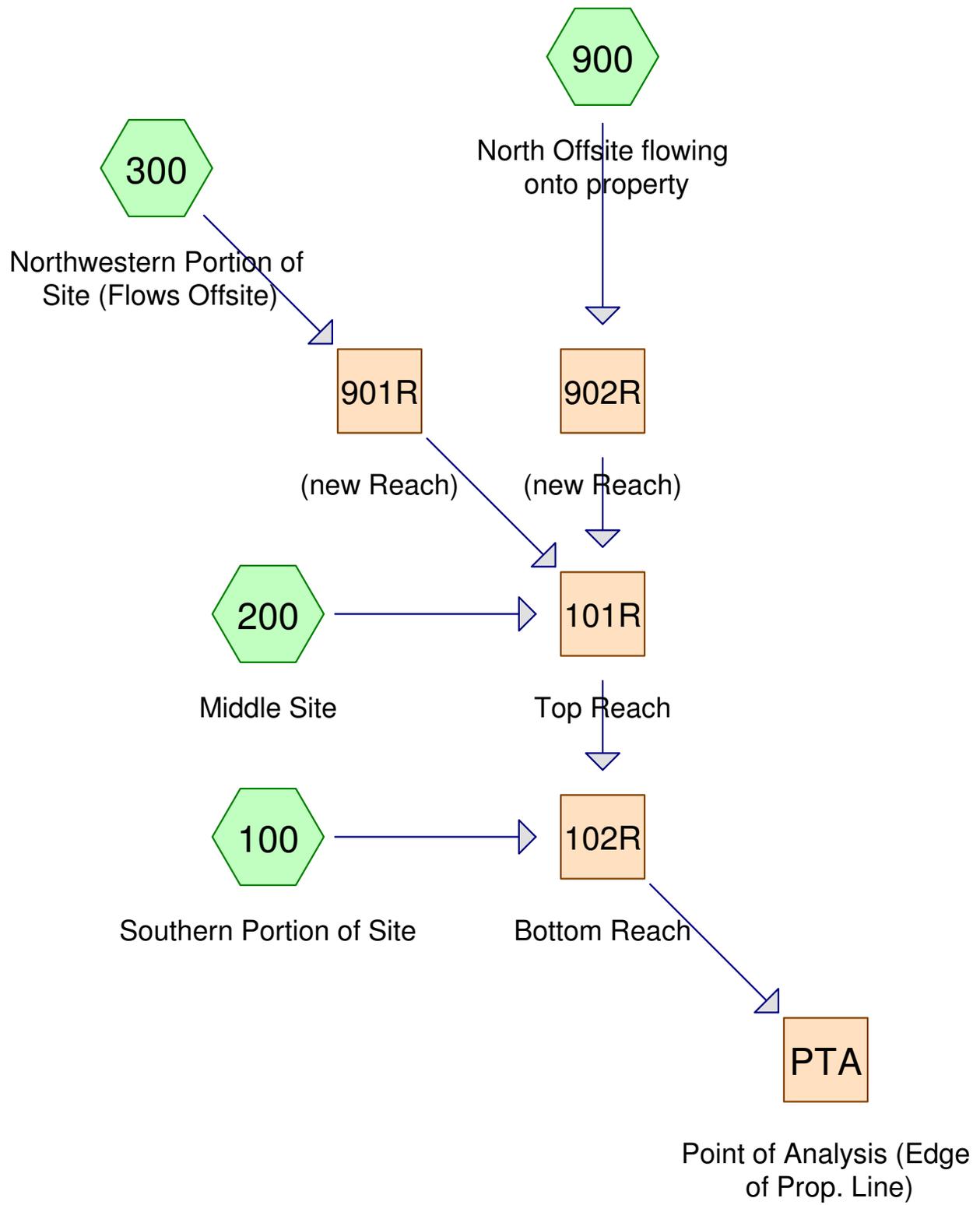
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A 40B RESIDENTIAL PROJECT OFF LONG RIDGE ROAD, CARLISLE, MA*

HydroCAD Printouts

Pre Development

Storm Frequency: 2, 10, 25, 100 Year



## 2066 Predevelopment\_4c

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2/6/2015

### Area Listing (selected nodes)

<u>Area (sq-ft)</u>	<u>CN</u>	<u>Description (subcats)</u>
143,231	70	Woods, Good, HSG C (100,200,300,900)
52,040	74	>75% Grass cover, Good, HSG C (100,300)
4,161	89	Gravel roads, HSG C (200)
74,919	91	Fallow, bare soil, HSG C (100,200,300)
20,909	98	Paved parking & roofs (100,200)
<hr/>		
295,260		

**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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Page 3

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 100: Southern Portion of Site**

Runoff Area=134,123 sf Runoff Depth&gt;1.07"

Flow Length=560' Tc=13.3 min CN=77 Runoff=2.94 cfs 11,931 cf

**Subcatchment 200: Middle Site**

Runoff Area=78,511 sf Runoff Depth&gt;1.44"

Flow Length=570' Tc=12.3 min CN=83 Runoff=2.48 cfs 9,439 cf

**Subcatchment 300: Northwestern Portion of Site (Flows Offsi**

Runoff Area=68,550 sf Runoff Depth&gt;1.07"

Flow Length=450' Tc=14.2 min CN=77 Runoff=1.46 cfs 6,096 cf

**Subcatchment 900: North Offsite flowing onto property**

Runoff Area=14,076 sf Runoff Depth&gt;0.71"

Flow Length=340' Slope=0.0500 '/' Tc=12.8 min CN=70 Runoff=0.19 cfs 835 cf

**Reach 101R: Top Reach**

Avg. Depth=0.13' Max Vel=2.03 fps Inflow=4.09 cfs 16,370 cf

n=0.025 L=315.0' S=0.0190 '/' Capacity=1,068.23 cfs Outflow=4.00 cfs 16,330 cf

**Reach 102R: Bottom Reach**

Avg. Depth=0.16' Max Vel=3.84 fps Inflow=6.76 cfs 28,260 cf

n=0.025 L=120.0' S=0.0500 '/' Capacity=1,345.64 cfs Outflow=6.75 cfs 28,244 cf

**Reach 901R: (new Reach)**

Inflow=1.46 cfs 6,096 cf

Outflow=1.46 cfs 6,096 cf

**Reach 902R: (new Reach)**

Inflow=0.19 cfs 835 cf

Outflow=0.19 cfs 835 cf

**Reach PTA: Point of Analysis (Edge of Prop. Line)**

Inflow=6.75 cfs 28,244 cf

Outflow=6.75 cfs 28,244 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 28,301 cf Average Runoff Depth = 1.15"****92.92% Pervious Area = 274,351 sf 7.08% Impervious Area = 20,909 sf**

**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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2/6/2015

**Subcatchment 100: Southern Portion of Site**

Runoff = 2.94 cfs @ 12.19 hrs, Volume= 11,931 cf, Depth> 1.07"

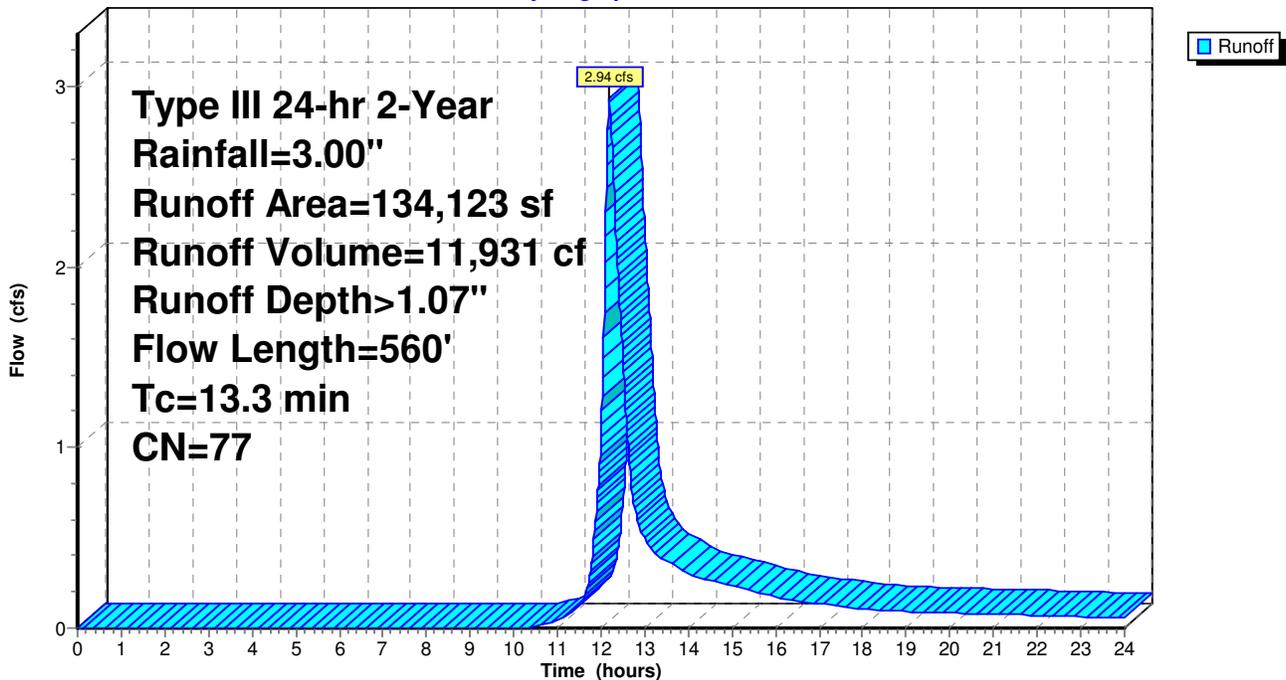
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
16,512	98	Paved parking & roofs
81,239	70	Woods, Good, HSG C
17,903	74	>75% Grass cover, Good, HSG C
18,469	91	Fallow, bare soil, HSG C
134,123	77	Weighted Average
117,611		Pervious Area
16,512		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.6	340	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.2	170	0.2100	2.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.3	560	Total			

**Subcatchment 100: Southern Portion of Site**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 200: Middle Site**

Runoff = 2.48 cfs @ 12.17 hrs, Volume= 9,439 cf, Depth&gt; 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

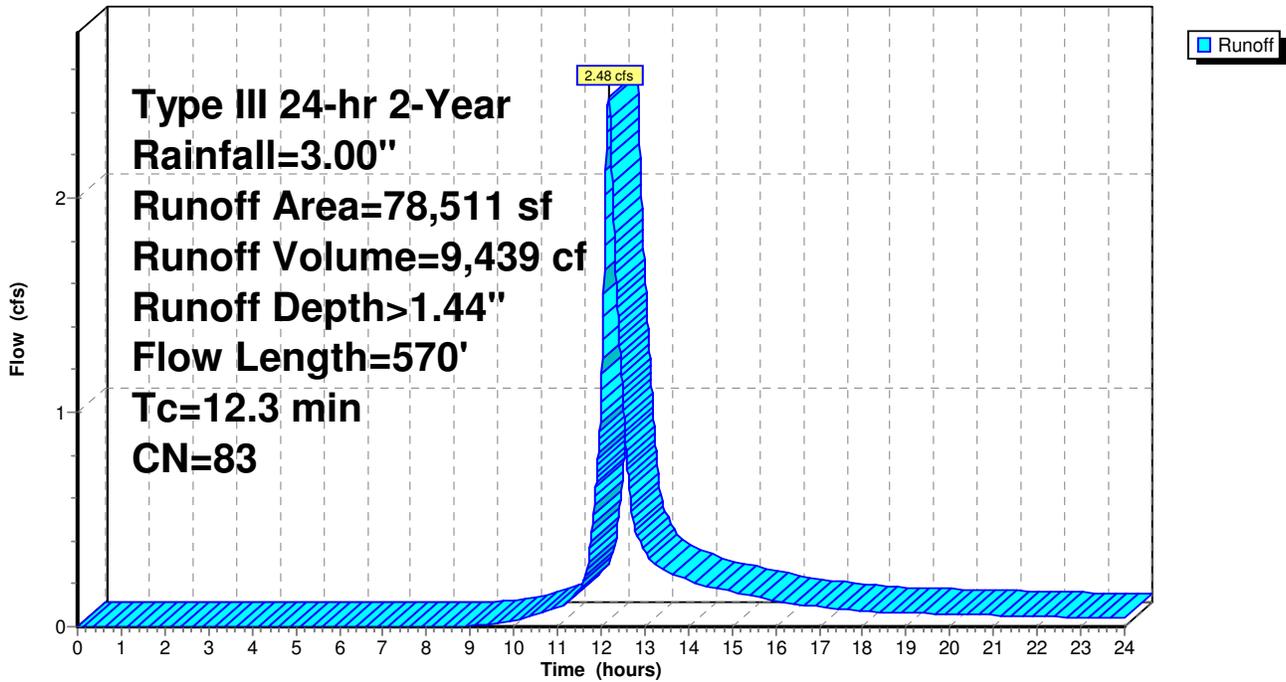
Area (sf)	CN	Description
4,397	98	Paved parking & roofs
31,363	70	Woods, Good, HSG C
38,590	91	Fallow, bare soil, HSG C
4,161	89	Gravel roads, HSG C
78,511	83	Weighted Average
74,114		Pervious Area
4,397		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	260	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.9	120	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.6	140	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.3	570	Total			

### Subcatchment 200: Middle Site

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Runoff = 1.46 cfs @ 12.20 hrs, Volume= 6,096 cf, Depth> 1.07"

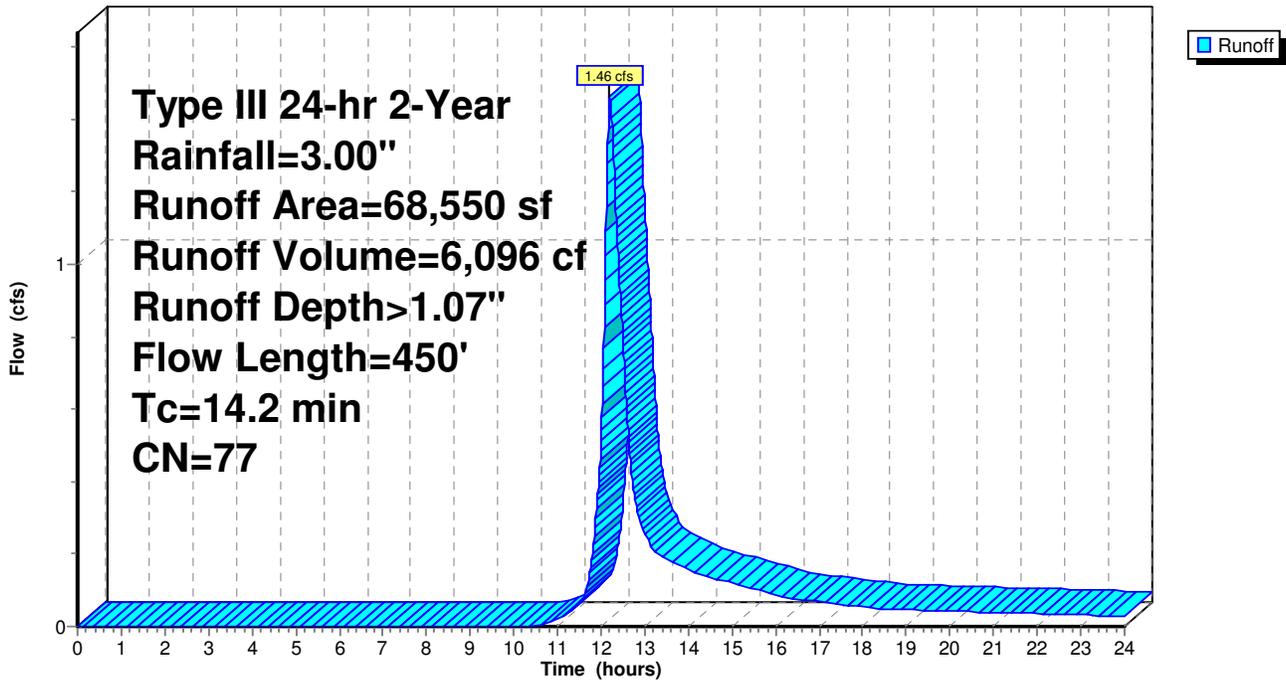
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
16,553	70	Woods, Good, HSG C
34,137	74	>75% Grass cover, Good, HSG C
17,860	91	Fallow, bare soil, HSG C
68,550	77	Weighted Average
68,550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	50	0.0250	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.5	200	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
1.4	200	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
14.2	450	Total			

**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.19 cfs @ 12.20 hrs, Volume= 835 cf, Depth> 0.71"

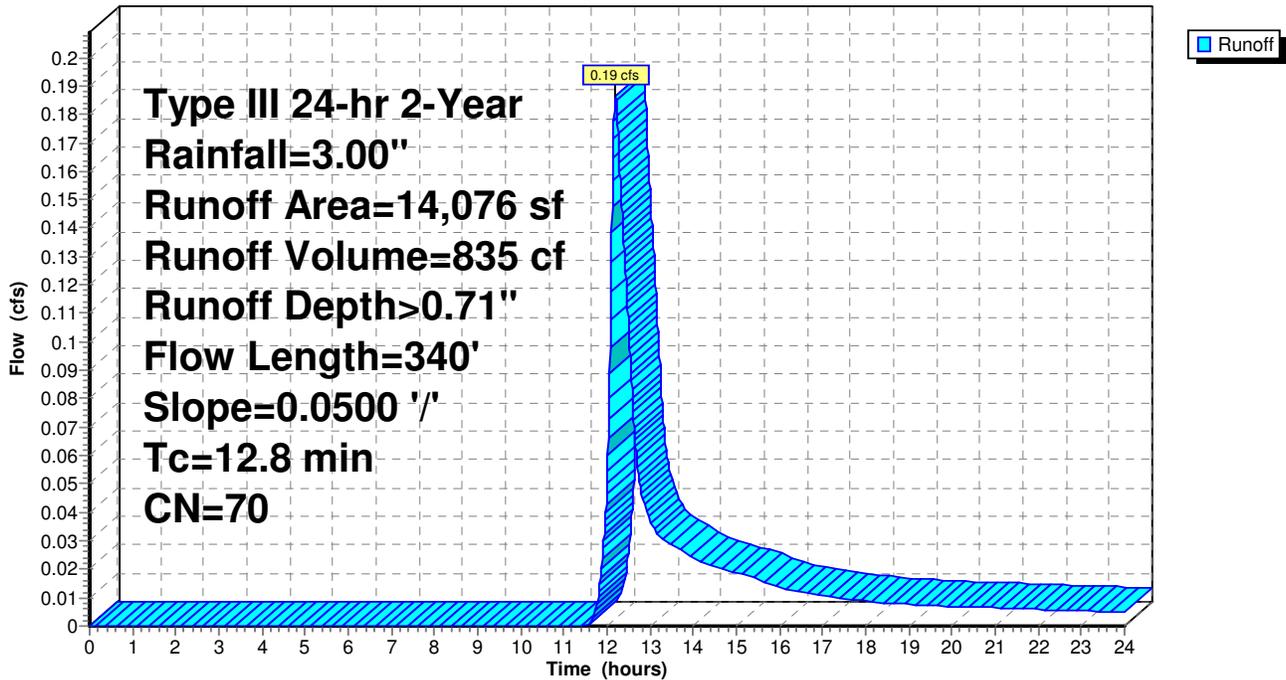
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.3	290	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.8	340	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 101R: Top Reach**

Inflow Area = 161,137 sf, Inflow Depth > 1.22" for 2-Year event  
Inflow = 4.09 cfs @ 12.18 hrs, Volume= 16,370 cf  
Outflow = 4.00 cfs @ 12.26 hrs, Volume= 16,330 cf, Atten= 2%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.03 fps, Min. Travel Time= 2.6 min  
Avg. Velocity = 0.85 fps, Avg. Travel Time= 6.2 min

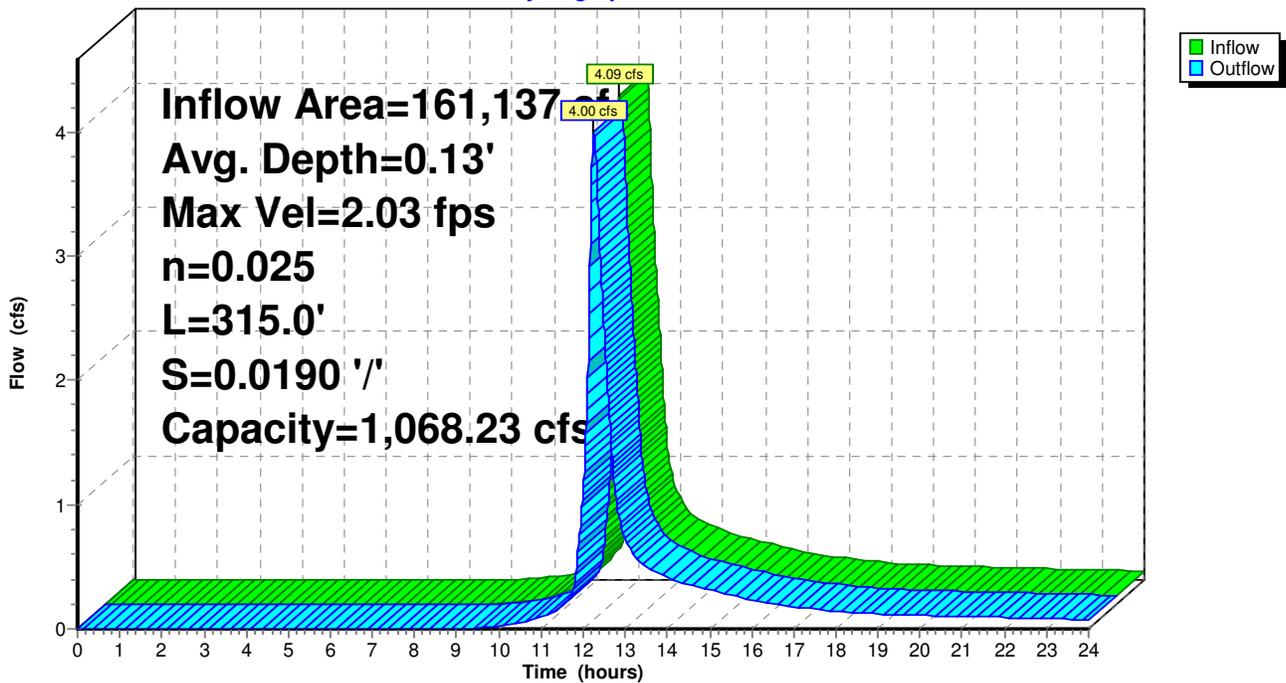
Peak Storage= 620 cf @ 12.21 hrs, Average Depth at Peak Storage= 0.13'  
Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,068.23 cfs

15.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
Side Slope Z-value= 4.0 '/' Top Width= 39.00'  
Length= 315.0' Slope= 0.0190 '/'  
Inlet Invert= 94.00', Outlet Invert= 88.00'



**Reach 101R: Top Reach**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 102R: Bottom Reach**

[61] Hint: Submerged 3% of Reach 101R bottom

Inflow Area =	295,260 sf,	Inflow Depth > 1.15"	for 2-Year event
Inflow =	6.76 cfs @ 12.24 hrs,	Volume=	28,260 cf
Outflow =	6.75 cfs @ 12.25 hrs,	Volume=	28,244 cf, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 3.84 fps, Min. Travel Time= 0.5 min  
 Avg. Velocity = 1.46 fps, Avg. Travel Time= 1.4 min

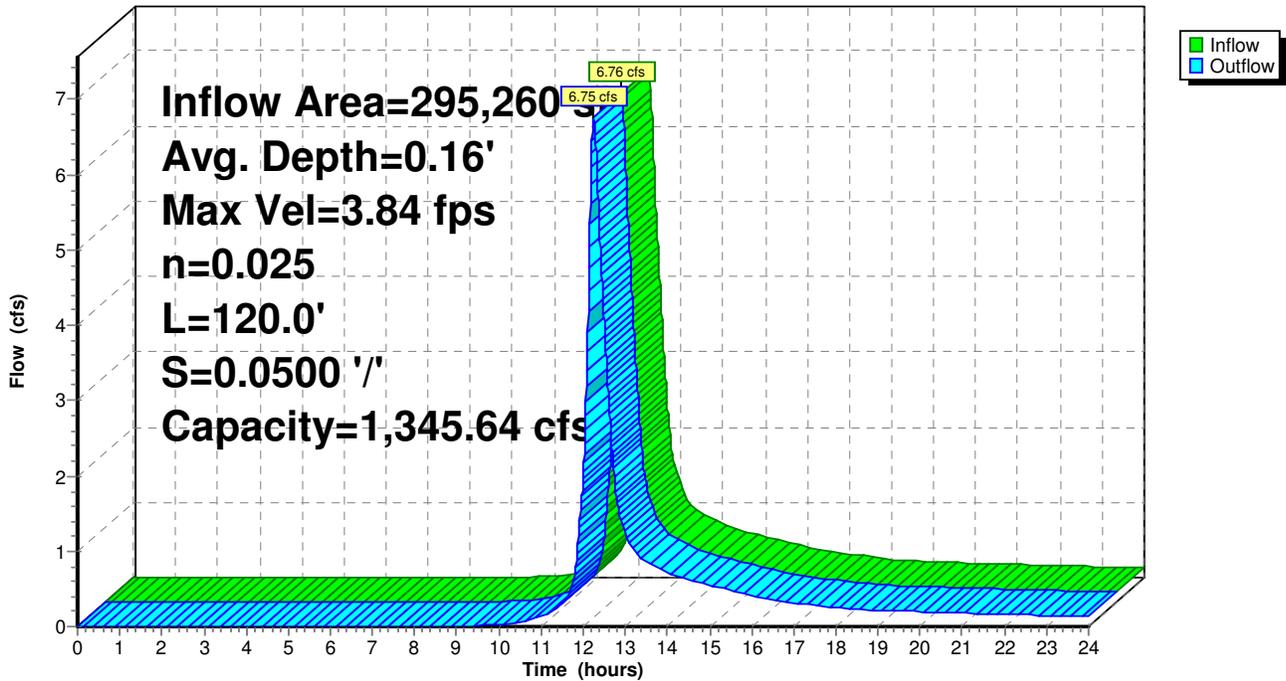
Peak Storage= 211 cf @ 12.24 hrs, Average Depth at Peak Storage= 0.16'  
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,345.64 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
 Side Slope Z-value= 4.0 '/' Top Width= 34.00'  
 Length= 120.0' Slope= 0.0500 '/'  
 Inlet Invert= 88.00', Outlet Invert= 82.00'



**Reach 102R: Bottom Reach**

Hydrograph



### Reach 901R: (new Reach)

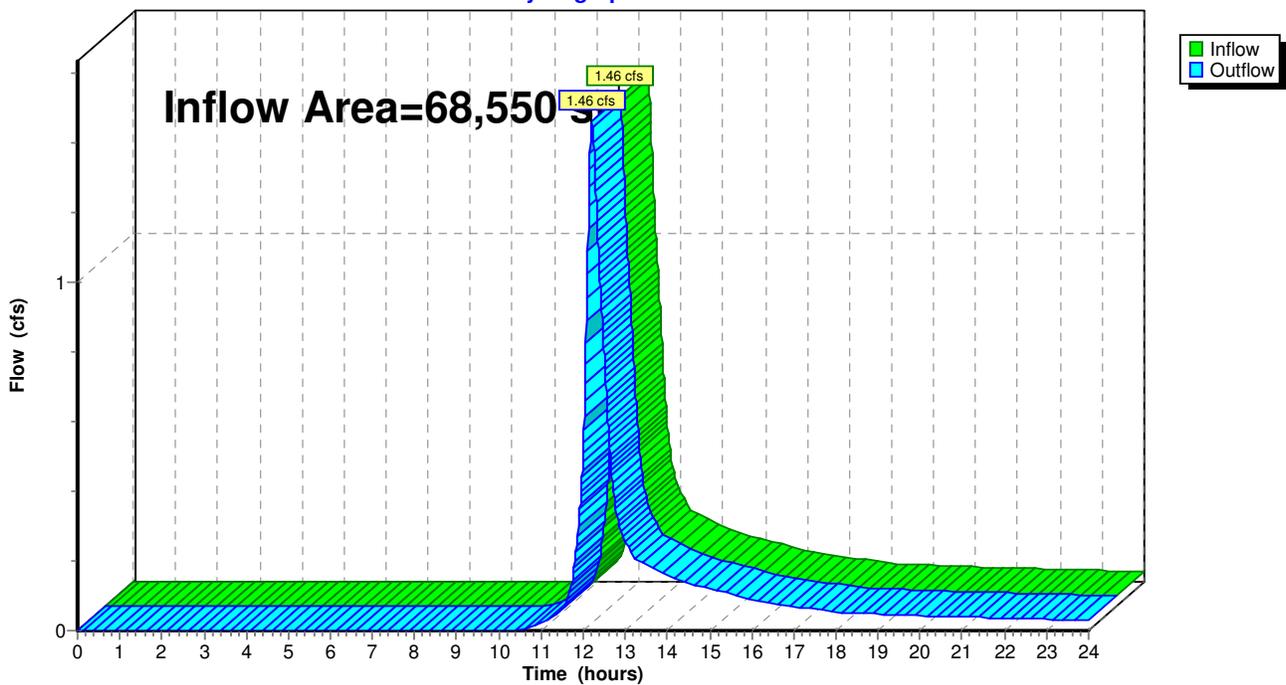
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 68,550 sf, Inflow Depth > 1.07" for 2-Year event  
Inflow = 1.46 cfs @ 12.20 hrs, Volume= 6,096 cf  
Outflow = 1.46 cfs @ 12.20 hrs, Volume= 6,096 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 901R: (new Reach)

Hydrograph



Reach 902R: (new Reach)

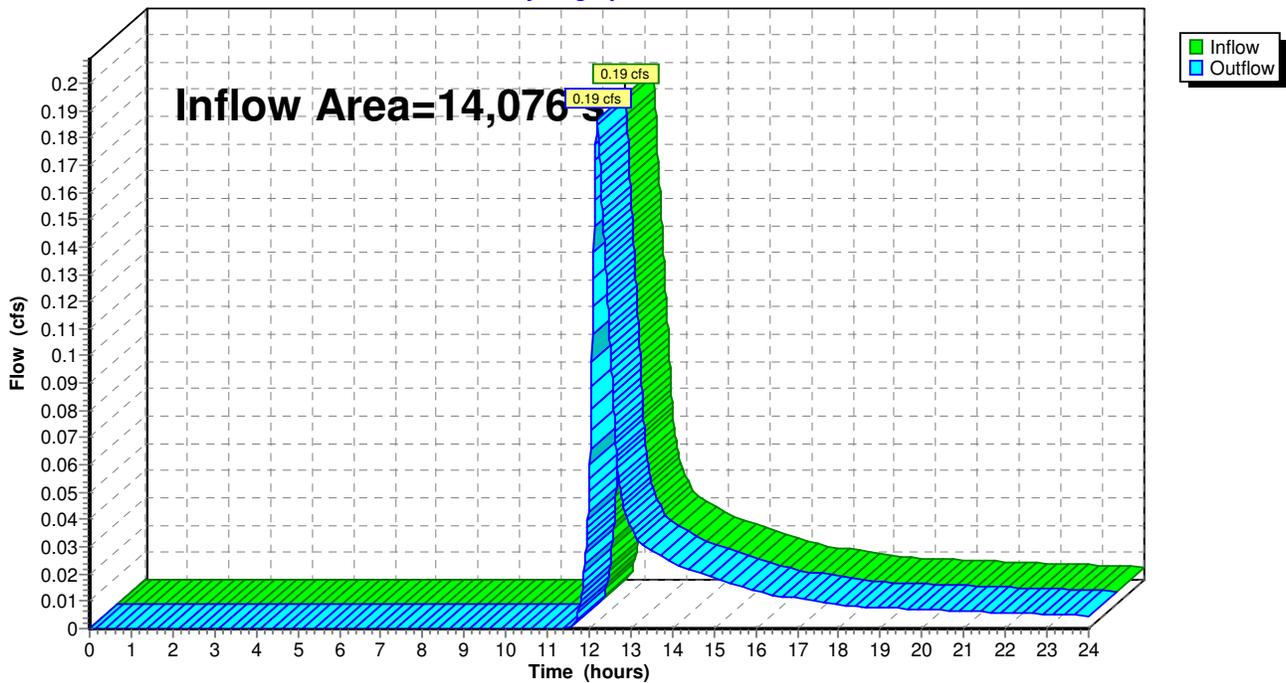
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14,076 sf, Inflow Depth > 0.71" for 2-Year event  
Inflow = 0.19 cfs @ 12.20 hrs, Volume= 835 cf  
Outflow = 0.19 cfs @ 12.20 hrs, Volume= 835 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 902R: (new Reach)

Hydrograph



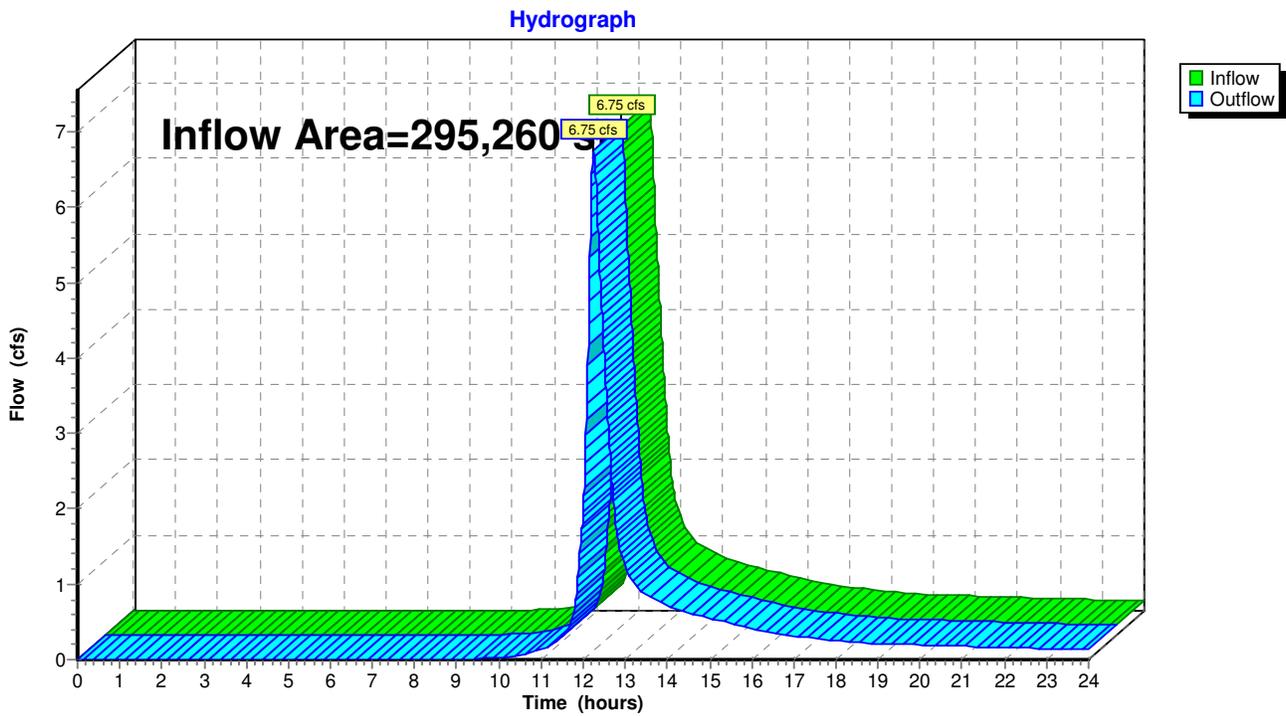
**Reach PTA: Point of Analysis (Edge of Prop. Line)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 295,260 sf, Inflow Depth > 1.15" for 2-Year event  
Inflow = 6.75 cfs @ 12.25 hrs, Volume= 28,244 cf  
Outflow = 6.75 cfs @ 12.25 hrs, Volume= 28,244 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach PTA: Point of Analysis (Edge of Prop. Line)**



## 2066 Predevelopment\_4c

Type III 24-hr 10-Year Rainfall=4.50"

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment 100: Southern Portion of Site

Runoff Area=134,123 sf Runoff Depth>2.20"

Flow Length=560' Tc=13.3 min CN=77 Runoff=6.30 cfs 24,637 cf

### Subcatchment 200: Middle Site

Runoff Area=78,511 sf Runoff Depth>2.72"

Flow Length=570' Tc=12.3 min CN=83 Runoff=4.69 cfs 17,790 cf

### Subcatchment 300: Northwestern Portion of Site (Flows Offsi

Runoff Area=68,550 sf Runoff Depth>2.20"

Flow Length=450' Tc=14.2 min CN=77 Runoff=3.14 cfs 12,589 cf

### Subcatchment 900: North Offsite flowing onto property

Runoff Area=14,076 sf Runoff Depth>1.67"

Flow Length=340' Slope=0.0500 '/' Tc=12.8 min CN=70 Runoff=0.49 cfs 1,957 cf

### Reach 101R: Top Reach

Avg. Depth=0.19' Max Vel=2.67 fps Inflow=8.27 cfs 32,337 cf

n=0.025 L=315.0' S=0.0190 '/' Capacity=1,068.23 cfs Outflow=8.15 cfs 32,272 cf

### Reach 102R: Bottom Reach

Avg. Depth=0.26' Max Vel=5.04 fps Inflow=14.21 cfs 56,909 cf

n=0.025 L=120.0' S=0.0500 '/' Capacity=1,345.64 cfs Outflow=14.19 cfs 56,883 cf

### Reach 901R: (new Reach)

Inflow=3.14 cfs 12,589 cf

Outflow=3.14 cfs 12,589 cf

### Reach 902R: (new Reach)

Inflow=0.49 cfs 1,957 cf

Outflow=0.49 cfs 1,957 cf

### Reach PTA: Point of Analysis (Edge of Prop. Line)

Inflow=14.19 cfs 56,883 cf

Outflow=14.19 cfs 56,883 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 56,974 cf Average Runoff Depth = 2.32"**

**92.92% Pervious Area = 274,351 sf 7.08% Impervious Area = 20,909 sf**

**2066 Predevelopment\_4c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 100: Southern Portion of Site**

Runoff = 6.30 cfs @ 12.19 hrs, Volume= 24,637 cf, Depth> 2.20"

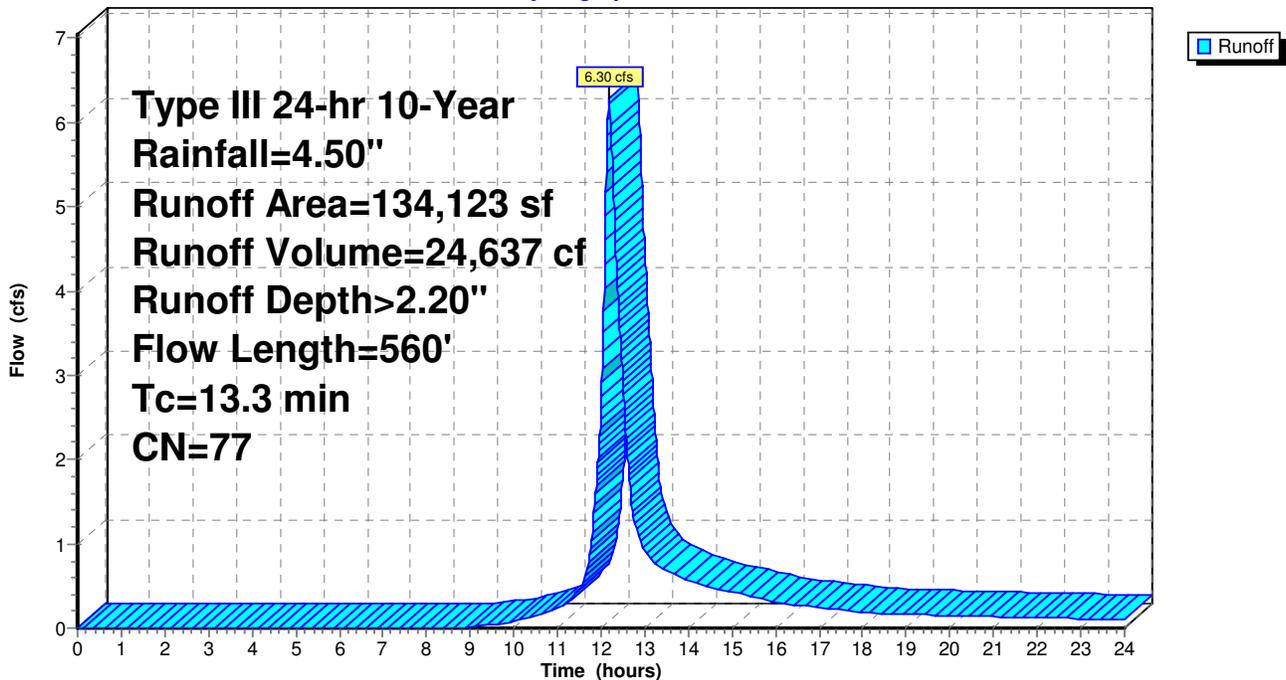
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
16,512	98	Paved parking & roofs
81,239	70	Woods, Good, HSG C
17,903	74	>75% Grass cover, Good, HSG C
18,469	91	Fallow, bare soil, HSG C
134,123	77	Weighted Average
117,611		Pervious Area
16,512		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.6	340	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.2	170	0.2100	2.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.3	560	Total			

**Subcatchment 100: Southern Portion of Site**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 200: Middle Site**

Runoff = 4.69 cfs @ 12.17 hrs, Volume= 17,790 cf, Depth&gt; 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

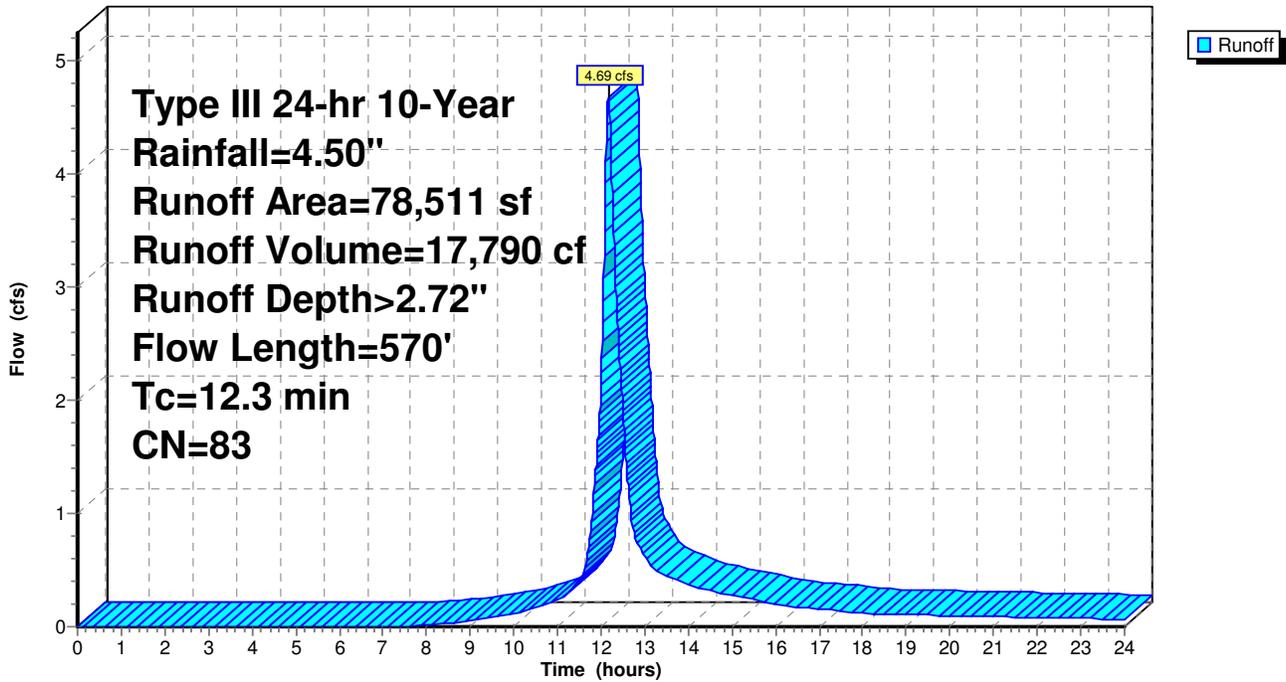
Area (sf)	CN	Description
4,397	98	Paved parking & roofs
31,363	70	Woods, Good, HSG C
38,590	91	Fallow, bare soil, HSG C
4,161	89	Gravel roads, HSG C
78,511	83	Weighted Average
74,114		Pervious Area
4,397		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	260	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.9	120	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.6	140	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.3	570	Total			

Subcatchment 200: Middle Site

Hydrograph



**2066 Predevelopment\_4c**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Runoff = 3.14 cfs @ 12.20 hrs, Volume= 12,589 cf, Depth> 2.20"

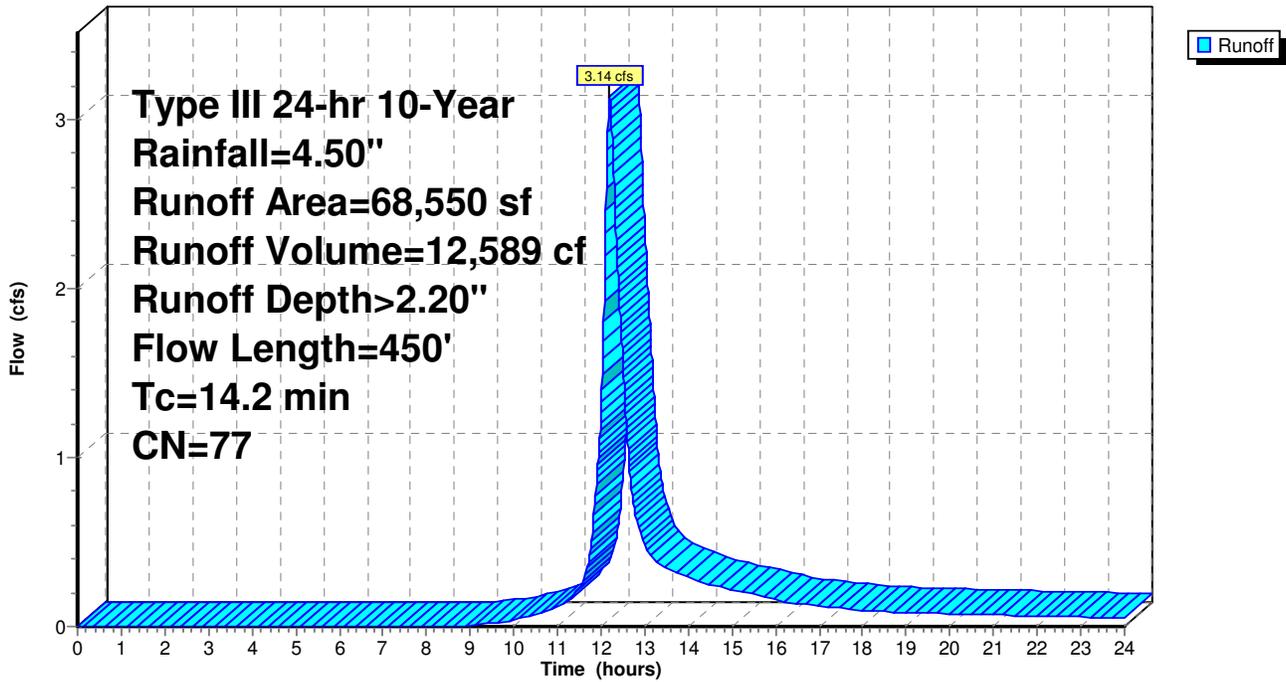
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
16,553	70	Woods, Good, HSG C
34,137	74	>75% Grass cover, Good, HSG C
17,860	91	Fallow, bare soil, HSG C
68,550	77	Weighted Average
68,550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	50	0.0250	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.5	200	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
1.4	200	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
14.2	450	Total			

**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.49 cfs @ 12.19 hrs, Volume= 1,957 cf, Depth> 1.67"

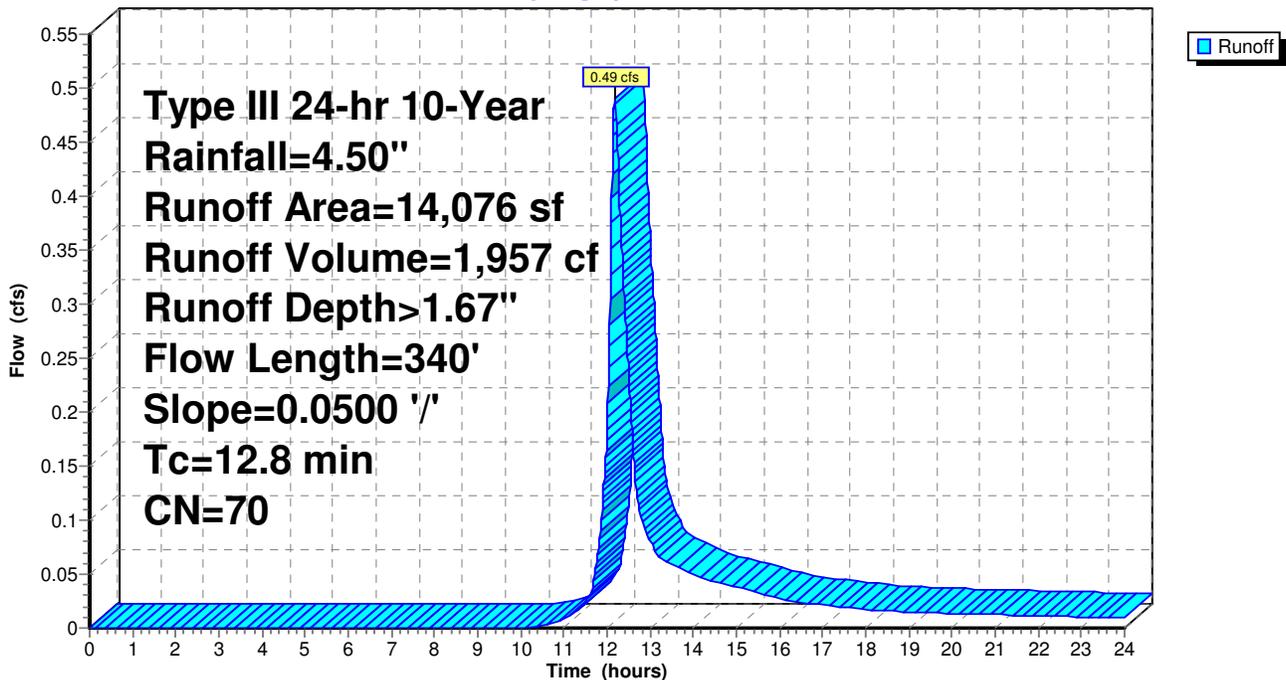
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.3	290	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.8	340	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



# 2066 Predevelopment\_4c

Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 101R: Top Reach

Inflow Area = 161,137 sf, Inflow Depth > 2.41" for 10-Year event  
Inflow = 8.27 cfs @ 12.18 hrs, Volume= 32,337 cf  
Outflow = 8.15 cfs @ 12.23 hrs, Volume= 32,272 cf, Atten= 1%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.67 fps, Min. Travel Time= 2.0 min  
Avg. Velocity = 0.92 fps, Avg. Travel Time= 5.7 min

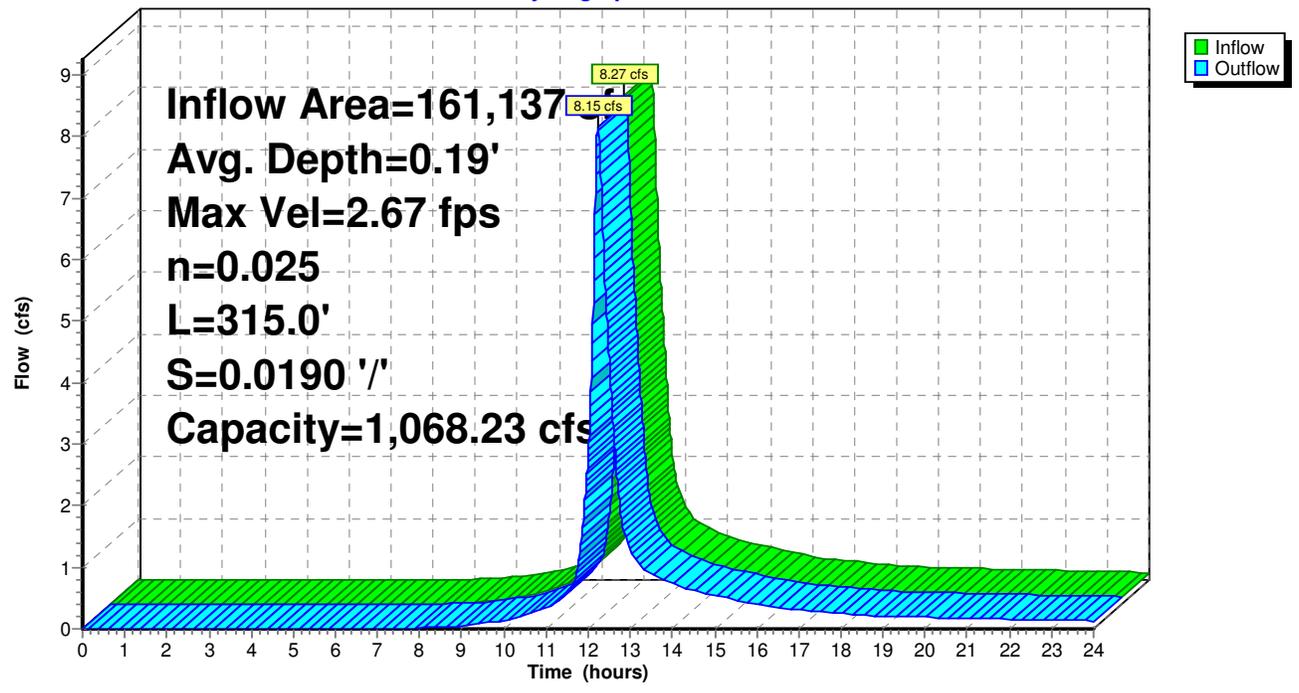
Peak Storage= 964 cf @ 12.20 hrs, Average Depth at Peak Storage= 0.19'  
Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,068.23 cfs

15.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
Side Slope Z-value= 4.0 '/' Top Width= 39.00'  
Length= 315.0' Slope= 0.0190 '/'  
Inlet Invert= 94.00', Outlet Invert= 88.00'



## Reach 101R: Top Reach

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Reach 102R: Bottom Reach**

[61] Hint: Submerged 4% of Reach 101R bottom

Inflow Area = 295,260 sf, Inflow Depth > 2.31" for 10-Year event  
 Inflow = 14.21 cfs @ 12.22 hrs, Volume= 56,909 cf  
 Outflow = 14.19 cfs @ 12.23 hrs, Volume= 56,883 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 5.04 fps, Min. Travel Time= 0.4 min  
 Avg. Velocity = 1.63 fps, Avg. Travel Time= 1.2 min

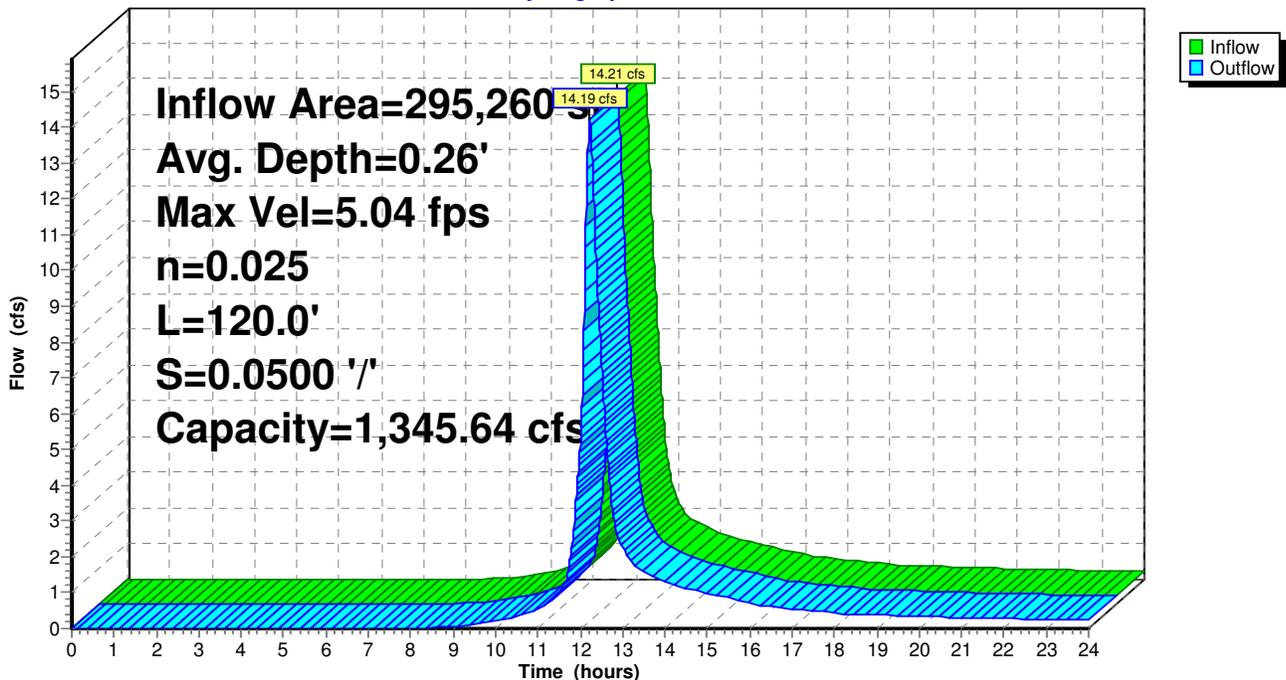
Peak Storage= 338 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.26'  
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,345.64 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
 Side Slope Z-value= 4.0 ' / ' Top Width= 34.00'  
 Length= 120.0' Slope= 0.0500 ' / '  
 Inlet Invert= 88.00', Outlet Invert= 82.00'



**Reach 102R: Bottom Reach**

Hydrograph



Reach 901R: (new Reach)

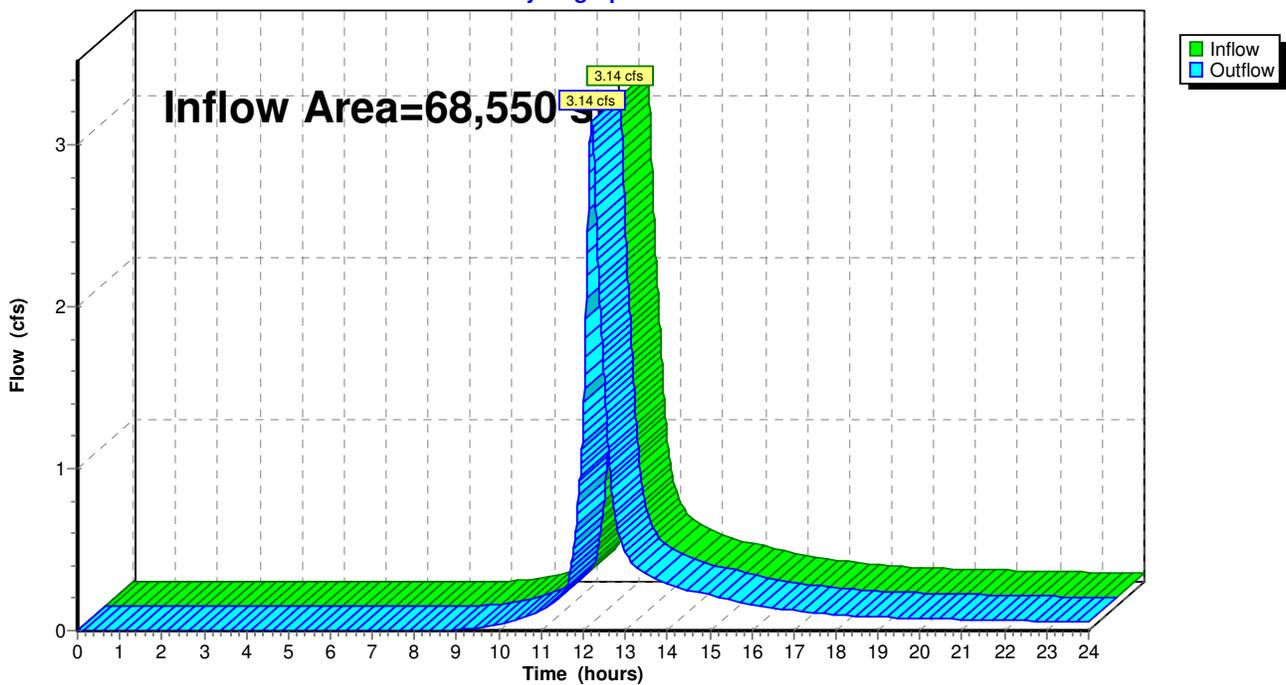
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 68,550 sf, Inflow Depth > 2.20" for 10-Year event  
Inflow = 3.14 cfs @ 12.20 hrs, Volume= 12,589 cf  
Outflow = 3.14 cfs @ 12.20 hrs, Volume= 12,589 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 901R: (new Reach)

Hydrograph



### Reach 902R: (new Reach)

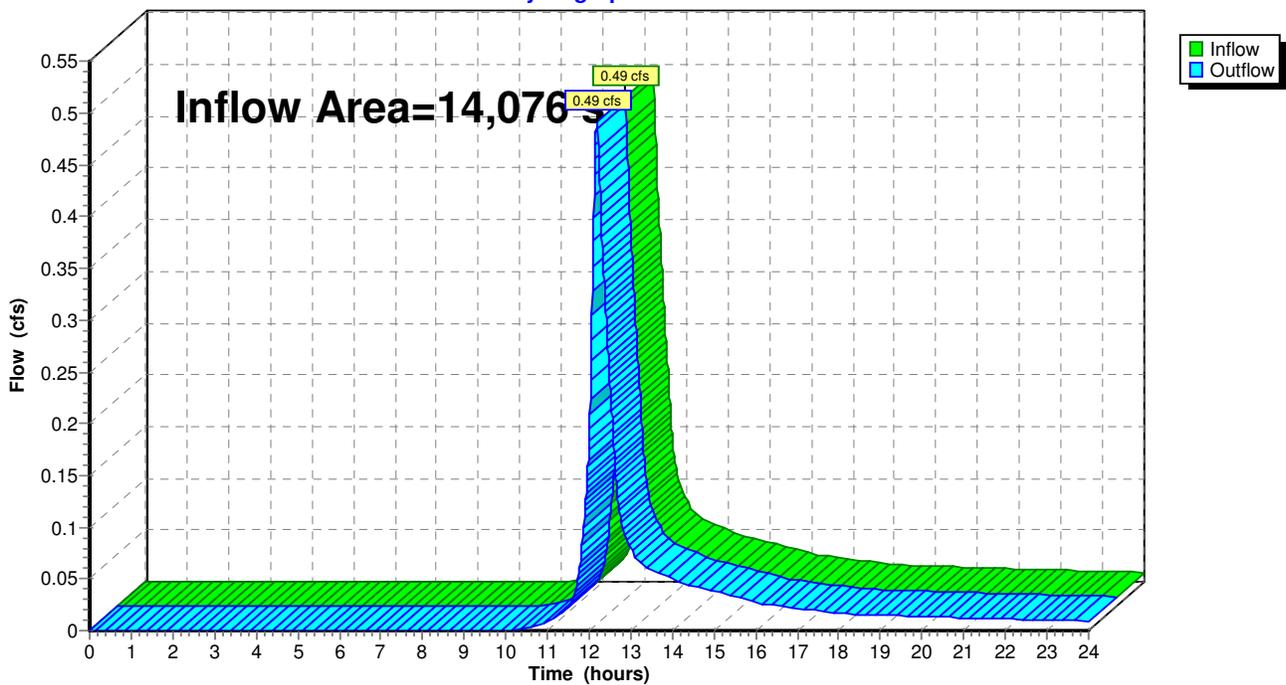
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14,076 sf, Inflow Depth > 1.67" for 10-Year event  
Inflow = 0.49 cfs @ 12.19 hrs, Volume= 1,957 cf  
Outflow = 0.49 cfs @ 12.19 hrs, Volume= 1,957 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 902R: (new Reach)

Hydrograph



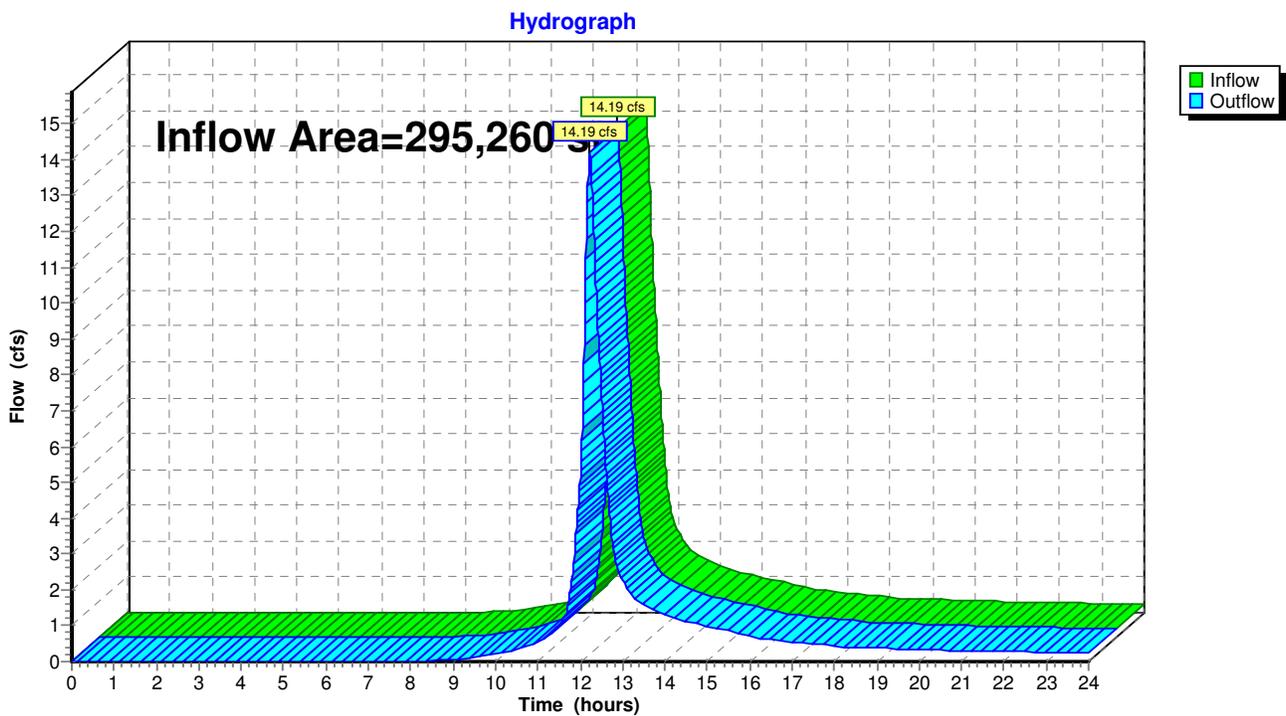
### Reach PTA: Point of Analysis (Edge of Prop. Line)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 295,260 sf, Inflow Depth > 2.31" for 10-Year event  
Inflow = 14.19 cfs @ 12.23 hrs, Volume= 56,883 cf  
Outflow = 14.19 cfs @ 12.23 hrs, Volume= 56,883 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach PTA: Point of Analysis (Edge of Prop. Line)



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 100: Southern Portion of Site**

Runoff Area=134,123 sf Runoff Depth&gt;2.87"

Flow Length=560' Tc=13.3 min CN=77 Runoff=8.22 cfs 32,056 cf

**Subcatchment 200: Middle Site**

Runoff Area=78,511 sf Runoff Depth&gt;3.44"

Flow Length=570' Tc=12.3 min CN=83 Runoff=5.90 cfs 22,500 cf

**Subcatchment 300: Northwestern Portion of Site (Flows Offsi**

Runoff Area=68,550 sf Runoff Depth&gt;2.87"

Flow Length=450' Tc=14.2 min CN=77 Runoff=4.10 cfs 16,381 cf

**Subcatchment 900: North Offsite flowing onto property**

Runoff Area=14,076 sf Runoff Depth&gt;2.25"

Flow Length=340' Slope=0.0500 '/' Tc=12.8 min CN=70 Runoff=0.68 cfs 2,645 cf

**Reach 101R: Top Reach**

Avg. Depth=0.23' Max Vel=2.93 fps Inflow=10.62 cfs 41,526 cf

n=0.025 L=315.0' S=0.0190 '/' Capacity=1,068.23 cfs Outflow=10.50 cfs 41,448 cf

**Reach 102R: Bottom Reach**

Avg. Depth=0.30' Max Vel=5.52 fps Inflow=18.45 cfs 73,505 cf

n=0.025 L=120.0' S=0.0500 '/' Capacity=1,345.64 cfs Outflow=18.44 cfs 73,473 cf

**Reach 901R: (new Reach)**

Inflow=4.10 cfs 16,381 cf

Outflow=4.10 cfs 16,381 cf

**Reach 902R: (new Reach)**

Inflow=0.68 cfs 2,645 cf

Outflow=0.68 cfs 2,645 cf

**Reach PTA: Point of Analysis (Edge of Prop. Line)**

Inflow=18.44 cfs 73,473 cf

Outflow=18.44 cfs 73,473 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 73,582 cf Average Runoff Depth = 2.99"****92.92% Pervious Area = 274,351 sf 7.08% Impervious Area = 20,909 sf**

**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 100: Southern Portion of Site**

Runoff = 8.22 cfs @ 12.19 hrs, Volume= 32,056 cf, Depth> 2.87"

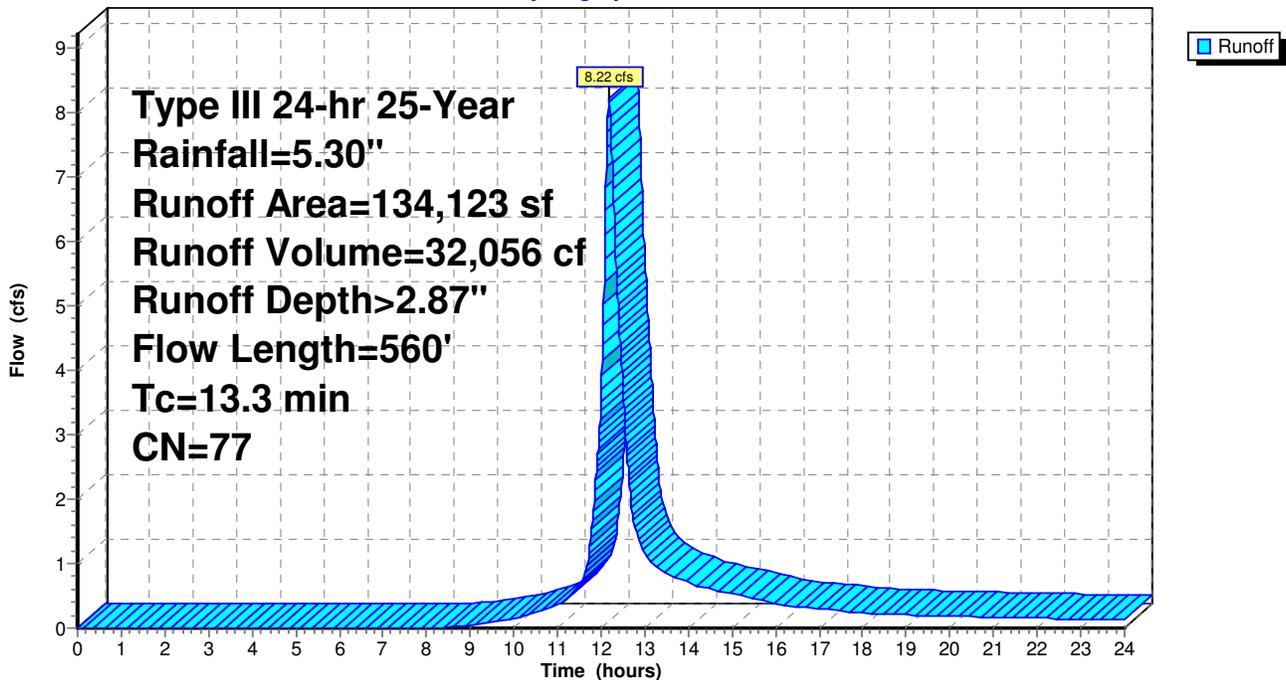
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
16,512	98	Paved parking & roofs
81,239	70	Woods, Good, HSG C
17,903	74	>75% Grass cover, Good, HSG C
18,469	91	Fallow, bare soil, HSG C
134,123	77	Weighted Average
117,611		Pervious Area
16,512		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.6	340	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.2	170	0.2100	2.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.3	560	Total			

**Subcatchment 100: Southern Portion of Site**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 200: Middle Site**

Runoff = 5.90 cfs @ 12.17 hrs, Volume= 22,500 cf, Depth&gt; 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

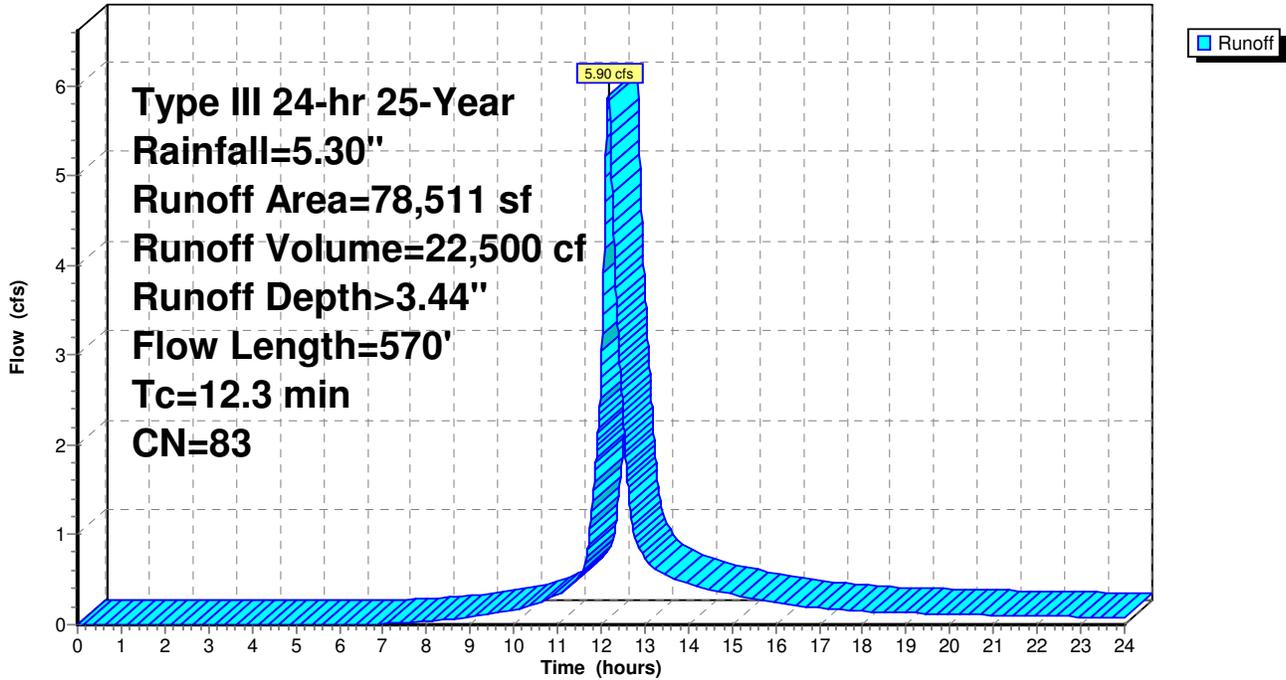
Area (sf)	CN	Description
4,397	98	Paved parking & roofs
31,363	70	Woods, Good, HSG C
38,590	91	Fallow, bare soil, HSG C
4,161	89	Gravel roads, HSG C
78,511	83	Weighted Average
74,114		Pervious Area
4,397		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	260	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.9	120	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.6	140	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.3	570	Total			

Subcatchment 200: Middle Site

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Runoff = 4.10 cfs @ 12.20 hrs, Volume= 16,381 cf, Depth> 2.87"

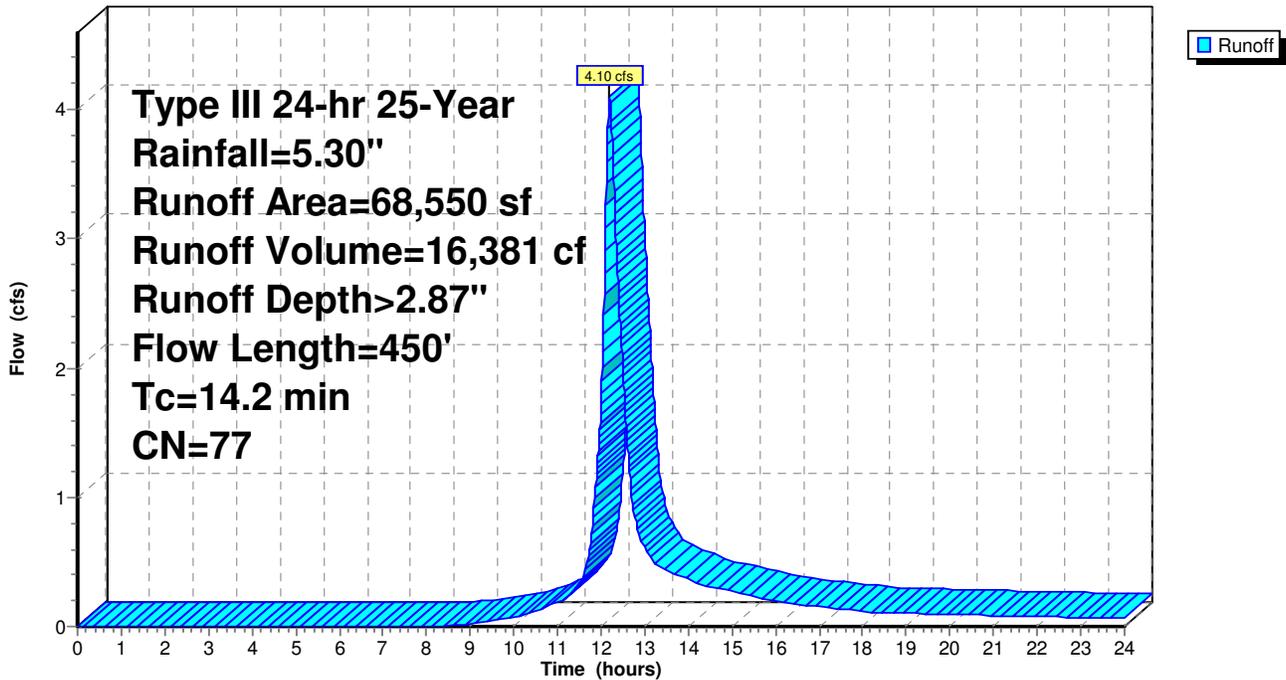
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
16,553	70	Woods, Good, HSG C
34,137	74	>75% Grass cover, Good, HSG C
17,860	91	Fallow, bare soil, HSG C
68,550	77	Weighted Average
68,550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	50	0.0250	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.5	200	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
1.4	200	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
14.2	450	Total			

**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.68 cfs @ 12.18 hrs, Volume= 2,645 cf, Depth> 2.25"

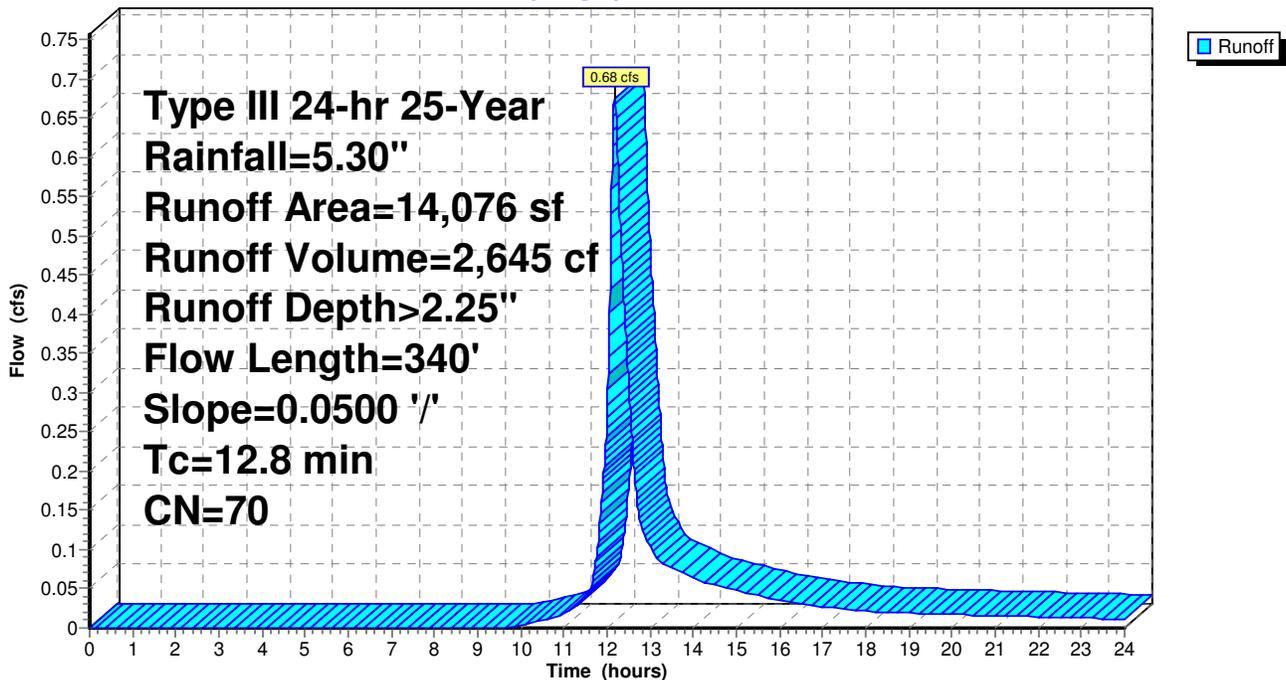
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.3	290	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.8	340	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Reach 101R: Top Reach**

Inflow Area = 161,137 sf, Inflow Depth > 3.09" for 25-Year event  
Inflow = 10.62 cfs @ 12.18 hrs, Volume= 41,526 cf  
Outflow = 10.50 cfs @ 12.23 hrs, Volume= 41,448 cf, Atten= 1%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.93 fps, Min. Travel Time= 1.8 min  
Avg. Velocity = 0.95 fps, Avg. Travel Time= 5.5 min

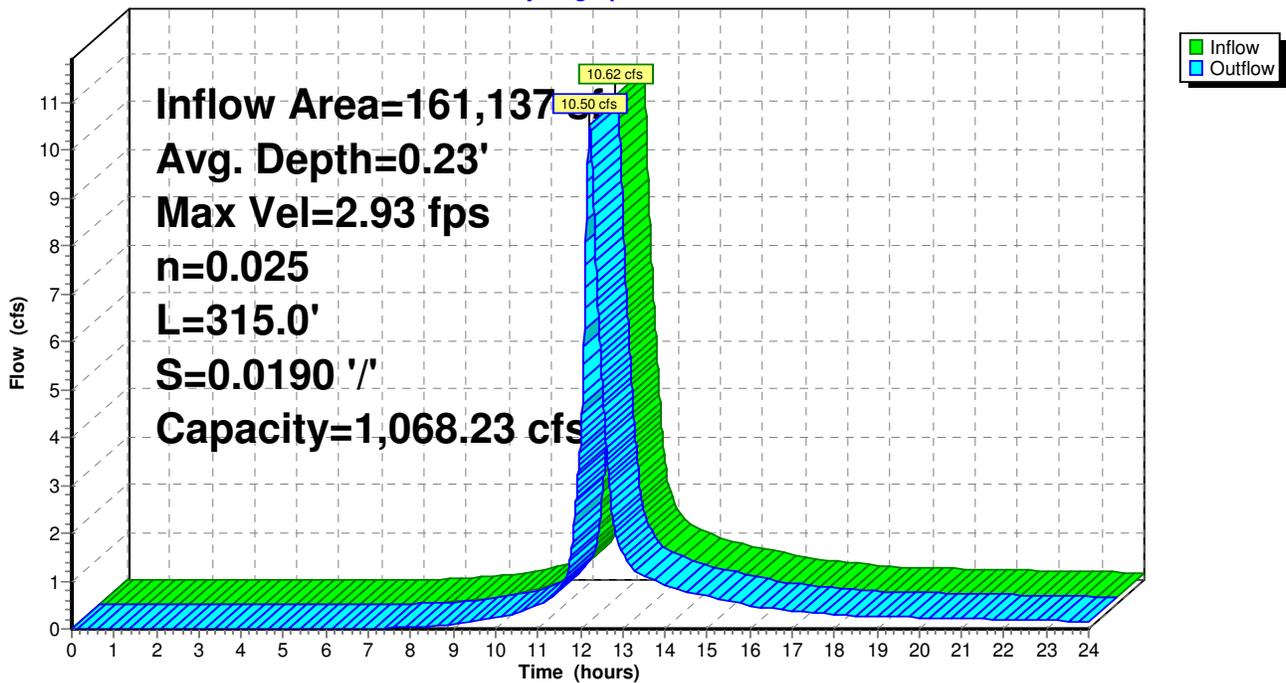
Peak Storage= 1,129 cf @ 12.20 hrs, Average Depth at Peak Storage= 0.23'  
Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,068.23 cfs

15.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
Side Slope Z-value= 4.0 '/' Top Width= 39.00'  
Length= 315.0' Slope= 0.0190 '/'  
Inlet Invert= 94.00', Outlet Invert= 88.00'



**Reach 101R: Top Reach**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 25-Year Rainfall=5.30"

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**Reach 102R: Bottom Reach**

[61] Hint: Submerged 5% of Reach 101R bottom

Inflow Area =	295,260 sf,	Inflow Depth > 2.99"	for 25-Year event
Inflow =	18.45 cfs @ 12.21 hrs,	Volume=	73,505 cf
Outflow =	18.44 cfs @ 12.22 hrs,	Volume=	73,473 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 5.52 fps, Min. Travel Time= 0.4 min  
 Avg. Velocity = 1.72 fps, Avg. Travel Time= 1.2 min

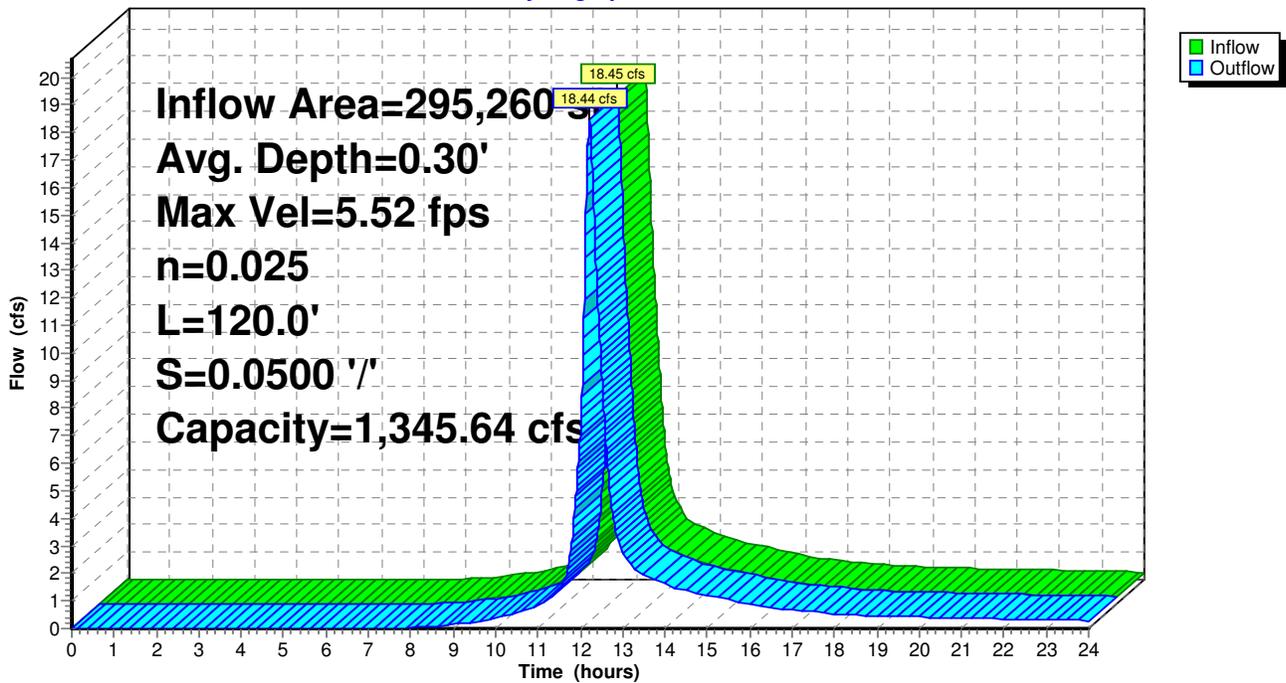
Peak Storage= 401 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.30'  
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,345.64 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
 Side Slope Z-value= 4.0 '/' Top Width= 34.00'  
 Length= 120.0' Slope= 0.0500 '/'  
 Inlet Invert= 88.00', Outlet Invert= 82.00'



**Reach 102R: Bottom Reach**

Hydrograph



### Reach 901R: (new Reach)

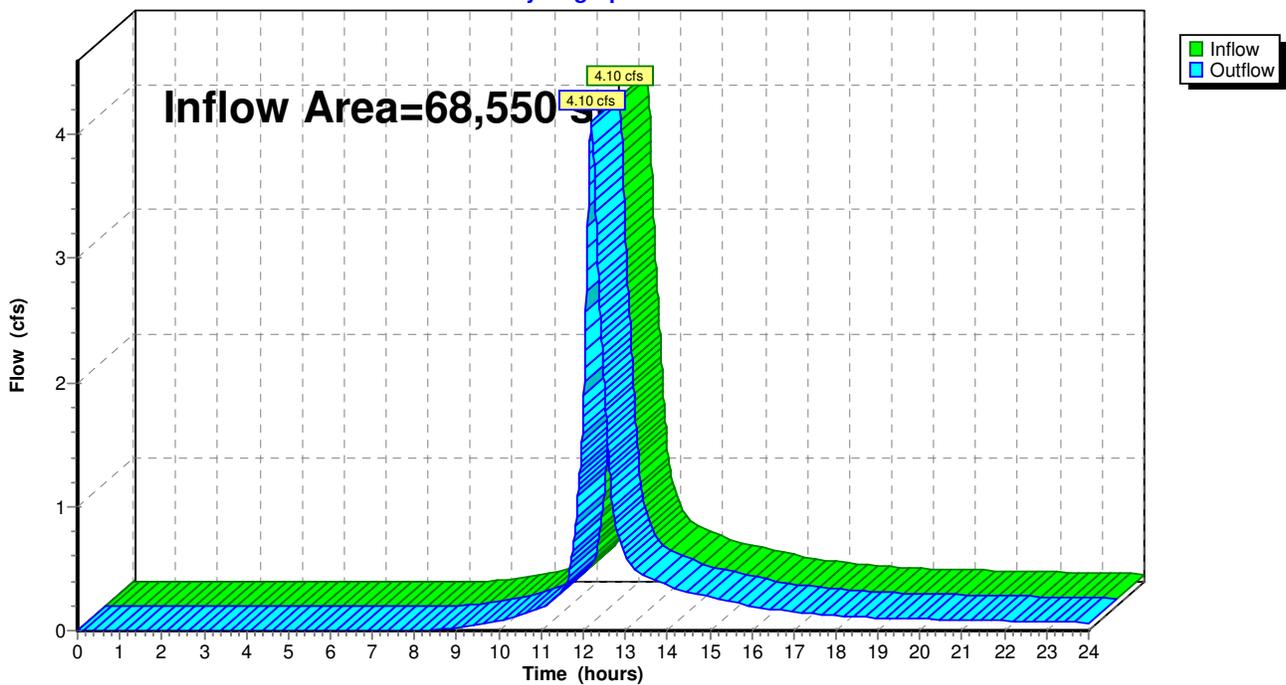
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 68,550 sf, Inflow Depth > 2.87" for 25-Year event  
Inflow = 4.10 cfs @ 12.20 hrs, Volume= 16,381 cf  
Outflow = 4.10 cfs @ 12.20 hrs, Volume= 16,381 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 901R: (new Reach)

Hydrograph



### Reach 902R: (new Reach)

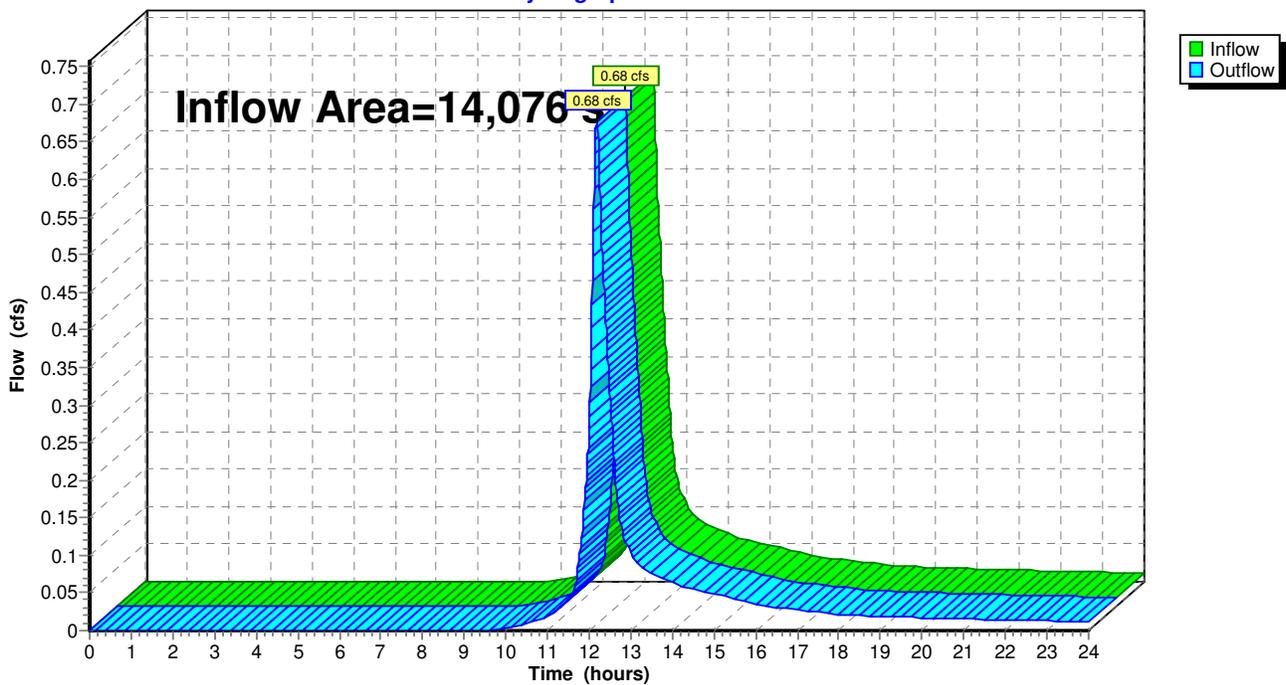
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14,076 sf, Inflow Depth > 2.25" for 25-Year event  
Inflow = 0.68 cfs @ 12.18 hrs, Volume= 2,645 cf  
Outflow = 0.68 cfs @ 12.18 hrs, Volume= 2,645 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 902R: (new Reach)

Hydrograph



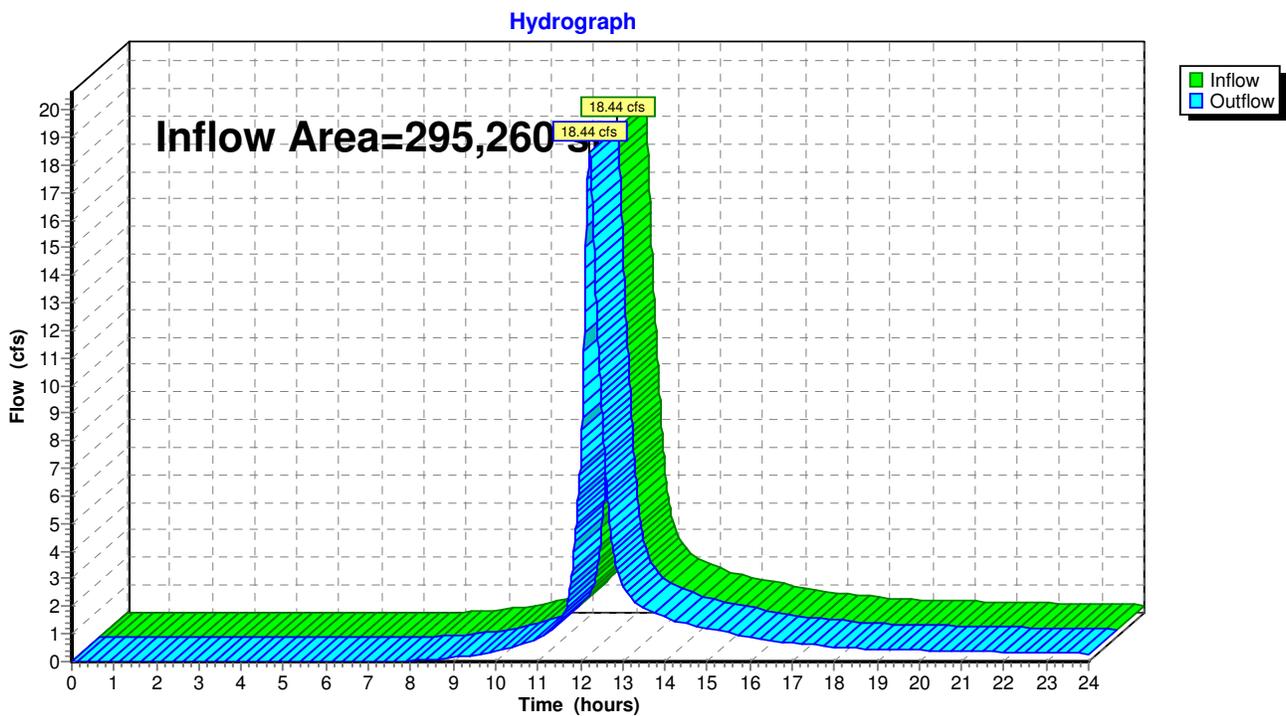
### Reach PTA: Point of Analysis (Edge of Prop. Line)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 295,260 sf, Inflow Depth > 2.99" for 25-Year event  
Inflow = 18.44 cfs @ 12.22 hrs, Volume= 73,473 cf  
Outflow = 18.44 cfs @ 12.22 hrs, Volume= 73,473 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach PTA: Point of Analysis (Edge of Prop. Line)



**2066 Predevelopment\_4c**

Type III 24-hr 100-Year Rainfall=6.50"

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 100: Southern Portion of Site**

Runoff Area=134,123 sf Runoff Depth&gt;3.91"

Flow Length=560' Tc=13.3 min CN=77 Runoff=11.19 cfs 43,694 cf

**Subcatchment 200: Middle Site**

Runoff Area=78,511 sf Runoff Depth&gt;4.55"

Flow Length=570' Tc=12.3 min CN=83 Runoff=7.74 cfs 29,755 cf

**Subcatchment 300: Northwestern Portion of Site (Flows Offsi**

Runoff Area=68,550 sf Runoff Depth&gt;3.91"

Flow Length=450' Tc=14.2 min CN=77 Runoff=5.59 cfs 22,328 cf

**Subcatchment 900: North Offsite flowing onto property**

Runoff Area=14,076 sf Runoff Depth&gt;3.20"

Flow Length=340' Slope=0.0500 '/' Tc=12.8 min CN=70 Runoff=0.97 cfs 3,752 cf

**Reach 101R: Top Reach**

Avg. Depth=0.27' Max Vel=3.26 fps Inflow=14.23 cfs 55,834 cf

n=0.025 L=315.0' S=0.0190 '/' Capacity=1,068.23 cfs Outflow=14.08 cfs 55,738 cf

**Reach 102R: Bottom Reach**

Avg. Depth=0.36' Max Vel=6.15 fps Inflow=24.98 cfs 99,431 cf

n=0.025 L=120.0' S=0.0500 '/' Capacity=1,345.64 cfs Outflow=24.96 cfs 99,391 cf

**Reach 901R: (new Reach)**

Inflow=5.59 cfs 22,328 cf

Outflow=5.59 cfs 22,328 cf

**Reach 902R: (new Reach)**

Inflow=0.97 cfs 3,752 cf

Outflow=0.97 cfs 3,752 cf

**Reach PTA: Point of Analysis (Edge of Prop. Line)**

Inflow=24.96 cfs 99,391 cf

Outflow=24.96 cfs 99,391 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 99,528 cf Average Runoff Depth = 4.05"****92.92% Pervious Area = 274,351 sf 7.08% Impervious Area = 20,909 sf**

**2066 Predevelopment\_4c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 100: Southern Portion of Site**

Runoff = 11.19 cfs @ 12.18 hrs, Volume= 43,694 cf, Depth> 3.91"

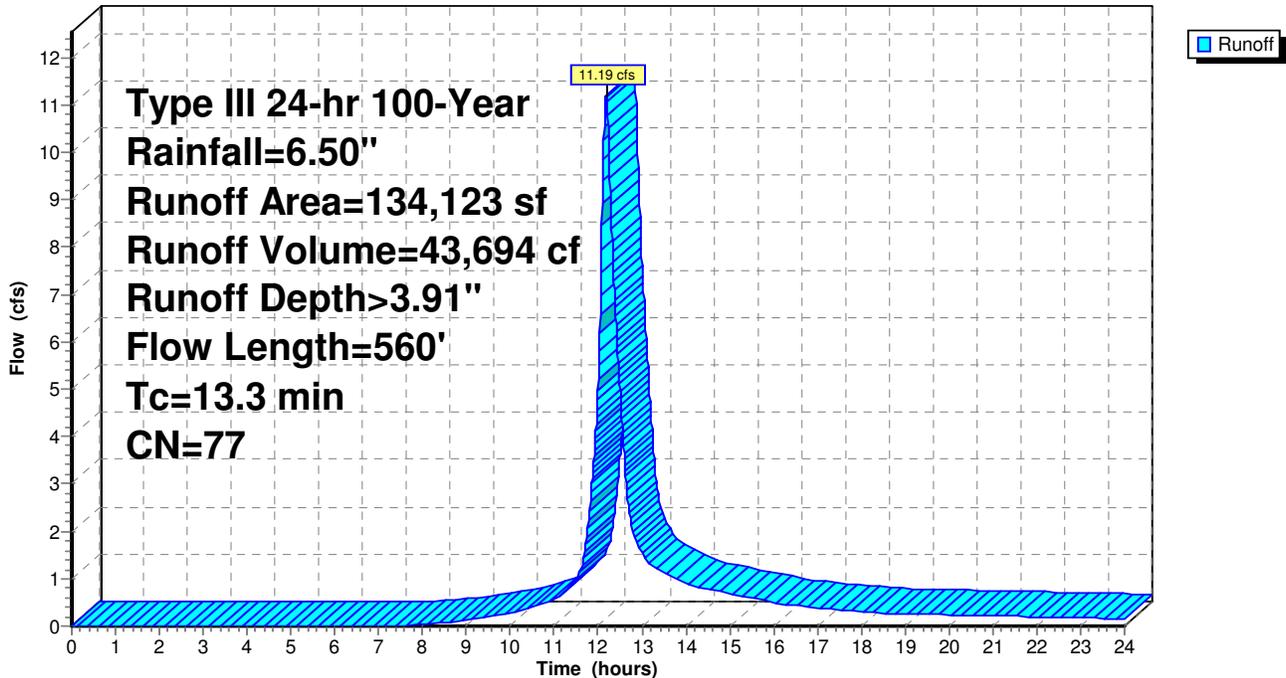
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
16,512	98	Paved parking & roofs
81,239	70	Woods, Good, HSG C
17,903	74	>75% Grass cover, Good, HSG C
18,469	91	Fallow, bare soil, HSG C
134,123	77	Weighted Average
117,611		Pervious Area
16,512		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.6	340	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.2	170	0.2100	2.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.3	560	Total			

**Subcatchment 100: Southern Portion of Site**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 200: Middle Site**

Runoff = 7.74 cfs @ 12.17 hrs, Volume= 29,755 cf, Depth&gt; 4.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

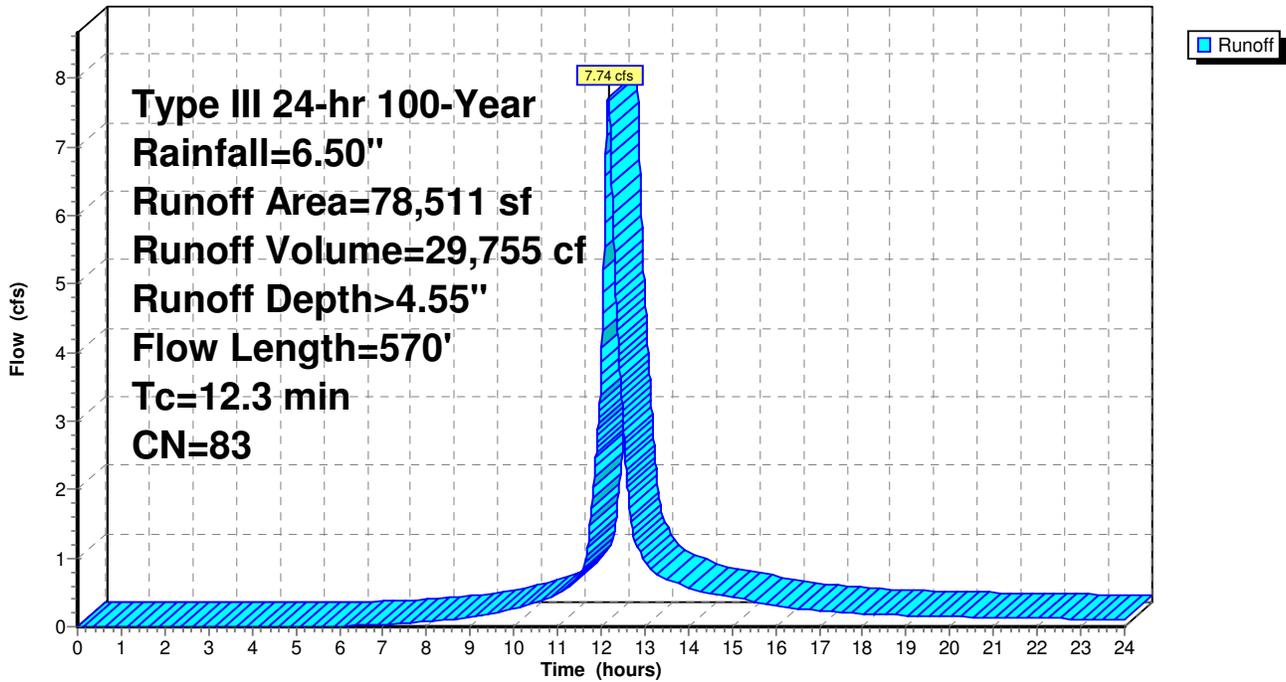
Area (sf)	CN	Description
4,397	98	Paved parking & roofs
31,363	70	Woods, Good, HSG C
38,590	91	Fallow, bare soil, HSG C
4,161	89	Gravel roads, HSG C
78,511	83	Weighted Average
74,114		Pervious Area
4,397		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	260	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.9	120	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.6	140	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.3	570	Total			

Subcatchment 200: Middle Site

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Runoff = 5.59 cfs @ 12.19 hrs, Volume= 22,328 cf, Depth> 3.91"

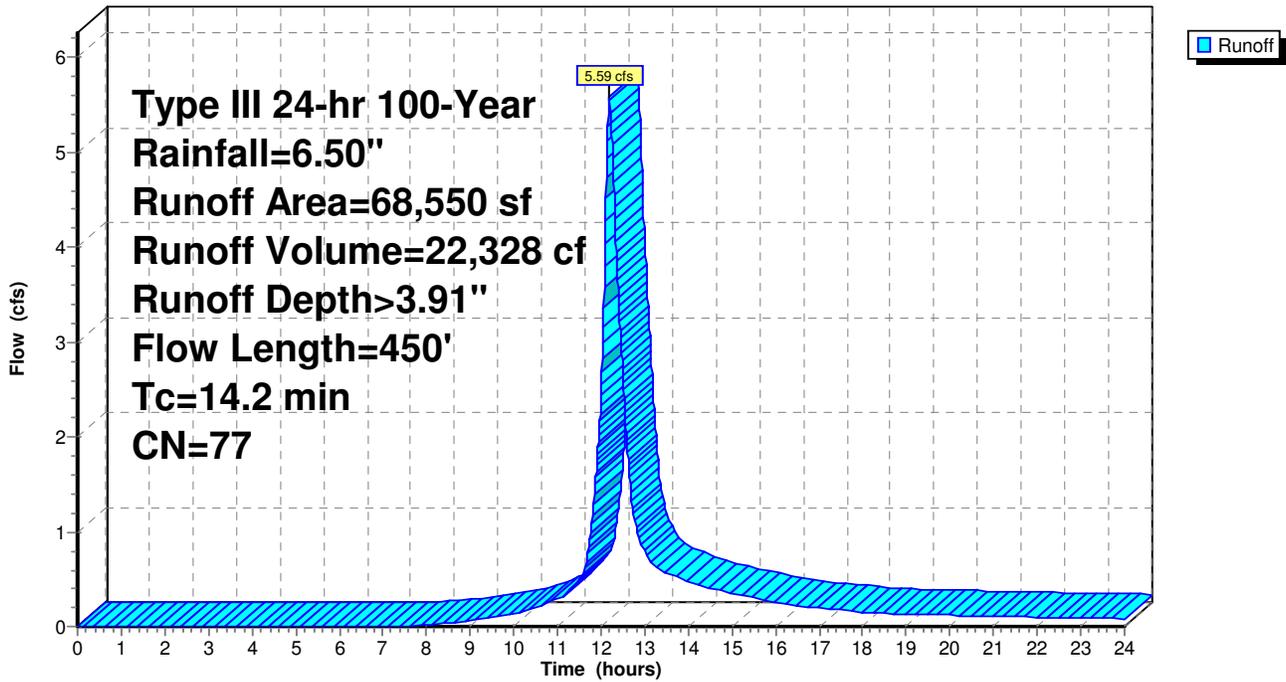
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
16,553	70	Woods, Good, HSG C
34,137	74	>75% Grass cover, Good, HSG C
17,860	91	Fallow, bare soil, HSG C
68,550	77	Weighted Average
68,550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	50	0.0250	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
1.5	200	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
1.4	200	0.1100	2.32		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
14.2	450	Total			

**Subcatchment 300: Northwestern Portion of Site (Flows Offsite)**

Hydrograph



**2066 Predevelopment\_4c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.97 cfs @ 12.18 hrs, Volume= 3,752 cf, Depth> 3.20"

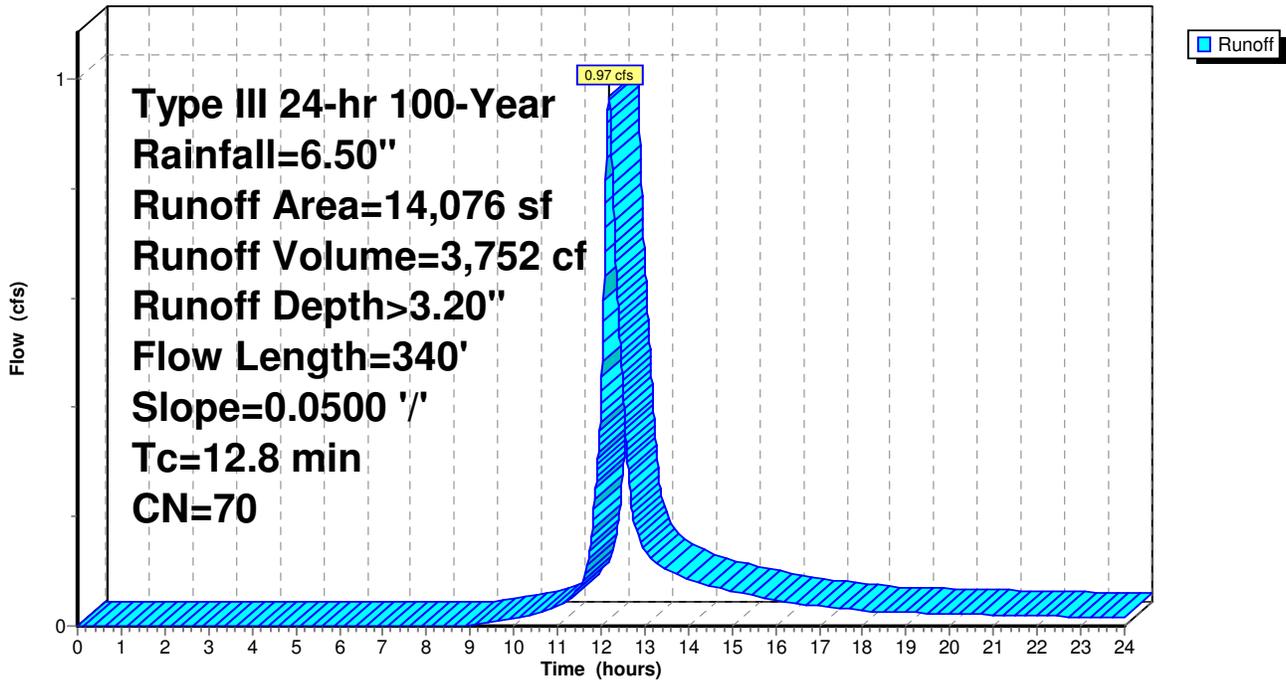
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.3	290	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.8	340	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



# 2066 Predevelopment\_4c

Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 101R: Top Reach

Inflow Area = 161,137 sf, Inflow Depth > 4.16" for 100-Year event  
Inflow = 14.23 cfs @ 12.18 hrs, Volume= 55,834 cf  
Outflow = 14.08 cfs @ 12.22 hrs, Volume= 55,738 cf, Atten= 1%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.26 fps, Min. Travel Time= 1.6 min  
Avg. Velocity = 1.00 fps, Avg. Travel Time= 5.2 min

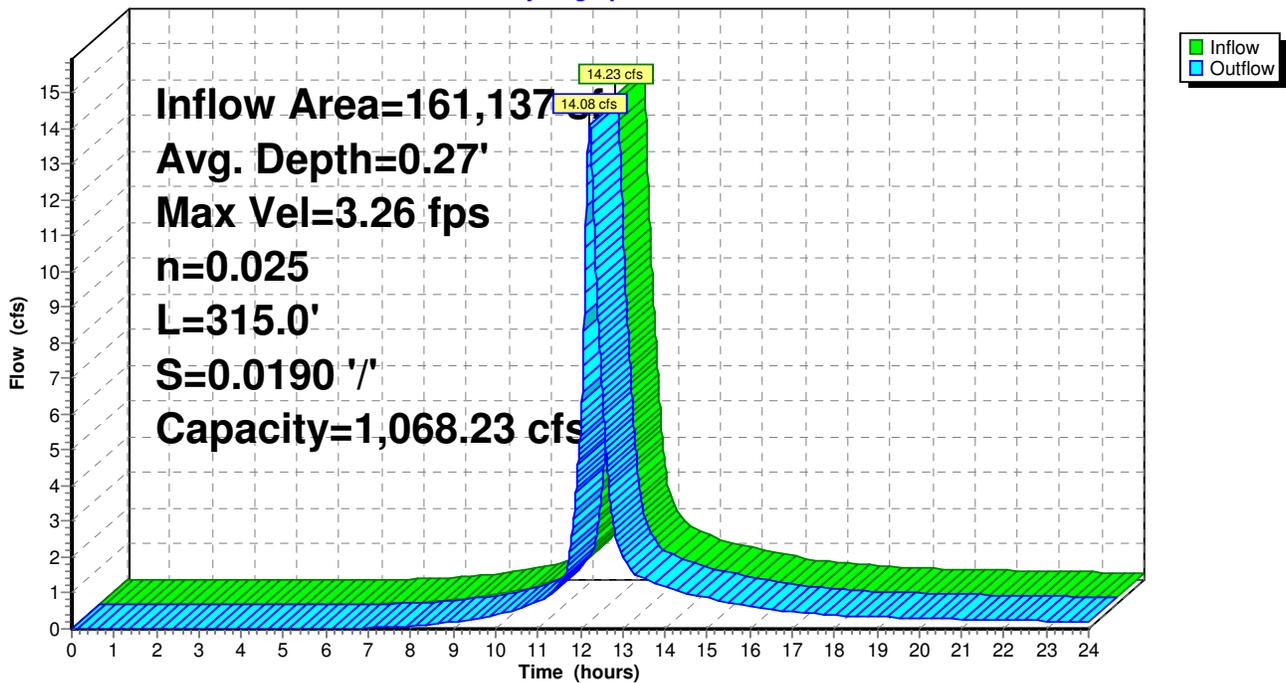
Peak Storage= 1,360 cf @ 12.19 hrs, Average Depth at Peak Storage= 0.27'  
Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,068.23 cfs

15.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
Side Slope Z-value= 4.0 '/' Top Width= 39.00'  
Length= 315.0' Slope= 0.0190 '/'  
Inlet Invert= 94.00', Outlet Invert= 88.00'



## Reach 101R: Top Reach

Hydrograph



**Reach 102R: Bottom Reach**

[61] Hint: Submerged 6% of Reach 101R bottom

Inflow Area = 295,260 sf, Inflow Depth > 4.04" for 100-Year event  
 Inflow = 24.98 cfs @ 12.21 hrs, Volume= 99,431 cf  
 Outflow = 24.96 cfs @ 12.21 hrs, Volume= 99,391 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 6.15 fps, Min. Travel Time= 0.3 min  
 Avg. Velocity = 1.86 fps, Avg. Travel Time= 1.1 min

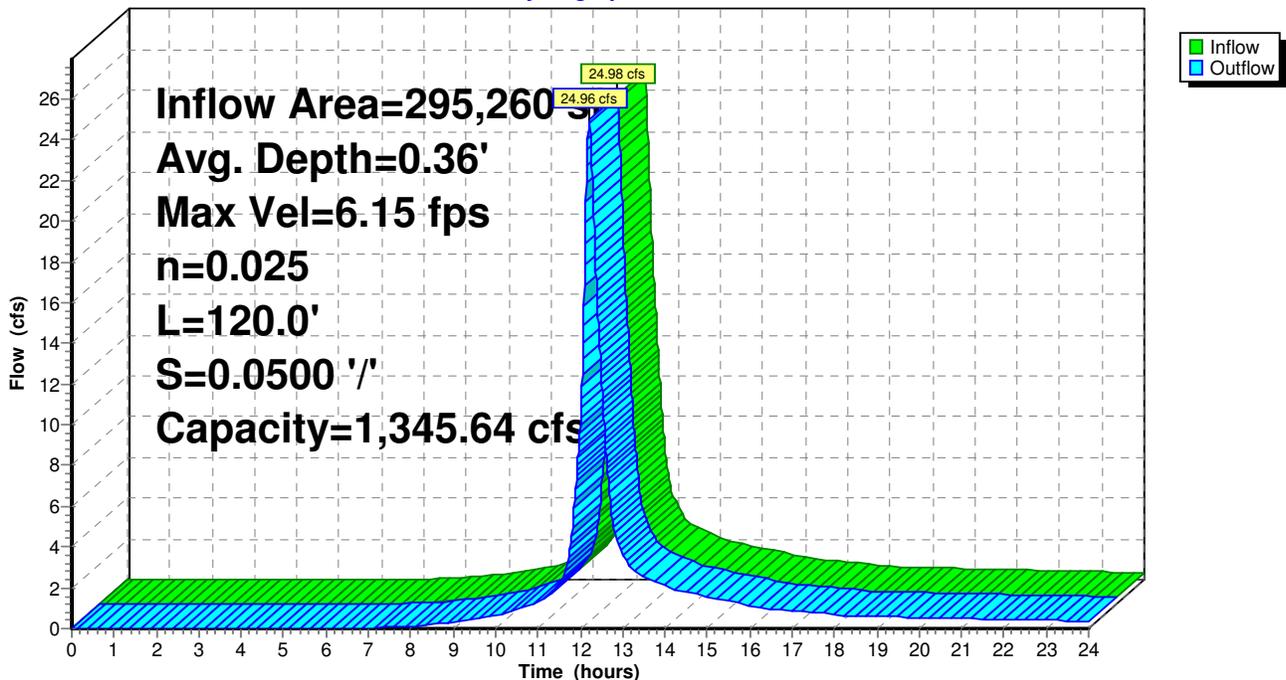
Peak Storage= 488 cf @ 12.21 hrs, Average Depth at Peak Storage= 0.36'  
 Bank-Full Depth= 3.00', Capacity at Bank-Full= 1,345.64 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, clean & winding  
 Side Slope Z-value= 4.0 '/' Top Width= 34.00'  
 Length= 120.0' Slope= 0.0500 '/'  
 Inlet Invert= 88.00', Outlet Invert= 82.00'



**Reach 102R: Bottom Reach**

Hydrograph



### Reach 901R: (new Reach)

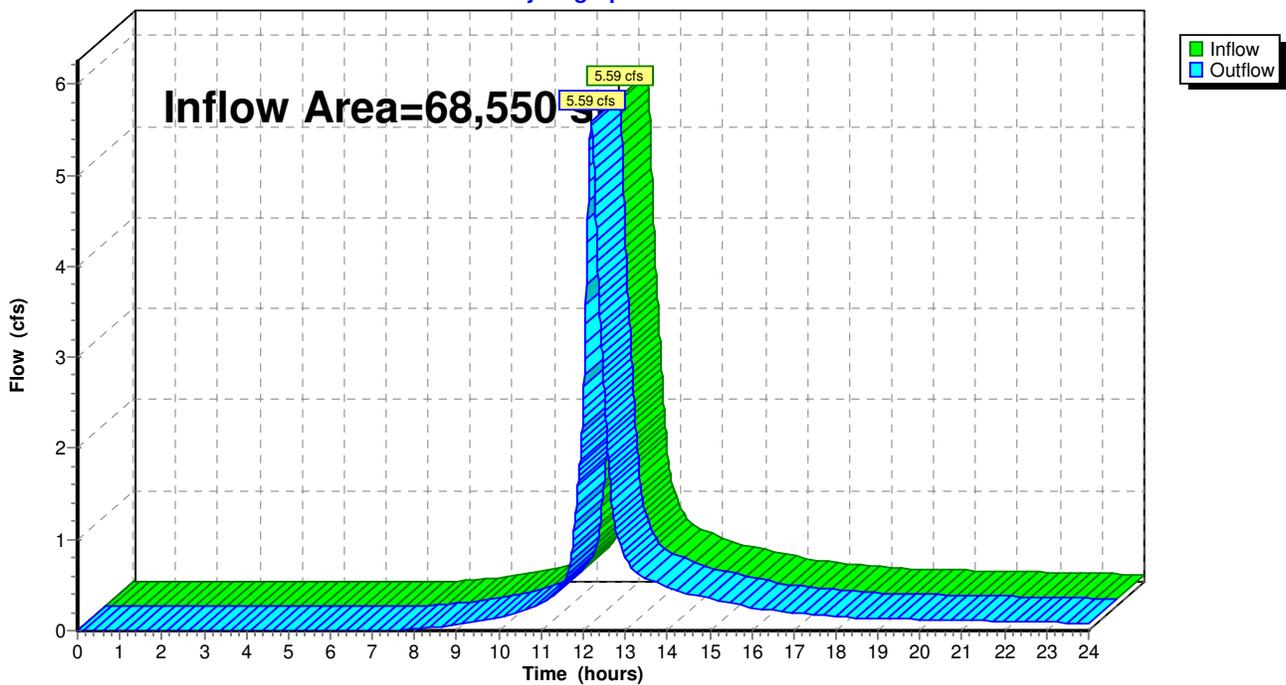
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 68,550 sf, Inflow Depth > 3.91" for 100-Year event  
Inflow = 5.59 cfs @ 12.19 hrs, Volume= 22,328 cf  
Outflow = 5.59 cfs @ 12.19 hrs, Volume= 22,328 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 901R: (new Reach)

Hydrograph



### Reach 902R: (new Reach)

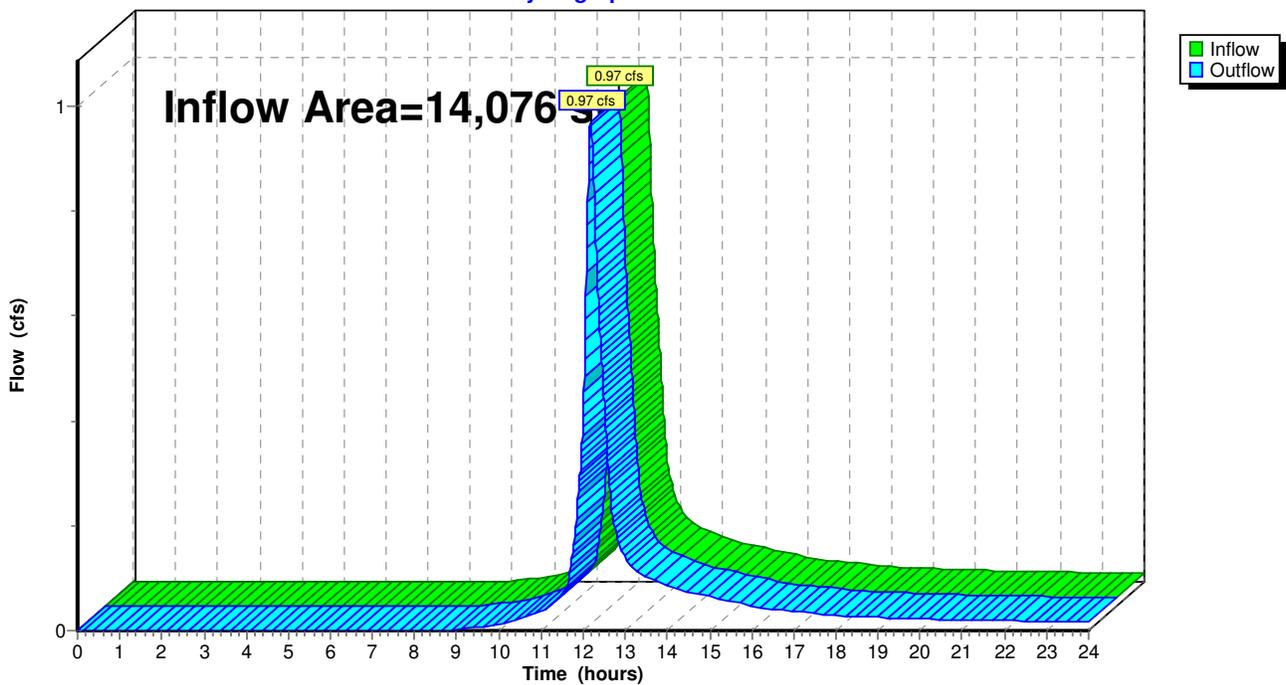
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 14,076 sf, Inflow Depth > 3.20" for 100-Year event  
Inflow = 0.97 cfs @ 12.18 hrs, Volume= 3,752 cf  
Outflow = 0.97 cfs @ 12.18 hrs, Volume= 3,752 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

### Reach 902R: (new Reach)

Hydrograph



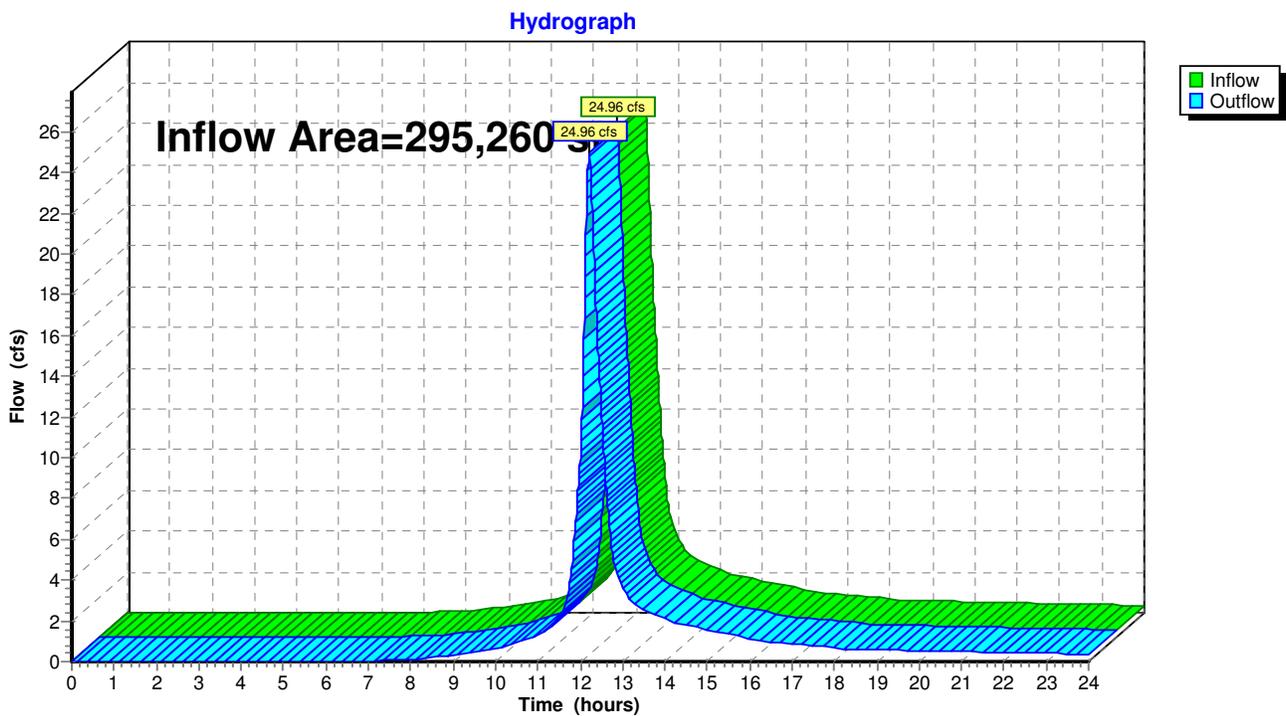
**Reach PTA: Point of Analysis (Edge of Prop. Line)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 295,260 sf, Inflow Depth > 4.04" for 100-Year event  
Inflow = 24.96 cfs @ 12.21 hrs, Volume= 99,391 cf  
Outflow = 24.96 cfs @ 12.21 hrs, Volume= 99,391 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach PTA: Point of Analysis (Edge of Prop. Line)**



**MEISNER BREM CORPORATION**

142 LITTLETON ROAD, STE. 16, WESTFORD, MA 01886

*THE BIRCHES*

*STORMWATER MANAGEMENT REPORT – VOLUME 2 OF 2  
A 40B RESIDENTIAL PROJECT OFF LONG RIDGE ROAD, CARLISLE, MA*

HydroCAD Printouts

Post Development

Storm Frequency: 2, 10, 25, 100 Year



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### Area Listing (selected nodes)

<u>Area (sq-ft)</u>	<u>CN</u>	<u>Description (subcats)</u>
21,776	70	Woods, Good, HSG C (62S,136S,140S,900)
202,427	74	>75% Grass cover, Good, HSG C (54S,56S,60S,62S,65S,68S,110S,112S,114S,116S,118S,
71,057	98	Paved parking & roofs (54S,54S,56S,56S,60S,60S,62S,62S,65S,65S,68S,68S,110S,110S,1
<hr/>		
295,260		

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 54S: CB at Cul-de-Sac - Outside** Runoff Area=20,970 sf Runoff Depth>1.38"  
Flow Length=90' Tc=0.5 min CN=82 Runoff=0.94 cfs 2,410 cf

**Subcatchment 56S: CB at Cul-de-Sac - Inside** Runoff Area=8,660 sf Runoff Depth>1.59"  
Flow Length=100' Slope=0.0150 '/' Tc=0.7 min CN=85 Runoff=0.45 cfs 1,146 cf

**Subcatchment 60S:** Runoff Area=4,640 sf Runoff Depth>1.90"  
Flow Length=80' Tc=2.0 min CN=89 Runoff=0.27 cfs 734 cf

**Subcatchment 62S: Large Area including 2 Septics** Runoff Area=39,429 sf Runoff Depth>1.13"  
Flow Length=235' Tc=6.9 min CN=78 Runoff=1.13 cfs 3,703 cf

**Subcatchment 65S: Throat of Cul-de-sac u.g.** Runoff Area=11,590 sf Runoff Depth>1.19"  
Flow Length=170' Slope=0.0400 '/' Tc=0.7 min CN=79 Runoff=0.44 cfs 1,148 cf

**Subcatchment 68S: From hill near 19,20 to Lawn CB** Runoff Area=15,091 sf Runoff Depth>1.13"  
Flow Length=190' Tc=3.0 min CN=78 Runoff=0.50 cfs 1,419 cf

**Subcatchment 110S: To CB 20** Runoff Area=7,780 sf Runoff Depth>1.82"  
Flow Length=100' Slope=0.0200 '/' Tc=0.6 min CN=88 Runoff=0.46 cfs 1,179 cf

**Subcatchment 112S: To CB 22** Runoff Area=2,898 sf Runoff Depth>1.45"  
Flow Length=60' Tc=0.3 min CN=83 Runoff=0.14 cfs 349 cf

**Subcatchment 114S: Behind Units 1&2** Runoff Area=15,260 sf Runoff Depth>1.07"  
Flow Length=130' Tc=8.7 min CN=77 Runoff=0.39 cfs 1,359 cf

**Subcatchment 116S:** Runoff Area=3,050 sf Runoff Depth>1.98"  
Flow Length=70' Tc=0.3 min CN=90 Runoff=0.20 cfs 504 cf

**Subcatchment 118S:** Runoff Area=3,610 sf Runoff Depth>1.82"  
Flow Length=50' Tc=0.2 min CN=88 Runoff=0.21 cfs 547 cf

**Subcatchment 120S:** Runoff Area=6,190 sf Runoff Depth>1.74"  
Flow Length=90' Tc=0.5 min CN=87 Runoff=0.35 cfs 897 cf

**Subcatchment 122S:** Runoff Area=6,066 sf Runoff Depth>1.07"  
Flow Length=100' Tc=3.6 min CN=77 Runoff=0.18 cfs 541 cf

**Subcatchment 124S:** Runoff Area=7,500 sf Runoff Depth>1.74"  
Flow Length=80' Tc=0.5 min CN=87 Runoff=0.43 cfs 1,087 cf

**Subcatchment 126S:** Runoff Area=5,370 sf Runoff Depth>1.74"  
Flow Length=60' Tc=0.3 min CN=87 Runoff=0.30 cfs 778 cf

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<b>Subcatchment 128S:</b>	Runoff Area=7,200 sf	Runoff Depth>1.59"
Flow Length=115'	Slope=0.0200 '/'	Tc=3.2 min CN=85 Runoff=0.34 cfs 952 cf
<b>Subcatchment 130S:</b>	Runoff Area=6,950 sf	Runoff Depth>1.45"
Flow Length=60'	Tc=0.3 min CN=83	Runoff=0.33 cfs 838 cf
<b>Subcatchment 132S: Behind Unit 3</b>	Runoff Area=26,270 sf	Runoff Depth>1.01"
Flow Length=120'	Tc=0.7 min CN=76	Runoff=0.83 cfs 2,222 cf
<b>Subcatchment 134S: To Swale behind 7,6,5</b>	Runoff Area=13,850 sf	Runoff Depth>1.19"
Flow Length=70'	Slope=0.0200 '/'	Tc=3.1 min CN=79 Runoff=0.48 cfs 1,371 cf
<b>Subcatchment 136S: To Swale behind 4 to HW 30</b>	Runoff Area=21,060 sf	Runoff Depth>1.01"
Flow Length=100'	Tc=0.6 min CN=76	Runoff=0.67 cfs 1,781 cf
<b>Subcatchment 138S: Rear of Units 10,11,12,13</b>	Runoff Area=15,030 sf	Runoff Depth>1.25"
Flow Length=400'	Tc=12.1 min CN=80	Runoff=0.41 cfs 1,561 cf
<b>Subcatchment 140S: Behind Units 14, 15, 16</b>	Runoff Area=21,630 sf	Runoff Depth>1.01"
Flow Length=130'	Slope=0.0100 '/'	Tc=11.7 min CN=76 Runoff=0.46 cfs 1,824 cf
<b>Subcatchment 214S:</b>	Runoff Area=6,950 sf	Runoff Depth>1.45"
	Tc=1.0 min CN=83	Runoff=0.32 cfs 838 cf
<b>Subcatchment 216S:</b>	Runoff Area=4,140 sf	Runoff Depth>1.59"
	Tc=1.0 min CN=85	Runoff=0.21 cfs 548 cf
<b>Subcatchment 900: North Offsite flowing onto property</b>	Runoff Area=14,076 sf	Runoff Depth>0.71"
Flow Length=360'	Slope=0.0500 '/'	Tc=12.0 min CN=70 Runoff=0.19 cfs 835 cf
<b>Reach 1R: Existing wetland channel to WF</b>	Avg. Depth=0.13'	Max Vel=2.99 fps Inflow=2.36 cfs 12,372 cf
n=0.022 L=300.0'	S=0.0333 '/'	Capacity=82.44 cfs Outflow=2.34 cfs 12,339 cf
<b>Reach 2R: CB 23 to HW 40</b>	Avg. Depth=0.39'	Max Vel=5.08 fps Inflow=1.65 cfs 8,155 cf
D=15.0" n=0.013 L=75.0'	S=0.0149 '/'	Capacity=7.89 cfs Outflow=1.65 cfs 8,152 cf
<b>Reach 55R: DMH 52 to DMH 50</b>	Avg. Depth=0.39'	Max Vel=6.59 fps Inflow=1.84 cfs 4,716 cf
D=12.0" n=0.013 L=32.0'	S=0.0269 '/'	Capacity=5.84 cfs Outflow=1.84 cfs 4,715 cf
<b>Reach 62R: DMH 64 to Bio-Retention A (HW</b>	Avg. Depth=0.37'	Max Vel=4.85 fps Inflow=1.31 cfs 4,437 cf
D=12.0" n=0.013 L=12.0'	S=0.0150 '/'	Capacity=4.36 cfs Outflow=1.30 cfs 4,437 cf
<b>Reach 64R: Swale from Drive at #12 to RG 10A</b>	Avg. Depth=0.00'	Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
n=0.022 L=10.0'	S=0.0450 '/'	Capacity=64.93 cfs Outflow=0.00 cfs 0 cf
<b>Reach 67R: Culvert under Unit 12 Drive</b>	Avg. Depth=0.23'	Max Vel=2.92 fps Inflow=0.32 cfs 732 cf
D=8.0" n=0.013 L=48.0'	S=0.0100 '/'	Capacity=1.21 cfs Outflow=0.32 cfs 732 cf
<b>Reach 68R: Underdrain to CB 66</b>	Avg. Depth=0.27'	Max Vel=7.69 fps Inflow=1.02 cfs 4,140 cf
D=8.0" n=0.013 L=15.0'	S=0.0600 '/'	Capacity=2.96 cfs Outflow=1.02 cfs 4,140 cf

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**Reach 69R: Drain to DMH 52** Avg. Depth=0.25' Max Vel=4.28 fps Inflow=0.51 cfs 1,160 cf  
D=8.0" n=0.013 L=38.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=0.51 cfs 1,160 cf

**Reach 114R: DMH 16 to DMH 14** Avg. Depth=0.26' Max Vel=3.72 fps Inflow=0.60 cfs 1,528 cf  
D=12.0" n=0.013 L=60.0' S=0.0133 '/' Capacity=4.11 cfs Outflow=0.59 cfs 1,528 cf

**Reach 118R: Swale from Drive at #4 to RG 11** Avg. Depth=0.17' Max Vel=3.56 fps Inflow=0.92 cfs 2,542 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.92 cfs 2,542 cf

**Reach 119R: Culvert under Unit 4 Drive** Avg. Depth=0.44' Max Vel=3.81 fps Inflow=0.92 cfs 2,542 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.92 cfs 2,542 cf

**Reach 127R: Swale from Drive at #3 to RG 11** Avg. Depth=0.17' Max Vel=3.52 fps Inflow=0.88 cfs 2,206 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.88 cfs 2,206 cf

**Reach 128R: Culvert under Unit 3 Drive** Avg. Depth=0.29' Max Vel=6.11 fps Inflow=0.88 cfs 2,206 cf  
D=8.0" n=0.013 L=30.0' S=0.0357 '/' Capacity=2.28 cfs Outflow=0.88 cfs 2,206 cf

**Reach 129R: Swale from Drive at #20 to RG 124** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf

**Reach 130R: Swale to RG 122** Avg. Depth=0.16' Max Vel=3.08 fps Inflow=0.75 cfs 1,708 cf  
n=0.022 L=30.0' S=0.0360 '/' Capacity=58.07 cfs Outflow=0.73 cfs 1,708 cf

**Reach 131R: Culvert under Unit 20 Drive** Avg. Depth=0.23' Max Vel=2.92 fps Inflow=0.32 cfs 719 cf  
D=8.0" n=0.013 L=48.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.32 cfs 719 cf

**Reach 137R: Swale Back of 7,6,5** Avg. Depth=0.11' Max Vel=1.26 fps Inflow=0.48 cfs 1,371 cf  
n=0.030 L=140.0' S=0.0143 '/' Capacity=26.48 cfs Outflow=0.46 cfs 1,367 cf

**Reach 138R: Swale Back of 4** Avg. Depth=0.22' Max Vel=1.53 fps Inflow=0.90 cfs 3,148 cf  
n=0.030 L=140.0' S=0.0100 '/' Capacity=17.63 cfs Outflow=0.89 cfs 3,141 cf

**Reach 149R: DMH 14 to DMH 12** Avg. Depth=0.53' Max Vel=6.16 fps Inflow=3.45 cfs 10,424 cf  
D=18.0" n=0.013 L=95.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=3.44 cfs 10,421 cf

**Reach 150R: DMH 12 to HW 10 - Outlet** Avg. Depth=0.53' Max Vel=6.18 fps Inflow=3.44 cfs 10,421 cf  
D=18.0" n=0.013 L=55.0' S=0.0151 '/' Capacity=12.90 cfs Outflow=3.43 cfs 10,420 cf

**Reach 153R: CB 116 to DMH 14** Avg. Depth=0.28' Max Vel=7.84 fps Inflow=1.10 cfs 3,003 cf  
D=8.0" n=0.013 L=28.0' S=0.0600 '/' Capacity=2.96 cfs Outflow=1.09 cfs 3,003 cf

**Reach 154R: Swale from Drive at #6 to RG 126** Avg. Depth=0.00' Max Vel=0.00 fps  
n=0.022 L=33.0' S=0.0091 '/' Capacity=29.18 cfs Outflow=0.00 cfs 0 cf

**Reach 155R: Swale from Drive at #5 to RG 120** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=50.0' S=0.0344 '/' Capacity=56.77 cfs Outflow=0.00 cfs 0 cf

**Reach 156R: Culvert under Unit 5 Drive** Avg. Depth=0.33' Max Vel=3.44 fps Inflow=0.59 cfs 1,688 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.59 cfs 1,688 cf

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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**Inflow=3.43 cfs 10,420 cf  
Outflow=3.43 cfs 10,420 cf**Reach 220R: CB 56 to DMH 52**Avg. Depth=0.24' Max Vel=3.10 fps Inflow=0.45 cfs 1,146 cf  
D=12.0" n=0.013 L=14.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.44 cfs 1,146 cf**Reach 222R: CB 54 to DMH 52**Avg. Depth=0.35' Max Vel=3.82 fps Inflow=0.94 cfs 2,410 cf  
D=12.0" n=0.013 L=22.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.93 cfs 2,409 cf**Reach 403R: CB 65 to DMH 50**Avg. Depth=0.30' Max Vel=5.02 fps Inflow=1.02 cfs 4,140 cf  
D=12.0" n=0.013 L=30.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=1.02 cfs 4,139 cf**Reach 902R: Existing wetland channel to W**Avg. Depth=0.13' Max Vel=3.36 fps Inflow=2.74 cfs 15,920 cf  
n=0.022 L=100.0' S=0.0400 '/' Capacity=90.31 cfs Outflow=2.73 cfs 15,907 cf**Pond 2P: Recharge System**Peak Elev=103.91' Storage=3,321 cf Inflow=2.62 cfs 11,406 cf  
Discarded=0.01 cfs 325 cf Primary=1.65 cfs 8,155 cf Secondary=0.00 cfs 0 cf Outflow=1.66 cfs 8,480 cf**Pond 7P: Forebay - Bio Retention**Peak Elev=111.66' Storage=206 cf Inflow=1.30 cfs 4,437 cf  
Discarded=0.00 cfs 0 cf Primary=1.30 cfs 4,269 cf Outflow=1.30 cfs 4,270 cf**Pond 8P: Main Cell - Bio Retention**Peak Elev=111.21' Storage=770 cf Inflow=1.30 cfs 4,269 cf  
Primary=1.02 cfs 4,140 cf Secondary=0.00 cfs 0 cf Outflow=1.02 cfs 4,140 cf**Pond 9P: CB 65**Peak Elev=107.98' Inflow=0.89 cfs 2,566 cf  
12.0" x 126.0' Culvert Outflow=0.89 cfs 2,566 cf**Pond 43R: CB 60 to DMH 64**Peak Elev=111.30' Inflow=0.27 cfs 734 cf  
12.0" x 12.0' Culvert Outflow=0.27 cfs 734 cf**Pond 61R: CB 62 to DMH 64**Peak Elev=111.74' Inflow=1.13 cfs 3,703 cf  
12.0" x 24.0' Culvert Outflow=1.13 cfs 3,703 cf**Pond 66P: RG 9A at Units 11/12 - CB 214**Peak Elev=108.90' Storage=117 cf Inflow=0.32 cfs 838 cf  
Primary=0.32 cfs 732 cf Secondary=0.00 cfs 0 cf Outflow=0.32 cfs 732 cf**Pond 67P: CB 66 (emergency vertical release)**Peak Elev=106.29' Inflow=1.02 cfs 4,140 cf  
Primary=1.02 cfs 4,140 cf Secondary=0.00 cfs 0 cf Outflow=1.02 cfs 4,140 cf**Pond 70P: RG 10A - CB 216 at Units 13**Peak Elev=106.92' Storage=139 cf Inflow=0.52 cfs 1,280 cf  
Primary=0.51 cfs 1,160 cf Secondary=0.00 cfs 0 cf Outflow=0.51 cfs 1,160 cf**Pond 111P: CB 20**Peak Elev=104.11' Inflow=0.46 cfs 1,179 cf  
12.0" x 16.0' Culvert Outflow=0.46 cfs 1,179 cf**Pond 112P: CB 22**Peak Elev=103.99' Inflow=0.14 cfs 349 cf  
12.0" x 22.0' Culvert Outflow=0.14 cfs 349 cf**Pond 119P: RG - 1A - CB 118 to DMH 14**Peak Elev=110.44' Storage=16 cf Inflow=1.07 cfs 2,753 cf  
Primary=1.05 cfs 2,753 cf Secondary=0.00 cfs 0 cf Outflow=1.05 cfs 2,753 cf

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4** Peak Elev=112.29' Storage=53 cf Inflow=0.92 cfs 2,585 cf  
Primary=0.92 cfs 2,542 cf Secondary=0.00 cfs 0 cf Outflow=0.92 cfs 2,542 cf

**Pond 128P: RG 2A - CB 122 RG Unit 3** Peak Elev=113.27' Storage=53 cf Inflow=0.88 cfs 2,249 cf  
Primary=0.88 cfs 2,206 cf Secondary=0.00 cfs 0 cf Outflow=0.88 cfs 2,206 cf

**Pond 132P: RG 3B - CB 124 Rain Garden - Unit** Peak Elev=115.04' Storage=98 cf Inflow=0.73 cfs 1,805 cf  
Outflow=0.75 cfs 1,708 cf

**Pond 133P: Large RG 4C at Unit 20** Peak Elev=116.90' Storage=134 cf Inflow=0.33 cfs 838 cf  
Primary=0.32 cfs 719 cf Secondary=0.00 cfs 0 cf Outflow=0.32 cfs 719 cf

**Pond 144R: HW 30 to DMH 14** Peak Elev=113.48' Inflow=0.89 cfs 3,141 cf  
12.0" x 114.0' Culvert Outflow=0.89 cfs 3,141 cf

**Pond 155P: RG 5A - CB 116 between Septic an** Peak Elev=108.12' Storage=54 cf Inflow=1.10 cfs 3,046 cf  
Primary=1.10 cfs 3,003 cf Secondary=0.00 cfs 0 cf Outflow=1.10 cfs 3,003 cf

**Pond 157P: RG 7A - CB 126 Under Drive Unit 5** Peak Elev=116.53' Storage=50 cf Inflow=0.59 cfs 1,731 cf  
Primary=0.59 cfs 1,688 cf Secondary=0.00 cfs 0 cf Outflow=0.59 cfs 1,688 cf

**Pond 158P: Culvert under Drive Unit 6** Peak Elev=117.40' Inflow=0.34 cfs 952 cf  
8.0" x 30.0' Culvert Outflow=0.34 cfs 952 cf

**Pond 218R: DMH 50 to Irrigation Cistern** Peak Elev=102.53' Inflow=2.92 cfs 11,421 cf  
15.0" x 5.0' Culvert Outflow=2.92 cfs 11,421 cf

**Pond 219P: Irrigation Cistern** Peak Elev=102.40' Storage=452 cf Inflow=2.92 cfs 11,421 cf  
12.0" x 5.0' Culvert Outflow=2.62 cfs 11,406 cf

**Link A: POA A** Inflow=4.77 cfs 26,327 cf  
Primary=4.77 cfs 26,327 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 30,571 cf Average Runoff Depth = 1.24"**  
**75.93% Pervious Area = 224,203 sf 24.07% Impervious Area = 71,057 sf**

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**Subcatchment 54S: CB at Cul-de-Sac - Outside**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.94 cfs @ 12.01 hrs, Volume= 2,410 cf, Depth> 1.38"

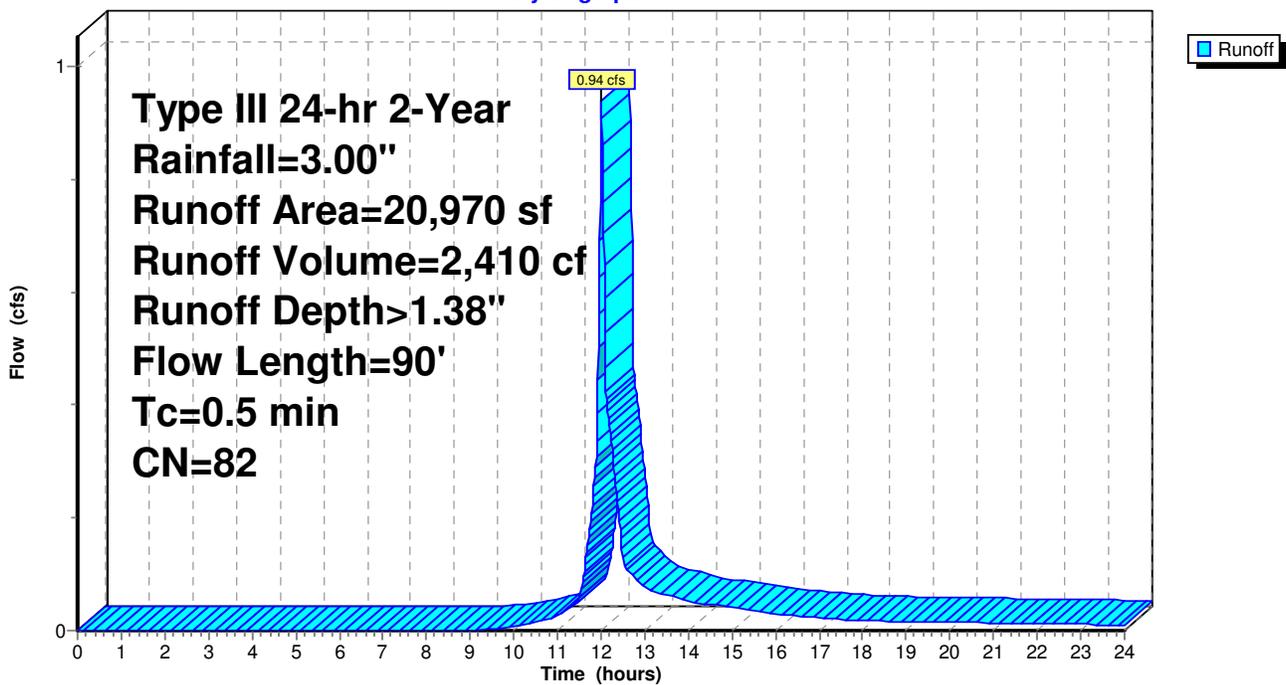
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,100	98	Paved parking & roofs
2,724	98	Paved parking & roofs
14,146	74	>75% Grass cover, Good, HSG C
20,970	82	Weighted Average
14,146		Pervious Area
6,824		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1500	2.42		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.20"
0.3	60	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	90	Total			

**Subcatchment 54S: CB at Cul-de-Sac - Outside**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 56S: CB at Cul-de-Sac - Inside**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.45 cfs @ 12.01 hrs, Volume= 1,146 cf, Depth> 1.59"

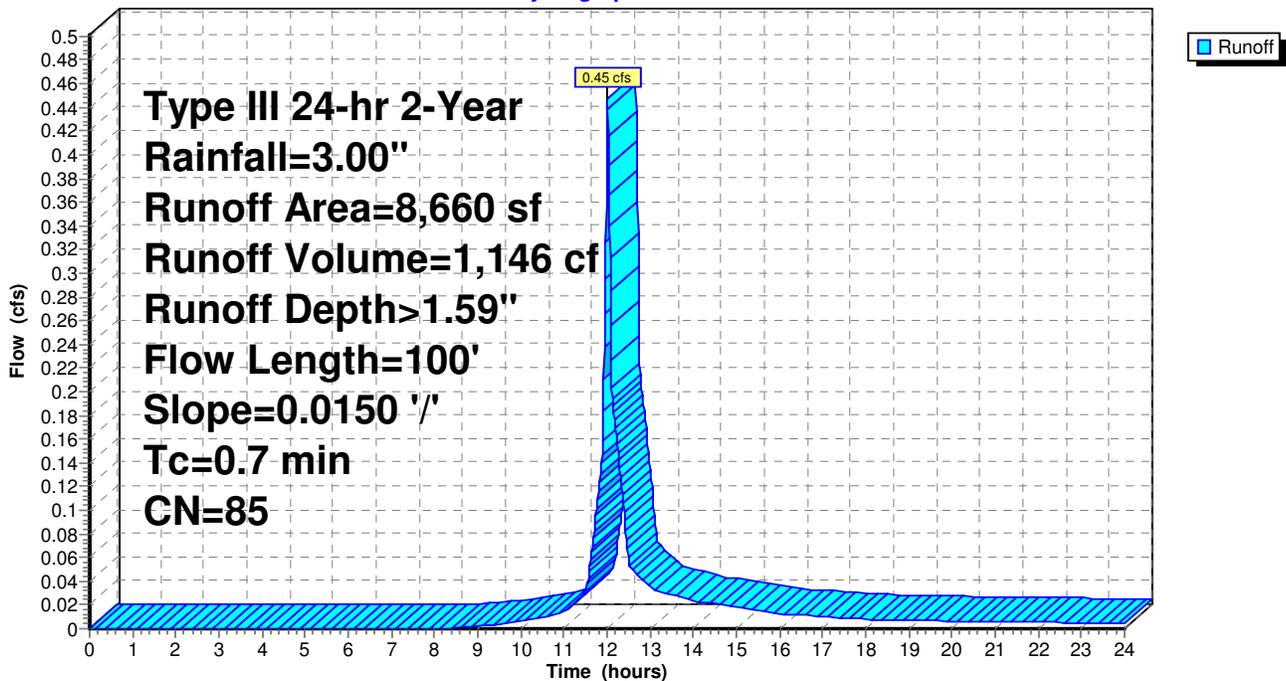
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
0	98	Paved parking & roofs
3,847	98	Paved parking & roofs
4,813	74	>75% Grass cover, Good, HSG C
8,660	85	Weighted Average
4,813		Pervious Area
3,847		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 56S: CB at Cul-de-Sac - Inside**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 60S:**

Runoff = 0.27 cfs @ 12.03 hrs, Volume= 734 cf, Depth> 1.90"

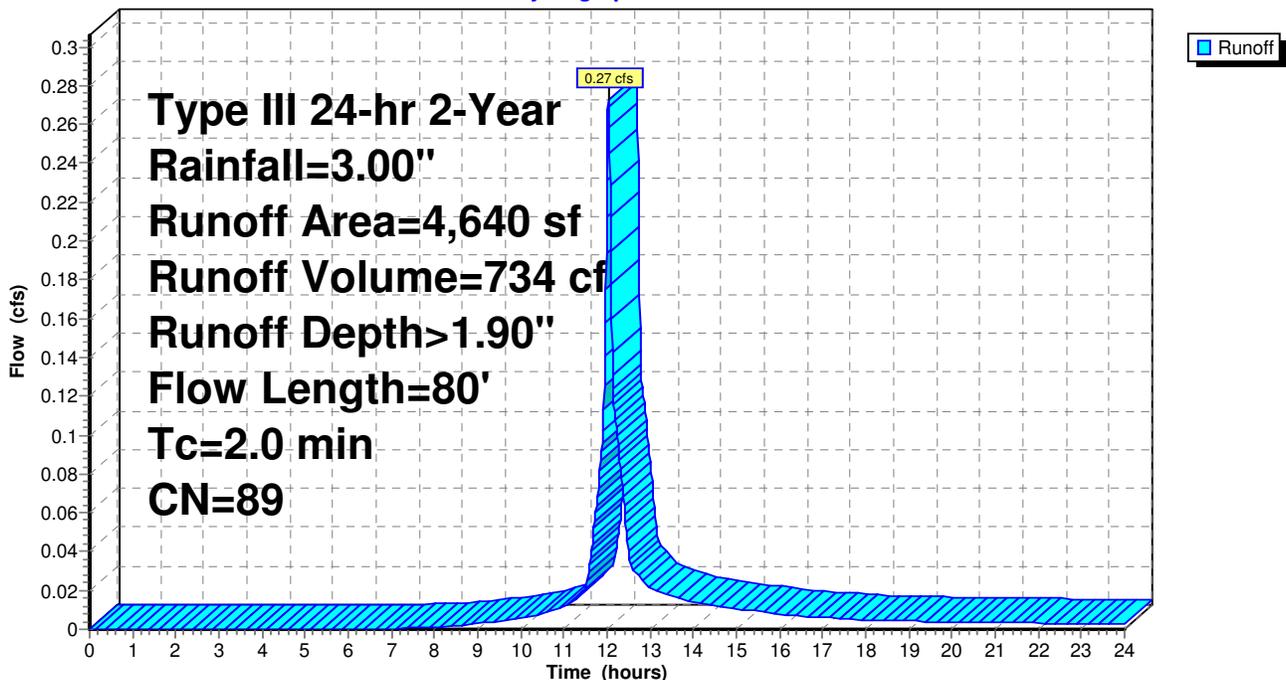
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
960	98	Paved parking & roofs
1,850	98	Paved parking & roofs
1,830	74	>75% Grass cover, Good, HSG C
4,640	89	Weighted Average
1,830		Pervious Area
2,810		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0250	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.6	70	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.0	80	Total			

**Subcatchment 60S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 62S: Large Area including 2 Septics**

Runoff = 1.13 cfs @ 12.11 hrs, Volume= 3,703 cf, Depth> 1.13"

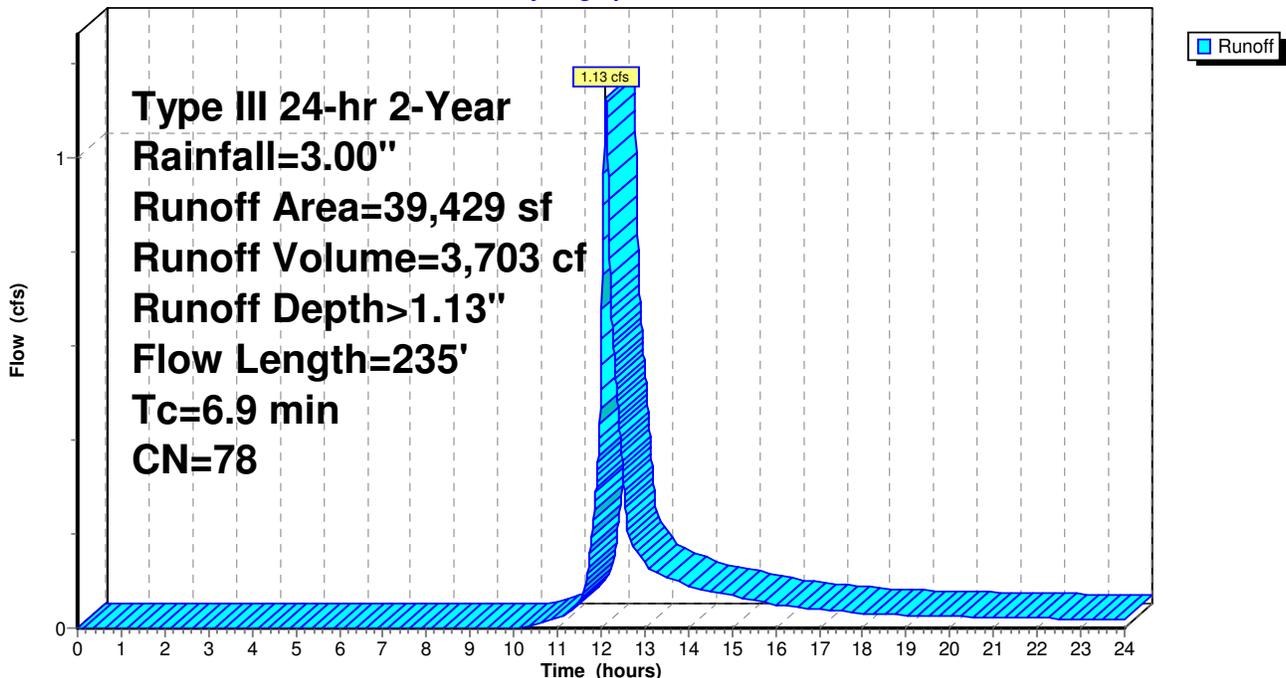
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,880	98	Paved parking & roofs
2,734	98	Paved parking & roofs
30,815	74	>75% Grass cover, Good, HSG C
2,000	70	Woods, Good, HSG C
39,429	78	Weighted Average
32,815		Pervious Area
6,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.1000	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	180	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
6.9	235	Total			

**Subcatchment 62S: Large Area including 2 Septics**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 65S: Throat of Cul-de-sac u.g.**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.44 cfs @ 12.01 hrs, Volume= 1,148 cf, Depth> 1.19"

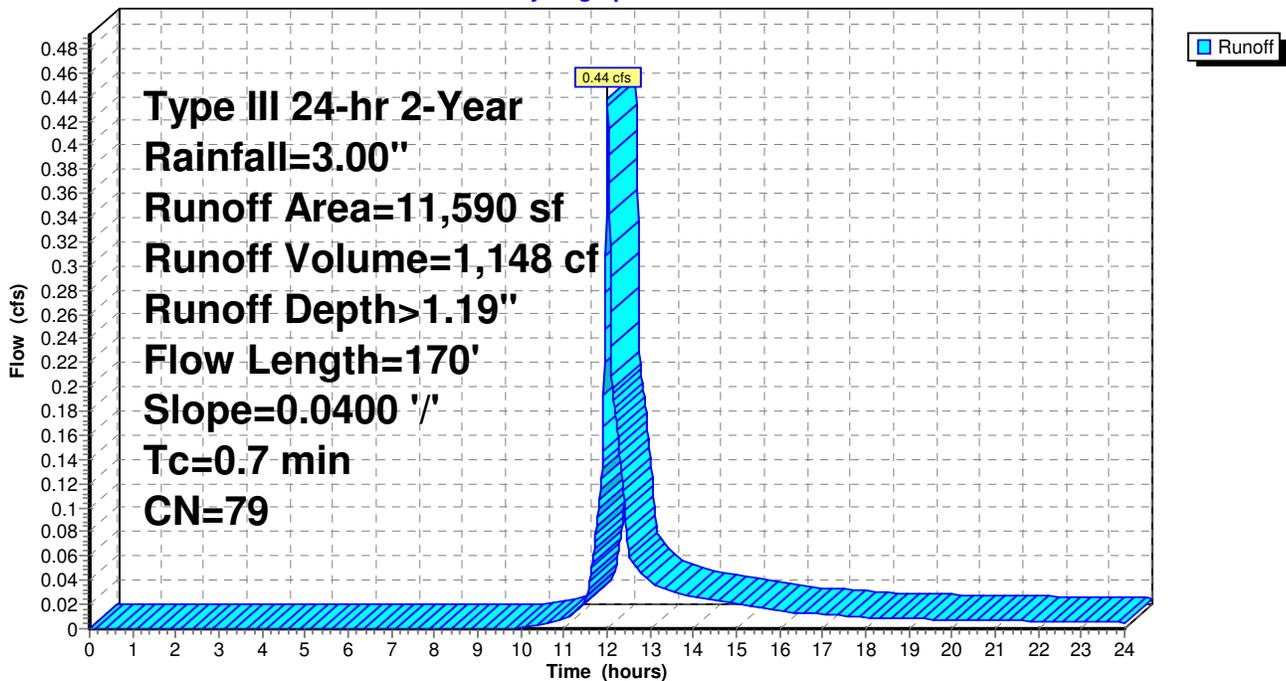
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
400	98	Paved parking & roofs
2,160	98	Paved parking & roofs
9,030	74	>75% Grass cover, Good, HSG C
11,590	79	Weighted Average
9,030		Pervious Area
2,560		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	170	0.0400	4.06		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 65S: Throat of Cul-de-sac u.g.**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Runoff = 0.50 cfs @ 12.05 hrs, Volume= 1,419 cf, Depth> 1.13"

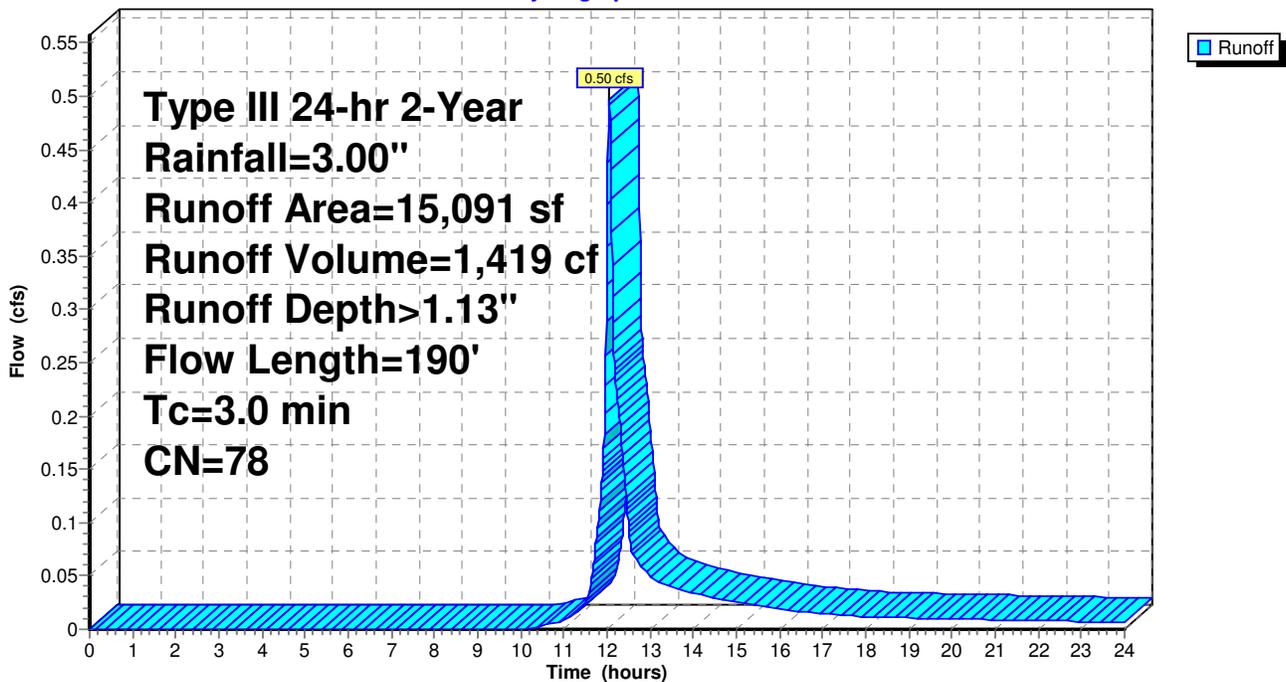
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,730	98	Paved parking & roofs
0	98	Paved parking & roofs
12,361	74	>75% Grass cover, Good, HSG C
15,091	78	Weighted Average
12,361		Pervious Area
2,730		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.1500	2.23		<b>Sheet Flow, Roof Unit 20</b> Smooth surfaces n= 0.011 P2= 3.20"
2.9	170	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.0	190	Total			

**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 110S: To CB 20**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.46 cfs @ 12.01 hrs, Volume= 1,179 cf, Depth> 1.82"

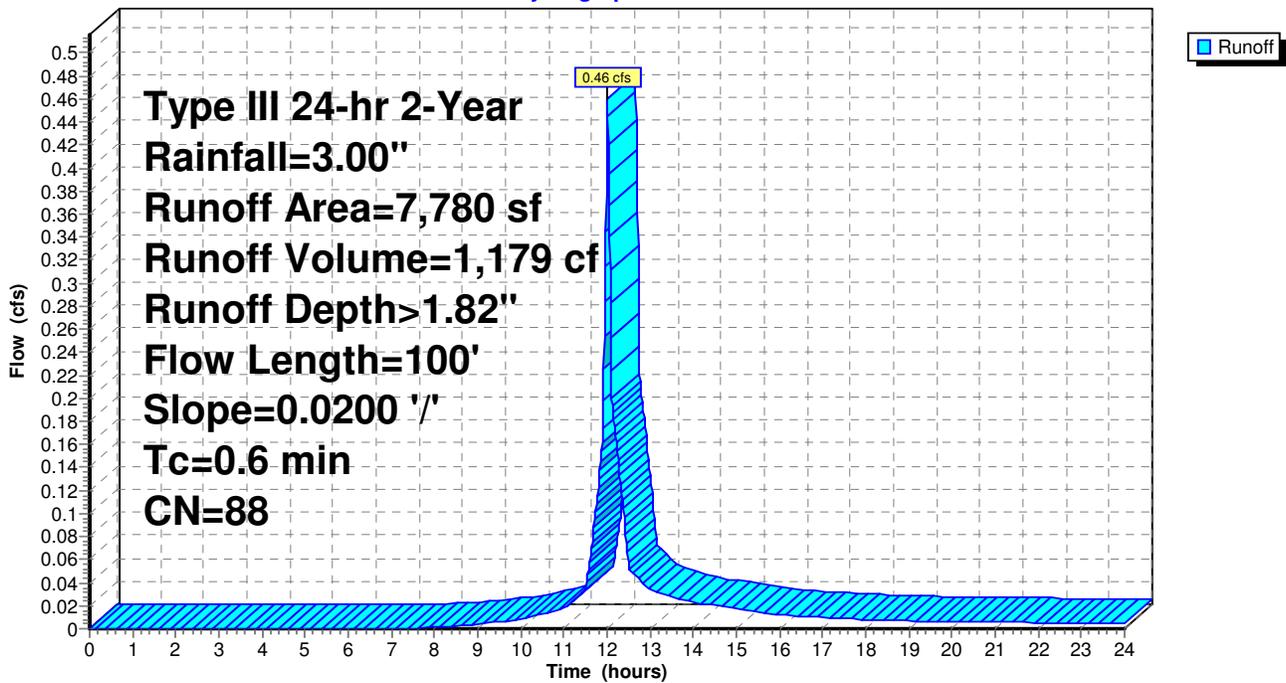
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
2,880	98	Paved parking & roofs
3,240	74	>75% Grass cover, Good, HSG C
7,780	88	Weighted Average
3,240		Pervious Area
4,540		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps

**Subcatchment 110S: To CB 20**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 112S: To CB 22**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.14 cfs @ 12.01 hrs, Volume= 349 cf, Depth> 1.45"

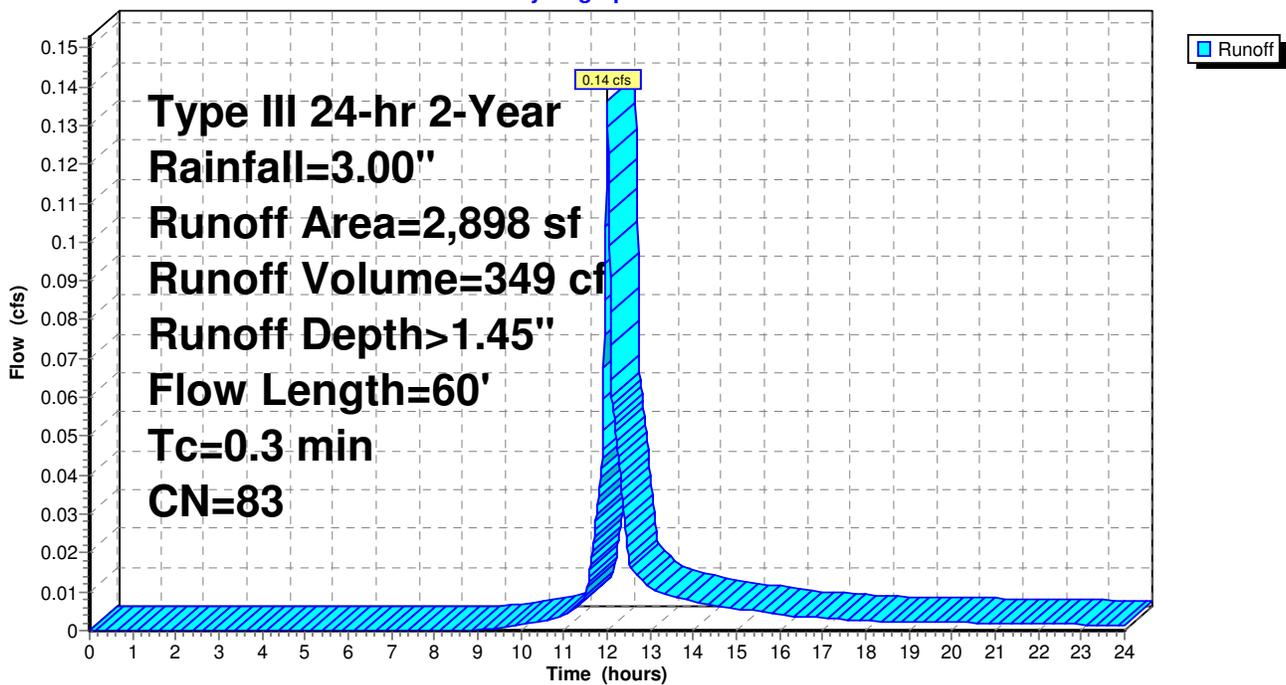
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
0	98	Paved parking & roofs
1,112	98	Paved parking & roofs
1,786	74	>75% Grass cover, Good, HSG C
2,898	83	Weighted Average
1,786		Pervious Area
1,112		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 112S: To CB 22**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 114S: Behind Units 1&2**

Runoff = 0.39 cfs @ 12.13 hrs, Volume= 1,359 cf, Depth> 1.07"

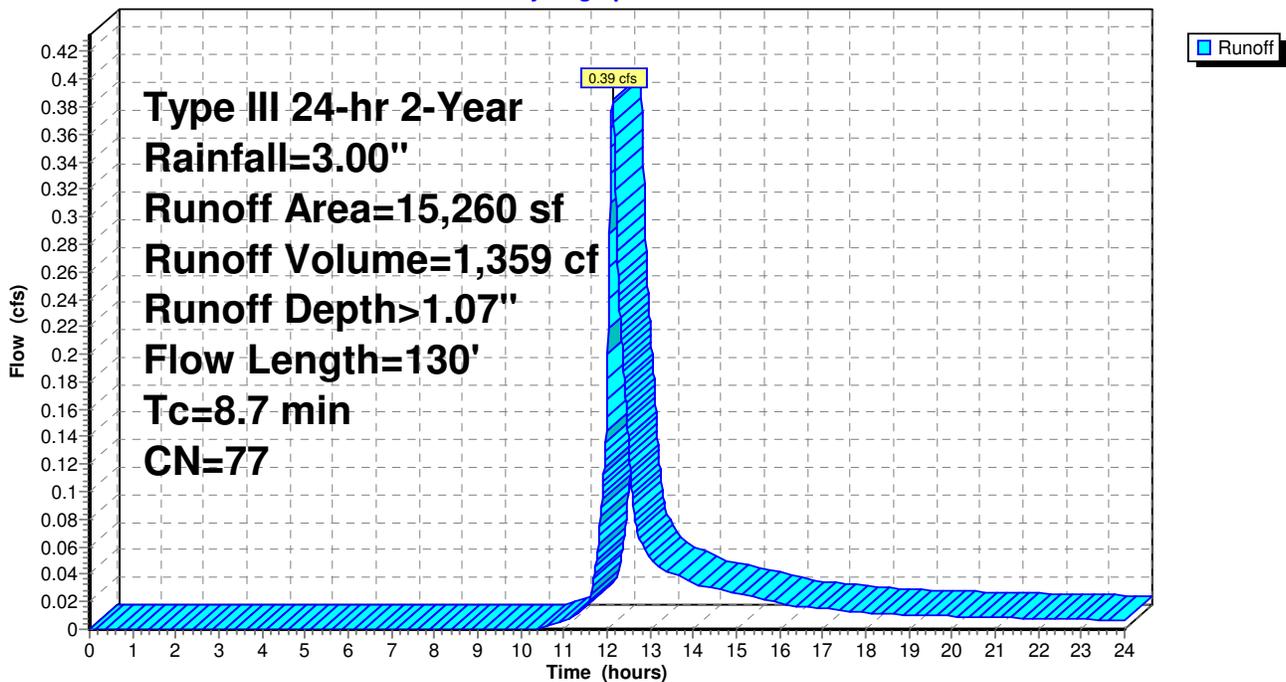
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
0	98	Paved parking & roofs
13,600	74	>75% Grass cover, Good, HSG C
15,260	77	Weighted Average
13,600		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
8.7	130	Total			

**Subcatchment 114S: Behind Units 1&2**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 116S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.20 cfs @ 12.01 hrs, Volume= 504 cf, Depth> 1.98"

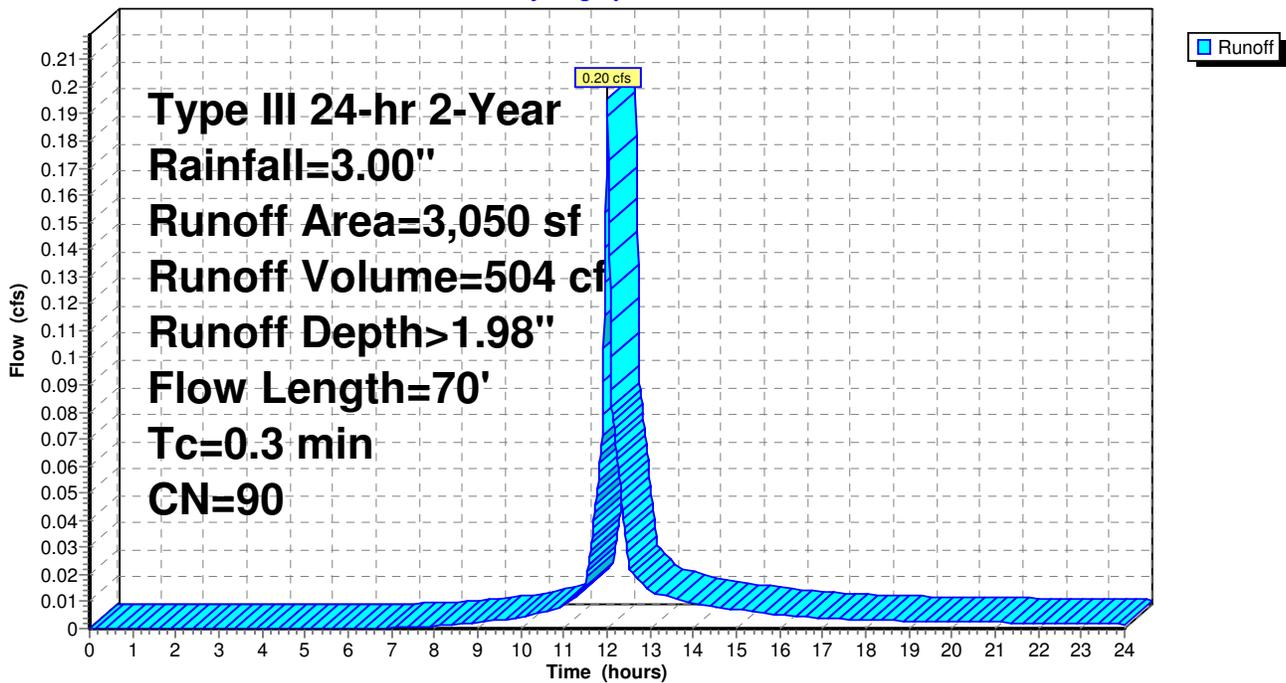
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,300	98	Paved parking & roofs
1,050	74	>75% Grass cover, Good, HSG C
3,050	90	Weighted Average
1,050		Pervious Area
2,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	40	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	70	Total			

**Subcatchment 116S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 118S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.21 cfs @ 12.00 hrs, Volume= 547 cf, Depth> 1.82"

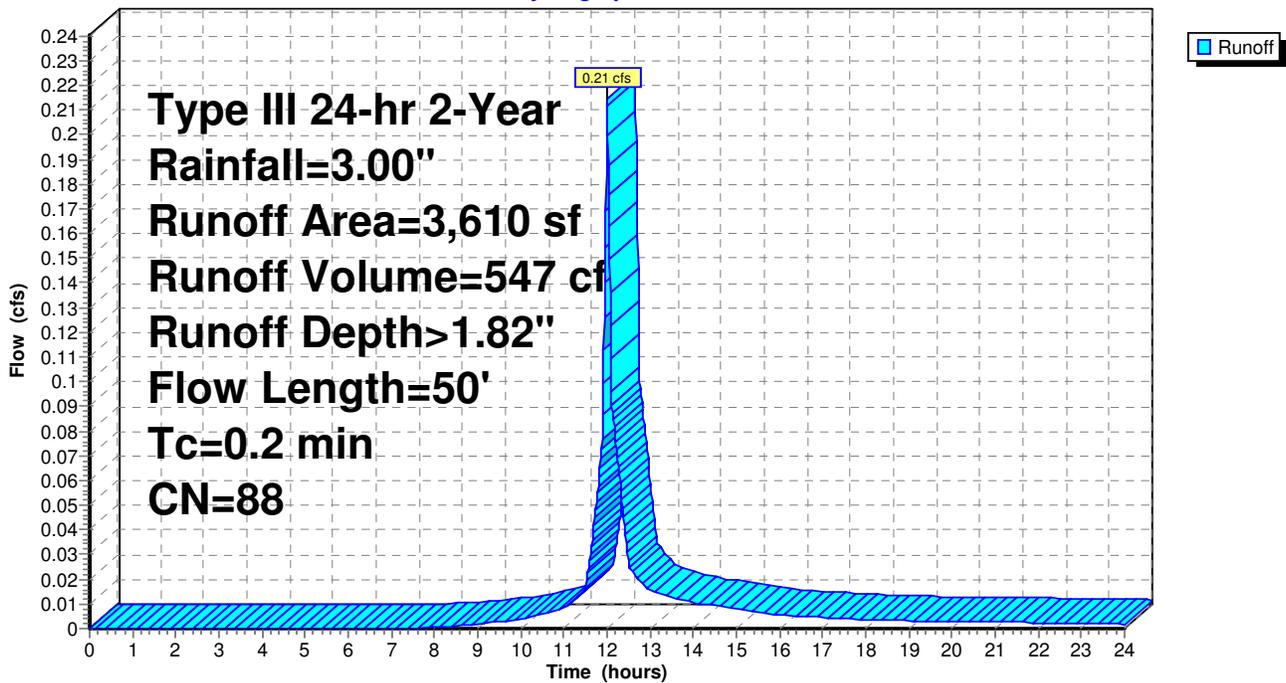
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,040	98	Paved parking & roofs
1,140	98	Paved parking & roofs
1,430	74	>75% Grass cover, Good, HSG C
3,610	88	Weighted Average
1,430		Pervious Area
2,180		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	50	Total			

**Subcatchment 118S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 120S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.35 cfs @ 12.01 hrs, Volume= 897 cf, Depth> 1.74"

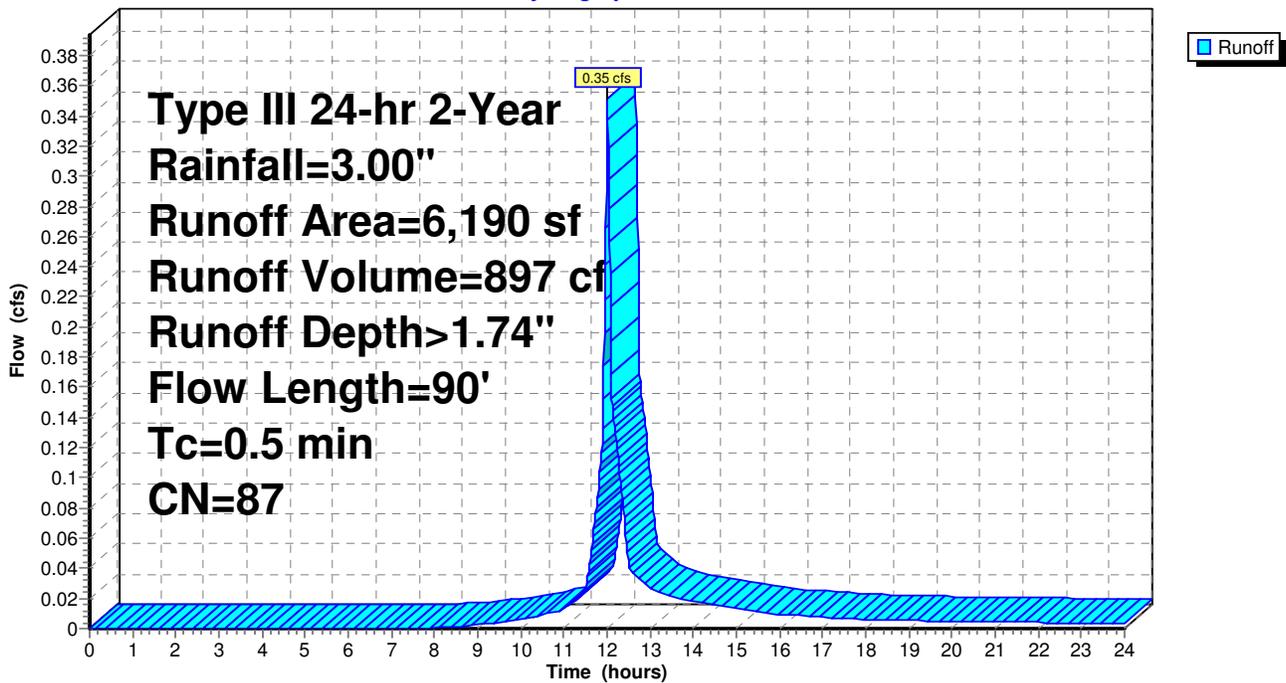
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,450	98	Paved parking & roofs
1,800	98	Paved parking & roofs
2,940	74	>75% Grass cover, Good, HSG C
6,190	87	Weighted Average
2,940		Pervious Area
3,250		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.4	60	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	90	Total			

**Subcatchment 120S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 122S:**

Runoff = 0.18 cfs @ 12.06 hrs, Volume= 541 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

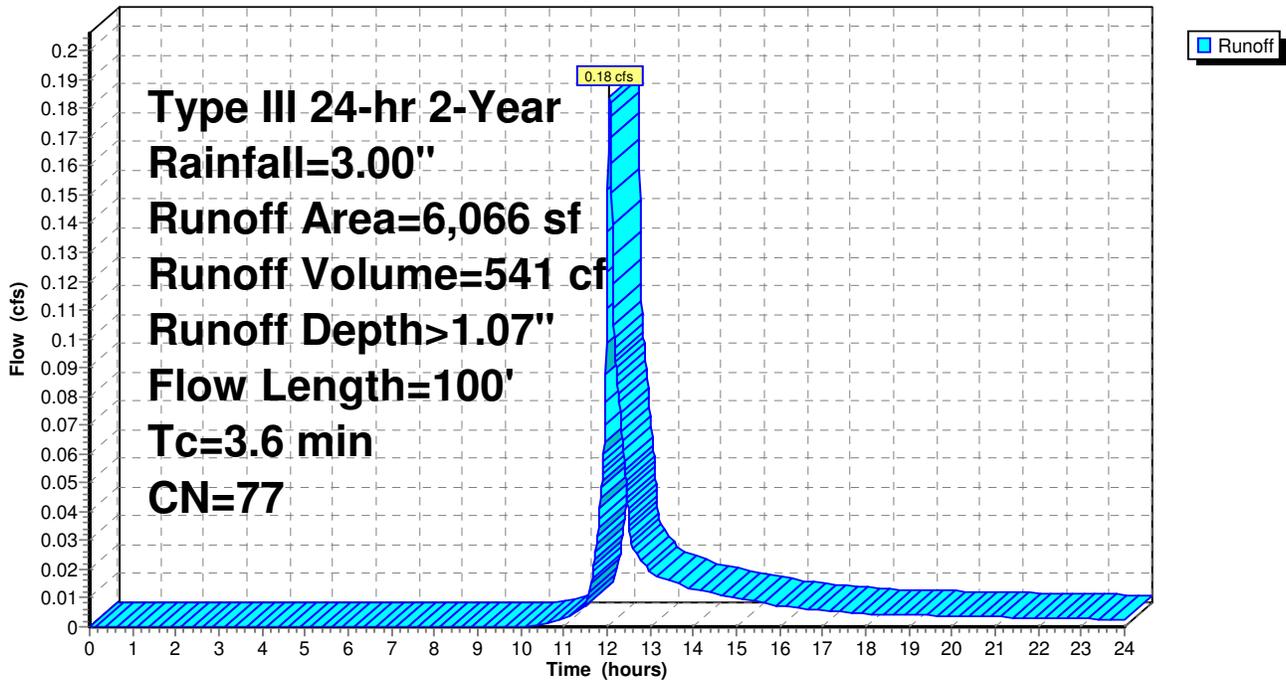
Area (sf)	CN	Description
720	98	Paved parking & roofs
5,346	74	>75% Grass cover, Good, HSG C
6,066	77	Weighted Average
5,346		Pervious Area
720		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	20	0.0300	0.14		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.6	100	Total			

**Subcatchment 122S:**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 124S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.43 cfs @ 12.01 hrs, Volume= 1,087 cf, Depth> 1.74"

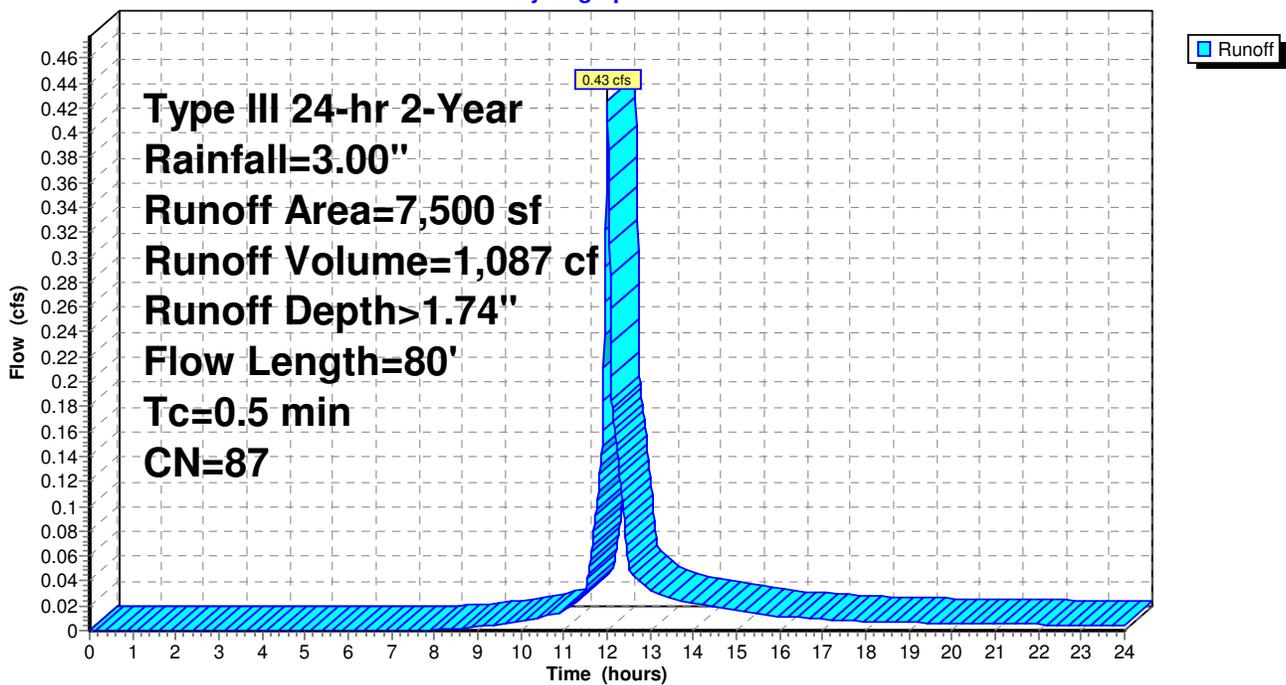
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,410	98	Paved parking & roofs
2,600	98	Paved parking & roofs
3,490	74	>75% Grass cover, Good, HSG C
7,500	87	Weighted Average
3,490		Pervious Area
4,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.5	80	Total			

**Subcatchment 124S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 126S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.30 cfs @ 12.01 hrs, Volume= 778 cf, Depth> 1.74"

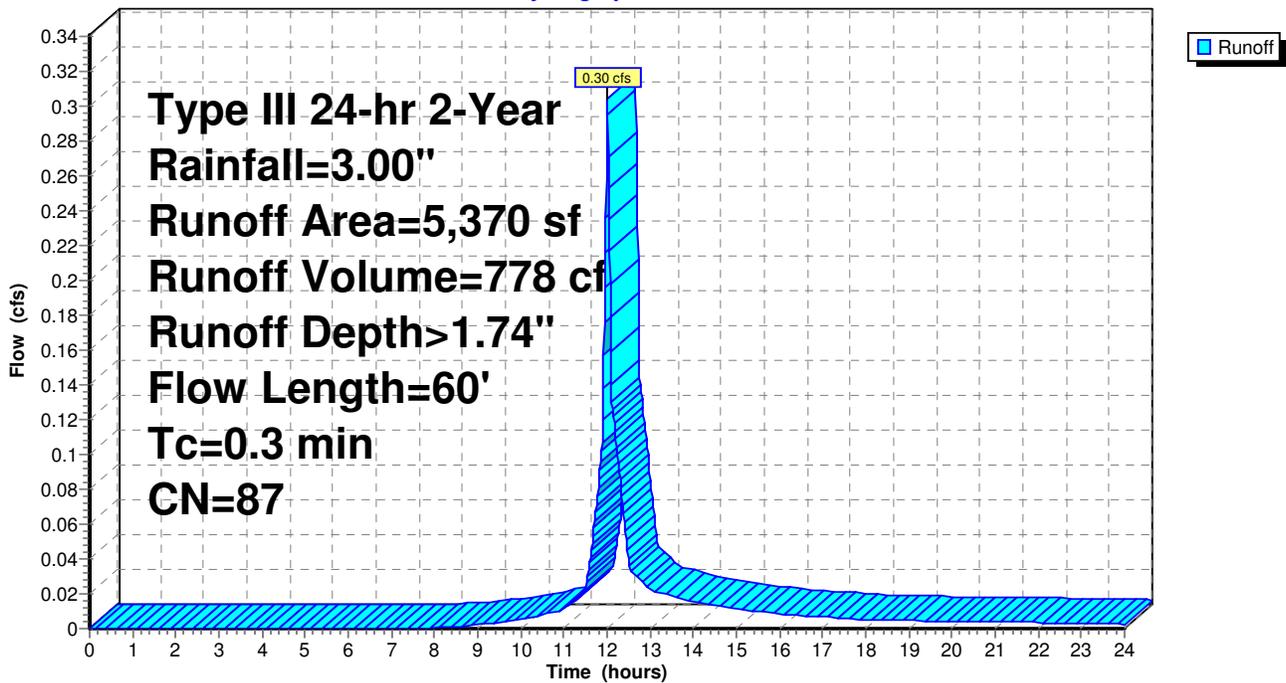
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,350	98	Paved parking & roofs
2,360	74	>75% Grass cover, Good, HSG C
5,370	87	Weighted Average
2,360		Pervious Area
3,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 126S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 128S:**

Runoff = 0.34 cfs @ 12.05 hrs, Volume= 952 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

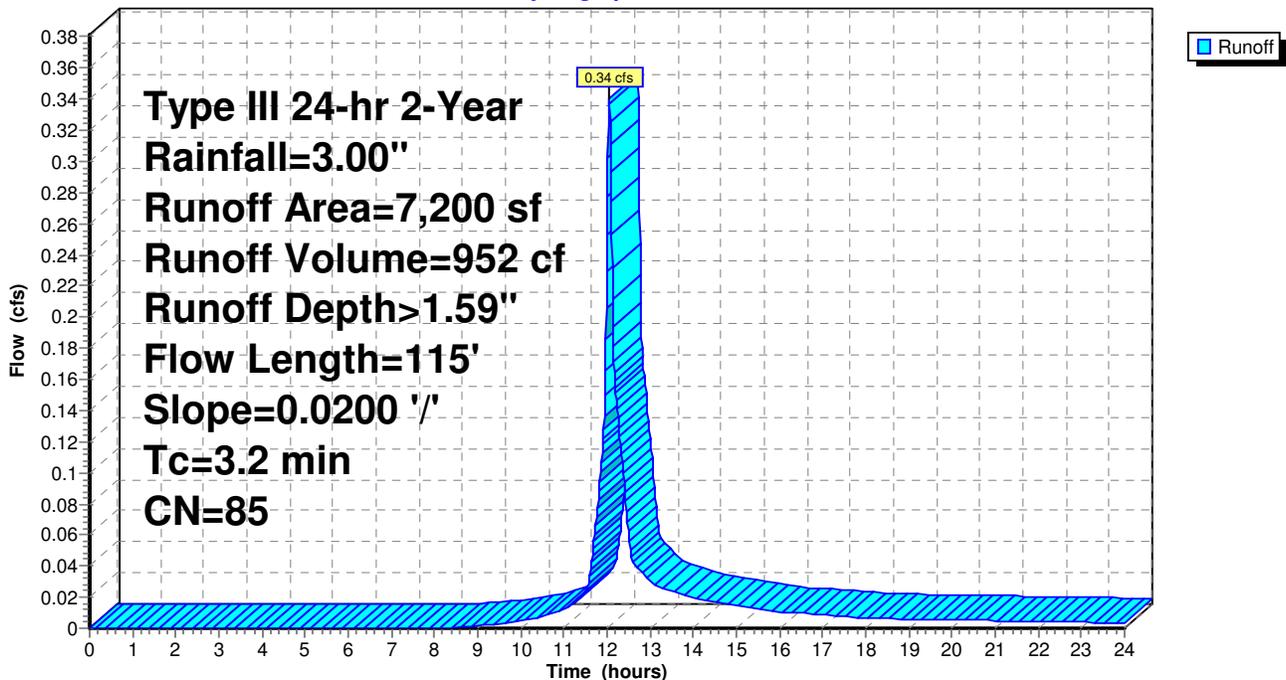
Area (sf)	CN	Description
1,550	98	Paved parking & roofs
1,600	98	Paved parking & roofs
4,050	74	>75% Grass cover, Good, HSG C
7,200	85	Weighted Average
4,050		Pervious Area
3,150		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.3	50	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	25	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	20	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.2	115	Total			

**Subcatchment 128S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 130S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.33 cfs @ 12.01 hrs, Volume= 838 cf, Depth> 1.45"

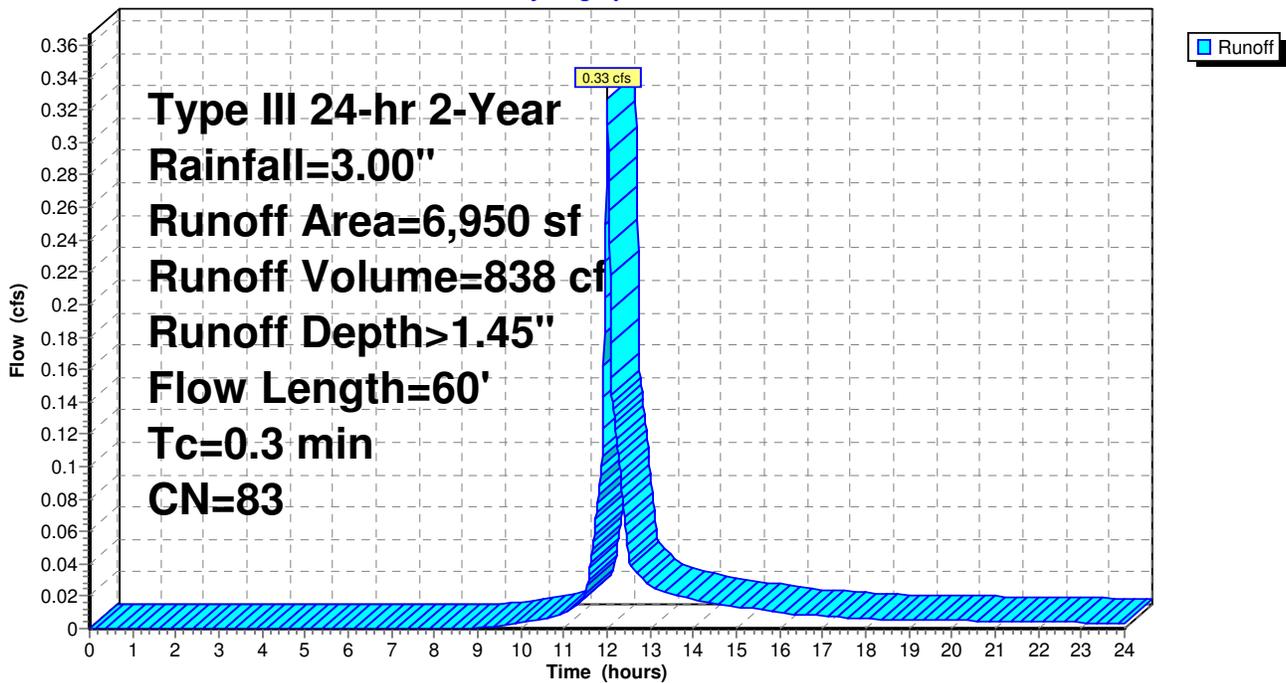
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	40	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 130S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 132S: Behind Unit 3**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.83 cfs @ 12.01 hrs, Volume= 2,222 cf, Depth> 1.01"

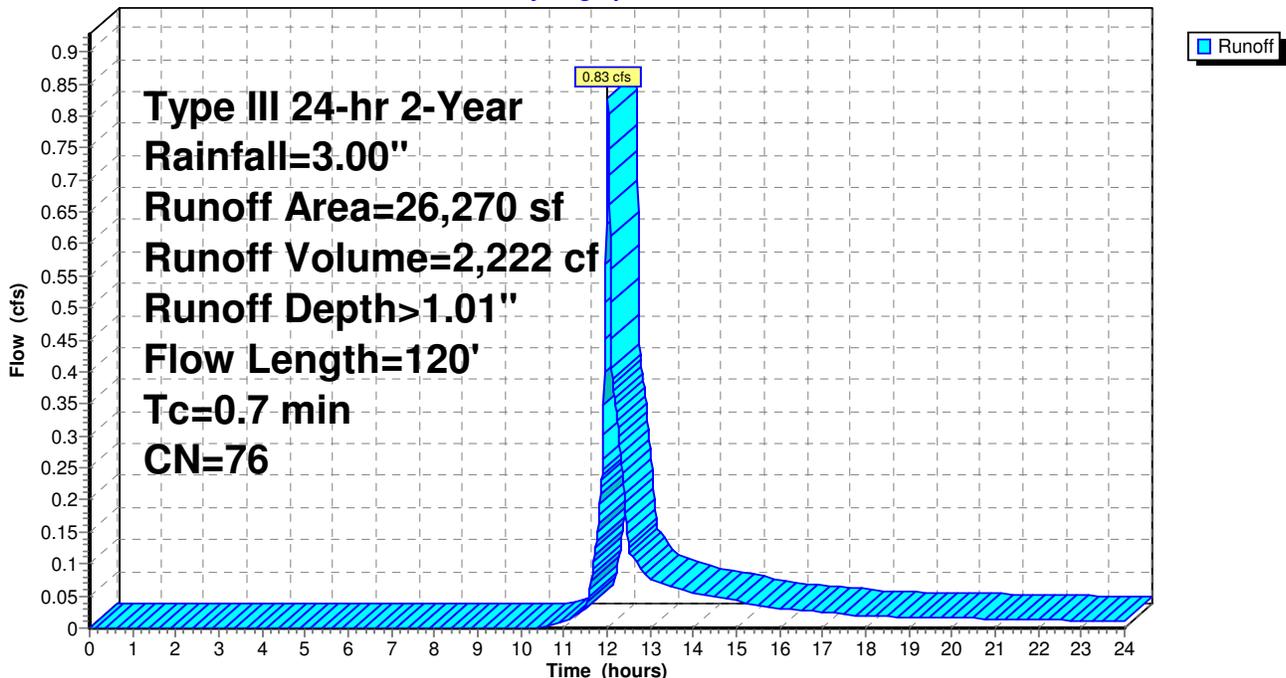
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,100	98	Paved parking & roofs
24,170	74	>75% Grass cover, Good, HSG C
26,270	76	Weighted Average
24,170		Pervious Area
2,100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.0250	2.55		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.1	20	0.1500	6.24		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	0.2500	2.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	120	Total			

**Subcatchment 132S: Behind Unit 3**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 134S: To Swale behind 7,6,5**

Runoff = 0.48 cfs @ 12.05 hrs, Volume= 1,371 cf, Depth> 1.19"

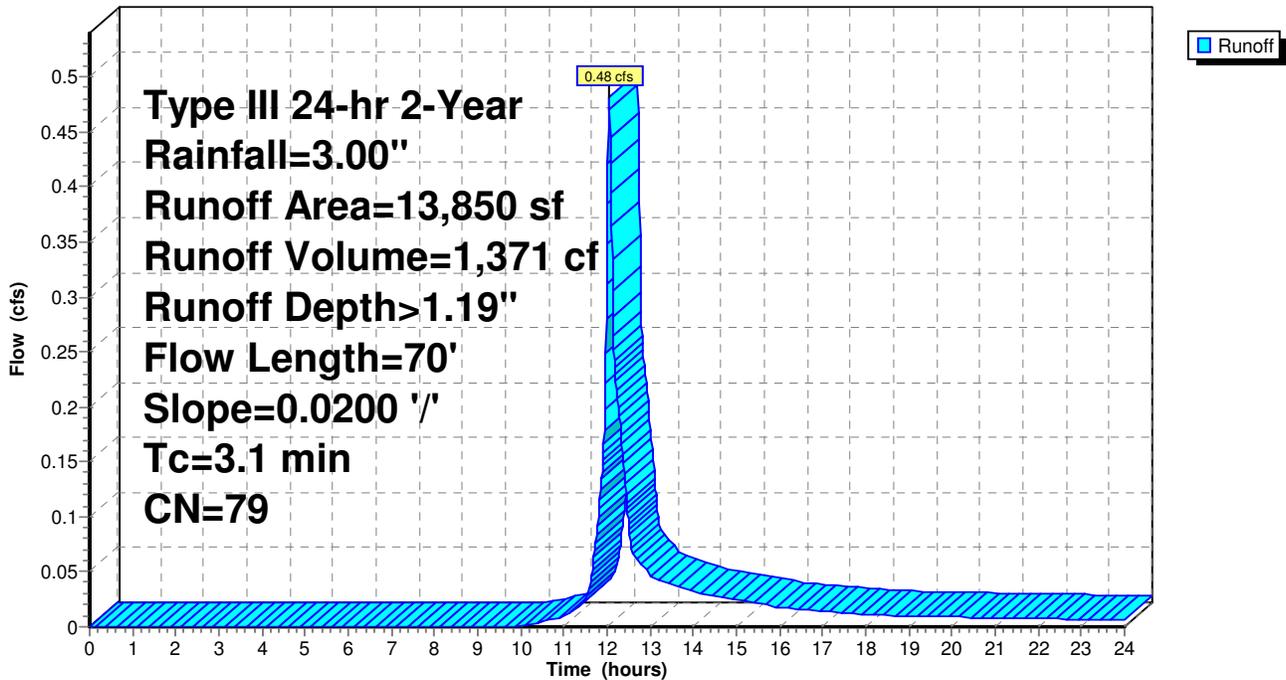
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,000	98	Paved parking & roofs
10,850	74	>75% Grass cover, Good, HSG C
13,850	79	Weighted Average
10,850		Pervious Area
3,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.1	70	Total			

**Subcatchment 134S: To Swale behind 7,6,5**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 136S: To Swale behind 4 to HW 30**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.67 cfs @ 12.01 hrs, Volume= 1,781 cf, Depth> 1.01"

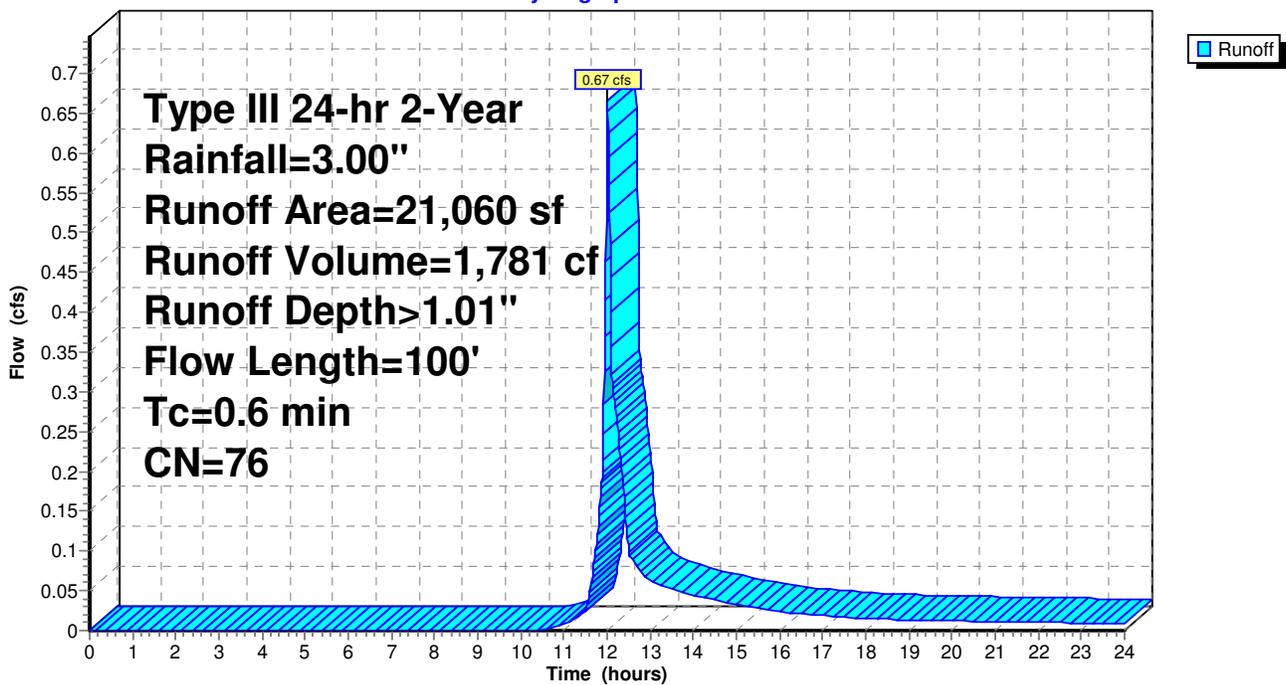
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,700	70	Woods, Good, HSG C
17,700	74	>75% Grass cover, Good, HSG C
21,060	76	Weighted Average
19,400		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.5	70	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.6	100	Total			

**Subcatchment 136S: To Swale behind 4 to HW 30**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Runoff = 0.41 cfs @ 12.17 hrs, Volume= 1,561 cf, Depth> 1.25"

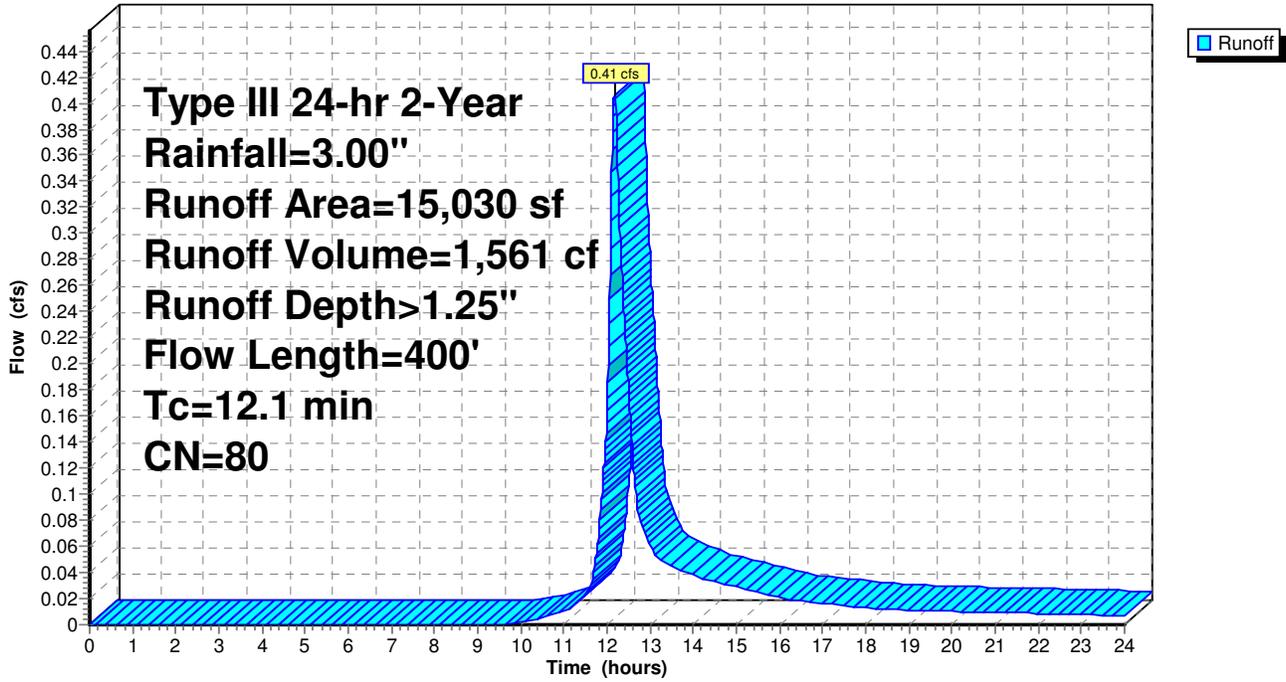
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,500	98	Paved parking & roofs
0	98	Paved parking & roofs
11,530	74	>75% Grass cover, Good, HSG C
15,030	80	Weighted Average
11,530		Pervious Area
3,500		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.2	50	0.2500	3.50		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.5	150	0.0500	4.63	2.02	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.25' Z= 3.0 '/' Top.W=2.50' n= 0.022 Earth, clean & straight
0.6	150	0.0300	3.89	2.68	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=0.25' Z= 3.0 '/' Top.W=3.50' n= 0.022 Earth, clean & straight
12.1	400	Total			

Subcatchment 138S: Rear of Units 10,11,12,13

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 140S: Behind Units 14, 15, 16**

Runoff = 0.46 cfs @ 12.17 hrs, Volume= 1,824 cf, Depth> 1.01"

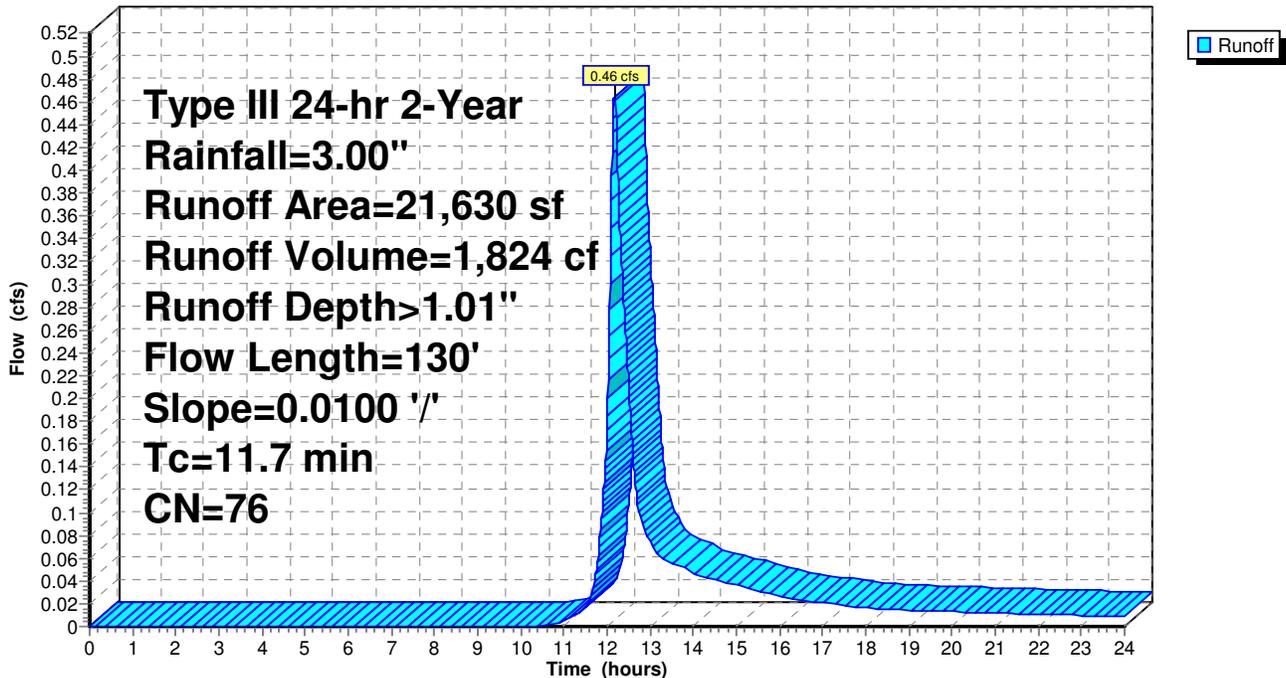
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,400	98	Paved parking & roofs
0	98	Paved parking & roofs
15,230	74	>75% Grass cover, Good, HSG C
4,000	70	Woods, Good, HSG C
21,630	76	Weighted Average
19,230		Pervious Area
2,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.9	80	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
11.7	130	Total			

**Subcatchment 140S: Behind Units 14, 15, 16**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 214S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.32 cfs @ 12.02 hrs, Volume= 838 cf, Depth> 1.45"

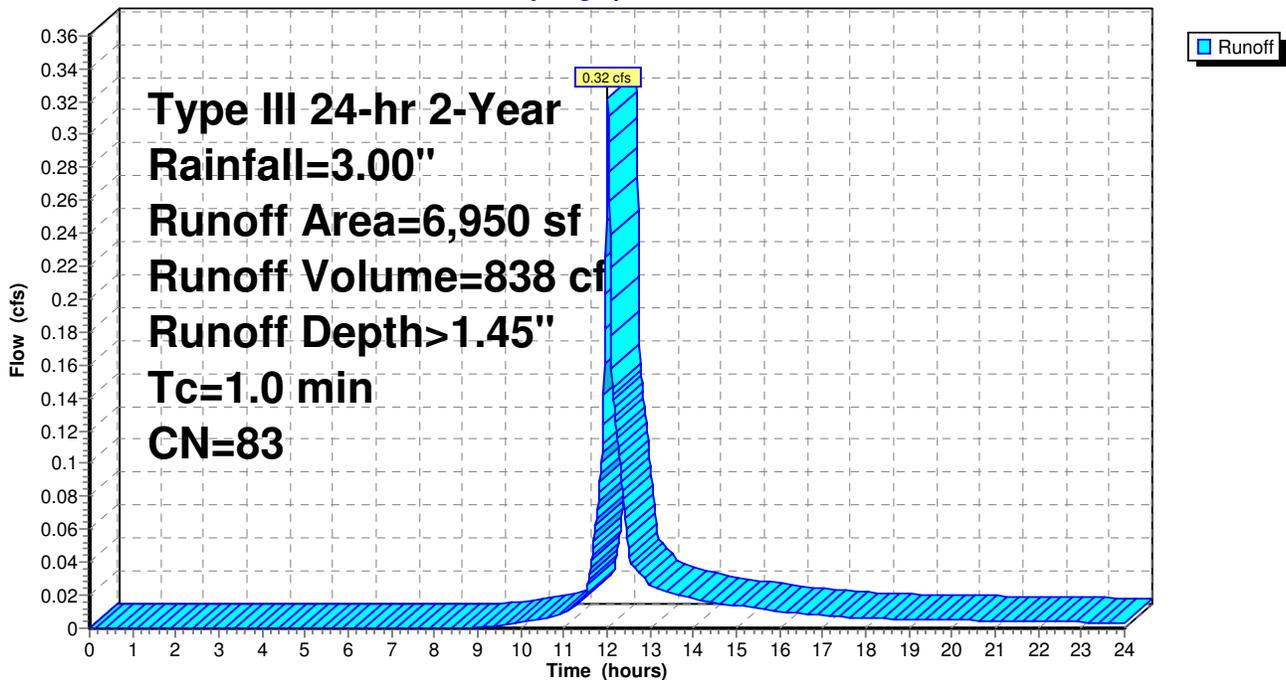
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

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

**Subcatchment 214S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 216S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.21 cfs @ 12.02 hrs, Volume= 548 cf, Depth> 1.59"

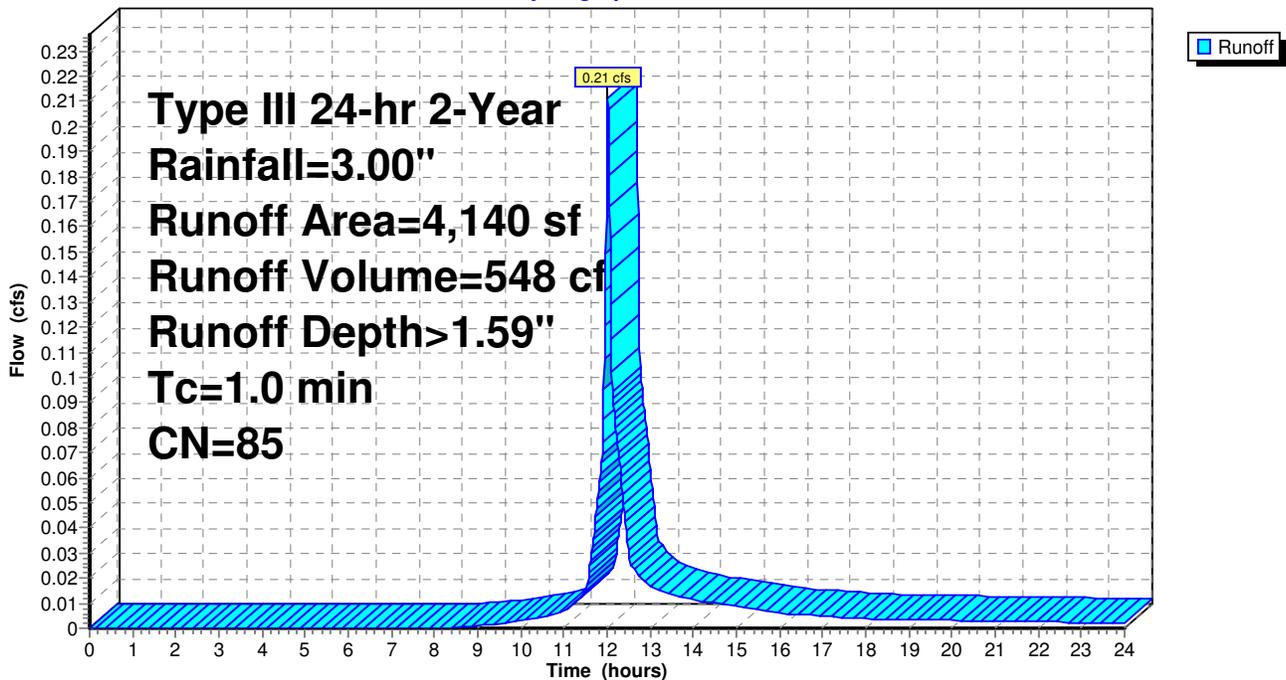
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,200	98	Paved parking & roofs
2,240	74	>75% Grass cover, Good, HSG C
4,140	85	Weighted Average
2,240		Pervious Area
1,900		Impervious Area

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

**Subcatchment 216S:**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.19 cfs @ 12.19 hrs, Volume= 835 cf, Depth> 0.71"

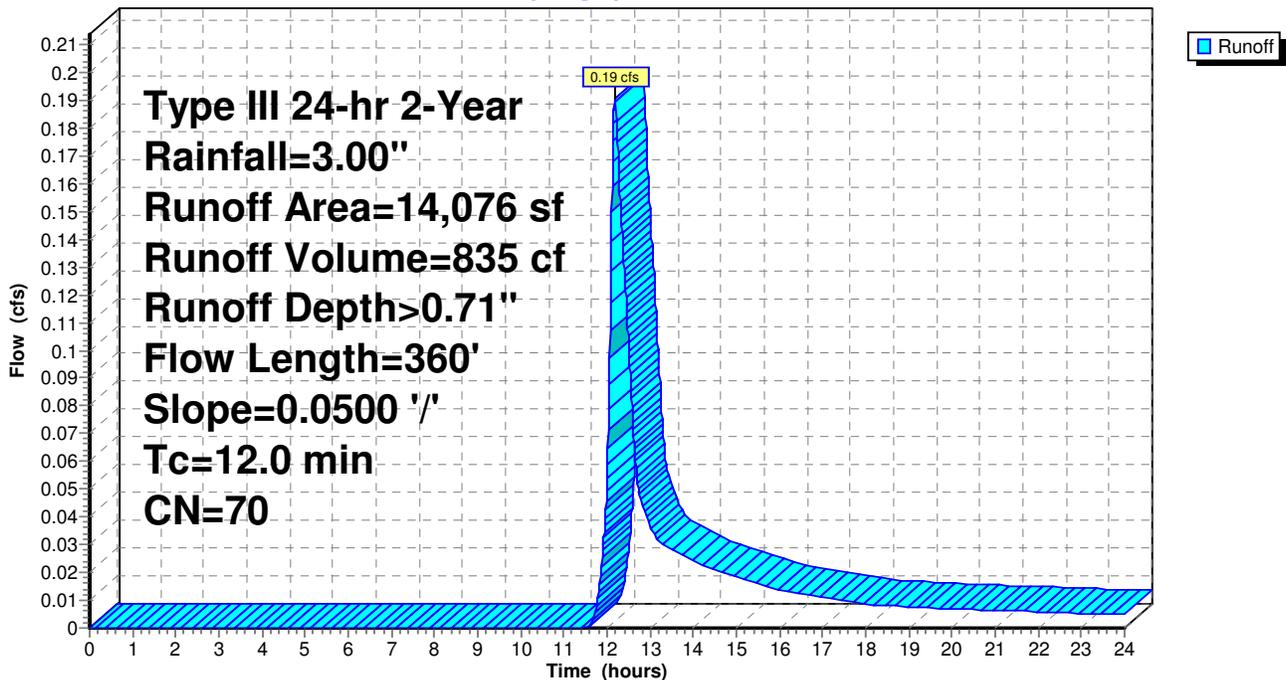
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	40	0.0500	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	320	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.0	360	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 1R: Existing wetland channel to WF 16**

Inflow Area = 162,206 sf, Inflow Depth > 0.92" for 2-Year event  
Inflow = 2.36 cfs @ 12.35 hrs, Volume= 12,372 cf  
Outflow = 2.34 cfs @ 12.40 hrs, Volume= 12,339 cf, Atten= 1%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.99 fps, Min. Travel Time= 1.7 min  
Avg. Velocity = 1.10 fps, Avg. Travel Time= 4.6 min

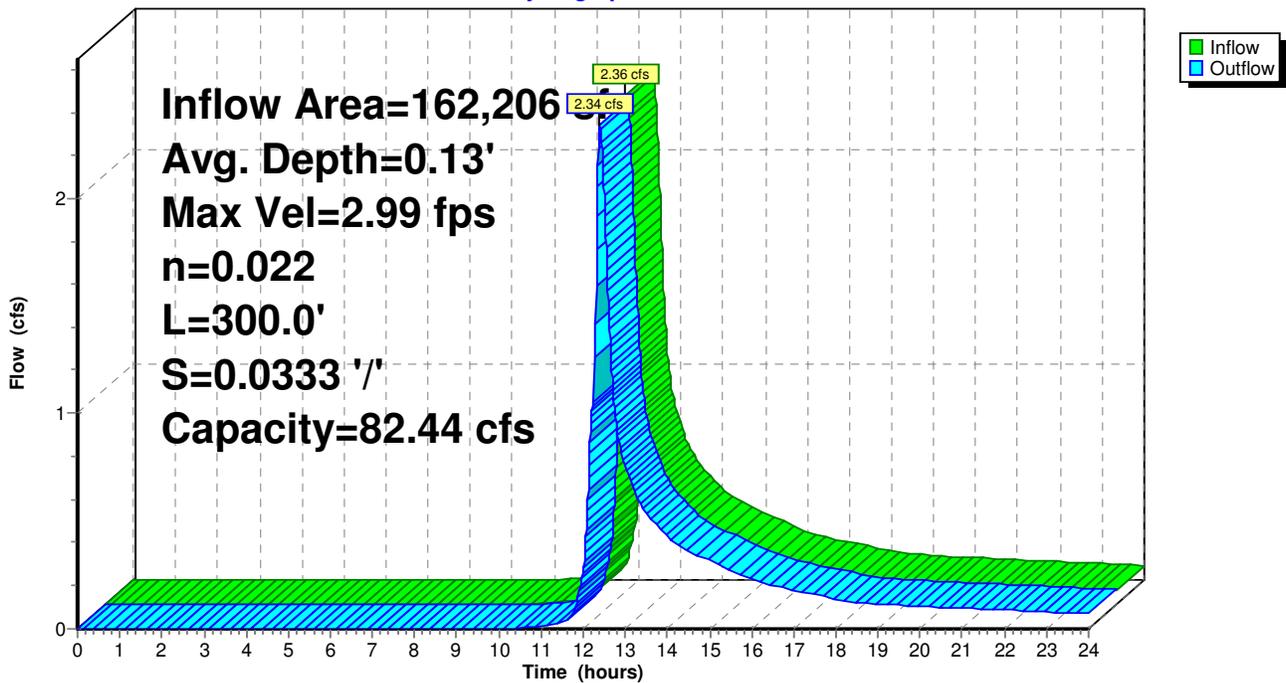
Peak Storage= 235 cf @ 12.37 hrs, Average Depth at Peak Storage= 0.13'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 82.44 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 300.0' Slope= 0.0333 '/'  
Inlet Invert= 96.00', Outlet Invert= 86.00'



**Reach 1R: Existing wetland channel to WF 16**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 2R: CB 23 to HW 40

[52] Hint: Inlet conditions not evaluated

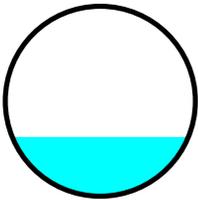
[79] Warning: Submerged Pond 2P Primary device # 2 by 0.39'

Inflow Area = 111,470 sf, Inflow Depth > 0.88" for 2-Year event  
Inflow = 1.65 cfs @ 12.36 hrs, Volume= 8,155 cf  
Outflow = 1.65 cfs @ 12.36 hrs, Volume= 8,152 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.08 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 2.46 fps, Avg. Travel Time= 0.5 min

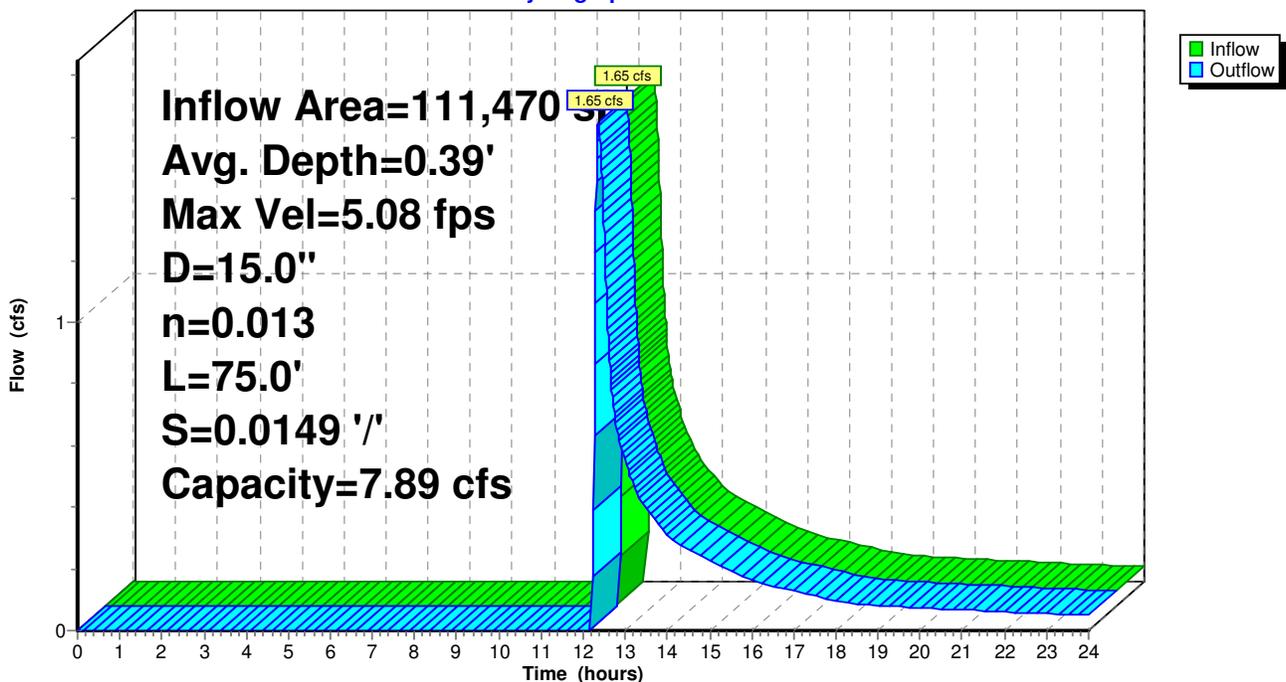
Peak Storage= 24 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.39'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 7.89 cfs

15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 75.0' Slope= 0.0149 '/'  
Inlet Invert= 103.22', Outlet Invert= 102.10'



## Reach 2R: CB 23 to HW 40

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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 55R: DMH 52 to DMH 50

[52] Hint: Inlet conditions not evaluated

[62] Warning: Submerged 15% of Reach 220R inlet

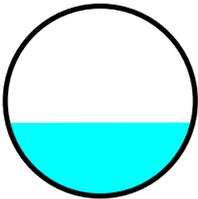
[62] Warning: Submerged 7% of Reach 222R inlet

Inflow Area = 40,720 sf, Inflow Depth > 1.39" for 2-Year event  
Inflow = 1.84 cfs @ 12.02 hrs, Volume= 4,716 cf  
Outflow = 1.84 cfs @ 12.02 hrs, Volume= 4,715 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.59 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.2 min

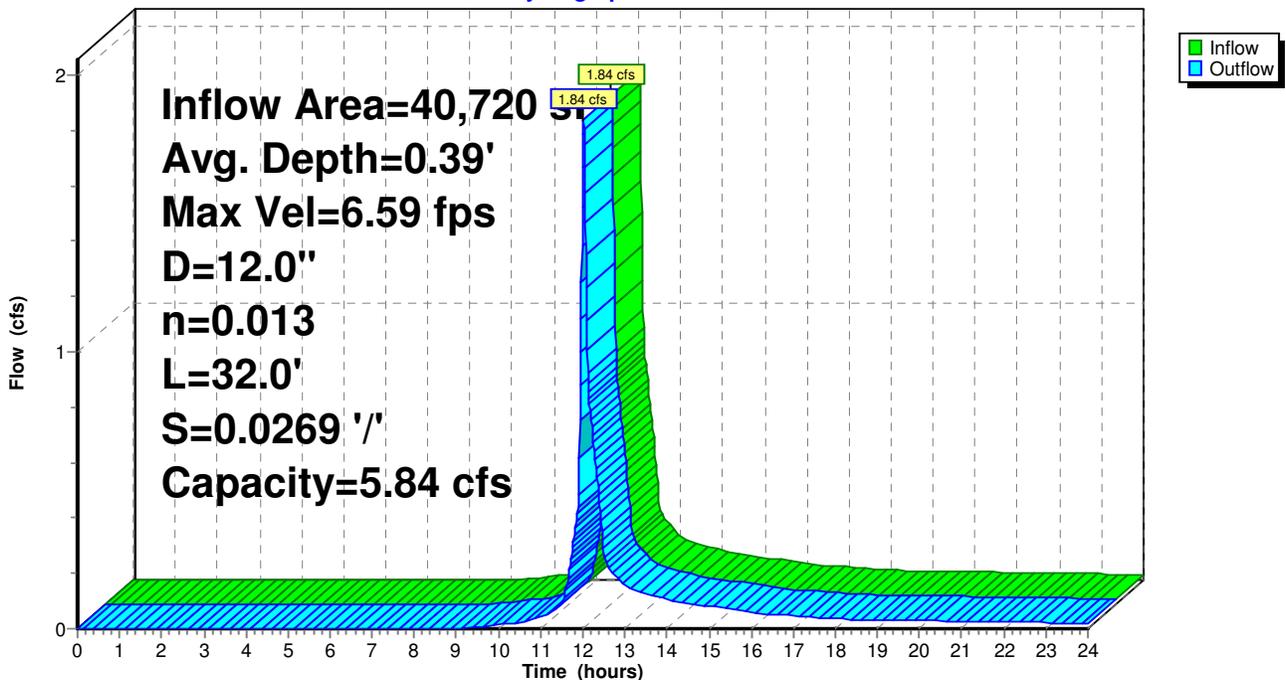
Peak Storage= 9 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.39'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.84 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 32.0' Slope= 0.0269 '/'  
Inlet Invert= 102.48', Outlet Invert= 101.62'



## Reach 55R: DMH 52 to DMH 50

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 62R: DMH 64 to Bio-Retention A (HW 46)**

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 43R Primary device # 1 INLET by 0.15'

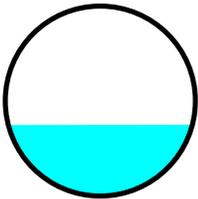
[79] Warning: Submerged Pond 61R Primary device # 1 INLET by 0.03'

Inflow Area =	44,069 sf,	Inflow Depth > 1.21"	for 2-Year event
Inflow =	1.31 cfs @ 12.09 hrs,	Volume=	4,437 cf
Outflow =	1.30 cfs @ 12.10 hrs,	Volume=	4,437 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 4.85 fps, Min. Travel Time= 0.0 min  
 Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.1 min

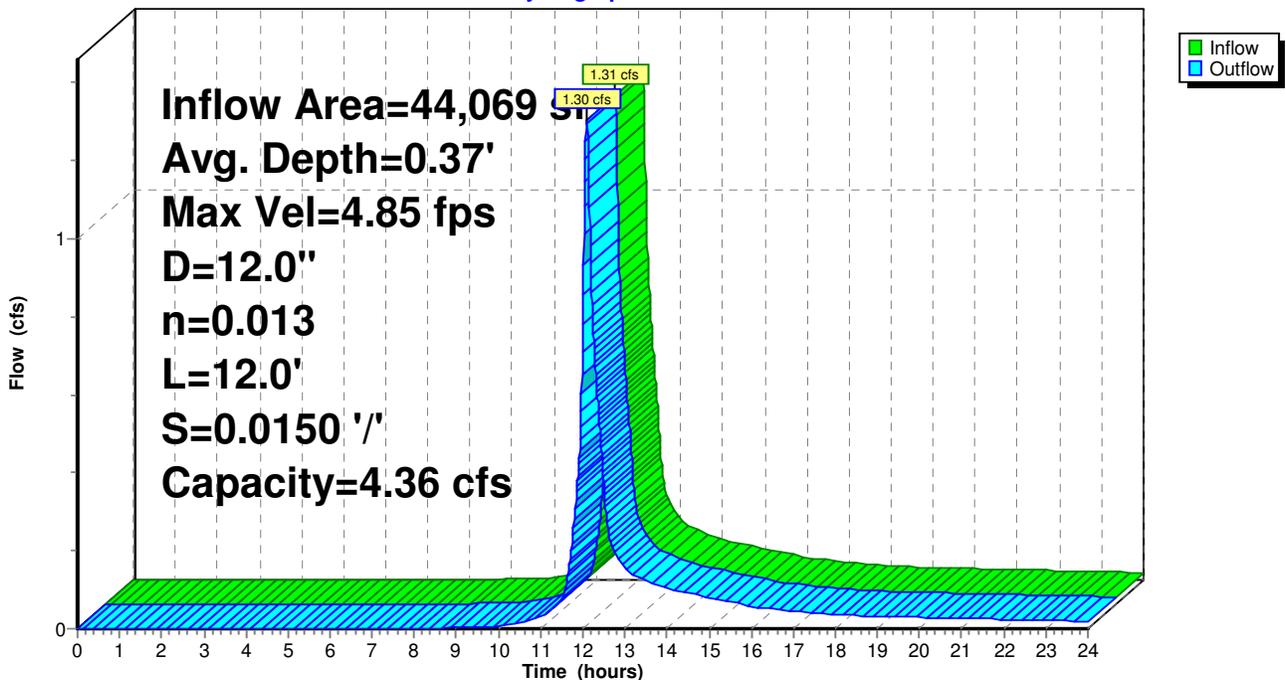
Peak Storage= 3 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.37'  
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.36 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
 Length= 12.0' Slope= 0.0150 '/'  
 Inlet Invert= 110.80', Outlet Invert= 110.62'



**Reach 62R: DMH 64 to Bio-Retention A (HW 46)**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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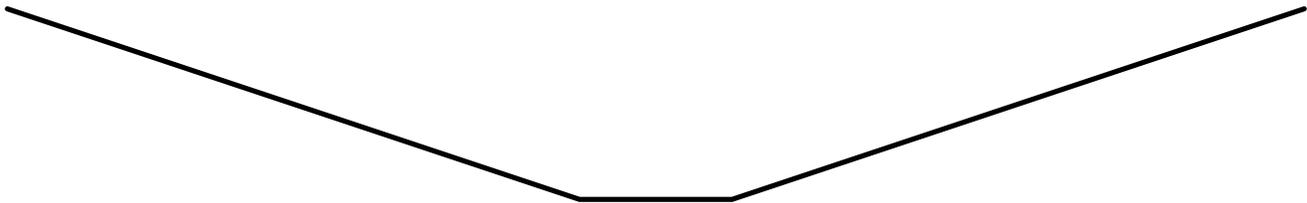
**Reach 64R: Swale from Drive at #12 to RG 10A**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

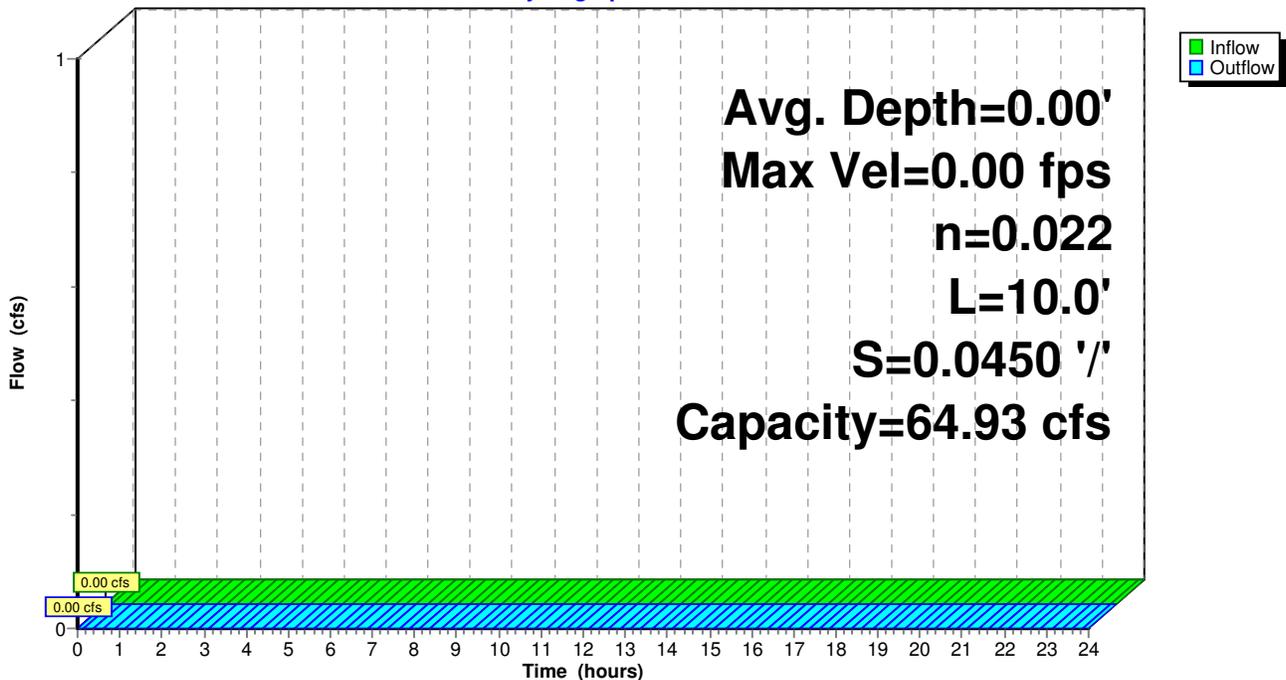
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 108.12', Outlet Invert= 107.67'



**Reach 64R: Swale from Drive at #12 to RG 10A**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 67R: Culvert under Unit 12 Drive

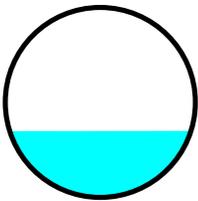
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 1.26" for 2-Year event  
Inflow = 0.32 cfs @ 12.03 hrs, Volume= 732 cf  
Outflow = 0.32 cfs @ 12.03 hrs, Volume= 732 cf, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.92 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.06 fps, Avg. Travel Time= 0.8 min

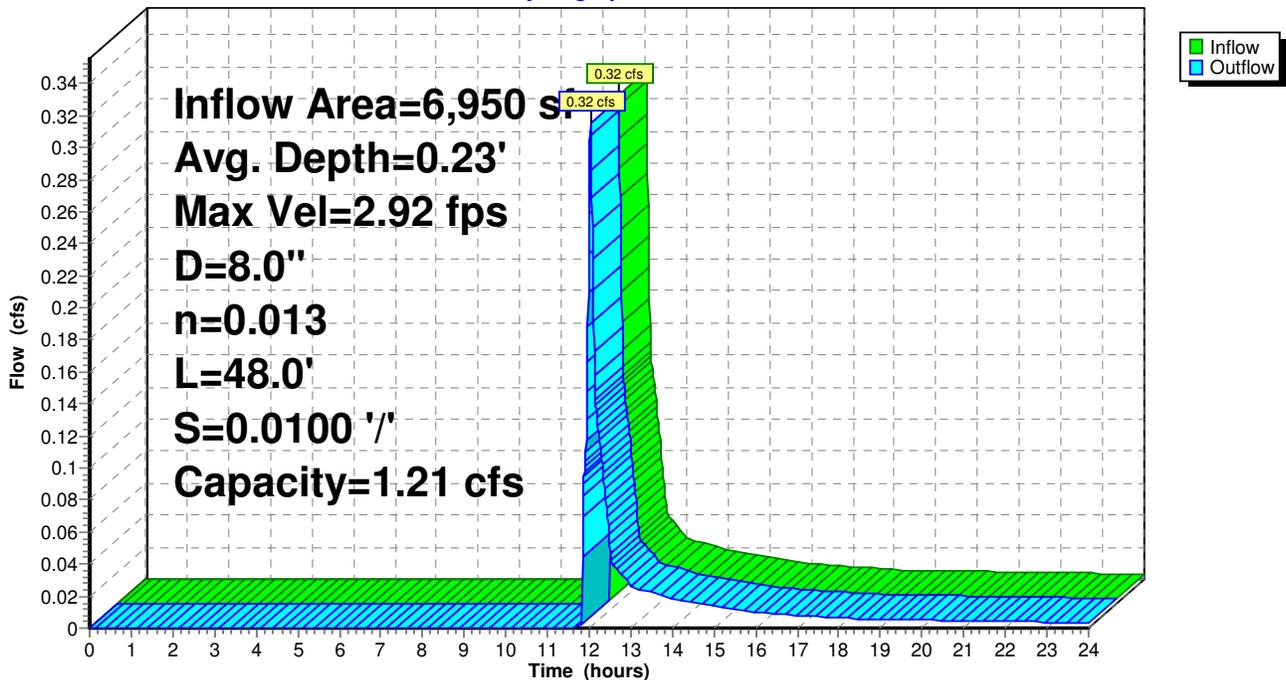
Peak Storage= 5 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.23'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 105.97', Outlet Invert= 105.49'



## Reach 67R: Culvert under Unit 12 Drive

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 68R: Underdrain to CB 66

[52] Hint: Inlet conditions not evaluated

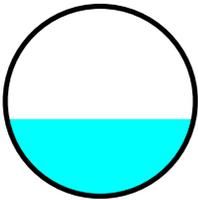
[79] Warning: Submerged Pond 8P Primary device # 7 INLET by 0.52'

Inflow Area = 44,069 sf, Inflow Depth > 1.13" for 2-Year event  
Inflow = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf  
Outflow = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.69 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 3.42 fps, Avg. Travel Time= 0.1 min

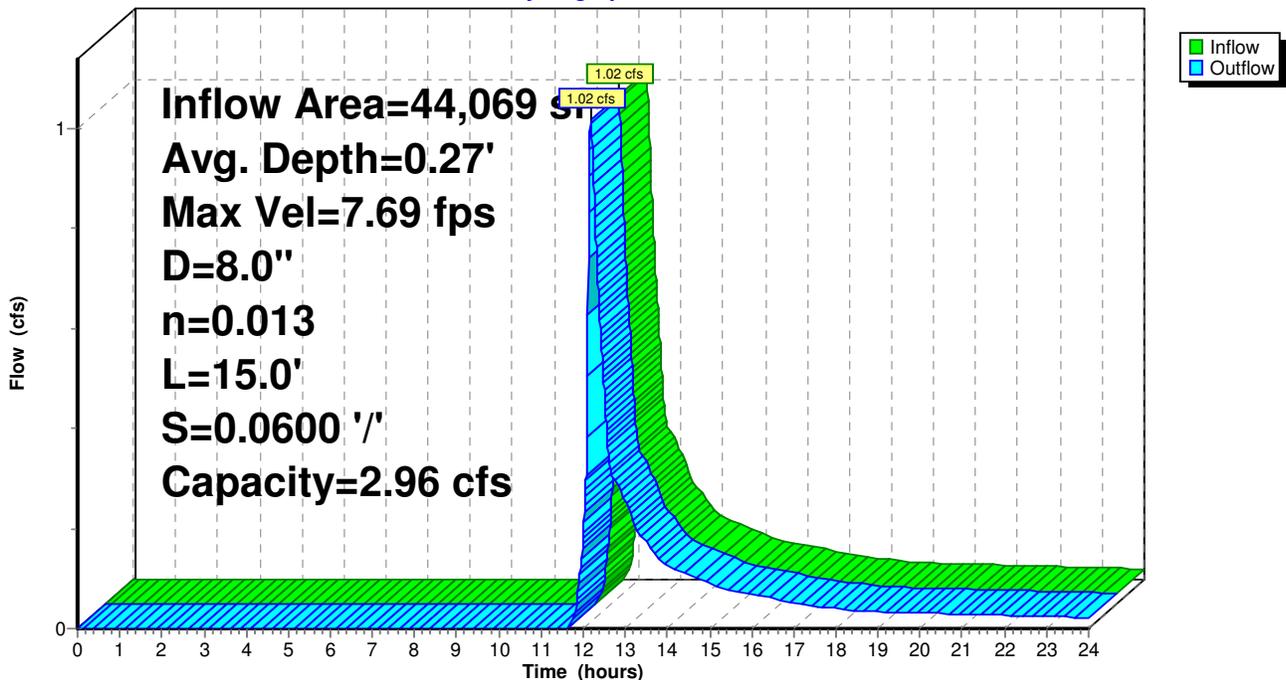
Peak Storage= 2 cf @ 12.18 hrs, Average Depth at Peak Storage= 0.27'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 15.0' Slope= 0.0600 '/'  
Inlet Invert= 107.25', Outlet Invert= 106.35'



## Reach 68R: Underdrain to CB 66

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 69R: Drain to DMH 52

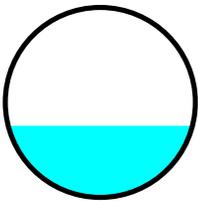
[52] Hint: Inlet conditions not evaluated

Inflow Area = 11,090 sf, Inflow Depth > 1.26" for 2-Year event  
Inflow = 0.51 cfs @ 12.04 hrs, Volume= 1,160 cf  
Outflow = 0.51 cfs @ 12.04 hrs, Volume= 1,160 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.28 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.4 min

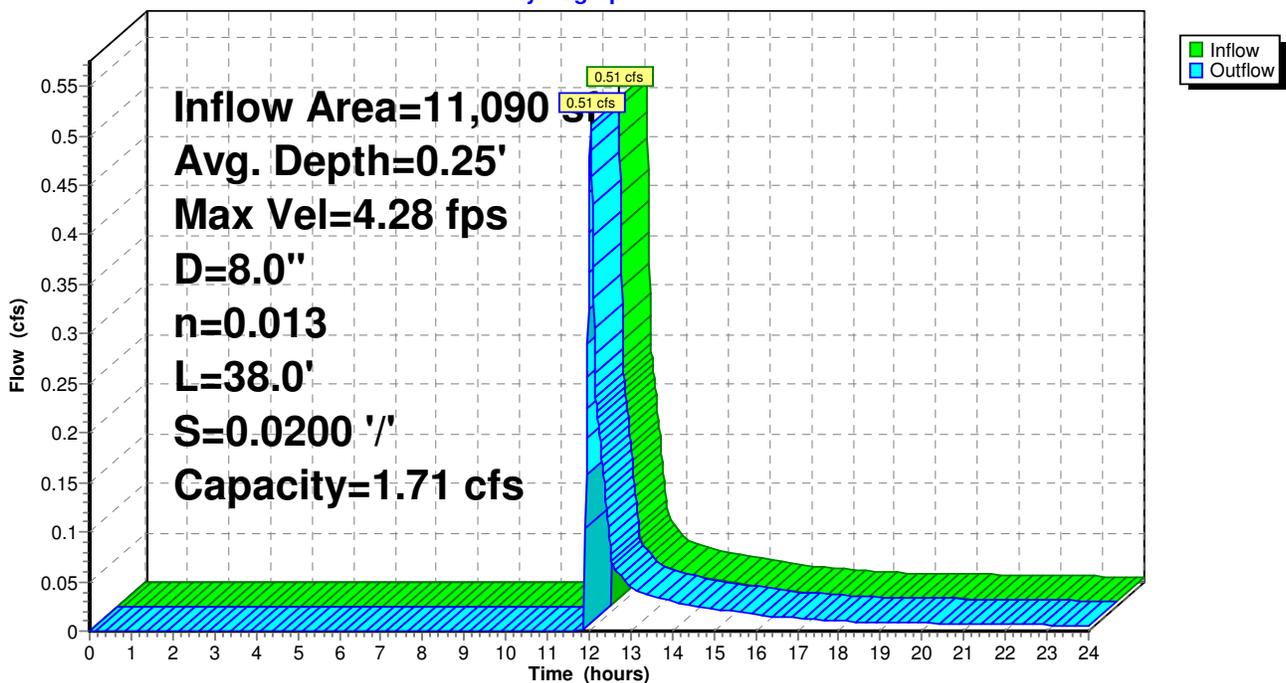
Peak Storage= 5 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.25'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.71 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 38.0' Slope= 0.0200 '/'  
Inlet Invert= 103.69', Outlet Invert= 102.93'



## Reach 69R: Drain to DMH 52

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 114R: DMH 16 to DMH 14

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 111P Primary device # 1 OUTLET by 0.16'

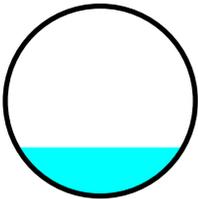
[79] Warning: Submerged Pond 112P Primary device # 1 OUTLET by 0.16'

Inflow Area = 10,678 sf, Inflow Depth > 1.72" for 2-Year event  
Inflow = 0.60 cfs @ 12.01 hrs, Volume= 1,528 cf  
Outflow = 0.59 cfs @ 12.02 hrs, Volume= 1,528 cf, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.72 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.22 fps, Avg. Travel Time= 0.8 min

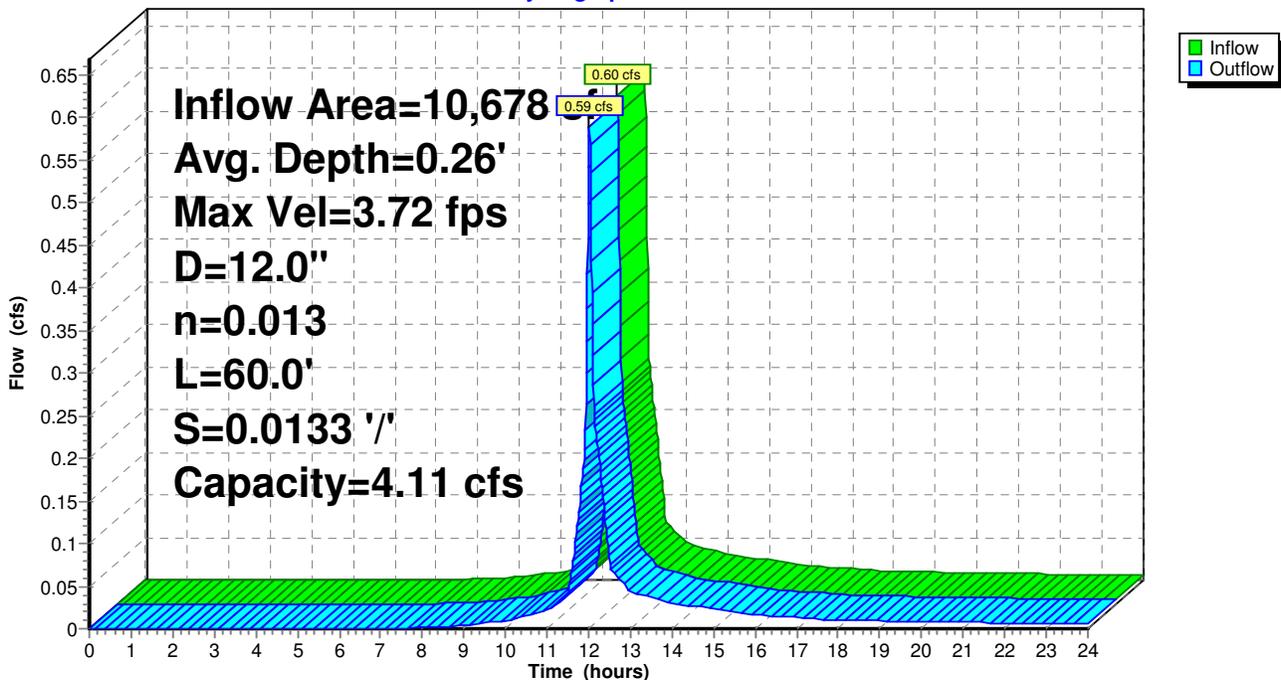
Peak Storage= 10 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.26'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.11 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 60.0' Slope= 0.0133 '/'  
Inlet Invert= 103.48', Outlet Invert= 102.68'



## Reach 114R: DMH 16 to DMH 14

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 118R: Swale from Drive at #4 to RG 116**

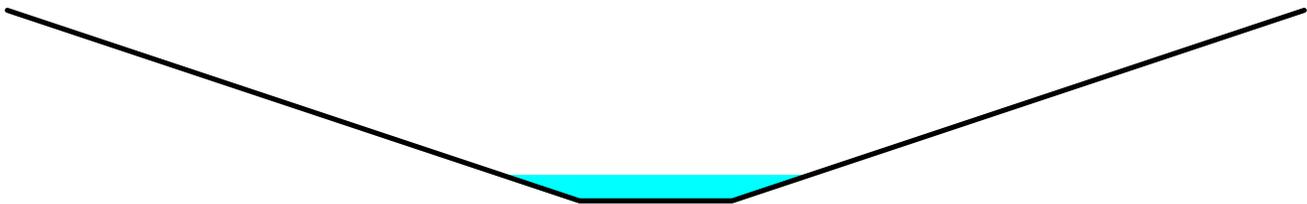
[62] Warning: Submerged 15% of Reach 119R inlet

Inflow Area = 18,760 sf, Inflow Depth > 1.63" for 2-Year event  
Inflow = 0.92 cfs @ 12.03 hrs, Volume= 2,542 cf  
Outflow = 0.92 cfs @ 12.03 hrs, Volume= 2,542 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3  
Max. Velocity= 3.56 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.1 min

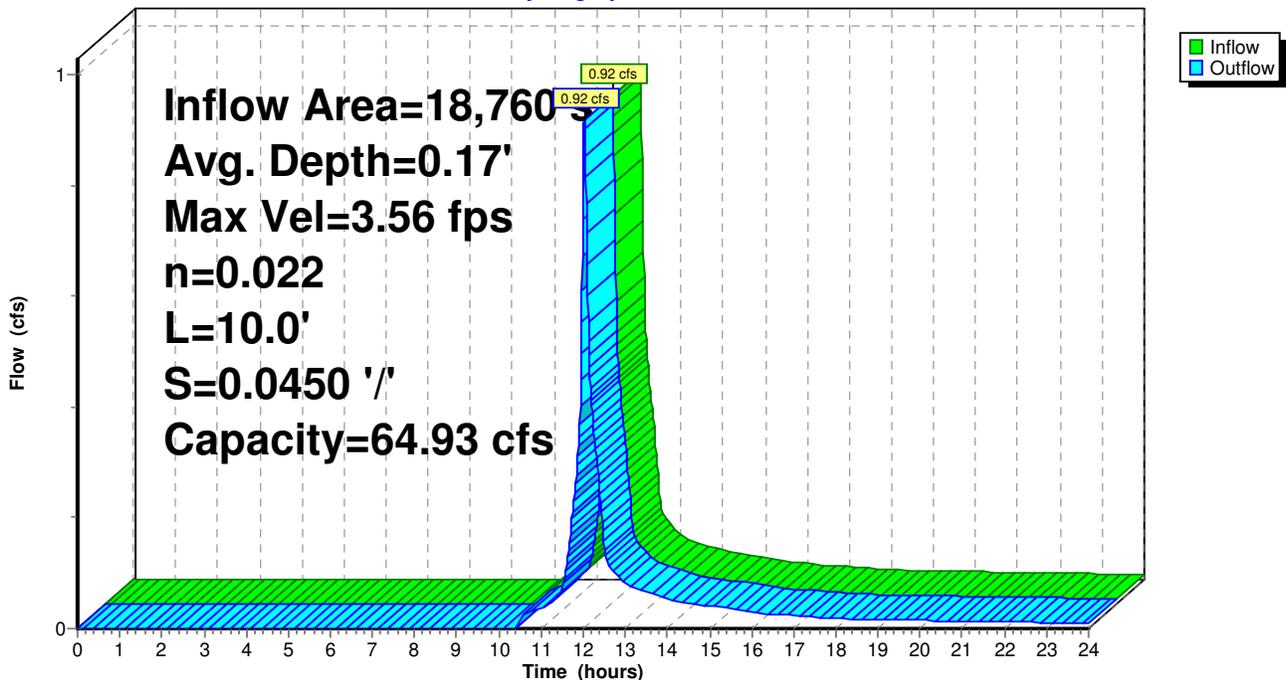
Peak Storage= 3 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.17'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 111.23', Outlet Invert= 110.78'



**Reach 118R: Swale from Drive at #4 to RG 116**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 119R: Culvert under Unit 4 Drive

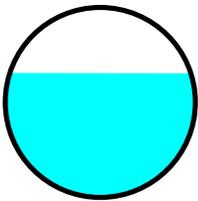
[52] Hint: Inlet conditions not evaluated

Inflow Area = 18,760 sf, Inflow Depth > 1.63" for 2-Year event  
Inflow = 0.92 cfs @ 12.02 hrs, Volume= 2,542 cf  
Outflow = 0.92 cfs @ 12.03 hrs, Volume= 2,542 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.81 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.3 min

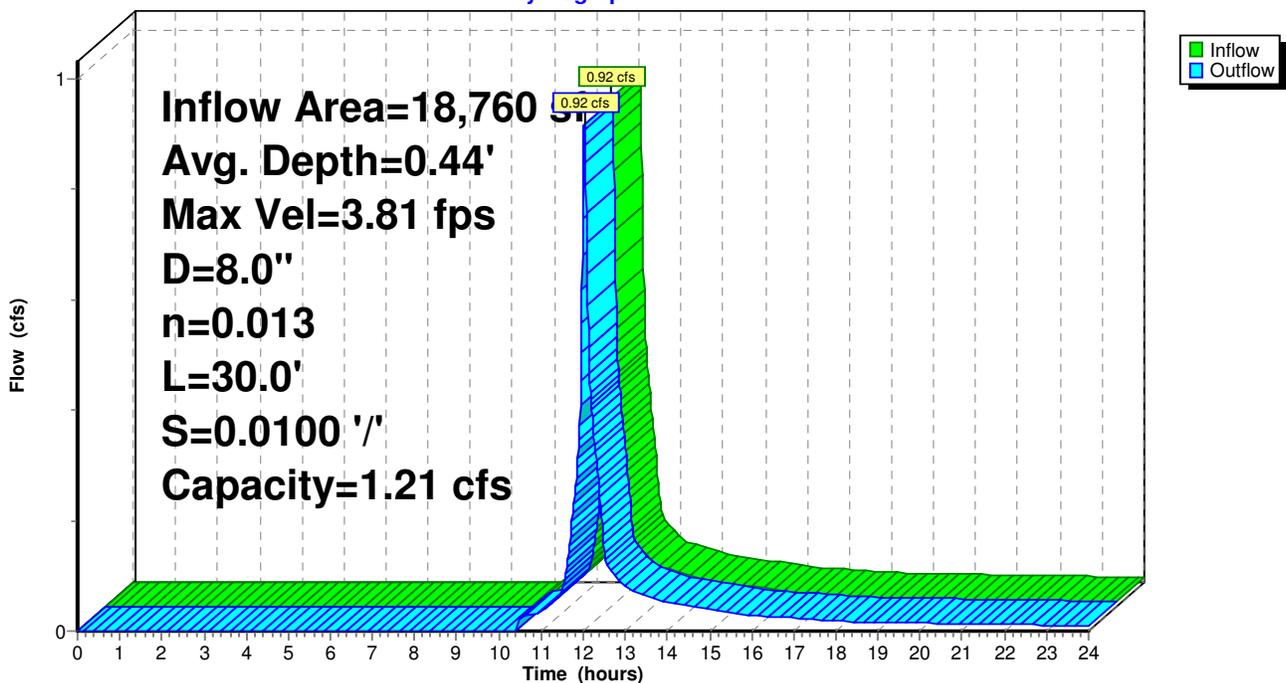
Peak Storage= 7 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.44'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 111.30', Outlet Invert= 111.00'



## Reach 119R: Culvert under Unit 4 Drive

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 127R: Swale from Drive at #3 to RG 118

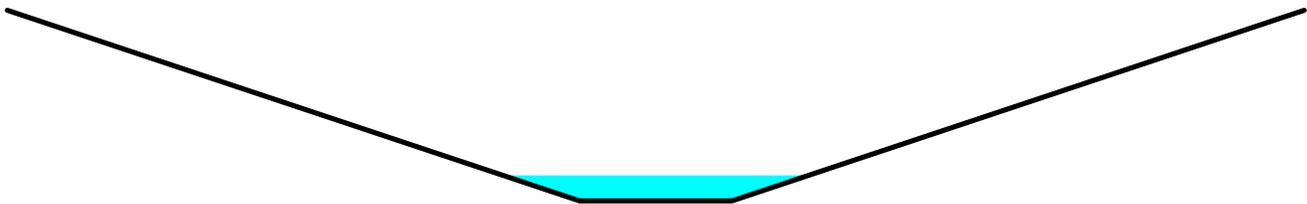
[61] Hint: Submerged 16% of Reach 128R bottom

Inflow Area = 20,516 sf, Inflow Depth > 1.29" for 2-Year event  
Inflow = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf  
Outflow = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.52 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.17 fps, Avg. Travel Time= 0.1 min

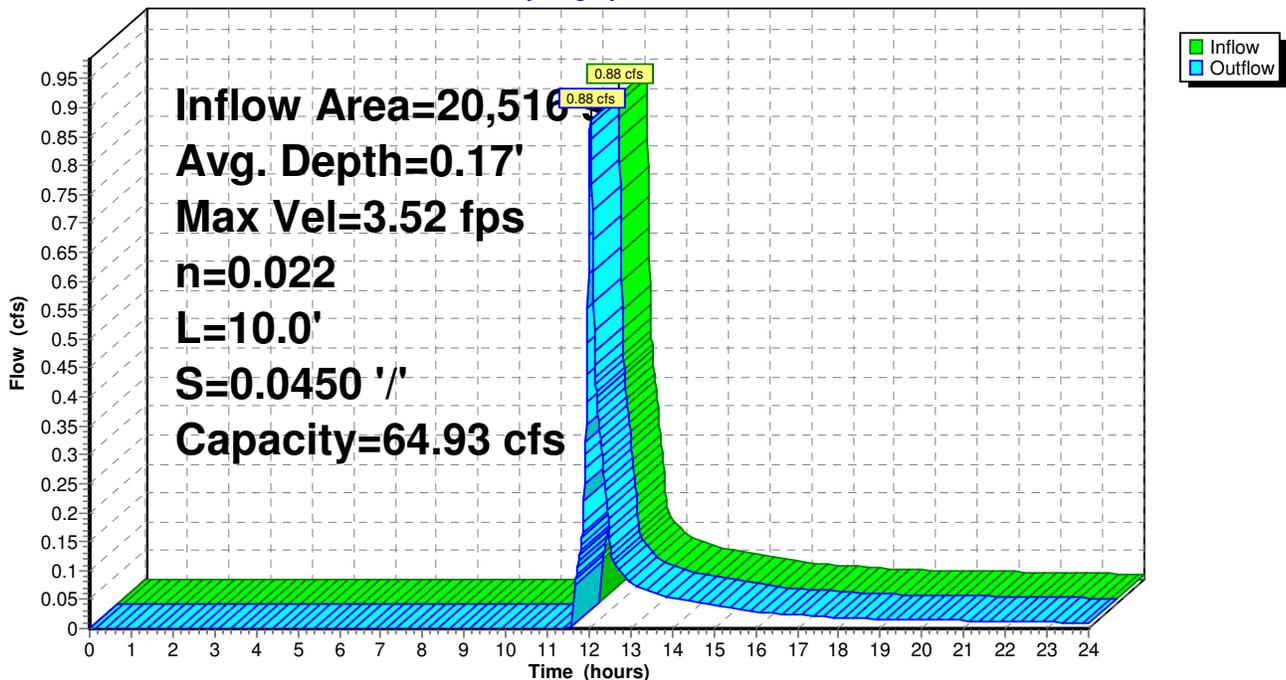
Peak Storage= 2 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.17'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 127R: Swale from Drive at #3 to RG 118

Hydrograph



# Postdevelopment9c

Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 128R: Culvert under Unit 3 Drive

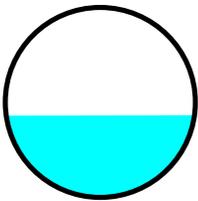
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,516 sf, Inflow Depth > 1.29" for 2-Year event  
Inflow = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf  
Outflow = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.11 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.2 min

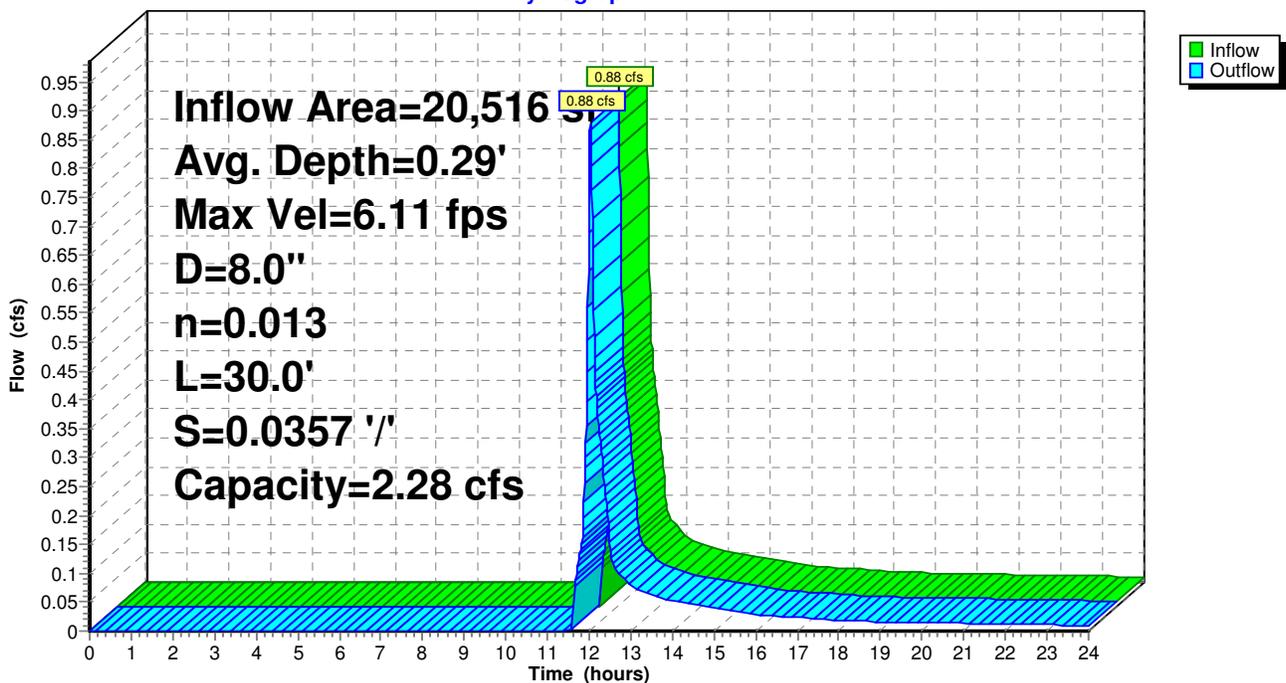
Peak Storage= 4 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.29'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.28 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0357 '/'  
Inlet Invert= 112.30', Outlet Invert= 111.23'



## Reach 128R: Culvert under Unit 3 Drive

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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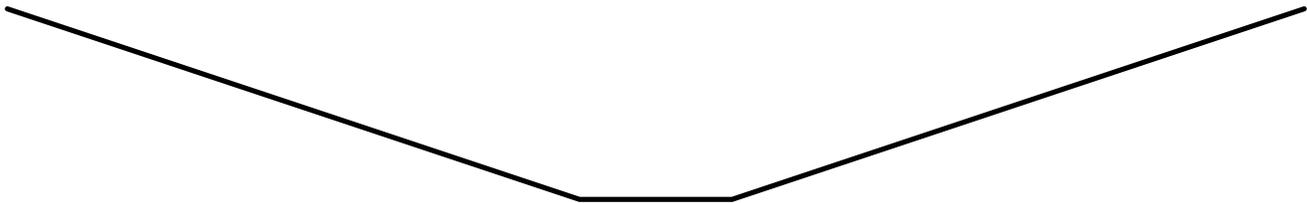
**Reach 129R: Swale from Drive at #20 to RG 124**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

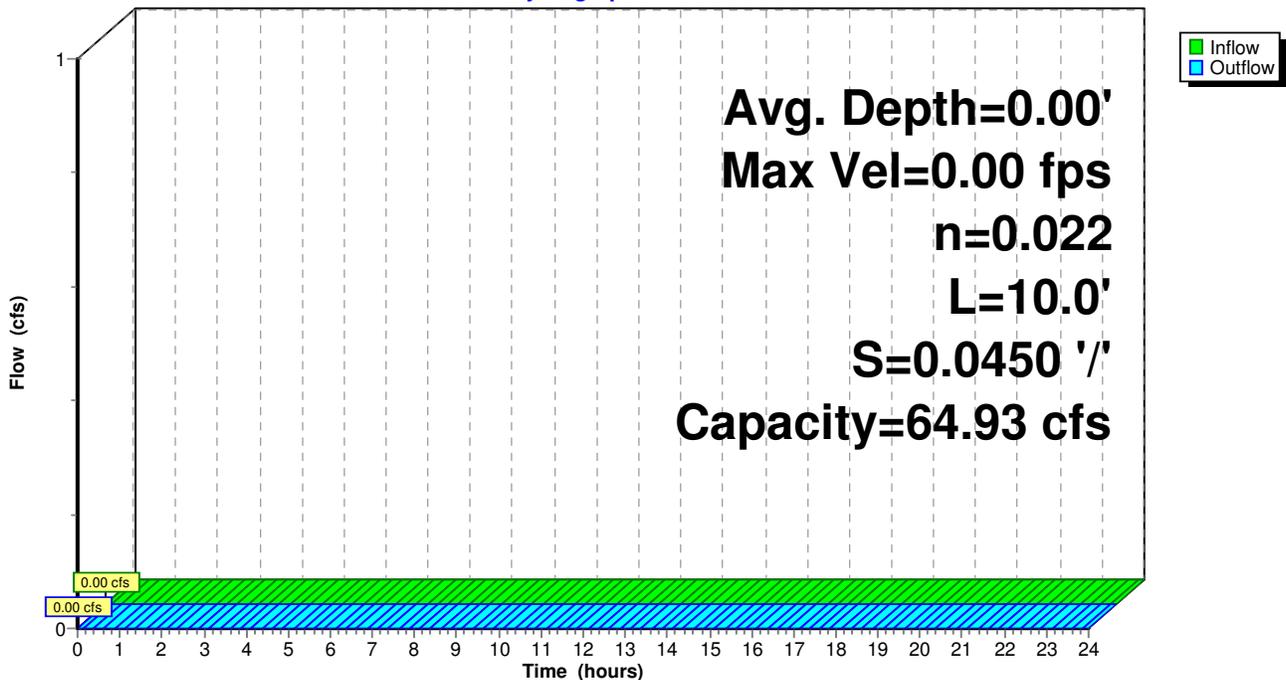
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 115.49', Outlet Invert= 115.04'



**Reach 129R: Swale from Drive at #20 to RG 124**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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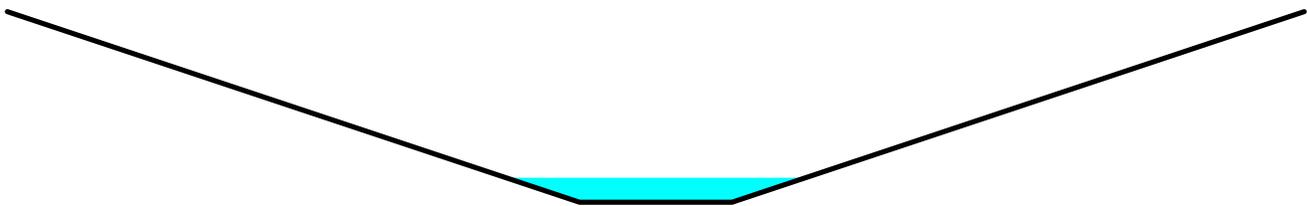
## Reach 130R: Swale to RG 122

Inflow Area = 14,450 sf, Inflow Depth > 1.42" for 2-Year event  
Inflow = 0.75 cfs @ 12.02 hrs, Volume= 1,708 cf  
Outflow = 0.73 cfs @ 12.02 hrs, Volume= 1,708 cf, Atten= 3%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.08 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 0.99 fps, Avg. Travel Time= 0.5 min

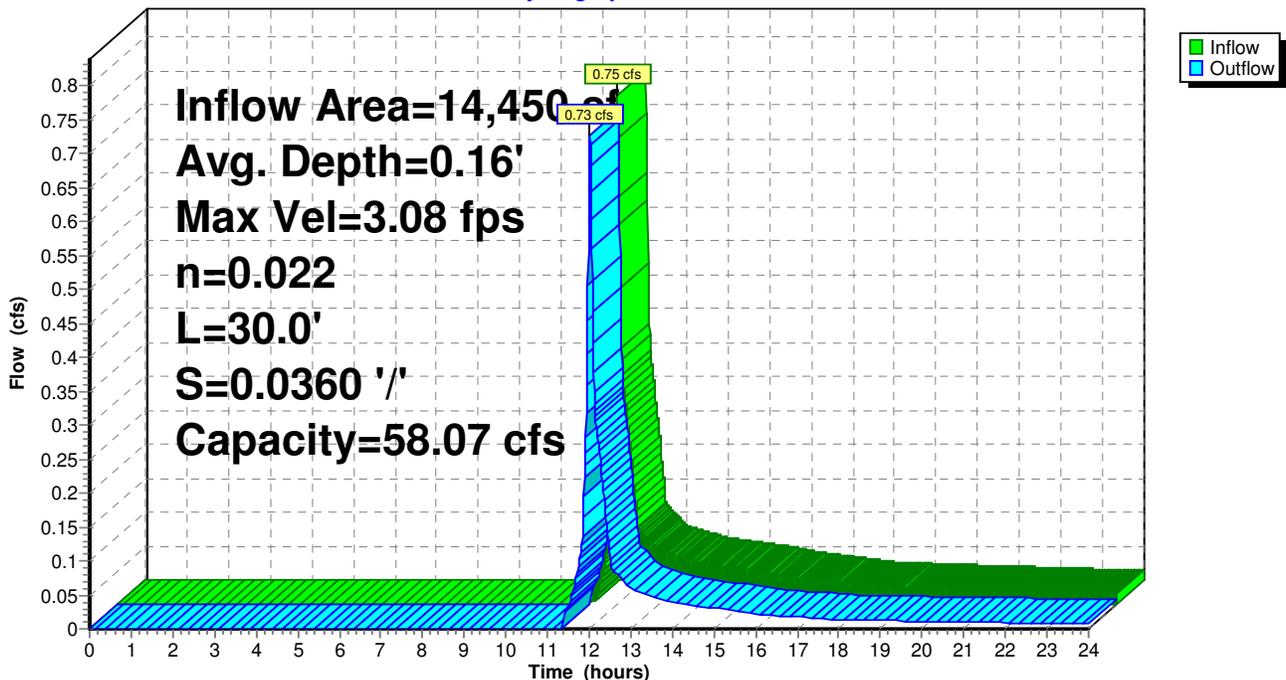
Peak Storage= 7 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.16'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 58.07 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 30.0' Slope= 0.0360 '/'  
Inlet Invert= 114.25', Outlet Invert= 113.17'



## Reach 130R: Swale to RG 122

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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 131R: Culvert under Unit 20 Drive

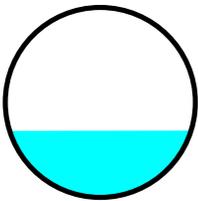
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 1.24" for 2-Year event  
Inflow = 0.32 cfs @ 12.02 hrs, Volume= 719 cf  
Outflow = 0.32 cfs @ 12.02 hrs, Volume= 719 cf, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.92 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.05 fps, Avg. Travel Time= 0.8 min

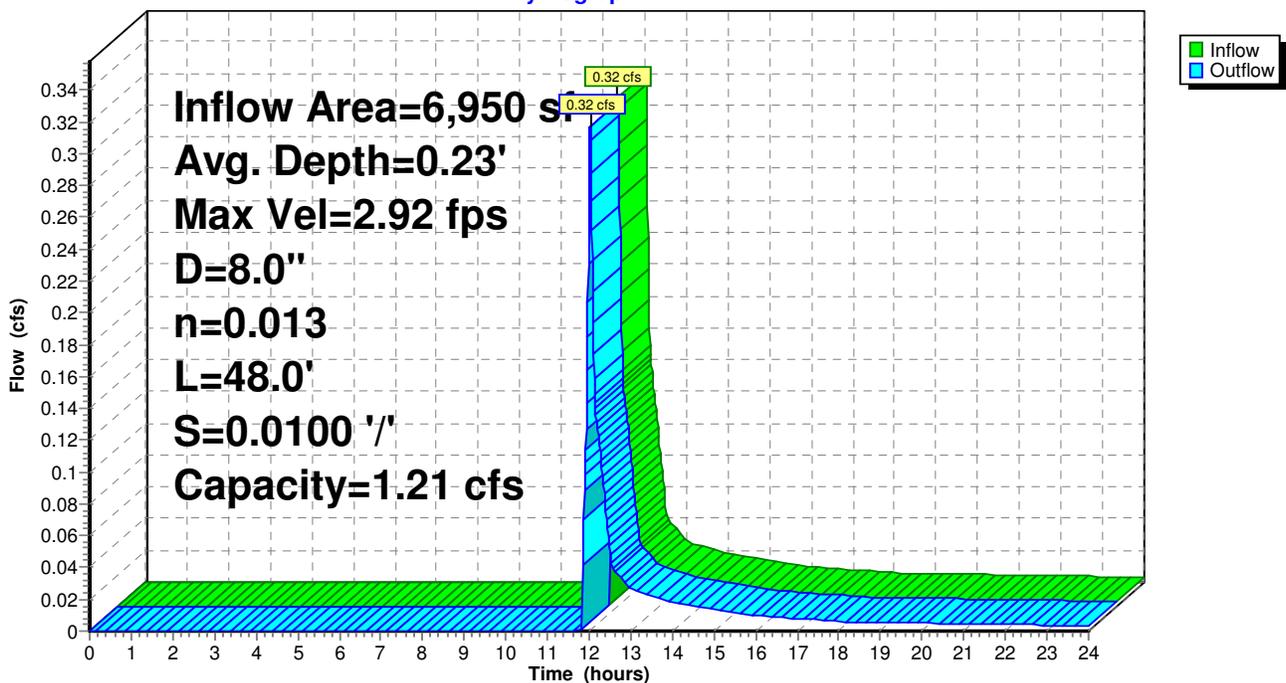
Peak Storage= 5 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.23'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 115.97', Outlet Invert= 115.49'



## Reach 131R: Culvert under Unit 20 Drive

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 137R: Swale Back of 7,6,5**

Inflow Area = 13,850 sf, Inflow Depth > 1.19" for 2-Year event  
Inflow = 0.48 cfs @ 12.05 hrs, Volume= 1,371 cf  
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 1,367 cf, Atten= 4%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.26 fps, Min. Travel Time= 1.8 min  
Avg. Velocity = 0.38 fps, Avg. Travel Time= 6.1 min

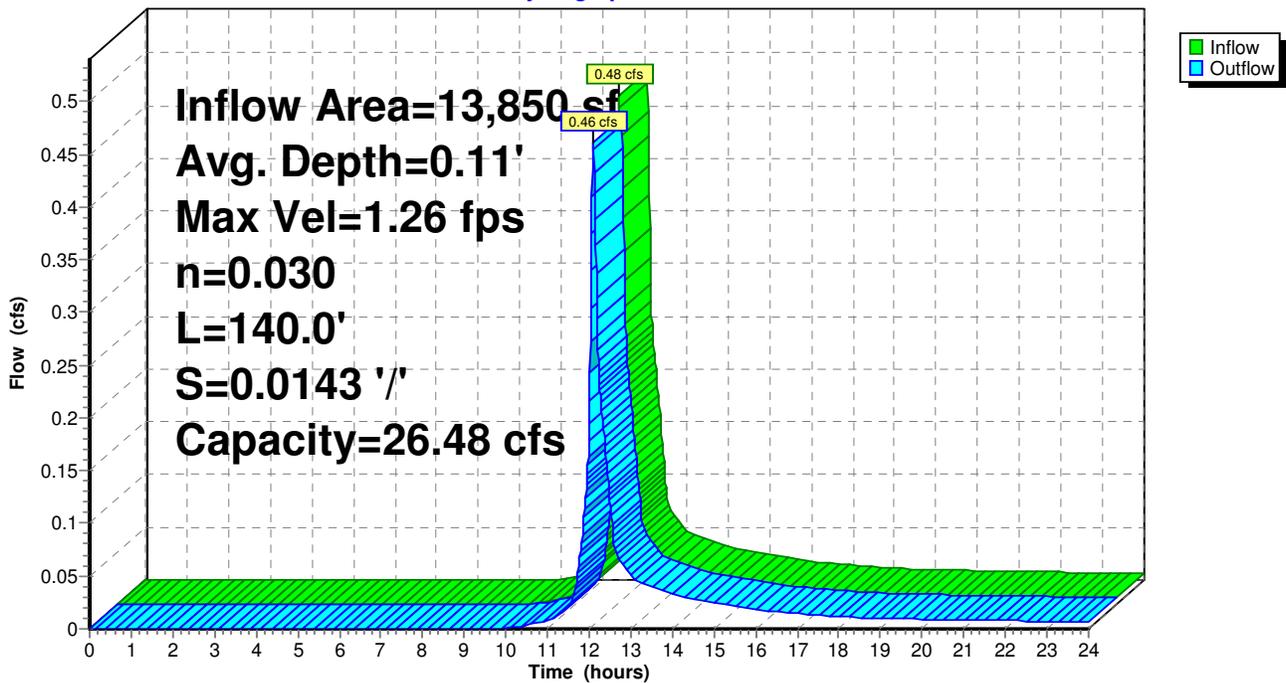
Peak Storage= 51 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.11'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 26.48 cfs

3.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 9.00'  
Length= 140.0' Slope= 0.0143 '/'  
Inlet Invert= 118.00', Outlet Invert= 116.00'



**Reach 137R: Swale Back of 7,6,5**

Hydrograph



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## Reach 138R: Swale Back of 4

[61] Hint: Submerged 11% of Reach 137R bottom

Inflow Area = 34,910 sf, Inflow Depth > 1.08" for 2-Year event  
Inflow = 0.90 cfs @ 12.05 hrs, Volume= 3,148 cf  
Outflow = 0.89 cfs @ 12.09 hrs, Volume= 3,141 cf, Atten= 1%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.53 fps, Min. Travel Time= 1.5 min  
Avg. Velocity = 0.52 fps, Avg. Travel Time= 4.5 min

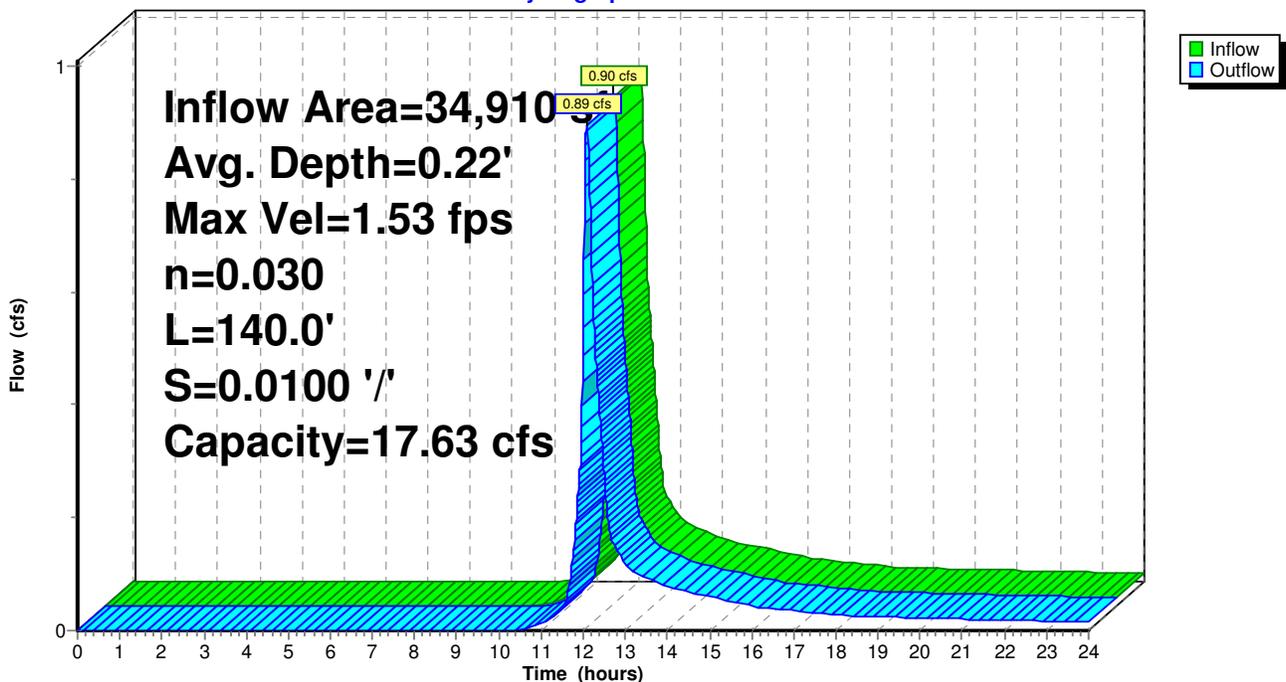
Peak Storage= 82 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.22'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 17.63 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 8.00'  
Length= 140.0' Slope= 0.0100 '/'  
Inlet Invert= 116.00', Outlet Invert= 114.60'



## Reach 138R: Swale Back of 4

Hydrograph



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## Reach 149R: DMH 14 to DMH 12

[52] Hint: Inlet conditions not evaluated

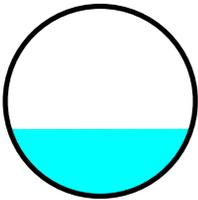
[61] Hint: Submerged 54% of Reach 114R bottom

Inflow Area = 91,524 sf, Inflow Depth > 1.37" for 2-Year event  
Inflow = 3.45 cfs @ 12.04 hrs, Volume= 10,424 cf  
Outflow = 3.44 cfs @ 12.05 hrs, Volume= 10,421 cf, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.16 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.8 min

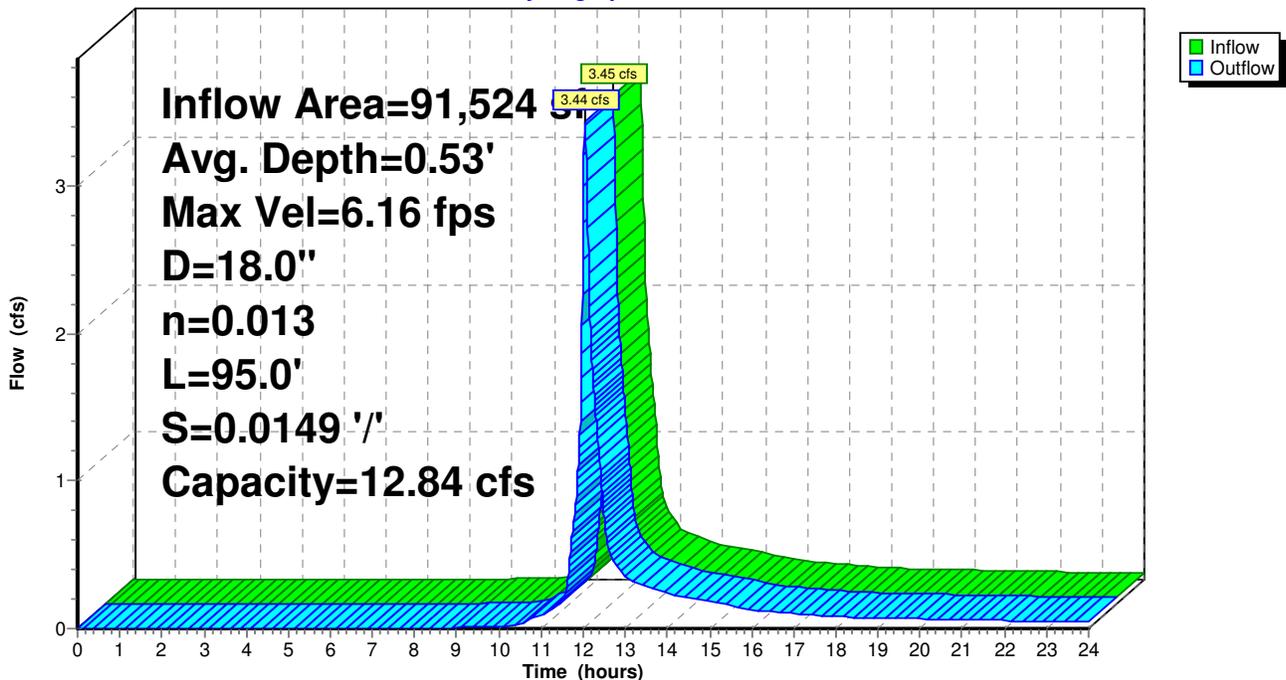
Peak Storage= 53 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.53'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.84 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 95.0' Slope= 0.0149 '/'  
Inlet Invert= 102.58', Outlet Invert= 101.16'



## Reach 149R: DMH 14 to DMH 12

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 150R: DMH 12 to HW 10 - Outlet

[52] Hint: Inlet conditions not evaluated

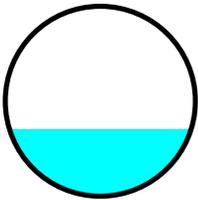
[61] Hint: Submerged 30% of Reach 149R bottom

Inflow Area = 91,524 sf, Inflow Depth > 1.37" for 2-Year event  
Inflow = 3.44 cfs @ 12.05 hrs, Volume= 10,421 cf  
Outflow = 3.43 cfs @ 12.05 hrs, Volume= 10,420 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.18 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.08 fps, Avg. Travel Time= 0.4 min

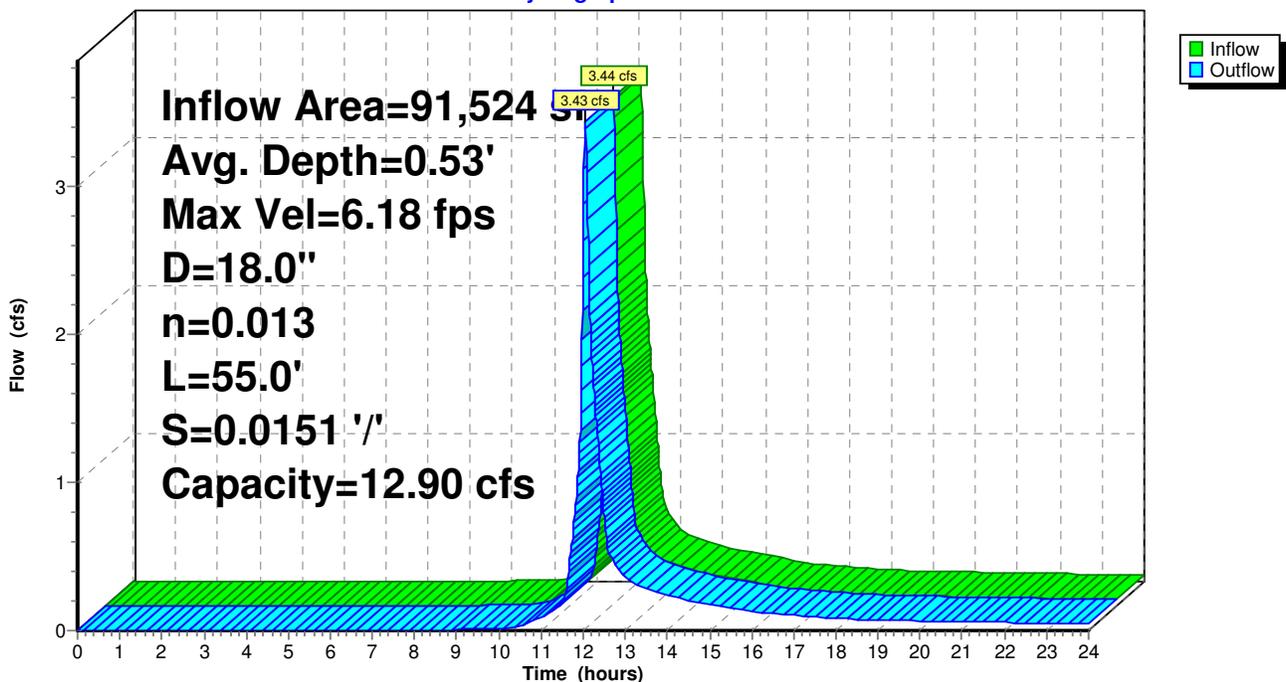
Peak Storage= 31 cf @ 12.05 hrs, Average Depth at Peak Storage= 0.53'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.90 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 55.0' Slope= 0.0151 '/'  
Inlet Invert= 101.06', Outlet Invert= 100.23'



## Reach 150R: DMH 12 to HW 10 - Outlet

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 153R: CB 116 to DMH 14**

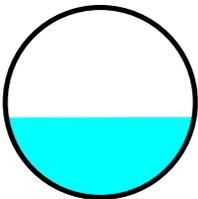
[52] Hint: Inlet conditions not evaluated

Inflow Area =	21,810 sf,	Inflow Depth > 1.65"	for 2-Year event
Inflow =	1.10 cfs @ 12.02 hrs,	Volume=	3,003 cf
Outflow =	1.09 cfs @ 12.03 hrs,	Volume=	3,003 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 7.84 fps, Min. Travel Time= 0.1 min  
 Avg. Velocity = 2.94 fps, Avg. Travel Time= 0.2 min

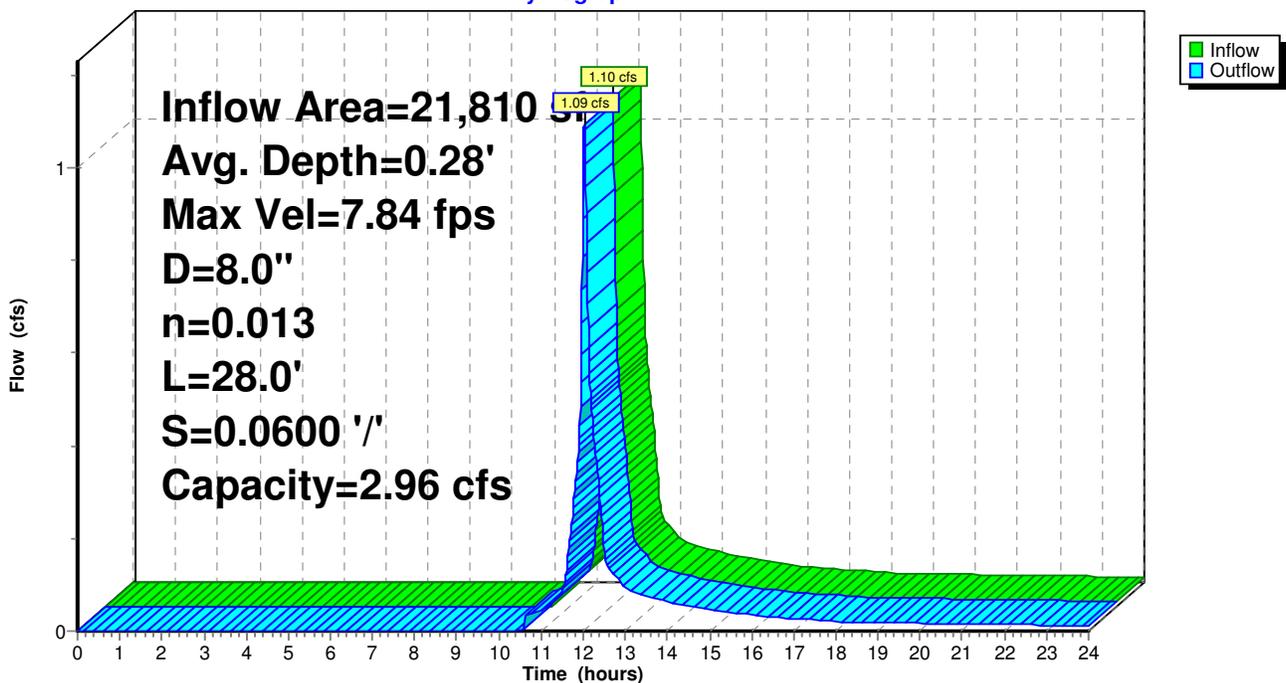
Peak Storage= 4 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.28'  
 Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
 Length= 28.0' Slope= 0.0600 '/'  
 Inlet Invert= 107.12', Outlet Invert= 105.44'



**Reach 153R: CB 116 to DMH 14**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 154R: Swale from Drive at #6 to RG 126**

[43] Hint: Has no inflow (Outflow=Zero)

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'

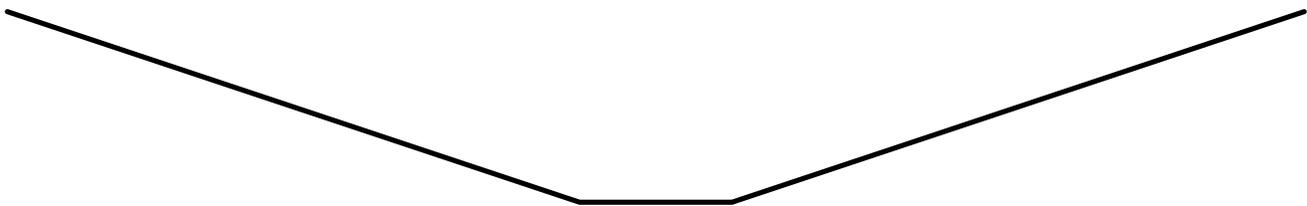
Bank-Full Depth= 1.25', Capacity at Bank-Full= 29.18 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 3.0 '/' Top Width= 8.50'

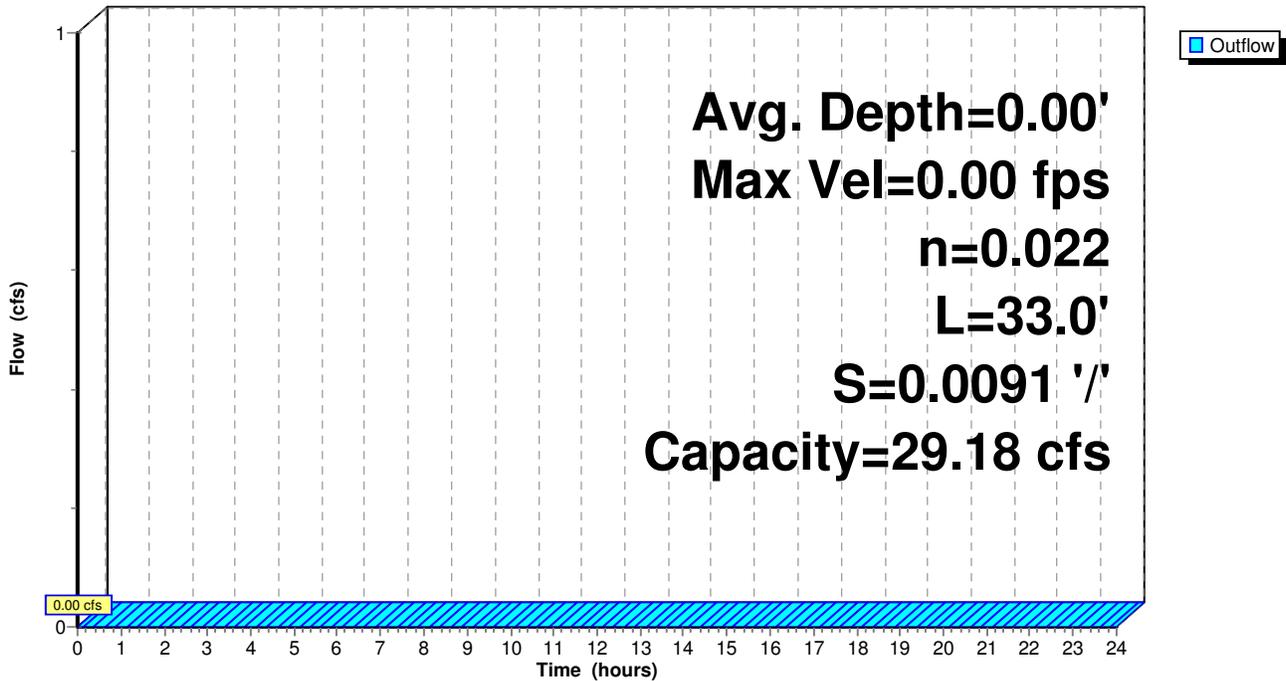
Length= 33.0' Slope= 0.0091 '/'

Inlet Invert= 116.75', Outlet Invert= 116.45'



**Reach 154R: Swale from Drive at #6 to RG 126**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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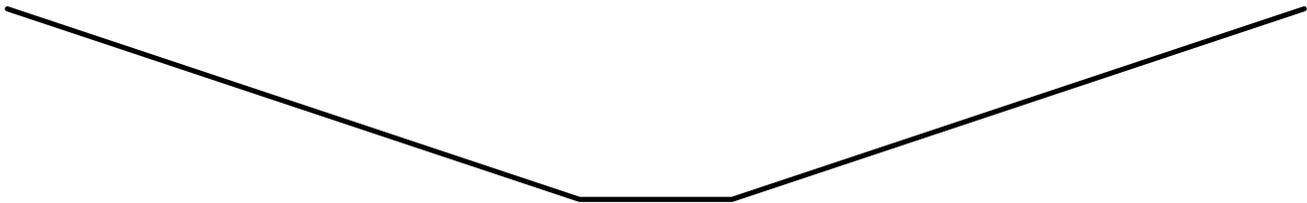
**Reach 155R: Swale from Drive at #5 to RG 120**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

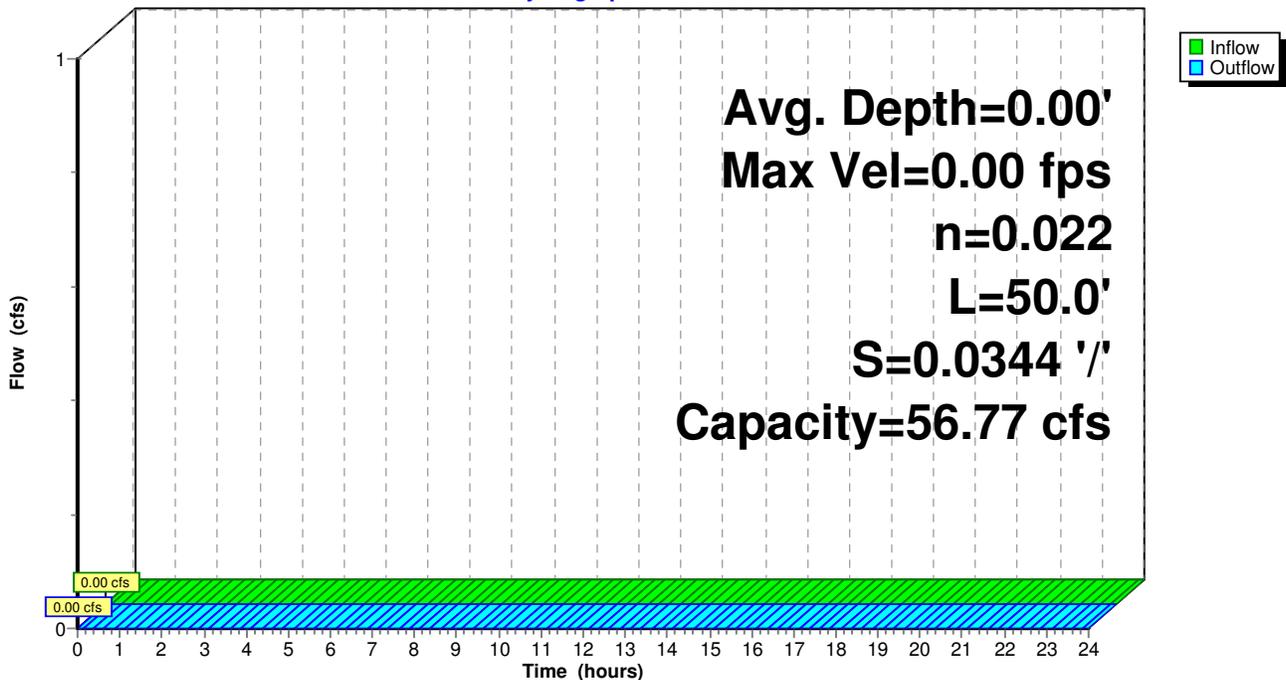
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 56.77 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 50.0' Slope= 0.0344 '/'  
Inlet Invert= 115.27', Outlet Invert= 113.55'



**Reach 155R: Swale from Drive at #5 to RG 120**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 156R: Culvert under Unit 5 Drive

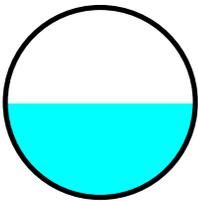
[52] Hint: Inlet conditions not evaluated

Inflow Area = 12,570 sf, Inflow Depth > 1.61" for 2-Year event  
Inflow = 0.59 cfs @ 12.03 hrs, Volume= 1,688 cf  
Outflow = 0.59 cfs @ 12.04 hrs, Volume= 1,688 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.44 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.31 fps, Avg. Travel Time= 0.4 min

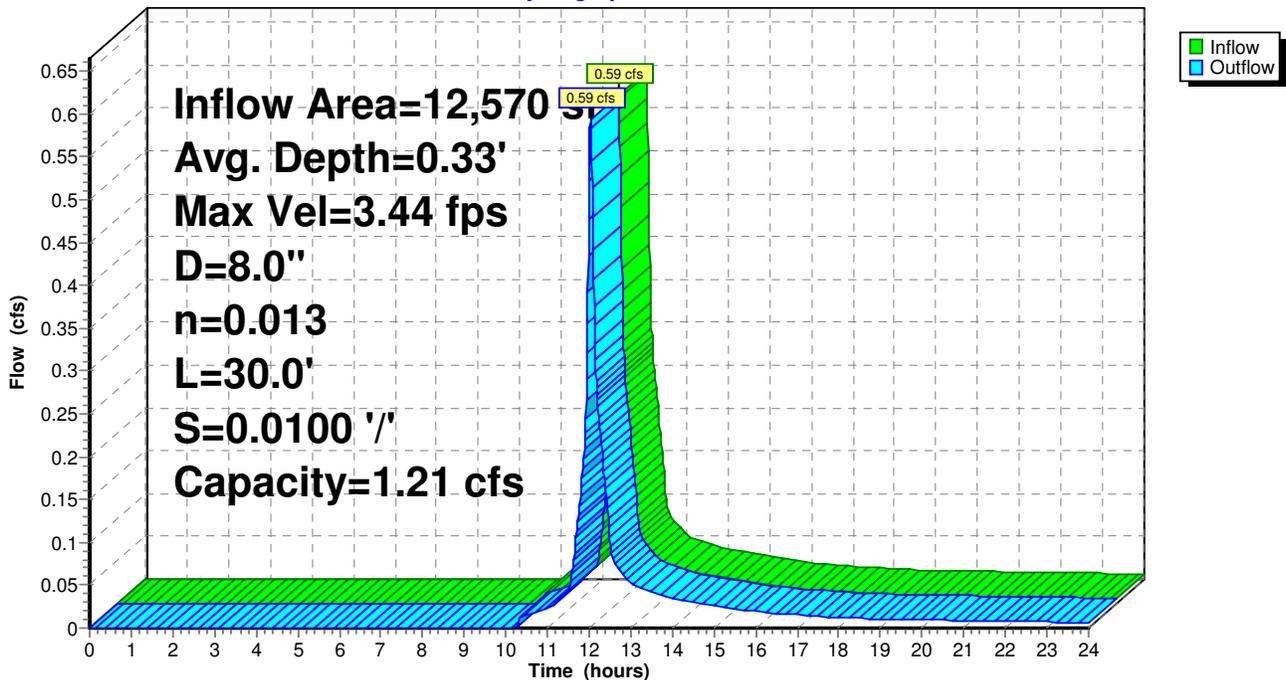
Peak Storage= 5 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.33'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 115.57', Outlet Invert= 115.27'



## Reach 156R: Culvert under Unit 5 Drive

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

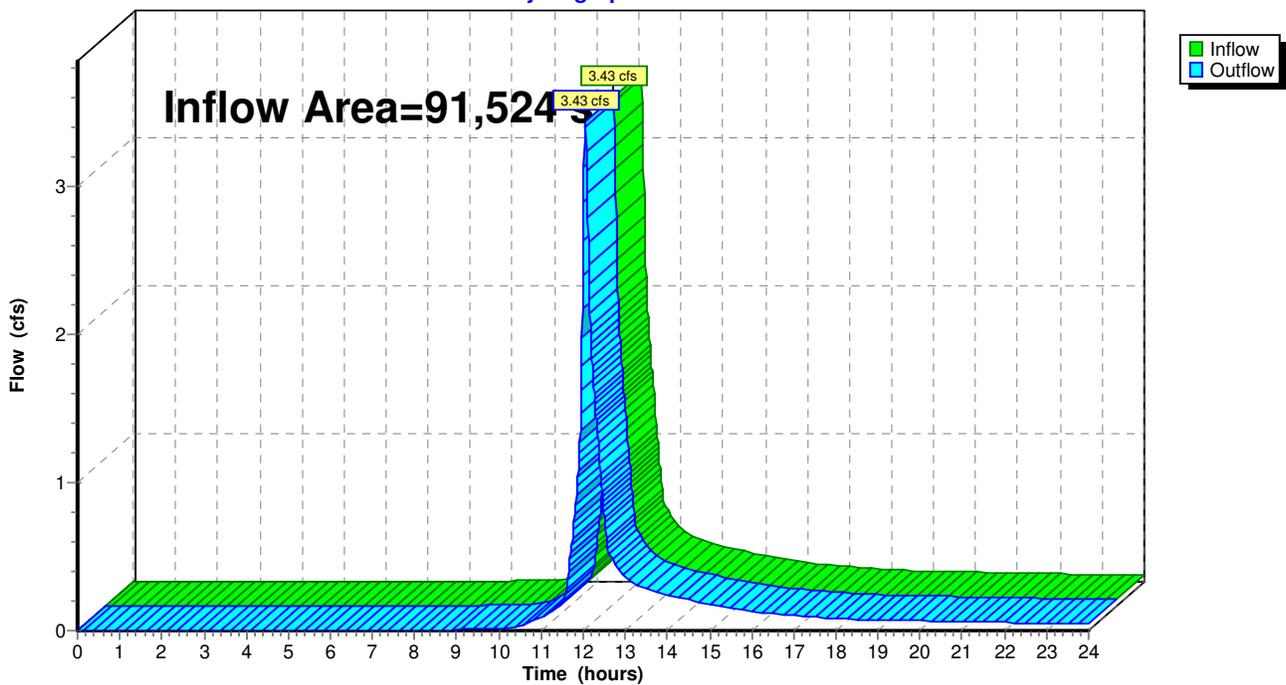
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 91,524 sf, Inflow Depth > 1.37" for 2-Year event  
Inflow = 3.43 cfs @ 12.05 hrs, Volume= 10,420 cf  
Outflow = 3.43 cfs @ 12.05 hrs, Volume= 10,420 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 220R: CB 56 to DMH 52**

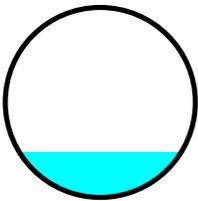
[52] Hint: Inlet conditions not evaluated

Inflow Area = 8,660 sf, Inflow Depth > 1.59" for 2-Year event  
Inflow = 0.45 cfs @ 12.01 hrs, Volume= 1,146 cf  
Outflow = 0.44 cfs @ 12.01 hrs, Volume= 1,146 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.10 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.04 fps, Avg. Travel Time= 0.2 min

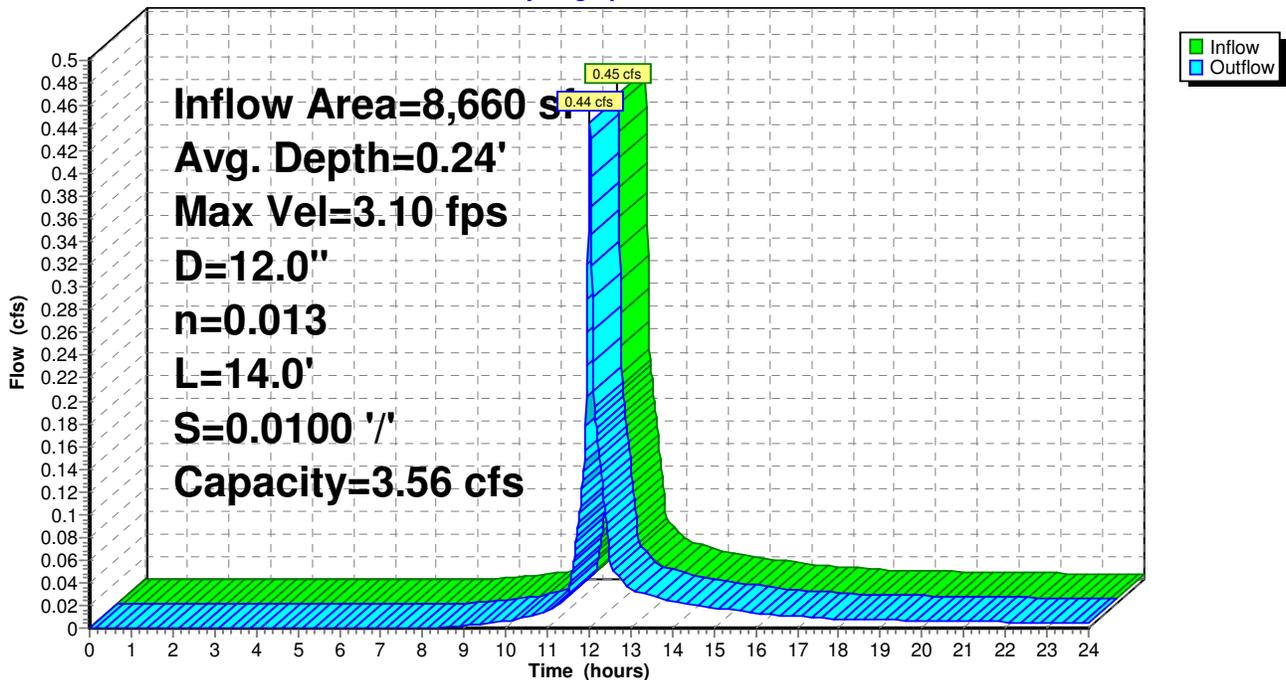
Peak Storage= 2 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.24'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 14.0' Slope= 0.0100 '/'  
Inlet Invert= 102.72', Outlet Invert= 102.58'



**Reach 220R: CB 56 to DMH 52**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Reach 222R: CB 54 to DMH 52

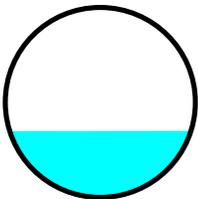
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,970 sf, Inflow Depth > 1.38" for 2-Year event  
Inflow = 0.94 cfs @ 12.01 hrs, Volume= 2,410 cf  
Outflow = 0.93 cfs @ 12.01 hrs, Volume= 2,409 cf, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.82 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.3 min

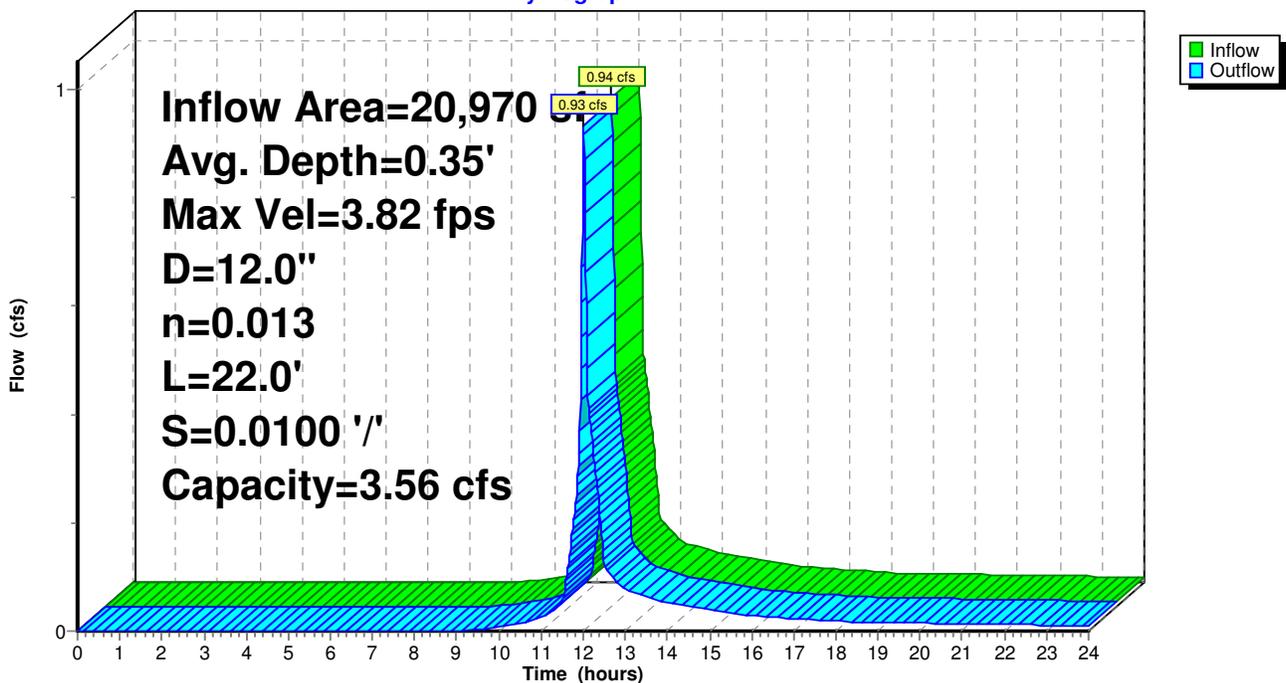
Peak Storage= 5 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.35'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 22.0' Slope= 0.0100 '/'  
Inlet Invert= 102.80', Outlet Invert= 102.58'



## Reach 222R: CB 54 to DMH 52

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 403R: CB 65 to DMH 50**

[52] Hint: Inlet conditions not evaluated

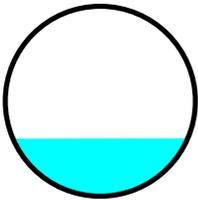
[79] Warning: Submerged Pond 67P Primary device # 1 OUTLET by 0.16'

Inflow Area =	44,069 sf,	Inflow Depth > 1.13"	for 2-Year event
Inflow =	1.02 cfs @ 12.18 hrs,	Volume=	4,140 cf
Outflow =	1.02 cfs @ 12.18 hrs,	Volume=	4,139 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 5.02 fps, Min. Travel Time= 0.1 min  
 Avg. Velocity = 2.21 fps, Avg. Travel Time= 0.2 min

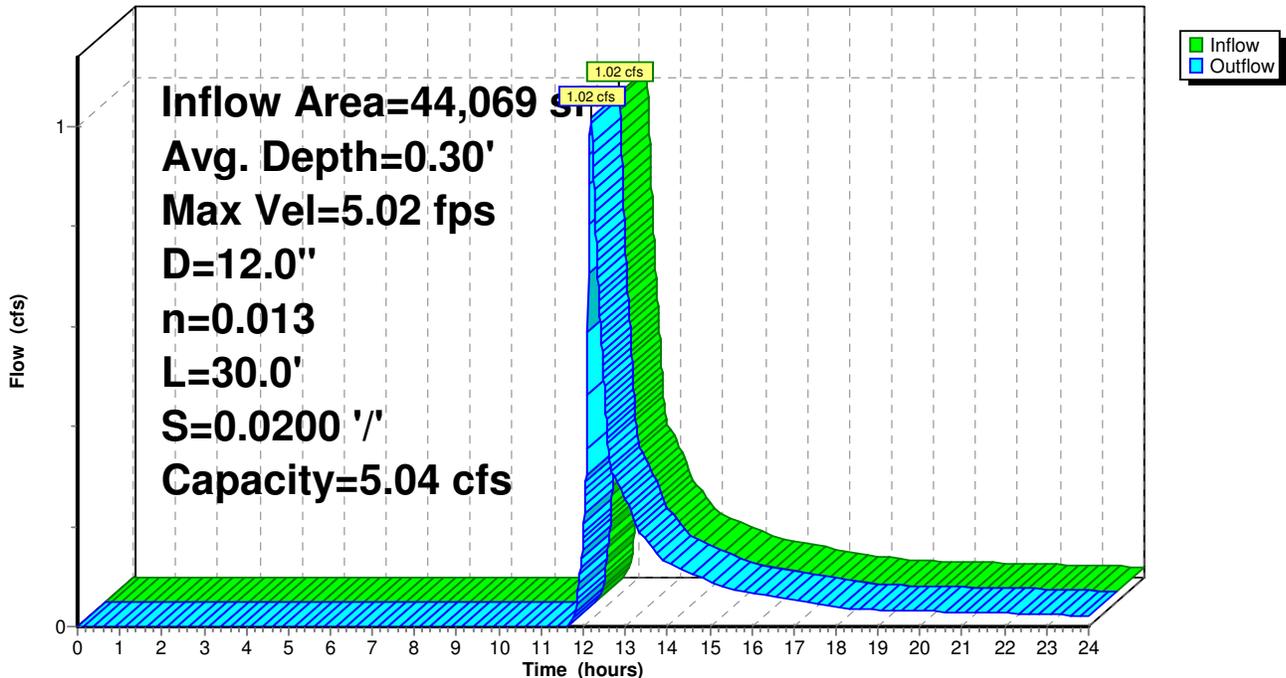
Peak Storage= 6 cf @ 12.18 hrs, Average Depth at Peak Storage= 0.30'  
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.04 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
 Length= 30.0' Slope= 0.0200 '/'  
 Inlet Invert= 102.22', Outlet Invert= 101.62'



**Reach 403R: CB 65 to DMH 50**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Reach 902R: Existing wetland channel to WF 13**

[61] Hint: Submerged 1% of Reach 1R bottom

Inflow Area = 203,736 sf, Inflow Depth > 0.94" for 2-Year event  
Inflow = 2.74 cfs @ 12.39 hrs, Volume= 15,920 cf  
Outflow = 2.73 cfs @ 12.40 hrs, Volume= 15,907 cf, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.36 fps, Min. Travel Time= 0.5 min  
Avg. Velocity = 1.28 fps, Avg. Travel Time= 1.3 min

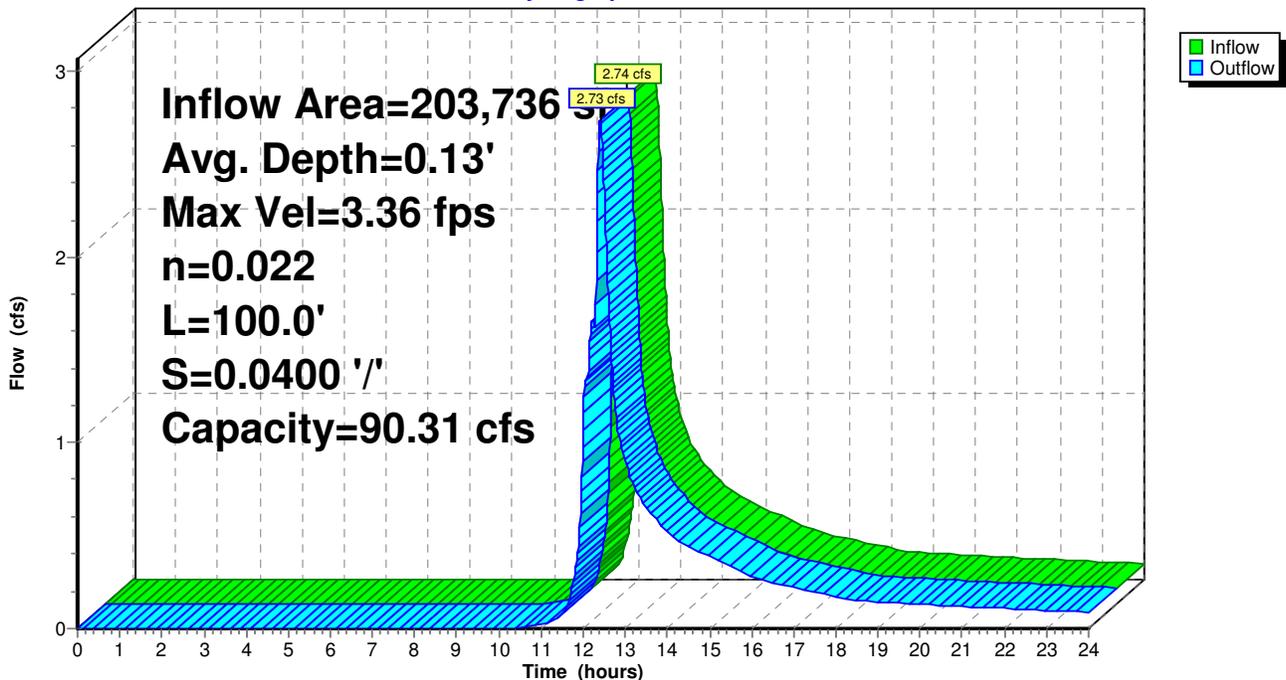
Peak Storage= 81 cf @ 12.39 hrs, Average Depth at Peak Storage= 0.13'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 90.31 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 100.0' Slope= 0.0400 '/'  
Inlet Invert= 86.00', Outlet Invert= 82.00'



**Reach 902R: Existing wetland channel to WF 13**

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# Postdevelopment9c

Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 2P: Recharge System

[81] Warning: Exceeded Pond 219P by 1.89' @ 16.05 hrs

Inflow Area = 111,470 sf, Inflow Depth > 1.23" for 2-Year event  
 Inflow = 2.62 cfs @ 12.07 hrs, Volume= 11,406 cf  
 Outflow = 1.66 cfs @ 12.36 hrs, Volume= 8,480 cf, Atten= 37%, Lag= 17.4 min  
 Discarded = 0.01 cfs @ 10.36 hrs, Volume= 325 cf  
 Primary = 1.65 cfs @ 12.36 hrs, Volume= 8,155 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 103.91' @ 12.36 hrs Surf.Area= 1,620 sf Storage= 3,321 cf

Plug-Flow detention time= 146.5 min calculated for 8,480 cf (74% of inflow)  
 Center-of-Mass det. time= 54.1 min ( 912.2 - 858.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	100.60'	1,810 cf	<b>36.00'W x 45.00'L x 4.00'H 100</b> 6,480 cf Overall - 1,956 cf Embedded = 4,524 cf x 40.0% Voids
#2	101.00'	1,956 cf	<b>47.8"W x 30.0"H x 6.25'L Cultec R-330</b> x 42 Inside #1
		3,766 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.170 in/hr Exfiltration over Surface area</b>
#2	Primary	103.22'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Secondary	106.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.01 cfs @ 10.36 hrs HW=100.65' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=1.65 cfs @ 12.36 hrs HW=103.91' (Free Discharge)

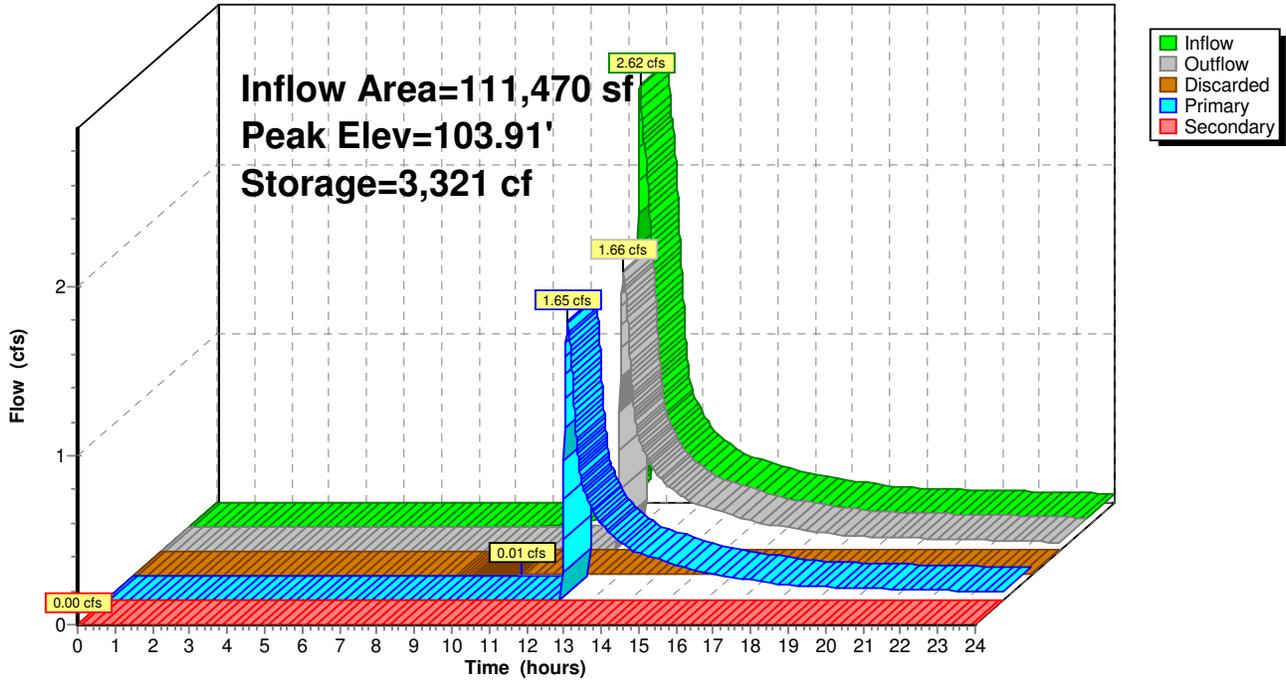
↑**2=Orifice/Grate** (Orifice Controls 1.65 cfs @ 2.84 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=100.60' (Free Discharge)

↑**3=Orifice/Grate** ( Controls 0.00 cfs)

### Pond 2P: Recharge System

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 7P: Forebay - Bio Retention**

[63] Warning: Exceeded Reach 62R inflow depth by 0.66' @ 23.99 hrs

Inflow Area = 44,069 sf, Inflow Depth > 1.21" for 2-Year event  
 Inflow = 1.30 cfs @ 12.10 hrs, Volume= 4,437 cf  
 Outflow = 1.30 cfs @ 12.10 hrs, Volume= 4,270 cf, Atten= 0%, Lag= 0.4 min  
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0 cf  
 Primary = 1.30 cfs @ 12.10 hrs, Volume= 4,269 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.66' @ 12.10 hrs Surf.Area= 266 sf Storage= 206 cf

Plug-Flow detention time= 29.2 min calculated for 4,268 cf (96% of inflow)  
 Center-of-Mass det. time= 8.6 min ( 854.2 - 845.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.49'	304 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.49	0	0	0
111.00	205	52	52
111.50	248	113	166
112.00	305	138	304

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.001 in/hr Exfiltration over Surface area</b>
#2	Primary	111.50'	<b>8.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

**Discarded OutFlow** Max=0.00 cfs @ 12.10 hrs HW=111.66' (Free Discharge)

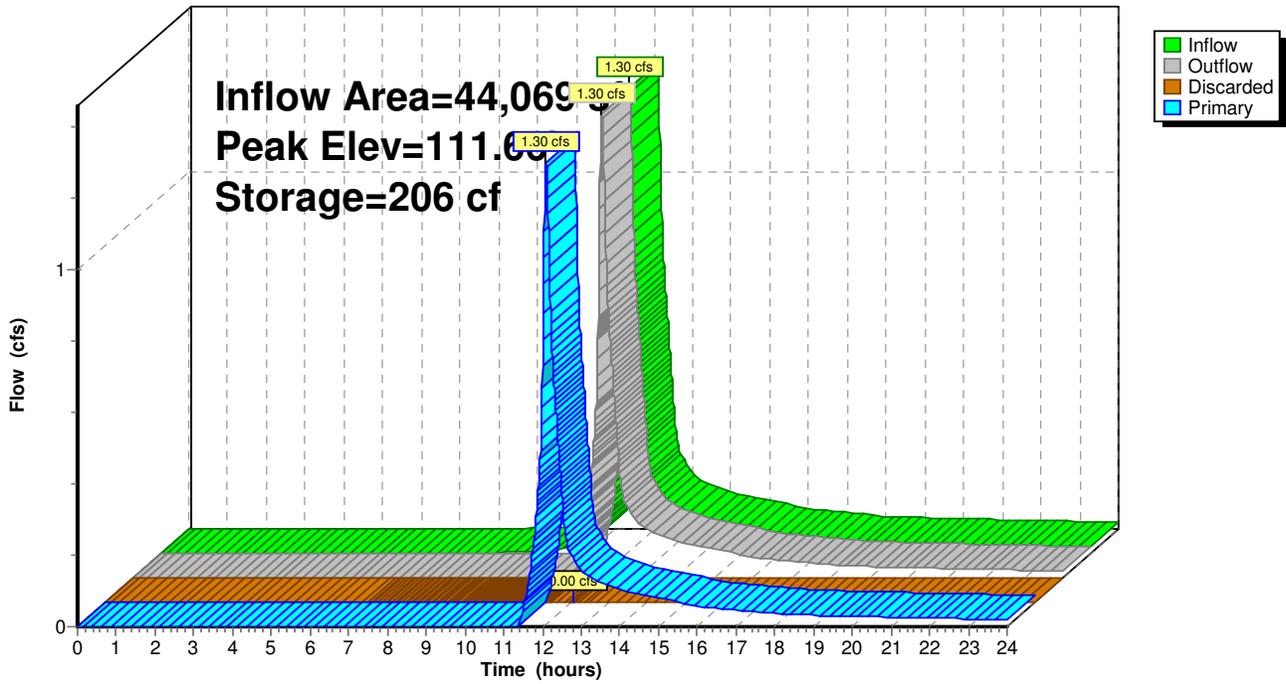
↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=1.30 cfs @ 12.10 hrs HW=111.66' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 1.30 cfs @ 1.02 fps)

### Pond 7P: Forebay - Bio Retention

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 8P: Main Cell - Bio Retention**

Inflow Area = 44,069 sf, Inflow Depth > 1.16" for 2-Year event  
 Inflow = 1.30 cfs @ 12.10 hrs, Volume= 4,269 cf  
 Outflow = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf, Atten= 22%, Lag= 4.7 min  
 Primary = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.21' @ 12.18 hrs Surf.Area= 829 sf Storage= 770 cf

Plug-Flow detention time= 40.2 min calculated for 4,138 cf (97% of inflow)  
 Center-of-Mass det. time= 23.6 min ( 877.8 - 854.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.74'	2,193 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.74	0	0	0
109.75	350	2	2
110.00	375	91	92
111.00	667	521	613
112.00	1,440	1,054	1,667
112.33	1,750	526	2,193

Device	Routing	Invert	Outlet Devices
#1	Device 7	110.00'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#2	Device 7	110.17'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#3	Device 7	110.33'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#4	Device 7	110.50'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#5	Device 7	110.67'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#6	Device 7	111.00'	<b>8.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.900
#7	Primary	107.00'	<b>12.0" x 126.0' long Culvert</b> CPP, mitered to conform to fill, Ke= 0.700 Outlet Invert= 105.61' S= 0.0110 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#8	Secondary	112.33'	<b>8.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

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**Primary OutFlow** Max=1.02 cfs @ 12.18 hrs HW=111.21' (Free Discharge)

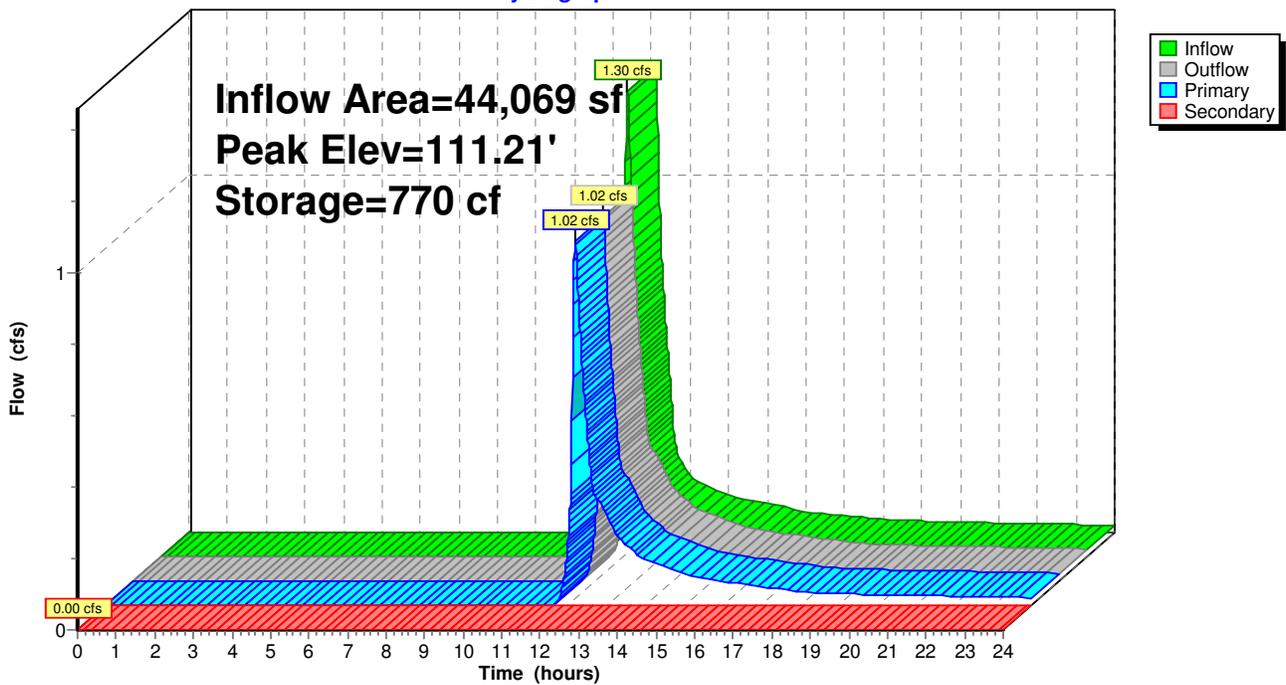
- 7=Culvert (Passes 1.02 cfs of 6.43 cfs potential flow)
- 1=Orifice/Grate (Orifice Controls 0.09 cfs @ 5.25 fps)
- 2=Orifice/Grate (Orifice Controls 0.08 cfs @ 4.86 fps)
- 3=Orifice/Grate (Orifice Controls 0.07 cfs @ 4.46 fps)
- 4=Orifice/Grate (Orifice Controls 0.07 cfs @ 4.00 fps)
- 5=Orifice/Grate (Orifice Controls 0.06 cfs @ 3.47 fps)
- 6=Orifice/Grate (Weir Controls 0.66 cfs @ 1.50 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=109.74' (Free Discharge)

- 8=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

## Pond 8P: Main Cell - Bio Retention

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 9P: CB 65

Inflow Area = 26,681 sf, Inflow Depth > 1.15" for 2-Year event  
Inflow = 0.89 cfs @ 12.03 hrs, Volume= 2,566 cf  
Outflow = 0.89 cfs @ 12.03 hrs, Volume= 2,566 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.89 cfs @ 12.03 hrs, Volume= 2,566 cf

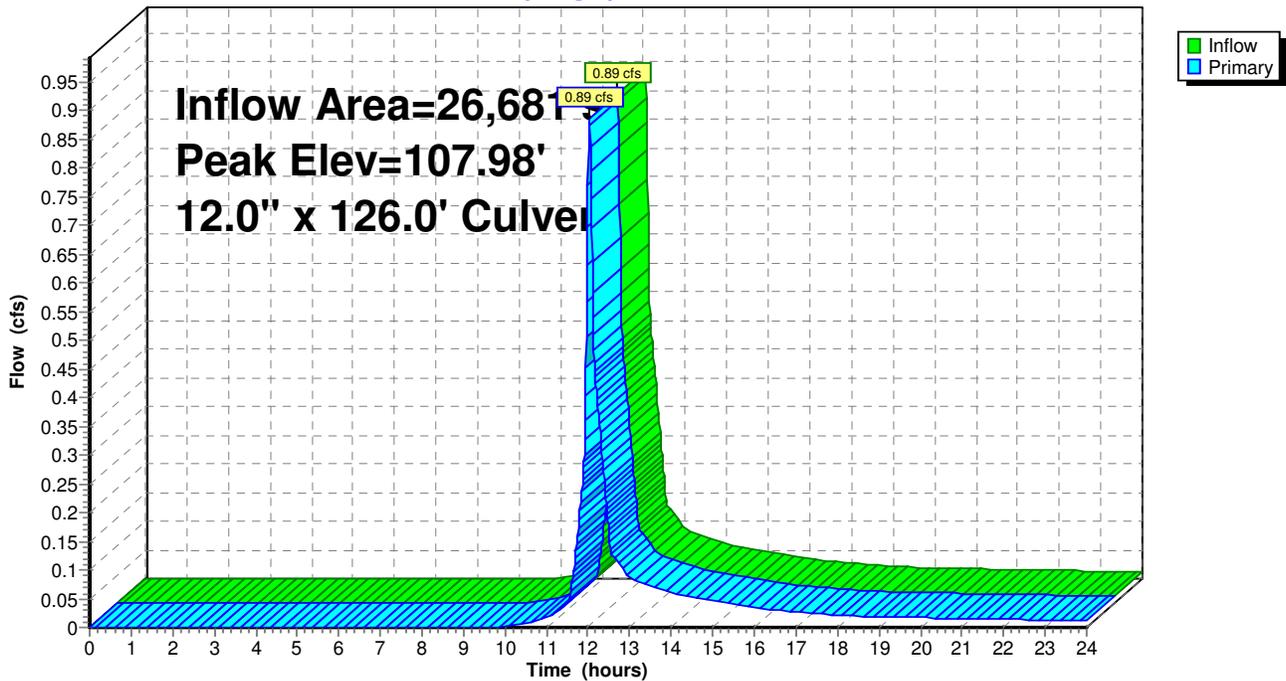
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 107.98' @ 12.03 hrs  
Flood Elev= 112.00'

Device #	Routing	Invert	Outlet Devices
#1	Primary	107.50'	<b>12.0" x 126.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 105.61' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.88 cfs @ 12.03 hrs HW=107.98' (Free Discharge)  
↑**1=Culvert** (Inlet Controls 0.88 cfs @ 2.36 fps)

## Pond 9P: CB 65

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 43R: CB 60 to DMH 64

[57] Hint: Peaked at 111.30' (Flood elevation advised)

Inflow Area = 4,640 sf, Inflow Depth > 1.90" for 2-Year event  
Inflow = 0.27 cfs @ 12.03 hrs, Volume= 734 cf  
Outflow = 0.27 cfs @ 12.03 hrs, Volume= 734 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.27 cfs @ 12.03 hrs, Volume= 734 cf

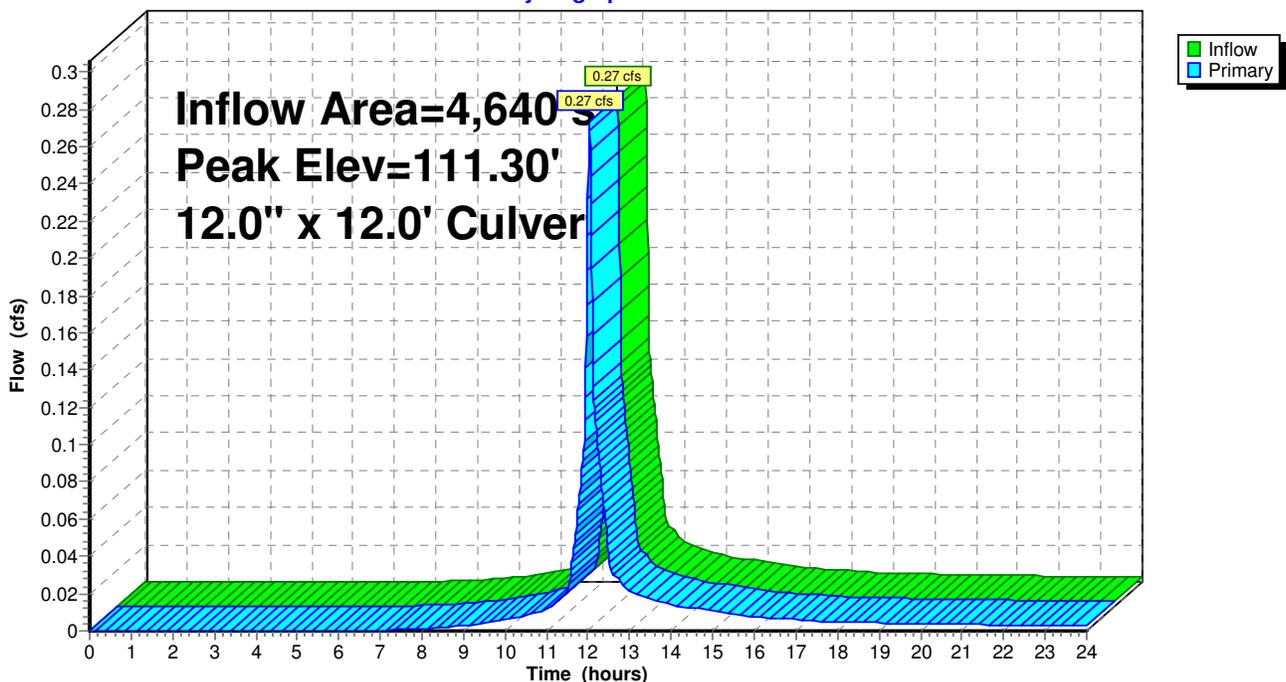
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 111.30' @ 12.03 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.02'	<b>12.0" x 12.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.27 cfs @ 12.03 hrs HW=111.30' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.27 cfs @ 2.25 fps)

## Pond 43R: CB 60 to DMH 64

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 61R: CB 62 to DMH 64**

[57] Hint: Peaked at 111.74' (Flood elevation advised)

Inflow Area = 39,429 sf, Inflow Depth > 1.13" for 2-Year event  
Inflow = 1.13 cfs @ 12.11 hrs, Volume= 3,703 cf  
Outflow = 1.13 cfs @ 12.11 hrs, Volume= 3,703 cf, Atten= 0%, Lag= 0.0 min  
Primary = 1.13 cfs @ 12.11 hrs, Volume= 3,703 cf

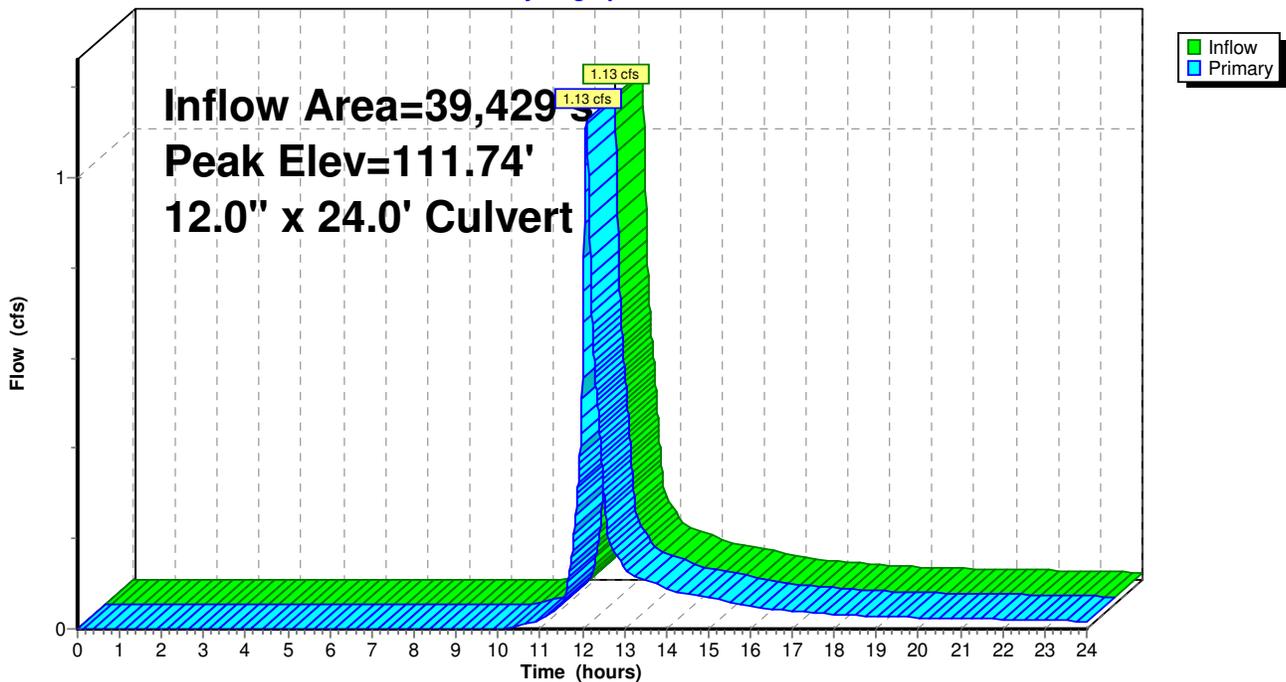
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 111.74' @ 12.11 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.14'	<b>12.0" x 24.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=1.13 cfs @ 12.11 hrs HW=111.74' (Free Discharge)  
↑1=Culvert (Barrel Controls 1.13 cfs @ 3.28 fps)

**Pond 61R: CB 62 to DMH 64**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Inflow Area = 6,950 sf, Inflow Depth > 1.45" for 2-Year event  
 Inflow = 0.32 cfs @ 12.02 hrs, Volume= 838 cf  
 Outflow = 0.32 cfs @ 12.03 hrs, Volume= 732 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 0.32 cfs @ 12.03 hrs, Volume= 732 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.90' @ 12.03 hrs Surf.Area= 229 sf Storage= 117 cf

Plug-Flow detention time= 81.3 min calculated for 732 cf (87% of inflow)  
 Center-of-Mass det. time= 23.4 min ( 854.7 - 831.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.35'	359 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.35	0	0	0
108.36	200	1	1
109.85	280	358	359

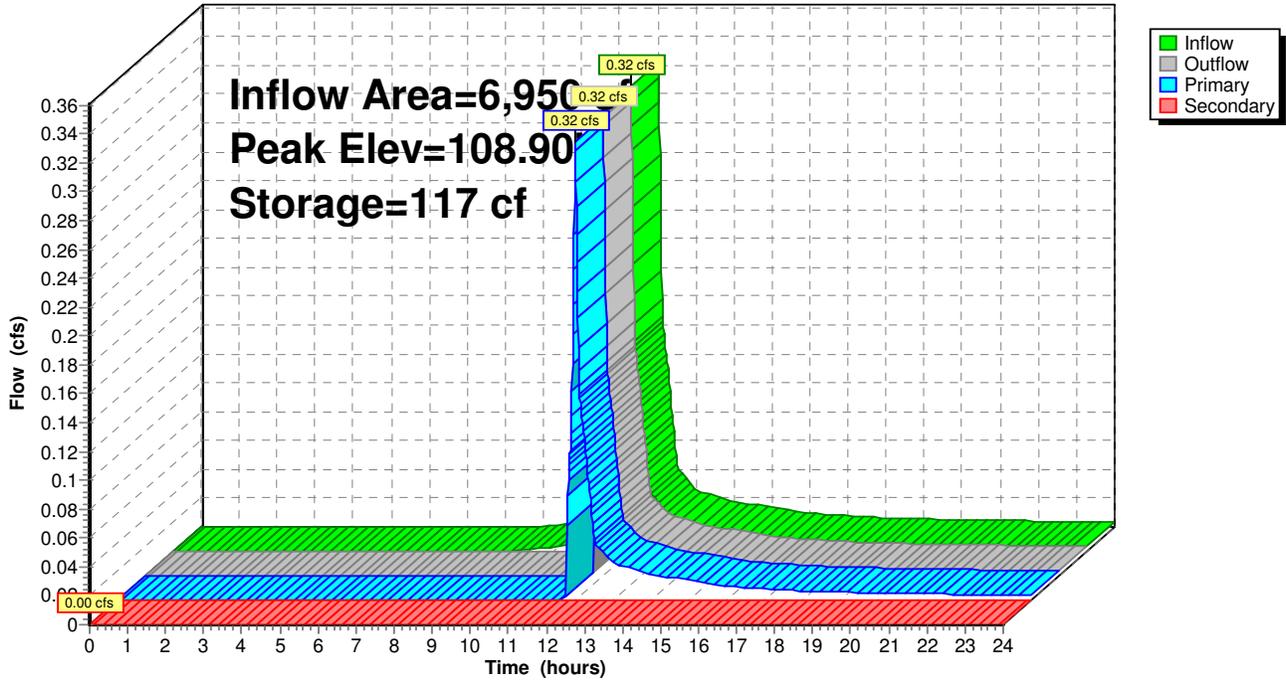
Device	Routing	Invert	Outlet Devices
#1	Primary	108.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.31 cfs @ 12.03 hrs HW=108.90' (Free Discharge)  
 ↑1=**Orifice/Grate** (Weir Controls 0.31 cfs @ 0.75 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=108.35' (Free Discharge)  
 ↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 66P: RG 9A at Units 11/12 - CB 214

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 67P: CB 66 (emergency vertical release)**

Inflow Area = 44,069 sf, Inflow Depth > 1.13" for 2-Year event  
 Inflow = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf  
 Outflow = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.02 cfs @ 12.18 hrs, Volume= 4,140 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

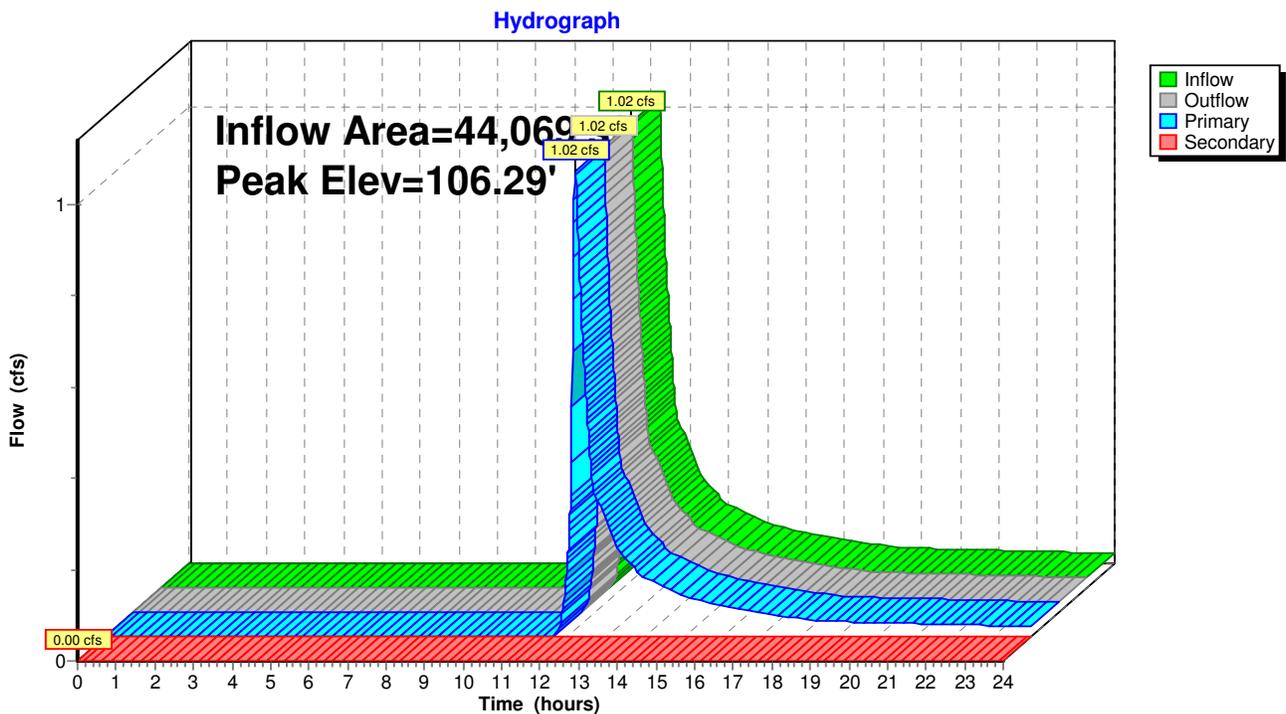
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.29' @ 12.18 hrs  
 Flood Elev= 112.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	106.00'	<b>2.00' W x 2.00' H x 52.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 102.36' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	112.00'	<b>2.00' W x 2.00' H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.01 cfs @ 12.18 hrs HW=106.29' (Free Discharge)  
 ↳1=Culvert (Inlet Controls 1.01 cfs @ 1.73 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.00' (Free Discharge)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)

**Pond 67P: CB 66 (emergency vertical release)**



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 70P: RG 10A - CB 216 at Units 13**

[63] Warning: Exceeded Reach 67R inflow depth by 0.86' @ 23.99 hrs

Inflow Area = 11,090 sf, Inflow Depth > 1.38" for 2-Year event  
 Inflow = 0.52 cfs @ 12.03 hrs, Volume= 1,280 cf  
 Outflow = 0.51 cfs @ 12.04 hrs, Volume= 1,160 cf, Atten= 1%, Lag= 0.5 min  
 Primary = 0.51 cfs @ 12.04 hrs, Volume= 1,160 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.92' @ 12.04 hrs Surf.Area= 292 sf Storage= 139 cf

Plug-Flow detention time= 62.9 min calculated for 1,160 cf (91% of inflow)  
 Center-of-Mass det. time= 17.3 min ( 859.4 - 842.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	106.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.35	0	0	0
106.36	200	1	1
106.85	280	118	119
107.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	106.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	107.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

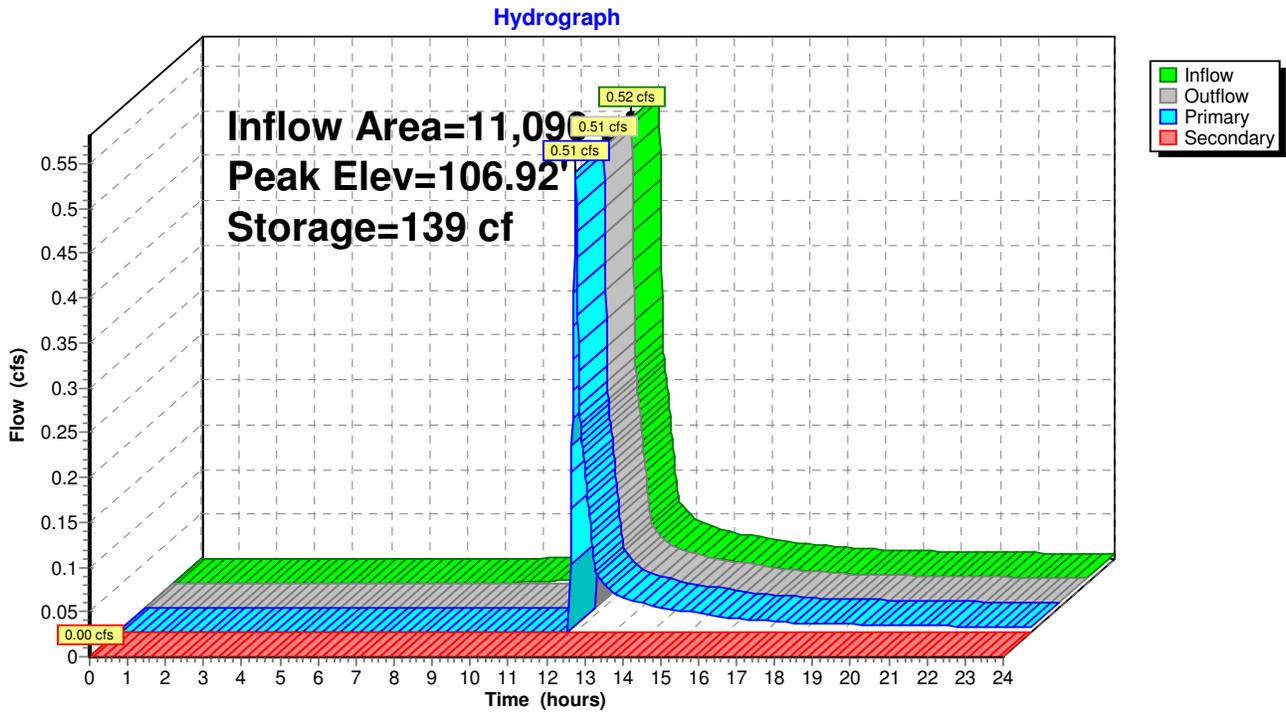
**Primary OutFlow** Max=0.51 cfs @ 12.04 hrs HW=106.92' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 0.51 cfs @ 0.88 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 70P: RG 10A - CB 216 at Units 13



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Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 111P: CB 20

Inflow Area = 7,780 sf, Inflow Depth > 1.82" for 2-Year event  
Inflow = 0.46 cfs @ 12.01 hrs, Volume= 1,179 cf  
Outflow = 0.46 cfs @ 12.01 hrs, Volume= 1,179 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.46 cfs @ 12.01 hrs, Volume= 1,179 cf

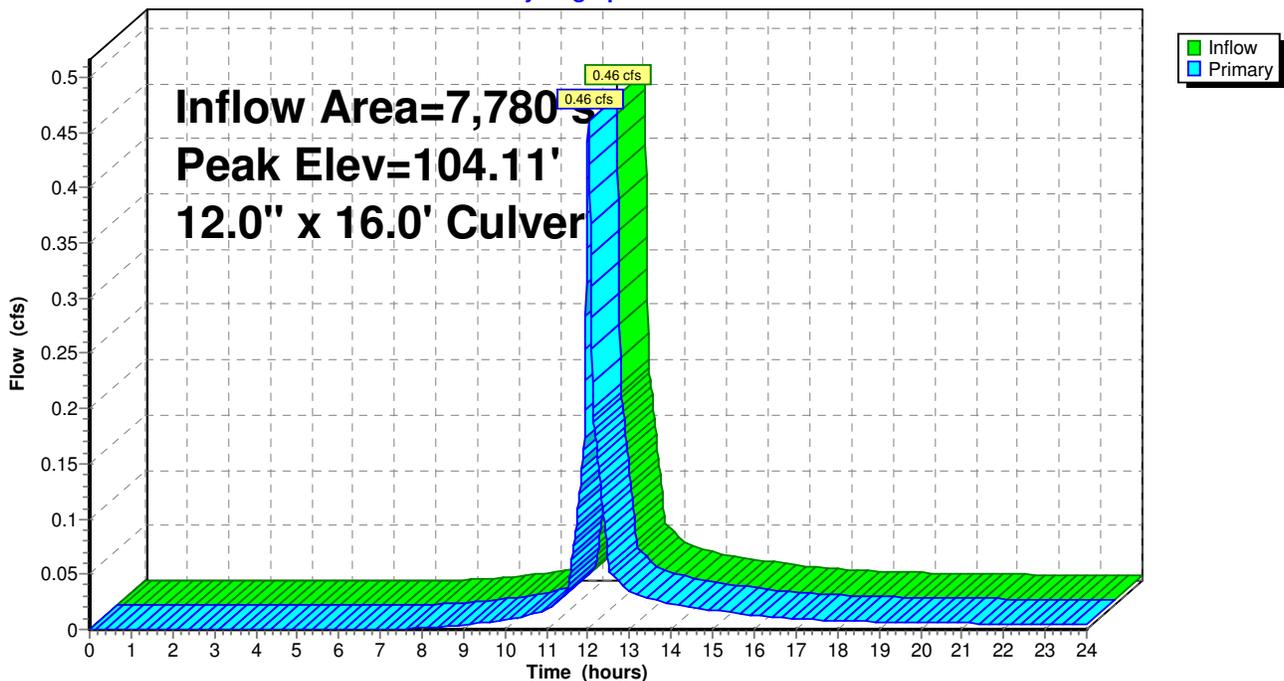
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.11' @ 12.01 hrs  
Flood Elev= 107.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	103.74'	<b>12.0" x 16.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.46 cfs @ 12.01 hrs HW=104.11' (Free Discharge)  
↑**1=Culvert** (Barrel Controls 0.46 cfs @ 2.59 fps)

## Pond 111P: CB 20

### Hydrograph



# Postdevelopment9c

Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 112P: CB 22

Inflow Area = 2,898 sf, Inflow Depth > 1.45" for 2-Year event  
Inflow = 0.14 cfs @ 12.01 hrs, Volume= 349 cf  
Outflow = 0.14 cfs @ 12.01 hrs, Volume= 349 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.14 cfs @ 12.01 hrs, Volume= 349 cf

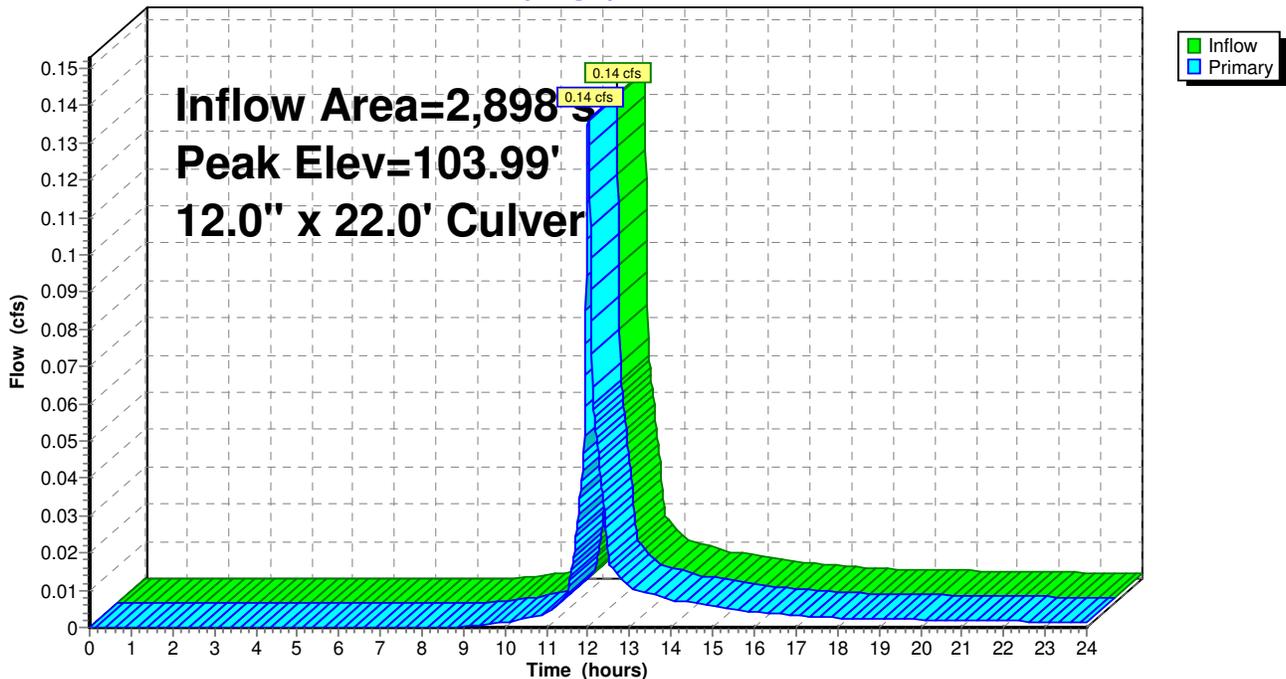
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 103.99' @ 12.01 hrs  
Flood Elev= 107.82'

Device #	Routing	Invert	Outlet Devices
#1	Primary	103.80'	<b>12.0" x 22.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.13 cfs @ 12.01 hrs HW=103.99' (Free Discharge)  
1=Culvert (Barrel Controls 0.13 cfs @ 2.00 fps)

## Pond 112P: CB 22

### Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

[85] Warning: Oscillations may require Finer Routing>1

Inflow Area = 24,126 sf, Inflow Depth > 1.37" for 2-Year event  
 Inflow = 1.07 cfs @ 12.03 hrs, Volume= 2,753 cf  
 Outflow = 1.05 cfs @ 12.04 hrs, Volume= 2,753 cf, Atten= 1%, Lag= 0.6 min  
 Primary = 1.05 cfs @ 12.04 hrs, Volume= 2,753 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 110.44' @ 12.04 hrs Surf.Area= 83 sf Storage= 16 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 0.0 min ( 843.2 - 843.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.24'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.24	0	0	0
110.25	75	0	0
110.74	96	42	42
111.74	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	110.74'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Primary	109.86'	<b>8.0" x 65.0' long Culvert</b> Ke= 0.200 Outlet Invert= 105.96' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	111.74'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

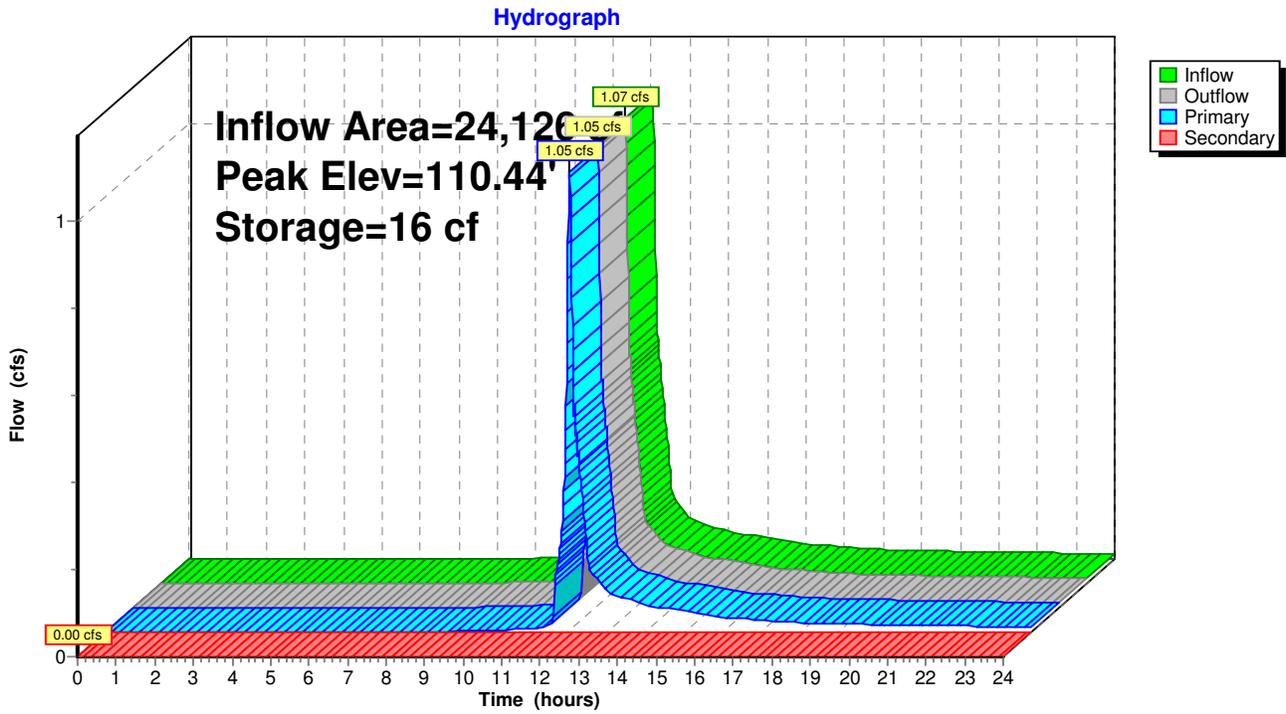
**Primary OutFlow** Max=1.05 cfs @ 12.04 hrs HW=110.44' (Free Discharge)

- ↑1=Orifice/Grate ( Controls 0.00 cfs)
- ↑2=Culvert (Inlet Controls 1.05 cfs @ 3.25 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=110.24' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 119P: RG - 1A - CB 118 to DMH 14



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4**

[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 18,760 sf, Inflow Depth > 1.65" for 2-Year event  
 Inflow = 0.92 cfs @ 12.02 hrs, Volume= 2,585 cf  
 Outflow = 0.92 cfs @ 12.02 hrs, Volume= 2,542 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 0.92 cfs @ 12.02 hrs, Volume= 2,542 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 112.29' @ 12.02 hrs Surf.Area= 99 sf Storage= 53 cf

Plug-Flow detention time= 13.9 min calculated for 2,541 cf (98% of inflow)  
 Center-of-Mass det. time= 4.2 min ( 828.6 - 824.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	111.68'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.68	0	0	0
111.69	75	0	0
112.18	96	42	42
113.18	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	112.18'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.18'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

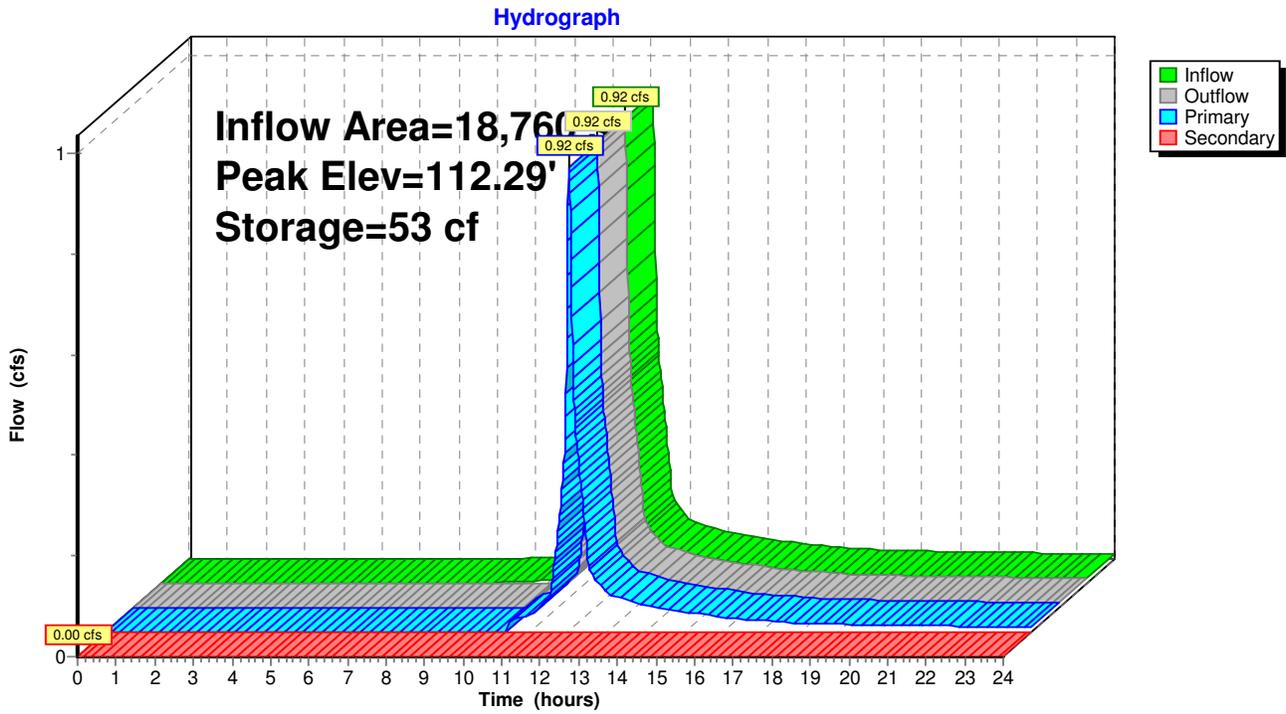
**Primary OutFlow** Max=0.92 cfs @ 12.02 hrs HW=112.29' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 0.92 cfs @ 1.07 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=111.68' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 121P: RG 6A - CB 120 Under Drive Unit 4



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**Pond 128P: RG 2A - CB 122 RG Unit 3**

[61] Hint: Submerged 10% of Reach 130R bottom

Inflow Area = 20,516 sf, Inflow Depth > 1.32" for 2-Year event  
 Inflow = 0.88 cfs @ 12.02 hrs, Volume= 2,249 cf  
 Outflow = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf, Atten= 0%, Lag= 0.2 min  
 Primary = 0.88 cfs @ 12.03 hrs, Volume= 2,206 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 113.27' @ 12.03 hrs Surf.Area= 102 sf Storage= 53 cf

Plug-Flow detention time= 14.1 min calculated for 2,205 cf (98% of inflow)  
 Center-of-Mass det. time= 3.4 min ( 850.5 - 847.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	112.67'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
112.67	0	0	0
112.68	75	0	0
113.17	96	42	42
113.67	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	113.17'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.67'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

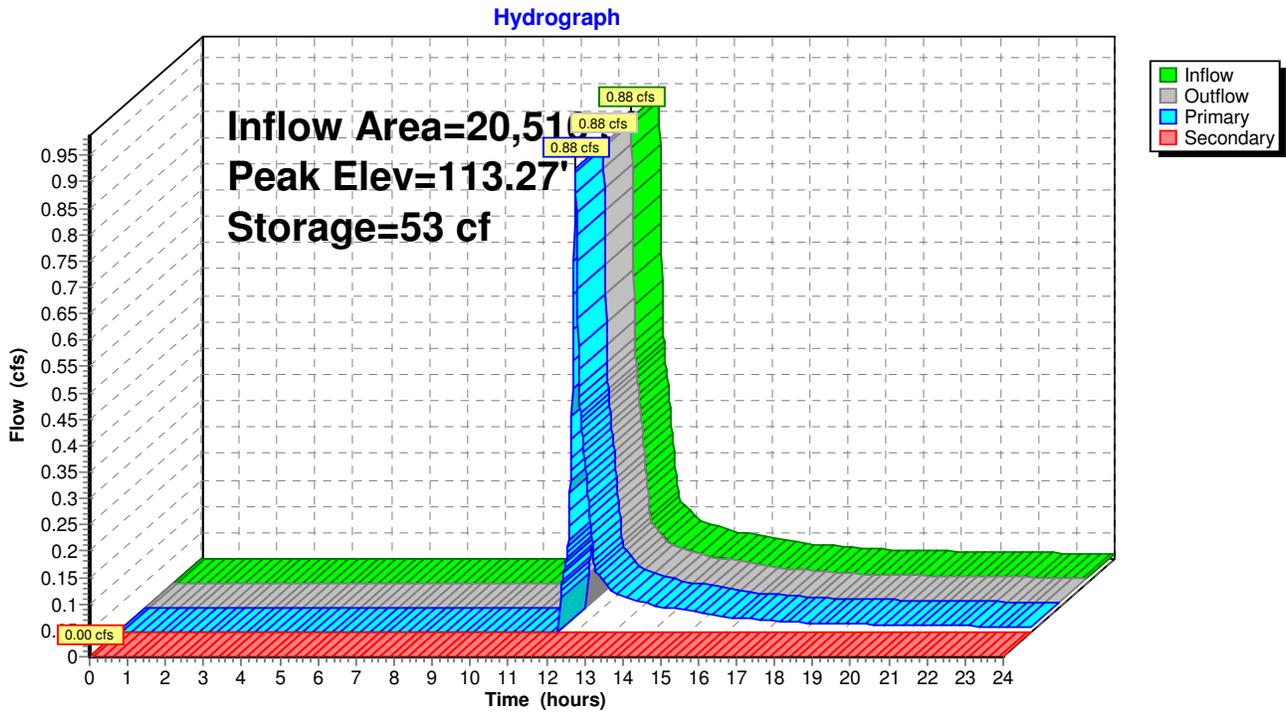
**Primary OutFlow** Max=0.88 cfs @ 12.03 hrs HW=113.27' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 0.88 cfs @ 1.05 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=112.67' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 128P: RG 2A - CB 122 RG Unit 3



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20**

- [93] Warning: Storage range exceeded by 0.29'
- [88] Warning: Qout>Qin may require Finer Routing>1
- [85] Warning: Oscillations may require Finer Routing>1

Inflow Area = 14,450 sf, Inflow Depth > 1.50" for 2-Year event  
 Inflow = 0.73 cfs @ 12.01 hrs, Volume= 1,805 cf  
 Outflow = 0.75 cfs @ 12.02 hrs, Volume= 1,708 cf, Atten= 0%, Lag= 0.3 min  
 Secondary = 0.75 cfs @ 12.02 hrs, Volume= 1,708 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.04' @ 12.02 hrs Surf.Area= 126 sf Storage= 98 cf

Plug-Flow detention time= 40.7 min calculated for 1,707 cf (95% of inflow)  
 Center-of-Mass det. time= 11.9 min ( 844.7 - 832.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	113.75'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

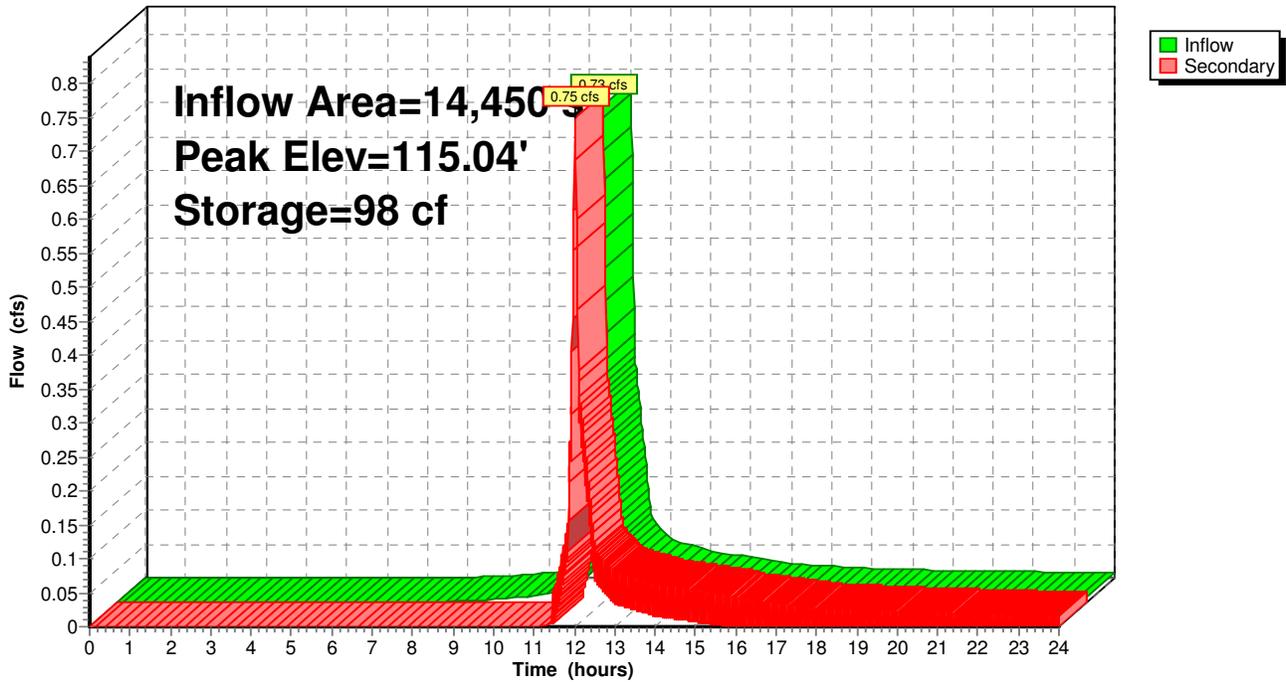
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
113.75	0	0	0
113.76	75	0	0
114.25	96	42	42
114.75	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Secondary	114.75'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Secondary OutFlow** Max=0.74 cfs @ 12.02 hrs HW=115.04' (Free Discharge)  
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.74 cfs @ 1.30 fps)

Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20

Hydrograph



**Postdevelopment9c**

Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 133P: Large RG 4C at Unit 20**

Inflow Area = 6,950 sf, Inflow Depth > 1.45" for 2-Year event  
 Inflow = 0.33 cfs @ 12.01 hrs, Volume= 838 cf  
 Outflow = 0.32 cfs @ 12.02 hrs, Volume= 719 cf, Atten= 2%, Lag= 0.5 min  
 Primary = 0.32 cfs @ 12.02 hrs, Volume= 719 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.90' @ 12.02 hrs Surf.Area= 288 sf Storage= 134 cf

Plug-Flow detention time= 89.2 min calculated for 719 cf (86% of inflow)  
 Center-of-Mass det. time= 26.3 min ( 857.0 - 830.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	116.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.35	0	0	0
116.36	200	1	1
116.85	280	118	119
117.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	116.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	117.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

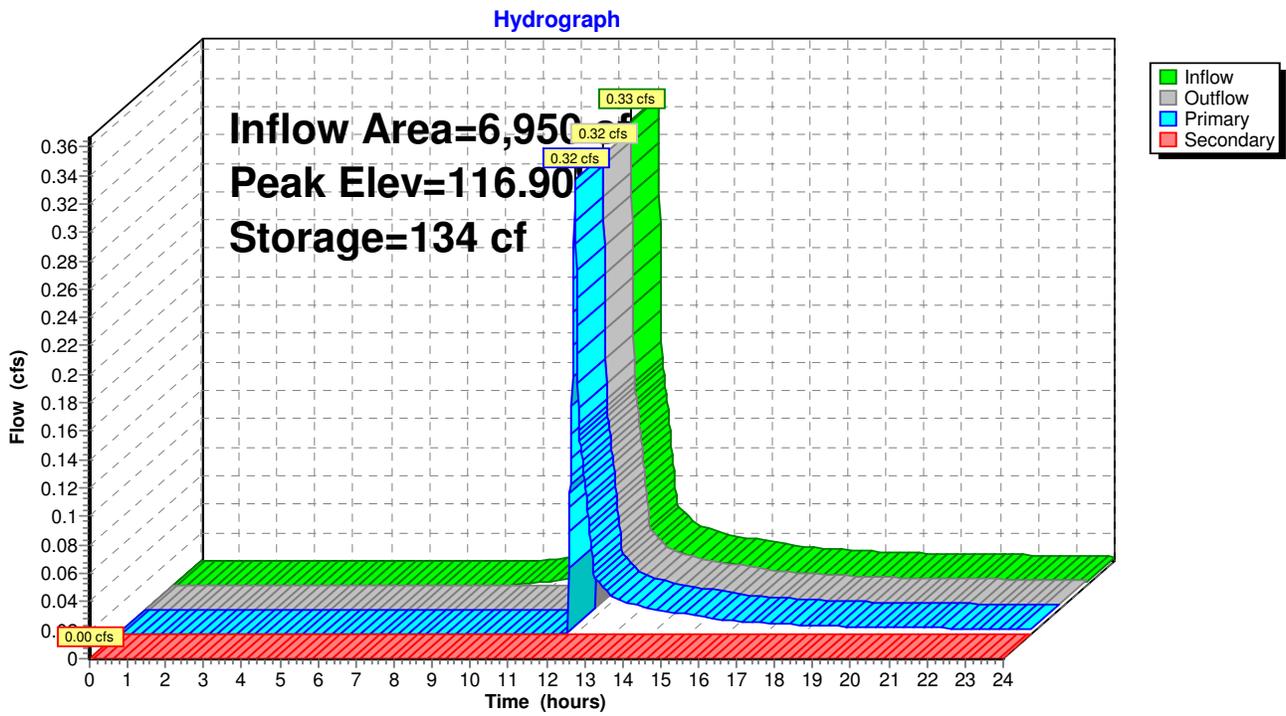
**Primary OutFlow** Max=0.32 cfs @ 12.02 hrs HW=116.90' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 0.32 cfs @ 0.75 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=116.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 133P: Large RG 4C at Unit 20



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**Pond 144R: HW 30 to DMH 14**

[57] Hint: Peaked at 113.48' (Flood elevation advised)

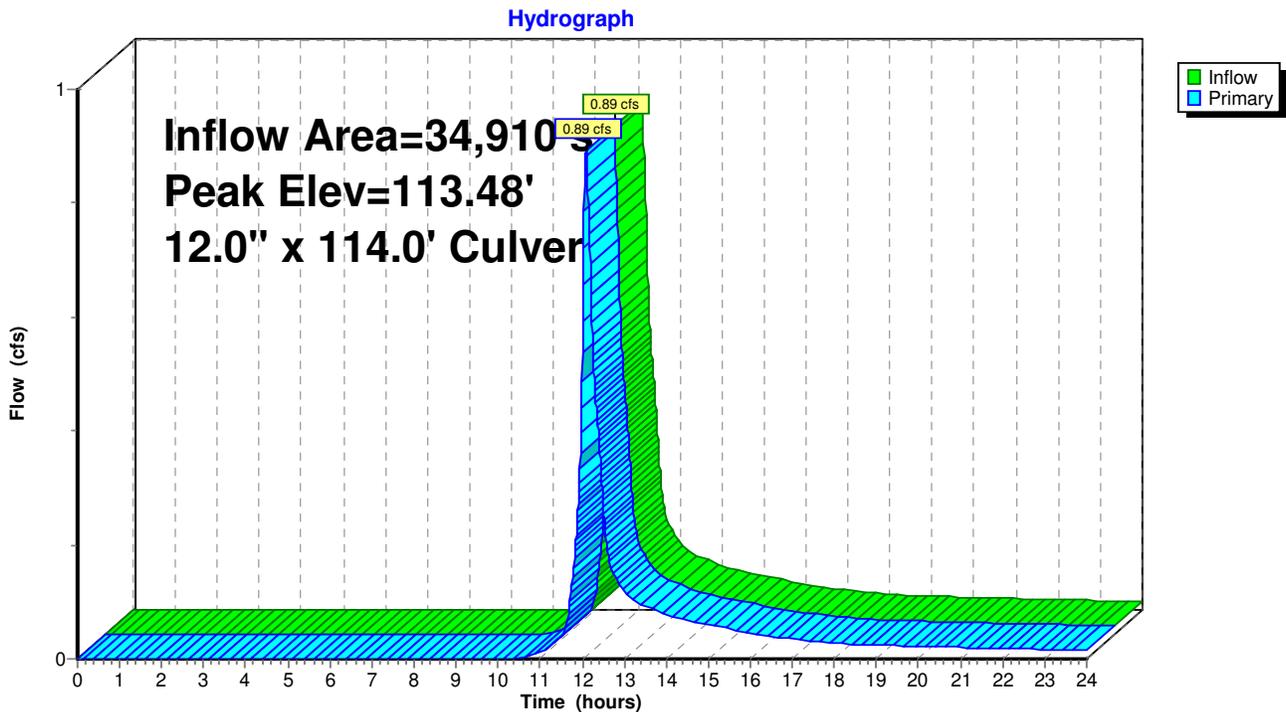
Inflow Area = 34,910 sf, Inflow Depth > 1.08" for 2-Year event  
Inflow = 0.89 cfs @ 12.09 hrs, Volume= 3,141 cf  
Outflow = 0.89 cfs @ 12.09 hrs, Volume= 3,141 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.89 cfs @ 12.09 hrs, Volume= 3,141 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 113.48' @ 12.09 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	113.00'	<b>12.0" x 114.0' long Culvert</b> Ke= 0.500 Outlet Invert= 103.88' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.89 cfs @ 12.09 hrs HW=113.48' (Free Discharge)  
↑1=Culvert (Inlet Controls 0.89 cfs @ 2.37 fps)

**Pond 144R: HW 30 to DMH 14**



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Inflow Area = 21,810 sf, Inflow Depth > 1.68" for 2-Year event  
 Inflow = 1.10 cfs @ 12.02 hrs, Volume= 3,046 cf  
 Outflow = 1.10 cfs @ 12.02 hrs, Volume= 3,003 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.10 cfs @ 12.02 hrs, Volume= 3,003 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.12' @ 12.02 hrs Surf.Area= 100 sf Storage= 54 cf

Plug-Flow detention time= 12.0 min calculated for 3,003 cf (99% of inflow)  
 Center-of-Mass det. time= 3.7 min ( 828.6 - 824.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	107.50'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.50	0	0	0
107.51	75	0	0
108.00	96	42	42
109.00	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	108.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.00'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.09 cfs @ 12.02 hrs HW=108.12' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.09 cfs @ 1.13 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=107.50' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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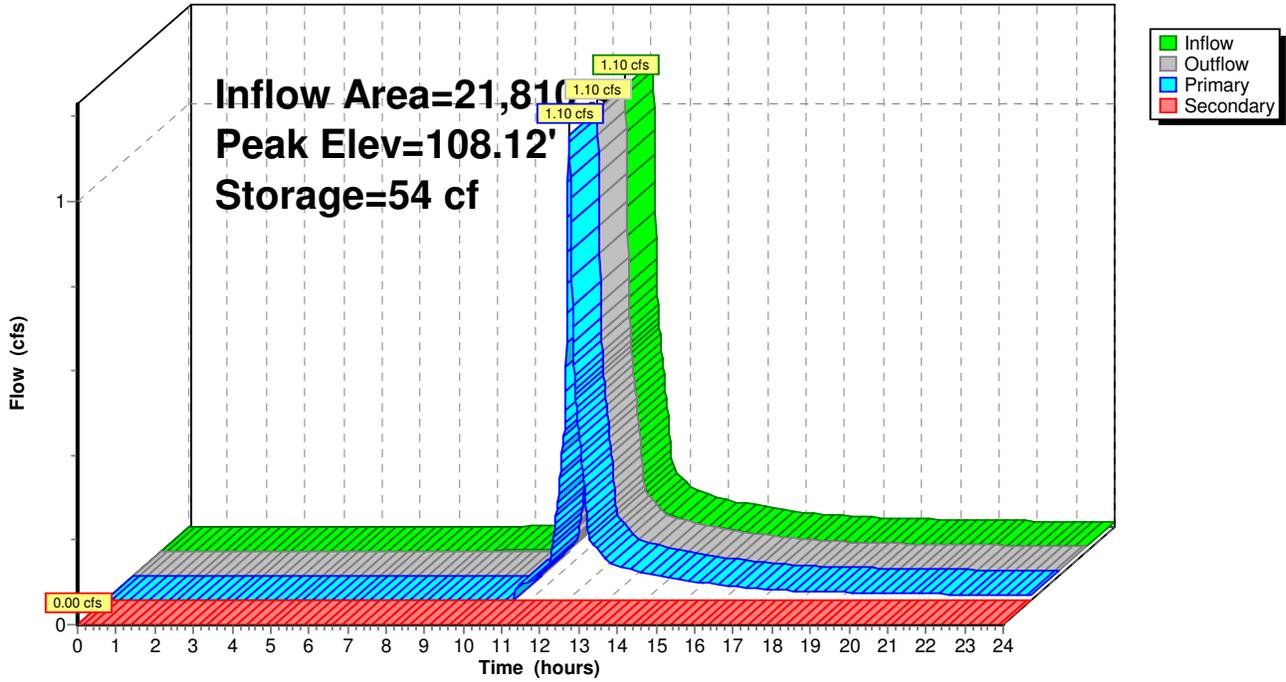
Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

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**Pond 157P: RG 7A - CB 126 Under Drive Unit 5**

[61] Hint: Submerged 27% of Reach 154R bottom

Inflow Area = 12,570 sf, Inflow Depth > 1.65" for 2-Year event  
 Inflow = 0.59 cfs @ 12.03 hrs, Volume= 1,731 cf  
 Outflow = 0.59 cfs @ 12.03 hrs, Volume= 1,688 cf, Atten= 0%, Lag= 0.2 min  
 Primary = 0.59 cfs @ 12.03 hrs, Volume= 1,688 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.53' @ 12.03 hrs Surf.Area= 101 sf Storage= 50 cf

Plug-Flow detention time= 20.8 min calculated for 1,687 cf (98% of inflow)  
 Center-of-Mass det. time= 6.6 min ( 828.2 - 821.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	115.95'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.95	0	0	0
115.96	75	0	0
116.45	96	42	42
116.95	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	116.45'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	116.95'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.59 cfs @ 12.03 hrs HW=116.53' (Free Discharge)

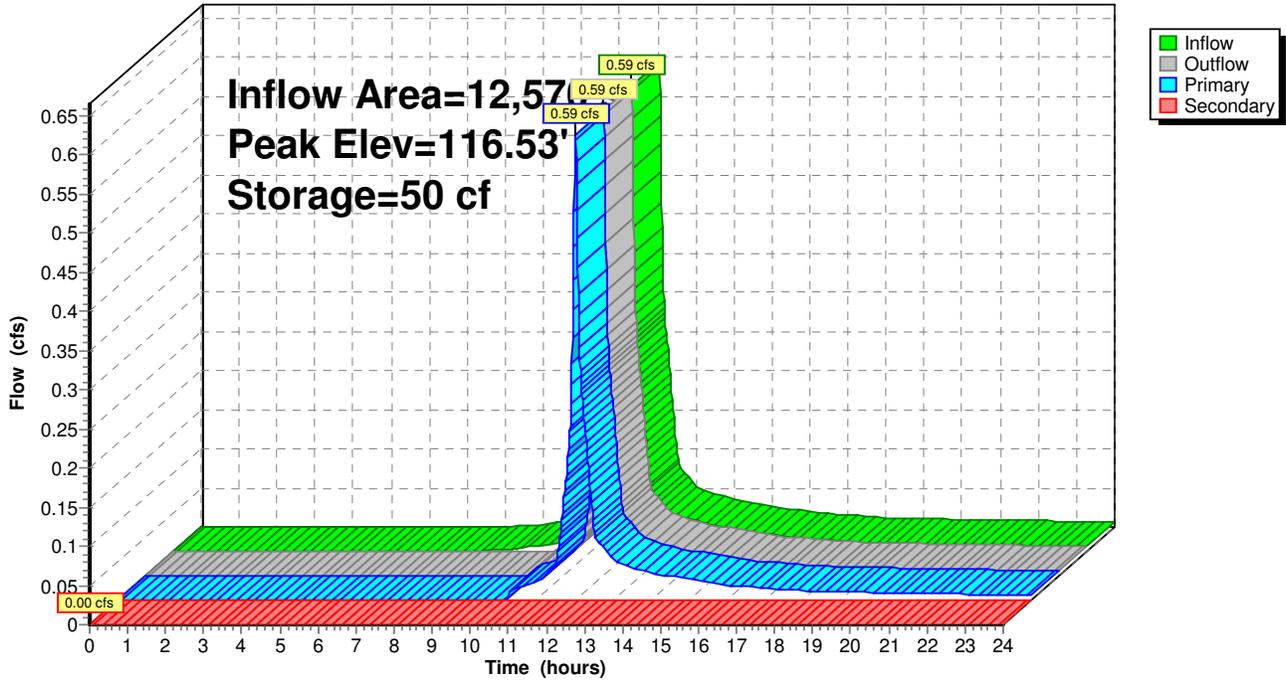
↑1=**Orifice/Grate** (Weir Controls 0.59 cfs @ 0.93 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=115.95' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 157P: RG 7A - CB 126 Under Drive Unit 5

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**Pond 158P: Culvert under Drive Unit 6**

[57] Hint: Peaked at 117.40' (Flood elevation advised)

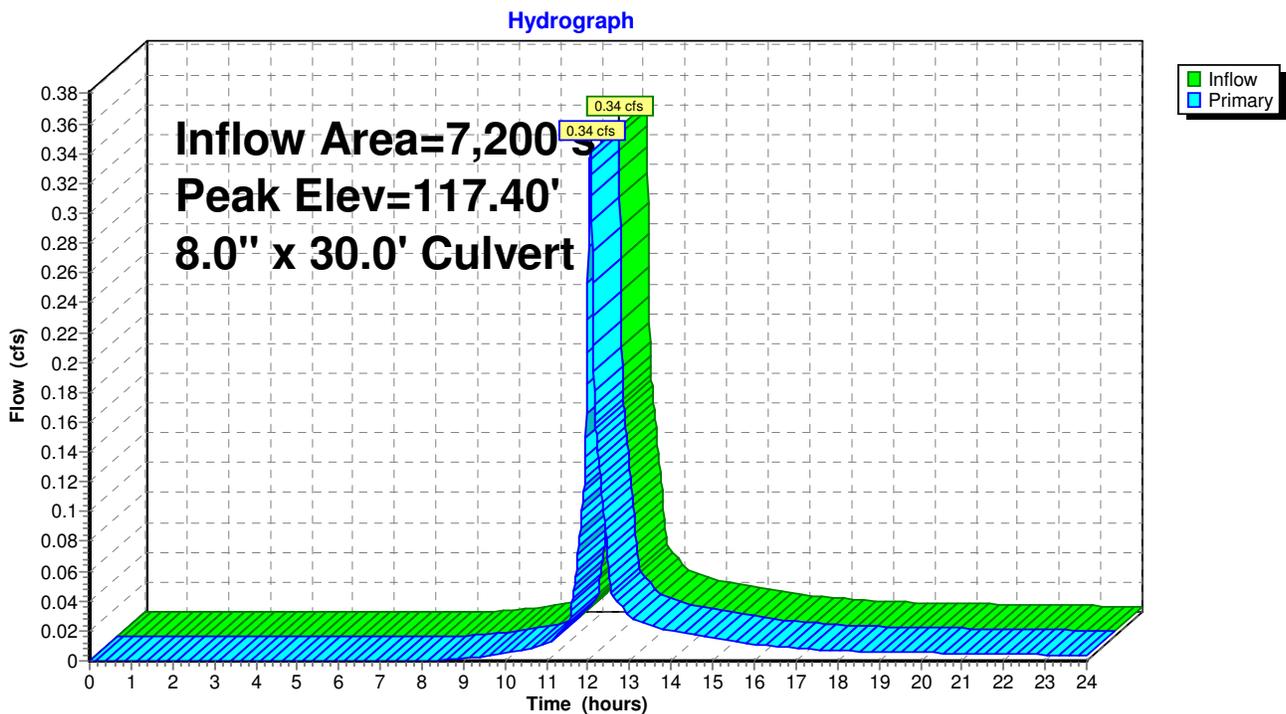
Inflow Area = 7,200 sf, Inflow Depth > 1.59" for 2-Year event  
Inflow = 0.34 cfs @ 12.05 hrs, Volume= 952 cf  
Outflow = 0.34 cfs @ 12.05 hrs, Volume= 952 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.34 cfs @ 12.05 hrs, Volume= 952 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 117.40' @ 12.05 hrs

Device #	Routing	Invert	Outlet Devices
1	Primary	117.05'	<b>8.0" x 30.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 116.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.34 cfs @ 12.05 hrs HW=117.40' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.34 cfs @ 2.66 fps)

**Pond 158P: Culvert under Drive Unit 6**



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Type III 24-hr 2-Year Rainfall=3.00"

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**Pond 218R: DMH 50 to Irrigation Cistern**

[57] Hint: Peaked at 102.53' (Flood elevation advised)

[62] Warning: Submerged 5% of Reach 55R inlet

[63] Warning: Exceeded Reach 403R inflow depth by 0.17' @ 12.02 hrs

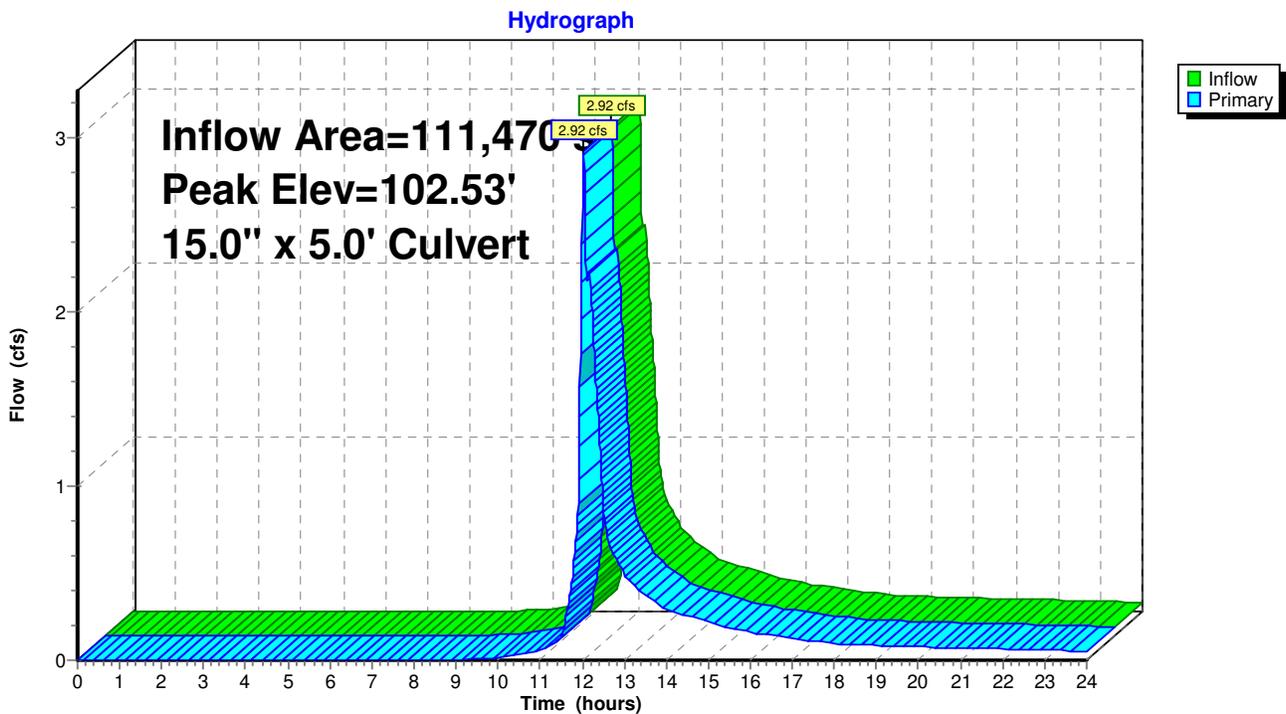
Inflow Area = 111,470 sf, Inflow Depth > 1.23" for 2-Year event  
 Inflow = 2.92 cfs @ 12.03 hrs, Volume= 11,421 cf  
 Outflow = 2.92 cfs @ 12.03 hrs, Volume= 11,421 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 2.92 cfs @ 12.03 hrs, Volume= 11,421 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 102.53' @ 12.03 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	101.52'	<b>15.0" x 5.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 101.42' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

**Primary OutFlow** Max=2.91 cfs @ 12.03 hrs HW=102.53' (Free Discharge)  
 ←1=Culvert (Barrel Controls 2.91 cfs @ 3.76 fps)

**Pond 218R: DMH 50 to Irrigation Cistern**



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Type III 24-hr 2-Year Rainfall=3.00"

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## Pond 219P: Irrigation Cistern

[79] Warning: Submerged Pond 218R Primary device # 1 INLET by 0.88'

Inflow Area = 111,470 sf, Inflow Depth > 1.23" for 2-Year event  
Inflow = 2.92 cfs @ 12.03 hrs, Volume= 11,421 cf  
Outflow = 2.62 cfs @ 12.07 hrs, Volume= 11,406 cf, Atten= 10%, Lag= 2.3 min  
Primary = 2.62 cfs @ 12.07 hrs, Volume= 11,406 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 102.40' @ 12.07 hrs Surf.Area= 460 sf Storage= 452 cf

Plug-Flow detention time= 4.1 min calculated for 11,401 cf (100% of inflow)  
Center-of-Mass det. time= 3.3 min ( 858.1 - 854.8 )

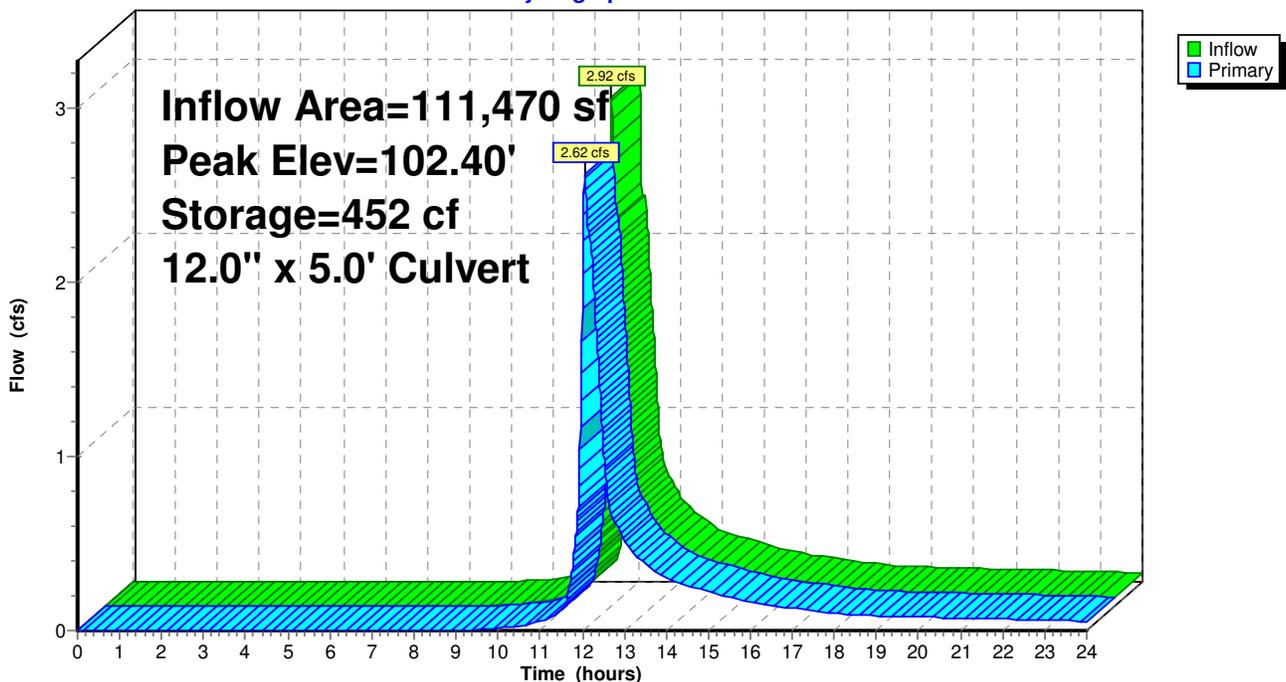
Volume	Invert	Avail.Storage	Storage Description
#1	101.42'	4,292 cf	11.50'W x 40.00'L x 9.33'H Prismatic

Device	Routing	Invert	Outlet Devices
#1	Primary	101.32'	12.0" x 5.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= 101.22' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

Primary OutFlow Max=2.62 cfs @ 12.07 hrs HW=102.40' (Free Discharge)  
←1=Culvert (Barrel Controls 2.62 cfs @ 3.84 fps)

## Pond 219P: Irrigation Cistern

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.00"

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## Link A: POA A

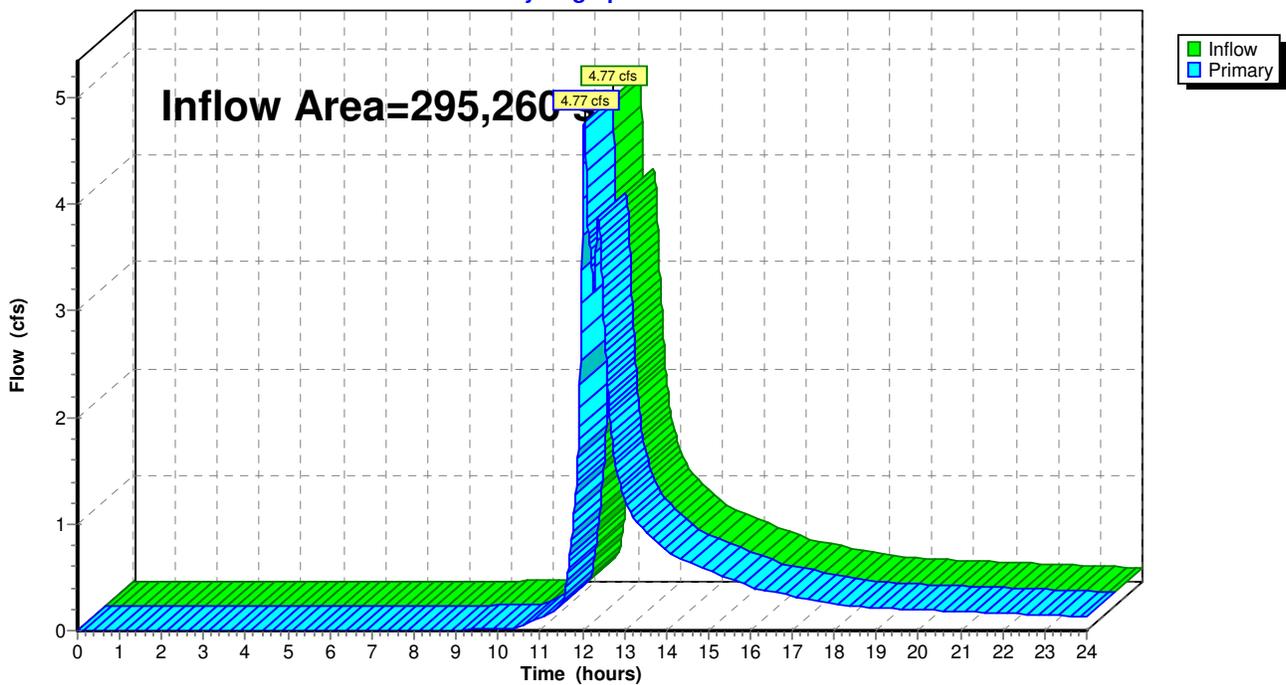
Inflow Area = 295,260 sf, Inflow Depth > 1.07" for 2-Year event  
Inflow = 4.77 cfs @ 12.05 hrs, Volume= 26,327 cf  
Primary = 4.77 cfs @ 12.05 hrs, Volume= 26,327 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 82.00'

## Link A: POA A

Hydrograph



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 54S: CB at Cul-de-Sac - Outside** Runoff Area=20,970 sf Runoff Depth>2.64"  
Flow Length=90' Tc=0.5 min CN=82 Runoff=1.80 cfs 4,606 cf

**Subcatchment 56S: CB at Cul-de-Sac - Inside** Runoff Area=8,660 sf Runoff Depth>2.91"  
Flow Length=100' Slope=0.0150 '/' Tc=0.7 min CN=85 Runoff=0.81 cfs 2,099 cf

**Subcatchment 60S:** Runoff Area=4,640 sf Runoff Depth>3.29"  
Flow Length=80' Tc=2.0 min CN=89 Runoff=0.46 cfs 1,274 cf

**Subcatchment 62S: Large Area including 2 Septics** Runoff Area=39,429 sf Runoff Depth>2.29"  
Flow Length=235' Tc=6.9 min CN=78 Runoff=2.35 cfs 7,523 cf

**Subcatchment 65S: Throat of Cul-de-sac u.g.** Runoff Area=11,590 sf Runoff Depth>2.38"  
Flow Length=170' Slope=0.0400 '/' Tc=0.7 min CN=79 Runoff=0.90 cfs 2,295 cf

**Subcatchment 68S: From hill near 19,20 to Lawn CB** Runoff Area=15,091 sf Runoff Depth>2.29"  
Flow Length=190' Tc=3.0 min CN=78 Runoff=1.04 cfs 2,882 cf

**Subcatchment 110S: To CB 20** Runoff Area=7,780 sf Runoff Depth>3.20"  
Flow Length=100' Slope=0.0200 '/' Tc=0.6 min CN=88 Runoff=0.80 cfs 2,072 cf

**Subcatchment 112S: To CB 22** Runoff Area=2,898 sf Runoff Depth>2.73"  
Flow Length=60' Tc=0.3 min CN=83 Runoff=0.26 cfs 658 cf

**Subcatchment 114S: Behind Units 1&2** Runoff Area=15,260 sf Runoff Depth>2.21"  
Flow Length=130' Tc=8.7 min CN=77 Runoff=0.82 cfs 2,806 cf

**Subcatchment 116S:** Runoff Area=3,050 sf Runoff Depth>3.40"  
Flow Length=70' Tc=0.3 min CN=90 Runoff=0.33 cfs 863 cf

**Subcatchment 118S:** Runoff Area=3,610 sf Runoff Depth>3.20"  
Flow Length=50' Tc=0.2 min CN=88 Runoff=0.37 cfs 962 cf

**Subcatchment 120S:** Runoff Area=6,190 sf Runoff Depth>3.10"  
Flow Length=90' Tc=0.5 min CN=87 Runoff=0.62 cfs 1,598 cf

**Subcatchment 122S:** Runoff Area=6,066 sf Runoff Depth>2.21"  
Flow Length=100' Tc=3.6 min CN=77 Runoff=0.39 cfs 1,117 cf

**Subcatchment 124S:** Runoff Area=7,500 sf Runoff Depth>3.10"  
Flow Length=80' Tc=0.5 min CN=87 Runoff=0.75 cfs 1,937 cf

**Subcatchment 126S:** Runoff Area=5,370 sf Runoff Depth>3.10"  
Flow Length=60' Tc=0.3 min CN=87 Runoff=0.54 cfs 1,387 cf

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<b>Subcatchment 128S:</b>	Runoff Area=7,200 sf	Runoff Depth>2.91"
Flow Length=115'	Slope=0.0200 '/'	Tc=3.2 min CN=85 Runoff=0.62 cfs 1,745 cf
<b>Subcatchment 130S:</b>	Runoff Area=6,950 sf	Runoff Depth>2.73"
Flow Length=60'	Tc=0.3 min CN=83	Runoff=0.62 cfs 1,579 cf
<b>Subcatchment 132S: Behind Unit 3</b>	Runoff Area=26,270 sf	Runoff Depth>2.13"
Flow Length=120'	Tc=0.7 min CN=76	Runoff=1.81 cfs 4,662 cf
<b>Subcatchment 134S: To Swale behind 7,6,5</b>	Runoff Area=13,850 sf	Runoff Depth>2.38"
Flow Length=70'	Slope=0.0200 '/'	Tc=3.1 min CN=79 Runoff=0.98 cfs 2,741 cf
<b>Subcatchment 136S: To Swale behind 4 to HW 30</b>	Runoff Area=21,060 sf	Runoff Depth>2.13"
Flow Length=100'	Tc=0.6 min CN=76	Runoff=1.46 cfs 3,738 cf
<b>Subcatchment 138S: Rear of Units 10,11,12,13</b>	Runoff Area=15,030 sf	Runoff Depth>2.46"
Flow Length=400'	Tc=12.1 min CN=80	Runoff=0.82 cfs 3,076 cf
<b>Subcatchment 140S: Behind Units 14, 15, 16</b>	Runoff Area=21,630 sf	Runoff Depth>2.12"
Flow Length=130'	Slope=0.0100 '/'	Tc=11.7 min CN=76 Runoff=1.02 cfs 3,829 cf
<b>Subcatchment 214S:</b>	Runoff Area=6,950 sf	Runoff Depth>2.73"
	Tc=1.0 min CN=83	Runoff=0.61 cfs 1,578 cf
<b>Subcatchment 216S:</b>	Runoff Area=4,140 sf	Runoff Depth>2.91"
	Tc=1.0 min CN=85	Runoff=0.38 cfs 1,004 cf
<b>Subcatchment 900: North Offsite flowing onto property</b>	Runoff Area=14,076 sf	Runoff Depth>1.67"
Flow Length=360'	Slope=0.0500 '/'	Tc=12.0 min CN=70 Runoff=0.50 cfs 1,957 cf
<b>Reach 1R: Existing wetland channel to WF</b>	Avg. Depth=0.24'	Max Vel=4.55 fps Inflow=7.24 cfs 28,007 cf
	n=0.022 L=300.0'	S=0.0333 '/' Capacity=82.44 cfs Outflow=7.22 cfs 27,962 cf
<b>Reach 2R: CB 23 to HW 40</b>	Avg. Depth=0.73'	Max Vel=6.84 fps Inflow=5.84 cfs 19,149 cf
	D=15.0" n=0.013 L=75.0'	S=0.0149 '/' Capacity=7.89 cfs Outflow=5.06 cfs 19,145 cf
<b>Reach 55R: DMH 52 to DMH 50</b>	Avg. Depth=0.56'	Max Vel=7.76 fps Inflow=3.48 cfs 9,061 cf
	D=12.0" n=0.013 L=32.0'	S=0.0269 '/' Capacity=5.84 cfs Outflow=3.48 cfs 9,060 cf
<b>Reach 62R: DMH 64 to Bio-Retention A (HW</b>	Avg. Depth=0.56'	Max Vel=5.83 fps Inflow=2.66 cfs 8,797 cf
	D=12.0" n=0.013 L=12.0'	S=0.0150 '/' Capacity=4.36 cfs Outflow=2.66 cfs 8,796 cf
<b>Reach 64R: Swale from Drive at #12 to RG 10A</b>	Avg. Depth=0.00'	Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
	n=0.022 L=10.0'	S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf
<b>Reach 67R: Culvert under Unit 12 Drive</b>	Avg. Depth=0.33'	Max Vel=3.45 fps Inflow=0.60 cfs 1,472 cf
	D=8.0" n=0.013 L=48.0'	S=0.0100 '/' Capacity=1.21 cfs Outflow=0.60 cfs 1,472 cf
<b>Reach 68R: Underdrain to CB 66</b>	Avg. Depth=0.43'	Max Vel=9.31 fps Inflow=2.22 cfs 8,461 cf
	D=8.0" n=0.013 L=15.0'	S=0.0600 '/' Capacity=2.96 cfs Outflow=2.22 cfs 8,461 cf

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**Reach 69R: Drain to DMH 52** Avg. Depth=0.36' Max Vel=5.04 fps Inflow=0.96 cfs 2,356 cf  
D=8.0" n=0.013 L=38.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=0.96 cfs 2,356 cf

**Reach 114R: DMH 16 to DMH 14** Avg. Depth=0.34' Max Vel=4.38 fps Inflow=1.05 cfs 2,730 cf  
D=12.0" n=0.013 L=60.0' S=0.0133 '/' Capacity=4.11 cfs Outflow=1.04 cfs 2,730 cf

**Reach 118R: Swale from Drive at #4 to RG 11** Avg. Depth=0.20' Max Vel=3.88 fps Inflow=1.25 cfs 4,643 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=1.24 cfs 4,643 cf

**Reach 119R: Culvert under Unit 4 Drive** Avg. Depth=0.67' Max Vel=3.94 fps Inflow=1.65 cfs 4,644 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.25 cfs 4,643 cf

**Reach 127R: Swale from Drive at #3 to RG 11** Avg. Depth=0.23' Max Vel=4.21 fps Inflow=1.65 cfs 4,371 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=1.65 cfs 4,371 cf

**Reach 128R: Culvert under Unit 3 Drive** Avg. Depth=0.42' Max Vel=7.12 fps Inflow=1.66 cfs 4,371 cf  
D=8.0" n=0.013 L=30.0' S=0.0357 '/' Capacity=2.28 cfs Outflow=1.65 cfs 4,371 cf

**Reach 129R: Swale from Drive at #20 to RG 124** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf

**Reach 130R: Swale to RG 122** Avg. Depth=0.22' Max Vel=3.65 fps Inflow=1.35 cfs 3,298 cf  
n=0.022 L=30.0' S=0.0360 '/' Capacity=58.07 cfs Outflow=1.33 cfs 3,298 cf

**Reach 131R: Culvert under Unit 20 Drive** Avg. Depth=0.33' Max Vel=3.46 fps Inflow=0.61 cfs 1,459 cf  
D=8.0" n=0.013 L=48.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.60 cfs 1,459 cf

**Reach 137R: Swale Back of 7,6,5** Avg. Depth=0.17' Max Vel=1.63 fps Inflow=0.98 cfs 2,741 cf  
n=0.030 L=140.0' S=0.0143 '/' Capacity=26.48 cfs Outflow=0.95 cfs 2,736 cf

**Reach 138R: Swale Back of 4** Avg. Depth=0.34' Max Vel=1.95 fps Inflow=2.01 cfs 6,473 cf  
n=0.030 L=140.0' S=0.0100 '/' Capacity=17.63 cfs Outflow=1.99 cfs 6,463 cf

**Reach 149R: DMH 14 to DMH 12** Avg. Depth=0.74' Max Vel=7.22 fps Inflow=6.27 cfs 19,989 cf  
D=18.0" n=0.013 L=95.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=6.25 cfs 19,984 cf

**Reach 150R: DMH 12 to HW 10 - Outlet** Avg. Depth=0.74' Max Vel=7.24 fps Inflow=6.25 cfs 19,984 cf  
D=18.0" n=0.013 L=55.0' S=0.0151 '/' Capacity=12.90 cfs Outflow=6.24 cfs 19,982 cf

**Reach 153R: CB 116 to DMH 14** Avg. Depth=0.34' Max Vel=8.56 fps Inflow=1.54 cfs 5,463 cf  
D=8.0" n=0.013 L=28.0' S=0.0600 '/' Capacity=2.96 cfs Outflow=1.54 cfs 5,463 cf

**Reach 154R: Swale from Drive at #6 to RG 126** Avg. Depth=0.00' Max Vel=0.00 fps  
n=0.022 L=33.0' S=0.0091 '/' Capacity=29.18 cfs Outflow=0.00 cfs 0 cf

**Reach 155R: Swale from Drive at #5 to RG 120** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=50.0' S=0.0344 '/' Capacity=56.77 cfs Outflow=0.00 cfs 0 cf

**Reach 156R: Culvert under Unit 5 Drive** Avg. Depth=0.49' Max Vel=3.91 fps Inflow=1.06 cfs 3,089 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.06 cfs 3,088 cf

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Type III 24-hr 10-Year Rainfall=4.50"

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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**Inflow=6.24 cfs 19,982 cf  
Outflow=6.24 cfs 19,982 cf**Reach 220R: CB 56 to DMH 52**Avg. Depth=0.32' Max Vel=3.67 fps Inflow=0.81 cfs 2,099 cf  
D=12.0" n=0.013 L=14.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.81 cfs 2,099 cf**Reach 222R: CB 54 to DMH 52**Avg. Depth=0.50' Max Vel=4.55 fps Inflow=1.80 cfs 4,606 cf  
D=12.0" n=0.013 L=22.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.80 cfs 4,606 cf**Reach 403R: CB 65 to DMH 50**Avg. Depth=0.46' Max Vel=6.21 fps Inflow=2.22 cfs 8,461 cf  
D=12.0" n=0.013 L=30.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=2.22 cfs 8,460 cf**Reach 902R: Existing wetland channel to W**Avg. Depth=0.26' Max Vel=5.16 fps Inflow=8.71 cfs 35,430 cf  
n=0.022 L=100.0' S=0.0400 '/' Capacity=90.31 cfs Outflow=8.71 cfs 35,413 cf**Pond 2P: Recharge System**Peak Elev=106.11' Storage=3,766 cf Inflow=5.52 cfs 22,672 cf  
Discarded=0.01 cfs 361 cf Primary=5.84 cfs 19,149 cf Secondary=0.91 cfs 209 cf Outflow=6.76 cfs 19,720 cf**Pond 7P: Forebay - Bio Retention**Peak Elev=111.75' Storage=232 cf Inflow=2.66 cfs 8,796 cf  
Discarded=0.00 cfs 0 cf Primary=2.66 cfs 8,627 cf Outflow=2.66 cfs 8,628 cf**Pond 8P: Main Cell - Bio Retention**Peak Elev=111.51' Storage=1,053 cf Inflow=2.66 cfs 8,627 cf  
Primary=2.22 cfs 8,461 cf Secondary=0.00 cfs 0 cf Outflow=2.22 cfs 8,461 cf**Pond 9P: CB 65**Peak Elev=108.24' Inflow=1.83 cfs 5,177 cf  
12.0" x 126.0' Culvert Outflow=1.83 cfs 5,177 cf**Pond 43R: CB 60 to DMH 64**Peak Elev=111.40' Inflow=0.46 cfs 1,274 cf  
12.0" x 12.0' Culvert Outflow=0.46 cfs 1,274 cf**Pond 61R: CB 62 to DMH 64**Peak Elev=112.11' Inflow=2.35 cfs 7,523 cf  
12.0" x 24.0' Culvert Outflow=2.35 cfs 7,523 cf**Pond 66P: RG 9A at Units 11/12 - CB 214**Peak Elev=108.93' Storage=124 cf Inflow=0.61 cfs 1,578 cf  
Primary=0.60 cfs 1,472 cf Secondary=0.00 cfs 0 cf Outflow=0.60 cfs 1,472 cf**Pond 67P: CB 66 (emergency vertical release)**Peak Elev=106.49' Inflow=2.22 cfs 8,461 cf  
Primary=2.22 cfs 8,461 cf Secondary=0.00 cfs 0 cf Outflow=2.22 cfs 8,461 cf**Pond 70P: RG 10A - CB 216 at Units 13**Peak Elev=106.96' Storage=151 cf Inflow=0.97 cfs 2,476 cf  
Primary=0.96 cfs 2,356 cf Secondary=0.00 cfs 0 cf Outflow=0.96 cfs 2,356 cf**Pond 111P: CB 20**Peak Elev=104.24' Inflow=0.80 cfs 2,072 cf  
12.0" x 16.0' Culvert Outflow=0.80 cfs 2,072 cf**Pond 112P: CB 22**Peak Elev=104.06' Inflow=0.26 cfs 658 cf  
12.0" x 22.0' Culvert Outflow=0.26 cfs 658 cf**Pond 119P: RG - 1A - CB 118 to DMH 14**Peak Elev=110.80' Storage=48 cf Inflow=1.99 cfs 5,332 cf  
Primary=1.98 cfs 5,332 cf Secondary=0.00 cfs 0 cf Outflow=1.98 cfs 5,332 cf

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4** Peak Elev=112.34' Storage=58 cf Inflow=1.64 cfs 4,687 cf  
Primary=1.65 cfs 4,644 cf Secondary=0.00 cfs 0 cf Outflow=1.65 cfs 4,644 cf

**Pond 128P: RG 2A - CB 122 RG Unit 3** Peak Elev=113.33' Storage=58 cf Inflow=1.66 cfs 4,414 cf  
Primary=1.66 cfs 4,371 cf Secondary=0.00 cfs 0 cf Outflow=1.66 cfs 4,371 cf

**Pond 132P: RG 3B - CB 124 Rain Garden - Unit** Peak Elev=115.17' Storage=98 cf Inflow=1.34 cfs 3,396 cf  
Outflow=1.35 cfs 3,298 cf

**Pond 133P: Large RG 4C at Unit 20** Peak Elev=116.93' Storage=142 cf Inflow=0.62 cfs 1,579 cf  
Primary=0.61 cfs 1,459 cf Secondary=0.00 cfs 0 cf Outflow=0.61 cfs 1,459 cf

**Pond 144R: HW 30 to DMH 14** Peak Elev=113.78' Inflow=1.99 cfs 6,463 cf  
12.0" x 114.0' Culvert Outflow=1.99 cfs 6,463 cf

**Pond 155P: RG 5A - CB 116 between Septic an** Peak Elev=108.15' Storage=57 cf Inflow=1.54 cfs 5,506 cf  
Primary=1.54 cfs 5,463 cf Secondary=0.00 cfs 0 cf Outflow=1.54 cfs 5,463 cf

**Pond 157P: RG 7A - CB 126 Under Drive Unit 5** Peak Elev=116.57' Storage=54 cf Inflow=1.06 cfs 3,131 cf  
Primary=1.06 cfs 3,089 cf Secondary=0.00 cfs 0 cf Outflow=1.06 cfs 3,089 cf

**Pond 158P: Culvert under Drive Unit 6** Peak Elev=117.55' Inflow=0.62 cfs 1,745 cf  
8.0" x 30.0' Culvert Outflow=0.62 cfs 1,745 cf

**Pond 218R: DMH 50 to Irrigation Cistern** Peak Elev=103.41' Inflow=6.66 cfs 22,697 cf  
15.0" x 5.0' Culvert Outflow=6.66 cfs 22,697 cf

**Pond 219P: Irrigation Cistern** Peak Elev=103.95' Storage=1,165 cf Inflow=6.66 cfs 22,697 cf  
12.0" x 5.0' Culvert Outflow=5.52 cfs 22,672 cf

**Link A: POA A** Inflow=14.17 cfs 55,604 cf  
Primary=14.17 cfs 55,604 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 59,987 cf Average Runoff Depth = 2.44"**  
**75.93% Pervious Area = 224,203 sf 24.07% Impervious Area = 71,057 sf**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 54S: CB at Cul-de-Sac - Outside**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.80 cfs @ 12.01 hrs, Volume= 4,606 cf, Depth> 2.64"

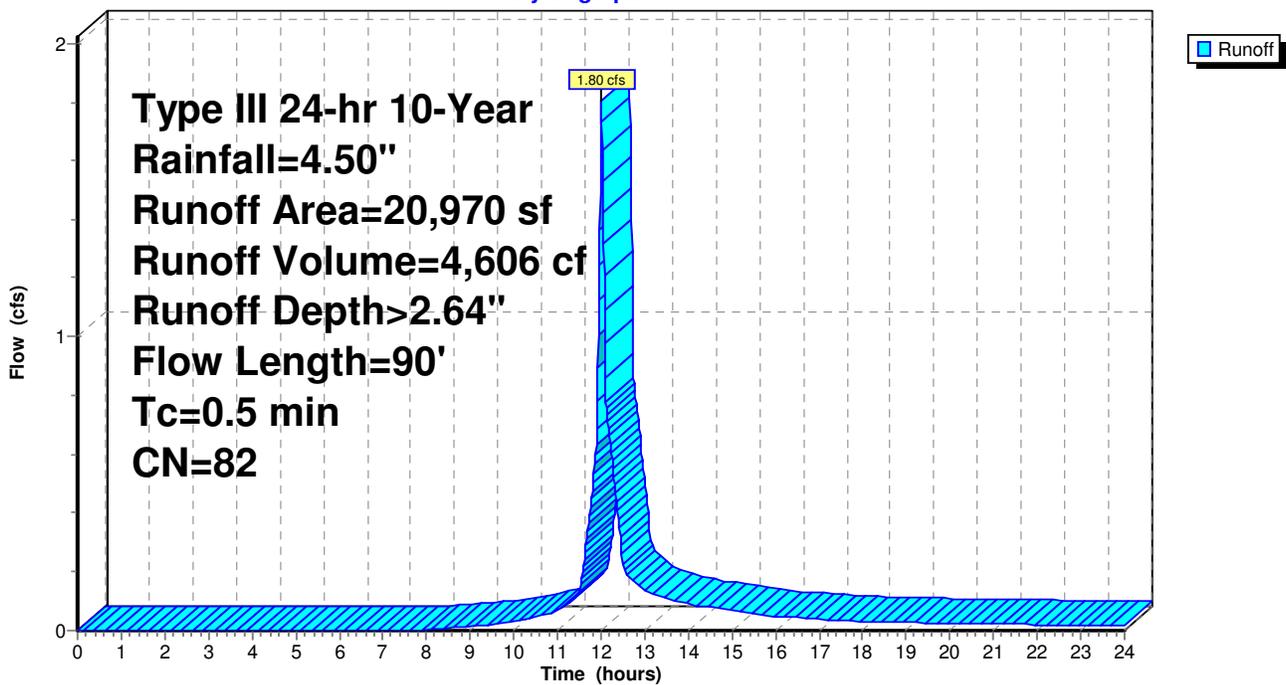
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
4,100	98	Paved parking & roofs
2,724	98	Paved parking & roofs
14,146	74	>75% Grass cover, Good, HSG C
20,970	82	Weighted Average
14,146		Pervious Area
6,824		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1500	2.42		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.20"
0.3	60	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	90	Total			

**Subcatchment 54S: CB at Cul-de-Sac - Outside**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 56S: CB at Cul-de-Sac - Inside**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.81 cfs @ 12.01 hrs, Volume= 2,099 cf, Depth> 2.91"

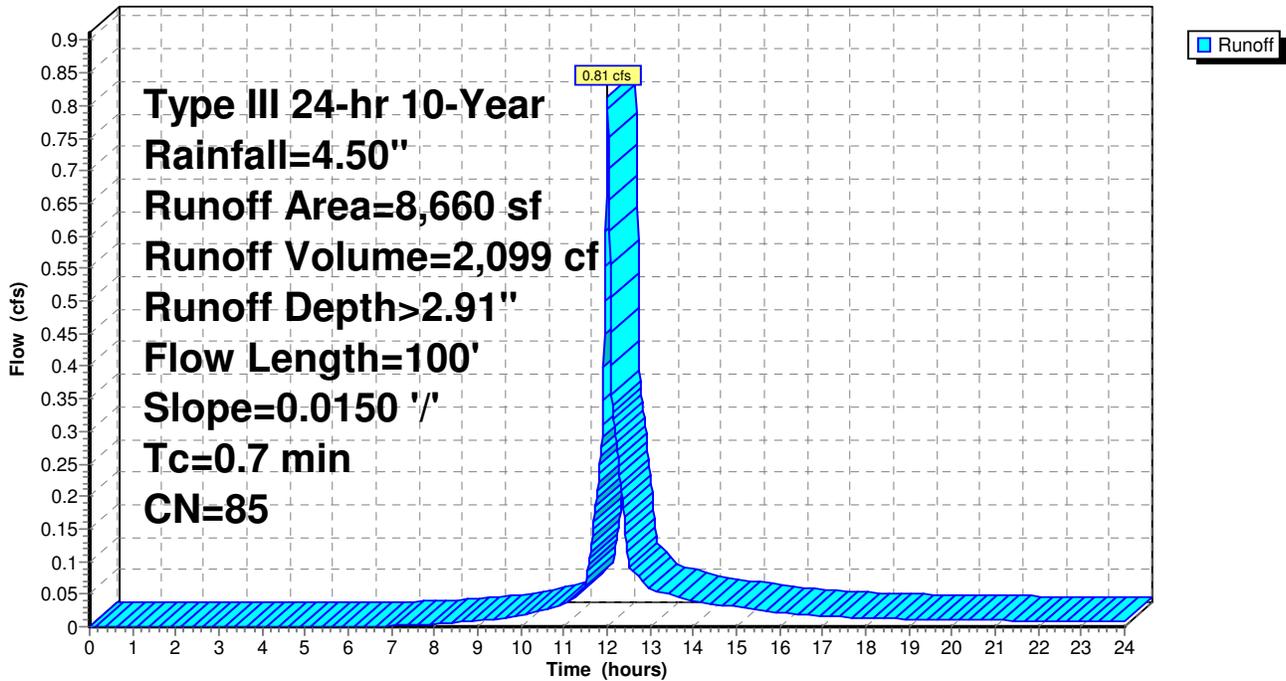
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
0	98	Paved parking & roofs
3,847	98	Paved parking & roofs
4,813	74	>75% Grass cover, Good, HSG C
8,660	85	Weighted Average
4,813		Pervious Area
3,847		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 56S: CB at Cul-de-Sac - Inside**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 60S:**

Runoff = 0.46 cfs @ 12.03 hrs, Volume= 1,274 cf, Depth> 3.29"

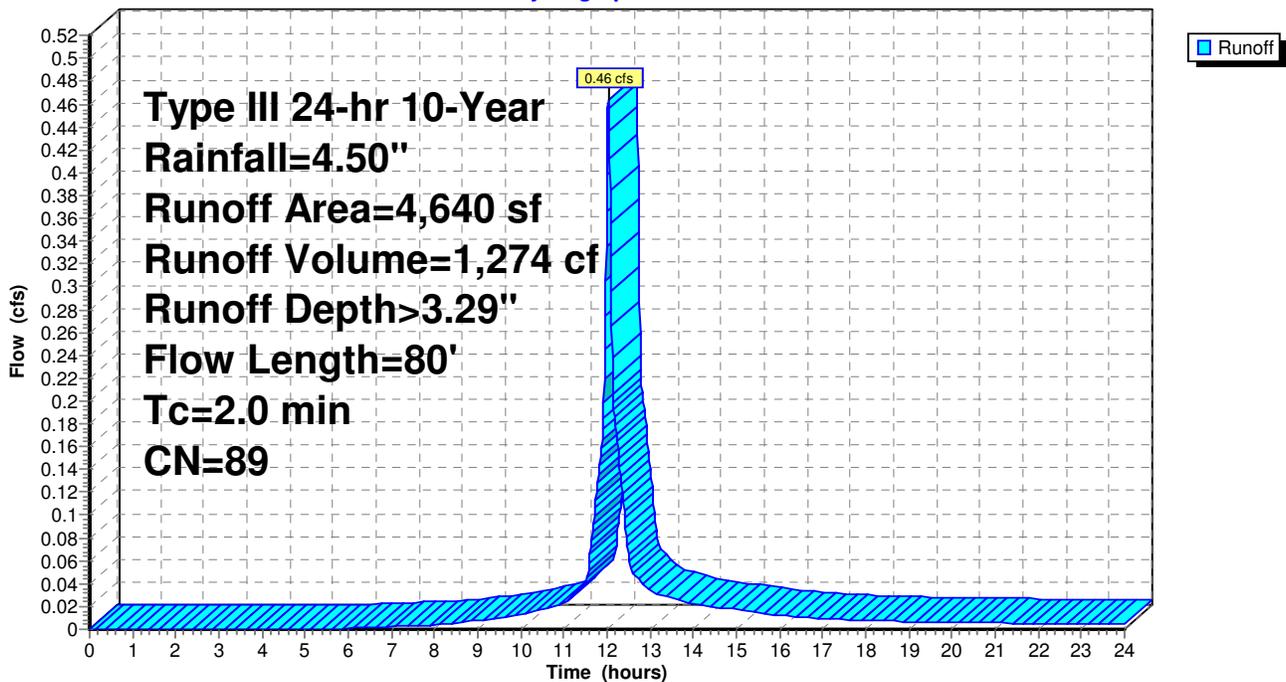
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
960	98	Paved parking & roofs
1,850	98	Paved parking & roofs
1,830	74	>75% Grass cover, Good, HSG C
4,640	89	Weighted Average
1,830		Pervious Area
2,810		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0250	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.6	70	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.0	80	Total			

**Subcatchment 60S:**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 62S: Large Area including 2 Septics**

Runoff = 2.35 cfs @ 12.10 hrs, Volume= 7,523 cf, Depth> 2.29"

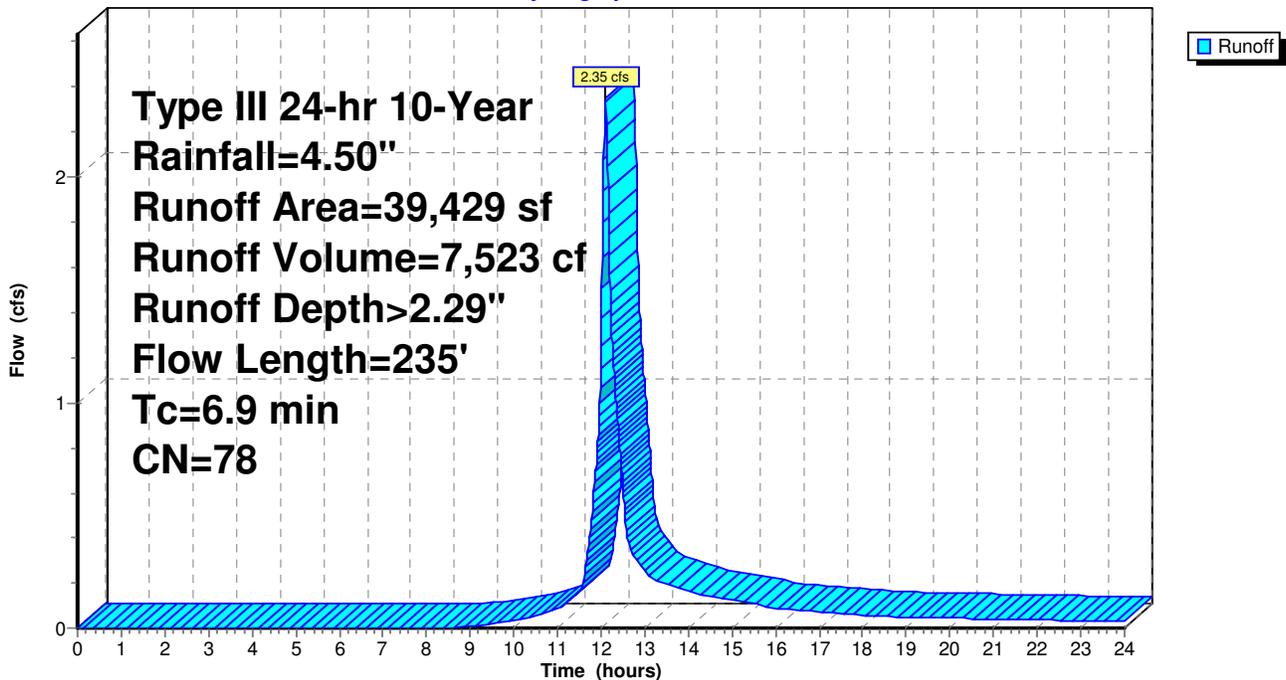
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
3,880	98	Paved parking & roofs
2,734	98	Paved parking & roofs
30,815	74	>75% Grass cover, Good, HSG C
2,000	70	Woods, Good, HSG C
39,429	78	Weighted Average
32,815		Pervious Area
6,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.1000	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	180	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
6.9	235	Total			

**Subcatchment 62S: Large Area including 2 Septics**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 65S: Throat of Cul-de-sac u.g.**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.90 cfs @ 12.01 hrs, Volume= 2,295 cf, Depth> 2.38"

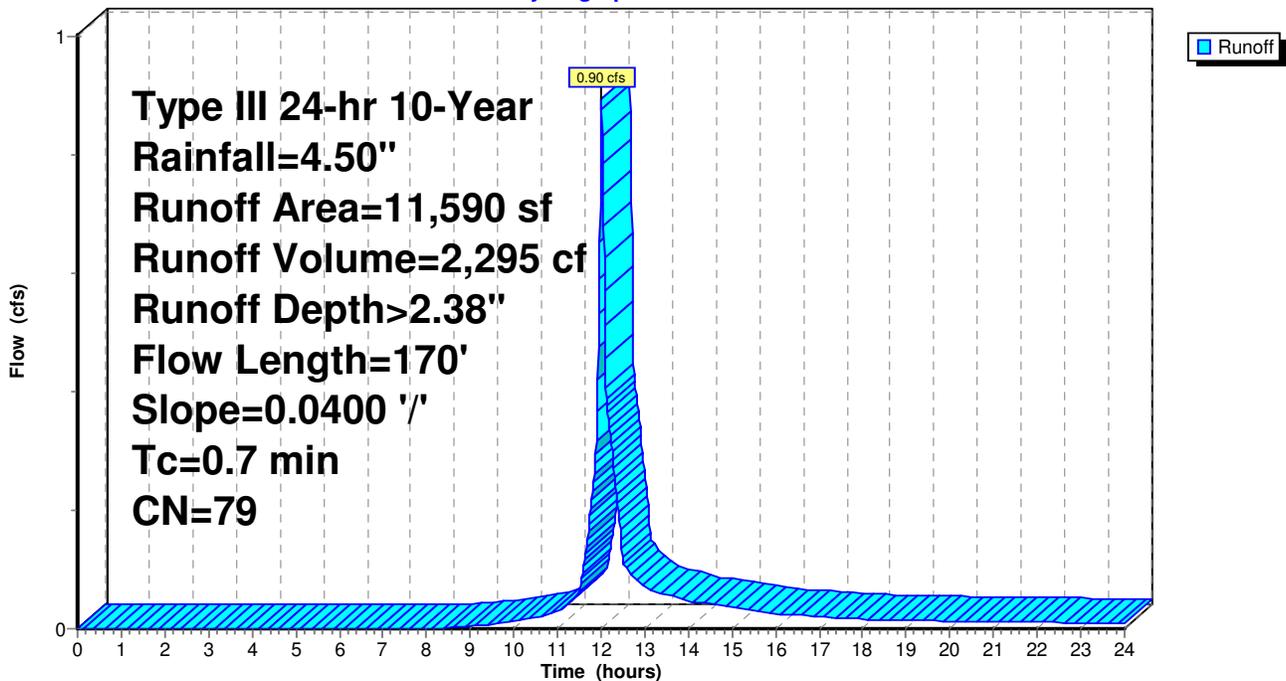
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
400	98	Paved parking & roofs
2,160	98	Paved parking & roofs
9,030	74	>75% Grass cover, Good, HSG C
11,590	79	Weighted Average
9,030		Pervious Area
2,560		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	170	0.0400	4.06		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 65S: Throat of Cul-de-sac u.g.**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Runoff = 1.04 cfs @ 12.05 hrs, Volume= 2,882 cf, Depth> 2.29"

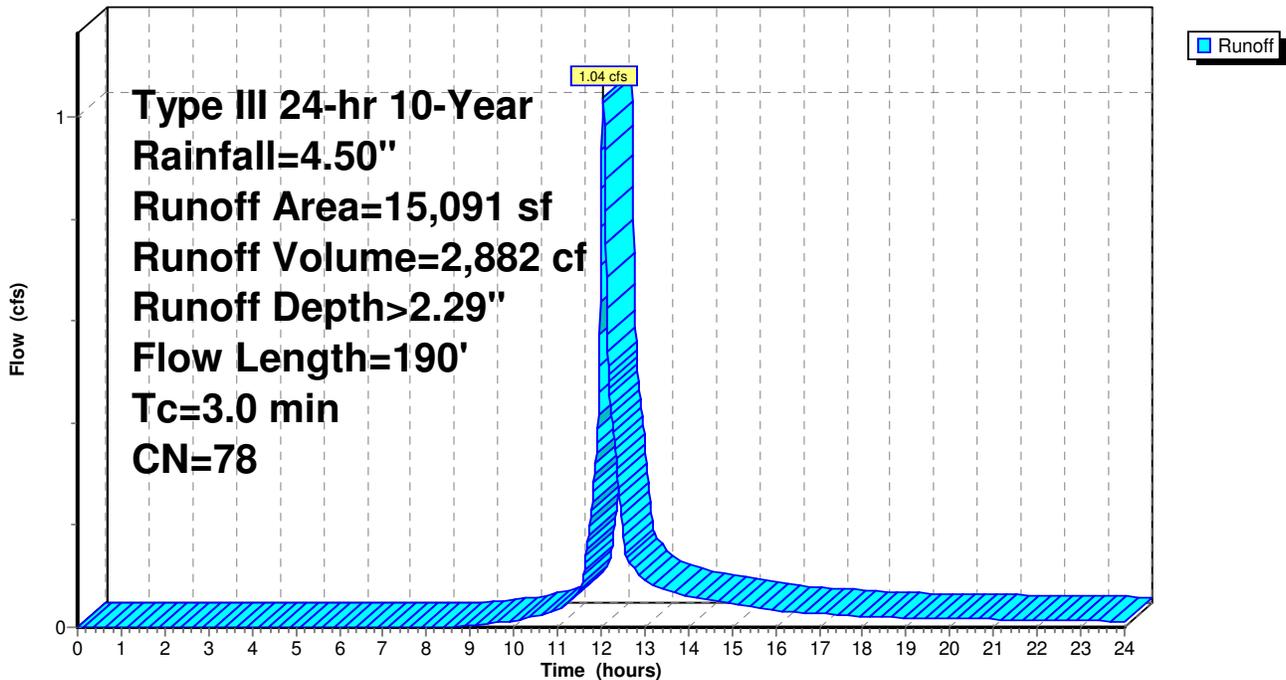
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
2,730	98	Paved parking & roofs
0	98	Paved parking & roofs
12,361	74	>75% Grass cover, Good, HSG C
15,091	78	Weighted Average
12,361		Pervious Area
2,730		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.1500	2.23		<b>Sheet Flow, Roof Unit 20</b> Smooth surfaces n= 0.011 P2= 3.20"
2.9	170	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.0	190	Total			

**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 110S: To CB 20**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.80 cfs @ 12.01 hrs, Volume= 2,072 cf, Depth> 3.20"

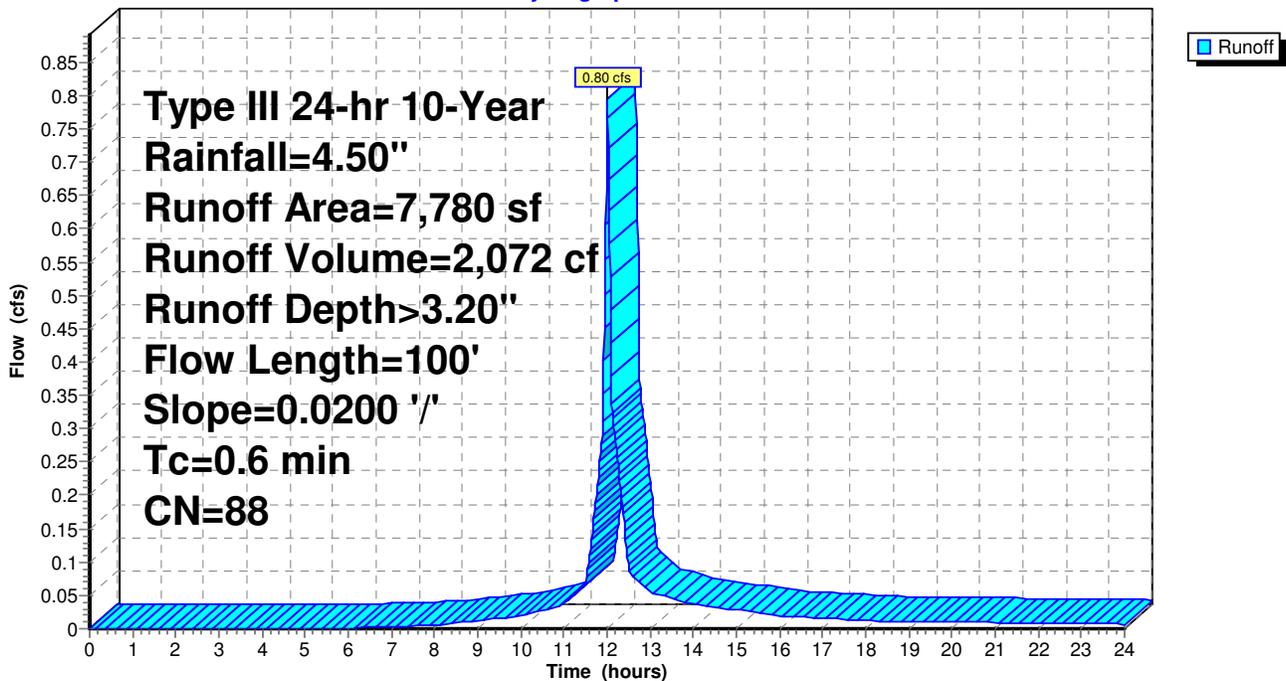
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
2,880	98	Paved parking & roofs
3,240	74	>75% Grass cover, Good, HSG C
7,780	88	Weighted Average
3,240		Pervious Area
4,540		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 110S: To CB 20**

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**Subcatchment 112S: To CB 22**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.26 cfs @ 12.01 hrs, Volume= 658 cf, Depth> 2.73"

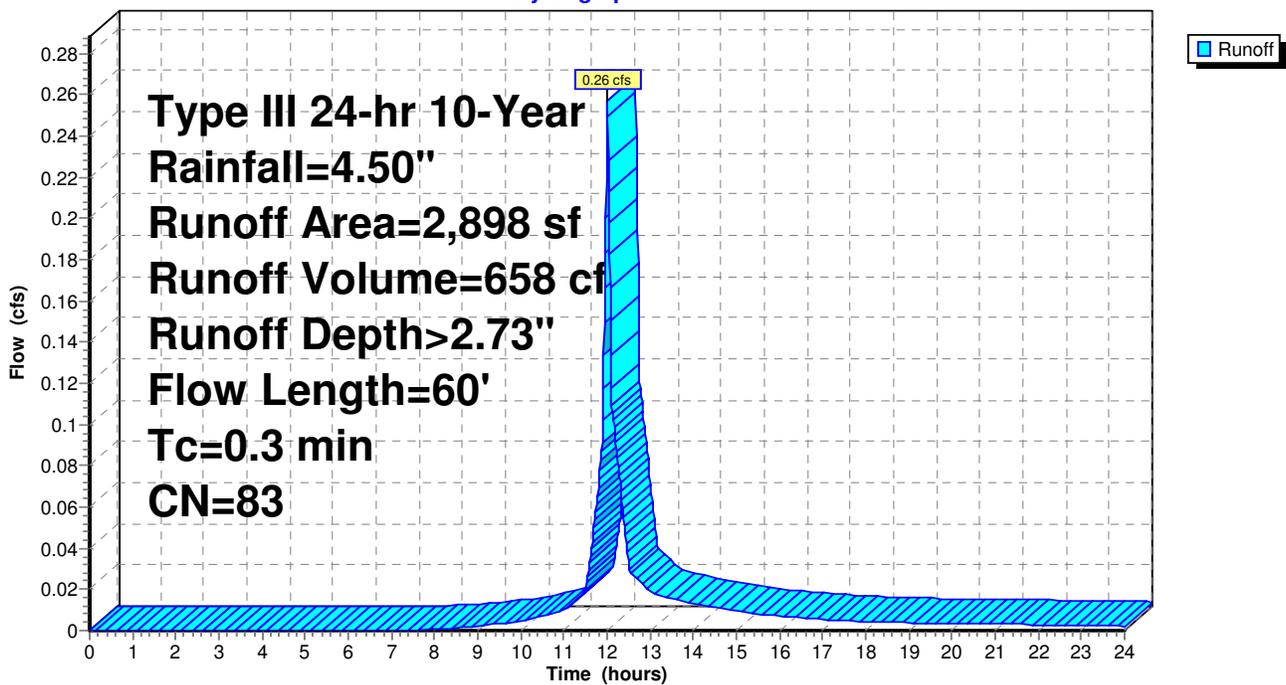
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
0	98	Paved parking & roofs
1,112	98	Paved parking & roofs
1,786	74	>75% Grass cover, Good, HSG C
2,898	83	Weighted Average
1,786		Pervious Area
1,112		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 112S: To CB 22**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 114S: Behind Units 1&2**

Runoff = 0.82 cfs @ 12.13 hrs, Volume= 2,806 cf, Depth> 2.21"

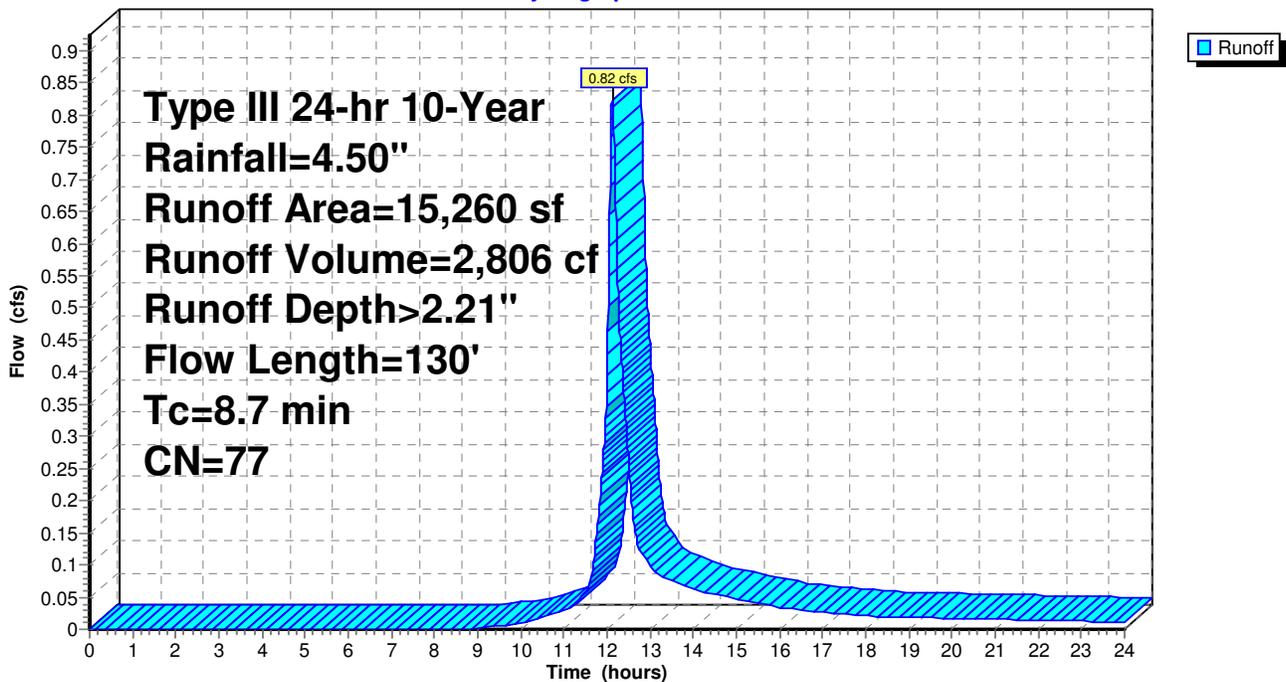
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
0	98	Paved parking & roofs
13,600	74	>75% Grass cover, Good, HSG C
15,260	77	Weighted Average
13,600		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
8.7	130	Total			

**Subcatchment 114S: Behind Units 1&2**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 116S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.33 cfs @ 12.00 hrs, Volume= 863 cf, Depth> 3.40"

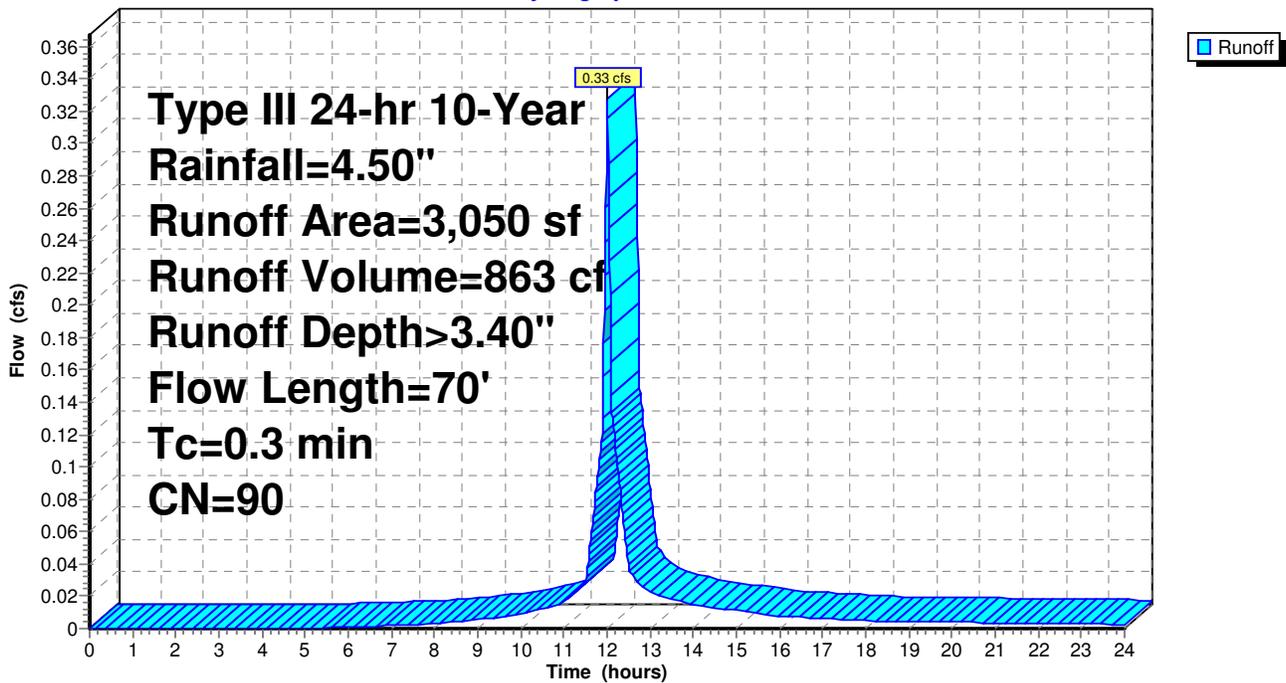
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,300	98	Paved parking & roofs
1,050	74	>75% Grass cover, Good, HSG C
3,050	90	Weighted Average
1,050		Pervious Area
2,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	40	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	70	Total			

**Subcatchment 116S:**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 118S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.37 cfs @ 12.00 hrs, Volume= 962 cf, Depth> 3.20"

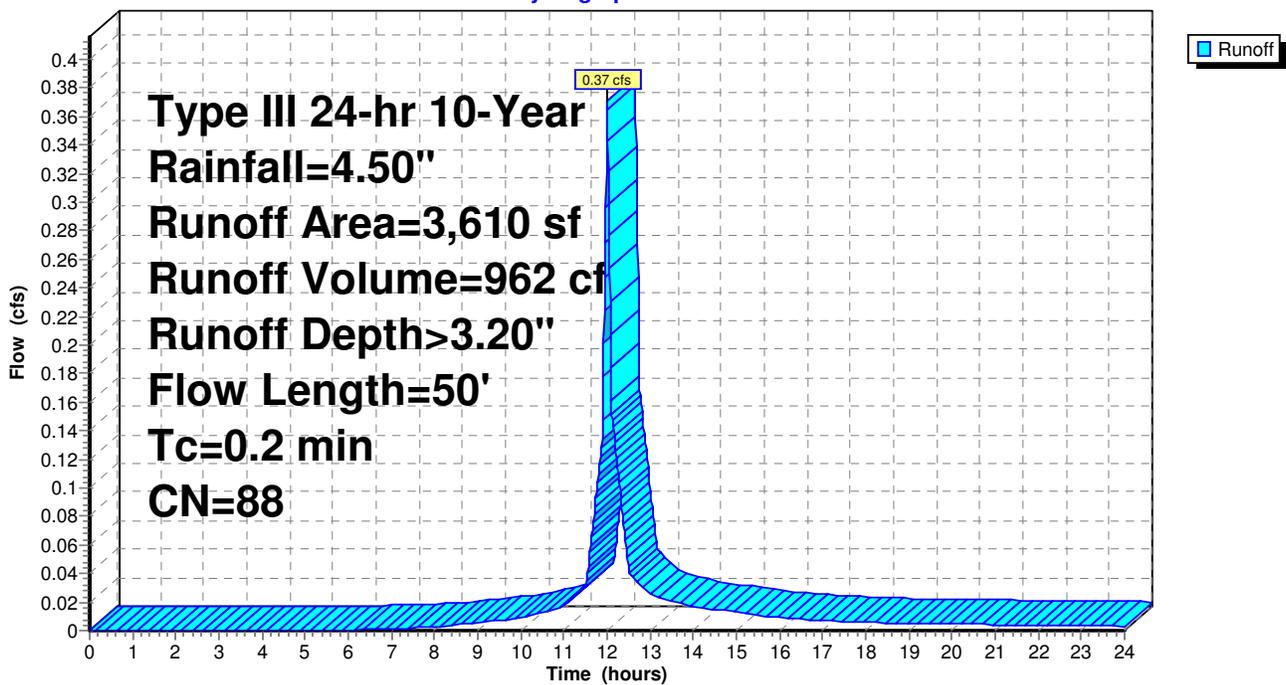
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,040	98	Paved parking & roofs
1,140	98	Paved parking & roofs
1,430	74	>75% Grass cover, Good, HSG C
3,610	88	Weighted Average
1,430		Pervious Area
2,180		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	50	Total			

**Subcatchment 118S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 120S:**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.62 cfs @ 12.01 hrs, Volume= 1,598 cf, Depth> 3.10"

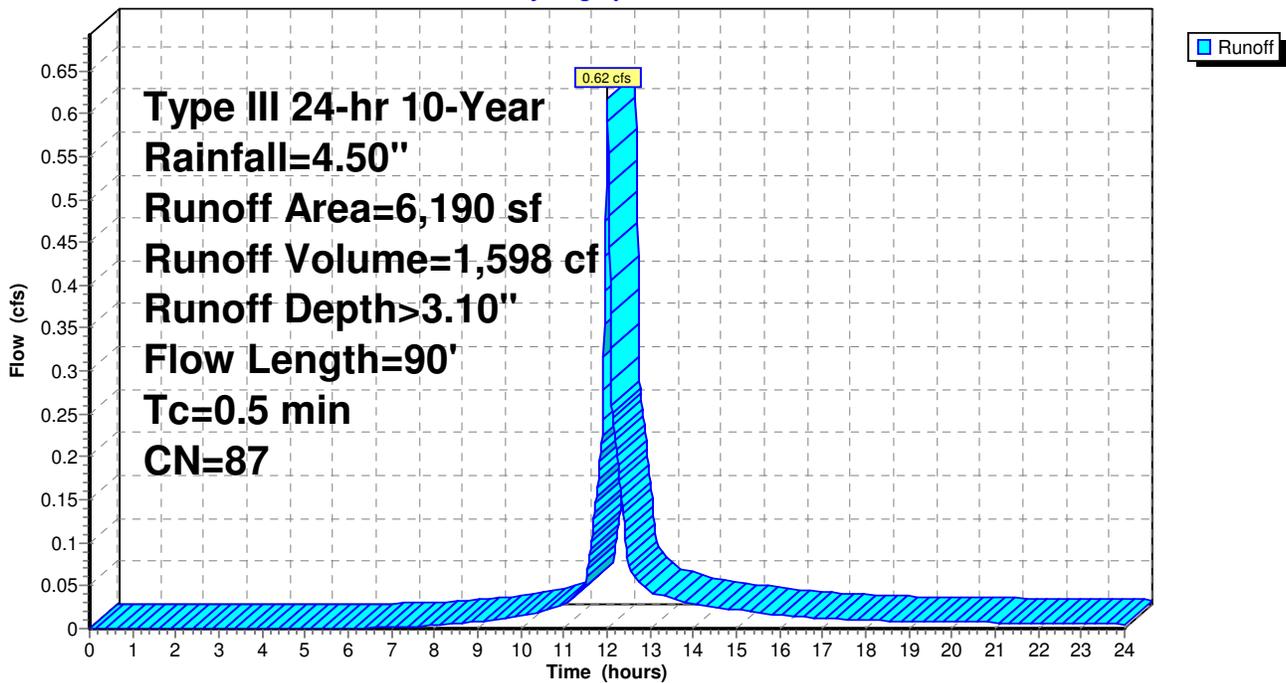
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,450	98	Paved parking & roofs
1,800	98	Paved parking & roofs
2,940	74	>75% Grass cover, Good, HSG C
6,190	87	Weighted Average
2,940		Pervious Area
3,250		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.4	60	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved $K_v=16.1$ fps
0.5	90	Total			

**Subcatchment 120S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 122S:**

Runoff = 0.39 cfs @ 12.06 hrs, Volume= 1,117 cf, Depth> 2.21"

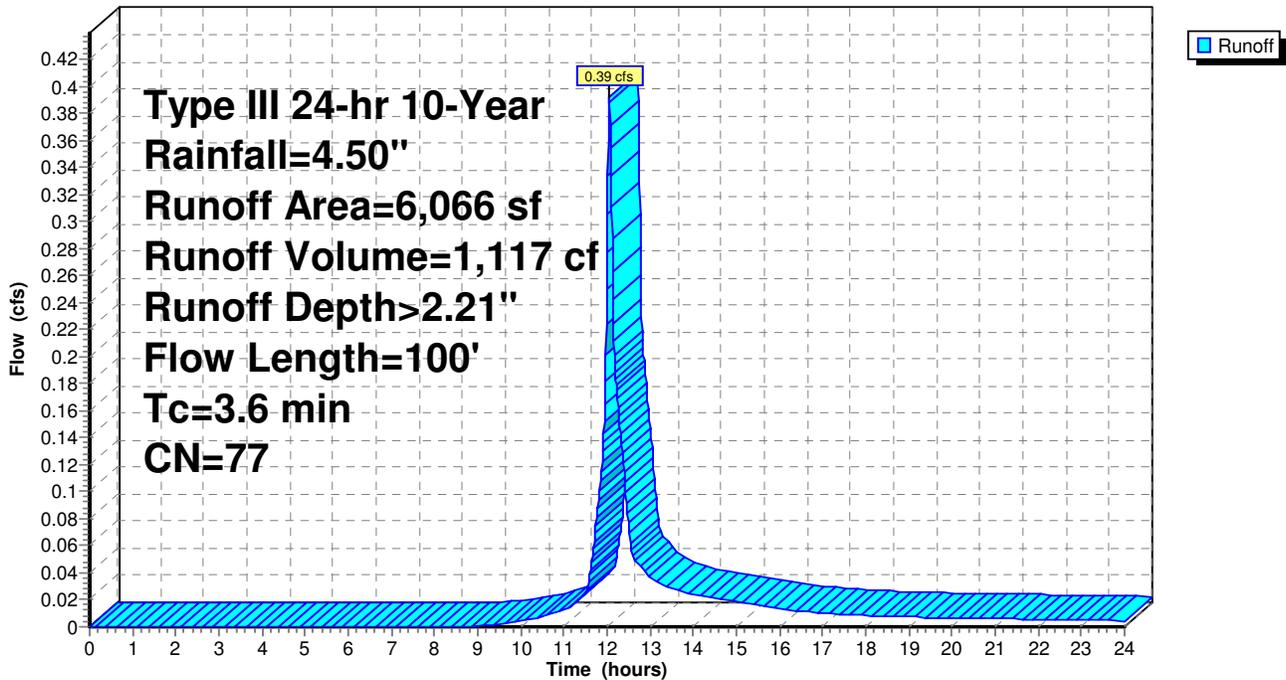
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
720	98	Paved parking & roofs
5,346	74	>75% Grass cover, Good, HSG C
6,066	77	Weighted Average
5,346		Pervious Area
720		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	20	0.0300	0.14		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.6	100	Total			

**Subcatchment 122S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 124S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.75 cfs @ 12.01 hrs, Volume= 1,937 cf, Depth> 3.10"

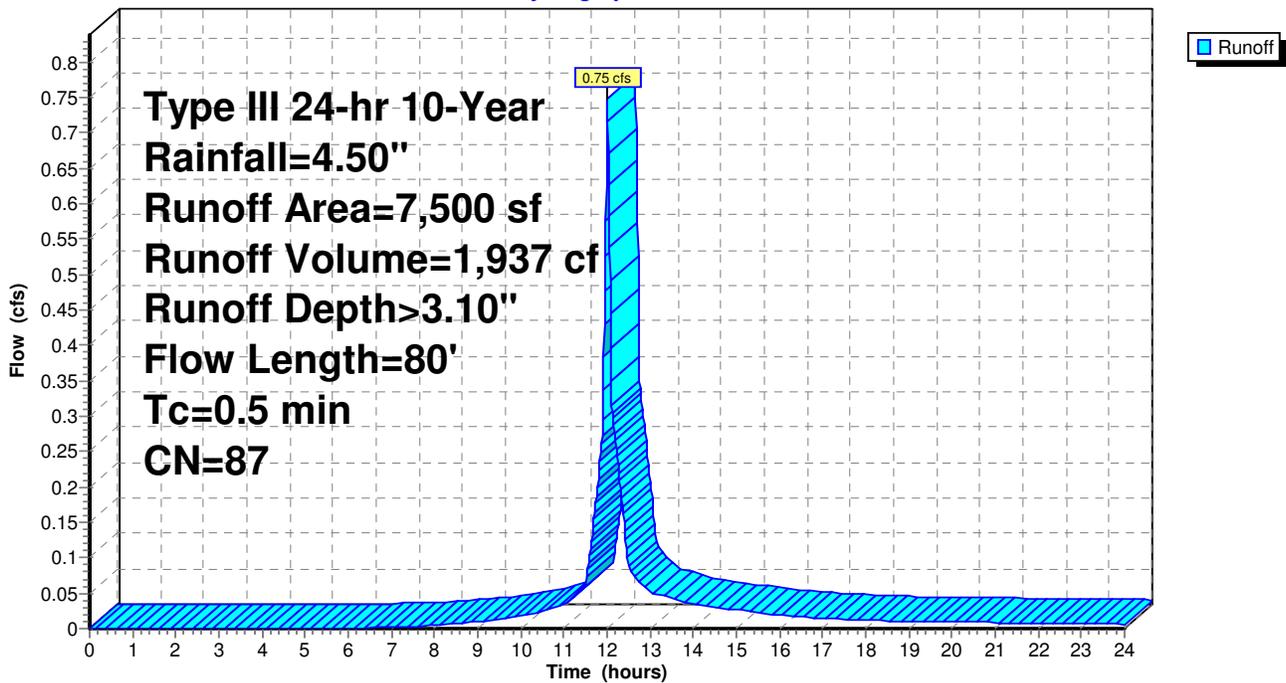
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,410	98	Paved parking & roofs
2,600	98	Paved parking & roofs
3,490	74	>75% Grass cover, Good, HSG C
7,500	87	Weighted Average
3,490		Pervious Area
4,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.5	80	Total			

**Subcatchment 124S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 126S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.54 cfs @ 12.01 hrs, Volume= 1,387 cf, Depth> 3.10"

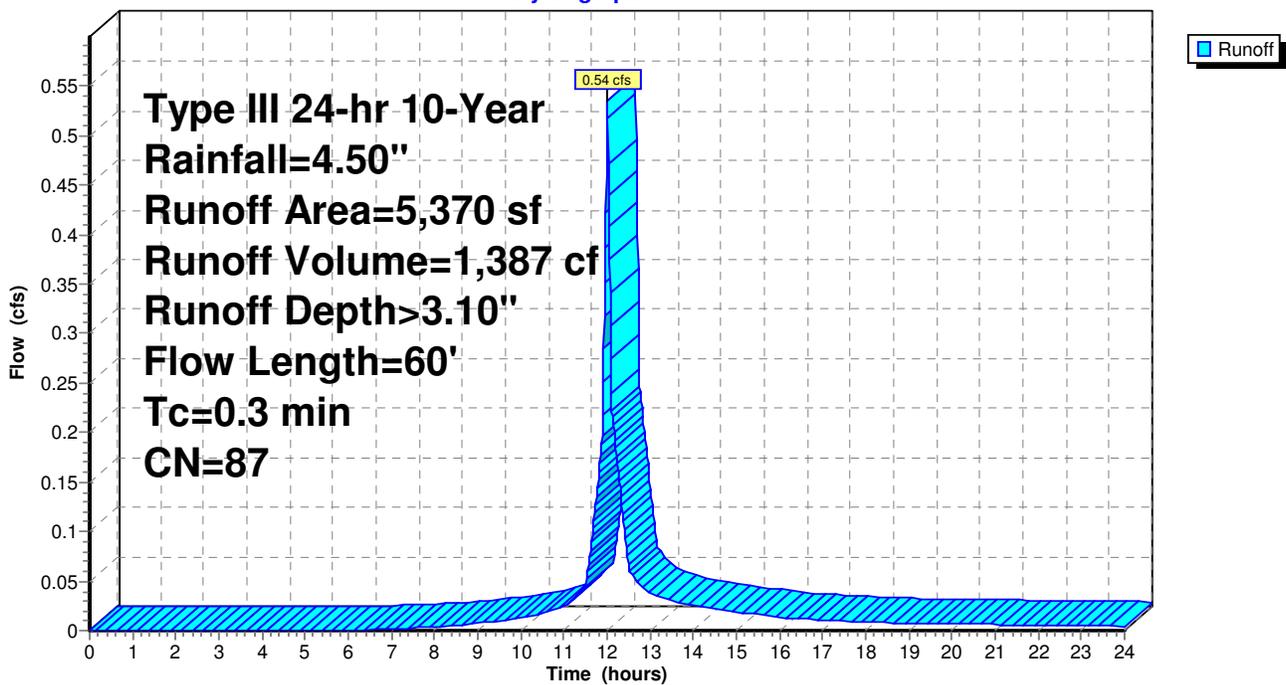
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,350	98	Paved parking & roofs
2,360	74	>75% Grass cover, Good, HSG C
5,370	87	Weighted Average
2,360		Pervious Area
3,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 126S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 128S:**

Runoff = 0.62 cfs @ 12.05 hrs, Volume= 1,745 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

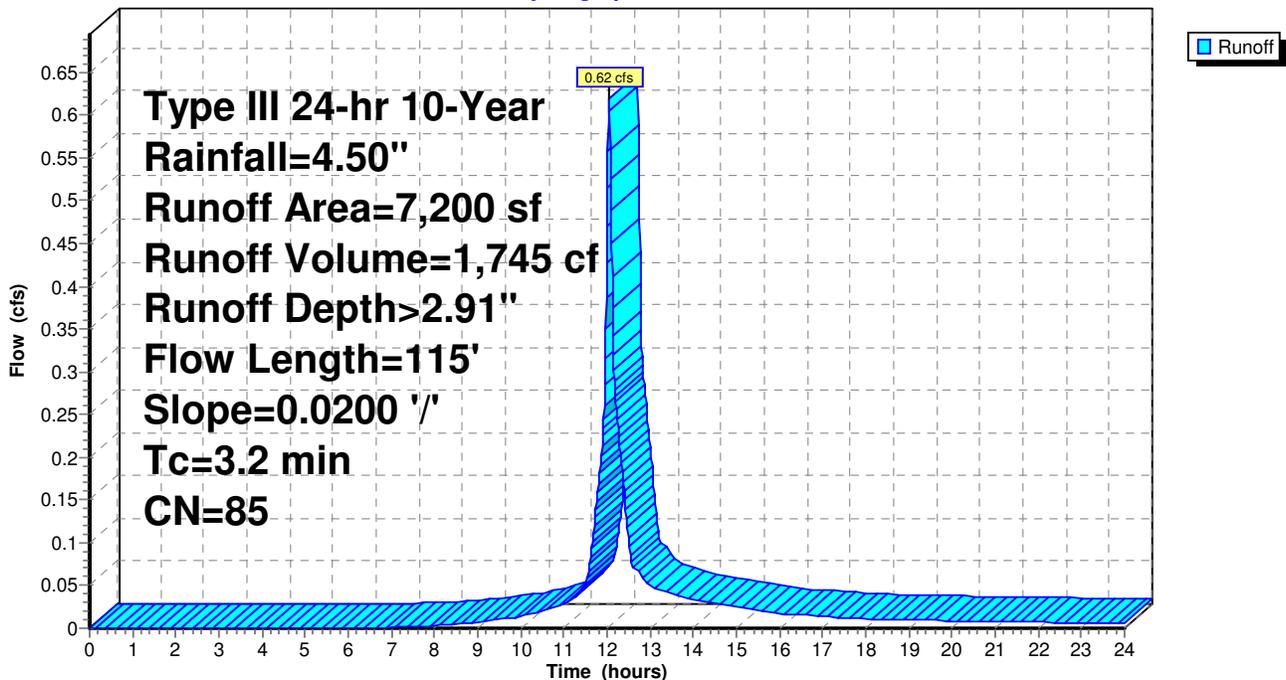
Area (sf)	CN	Description
1,550	98	Paved parking & roofs
1,600	98	Paved parking & roofs
4,050	74	>75% Grass cover, Good, HSG C
7,200	85	Weighted Average
4,050		Pervious Area
3,150		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.3	50	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	25	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	20	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.2	115	Total			

**Subcatchment 128S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 130S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.62 cfs @ 12.01 hrs, Volume= 1,579 cf, Depth> 2.73"

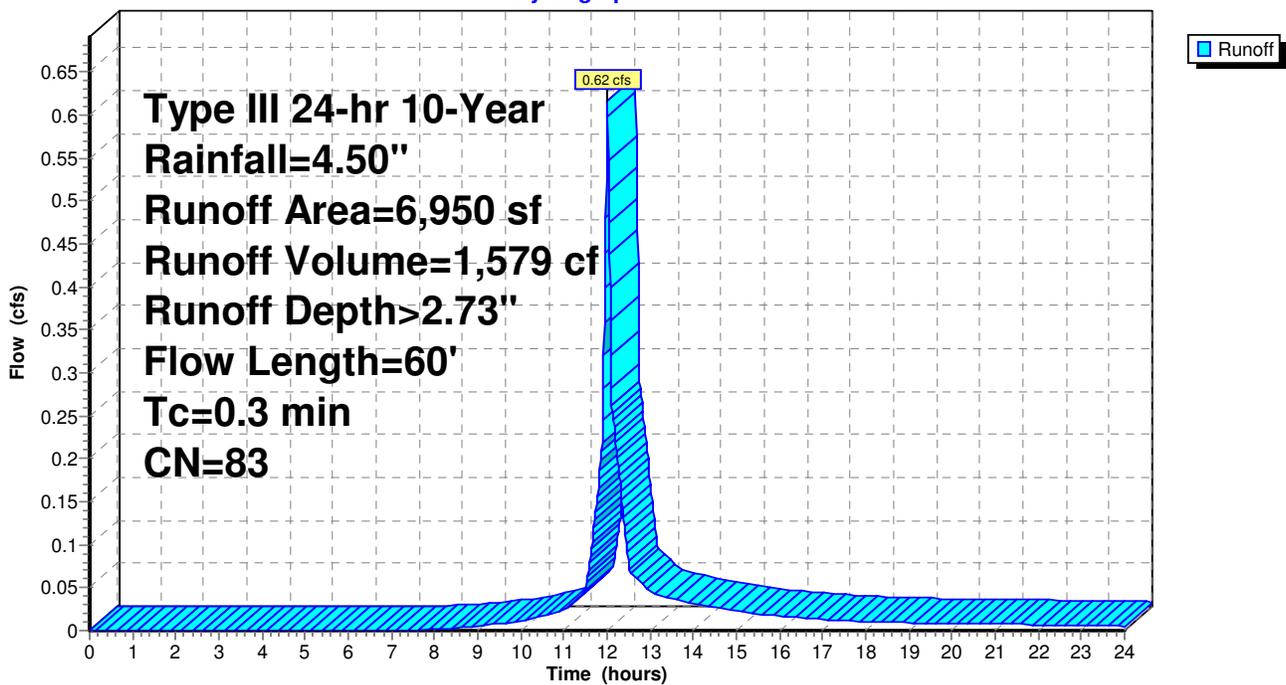
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.3	40	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.3	60	Total			

**Subcatchment 130S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 132S: Behind Unit 3**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.81 cfs @ 12.01 hrs, Volume= 4,662 cf, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

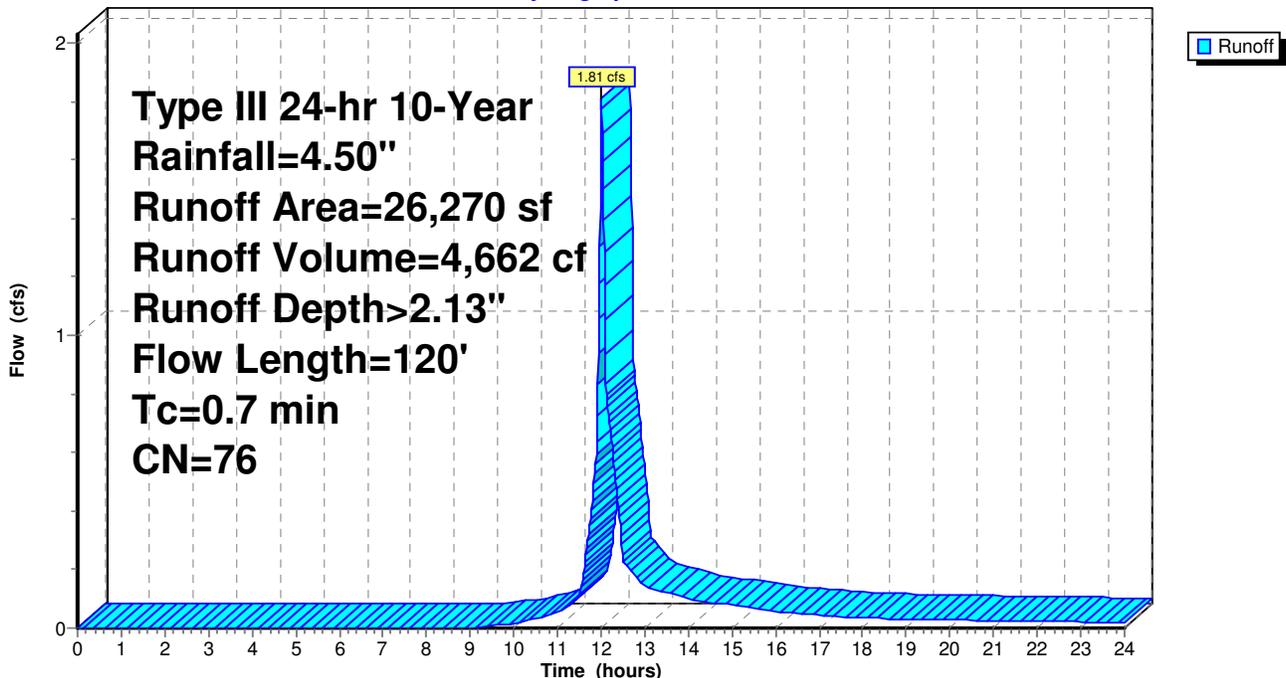
Area (sf)	CN	Description
2,100	98	Paved parking & roofs
24,170	74	>75% Grass cover, Good, HSG C
26,270	76	Weighted Average
24,170		Pervious Area
2,100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.0250	2.55		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.1	20	0.1500	6.24		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	0.2500	2.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	120	Total			

**Subcatchment 132S: Behind Unit 3**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 134S: To Swale behind 7,6,5**

Runoff = 0.98 cfs @ 12.05 hrs, Volume= 2,741 cf, Depth> 2.38"

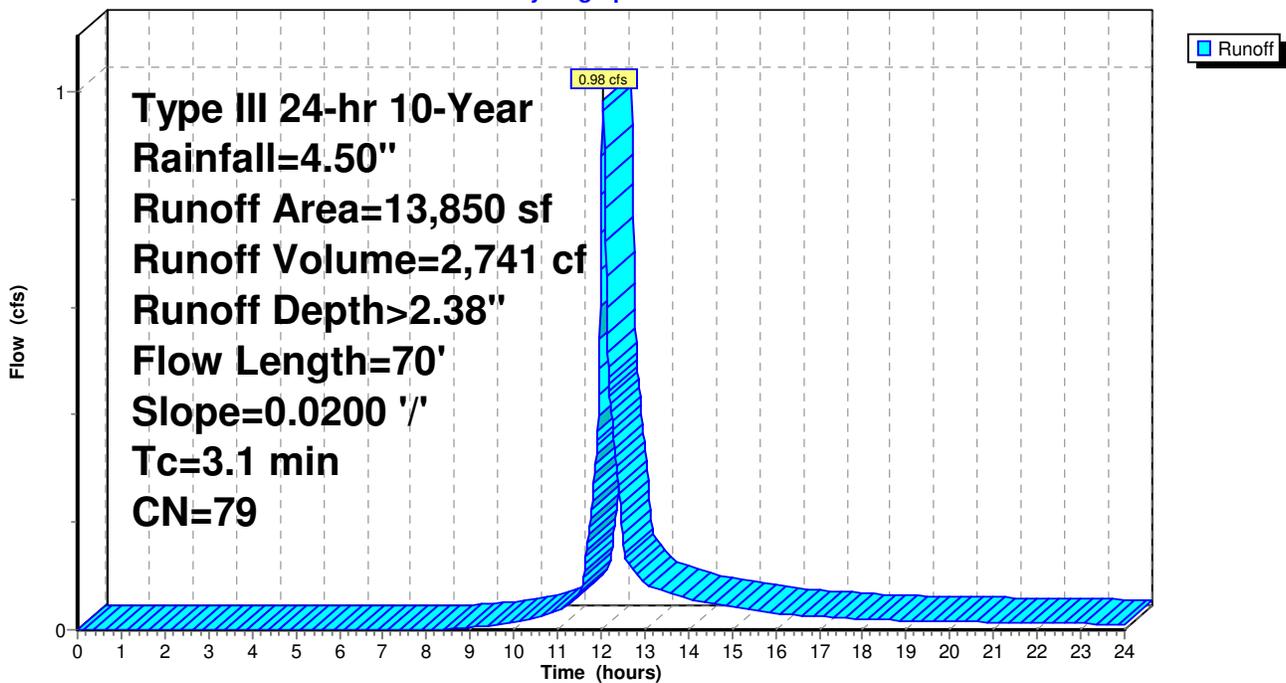
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
3,000	98	Paved parking & roofs
10,850	74	>75% Grass cover, Good, HSG C
13,850	79	Weighted Average
10,850		Pervious Area
3,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.1	70	Total			

**Subcatchment 134S: To Swale behind 7,6,5**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 136S: To Swale behind 4 to HW 30**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 1.46 cfs @ 12.01 hrs, Volume= 3,738 cf, Depth> 2.13"

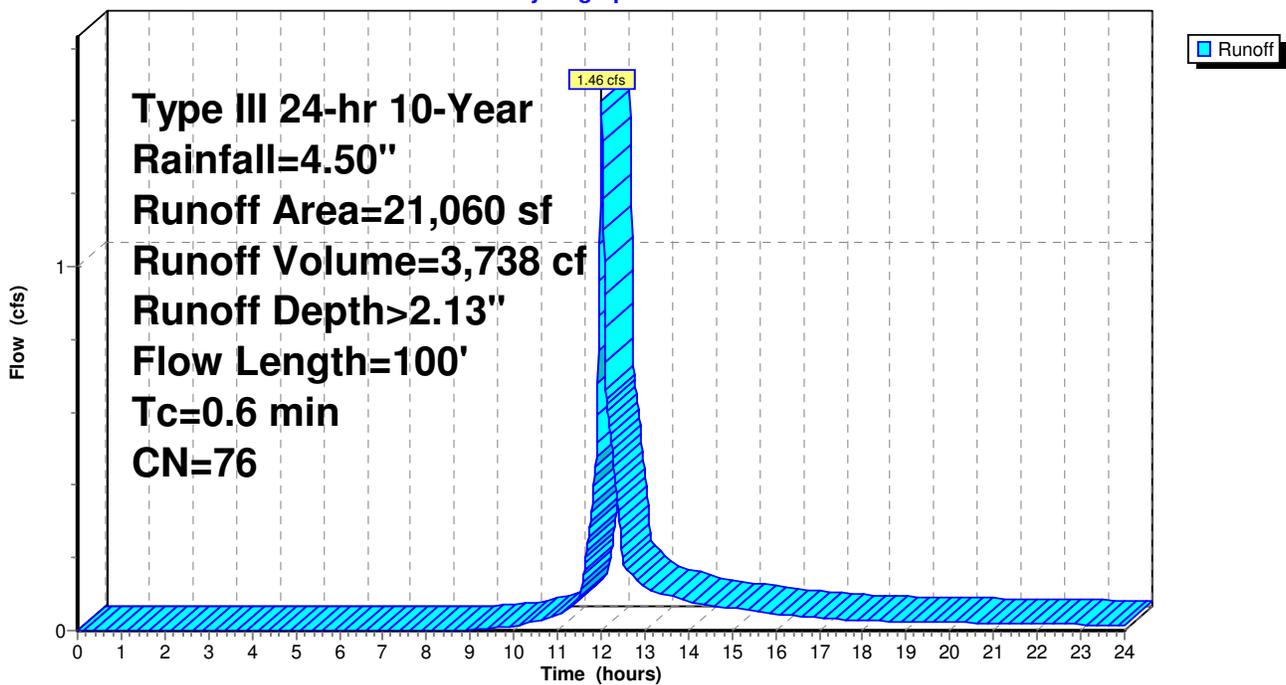
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,700	70	Woods, Good, HSG C
17,700	74	>75% Grass cover, Good, HSG C
21,060	76	Weighted Average
19,400		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.5	70	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v=16.1$ fps
0.6	100	Total			

**Subcatchment 136S: To Swale behind 4 to HW 30**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Runoff = 0.82 cfs @ 12.17 hrs, Volume= 3,076 cf, Depth> 2.46"

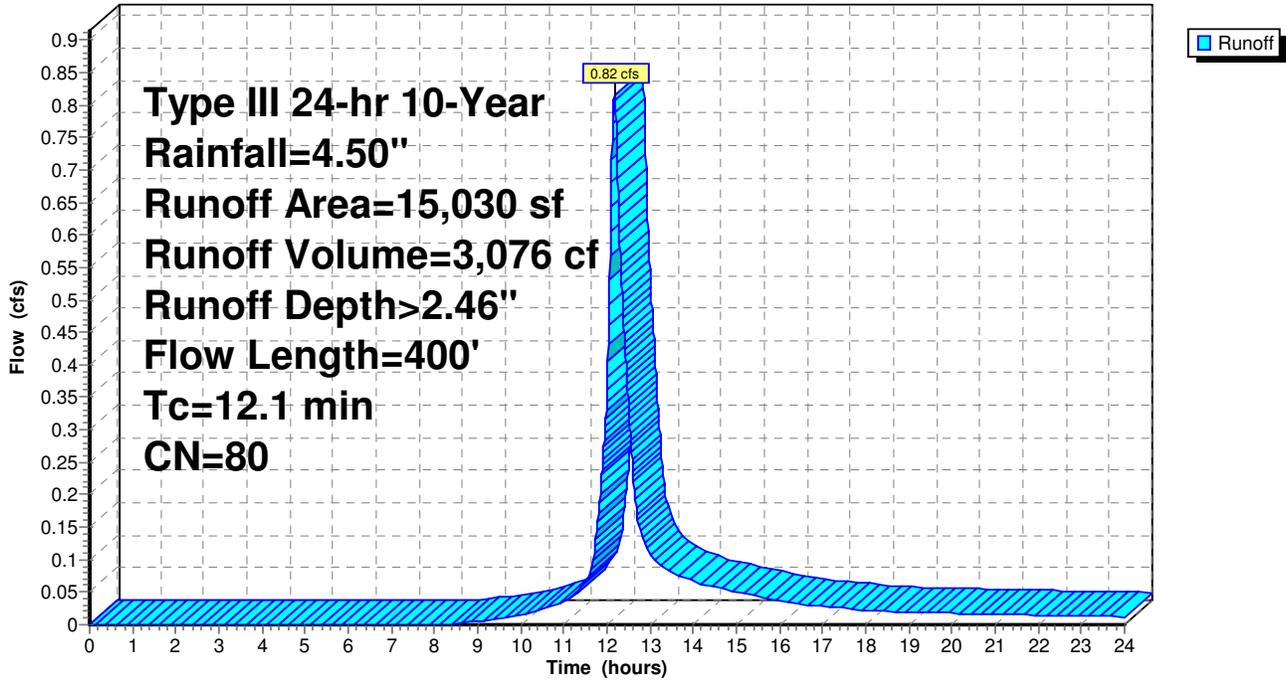
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
3,500	98	Paved parking & roofs
0	98	Paved parking & roofs
11,530	74	>75% Grass cover, Good, HSG C
15,030	80	Weighted Average
11,530		Pervious Area
3,500		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.2	50	0.2500	3.50		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.5	150	0.0500	4.63	2.02	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.25' Z= 3.0 '/' Top.W=2.50' n= 0.022 Earth, clean & straight
0.6	150	0.0300	3.89	2.68	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=0.25' Z= 3.0 '/' Top.W=3.50' n= 0.022 Earth, clean & straight
12.1	400	Total			

Subcatchment 138S: Rear of Units 10,11,12,13

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 140S: Behind Units 14, 15, 16**

Runoff = 1.02 cfs @ 12.16 hrs, Volume= 3,829 cf, Depth> 2.12"

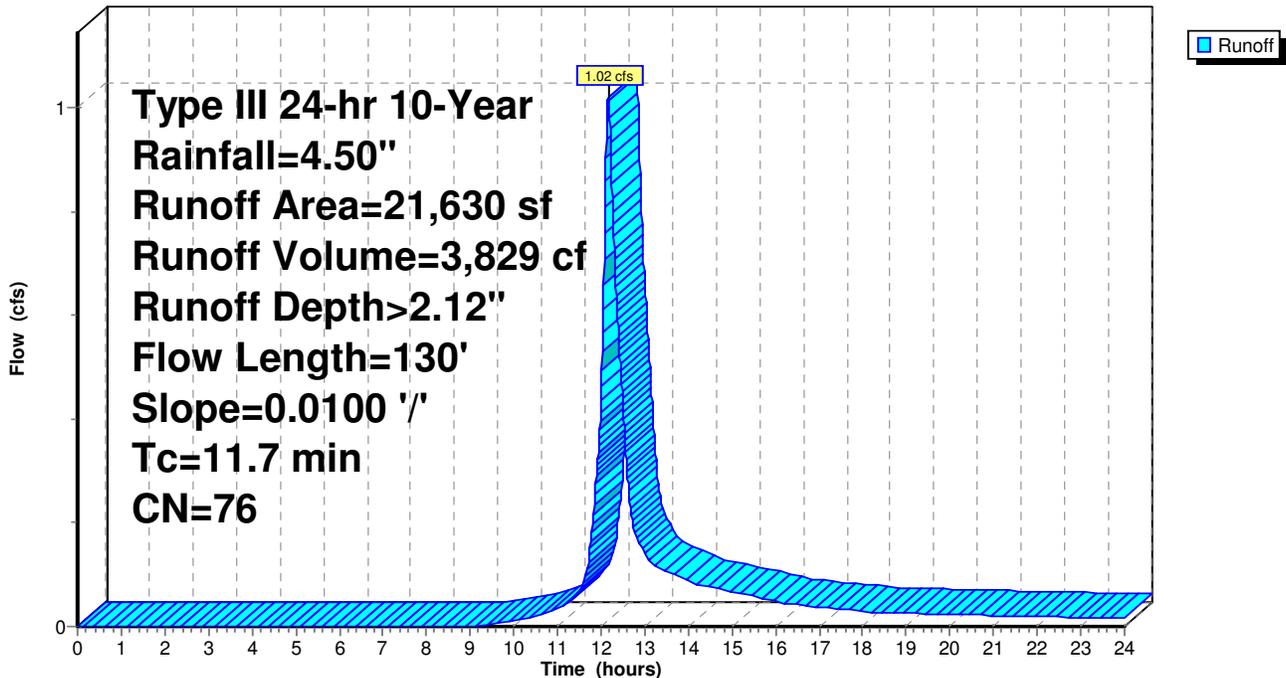
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
2,400	98	Paved parking & roofs
0	98	Paved parking & roofs
15,230	74	>75% Grass cover, Good, HSG C
4,000	70	Woods, Good, HSG C
21,630	76	Weighted Average
19,230		Pervious Area
2,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.9	80	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
11.7	130	Total			

**Subcatchment 140S: Behind Units 14, 15, 16**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Subcatchment 214S:

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.61 cfs @ 12.02 hrs, Volume= 1,578 cf, Depth> 2.73"

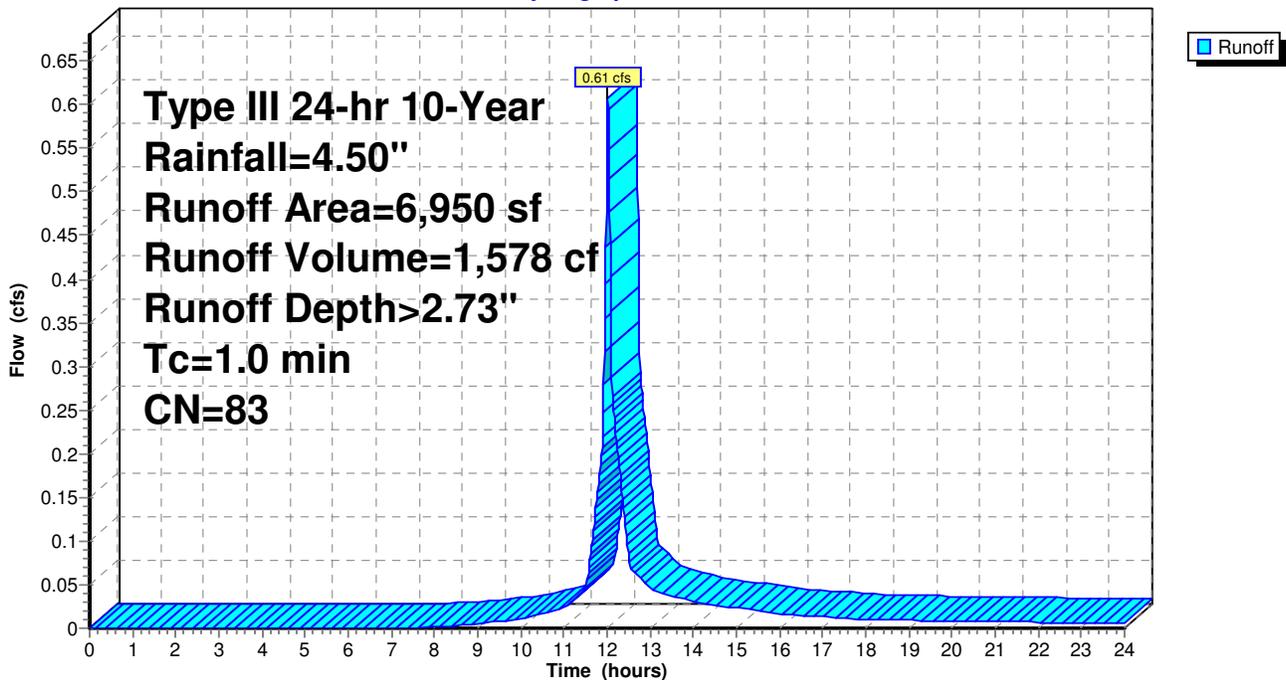
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt= 0.01$  hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

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

## Subcatchment 214S:

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 216S:**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.38 cfs @ 12.02 hrs, Volume= 1,004 cf, Depth> 2.91"

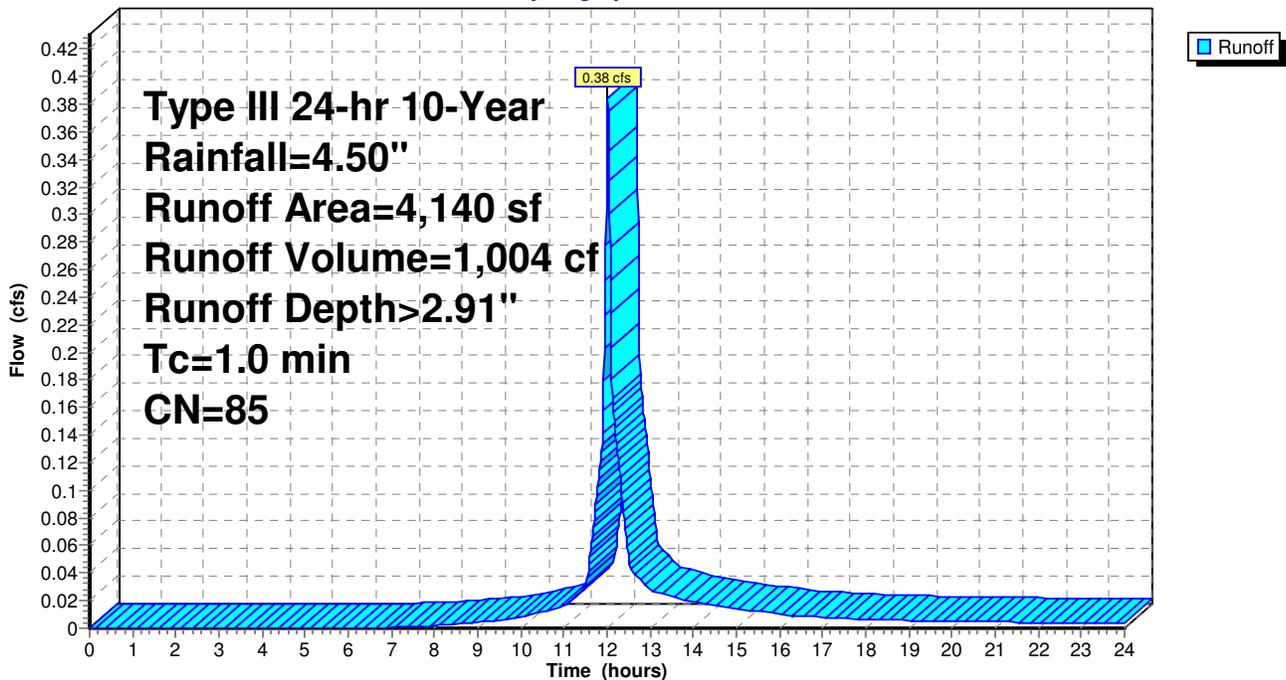
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt= 0.01$  hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,200	98	Paved parking & roofs
2,240	74	>75% Grass cover, Good, HSG C
4,140	85	Weighted Average
2,240		Pervious Area
1,900		Impervious Area

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

**Subcatchment 216S:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.50 cfs @ 12.17 hrs, Volume= 1,957 cf, Depth> 1.67"

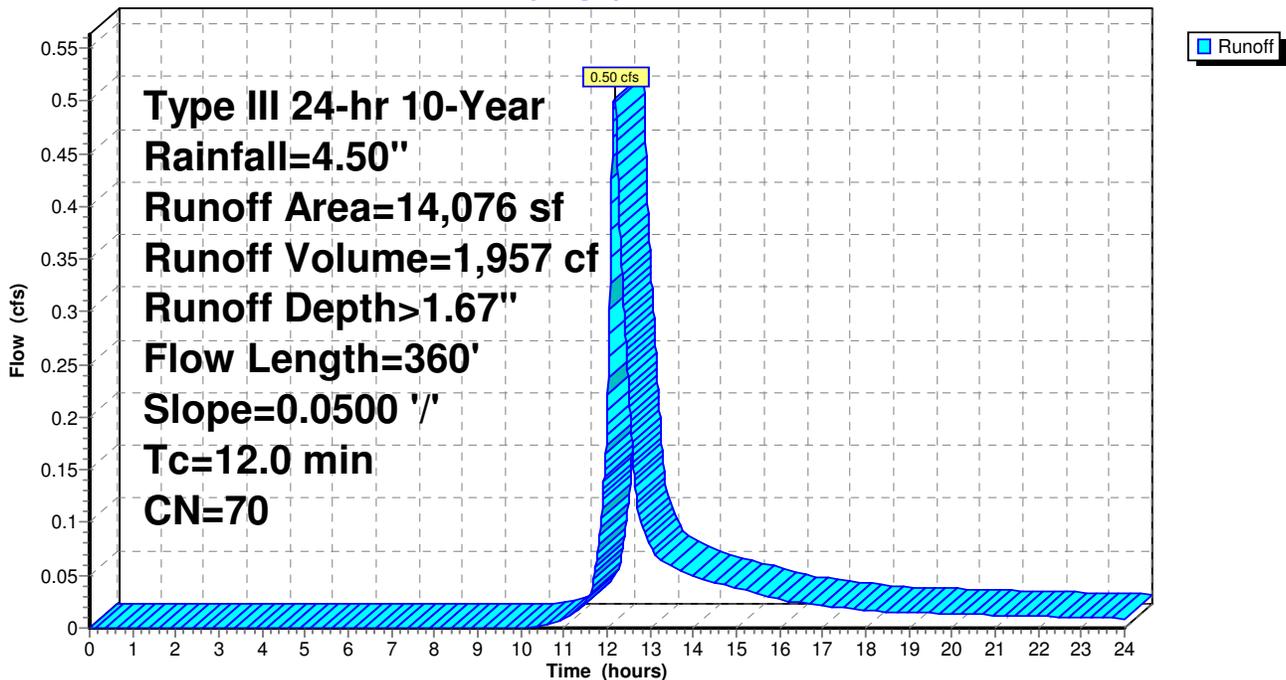
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	40	0.0500	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	320	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.0	360	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Reach 1R: Existing wetland channel to WF 16**

Inflow Area = 162,206 sf, Inflow Depth > 2.07" for 10-Year event  
Inflow = 7.24 cfs @ 12.14 hrs, Volume= 28,007 cf  
Outflow = 7.22 cfs @ 12.18 hrs, Volume= 27,962 cf, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.55 fps, Min. Travel Time= 1.1 min  
Avg. Velocity = 1.33 fps, Avg. Travel Time= 3.8 min

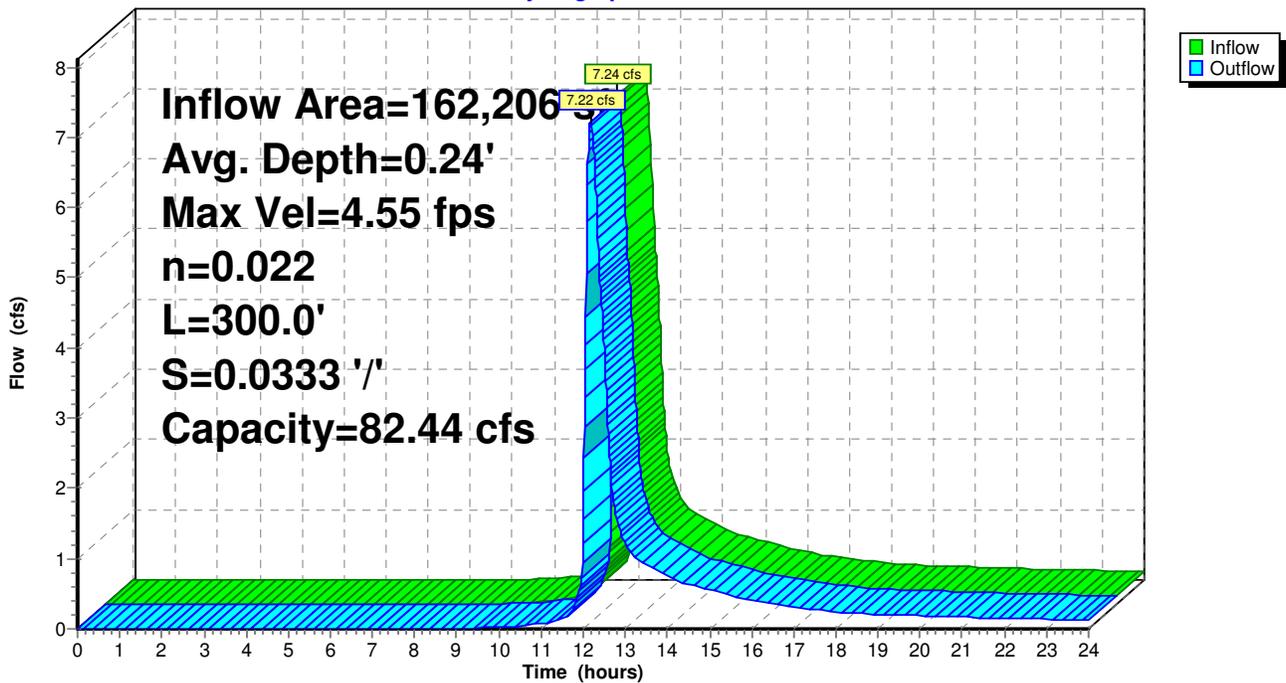
Peak Storage= 476 cf @ 12.16 hrs, Average Depth at Peak Storage= 0.24'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 82.44 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 300.0' Slope= 0.0333 '/'  
Inlet Invert= 96.00', Outlet Invert= 86.00'



**Reach 1R: Existing wetland channel to WF 16**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 2R: CB 23 to HW 40

[52] Hint: Inlet conditions not evaluated

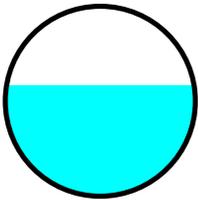
[79] Warning: Submerged Pond 2P Primary device # 2 by 0.73'

Inflow Area = 111,470 sf, Inflow Depth > 2.06" for 10-Year event  
Inflow = 5.84 cfs @ 12.10 hrs, Volume= 19,149 cf  
Outflow = 5.06 cfs @ 12.10 hrs, Volume= 19,145 cf, Atten= 13%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.84 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 2.98 fps, Avg. Travel Time= 0.4 min

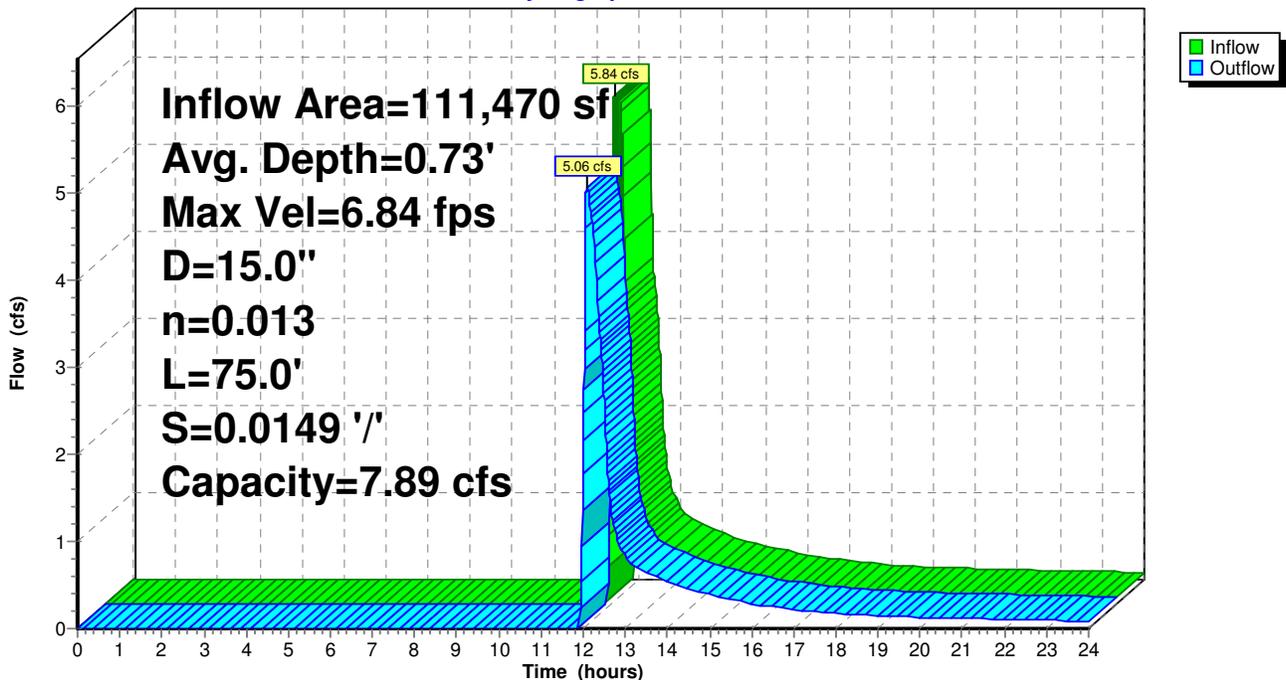
Peak Storage= 56 cf @ 12.06 hrs, Average Depth at Peak Storage= 0.73'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 7.89 cfs

15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 75.0' Slope= 0.0149 '/'  
Inlet Invert= 103.22', Outlet Invert= 102.10'



## Reach 2R: CB 23 to HW 40

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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### Reach 55R: DMH 52 to DMH 50

[52] Hint: Inlet conditions not evaluated

[61] Hint: Submerged 14% of Reach 69R bottom

[62] Warning: Submerged 32% of Reach 220R inlet

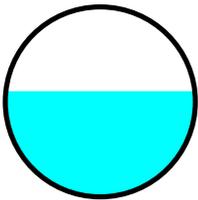
[62] Warning: Submerged 24% of Reach 222R inlet

Inflow Area = 40,720 sf, Inflow Depth > 2.67" for 10-Year event  
Inflow = 3.48 cfs @ 12.02 hrs, Volume= 9,061 cf  
Outflow = 3.48 cfs @ 12.02 hrs, Volume= 9,060 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.76 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.56 fps, Avg. Travel Time= 0.2 min

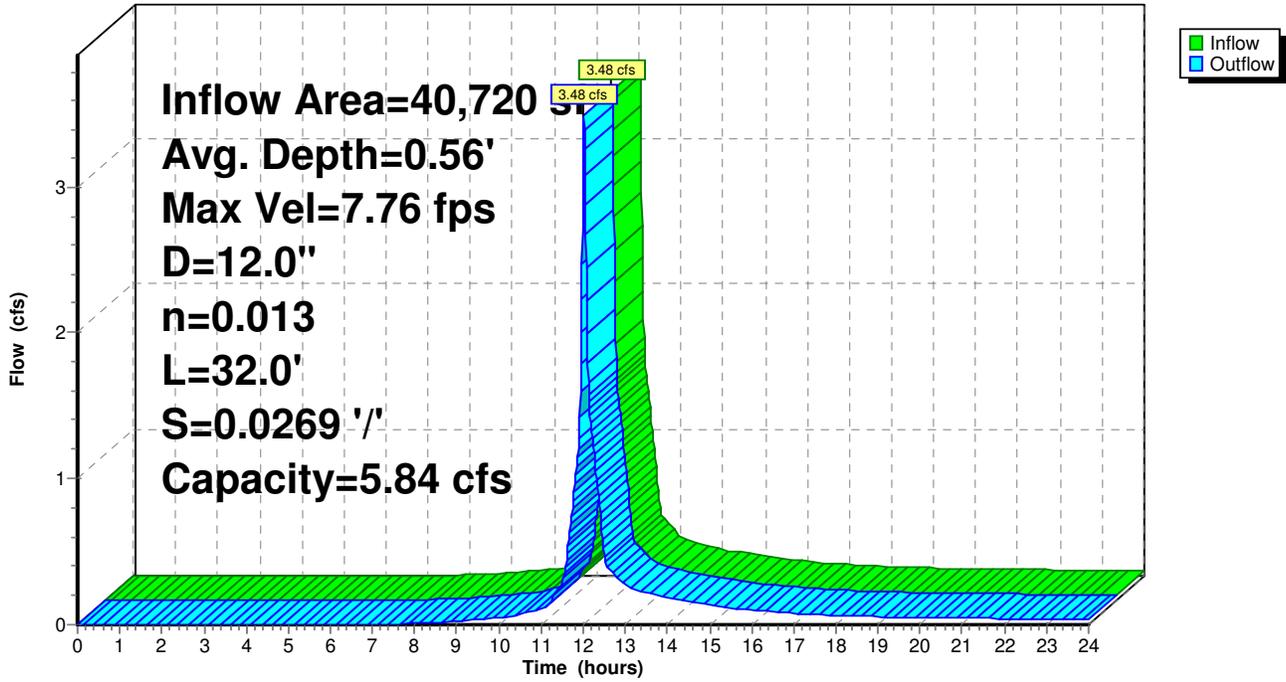
Peak Storage= 14 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.56'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.84 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 32.0' Slope= 0.0269 '/'  
Inlet Invert= 102.48', Outlet Invert= 101.62'



Reach 55R: DMH 52 to DMH 50

Hydrograph



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## Reach 62R: DMH 64 to Bio-Retention A (HW 46)

[52] Hint: Inlet conditions not evaluated

[81] Warning: Exceeded Pond 43R by 0.07' @ 12.13 hrs

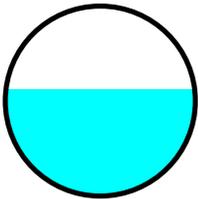
[79] Warning: Submerged Pond 61R Primary device # 1 INLET by 0.22'

Inflow Area = 44,069 sf, Inflow Depth > 2.40" for 10-Year event  
Inflow = 2.66 cfs @ 12.09 hrs, Volume= 8,797 cf  
Outflow = 2.66 cfs @ 12.09 hrs, Volume= 8,796 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.83 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.1 min

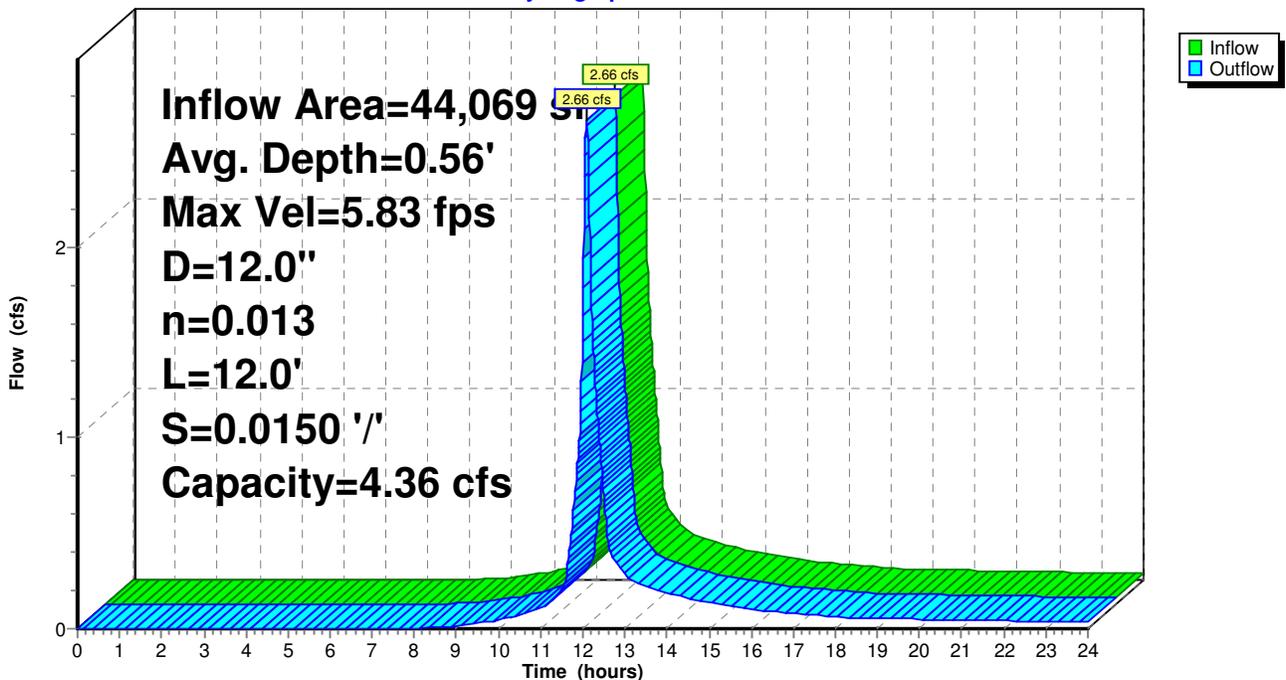
Peak Storage= 5 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.56'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.36 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 12.0' Slope= 0.0150 '/'  
Inlet Invert= 110.80', Outlet Invert= 110.62'



## Reach 62R: DMH 64 to Bio-Retention A (HW 46)

Hydrograph



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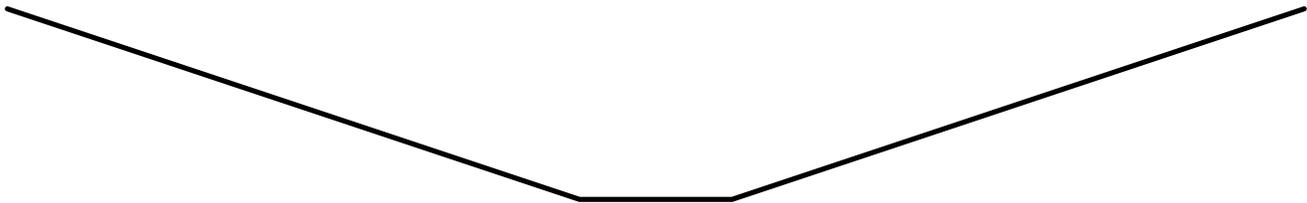
**Reach 64R: Swale from Drive at #12 to RG 10A**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

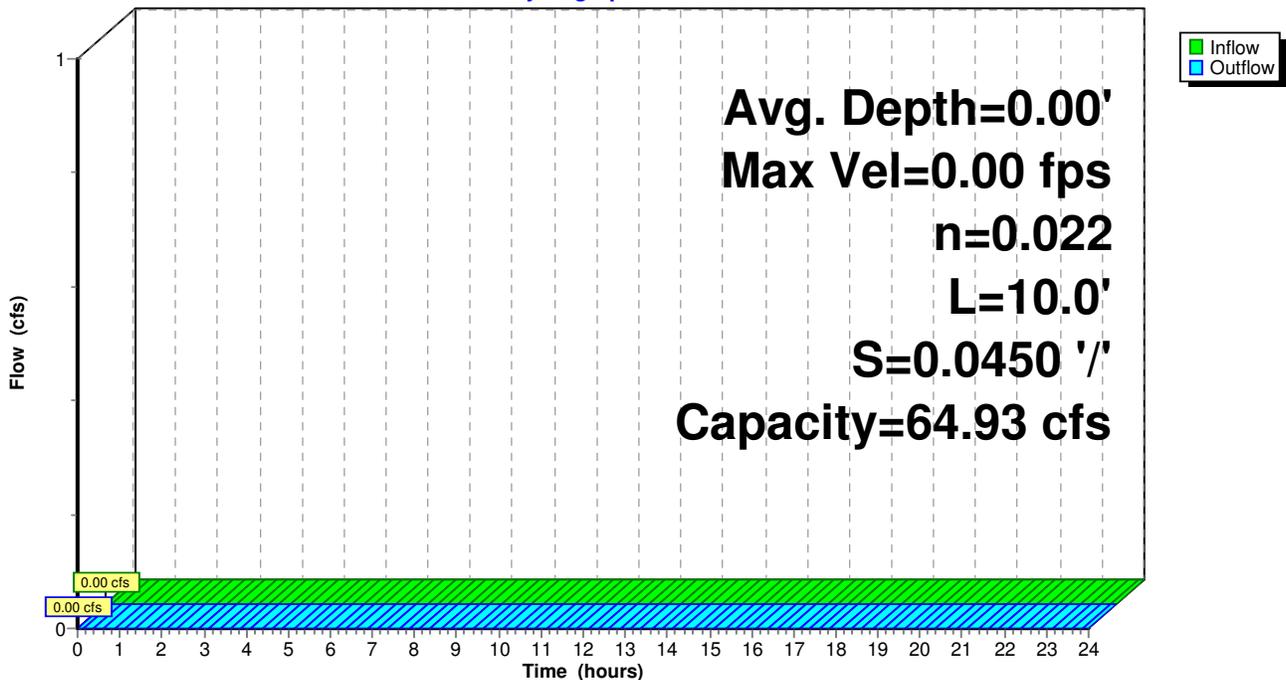
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 108.12', Outlet Invert= 107.67'



**Reach 64R: Swale from Drive at #12 to RG 10A**

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## Reach 67R: Culvert under Unit 12 Drive

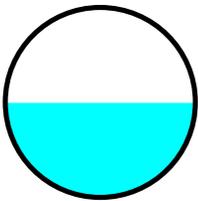
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 2.54" for 10-Year event  
Inflow = 0.60 cfs @ 12.02 hrs, Volume= 1,472 cf  
Outflow = 0.60 cfs @ 12.03 hrs, Volume= 1,472 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.45 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.27 fps, Avg. Travel Time= 0.6 min

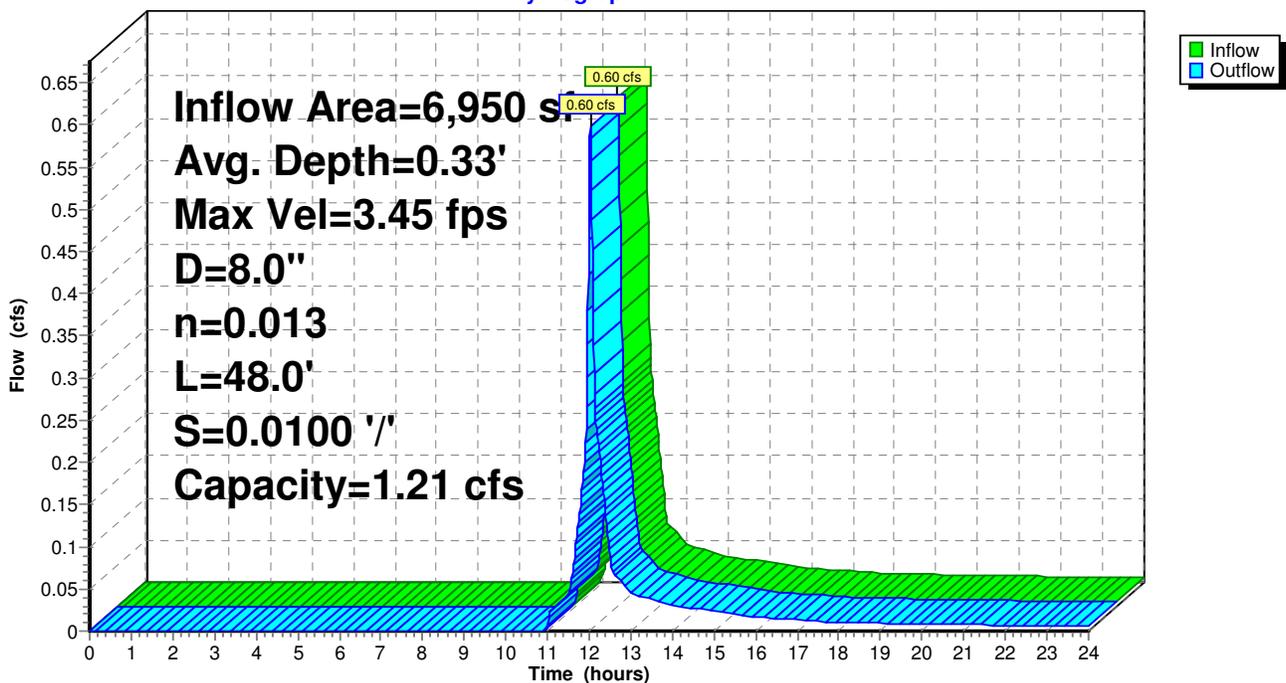
Peak Storage= 8 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.33'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 105.97', Outlet Invert= 105.49'



## Reach 67R: Culvert under Unit 12 Drive

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 68R: Underdrain to CB 66

[52] Hint: Inlet conditions not evaluated

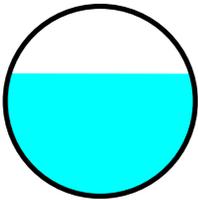
[79] Warning: Submerged Pond 8P Primary device # 7 INLET by 0.68'

Inflow Area = 44,069 sf, Inflow Depth > 2.30" for 10-Year event  
Inflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf  
Outflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 9.31 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 4.01 fps, Avg. Travel Time= 0.1 min

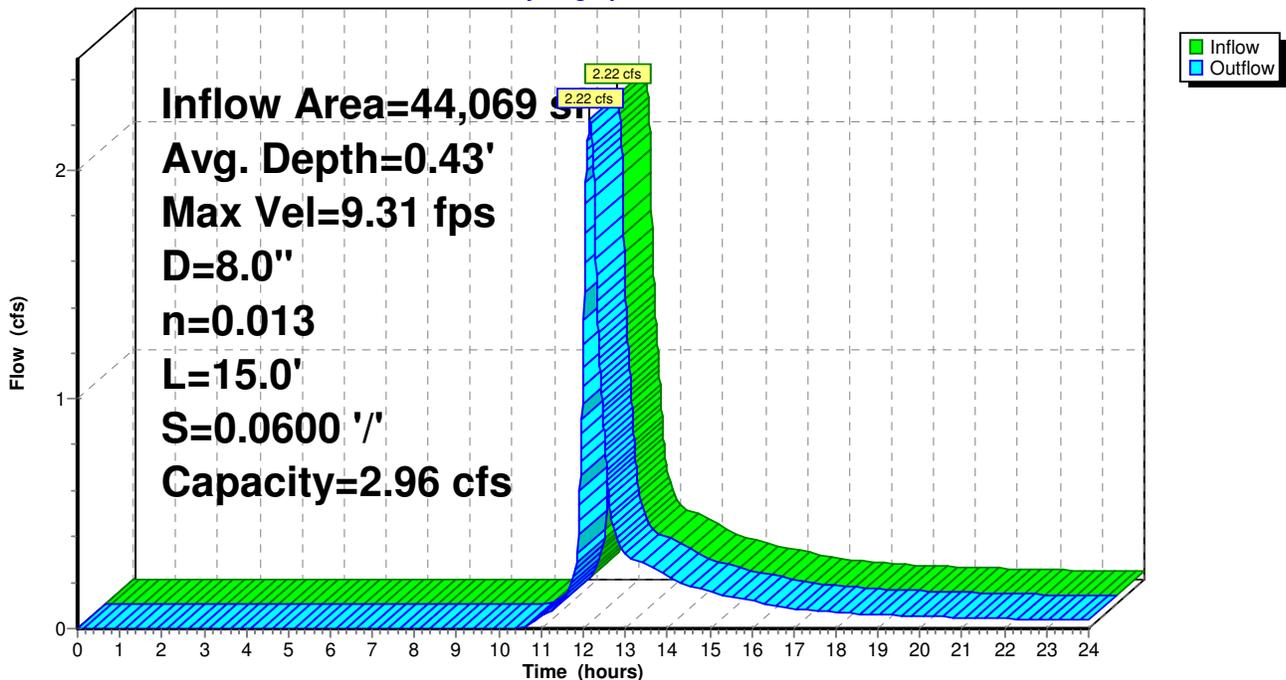
Peak Storage= 4 cf @ 12.16 hrs, Average Depth at Peak Storage= 0.43'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 15.0' Slope= 0.0600 '/'  
Inlet Invert= 107.25', Outlet Invert= 106.35'



## Reach 68R: Underdrain to CB 66

Hydrograph



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## Reach 69R: Drain to DMH 52

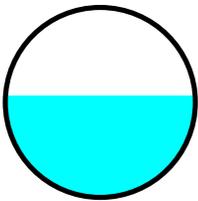
[52] Hint: Inlet conditions not evaluated

Inflow Area = 11,090 sf, Inflow Depth > 2.55" for 10-Year event  
Inflow = 0.96 cfs @ 12.03 hrs, Volume= 2,356 cf  
Outflow = 0.96 cfs @ 12.03 hrs, Volume= 2,356 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.04 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.86 fps, Avg. Travel Time= 0.3 min

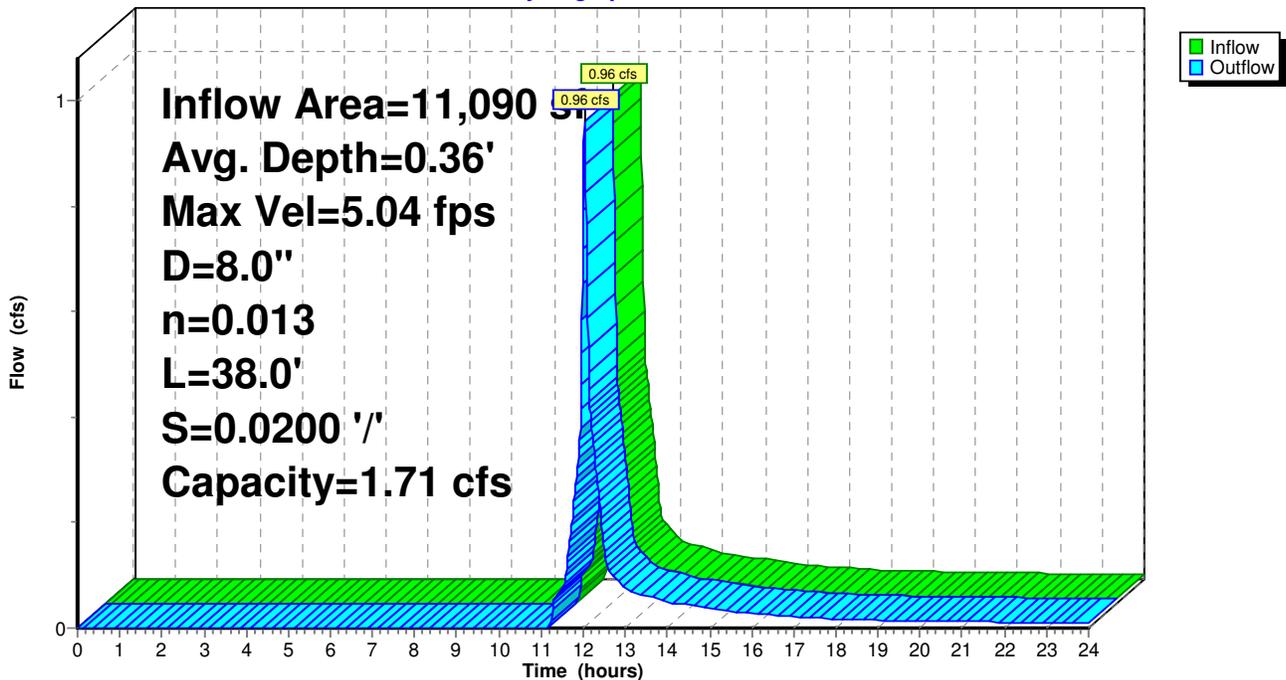
Peak Storage= 7 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.36'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.71 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 38.0' Slope= 0.0200 '/'  
Inlet Invert= 103.69', Outlet Invert= 102.93'



## Reach 69R: Drain to DMH 52

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## Reach 114R: DMH 16 to DMH 14

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 111P Primary device # 1 INLET by 0.08'

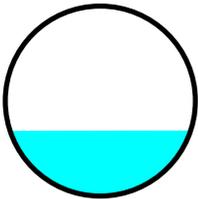
[79] Warning: Submerged Pond 112P Primary device # 1 INLET by 0.02'

Inflow Area = 10,678 sf, Inflow Depth > 3.07" for 10-Year event  
Inflow = 1.05 cfs @ 12.01 hrs, Volume= 2,730 cf  
Outflow = 1.04 cfs @ 12.02 hrs, Volume= 2,730 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.39 fps, Avg. Travel Time= 0.7 min

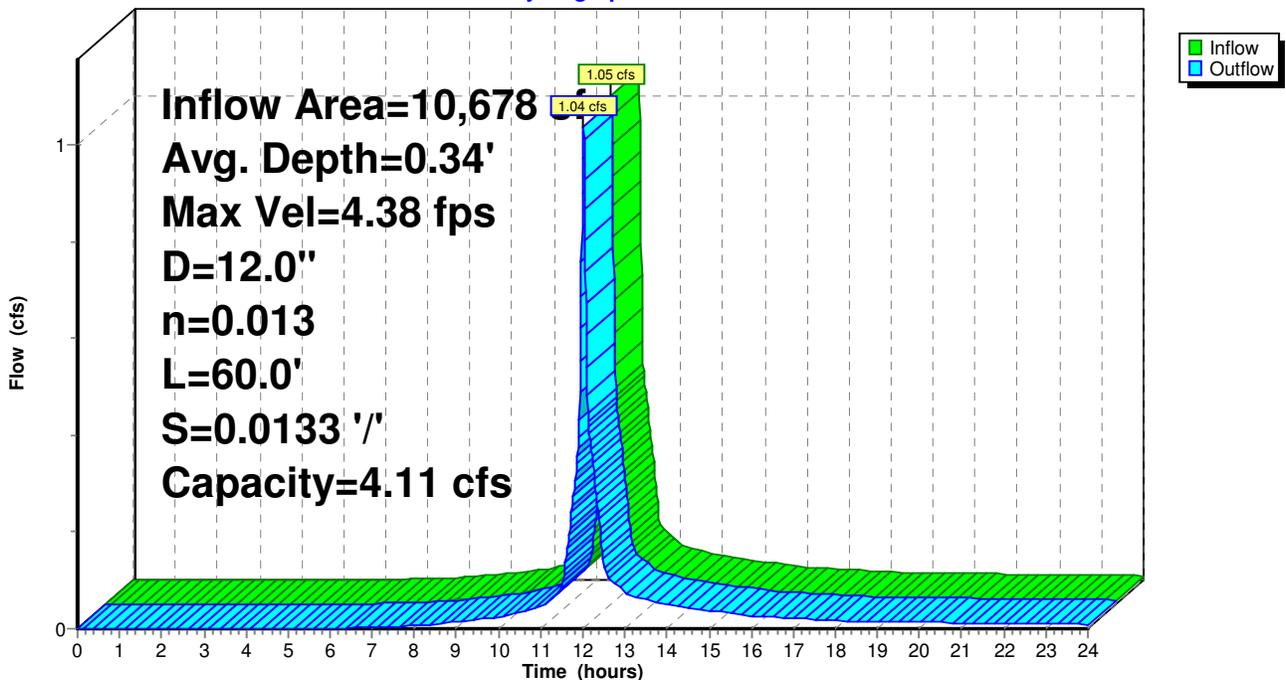
Peak Storage= 14 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.34'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.11 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 60.0' Slope= 0.0133 '/'  
Inlet Invert= 103.48', Outlet Invert= 102.68'



## Reach 114R: DMH 16 to DMH 14

Hydrograph



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**Reach 118R: Swale from Drive at #4 to RG 116**

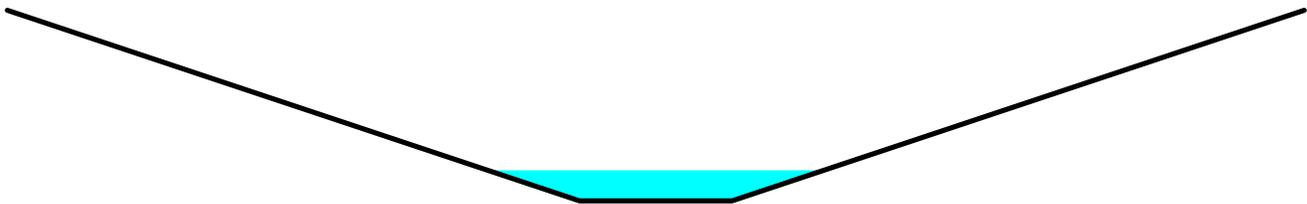
[62] Warning: Submerged 19% of Reach 119R inlet

Inflow Area = 18,760 sf, Inflow Depth > 2.97" for 10-Year event  
Inflow = 1.25 cfs @ 11.98 hrs, Volume= 4,643 cf  
Outflow = 1.24 cfs @ 11.98 hrs, Volume= 4,643 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3  
Max. Velocity= 3.88 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.42 fps, Avg. Travel Time= 0.1 min

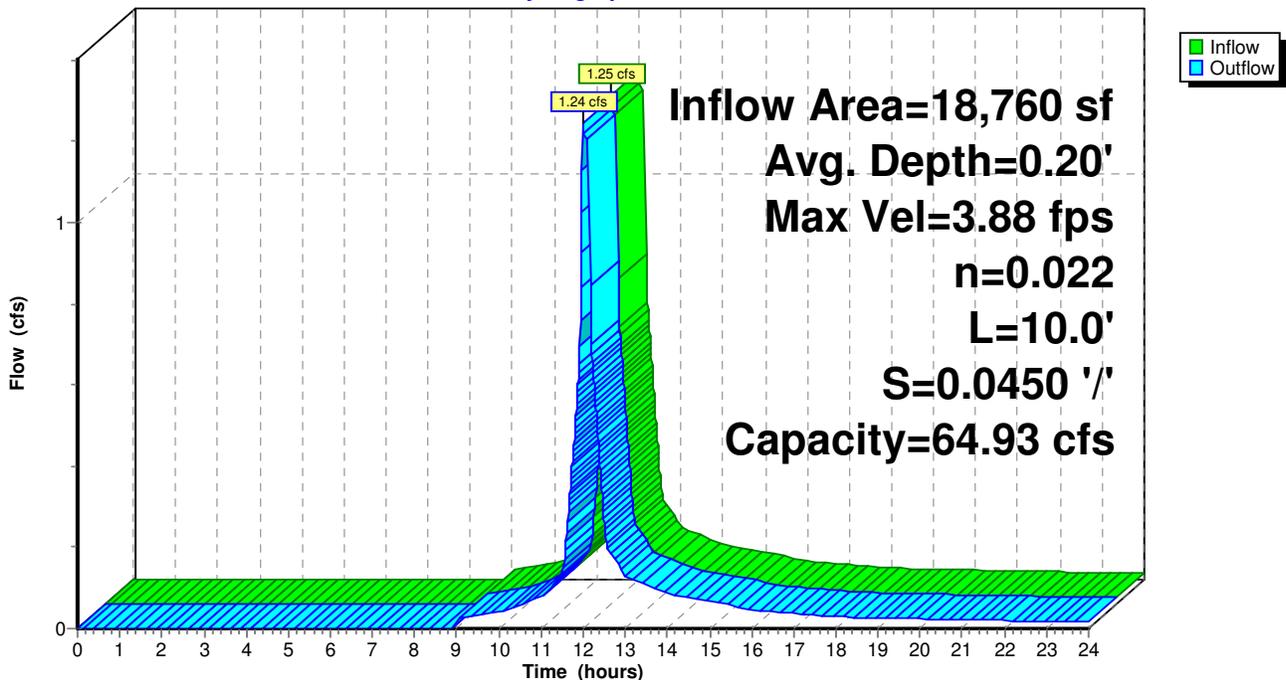
Peak Storage= 3 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.20'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 ' / ' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 ' / '  
Inlet Invert= 111.23', Outlet Invert= 110.78'



**Reach 118R: Swale from Drive at #4 to RG 116**

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## Reach 119R: Culvert under Unit 4 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 136% of Manning's capacity

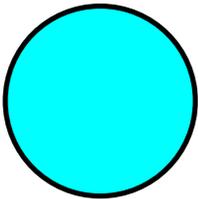
[76] Warning: Detained 109 cf (Pond w/culvert advised)

Inflow Area = 18,760 sf, Inflow Depth > 2.97" for 10-Year event  
Inflow = 1.65 cfs @ 12.02 hrs, Volume= 4,644 cf  
Outflow = 1.25 cfs @ 11.98 hrs, Volume= 4,643 cf, Atten= 24%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.94 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.71 fps, Avg. Travel Time= 0.3 min

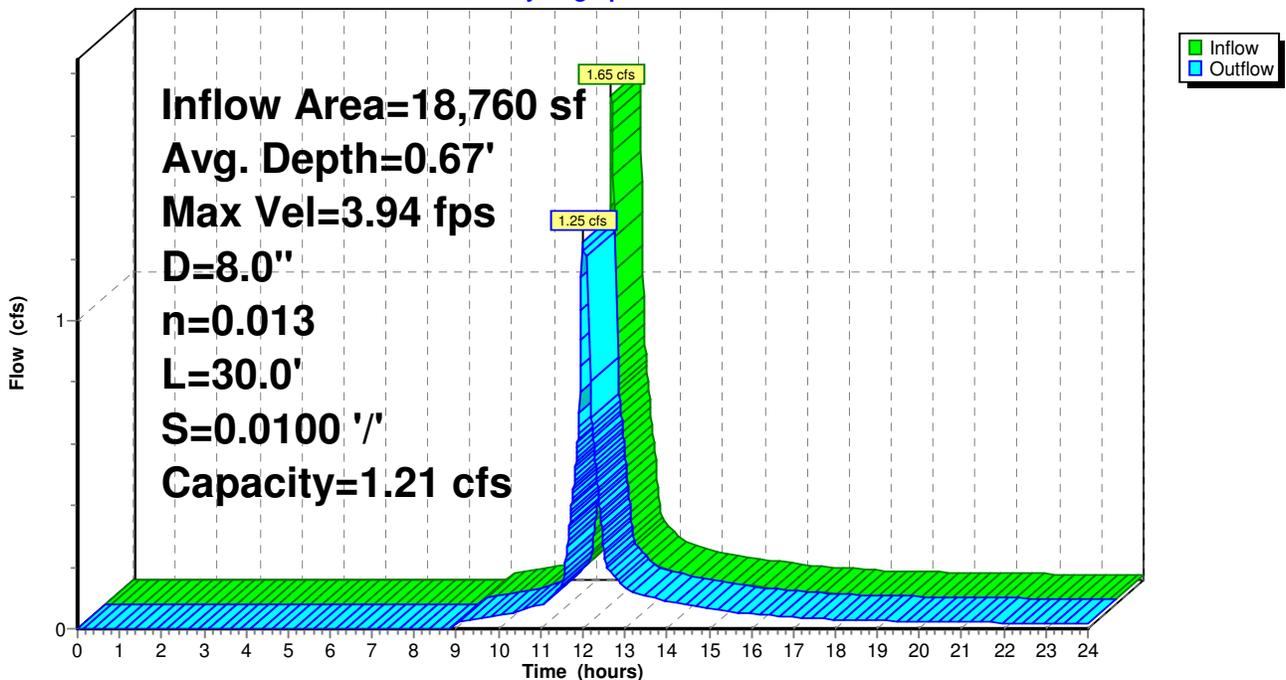
Peak Storage= 10 cf @ 11.99 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 111.30', Outlet Invert= 111.00'



## Reach 119R: Culvert under Unit 4 Drive

Hydrograph



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## Reach 127R: Swale from Drive at #3 to RG 118

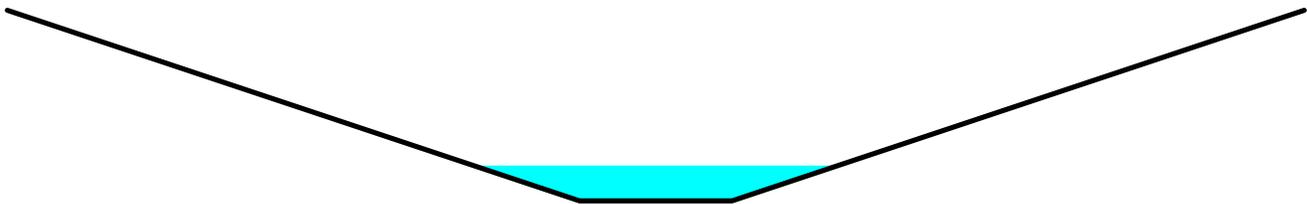
[61] Hint: Submerged 22% of Reach 128R bottom

Inflow Area = 20,516 sf, Inflow Depth > 2.56" for 10-Year event  
Inflow = 1.65 cfs @ 12.03 hrs, Volume= 4,371 cf  
Outflow = 1.65 cfs @ 12.03 hrs, Volume= 4,371 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.21 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.1 min

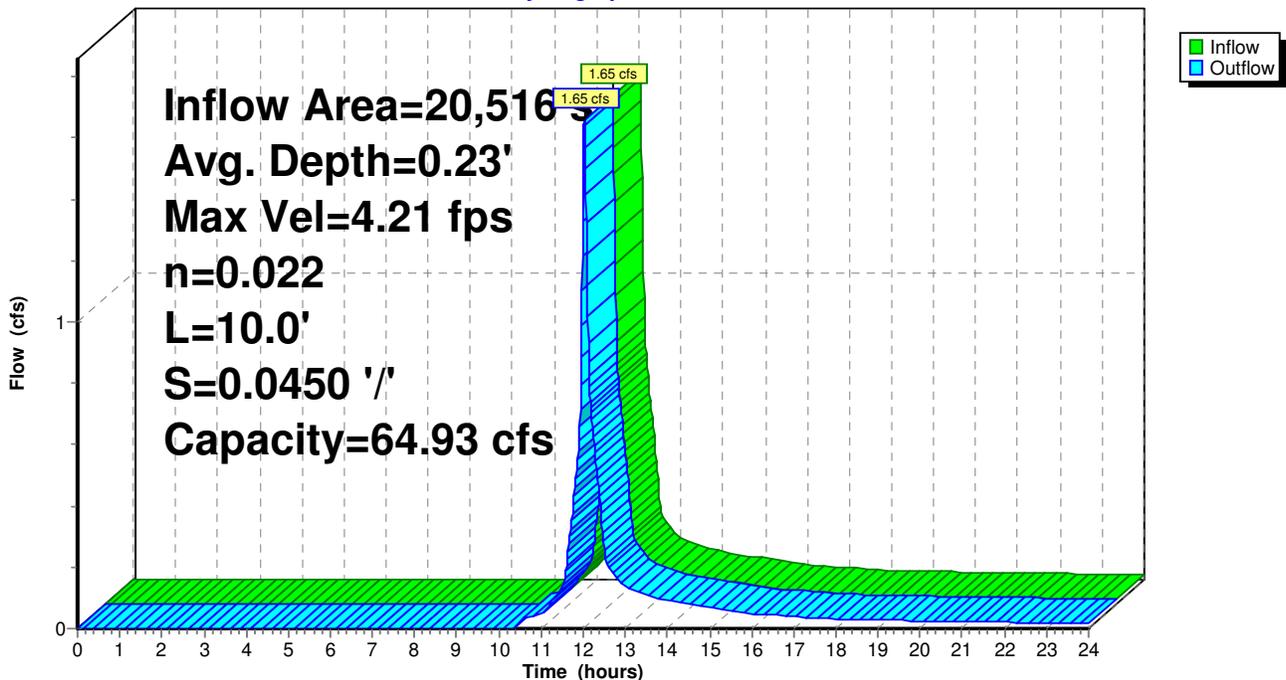
Peak Storage= 4 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.23'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 127R: Swale from Drive at #3 to RG 118

Hydrograph



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## Reach 128R: Culvert under Unit 3 Drive

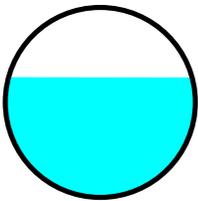
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,516 sf, Inflow Depth > 2.56" for 10-Year event  
Inflow = 1.66 cfs @ 12.02 hrs, Volume= 4,371 cf  
Outflow = 1.65 cfs @ 12.03 hrs, Volume= 4,371 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.12 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.71 fps, Avg. Travel Time= 0.2 min

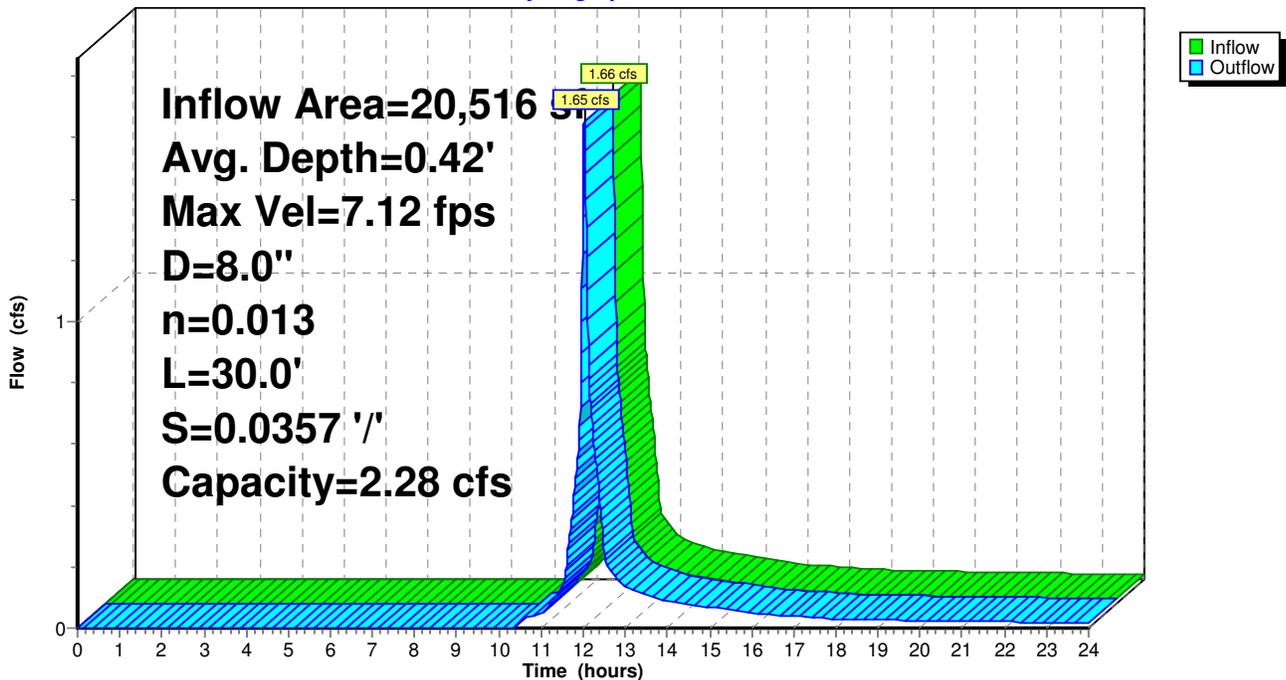
Peak Storage= 7 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.42'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.28 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0357 '/'  
Inlet Invert= 112.30', Outlet Invert= 111.23'



## Reach 128R: Culvert under Unit 3 Drive

Hydrograph



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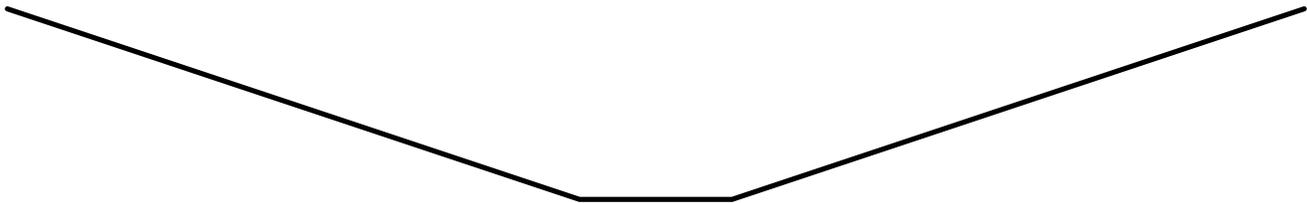
**Reach 129R: Swale from Drive at #20 to RG 124**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

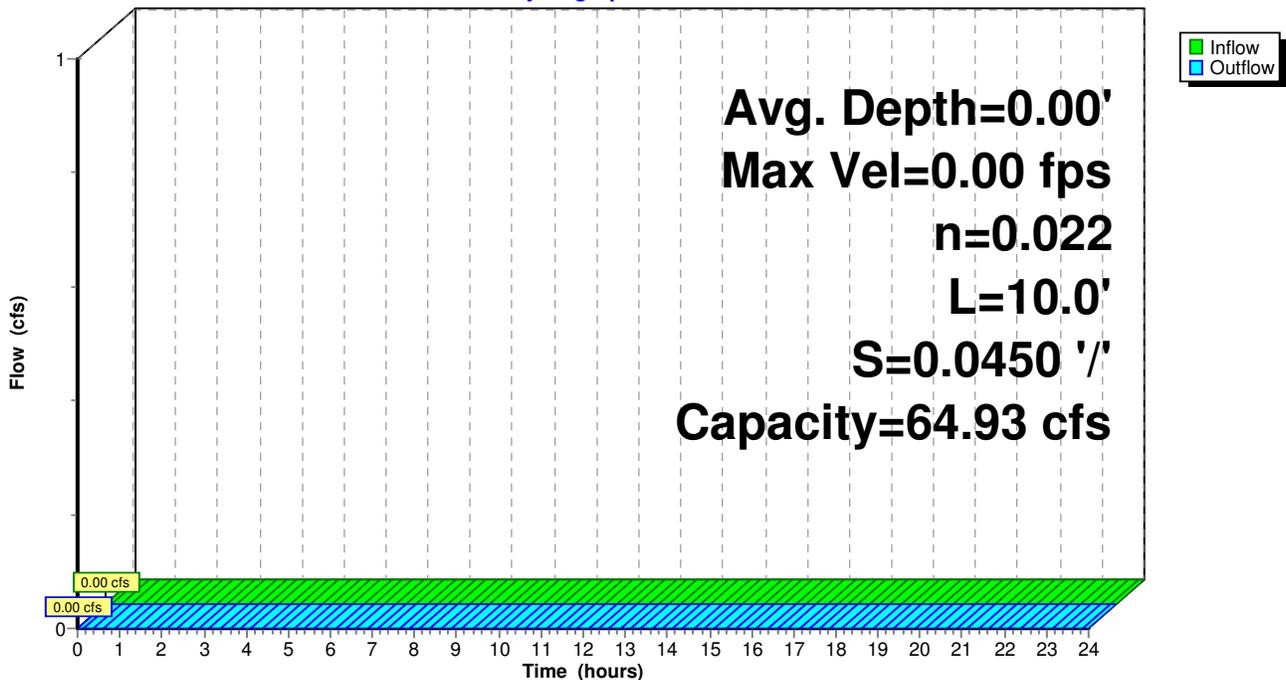
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 115.49', Outlet Invert= 115.04'



**Reach 129R: Swale from Drive at #20 to RG 124**

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Type III 24-hr 10-Year Rainfall=4.50"

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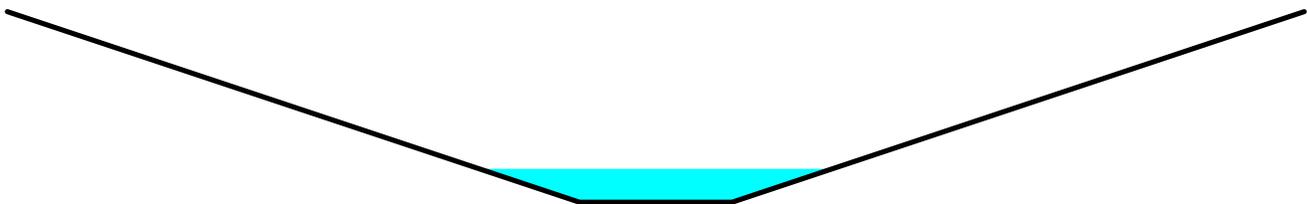
**Reach 130R: Swale to RG 122**

Inflow Area = 14,450 sf, Inflow Depth > 2.74" for 10-Year event  
Inflow = 1.35 cfs @ 12.01 hrs, Volume= 3,298 cf  
Outflow = 1.33 cfs @ 12.02 hrs, Volume= 3,298 cf, Atten= 2%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.65 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.4 min

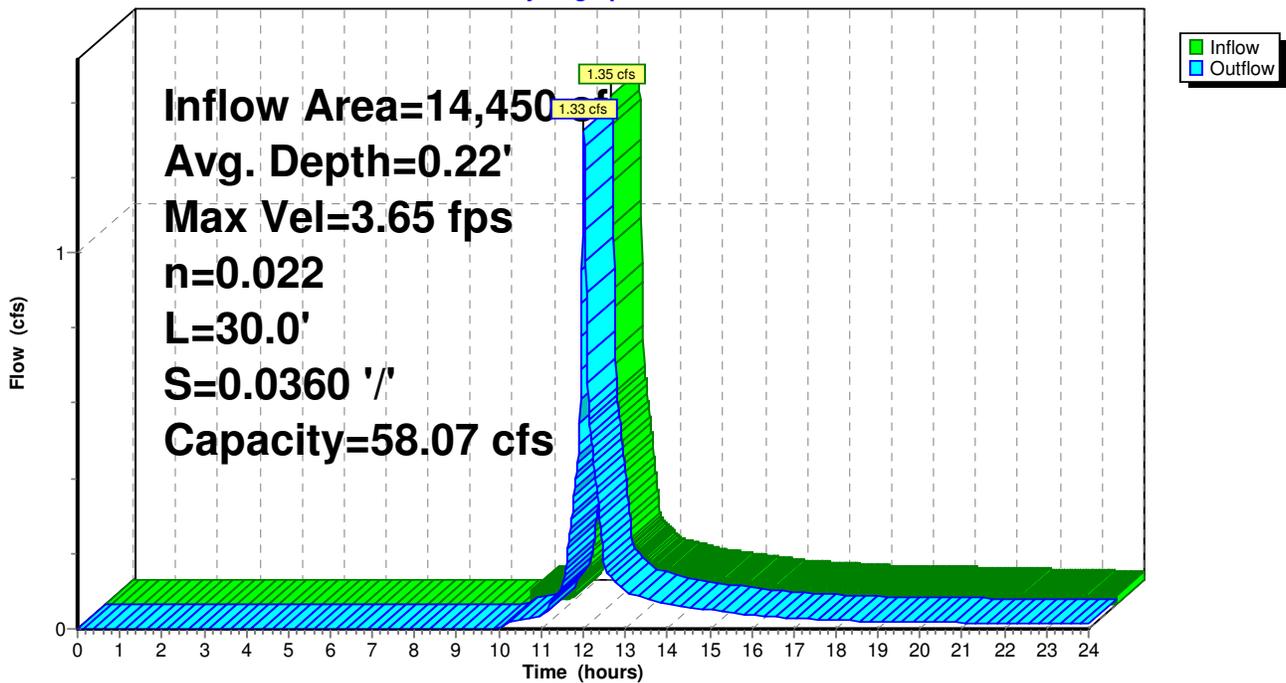
Peak Storage= 11 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.22'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 58.07 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 30.0' Slope= 0.0360 '/'  
Inlet Invert= 114.25', Outlet Invert= 113.17'



**Reach 130R: Swale to RG 122**

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## Reach 131R: Culvert under Unit 20 Drive

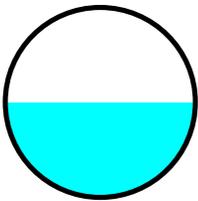
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 2.52" for 10-Year event  
Inflow = 0.61 cfs @ 12.01 hrs, Volume= 1,459 cf  
Outflow = 0.60 cfs @ 12.02 hrs, Volume= 1,459 cf, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.46 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.27 fps, Avg. Travel Time= 0.6 min

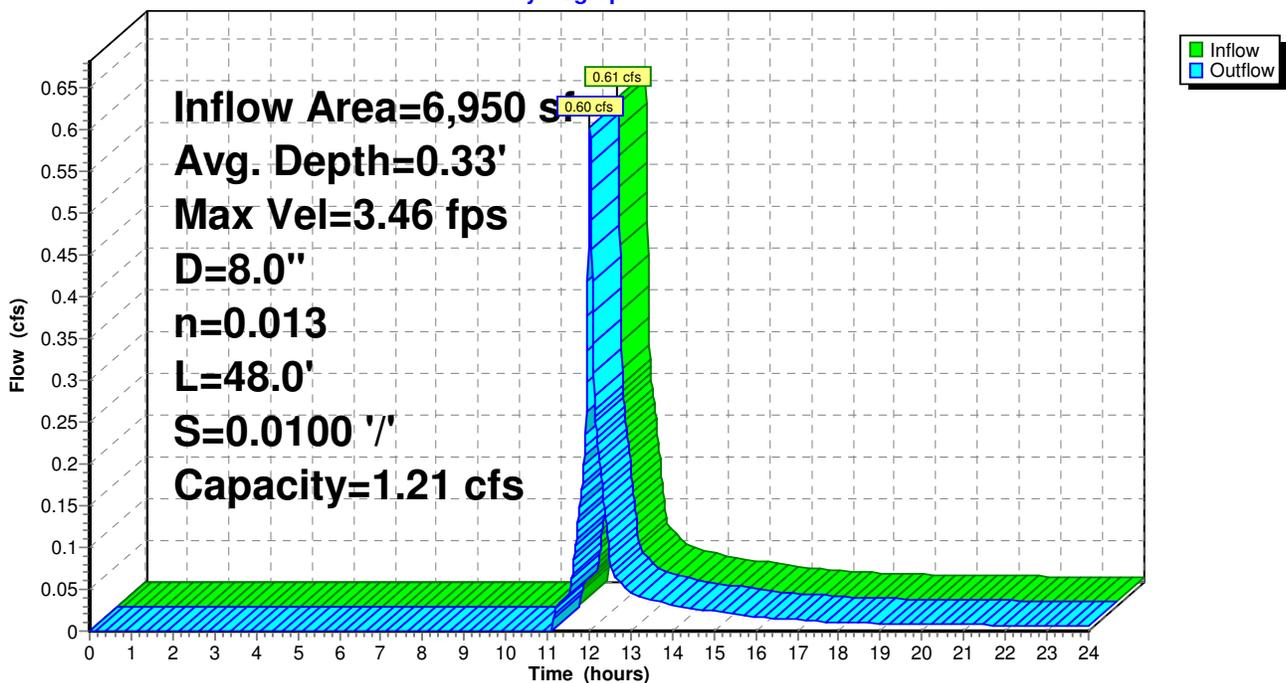
Peak Storage= 8 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.33'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 115.97', Outlet Invert= 115.49'



## Reach 131R: Culvert under Unit 20 Drive

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Reach 137R: Swale Back of 7,6,5**

Inflow Area = 13,850 sf, Inflow Depth > 2.38" for 10-Year event  
Inflow = 0.98 cfs @ 12.05 hrs, Volume= 2,741 cf  
Outflow = 0.95 cfs @ 12.09 hrs, Volume= 2,736 cf, Atten= 3%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.63 fps, Min. Travel Time= 1.4 min  
Avg. Velocity = 0.46 fps, Avg. Travel Time= 5.0 min

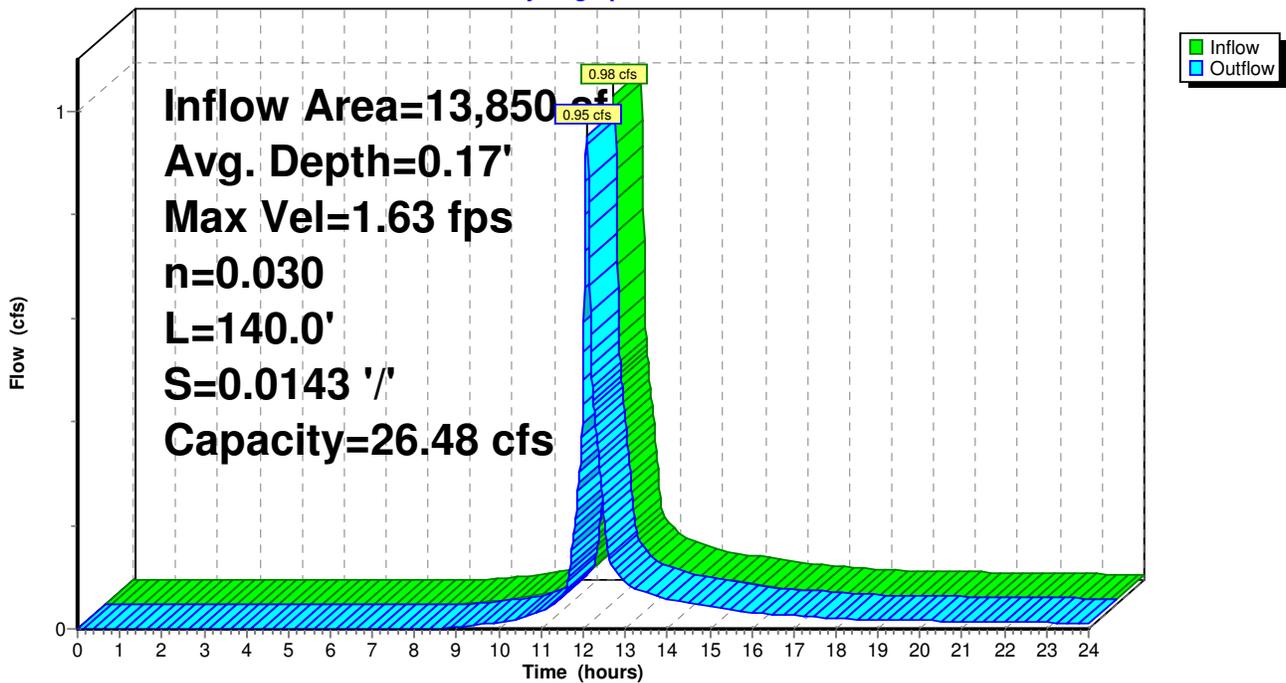
Peak Storage= 82 cf @ 12.06 hrs, Average Depth at Peak Storage= 0.17'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 26.48 cfs

3.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 9.00'  
Length= 140.0' Slope= 0.0143 '/'  
Inlet Invert= 118.00', Outlet Invert= 116.00'



**Reach 137R: Swale Back of 7,6,5**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 138R: Swale Back of 4

[61] Hint: Submerged 17% of Reach 137R bottom

Inflow Area = 34,910 sf, Inflow Depth > 2.23" for 10-Year event  
Inflow = 2.01 cfs @ 12.02 hrs, Volume= 6,473 cf  
Outflow = 1.99 cfs @ 12.07 hrs, Volume= 6,463 cf, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.95 fps, Min. Travel Time= 1.2 min  
Avg. Velocity = 0.64 fps, Avg. Travel Time= 3.7 min

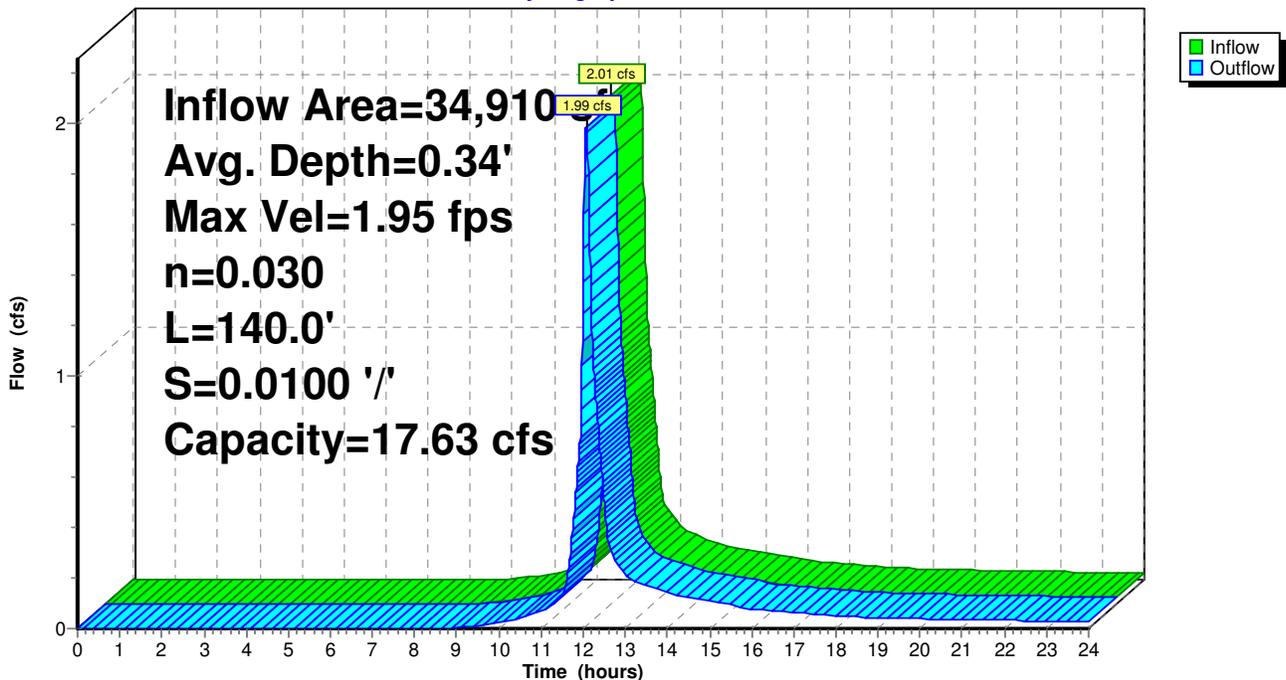
Peak Storage= 143 cf @ 12.05 hrs, Average Depth at Peak Storage= 0.34'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 17.63 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 8.00'  
Length= 140.0' Slope= 0.0100 '/'  
Inlet Invert= 116.00', Outlet Invert= 114.60'



## Reach 138R: Swale Back of 4

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 149R: DMH 14 to DMH 12

[52] Hint: Inlet conditions not evaluated

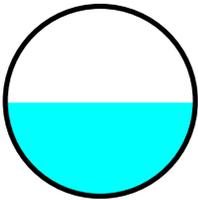
[61] Hint: Submerged 80% of Reach 114R bottom

Inflow Area = 91,524 sf, Inflow Depth > 2.62" for 10-Year event  
Inflow = 6.27 cfs @ 12.03 hrs, Volume= 19,989 cf  
Outflow = 6.25 cfs @ 12.04 hrs, Volume= 19,984 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.22 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 2.39 fps, Avg. Travel Time= 0.7 min

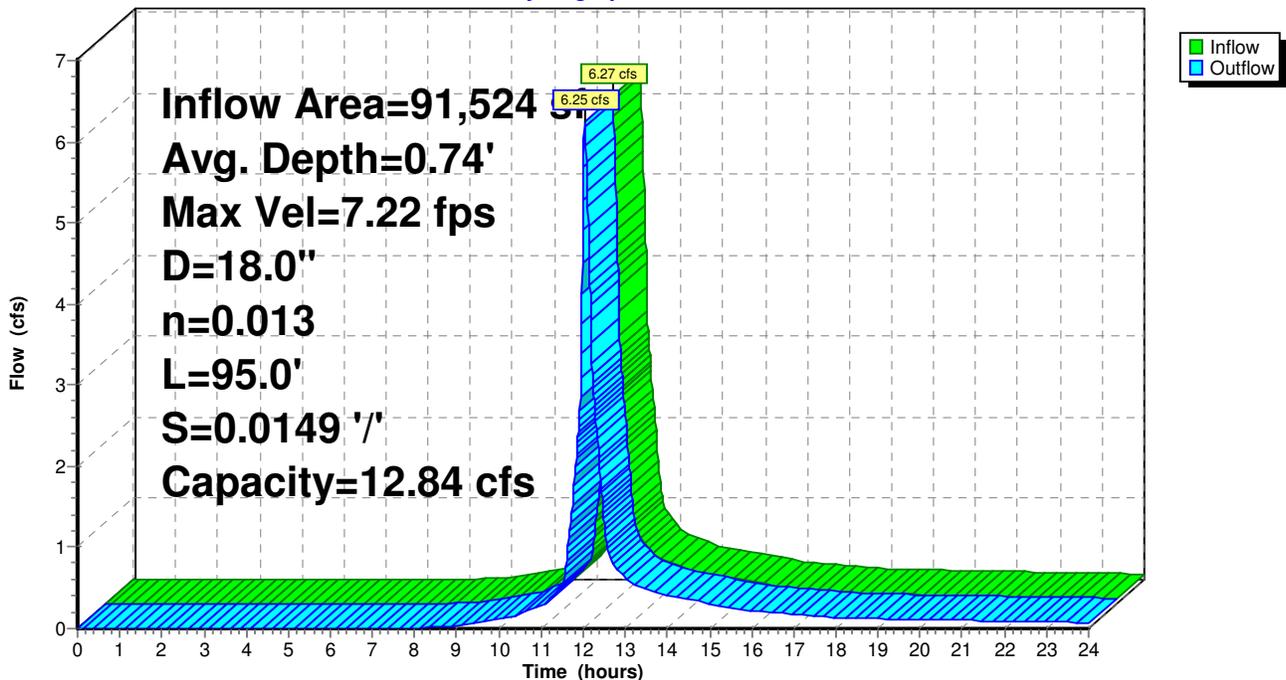
Peak Storage= 82 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.74'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.84 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 95.0' Slope= 0.0149 '/'  
Inlet Invert= 102.58', Outlet Invert= 101.16'



## Reach 149R: DMH 14 to DMH 12

Hydrograph



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## Reach 150R: DMH 12 to HW 10 - Outlet

[52] Hint: Inlet conditions not evaluated

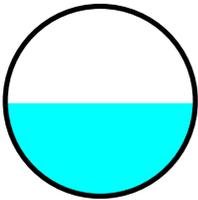
[61] Hint: Submerged 45% of Reach 149R bottom

Inflow Area = 91,524 sf, Inflow Depth > 2.62" for 10-Year event  
Inflow = 6.25 cfs @ 12.04 hrs, Volume= 19,984 cf  
Outflow = 6.24 cfs @ 12.04 hrs, Volume= 19,982 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.24 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.40 fps, Avg. Travel Time= 0.4 min

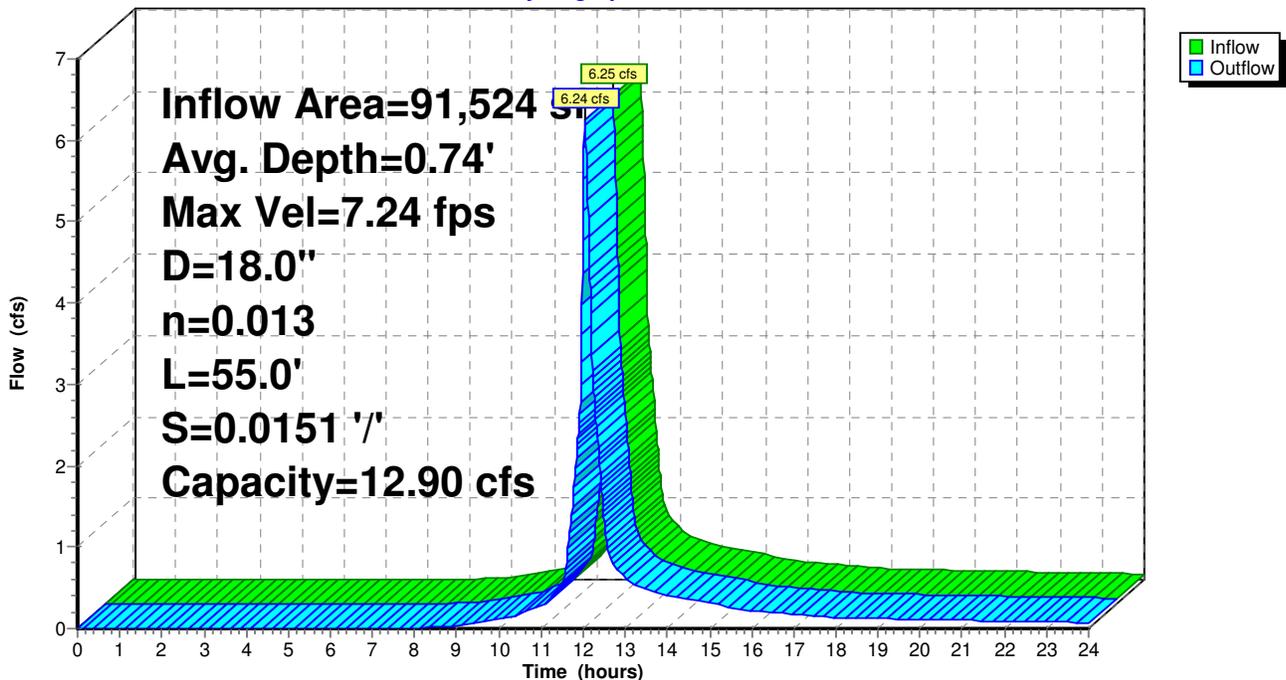
Peak Storage= 47 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.74'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.90 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 55.0' Slope= 0.0151 '/'  
Inlet Invert= 101.06', Outlet Invert= 100.23'



## Reach 150R: DMH 12 to HW 10 - Outlet

Hydrograph



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## Reach 153R: CB 116 to DMH 14

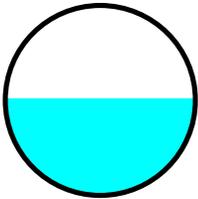
[52] Hint: Inlet conditions not evaluated

Inflow Area = 21,810 sf, Inflow Depth > 3.01" for 10-Year event  
Inflow = 1.54 cfs @ 12.01 hrs, Volume= 5,463 cf  
Outflow = 1.54 cfs @ 12.01 hrs, Volume= 5,463 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 8.56 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 3.40 fps, Avg. Travel Time= 0.1 min

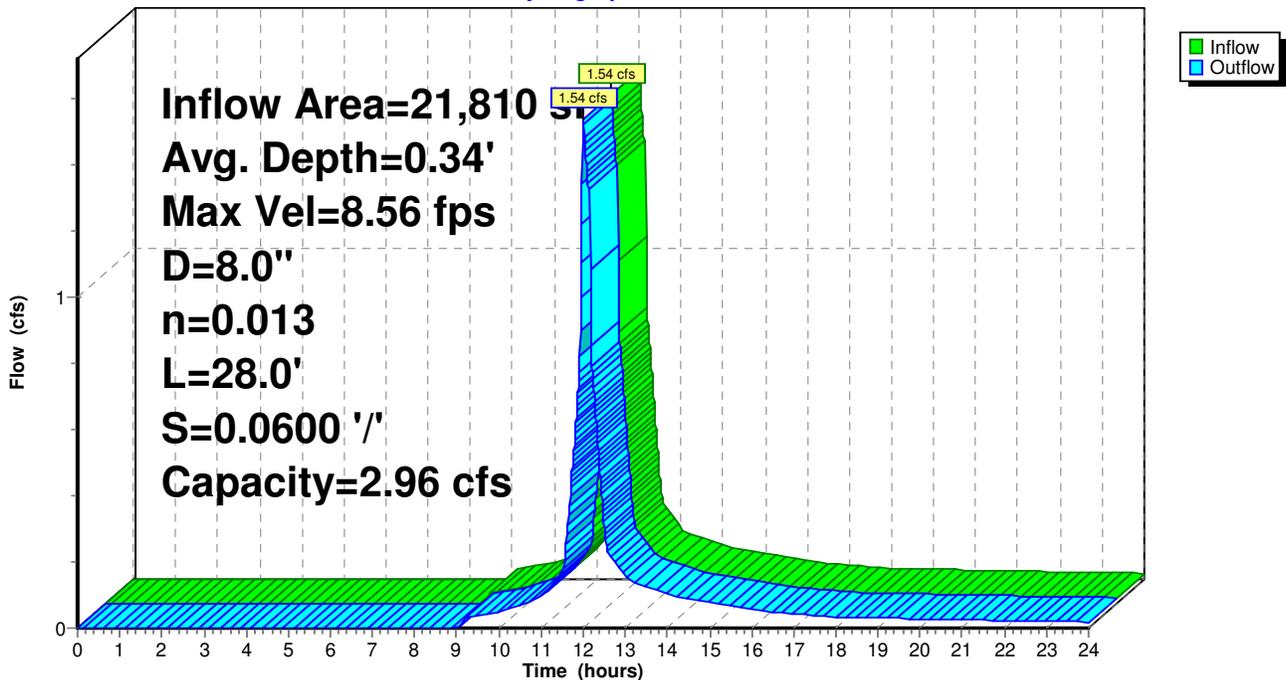
Peak Storage= 5 cf @ 11.99 hrs, Average Depth at Peak Storage= 0.34'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 28.0' Slope= 0.0600 '/'  
Inlet Invert= 107.12', Outlet Invert= 105.44'



## Reach 153R: CB 116 to DMH 14

Hydrograph



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**Reach 154R: Swale from Drive at #6 to RG 126**

[43] Hint: Has no inflow (Outflow=Zero)

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'

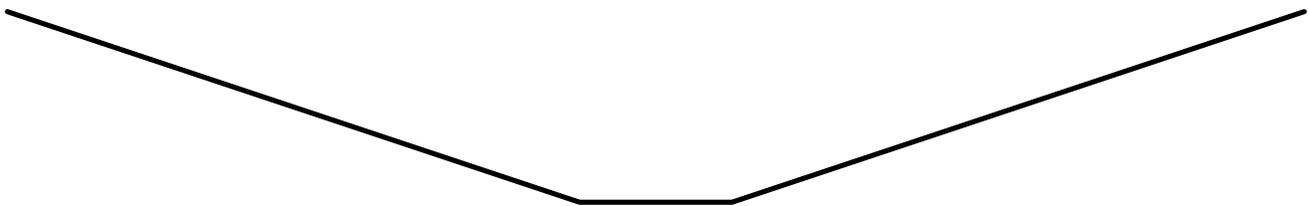
Bank-Full Depth= 1.25', Capacity at Bank-Full= 29.18 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 3.0 '/' Top Width= 8.50'

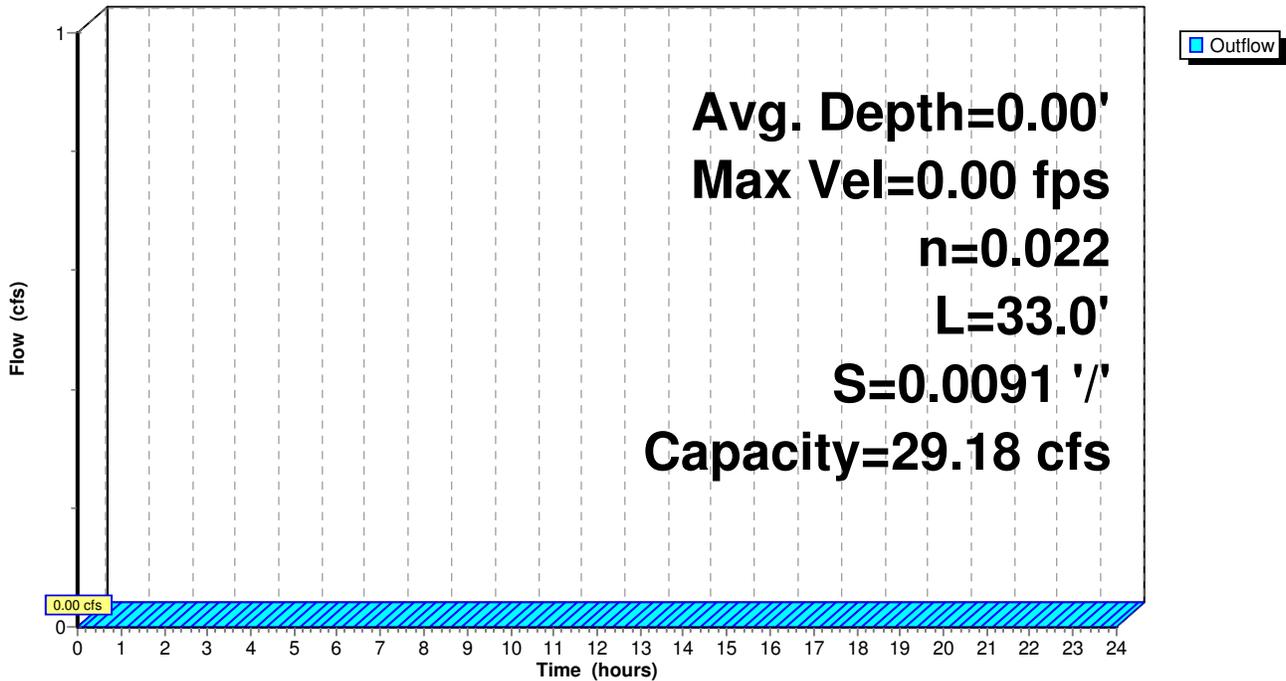
Length= 33.0' Slope= 0.0091 '/'

Inlet Invert= 116.75', Outlet Invert= 116.45'



**Reach 154R: Swale from Drive at #6 to RG 126**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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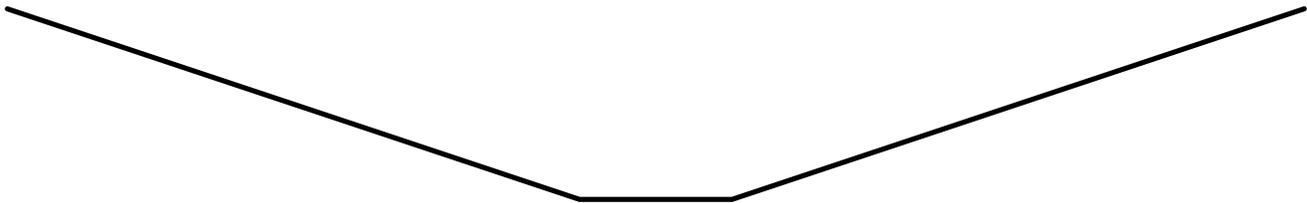
**Reach 155R: Swale from Drive at #5 to RG 120**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

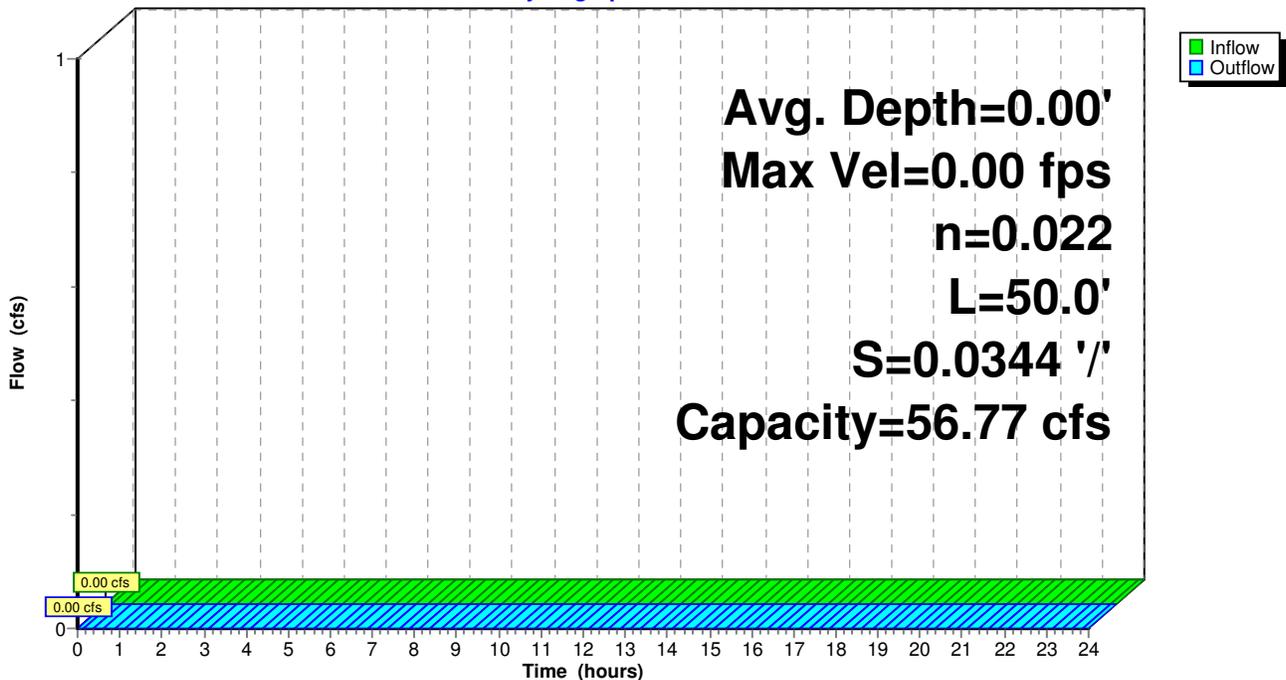
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 56.77 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 50.0' Slope= 0.0344 '/'  
Inlet Invert= 115.27', Outlet Invert= 113.55'



**Reach 155R: Swale from Drive at #5 to RG 120**

Hydrograph



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## Reach 156R: Culvert under Unit 5 Drive

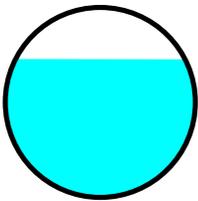
[52] Hint: Inlet conditions not evaluated

Inflow Area = 12,570 sf, Inflow Depth > 2.95" for 10-Year event  
Inflow = 1.06 cfs @ 12.03 hrs, Volume= 3,089 cf  
Outflow = 1.06 cfs @ 12.03 hrs, Volume= 3,088 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.91 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.52 fps, Avg. Travel Time= 0.3 min

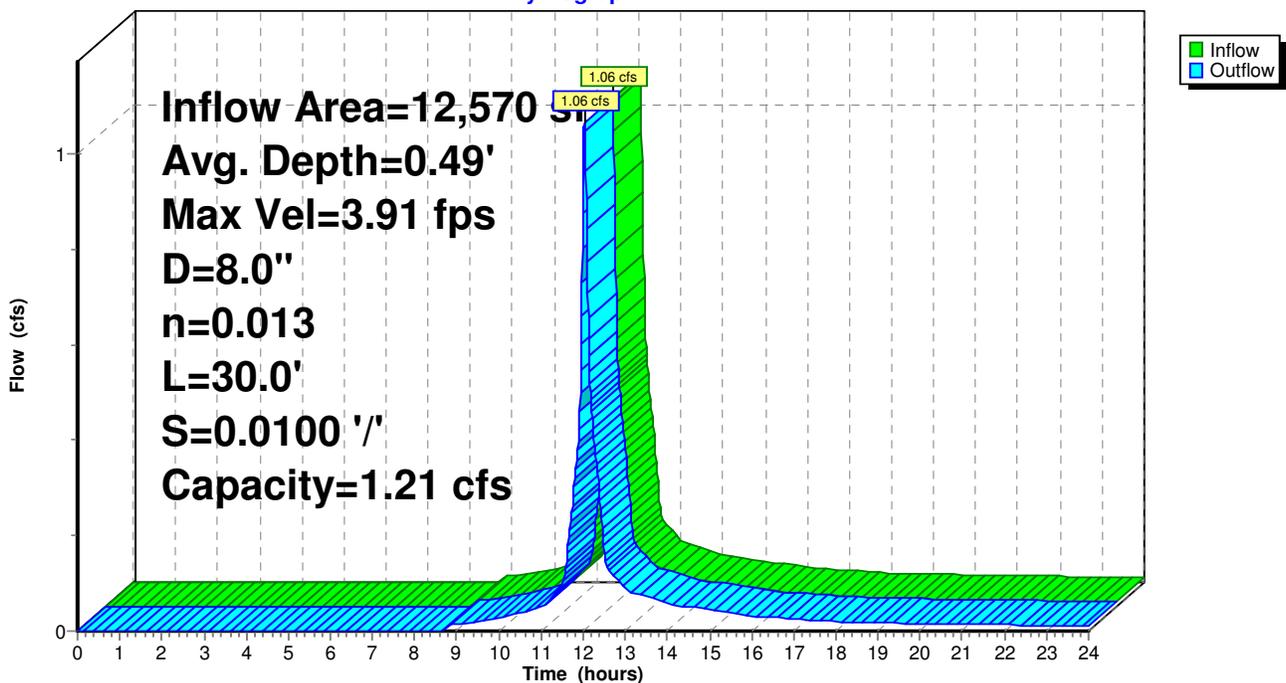
Peak Storage= 8 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.49'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 115.57', Outlet Invert= 115.27'



## Reach 156R: Culvert under Unit 5 Drive

Hydrograph



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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

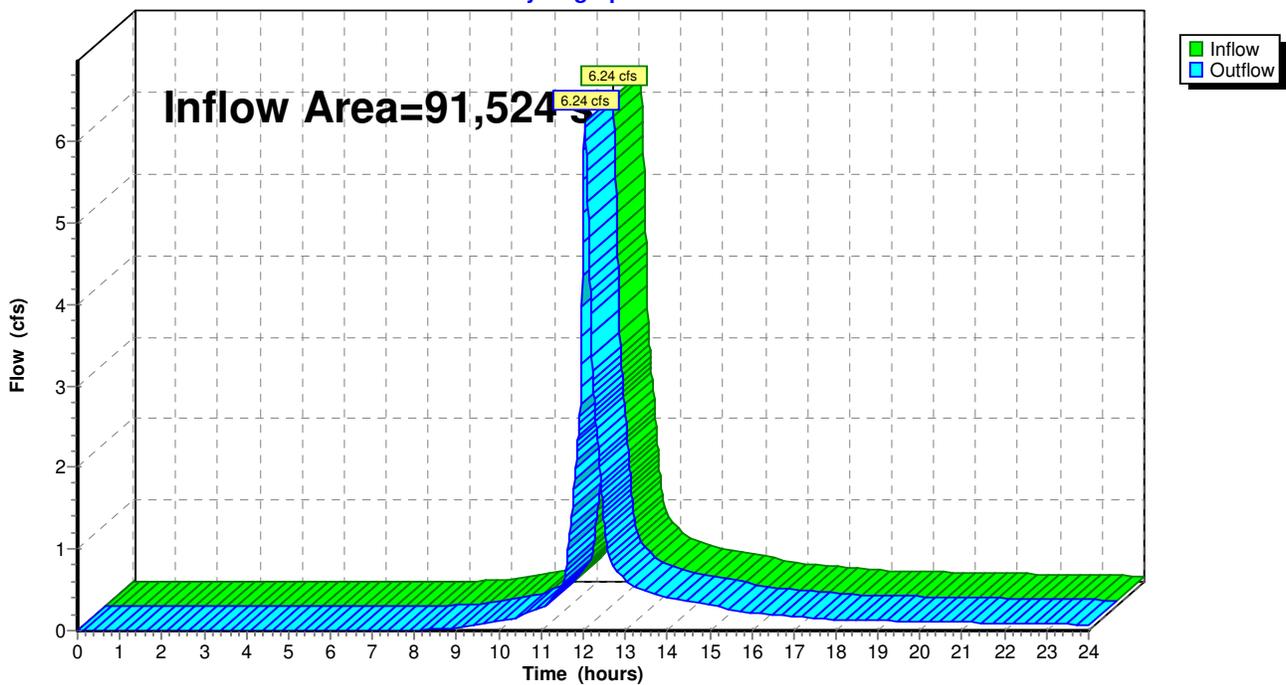
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 91,524 sf, Inflow Depth > 2.62" for 10-Year event  
Inflow = 6.24 cfs @ 12.04 hrs, Volume= 19,982 cf  
Outflow = 6.24 cfs @ 12.04 hrs, Volume= 19,982 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

Hydrograph



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## Reach 220R: CB 56 to DMH 52

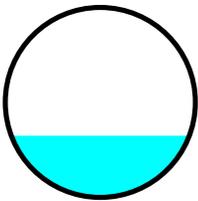
[52] Hint: Inlet conditions not evaluated

Inflow Area = 8,660 sf, Inflow Depth > 2.91" for 10-Year event  
Inflow = 0.81 cfs @ 12.01 hrs, Volume= 2,099 cf  
Outflow = 0.81 cfs @ 12.01 hrs, Volume= 2,099 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.67 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.2 min

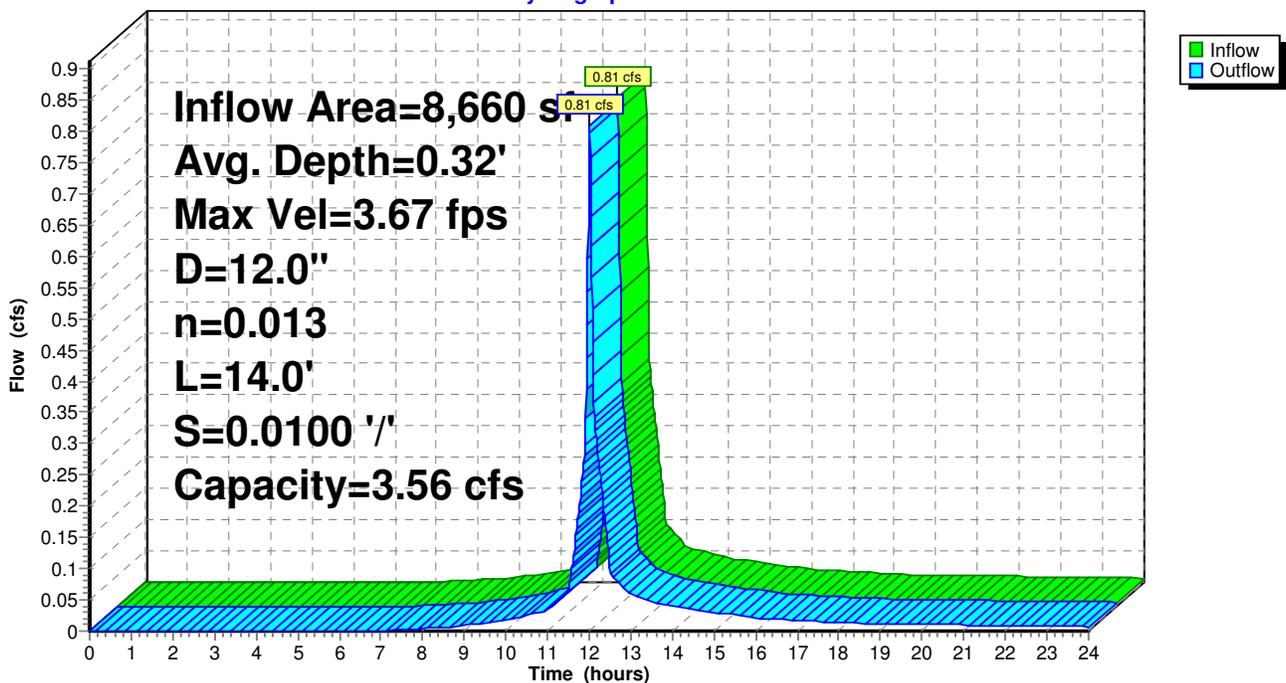
Peak Storage= 3 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.32'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 14.0' Slope= 0.0100 '/'  
Inlet Invert= 102.72', Outlet Invert= 102.58'



## Reach 220R: CB 56 to DMH 52

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Reach 222R: CB 54 to DMH 52

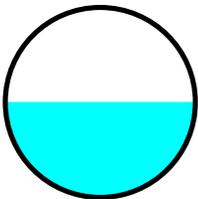
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,970 sf, Inflow Depth > 2.64" for 10-Year event  
Inflow = 1.80 cfs @ 12.01 hrs, Volume= 4,606 cf  
Outflow = 1.80 cfs @ 12.01 hrs, Volume= 4,606 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.55 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.2 min

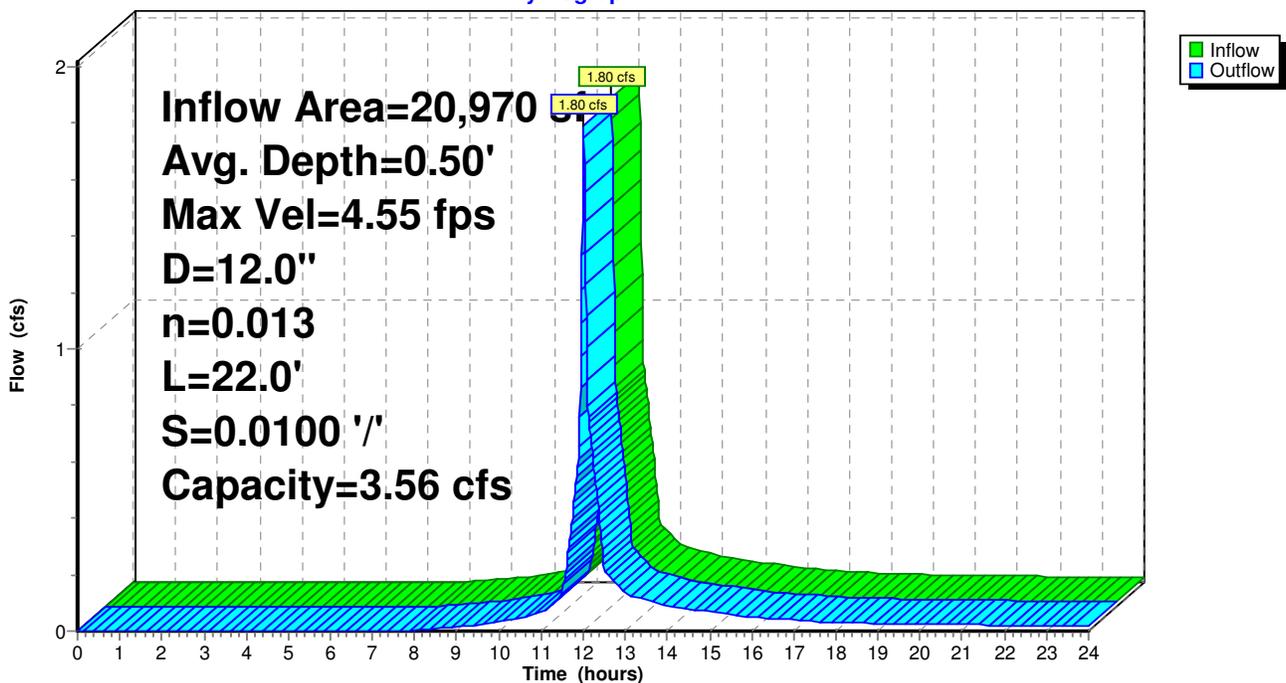
Peak Storage= 9 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.50'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 22.0' Slope= 0.0100 '/'  
Inlet Invert= 102.80', Outlet Invert= 102.58'



## Reach 222R: CB 54 to DMH 52

Hydrograph



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## Reach 403R: CB 65 to DMH 50

[52] Hint: Inlet conditions not evaluated

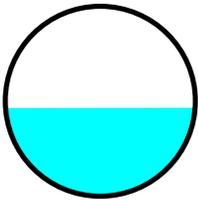
[79] Warning: Submerged Pond 67P Primary device # 1 OUTLET by 0.32'

Inflow Area = 44,069 sf, Inflow Depth > 2.30" for 10-Year event  
Inflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf  
Outflow = 2.22 cfs @ 12.16 hrs, Volume= 8,460 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.21 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.2 min

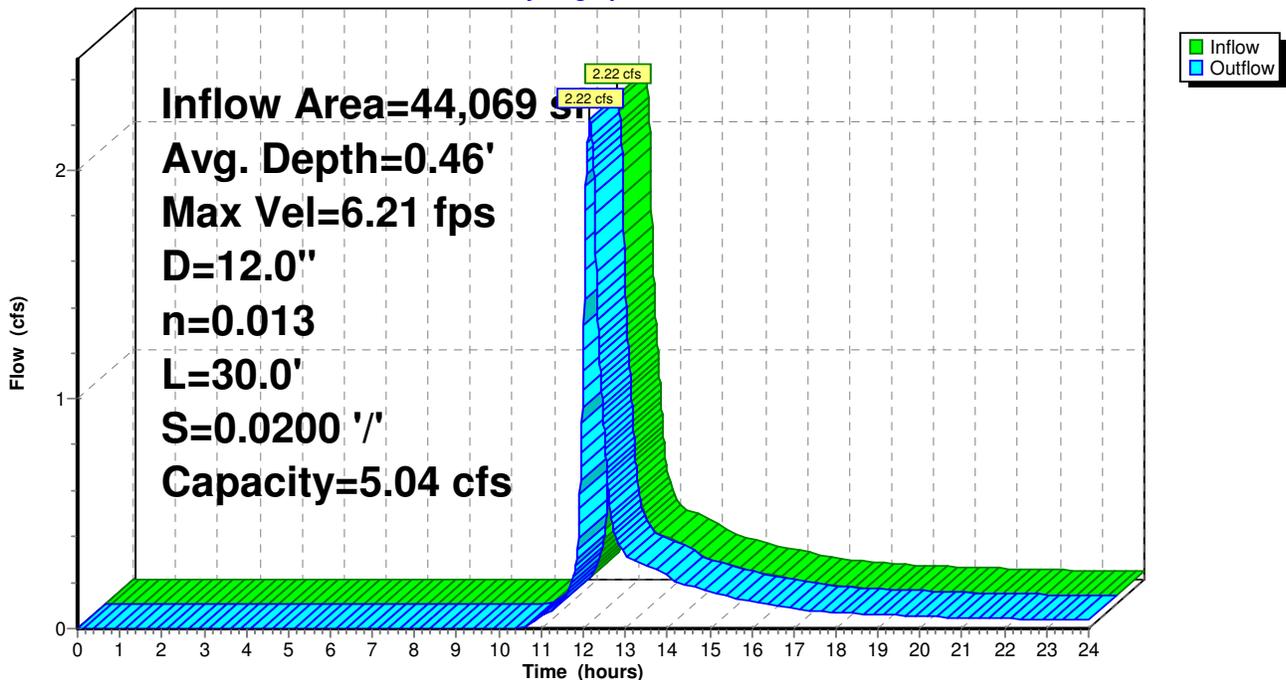
Peak Storage= 11 cf @ 12.16 hrs, Average Depth at Peak Storage= 0.46'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.04 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0200 '/'  
Inlet Invert= 102.22', Outlet Invert= 101.62'



## Reach 403R: CB 65 to DMH 50

Hydrograph



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**Reach 902R: Existing wetland channel to WF 13**

[61] Hint: Submerged 3% of Reach 1R bottom

Inflow Area = 203,736 sf, Inflow Depth > 2.09" for 10-Year event  
Inflow = 8.71 cfs @ 12.16 hrs, Volume= 35,430 cf  
Outflow = 8.71 cfs @ 12.17 hrs, Volume= 35,413 cf, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.16 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.55 fps, Avg. Travel Time= 1.1 min

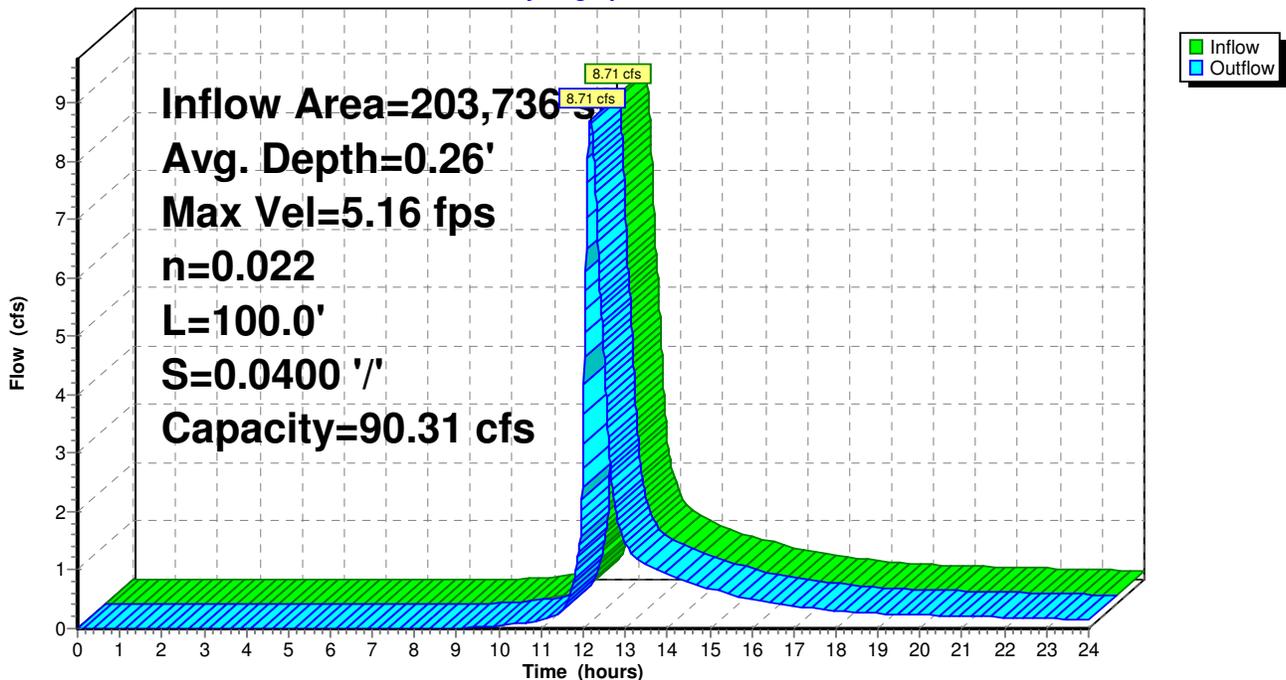
Peak Storage= 169 cf @ 12.16 hrs, Average Depth at Peak Storage= 0.26'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 90.31 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 100.0' Slope= 0.0400 '/'  
Inlet Invert= 86.00', Outlet Invert= 82.00'



**Reach 902R: Existing wetland channel to WF 13**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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### Pond 2P: Recharge System

[93] Warning: Storage range exceeded by 1.51'  
[88] Warning: Qout>Qin may require Finer Routing>1  
[85] Warning: Oscillations may require Finer Routing>1  
[81] Warning: Exceeded Pond 219P by 2.64' @ 12.24 hrs

Inflow Area = 111,470 sf, Inflow Depth > 2.44" for 10-Year event  
Inflow = 5.52 cfs @ 12.09 hrs, Volume= 22,672 cf  
Outflow = 6.76 cfs @ 12.10 hrs, Volume= 19,720 cf, Atten= 0%, Lag= 0.3 min  
Discarded = 0.01 cfs @ 8.81 hrs, Volume= 361 cf  
Primary = 5.84 cfs @ 12.10 hrs, Volume= 19,149 cf  
Secondary = 0.91 cfs @ 12.10 hrs, Volume= 209 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 106.11' @ 12.10 hrs Surf.Area= 1,620 sf Storage= 3,766 cf

Plug-Flow detention time= 84.7 min calculated for 19,712 cf (87% of inflow)  
Center-of-Mass det. time= 26.6 min ( 861.7 - 835.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	100.60'	1,810 cf	<b>36.00'W x 45.00'L x 4.00'H 100</b> 6,480 cf Overall - 1,956 cf Embedded = 4,524 cf x 40.0% Voids
#2	101.00'	1,956 cf	<b>47.8"W x 30.0"H x 6.25'L Cultec R-330</b> x 42 Inside #1
		3,766 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.170 in/hr Exfiltration over Surface area</b>
#2	Primary	103.22'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Secondary	106.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

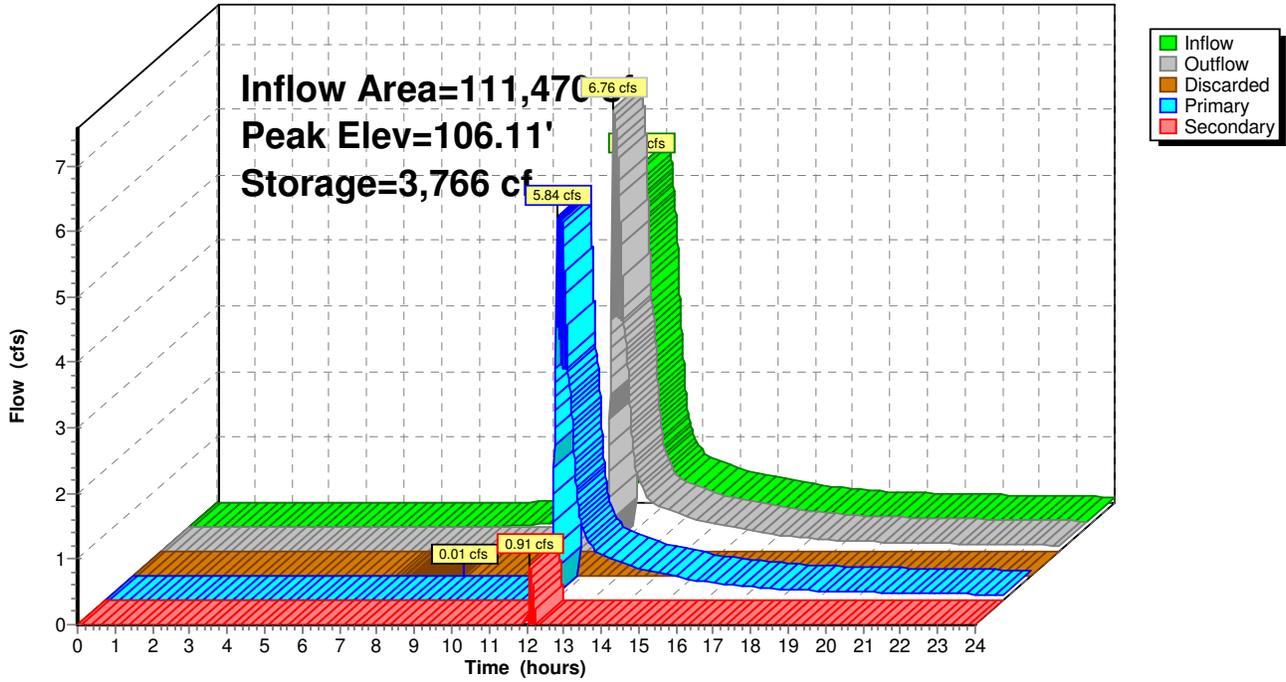
**Discarded OutFlow** Max=0.01 cfs @ 8.81 hrs HW=100.65' (Free Discharge)  
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=5.84 cfs @ 12.10 hrs HW=106.10' (Free Discharge)  
↑2=Orifice/Grate (Orifice Controls 5.84 cfs @ 7.43 fps)

**Secondary OutFlow** Max=0.91 cfs @ 12.10 hrs HW=106.11' (Free Discharge)  
↑3=Orifice/Grate (Weir Controls 0.91 cfs @ 1.07 fps)

### Pond 2P: Recharge System

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 7P: Forebay - Bio Retention**

[63] Warning: Exceeded Reach 62R inflow depth by 0.65' @ 23.99 hrs

Inflow Area = 44,069 sf, Inflow Depth > 2.40" for 10-Year event  
 Inflow = 2.66 cfs @ 12.09 hrs, Volume= 8,796 cf  
 Outflow = 2.66 cfs @ 12.10 hrs, Volume= 8,628 cf, Atten= 0%, Lag= 0.3 min  
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0 cf  
 Primary = 2.66 cfs @ 12.10 hrs, Volume= 8,627 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.75' @ 12.10 hrs Surf.Area= 277 sf Storage= 232 cf

Plug-Flow detention time= 17.0 min calculated for 8,628 cf (98% of inflow)  
 Center-of-Mass det. time= 5.9 min ( 832.4 - 826.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.49'	304 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.49	0	0	0
111.00	205	52	52
111.50	248	113	166
112.00	305	138	304

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.001 in/hr Exfiltration over Surface area</b>
#2	Primary	111.50'	<b>8.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

**Discarded OutFlow** Max=0.00 cfs @ 12.10 hrs HW=111.75' (Free Discharge)

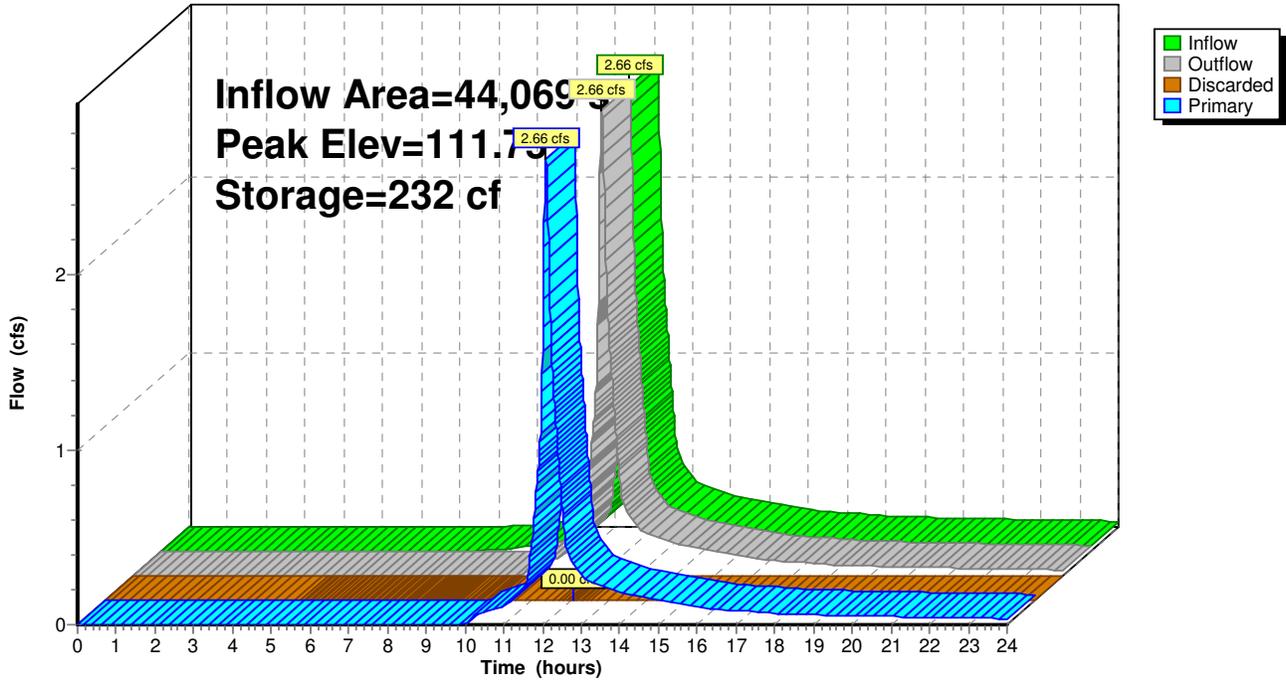
↑1=**Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=2.65 cfs @ 12.10 hrs HW=111.75' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** (Weir Controls 2.65 cfs @ 1.30 fps)

### Pond 7P: Forebay - Bio Retention

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 8P: Main Cell - Bio Retention**

[79] Warning: Submerged Pond 7P Primary device # 2 by 0.01'

Inflow Area = 44,069 sf, Inflow Depth > 2.35" for 10-Year event  
 Inflow = 2.66 cfs @ 12.10 hrs, Volume= 8,627 cf  
 Outflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf, Atten= 16%, Lag= 3.6 min  
 Primary = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.51' @ 12.16 hrs Surf.Area= 1,061 sf Storage= 1,053 cf

Plug-Flow detention time= 28.3 min calculated for 8,457 cf (98% of inflow)  
 Center-of-Mass det. time= 17.1 min ( 849.5 - 832.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.74'	2,193 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.74	0	0	0
109.75	350	2	2
110.00	375	91	92
111.00	667	521	613
112.00	1,440	1,054	1,667
112.33	1,750	526	2,193

Device	Routing	Invert	Outlet Devices
#1	Device 7	110.00'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#2	Device 7	110.17'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#3	Device 7	110.33'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#4	Device 7	110.50'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#5	Device 7	110.67'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#6	Device 7	111.00'	<b>8.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.900
#7	Primary	107.00'	<b>12.0" x 126.0' long Culvert</b> CPP, mitered to conform to fill, Ke= 0.700 Outlet Invert= 105.61' S= 0.0110 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#8	Secondary	112.33'	<b>8.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

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Type III 24-hr 10-Year Rainfall=4.50"

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**Primary OutFlow** Max=2.22 cfs @ 12.16 hrs HW=111.51' (Free Discharge)

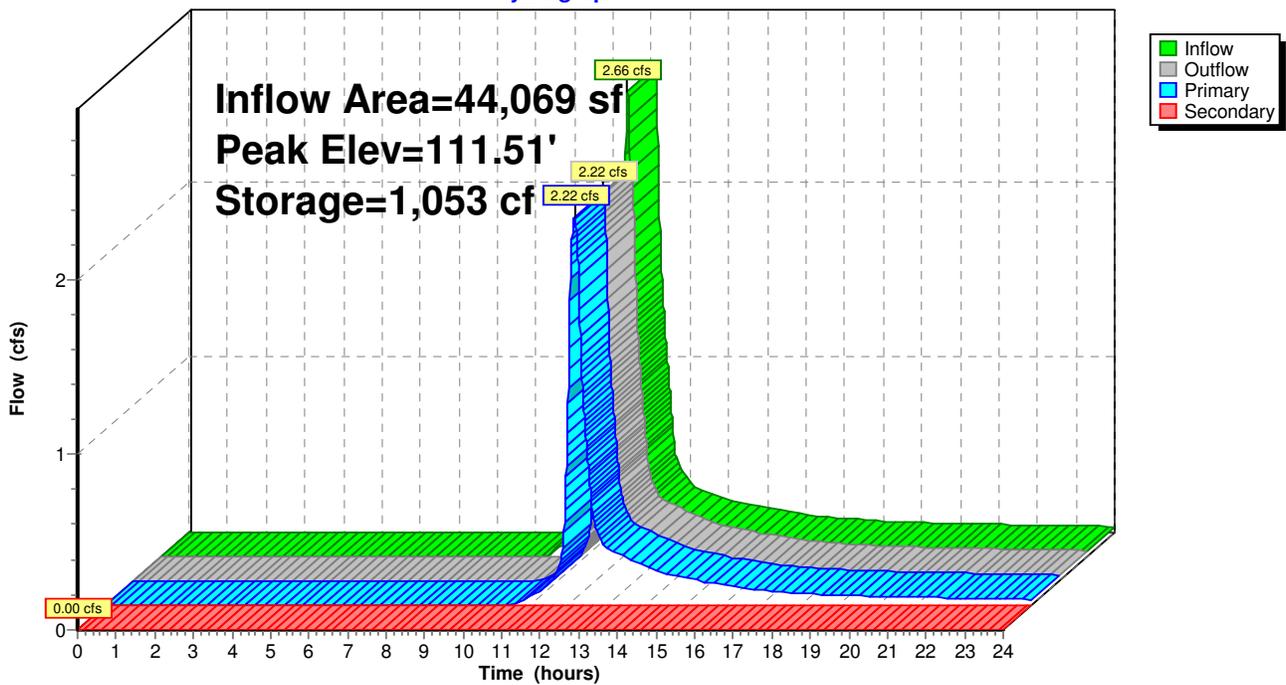
- 7=Culvert (Passes 2.22 cfs of 6.68 cfs potential flow)
- 1=Orifice/Grate (Orifice Controls 0.10 cfs @ 5.87 fps)
- 2=Orifice/Grate (Orifice Controls 0.09 cfs @ 5.53 fps)
- 3=Orifice/Grate (Orifice Controls 0.08 cfs @ 5.18 fps)
- 4=Orifice/Grate (Orifice Controls 0.08 cfs @ 4.79 fps)
- 5=Orifice/Grate (Orifice Controls 0.07 cfs @ 4.36 fps)
- 6=Orifice/Grate (Orifice Controls 1.80 cfs @ 5.15 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=109.74' (Free Discharge)

- 8=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

## Pond 8P: Main Cell - Bio Retention

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 9P: CB 65

Inflow Area = 26,681 sf, Inflow Depth > 2.33" for 10-Year event  
Inflow = 1.83 cfs @ 12.03 hrs, Volume= 5,177 cf  
Outflow = 1.83 cfs @ 12.03 hrs, Volume= 5,177 cf, Atten= 0%, Lag= 0.0 min  
Primary = 1.83 cfs @ 12.03 hrs, Volume= 5,177 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 108.24' @ 12.03 hrs

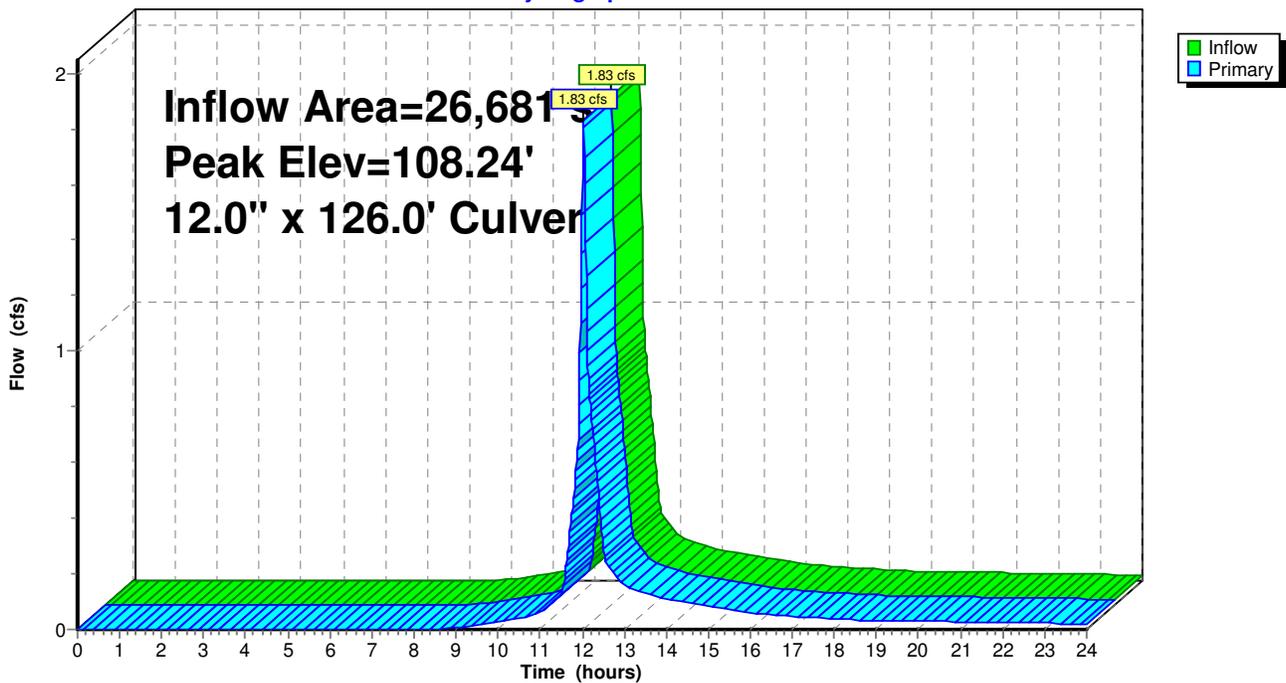
Flood Elev= 112.00'

Device #	Routing	Invert	Outlet Devices
#1	Primary	107.50'	<b>12.0" x 126.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 105.61' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=1.83 cfs @ 12.03 hrs HW=108.24' (Free Discharge)  
↑1=Culvert (Inlet Controls 1.83 cfs @ 2.93 fps)

## Pond 9P: CB 65

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 43R: CB 60 to DMH 64

[57] Hint: Peaked at 111.40' (Flood elevation advised)

Inflow Area = 4,640 sf, Inflow Depth > 3.29" for 10-Year event  
Inflow = 0.46 cfs @ 12.03 hrs, Volume= 1,274 cf  
Outflow = 0.46 cfs @ 12.03 hrs, Volume= 1,274 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.46 cfs @ 12.03 hrs, Volume= 1,274 cf

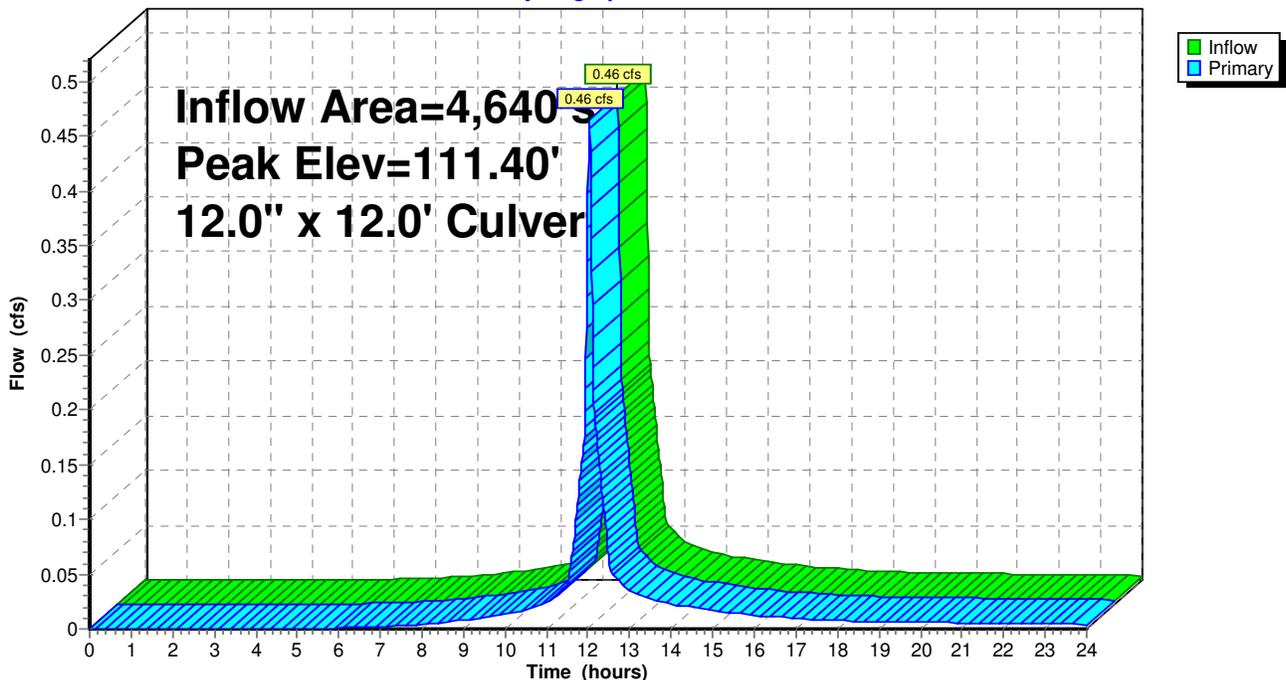
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 111.40' @ 12.03 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.02'	<b>12.0" x 12.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.46 cfs @ 12.03 hrs HW=111.40' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.46 cfs @ 2.53 fps)

## Pond 43R: CB 60 to DMH 64

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 61R: CB 62 to DMH 64**

[57] Hint: Peaked at 112.11' (Flood elevation advised)

Inflow Area = 39,429 sf, Inflow Depth > 2.29" for 10-Year event  
Inflow = 2.35 cfs @ 12.10 hrs, Volume= 7,523 cf  
Outflow = 2.35 cfs @ 12.10 hrs, Volume= 7,523 cf, Atten= 0%, Lag= 0.0 min  
Primary = 2.35 cfs @ 12.10 hrs, Volume= 7,523 cf

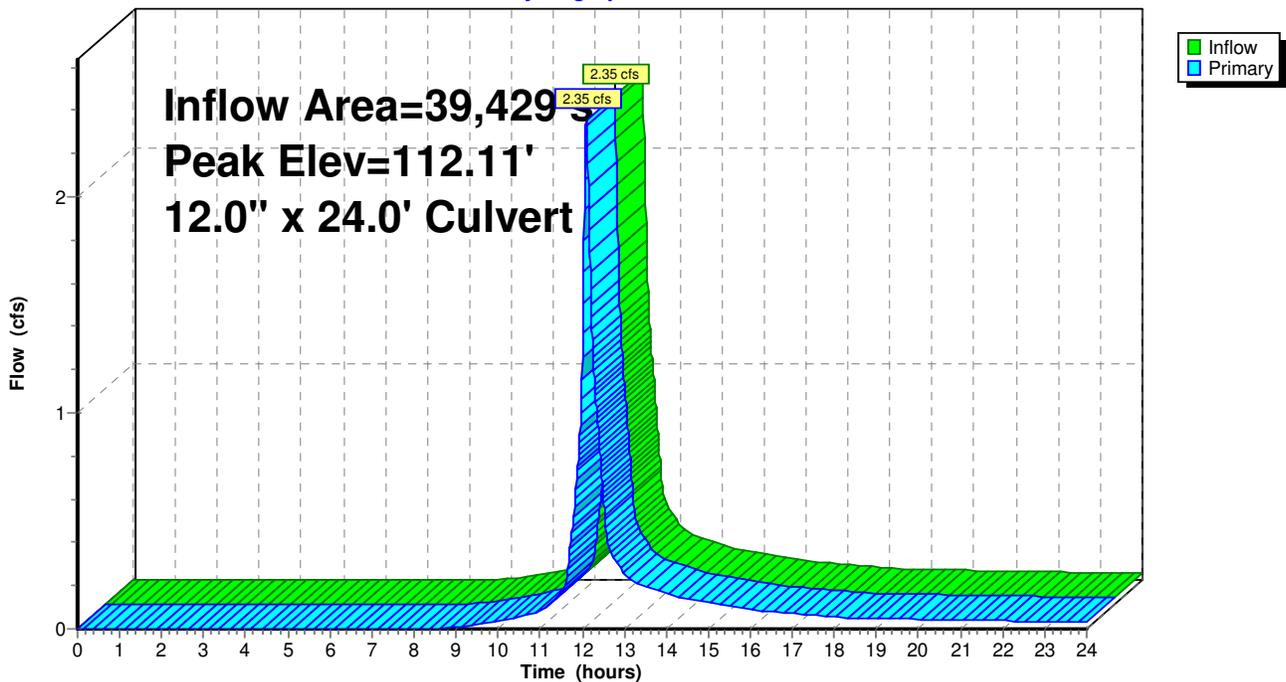
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 112.11' @ 12.10 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.14'	<b>12.0" x 24.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=2.35 cfs @ 12.10 hrs HW=112.11' (Free Discharge)  
↑1=Culvert (Barrel Controls 2.35 cfs @ 3.85 fps)

**Pond 61R: CB 62 to DMH 64**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Inflow Area = 6,950 sf, Inflow Depth > 2.73" for 10-Year event  
 Inflow = 0.61 cfs @ 12.02 hrs, Volume= 1,578 cf  
 Outflow = 0.60 cfs @ 12.02 hrs, Volume= 1,472 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 0.60 cfs @ 12.02 hrs, Volume= 1,472 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.93' @ 12.02 hrs Surf.Area= 231 sf Storage= 124 cf

Plug-Flow detention time= 51.5 min calculated for 1,472 cf (93% of inflow)  
 Center-of-Mass det. time= 16.2 min ( 829.2 - 813.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.35'	359 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.35	0	0	0
108.36	200	1	1
109.85	280	358	359

Device	Routing	Invert	Outlet Devices
#1	Primary	108.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.60 cfs @ 12.02 hrs HW=108.93' (Free Discharge)  
 ↑1=**Orifice/Grate** (Weir Controls 0.60 cfs @ 0.93 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=108.35' (Free Discharge)  
 ↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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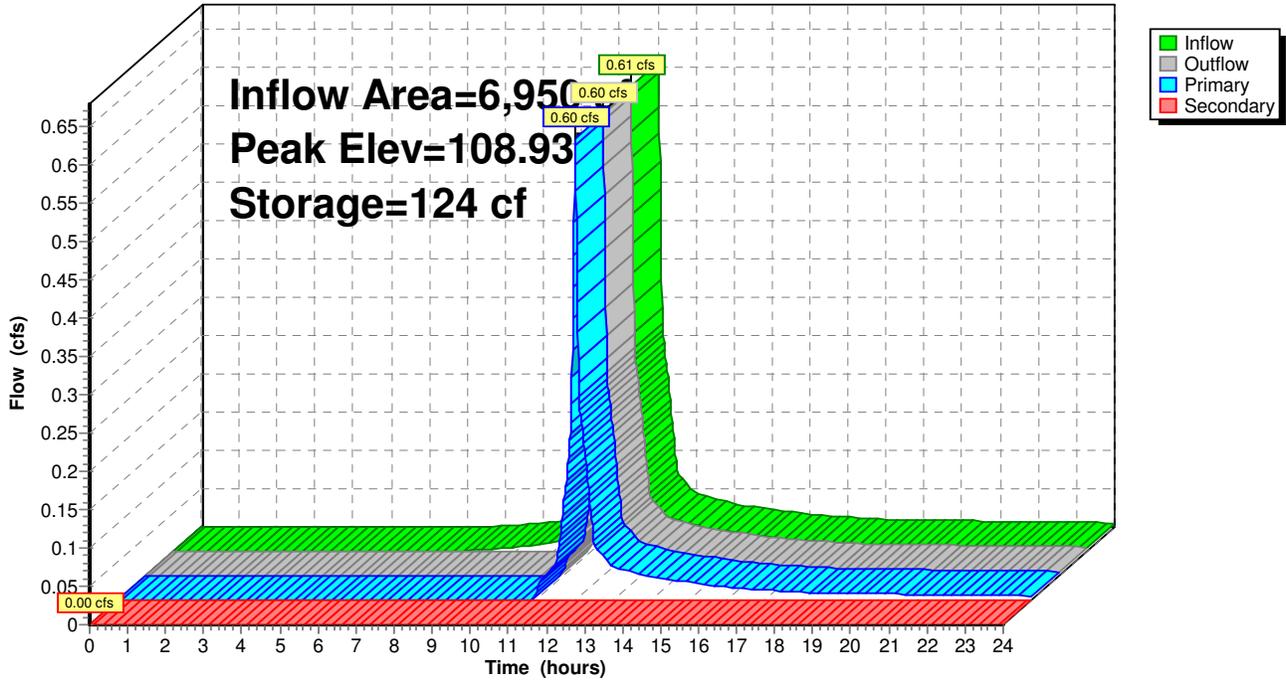
Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 67P: CB 66 (emergency vertical release)**

[61] Hint: Submerged 16% of Reach 68R bottom

Inflow Area = 44,069 sf, Inflow Depth > 2.30" for 10-Year event  
 Inflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf  
 Outflow = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 2.22 cfs @ 12.16 hrs, Volume= 8,461 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

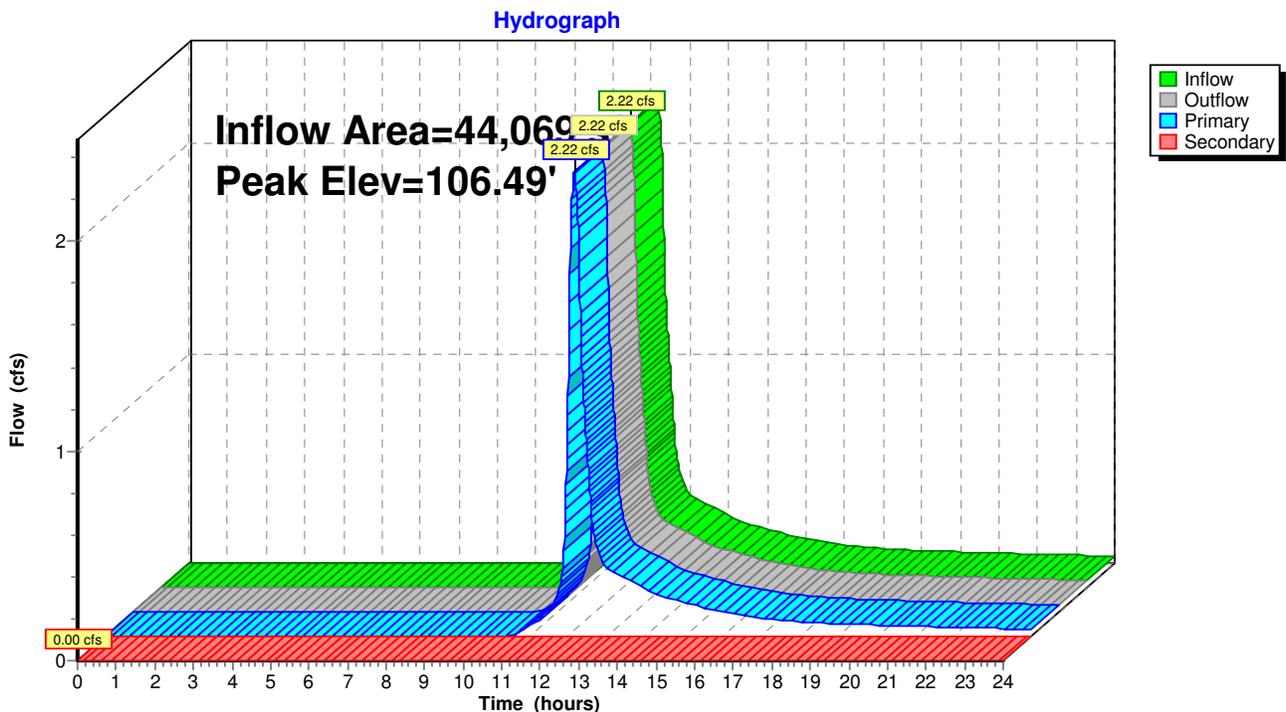
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.49' @ 12.16 hrs  
 Flood Elev= 112.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	106.00'	<b>2.00' W x 2.00' H x 52.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 102.36' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	112.00'	<b>2.00' W x 2.00' H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=2.22 cfs @ 12.16 hrs HW=106.49' (Free Discharge)  
 ↳1=Culvert (Inlet Controls 2.22 cfs @ 2.25 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.00' (Free Discharge)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)

**Pond 67P: CB 66 (emergency vertical release)**



**Postdevelopment9c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 70P: RG 10A - CB 216 at Units 13**

[63] Warning: Exceeded Reach 67R inflow depth by 0.85' @ 23.99 hrs

Inflow Area = 11,090 sf, Inflow Depth > 2.68" for 10-Year event  
 Inflow = 0.97 cfs @ 12.02 hrs, Volume= 2,476 cf  
 Outflow = 0.96 cfs @ 12.03 hrs, Volume= 2,356 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 0.96 cfs @ 12.03 hrs, Volume= 2,356 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.96' @ 12.03 hrs Surf.Area= 298 sf Storage= 151 cf

Plug-Flow detention time= 37.5 min calculated for 2,356 cf (95% of inflow)  
 Center-of-Mass det. time= 11.2 min ( 831.7 - 820.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	106.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.35	0	0	0
106.36	200	1	1
106.85	280	118	119
107.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	106.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	107.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

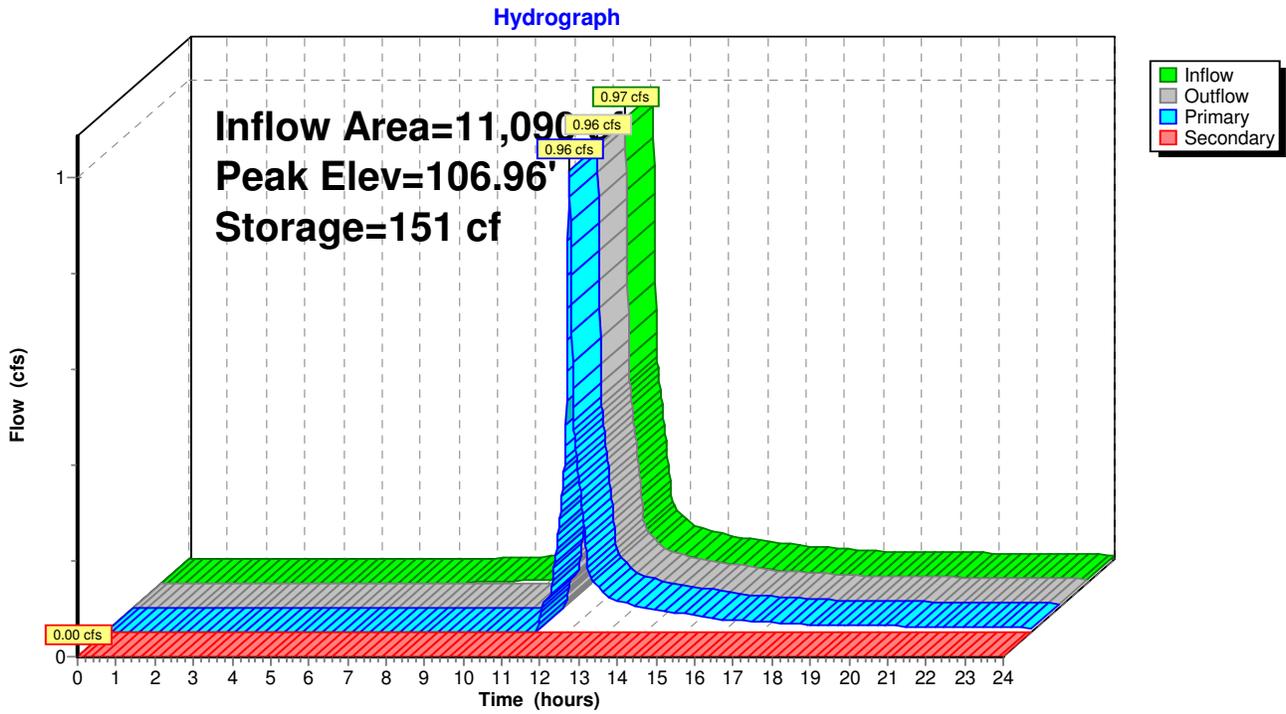
**Primary OutFlow** Max=0.96 cfs @ 12.03 hrs HW=106.96' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 0.96 cfs @ 1.09 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 70P: RG 10A - CB 216 at Units 13



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 111P: CB 20

Inflow Area = 7,780 sf, Inflow Depth > 3.20" for 10-Year event  
Inflow = 0.80 cfs @ 12.01 hrs, Volume= 2,072 cf  
Outflow = 0.80 cfs @ 12.01 hrs, Volume= 2,072 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.80 cfs @ 12.01 hrs, Volume= 2,072 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 104.24' @ 12.01 hrs

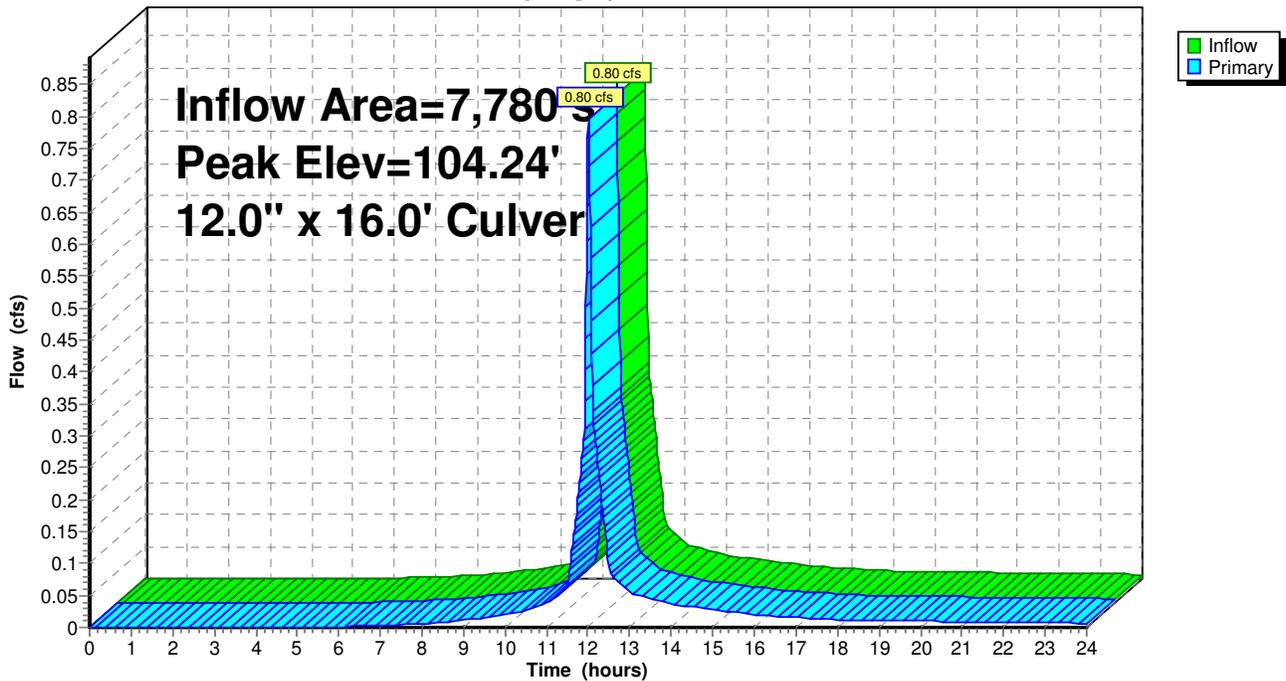
Flood Elev= 107.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	103.74'	<b>12.0" x 16.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.80 cfs @ 12.01 hrs HW=104.24' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.80 cfs @ 2.92 fps)

## Pond 111P: CB 20

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 112P: CB 22

Inflow Area = 2,898 sf, Inflow Depth > 2.73" for 10-Year event  
Inflow = 0.26 cfs @ 12.01 hrs, Volume= 658 cf  
Outflow = 0.26 cfs @ 12.01 hrs, Volume= 658 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.26 cfs @ 12.01 hrs, Volume= 658 cf

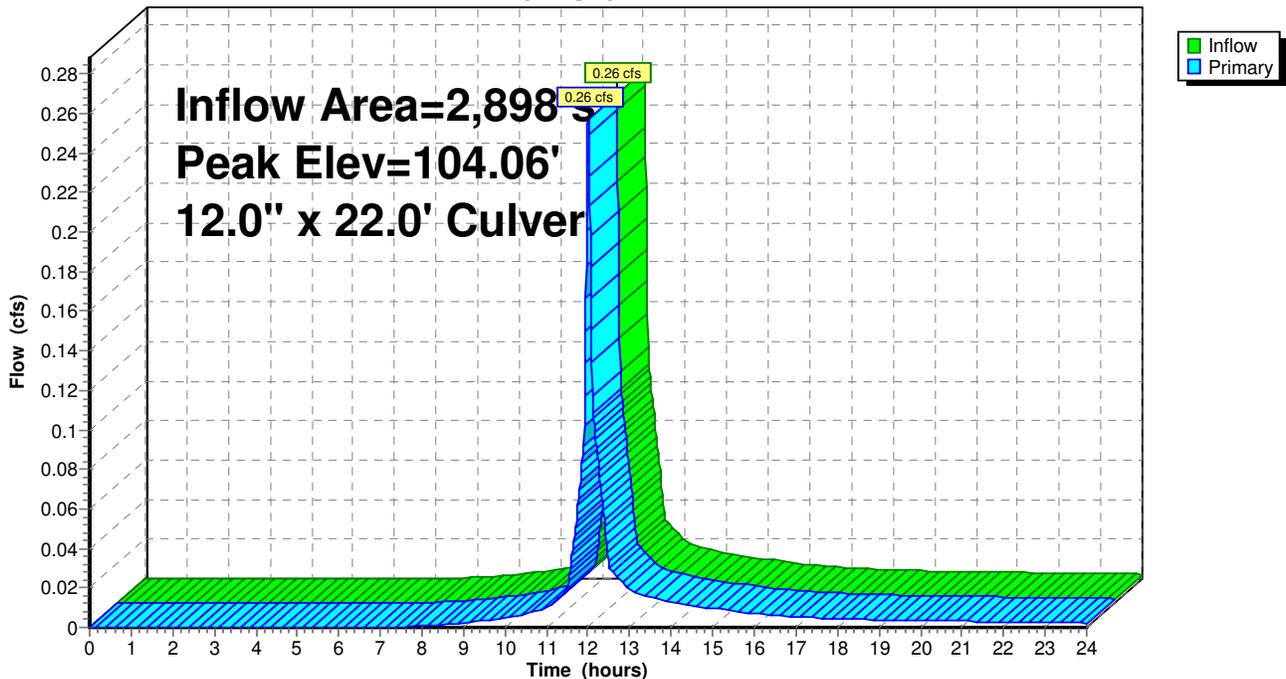
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.06' @ 12.01 hrs  
Flood Elev= 107.82'

Device #	Routing	Invert	Outlet Devices
#1	Primary	103.80'	<b>12.0" x 22.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.25 cfs @ 12.01 hrs HW=104.06' (Free Discharge)  
↑**1=Culvert** (Barrel Controls 0.25 cfs @ 2.34 fps)

## Pond 112P: CB 22

Hydrograph



**Postdevelopment9c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

[61] Hint: Submerged 4% of Reach 127R bottom

Inflow Area = 24,126 sf, Inflow Depth > 2.65" for 10-Year event  
 Inflow = 1.99 cfs @ 12.02 hrs, Volume= 5,332 cf  
 Outflow = 1.98 cfs @ 12.03 hrs, Volume= 5,332 cf, Atten= 0%, Lag= 0.3 min  
 Primary = 1.98 cfs @ 12.03 hrs, Volume= 5,332 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 110.80' @ 12.03 hrs Surf.Area= 98 sf Storage= 48 cf

Plug-Flow detention time= 0.1 min calculated for 5,330 cf (100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 821.6 - 821.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.24'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.24	0	0	0
110.25	75	0	0
110.74	96	42	42
111.74	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	110.74'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Primary	109.86'	<b>8.0" x 65.0' long Culvert</b> Ke= 0.200 Outlet Invert= 105.96' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	111.74'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.98 cfs @ 12.03 hrs HW=110.80' (Free Discharge)

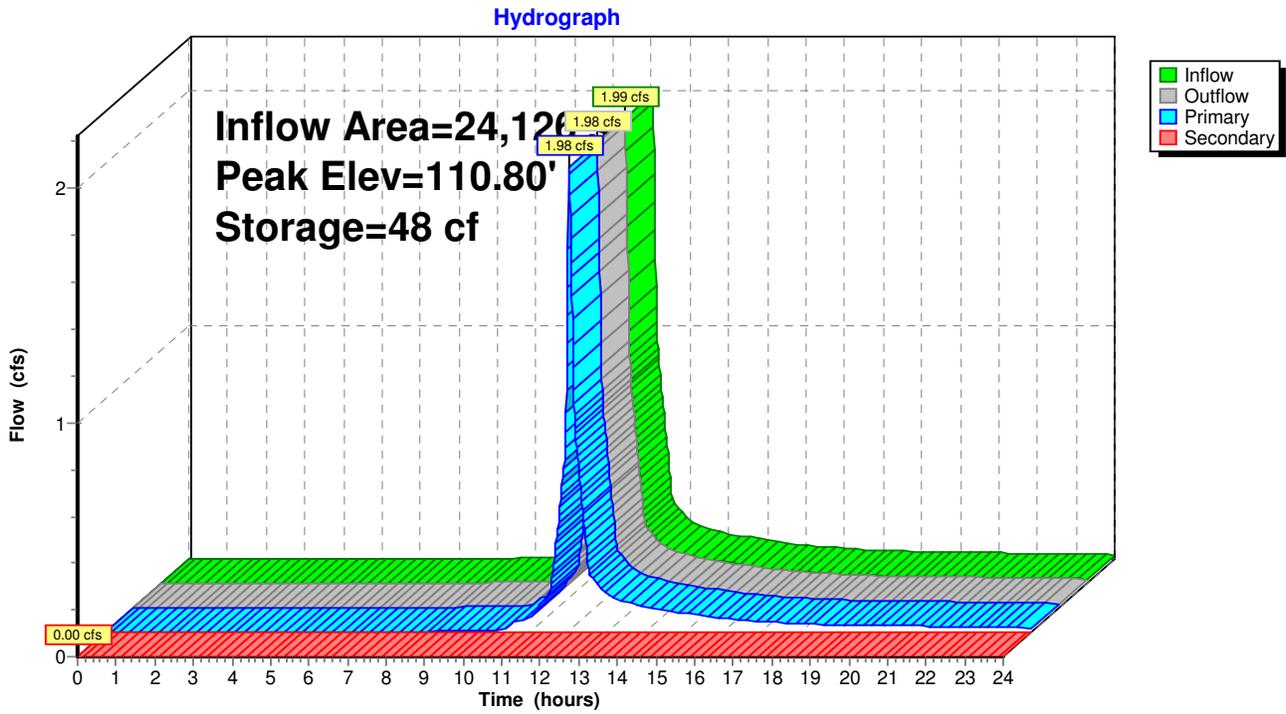
↑1=**Orifice/Grate** (Weir Controls 0.35 cfs @ 0.77 fps)

└2=**Culvert** (Inlet Controls 1.63 cfs @ 4.67 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=110.24' (Free Discharge)

↑3=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 119P: RG - 1A - CB 118 to DMH 14



**Postdevelopment9c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4**

[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 18,760 sf, Inflow Depth > 3.00" for 10-Year event  
 Inflow = 1.64 cfs @ 12.02 hrs, Volume= 4,687 cf  
 Outflow = 1.65 cfs @ 12.02 hrs, Volume= 4,644 cf, Atten= 0%, Lag= 0.2 min  
 Primary = 1.65 cfs @ 12.02 hrs, Volume= 4,644 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 112.34' @ 12.02 hrs Surf.Area= 101 sf Storage= 58 cf

Plug-Flow detention time= 8.7 min calculated for 4,642 cf (99% of inflow)  
 Center-of-Mass det. time= 3.1 min ( 809.7 - 806.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	111.68'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.68	0	0	0
111.69	75	0	0
112.18	96	42	42
113.18	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	112.18'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.18'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

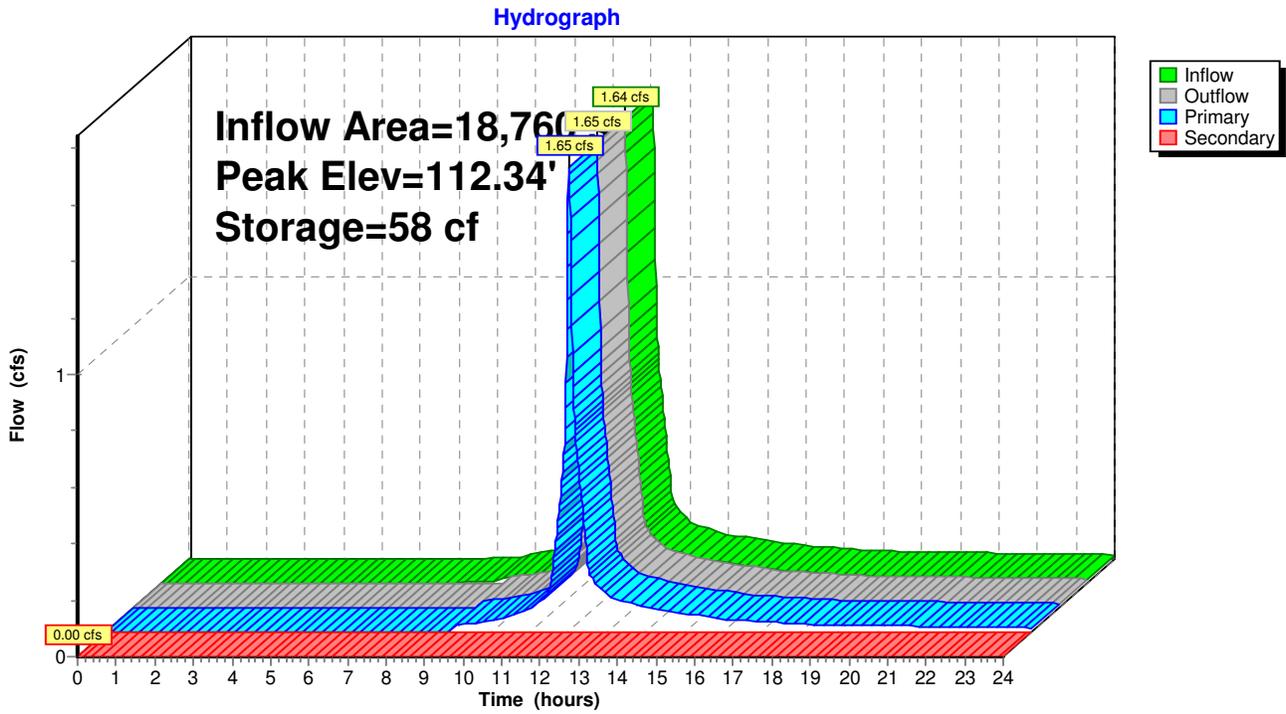
**Primary OutFlow** Max=1.64 cfs @ 12.02 hrs HW=112.34' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.64 cfs @ 1.30 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=111.68' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 121P: RG 6A - CB 120 Under Drive Unit 4



**Postdevelopment9c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 128P: RG 2A - CB 122 RG Unit 3**

[61] Hint: Submerged 15% of Reach 130R bottom

Inflow Area = 20,516 sf, Inflow Depth > 2.58" for 10-Year event  
 Inflow = 1.66 cfs @ 12.02 hrs, Volume= 4,414 cf  
 Outflow = 1.66 cfs @ 12.02 hrs, Volume= 4,371 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.66 cfs @ 12.02 hrs, Volume= 4,371 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 113.33' @ 12.02 hrs Surf.Area= 106 sf Storage= 58 cf

Plug-Flow detention time= 8.2 min calculated for 4,370 cf (99% of inflow)  
 Center-of-Mass det. time= 2.4 min ( 826.8 - 824.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	112.67'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
112.67	0	0	0
112.68	75	0	0
113.17	96	42	42
113.67	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	113.17'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.67'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

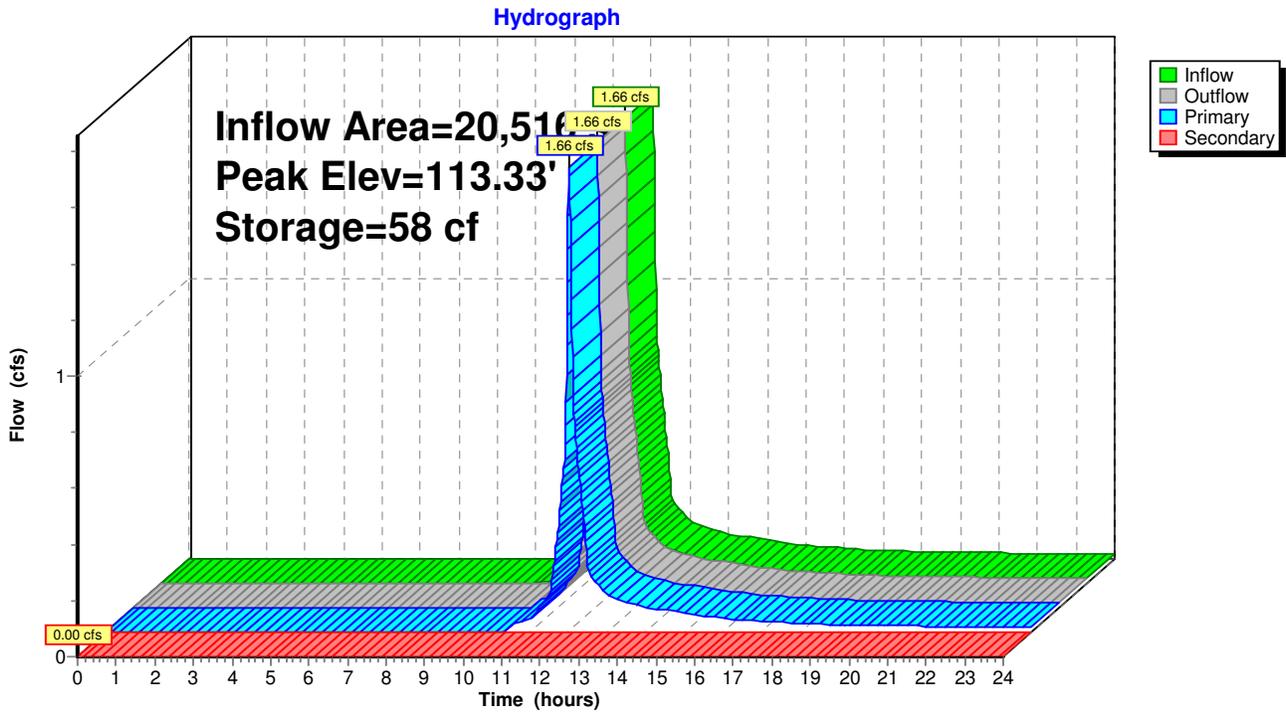
**Primary OutFlow** Max=1.65 cfs @ 12.02 hrs HW=113.33' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.65 cfs @ 1.30 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=112.67' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 128P: RG 2A - CB 122 RG Unit 3



**Postdevelopment9c**

Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20**

- [93] Warning: Storage range exceeded by 0.42'
- [88] Warning: Qout>Qin may require Finer Routing>1
- [85] Warning: Oscillations may require Finer Routing>1
- [61] Hint: Submerged 28% of Reach 129R bottom

Inflow Area = 14,450 sf, Inflow Depth > 2.82" for 10-Year event  
 Inflow = 1.34 cfs @ 12.01 hrs, Volume= 3,396 cf  
 Outflow = 1.35 cfs @ 12.01 hrs, Volume= 3,298 cf, Atten= 0%, Lag= 0.0 min  
 Secondary = 1.35 cfs @ 12.01 hrs, Volume= 3,298 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.17' @ 12.01 hrs Surf.Area= 126 sf Storage= 98 cf

Plug-Flow detention time= 24.9 min calculated for 3,298 cf (97% of inflow)  
 Center-of-Mass det. time= 8.2 min ( 821.5 - 813.3 )

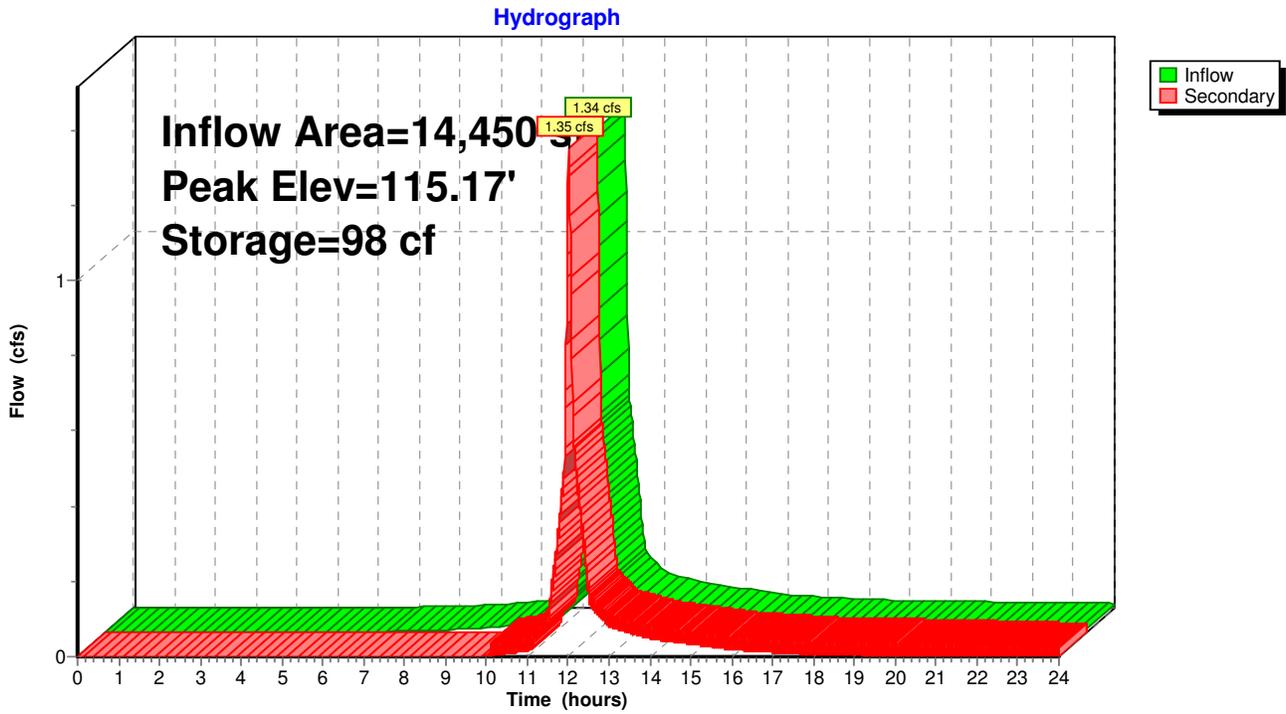
Volume	Invert	Avail.Storage	Storage Description
#1	113.75'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
113.75	0	0	0
113.76	75	0	0
114.25	96	42	42
114.75	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Secondary	114.75'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Secondary OutFlow** Max=1.34 cfs @ 12.01 hrs HW=115.16' (Free Discharge)  
 ↳1=**Broad-Crested Rectangular Weir** (Weir Controls 1.34 cfs @ 1.62 fps)

Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 133P: Large RG 4C at Unit 20**

Inflow Area = 6,950 sf, Inflow Depth > 2.73" for 10-Year event  
 Inflow = 0.62 cfs @ 12.01 hrs, Volume= 1,579 cf  
 Outflow = 0.61 cfs @ 12.01 hrs, Volume= 1,459 cf, Atten= 2%, Lag= 0.4 min  
 Primary = 0.61 cfs @ 12.01 hrs, Volume= 1,459 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.93' @ 12.01 hrs Surf.Area= 293 sf Storage= 142 cf

Plug-Flow detention time= 56.7 min calculated for 1,459 cf (92% of inflow)  
 Center-of-Mass det. time= 17.9 min ( 830.4 - 812.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	116.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.35	0	0	0
116.36	200	1	1
116.85	280	118	119
117.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	116.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	117.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.60 cfs @ 12.01 hrs HW=116.93' (Free Discharge)

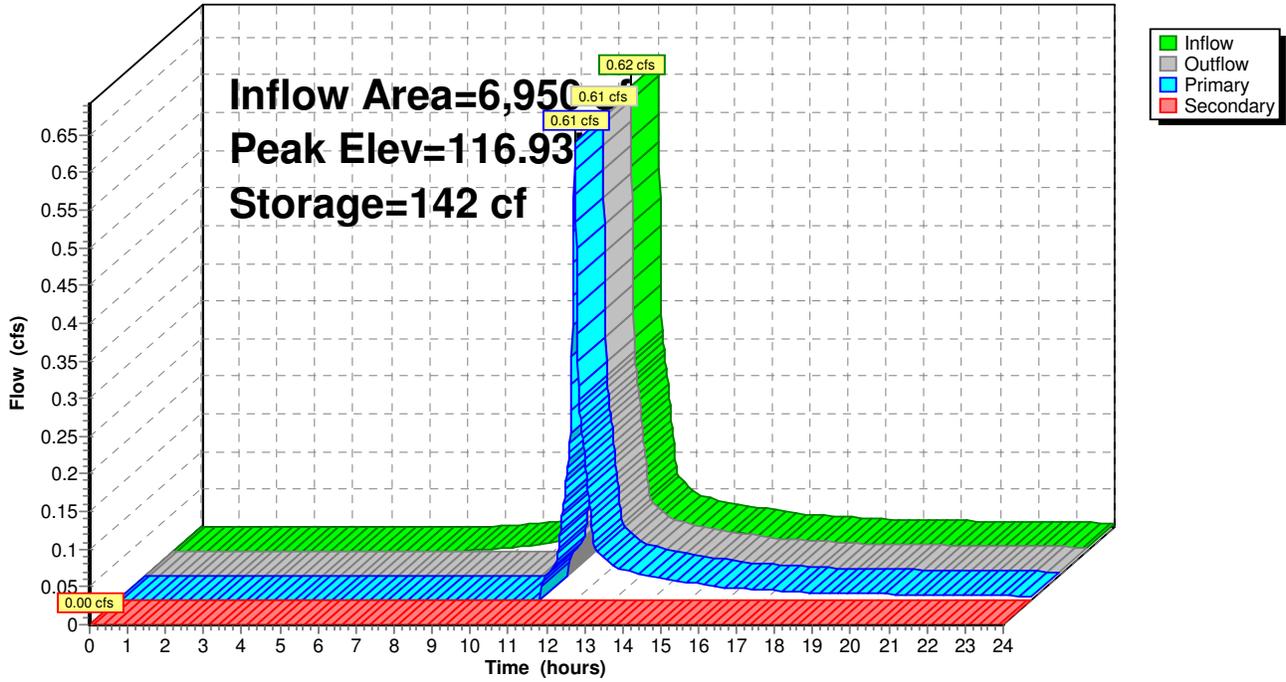
↑1=**Orifice/Grate** (Weir Controls 0.60 cfs @ 0.93 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=116.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 133P: Large RG 4C at Unit 20

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 144R: HW 30 to DMH 14

[57] Hint: Peaked at 113.78' (Flood elevation advised)

Inflow Area = 34,910 sf, Inflow Depth > 2.22" for 10-Year event  
Inflow = 1.99 cfs @ 12.07 hrs, Volume= 6,463 cf  
Outflow = 1.99 cfs @ 12.07 hrs, Volume= 6,463 cf, Atten= 0%, Lag= 0.0 min  
Primary = 1.99 cfs @ 12.07 hrs, Volume= 6,463 cf

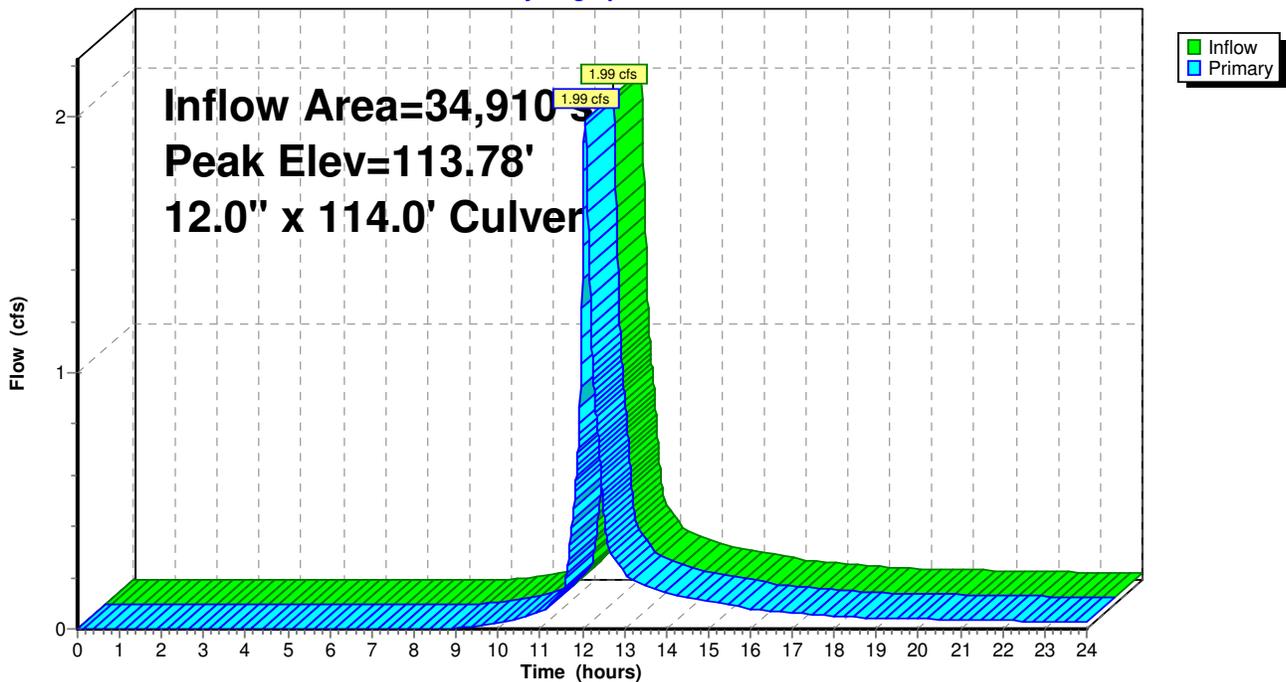
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 113.78' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	113.00'	<b>12.0" x 114.0' long Culvert</b> Ke= 0.500 Outlet Invert= 103.88' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=1.99 cfs @ 12.07 hrs HW=113.78' (Free Discharge)  
↑1=Culvert (Inlet Controls 1.99 cfs @ 3.01 fps)

## Pond 144R: HW 30 to DMH 14

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Inflow Area = 21,810 sf, Inflow Depth > 3.03" for 10-Year event  
 Inflow = 1.54 cfs @ 12.00 hrs, Volume= 5,506 cf  
 Outflow = 1.54 cfs @ 12.01 hrs, Volume= 5,463 cf, Atten= 0%, Lag= 0.4 min  
 Primary = 1.54 cfs @ 12.01 hrs, Volume= 5,463 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.15' @ 12.01 hrs Surf.Area= 101 sf Storage= 57 cf

Plug-Flow detention time= 7.5 min calculated for 5,463 cf (99% of inflow)  
 Center-of-Mass det. time= 2.7 min ( 809.6 - 806.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	107.50'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.50	0	0	0
107.51	75	0	0
108.00	96	42	42
109.00	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	108.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.00'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.54 cfs @ 12.01 hrs HW=108.15' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.54 cfs @ 1.27 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=107.50' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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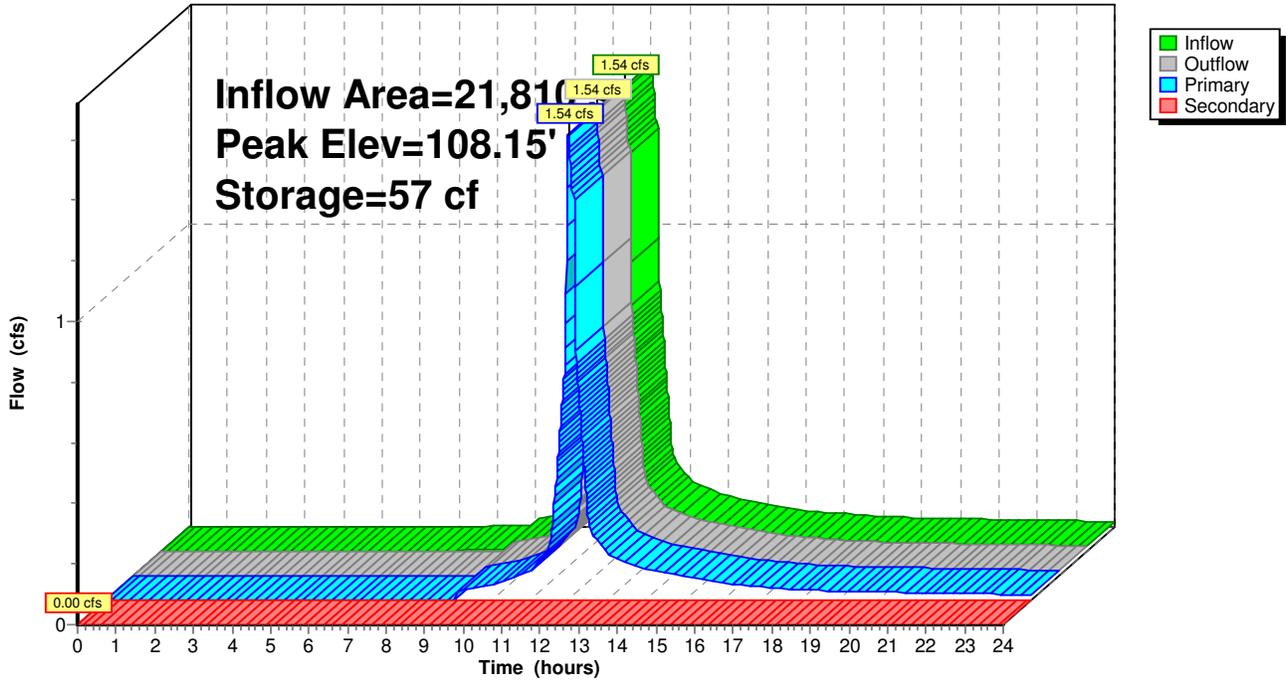
Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 157P: RG 7A - CB 126 Under Drive Unit 5**

[61] Hint: Submerged 39% of Reach 154R bottom

Inflow Area = 12,570 sf, Inflow Depth > 2.99" for 10-Year event  
 Inflow = 1.06 cfs @ 12.03 hrs, Volume= 3,131 cf  
 Outflow = 1.06 cfs @ 12.03 hrs, Volume= 3,089 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.06 cfs @ 12.03 hrs, Volume= 3,089 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.57' @ 12.03 hrs Surf.Area= 103 sf Storage= 54 cf

Plug-Flow detention time= 13.1 min calculated for 3,087 cf (99% of inflow)  
 Center-of-Mass det. time= 4.8 min ( 809.6 - 804.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	115.95'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.95	0	0	0
115.96	75	0	0
116.45	96	42	42
116.95	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	116.45'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	116.95'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.06 cfs @ 12.03 hrs HW=116.57' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.06 cfs @ 1.12 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=115.95' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Postdevelopment9c**

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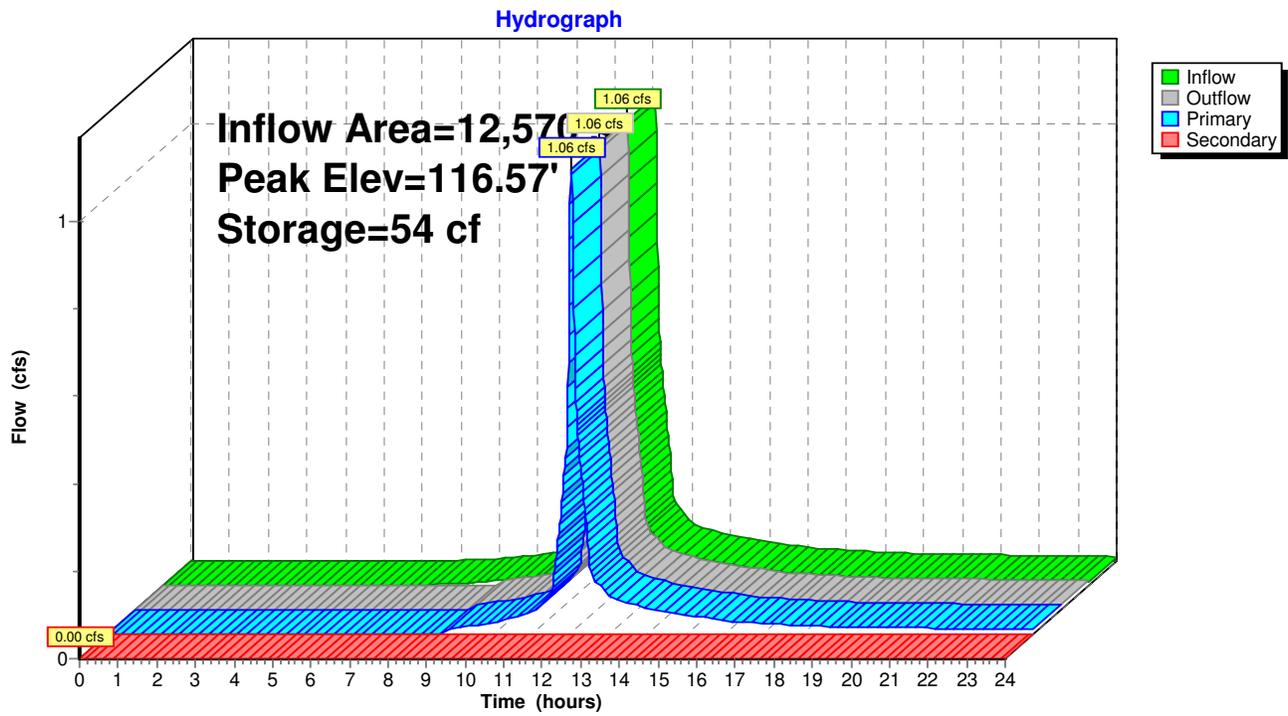
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Type III 24-hr 10-Year Rainfall=4.50"

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**Pond 157P: RG 7A - CB 126 Under Drive Unit 5**



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 158P: Culvert under Drive Unit 6

[57] Hint: Peaked at 117.55' (Flood elevation advised)

Inflow Area = 7,200 sf, Inflow Depth > 2.91" for 10-Year event  
Inflow = 0.62 cfs @ 12.05 hrs, Volume= 1,745 cf  
Outflow = 0.62 cfs @ 12.05 hrs, Volume= 1,745 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.62 cfs @ 12.05 hrs, Volume= 1,745 cf

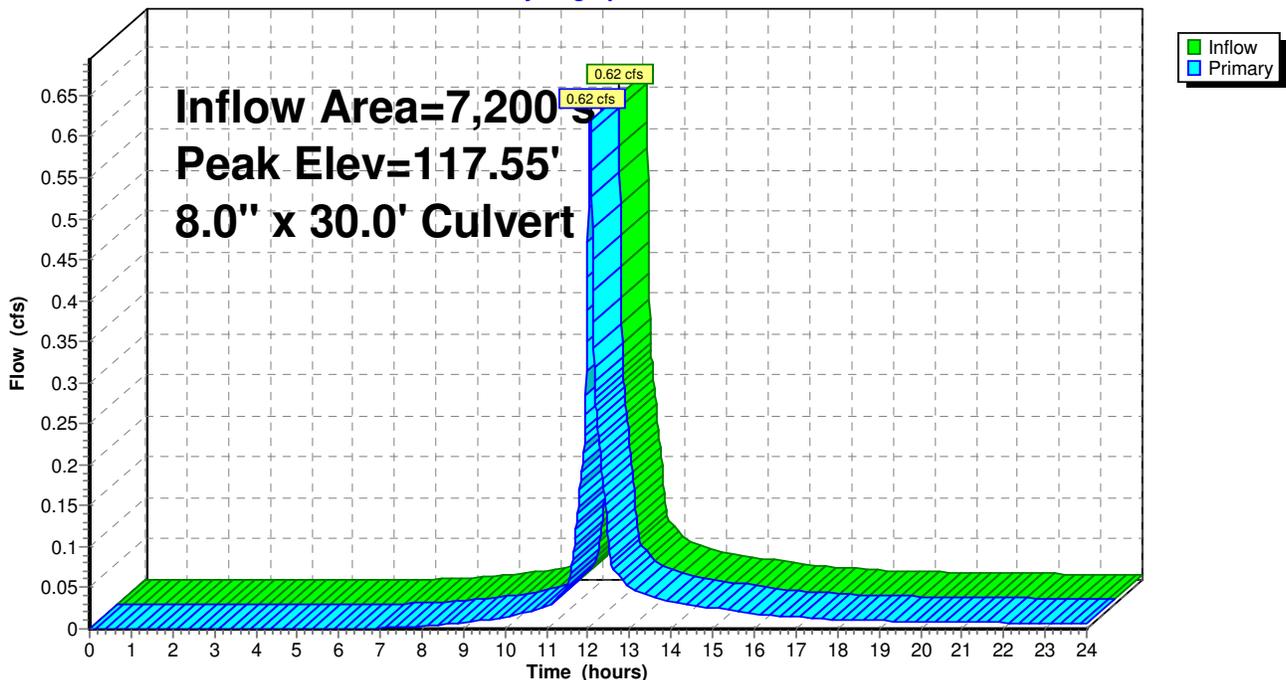
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 117.55' @ 12.05 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	117.05'	<b>8.0" x 30.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 116.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.62 cfs @ 12.05 hrs HW=117.55' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.62 cfs @ 3.04 fps)

## Pond 158P: Culvert under Drive Unit 6

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 218R: DMH 50 to Irrigation Cistern

[57] Hint: Peaked at 103.41' (Flood elevation advised)

[63] Warning: Exceeded Reach 55R inflow depth by 0.39' @ 12.04 hrs

[63] Warning: Exceeded Reach 403R inflow depth by 0.83' @ 12.02 hrs

Inflow Area = 111,470 sf, Inflow Depth > 2.44" for 10-Year event  
Inflow = 6.66 cfs @ 12.03 hrs, Volume= 22,697 cf  
Outflow = 6.66 cfs @ 12.03 hrs, Volume= 22,697 cf, Atten= 0%, Lag= 0.0 min  
Primary = 6.66 cfs @ 12.03 hrs, Volume= 22,697 cf

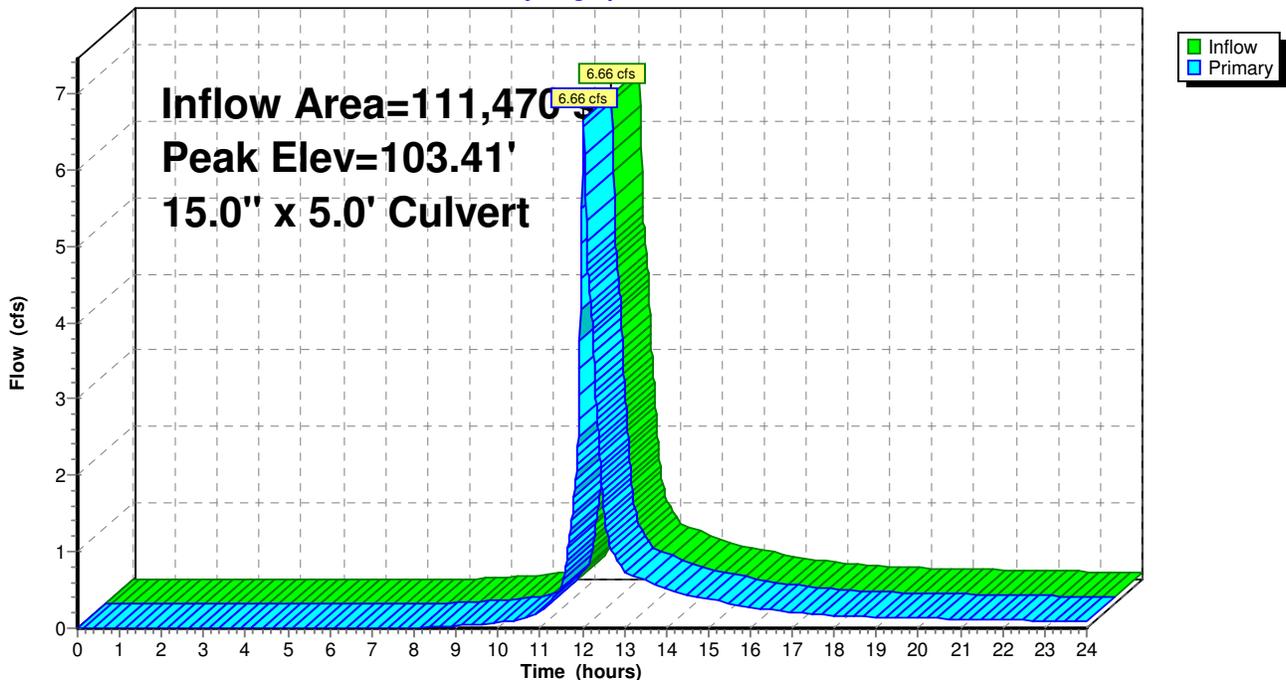
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 103.41' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	101.52'	<b>15.0" x 5.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 101.42' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

**Primary OutFlow** Max=6.65 cfs @ 12.03 hrs HW=103.41' (Free Discharge)  
↑1=Culvert (Inlet Controls 6.65 cfs @ 5.42 fps)

## Pond 218R: DMH 50 to Irrigation Cistern

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.50"

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## Pond 219P: Irrigation Cistern

[81] Warning: Exceeded Pond 218R by 0.92' @ 12.12 hrs

Inflow Area = 111,470 sf, Inflow Depth > 2.44" for 10-Year event  
Inflow = 6.66 cfs @ 12.03 hrs, Volume= 22,697 cf  
Outflow = 5.52 cfs @ 12.09 hrs, Volume= 22,672 cf, Atten= 17%, Lag= 3.7 min  
Primary = 5.52 cfs @ 12.09 hrs, Volume= 22,672 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 103.95' @ 12.09 hrs Surf.Area= 460 sf Storage= 1,165 cf

Plug-Flow detention time= 3.9 min calculated for 22,672 cf (100% of inflow)  
Center-of-Mass det. time= 3.2 min ( 835.1 - 831.9 )

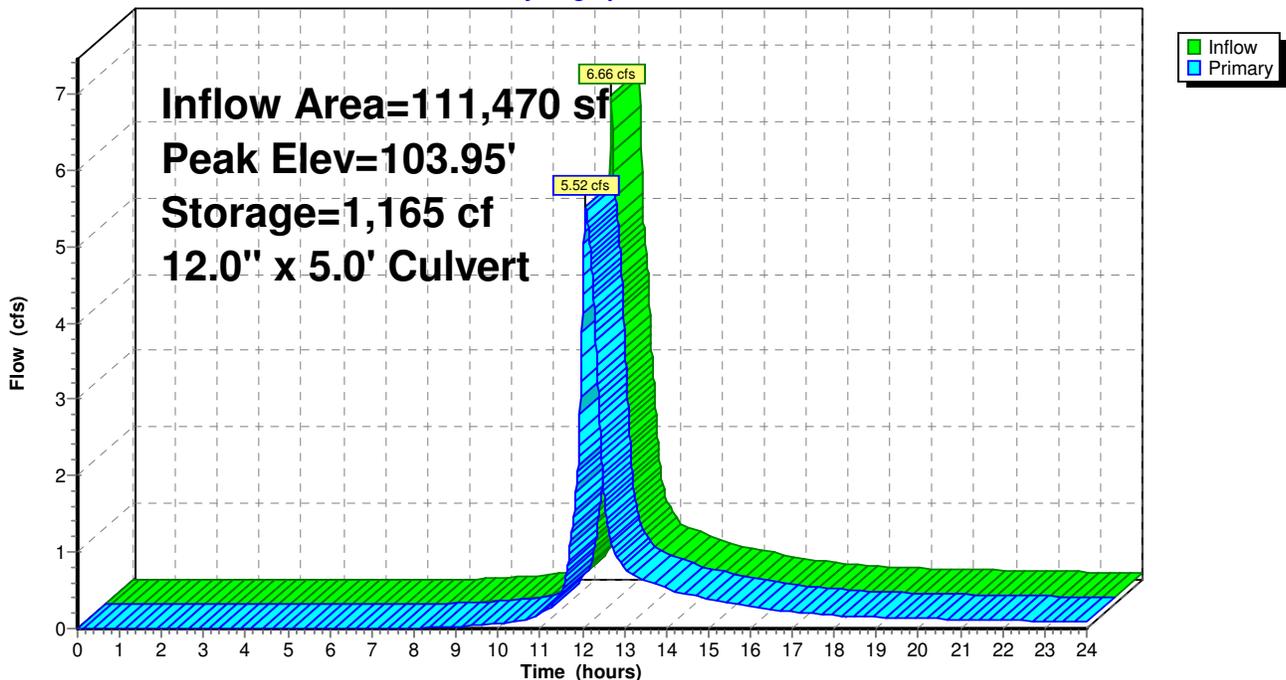
Volume	Invert	Avail.Storage	Storage Description
#1	101.42'	4,292 cf	11.50'W x 40.00'L x 9.33'H Prismatic

Device	Routing	Invert	Outlet Devices
#1	Primary	101.32'	12.0" x 5.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= 101.22' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

Primary OutFlow Max=5.52 cfs @ 12.09 hrs HW=103.95' (Free Discharge)  
←1=Culvert (Inlet Controls 5.52 cfs @ 7.03 fps)

## Pond 219P: Irrigation Cistern

Hydrograph



**Postdevelopment9c**

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Type III 24-hr 10-Year Rainfall=4.50"

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**Link A: POA A**

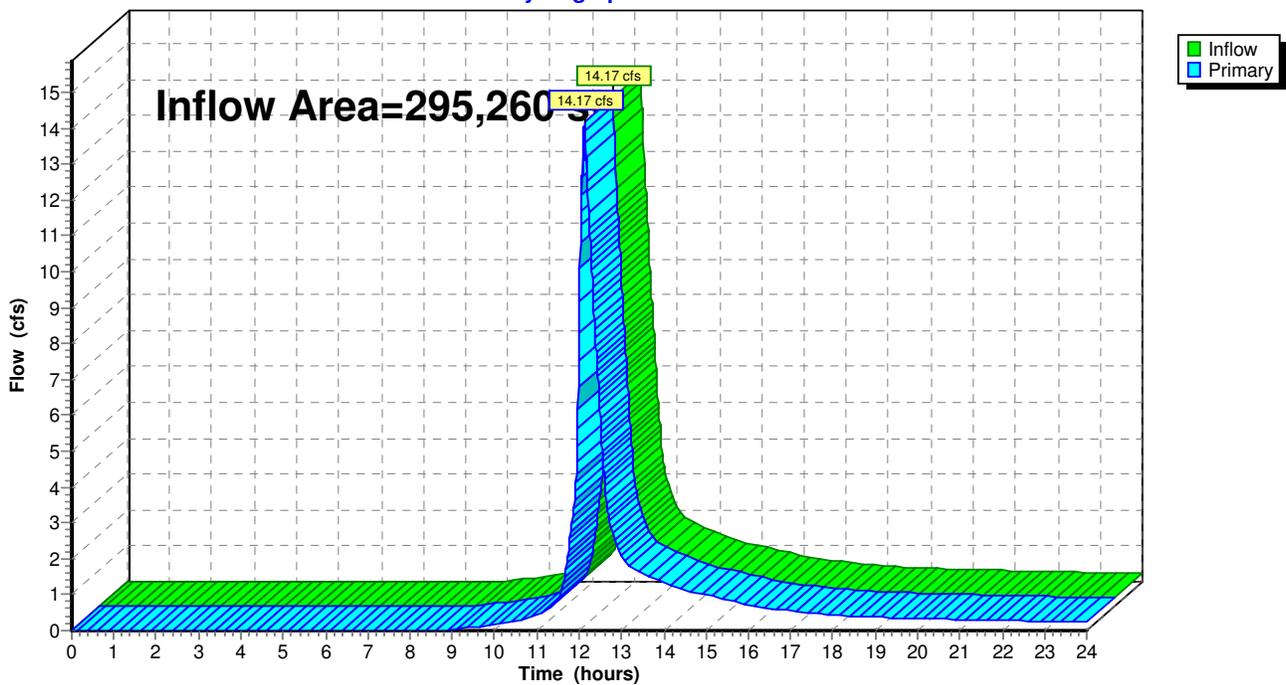
Inflow Area = 295,260 sf, Inflow Depth > 2.26" for 10-Year event  
Inflow = 14.17 cfs @ 12.12 hrs, Volume= 55,604 cf  
Primary = 14.17 cfs @ 12.12 hrs, Volume= 55,604 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 82.00'

**Link A: POA A**

Hydrograph



## Postdevelopment9c

Type III 24-hr 25-Year Rainfall=5.30"

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 54S: CB at Cul-de-Sac - Outside** Runoff Area=20,970 sf Runoff Depth>3.35"  
Flow Length=90' Tc=0.5 min CN=82 Runoff=2.28 cfs 5,852 cf

**Subcatchment 56S: CB at Cul-de-Sac - Inside** Runoff Area=8,660 sf Runoff Depth>3.65"  
Flow Length=100' Slope=0.0150 '/' Tc=0.7 min CN=85 Runoff=1.01 cfs 2,631 cf

**Subcatchment 60S:** Runoff Area=4,640 sf Runoff Depth>4.06"  
Flow Length=80' Tc=2.0 min CN=89 Runoff=0.57 cfs 1,569 cf

**Subcatchment 62S: Large Area including 2 Septics** Runoff Area=39,429 sf Runoff Depth>2.96"  
Flow Length=235' Tc=6.9 min CN=78 Runoff=3.05 cfs 9,740 cf

**Subcatchment 65S: Throat of Cul-de-sac u.g.** Runoff Area=11,590 sf Runoff Depth>3.06"  
Flow Length=170' Slope=0.0400 '/' Tc=0.7 min CN=79 Runoff=1.15 cfs 2,957 cf

**Subcatchment 68S: From hill near 19,20 to Lawn CB** Runoff Area=15,091 sf Runoff Depth>2.97"  
Flow Length=190' Tc=3.0 min CN=78 Runoff=1.34 cfs 3,731 cf

**Subcatchment 110S: To CB 20** Runoff Area=7,780 sf Runoff Depth>3.95"  
Flow Length=100' Slope=0.0200 '/' Tc=0.6 min CN=88 Runoff=0.98 cfs 2,564 cf

**Subcatchment 112S: To CB 22** Runoff Area=2,898 sf Runoff Depth>3.45"  
Flow Length=60' Tc=0.3 min CN=83 Runoff=0.32 cfs 832 cf

**Subcatchment 114S: Behind Units 1&2** Runoff Area=15,260 sf Runoff Depth>2.87"  
Flow Length=130' Tc=8.7 min CN=77 Runoff=1.08 cfs 3,651 cf

**Subcatchment 116S:** Runoff Area=3,050 sf Runoff Depth>4.17"  
Flow Length=70' Tc=0.3 min CN=90 Runoff=0.40 cfs 1,059 cf

**Subcatchment 118S:** Runoff Area=3,610 sf Runoff Depth>3.95"  
Flow Length=50' Tc=0.2 min CN=88 Runoff=0.45 cfs 1,190 cf

**Subcatchment 120S:** Runoff Area=6,190 sf Runoff Depth>3.85"  
Flow Length=90' Tc=0.5 min CN=87 Runoff=0.76 cfs 1,986 cf

**Subcatchment 122S:** Runoff Area=6,066 sf Runoff Depth>2.87"  
Flow Length=100' Tc=3.6 min CN=77 Runoff=0.51 cfs 1,453 cf

**Subcatchment 124S:** Runoff Area=7,500 sf Runoff Depth>3.85"  
Flow Length=80' Tc=0.5 min CN=87 Runoff=0.92 cfs 2,407 cf

**Subcatchment 126S:** Runoff Area=5,370 sf Runoff Depth>3.85"  
Flow Length=60' Tc=0.3 min CN=87 Runoff=0.66 cfs 1,723 cf

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Type III 24-hr 25-Year Rainfall=5.30"

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<b>Subcatchment 128S:</b>	Runoff Area=7,200 sf	Runoff Depth>3.64"
Flow Length=115'	Slope=0.0200 '/'	Tc=3.2 min CN=85 Runoff=0.77 cfs 2,187 cf
<b>Subcatchment 130S:</b>	Runoff Area=6,950 sf	Runoff Depth>3.45"
Flow Length=60'	Tc=0.3 min CN=83	Runoff=0.78 cfs 1,996 cf
<b>Subcatchment 132S: Behind Unit 3</b>	Runoff Area=26,270 sf	Runoff Depth>2.78"
Flow Length=120'	Tc=0.7 min CN=76	Runoff=2.38 cfs 6,096 cf
<b>Subcatchment 134S: To Swale behind 7,6,5</b>	Runoff Area=13,850 sf	Runoff Depth>3.06"
Flow Length=70'	Slope=0.0200 '/'	Tc=3.1 min CN=79 Runoff=1.27 cfs 3,532 cf
<b>Subcatchment 136S: To Swale behind 4 to HW 30</b>	Runoff Area=21,060 sf	Runoff Depth>2.78"
Flow Length=100'	Tc=0.6 min CN=76	Runoff=1.91 cfs 4,887 cf
<b>Subcatchment 138S: Rear of Units 10,11,12,13</b>	Runoff Area=15,030 sf	Runoff Depth>3.15"
Flow Length=400'	Tc=12.1 min CN=80	Runoff=1.05 cfs 3,944 cf
<b>Subcatchment 140S: Behind Units 14, 15, 16</b>	Runoff Area=21,630 sf	Runoff Depth>2.78"
Flow Length=130'	Slope=0.0100 '/'	Tc=11.7 min CN=76 Runoff=1.34 cfs 5,007 cf
<b>Subcatchment 214S:</b>	Runoff Area=6,950 sf	Runoff Depth>3.45"
	Tc=1.0 min CN=83	Runoff=0.76 cfs 1,996 cf
<b>Subcatchment 216S:</b>	Runoff Area=4,140 sf	Runoff Depth>3.65"
	Tc=1.0 min CN=85	Runoff=0.48 cfs 1,258 cf
<b>Subcatchment 900: North Offsite flowing onto property</b>	Runoff Area=14,076 sf	Runoff Depth>2.26"
Flow Length=360'	Slope=0.0500 '/'	Tc=12.0 min CN=70 Runoff=0.69 cfs 2,645 cf
<b>Reach 1R: Existing wetland channel to WF</b>	Avg. Depth=0.28'	Max Vel=4.90 fps Inflow=8.87 cfs 36,931 cf
	n=0.022 L=300.0'	S=0.0333 '/' Capacity=82.44 cfs Outflow=8.85 cfs 36,879 cf
<b>Reach 2R: CB 23 to HW 40</b>	Avg. Depth=0.80'	Max Vel=7.04 fps Inflow=5.87 cfs 25,339 cf
	D=15.0" n=0.013 L=75.0'	S=0.0149 '/' Capacity=7.89 cfs Outflow=5.83 cfs 25,335 cf
<b>Reach 55R: DMH 52 to DMH 50</b>	Avg. Depth=0.65'	Max Vel=8.16 fps Inflow=4.39 cfs 11,510 cf
	D=12.0" n=0.013 L=32.0'	S=0.0269 '/' Capacity=5.84 cfs Outflow=4.38 cfs 11,509 cf
<b>Reach 62R: DMH 64 to Bio-Retention A (HW</b>	Avg. Depth=0.67'	Max Vel=6.15 fps Inflow=3.43 cfs 11,309 cf
	D=12.0" n=0.013 L=12.0'	S=0.0150 '/' Capacity=4.36 cfs Outflow=3.43 cfs 11,309 cf
<b>Reach 64R: Swale from Drive at #12 to RG 10A</b>	Avg. Depth=0.00'	Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
	n=0.022 L=10.0'	S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf
<b>Reach 67R: Culvert under Unit 12 Drive</b>	Avg. Depth=0.38'	Max Vel=3.65 fps Inflow=0.76 cfs 1,890 cf
	D=8.0" n=0.013 L=48.0'	S=0.0100 '/' Capacity=1.21 cfs Outflow=0.75 cfs 1,890 cf
<b>Reach 68R: Underdrain to CB 66</b>	Avg. Depth=0.49'	Max Vel=9.57 fps Inflow=2.62 cfs 10,964 cf
	D=8.0" n=0.013 L=15.0'	S=0.0600 '/' Capacity=2.96 cfs Outflow=2.62 cfs 10,964 cf

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Type III 24-hr 25-Year Rainfall=5.30"

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**Reach 69R: Drain to DMH 52** Avg. Depth=0.41' Max Vel=5.31 fps Inflow=1.21 cfs 3,028 cf  
D=8.0" n=0.013 L=38.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=1.21 cfs 3,027 cf

**Reach 114R: DMH 16 to DMH 14** Avg. Depth=0.39' Max Vel=4.64 fps Inflow=1.30 cfs 3,396 cf  
D=12.0" n=0.013 L=60.0' S=0.0133 '/' Capacity=4.11 cfs Outflow=1.28 cfs 3,395 cf

**Reach 118R: Swale from Drive at #4 to RG 11** Avg. Depth=0.20' Max Vel=3.91 fps Inflow=1.28 cfs 5,809 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=1.27 cfs 5,809 cf

**Reach 119R: Culvert under Unit 4 Drive** Avg. Depth=0.67' Max Vel=3.95 fps Inflow=2.01 cfs 5,810 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.28 cfs 5,809 cf

**Reach 127R: Swale from Drive at #3 to RG 11** Avg. Depth=0.26' Max Vel=4.49 fps Inflow=2.08 cfs 5,594 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=2.08 cfs 5,594 cf

**Reach 128R: Culvert under Unit 3 Drive** Avg. Depth=0.50' Max Vel=7.41 fps Inflow=2.09 cfs 5,595 cf  
D=8.0" n=0.013 L=30.0' S=0.0357 '/' Capacity=2.28 cfs Outflow=2.08 cfs 5,594 cf

**Reach 129R: Swale from Drive at #20 to RG 124** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf

**Reach 130R: Swale to RG 122** Avg. Depth=0.25' Max Vel=3.89 fps Inflow=1.66 cfs 4,186 cf  
n=0.022 L=30.0' S=0.0360 '/' Capacity=58.07 cfs Outflow=1.65 cfs 4,185 cf

**Reach 131R: Culvert under Unit 20 Drive** Avg. Depth=0.38' Max Vel=3.66 fps Inflow=0.77 cfs 1,877 cf  
D=8.0" n=0.013 L=48.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.76 cfs 1,877 cf

**Reach 137R: Swale Back of 7,6,5** Avg. Depth=0.19' Max Vel=1.78 fps Inflow=1.27 cfs 3,532 cf  
n=0.030 L=140.0' S=0.0143 '/' Capacity=26.48 cfs Outflow=1.23 cfs 3,525 cf

**Reach 138R: Swale Back of 4** Avg. Depth=0.39' Max Vel=2.11 fps Inflow=2.66 cfs 8,412 cf  
n=0.030 L=140.0' S=0.0100 '/' Capacity=17.63 cfs Outflow=2.63 cfs 8,401 cf

**Reach 149R: DMH 14 to DMH 12** Avg. Depth=0.84' Max Vel=7.58 fps Inflow=7.68 cfs 25,405 cf  
D=18.0" n=0.013 L=95.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=7.66 cfs 25,400 cf

**Reach 150R: DMH 12 to HW 10 - Outlet** Avg. Depth=0.83' Max Vel=7.61 fps Inflow=7.66 cfs 25,400 cf  
D=18.0" n=0.013 L=55.0' S=0.0151 '/' Capacity=12.90 cfs Outflow=7.65 cfs 25,397 cf

**Reach 153R: CB 116 to DMH 14** Avg. Depth=0.35' Max Vel=8.65 fps Inflow=1.61 cfs 6,825 cf  
D=8.0" n=0.013 L=28.0' S=0.0600 '/' Capacity=2.96 cfs Outflow=1.60 cfs 6,825 cf

**Reach 154R: Swale from Drive at #6 to RG 126** Avg. Depth=0.00' Max Vel=0.00 fps  
n=0.022 L=33.0' S=0.0091 '/' Capacity=29.18 cfs Outflow=0.00 cfs 0 cf

**Reach 155R: Swale from Drive at #5 to RG 120** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=50.0' S=0.0344 '/' Capacity=56.77 cfs Outflow=0.00 cfs 0 cf

**Reach 156R: Culvert under Unit 5 Drive** Avg. Depth=0.67' Max Vel=3.95 fps Inflow=1.32 cfs 3,867 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.28 cfs 3,867 cf

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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**Inflow=7.65 cfs 25,397 cf  
Outflow=7.65 cfs 25,397 cf**Reach 220R: CB 56 to DMH 52**Avg. Depth=0.36' Max Vel=3.90 fps Inflow=1.01 cfs 2,631 cf  
D=12.0" n=0.013 L=14.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.01 cfs 2,631 cf**Reach 222R: CB 54 to DMH 52**Avg. Depth=0.58' Max Vel=4.81 fps Inflow=2.28 cfs 5,852 cf  
D=12.0" n=0.013 L=22.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=2.27 cfs 5,851 cf**Reach 403R: CB 65 to DMH 50**Avg. Depth=0.51' Max Vel=6.48 fps Inflow=2.62 cfs 10,964 cf  
D=12.0" n=0.013 L=30.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=2.62 cfs 10,963 cf**Reach 902R: Existing wetland channel to**Avg. Depth=0.29' Max Vel=5.56 fps Inflow=10.72 cfs 46,626 cf  
n=0.022 L=100.0' S=0.0400 '/' Capacity=90.31 cfs Outflow=10.72 cfs 46,607 cf**Pond 2P: Recharge System**Peak Elev=106.13' Storage=3,766 cf Inflow=6.68 cfs 29,129 cf  
Discarded=0.01 cfs 377 cf Primary=5.87 cfs 25,339 cf Secondary=1.26 cfs 449 cf Outflow=7.14 cfs 26,166 cf**Pond 7P: Forebay - Bio Retention**Peak Elev=111.80' Storage=245 cf Inflow=3.43 cfs 11,309 cf  
Discarded=0.00 cfs 0 cf Primary=3.42 cfs 11,139 cf Outflow=3.42 cfs 11,139 cf**Pond 8P: Main Cell - Bio Retention**Peak Elev=111.73' Storage=1,309 cf Inflow=3.42 cfs 11,139 cf  
Primary=2.62 cfs 10,964 cf Secondary=0.00 cfs 0 cf Outflow=2.62 cfs 10,964 cf**Pond 9P: CB 65**Peak Elev=108.39' Inflow=2.36 cfs 6,687 cf  
12.0" x 126.0' Culvert Outflow=2.36 cfs 6,687 cf**Pond 43R: CB 60 to DMH 64**Peak Elev=111.44' Inflow=0.57 cfs 1,569 cf  
12.0" x 12.0' Culvert Outflow=0.57 cfs 1,569 cf**Pond 61R: CB 62 to DMH 64**Peak Elev=112.35' Inflow=3.05 cfs 9,740 cf  
12.0" x 24.0' Culvert Outflow=3.05 cfs 9,740 cf**Pond 66P: RG 9A at Units 11/12 - CB 214**Peak Elev=108.94' Storage=127 cf Inflow=0.76 cfs 1,996 cf  
Primary=0.76 cfs 1,890 cf Secondary=0.00 cfs 0 cf Outflow=0.76 cfs 1,890 cf**Pond 67P: CB 66 (emergency vertical release)**Peak Elev=106.55' Inflow=2.62 cfs 10,964 cf  
Primary=2.62 cfs 10,964 cf Secondary=0.00 cfs 0 cf Outflow=2.62 cfs 10,964 cf**Pond 70P: RG 10A - CB 216 at Units 13**Peak Elev=106.98' Storage=156 cf Inflow=1.22 cfs 3,147 cf  
Primary=1.21 cfs 3,028 cf Secondary=0.00 cfs 0 cf Outflow=1.21 cfs 3,028 cf**Pond 111P: CB 20**Peak Elev=104.31' Inflow=0.98 cfs 2,564 cf  
12.0" x 16.0' Culvert Outflow=0.98 cfs 2,564 cf**Pond 112P: CB 22**Peak Elev=104.10' Inflow=0.32 cfs 832 cf  
12.0" x 22.0' Culvert Outflow=0.32 cfs 832 cf**Pond 119P: RG - 1A - CB 118 to DMH 14**Peak Elev=110.84' Storage=52 cf Inflow=2.49 cfs 6,784 cf  
Primary=2.49 cfs 6,784 cf Secondary=0.00 cfs 0 cf Outflow=2.49 cfs 6,784 cf

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4** Peak Elev=112.36' Storage=60 cf Inflow=2.02 cfs 5,853 cf  
Primary=2.01 cfs 5,810 cf Secondary=0.00 cfs 0 cf Outflow=2.01 cfs 5,810 cf

**Pond 128P: RG 2A - CB 122 RG Unit 3** Peak Elev=113.36' Storage=61 cf Inflow=2.09 cfs 5,637 cf  
Primary=2.09 cfs 5,595 cf Secondary=0.00 cfs 0 cf Outflow=2.09 cfs 5,595 cf

**Pond 132P: RG 3B - CB 124 Rain Garden - Unit** Peak Elev=115.22' Storage=98 cf Inflow=1.67 cfs 4,283 cf  
Outflow=1.66 cfs 4,186 cf

**Pond 133P: Large RG 4C at Unit 20** Peak Elev=116.94' Storage=146 cf Inflow=0.78 cfs 1,996 cf  
Primary=0.77 cfs 1,877 cf Secondary=0.00 cfs 0 cf Outflow=0.77 cfs 1,877 cf

**Pond 144R: HW 30 to DMH 14** Peak Elev=113.98' Inflow=2.63 cfs 8,401 cf  
12.0" x 114.0' Culvert Outflow=2.63 cfs 8,401 cf

**Pond 155P: RG 5A - CB 116 between Septic an** Peak Elev=108.16' Storage=58 cf Inflow=1.61 cfs 6,868 cf  
Primary=1.61 cfs 6,825 cf Secondary=0.00 cfs 0 cf Outflow=1.61 cfs 6,825 cf

**Pond 157P: RG 7A - CB 126 Under Drive Unit 5** Peak Elev=116.59' Storage=56 cf Inflow=1.32 cfs 3,910 cf  
Primary=1.32 cfs 3,867 cf Secondary=0.00 cfs 0 cf Outflow=1.32 cfs 3,867 cf

**Pond 158P: Culvert under Drive Unit 6** Peak Elev=117.63' Inflow=0.77 cfs 2,187 cf  
8.0" x 30.0' Culvert Outflow=0.77 cfs 2,187 cf

**Pond 218R: DMH 50 to Irrigation Cistern** Peak Elev=104.24' Inflow=8.54 cfs 29,160 cf  
15.0" x 5.0' Culvert Outflow=8.54 cfs 29,160 cf

**Pond 219P: Irrigation Cistern** Peak Elev=104.94' Storage=1,619 cf Inflow=8.54 cfs 29,160 cf  
12.0" x 5.0' Culvert Outflow=6.68 cfs 29,129 cf

**Link A: POA A** Inflow=18.28 cfs 72,453 cf  
Primary=18.28 cfs 72,453 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 76,891 cf Average Runoff Depth = 3.13"**  
**75.93% Pervious Area = 224,203 sf 24.07% Impervious Area = 71,057 sf**

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**Subcatchment 54S: CB at Cul-de-Sac - Outside**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.28 cfs @ 12.01 hrs, Volume= 5,852 cf, Depth> 3.35"

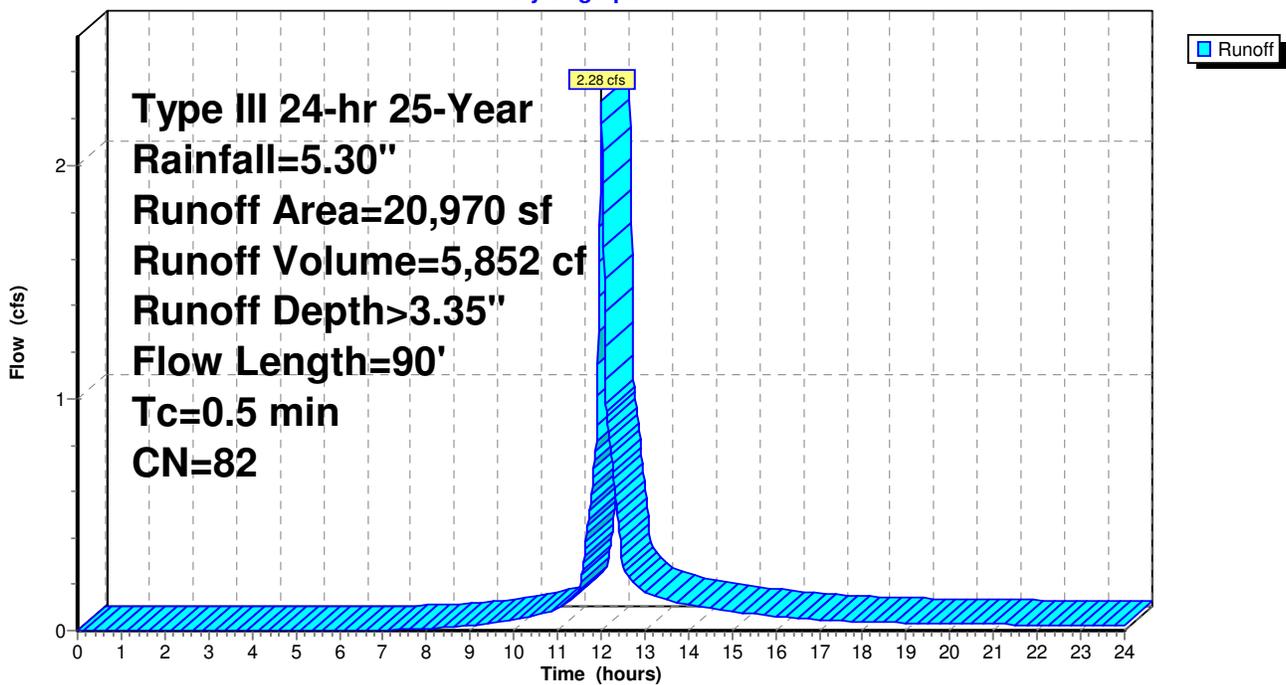
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
4,100	98	Paved parking & roofs
2,724	98	Paved parking & roofs
14,146	74	>75% Grass cover, Good, HSG C
20,970	82	Weighted Average
14,146		Pervious Area
6,824		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1500	2.42		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.20"
0.3	60	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	90	Total			

**Subcatchment 54S: CB at Cul-de-Sac - Outside**

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**Subcatchment 56S: CB at Cul-de-Sac - Inside**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 1.01 cfs @ 12.01 hrs, Volume= 2,631 cf, Depth> 3.65"

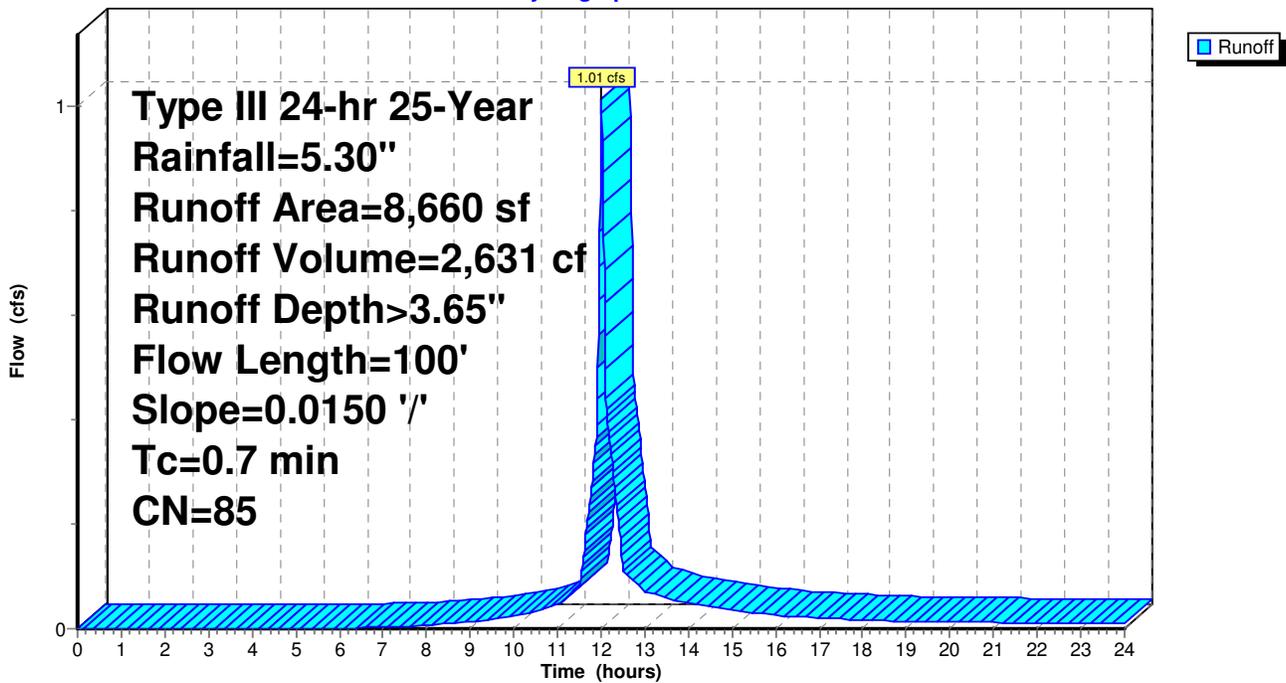
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
0	98	Paved parking & roofs
3,847	98	Paved parking & roofs
4,813	74	>75% Grass cover, Good, HSG C
8,660	85	Weighted Average
4,813		Pervious Area
3,847		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 56S: CB at Cul-de-Sac - Inside**

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**Subcatchment 60S:**

Runoff = 0.57 cfs @ 12.03 hrs, Volume= 1,569 cf, Depth> 4.06"

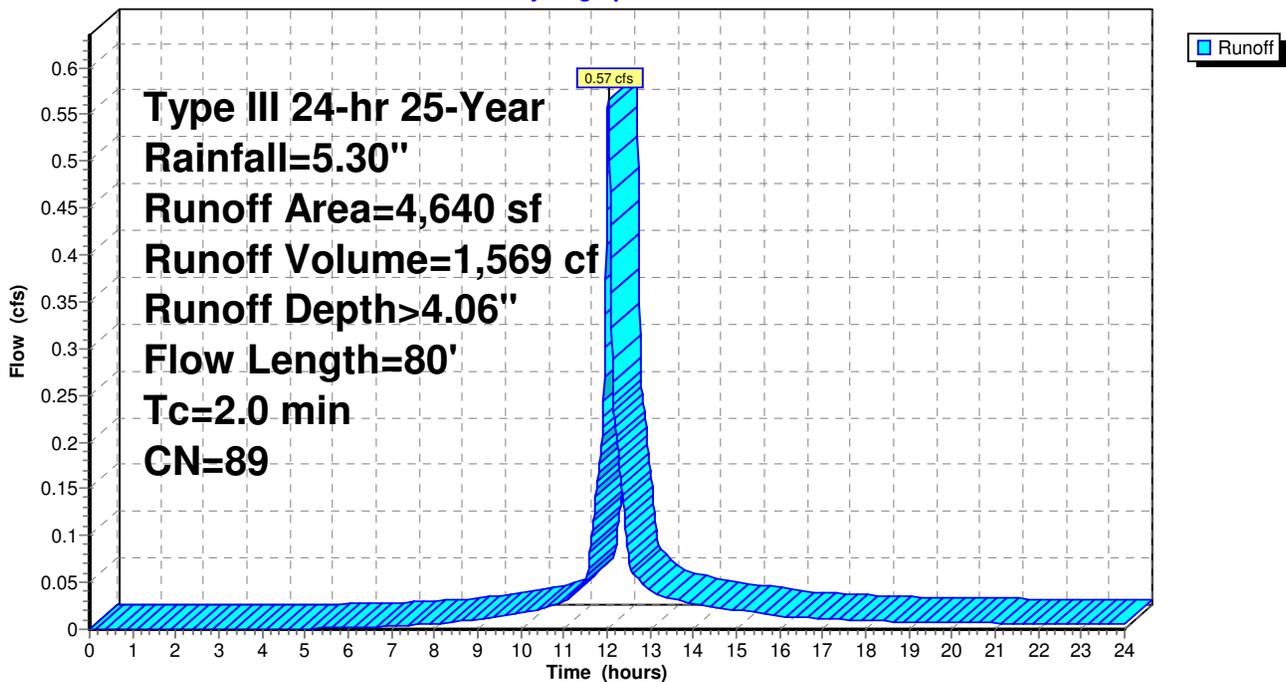
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
960	98	Paved parking & roofs
1,850	98	Paved parking & roofs
1,830	74	>75% Grass cover, Good, HSG C
4,640	89	Weighted Average
1,830		Pervious Area
2,810		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0250	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.6	70	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.0	80	Total			

**Subcatchment 60S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 62S: Large Area including 2 Septics**

Runoff = 3.05 cfs @ 12.10 hrs, Volume= 9,740 cf, Depth> 2.96"

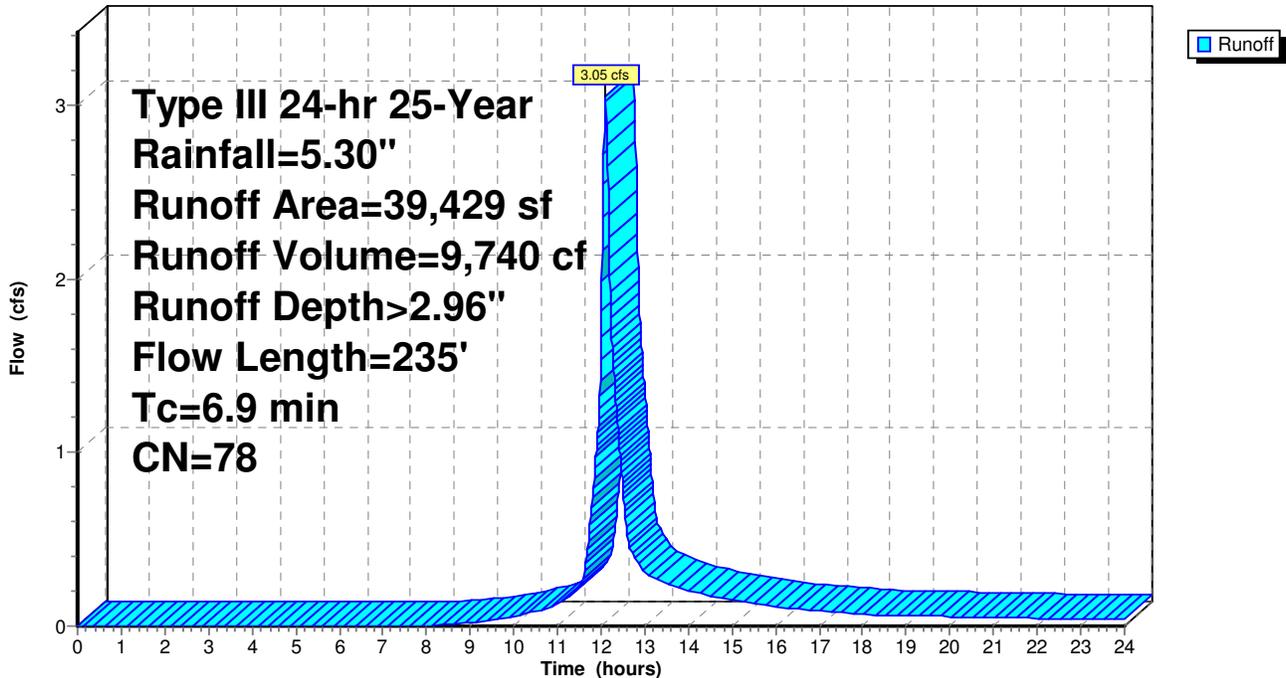
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
3,880	98	Paved parking & roofs
2,734	98	Paved parking & roofs
30,815	74	>75% Grass cover, Good, HSG C
2,000	70	Woods, Good, HSG C
39,429	78	Weighted Average
32,815		Pervious Area
6,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.1000	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	180	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
6.9	235	Total			

**Subcatchment 62S: Large Area including 2 Septics**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 65S: Throat of Cul-de-sac u.g.**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 1.15 cfs @ 12.01 hrs, Volume= 2,957 cf, Depth> 3.06"

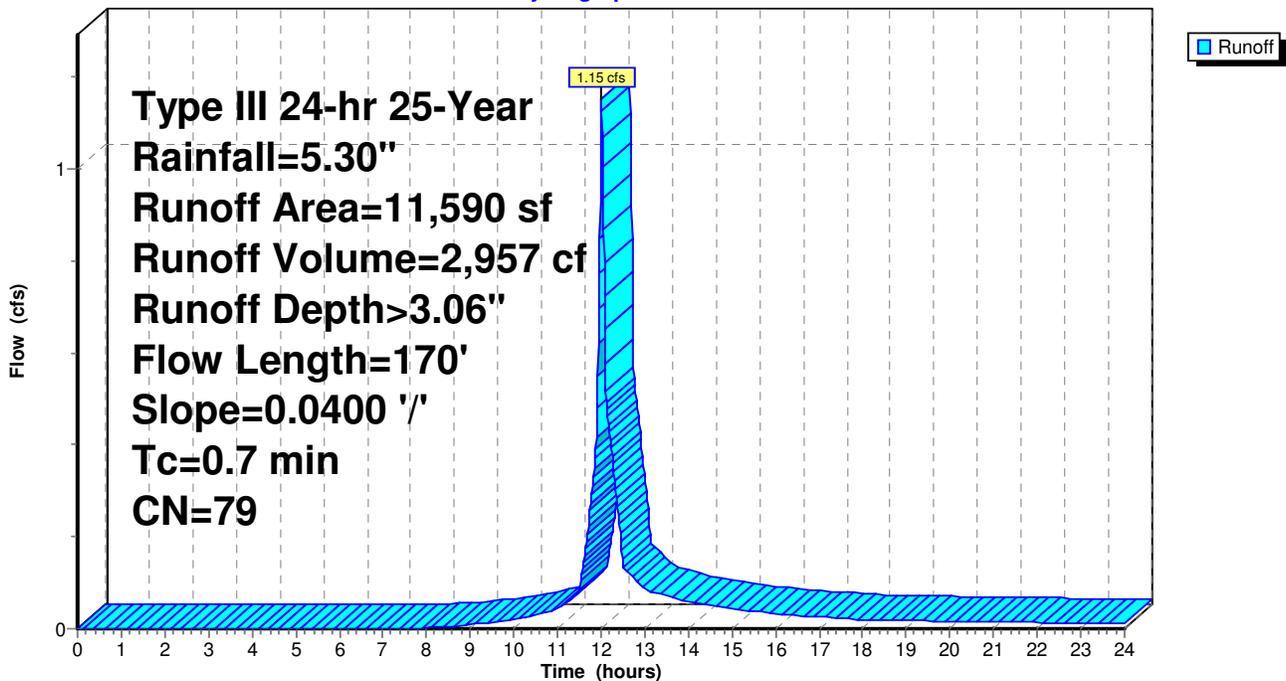
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
400	98	Paved parking & roofs
2,160	98	Paved parking & roofs
9,030	74	>75% Grass cover, Good, HSG C
11,590	79	Weighted Average
9,030		Pervious Area
2,560		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	170	0.0400	4.06		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 65S: Throat of Cul-de-sac u.g.**

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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Runoff = 1.34 cfs @ 12.05 hrs, Volume= 3,731 cf, Depth> 2.97"

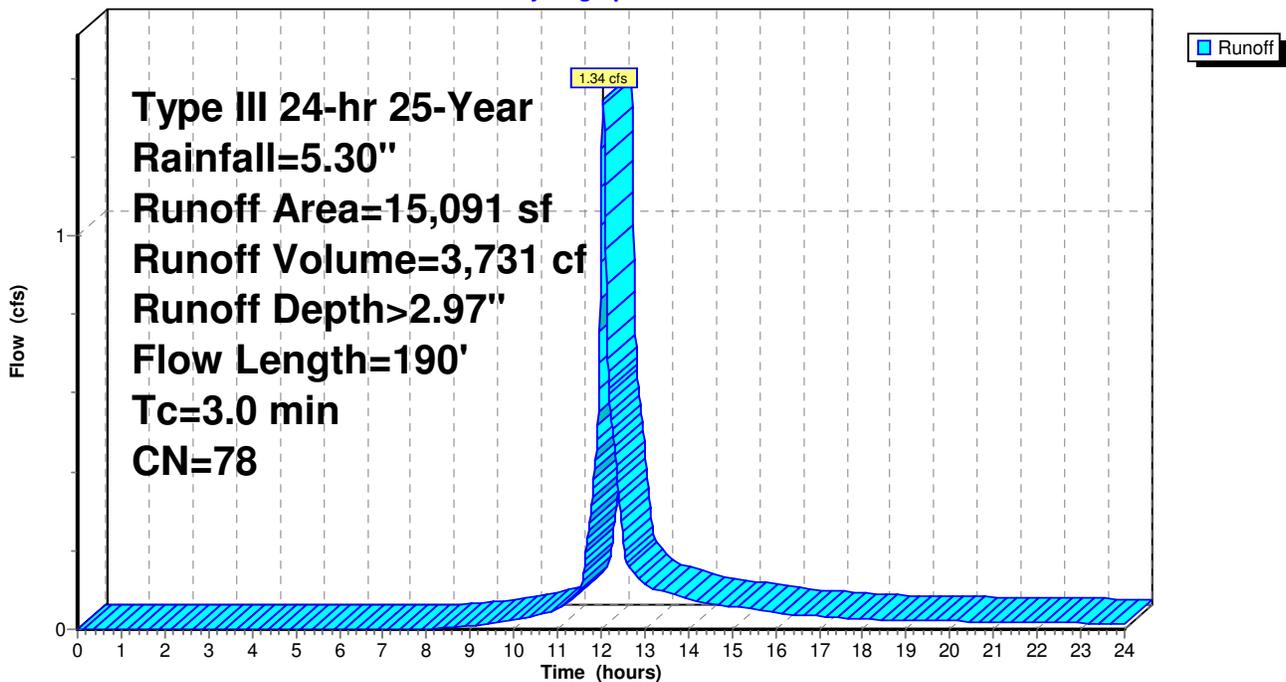
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
2,730	98	Paved parking & roofs
0	98	Paved parking & roofs
12,361	74	>75% Grass cover, Good, HSG C
15,091	78	Weighted Average
12,361		Pervious Area
2,730		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.1500	2.23		<b>Sheet Flow, Roof Unit 20</b> Smooth surfaces n= 0.011 P2= 3.20"
2.9	170	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.0	190	Total			

**Subcatchment 68S: From hill near 19,20 to Lawn CB**

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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 110S: To CB 20**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.98 cfs @ 12.01 hrs, Volume= 2,564 cf, Depth> 3.95"

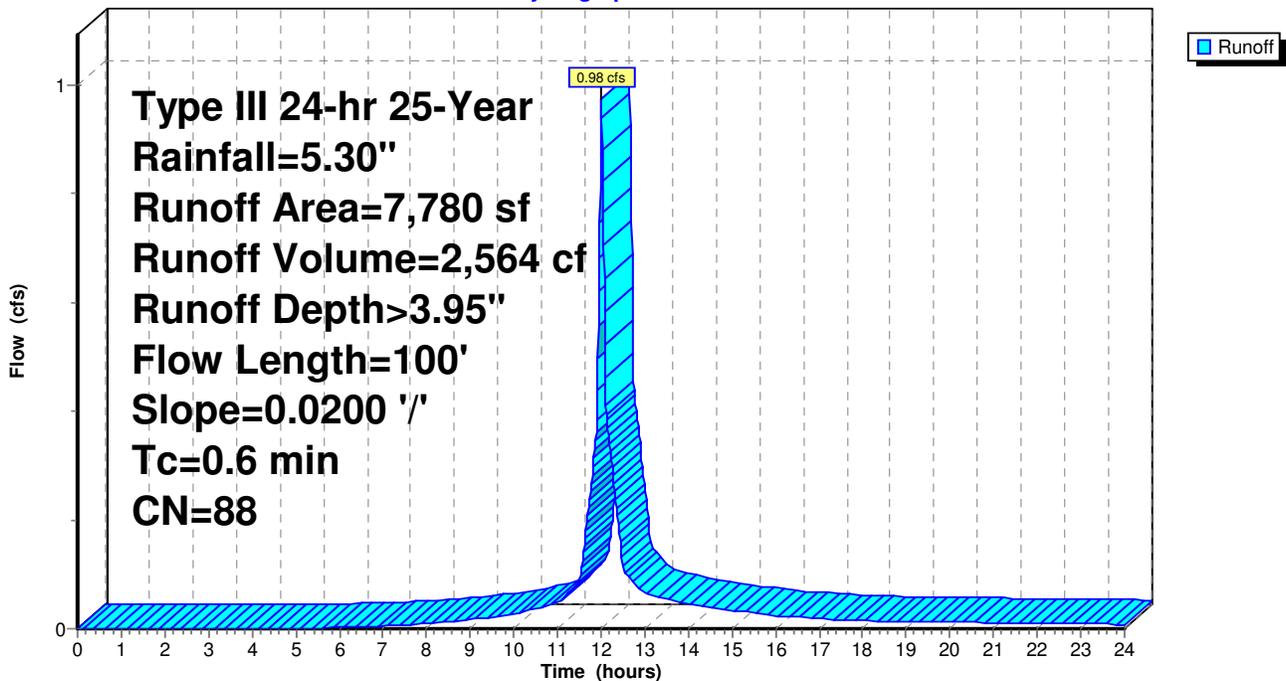
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
2,880	98	Paved parking & roofs
3,240	74	>75% Grass cover, Good, HSG C
7,780	88	Weighted Average
3,240		Pervious Area
4,540		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 110S: To CB 20**

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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 112S: To CB 22**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.32 cfs @ 12.01 hrs, Volume= 832 cf, Depth> 3.45"

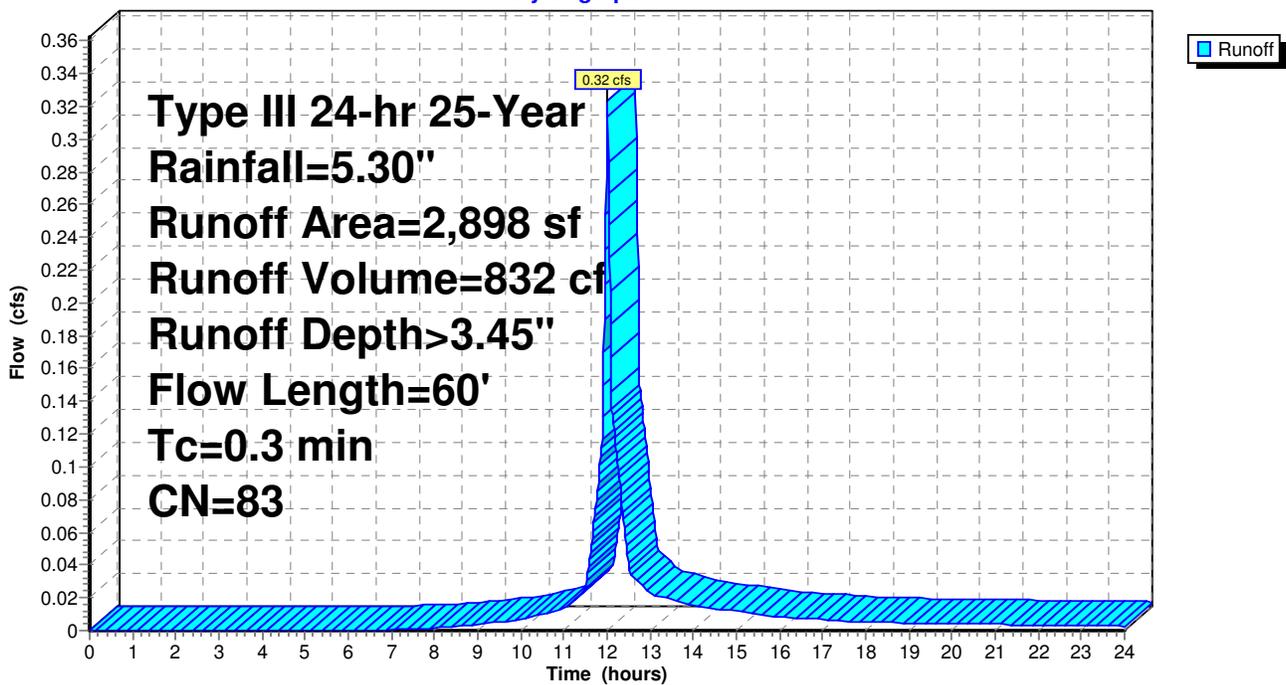
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
0	98	Paved parking & roofs
1,112	98	Paved parking & roofs
1,786	74	>75% Grass cover, Good, HSG C
2,898	83	Weighted Average
1,786		Pervious Area
1,112		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 112S: To CB 22**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 114S: Behind Units 1&2**

Runoff = 1.08 cfs @ 12.12 hrs, Volume= 3,651 cf, Depth> 2.87"

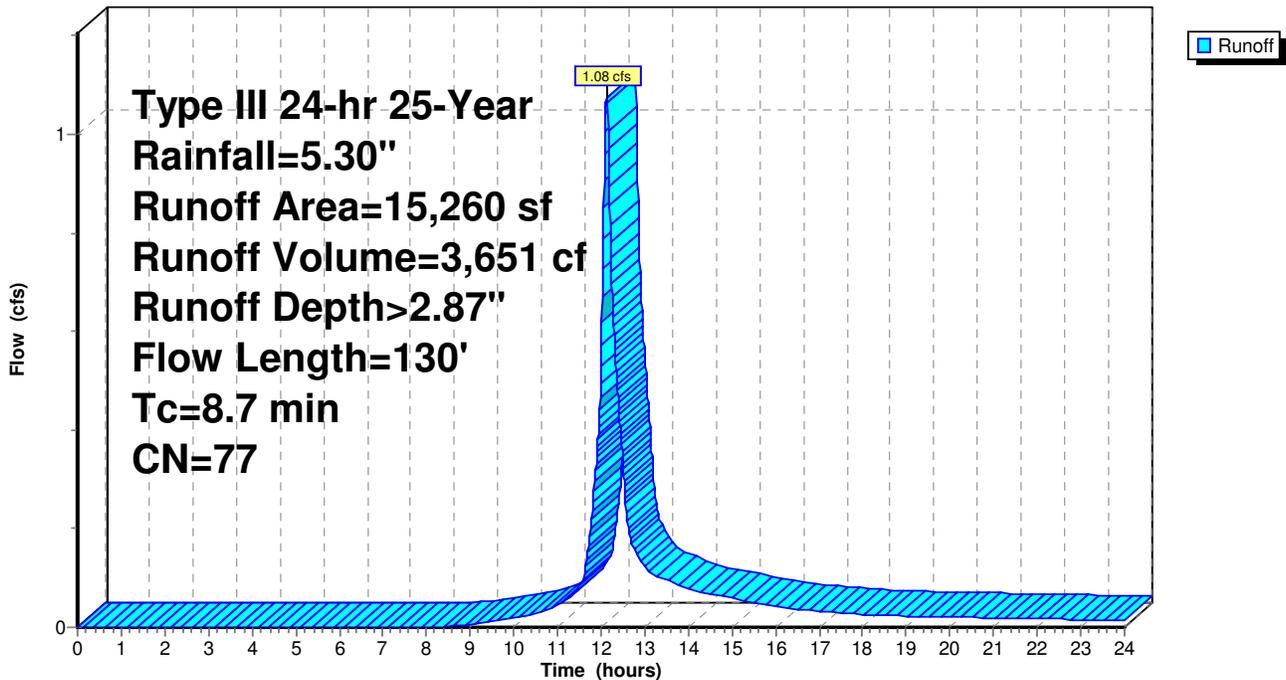
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
0	98	Paved parking & roofs
13,600	74	>75% Grass cover, Good, HSG C
15,260	77	Weighted Average
13,600		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
8.7	130	Total			

**Subcatchment 114S: Behind Units 1&2**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 116S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.40 cfs @ 12.00 hrs, Volume= 1,059 cf, Depth> 4.17"

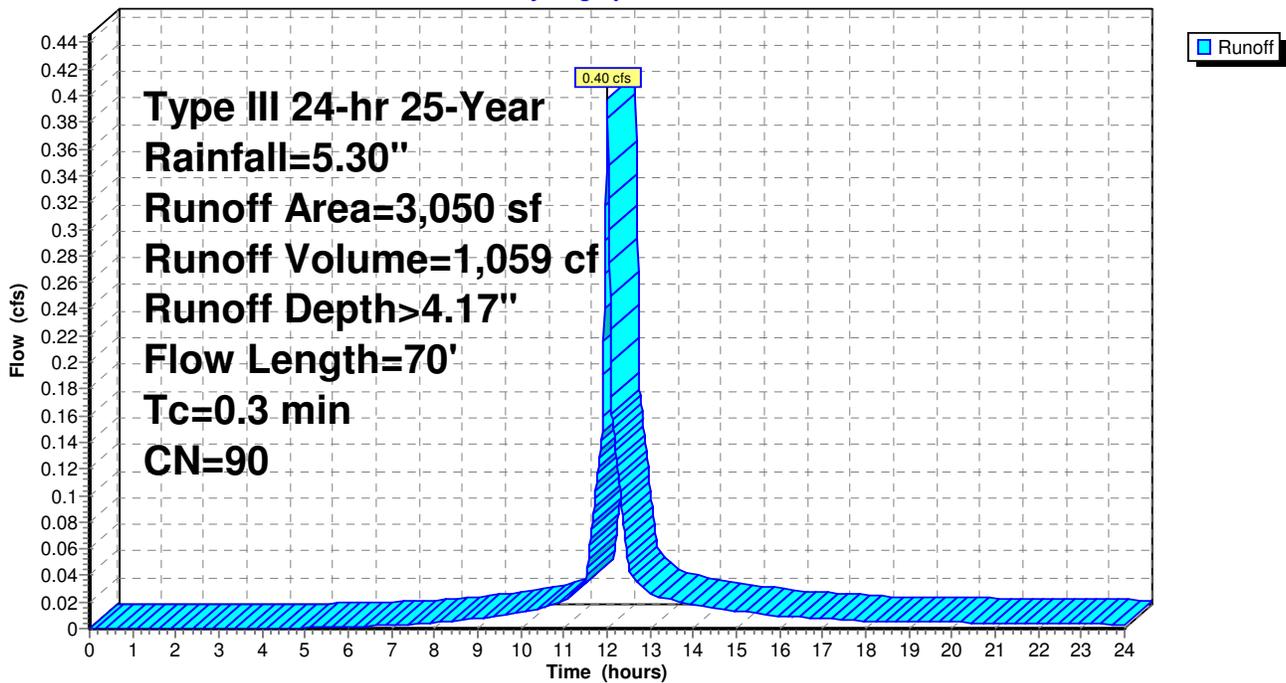
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,300	98	Paved parking & roofs
1,050	74	>75% Grass cover, Good, HSG C
3,050	90	Weighted Average
1,050		Pervious Area
2,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	40	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.2	30	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.3	70	Total			

**Subcatchment 116S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 118S:**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.45 cfs @ 12.00 hrs, Volume= 1,190 cf, Depth> 3.95"

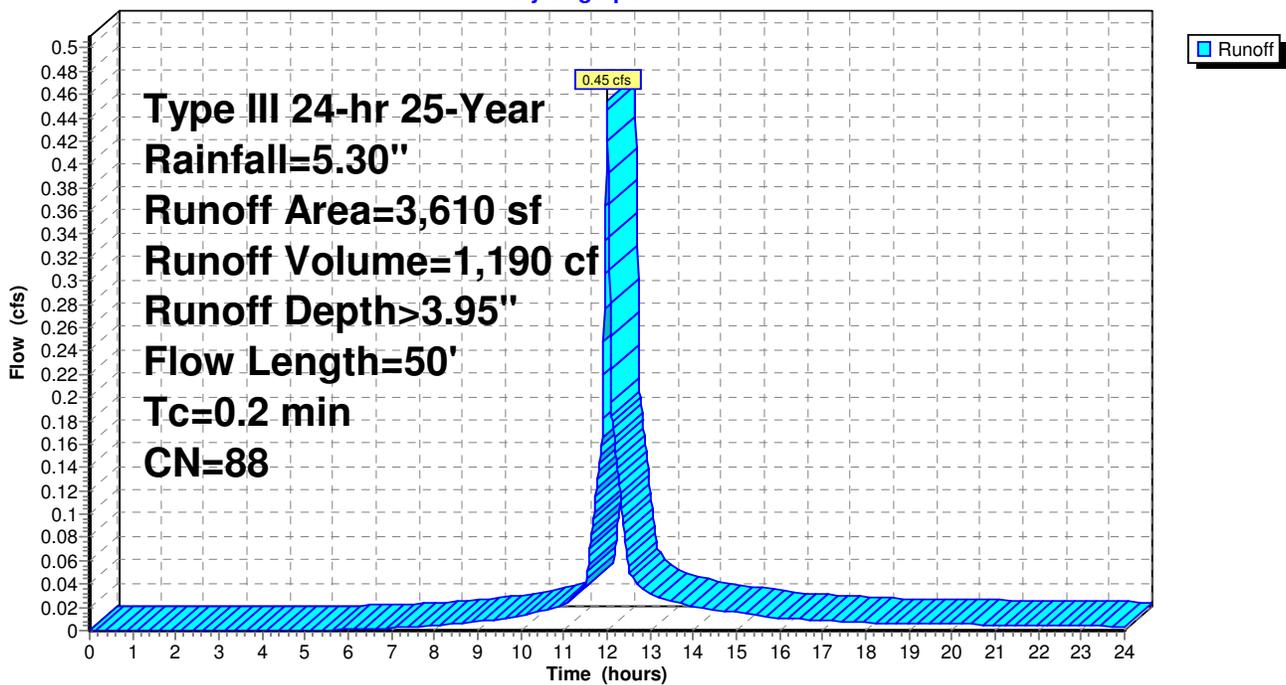
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,040	98	Paved parking & roofs
1,140	98	Paved parking & roofs
1,430	74	>75% Grass cover, Good, HSG C
3,610	88	Weighted Average
1,430		Pervious Area
2,180		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.2	30	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.2	50	Total			

**Subcatchment 118S:**

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**Subcatchment 120S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.76 cfs @ 12.01 hrs, Volume= 1,986 cf, Depth> 3.85"

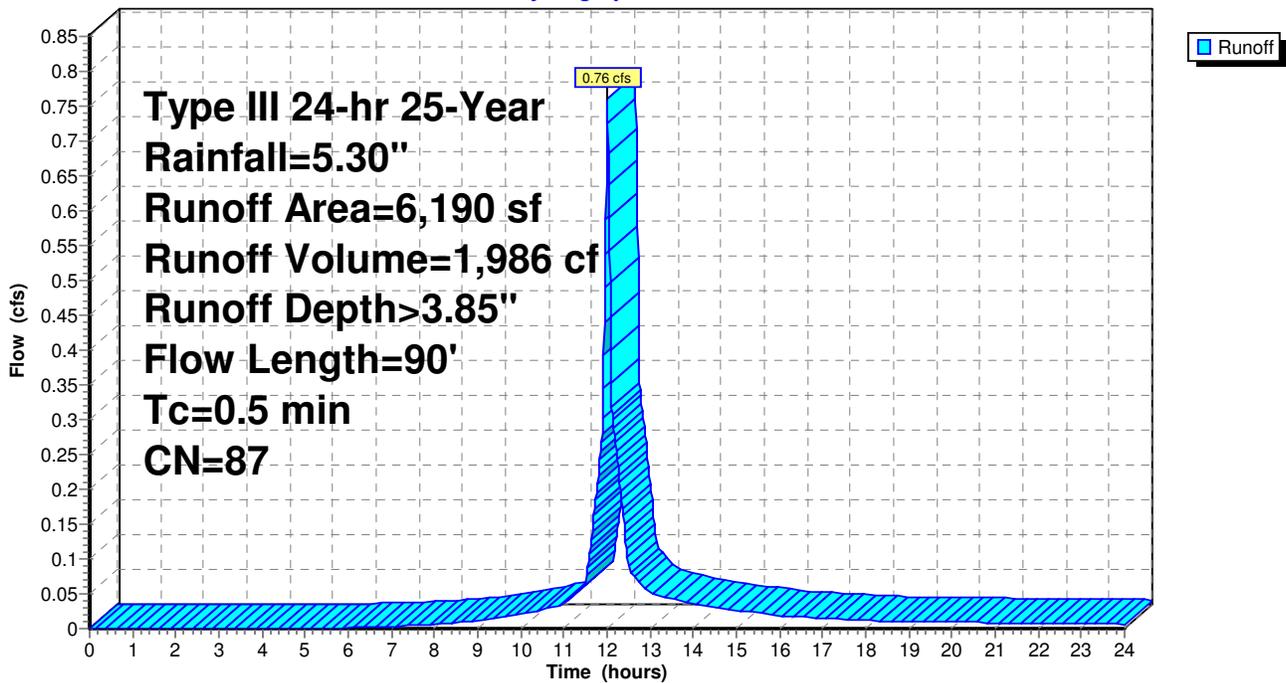
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,450	98	Paved parking & roofs
1,800	98	Paved parking & roofs
2,940	74	>75% Grass cover, Good, HSG C
6,190	87	Weighted Average
2,940		Pervious Area
3,250		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.4	60	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	90	Total			

**Subcatchment 120S:**

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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 122S:**

Runoff = 0.51 cfs @ 12.06 hrs, Volume= 1,453 cf, Depth> 2.87"

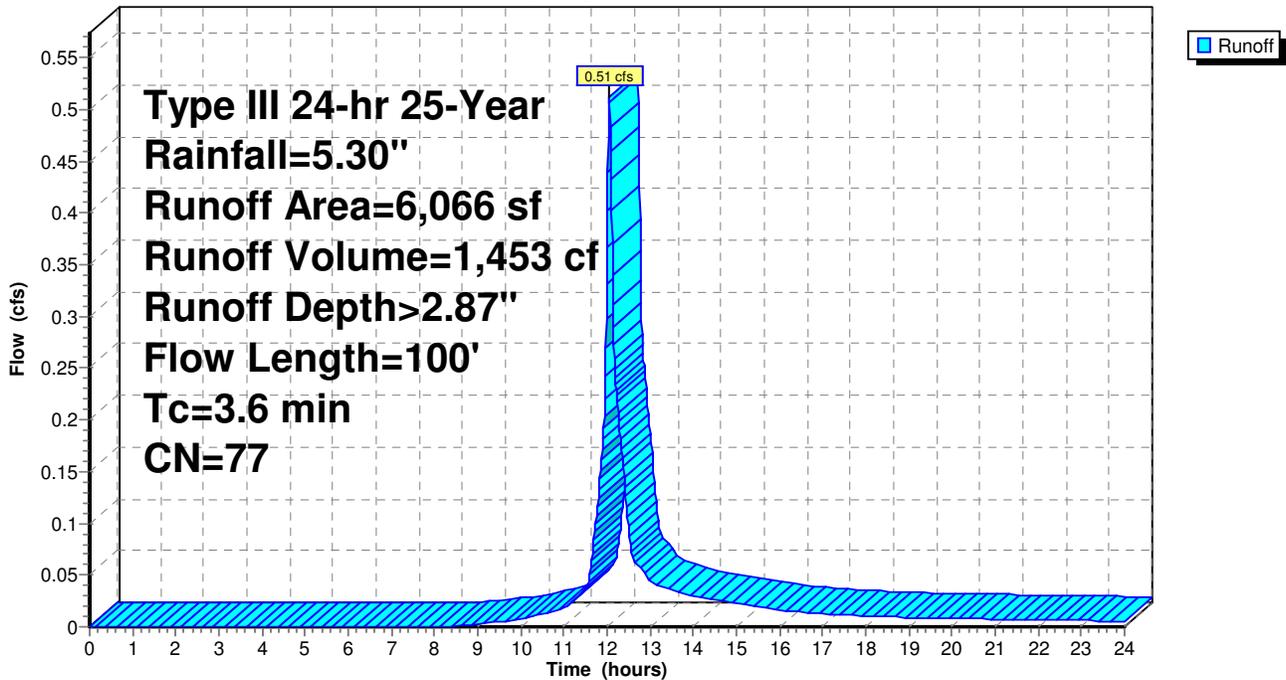
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
720	98	Paved parking & roofs
5,346	74	>75% Grass cover, Good, HSG C
6,066	77	Weighted Average
5,346		Pervious Area
720		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	20	0.0300	0.14		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.6	100	Total			

**Subcatchment 122S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 124S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,407 cf, Depth> 3.85"

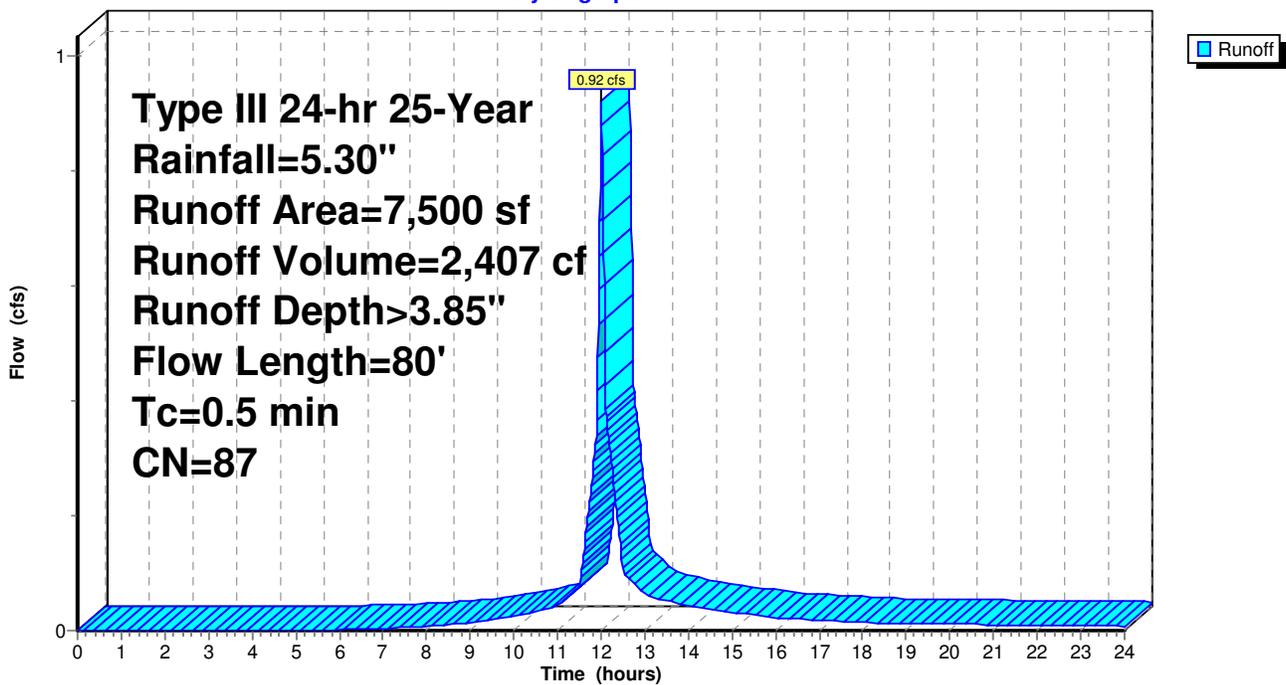
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,410	98	Paved parking & roofs
2,600	98	Paved parking & roofs
3,490	74	>75% Grass cover, Good, HSG C
7,500	87	Weighted Average
3,490		Pervious Area
4,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	Total			

**Subcatchment 124S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 126S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.66 cfs @ 12.01 hrs, Volume= 1,723 cf, Depth> 3.85"

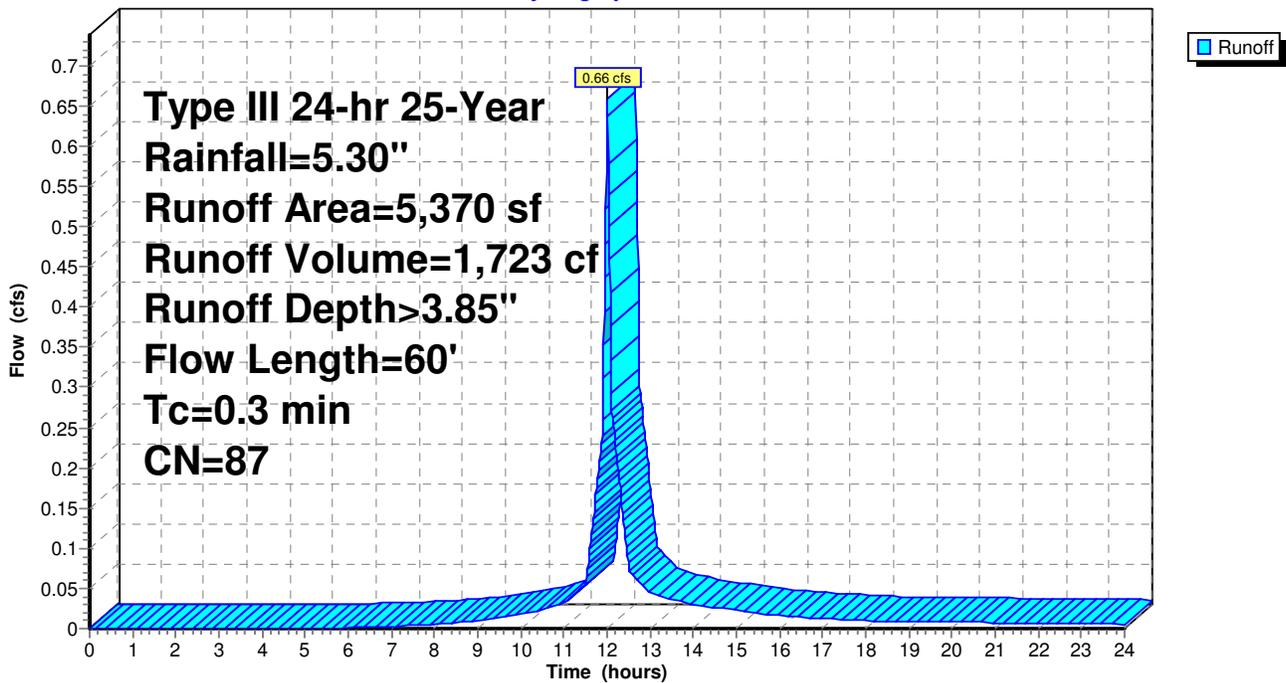
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,350	98	Paved parking & roofs
2,360	74	>75% Grass cover, Good, HSG C
5,370	87	Weighted Average
2,360		Pervious Area
3,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v = 20.3$ fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v = 16.1$ fps
0.3	60	Total			

**Subcatchment 126S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 128S:**

Runoff = 0.77 cfs @ 12.05 hrs, Volume= 2,187 cf, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

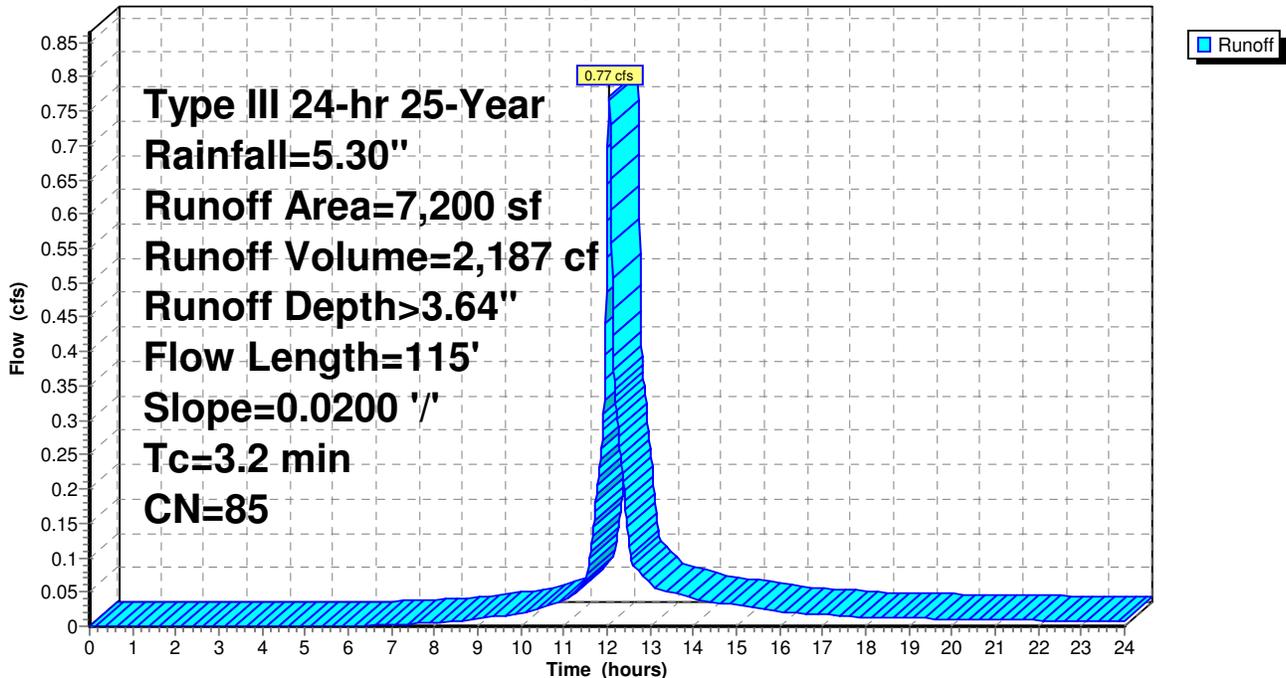
Area (sf)	CN	Description
1,550	98	Paved parking & roofs
1,600	98	Paved parking & roofs
4,050	74	>75% Grass cover, Good, HSG C
7,200	85	Weighted Average
4,050		Pervious Area
3,150		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.3	50	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	25	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	20	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.2	115	Total			

**Subcatchment 128S:**

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**Subcatchment 130S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.78 cfs @ 12.01 hrs, Volume= 1,996 cf, Depth> 3.45"

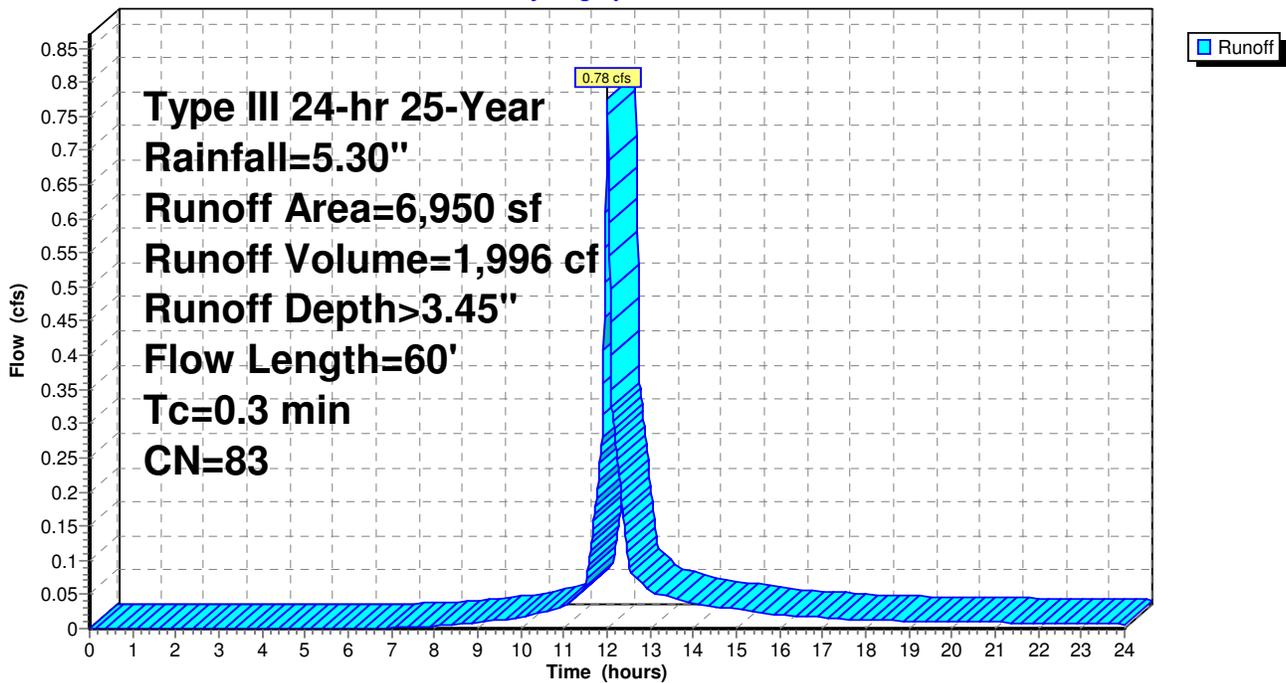
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	40	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 130S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 132S: Behind Unit 3**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.38 cfs @ 12.01 hrs, Volume= 6,096 cf, Depth> 2.78"

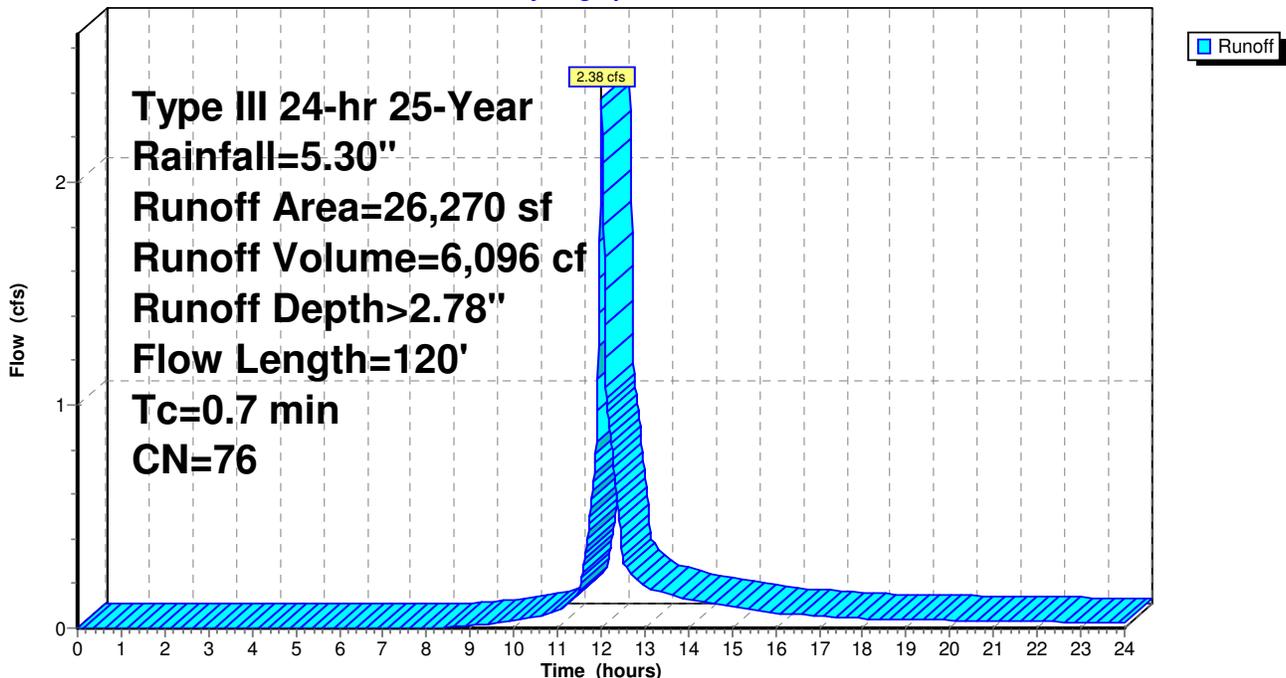
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
2,100	98	Paved parking & roofs
24,170	74	>75% Grass cover, Good, HSG C
26,270	76	Weighted Average
24,170		Pervious Area
2,100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.0250	2.55		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.1	20	0.1500	6.24		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	0.2500	2.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	120	Total			

**Subcatchment 132S: Behind Unit 3**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 134S: To Swale behind 7,6,5**

Runoff = 1.27 cfs @ 12.05 hrs, Volume= 3,532 cf, Depth> 3.06"

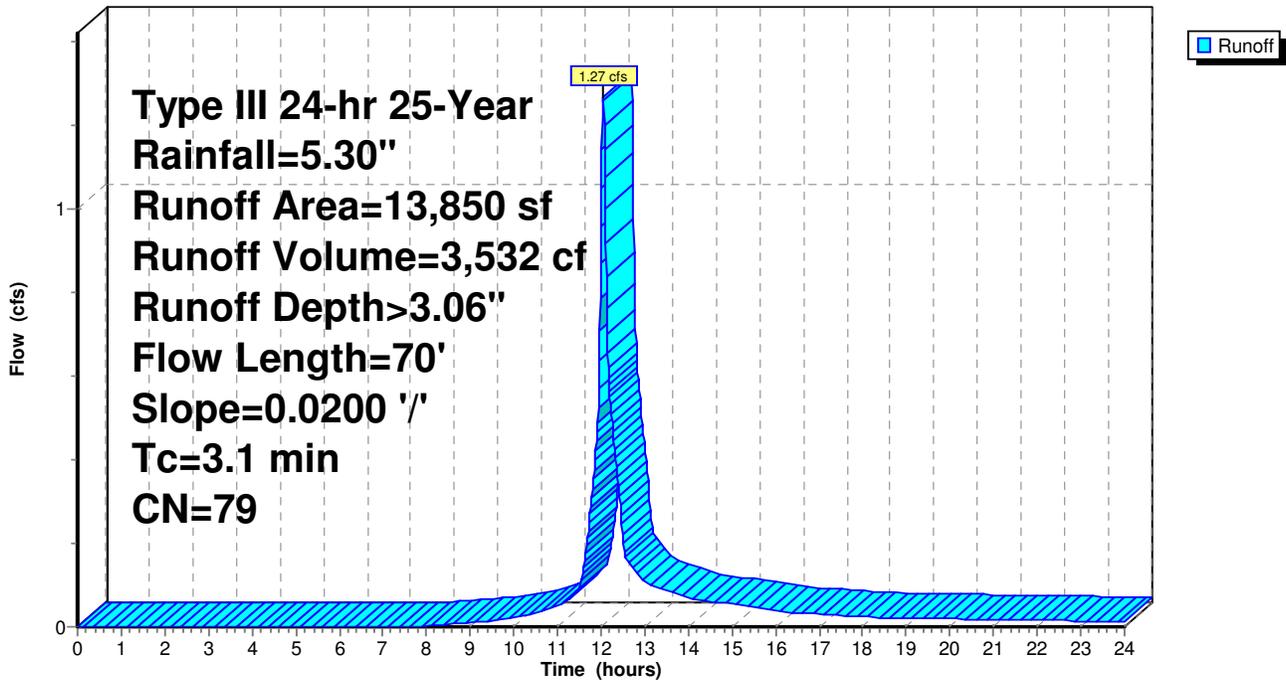
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
3,000	98	Paved parking & roofs
10,850	74	>75% Grass cover, Good, HSG C
13,850	79	Weighted Average
10,850		Pervious Area
3,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.1	70	Total			

**Subcatchment 134S: To Swale behind 7,6,5**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 136S: To Swale behind 4 to HW 30**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.91 cfs @ 12.01 hrs, Volume= 4,887 cf, Depth> 2.78"

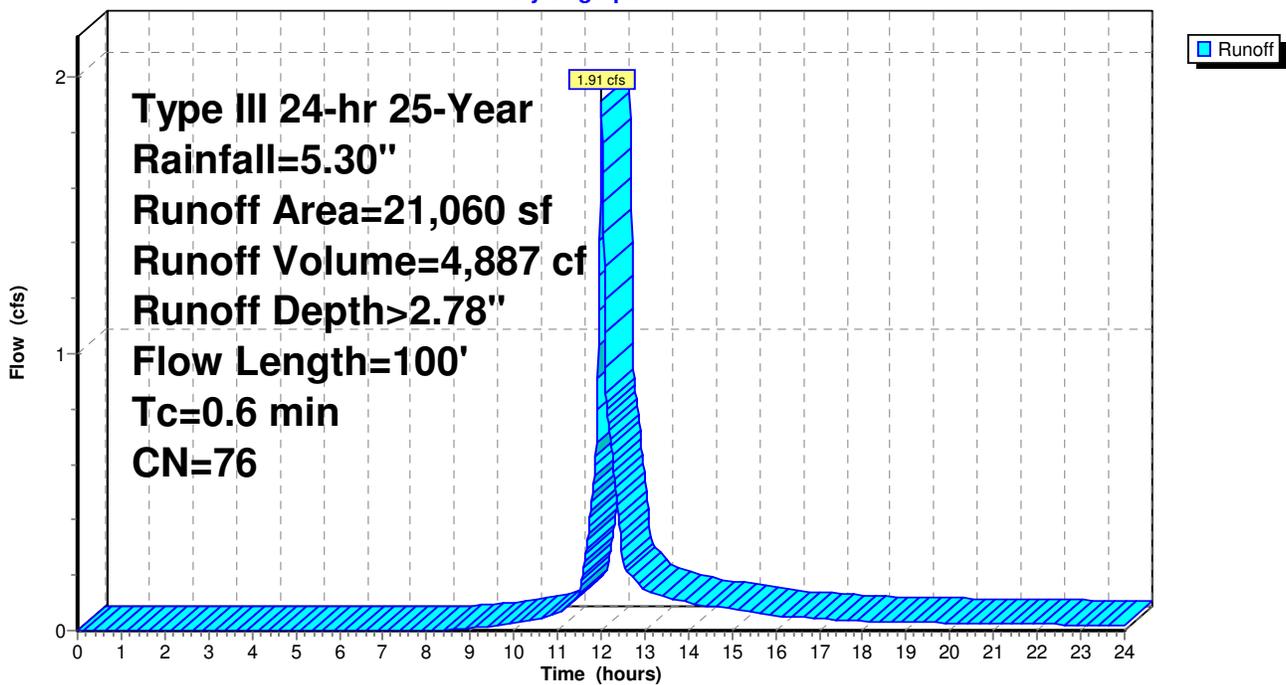
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,700	70	Woods, Good, HSG C
17,700	74	>75% Grass cover, Good, HSG C
21,060	76	Weighted Average
19,400		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	70	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.6	100	Total			

**Subcatchment 136S: To Swale behind 4 to HW 30**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Runoff = 1.05 cfs @ 12.17 hrs, Volume= 3,944 cf, Depth> 3.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
3,500	98	Paved parking & roofs
0	98	Paved parking & roofs
11,530	74	>75% Grass cover, Good, HSG C
15,030	80	Weighted Average
11,530		Pervious Area
3,500		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.2	50	0.2500	3.50		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.5	150	0.0500	4.63	2.02	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.25' Z= 3.0 '/' Top.W=2.50' n= 0.022 Earth, clean & straight
0.6	150	0.0300	3.89	2.68	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=0.25' Z= 3.0 '/' Top.W=3.50' n= 0.022 Earth, clean & straight
12.1	400	Total			

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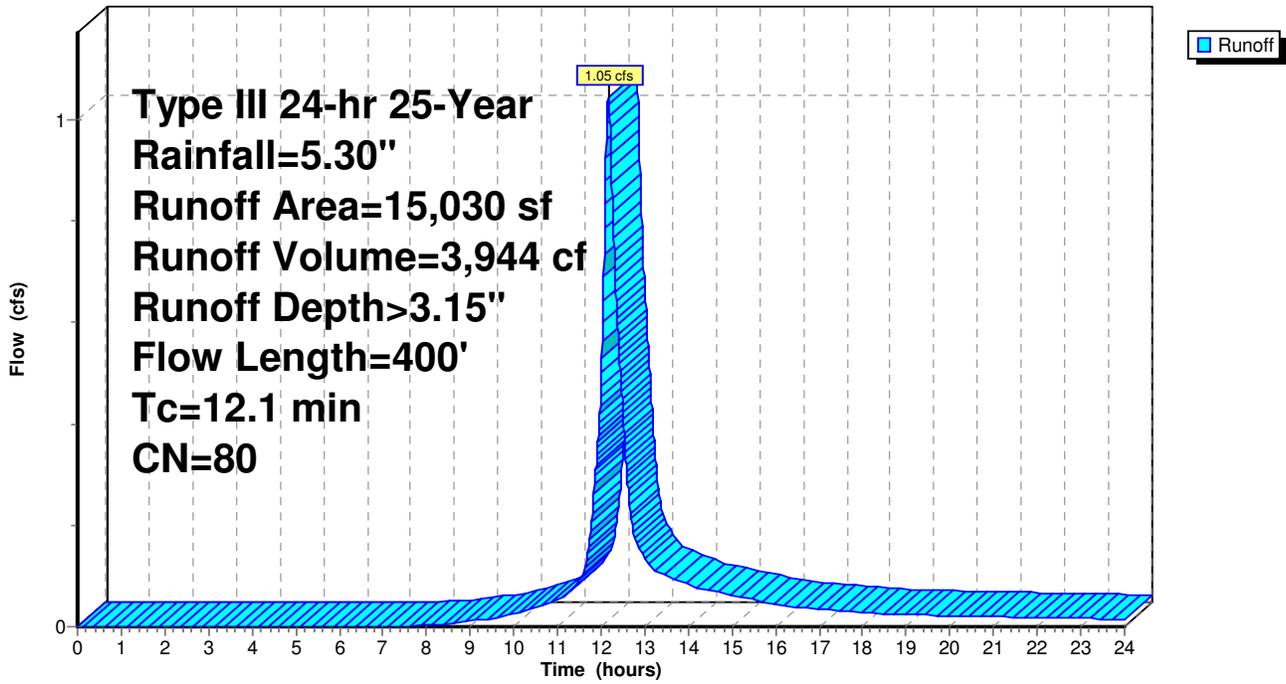
Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 140S: Behind Units 14, 15, 16**

Runoff = 1.34 cfs @ 12.16 hrs, Volume= 5,007 cf, Depth> 2.78"

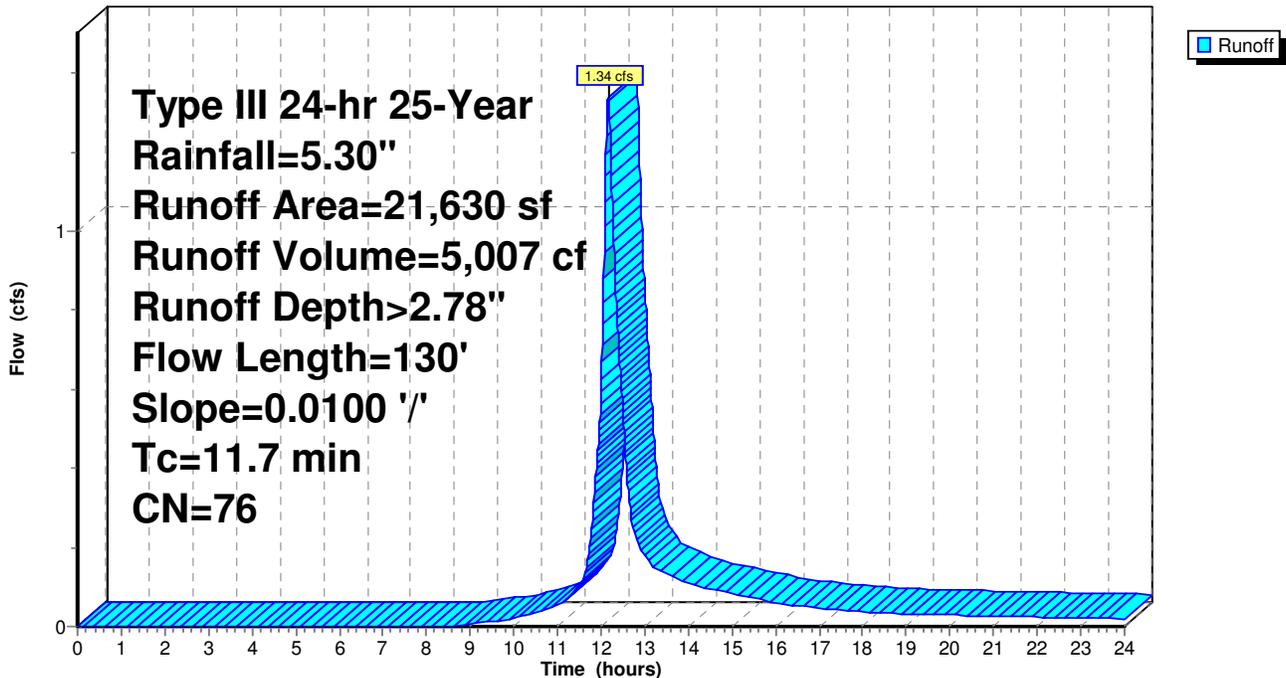
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
2,400	98	Paved parking & roofs
0	98	Paved parking & roofs
15,230	74	>75% Grass cover, Good, HSG C
4,000	70	Woods, Good, HSG C
21,630	76	Weighted Average
19,230		Pervious Area
2,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.9	80	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
11.7	130	Total			

**Subcatchment 140S: Behind Units 14, 15, 16**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 214S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.76 cfs @ 12.02 hrs, Volume= 1,996 cf, Depth> 3.45"

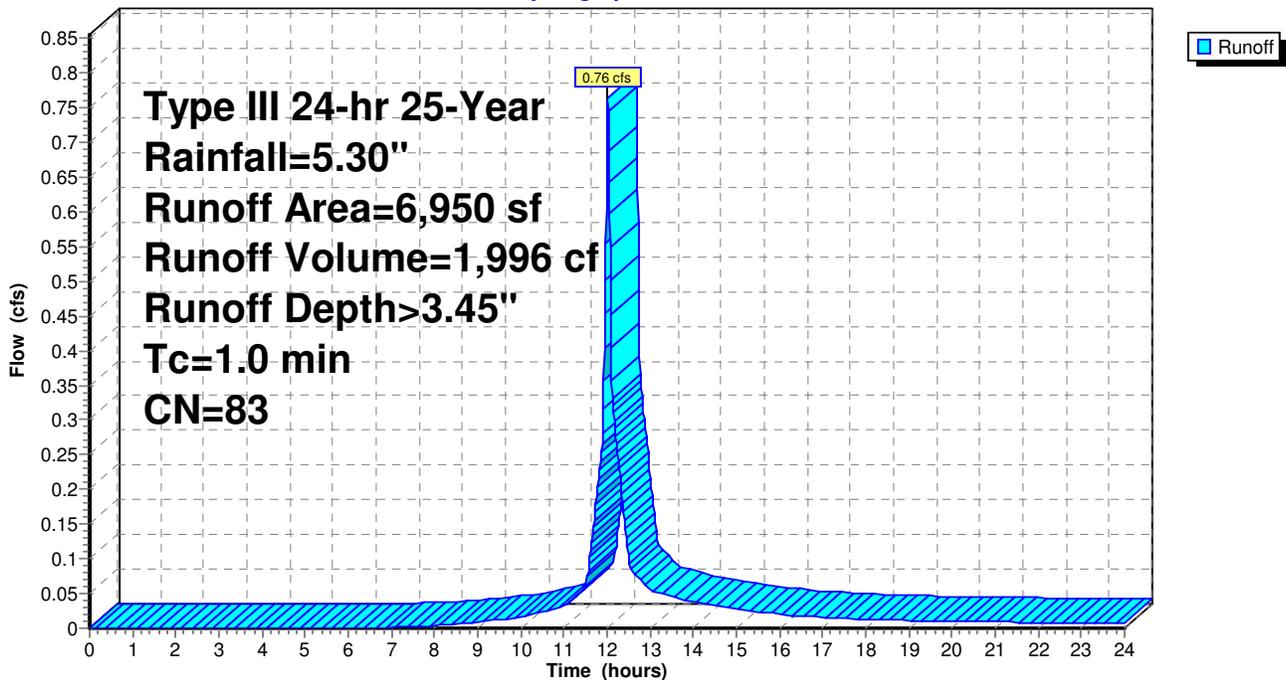
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

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

**Subcatchment 214S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 216S:**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.48 cfs @ 12.02 hrs, Volume= 1,258 cf, Depth> 3.65"

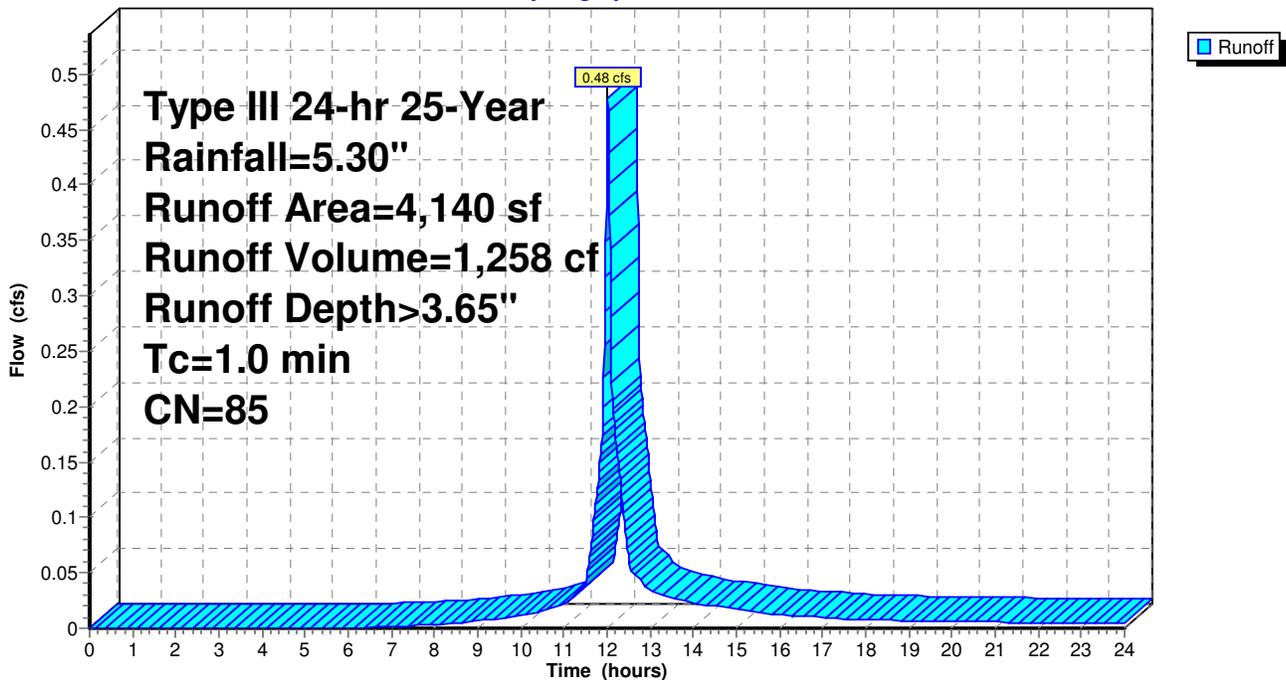
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,200	98	Paved parking & roofs
2,240	74	>75% Grass cover, Good, HSG C
4,140	85	Weighted Average
2,240		Pervious Area
1,900		Impervious Area

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

**Subcatchment 216S:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.69 cfs @ 12.17 hrs, Volume= 2,645 cf, Depth> 2.26"

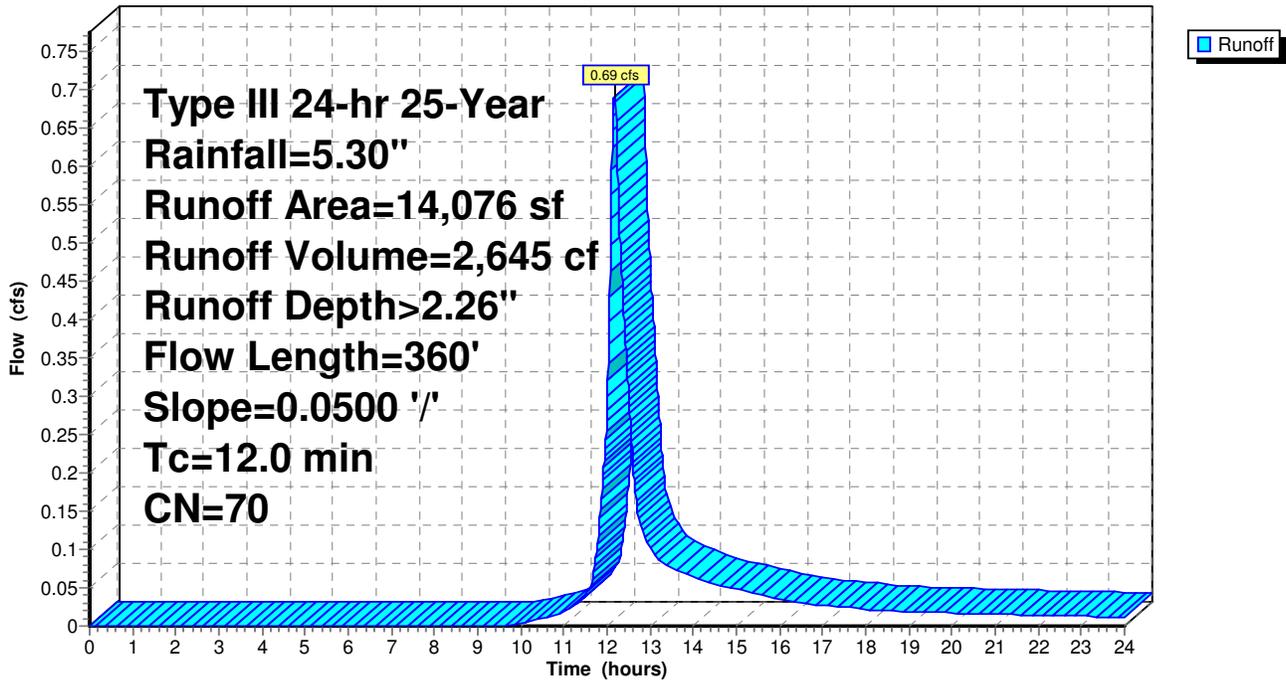
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=5.30"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	40	0.0500	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	320	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.0	360	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 1R: Existing wetland channel to WF 16

Inflow Area = 162,206 sf, Inflow Depth > 2.73" for 25-Year event  
Inflow = 8.87 cfs @ 12.16 hrs, Volume= 36,931 cf  
Outflow = 8.85 cfs @ 12.19 hrs, Volume= 36,879 cf, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.90 fps, Min. Travel Time= 1.0 min  
Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.5 min

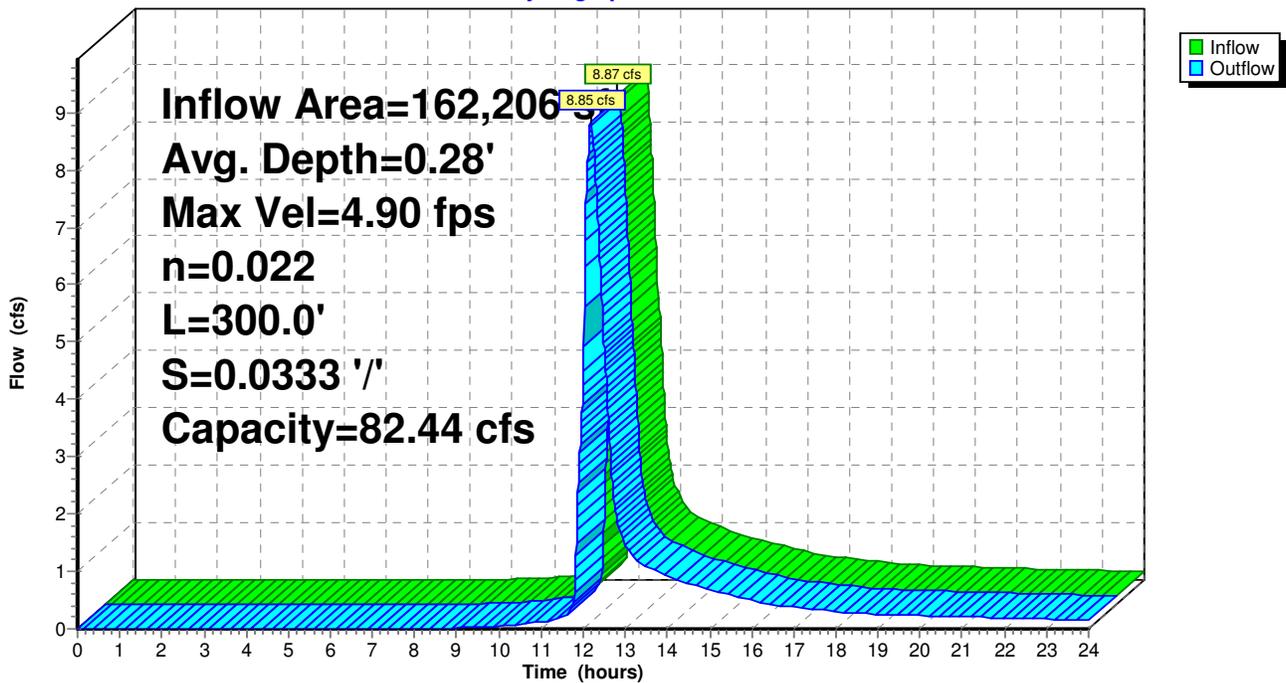
Peak Storage= 543 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.28'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 82.44 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 300.0' Slope= 0.0333 '/'  
Inlet Invert= 96.00', Outlet Invert= 86.00'



## Reach 1R: Existing wetland channel to WF 16

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 2R: CB 23 to HW 40

[52] Hint: Inlet conditions not evaluated

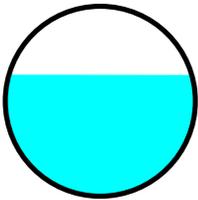
[79] Warning: Submerged Pond 2P Primary device # 2 by 0.80'

Inflow Area = 111,470 sf, Inflow Depth > 2.73" for 25-Year event  
Inflow = 5.87 cfs @ 12.09 hrs, Volume= 25,339 cf  
Outflow = 5.83 cfs @ 12.10 hrs, Volume= 25,335 cf, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.04 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 3.20 fps, Avg. Travel Time= 0.4 min

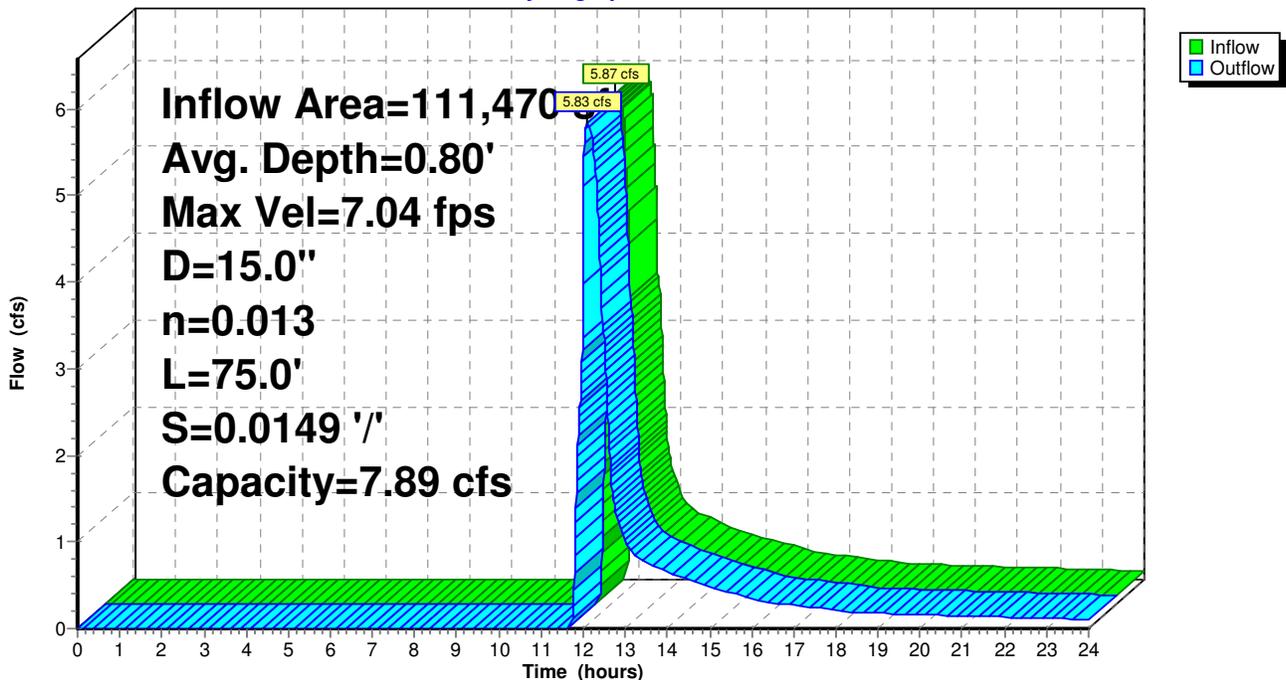
Peak Storage= 62 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.80'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 7.89 cfs

15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 75.0' Slope= 0.0149 '/'  
Inlet Invert= 103.22', Outlet Invert= 102.10'



## Reach 2R: CB 23 to HW 40

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Reach 55R: DMH 52 to DMH 50**

[52] Hint: Inlet conditions not evaluated

[61] Hint: Submerged 26% of Reach 69R bottom

[63] Warning: Exceeded Reach 220R inflow depth by 0.05' @ 12.02 hrs

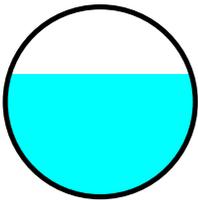
[62] Warning: Submerged 33% of Reach 222R inlet

Inflow Area =	40,720 sf,	Inflow Depth > 3.39"	for 25-Year event
Inflow =	4.39 cfs @ 12.02 hrs,	Volume=	11,510 cf
Outflow =	4.38 cfs @ 12.02 hrs,	Volume=	11,509 cf, Atten= 0%, Lag= 0.2 min

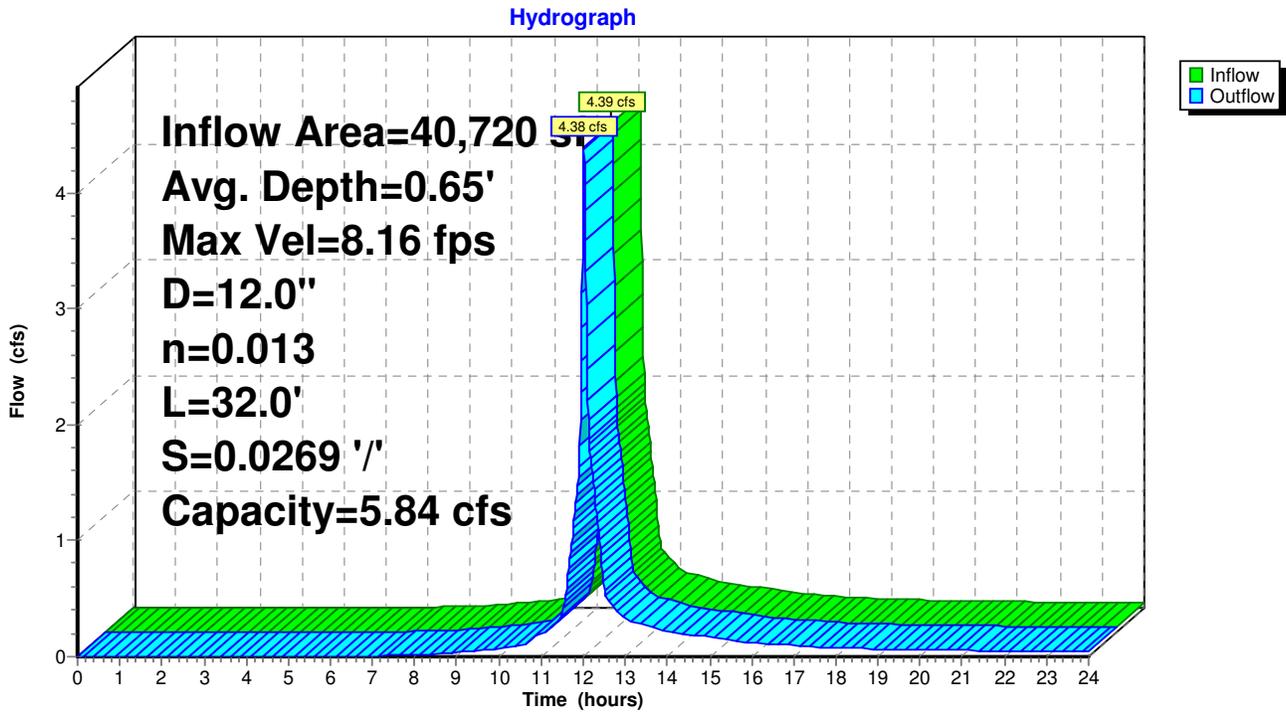
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 8.16 fps, Min. Travel Time= 0.1 min  
 Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.2 min

Peak Storage= 17 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.65'  
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.84 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
 Length= 32.0' Slope= 0.0269 '/'  
 Inlet Invert= 102.48', Outlet Invert= 101.62'



Reach 55R: DMH 52 to DMH 50



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 62R: DMH 64 to Bio-Retention A (HW 46)

[52] Hint: Inlet conditions not evaluated

[81] Warning: Exceeded Pond 43R by 0.13' @ 12.12 hrs

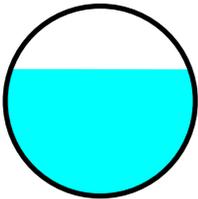
[79] Warning: Submerged Pond 61R Primary device # 1 INLET by 0.33'

Inflow Area = 44,069 sf, Inflow Depth > 3.08" for 25-Year event  
Inflow = 3.43 cfs @ 12.09 hrs, Volume= 11,309 cf  
Outflow = 3.43 cfs @ 12.09 hrs, Volume= 11,309 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.15 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 2.08 fps, Avg. Travel Time= 0.1 min

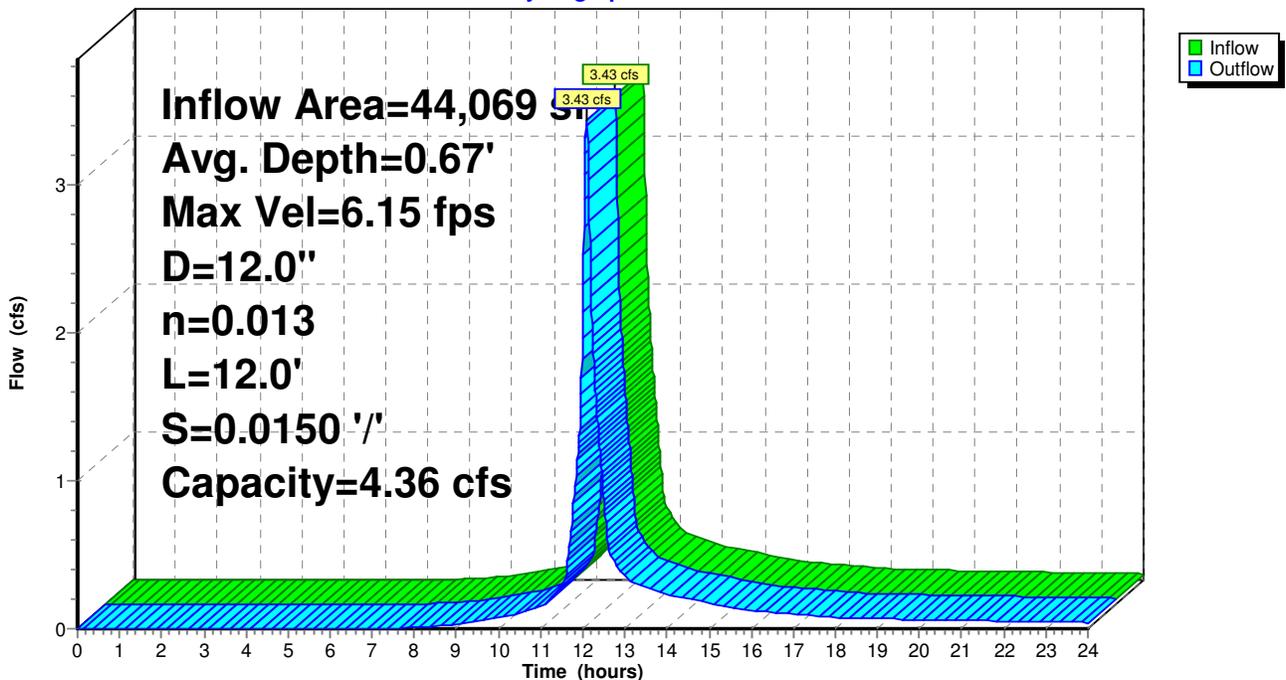
Peak Storage= 7 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.36 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 12.0' Slope= 0.0150 '/'  
Inlet Invert= 110.80', Outlet Invert= 110.62'



## Reach 62R: DMH 64 to Bio-Retention A (HW 46)

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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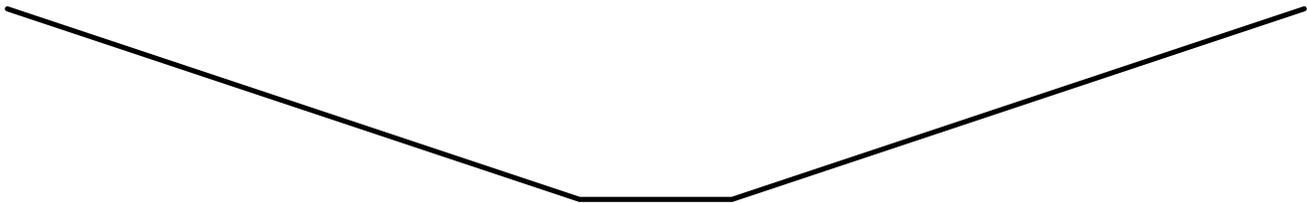
**Reach 64R: Swale from Drive at #12 to RG 10A**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

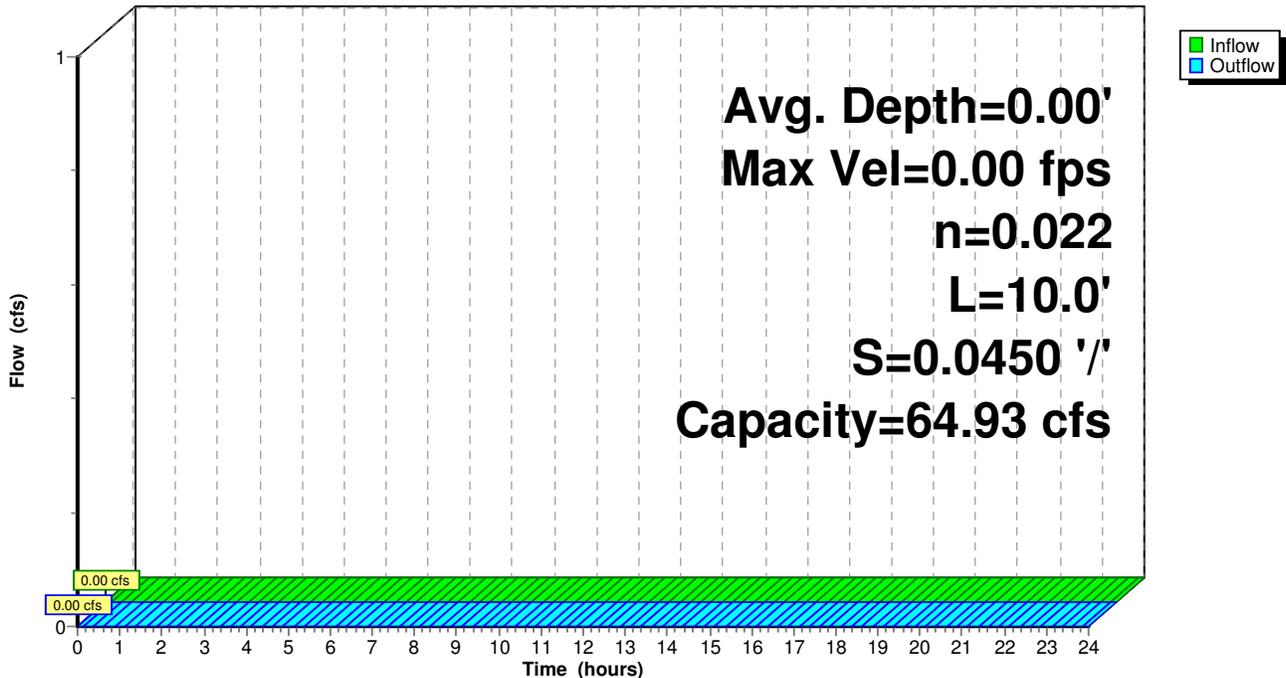
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 108.12', Outlet Invert= 107.67'



**Reach 64R: Swale from Drive at #12 to RG 10A**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 67R: Culvert under Unit 12 Drive

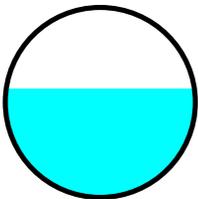
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 3.26" for 25-Year event  
Inflow = 0.76 cfs @ 12.02 hrs, Volume= 1,890 cf  
Outflow = 0.75 cfs @ 12.03 hrs, Volume= 1,890 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.65 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.6 min

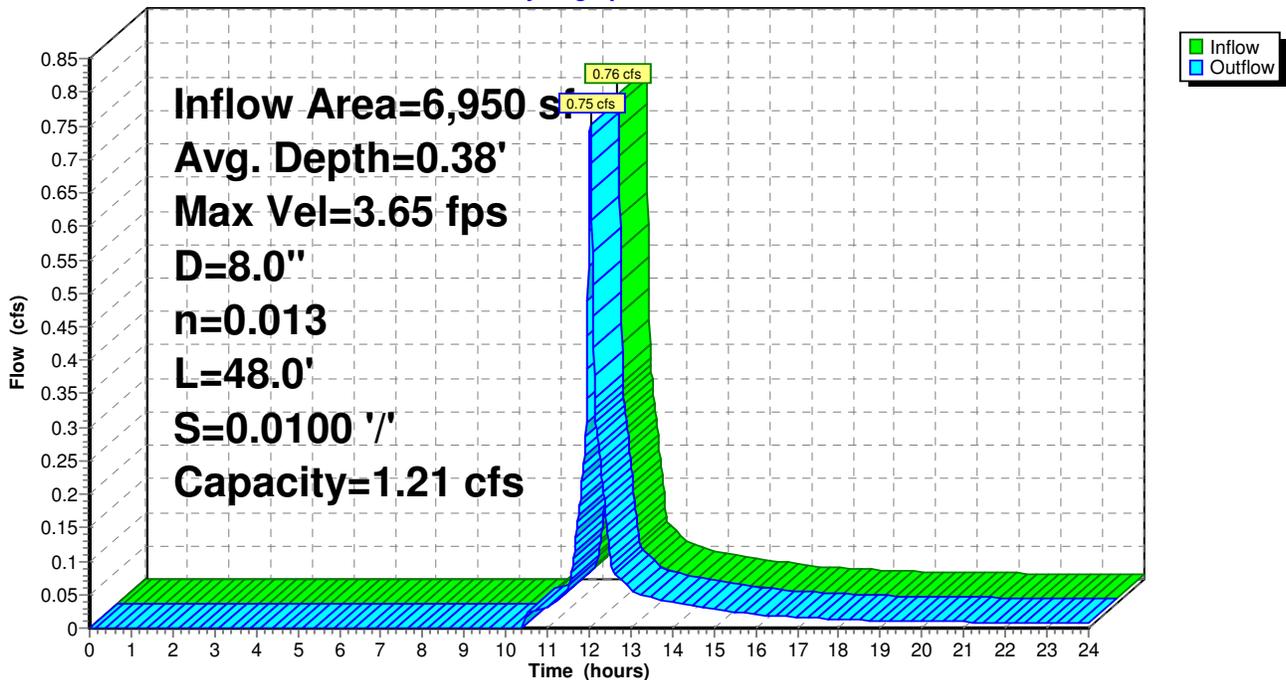
Peak Storage= 10 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.38'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 105.97', Outlet Invert= 105.49'



## Reach 67R: Culvert under Unit 12 Drive

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 68R: Underdrain to CB 66

[52] Hint: Inlet conditions not evaluated

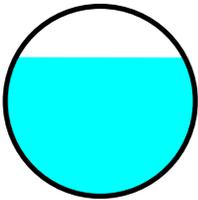
[79] Warning: Submerged Pond 8P Primary device # 7 INLET by 0.74'

Inflow Area = 44,069 sf, Inflow Depth > 2.99" for 25-Year event  
Inflow = 2.62 cfs @ 12.17 hrs, Volume= 10,964 cf  
Outflow = 2.62 cfs @ 12.18 hrs, Volume= 10,964 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 9.57 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 4.26 fps, Avg. Travel Time= 0.1 min

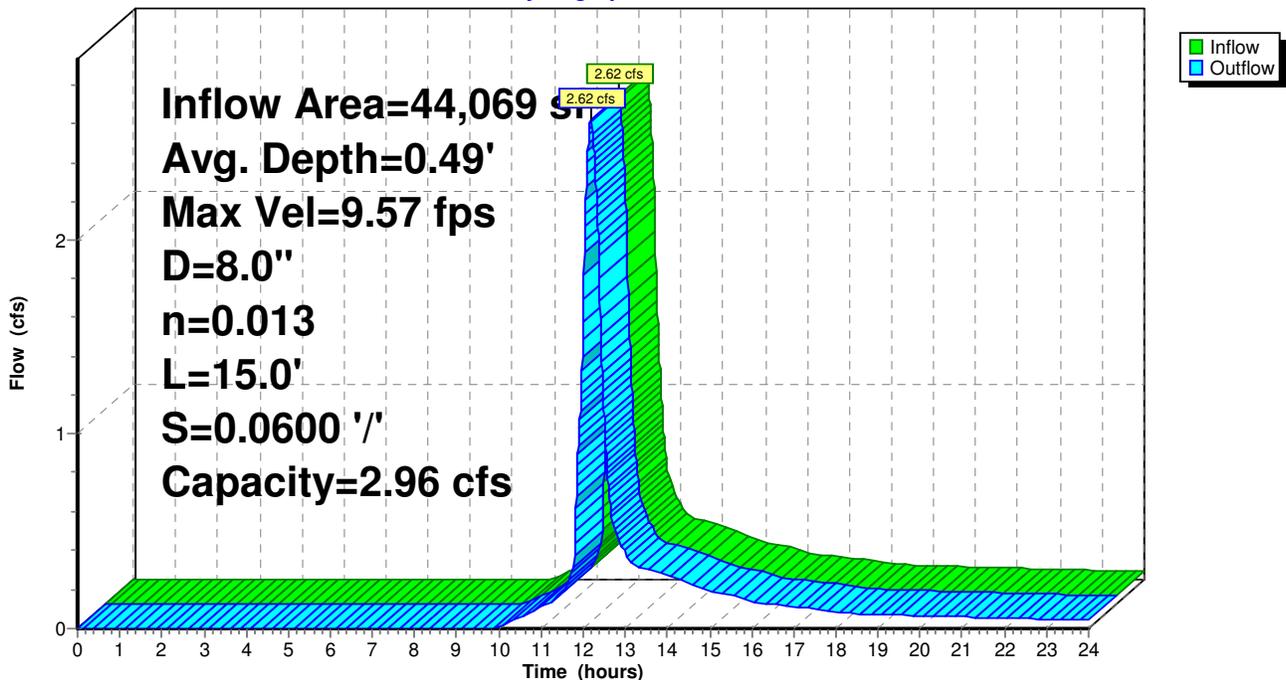
Peak Storage= 4 cf @ 12.18 hrs, Average Depth at Peak Storage= 0.49'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 15.0' Slope= 0.0600 '/'  
Inlet Invert= 107.25', Outlet Invert= 106.35'



## Reach 68R: Underdrain to CB 66

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 69R: Drain to DMH 52

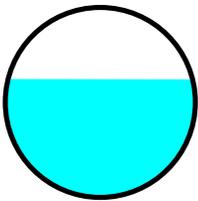
[52] Hint: Inlet conditions not evaluated

Inflow Area = 11,090 sf, Inflow Depth > 3.28" for 25-Year event  
Inflow = 1.21 cfs @ 12.03 hrs, Volume= 3,028 cf  
Outflow = 1.21 cfs @ 12.03 hrs, Volume= 3,027 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.31 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.99 fps, Avg. Travel Time= 0.3 min

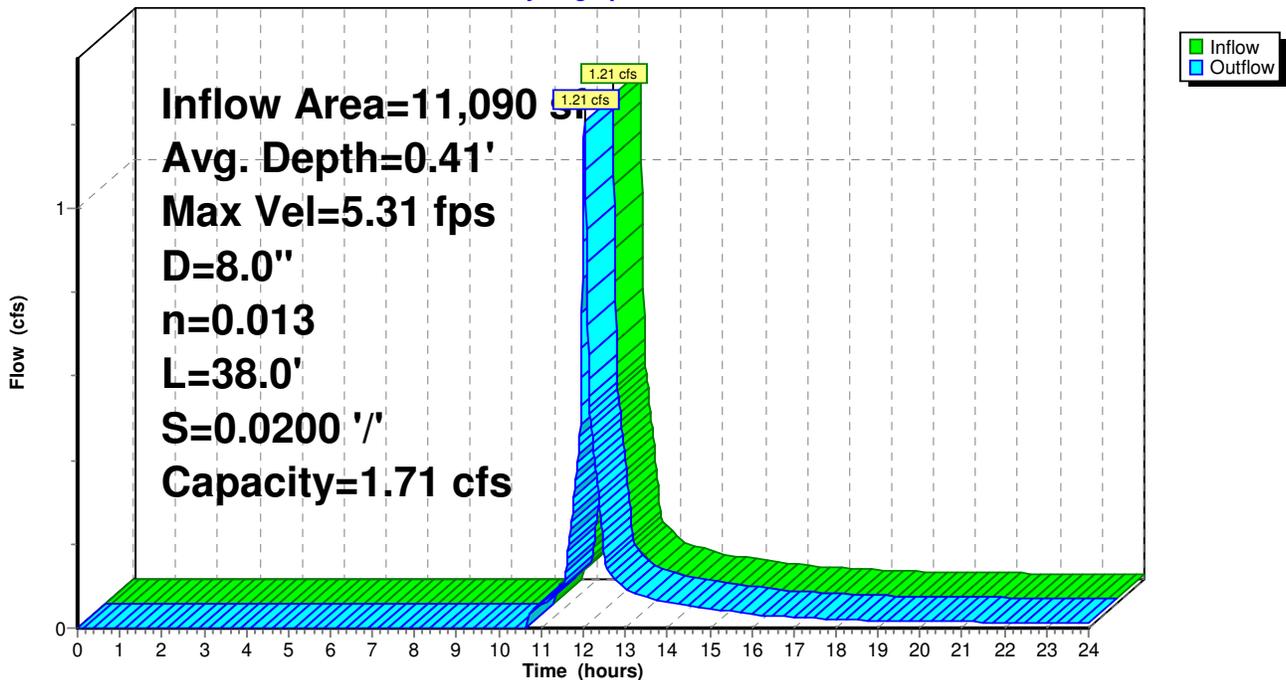
Peak Storage= 9 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.41'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.71 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 38.0' Slope= 0.0200 '/'  
Inlet Invert= 103.69', Outlet Invert= 102.93'



## Reach 69R: Drain to DMH 52

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Reach 114R: DMH 16 to DMH 14

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 111P Primary device # 1 INLET by 0.12'

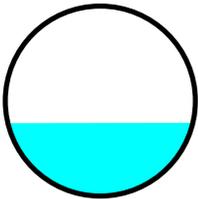
[79] Warning: Submerged Pond 112P Primary device # 1 INLET by 0.06'

Inflow Area = 10,678 sf, Inflow Depth > 3.82" for 25-Year event  
Inflow = 1.30 cfs @ 12.01 hrs, Volume= 3,396 cf  
Outflow = 1.28 cfs @ 12.02 hrs, Volume= 3,395 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.64 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.46 fps, Avg. Travel Time= 0.7 min

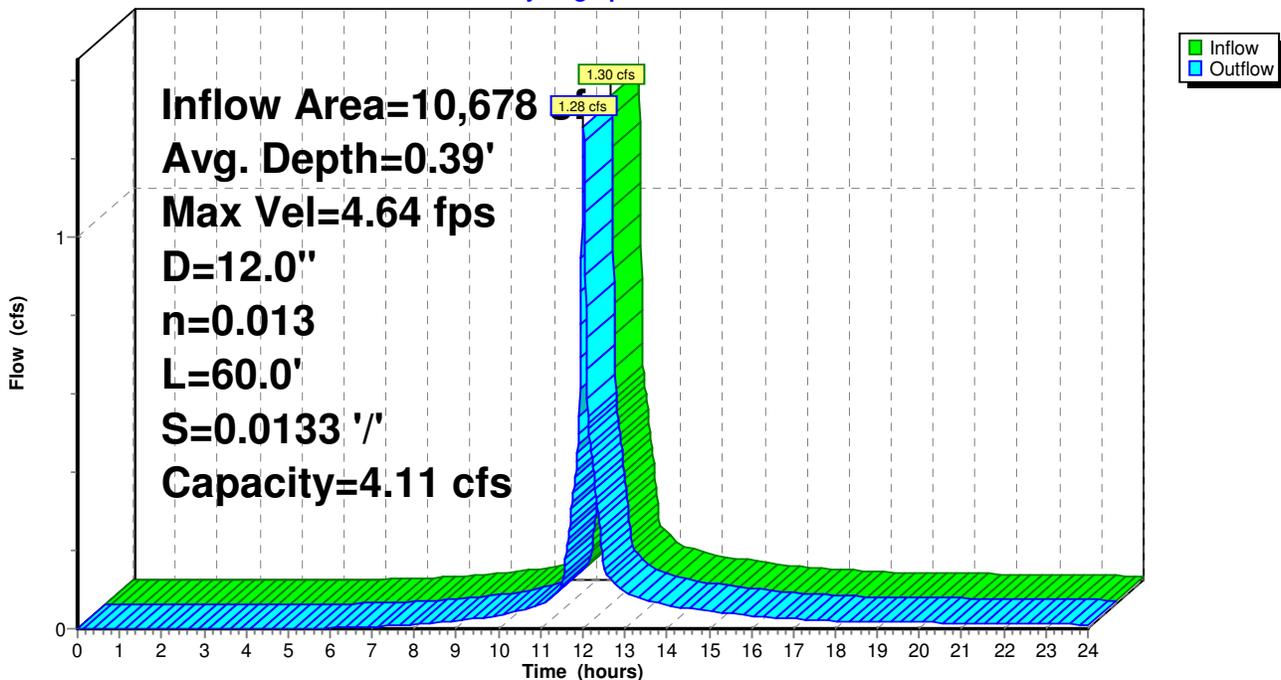
Peak Storage= 17 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.39'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.11 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 60.0' Slope= 0.0133 '/'  
Inlet Invert= 103.48', Outlet Invert= 102.68'



## Reach 114R: DMH 16 to DMH 14

Hydrograph



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## Reach 118R: Swale from Drive at #4 to RG 116

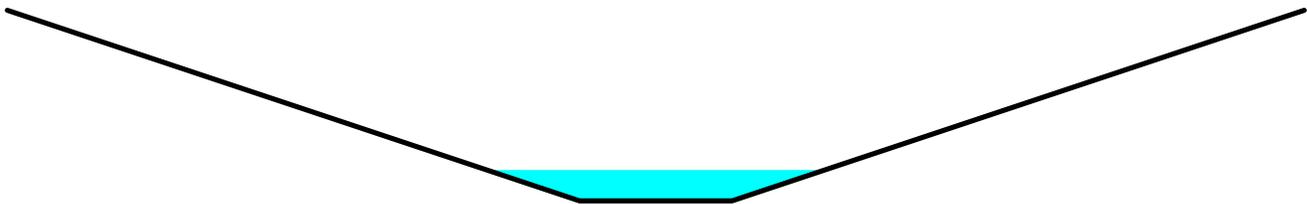
[62] Warning: Submerged 20% of Reach 119R inlet

Inflow Area = 18,760 sf, Inflow Depth > 3.72" for 25-Year event  
Inflow = 1.28 cfs @ 11.96 hrs, Volume= 5,809 cf  
Outflow = 1.27 cfs @ 11.96 hrs, Volume= 5,809 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3  
Max. Velocity= 3.91 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.50 fps, Avg. Travel Time= 0.1 min

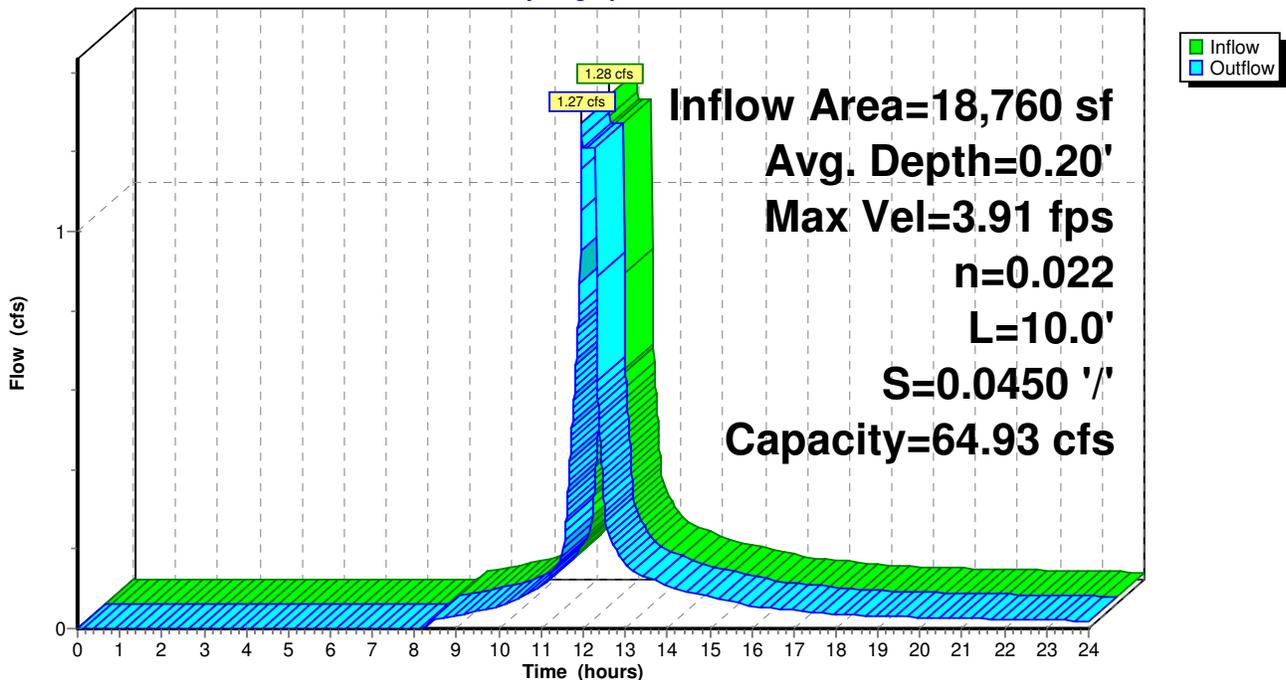
Peak Storage= 3 cf @ 11.96 hrs, Average Depth at Peak Storage= 0.20'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 118R: Swale from Drive at #4 to RG 116

Hydrograph



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## Reach 119R: Culvert under Unit 4 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 167% of Manning's capacity

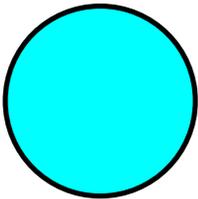
[76] Warning: Detained 275 cf (Pond w/culvert advised)

Inflow Area = 18,760 sf, Inflow Depth > 3.72" for 25-Year event  
Inflow = 2.01 cfs @ 12.01 hrs, Volume= 5,810 cf  
Outflow = 1.28 cfs @ 11.96 hrs, Volume= 5,809 cf, Atten= 36%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.95 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.3 min

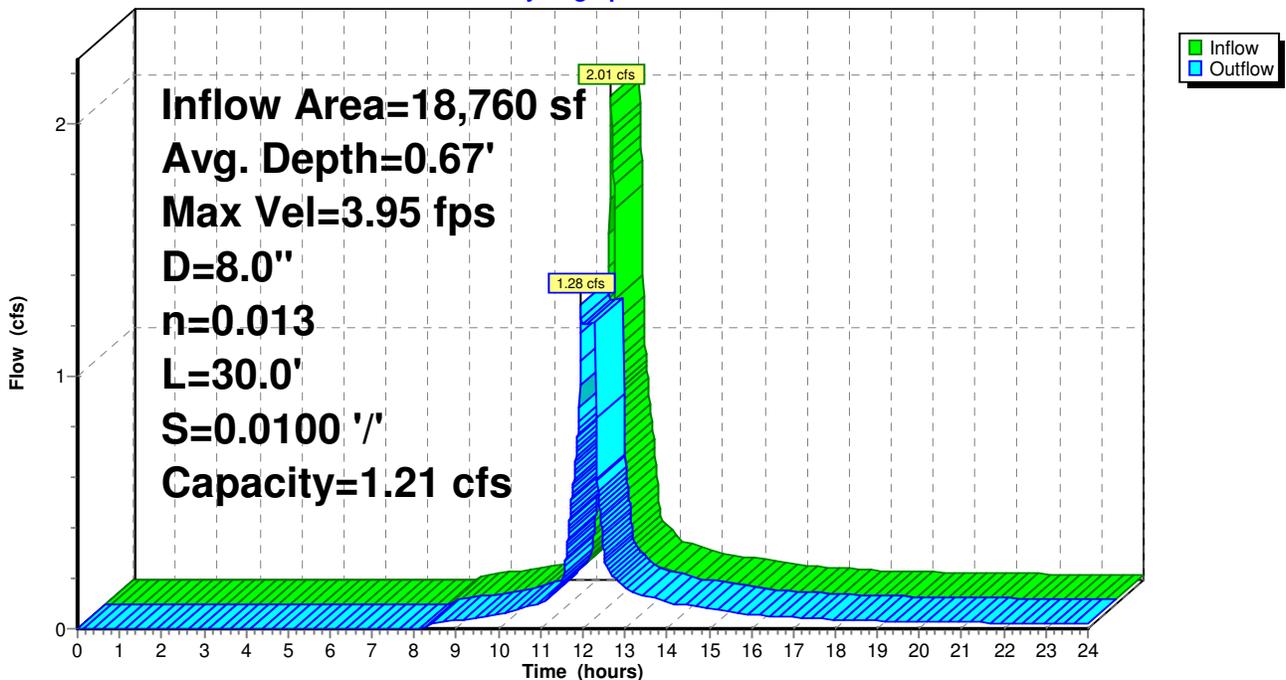
Peak Storage= 10 cf @ 11.97 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 111.30', Outlet Invert= 111.00'



## Reach 119R: Culvert under Unit 4 Drive

Hydrograph



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## Reach 127R: Swale from Drive at #3 to RG 118

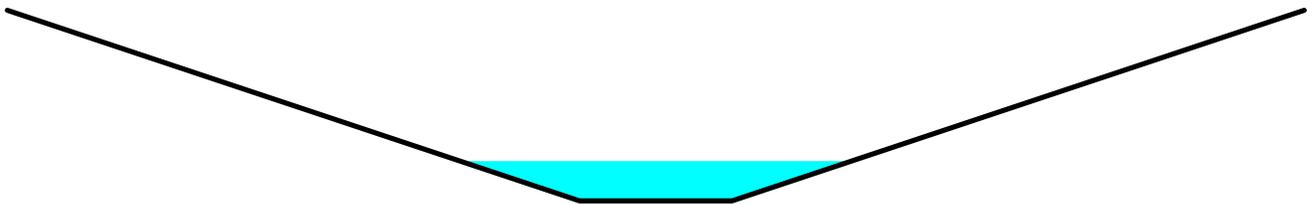
[61] Hint: Submerged 24% of Reach 128R bottom

Inflow Area = 20,516 sf, Inflow Depth > 3.27" for 25-Year event  
Inflow = 2.08 cfs @ 12.03 hrs, Volume= 5,594 cf  
Outflow = 2.08 cfs @ 12.03 hrs, Volume= 5,594 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.49 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.53 fps, Avg. Travel Time= 0.1 min

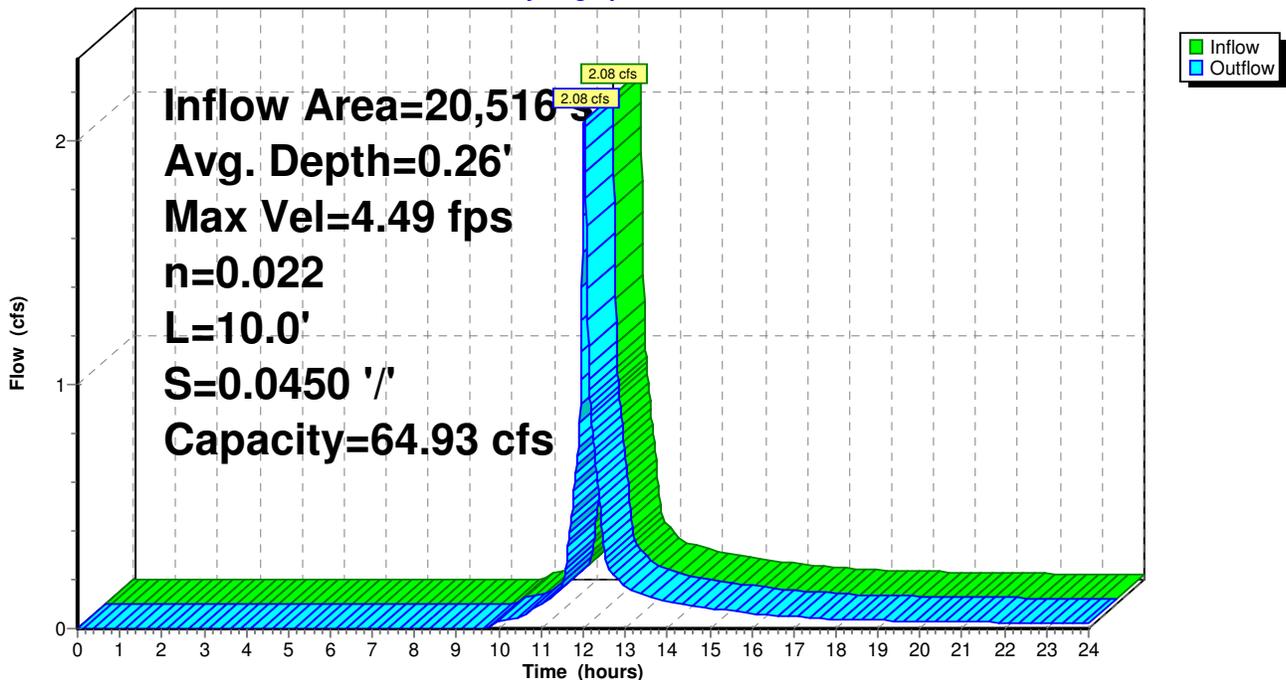
Peak Storage= 5 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.26'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 127R: Swale from Drive at #3 to RG 118

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## Reach 128R: Culvert under Unit 3 Drive

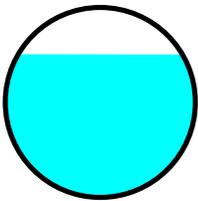
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,516 sf, Inflow Depth > 3.27" for 25-Year event  
Inflow = 2.09 cfs @ 12.02 hrs, Volume= 5,595 cf  
Outflow = 2.08 cfs @ 12.03 hrs, Volume= 5,594 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.41 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.88 fps, Avg. Travel Time= 0.2 min

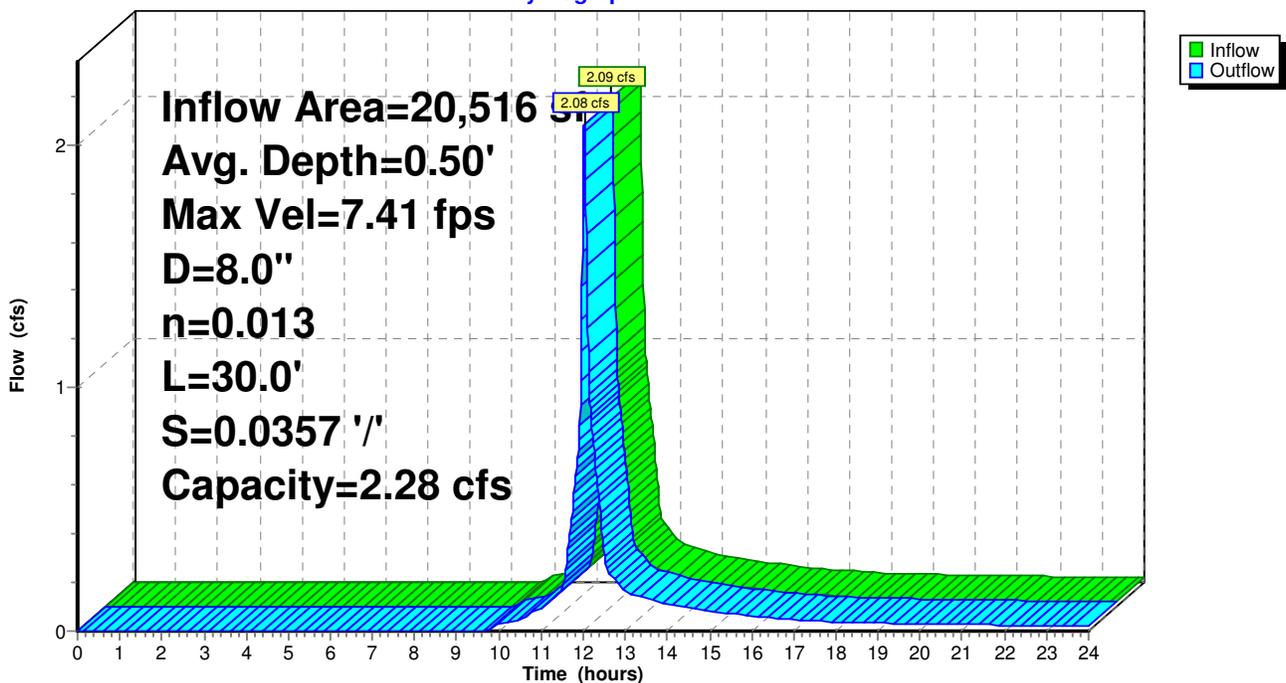
Peak Storage= 8 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.50'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.28 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0357 '/'  
Inlet Invert= 112.30', Outlet Invert= 111.23'



## Reach 128R: Culvert under Unit 3 Drive

Hydrograph



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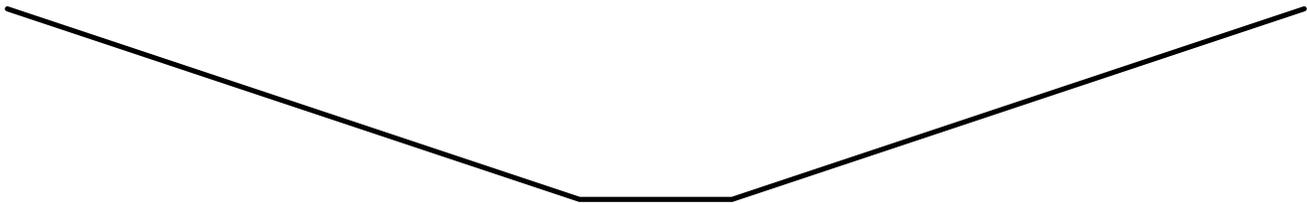
**Reach 129R: Swale from Drive at #20 to RG 124**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

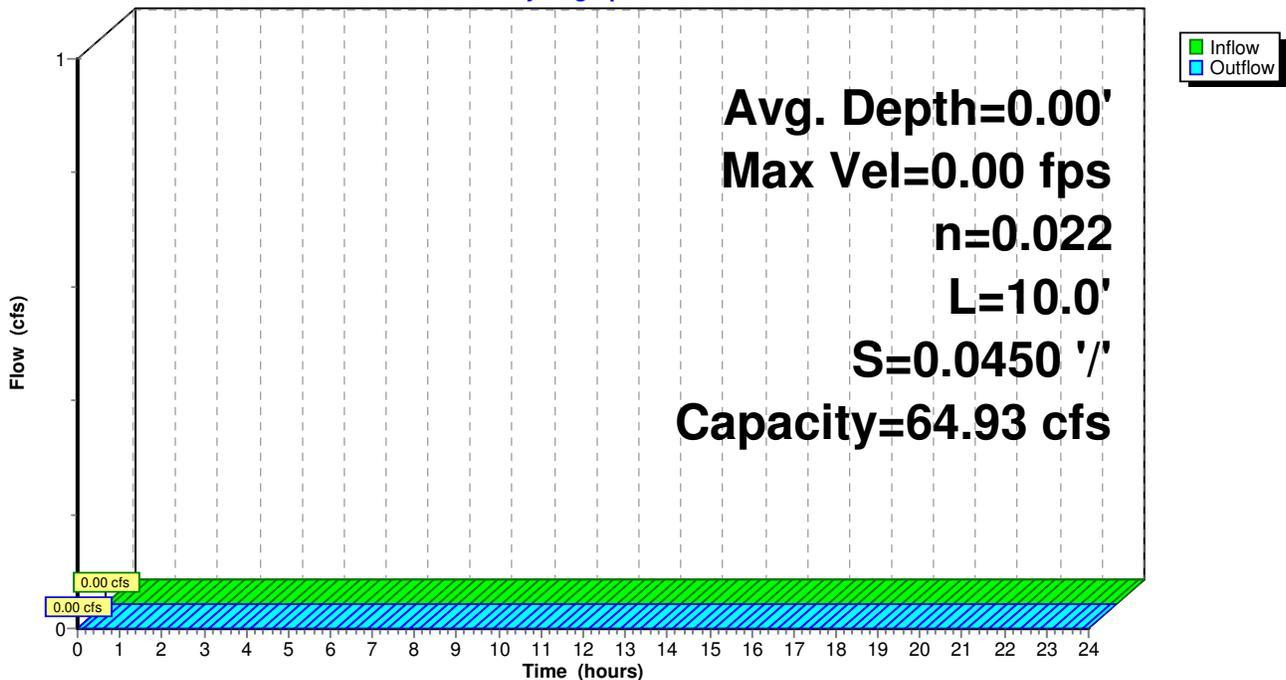
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 115.49', Outlet Invert= 115.04'



**Reach 129R: Swale from Drive at #20 to RG 124**

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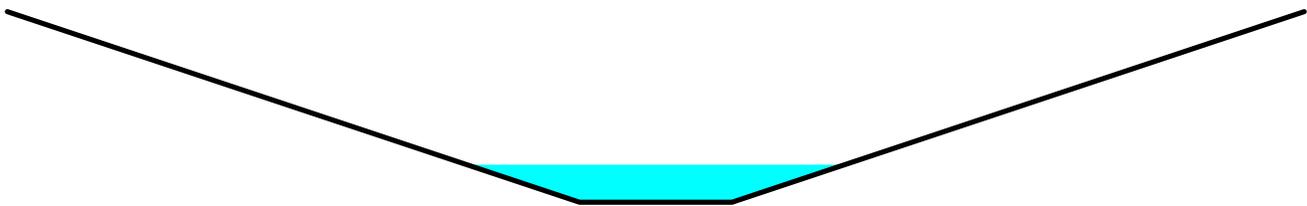
**Reach 130R: Swale to RG 122**

Inflow Area = 14,450 sf, Inflow Depth > 3.48" for 25-Year event  
Inflow = 1.66 cfs @ 12.01 hrs, Volume= 4,186 cf  
Outflow = 1.65 cfs @ 12.02 hrs, Volume= 4,185 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.89 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.28 fps, Avg. Travel Time= 0.4 min

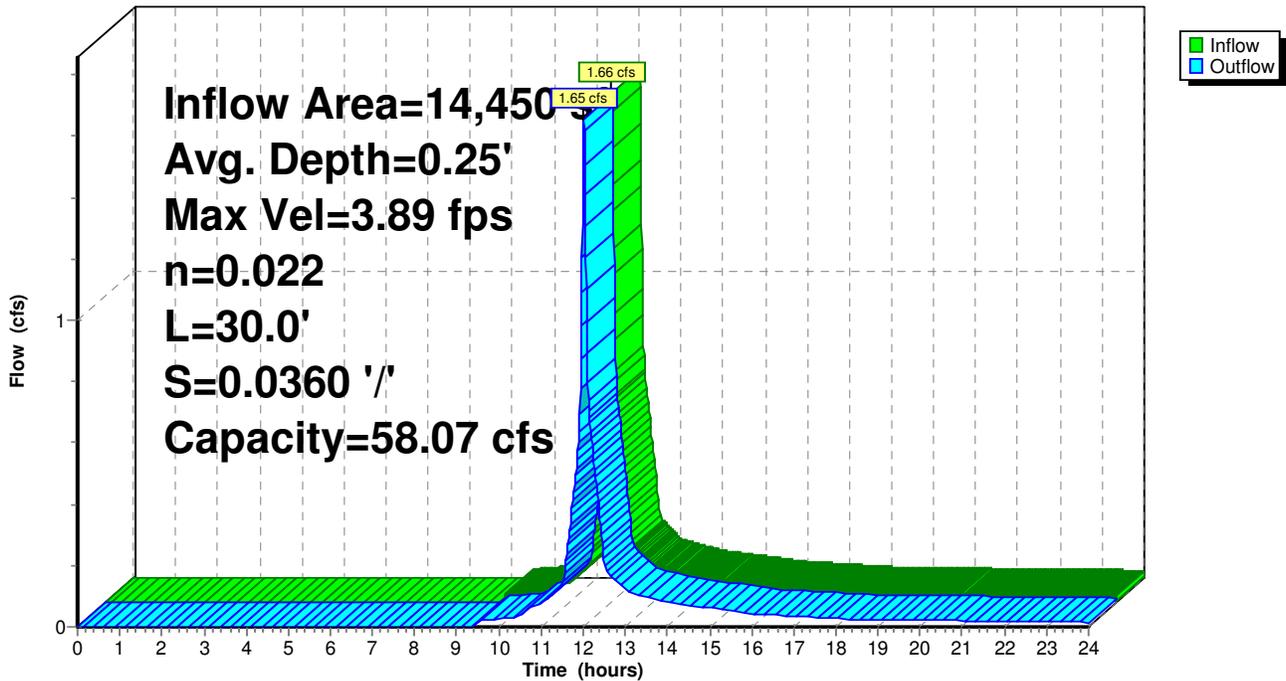
Peak Storage= 13 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.25'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 58.07 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 30.0' Slope= 0.0360 '/'  
Inlet Invert= 114.25', Outlet Invert= 113.17'



**Reach 130R: Swale to RG 122**

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## Reach 131R: Culvert under Unit 20 Drive

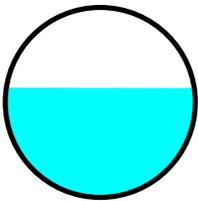
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 3.24" for 25-Year event  
Inflow = 0.77 cfs @ 12.01 hrs, Volume= 1,877 cf  
Outflow = 0.76 cfs @ 12.02 hrs, Volume= 1,877 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.66 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.6 min

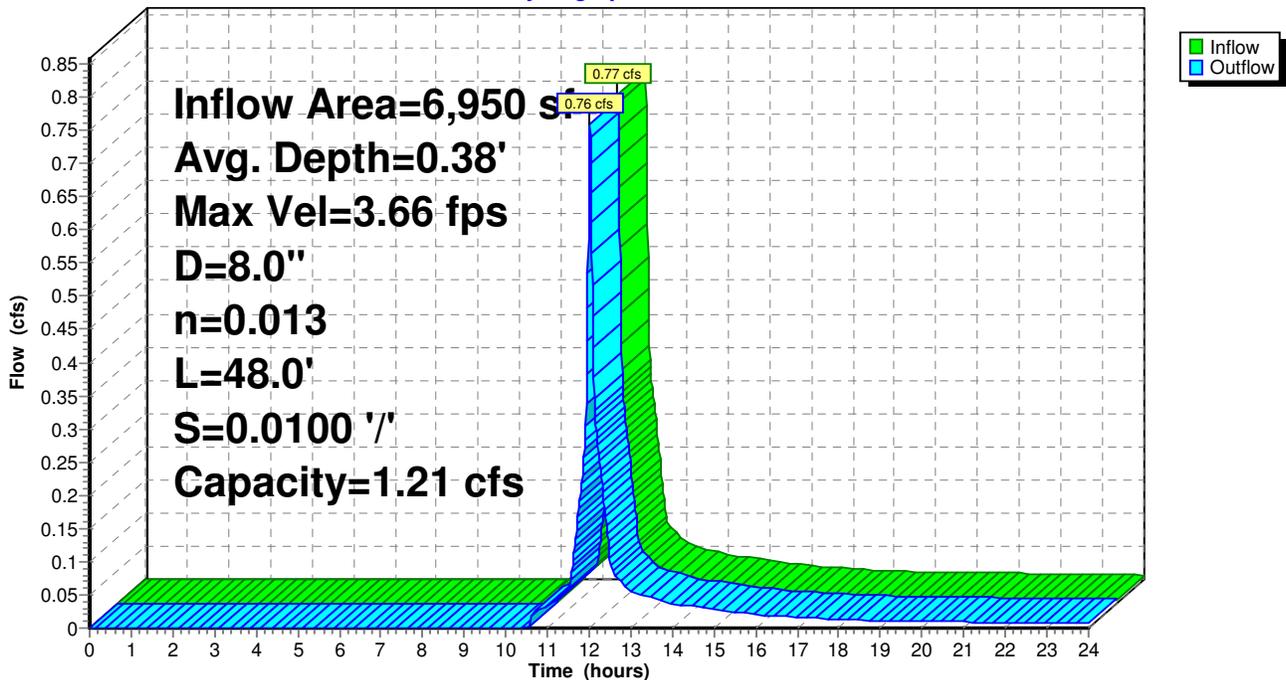
Peak Storage= 10 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.38'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 115.97', Outlet Invert= 115.49'



## Reach 131R: Culvert under Unit 20 Drive

Hydrograph



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## Reach 137R: Swale Back of 7,6,5

Inflow Area = 13,850 sf, Inflow Depth > 3.06" for 25-Year event  
Inflow = 1.27 cfs @ 12.05 hrs, Volume= 3,532 cf  
Outflow = 1.23 cfs @ 12.08 hrs, Volume= 3,525 cf, Atten= 3%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.78 fps, Min. Travel Time= 1.3 min  
Avg. Velocity = 0.50 fps, Avg. Travel Time= 4.7 min

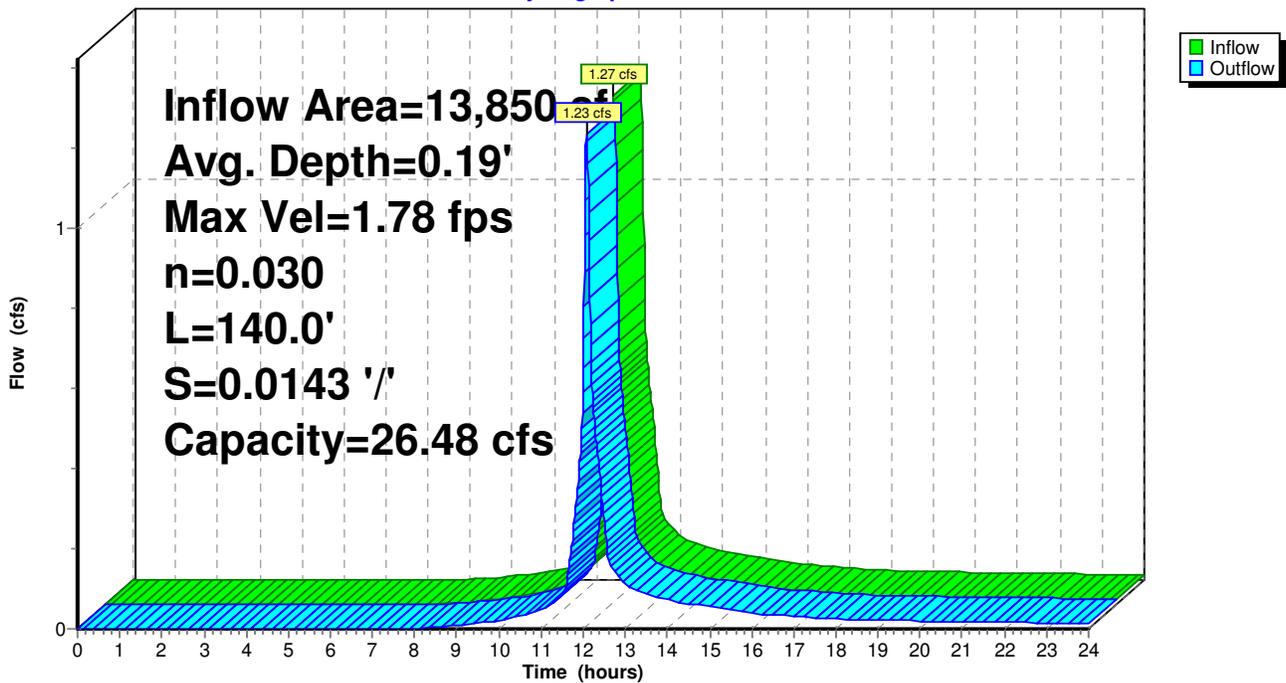
Peak Storage= 97 cf @ 12.06 hrs, Average Depth at Peak Storage= 0.19'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 26.48 cfs

3.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 9.00'  
Length= 140.0' Slope= 0.0143 '/'  
Inlet Invert= 118.00', Outlet Invert= 116.00'



## Reach 137R: Swale Back of 7,6,5

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## Reach 138R: Swale Back of 4

[61] Hint: Submerged 20% of Reach 137R bottom

Inflow Area = 34,910 sf, Inflow Depth > 2.89" for 25-Year event  
Inflow = 2.66 cfs @ 12.02 hrs, Volume= 8,412 cf  
Outflow = 2.63 cfs @ 12.06 hrs, Volume= 8,401 cf, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.11 fps, Min. Travel Time= 1.1 min  
Avg. Velocity = 0.68 fps, Avg. Travel Time= 3.4 min

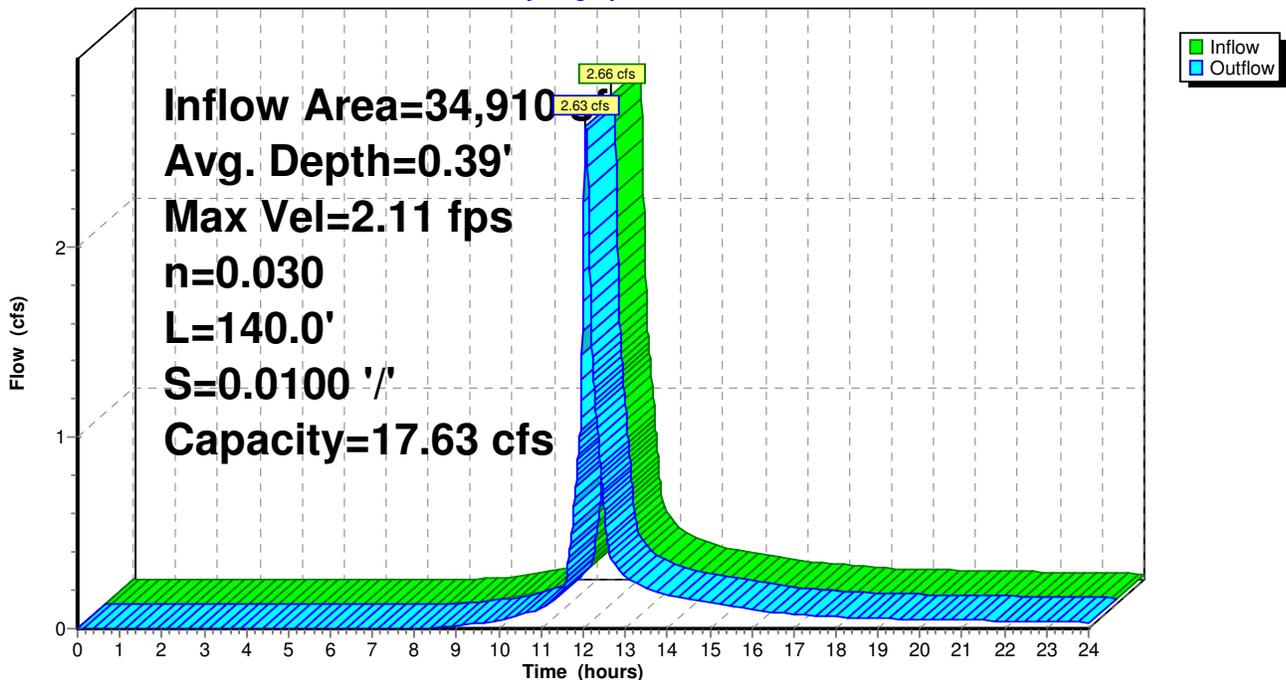
Peak Storage= 174 cf @ 12.05 hrs, Average Depth at Peak Storage= 0.39'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 17.63 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 8.00'  
Length= 140.0' Slope= 0.0100 '/'  
Inlet Invert= 116.00', Outlet Invert= 114.60'



## Reach 138R: Swale Back of 4

Hydrograph



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## Reach 149R: DMH 14 to DMH 12

[52] Hint: Inlet conditions not evaluated

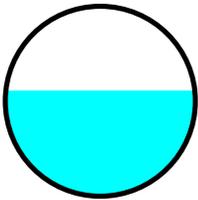
[61] Hint: Submerged 92% of Reach 114R bottom

Inflow Area = 91,524 sf, Inflow Depth > 3.33" for 25-Year event  
Inflow = 7.68 cfs @ 12.03 hrs, Volume= 25,405 cf  
Outflow = 7.66 cfs @ 12.04 hrs, Volume= 25,400 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.58 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 2.53 fps, Avg. Travel Time= 0.6 min

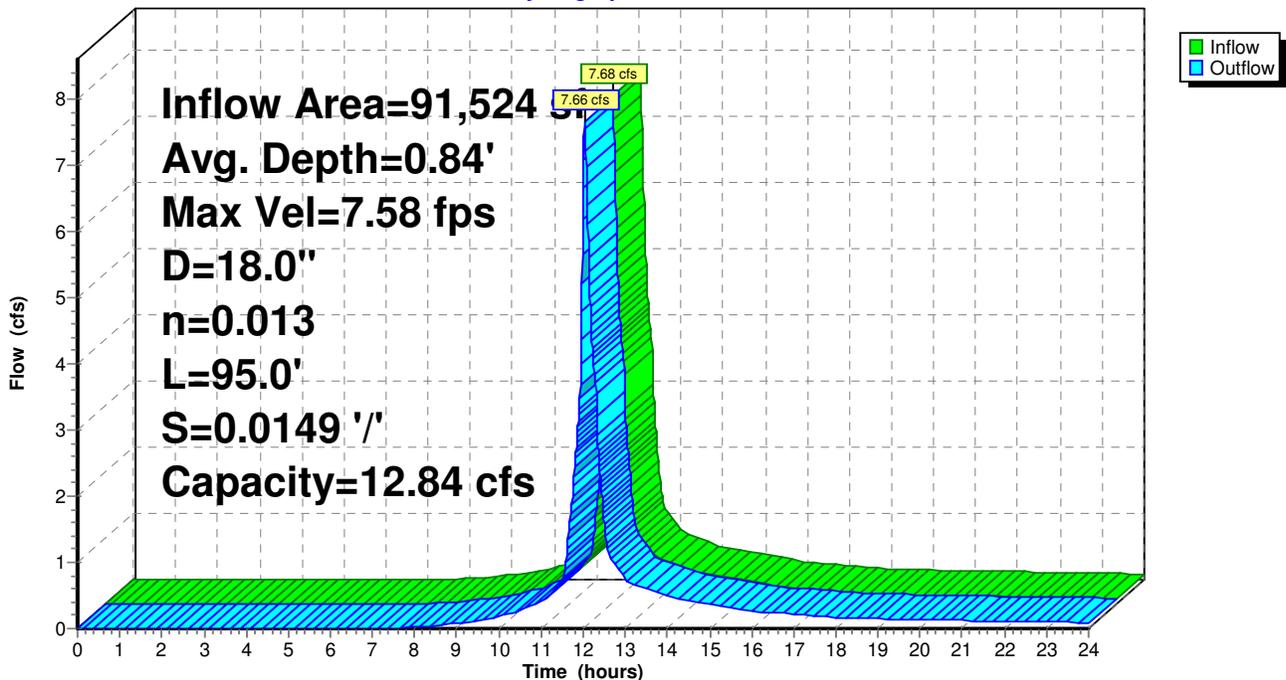
Peak Storage= 96 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.84'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.84 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 95.0' Slope= 0.0149 '/'  
Inlet Invert= 102.58', Outlet Invert= 101.16'



## Reach 149R: DMH 14 to DMH 12

Hydrograph



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## Reach 150R: DMH 12 to HW 10 - Outlet

[52] Hint: Inlet conditions not evaluated

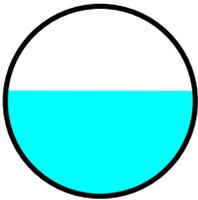
[61] Hint: Submerged 52% of Reach 149R bottom

Inflow Area = 91,524 sf, Inflow Depth > 3.33" for 25-Year event  
Inflow = 7.66 cfs @ 12.04 hrs, Volume= 25,400 cf  
Outflow = 7.65 cfs @ 12.04 hrs, Volume= 25,397 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.61 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.55 fps, Avg. Travel Time= 0.4 min

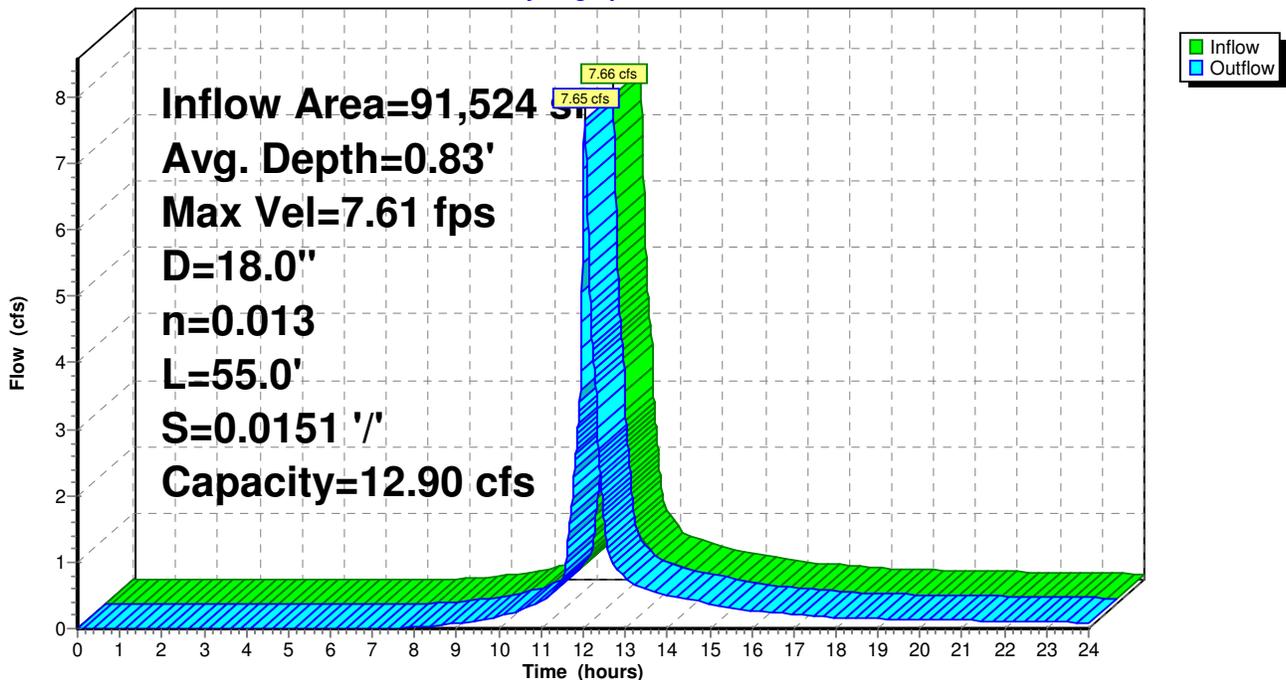
Peak Storage= 55 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.83'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.90 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 55.0' Slope= 0.0151 '/'  
Inlet Invert= 101.06', Outlet Invert= 100.23'



## Reach 150R: DMH 12 to HW 10 - Outlet

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## Reach 153R: CB 116 to DMH 14

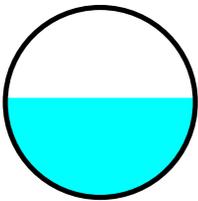
[52] Hint: Inlet conditions not evaluated

Inflow Area = 21,810 sf, Inflow Depth > 3.76" for 25-Year event  
Inflow = 1.61 cfs @ 12.01 hrs, Volume= 6,825 cf  
Outflow = 1.60 cfs @ 12.01 hrs, Volume= 6,825 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 8.65 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 3.58 fps, Avg. Travel Time= 0.1 min

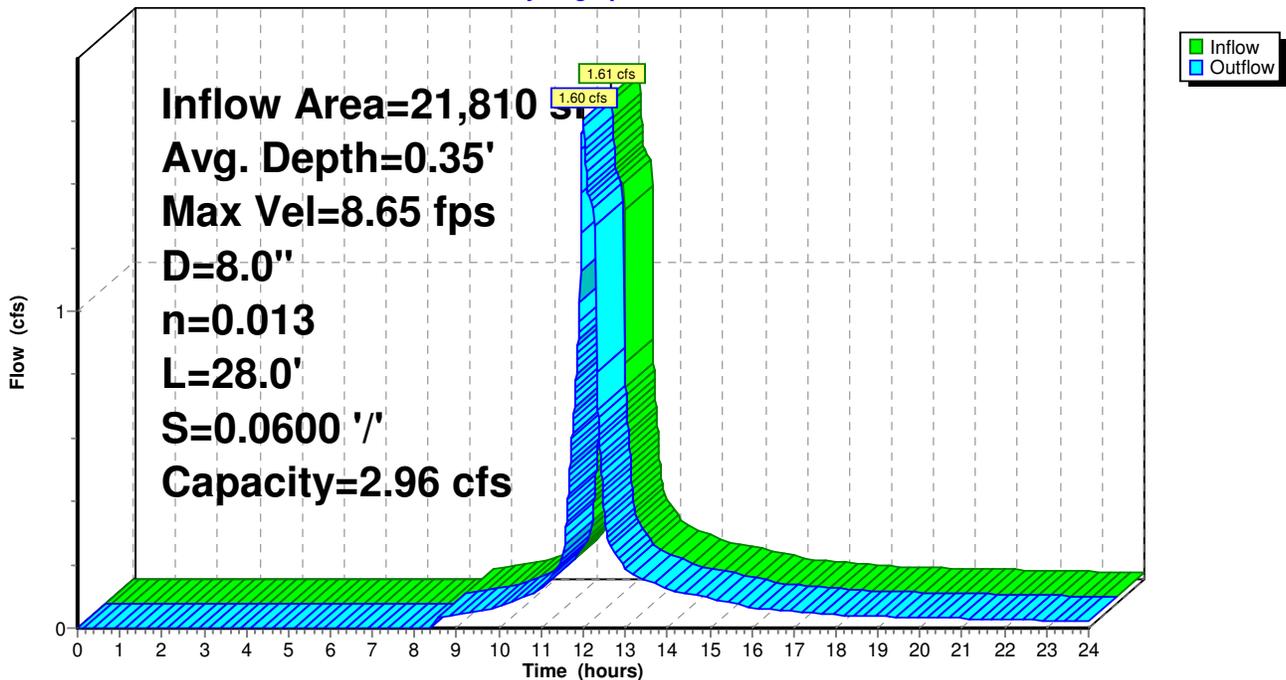
Peak Storage= 5 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.35'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 28.0' Slope= 0.0600 '/'  
Inlet Invert= 107.12', Outlet Invert= 105.44'



## Reach 153R: CB 116 to DMH 14

Hydrograph



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**Reach 154R: Swale from Drive at #6 to RG 126**

[43] Hint: Has no inflow (Outflow=Zero)

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'

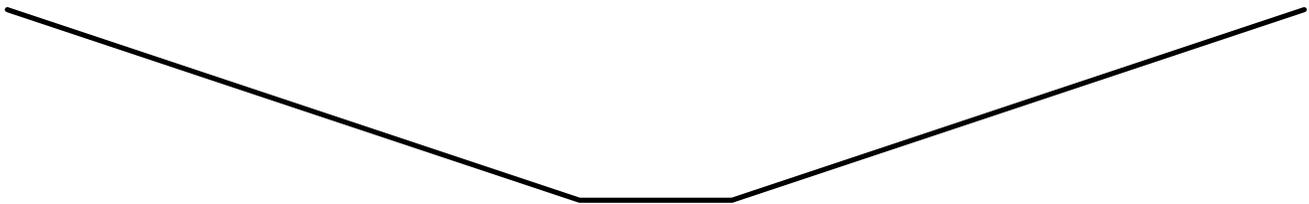
Bank-Full Depth= 1.25', Capacity at Bank-Full= 29.18 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 3.0 '/' Top Width= 8.50'

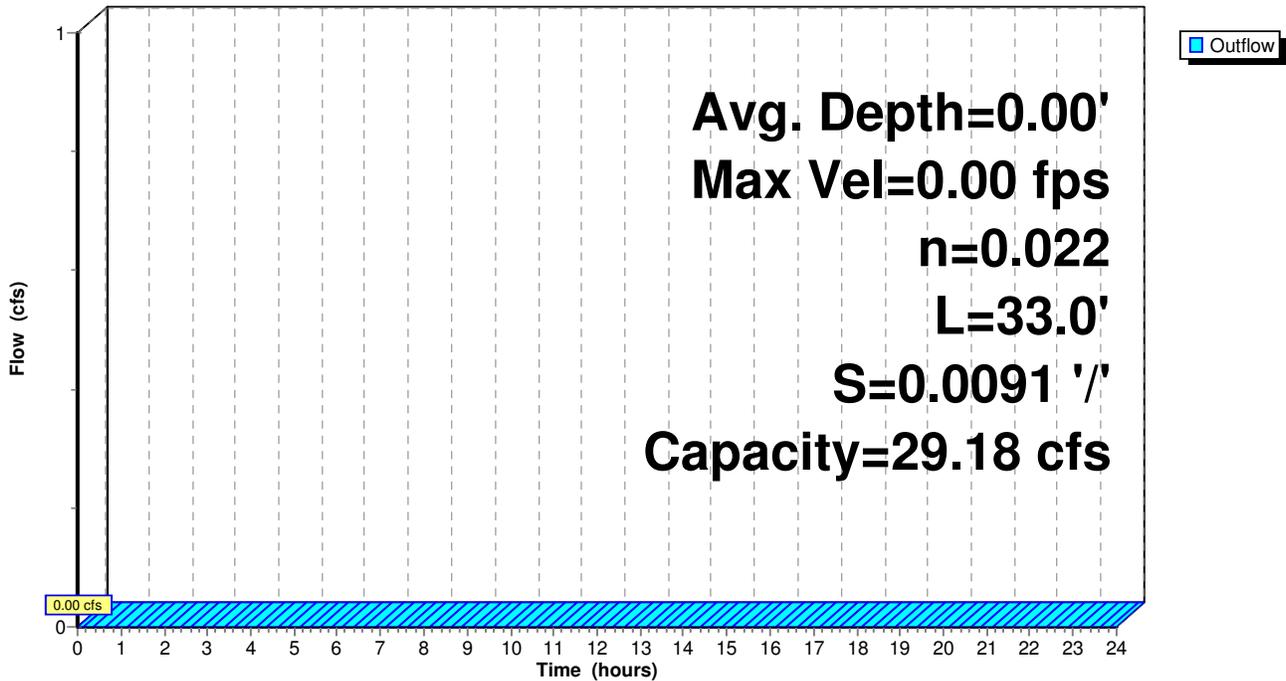
Length= 33.0' Slope= 0.0091 '/'

Inlet Invert= 116.75', Outlet Invert= 116.45'



**Reach 154R: Swale from Drive at #6 to RG 126**

Hydrograph



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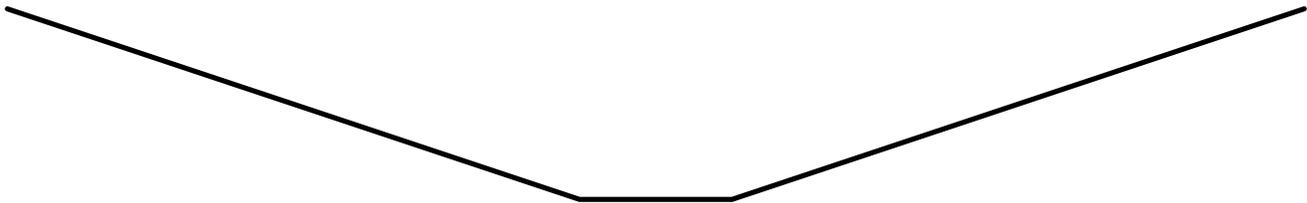
**Reach 155R: Swale from Drive at #5 to RG 120**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

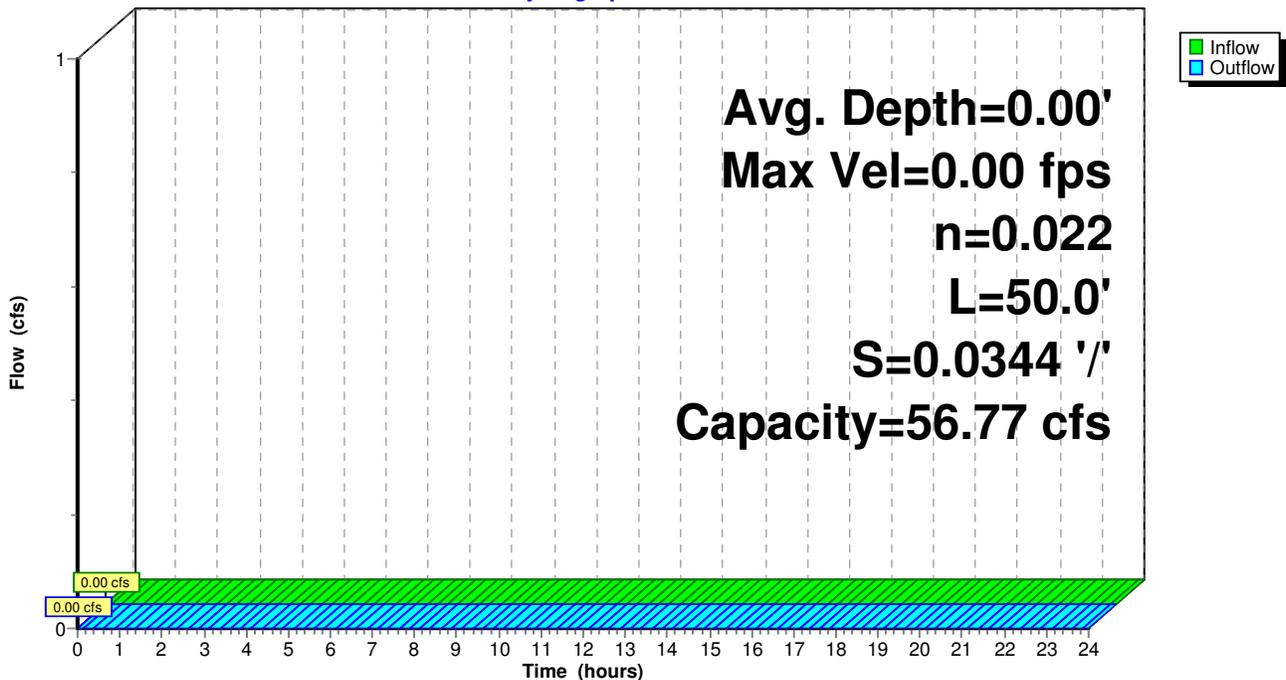
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 56.77 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 50.0' Slope= 0.0344 '/'  
Inlet Invert= 115.27', Outlet Invert= 113.55'



**Reach 155R: Swale from Drive at #5 to RG 120**

Hydrograph



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## Reach 156R: Culvert under Unit 5 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 109% of Manning's capacity

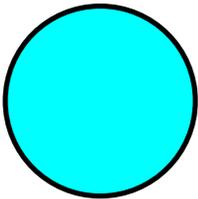
[76] Warning: Detained 14 cf (Pond w/culvert advised)

Inflow Area = 12,570 sf, Inflow Depth > 3.69" for 25-Year event  
Inflow = 1.32 cfs @ 12.03 hrs, Volume= 3,867 cf  
Outflow = 1.28 cfs @ 12.09 hrs, Volume= 3,867 cf, Atten= 3%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.95 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.59 fps, Avg. Travel Time= 0.3 min

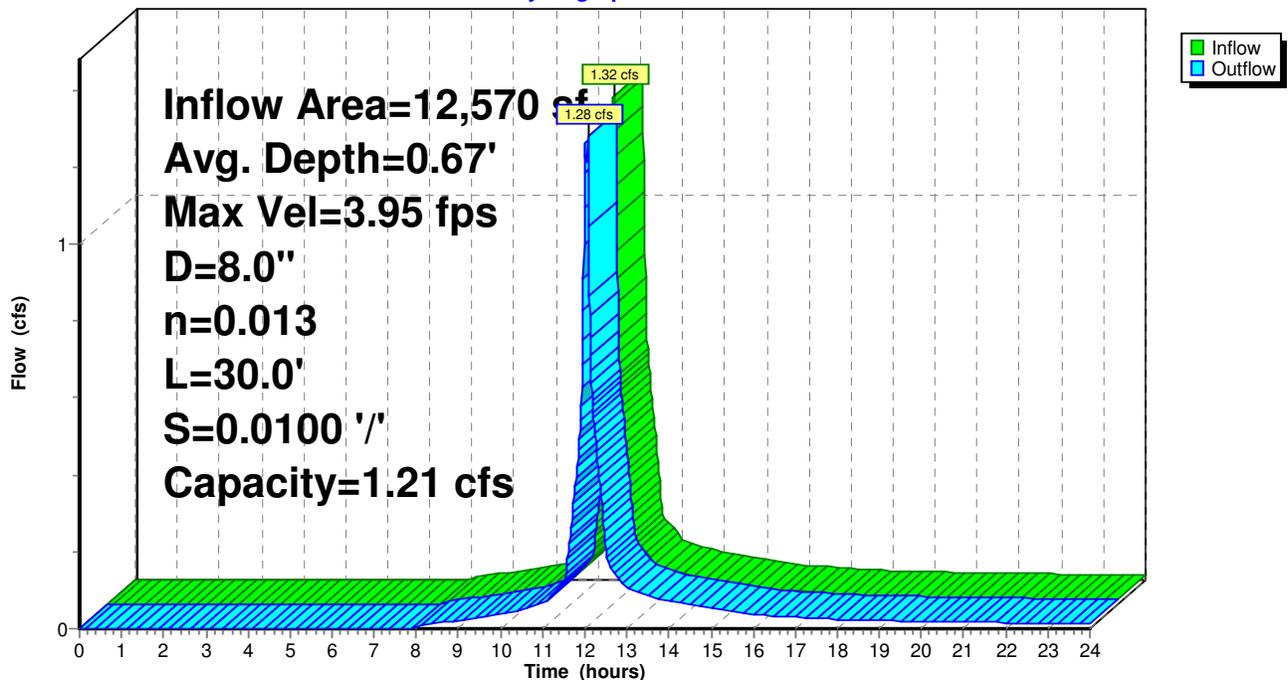
Peak Storage= 10 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 115.57', Outlet Invert= 115.27'



## Reach 156R: Culvert under Unit 5 Drive

Hydrograph



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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

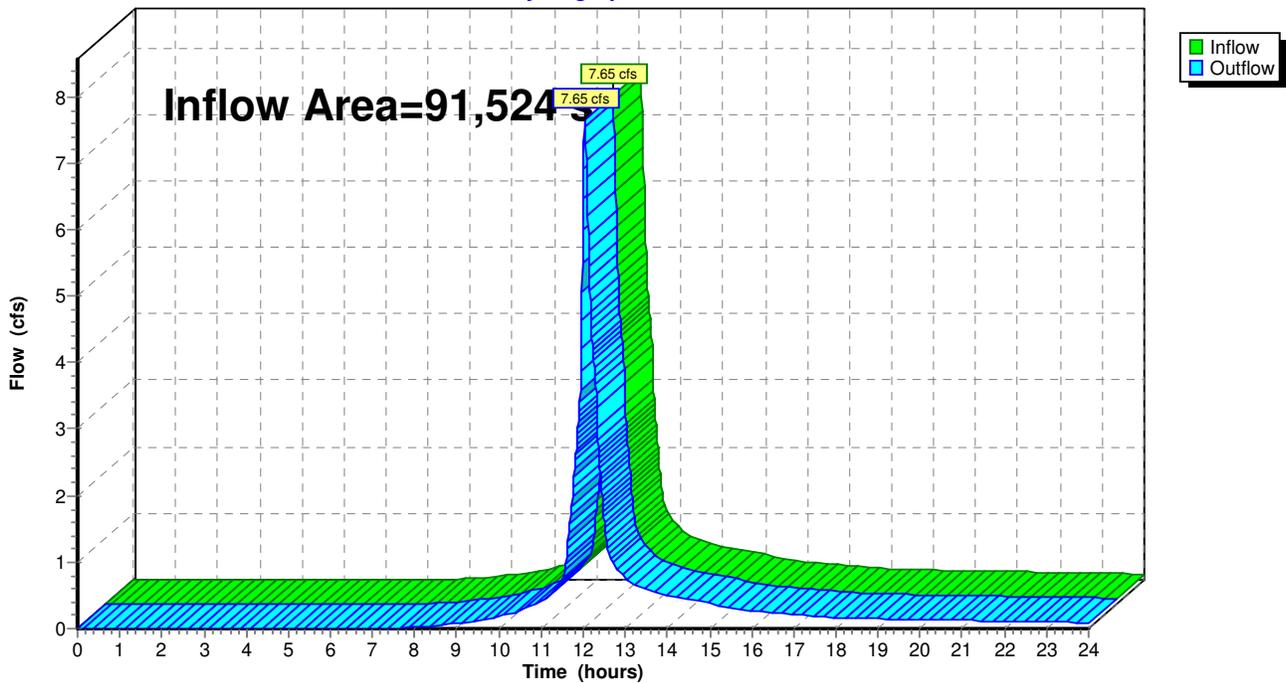
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 91,524 sf, Inflow Depth > 3.33" for 25-Year event  
Inflow = 7.65 cfs @ 12.04 hrs, Volume= 25,397 cf  
Outflow = 7.65 cfs @ 12.04 hrs, Volume= 25,397 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

Hydrograph



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## Reach 220R: CB 56 to DMH 52

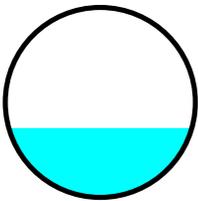
[52] Hint: Inlet conditions not evaluated

Inflow Area = 8,660 sf, Inflow Depth > 3.65" for 25-Year event  
Inflow = 1.01 cfs @ 12.01 hrs, Volume= 2,631 cf  
Outflow = 1.01 cfs @ 12.01 hrs, Volume= 2,631 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.90 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.26 fps, Avg. Travel Time= 0.2 min

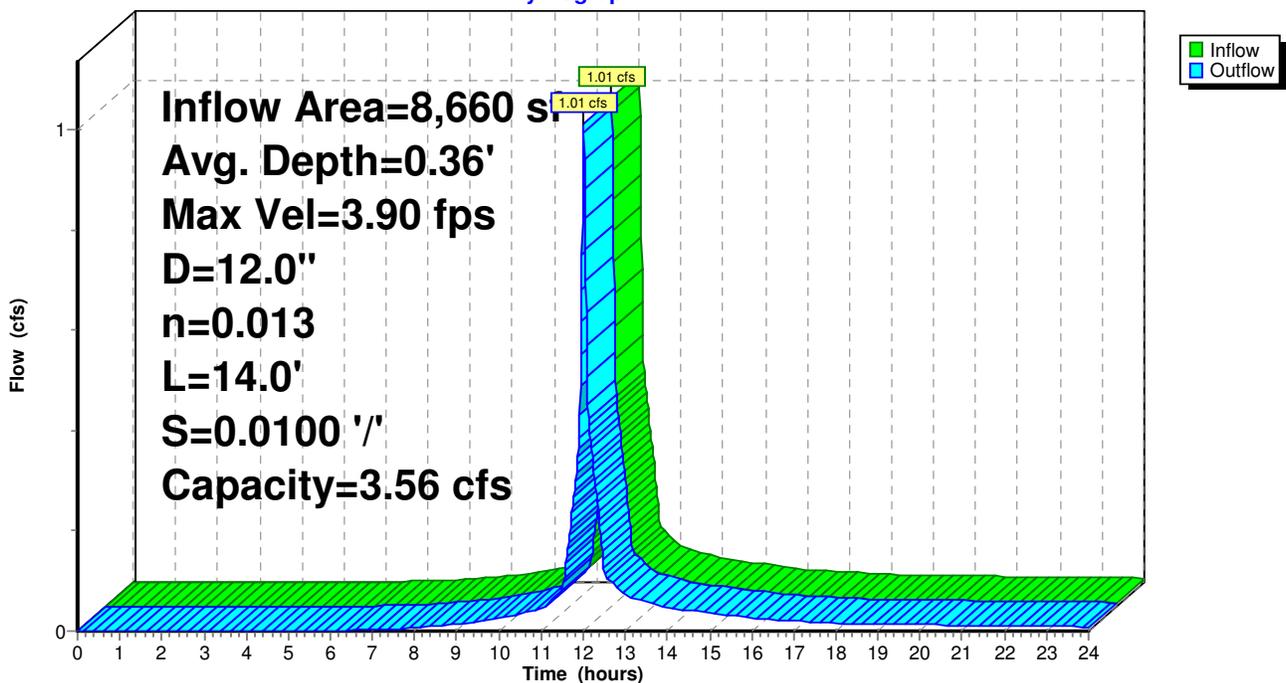
Peak Storage= 4 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.36'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 14.0' Slope= 0.0100 '/'  
Inlet Invert= 102.72', Outlet Invert= 102.58'



## Reach 220R: CB 56 to DMH 52

Hydrograph



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## Reach 222R: CB 54 to DMH 52

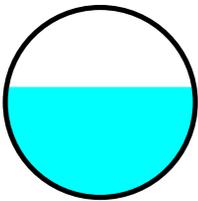
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,970 sf, Inflow Depth > 3.35" for 25-Year event  
Inflow = 2.28 cfs @ 12.01 hrs, Volume= 5,852 cf  
Outflow = 2.27 cfs @ 12.01 hrs, Volume= 5,851 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.81 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.63 fps, Avg. Travel Time= 0.2 min

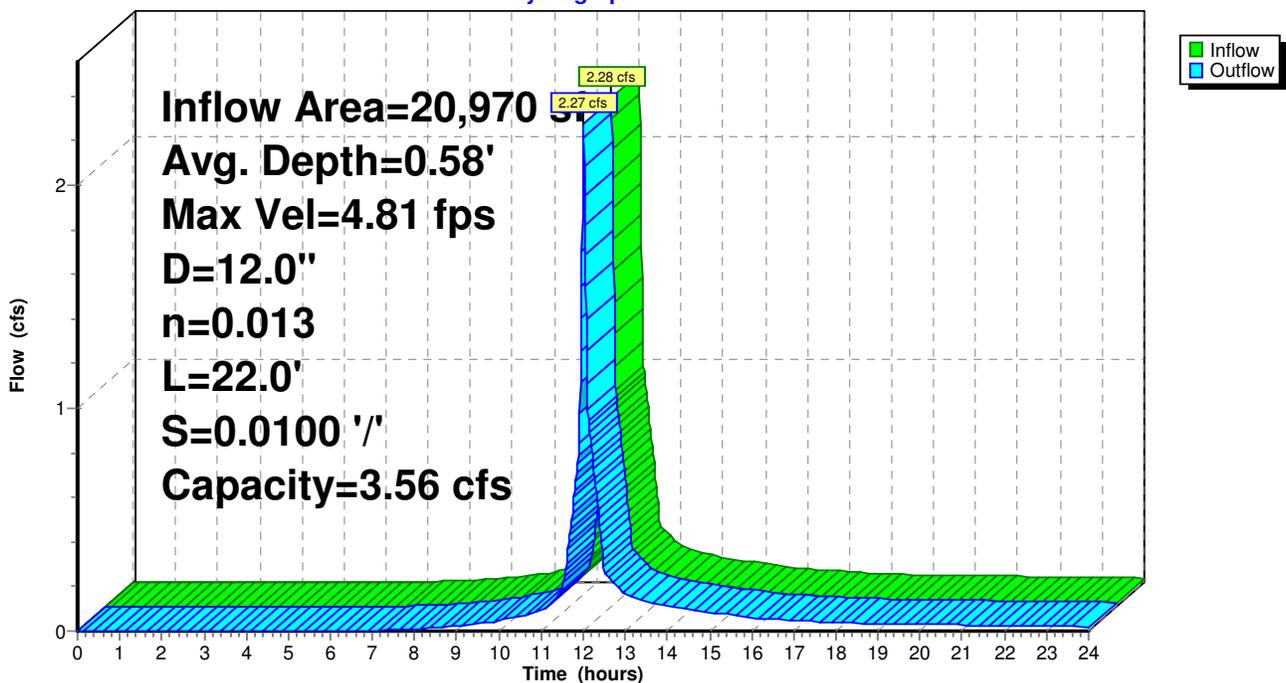
Peak Storage= 10 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.58'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 22.0' Slope= 0.0100 '/'  
Inlet Invert= 102.80', Outlet Invert= 102.58'



## Reach 222R: CB 54 to DMH 52

Hydrograph



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## Reach 403R: CB 65 to DMH 50

[52] Hint: Inlet conditions not evaluated

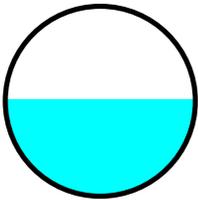
[79] Warning: Submerged Pond 67P Primary device # 1 OUTLET by 0.37'

Inflow Area = 44,069 sf, Inflow Depth > 2.99" for 25-Year event  
Inflow = 2.62 cfs @ 12.18 hrs, Volume= 10,964 cf  
Outflow = 2.62 cfs @ 12.18 hrs, Volume= 10,963 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.48 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.76 fps, Avg. Travel Time= 0.2 min

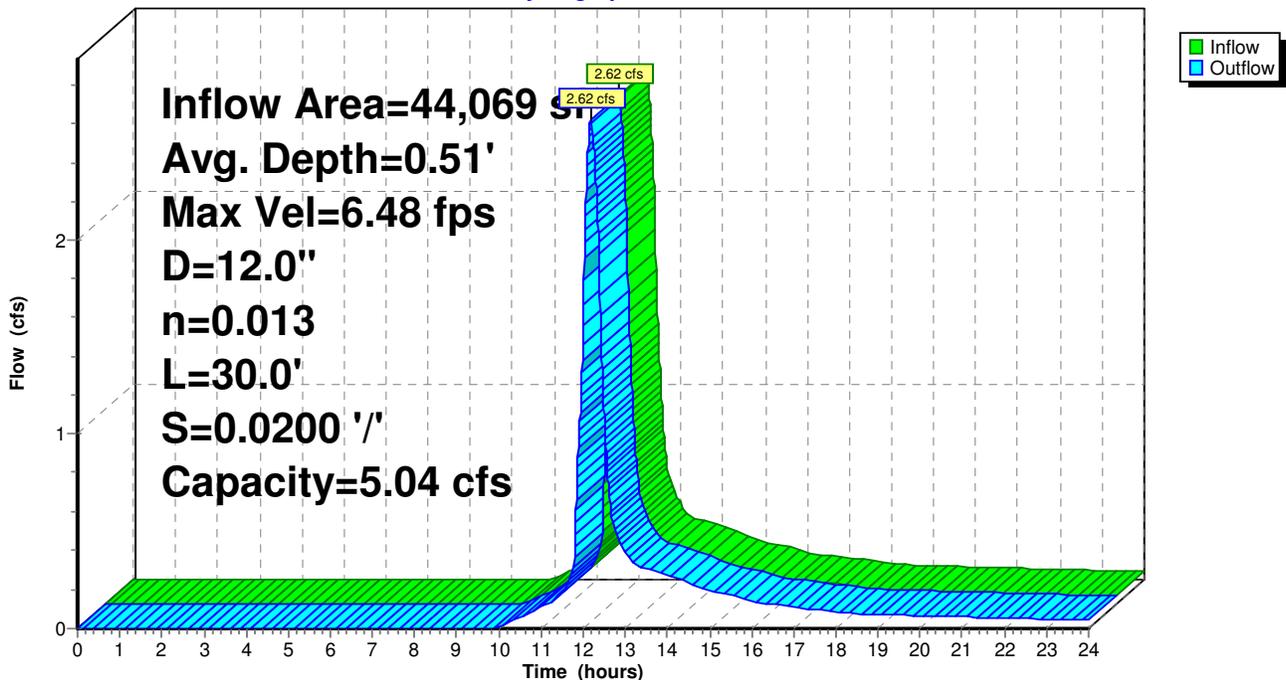
Peak Storage= 12 cf @ 12.18 hrs, Average Depth at Peak Storage= 0.51'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.04 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0200 '/'  
Inlet Invert= 102.22', Outlet Invert= 101.62'



## Reach 403R: CB 65 to DMH 50

Hydrograph



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## Reach 902R: Existing wetland channel to WF 13

[61] Hint: Submerged 3% of Reach 1R bottom

Inflow Area = 203,736 sf, Inflow Depth > 2.75" for 25-Year event  
Inflow = 10.72 cfs @ 12.17 hrs, Volume= 46,626 cf  
Outflow = 10.72 cfs @ 12.18 hrs, Volume= 46,607 cf, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.56 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.67 fps, Avg. Travel Time= 1.0 min

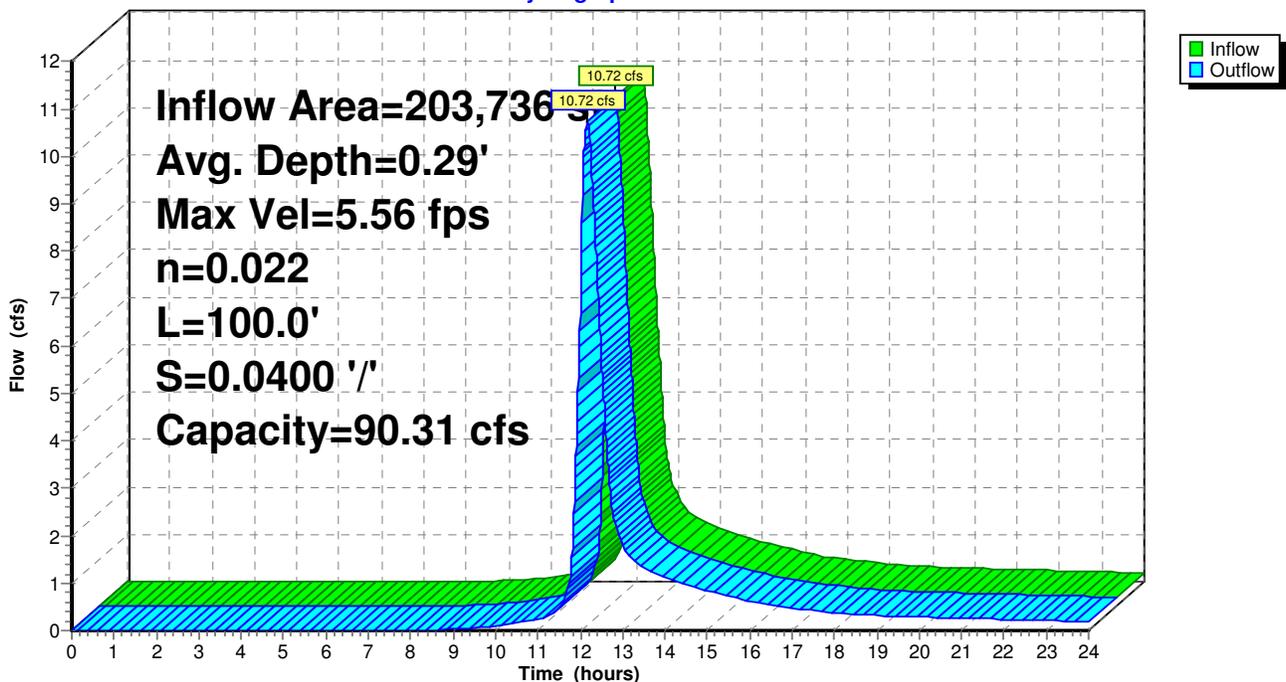
Peak Storage= 193 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.29'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 90.31 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 100.0' Slope= 0.0400 '/'  
Inlet Invert= 86.00', Outlet Invert= 82.00'



## Reach 902R: Existing wetland channel to WF 13

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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### Pond 2P: Recharge System

[93] Warning: Storage range exceeded by 1.53'

[88] Warning: Qout>Qin may require Finer Routing>1

[85] Warning: Oscillations may require Finer Routing>1

[81] Warning: Exceeded Pond 219P by 2.24' @ 12.31 hrs

Inflow Area = 111,470 sf, Inflow Depth > 3.14" for 25-Year event  
Inflow = 6.68 cfs @ 12.10 hrs, Volume= 29,129 cf  
Outflow = 7.14 cfs @ 12.09 hrs, Volume= 26,166 cf, Atten= 0%, Lag= 0.0 min  
Discarded = 0.01 cfs @ 8.15 hrs, Volume= 377 cf  
Primary = 5.87 cfs @ 12.09 hrs, Volume= 25,339 cf  
Secondary = 1.26 cfs @ 12.09 hrs, Volume= 449 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 106.13' @ 12.09 hrs Surf.Area= 1,620 sf Storage= 3,766 cf

Plug-Flow detention time= 71.0 min calculated for 26,155 cf (90% of inflow)  
Center-of-Mass det. time= 22.6 min ( 850.1 - 827.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	100.60'	1,810 cf	<b>36.00'W x 45.00'L x 4.00'H 100</b> 6,480 cf Overall - 1,956 cf Embedded = 4,524 cf x 40.0% Voids
#2	101.00'	1,956 cf	<b>47.8"W x 30.0"H x 6.25'L Cultec R-330</b> x 42 Inside #1
		3,766 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.170 in/hr Exfiltration over Surface area</b>
#2	Primary	103.22'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Secondary	106.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Discarded OutFlow** Max=0.01 cfs @ 8.15 hrs HW=100.65' (Free Discharge)  
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=5.87 cfs @ 12.09 hrs HW=106.13' (Free Discharge)  
↑2=Orifice/Grate (Orifice Controls 5.87 cfs @ 7.48 fps)

**Secondary OutFlow** Max=1.23 cfs @ 12.09 hrs HW=106.13' (Free Discharge)  
↑3=Orifice/Grate (Weir Controls 1.23 cfs @ 1.18 fps)

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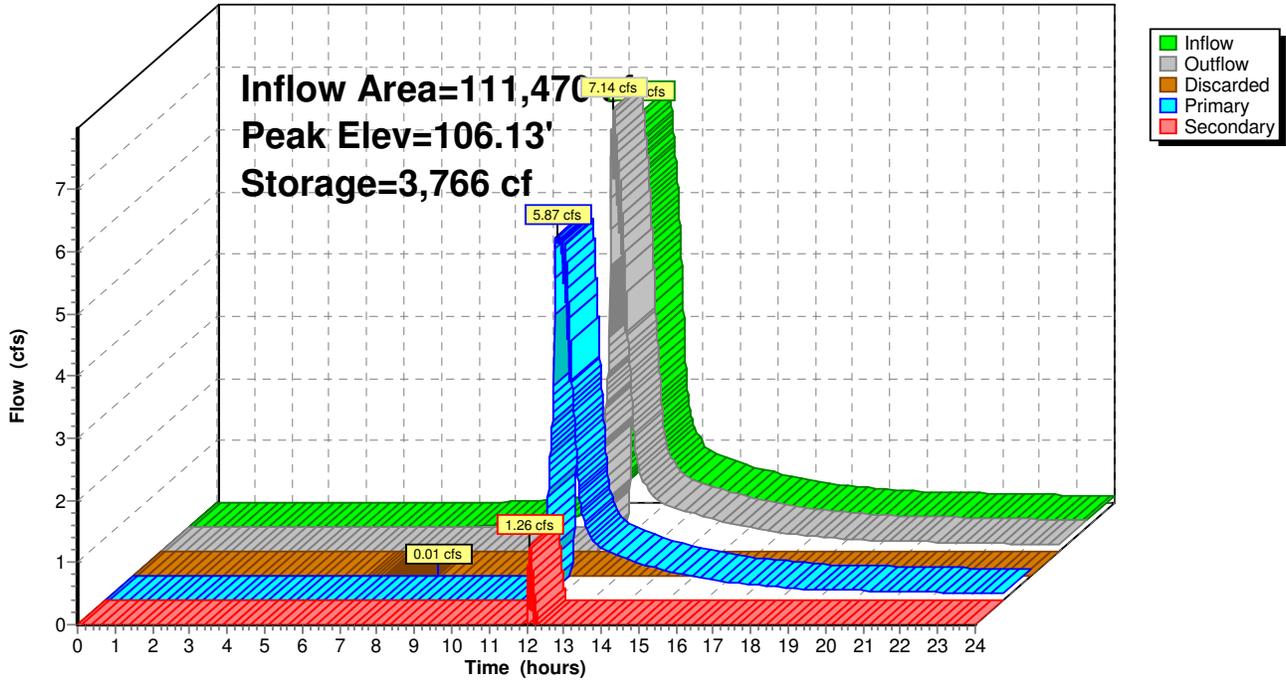
Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 2P: Recharge System**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 7P: Forebay - Bio Retention**

[63] Warning: Exceeded Reach 62R inflow depth by 0.65' @ 23.99 hrs

Inflow Area = 44,069 sf, Inflow Depth > 3.08" for 25-Year event  
 Inflow = 3.43 cfs @ 12.09 hrs, Volume= 11,309 cf  
 Outflow = 3.42 cfs @ 12.10 hrs, Volume= 11,139 cf, Atten= 0%, Lag= 0.3 min  
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0 cf  
 Primary = 3.42 cfs @ 12.10 hrs, Volume= 11,139 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.80' @ 12.10 hrs Surf.Area= 282 sf Storage= 245 cf

Plug-Flow detention time= 14.0 min calculated for 11,135 cf (98% of inflow)  
 Center-of-Mass det. time= 5.1 min ( 824.7 - 819.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.49'	304 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.49	0	0	0
111.00	205	52	52
111.50	248	113	166
112.00	305	138	304

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.001 in/hr Exfiltration over Surface area</b>
#2	Primary	111.50'	<b>8.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

**Discarded OutFlow** Max=0.00 cfs @ 12.10 hrs HW=111.80' (Free Discharge)

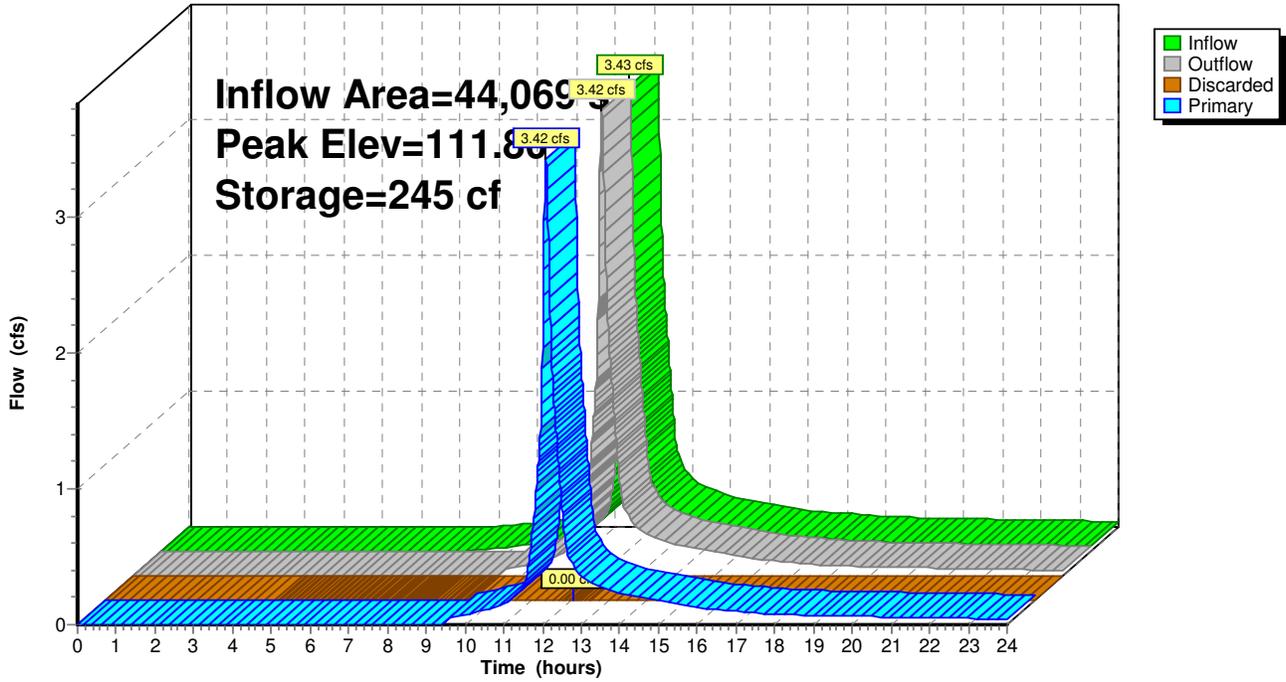
↑1=**Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=3.42 cfs @ 12.10 hrs HW=111.80' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** (Weir Controls 3.42 cfs @ 1.42 fps)

### Pond 7P: Forebay - Bio Retention

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 8P: Main Cell - Bio Retention**

[79] Warning: Submerged Pond 7P Primary device # 2 by 0.23'

Inflow Area = 44,069 sf, Inflow Depth > 3.03" for 25-Year event  
 Inflow = 3.42 cfs @ 12.10 hrs, Volume= 11,139 cf  
 Outflow = 2.62 cfs @ 12.17 hrs, Volume= 10,964 cf, Atten= 23%, Lag= 4.6 min  
 Primary = 2.62 cfs @ 12.17 hrs, Volume= 10,964 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.73' @ 12.17 hrs Surf.Area= 1,233 sf Storage= 1,309 cf

Plug-Flow detention time= 25.6 min calculated for 10,964 cf (98% of inflow)  
 Center-of-Mass det. time= 16.4 min ( 841.1 - 824.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.74'	2,193 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.74	0	0	0
109.75	350	2	2
110.00	375	91	92
111.00	667	521	613
112.00	1,440	1,054	1,667
112.33	1,750	526	2,193

Device	Routing	Invert	Outlet Devices
#1	Device 7	110.00'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#2	Device 7	110.17'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#3	Device 7	110.33'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#4	Device 7	110.50'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#5	Device 7	110.67'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#6	Device 7	111.00'	<b>8.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.900
#7	Primary	107.00'	<b>12.0" x 126.0' long Culvert</b> CPP, mitered to conform to fill, Ke= 0.700 Outlet Invert= 105.61' S= 0.0110 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#8	Secondary	112.33'	<b>8.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

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**Primary OutFlow** Max=2.62 cfs @ 12.17 hrs HW=111.73' (Free Discharge)

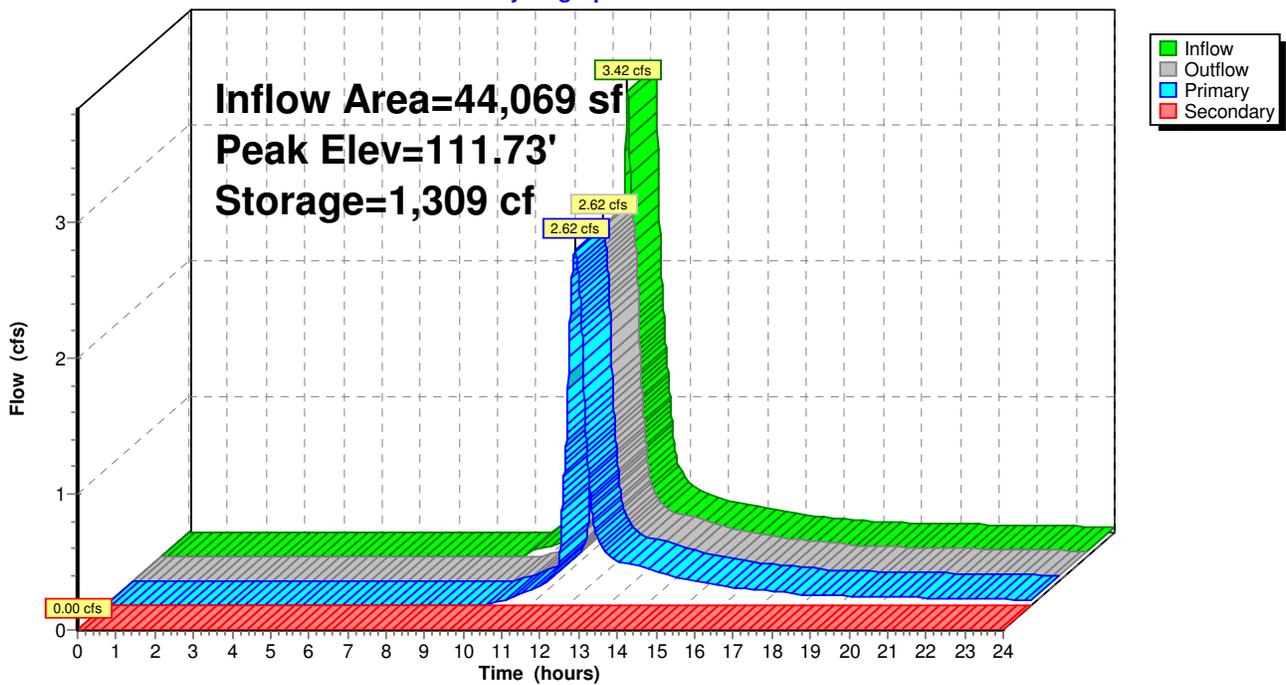
- 7=Culvert (Passes 2.62 cfs of 6.86 cfs potential flow)
- 1=Orifice/Grate (Orifice Controls 0.10 cfs @ 6.30 fps)
- 2=Orifice/Grate (Orifice Controls 0.10 cfs @ 5.98 fps)
- 3=Orifice/Grate (Orifice Controls 0.09 cfs @ 5.66 fps)
- 4=Orifice/Grate (Orifice Controls 0.09 cfs @ 5.30 fps)
- 5=Orifice/Grate (Orifice Controls 0.08 cfs @ 4.91 fps)
- 6=Orifice/Grate (Orifice Controls 2.16 cfs @ 6.18 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=109.74' (Free Discharge)

- 8=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

## Pond 8P: Main Cell - Bio Retention

Hydrograph



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## Pond 9P: CB 65

Inflow Area = 26,681 sf, Inflow Depth > 3.01" for 25-Year event  
Inflow = 2.36 cfs @ 12.03 hrs, Volume= 6,687 cf  
Outflow = 2.36 cfs @ 12.03 hrs, Volume= 6,687 cf, Atten= 0%, Lag= 0.0 min  
Primary = 2.36 cfs @ 12.03 hrs, Volume= 6,687 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 108.39' @ 12.03 hrs

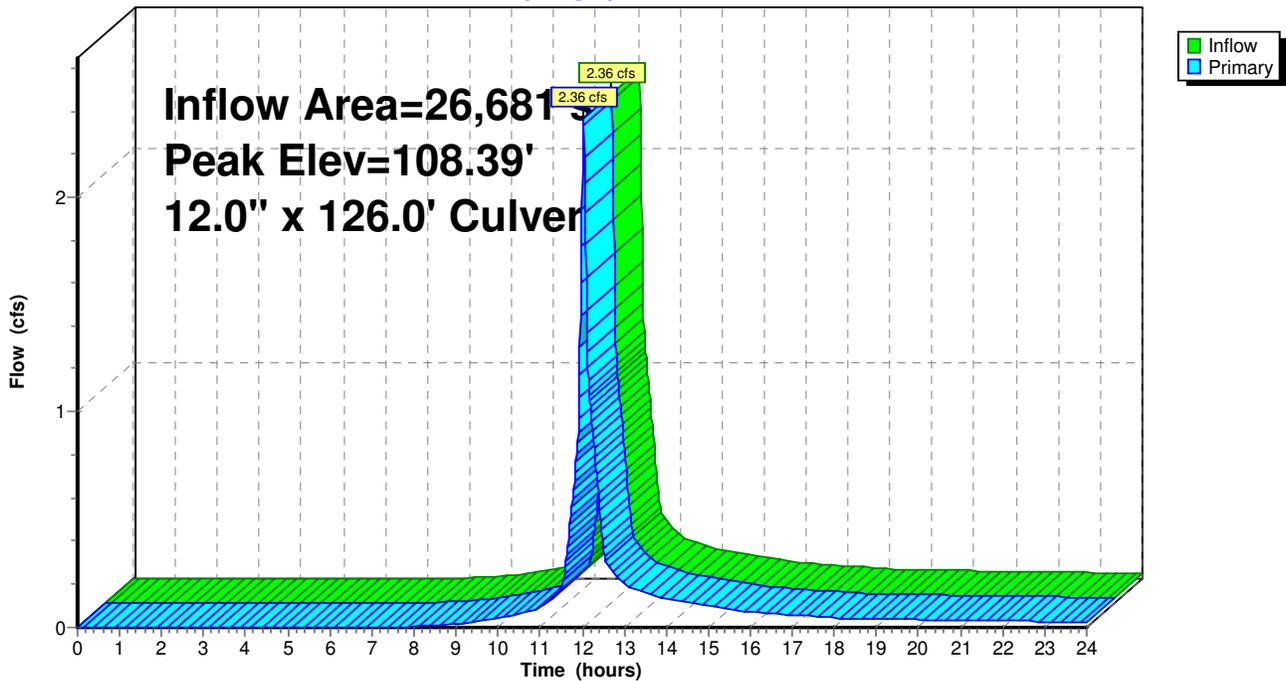
Flood Elev= 112.00'

Device #	Routing	Invert	Outlet Devices
#1	Primary	107.50'	<b>12.0" x 126.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 105.61' S= 0.0150 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=2.36 cfs @ 12.03 hrs HW=108.39' (Free Discharge)  
↑**1=Culvert** (Inlet Controls 2.36 cfs @ 3.21 fps)

## Pond 9P: CB 65

Hydrograph



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## Pond 43R: CB 60 to DMH 64

[57] Hint: Peaked at 111.44' (Flood elevation advised)

Inflow Area = 4,640 sf, Inflow Depth > 4.06" for 25-Year event  
Inflow = 0.57 cfs @ 12.03 hrs, Volume= 1,569 cf  
Outflow = 0.57 cfs @ 12.03 hrs, Volume= 1,569 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.57 cfs @ 12.03 hrs, Volume= 1,569 cf

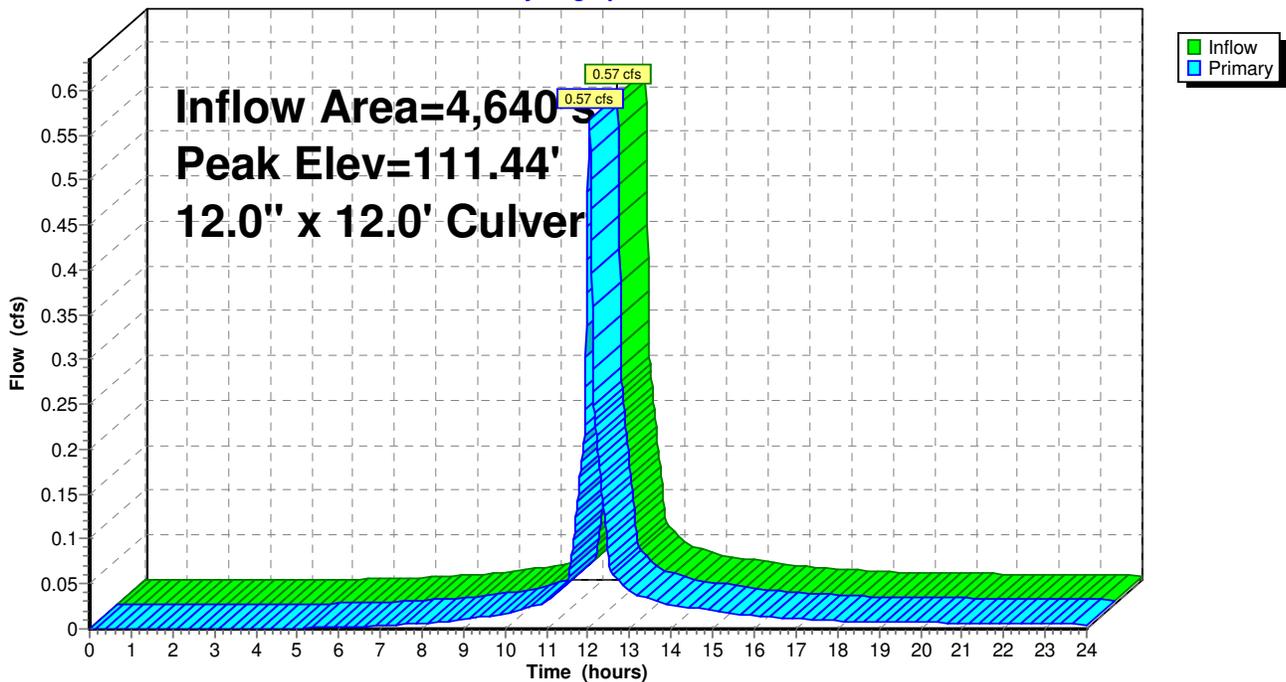
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 111.44' @ 12.03 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.02'	<b>12.0" x 12.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.57 cfs @ 12.03 hrs HW=111.44' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.57 cfs @ 2.64 fps)

## Pond 43R: CB 60 to DMH 64

Hydrograph



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## Pond 61R: CB 62 to DMH 64

[57] Hint: Peaked at 112.35' (Flood elevation advised)

Inflow Area = 39,429 sf, Inflow Depth > 2.96" for 25-Year event  
Inflow = 3.05 cfs @ 12.10 hrs, Volume= 9,740 cf  
Outflow = 3.05 cfs @ 12.10 hrs, Volume= 9,740 cf, Atten= 0%, Lag= 0.0 min  
Primary = 3.05 cfs @ 12.10 hrs, Volume= 9,740 cf

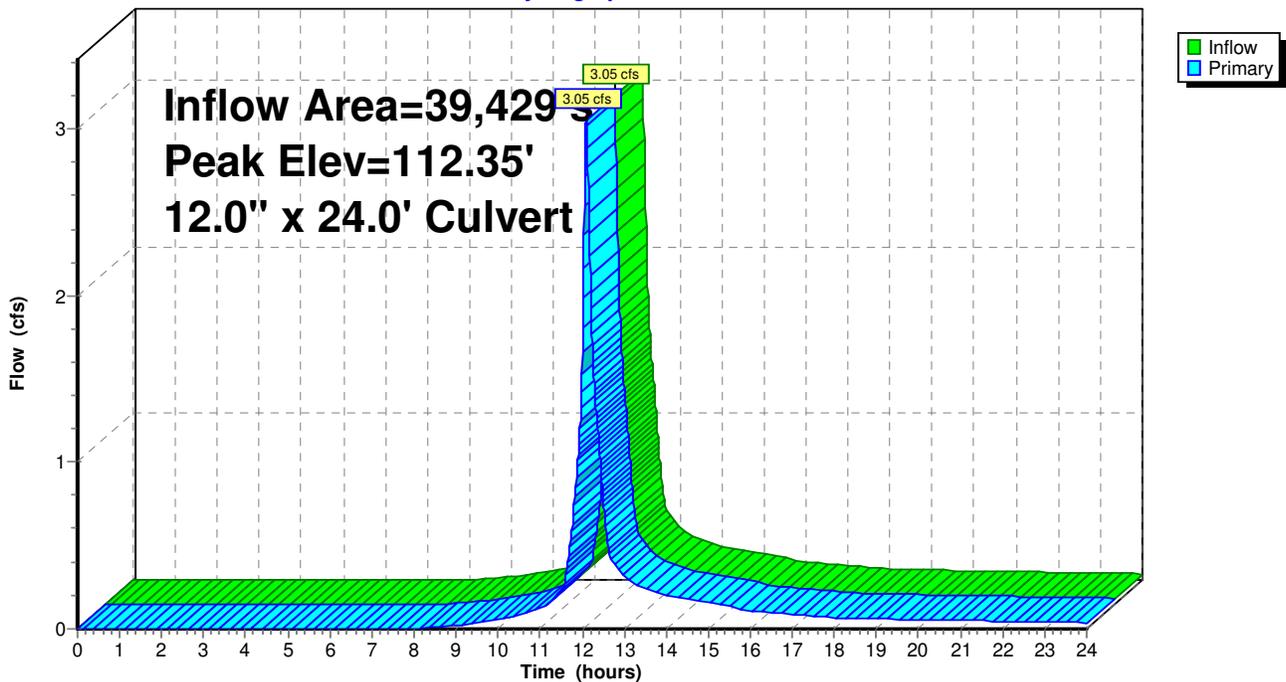
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 112.35' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	111.14'	<b>12.0" x 24.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=3.05 cfs @ 12.10 hrs HW=112.35' (Free Discharge)  
↑1=Culvert (Barrel Controls 3.05 cfs @ 4.08 fps)

## Pond 61R: CB 62 to DMH 64

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Inflow Area = 6,950 sf, Inflow Depth > 3.45" for 25-Year event  
 Inflow = 0.76 cfs @ 12.02 hrs, Volume= 1,996 cf  
 Outflow = 0.76 cfs @ 12.02 hrs, Volume= 1,890 cf, Atten= 1%, Lag= 0.3 min  
 Primary = 0.76 cfs @ 12.02 hrs, Volume= 1,890 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.94' @ 12.02 hrs Surf.Area= 231 sf Storage= 127 cf

Plug-Flow detention time= 43.5 min calculated for 1,890 cf (95% of inflow)  
 Center-of-Mass det. time= 14.5 min ( 820.8 - 806.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.35'	359 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.35	0	0	0
108.36	200	1	1
109.85	280	358	359

Device	Routing	Invert	Outlet Devices
#1	Primary	108.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.75 cfs @ 12.02 hrs HW=108.94' (Free Discharge)  
 ↑1=**Orifice/Grate** (Weir Controls 0.75 cfs @ 1.00 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=108.35' (Free Discharge)  
 ↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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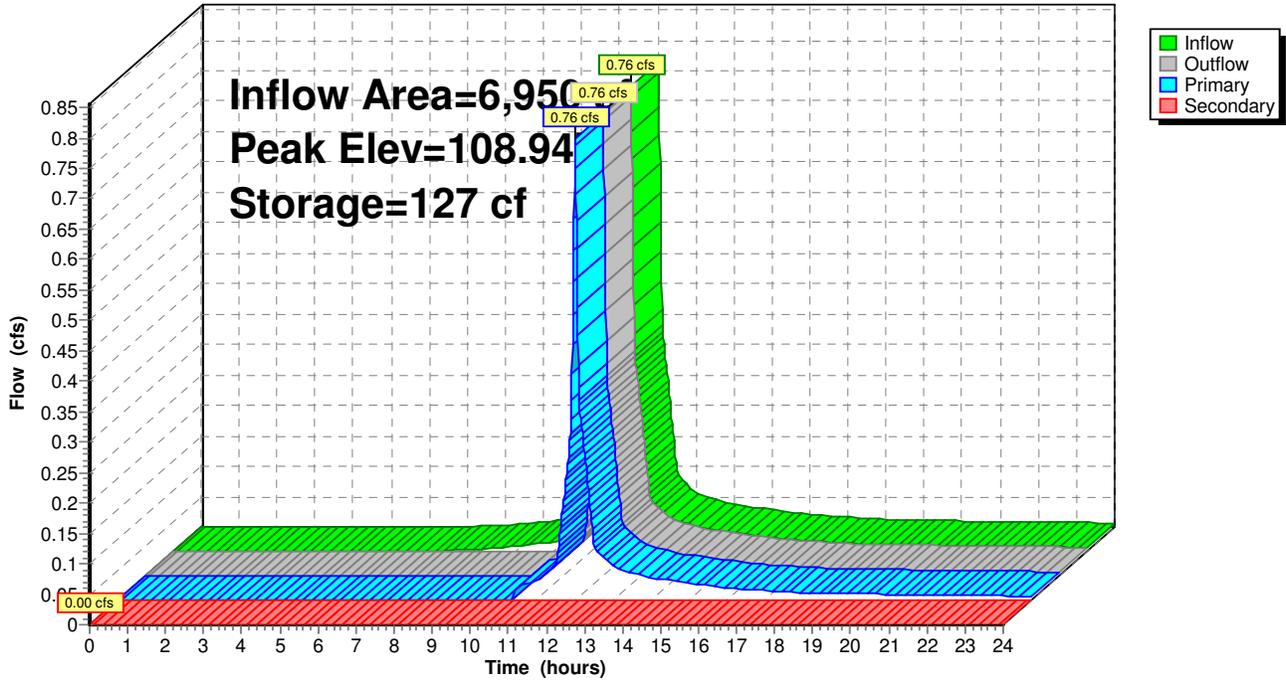
Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 67P: CB 66 (emergency vertical release)**

[61] Hint: Submerged 22% of Reach 68R bottom

Inflow Area = 44,069 sf, Inflow Depth > 2.99" for 25-Year event  
 Inflow = 2.62 cfs @ 12.18 hrs, Volume= 10,964 cf  
 Outflow = 2.62 cfs @ 12.18 hrs, Volume= 10,964 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 2.62 cfs @ 12.18 hrs, Volume= 10,964 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.55' @ 12.18 hrs  
 Flood Elev= 112.00'

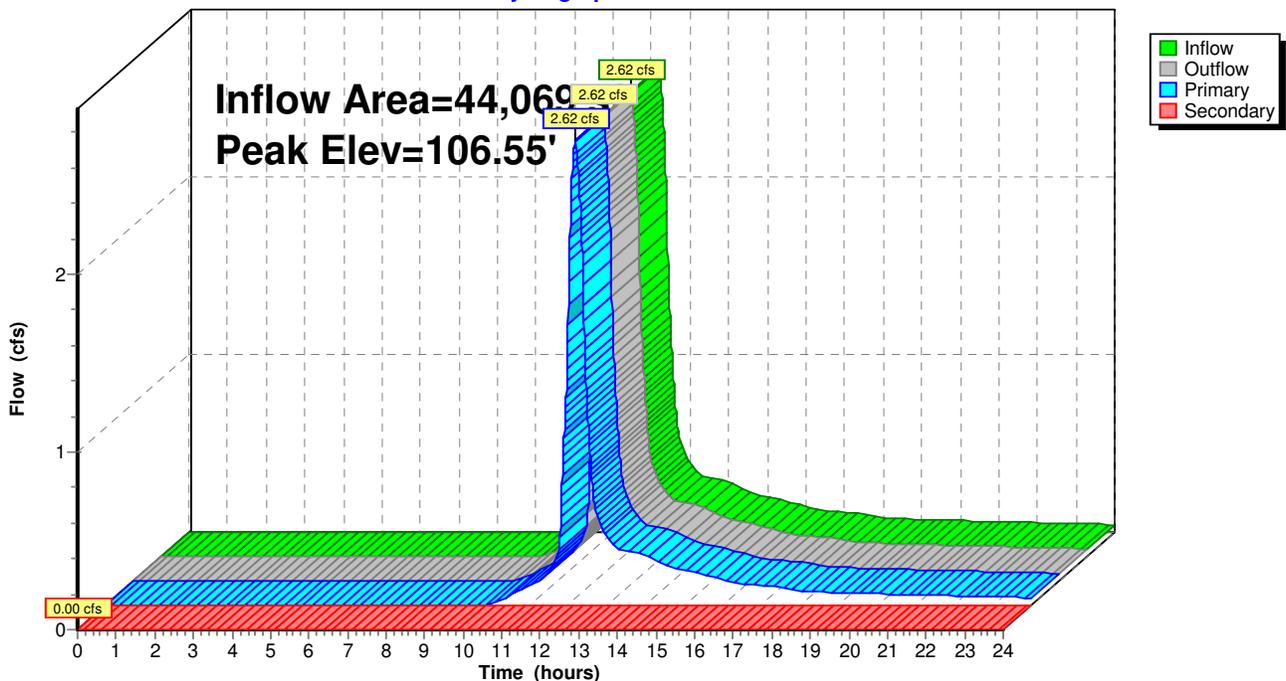
Device	Routing	Invert	Outlet Devices
#1	Primary	106.00'	<b>2.00' W x 2.00' H x 52.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 102.36' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	112.00'	<b>2.00' W x 2.00' H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=2.62 cfs @ 12.18 hrs HW=106.55' (Free Discharge)  
 ↳1=Culvert (Inlet Controls 2.62 cfs @ 2.38 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.00' (Free Discharge)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)

**Pond 67P: CB 66 (emergency vertical release)**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 70P: RG 10A - CB 216 at Units 13**

[63] Warning: Exceeded Reach 67R inflow depth by 0.85' @ 23.99 hrs

Inflow Area = 11,090 sf, Inflow Depth > 3.41" for 25-Year event  
 Inflow = 1.22 cfs @ 12.02 hrs, Volume= 3,147 cf  
 Outflow = 1.21 cfs @ 12.03 hrs, Volume= 3,028 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 1.21 cfs @ 12.03 hrs, Volume= 3,028 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.98' @ 12.03 hrs Surf.Area= 301 sf Storage= 156 cf

Plug-Flow detention time= 31.4 min calculated for 3,026 cf (96% of inflow)  
 Center-of-Mass det. time= 10.0 min ( 823.0 - 813.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	106.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.35	0	0	0
106.36	200	1	1
106.85	280	118	119
107.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	106.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	107.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

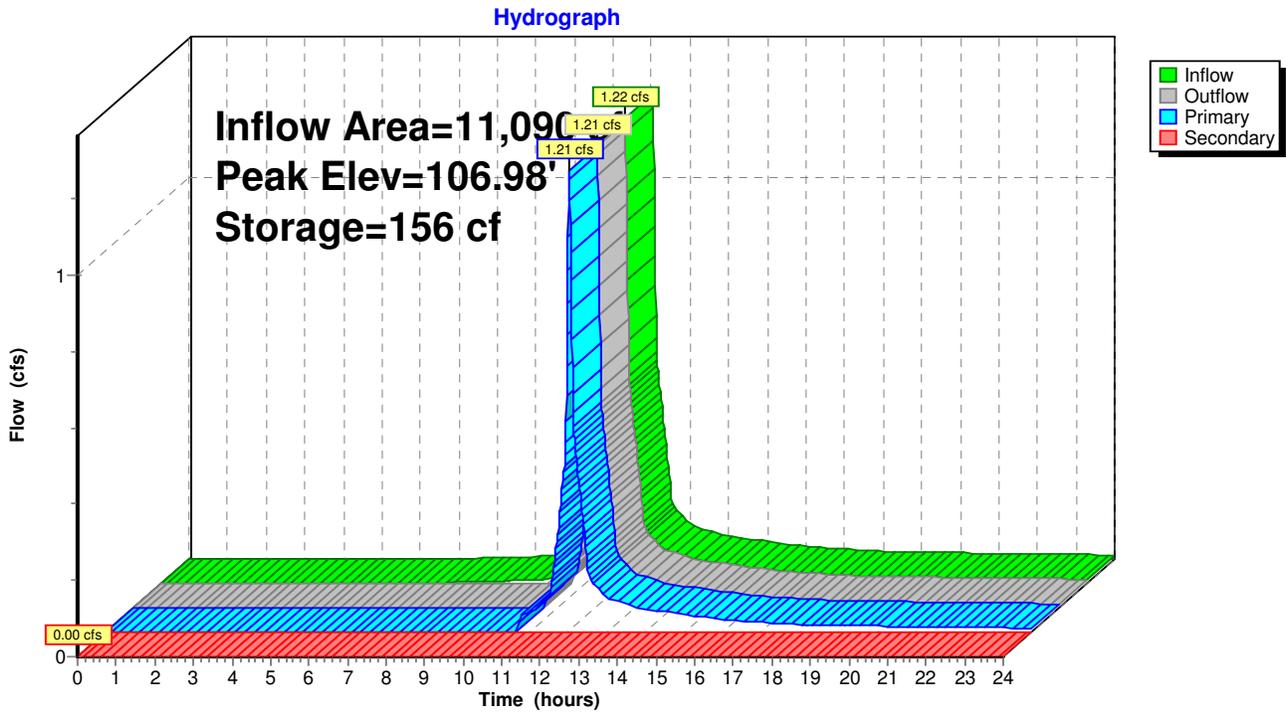
**Primary OutFlow** Max=1.21 cfs @ 12.03 hrs HW=106.98' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.21 cfs @ 1.17 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 70P: RG 10A - CB 216 at Units 13



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## Pond 111P: CB 20

Inflow Area = 7,780 sf, Inflow Depth > 3.95" for 25-Year event  
Inflow = 0.98 cfs @ 12.01 hrs, Volume= 2,564 cf  
Outflow = 0.98 cfs @ 12.01 hrs, Volume= 2,564 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.98 cfs @ 12.01 hrs, Volume= 2,564 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 104.31' @ 12.01 hrs

Flood Elev= 107.82'

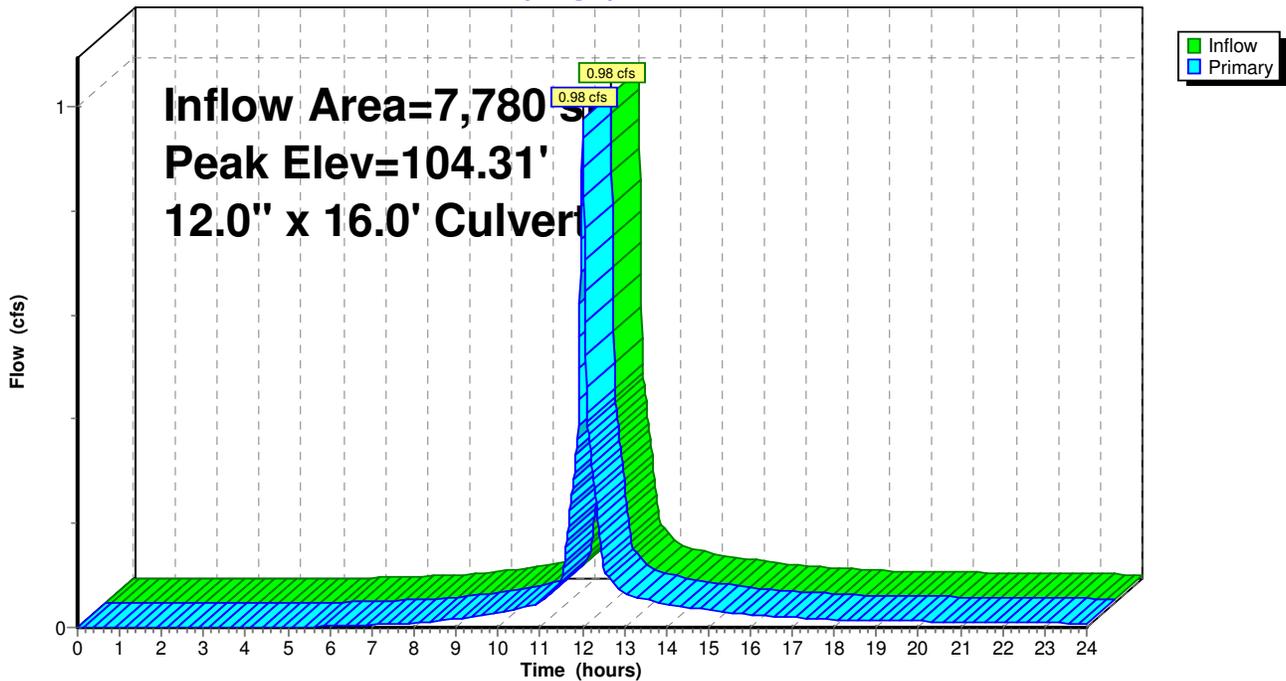
Device	Routing	Invert	Outlet Devices
#1	Primary	103.74'	<b>12.0" x 16.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.97 cfs @ 12.01 hrs HW=104.31' (Free Discharge)

↑1=Culvert (Barrel Controls 0.97 cfs @ 3.06 fps)

## Pond 111P: CB 20

### Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 112P: CB 22**

Inflow Area = 2,898 sf, Inflow Depth > 3.45" for 25-Year event  
 Inflow = 0.32 cfs @ 12.01 hrs, Volume= 832 cf  
 Outflow = 0.32 cfs @ 12.01 hrs, Volume= 832 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.32 cfs @ 12.01 hrs, Volume= 832 cf

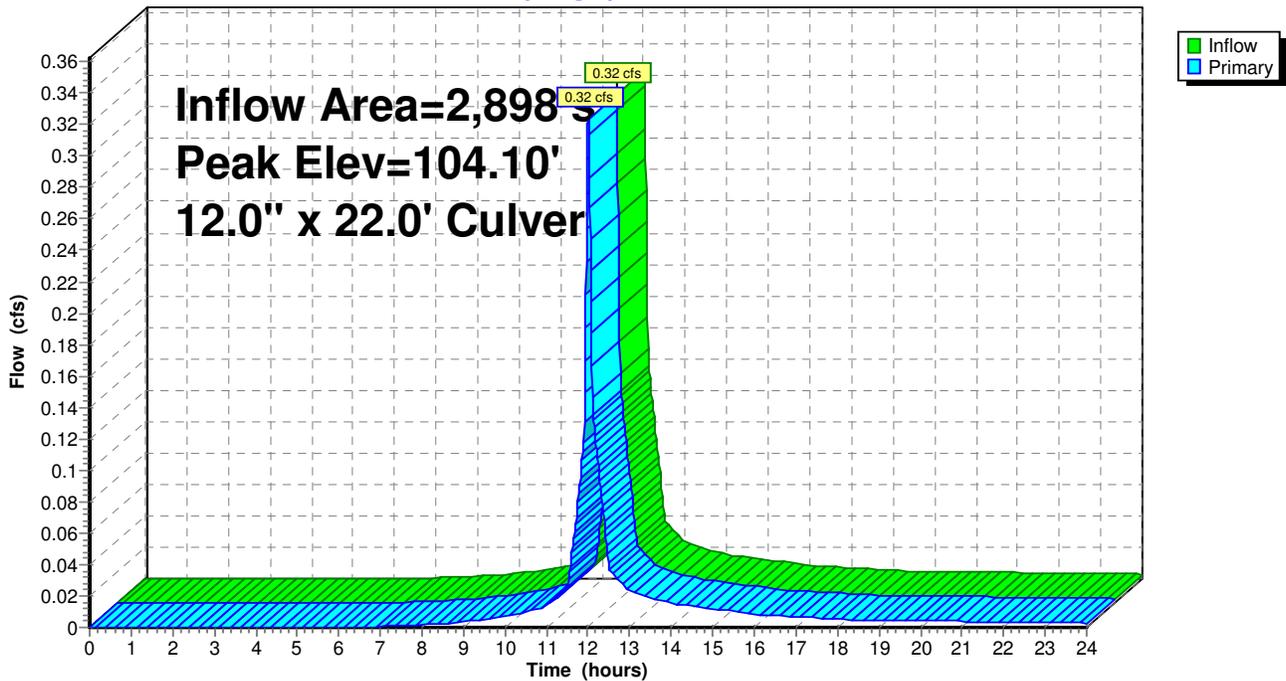
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 104.10' @ 12.01 hrs  
 Flood Elev= 107.82'

Device #	Routing	Invert	Outlet Devices
#1	Primary	103.80'	<b>12.0" x 22.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.32 cfs @ 12.01 hrs HW=104.10' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 0.32 cfs @ 2.47 fps)

**Pond 112P: CB 22**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

[85] Warning: Oscillations may require Finer Routing>1

[61] Hint: Submerged 13% of Reach 127R bottom

Inflow Area = 24,126 sf, Inflow Depth > 3.37" for 25-Year event  
 Inflow = 2.49 cfs @ 12.02 hrs, Volume= 6,784 cf  
 Outflow = 2.49 cfs @ 12.03 hrs, Volume= 6,784 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 2.49 cfs @ 12.03 hrs, Volume= 6,784 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 110.84' @ 12.03 hrs Surf.Area= 99 sf Storage= 52 cf

Plug-Flow detention time= 0.1 min calculated for 6,784 cf (100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 814.1 - 814.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.24'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.24	0	0	0
110.25	75	0	0
110.74	96	42	42
111.74	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	110.74'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Primary	109.86'	<b>8.0" x 65.0' long Culvert</b> Ke= 0.200 Outlet Invert= 105.96' S= 0.0600 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	111.74'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.48 cfs @ 12.03 hrs HW=110.84' (Free Discharge)

↑ **1=Orifice/Grate** (Weir Controls 0.79 cfs @ 1.02 fps)

└ **2=Culvert** (Inlet Controls 1.69 cfs @ 4.83 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=110.24' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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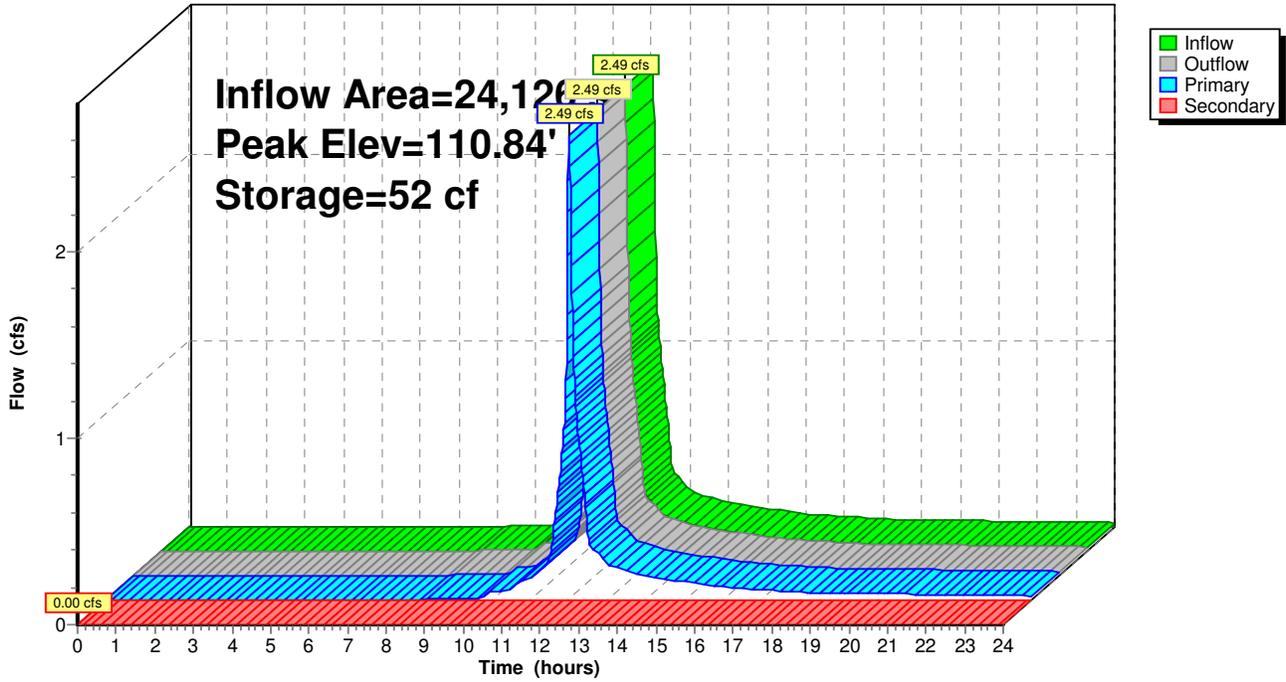
Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4**

Inflow Area = 18,760 sf, Inflow Depth > 3.74" for 25-Year event  
 Inflow = 2.02 cfs @ 12.01 hrs, Volume= 5,853 cf  
 Outflow = 2.01 cfs @ 12.01 hrs, Volume= 5,810 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 2.01 cfs @ 12.01 hrs, Volume= 5,810 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 112.36' @ 12.01 hrs Surf.Area= 101 sf Storage= 60 cf

Plug-Flow detention time= 7.3 min calculated for 5,808 cf (99% of inflow)  
 Center-of-Mass det. time= 2.8 min ( 802.8 - 800.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	111.68'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.68	0	0	0
111.69	75	0	0
112.18	96	42	42
113.18	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	112.18'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.18'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.00 cfs @ 12.01 hrs HW=112.36' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 2.00 cfs @ 1.39 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=111.68' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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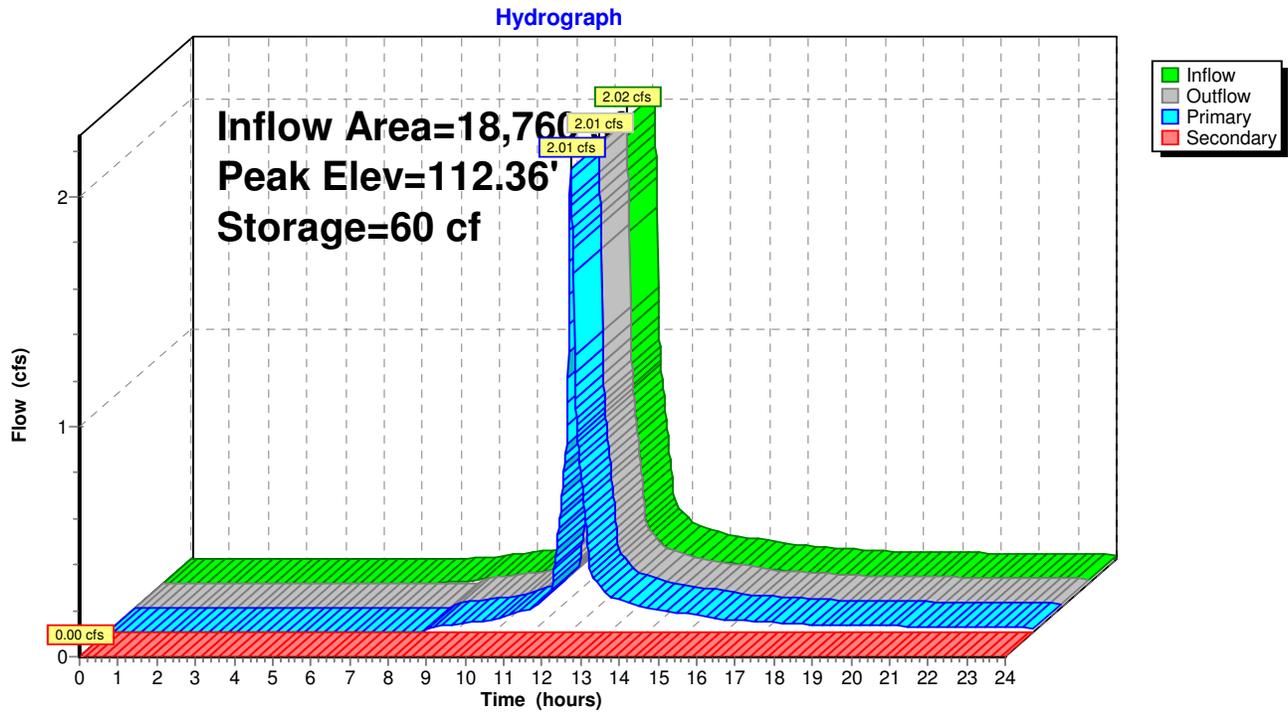
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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4**



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 128P: RG 2A - CB 122 RG Unit 3**

[61] Hint: Submerged 17% of Reach 130R bottom

Inflow Area = 20,516 sf, Inflow Depth > 3.30" for 25-Year event  
 Inflow = 2.09 cfs @ 12.02 hrs, Volume= 5,637 cf  
 Outflow = 2.09 cfs @ 12.02 hrs, Volume= 5,595 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 2.09 cfs @ 12.02 hrs, Volume= 5,595 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 113.36' @ 12.02 hrs Surf.Area= 107 sf Storage= 61 cf

Plug-Flow detention time= 6.7 min calculated for 5,595 cf (99% of inflow)  
 Center-of-Mass det. time= 2.1 min ( 818.8 - 816.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	112.67'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
112.67	0	0	0
112.68	75	0	0
113.17	96	42	42
113.67	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	113.17'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.67'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.08 cfs @ 12.02 hrs HW=113.35' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 2.08 cfs @ 1.41 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=112.67' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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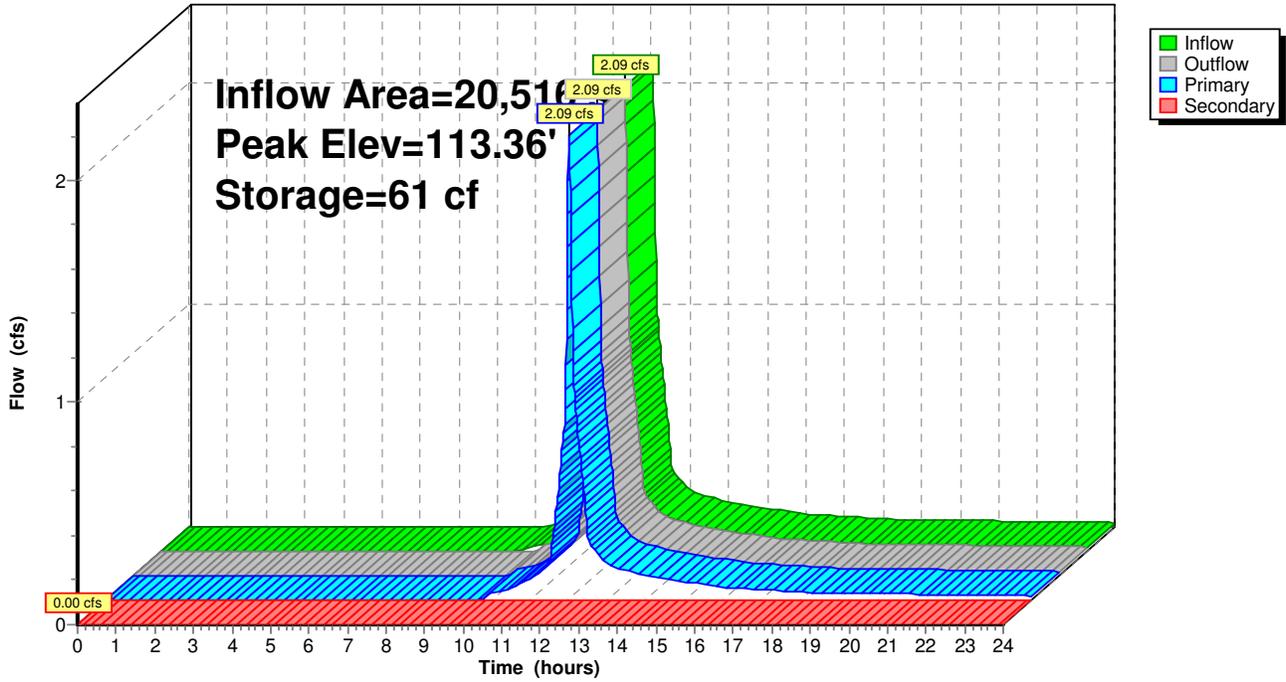
Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 128P: RG 2A - CB 122 RG Unit 3**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20**

[93] Warning: Storage range exceeded by 0.47'

[85] Warning: Oscillations may require Finer Routing>1

[61] Hint: Submerged 40% of Reach 129R bottom

Inflow Area = 14,450 sf, Inflow Depth > 3.56" for 25-Year event  
 Inflow = 1.67 cfs @ 12.01 hrs, Volume= 4,283 cf  
 Outflow = 1.66 cfs @ 12.01 hrs, Volume= 4,186 cf, Atten= 1%, Lag= 0.1 min  
 Secondary = 1.66 cfs @ 12.01 hrs, Volume= 4,186 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.22' @ 12.01 hrs Surf.Area= 126 sf Storage= 98 cf

Plug-Flow detention time= 20.7 min calculated for 4,184 cf (98% of inflow)  
 Center-of-Mass det. time= 7.3 min ( 813.7 - 806.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	113.75'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

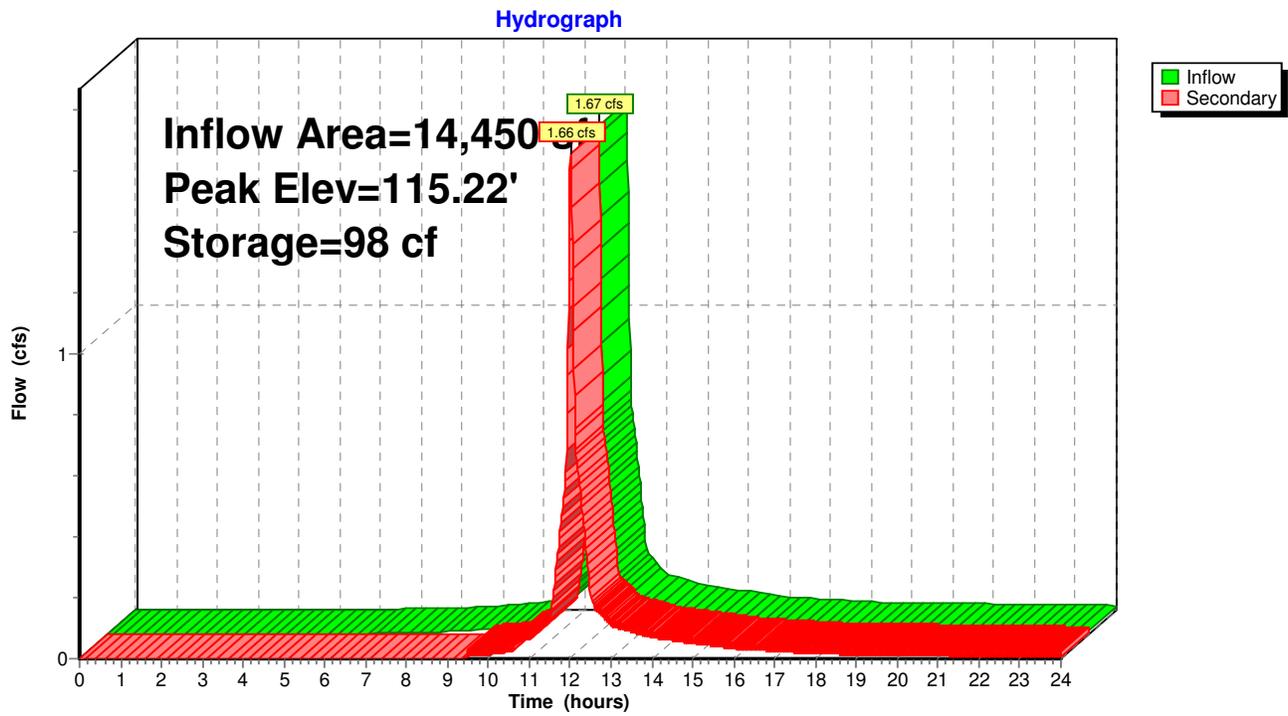
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
113.75	0	0	0
113.76	75	0	0
114.25	96	42	42
114.75	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Secondary	114.75'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Secondary OutFlow** Max=1.65 cfs @ 12.01 hrs HW=115.22' (Free Discharge)

↑=Broad-Crested Rectangular Weir (Weir Controls 1.65 cfs @ 1.76 fps)

Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 133P: Large RG 4C at Unit 20**

Inflow Area = 6,950 sf, Inflow Depth > 3.45" for 25-Year event  
 Inflow = 0.78 cfs @ 12.01 hrs, Volume= 1,996 cf  
 Outflow = 0.77 cfs @ 12.01 hrs, Volume= 1,877 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 0.77 cfs @ 12.01 hrs, Volume= 1,877 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.94' @ 12.01 hrs Surf.Area= 295 sf Storage= 146 cf

Plug-Flow detention time= 48.1 min calculated for 1,876 cf (94% of inflow)  
 Center-of-Mass det. time= 16.0 min ( 821.8 - 805.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	116.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.35	0	0	0
116.36	200	1	1
116.85	280	118	119
117.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	116.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	117.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.76 cfs @ 12.01 hrs HW=116.94' (Free Discharge)

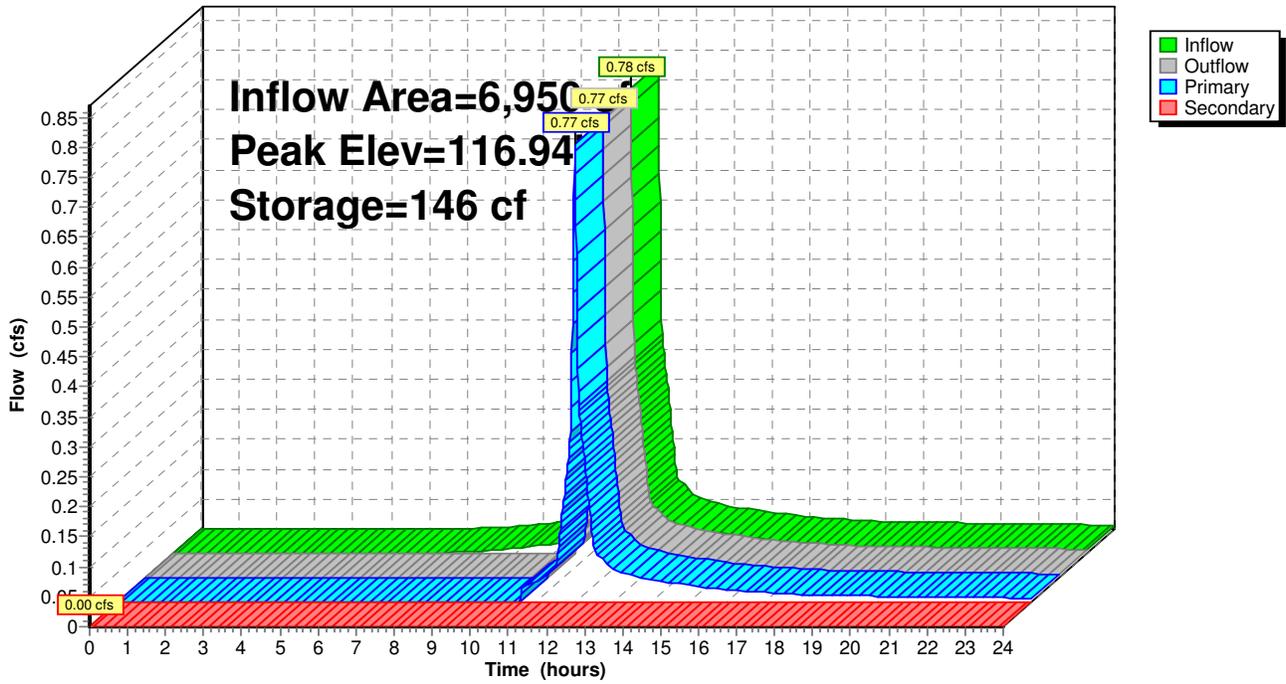
↑1=**Orifice/Grate** (Weir Controls 0.76 cfs @ 1.01 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=116.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 133P: Large RG 4C at Unit 20

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Pond 144R: HW 30 to DMH 14

[57] Hint: Peaked at 113.98' (Flood elevation advised)

Inflow Area = 34,910 sf, Inflow Depth > 2.89" for 25-Year event  
Inflow = 2.63 cfs @ 12.06 hrs, Volume= 8,401 cf  
Outflow = 2.63 cfs @ 12.06 hrs, Volume= 8,401 cf, Atten= 0%, Lag= 0.0 min  
Primary = 2.63 cfs @ 12.06 hrs, Volume= 8,401 cf

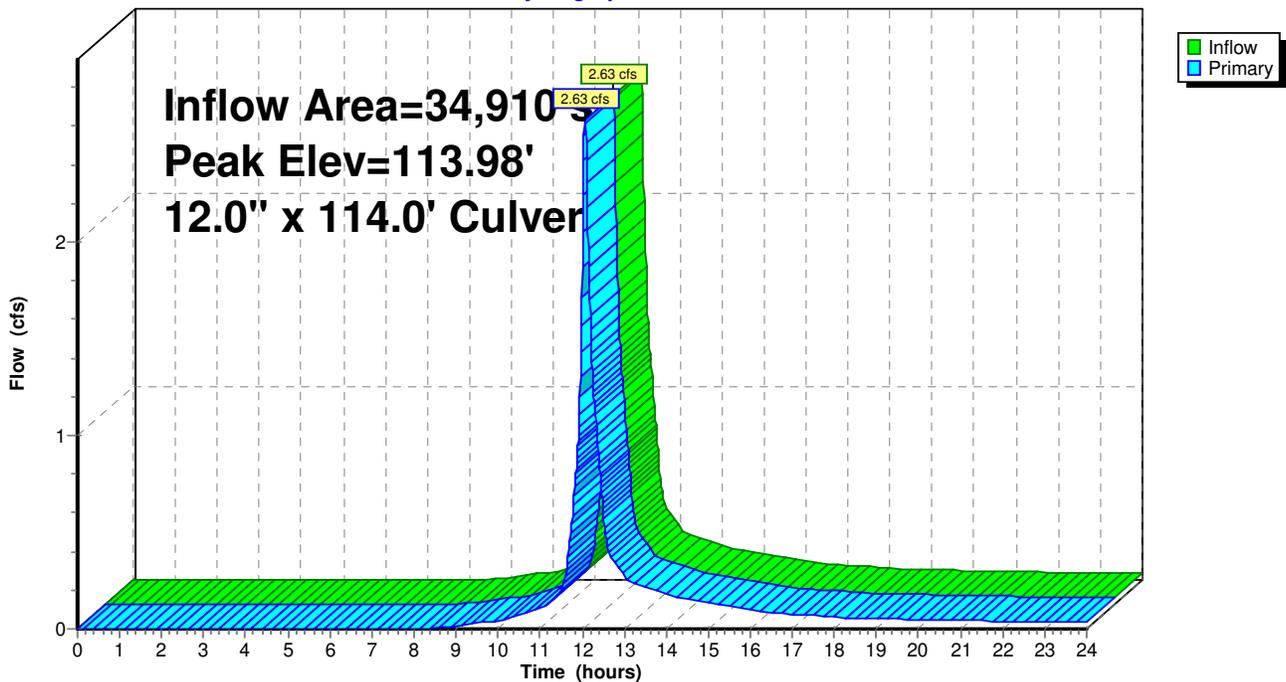
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 113.98' @ 12.06 hrs

Device #	Routing	Invert	Outlet Devices
1	Primary	113.00'	<b>12.0" x 114.0' long Culvert</b> Ke= 0.500 Outlet Invert= 103.88' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=2.62 cfs @ 12.06 hrs HW=113.98' (Free Discharge)  
↑1=Culvert (Inlet Controls 2.62 cfs @ 3.36 fps)

## Pond 144R: HW 30 to DMH 14

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Inflow Area = 21,810 sf, Inflow Depth > 3.78" for 25-Year event  
 Inflow = 1.61 cfs @ 12.00 hrs, Volume= 6,868 cf  
 Outflow = 1.61 cfs @ 12.01 hrs, Volume= 6,825 cf, Atten= 0%, Lag= 0.2 min  
 Primary = 1.61 cfs @ 12.01 hrs, Volume= 6,825 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.16' @ 12.01 hrs Surf.Area= 101 sf Storage= 58 cf

Plug-Flow detention time= 6.3 min calculated for 6,822 cf (99% of inflow)  
 Center-of-Mass det. time= 2.4 min ( 803.1 - 800.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	107.50'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.50	0	0	0
107.51	75	0	0
108.00	96	42	42
109.00	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	108.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.00'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.60 cfs @ 12.01 hrs HW=108.16' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.60 cfs @ 1.29 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=107.50' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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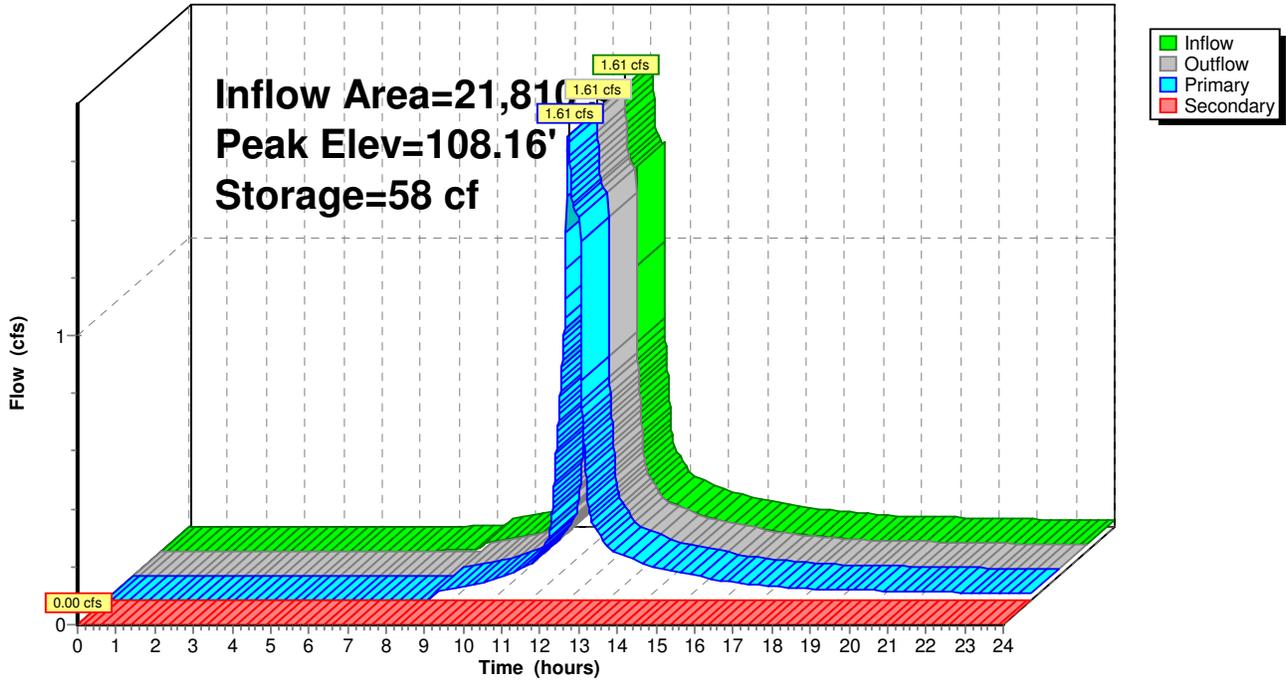
Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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**Pond 157P: RG 7A - CB 126 Under Drive Unit 5**

[61] Hint: Submerged 45% of Reach 154R bottom

Inflow Area = 12,570 sf, Inflow Depth > 3.73" for 25-Year event  
 Inflow = 1.32 cfs @ 12.03 hrs, Volume= 3,910 cf  
 Outflow = 1.32 cfs @ 12.03 hrs, Volume= 3,867 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.32 cfs @ 12.03 hrs, Volume= 3,867 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.59' @ 12.03 hrs Surf.Area= 104 sf Storage= 56 cf

Plug-Flow detention time= 11.0 min calculated for 3,866 cf (99% of inflow)  
 Center-of-Mass det. time= 4.3 min ( 802.9 - 798.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	115.95'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.95	0	0	0
115.96	75	0	0
116.45	96	42	42
116.95	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	116.45'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	116.95'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

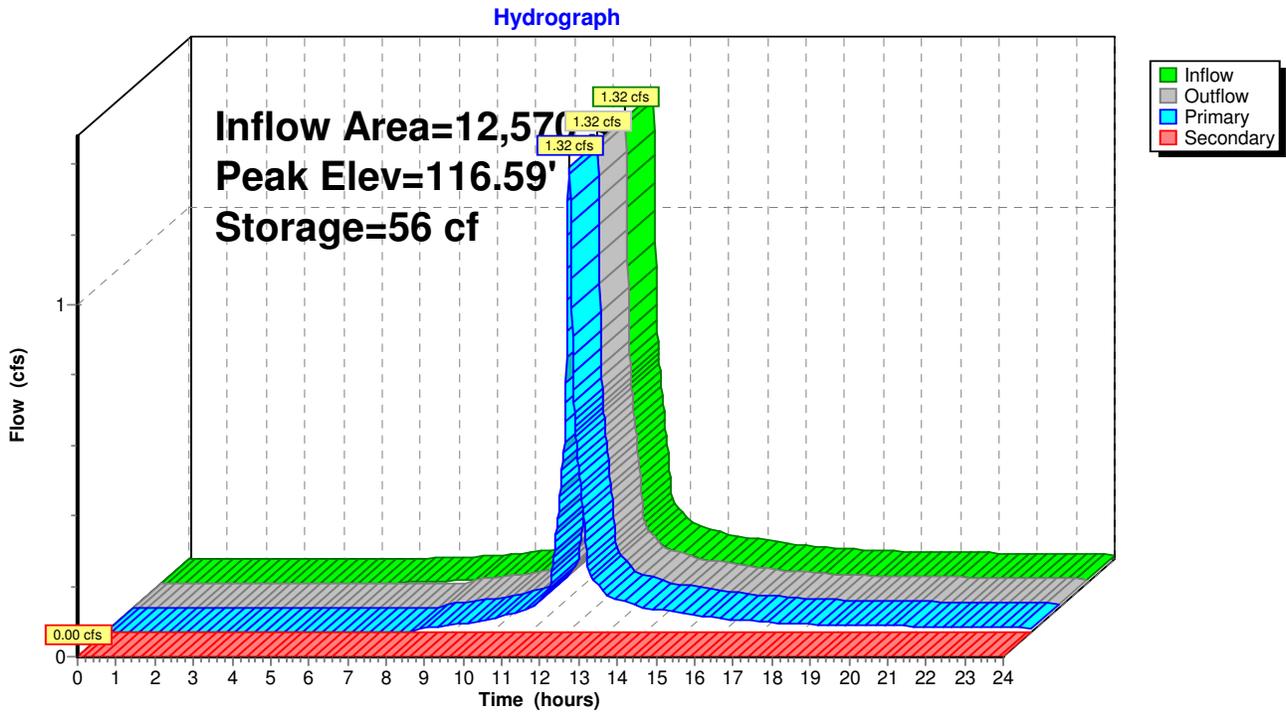
**Primary OutFlow** Max=1.32 cfs @ 12.03 hrs HW=116.59' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.32 cfs @ 1.21 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=115.95' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 157P: RG 7A - CB 126 Under Drive Unit 5



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## Pond 158P: Culvert under Drive Unit 6

[57] Hint: Peaked at 117.63' (Flood elevation advised)

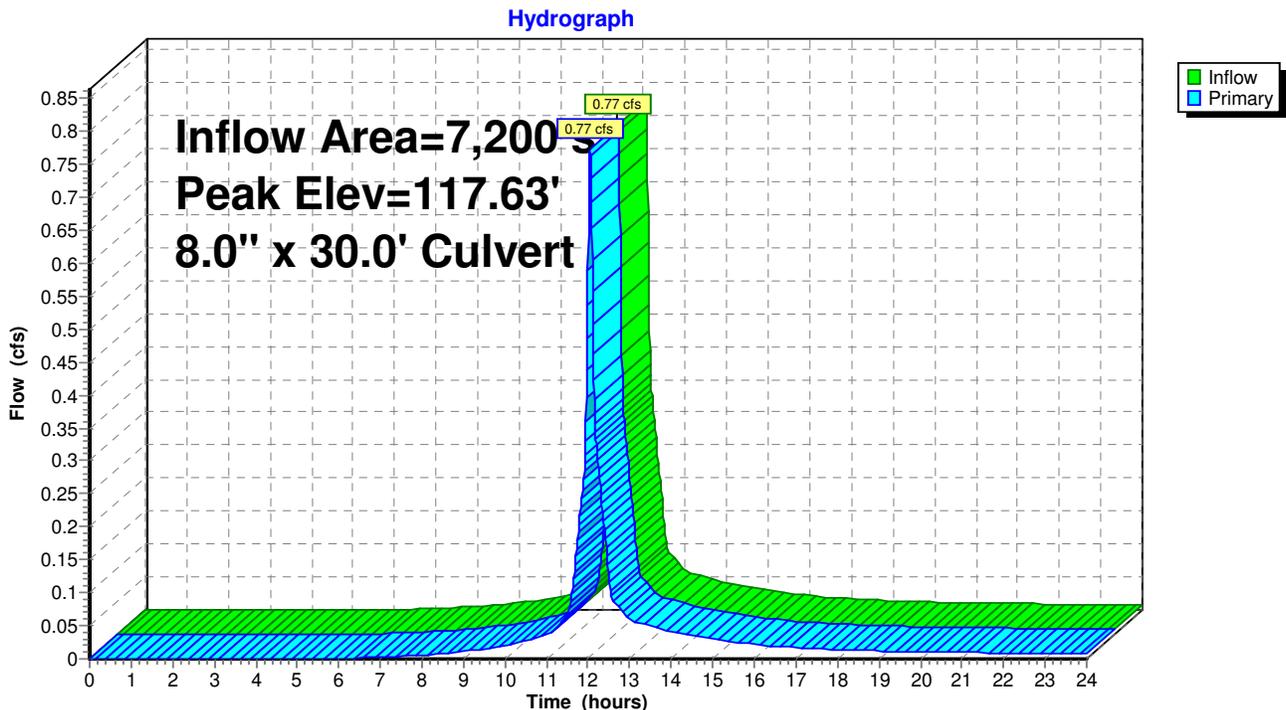
Inflow Area = 7,200 sf, Inflow Depth > 3.64" for 25-Year event  
Inflow = 0.77 cfs @ 12.05 hrs, Volume= 2,187 cf  
Outflow = 0.77 cfs @ 12.05 hrs, Volume= 2,187 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.77 cfs @ 12.05 hrs, Volume= 2,187 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 117.63' @ 12.05 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	117.05'	<b>8.0" x 30.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 116.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.77 cfs @ 12.05 hrs HW=117.63' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.77 cfs @ 3.18 fps)

## Pond 158P: Culvert under Drive Unit 6



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Type III 24-hr 25-Year Rainfall=5.30"

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## Pond 218R: DMH 50 to Irrigation Cistern

[57] Hint: Peaked at 104.24' (Flood elevation advised)

[63] Warning: Exceeded Reach 55R inflow depth by 1.12' @ 12.03 hrs

[63] Warning: Exceeded Reach 403R inflow depth by 1.59' @ 12.02 hrs

Inflow Area = 111,470 sf, Inflow Depth > 3.14" for 25-Year event  
Inflow = 8.54 cfs @ 12.03 hrs, Volume= 29,160 cf  
Outflow = 8.54 cfs @ 12.03 hrs, Volume= 29,160 cf, Atten= 0%, Lag= 0.0 min  
Primary = 8.54 cfs @ 12.03 hrs, Volume= 29,160 cf

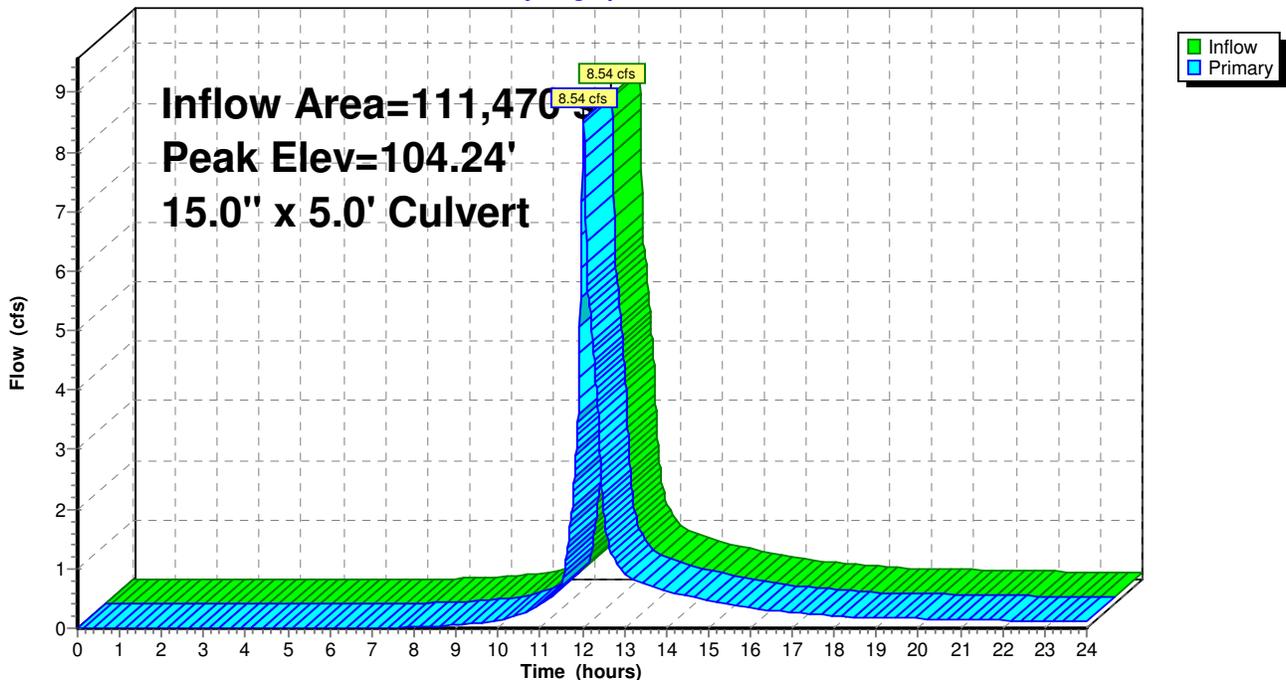
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.24' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	101.52'	<b>15.0" x 5.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 101.42' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

**Primary OutFlow** Max=8.53 cfs @ 12.03 hrs HW=104.23' (Free Discharge)  
↑1=Culvert (Inlet Controls 8.53 cfs @ 6.95 fps)

## Pond 218R: DMH 50 to Irrigation Cistern

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Pond 219P: Irrigation Cistern

[81] Warning: Exceeded Pond 218R by 1.61' @ 12.11 hrs

Inflow Area = 111,470 sf, Inflow Depth > 3.14" for 25-Year event  
Inflow = 8.54 cfs @ 12.03 hrs, Volume= 29,160 cf  
Outflow = 6.68 cfs @ 12.10 hrs, Volume= 29,129 cf, Atten= 22%, Lag= 4.1 min  
Primary = 6.68 cfs @ 12.10 hrs, Volume= 29,129 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.94' @ 12.10 hrs Surf.Area= 460 sf Storage= 1,619 cf

Plug-Flow detention time= 3.9 min calculated for 29,129 cf (100% of inflow)  
Center-of-Mass det. time= 3.3 min ( 827.6 - 824.3 )

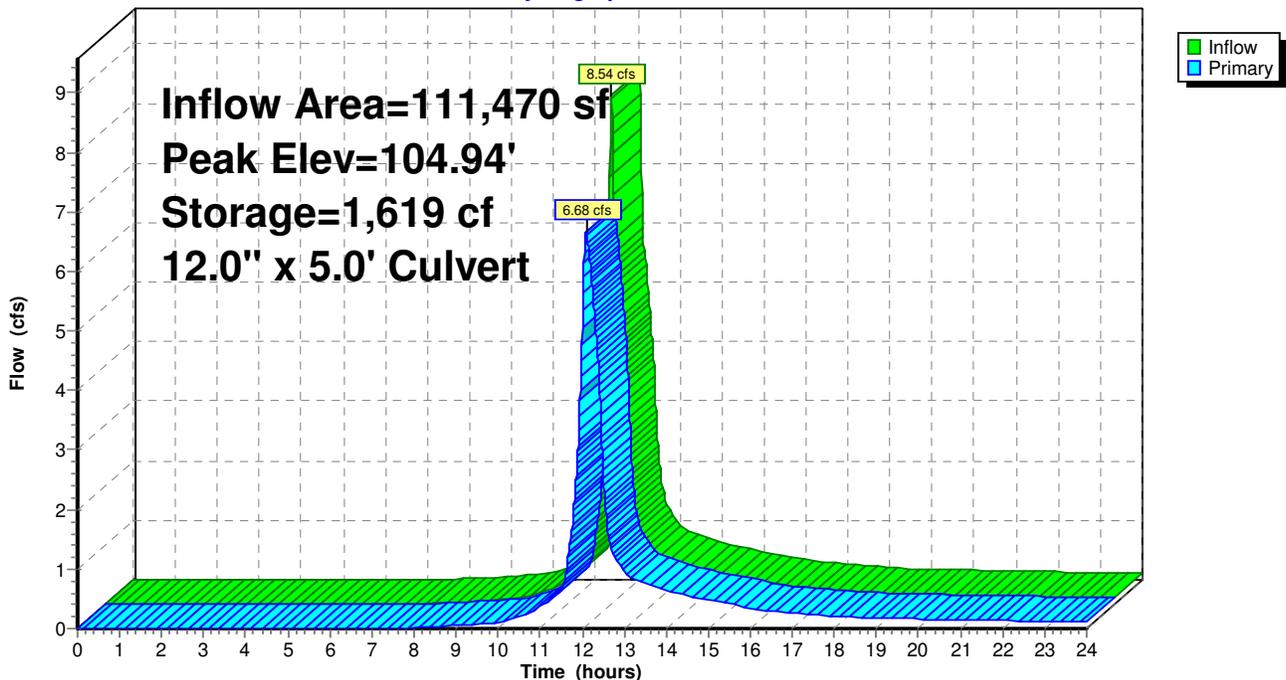
Volume	Invert	Avail.Storage	Storage Description
#1	101.42'	4,292 cf	11.50'W x 40.00'L x 9.33'H Prismatic

Device	Routing	Invert	Outlet Devices
#1	Primary	101.32'	12.0" x 5.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= 101.22' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

Primary OutFlow Max=6.68 cfs @ 12.10 hrs HW=104.94' (Free Discharge)  
←1=Culvert (Inlet Controls 6.68 cfs @ 8.50 fps)

## Pond 219P: Irrigation Cistern

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.30"

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## Link A: POA A

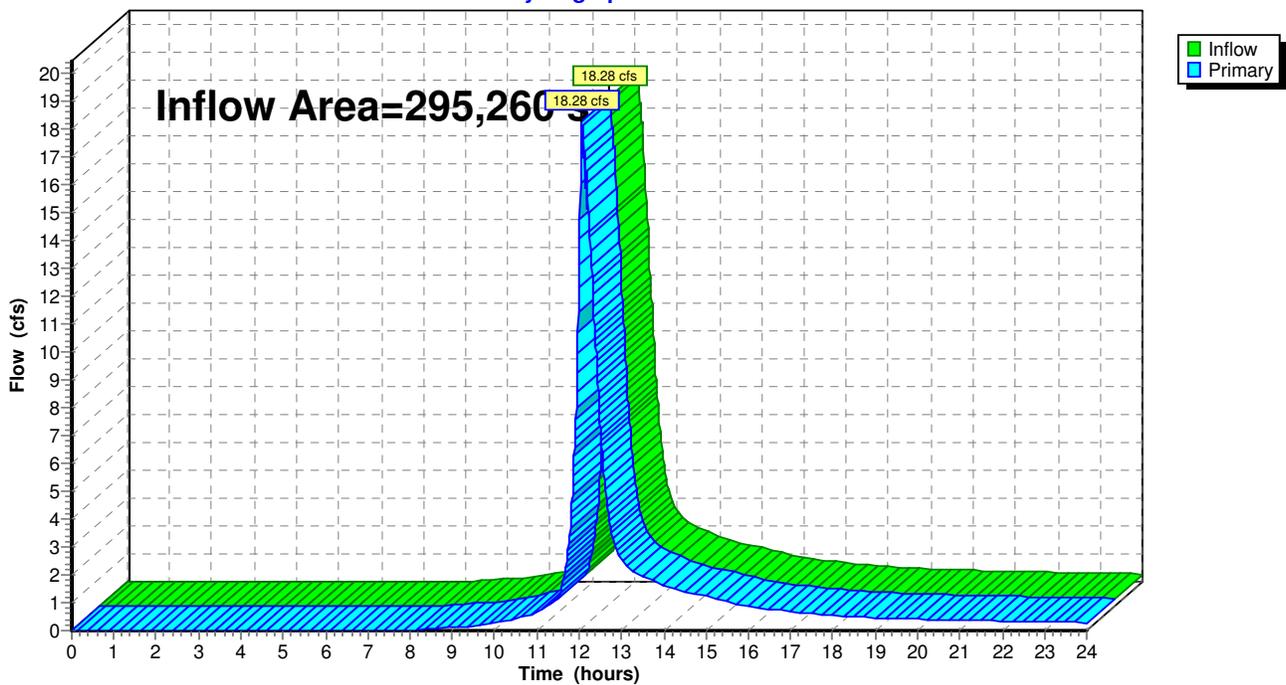
Inflow Area = 295,260 sf, Inflow Depth > 2.94" for 25-Year event  
Inflow = 18.28 cfs @ 12.07 hrs, Volume= 72,453 cf  
Primary = 18.28 cfs @ 12.07 hrs, Volume= 72,453 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 82.00'

## Link A: POA A

Hydrograph



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 54S: CB at Cul-de-Sac - Outside** Runoff Area=20,970 sf Runoff Depth>4.45"  
Flow Length=90' Tc=0.5 min CN=82 Runoff=3.01 cfs 7,775 cf

**Subcatchment 56S: CB at Cul-de-Sac - Inside** Runoff Area=8,660 sf Runoff Depth>4.78"  
Flow Length=100' Slope=0.0150 '/' Tc=0.7 min CN=85 Runoff=1.31 cfs 3,446 cf

**Subcatchment 60S:** Runoff Area=4,640 sf Runoff Depth>5.22"  
Flow Length=80' Tc=2.0 min CN=89 Runoff=0.72 cfs 2,018 cf

**Subcatchment 62S: Large Area including 2 Septics** Runoff Area=39,429 sf Runoff Depth>4.02"  
Flow Length=235' Tc=6.9 min CN=78 Runoff=4.13 cfs 13,205 cf

**Subcatchment 65S: Throat of Cul-de-sac u.g.** Runoff Area=11,590 sf Runoff Depth>4.13"  
Flow Length=170' Slope=0.0400 '/' Tc=0.7 min CN=79 Runoff=1.55 cfs 3,988 cf

**Subcatchment 68S: From hill near 19,20 to Lawn CB** Runoff Area=15,091 sf Runoff Depth>4.02"  
Flow Length=190' Tc=3.0 min CN=78 Runoff=1.82 cfs 5,058 cf

**Subcatchment 110S: To CB 20** Runoff Area=7,780 sf Runoff Depth>5.11"  
Flow Length=100' Slope=0.0200 '/' Tc=0.6 min CN=88 Runoff=1.24 cfs 3,312 cf

**Subcatchment 112S: To CB 22** Runoff Area=2,898 sf Runoff Depth>4.56"  
Flow Length=60' Tc=0.3 min CN=83 Runoff=0.42 cfs 1,101 cf

**Subcatchment 114S: Behind Units 1&2** Runoff Area=15,260 sf Runoff Depth>3.91"  
Flow Length=130' Tc=8.7 min CN=77 Runoff=1.46 cfs 4,976 cf

**Subcatchment 116S:** Runoff Area=3,050 sf Runoff Depth>5.33"  
Flow Length=70' Tc=0.3 min CN=90 Runoff=0.50 cfs 1,356 cf

**Subcatchment 118S:** Runoff Area=3,610 sf Runoff Depth>5.11"  
Flow Length=50' Tc=0.2 min CN=88 Runoff=0.58 cfs 1,537 cf

**Subcatchment 120S:** Runoff Area=6,190 sf Runoff Depth>5.00"  
Flow Length=90' Tc=0.5 min CN=87 Runoff=0.97 cfs 2,578 cf

**Subcatchment 122S:** Runoff Area=6,066 sf Runoff Depth>3.92"  
Flow Length=100' Tc=3.6 min CN=77 Runoff=0.70 cfs 1,980 cf

**Subcatchment 124S:** Runoff Area=7,500 sf Runoff Depth>5.00"  
Flow Length=80' Tc=0.5 min CN=87 Runoff=1.18 cfs 3,123 cf

**Subcatchment 126S:** Runoff Area=5,370 sf Runoff Depth>5.00"  
Flow Length=60' Tc=0.3 min CN=87 Runoff=0.85 cfs 2,236 cf

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<b>Subcatchment 128S:</b>	Runoff Area=7,200 sf	Runoff Depth>4.77"
Flow Length=115'	Slope=0.0200 '/'	Tc=3.2 min CN=85 Runoff=1.00 cfs 2,864 cf
<b>Subcatchment 130S:</b>	Runoff Area=6,950 sf	Runoff Depth>4.56"
Flow Length=60'	Tc=0.3 min CN=83	Runoff=1.02 cfs 2,640 cf
<b>Subcatchment 132S: Behind Unit 3</b>	Runoff Area=26,270 sf	Runoff Depth>3.82"
Flow Length=120'	Tc=0.7 min CN=76	Runoff=3.26 cfs 8,352 cf
<b>Subcatchment 134S: To Swale behind 7,6,5</b>	Runoff Area=13,850 sf	Runoff Depth>4.13"
Flow Length=70'	Slope=0.0200 '/'	Tc=3.1 min CN=79 Runoff=1.70 cfs 4,763 cf
<b>Subcatchment 136S: To Swale behind 4 to HW 30</b>	Runoff Area=21,060 sf	Runoff Depth>3.82"
Flow Length=100'	Tc=0.6 min CN=76	Runoff=2.62 cfs 6,696 cf
<b>Subcatchment 138S: Rear of Units 10,11,12,13</b>	Runoff Area=15,030 sf	Runoff Depth>4.23"
Flow Length=400'	Tc=12.1 min CN=80	Runoff=1.40 cfs 5,293 cf
<b>Subcatchment 140S: Behind Units 14, 15, 16</b>	Runoff Area=21,630 sf	Runoff Depth>3.81"
Flow Length=130'	Slope=0.0100 '/'	Tc=11.7 min CN=76 Runoff=1.84 cfs 6,862 cf
<b>Subcatchment 214S:</b>	Runoff Area=6,950 sf	Runoff Depth>4.56"
	Tc=1.0 min CN=83	Runoff=1.00 cfs 2,639 cf
<b>Subcatchment 216S:</b>	Runoff Area=4,140 sf	Runoff Depth>4.78"
	Tc=1.0 min CN=85	Runoff=0.62 cfs 1,648 cf
<b>Subcatchment 900: North Offsite flowing onto property</b>	Runoff Area=14,076 sf	Runoff Depth>3.20"
Flow Length=360'	Slope=0.0500 '/'	Tc=12.0 min CN=70 Runoff=0.99 cfs 3,752 cf
<b>Reach 1R: Existing wetland channel to WF</b>	Avg. Depth=0.30'	Max Vel=5.14 fps Inflow=10.16 cfs 49,561 cf
	n=0.022 L=300.0'	S=0.0333 '/' Capacity=82.44 cfs Outflow=10.14 cfs 49,499 cf
<b>Reach 2R: CB 23 to HW 40</b>	Avg. Depth=0.81'	Max Vel=7.07 fps Inflow=5.99 cfs 33,660 cf
	D=15.0" n=0.013 L=75.0'	S=0.0149 '/' Capacity=7.89 cfs Outflow=5.95 cfs 33,654 cf
<b>Reach 55R: DMH 52 to DMH 50</b>	Avg. Depth=0.81'	Max Vel=8.48 fps Inflow=5.77 cfs 15,281 cf
	D=12.0" n=0.013 L=32.0'	S=0.0269 '/' Capacity=5.84 cfs Outflow=5.75 cfs 15,280 cf
<b>Reach 62R: DMH 64 to Bio-Retention A (HW</b>	Avg. Depth=0.88'	Max Vel=6.33 fps Inflow=4.60 cfs 15,223 cf
	D=12.0" n=0.013 L=12.0'	S=0.0150 '/' Capacity=4.36 cfs Outflow=4.60 cfs 15,223 cf
<b>Reach 64R: Swale from Drive at #12 to RG 10A</b>	Avg. Depth=0.00'	Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
	n=0.022 L=10.0'	S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf
<b>Reach 67R: Culvert under Unit 12 Drive</b>	Avg. Depth=0.46'	Max Vel=3.86 fps Inflow=1.00 cfs 2,533 cf
	D=8.0" n=0.013 L=48.0'	S=0.0100 '/' Capacity=1.21 cfs Outflow=0.99 cfs 2,533 cf
<b>Reach 68R: Underdrain to CB 66</b>	Avg. Depth=0.60'	Max Vel=9.67 fps Inflow=3.15 cfs 14,860 cf
	D=8.0" n=0.013 L=15.0'	S=0.0600 '/' Capacity=2.96 cfs Outflow=3.15 cfs 14,859 cf

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**Reach 69R: Drain to DMH 52** Avg. Depth=0.51' Max Vel=5.56 fps Inflow=1.58 cfs 4,060 cf  
D=8.0" n=0.013 L=38.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=1.58 cfs 4,060 cf

**Reach 114R: DMH 16 to DMH 14** Avg. Depth=0.44' Max Vel=4.96 fps Inflow=1.66 cfs 4,413 cf  
D=12.0" n=0.013 L=60.0' S=0.0133 '/' Capacity=4.11 cfs Outflow=1.64 cfs 4,412 cf

**Reach 118R: Swale from Drive at #4 to RG 11** Avg. Depth=0.20' Max Vel=3.89 fps Inflow=1.26 cfs 7,591 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=1.25 cfs 7,591 cf

**Reach 119R: Culvert under Unit 4 Drive** Avg. Depth=0.67' Max Vel=3.94 fps Inflow=2.18 cfs 7,591 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.26 cfs 7,591 cf

**Reach 127R: Swale from Drive at #3 to RG 11** Avg. Depth=0.28' Max Vel=4.68 fps Inflow=2.44 cfs 7,481 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=2.42 cfs 7,480 cf

**Reach 128R: Culvert under Unit 3 Drive** Avg. Depth=0.67' Max Vel=7.45 fps Inflow=2.74 cfs 7,481 cf  
D=8.0" n=0.013 L=30.0' S=0.0357 '/' Capacity=2.28 cfs Outflow=2.44 cfs 7,481 cf

**Reach 129R: Swale from Drive at #20 to RG 124** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=10.0' S=0.0450 '/' Capacity=64.93 cfs Outflow=0.00 cfs 0 cf

**Reach 130R: Swale to RG 122** Avg. Depth=0.28' Max Vel=4.17 fps Inflow=2.17 cfs 5,545 cf  
n=0.022 L=30.0' S=0.0360 '/' Capacity=58.07 cfs Outflow=2.14 cfs 5,544 cf

**Reach 131R: Culvert under Unit 20 Drive** Avg. Depth=0.46' Max Vel=3.87 fps Inflow=1.01 cfs 2,520 cf  
D=8.0" n=0.013 L=48.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.99 cfs 2,520 cf

**Reach 137R: Swale Back of 7,6,5** Avg. Depth=0.23' Max Vel=1.96 fps Inflow=1.70 cfs 4,763 cf  
n=0.030 L=140.0' S=0.0143 '/' Capacity=26.48 cfs Outflow=1.66 cfs 4,756 cf

**Reach 138R: Swale Back of 4** Avg. Depth=0.46' Max Vel=2.31 fps Inflow=3.67 cfs 11,452 cf  
n=0.030 L=140.0' S=0.0100 '/' Capacity=17.63 cfs Outflow=3.62 cfs 11,438 cf

**Reach 149R: DMH 14 to DMH 12** Avg. Depth=0.95' Max Vel=7.94 fps Inflow=9.41 cfs 33,770 cf  
D=18.0" n=0.013 L=95.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=9.39 cfs 33,764 cf

**Reach 150R: DMH 12 to HW 10 - Outlet** Avg. Depth=0.95' Max Vel=7.96 fps Inflow=9.39 cfs 33,764 cf  
D=18.0" n=0.013 L=55.0' S=0.0151 '/' Capacity=12.90 cfs Outflow=9.38 cfs 33,761 cf

**Reach 153R: CB 116 to DMH 14** Avg. Depth=0.36' Max Vel=8.78 fps Inflow=1.71 cfs 8,903 cf  
D=8.0" n=0.013 L=28.0' S=0.0600 '/' Capacity=2.96 cfs Outflow=1.71 cfs 8,903 cf

**Reach 154R: Swale from Drive at #6 to RG 126** Avg. Depth=0.00' Max Vel=0.00 fps  
n=0.022 L=33.0' S=0.0091 '/' Capacity=29.18 cfs Outflow=0.00 cfs 0 cf

**Reach 155R: Swale from Drive at #5 to RG 120** Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf  
n=0.022 L=50.0' S=0.0344 '/' Capacity=56.77 cfs Outflow=0.00 cfs 0 cf

**Reach 156R: Culvert under Unit 5 Drive** Avg. Depth=0.67' Max Vel=3.95 fps Inflow=1.70 cfs 5,058 cf  
D=8.0" n=0.013 L=30.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=1.21 cfs 5,057 cf

**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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<b>Reach 159R: HW 10 Outlet to Rip Rap &gt;100' from Wetland</b>	Inflow=9.38 cfs 33,761 cf Outflow=9.38 cfs 33,761 cf
<b>Reach 220R: CB 56 to DMH 52</b>	Avg. Depth=0.42' Max Vel=4.19 fps Inflow=1.31 cfs 3,446 cf D=12.0" n=0.013 L=14.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.31 cfs 3,446 cf
<b>Reach 222R: CB 54 to DMH 52</b>	Avg. Depth=0.70' Max Vel=5.09 fps Inflow=3.01 cfs 7,775 cf D=12.0" n=0.013 L=22.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=2.99 cfs 7,775 cf
<b>Reach 403R: CB 65 to DMH 50</b>	Avg. Depth=0.57' Max Vel=6.77 fps Inflow=3.15 cfs 14,859 cf D=12.0" n=0.013 L=30.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=3.15 cfs 14,858 cf
<b>Reach 902R: Existing wetland channel to</b>	Avg. Depth=0.32' Max Vel=5.90 fps Inflow=12.66 cfs 62,827 cf n=0.022 L=100.0' S=0.0400 '/' Capacity=90.31 cfs Outflow=12.66 cfs 62,805 cf
<b>Pond 2P: Recharge System</b>	Peak Elev=106.23' Storage=3,766 cf Inflow=8.25 cfs 39,145 cf Discarded=0.01 cfs 398 cf Primary=5.99 cfs 33,660 cf Secondary=2.82 cfs 2,107 cf Outflow=8.81 cfs 36,165 cf
<b>Pond 7P: Forebay - Bio Retention</b>	Peak Elev=111.86' Storage=264 cf Inflow=4.60 cfs 15,223 cf Discarded=0.00 cfs 0 cf Primary=4.60 cfs 15,052 cf Outflow=4.60 cfs 15,053 cf
<b>Pond 8P: Main Cell - Bio Retention</b>	Peak Elev=112.09' Storage=1,801 cf Inflow=4.60 cfs 15,052 cf Primary=3.15 cfs 14,860 cf Secondary=0.00 cfs 0 cf Outflow=3.15 cfs 14,860 cf
<b>Pond 9P: CB 65</b>	Peak Elev=108.71' Inflow=3.18 cfs 9,046 cf 12.0" x 126.0' Culvert Outflow=3.18 cfs 9,046 cf
<b>Pond 43R: CB 60 to DMH 64</b>	Peak Elev=111.51' Inflow=0.72 cfs 2,018 cf 12.0" x 12.0' Culvert Outflow=0.72 cfs 2,018 cf
<b>Pond 61R: CB 62 to DMH 64</b>	Peak Elev=112.87' Inflow=4.13 cfs 13,205 cf 12.0" x 24.0' Culvert Outflow=4.13 cfs 13,205 cf
<b>Pond 66P: RG 9A at Units 11/12 - CB 214</b>	Peak Elev=108.96' Storage=131 cf Inflow=1.00 cfs 2,639 cf Primary=1.00 cfs 2,533 cf Secondary=0.00 cfs 0 cf Outflow=1.00 cfs 2,533 cf
<b>Pond 67P: CB 66 (emergency vertical release)</b>	Peak Elev=106.62' Inflow=3.15 cfs 14,859 cf Primary=3.15 cfs 14,859 cf Secondary=0.00 cfs 0 cf Outflow=3.15 cfs 14,859 cf
<b>Pond 70P: RG 10A - CB 216 at Units 13</b>	Peak Elev=107.00' Storage=164 cf Inflow=1.59 cfs 4,180 cf Primary=1.58 cfs 4,060 cf Secondary=0.00 cfs 0 cf Outflow=1.58 cfs 4,060 cf
<b>Pond 111P: CB 20</b>	Peak Elev=104.40' Inflow=1.24 cfs 3,312 cf 12.0" x 16.0' Culvert Outflow=1.24 cfs 3,312 cf
<b>Pond 112P: CB 22</b>	Peak Elev=104.14' Inflow=0.42 cfs 1,101 cf 12.0" x 22.0' Culvert Outflow=0.42 cfs 1,101 cf
<b>Pond 119P: RG - 1A - CB 118 to DMH 14</b>	Peak Elev=110.87' Storage=55 cf Inflow=3.00 cfs 9,017 cf Primary=2.98 cfs 9,017 cf Secondary=0.00 cfs 0 cf Outflow=2.98 cfs 9,017 cf

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4** Peak Elev=112.37' Storage=61 cf Inflow=2.18 cfs 7,635 cf  
Primary=2.18 cfs 7,591 cf Secondary=0.00 cfs 0 cf Outflow=2.18 cfs 7,591 cf

**Pond 128P: RG 2A - CB 122 RG Unit 3** Peak Elev=113.39' Storage=65 cf Inflow=2.74 cfs 7,524 cf  
Primary=2.74 cfs 7,481 cf Secondary=0.00 cfs 0 cf Outflow=2.74 cfs 7,481 cf

**Pond 132P: RG 3B - CB 124 Rain Garden - Unit** Peak Elev=115.30' Storage=98 cf Inflow=2.16 cfs 5,643 cf  
Outflow=2.17 cfs 5,545 cf

**Pond 133P: Large RG 4C at Unit 20** Peak Elev=116.96' Storage=152 cf Inflow=1.02 cfs 2,640 cf  
Primary=1.01 cfs 2,520 cf Secondary=0.00 cfs 0 cf Outflow=1.01 cfs 2,520 cf

**Pond 144R: HW 30 to DMH 14** Peak Elev=114.41' Inflow=3.62 cfs 11,438 cf  
12.0" x 114.0' Culvert Outflow=3.62 cfs 11,438 cf

**Pond 155P: RG 5A - CB 116 between Septic an** Peak Elev=108.16' Storage=58 cf Inflow=1.71 cfs 8,946 cf  
Primary=1.71 cfs 8,903 cf Secondary=0.00 cfs 0 cf Outflow=1.71 cfs 8,903 cf

**Pond 157P: RG 7A - CB 126 Under Drive Unit 5** Peak Elev=116.61' Storage=59 cf Inflow=1.70 cfs 5,100 cf  
Primary=1.70 cfs 5,058 cf Secondary=0.00 cfs 0 cf Outflow=1.70 cfs 5,058 cf

**Pond 158P: Culvert under Drive Unit 6** Peak Elev=117.76' Inflow=1.00 cfs 2,864 cf  
8.0" x 30.0' Culvert Outflow=1.00 cfs 2,864 cf

**Pond 218R: DMH 50 to Irrigation Cistern** Peak Elev=105.65' Inflow=11.06 cfs 39,184 cf  
15.0" x 5.0' Culvert Outflow=11.06 cfs 39,184 cf

**Pond 219P: Irrigation Cistern** Peak Elev=106.58' Storage=2,372 cf Inflow=11.06 cfs 39,184 cf  
12.0" x 5.0' Culvert Outflow=8.25 cfs 39,145 cf

**Link A: POA A** Inflow=23.63 cfs 98,672 cf  
Primary=23.63 cfs 98,672 cf

**Total Runoff Area = 295,260 sf Runoff Volume = 103,196 cf Average Runoff Depth = 4.19"**  
**75.93% Pervious Area = 224,203 sf 24.07% Impervious Area = 71,057 sf**

**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 54S: CB at Cul-de-Sac - Outside**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.01 cfs @ 12.01 hrs, Volume= 7,775 cf, Depth> 4.45"

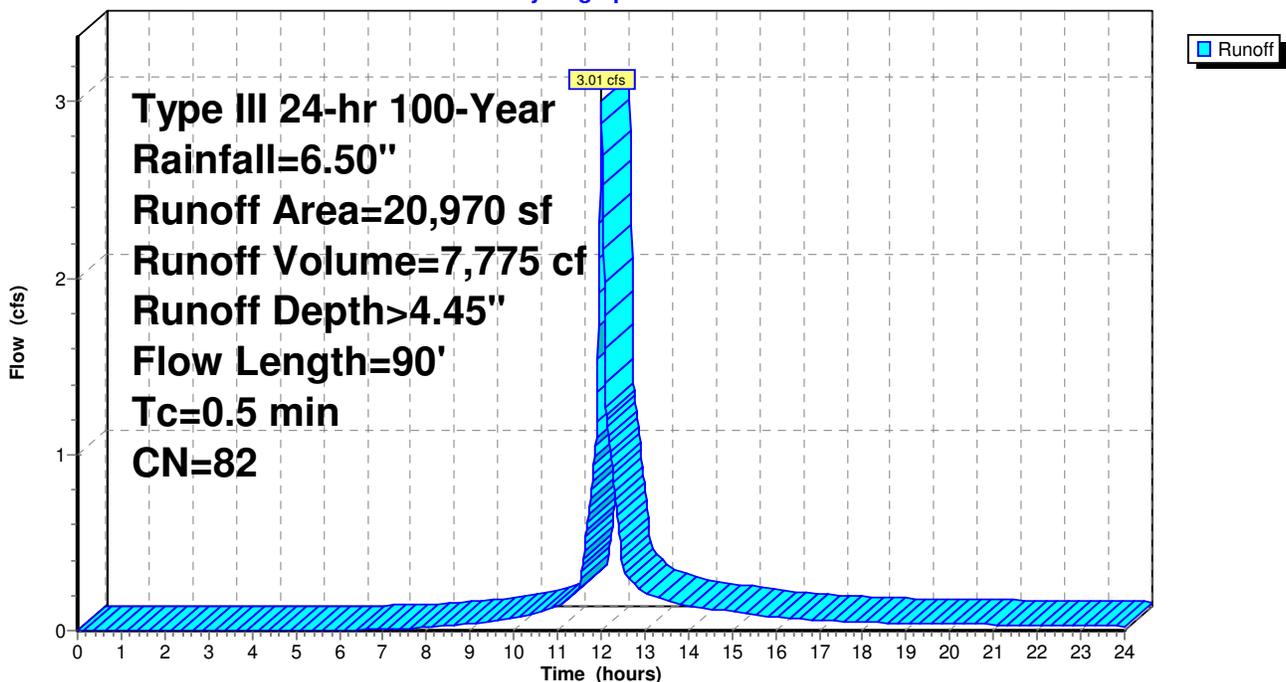
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,100	98	Paved parking & roofs
2,724	98	Paved parking & roofs
14,146	74	>75% Grass cover, Good, HSG C
20,970	82	Weighted Average
14,146		Pervious Area
6,824		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1500	2.42		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.20"
0.3	60	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	90	Total			

**Subcatchment 54S: CB at Cul-de-Sac - Outside**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 56S: CB at Cul-de-Sac - Inside**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 1.31 cfs @ 12.01 hrs, Volume= 3,446 cf, Depth> 4.78"

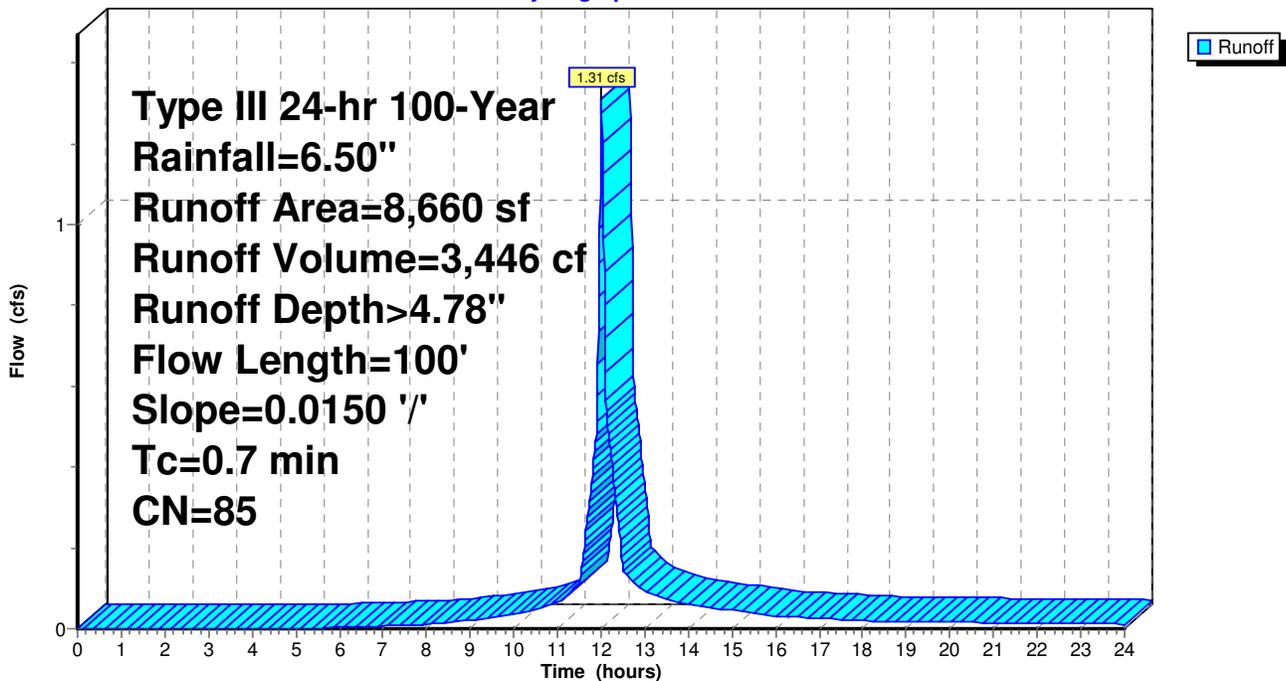
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
0	98	Paved parking & roofs
3,847	98	Paved parking & roofs
4,813	74	>75% Grass cover, Good, HSG C
8,660	85	Weighted Average
4,813		Pervious Area
3,847		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 56S: CB at Cul-de-Sac - Inside**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 60S:**

Runoff = 0.72 cfs @ 12.03 hrs, Volume= 2,018 cf, Depth> 5.22"

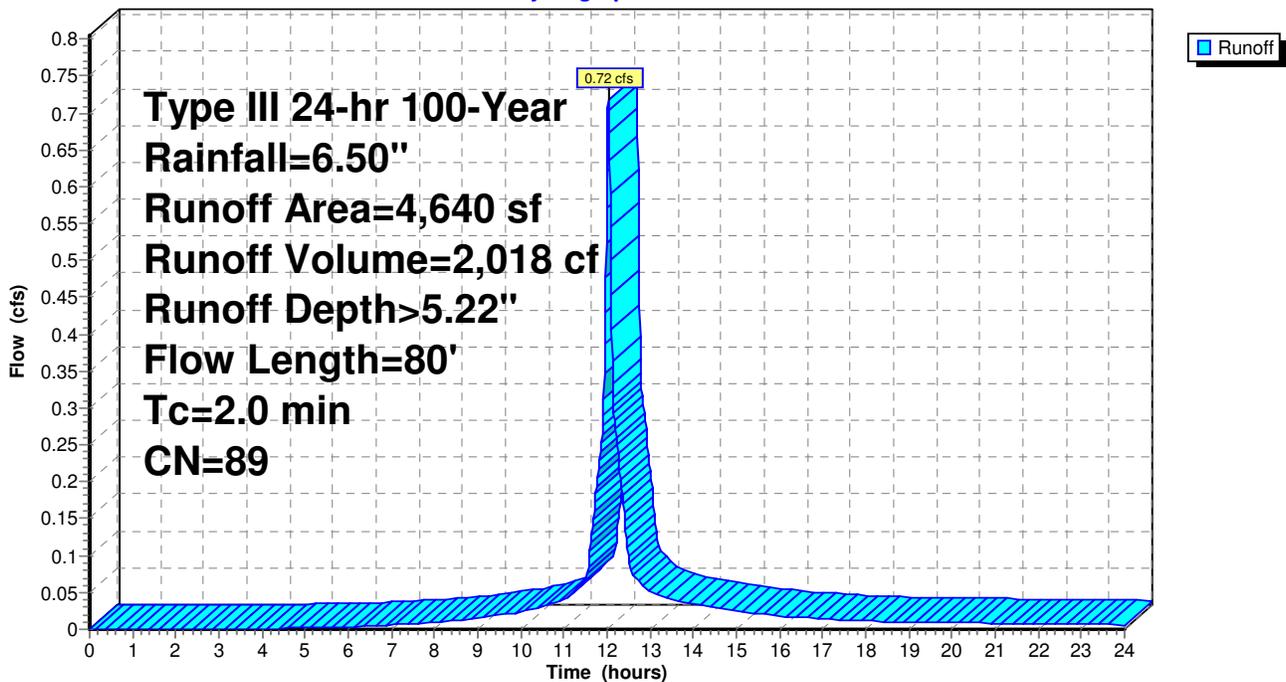
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
960	98	Paved parking & roofs
1,850	98	Paved parking & roofs
1,830	74	>75% Grass cover, Good, HSG C
4,640	89	Weighted Average
1,830		Pervious Area
2,810		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0250	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.6	70	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.0	80	Total			

**Subcatchment 60S:**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 62S: Large Area including 2 Septics**

Runoff = 4.13 cfs @ 12.10 hrs, Volume= 13,205 cf, Depth> 4.02"

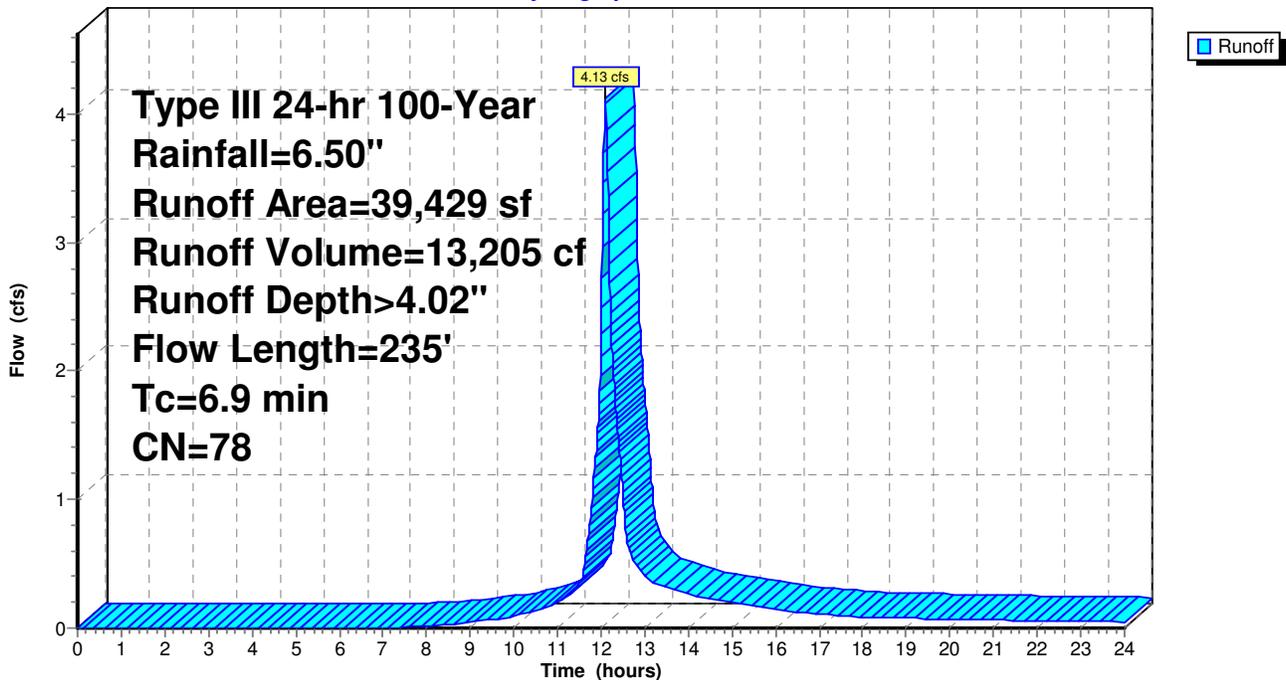
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,880	98	Paved parking & roofs
2,734	98	Paved parking & roofs
30,815	74	>75% Grass cover, Good, HSG C
2,000	70	Woods, Good, HSG C
39,429	78	Weighted Average
32,815		Pervious Area
6,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.1000	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	180	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0400	3.22		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
6.9	235	Total			

**Subcatchment 62S: Large Area including 2 Septics**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 65S: Throat of Cul-de-sac u.g.**

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 1.55 cfs @ 12.01 hrs, Volume= 3,988 cf, Depth> 4.13"

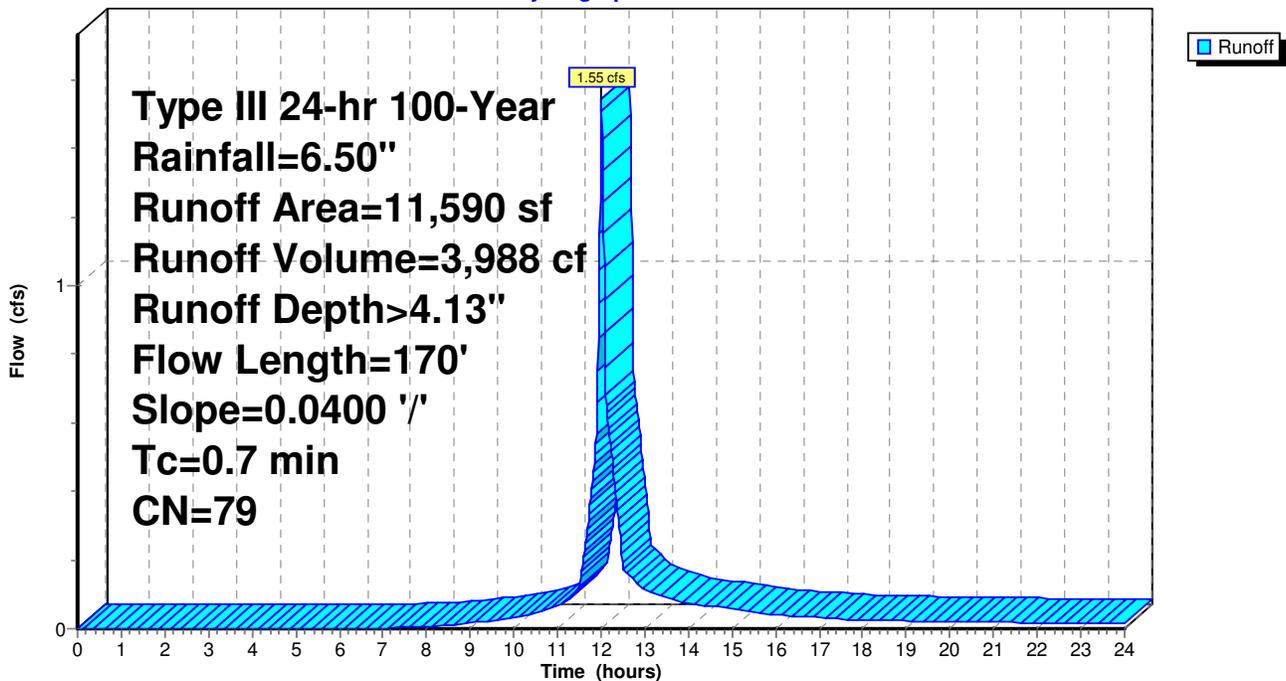
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
400	98	Paved parking & roofs
2,160	98	Paved parking & roofs
9,030	74	>75% Grass cover, Good, HSG C
11,590	79	Weighted Average
9,030		Pervious Area
2,560		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	170	0.0400	4.06		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 65S: Throat of Cul-de-sac u.g.**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 68S: From hill near 19,20 to Lawn CB**

Runoff = 1.82 cfs @ 12.05 hrs, Volume= 5,058 cf, Depth> 4.02"

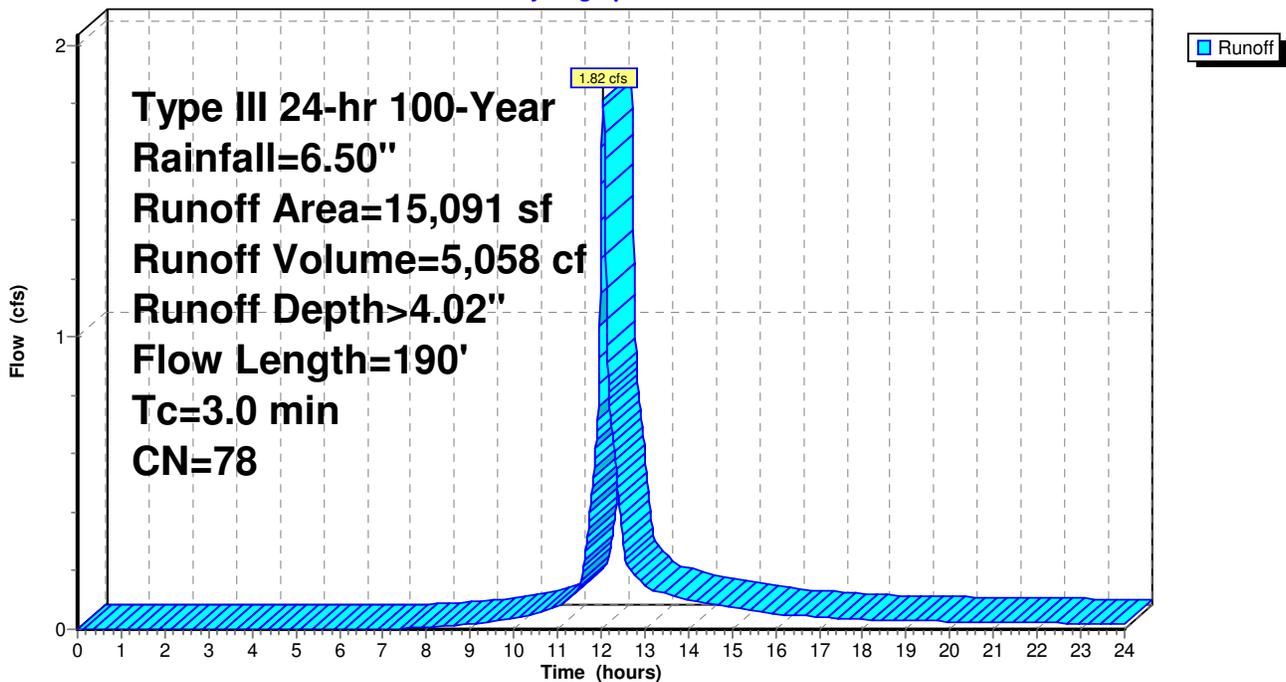
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,730	98	Paved parking & roofs
0	98	Paved parking & roofs
12,361	74	>75% Grass cover, Good, HSG C
15,091	78	Weighted Average
12,361		Pervious Area
2,730		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.1500	2.23		<b>Sheet Flow, Roof Unit 20</b> Smooth surfaces n= 0.011 P2= 3.20"
2.9	170	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.0	190	Total			

**Subcatchment 68S: From hill near 19,20 to Lawn CB**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 110S: To CB 20**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.24 cfs @ 12.01 hrs, Volume= 3,312 cf, Depth> 5.11"

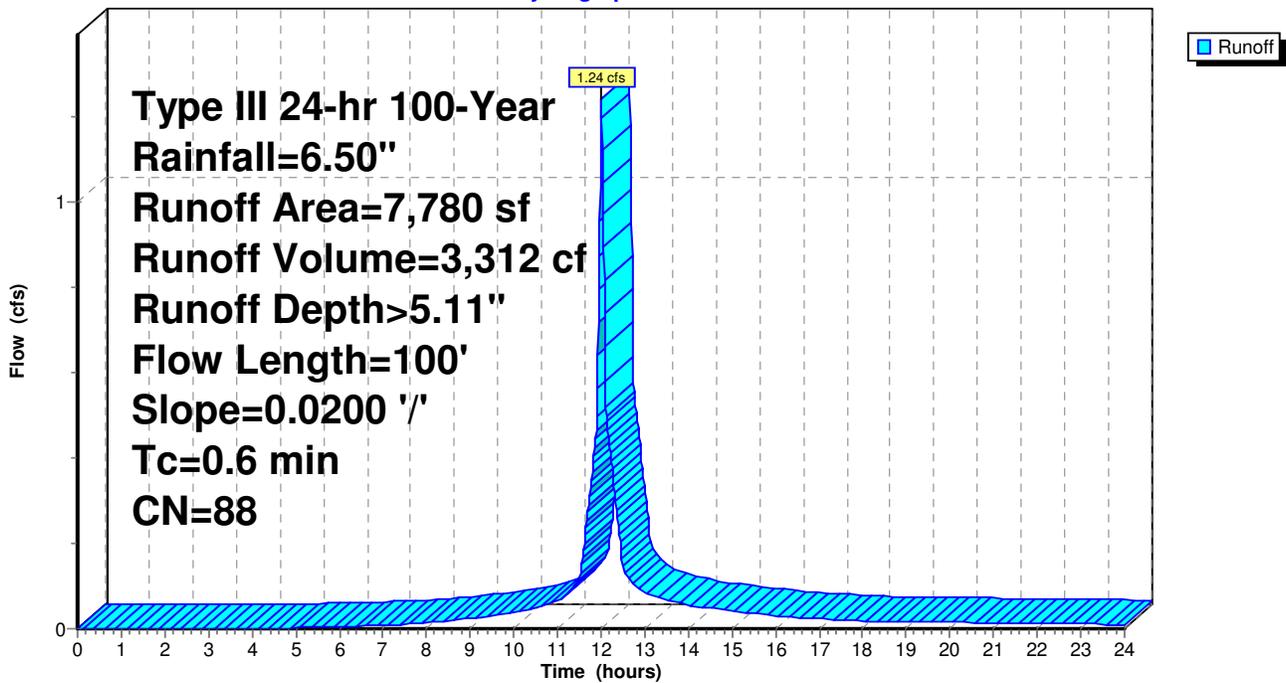
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
2,880	98	Paved parking & roofs
3,240	74	>75% Grass cover, Good, HSG C
7,780	88	Weighted Average
3,240		Pervious Area
4,540		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps

**Subcatchment 110S: To CB 20**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 112S: To CB 22**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.42 cfs @ 12.01 hrs, Volume= 1,101 cf, Depth> 4.56"

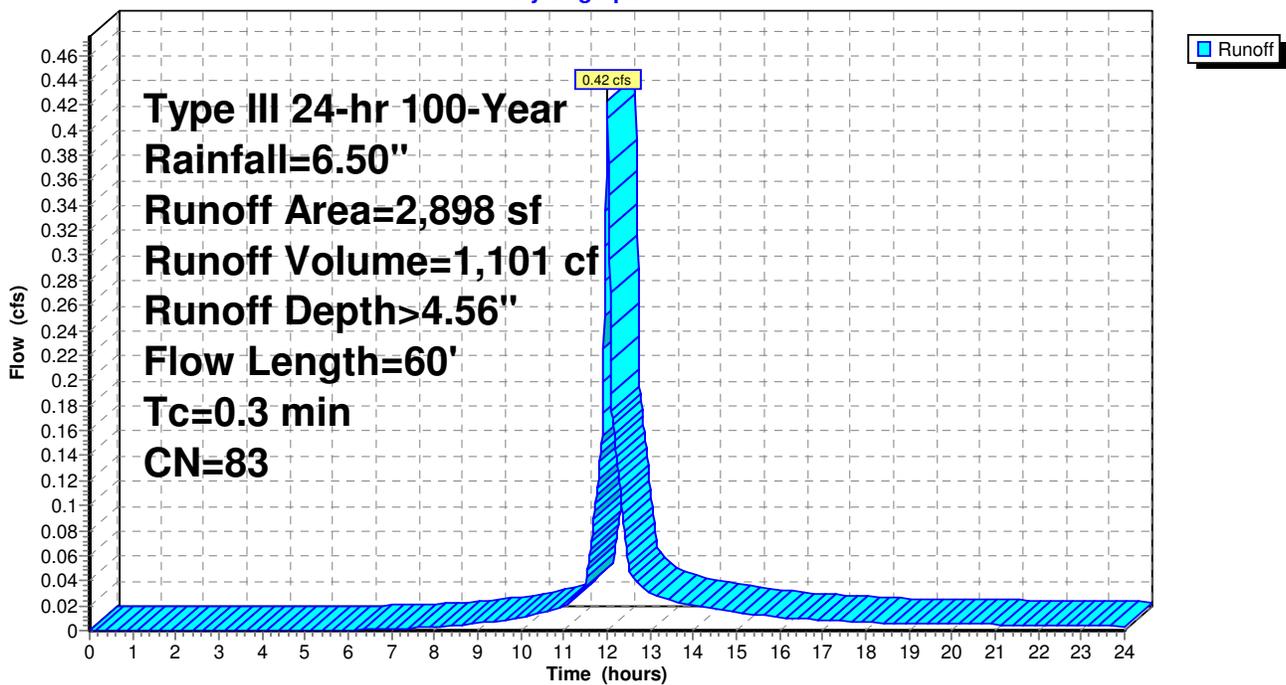
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
0	98	Paved parking & roofs
1,112	98	Paved parking & roofs
1,786	74	>75% Grass cover, Good, HSG C
2,898	83	Weighted Average
1,786		Pervious Area
1,112		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 112S: To CB 22**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 114S: Behind Units 1&2**

Runoff = 1.46 cfs @ 12.12 hrs, Volume= 4,976 cf, Depth> 3.91"

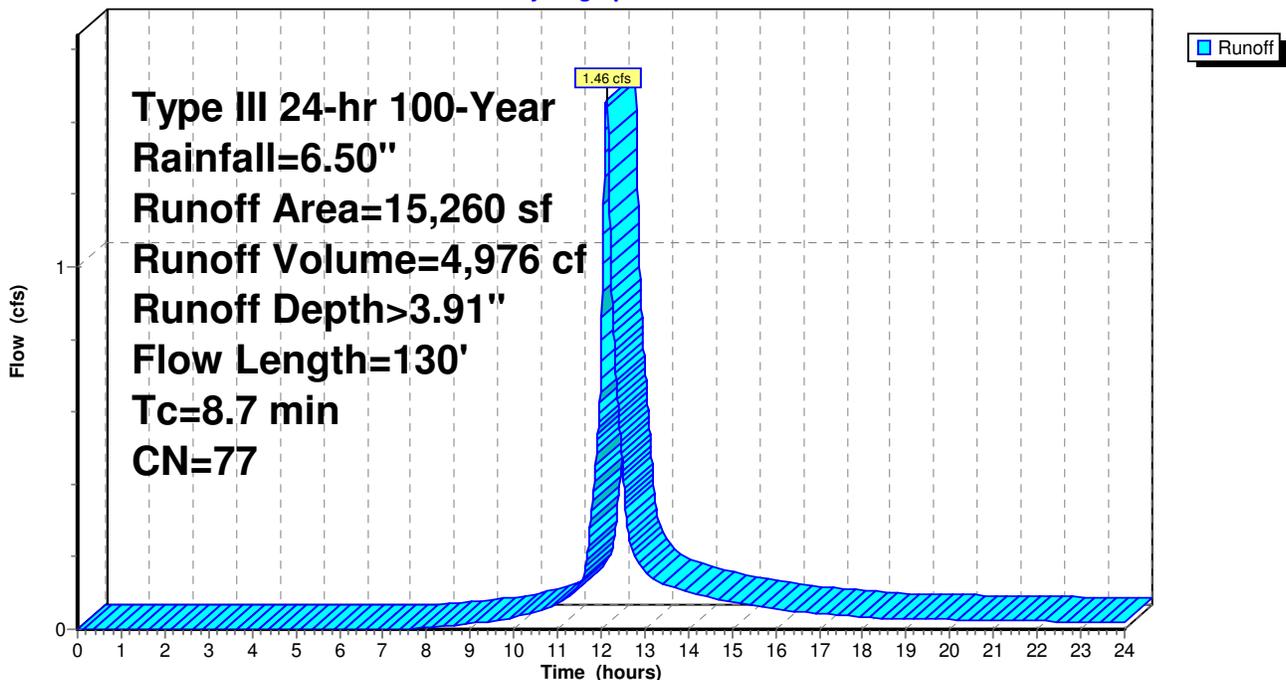
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
0	98	Paved parking & roofs
13,600	74	>75% Grass cover, Good, HSG C
15,260	77	Weighted Average
13,600		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
8.7	130	Total			

**Subcatchment 114S: Behind Units 1&2**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 116S:**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.50 cfs @ 12.00 hrs, Volume= 1,356 cf, Depth> 5.33"

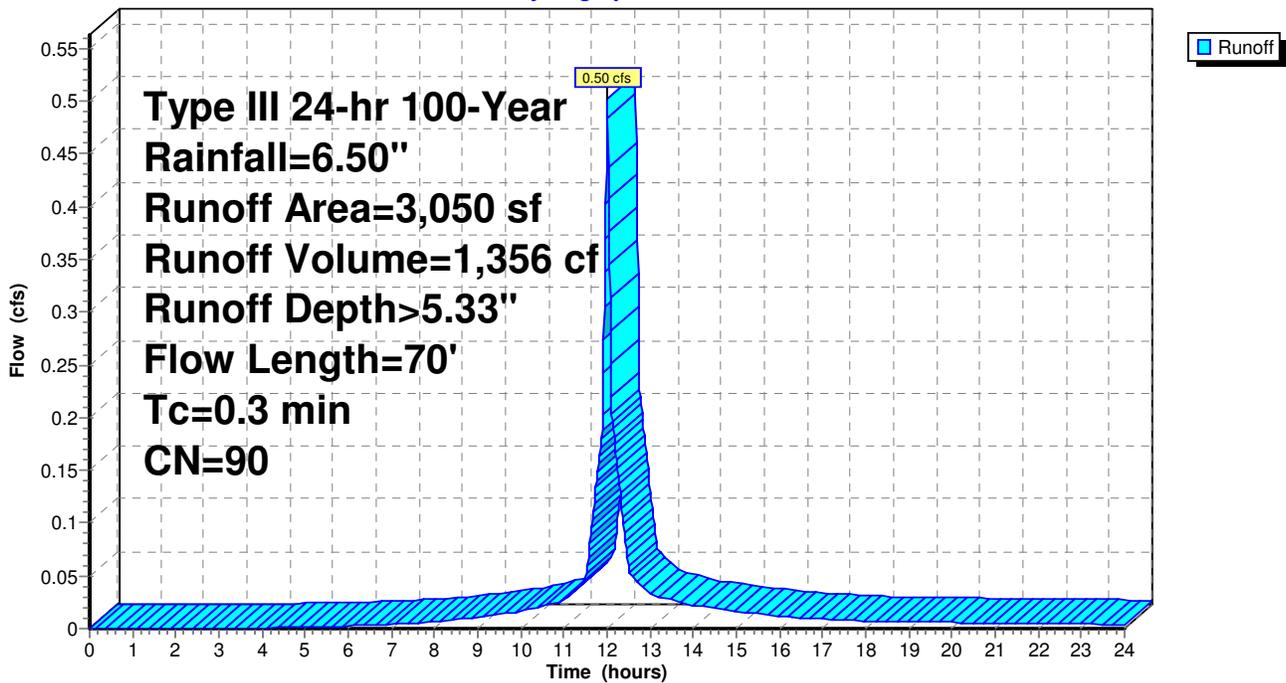
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,300	98	Paved parking & roofs
1,050	74	>75% Grass cover, Good, HSG C
3,050	90	Weighted Average
1,050		Pervious Area
2,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	40	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.2	30	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved $K_v=16.1$ fps
0.3	70	Total			

**Subcatchment 116S:**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 118S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.58 cfs @ 12.00 hrs, Volume= 1,537 cf, Depth> 5.11"

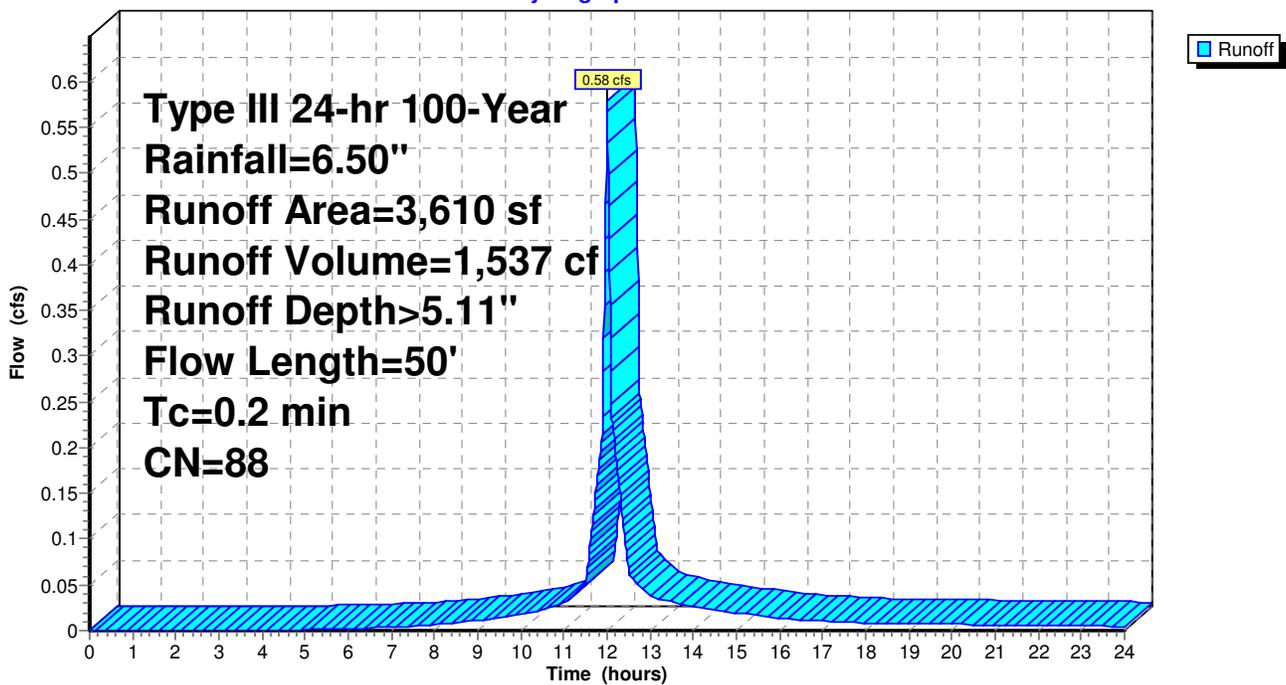
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,040	98	Paved parking & roofs
1,140	98	Paved parking & roofs
1,430	74	>75% Grass cover, Good, HSG C
3,610	88	Weighted Average
1,430		Pervious Area
2,180		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	50	Total			

**Subcatchment 118S:**

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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 120S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.97 cfs @ 12.01 hrs, Volume= 2,578 cf, Depth> 5.00"

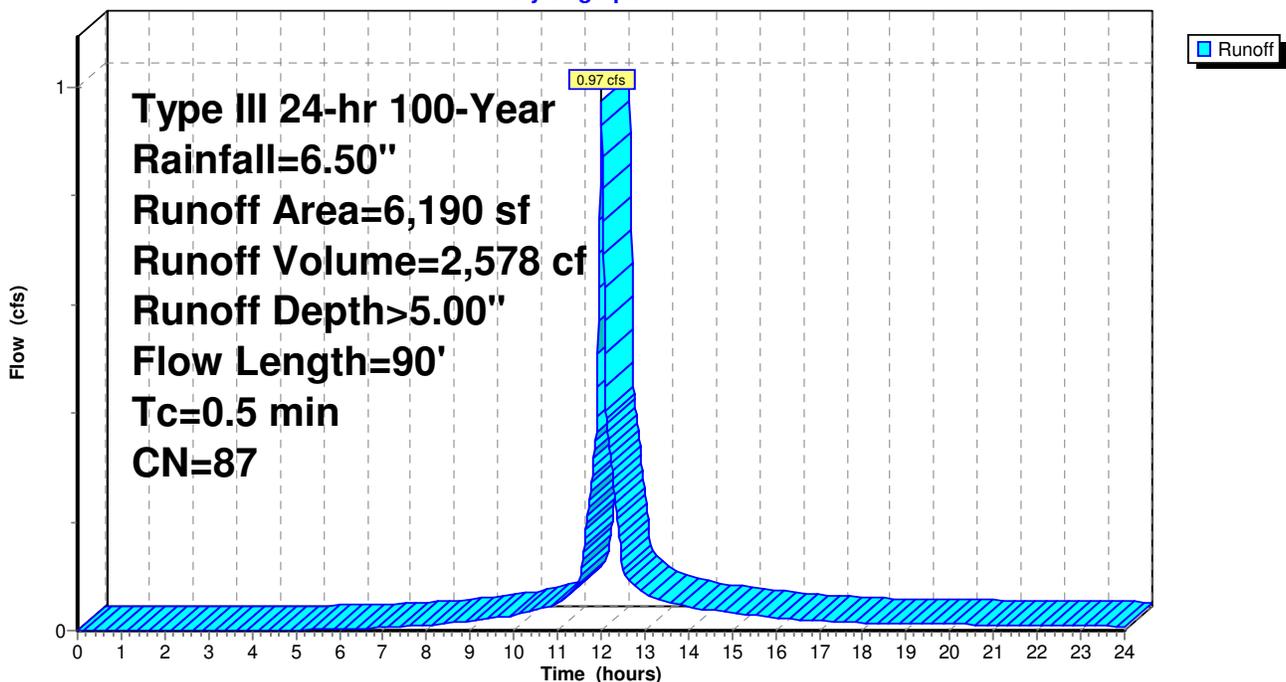
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,450	98	Paved parking & roofs
1,800	98	Paved parking & roofs
2,940	74	>75% Grass cover, Good, HSG C
6,190	87	Weighted Average
2,940		Pervious Area
3,250		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.4	60	0.0300	2.79		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	90	Total			

**Subcatchment 120S:**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 122S:**

Runoff = 0.70 cfs @ 12.05 hrs, Volume= 1,980 cf, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

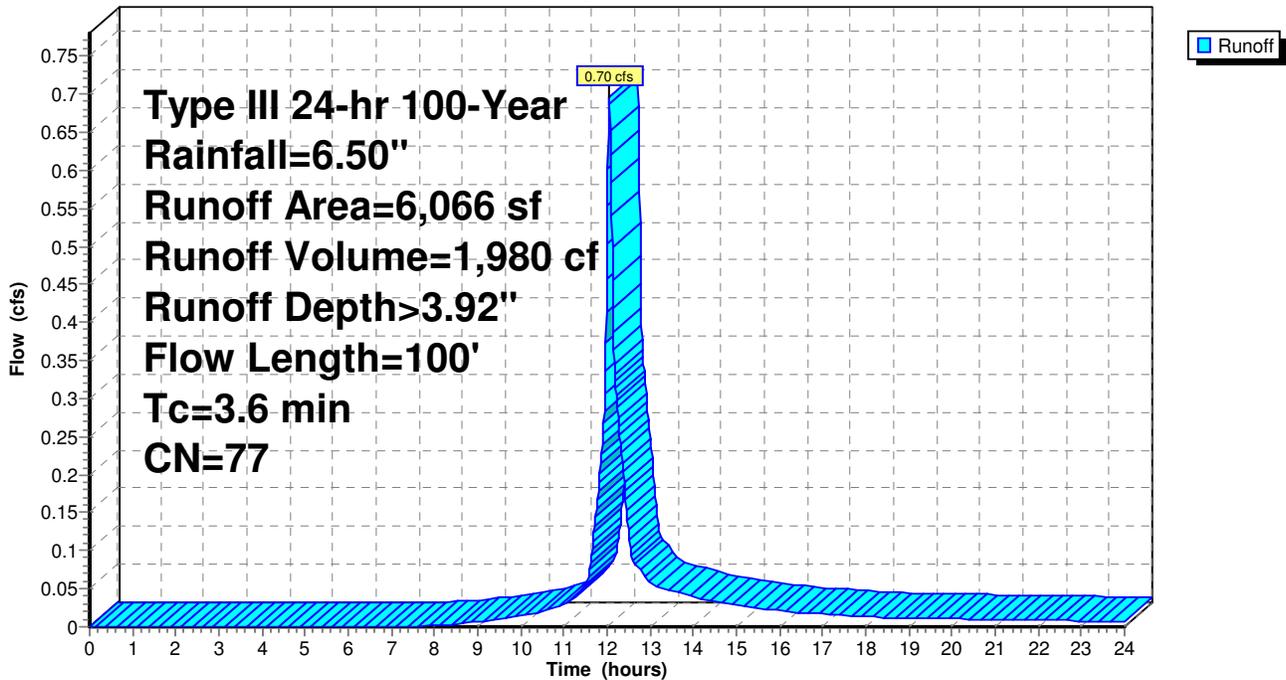
Area (sf)	CN	Description
720	98	Paved parking & roofs
5,346	74	>75% Grass cover, Good, HSG C
6,066	77	Weighted Average
5,346		Pervious Area
720		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	20	0.0300	0.14		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.6	100	Total			

**Subcatchment 122S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 124S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.18 cfs @ 12.01 hrs, Volume= 3,123 cf, Depth> 5.00"

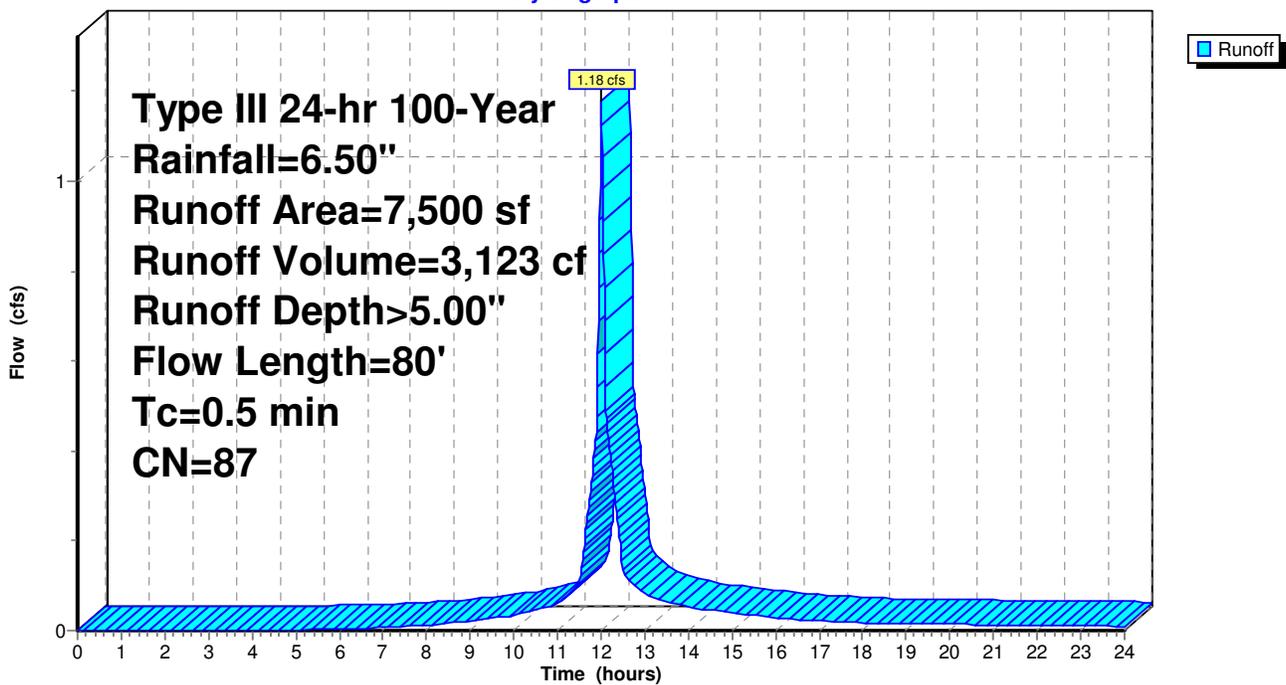
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,410	98	Paved parking & roofs
2,600	98	Paved parking & roofs
3,490	74	>75% Grass cover, Good, HSG C
7,500	87	Weighted Average
3,490		Pervious Area
4,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	Total			

**Subcatchment 124S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 126S:**

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.85 cfs @ 12.00 hrs, Volume= 2,236 cf, Depth> 5.00"

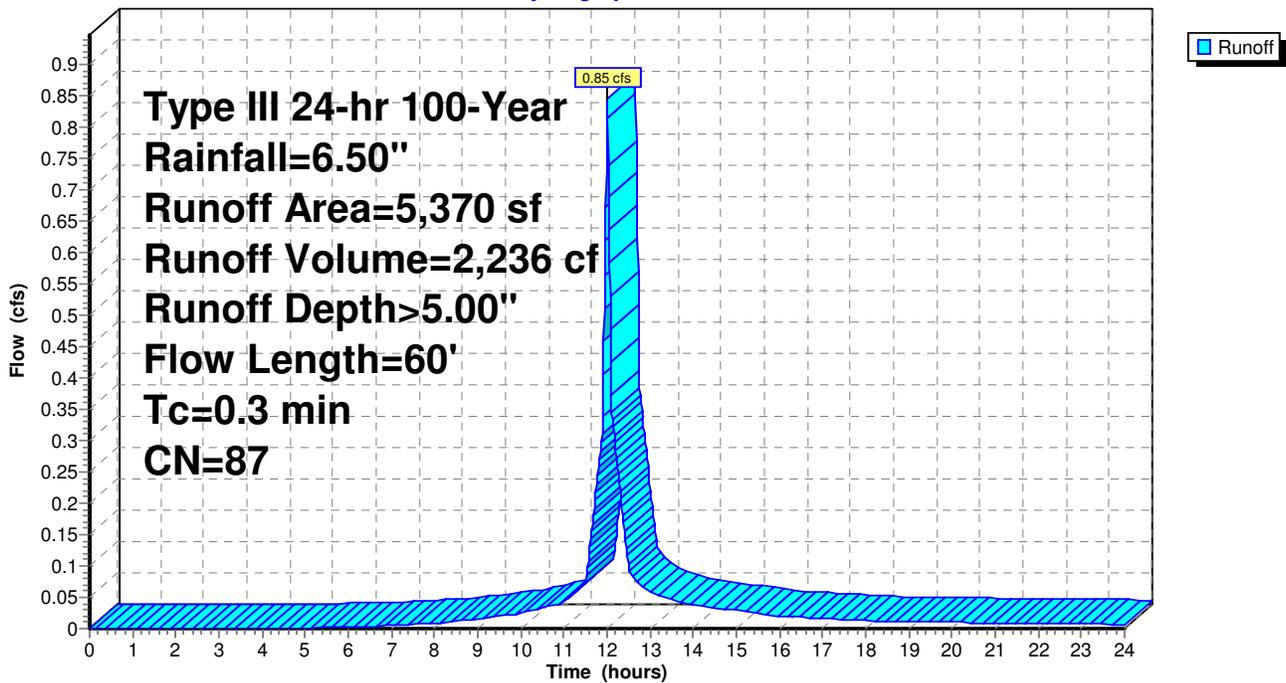
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs,  $dt=0.01$  hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,350	98	Paved parking & roofs
2,360	74	>75% Grass cover, Good, HSG C
5,370	87	Weighted Average
2,360		Pervious Area
3,010		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved $K_v=20.3$ fps
0.2	30	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved $K_v=16.1$ fps
0.3	60	Total			

**Subcatchment 126S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 128S:**

Runoff = 1.00 cfs @ 12.05 hrs, Volume= 2,864 cf, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

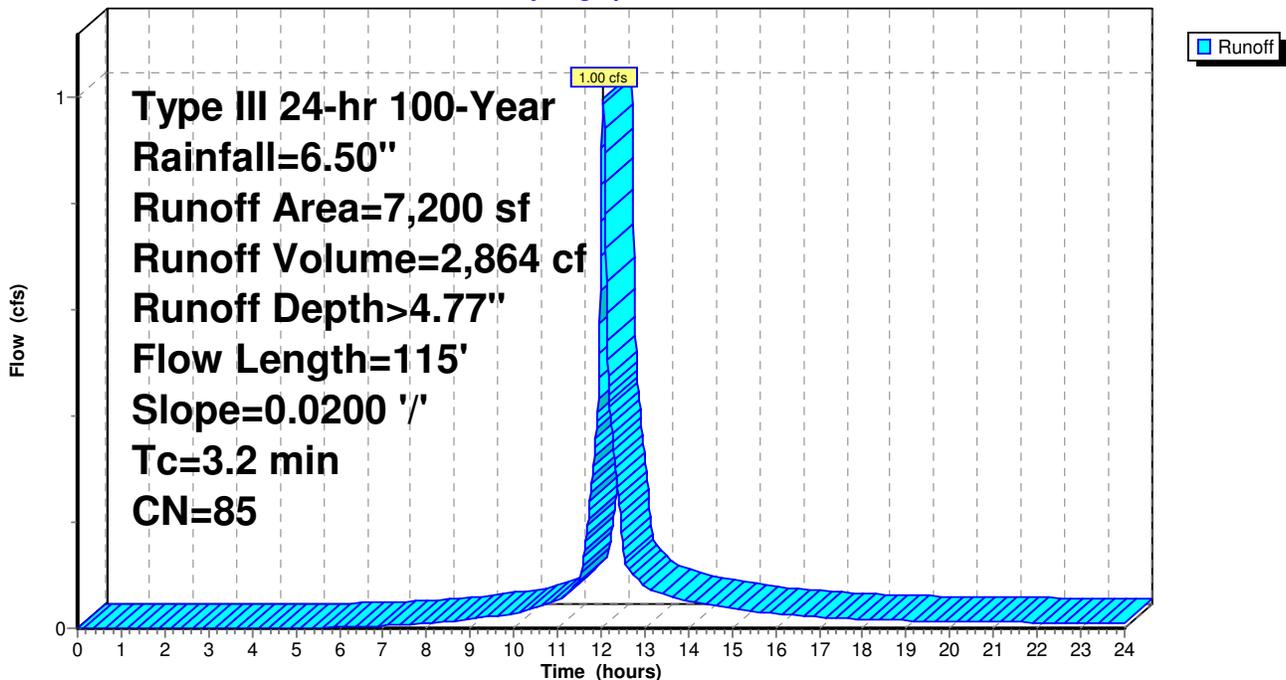
Area (sf)	CN	Description
1,550	98	Paved parking & roofs
1,600	98	Paved parking & roofs
4,050	74	>75% Grass cover, Good, HSG C
7,200	85	Weighted Average
4,050		Pervious Area
3,150		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.3	50	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	25	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.1	20	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.2	115	Total			

**Subcatchment 128S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 130S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.02 cfs @ 12.01 hrs, Volume= 2,640 cf, Depth> 4.56"

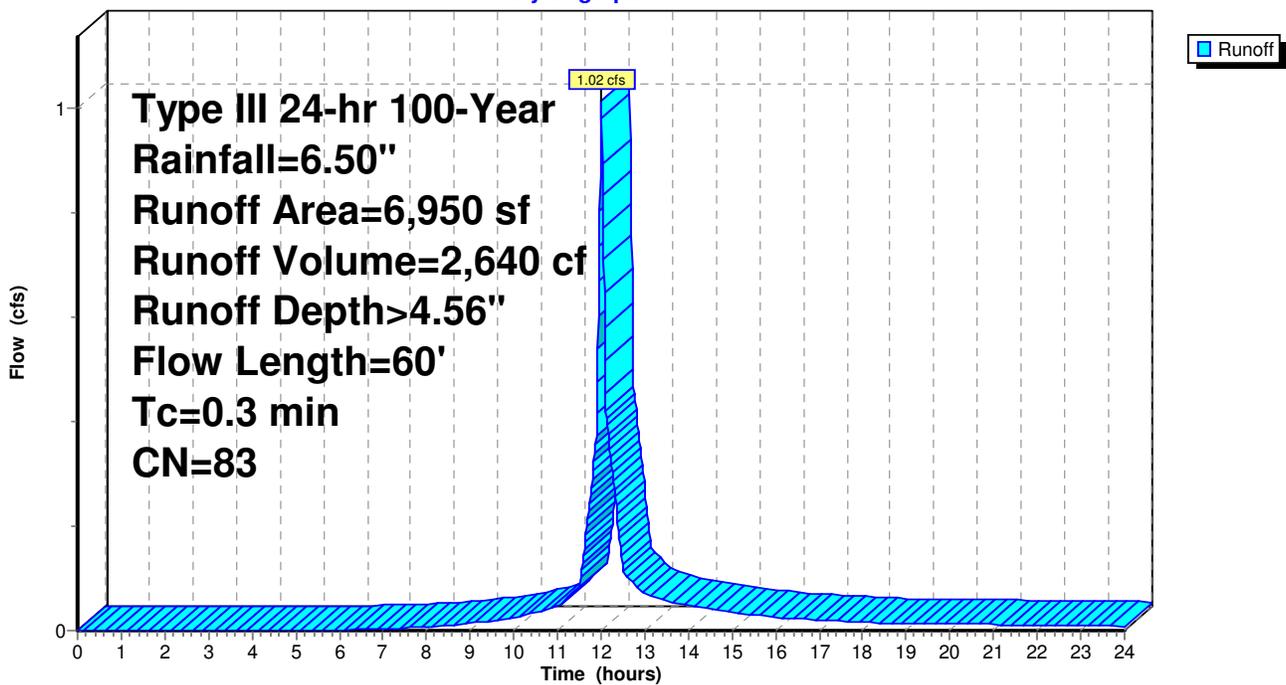
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	40	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.3	60	Total			

**Subcatchment 130S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 132S: Behind Unit 3**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.26 cfs @ 12.01 hrs, Volume= 8,352 cf, Depth> 3.82"

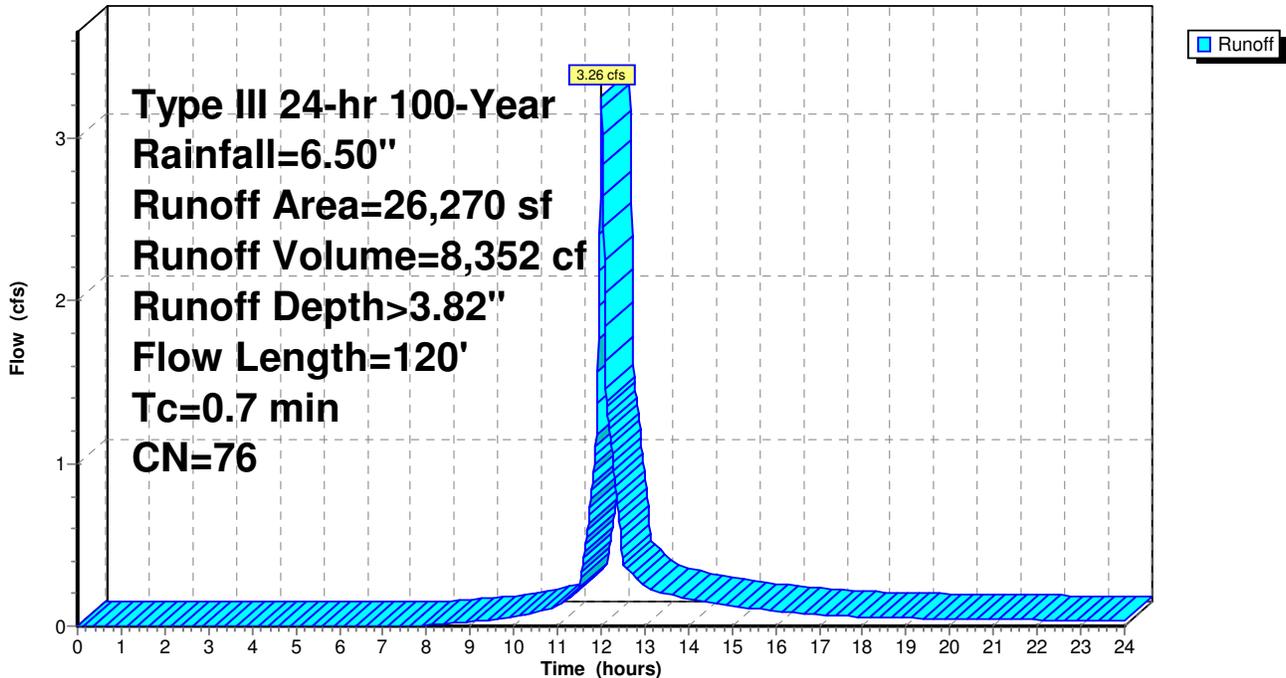
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,100	98	Paved parking & roofs
24,170	74	>75% Grass cover, Good, HSG C
26,270	76	Weighted Average
24,170		Pervious Area
2,100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.0250	2.55		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.1	20	0.1500	6.24		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.5	80	0.2500	2.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	120	Total			

**Subcatchment 132S: Behind Unit 3**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 134S: To Swale behind 7,6,5**

Runoff = 1.70 cfs @ 12.05 hrs, Volume= 4,763 cf, Depth> 4.13"

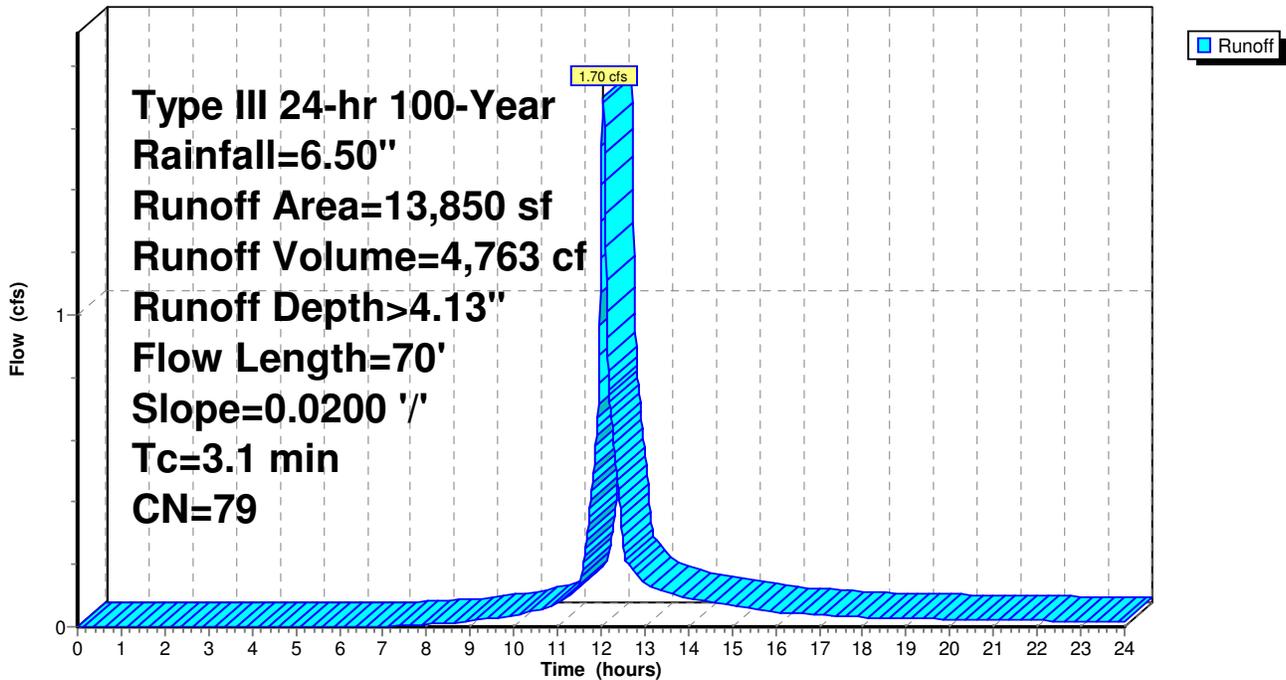
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,000	98	Paved parking & roofs
10,850	74	>75% Grass cover, Good, HSG C
13,850	79	Weighted Average
10,850		Pervious Area
3,000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.20"
0.4	50	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
3.1	70	Total			

**Subcatchment 134S: To Swale behind 7,6,5**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 136S: To Swale behind 4 to HW 30**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.62 cfs @ 12.01 hrs, Volume= 6,696 cf, Depth> 3.82"

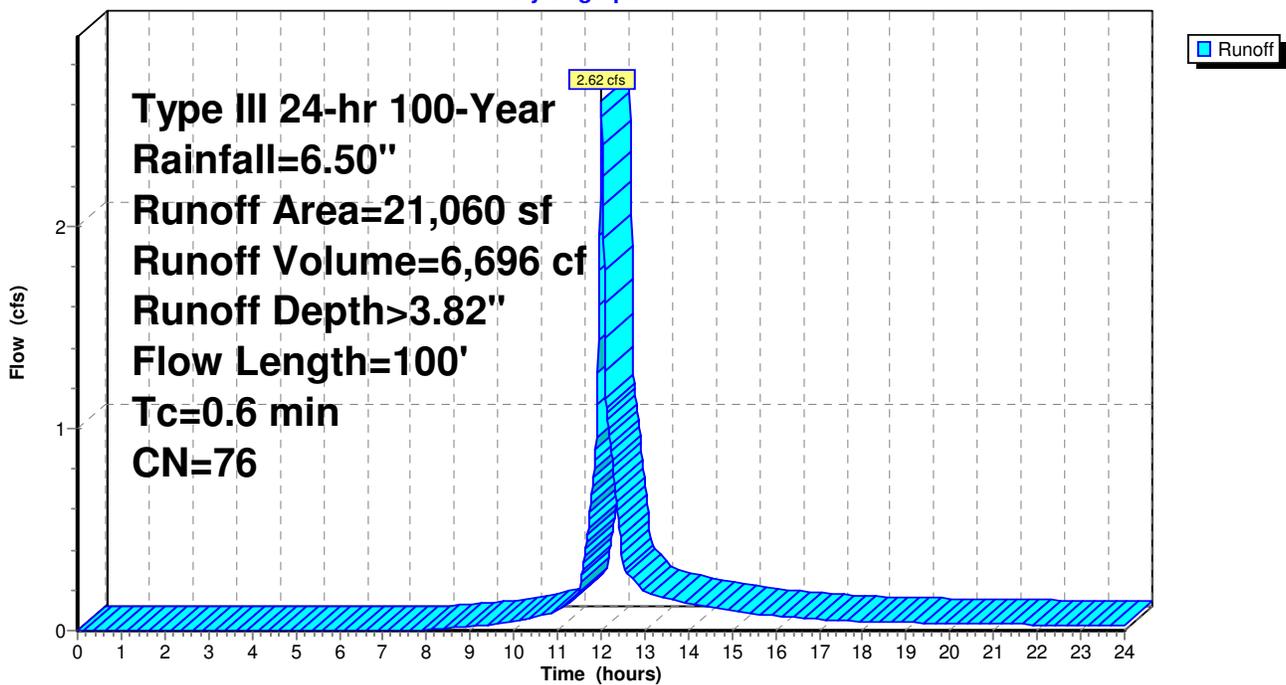
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,660	98	Paved parking & roofs
1,700	70	Woods, Good, HSG C
17,700	74	>75% Grass cover, Good, HSG C
21,060	76	Weighted Average
19,400		Pervious Area
1,660		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	30	0.1500	7.86		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.5	70	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.6	100	Total			

**Subcatchment 136S: To Swale behind 4 to HW 30**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Runoff = 1.40 cfs @ 12.17 hrs, Volume= 5,293 cf, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,500	98	Paved parking & roofs
0	98	Paved parking & roofs
11,530	74	>75% Grass cover, Good, HSG C
15,030	80	Weighted Average
11,530		Pervious Area
3,500		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.2	50	0.2500	3.50		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.5	150	0.0500	4.63	2.02	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.25' Z= 3.0 '/' Top.W=2.50' n= 0.022 Earth, clean & straight
0.6	150	0.0300	3.89	2.68	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=0.25' Z= 3.0 '/' Top.W=3.50' n= 0.022 Earth, clean & straight
12.1	400	Total			

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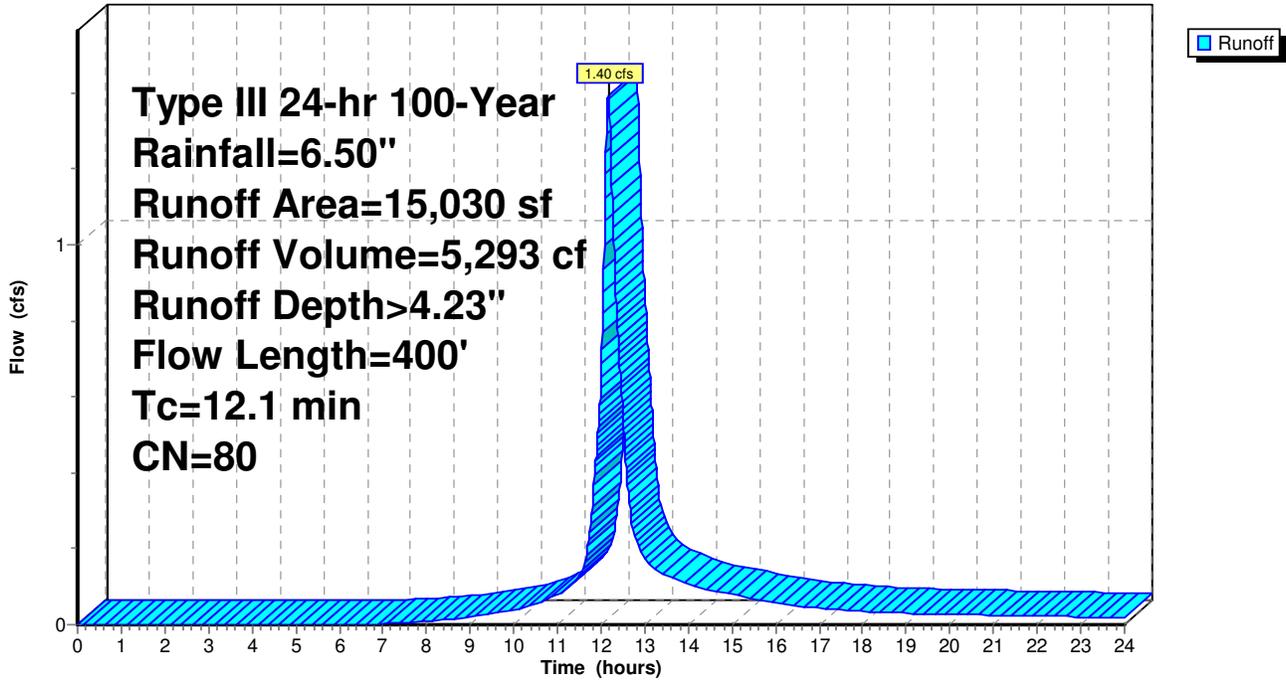
Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 138S: Rear of Units 10,11,12,13**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 140S: Behind Units 14, 15, 16**

Runoff = 1.84 cfs @ 12.16 hrs, Volume= 6,862 cf, Depth> 3.81"

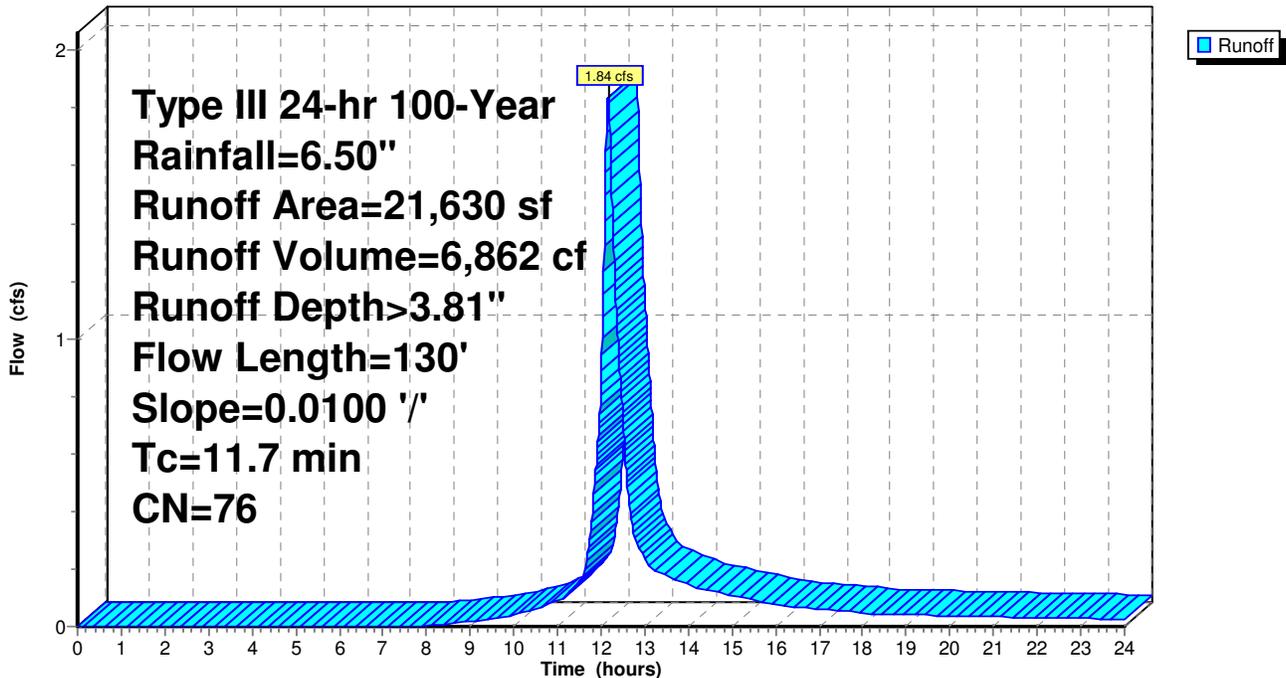
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,400	98	Paved parking & roofs
0	98	Paved parking & roofs
15,230	74	>75% Grass cover, Good, HSG C
4,000	70	Woods, Good, HSG C
21,630	76	Weighted Average
19,230		Pervious Area
2,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.20"
0.9	80	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
11.7	130	Total			

**Subcatchment 140S: Behind Units 14, 15, 16**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 214S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.00 cfs @ 12.02 hrs, Volume= 2,639 cf, Depth> 4.56"

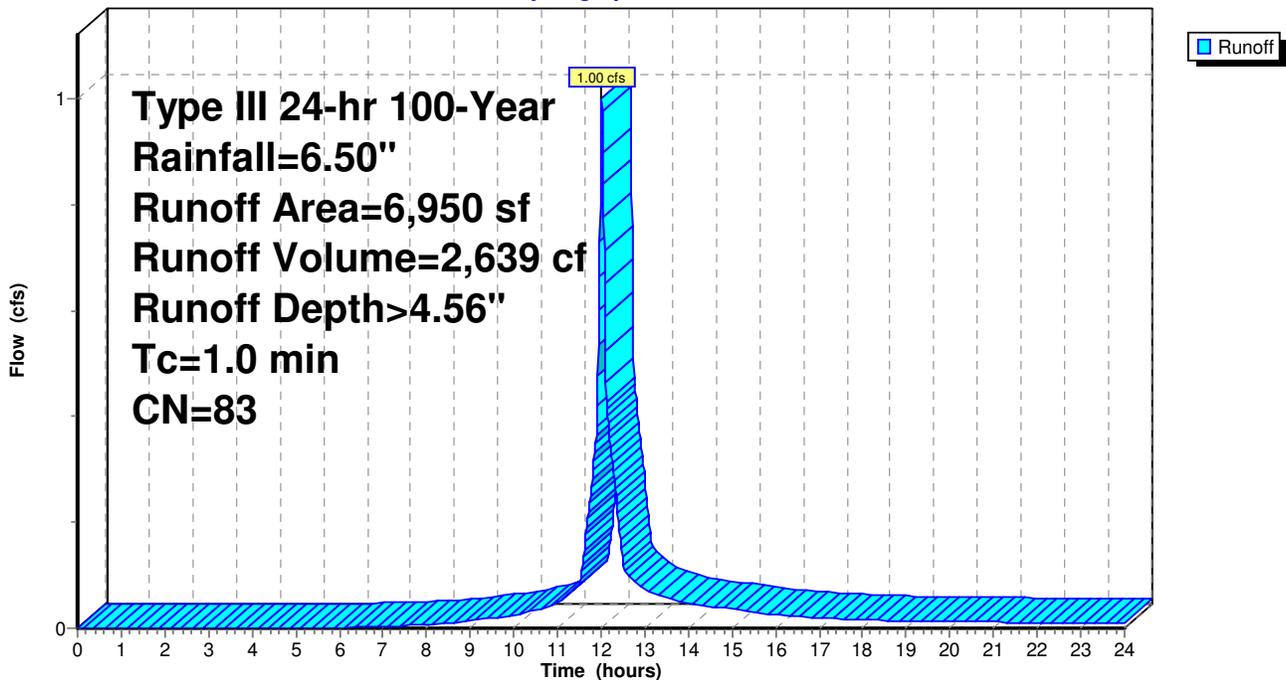
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
800	98	Paved parking & roofs
1,940	98	Paved parking & roofs
4,210	74	>75% Grass cover, Good, HSG C
6,950	83	Weighted Average
4,210		Pervious Area
2,740		Impervious Area

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

**Subcatchment 214S:**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 216S:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.62 cfs @ 12.02 hrs, Volume= 1,648 cf, Depth> 4.78"

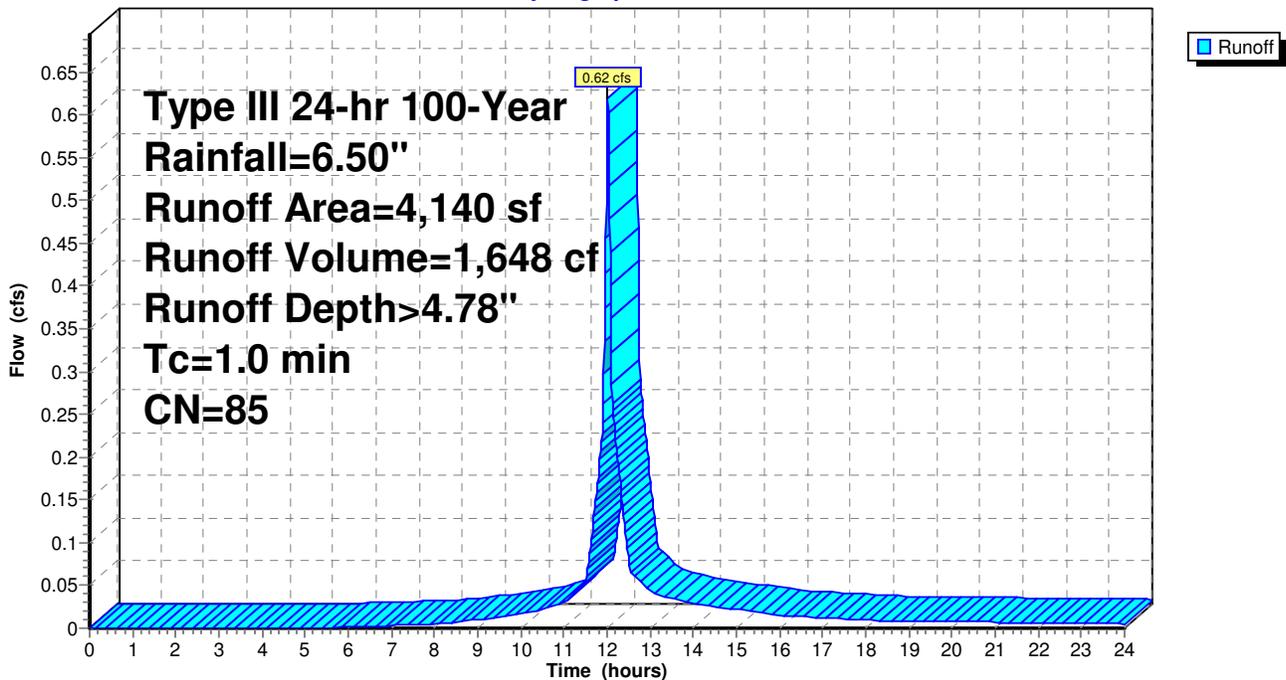
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
700	98	Paved parking & roofs
1,200	98	Paved parking & roofs
2,240	74	>75% Grass cover, Good, HSG C
4,140	85	Weighted Average
2,240		Pervious Area
1,900		Impervious Area

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

**Subcatchment 216S:**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Subcatchment 900: North Offsite flowing onto property**

Runoff = 0.99 cfs @ 12.17 hrs, Volume= 3,752 cf, Depth> 3.20"

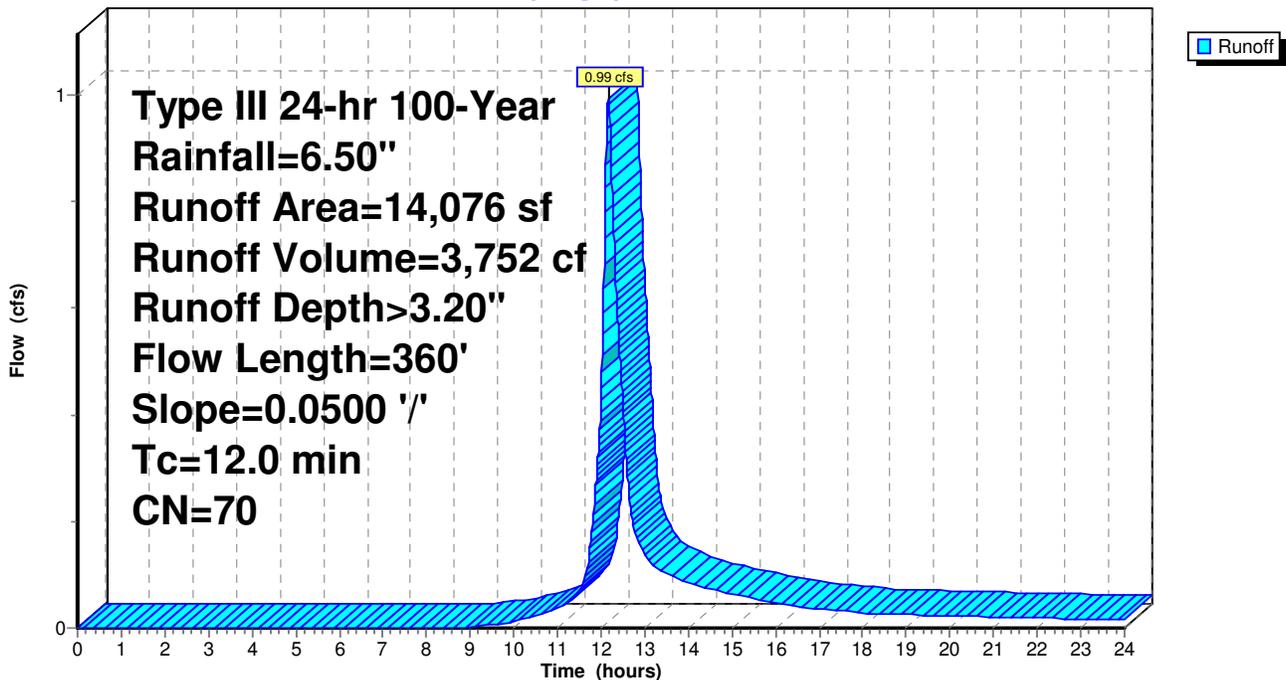
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,076	70	Woods, Good, HSG C
14,076		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	40	0.0500	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	320	0.0500	1.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.0	360	Total			

**Subcatchment 900: North Offsite flowing onto property**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 1R: Existing wetland channel to WF 16**

Inflow Area = 162,206 sf, Inflow Depth > 3.67" for 100-Year event  
Inflow = 10.16 cfs @ 12.16 hrs, Volume= 49,561 cf  
Outflow = 10.14 cfs @ 12.19 hrs, Volume= 49,499 cf, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.14 fps, Min. Travel Time= 1.0 min  
Avg. Velocity = 1.55 fps, Avg. Travel Time= 3.2 min

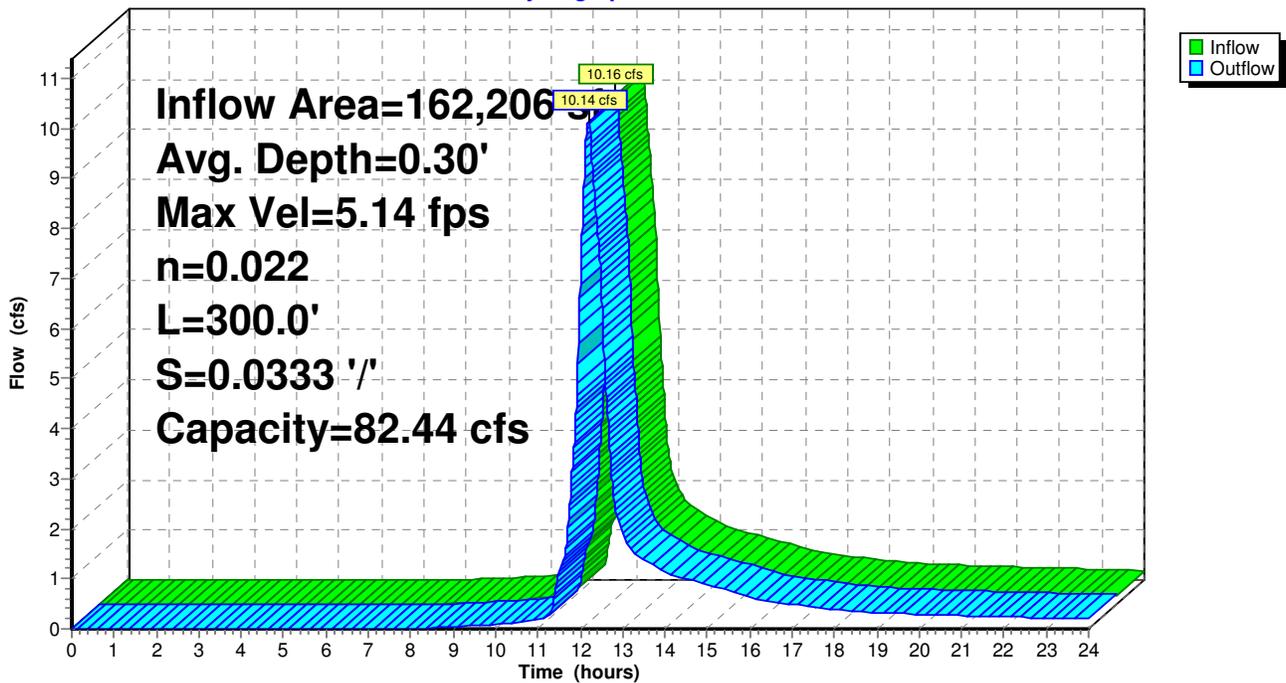
Peak Storage= 592 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.30'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 82.44 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 300.0' Slope= 0.0333 '/'  
Inlet Invert= 96.00', Outlet Invert= 86.00'



**Reach 1R: Existing wetland channel to WF 16**

Hydrograph



# Postdevelopment9c

Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 2R: CB 23 to HW 40

[52] Hint: Inlet conditions not evaluated

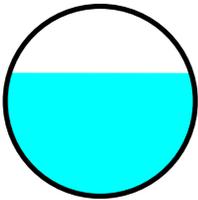
[79] Warning: Submerged Pond 2P Primary device # 2 by 0.81'

Inflow Area = 111,470 sf, Inflow Depth > 3.62" for 100-Year event  
Inflow = 5.99 cfs @ 12.09 hrs, Volume= 33,660 cf  
Outflow = 5.95 cfs @ 12.10 hrs, Volume= 33,654 cf, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.07 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 3.47 fps, Avg. Travel Time= 0.4 min

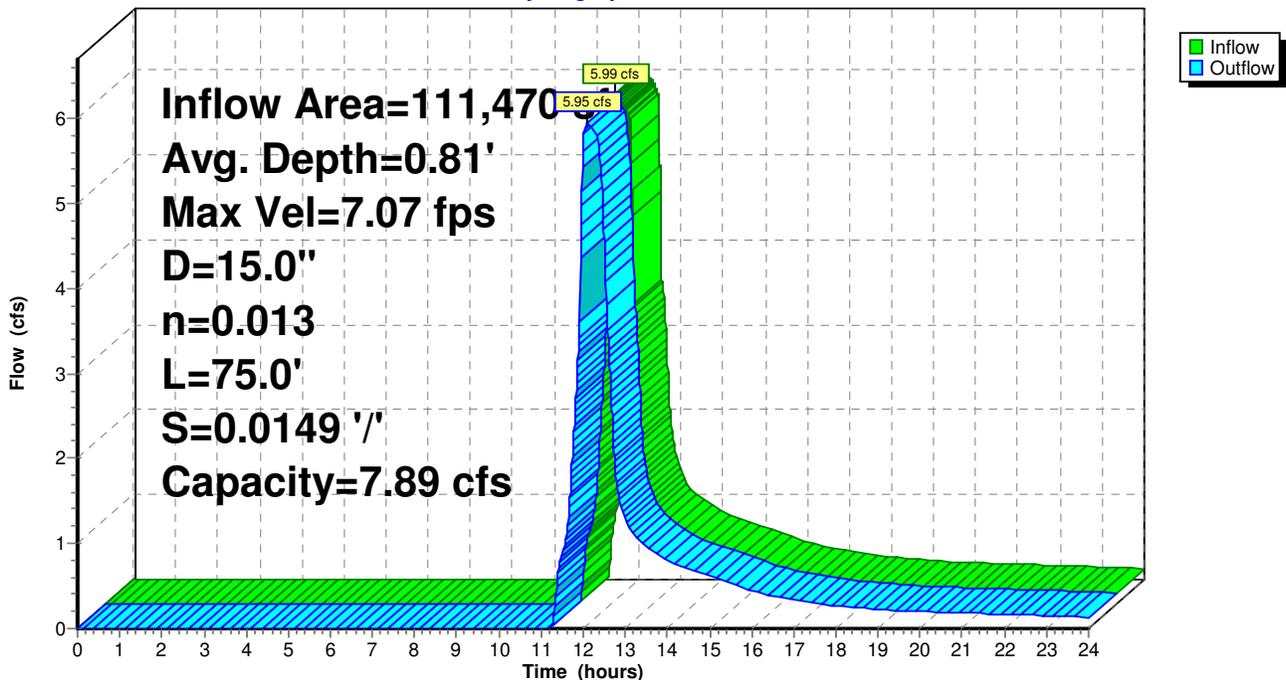
Peak Storage= 63 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.81'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 7.89 cfs

15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 75.0' Slope= 0.0149 '/'  
Inlet Invert= 103.22', Outlet Invert= 102.10'



## Reach 2R: CB 23 to HW 40

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 55R: DMH 52 to DMH 50**

[52] Hint: Inlet conditions not evaluated

[61] Hint: Submerged 47% of Reach 69R bottom

[63] Warning: Exceeded Reach 220R inflow depth by 0.15' @ 12.02 hrs

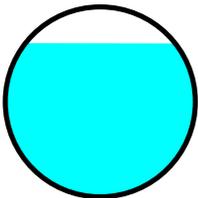
[62] Warning: Submerged 48% of Reach 222R inlet

Inflow Area =	40,720 sf,	Inflow Depth > 4.50"	for 100-Year event
Inflow =	5.77 cfs @ 12.01 hrs,	Volume=	15,281 cf
Outflow =	5.75 cfs @ 12.02 hrs,	Volume=	15,280 cf, Atten= 0%, Lag= 0.2 min

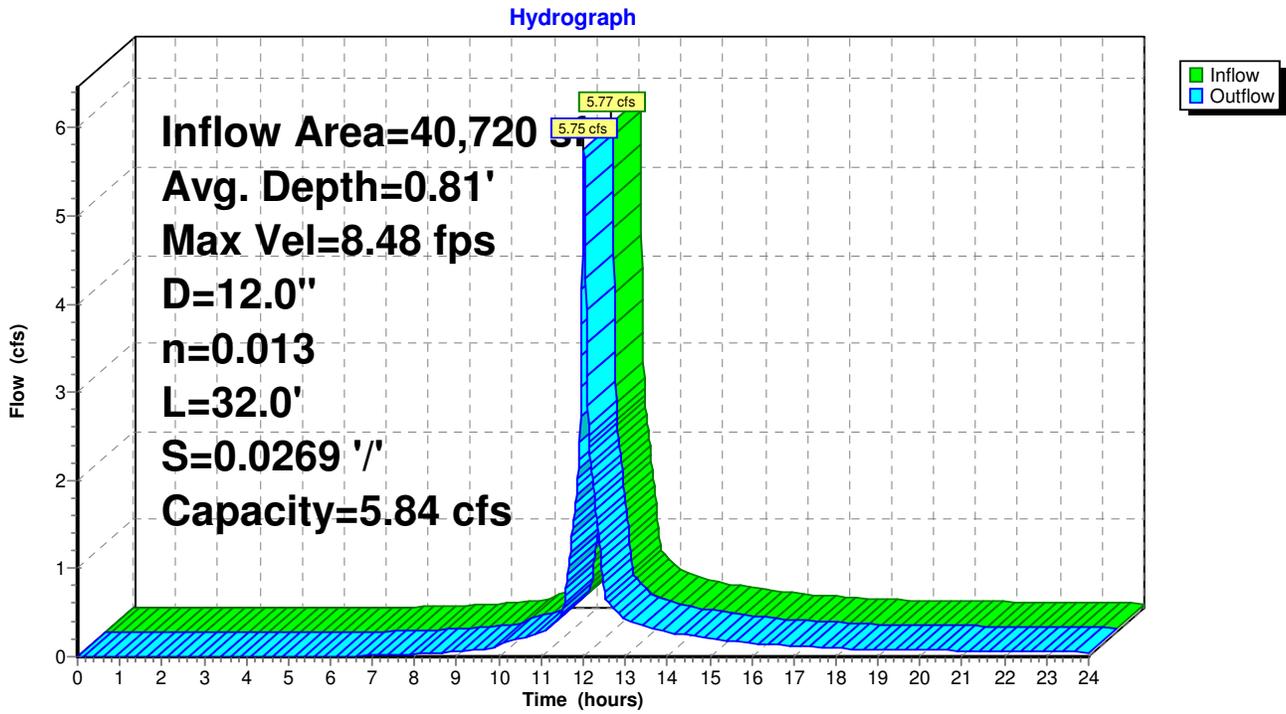
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 8.48 fps, Min. Travel Time= 0.1 min  
 Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.2 min

Peak Storage= 22 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.81'  
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.84 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
 Length= 32.0' Slope= 0.0269 '/'  
 Inlet Invert= 102.48', Outlet Invert= 101.62'



Reach 55R: DMH 52 to DMH 50



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**Reach 62R: DMH 64 to Bio-Retention A (HW 46)**

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 106% of Manning's capacity

[81] Warning: Exceeded Pond 43R by 0.28' @ 12.11 hrs

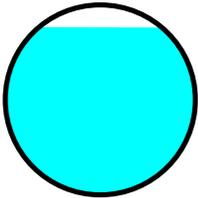
[79] Warning: Submerged Pond 61R Primary device # 1 INLET by 0.54'

Inflow Area =	44,069 sf,	Inflow Depth > 4.15"	for 100-Year event
Inflow =	4.60 cfs @ 12.09 hrs,	Volume=	15,223 cf
Outflow =	4.60 cfs @ 12.09 hrs,	Volume=	15,223 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 6.33 fps, Min. Travel Time= 0.0 min  
 Avg. Velocity = 2.24 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.88'  
 Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.36 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
 Length= 12.0' Slope= 0.0150 '/'  
 Inlet Invert= 110.80', Outlet Invert= 110.62'



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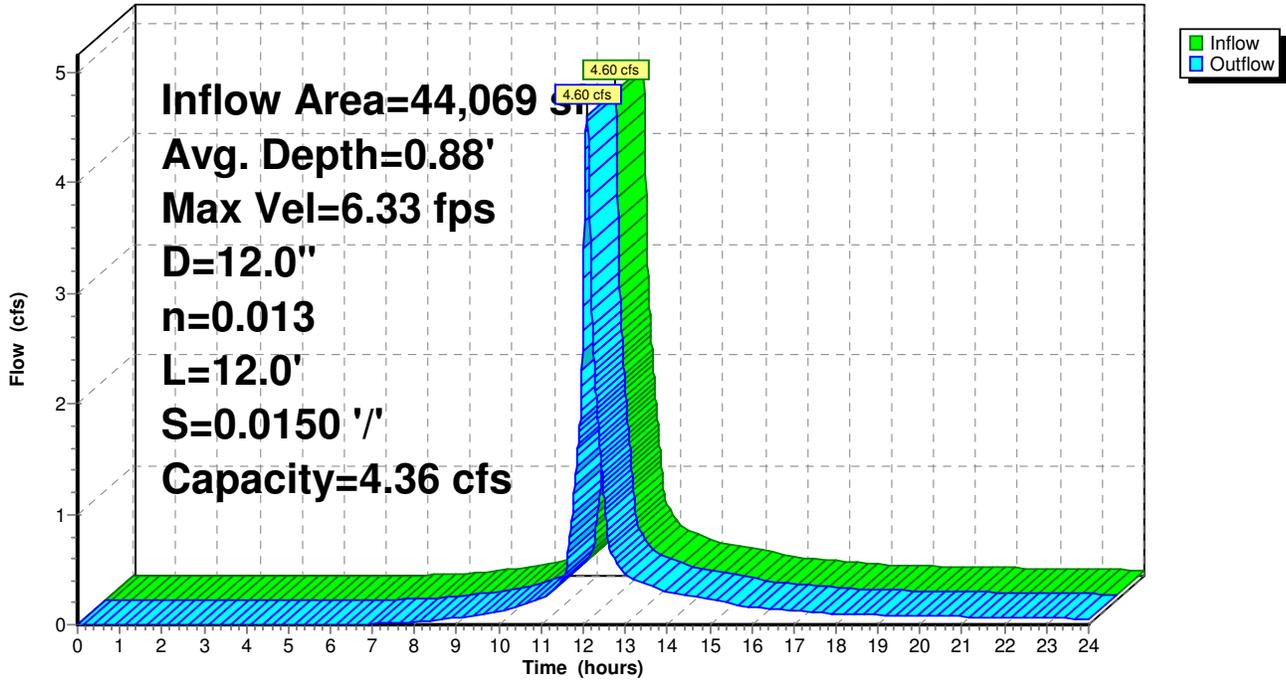
Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 62R: DMH 64 to Bio-Retention A (HW 46)**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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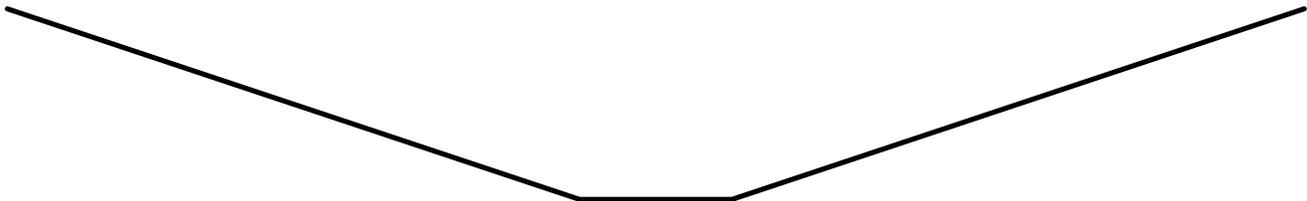
**Reach 64R: Swale from Drive at #12 to RG 10A**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

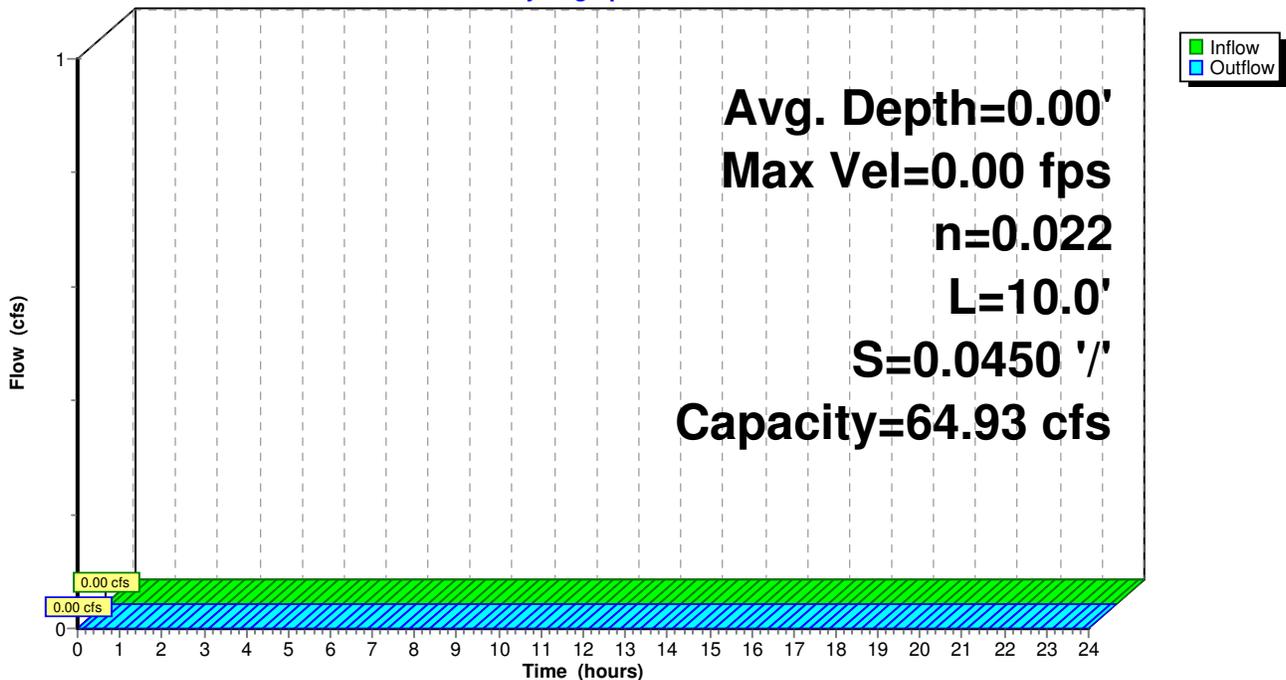
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 108.12', Outlet Invert= 107.67'



**Reach 64R: Swale from Drive at #12 to RG 10A**

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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 67R: Culvert under Unit 12 Drive

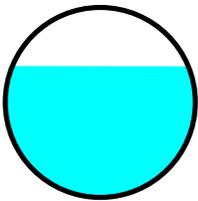
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 4.37" for 100-Year event  
Inflow = 1.00 cfs @ 12.02 hrs, Volume= 2,533 cf  
Outflow = 0.99 cfs @ 12.03 hrs, Volume= 2,533 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.86 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.45 fps, Avg. Travel Time= 0.6 min

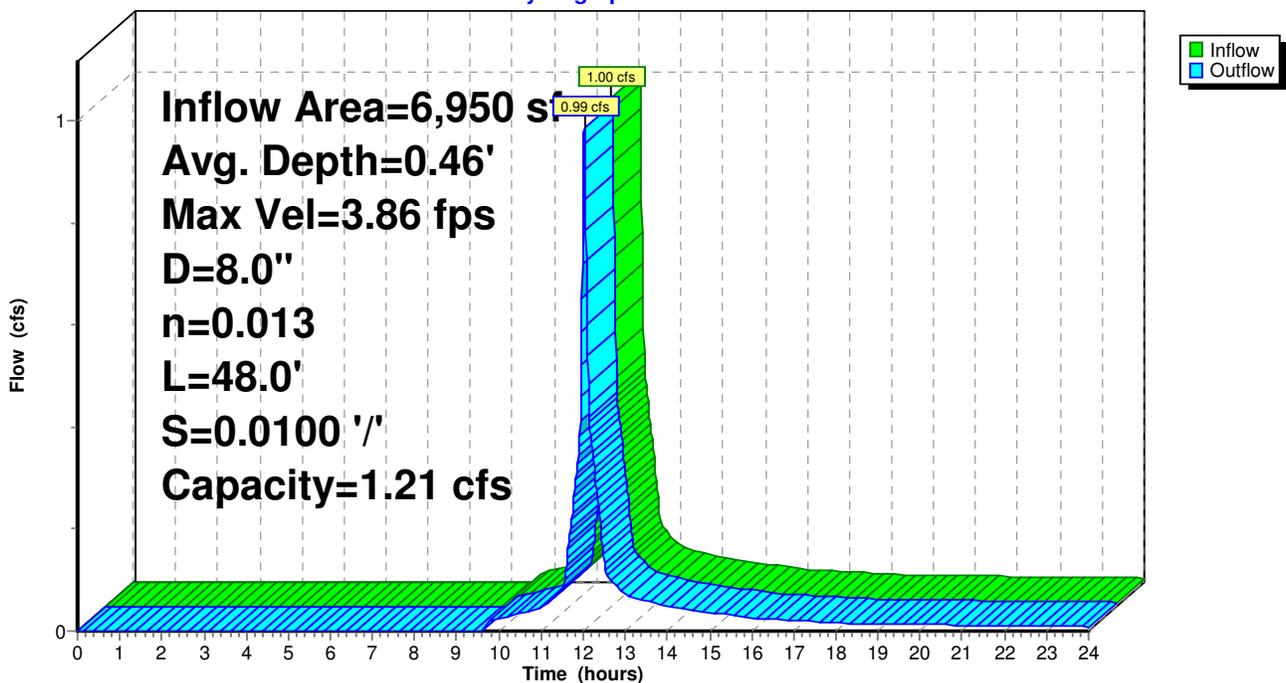
Peak Storage= 12 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.46'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 105.97', Outlet Invert= 105.49'



## Reach 67R: Culvert under Unit 12 Drive

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 68R: Underdrain to CB 66

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 106% of Manning's capacity

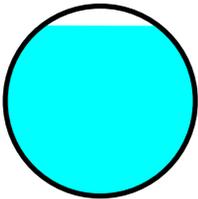
[79] Warning: Submerged Pond 8P Primary device # 7 INLET by 0.85'

Inflow Area = 44,069 sf, Inflow Depth > 4.05" for 100-Year event  
Inflow = 3.15 cfs @ 12.19 hrs, Volume= 14,860 cf  
Outflow = 3.15 cfs @ 12.19 hrs, Volume= 14,859 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 9.67 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 4.56 fps, Avg. Travel Time= 0.1 min

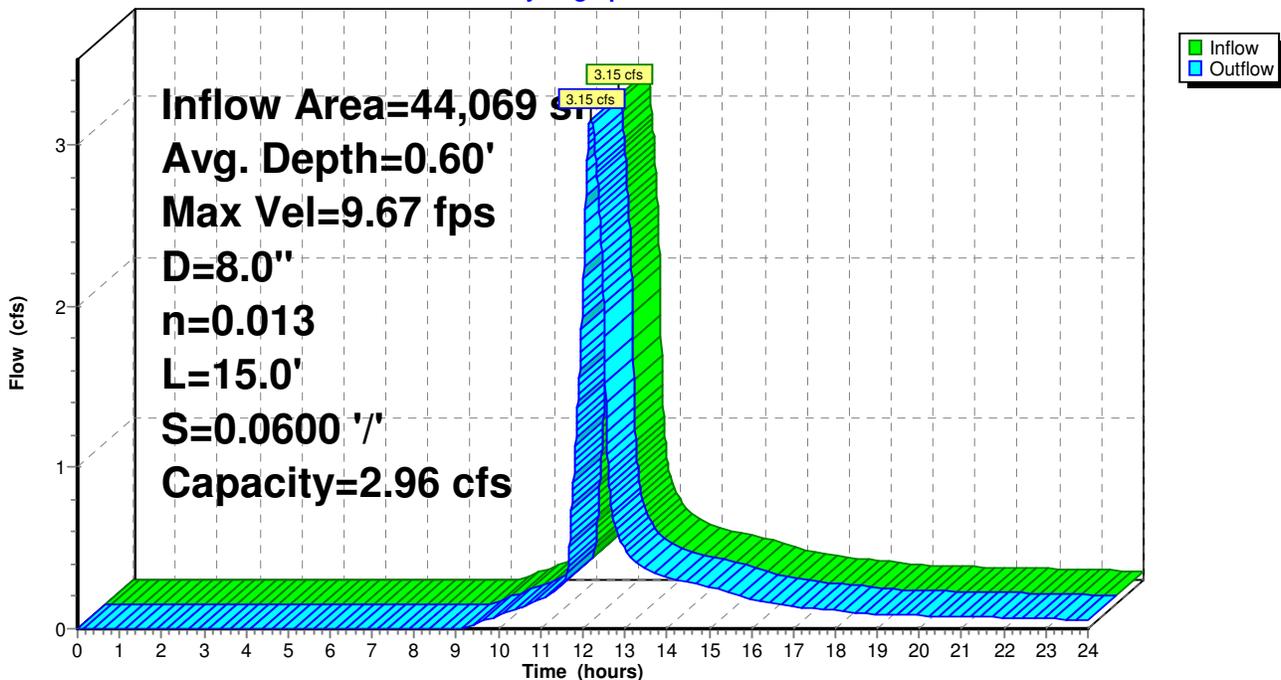
Peak Storage= 5 cf @ 12.19 hrs, Average Depth at Peak Storage= 0.60'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 15.0' Slope= 0.0600 '/'  
Inlet Invert= 107.25', Outlet Invert= 106.35'



## Reach 68R: Underdrain to CB 66

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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 69R: Drain to DMH 52

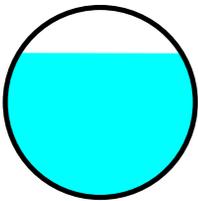
[52] Hint: Inlet conditions not evaluated

Inflow Area = 11,090 sf, Inflow Depth > 4.39" for 100-Year event  
Inflow = 1.58 cfs @ 12.03 hrs, Volume= 4,060 cf  
Outflow = 1.58 cfs @ 12.03 hrs, Volume= 4,060 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.56 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.14 fps, Avg. Travel Time= 0.3 min

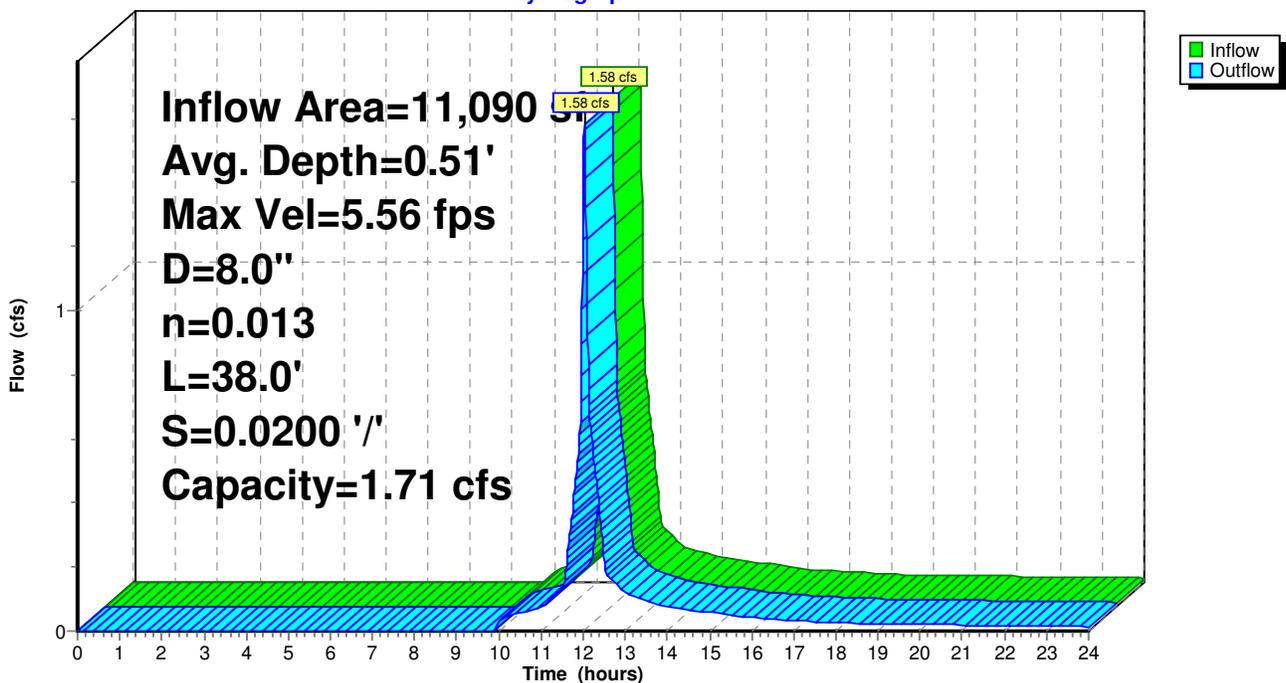
Peak Storage= 11 cf @ 12.03 hrs, Average Depth at Peak Storage= 0.51'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.71 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 38.0' Slope= 0.0200 '/'  
Inlet Invert= 103.69', Outlet Invert= 102.93'



## Reach 69R: Drain to DMH 52

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## Reach 114R: DMH 16 to DMH 14

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 111P Primary device # 1 INLET by 0.18'

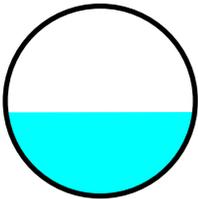
[79] Warning: Submerged Pond 112P Primary device # 1 INLET by 0.12'

Inflow Area = 10,678 sf, Inflow Depth > 4.96" for 100-Year event  
Inflow = 1.66 cfs @ 12.01 hrs, Volume= 4,413 cf  
Outflow = 1.64 cfs @ 12.01 hrs, Volume= 4,412 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.96 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.6 min

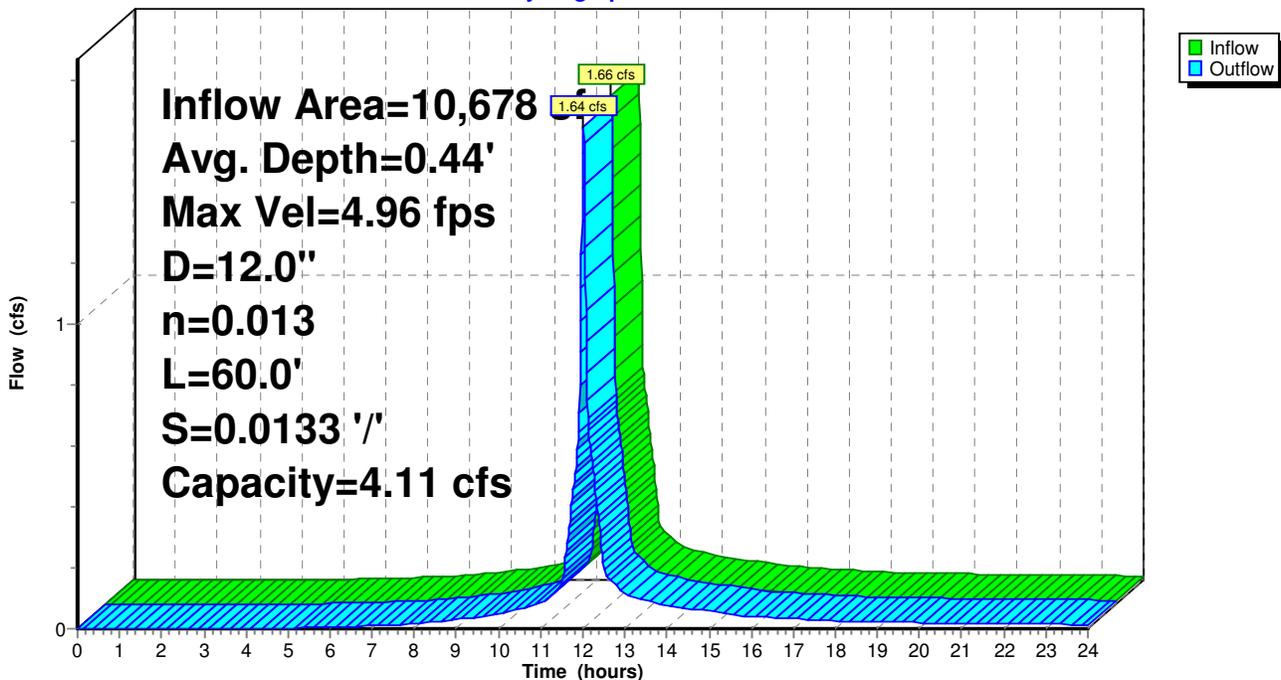
Peak Storage= 20 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.44'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.11 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 60.0' Slope= 0.0133 '/'  
Inlet Invert= 103.48', Outlet Invert= 102.68'



## Reach 114R: DMH 16 to DMH 14

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## Reach 118R: Swale from Drive at #4 to RG 116

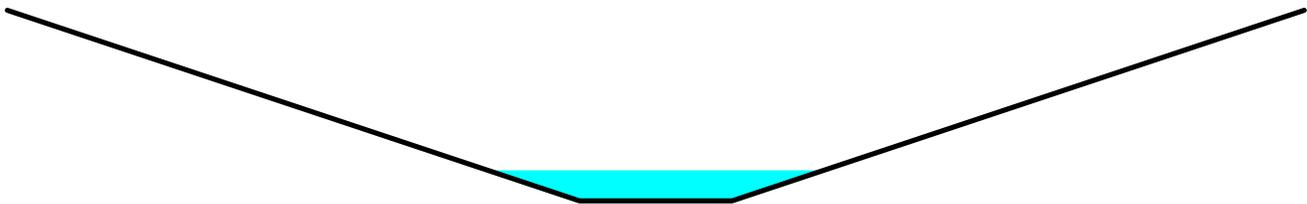
[62] Warning: Submerged 20% of Reach 119R inlet

Inflow Area = 18,760 sf, Inflow Depth > 4.86" for 100-Year event  
Inflow = 1.26 cfs @ 11.93 hrs, Volume= 7,591 cf  
Outflow = 1.25 cfs @ 11.93 hrs, Volume= 7,591 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3  
Max. Velocity= 3.89 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.61 fps, Avg. Travel Time= 0.1 min

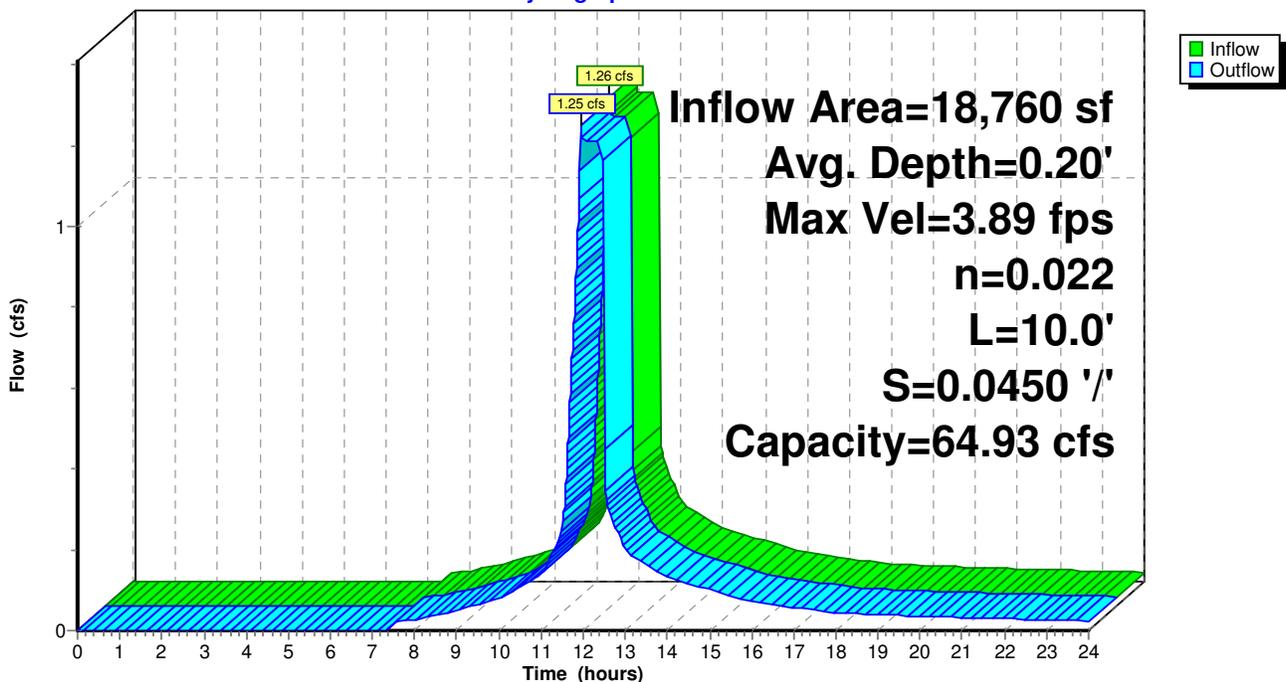
Peak Storage= 3 cf @ 11.93 hrs, Average Depth at Peak Storage= 0.20'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 ' / ' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 ' / '  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 118R: Swale from Drive at #4 to RG 116

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## Reach 119R: Culvert under Unit 4 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 180% of Manning's capacity

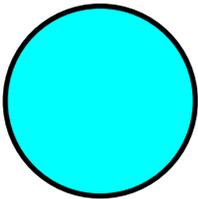
[76] Warning: Detained 566 cf (Pond w/culvert advised)

Inflow Area = 18,760 sf, Inflow Depth > 4.86" for 100-Year event  
Inflow = 2.18 cfs @ 12.01 hrs, Volume= 7,591 cf  
Outflow = 1.26 cfs @ 11.93 hrs, Volume= 7,591 cf, Atten= 42%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.94 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.3 min

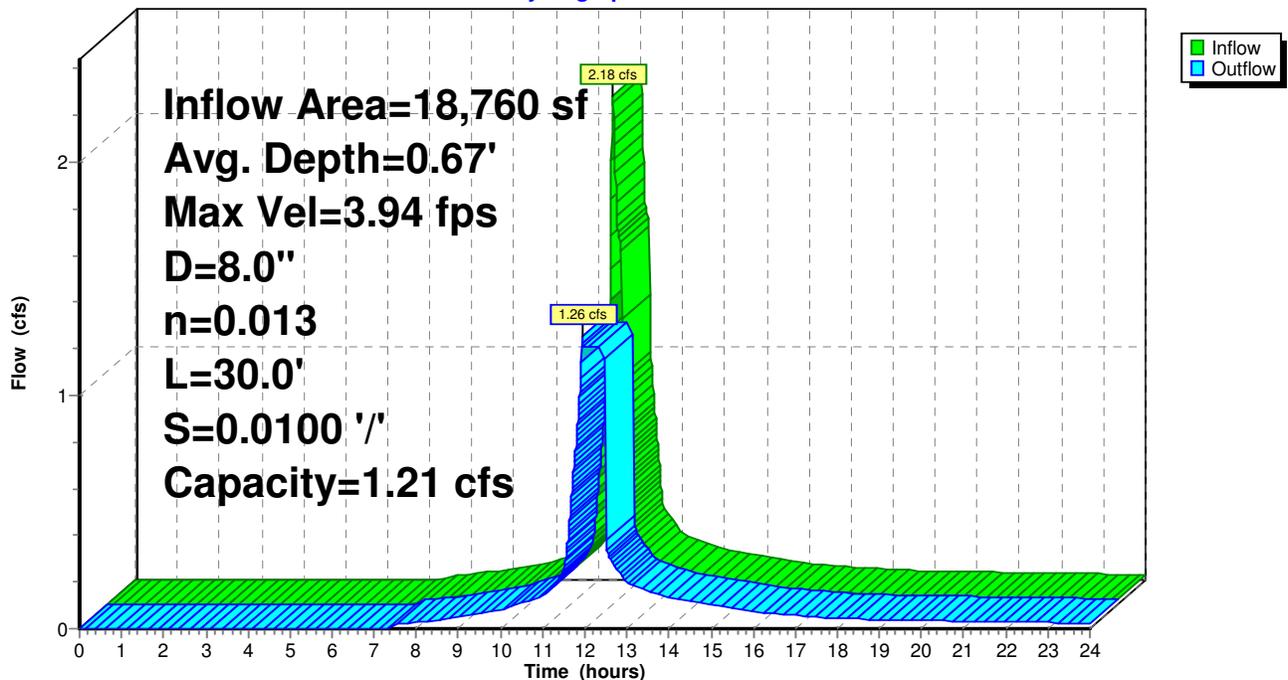
Peak Storage= 10 cf @ 11.94 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 111.30', Outlet Invert= 111.00'



## Reach 119R: Culvert under Unit 4 Drive

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## Reach 127R: Swale from Drive at #3 to RG 118

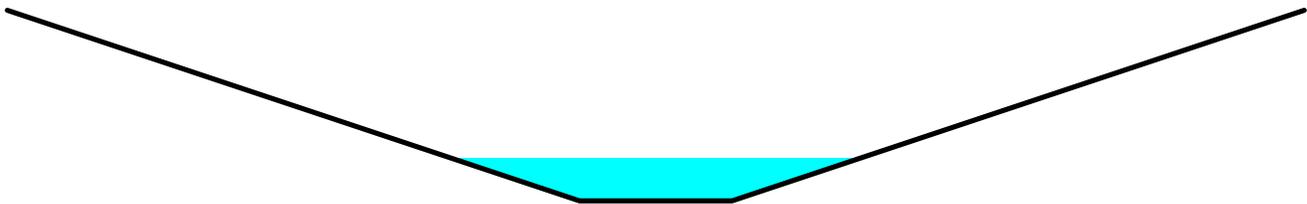
[61] Hint: Submerged 26% of Reach 128R bottom

Inflow Area = 20,516 sf, Inflow Depth > 4.38" for 100-Year event  
Inflow = 2.44 cfs @ 12.00 hrs, Volume= 7,481 cf  
Outflow = 2.42 cfs @ 12.00 hrs, Volume= 7,480 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.68 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 1.66 fps, Avg. Travel Time= 0.1 min

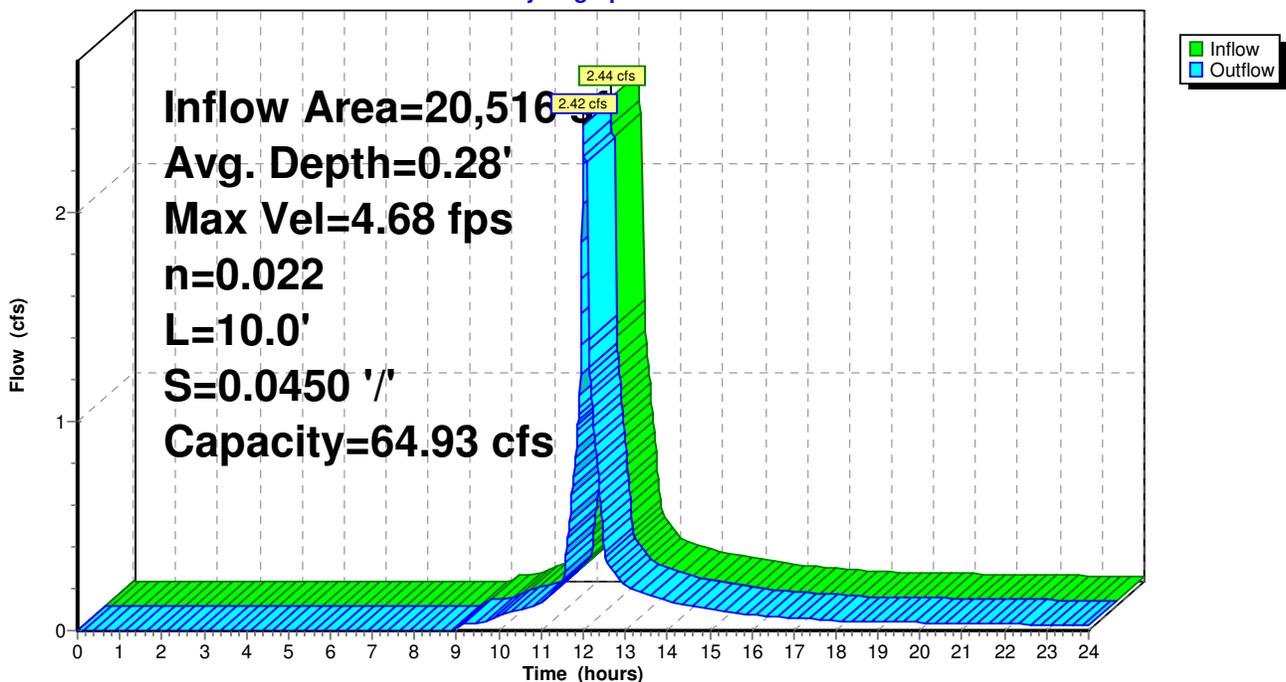
Peak Storage= 5 cf @ 12.00 hrs, Average Depth at Peak Storage= 0.28'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 ' / ' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 ' / '  
Inlet Invert= 111.23', Outlet Invert= 110.78'



## Reach 127R: Swale from Drive at #3 to RG 118

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## Reach 128R: Culvert under Unit 3 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 120% of Manning's capacity

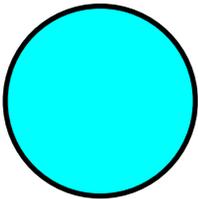
[76] Warning: Detained 71 cf (Pond w/culvert advised)

Inflow Area = 20,516 sf, Inflow Depth > 4.38" for 100-Year event  
Inflow = 2.74 cfs @ 12.02 hrs, Volume= 7,481 cf  
Outflow = 2.44 cfs @ 12.00 hrs, Volume= 7,481 cf, Atten= 11%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.45 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 3.08 fps, Avg. Travel Time= 0.2 min

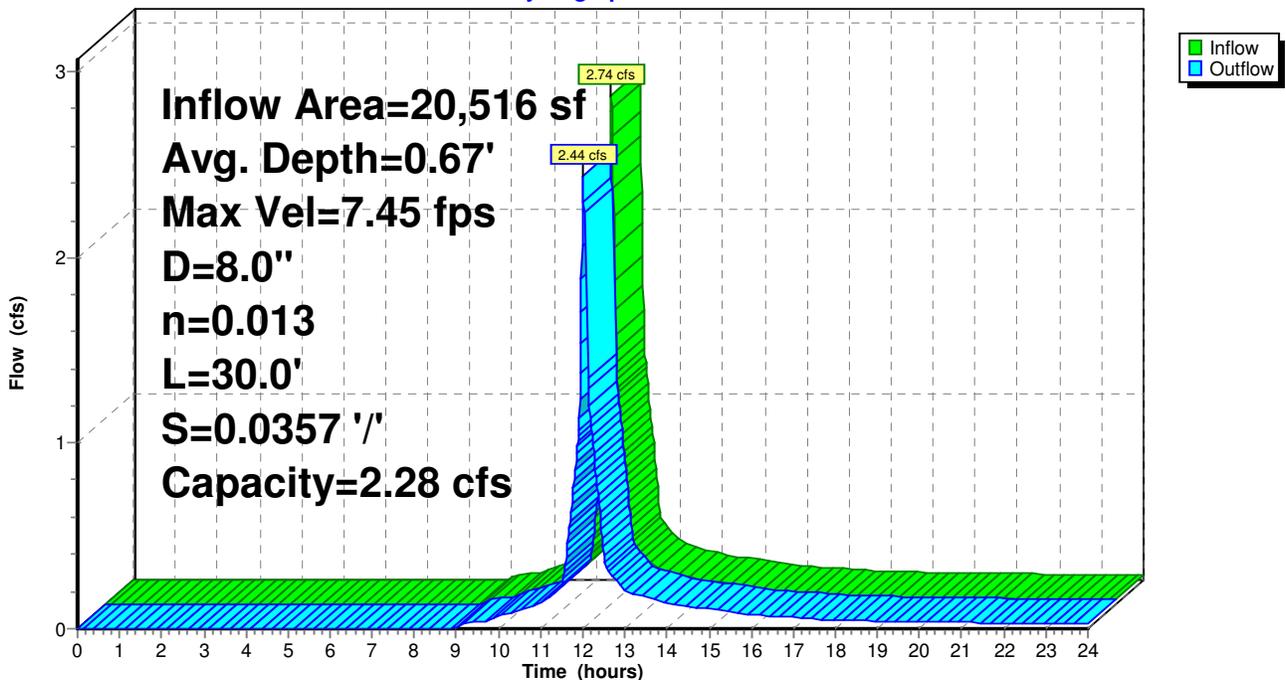
Peak Storage= 10 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.28 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0357 '/'  
Inlet Invert= 112.30', Outlet Invert= 111.23'



## Reach 128R: Culvert under Unit 3 Drive

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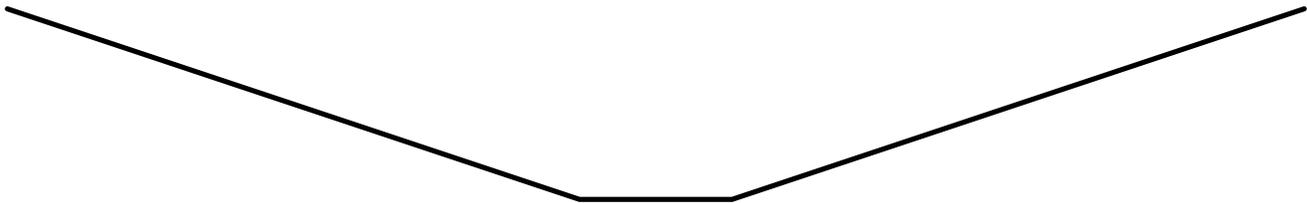
**Reach 129R: Swale from Drive at #20 to RG 124**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

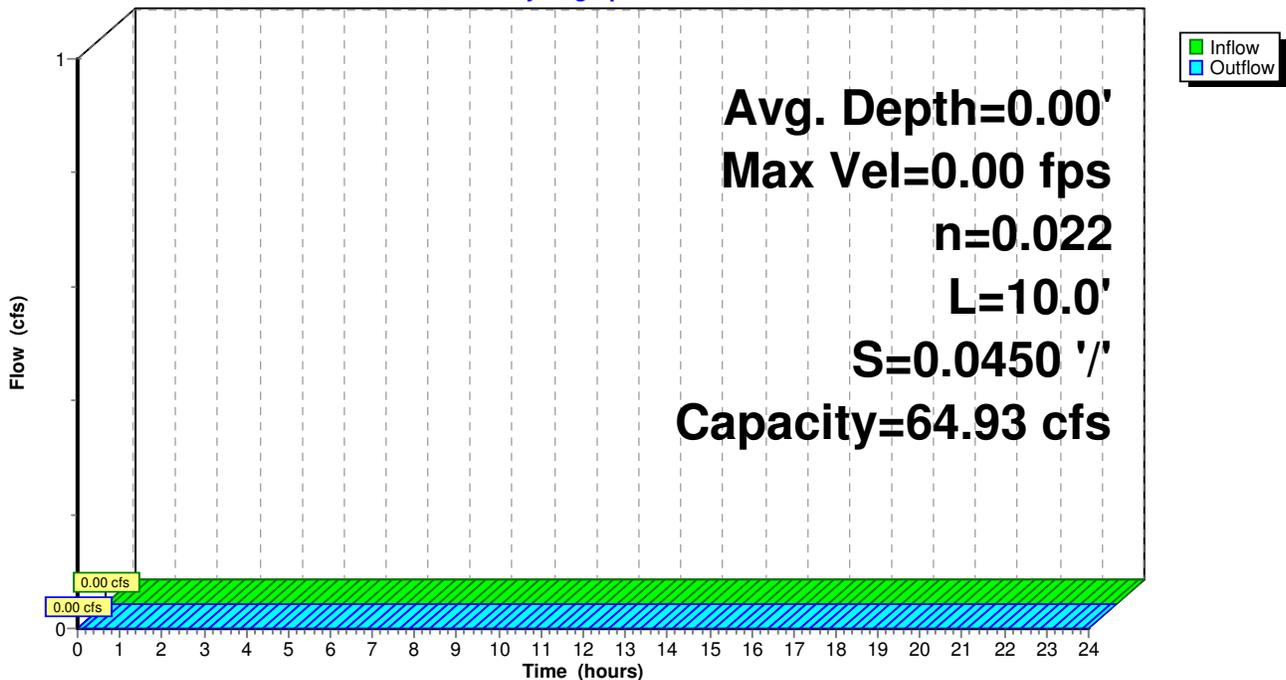
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 64.93 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 10.0' Slope= 0.0450 '/'  
Inlet Invert= 115.49', Outlet Invert= 115.04'



**Reach 129R: Swale from Drive at #20 to RG 124**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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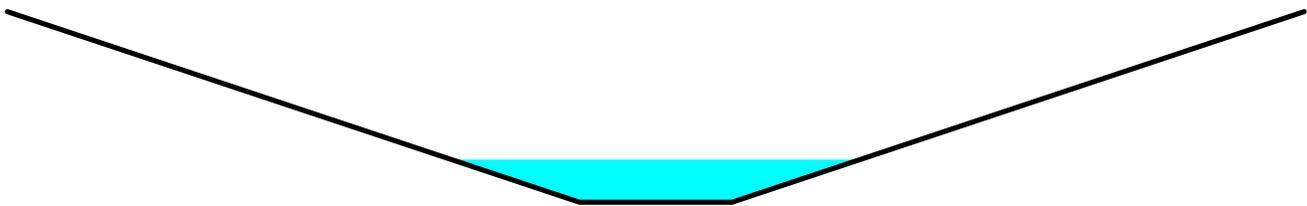
**Reach 130R: Swale to RG 122**

Inflow Area = 14,450 sf, Inflow Depth > 4.60" for 100-Year event  
Inflow = 2.17 cfs @ 12.01 hrs, Volume= 5,545 cf  
Outflow = 2.14 cfs @ 12.02 hrs, Volume= 5,544 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.17 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.38 fps, Avg. Travel Time= 0.4 min

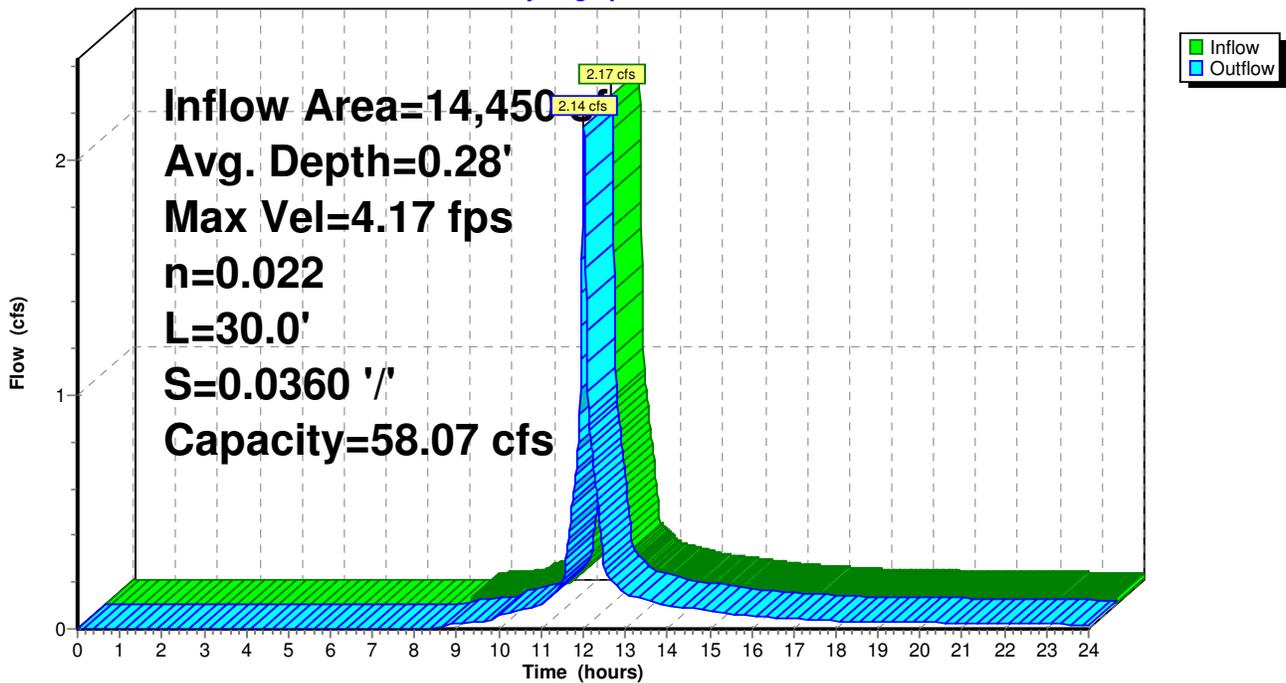
Peak Storage= 15 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.28'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 58.07 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 30.0' Slope= 0.0360 '/'  
Inlet Invert= 114.25', Outlet Invert= 113.17'



**Reach 130R: Swale to RG 122**

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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 131R: Culvert under Unit 20 Drive

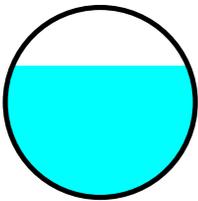
[52] Hint: Inlet conditions not evaluated

Inflow Area = 6,950 sf, Inflow Depth > 4.35" for 100-Year event  
Inflow = 1.01 cfs @ 12.01 hrs, Volume= 2,520 cf  
Outflow = 0.99 cfs @ 12.02 hrs, Volume= 2,520 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.87 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.45 fps, Avg. Travel Time= 0.6 min

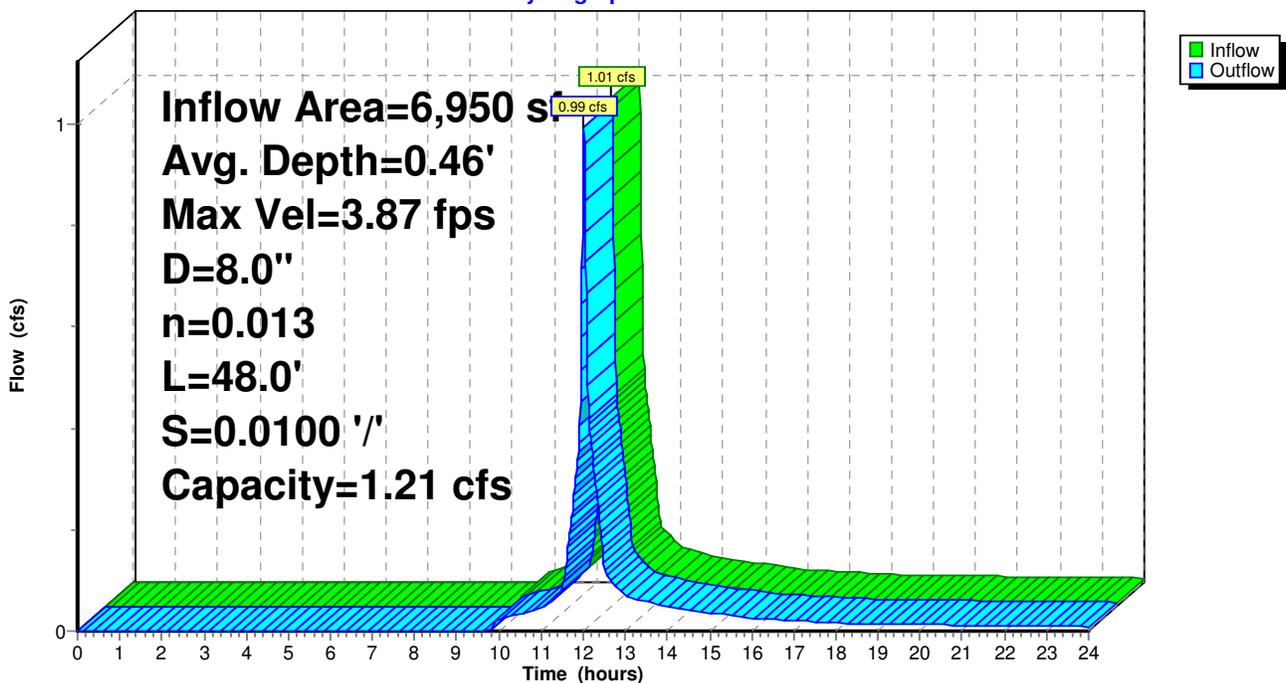
Peak Storage= 12 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.46'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 48.0' Slope= 0.0100 '/'  
Inlet Invert= 115.97', Outlet Invert= 115.49'



## Reach 131R: Culvert under Unit 20 Drive

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 137R: Swale Back of 7,6,5**

Inflow Area = 13,850 sf, Inflow Depth > 4.13" for 100-Year event  
Inflow = 1.70 cfs @ 12.05 hrs, Volume= 4,763 cf  
Outflow = 1.66 cfs @ 12.08 hrs, Volume= 4,756 cf, Atten= 2%, Lag= 2.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 1.96 fps, Min. Travel Time= 1.2 min  
Avg. Velocity = 0.54 fps, Avg. Travel Time= 4.3 min

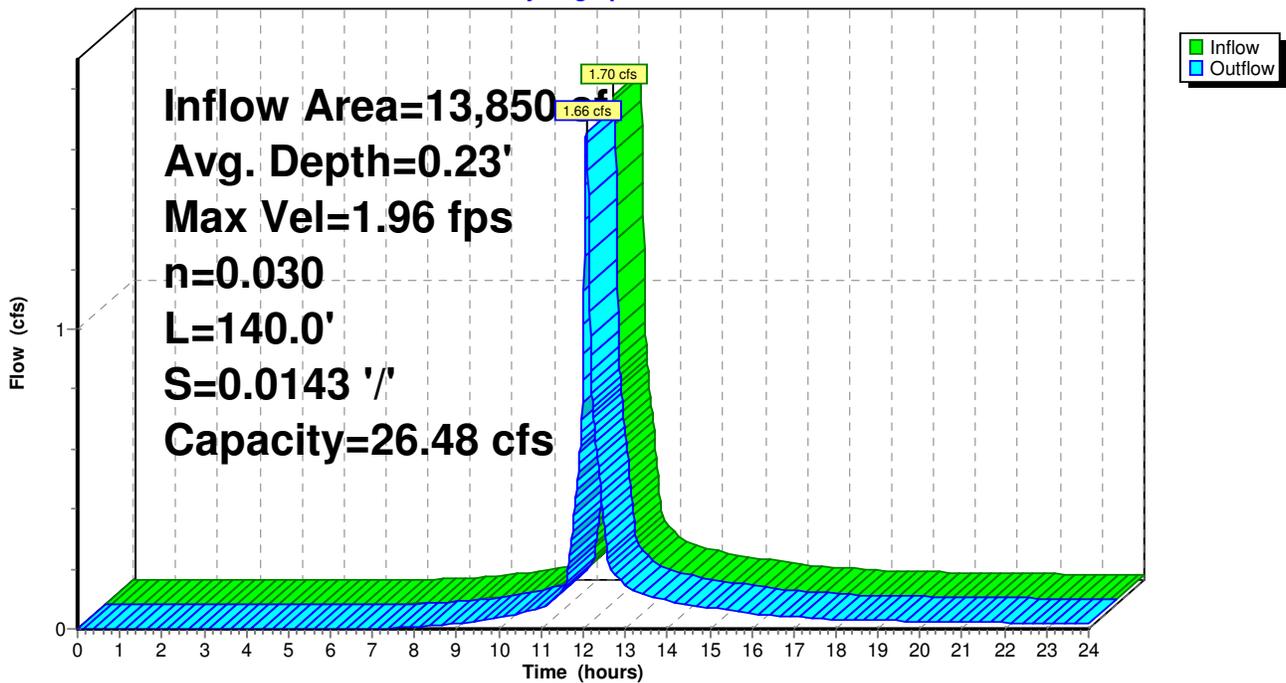
Peak Storage= 119 cf @ 12.06 hrs, Average Depth at Peak Storage= 0.23'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 26.48 cfs

3.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 9.00'  
Length= 140.0' Slope= 0.0143 '/'  
Inlet Invert= 118.00', Outlet Invert= 116.00'



**Reach 137R: Swale Back of 7,6,5**

Hydrograph



# Postdevelopment9c

Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 138R: Swale Back of 4

[61] Hint: Submerged 23% of Reach 137R bottom

Inflow Area = 34,910 sf, Inflow Depth > 3.94" for 100-Year event  
Inflow = 3.67 cfs @ 12.02 hrs, Volume= 11,452 cf  
Outflow = 3.62 cfs @ 12.06 hrs, Volume= 11,438 cf, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 2.31 fps, Min. Travel Time= 1.0 min  
Avg. Velocity = 0.74 fps, Avg. Travel Time= 3.2 min

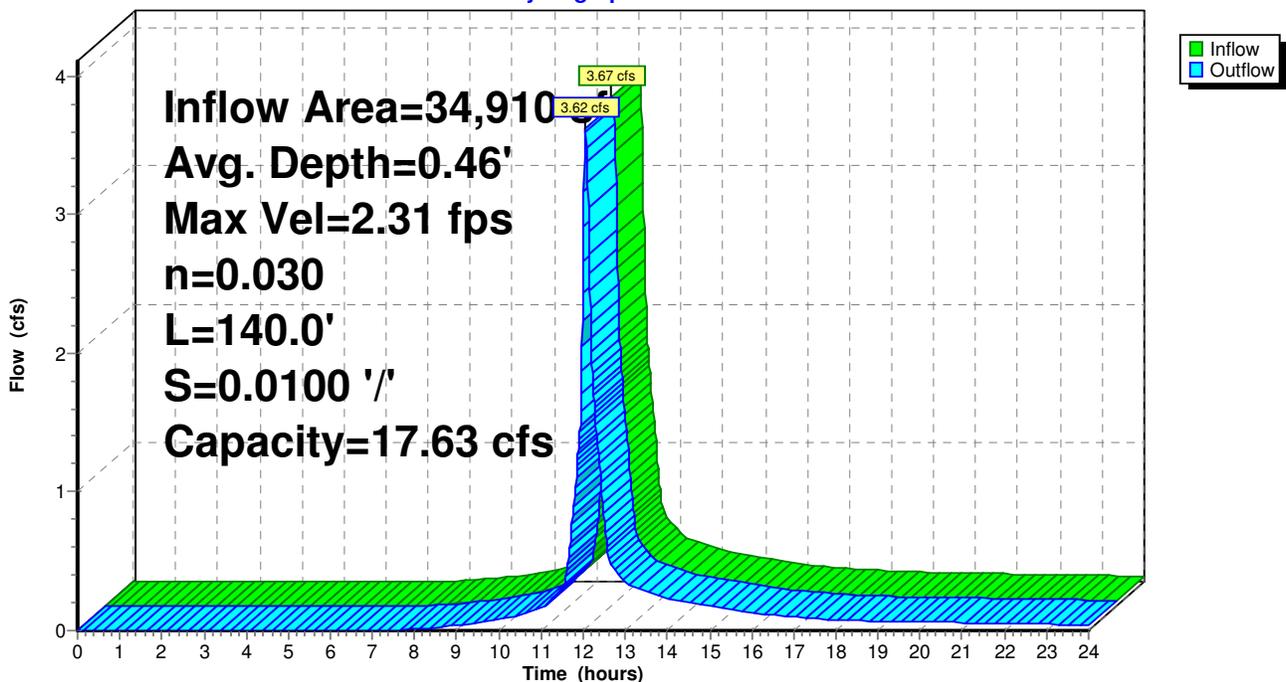
Peak Storage= 219 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.46'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 17.63 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding  
Side Slope Z-value= 3.0 '/' Top Width= 8.00'  
Length= 140.0' Slope= 0.0100 '/'  
Inlet Invert= 116.00', Outlet Invert= 114.60'



## Reach 138R: Swale Back of 4

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 149R: DMH 14 to DMH 12

[52] Hint: Inlet conditions not evaluated

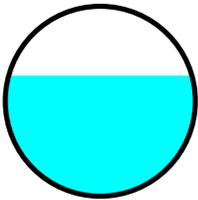
[62] Warning: Submerged 5% of Reach 114R inlet

Inflow Area = 91,524 sf, Inflow Depth > 4.43" for 100-Year event  
Inflow = 9.41 cfs @ 12.03 hrs, Volume= 33,770 cf  
Outflow = 9.39 cfs @ 12.04 hrs, Volume= 33,764 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.94 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 2.73 fps, Avg. Travel Time= 0.6 min

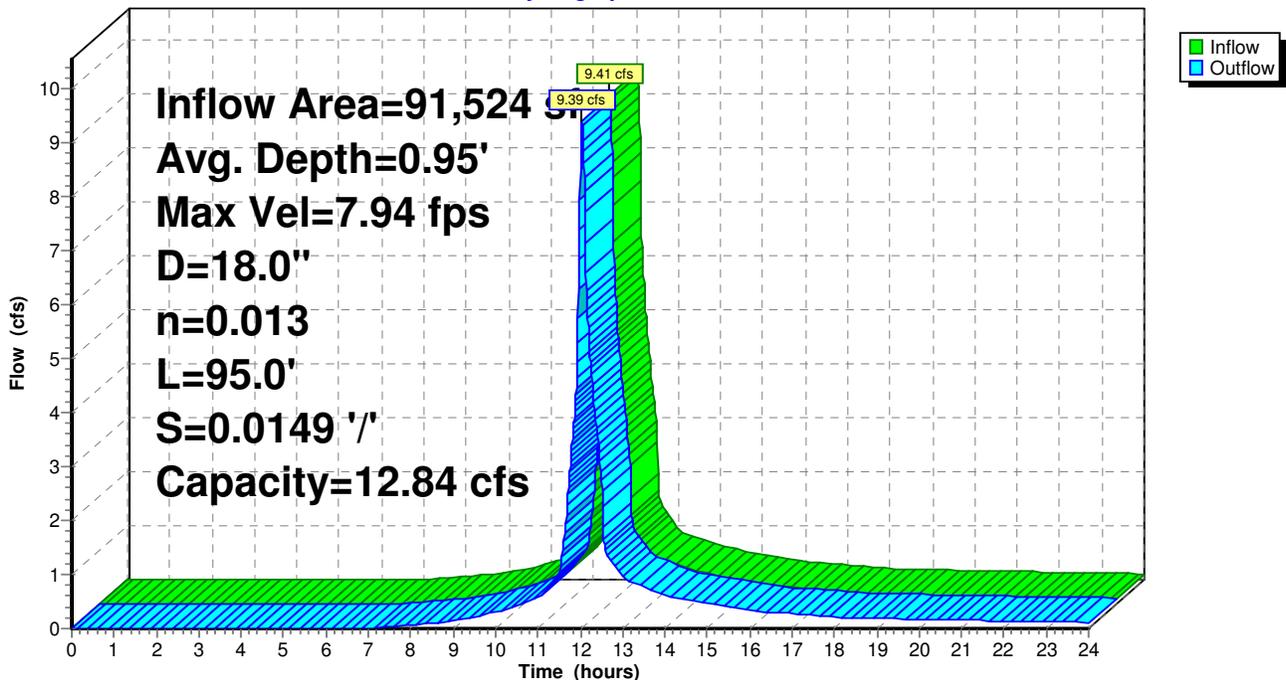
Peak Storage= 113 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.95'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.84 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 95.0' Slope= 0.0149 '/'  
Inlet Invert= 102.58', Outlet Invert= 101.16'



## Reach 149R: DMH 14 to DMH 12

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 150R: DMH 12 to HW 10 - Outlet

[52] Hint: Inlet conditions not evaluated

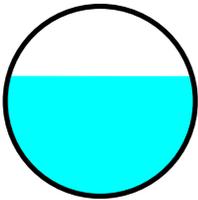
[61] Hint: Submerged 60% of Reach 149R bottom

Inflow Area = 91,524 sf, Inflow Depth > 4.43" for 100-Year event  
Inflow = 9.39 cfs @ 12.04 hrs, Volume= 33,764 cf  
Outflow = 9.38 cfs @ 12.04 hrs, Volume= 33,761 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 7.96 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.74 fps, Avg. Travel Time= 0.3 min

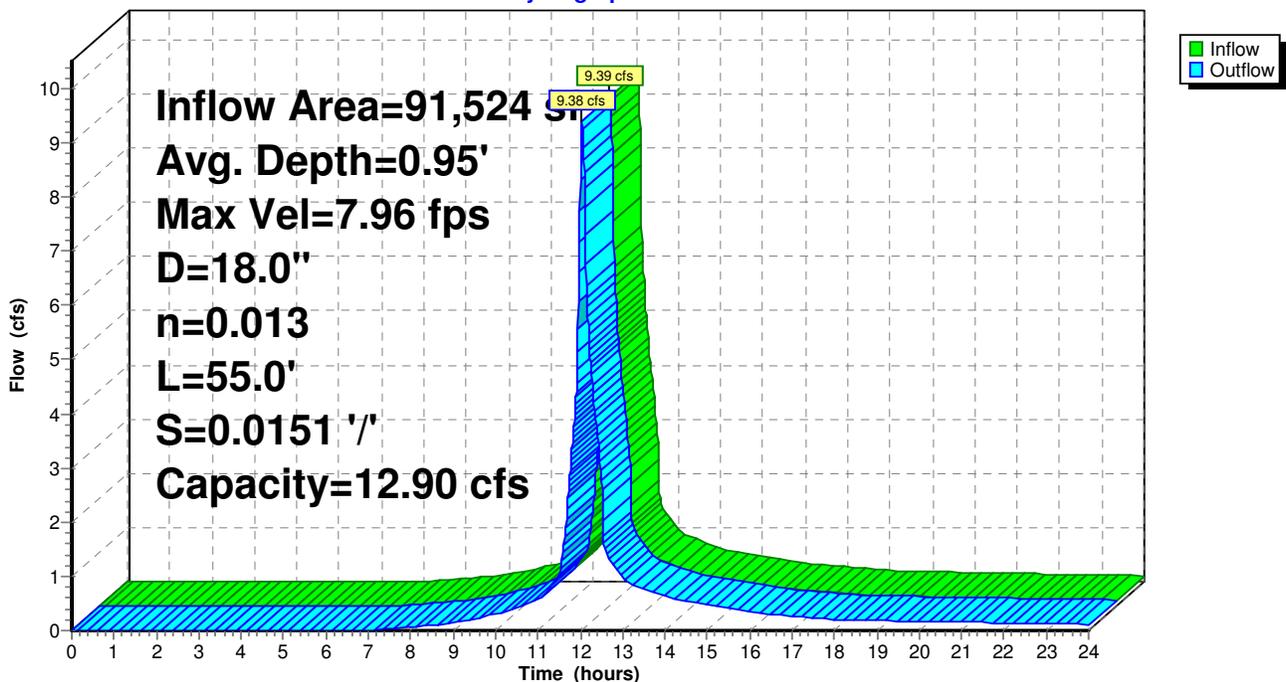
Peak Storage= 65 cf @ 12.04 hrs, Average Depth at Peak Storage= 0.95'  
Bank-Full Depth= 1.50', Capacity at Bank-Full= 12.90 cfs

18.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 55.0' Slope= 0.0151 '/'  
Inlet Invert= 101.06', Outlet Invert= 100.23'



## Reach 150R: DMH 12 to HW 10 - Outlet

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 153R: CB 116 to DMH 14**

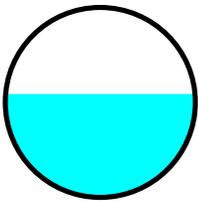
[52] Hint: Inlet conditions not evaluated

Inflow Area = 21,810 sf, Inflow Depth > 4.90" for 100-Year event  
Inflow = 1.71 cfs @ 12.01 hrs, Volume= 8,903 cf  
Outflow = 1.71 cfs @ 12.01 hrs, Volume= 8,903 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 8.78 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.1 min

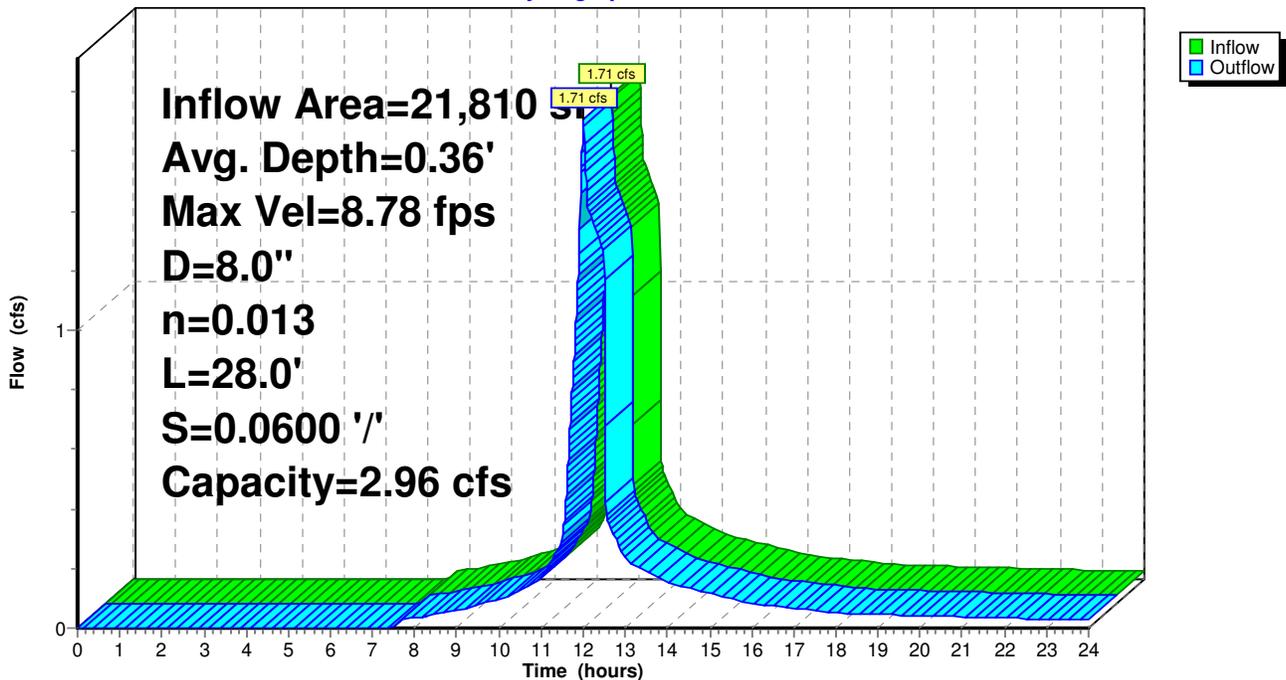
Peak Storage= 5 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.36'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 2.96 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 28.0' Slope= 0.0600 '/'  
Inlet Invert= 107.12', Outlet Invert= 105.44'



**Reach 153R: CB 116 to DMH 14**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Reach 154R: Swale from Drive at #6 to RG 126**

[43] Hint: Has no inflow (Outflow=Zero)

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'

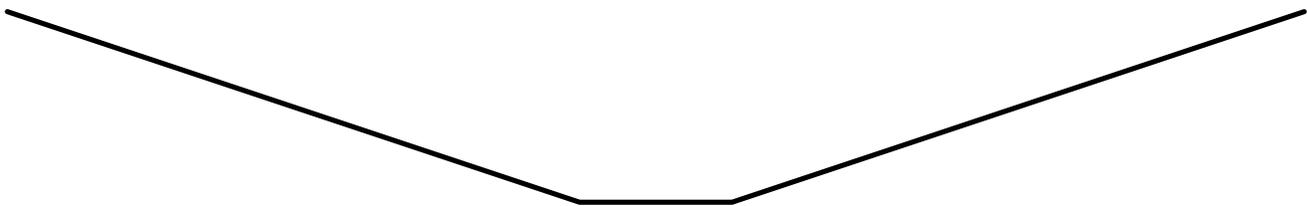
Bank-Full Depth= 1.25', Capacity at Bank-Full= 29.18 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 3.0 '/' Top Width= 8.50'

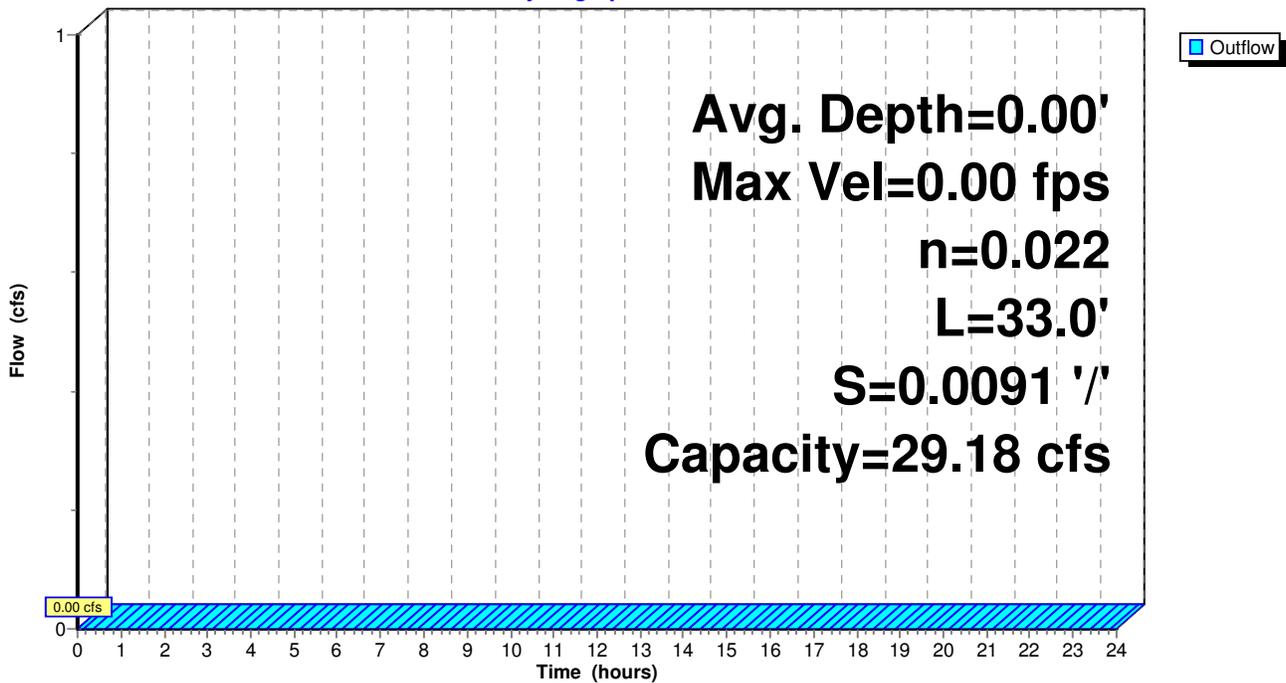
Length= 33.0' Slope= 0.0091 '/'

Inlet Invert= 116.75', Outlet Invert= 116.45'



**Reach 154R: Swale from Drive at #6 to RG 126**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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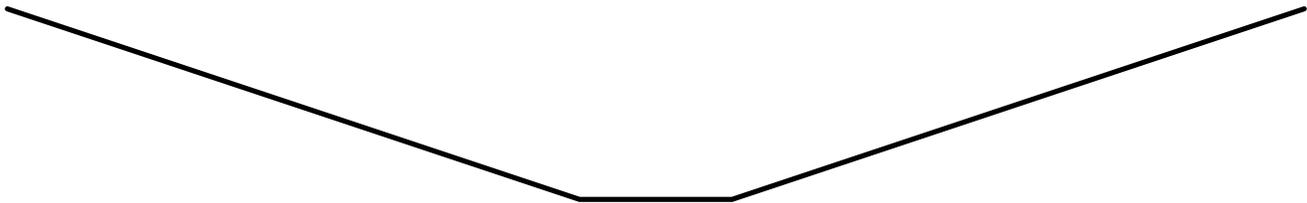
**Reach 155R: Swale from Drive at #5 to RG 120**

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min  
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

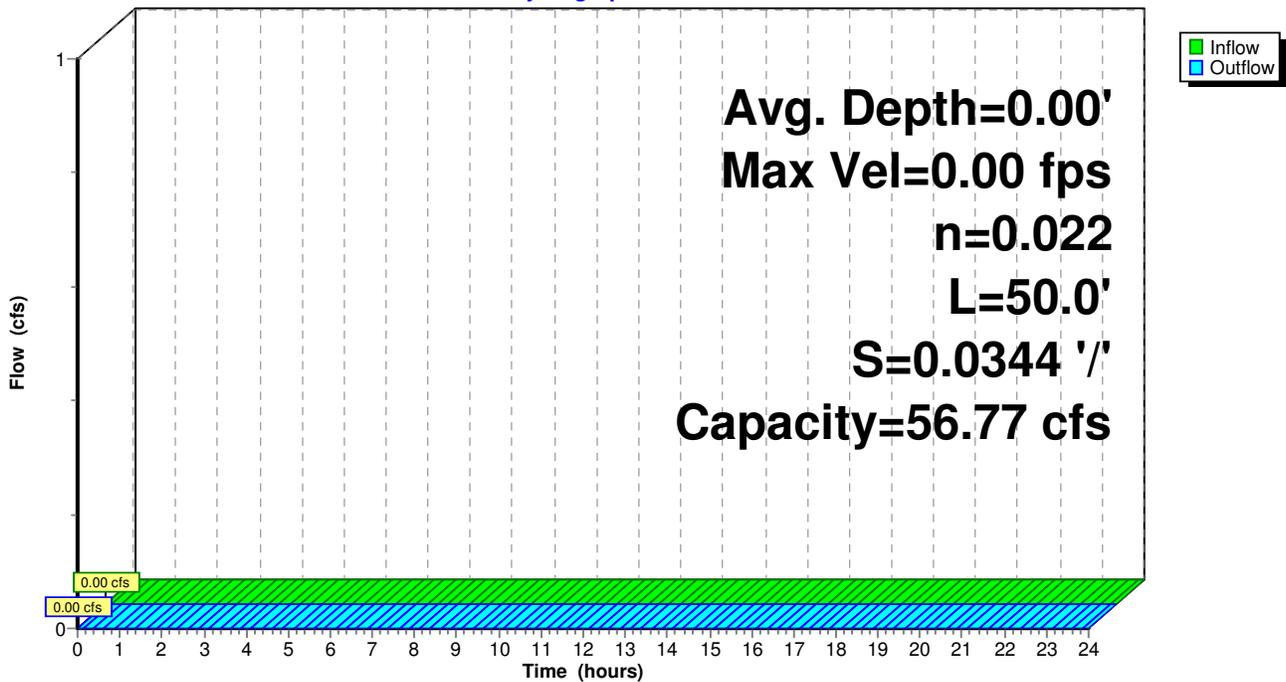
Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'  
Bank-Full Depth= 1.25', Capacity at Bank-Full= 56.77 cfs

1.00' x 1.25' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 3.0 '/' Top Width= 8.50'  
Length= 50.0' Slope= 0.0344 '/'  
Inlet Invert= 115.27', Outlet Invert= 113.55'



**Reach 155R: Swale from Drive at #5 to RG 120**

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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 156R: Culvert under Unit 5 Drive

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 141% of Manning's capacity

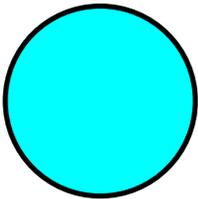
[76] Warning: Detained 145 cf (Pond w/culvert advised)

Inflow Area = 12,570 sf, Inflow Depth > 4.83" for 100-Year event  
Inflow = 1.70 cfs @ 12.03 hrs, Volume= 5,058 cf  
Outflow = 1.21 cfs @ 11.99 hrs, Volume= 5,057 cf, Atten= 29%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 3.95 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.69 fps, Avg. Travel Time= 0.3 min

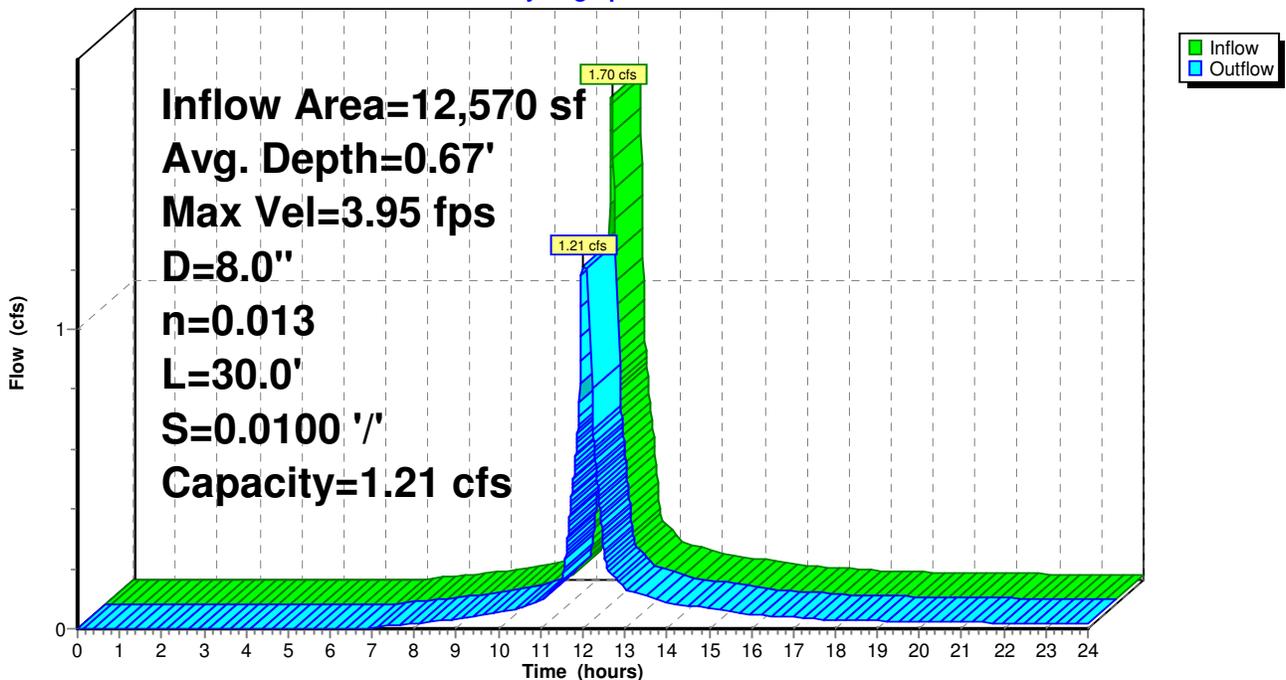
Peak Storage= 10 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.67'  
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.21 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0100 '/'  
Inlet Invert= 115.57', Outlet Invert= 115.27'



## Reach 156R: Culvert under Unit 5 Drive

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**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

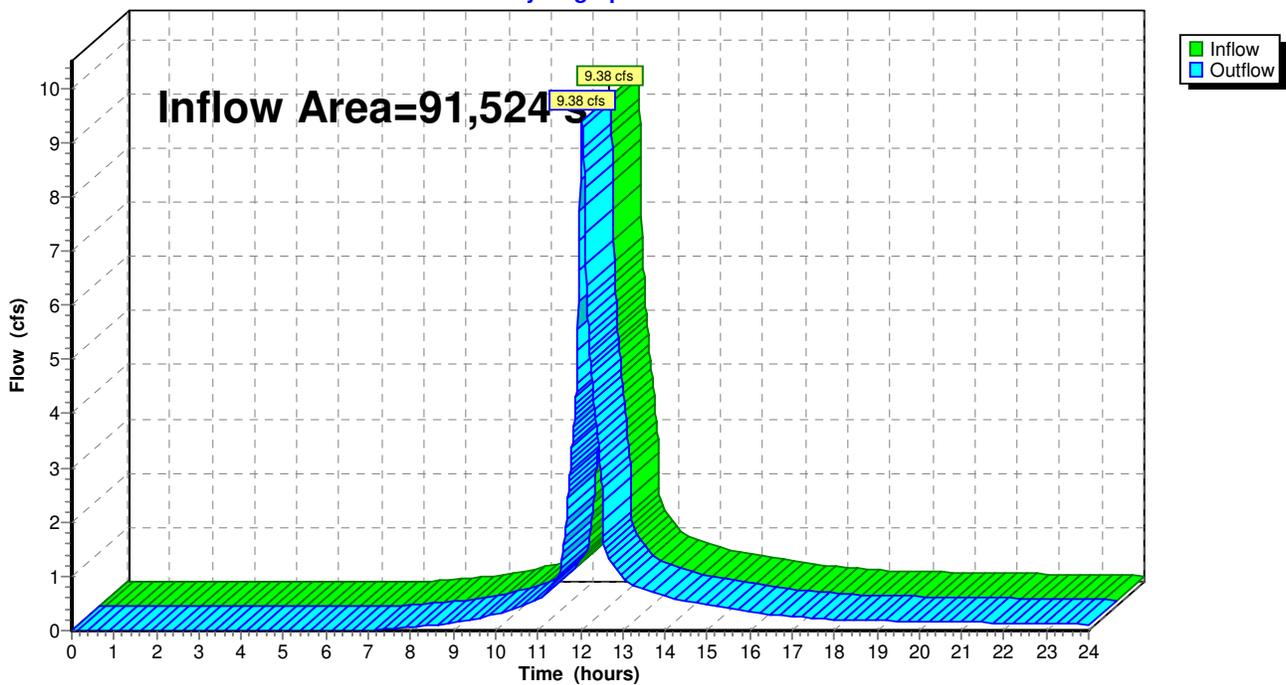
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 91,524 sf, Inflow Depth > 4.43" for 100-Year event  
Inflow = 9.38 cfs @ 12.04 hrs, Volume= 33,761 cf  
Outflow = 9.38 cfs @ 12.04 hrs, Volume= 33,761 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Reach 159R: HW 10 Outlet to Rip Rap >100' from Wetland**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 220R: CB 56 to DMH 52

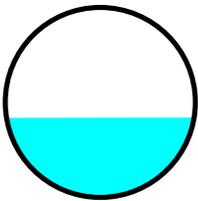
[52] Hint: Inlet conditions not evaluated

Inflow Area = 8,660 sf, Inflow Depth > 4.78" for 100-Year event  
Inflow = 1.31 cfs @ 12.01 hrs, Volume= 3,446 cf  
Outflow = 1.31 cfs @ 12.01 hrs, Volume= 3,446 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 4.19 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.2 min

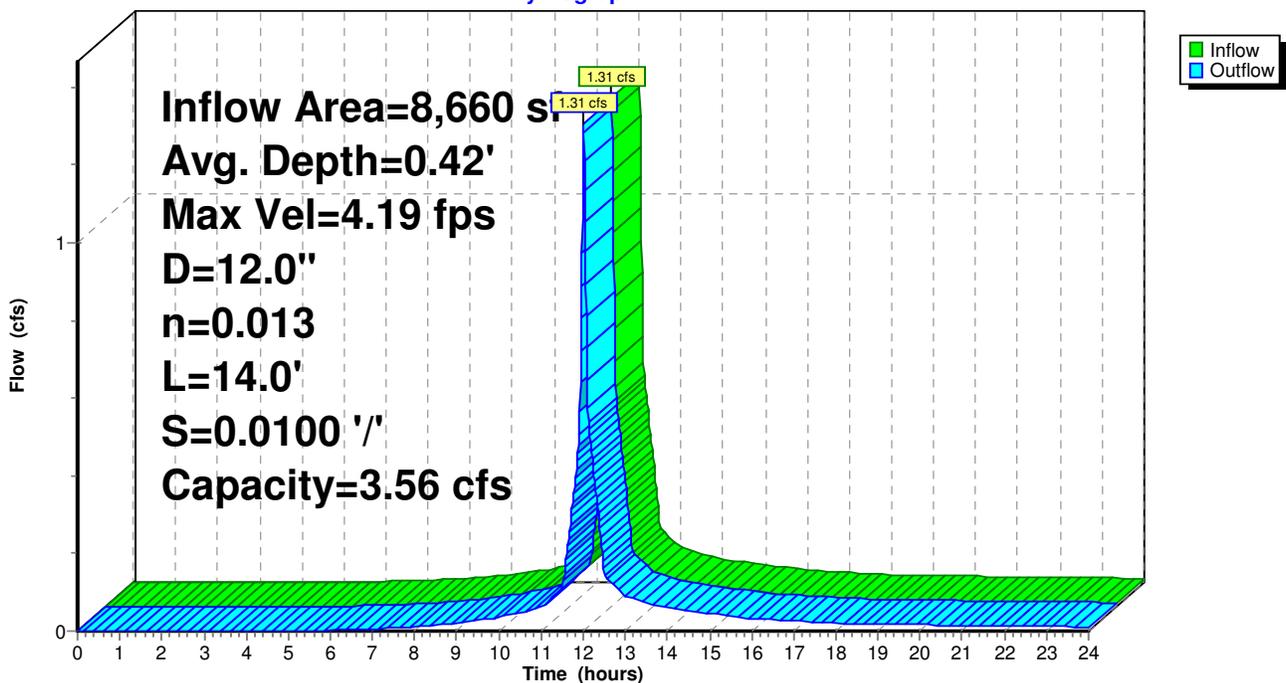
Peak Storage= 4 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.42'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 14.0' Slope= 0.0100 '/'  
Inlet Invert= 102.72', Outlet Invert= 102.58'



## Reach 220R: CB 56 to DMH 52

Hydrograph



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## Reach 222R: CB 54 to DMH 52

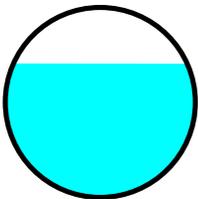
[52] Hint: Inlet conditions not evaluated

Inflow Area = 20,970 sf, Inflow Depth > 4.45" for 100-Year event  
Inflow = 3.01 cfs @ 12.01 hrs, Volume= 7,775 cf  
Outflow = 2.99 cfs @ 12.01 hrs, Volume= 7,775 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.09 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.2 min

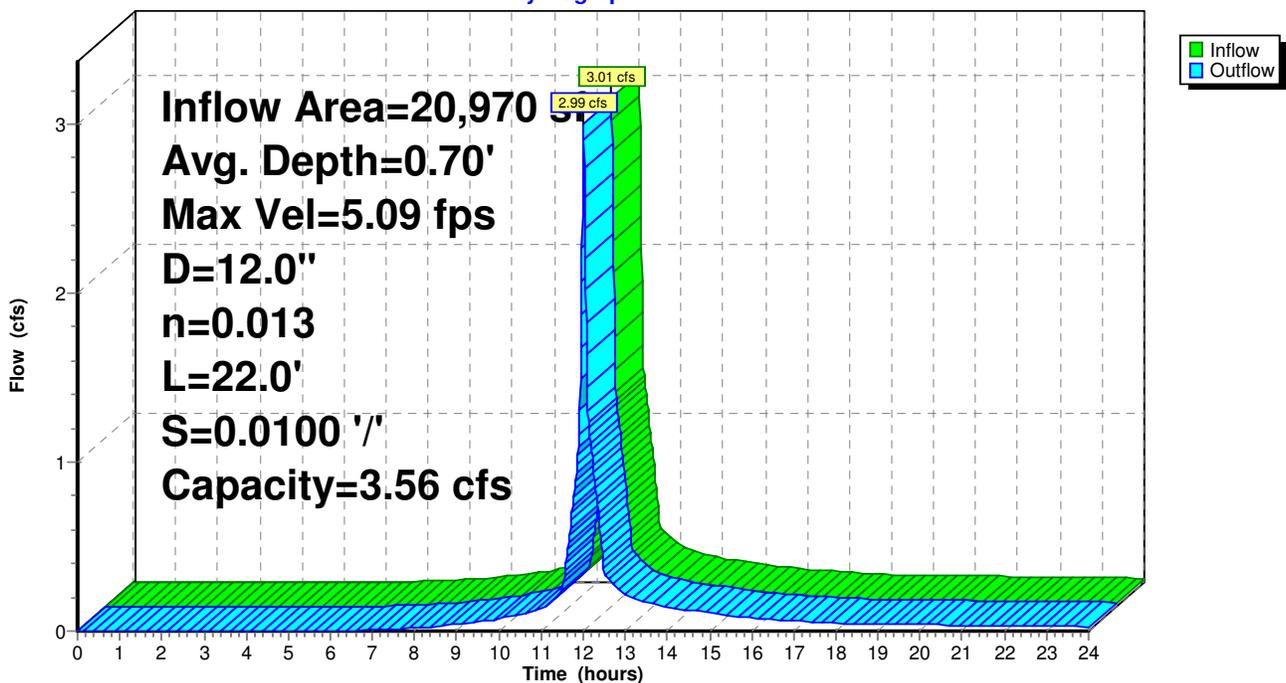
Peak Storage= 13 cf @ 12.01 hrs, Average Depth at Peak Storage= 0.70'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.56 cfs

12.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections  
Length= 22.0' Slope= 0.0100 '/'  
Inlet Invert= 102.80', Outlet Invert= 102.58'



## Reach 222R: CB 54 to DMH 52

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 403R: CB 65 to DMH 50

[52] Hint: Inlet conditions not evaluated

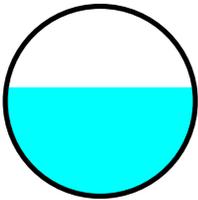
[79] Warning: Submerged Pond 67P Primary device # 1 OUTLET by 0.43'

Inflow Area = 44,069 sf, Inflow Depth > 4.05" for 100-Year event  
Inflow = 3.15 cfs @ 12.19 hrs, Volume= 14,859 cf  
Outflow = 3.15 cfs @ 12.20 hrs, Volume= 14,858 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 6.77 fps, Min. Travel Time= 0.1 min  
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.2 min

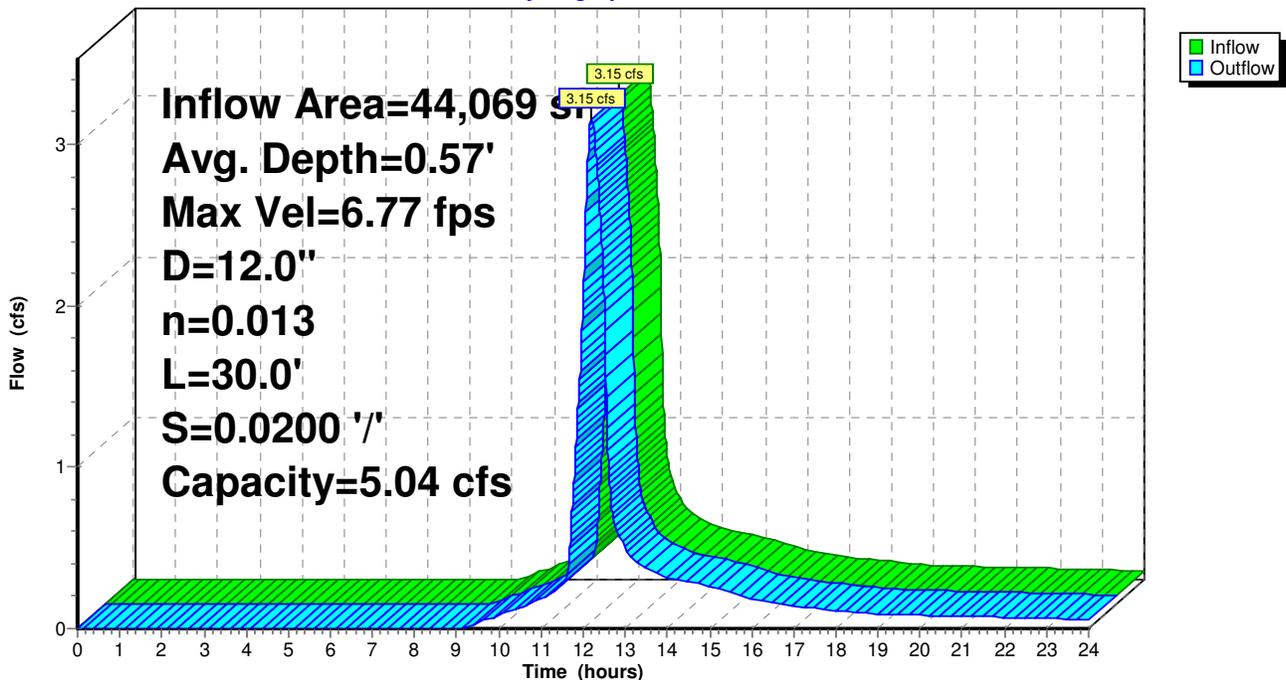
Peak Storage= 14 cf @ 12.20 hrs, Average Depth at Peak Storage= 0.57'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 5.04 cfs

12.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior  
Length= 30.0' Slope= 0.0200 '/'  
Inlet Invert= 102.22', Outlet Invert= 101.62'



## Reach 403R: CB 65 to DMH 50

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Reach 902R: Existing wetland channel to WF 13

[61] Hint: Submerged 3% of Reach 1R bottom

Inflow Area = 203,736 sf, Inflow Depth > 3.70" for 100-Year event  
Inflow = 12.66 cfs @ 12.17 hrs, Volume= 62,827 cf  
Outflow = 12.66 cfs @ 12.17 hrs, Volume= 62,805 cf, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Max. Velocity= 5.90 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.9 min

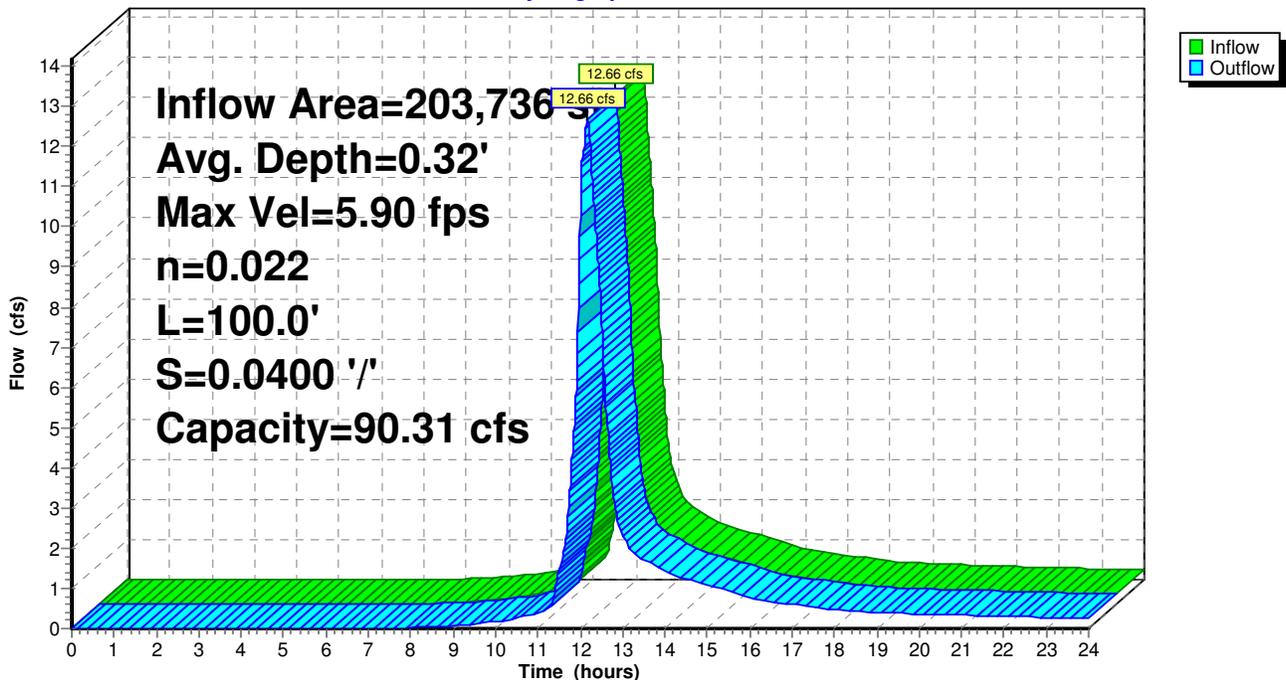
Peak Storage= 215 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.32'  
Bank-Full Depth= 1.00', Capacity at Bank-Full= 90.31 cfs

6.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight  
Side Slope Z-value= 2.0 '/' Top Width= 10.00'  
Length= 100.0' Slope= 0.0400 '/'  
Inlet Invert= 86.00', Outlet Invert= 82.00'



## Reach 902R: Existing wetland channel to WF 13

Hydrograph



## Postdevelopment9c

Type III 24-hr 100-Year Rainfall=6.50"

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### Pond 2P: Recharge System

[93] Warning: Storage range exceeded by 1.63'

[88] Warning: Qout>Qin may require Finer Routing>1

[85] Warning: Oscillations may require Finer Routing>1

[81] Warning: Exceeded Pond 219P by 2.32' @ 12.45 hrs

Inflow Area = 111,470 sf, Inflow Depth > 4.21" for 100-Year event  
Inflow = 8.25 cfs @ 12.10 hrs, Volume= 39,145 cf  
Outflow = 8.81 cfs @ 12.09 hrs, Volume= 36,165 cf, Atten= 0%, Lag= 0.0 min  
Discarded = 0.01 cfs @ 7.26 hrs, Volume= 398 cf  
Primary = 5.99 cfs @ 12.09 hrs, Volume= 33,660 cf  
Secondary = 2.82 cfs @ 12.09 hrs, Volume= 2,107 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 106.23' @ 12.09 hrs Surf.Area= 1,620 sf Storage= 3,766 cf

Plug-Flow detention time= 58.1 min calculated for 36,150 cf (92% of inflow)  
Center-of-Mass det. time= 19.5 min ( 838.3 - 818.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	100.60'	1,810 cf	<b>36.00'W x 45.00'L x 4.00'H 100</b> 6,480 cf Overall - 1,956 cf Embedded = 4,524 cf x 40.0% Voids
#2	101.00'	1,956 cf	<b>47.8"W x 30.0"H x 6.25'L Cultec R-330</b> x 42 Inside #1
		3,766 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.170 in/hr Exfiltration over Surface area</b>
#2	Primary	103.22'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Secondary	106.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

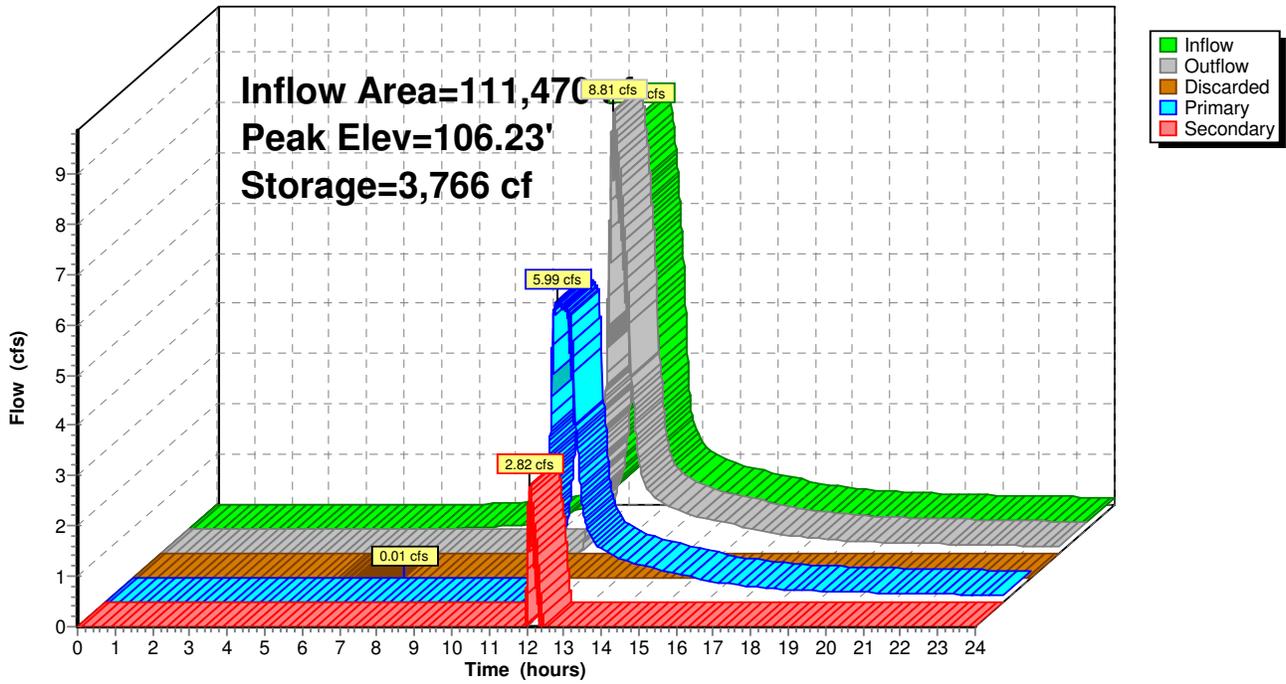
**Discarded OutFlow** Max=0.01 cfs @ 7.26 hrs HW=100.65' (Free Discharge)  
↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=5.99 cfs @ 12.09 hrs HW=106.23' (Free Discharge)  
↑**2=Orifice/Grate** (Orifice Controls 5.99 cfs @ 7.62 fps)

**Secondary OutFlow** Max=2.79 cfs @ 12.09 hrs HW=106.23' (Free Discharge)  
↑**3=Orifice/Grate** (Weir Controls 2.79 cfs @ 1.55 fps)

### Pond 2P: Recharge System

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 7P: Forebay - Bio Retention**

[63] Warning: Exceeded Reach 62R inflow depth by 0.64' @ 8.75 hrs

Inflow Area = 44,069 sf, Inflow Depth > 4.15" for 100-Year event  
 Inflow = 4.60 cfs @ 12.09 hrs, Volume= 15,223 cf  
 Outflow = 4.60 cfs @ 12.10 hrs, Volume= 15,053 cf, Atten= 0%, Lag= 0.3 min  
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0 cf  
 Primary = 4.60 cfs @ 12.10 hrs, Volume= 15,052 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 111.86' @ 12.10 hrs Surf.Area= 290 sf Storage= 264 cf

Plug-Flow detention time= 11.1 min calculated for 15,046 cf (99% of inflow)  
 Center-of-Mass det. time= 4.4 min ( 815.7 - 811.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.49'	304 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.49	0	0	0
111.00	205	52	52
111.50	248	113	166
112.00	305	138	304

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	<b>0.001 in/hr Exfiltration over Surface area</b>
#2	Primary	111.50'	<b>8.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

**Discarded OutFlow** Max=0.00 cfs @ 12.10 hrs HW=111.86' (Free Discharge)

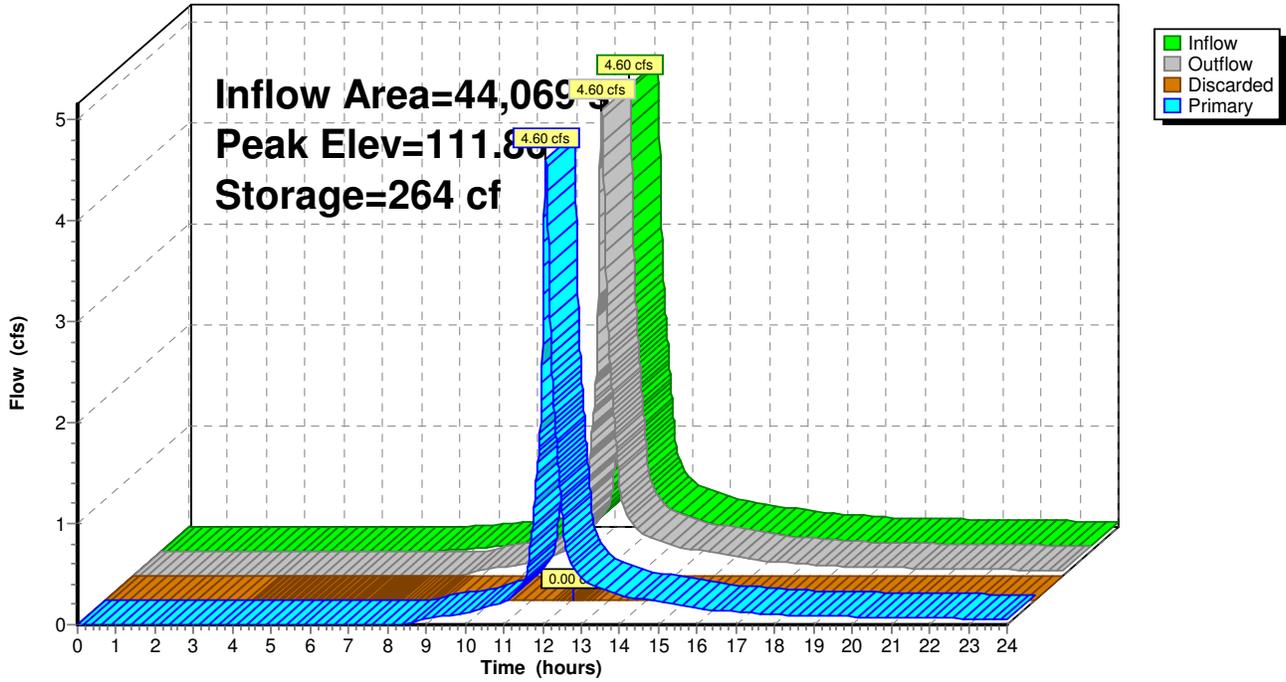
↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=4.59 cfs @ 12.10 hrs HW=111.86' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 4.59 cfs @ 1.58 fps)

### Pond 7P: Forebay - Bio Retention

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 8P: Main Cell - Bio Retention**

[81] Warning: Exceeded Pond 7P by 0.32' @ 12.22 hrs

Inflow Area = 44,069 sf, Inflow Depth > 4.10" for 100-Year event  
 Inflow = 4.60 cfs @ 12.10 hrs, Volume= 15,052 cf  
 Outflow = 3.15 cfs @ 12.19 hrs, Volume= 14,860 cf, Atten= 31%, Lag= 5.8 min  
 Primary = 3.15 cfs @ 12.19 hrs, Volume= 14,860 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 112.09' @ 12.19 hrs Surf.Area= 1,525 sf Storage= 1,801 cf

Plug-Flow detention time= 23.2 min calculated for 14,860 cf (99% of inflow)  
 Center-of-Mass det. time= 15.5 min ( 831.2 - 815.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.74'	2,193 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.74	0	0	0
109.75	350	2	2
110.00	375	91	92
111.00	667	521	613
112.00	1,440	1,054	1,667
112.33	1,750	526	2,193

Device	Routing	Invert	Outlet Devices
#1	Device 7	110.00'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#2	Device 7	110.17'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#3	Device 7	110.33'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#4	Device 7	110.50'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#5	Device 7	110.67'	<b>0.5" Vert. Orifice/Grate X 12.00</b> C= 0.600
#6	Device 7	111.00'	<b>8.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.900
#7	Primary	107.00'	<b>12.0" x 126.0' long Culvert</b> CPP, mitered to conform to fill, Ke= 0.700 Outlet Invert= 105.61' S= 0.0110 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#8	Secondary	112.33'	<b>8.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

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Type III 24-hr 100-Year Rainfall=6.50"

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**Primary OutFlow** Max=3.15 cfs @ 12.19 hrs HW=112.09' (Free Discharge)

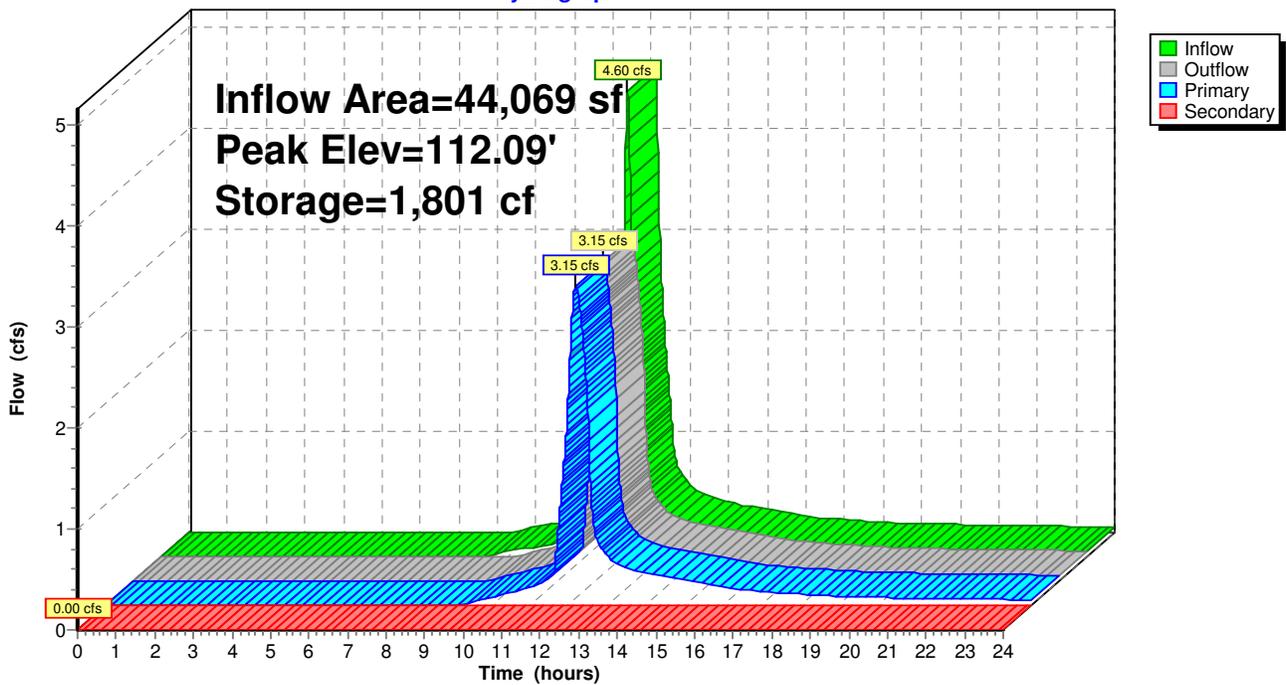
- 7=Culvert (Passes 3.15 cfs of 7.15 cfs potential flow)
- 1=Orifice/Grate (Orifice Controls 0.11 cfs @ 6.93 fps)
- 2=Orifice/Grate (Orifice Controls 0.11 cfs @ 6.64 fps)
- 3=Orifice/Grate (Orifice Controls 0.10 cfs @ 6.35 fps)
- 4=Orifice/Grate (Orifice Controls 0.10 cfs @ 6.03 fps)
- 5=Orifice/Grate (Orifice Controls 0.09 cfs @ 5.70 fps)
- 6=Orifice/Grate (Orifice Controls 2.63 cfs @ 7.54 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=109.74' (Free Discharge)

- 8=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 8P: Main Cell - Bio Retention**

Hydrograph



# Postdevelopment9c

Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 9P: CB 65

Inflow Area = 26,681 sf, Inflow Depth > 4.07" for 100-Year event  
Inflow = 3.18 cfs @ 12.03 hrs, Volume= 9,046 cf  
Outflow = 3.18 cfs @ 12.03 hrs, Volume= 9,046 cf, Atten= 0%, Lag= 0.0 min  
Primary = 3.18 cfs @ 12.03 hrs, Volume= 9,046 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 108.71' @ 12.03 hrs

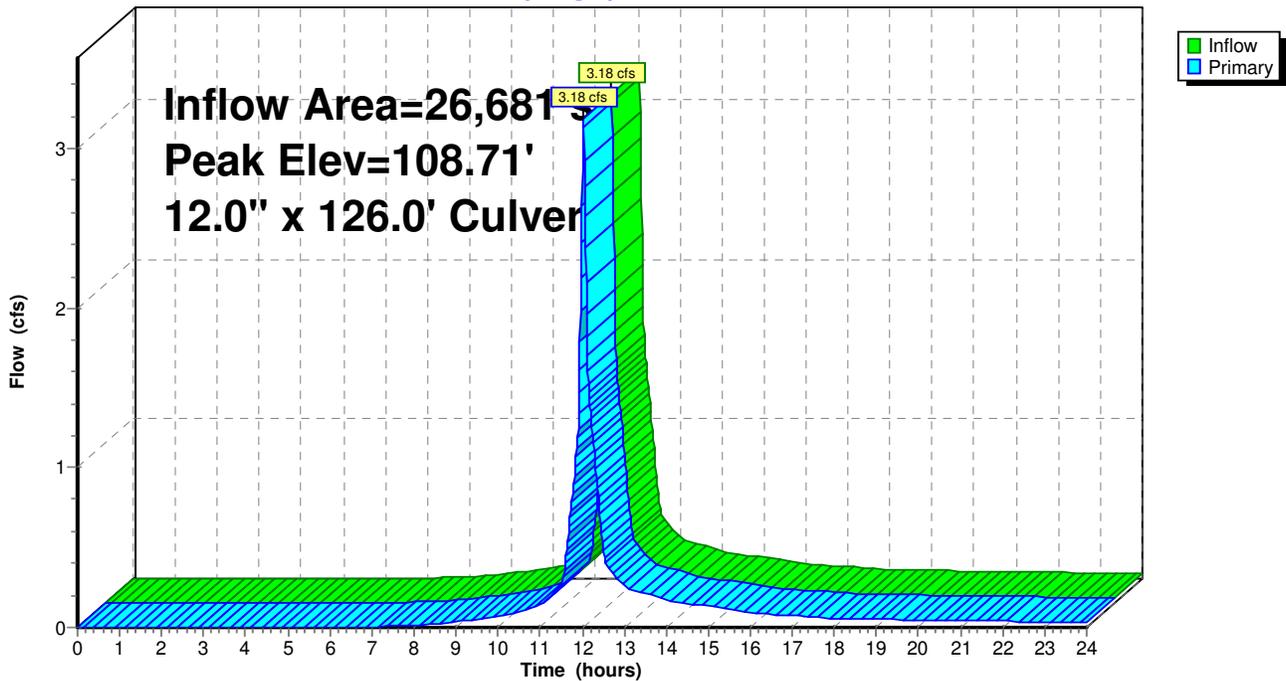
Flood Elev= 112.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.50'	<b>12.0" x 126.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 105.61' S= 0.0150 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=3.18 cfs @ 12.03 hrs HW=108.71' (Free Discharge)  
↑1=Culvert (Inlet Controls 3.18 cfs @ 4.05 fps)

## Pond 9P: CB 65

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 43R: CB 60 to DMH 64

[57] Hint: Peaked at 111.51' (Flood elevation advised)

Inflow Area = 4,640 sf, Inflow Depth > 5.22" for 100-Year event  
Inflow = 0.72 cfs @ 12.03 hrs, Volume= 2,018 cf  
Outflow = 0.72 cfs @ 12.03 hrs, Volume= 2,018 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.72 cfs @ 12.03 hrs, Volume= 2,018 cf

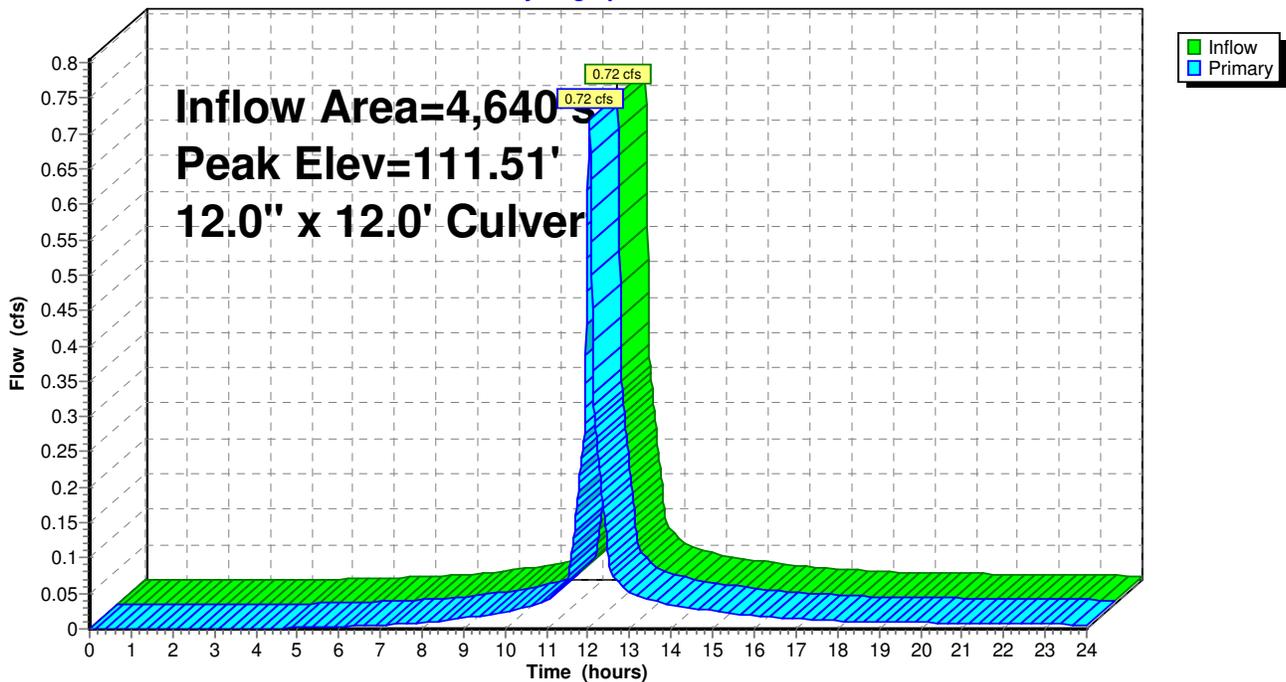
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 111.51' @ 12.03 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	111.02'	<b>12.0" x 12.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.72 cfs @ 12.03 hrs HW=111.51' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.72 cfs @ 2.78 fps)

## Pond 43R: CB 60 to DMH 64

Hydrograph



# Postdevelopment9c

Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 61R: CB 62 to DMH 64

[57] Hint: Peaked at 112.87' (Flood elevation advised)

Inflow Area = 39,429 sf, Inflow Depth > 4.02" for 100-Year event  
Inflow = 4.13 cfs @ 12.10 hrs, Volume= 13,205 cf  
Outflow = 4.13 cfs @ 12.10 hrs, Volume= 13,205 cf, Atten= 0%, Lag= 0.0 min  
Primary = 4.13 cfs @ 12.10 hrs, Volume= 13,205 cf

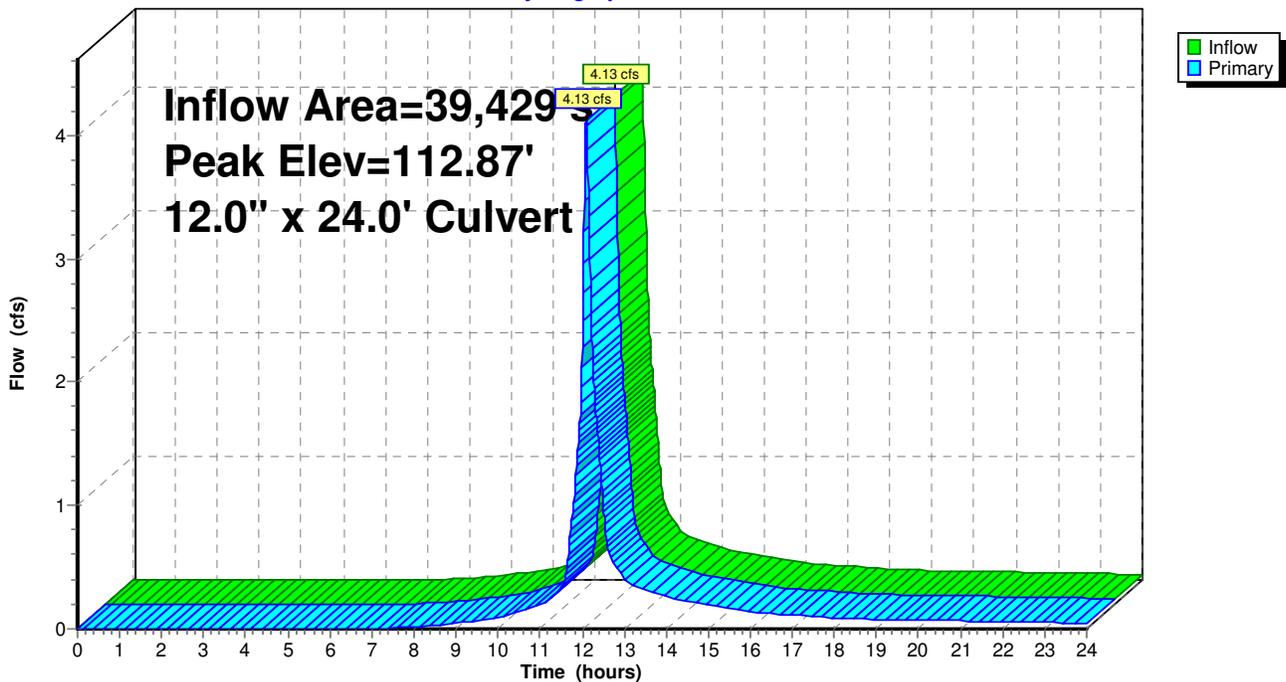
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 112.87' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	111.14'	<b>12.0" x 24.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=4.12 cfs @ 12.10 hrs HW=112.86' (Free Discharge)  
↑1=Culvert (Barrel Controls 4.12 cfs @ 5.25 fps)

## Pond 61R: CB 62 to DMH 64

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**

Inflow Area = 6,950 sf, Inflow Depth > 4.56" for 100-Year event  
 Inflow = 1.00 cfs @ 12.02 hrs, Volume= 2,639 cf  
 Outflow = 1.00 cfs @ 12.02 hrs, Volume= 2,533 cf, Atten= 1%, Lag= 0.3 min  
 Primary = 1.00 cfs @ 12.02 hrs, Volume= 2,533 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.96' @ 12.02 hrs Surf.Area= 232 sf Storage= 131 cf

Plug-Flow detention time= 35.5 min calculated for 2,532 cf (96% of inflow)  
 Center-of-Mass det. time= 12.6 min ( 811.1 - 798.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.35'	359 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.35	0	0	0
108.36	200	1	1
109.85	280	358	359

Device	Routing	Invert	Outlet Devices
#1	Primary	108.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.99 cfs @ 12.02 hrs HW=108.96' (Free Discharge)  
 ↑1=**Orifice/Grate** (Weir Controls 0.99 cfs @ 1.10 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=108.35' (Free Discharge)  
 ↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Postdevelopment9c**

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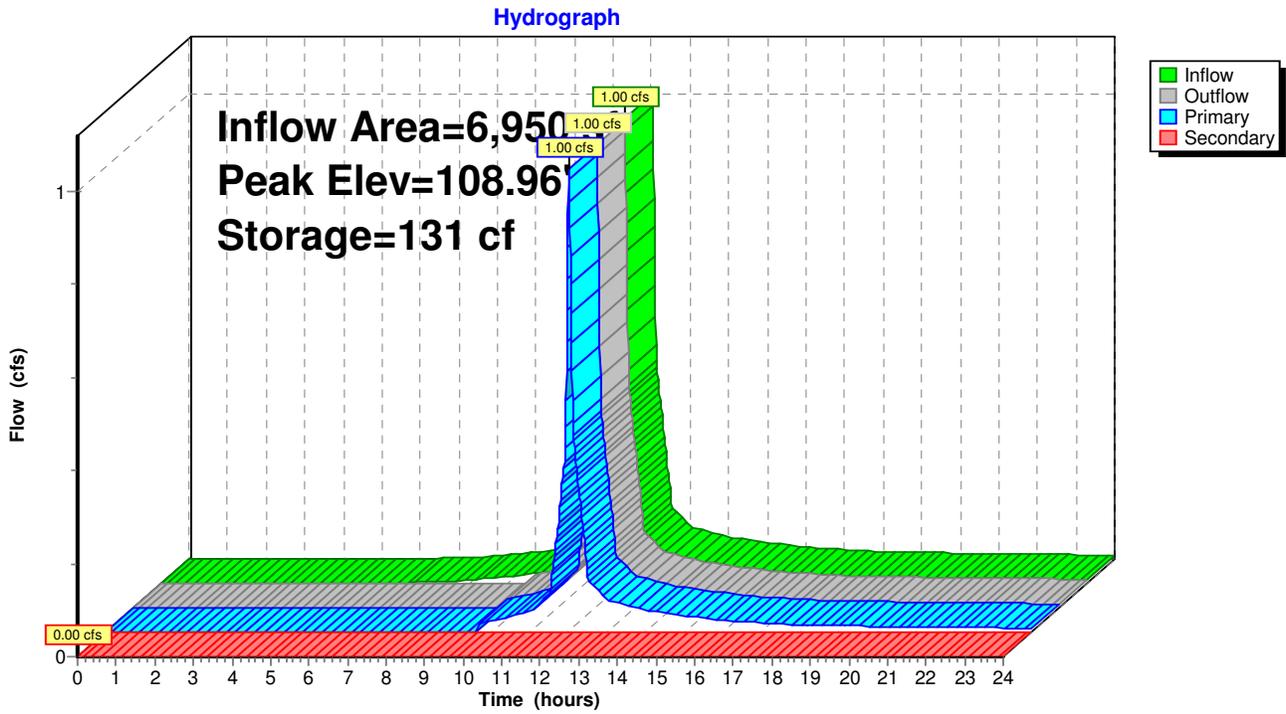
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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 66P: RG 9A at Units 11/12 - CB 214**



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 67P: CB 66 (emergency vertical release)**

[61] Hint: Submerged 30% of Reach 68R bottom

Inflow Area = 44,069 sf, Inflow Depth > 4.05" for 100-Year event  
 Inflow = 3.15 cfs @ 12.19 hrs, Volume= 14,859 cf  
 Outflow = 3.15 cfs @ 12.19 hrs, Volume= 14,859 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.15 cfs @ 12.19 hrs, Volume= 14,859 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 106.62' @ 12.19 hrs  
 Flood Elev= 112.00'

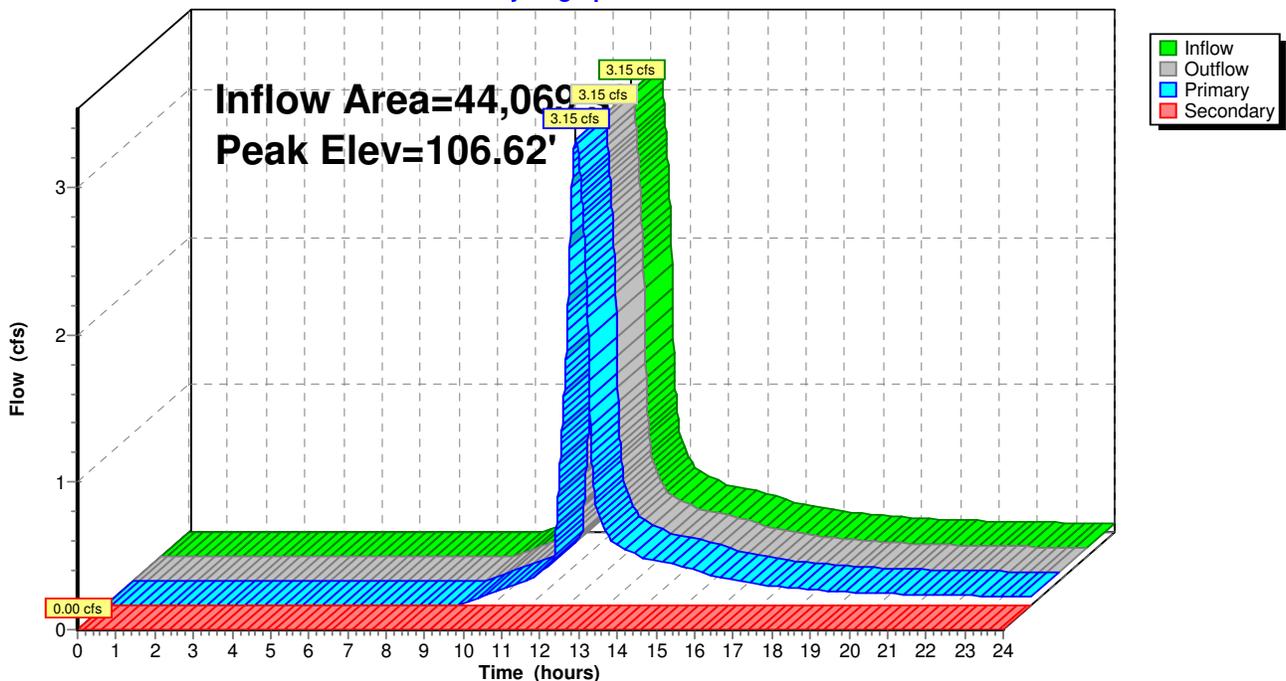
Device	Routing	Invert	Outlet Devices
#1	Primary	106.00'	<b>2.00' W x 2.00' H x 52.0' long Culvert</b> CPP, square edge headwall, Ke= 0.500 Outlet Invert= 102.36' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	112.00'	<b>2.00' W x 2.00' H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=3.15 cfs @ 12.19 hrs HW=106.62' (Free Discharge)  
 ↳1=Culvert (Inlet Controls 3.15 cfs @ 2.53 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.00' (Free Discharge)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)

**Pond 67P: CB 66 (emergency vertical release)**

Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 70P: RG 10A - CB 216 at Units 13**

[63] Warning: Exceeded Reach 67R inflow depth by 0.85' @ 23.99 hrs

Inflow Area = 11,090 sf, Inflow Depth > 4.52" for 100-Year event  
 Inflow = 1.59 cfs @ 12.02 hrs, Volume= 4,180 cf  
 Outflow = 1.58 cfs @ 12.03 hrs, Volume= 4,060 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 1.58 cfs @ 12.03 hrs, Volume= 4,060 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 107.00' @ 12.03 hrs Surf.Area= 305 sf Storage= 164 cf

Plug-Flow detention time= 25.4 min calculated for 4,058 cf (97% of inflow)  
 Center-of-Mass det. time= 8.7 min ( 813.0 - 804.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	106.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
106.35	0	0	0
106.36	200	1	1
106.85	280	118	119
107.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	106.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	107.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

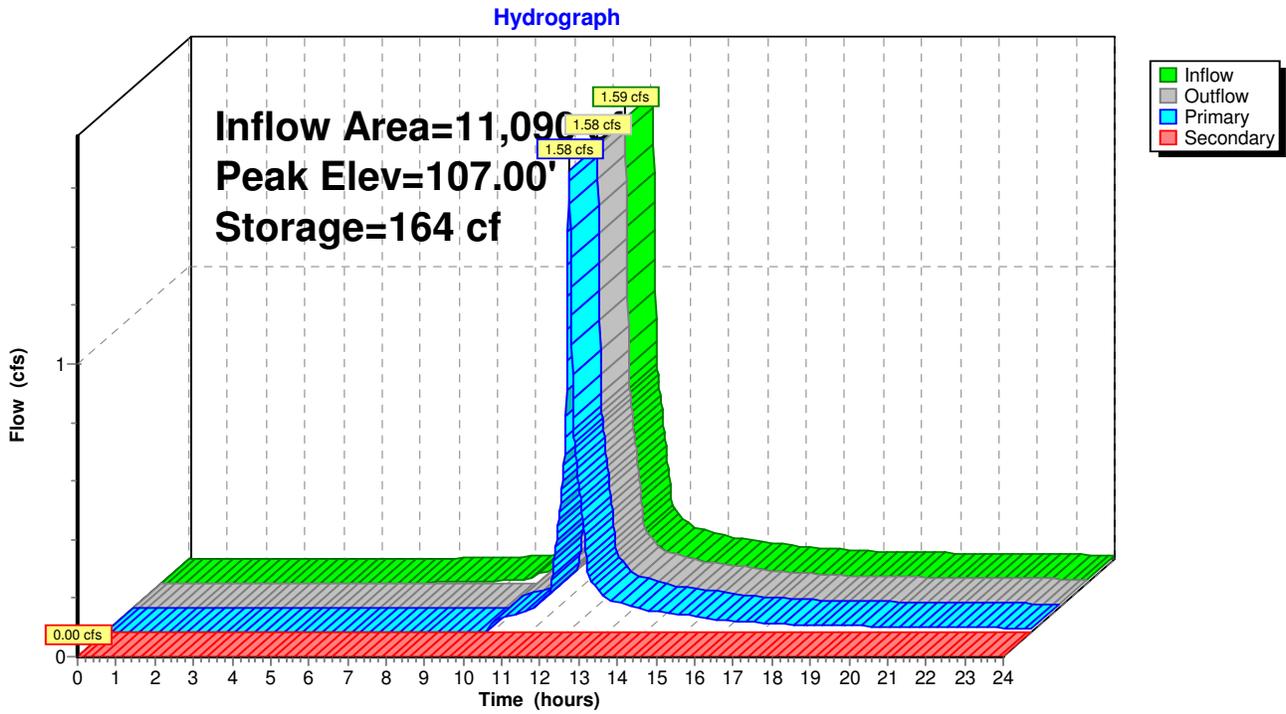
**Primary OutFlow** Max=1.58 cfs @ 12.03 hrs HW=107.00' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.58 cfs @ 1.28 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=106.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 70P: RG 10A - CB 216 at Units 13



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 111P: CB 20**

Inflow Area = 7,780 sf, Inflow Depth > 5.11" for 100-Year event  
Inflow = 1.24 cfs @ 12.01 hrs, Volume= 3,312 cf  
Outflow = 1.24 cfs @ 12.01 hrs, Volume= 3,312 cf, Atten= 0%, Lag= 0.0 min  
Primary = 1.24 cfs @ 12.01 hrs, Volume= 3,312 cf

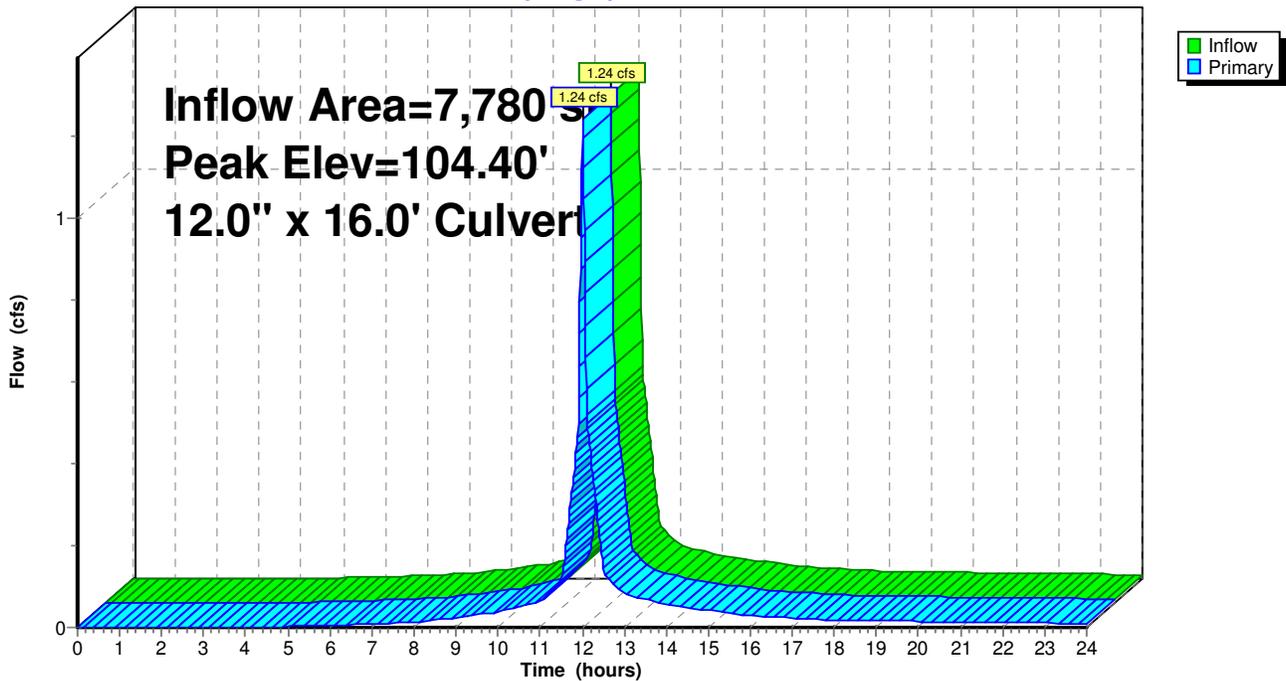
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.40' @ 12.01 hrs  
Flood Elev= 107.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	103.74'	<b>12.0" x 16.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=1.24 cfs @ 12.01 hrs HW=104.40' (Free Discharge)  
↑=Culvert (Barrel Controls 1.24 cfs @ 3.22 fps)

**Pond 111P: CB 20**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 112P: CB 22

Inflow Area = 2,898 sf, Inflow Depth > 4.56" for 100-Year event  
Inflow = 0.42 cfs @ 12.01 hrs, Volume= 1,101 cf  
Outflow = 0.42 cfs @ 12.01 hrs, Volume= 1,101 cf, Atten= 0%, Lag= 0.0 min  
Primary = 0.42 cfs @ 12.01 hrs, Volume= 1,101 cf

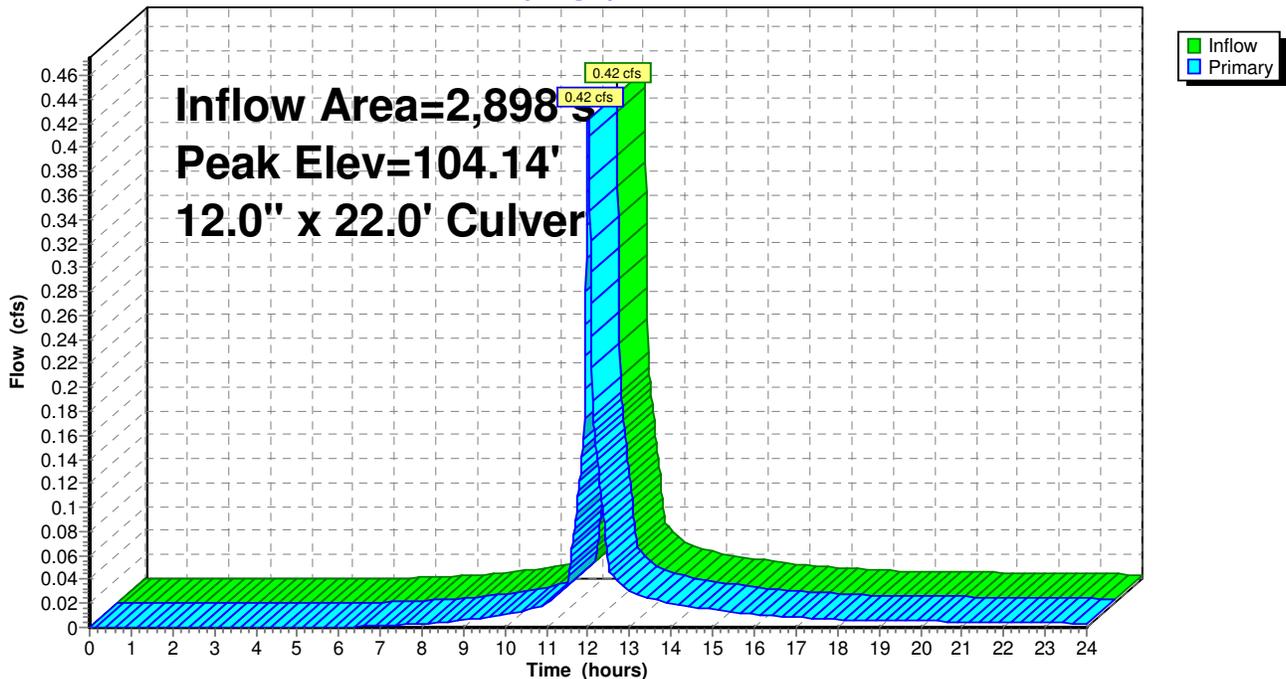
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 104.14' @ 12.01 hrs  
Flood Elev= 107.82'

Device	Routing	Invert	Outlet Devices
#1	Primary	103.80'	<b>12.0" x 22.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 103.58' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=0.42 cfs @ 12.01 hrs HW=104.14' (Free Discharge)  
↑1=Culvert (Barrel Controls 0.42 cfs @ 2.62 fps)

## Pond 112P: CB 22

### Hydrograph



**Postdevelopment9c**

Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

[61] Hint: Submerged 20% of Reach 127R bottom

Inflow Area = 24,126 sf, Inflow Depth > 4.48" for 100-Year event  
 Inflow = 3.00 cfs @ 12.00 hrs, Volume= 9,017 cf  
 Outflow = 2.98 cfs @ 12.00 hrs, Volume= 9,017 cf, Atten= 1%, Lag= 0.1 min  
 Primary = 2.98 cfs @ 12.00 hrs, Volume= 9,017 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 110.87' @ 12.00 hrs Surf.Area= 100 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 9,017 cf (100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 805.4 - 805.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.24'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.24	0	0	0
110.25	75	0	0
110.74	96	42	42
111.74	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	110.74'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Primary	109.86'	<b>8.0" x 65.0' long Culvert</b> Ke= 0.200 Outlet Invert= 105.96' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	111.74'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.95 cfs @ 12.00 hrs HW=110.87' (Free Discharge)

↑ **1=Orifice/Grate** (Weir Controls 1.22 cfs @ 1.18 fps)

└ **2=Culvert** (Inlet Controls 1.73 cfs @ 4.95 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=110.24' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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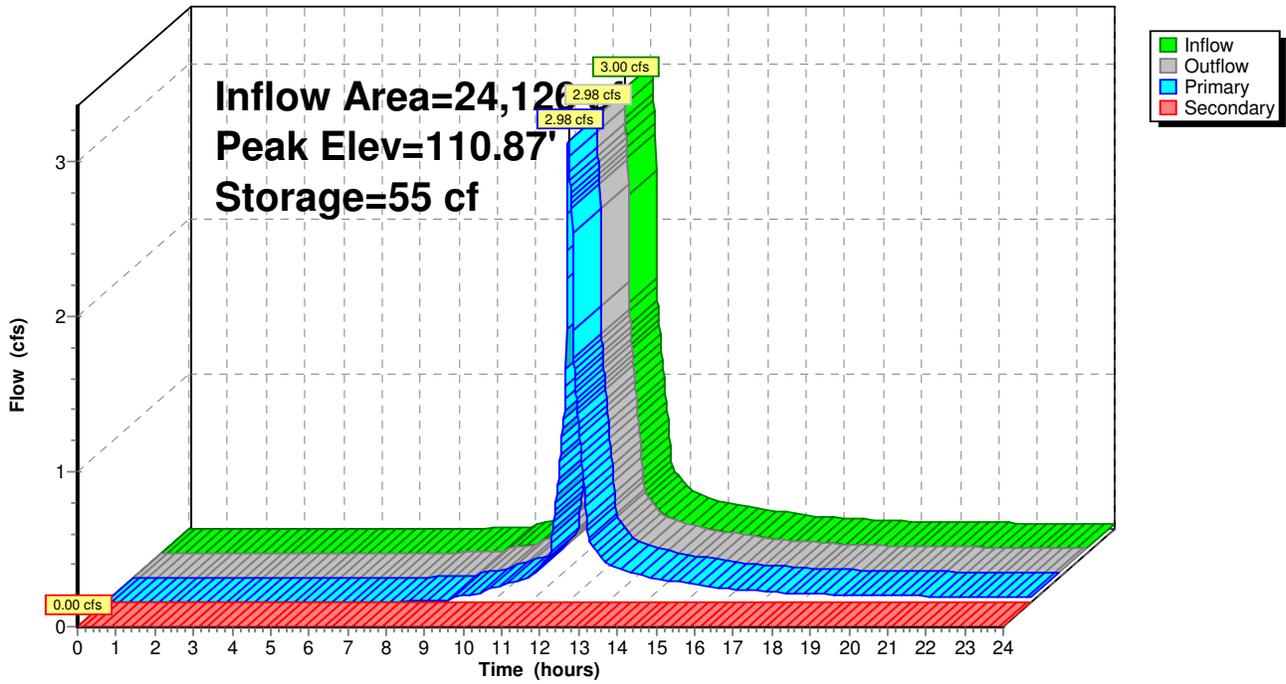
Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 119P: RG - 1A - CB 118 to DMH 14**

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 121P: RG 6A - CB 120 Under Drive Unit 4**

Inflow Area = 18,760 sf, Inflow Depth > 4.88" for 100-Year event  
 Inflow = 2.18 cfs @ 12.01 hrs, Volume= 7,635 cf  
 Outflow = 2.18 cfs @ 12.01 hrs, Volume= 7,591 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 2.18 cfs @ 12.01 hrs, Volume= 7,591 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 112.37' @ 12.01 hrs Surf.Area= 102 sf Storage= 61 cf

Plug-Flow detention time= 6.0 min calculated for 7,591 cf (99% of inflow)  
 Center-of-Mass det. time= 2.4 min ( 794.9 - 792.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	111.68'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.68	0	0	0
111.69	75	0	0
112.18	96	42	42
113.18	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	112.18'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.18'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

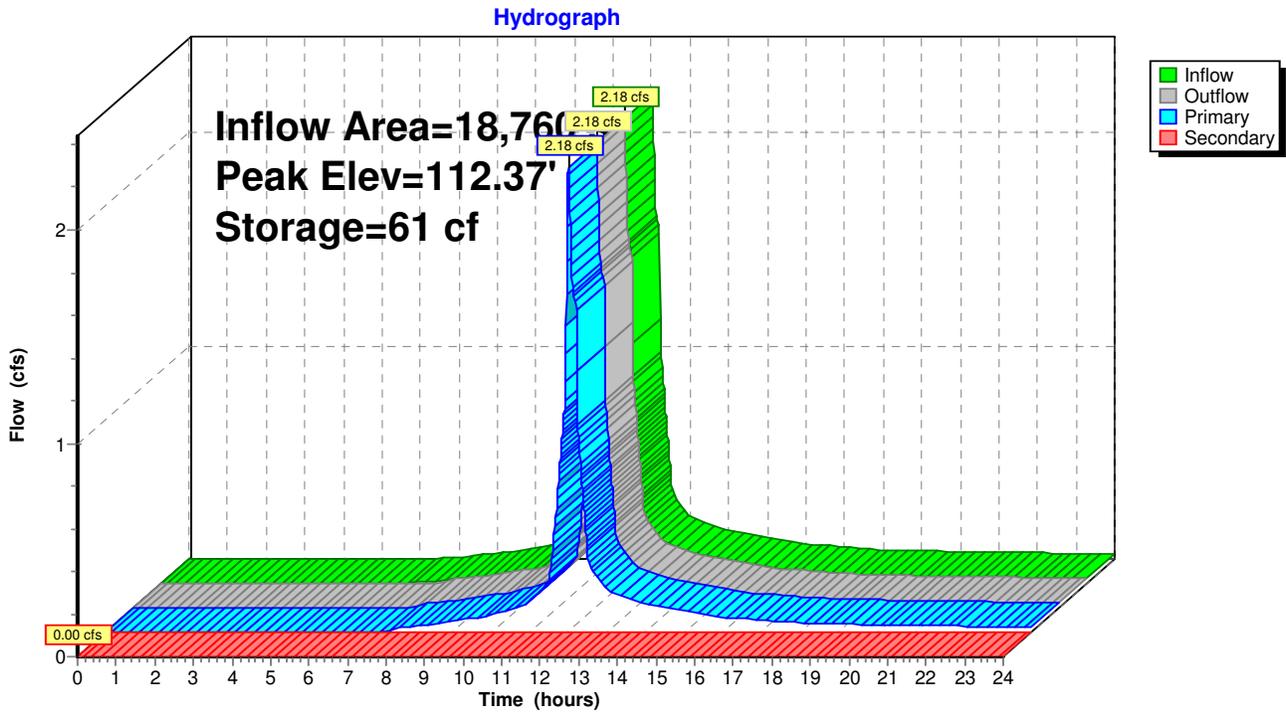
**Primary OutFlow** Max=2.18 cfs @ 12.01 hrs HW=112.37' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 2.18 cfs @ 1.43 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=111.68' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 121P: RG 6A - CB 120 Under Drive Unit 4



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 128P: RG 2A - CB 122 RG Unit 3**

[61] Hint: Submerged 21% of Reach 130R bottom

Inflow Area = 20,516 sf, Inflow Depth > 4.40" for 100-Year event  
 Inflow = 2.74 cfs @ 12.02 hrs, Volume= 7,524 cf  
 Outflow = 2.74 cfs @ 12.02 hrs, Volume= 7,481 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 2.74 cfs @ 12.02 hrs, Volume= 7,481 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 113.39' @ 12.02 hrs Surf.Area= 109 sf Storage= 65 cf

Plug-Flow detention time= 5.4 min calculated for 7,481 cf (99% of inflow)  
 Center-of-Mass det. time= 1.8 min ( 809.4 - 807.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	112.67'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
112.67	0	0	0
112.68	75	0	0
113.17	96	42	42
113.67	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	113.17'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	113.67'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

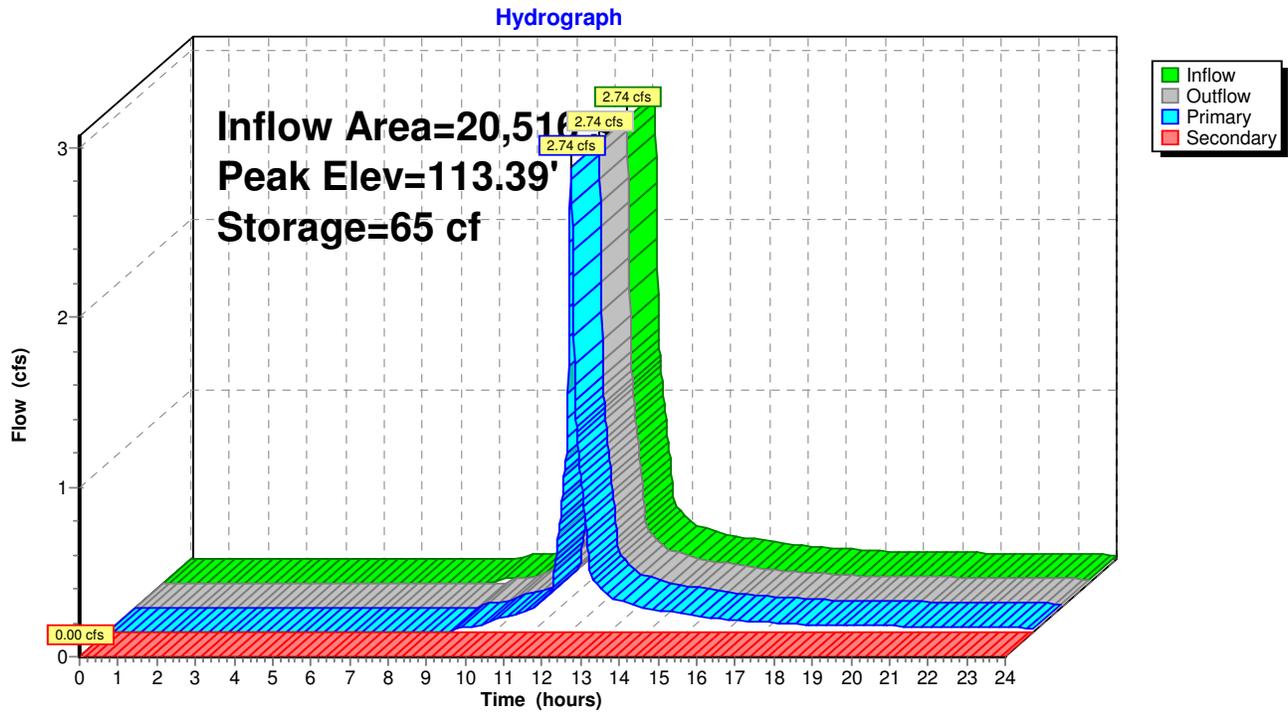
**Primary OutFlow** Max=2.73 cfs @ 12.02 hrs HW=113.39' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 2.73 cfs @ 1.54 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=112.67' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 128P: RG 2A - CB 122 RG Unit 3



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20**

- [93] Warning: Storage range exceeded by 0.55'
- [88] Warning: Qout>Qin may require Finer Routing>1
- [85] Warning: Oscillations may require Finer Routing>1
- [61] Hint: Submerged 58% of Reach 129R bottom

Inflow Area = 14,450 sf, Inflow Depth > 4.69" for 100-Year event  
 Inflow = 2.16 cfs @ 12.01 hrs, Volume= 5,643 cf  
 Outflow = 2.17 cfs @ 12.01 hrs, Volume= 5,545 cf, Atten= 0%, Lag= 0.0 min  
 Secondary = 2.17 cfs @ 12.01 hrs, Volume= 5,545 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.30' @ 12.01 hrs Surf.Area= 126 sf Storage= 98 cf

Plug-Flow detention time= 16.7 min calculated for 5,545 cf (98% of inflow)  
 Center-of-Mass det. time= 6.2 min ( 804.4 - 798.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	113.75'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
113.75	0	0	0
113.76	75	0	0
114.25	96	42	42
114.75	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Secondary	114.75'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Secondary OutFlow** Max=2.16 cfs @ 12.01 hrs HW=115.30' (Free Discharge)  
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 2.16 cfs @ 1.97 fps)

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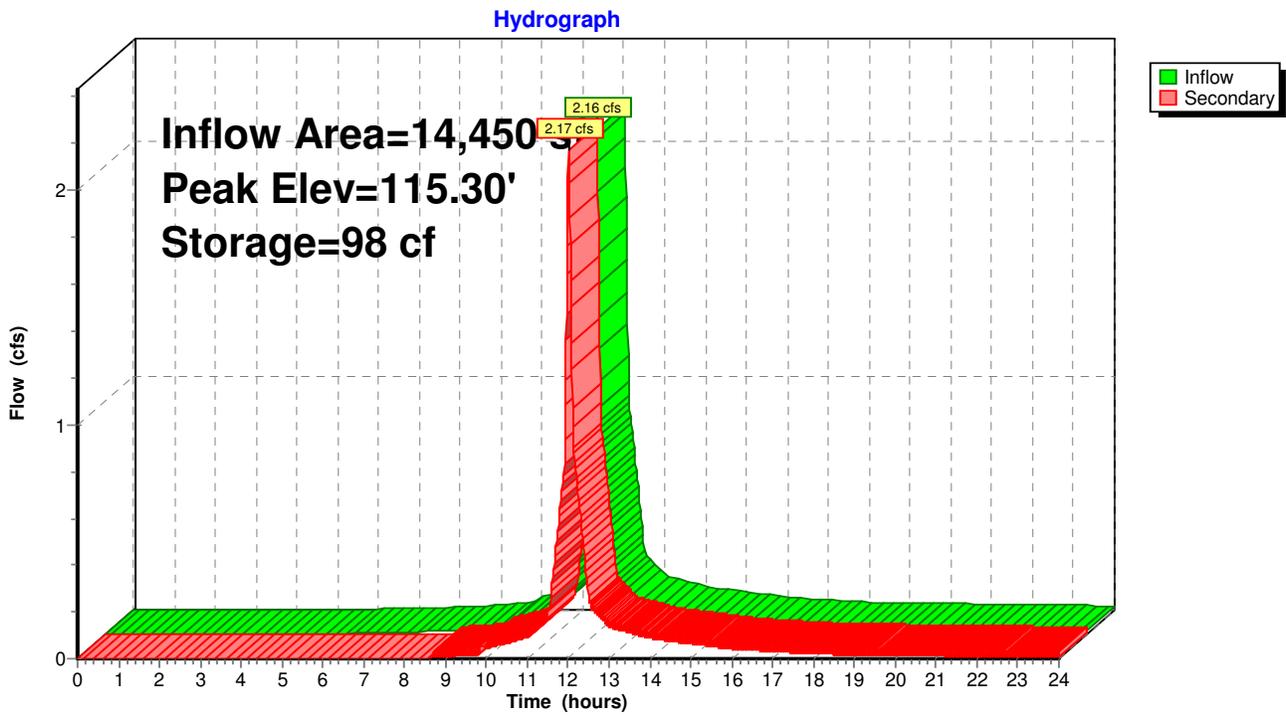
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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 132P: RG 3B - CB 124 Rain Garden - Unit 20**



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 133P: Large RG 4C at Unit 20**

Inflow Area = 6,950 sf, Inflow Depth > 4.56" for 100-Year event  
 Inflow = 1.02 cfs @ 12.01 hrs, Volume= 2,640 cf  
 Outflow = 1.01 cfs @ 12.01 hrs, Volume= 2,520 cf, Atten= 1%, Lag= 0.4 min  
 Primary = 1.01 cfs @ 12.01 hrs, Volume= 2,520 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.96' @ 12.01 hrs Surf.Area= 298 sf Storage= 152 cf

Plug-Flow detention time= 39.5 min calculated for 2,520 cf (95% of inflow)  
 Center-of-Mass det. time= 14.0 min ( 811.9 - 797.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	116.35'	279 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.35	0	0	0
116.36	200	1	1
116.85	280	118	119
117.35	360	160	279

Device	Routing	Invert	Outlet Devices
#1	Primary	116.85'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	117.35'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=1.00 cfs @ 12.01 hrs HW=116.96' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.00 cfs @ 1.10 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=116.35' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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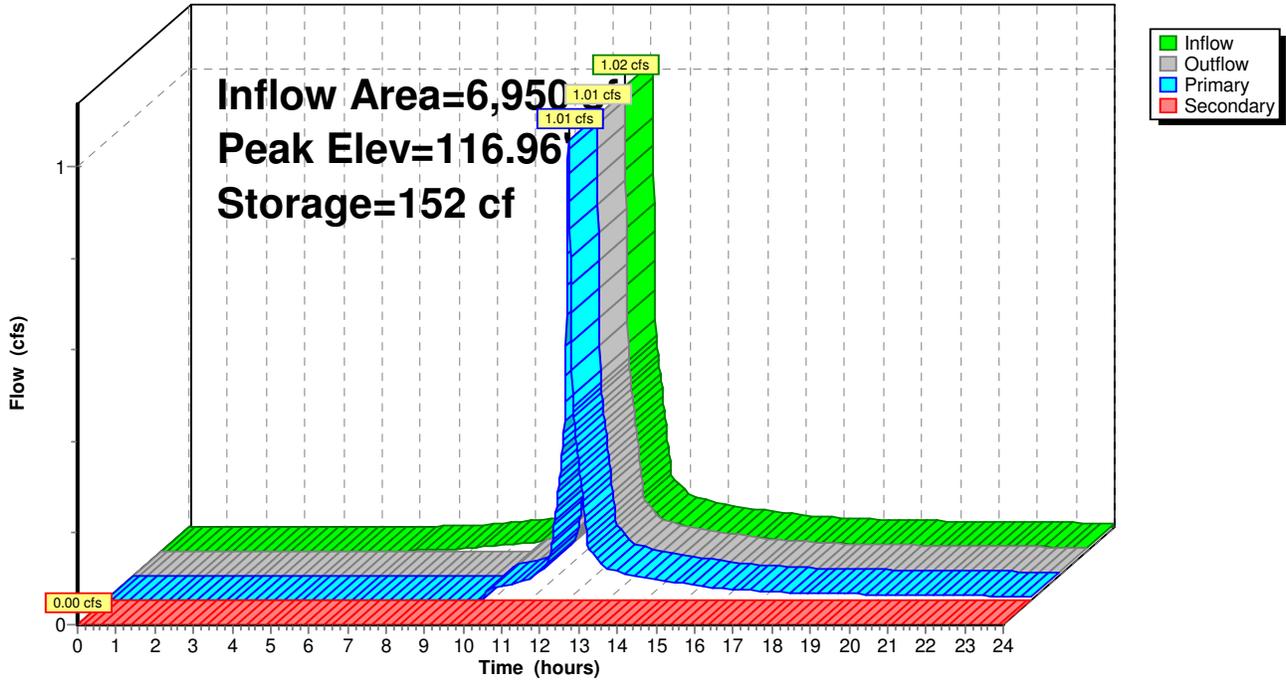
Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 133P: Large RG 4C at Unit 20**

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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 144R: HW 30 to DMH 14

[57] Hint: Peaked at 114.41' (Flood elevation advised)

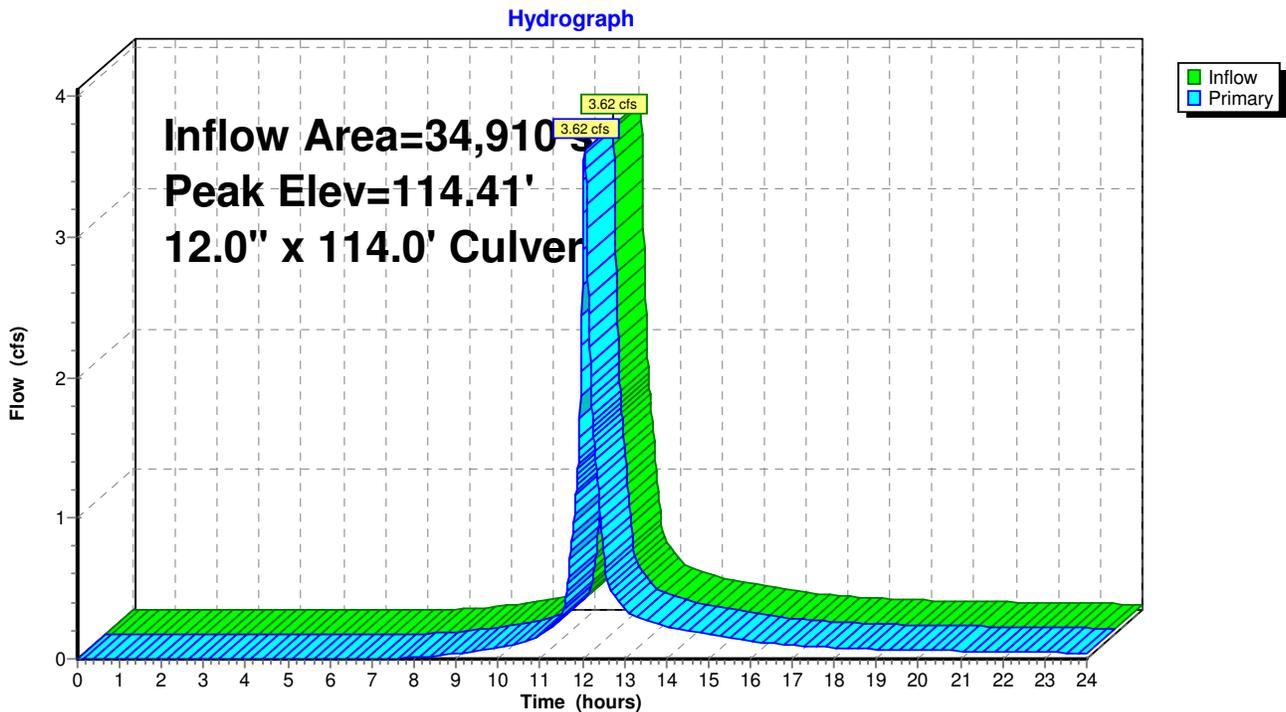
Inflow Area = 34,910 sf, Inflow Depth > 3.93" for 100-Year event  
Inflow = 3.62 cfs @ 12.06 hrs, Volume= 11,438 cf  
Outflow = 3.62 cfs @ 12.06 hrs, Volume= 11,438 cf, Atten= 0%, Lag= 0.0 min  
Primary = 3.62 cfs @ 12.06 hrs, Volume= 11,438 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 114.41' @ 12.06 hrs

Device #	Routing	Invert	Outlet Devices
1	Primary	113.00'	<b>12.0" x 114.0' long Culvert</b> Ke= 0.500 Outlet Invert= 103.88' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=3.61 cfs @ 12.06 hrs HW=114.41' (Free Discharge)  
↑1=Culvert (Inlet Controls 3.61 cfs @ 4.60 fps)

## Pond 144R: HW 30 to DMH 14



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 155P: RG 5A - CB 116 between Septic and Unit 4**

Inflow Area = 21,810 sf, Inflow Depth > 4.92" for 100-Year event  
 Inflow = 1.71 cfs @ 12.00 hrs, Volume= 8,946 cf  
 Outflow = 1.71 cfs @ 12.01 hrs, Volume= 8,903 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.71 cfs @ 12.01 hrs, Volume= 8,903 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 108.16' @ 12.01 hrs Surf.Area= 101 sf Storage= 58 cf

Plug-Flow detention time= 5.1 min calculated for 8,899 cf (99% of inflow)  
 Center-of-Mass det. time= 2.1 min ( 795.9 - 793.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	107.50'	153 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.50	0	0	0
107.51	75	0	0
108.00	96	42	42
109.00	126	111	153

Device	Routing	Invert	Outlet Devices
#1	Primary	108.00'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	109.00'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

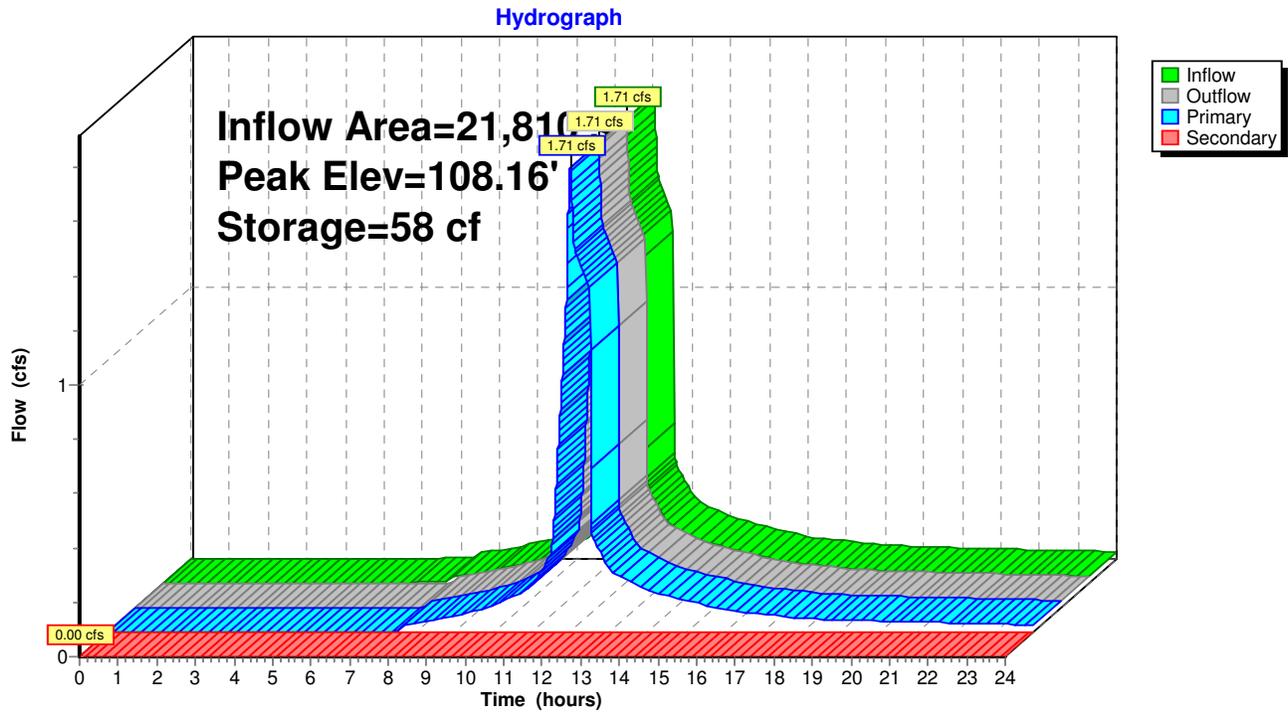
**Primary OutFlow** Max=1.71 cfs @ 12.01 hrs HW=108.16' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.71 cfs @ 1.32 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=107.50' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 155P: RG 5A - CB 116 between Septic and Unit 4



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Type III 24-hr 100-Year Rainfall=6.50"

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**Pond 157P: RG 7A - CB 126 Under Drive Unit 5**

[61] Hint: Submerged 54% of Reach 154R bottom

Inflow Area = 12,570 sf, Inflow Depth > 4.87" for 100-Year event  
 Inflow = 1.70 cfs @ 12.03 hrs, Volume= 5,100 cf  
 Outflow = 1.70 cfs @ 12.03 hrs, Volume= 5,058 cf, Atten= 0%, Lag= 0.1 min  
 Primary = 1.70 cfs @ 12.03 hrs, Volume= 5,058 cf  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.61' @ 12.03 hrs Surf.Area= 106 sf Storage= 59 cf

Plug-Flow detention time= 9.0 min calculated for 5,055 cf (99% of inflow)  
 Center-of-Mass det. time= 3.7 min ( 794.9 - 791.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	115.95'	98 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.95	0	0	0
115.96	75	0	0
116.45	96	42	42
116.95	126	56	98

Device	Routing	Invert	Outlet Devices
#1	Primary	116.45'	<b>2.00' x 2.00' Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
#2	Secondary	116.95'	<b>2.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

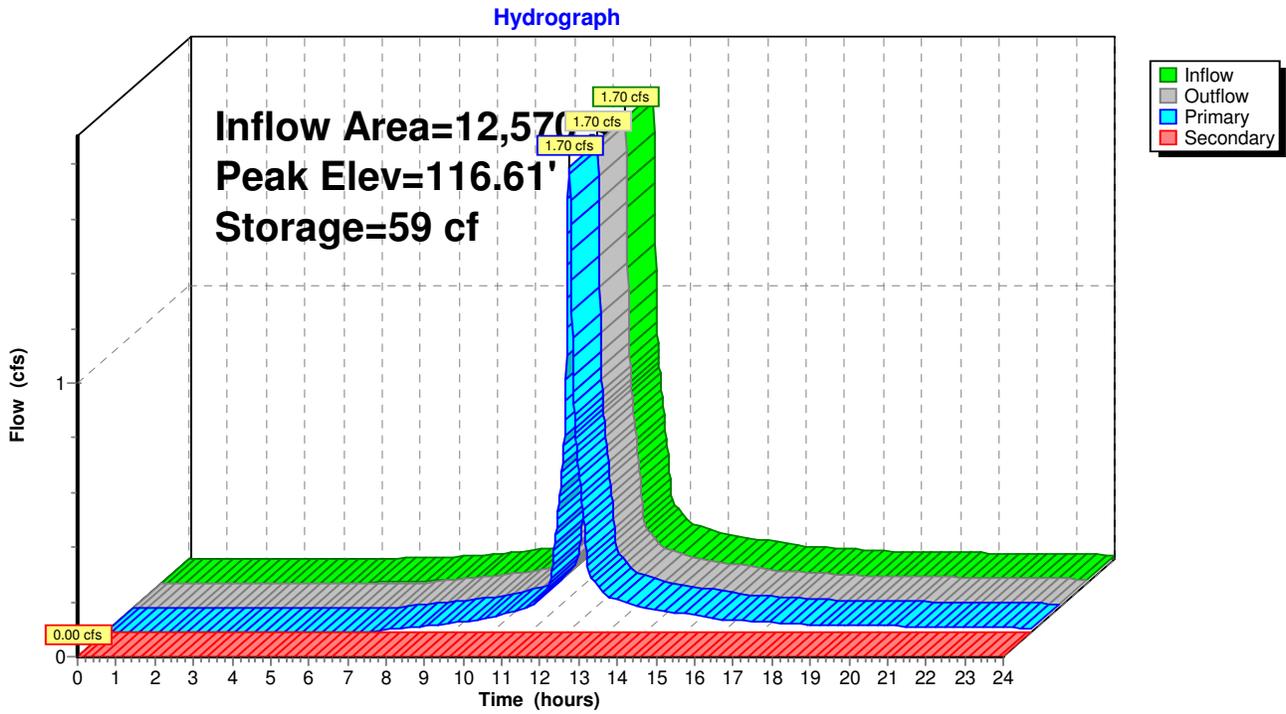
**Primary OutFlow** Max=1.70 cfs @ 12.03 hrs HW=116.61' (Free Discharge)

↑1=**Orifice/Grate** (Weir Controls 1.70 cfs @ 1.31 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=115.95' (Free Discharge)

↑2=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

Pond 157P: RG 7A - CB 126 Under Drive Unit 5



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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 158P: Culvert under Drive Unit 6

[57] Hint: Peaked at 117.76' (Flood elevation advised)

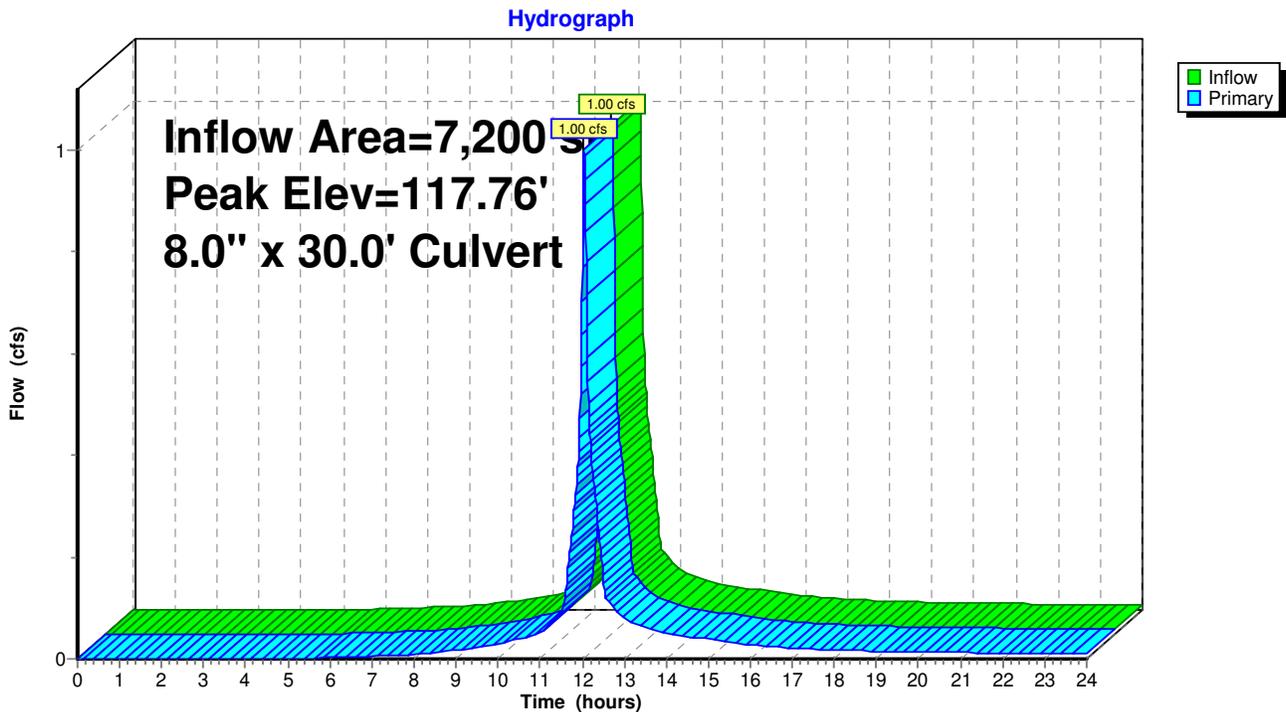
Inflow Area = 7,200 sf, Inflow Depth > 4.77" for 100-Year event  
Inflow = 1.00 cfs @ 12.05 hrs, Volume= 2,864 cf  
Outflow = 1.00 cfs @ 12.05 hrs, Volume= 2,864 cf, Atten= 0%, Lag= 0.0 min  
Primary = 1.00 cfs @ 12.05 hrs, Volume= 2,864 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 117.76' @ 12.05 hrs

Device #	Routing	Invert	Outlet Devices
1	Primary	117.05'	<b>8.0" x 30.0' long Culvert</b> RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 116.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

**Primary OutFlow** Max=1.00 cfs @ 12.05 hrs HW=117.76' (Free Discharge)  
↑1=Culvert (Barrel Controls 1.00 cfs @ 3.34 fps)

## Pond 158P: Culvert under Drive Unit 6



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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 218R: DMH 50 to Irrigation Cistern

[57] Hint: Peaked at 105.65' (Flood elevation advised)

[63] Warning: Exceeded Reach 55R inflow depth by 2.36' @ 12.02 hrs

[63] Warning: Exceeded Reach 403R inflow depth by 2.97' @ 12.02 hrs

[79] Warning: Submerged Pond 9P Primary device # 1 OUTLET by 0.03'

Inflow Area = 111,470 sf, Inflow Depth > 4.22" for 100-Year event  
Inflow = 11.06 cfs @ 12.02 hrs, Volume= 39,184 cf  
Outflow = 11.06 cfs @ 12.02 hrs, Volume= 39,184 cf, Atten= 0%, Lag= 0.0 min  
Primary = 11.06 cfs @ 12.02 hrs, Volume= 39,184 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

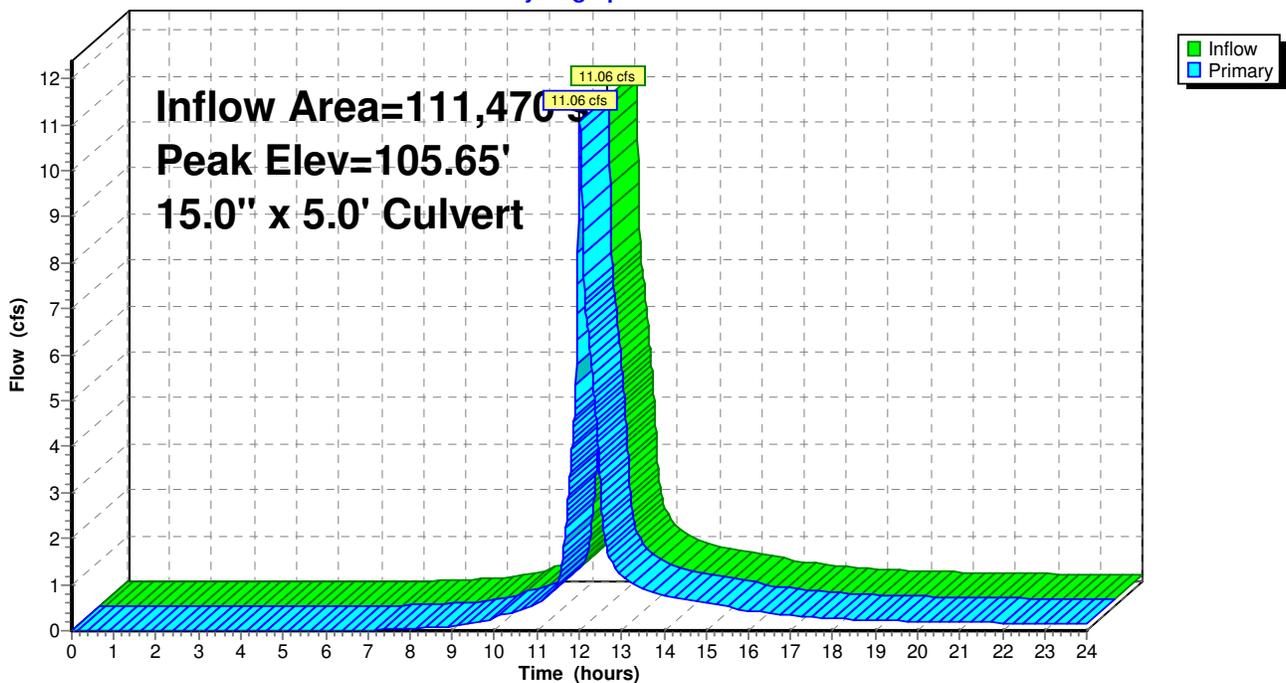
Peak Elev= 105.65' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	101.52'	<b>15.0" x 5.0' long Culvert</b> Square-edged headwall, Ke= 0.500 Outlet Invert= 101.42' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

**Primary OutFlow** Max=11.04 cfs @ 12.02 hrs HW=105.63' (Free Discharge)  
↑1=Culvert (Inlet Controls 11.04 cfs @ 8.99 fps)

## Pond 218R: DMH 50 to Irrigation Cistern

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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## Pond 219P: Irrigation Cistern

[81] Warning: Exceeded Pond 218R by 2.80' @ 12.13 hrs

Inflow Area = 111,470 sf, Inflow Depth > 4.22" for 100-Year event  
Inflow = 11.06 cfs @ 12.02 hrs, Volume= 39,184 cf  
Outflow = 8.25 cfs @ 12.10 hrs, Volume= 39,145 cf, Atten= 25%, Lag= 4.6 min  
Primary = 8.25 cfs @ 12.10 hrs, Volume= 39,145 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
Peak Elev= 106.58' @ 12.10 hrs Surf.Area= 460 sf Storage= 2,372 cf

Plug-Flow detention time= 4.0 min calculated for 39,128 cf (100% of inflow)  
Center-of-Mass det. time= 3.4 min ( 818.8 - 815.4 )

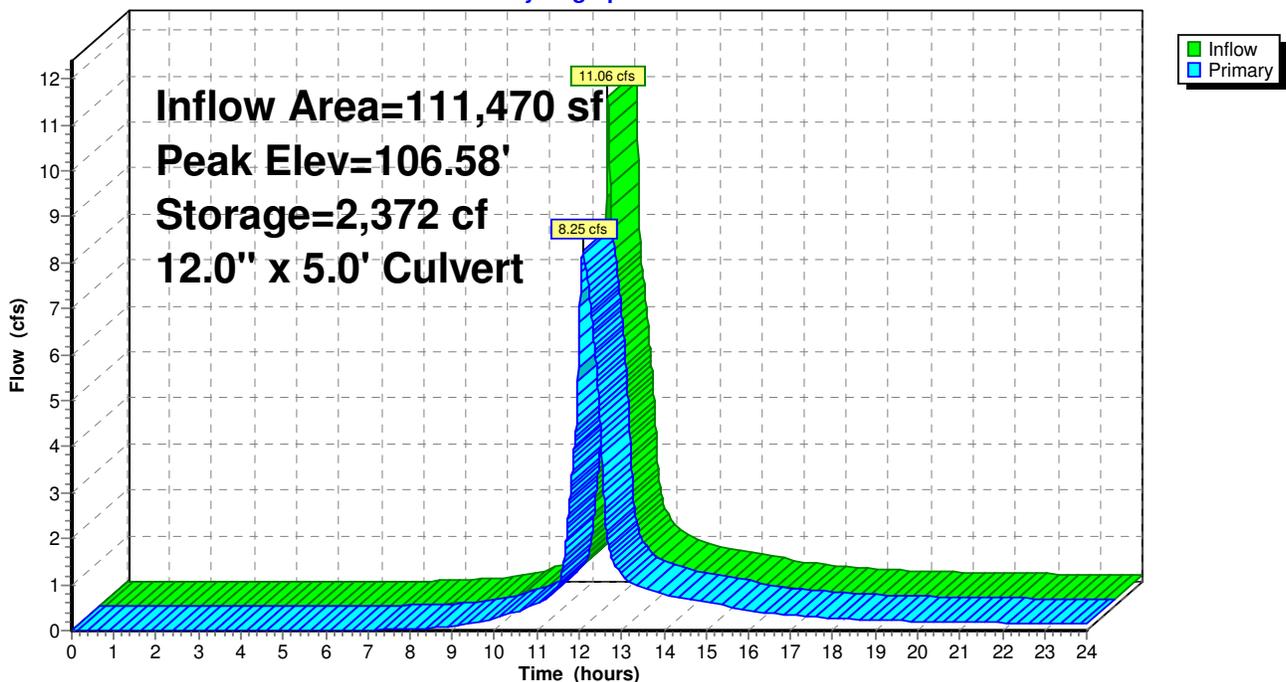
Volume	Invert	Avail.Storage	Storage Description
#1	101.42'	4,292 cf	11.50'W x 40.00'L x 9.33'H Prismatic

Device	Routing	Invert	Outlet Devices
#1	Primary	101.32'	12.0" x 5.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= 101.22' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

Primary OutFlow Max=8.25 cfs @ 12.10 hrs HW=106.57' (Free Discharge)  
←1=Culvert (Inlet Controls 8.25 cfs @ 10.50 fps)

## Pond 219P: Irrigation Cistern

Hydrograph



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Type III 24-hr 100-Year Rainfall=6.50"

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**Link A: POA A**

Inflow Area = 295,260 sf, Inflow Depth > 4.01" for 100-Year event  
Inflow = 23.63 cfs @ 12.07 hrs, Volume= 98,672 cf  
Primary = 23.63 cfs @ 12.07 hrs, Volume= 98,672 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 82.00'

**Link A: POA A**

Hydrograph

