Stormwater Permit Application for Administrative Review for Low Impact Projects

Town of Scituate Stormwater Bylaw (Sec. 32050) & Stormwater Regulations

Project

Four Single Family ANR Lots
Off of Mann Lot Road & Creelman Drive
Scituate, Massachusetts
Assessor's Parcels: 25-2-3 & 25-2-4

Owner/Applicant

Creel-Mann Realty Trust
17 New Driftway
Scituate, MA 02066

Date: June 13, 2016

Prepared by:

MORSE ENGINEERING CO., INC.
42.12N 70.44W

Registered Professional Engineers, Land Surveyors & Environmental Consultants

19 Union Street, P.O. Box 92
Scituate, MA 02066
Tel. 781.545.0895
GMorse@Morsecoinc.com

www.Morsecoinc.com

COMMONWEALTH OF MASSACHUSETTS
JEFFREY M. HASSETT
CIVIL
No. 49293
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

Project Narrative.....3-4

Town of Scituate Application for a Stormwater Permit Appendix Form.....5

APPENDIX A
- Post Construction Phase – Best Management Practices - Inspection Schedule & Evaluation Checklist
- Illicit Discharge Compliance Statement

APPENDIX B
- Pre-Development HydroCAD Analysis
- Post-Development HydroCAD Analysis

APPENDIX C
- Soil Testing Results
- NRCS Soil Map

Application Date: _____

Town of Scituate
Stormwater Permit Application

April, 2009
Revised December 2011

1. Project / Site Information

Four Single Family ANR Lots off of Mann Lot Road & Creelman Drive
Site Address

Scituate	Massachusetts	02066
	State	Zip Code
25-2-3 & 25-2-4	82,098 s.f.	58,549 s.f. total, 26,884 increase
Map-Block-Lot	Parcel Size	Number of Sq. ft. to be Disturbed

Is there an existing larger project this site is now a part of? ☒No ☐Yes

If **yes**, name of larger project: _____

EXISTING SITE DESCRIPTION: (Example: 5 Acres of forest land, 2 Acre single family residence, 50 Acre Farm Land. Attach Project Narrative and provide information on areas of slopes > 15%, if any.)

Existing 82,098 s.f. lot currently developed with a single family dwelling, gravel driveway and lawn.

2. Builder / Contractor Information

Creel-Mann Realty Trust
Builder / Contractor Name

17 New Driftway
Address

Scituate	Massachusetts	02061
Town	State	Zip Code
Salamone	Nancy	617-901-1737
Contact / Last Name	First Name	Telephone (cell phone where available)

3. Owner Information

same
Property Owner Name

Mailing Address

Town	State	Zip Code
Contact / Last Name	First Name	Telephone (including area code)

4. Authorized Representative

Morse Engineering Company, Inc.

Authorized Representative Name

P.O. Box 92

Address

Town	State	Zip Code
Scituate	Massachusetts	02066

Contact / Last Name	First Name	Telephone (cell phone where available)
Hassett, P.E.	Jeffrey	(781) 545-0895

5. Project Description / Features

__ Re-grading or Clearing

(4) Single Family/Multi Family Home

__ Subdivision # of Lots: _____

__ New Business / Commercial / Industrial Development

__ Business / Commercial/ Industrial Redevelopment

__ Other

Proposed Project Site includes the following features:

X Lot Area Provide sq. ft. 82,098

X Site contains wooded area or natural vegetation (X) landscaping (X) or areas subject to Wetland Protection Act or Rivers Act / Conservation Commission Jurisdiction (__) (Check all that apply)

X New Re-grading or Clearing Area (sq. ft.) 26,884 s.f. of new clearing.

X Impervious Area Existing (sq. ft.) 2,650+/ Proposed (sq. ft.) 11,630 +/-

Describe overall system of stormwater management: Swales, shallow grassed depression, crushed stone trenches and roof drywells.

Describe use of BMP's and LID techniques: Swales, shallow grassed depression, crushed stone trenches and roof drywells.

Describe long term maintenance and the party responsible, including inspection schedules:
All long-term maintenance will be the responsibility of the property owners. See Appendix A for Long-Term Operation & Maintenance schedule. The individual lot owners will be responsible for the BMPs on the respective lots.

X Plan and Information on Erosion / Sedimentation Control provided

6. Stormwater Management Plan and Report

The Stormwater Permit Application must include submission of a ***Land Alteration and Stormwater Management Plan and Report***. The purpose of the Stormwater Management Plan is to ensure that the runoff from a site has been treated for water quality and quantity impacts during the construction of the project and for the long term. See the Scituate Stormwater Regulations for additional information and references to Low Impact Development and Best Management Practices, and requirements for plan contents.

The applicant shall provide a narrative and supporting drainage calculations containing sufficient information for the Town to evaluate the environmental impact, effectiveness, and acceptability of the measures proposed by the applicant for reducing adverse impacts from stormwater. The calculations **must** include a diagram depicting the flow of runoff through the proposed system for treatment.

The Stormwater Report shall indicate the extent of compliance with the Stormwater Management Standards identified in the Scituate Stormwater Regulations.

All components of the Stormwater Management Plan shall be prepared and stamped by a licensed Professional Engineer for all site plans, subdivisions and residential projects greater than 2 building lots.

7. Engineer's Agreement

In signing the plan, the authorized representative certifies that the information is true and assumes liability for the plan. In addition, the undersigned agrees:

1. To furnish additional information relating to the quality or quantity of the stormwater from this site or evaluation of the adequacy of the stormwater management system for which this permit is sought as may be requested by the Planning Board or Conservation Commission.
2. To accept and abide by all the provisions of the Stormwater Bylaw of the Town of Scituate and of all other pertinent local, state or federal laws and regulations regarding stormwater discharge.
3. To operate and maintain any stormwater management facilities in an efficient manner at all items, with no municipal responsibility or liability, and at no expense to the Town. *See note pg. 4.
4. To cooperate at all items with the Planning Board or Conservation Commission, as applicable, and the Department of Public Works, and their representatives in the inspection of the stormwater management system authorized by this Permit, and any maintenance thereof.
5. To notify the Planning Board or Conservation Commission, as applicable, and Department of Public Works immediately in the event of any accident, negligence, or other occurrence that occasions discharge to the storm drain or any downstream wetlands or waterways, of any wastes or process waters not covered by this permit or allowed by the Stormwater Bylaw. **See note pg. 4.

6. To indemnify the Town of Scituate from loss or damage that may directly or indirectly be occasioned by the installation and use of the Stormwater Management System, and related facilities or connections.

8. Engineer Certification Statement

The Stormwater Permit Application must include a statement signed by the applicant or his representative that the drainage system can be expected to result in post-development runoff characteristics (including peak flow, total volume of runoff, and water quality of the runoff) for development and redevelopment projects equal to or less than the pre-development runoff characteristics. It is recommended that this be by a Professional Engineer.

I hereby certify that I prepared the Plan, that I have reviewed the Town of Scituate Stormwater Regulations, and that the drainage system will result in post-development runoff characteristics equal to or less than the pre-development runoff characteristics.

SIGNED UNDER OATH AND SUBJECT TO PENALTIES OF PERJURY THIS 13th DAY OF June, 2016.

Signature of Registered Engineer
(Print Name: Jeffrey M. Hassett, P.E., Morse Engineering

*The engineer does not agree to operate and maintain the proposed stormwater management system. The system will be owned/operated by the property owners.

**The engineer will only provide notification if employed by the property owner to inspect the stormwater management system.

ADDRESS: 4 ANR LOTS OFF OF MANN LOT ROAD & CREELMAN DRIVE

APPLICATION MADE BY:

(Print Owner's Name) NANCY SALAMONE - CREEL-MANN REALTY TRUST

Signed:_____

CERTIFICATION BY:

(Print Engineer's Name) JEFFREY M. HASSETT, P.E. - MORSE ENG.

Signed_____

DATE OF FINAL APPROVED PLAN:_____

CONDITIONS OF PERMIT ATTACHED:_____ **(YES/NO)**

APPLICATION APPROVED AND PERMIT GRANTED

Signed_____ **(For Town of Scituate) Date:**_____

Project Narrative
4 Single Family ANR Lots off of Mann Lot Road & Creelman Drive
Scituate, Massachusetts

Project Summary

The project Applicant proposes to demolish an existing single family dwelling and construct four single family dwellings off of Mann Lot Road and Creelman Drive, Scituate, MA. The existing dwelling to be demolished is known as #81 Mann Lot Road. The property is residentially zoned and was recently subdivided into four lots as an ANR Form-A subdivision. Each lot is comprised of a minimum of 20,000 s.f.. There are no wetland resource areas on the subject property or within 100' of the proposed work. The properties have frontage on Mann Lot Road to the west, frontage on Creelman Drive to the south and are bordered by developed residentially zoned properties to the north and east. This report contains a narrative review of the stormwater management systems associated with the proposed project in accordance with the Town of Scituate Stormwater Bylaw.

The work proposed by this project is described as demolishing an existing single family dwelling and constructing four single family dwellings and associated driveways, grading, lawn, landscaping and utility connections. The disturbed areas will be restored and stabilized with the proposed driveways, dwellings and lawn surfaces.

Pre-Development Condition

The site is developed with a single family dwelling residential structure, gravel driveway, and lawn. No drainage systems exist at the subject property. The majority of the site slopes gently in an easterly direction towards the abutting properties to the rear. Smaller portions of the site slope gently to the roadway, the abutting property on Mann Lot Road and to the abutting property on Creelman Drive.

Soil information was obtained from the Soils Conservation Services (SCS) Survey of Plymouth County, Massachusetts and on-site soil testing. Based on SCS Soils Mapping the soils are classified as "311B-Woodbridge fine sandy loam, 3 to 8 percent slopes, very stony" and "323B-Poquonock sand, 3 to 8 percent slopes, very stony." However, based upon on-site soils analysis performed by Morse Engineering and witnessed by Ralph Cole, P.L.S., DEP Soil Evaluator #410 in November and December 2015, the soils appear to be sandy loams, not sand.

Post-Development Condition

The proposed site will consist of four single family dwellings, driveways and lawn surfaces. The dwellings will be serviced by individual on-site septic systems and municipal water. The project results in 58,549+/- s.f. of disturbed areas and 11,630+/- s.f. of impervious surfaces. The project results in a net increase of 26,884+/- s.f. of disturbed areas and an increase of 8,980+/- s.f. of impervious surfaces Stormwater runoff

is proposed to be mitigated with swales, grassed depressions, crushed stone trenches and roof drywells.

There were three objectives in designing the proposed drainage facilities, which are described below:

1.) Maintain existing drainage patterns: The proposed site does not alter the direction of existing surface water runoff. In the current conditions and the proposed conditions, runoff flows towards the abutting properties to the rear, to the roadway, to the abutting property on Mann Lot Road and to the abutting property on Creelman Drive.
2.) Provide Groundwater Recharge: The proposed site utilizes roof drywell systems, crushed stone trenches and a shallow grassed depression to infiltrate roof runoff.

Recharge Volume = 0.10 inches of runoff X Increased Impervious Area** (Hydrologic Soil Group D)

The project results in a net increase of 8,890 s.f. of impervious area.

Therefore;
Minimum Recharge Volume = 0.10 in. 8,890 s .f. X (1 ft./12 in.) = 74 c.f.

PROVIDED RECHARGE = 942 c.f.
(Provided within the roof drywell systems, crushed stone trenches and a shallow grassed depression – see HydroCAD results in Appendix B)

3.) Maintain Pre vs. Post Rates & Volumes of Runoff: The HydroCAD calculations included in appendix B demonstrate compliance that the post-development conditions result in equal or less runoff than pre-development characteristics as summarized in the following table:

Peak Discharge Rates (cfs):

Design Point #1:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	1.24	2.05	2.63	3.55
Post-Development	1.03	1.86	2.49	3.55

Design Point #2:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.57	1.02	1.35	1.87
Post-Development	0.57	0.93	1.18	1.56

Design Point #3:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.27	0.48	0.64	0.89
Post-Development	0.23	0.39	0.51	0.70

Design Point #4:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.69	1.13	1.45	1.94
Post-Development	0.69	1.13	1.44	1.93

Volume of Runoff (ac-ft.):

Design Point #1:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.112	0.185	0.238	0.323
Post-Development	0.095	0.169	0.226	0.320

Design Point #2:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.052	0.091	0.120	0.167
Post-Development	0.052	0.083	0.107	0.143

Design Point #3:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.024	0.042	0.056	0.078
Post-Development	0.020	0.034	0.043	0.061

Design Point #4:

	2-Yr.	10-Yr.	25-Yr.	100-Yr.
Pre-Development	0.063	0.103	0.132	0.178
Post-Development	0.055	0.098	0.128	0.178

Erosion and Siltation Control

Erosion control consisting of siltation fencing will be placed along the down gradient limit of work where there is potential for erosion onto the roadways and/or abutting properties prior to project commencement. The integrity of the erosion control barrier will be maintained by periodic inspection and replacement as necessary. The barrier will remain in place until all disturbed surfaces have been loamed and seeded and vegetation has been established.

Crushed stone stabilized construction entrances shall be installed at the project entrances on Mann Lot Road and Creelman Drive. These entrances will help minimize the migration of sediments onto nearby streets from construction traffic.

APPENDIX A

- Post Construction Phase – Best Management Practices - Inspection Schedule & Evaluation Checklist
- Illicit Discharge Compliance Statement

Project Location: Four ANR lots off of Mann Lot Road and Creelman Drive, Scituate, MA

Stormwater Management – Post Construction Phase

Best Management Practices – Inspection Schedule and Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency (1)	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check (1)	Cleaning/Repair Needed: ☐yes ☐no (List Items)	Date of Cleaning/ Repair	Performed by
Roof drywell system	Semi-Annually			Inspect water level in leaching pit. Remove debris from leaching pit.			
Roof gutters	Semi-Annually			Remove leaf litter if accumulated. Install gutter guards or filter screens over Gutters.			
Turf Management	Semi-Annually			Repair eroded site areas. Plant grass or mulch exposed soil surfaces			
Driveway Surface	Semi-Annually			Sweep clean of any accumulated sediments			
Crushed Stone Trench	Semi-annually			Remove sediment trash and debris. Remove weeds. Repair Erosion Remove and replace mulch/stone filter, filter fabric and crushed stone as needed if trench becomes clogged with sediment, debris, etc.			
Shallow Grassed Depression	Semi-annually			Remove sediment trash and debris, Remove weds. Mow twice/ year minimum. Repair erosion. Re-seed as necessary			

Illicit Discharge Compliance Statement

To: Town of Scituate
600 Chief Justice Cushing Highway
Town Hall
Scituate, MA 02066

RE: Four Single Family ANR Lots off of Mann Lot Road and Creelman Drive
Scituate, MA

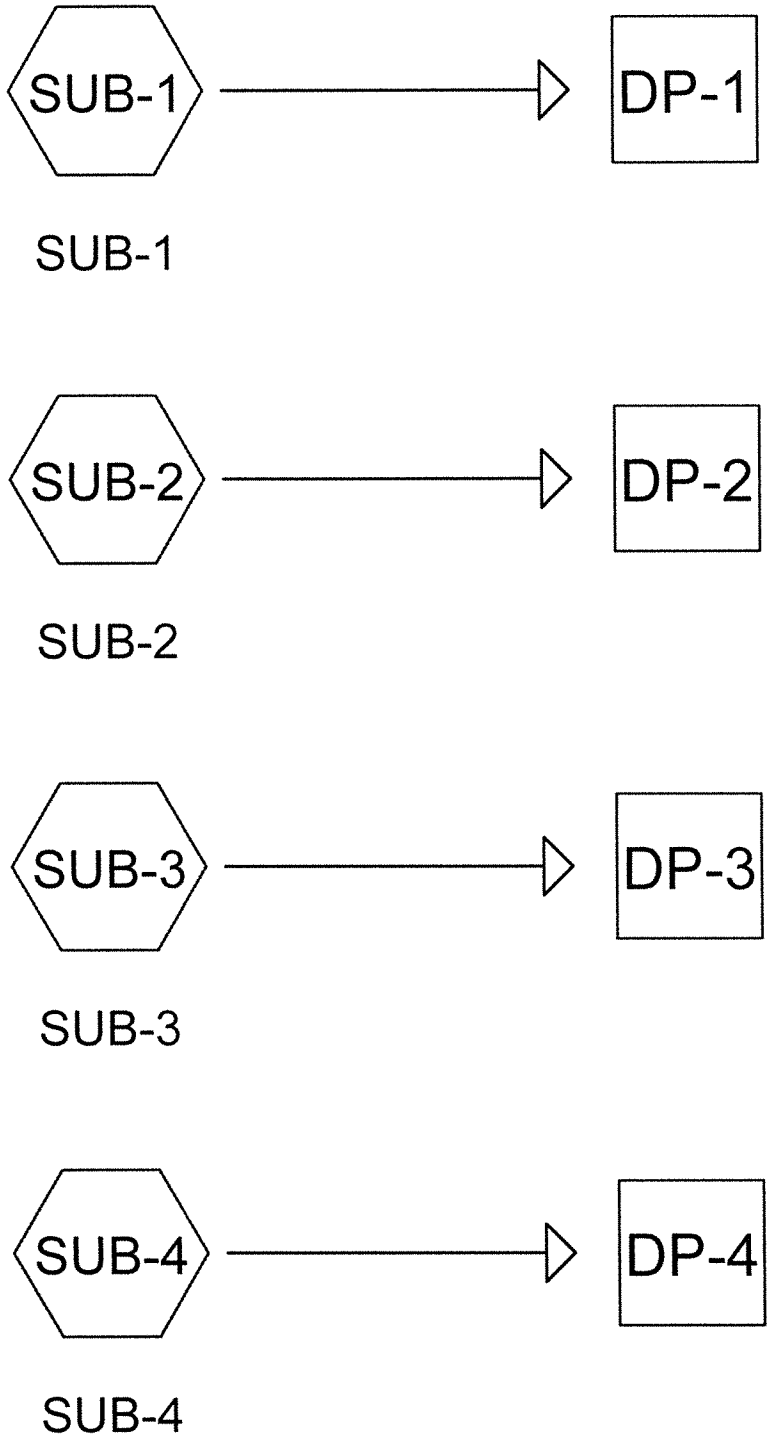
To Whom it May Concern:

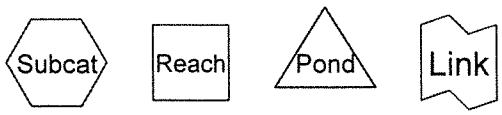
This letter is a statement that to the best of my knowledge, no illicit discharges currently exist or are being considered by me to the stormwater management system at the above referenced property.

Jeffrey M. Hassett, P.E.
Applicant's Representative

APPENDIX B

- Pre-Development HydroCAD Analysis
- Post-Development HydroCAD Analysis





Drainage Diagram for Existing Conditions
Prepared by {enter your company name here}, Printed 6/13/2016
HydroCAD® 9.10 s/n 06290 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.158	77	X-Woods, Good, HSG D (SUB-1, SUB-2, SUB-3, SUB-4)
0.616	84	X-50-75% Grass cover, Fair, HSG D (SUB-1, SUB-4)
0.050	91	X-Gravel driveway, HSG D (SUB-1, SUB-4)
0.046	98	X-House (SUB-1)
0.015	98	X-Imperv Patio (SUB-1)
1.885		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1: SUB-1 Runoff Area=34,304 sf 7.73% Impervious Runoff Depth=1.70"
Flow Length=260' Tc=13.3 min CN=82 Runoff=1.24 cfs 0.112 af

Subcatchment SUB-2: SUB-2 Runoff Area=19,984 sf 0.00% Impervious Runoff Depth=1.36"
Flow Length=170' Slope=0.0200 '/' Tc=12.9 min CN=77 Runoff=0.57 cfs 0.052 af

Subcatchment SUB-3: SUB-3 Runoff Area=9,333 sf 0.00% Impervious Runoff Depth=1.36"
Flow Length=110' Slope=0.0200 '/' Tc=12.4 min CN=77 Runoff=0.27 cfs 0.024 af

Subcatchment SUB-4: SUB-4 Runoff Area=18,477 sf 0.00% Impervious Runoff Depth=1.77"
Flow Length=250' Slope=0.0200 '/' Tc=13.5 min CN=83 Runoff=0.69 cfs 0.063 af

Reach DP-1: Inflow=1.24 cfs 0.112 af
Outflow=1.24 cfs 0.112 af

Reach DP-2: Inflow=0.57 cfs 0.052 af
Outflow=0.57 cfs 0.052 af

Reach DP-3: Inflow=0.27 cfs 0.024 af
Outflow=0.27 cfs 0.024 af

Reach DP-4: Inflow=0.69 cfs 0.063 af
Outflow=0.69 cfs 0.063 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.250 af Average Runoff Depth = 1.59"
96.77% Pervious = 1.824 ac 3.23% Impervious = 0.061 ac

Summary for Subcatchment SUB-1: SUB-1

Runoff = 1.24 cfs @ 12.19 hrs, Volume= 0.112 af, Depth= 1.70"

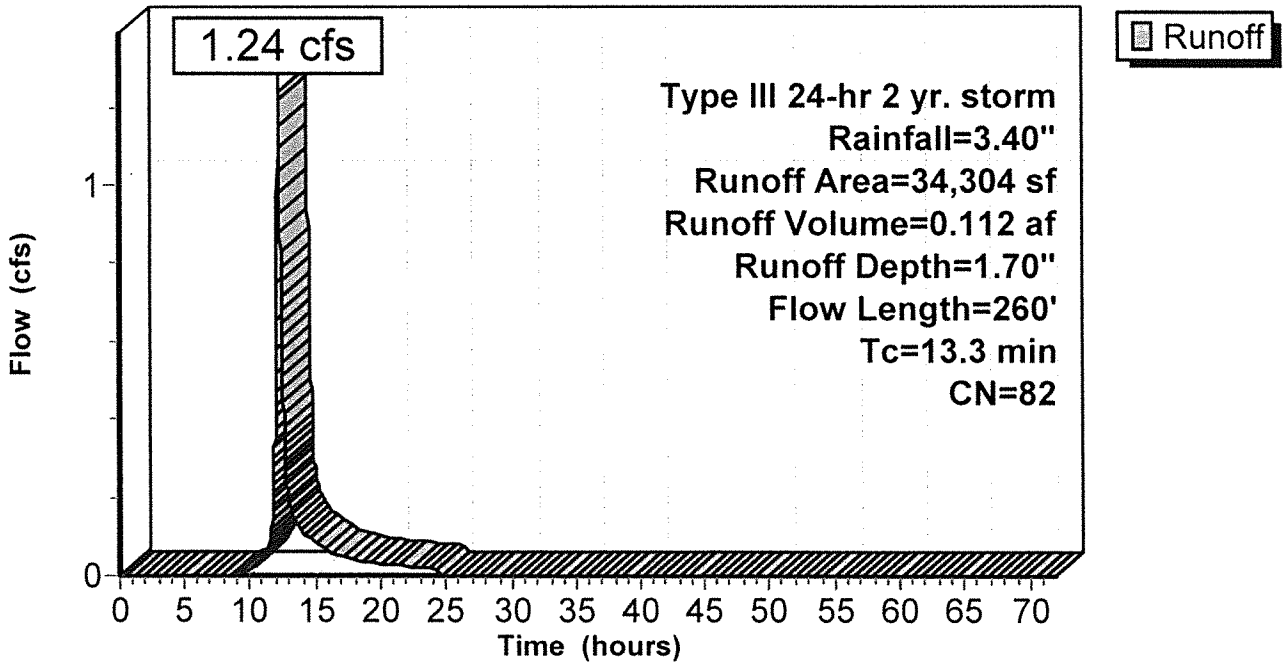
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	2,010	98	X-House
*	640	98	X-Imperv Patio
*	1,102	91	X-Gravel driveway, HSG D
*	14,244	84	X-50-75% Grass cover, Fair, HSG D
*	16,308	77	X-Woods, Good, HSG D
	34,304	82	Weighted Average
	31,654		92.27% Pervious Area
	2,650		7.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.3	210	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.3	260	Total			

Subcatchment SUB-1: SUB-1

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 0.57 cfs @ 12.19 hrs, Volume= 0.052 af, Depth= 1.36"

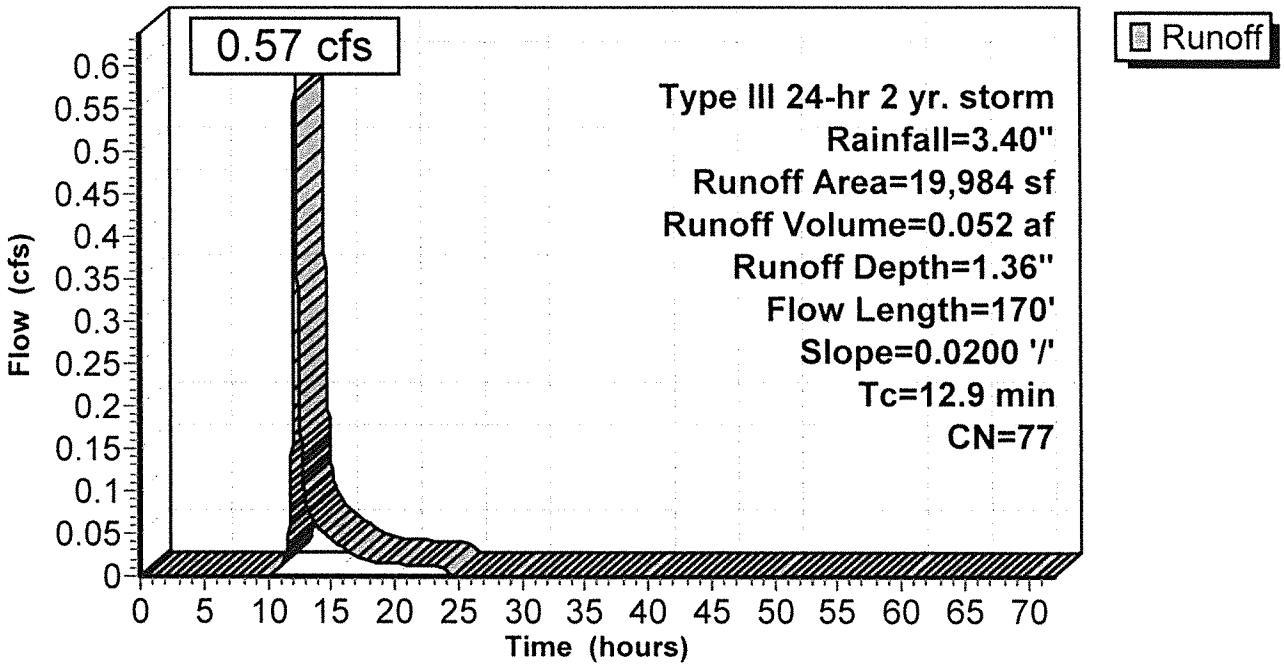
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	19,984	77	X-Woods, Good, HSG D
	19,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	120	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	170	Total			

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3: SUB-3

Runoff = 0.27 cfs @ 12.18 hrs, Volume= 0.024 af, Depth= 1.36"

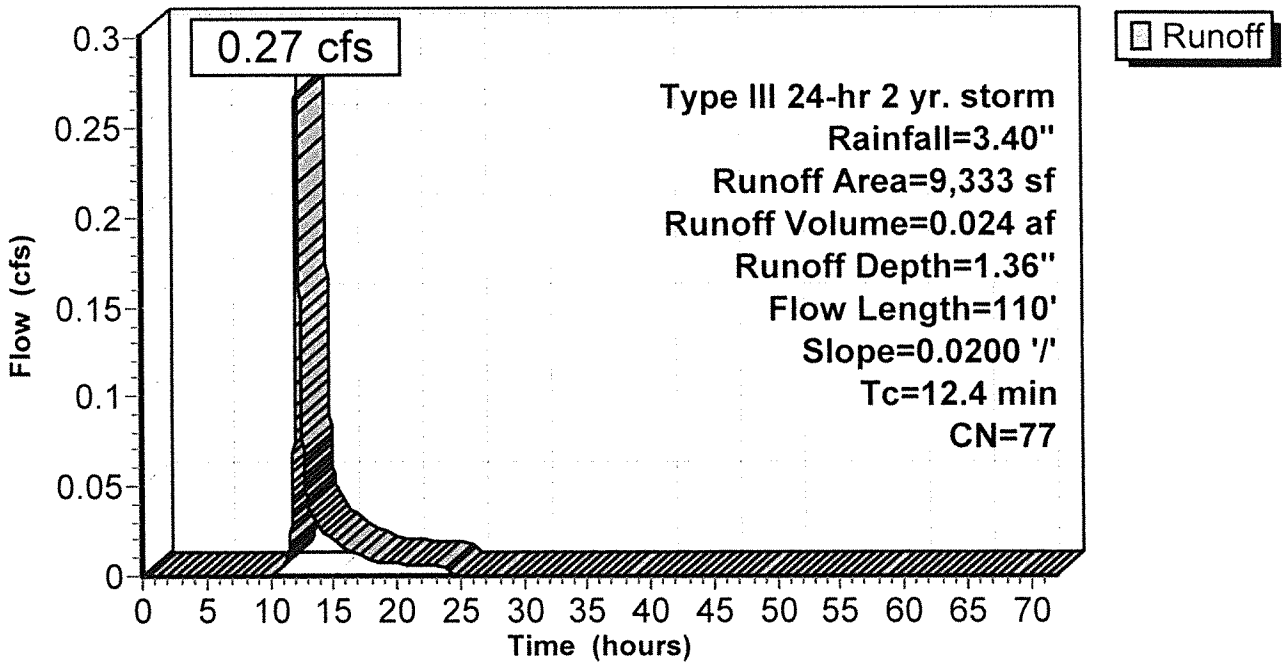
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	9,333	77	X-Woods, Good, HSG D
	9,333		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	110	Total			

Subcatchment SUB-3: SUB-3

Hydrograph



Summary for Subcatchment SUB-4: SUB-4

Runoff = 0.69 cfs @ 12.19 hrs, Volume= 0.063 af, Depth= 1.77"

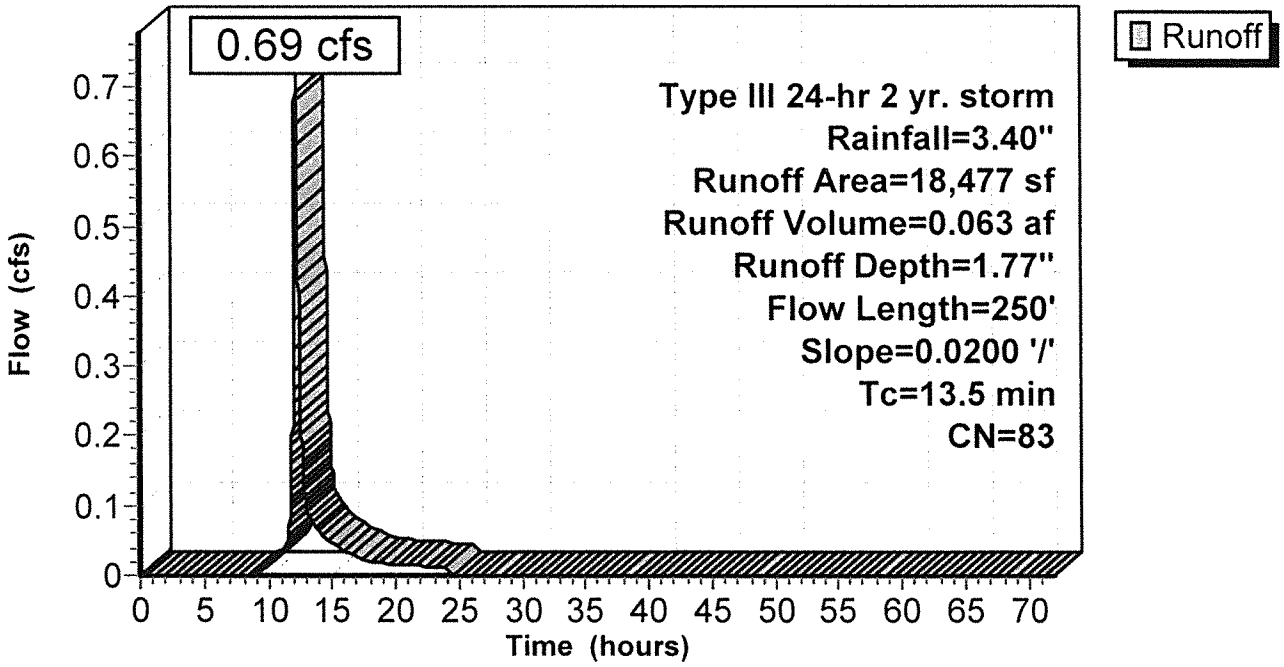
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,080	91	X-Gravel driveway, HSG D
*	12,589	84	X-50-75% Grass cover, Fair, HSG D
*	4,808	77	X-Woods, Good, HSG D
	18,477	83	Weighted Average
	18,477		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.5	200	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	250	Total			

Subcatchment SUB-4: SUB-4

Hydrograph



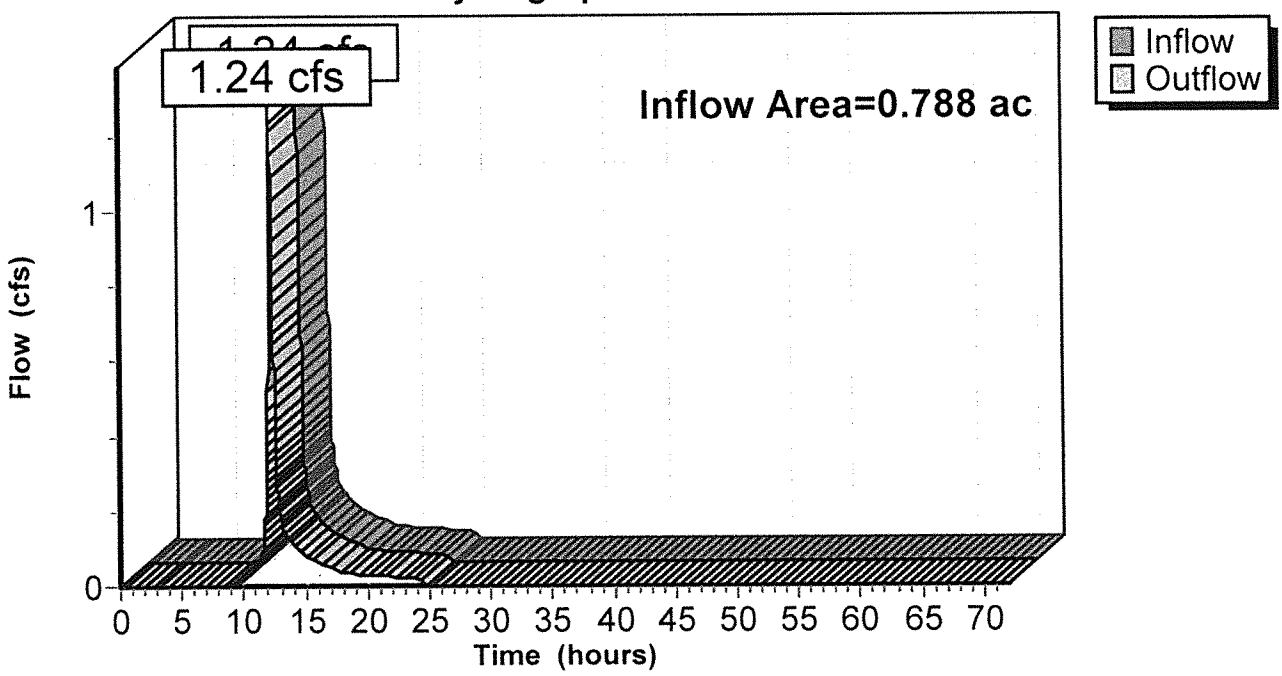
Summary for Reach DP-1:

Inflow Area =	0.788 ac,	7.73% Impervious,	Inflow Depth =	1.70"	for 2 yr. storm event
Inflow =	1.24 cfs @	12.19 hrs, Volume=	0.112 af		
Outflow =	1.24 cfs @	12.19 hrs, Volume=	0.112 af, Atten= 0%, Lag= 0.0 min		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-1:

Hydrograph



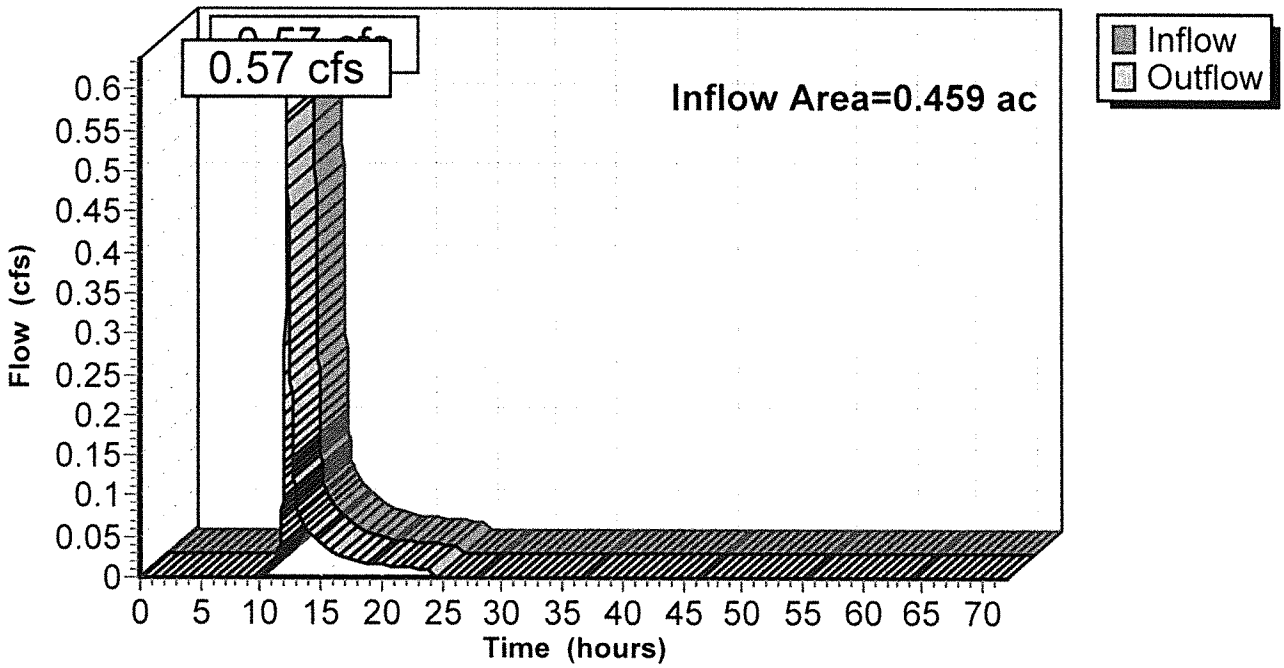
Summary for Reach DP-2:

Inflow Area =	0.459 ac,	0.00% Impervious,	Inflow Depth =	1.36"	for 2 yr. storm event
Inflow =	0.57 cfs @	12.19 hrs,	Volume=	0.052 af	
Outflow =	0.57 cfs @	12.19 hrs,	Volume=	0.052 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-2:

Hydrograph



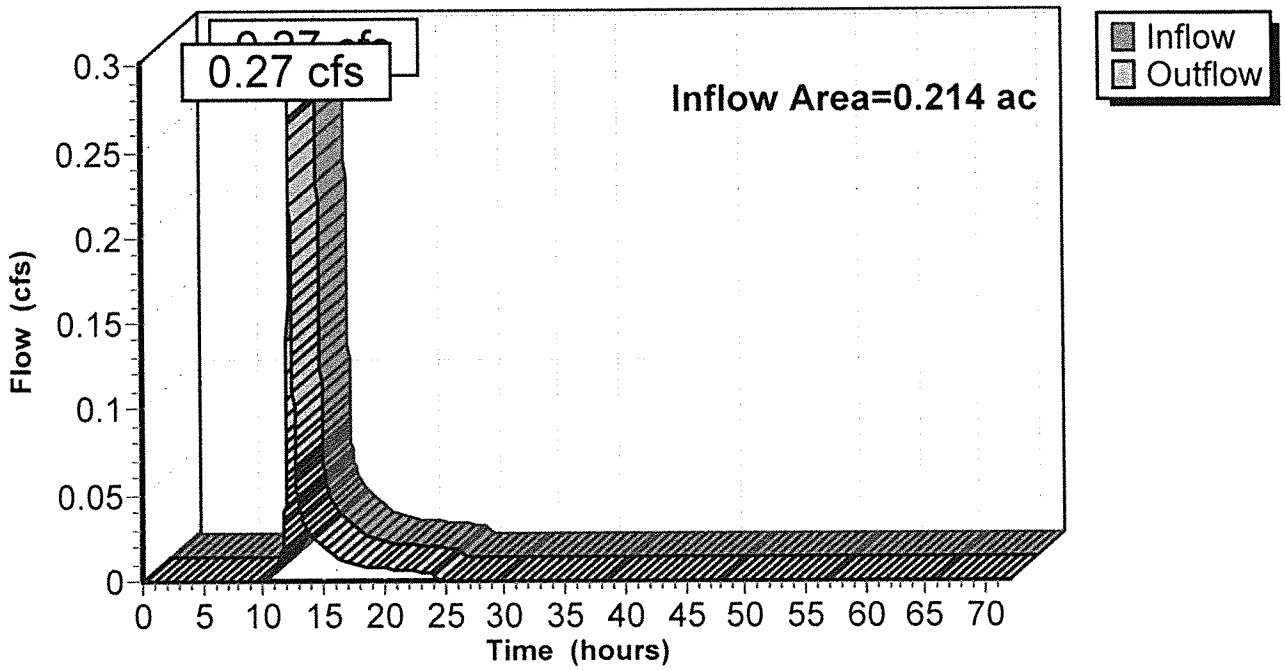
Summary for Reach DP-3:

Inflow Area =	0.214 ac,	0.00% Impervious,	Inflow Depth =	1.36"	for 2 yr. storm event
Inflow =	0.27 cfs @	12.18 hrs, Volume=	0.024 af		
Outflow =	0.27 cfs @	12.18 hrs, Volume=	0.024 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-3:

Hydrograph



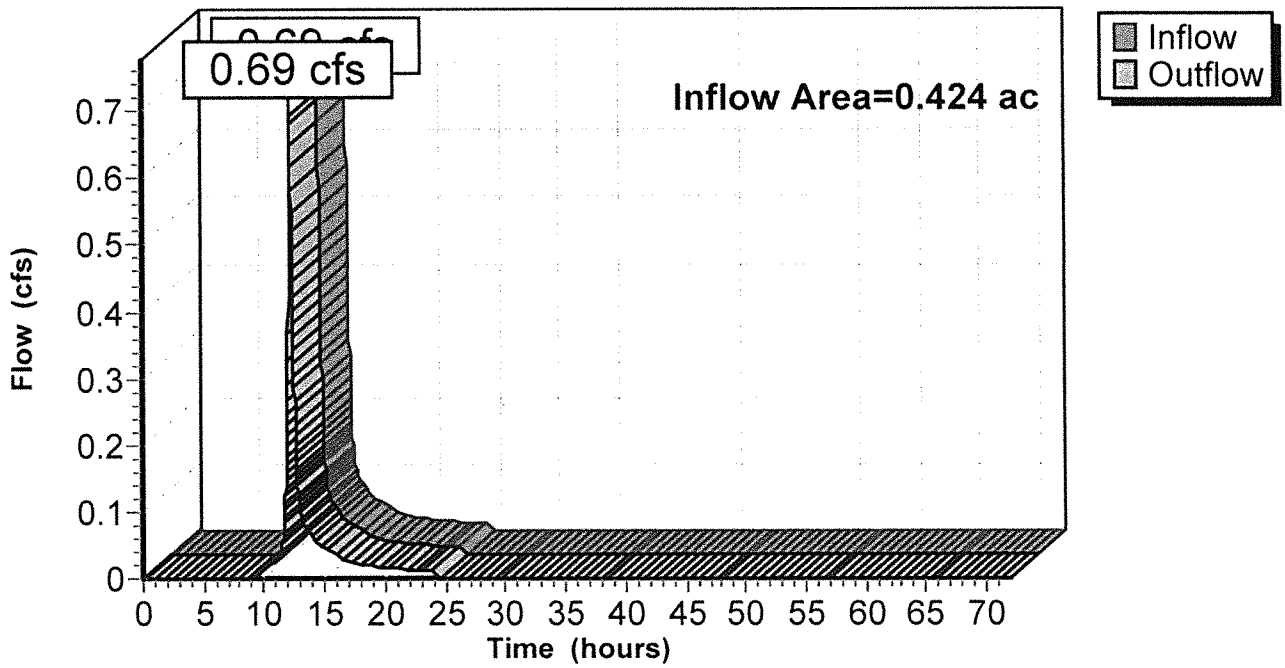
Summary for Reach DP-4:

Inflow Area =	0.424 ac,	0.00% Impervious,	Inflow Depth =	1.77"	for 2 yr. storm event
Inflow =	0.69 cfs @	12.19 hrs, Volume=	0.063 af		
Outflow =	0.69 cfs @	12.19 hrs, Volume=	0.063 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-4:

Hydrograph



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1: SUB-1 Runoff Area=34,304 sf 7.73% Impervious Runoff Depth=2.81"
Flow Length=260' Tc=13.3 min CN=82 Runoff=2.05 cfs 0.185 af

Subcatchment SUB-2: SUB-2 Runoff Area=19,984 sf 0.00% Impervious Runoff Depth=2.37"
Flow Length=170' Slope=0.0200 '/' Tc=12.9 min CN=77 Runoff=1.02 cfs 0.091 af

Subcatchment SUB-3: SUB-3 Runoff Area=9,333 sf 0.00% Impervious Runoff Depth=2.37"
Flow Length=110' Slope=0.0200 '/' Tc=12.4 min CN=77 Runoff=0.48 cfs 0.042 af

Subcatchment SUB-4: SUB-4 Runoff Area=18,477 sf 0.00% Impervious Runoff Depth=2.90"
Flow Length=250' Slope=0.0200 '/' Tc=13.5 min CN=83 Runoff=1.13 cfs 0.103 af

Reach DP-1: Inflow=2.05 cfs 0.185 af
Outflow=2.05 cfs 0.185 af

Reach DP-2: Inflow=1.02 cfs 0.091 af
Outflow=1.02 cfs 0.091 af

Reach DP-3: Inflow=0.48 cfs 0.042 af
Outflow=0.48 cfs 0.042 af

Reach DP-4: Inflow=1.13 cfs 0.103 af
Outflow=1.13 cfs 0.103 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.420 af Average Runoff Depth = 2.68"
96.77% Pervious = 1.824 ac 3.23% Impervious = 0.061 ac

Summary for Subcatchment SUB-1: SUB-1

Runoff = 2.05 cfs @ 12.18 hrs, Volume= 0.185 af, Depth= 2.81"

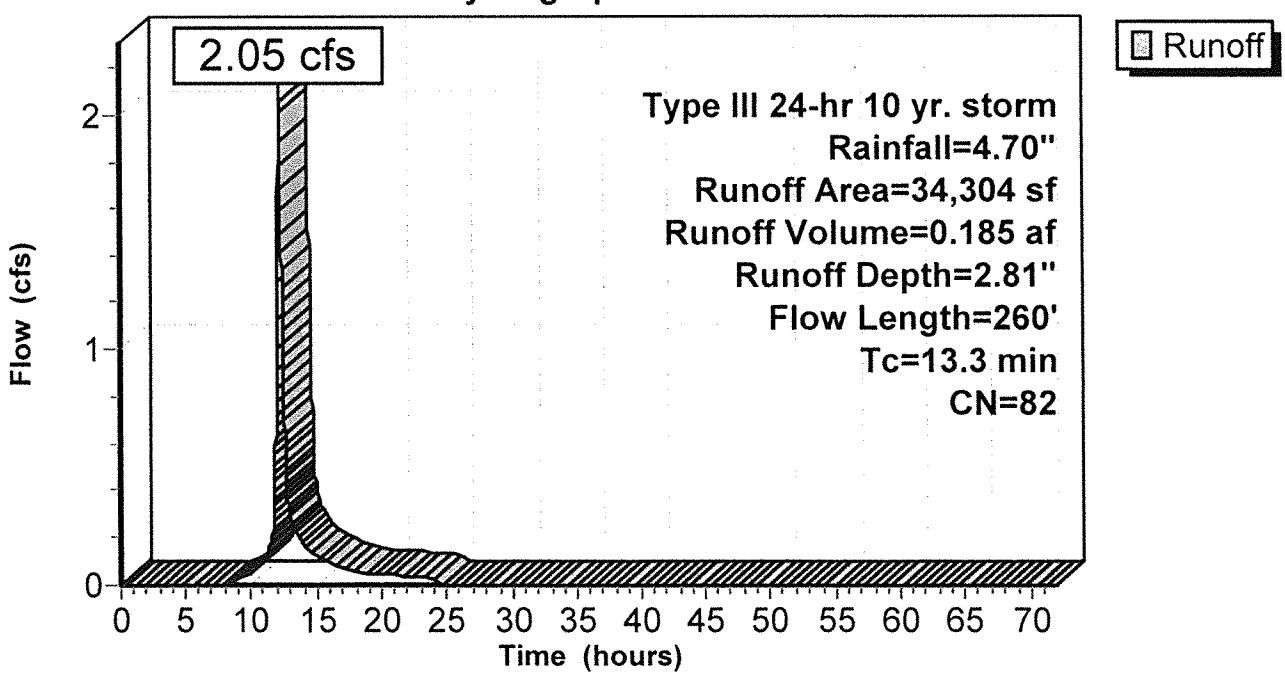
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	2,010	98	X-House
*	640	98	X-Imperv Patio
*	1,102	91	X-Gravel driveway, HSG D
*	14,244	84	X-50-75% Grass cover, Fair, HSG D
*	16,308	77	X-Woods, Good, HSG D
	34,304	82	Weighted Average
	31,654		92.27% Pervious Area
	2,650		7.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.3	210	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.3	260	Total			

Subcatchment SUB-1: SUB-1

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 1.02 cfs @ 12.18 hrs, Volume= 0.091 af, Depth= 2.37"

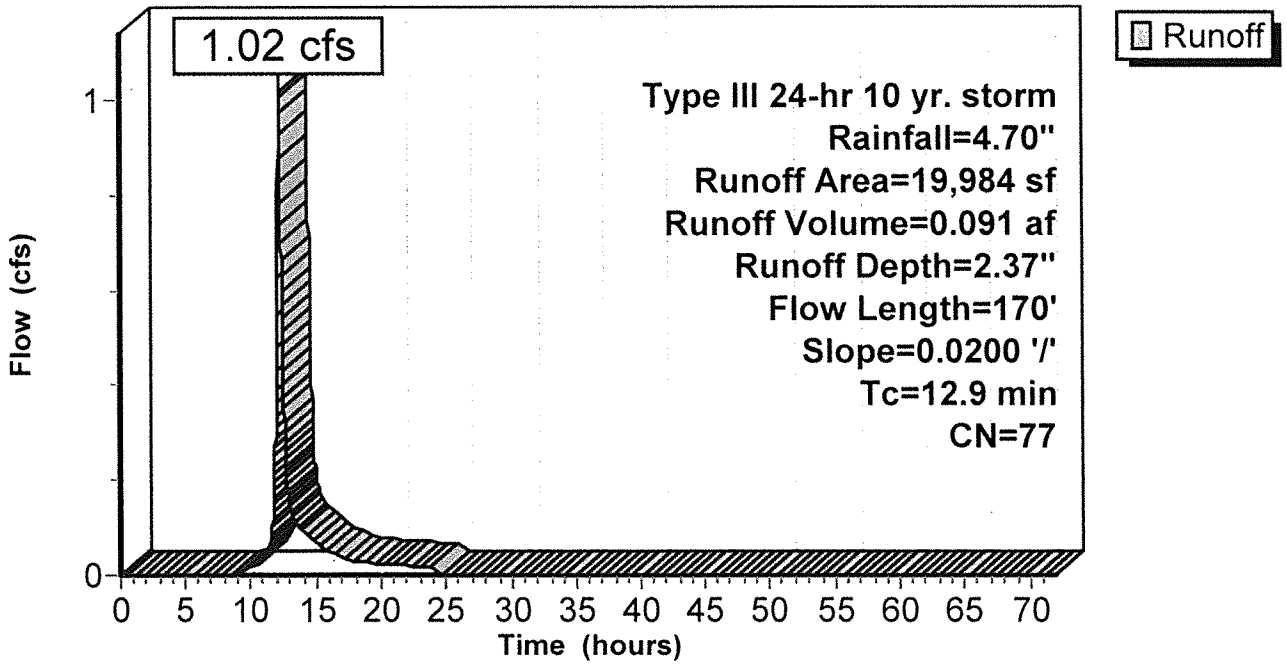
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	19,984	77	X-Woods, Good, HSG D
	19,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	120	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	170	Total			

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3: SUB-3

Runoff = 0.48 cfs @ 12.17 hrs, Volume= 0.042 af, Depth= 2.37"

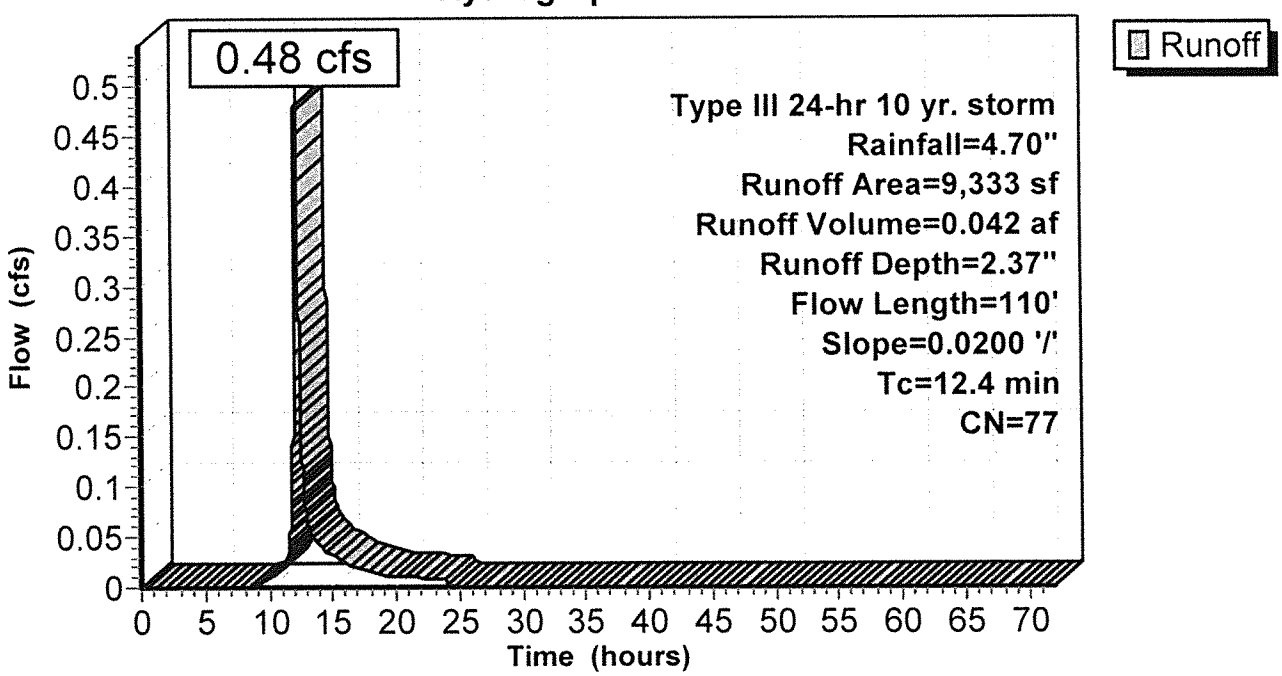
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	9,333	77	X-Woods, Good, HSG D
	9,333		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	110	Total			

Subcatchment SUB-3: SUB-3

Hydrograph



Summary for Subcatchment SUB-4: SUB-4

Runoff = 1.13 cfs @ 12.18 hrs, Volume= 0.103 af, Depth= 2.90"

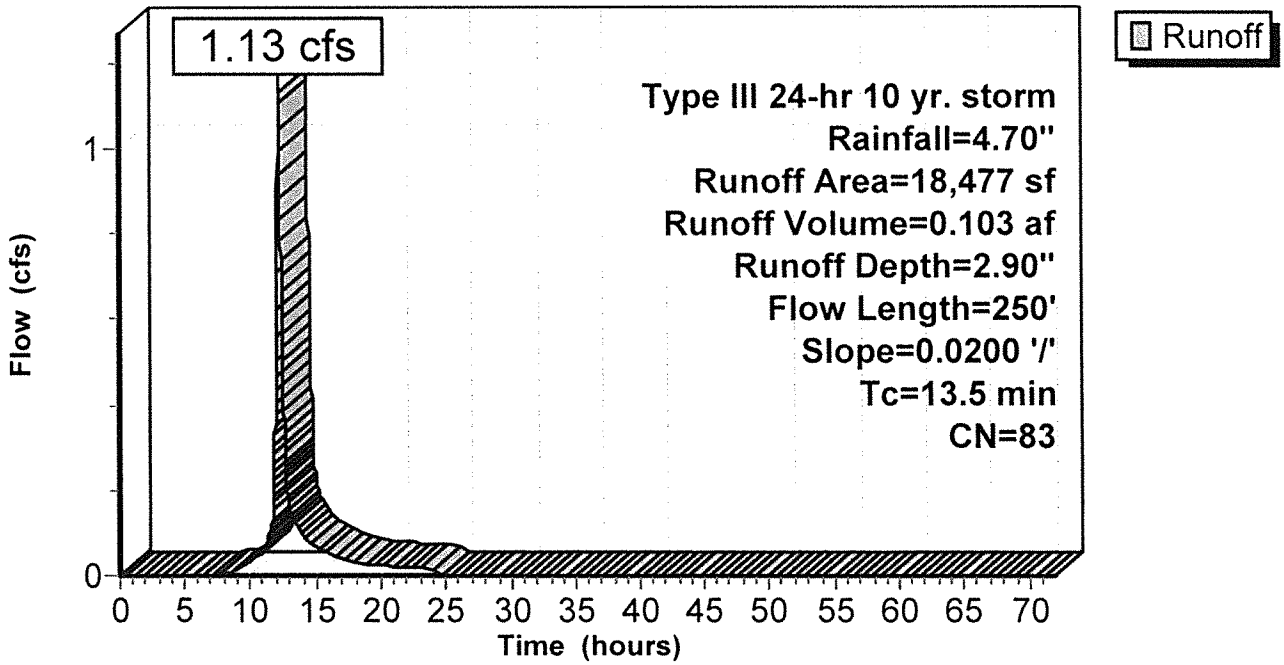
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,080	91	X-Gravel driveway, HSG D
*	12,589	84	X-50-75% Grass cover, Fair, HSG D
*	4,808	77	X-Woods, Good, HSG D
	18,477	83	Weighted Average
	18,477		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.5	200	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	250	Total			

Subcatchment SUB-4: SUB-4

Hydrograph



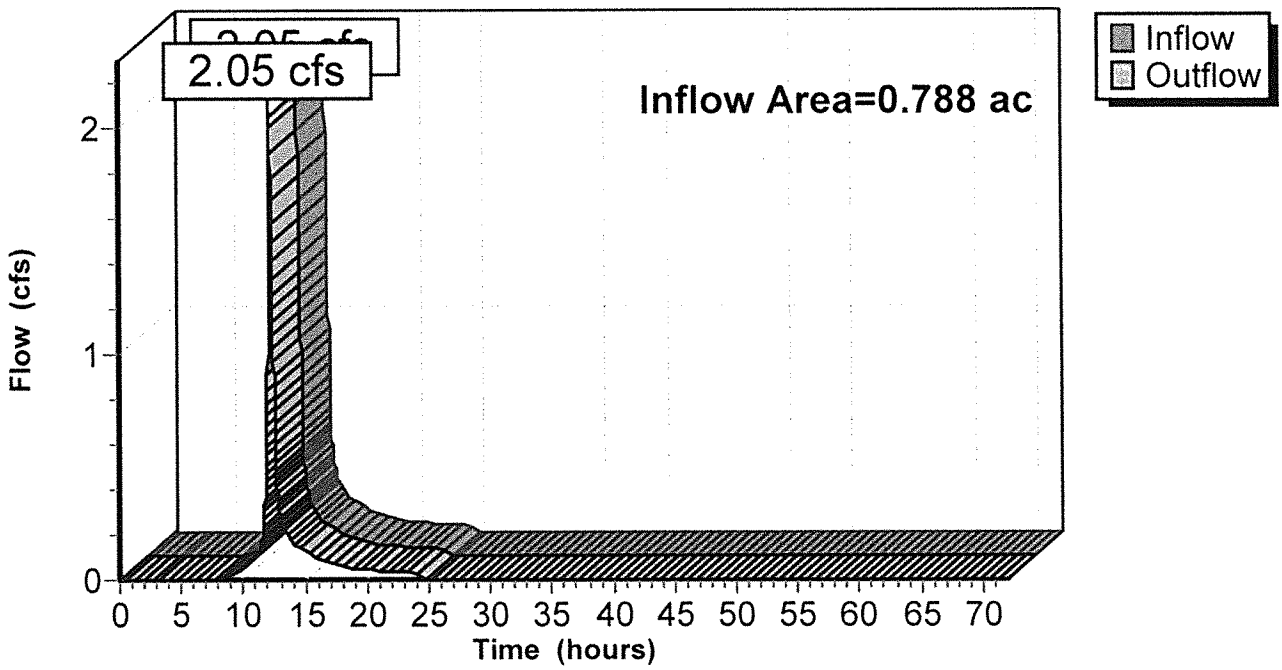
Summary for Reach DP-1:

Inflow Area =	0.788 ac,	7.73% Impervious,	Inflow Depth =	2.81"	for 10 yr. storm event
Inflow =	2.05 cfs @	12.18 hrs,	Volume=	0.185 af	
Outflow =	2.05 cfs @	12.18 hrs,	Volume=	0.185 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-1:

Hydrograph



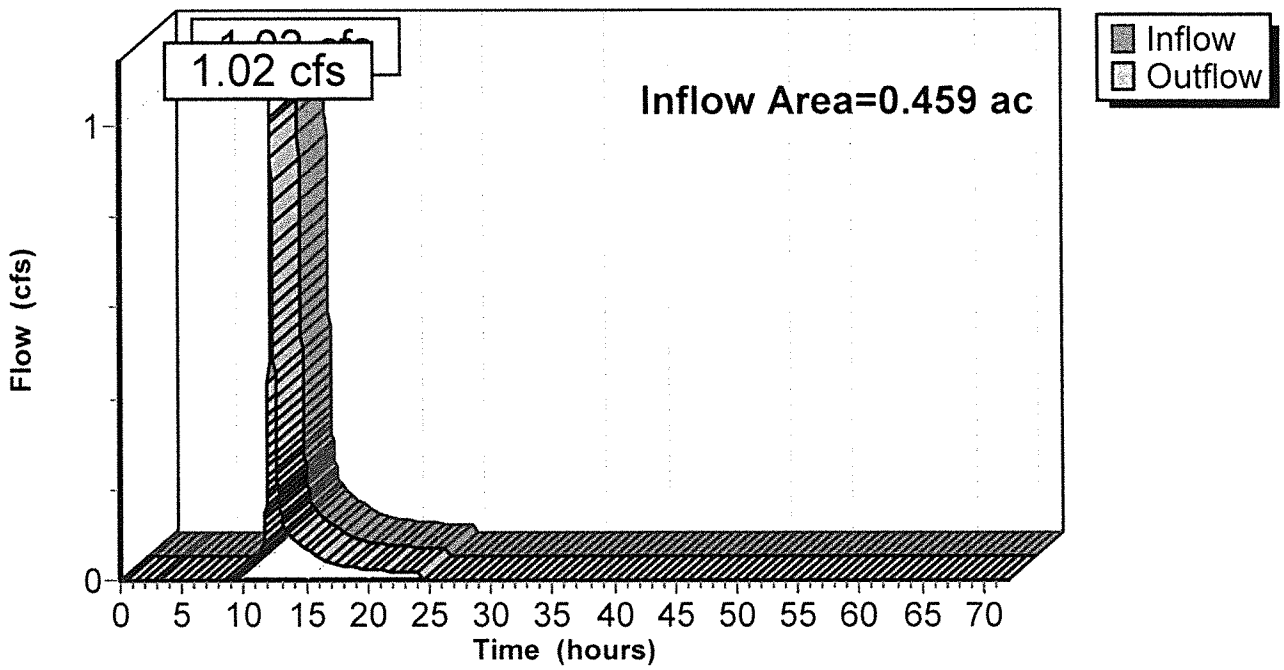
Summary for Reach DP-2:

Inflow Area =	0.459 ac,	0.00% Impervious,	Inflow Depth =	2.37"	for 10 yr. storm event
Inflow =	1.02 cfs @	12.18 hrs,	Volume=	0.091 af	
Outflow =	1.02 cfs @	12.18 hrs,	Volume=	0.091 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-2:

Hydrograph



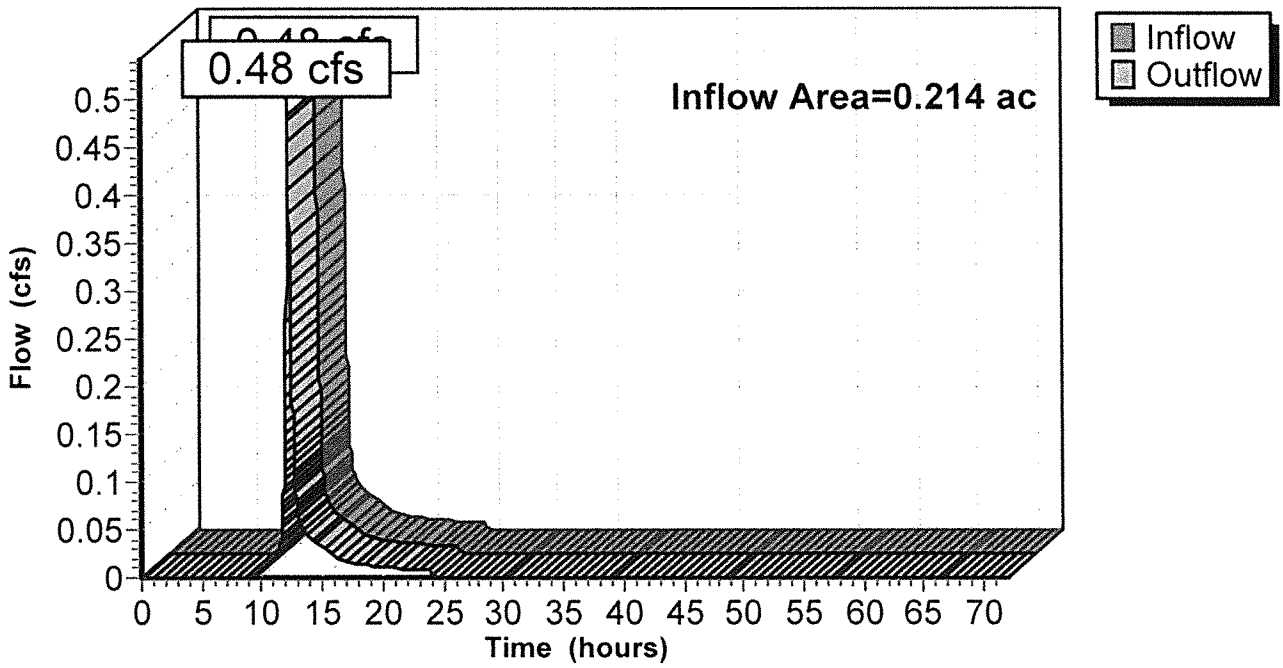
Summary for Reach DP-3:

Inflow Area =	0.214 ac,	0.00% Impervious,	Inflow Depth =	2.37"	for 10 yr. storm event
Inflow =	0.48 cfs @	12.17 hrs,	Volume=	0.042 af	
Outflow =	0.48 cfs @	12.17 hrs,	Volume=	0.042 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-3:

Hydrograph



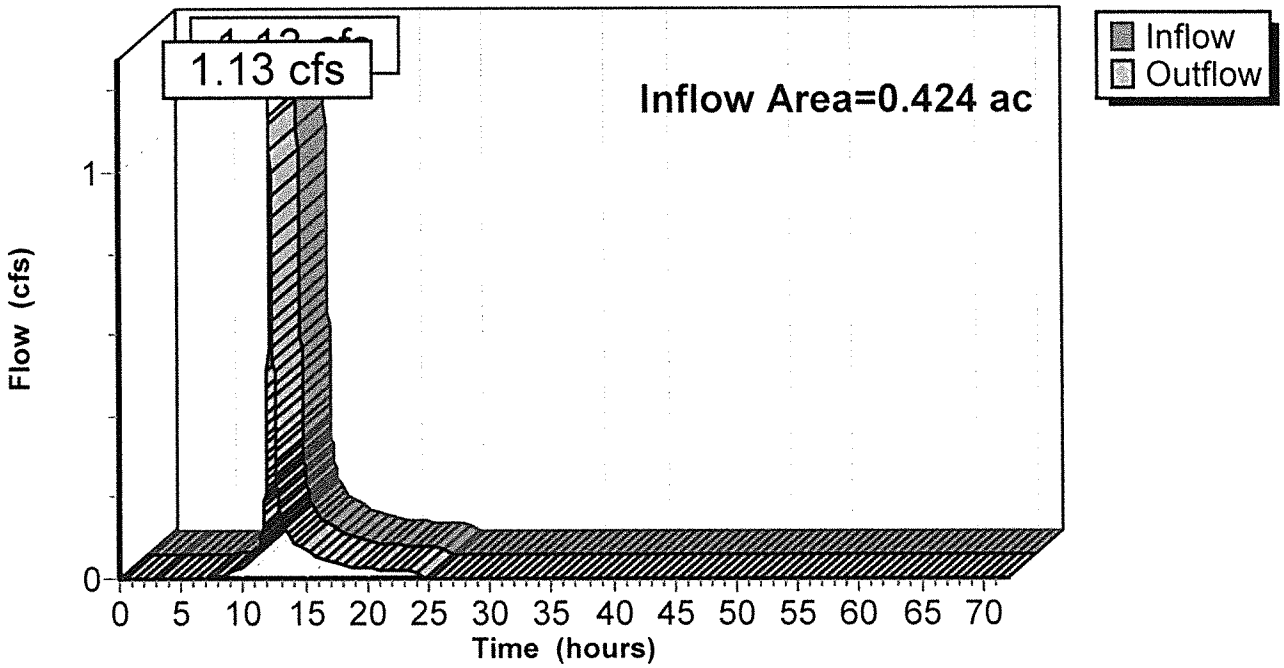
Summary for Reach DP-4:

Inflow Area =	0.424 ac,	0.00% Impervious,	Inflow Depth =	2.90"	for 10 yr. storm event
Inflow =	1.13 cfs @	12.18 hrs,	Volume=	0.103 af	
Outflow =	1.13 cfs @	12.18 hrs,	Volume=	0.103 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-4:

Hydrograph



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1: SUB-1 Runoff Area=34,304 sf 7.73% Impervious Runoff Depth=3.62"
Flow Length=260' Tc=13.3 min CN=82 Runoff=2.63 cfs 0.238 af

Subcatchment SUB-2: SUB-2 Runoff Area=19,984 sf 0.00% Impervious Runoff Depth=3.13"
Flow Length=170' Slope=0.0200 '/' Tc=12.9 min CN=77 Runoff=1.35 cfs 0.120 af

Subcatchment SUB-3: SUB-3 Runoff Area=9,333 sf 0.00% Impervious Runoff Depth=3.13"
Flow Length=110' Slope=0.0200 '/' Tc=12.4 min CN=77 Runoff=0.64 cfs 0.056 af

Subcatchment SUB-4: SUB-4 Runoff Area=18,477 sf 0.00% Impervious Runoff Depth=3.72"
Flow Length=250' Slope=0.0200 '/' Tc=13.5 min CN=83 Runoff=1.45 cfs 0.132 af

Reach DP-1: Inflow=2.63 cfs 0.238 af
Outflow=2.63 cfs 0.238 af

Reach DP-2: Inflow=1.35 cfs 0.120 af
Outflow=1.35 cfs 0.120 af

Reach DP-3: Inflow=0.64 cfs 0.056 af
Outflow=0.64 cfs 0.056 af

Reach DP-4: Inflow=1.45 cfs 0.132 af
Outflow=1.45 cfs 0.132 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.545 af Average Runoff Depth = 3.47"
96.77% Pervious = 1.824 ac 3.23% Impervious = 0.061 ac

Summary for Subcatchment SUB-1: SUB-1

Runoff = 2.63 cfs @ 12.18 hrs, Volume= 0.238 af, Depth= 3.62"

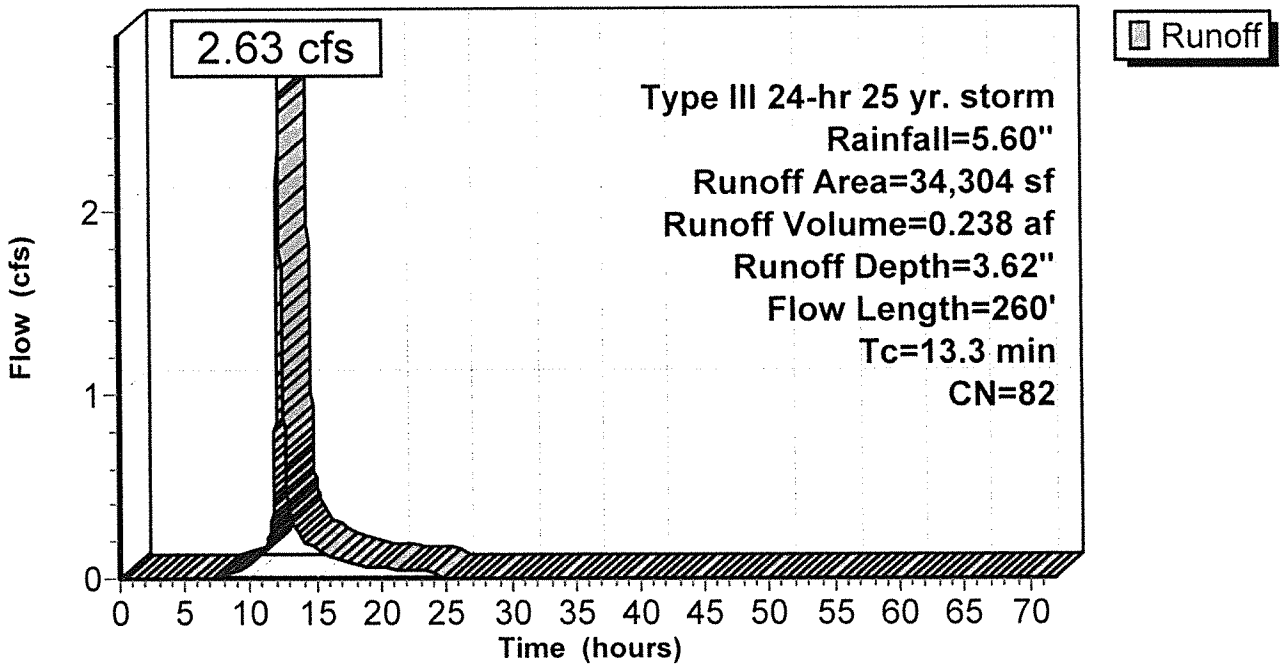
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	2,010	98	X-House
*	640	98	X-Imperv Patio
*	1,102	91	X-Gravel driveway, HSG D
*	14,244	84	X-50-75% Grass cover, Fair, HSG D
*	16,308	77	X-Woods, Good, HSG D
	34,304	82	Weighted Average
	31,654		92.27% Pervious Area
	2,650		7.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.3	210	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.3	260	Total			

Subcatchment SUB-1: SUB-1

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 1.35 cfs @ 12.18 hrs, Volume= 0.120 af, Depth= 3.13"

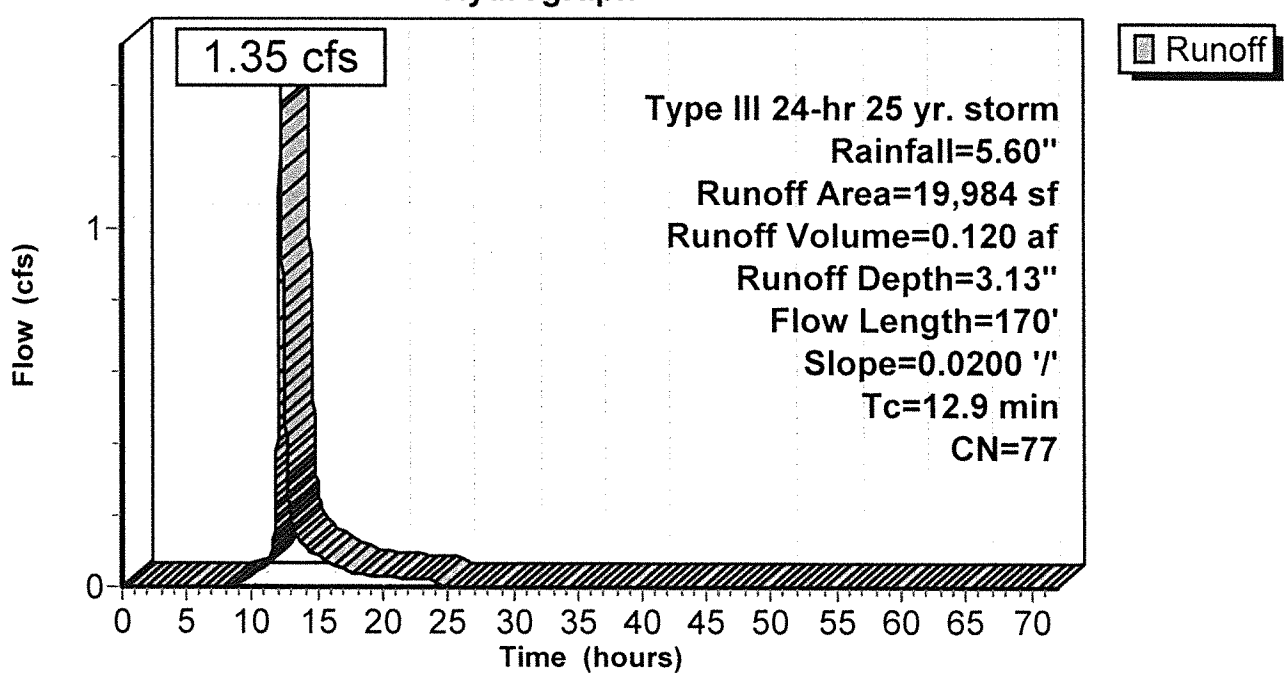
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	19,984	77	X-Woods, Good, HSG D
	19,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	120	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	170	Total			

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3: SUB-3

Runoff = 0.64 cfs @ 12.17 hrs, Volume= 0.056 af, Depth= 3.13"

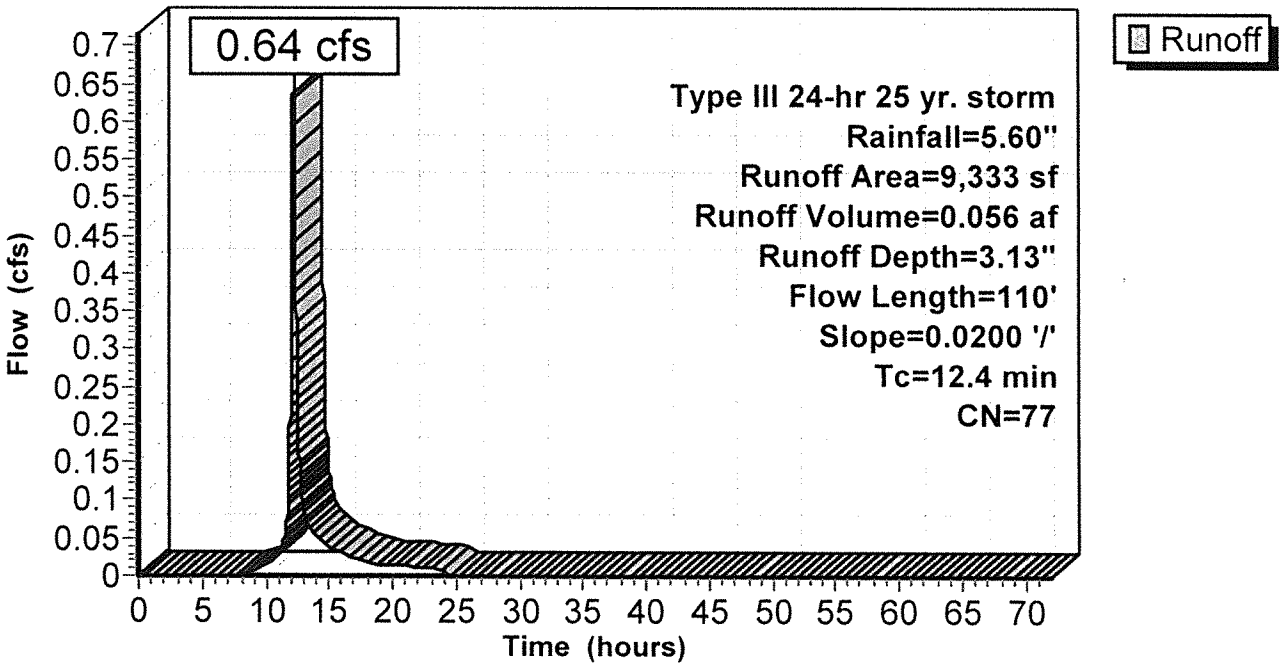
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	9,333	77	X-Woods, Good, HSG D
	9,333		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	110	Total			

Subcatchment SUB-3: SUB-3

Hydrograph



Summary for Subcatchment SUB-4: SUB-4

Runoff = 1.45 cfs @ 12.18 hrs, Volume= 0.132 af, Depth= 3.72"

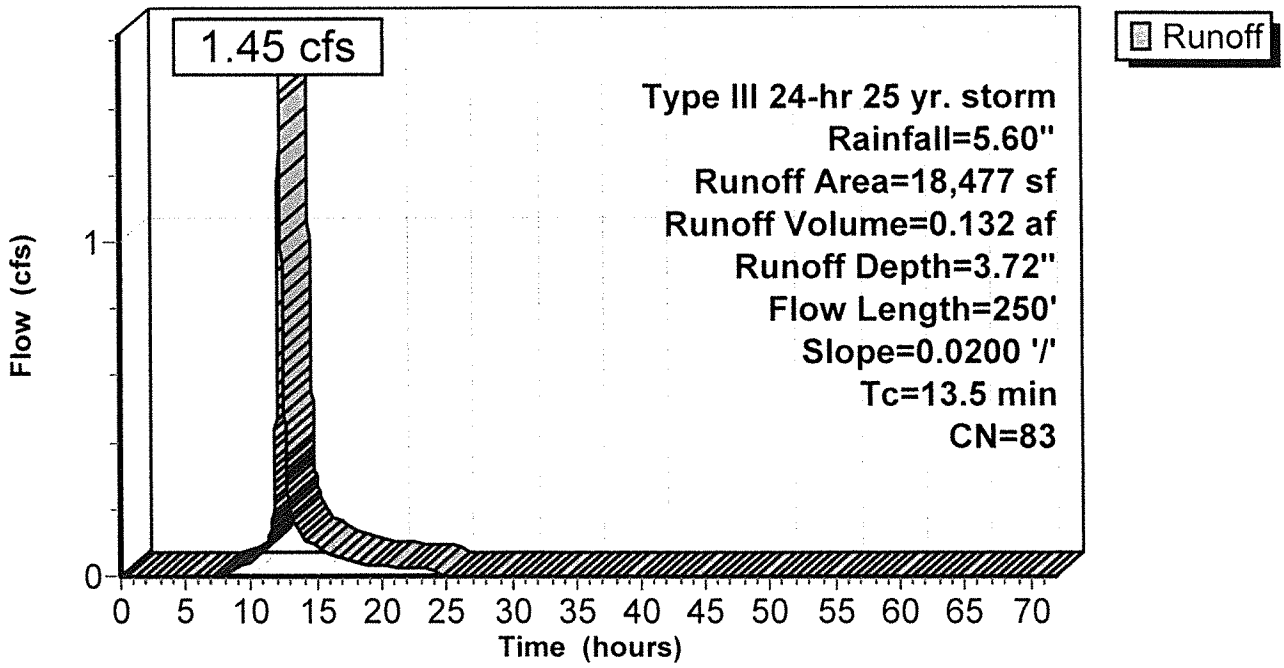
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,080	91	X-Gravel driveway, HSG D
*	12,589	84	X-50-75% Grass cover, Fair, HSG D
*	4,808	77	X-Woods, Good, HSG D
	18,477	83	Weighted Average
	18,477		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.5	200	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	250	Total			

Subcatchment SUB-4: SUB-4

Hydrograph



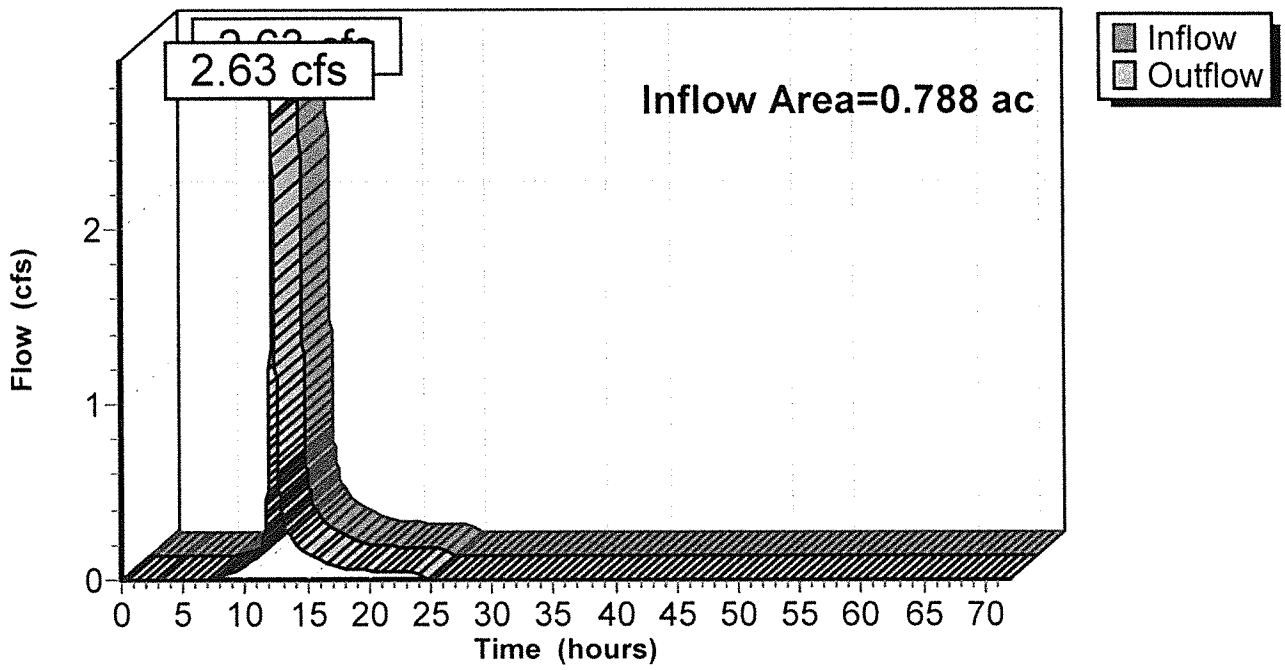
Summary for Reach DP-1:

Inflow Area =	0.788 ac,	7.73% Impervious,	Inflow Depth =	3.62"	for 25 yr. storm event
Inflow =	2.63 cfs @	12.18 hrs,	Volume=	0.238 af	
Outflow =	2.63 cfs @	12.18 hrs,	Volume=	0.238 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-1:

Hydrograph



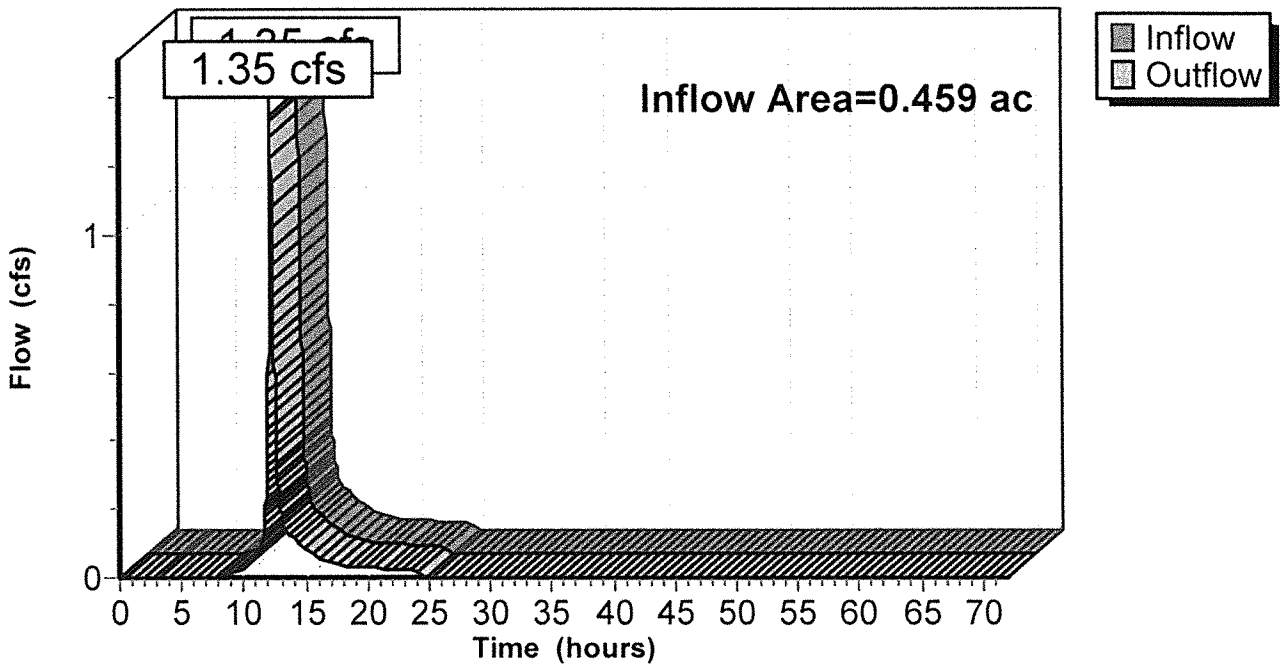
Summary for Reach DP-2:

Inflow Area = 0.459 ac, 0.00% Impervious, Inflow Depth = 3.13" for 25 yr. storm event
Inflow = 1.35 cfs @ 12.18 hrs, Volume= 0.120 af
Outflow = 1.35 cfs @ 12.18 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-2:

Hydrograph



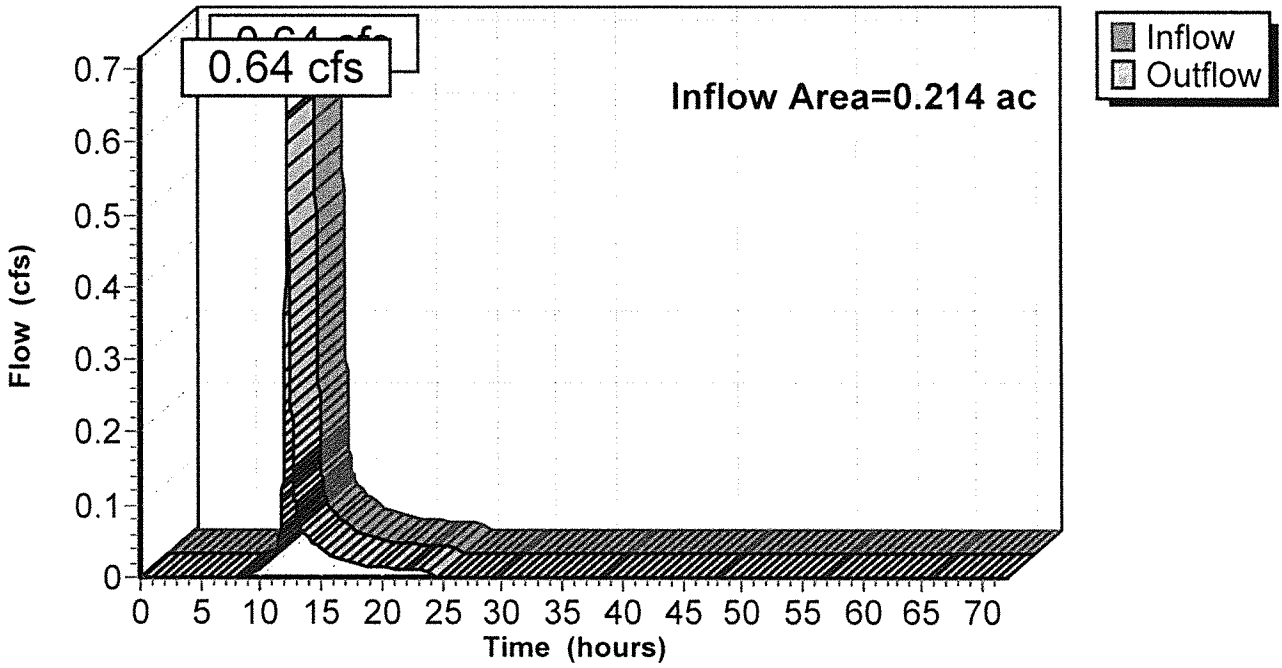
Summary for Reach DP-3:

Inflow Area =	0.214 ac,	0.00% Impervious,	Inflow Depth =	3.13"	for 25 yr. storm event
Inflow =	0.64 cfs @	12.17 hrs,	Volume=	0.056 af	
Outflow =	0.64 cfs @	12.17 hrs,	Volume=	0.056 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-3:

Hydrograph



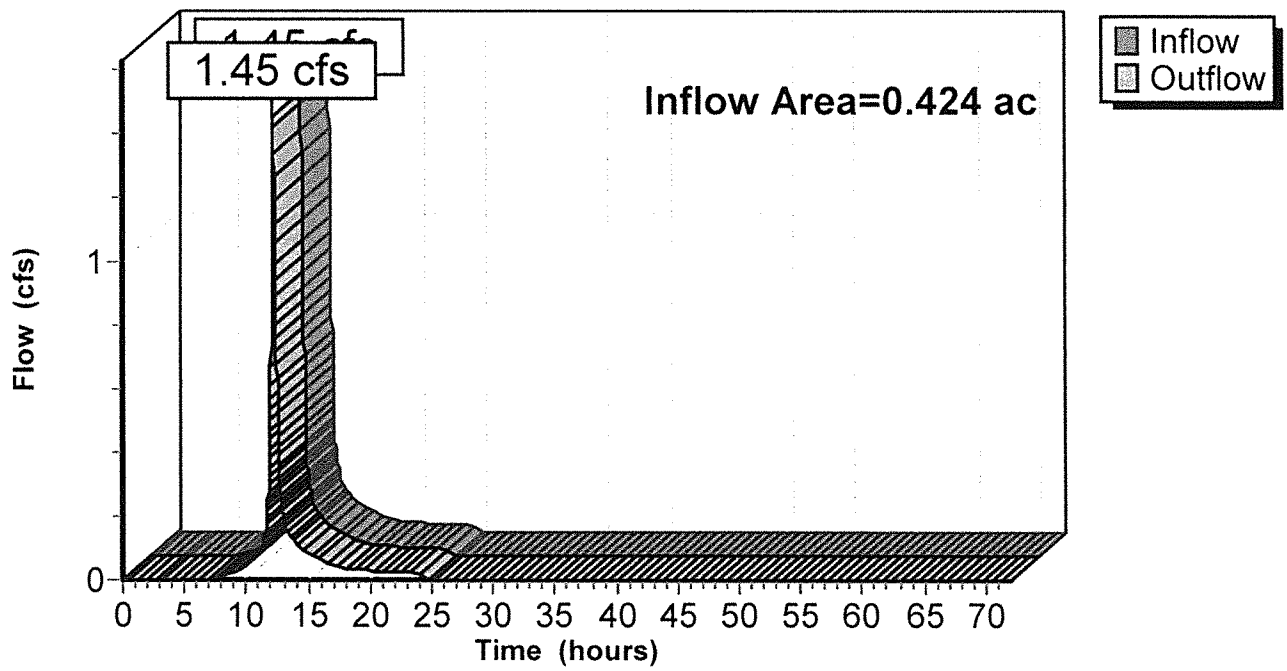
Summary for Reach DP-4:

Inflow Area = 0.424 ac, 0.00% Impervious, Inflow Depth = 3.72" for 25 yr. storm event
Inflow = 1.45 cfs @ 12.18 hrs, Volume= 0.132 af
Outflow = 1.45 cfs @ 12.18 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-4:

Hydrograph



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1: SUB-1 Runoff Area=34,304 sf 7.73% Impervious Runoff Depth=4.92"
Flow Length=260' Tc=13.3 min CN=82 Runoff=3.55 cfs 0.323 af

Subcatchment SUB-2: SUB-2 Runoff Area=19,984 sf 0.00% Impervious Runoff Depth=4.37"
Flow Length=170' Slope=0.0200 '/' Tc=12.9 min CN=77 Runoff=1.87 cfs 0.167 af

Subcatchment SUB-3: SUB-3 Runoff Area=9,333 sf 0.00% Impervious Runoff Depth=4.37"
Flow Length=110' Slope=0.0200 '/' Tc=12.4 min CN=77 Runoff=0.89 cfs 0.078 af

Subcatchment SUB-4: SUB-4 Runoff Area=18,477 sf 0.00% Impervious Runoff Depth=5.03"
Flow Length=250' Slope=0.0200 '/' Tc=13.5 min CN=83 Runoff=1.94 cfs 0.178 af

Reach DP-1: Inflow=3.55 cfs 0.323 af
Outflow=3.55 cfs 0.323 af

Reach DP-2: Inflow=1.87 cfs 0.167 af
Outflow=1.87 cfs 0.167 af

Reach DP-3: Inflow=0.89 cfs 0.078 af
Outflow=0.89 cfs 0.078 af

Reach DP-4: Inflow=1.94 cfs 0.178 af
Outflow=1.94 cfs 0.178 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.745 af Average Runoff Depth = 4.74"
96.77% Pervious = 1.824 ac 3.23% Impervious = 0.061 ac

Summary for Subcatchment SUB-1: SUB-1

Runoff = 3.55 cfs @ 12.18 hrs, Volume= 0.323 af, Depth= 4.92"

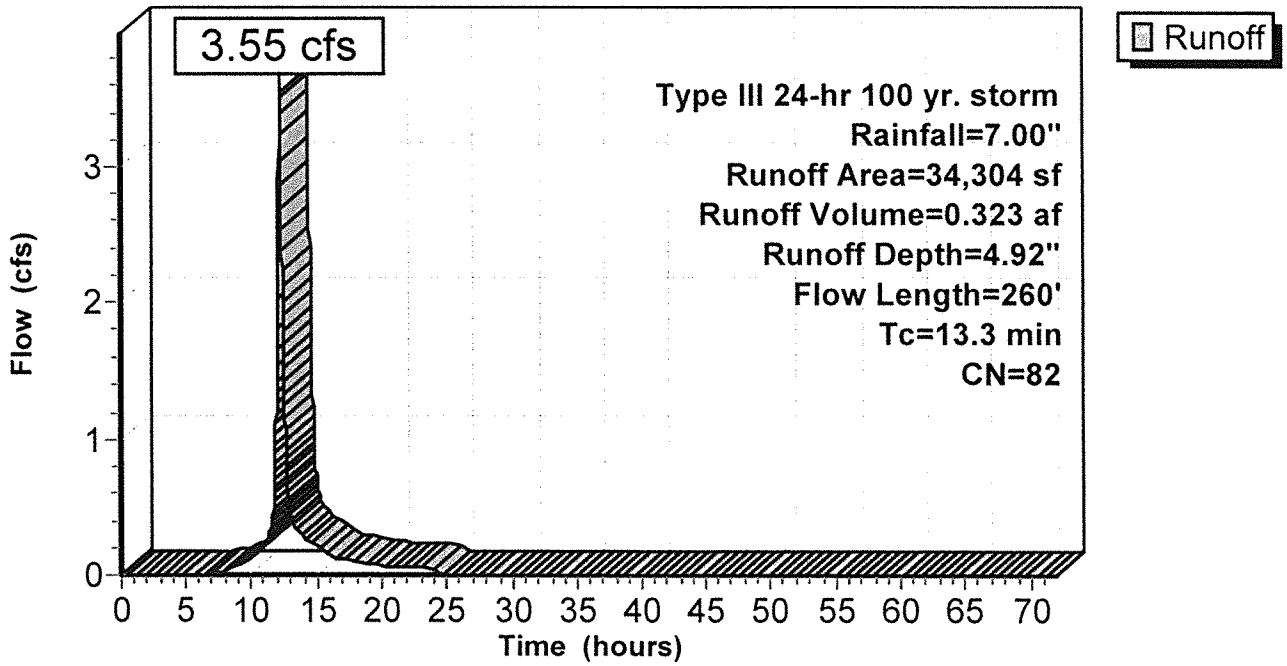
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	2,010	98	X-House
*	640	98	X-Imperv Patio
*	1,102	91	X-Gravel driveway, HSG D
*	14,244	84	X-50-75% Grass cover, Fair, HSG D
*	16,308	77	X-Woods, Good, HSG D
	34,304	82	Weighted Average
	31,654		92.27% Pervious Area
	2,650		7.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.3	210	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.3	260	Total			

Subcatchment SUB-1: SUB-1

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 1.87 cfs @ 12.18 hrs, Volume= 0.167 af, Depth= 4.37"

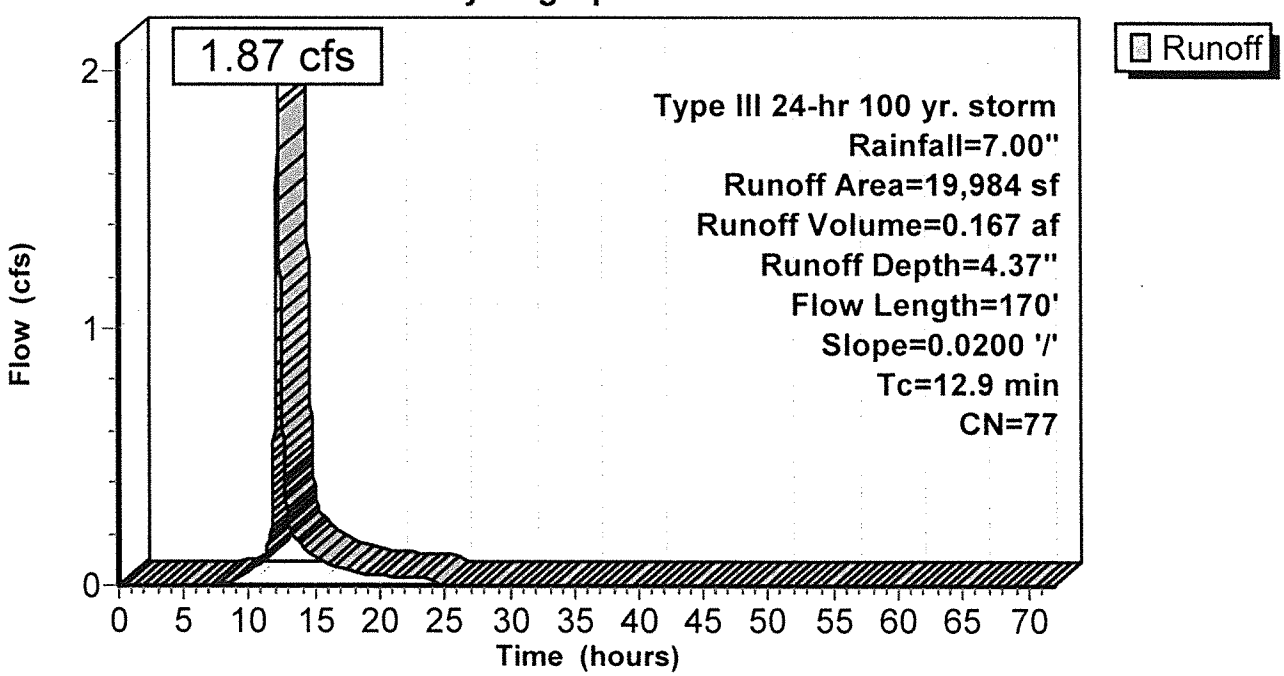
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	19,984	77	X-Woods, Good, HSG D
	19,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	120	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	170	Total			

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3: SUB-3

Runoff = 0.89 cfs @ 12.17 hrs, Volume= 0.078 af, Depth= 4.37"

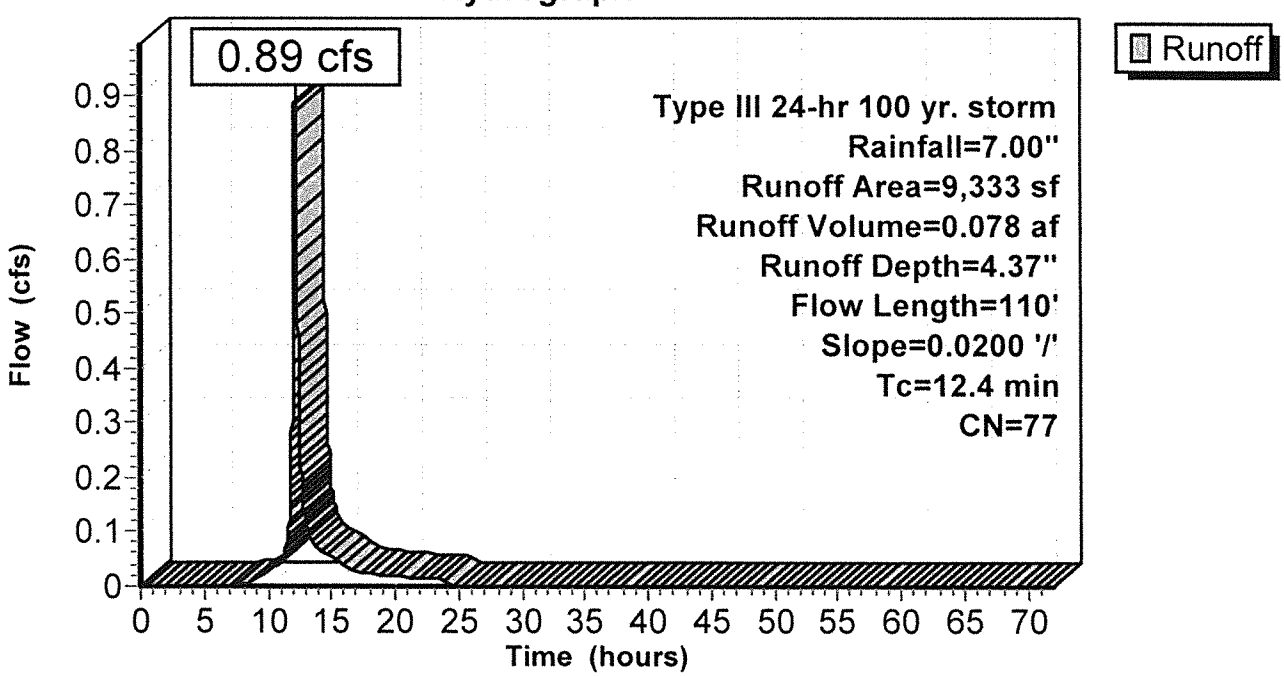
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	9,333	77	X-Woods, Good, HSG D
	9,333		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.4	110	Total			

Subcatchment SUB-3: SUB-3

Hydrograph



Summary for Subcatchment SUB-4: SUB-4

Runoff = 1.94 cfs @ 12.18 hrs, Volume= 0.178 af, Depth= 5.03"

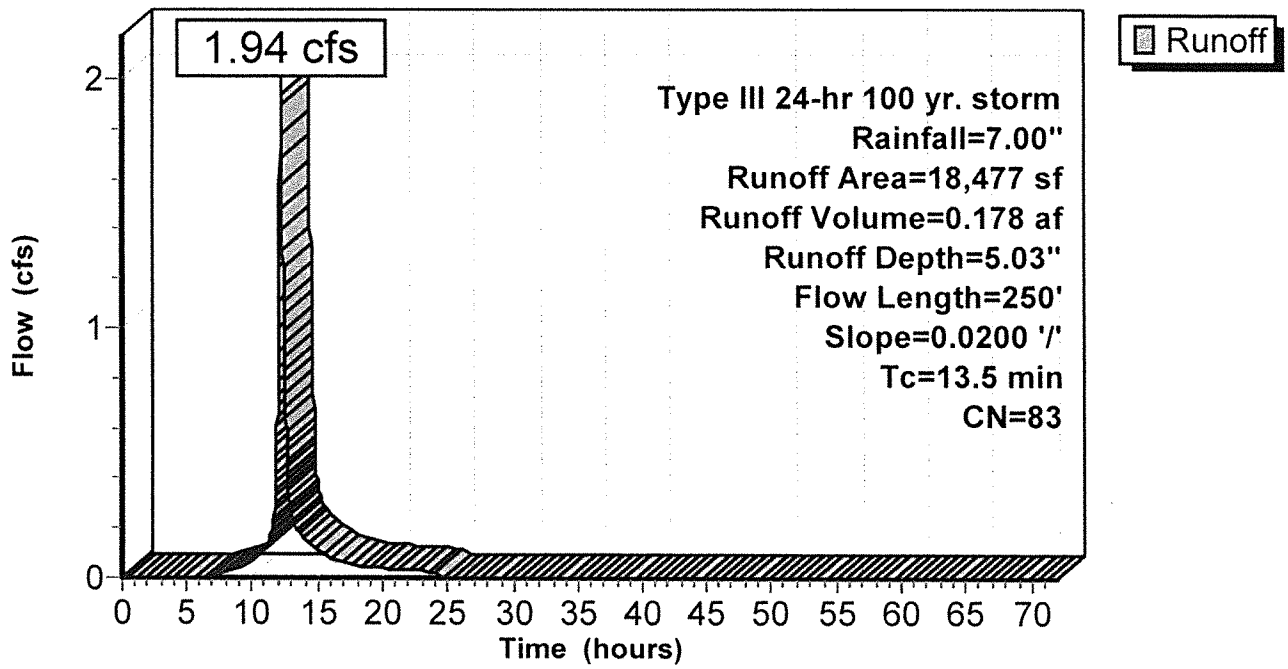
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,080	91	X-Gravel driveway, HSG D
*	12,589	84	X-50-75% Grass cover, Fair, HSG D
*	4,808	77	X-Woods, Good, HSG D
	18,477	83	Weighted Average
	18,477		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.5	200	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.5	250	Total			

Subcatchment SUB-4: SUB-4

Hydrograph



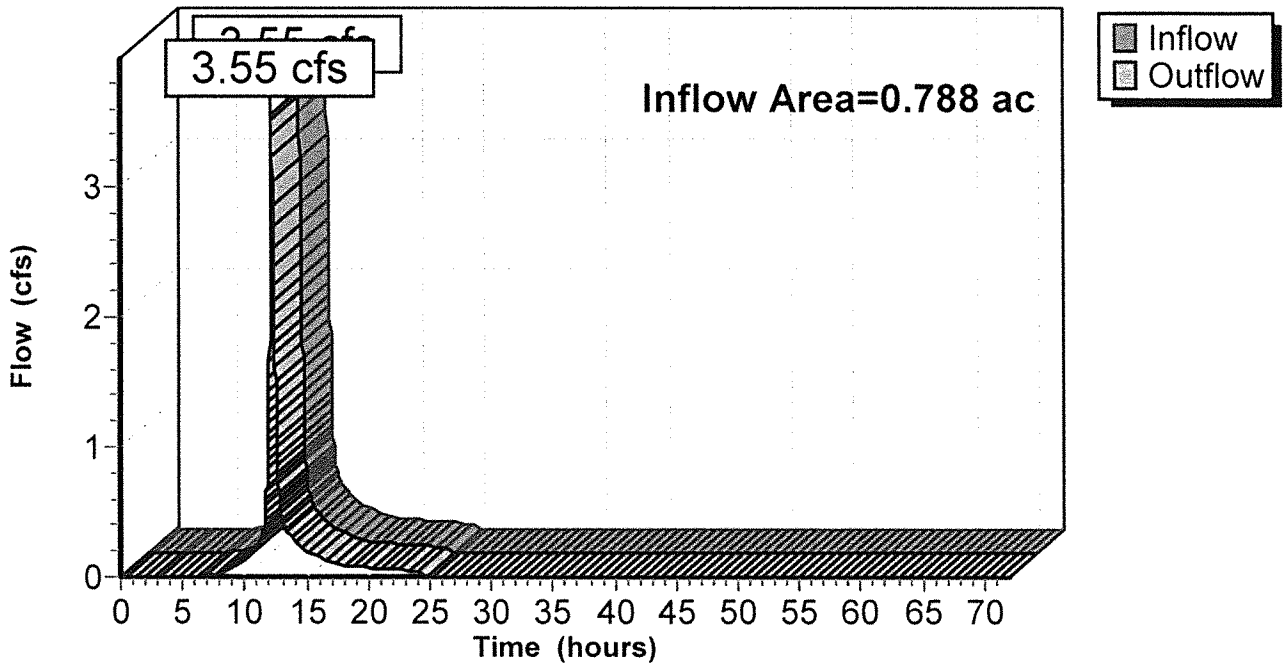
Summary for Reach DP-1:

Inflow Area =	0.788 ac,	7.73% Impervious,	Inflow Depth =	4.92"	for 100 yr. storm event
Inflow =	3.55 cfs @	12.18 hrs, Volume=	0.323 af		
Outflow =	3.55 cfs @	12.18 hrs, Volume=	0.323 af, Atten= 0%, Lag= 0.0 min		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-1:

Hydrograph



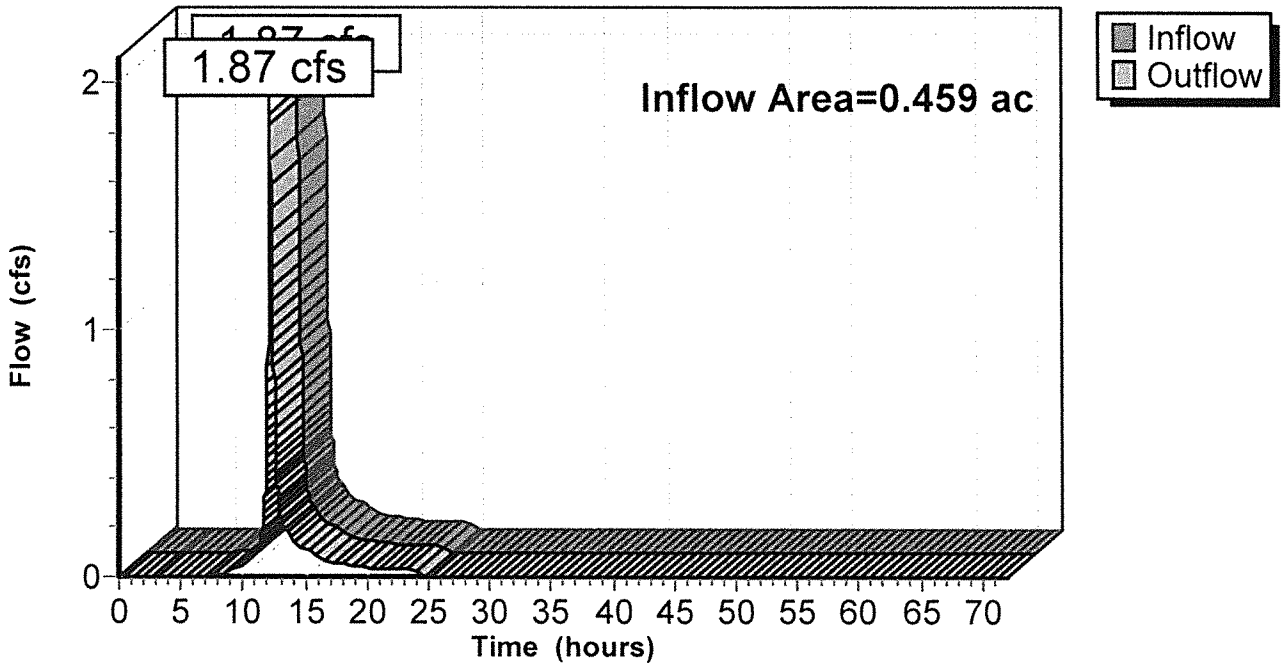
Summary for Reach DP-2:

Inflow Area =	0.459 ac,	0.00% Impervious,	Inflow Depth =	4.37"	for 100 yr. storm event
Inflow =	1.87 cfs @	12.18 hrs,	Volume=	0.167 af	
Outflow =	1.87 cfs @	12.18 hrs,	Volume=	0.167 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-2:

Hydrograph



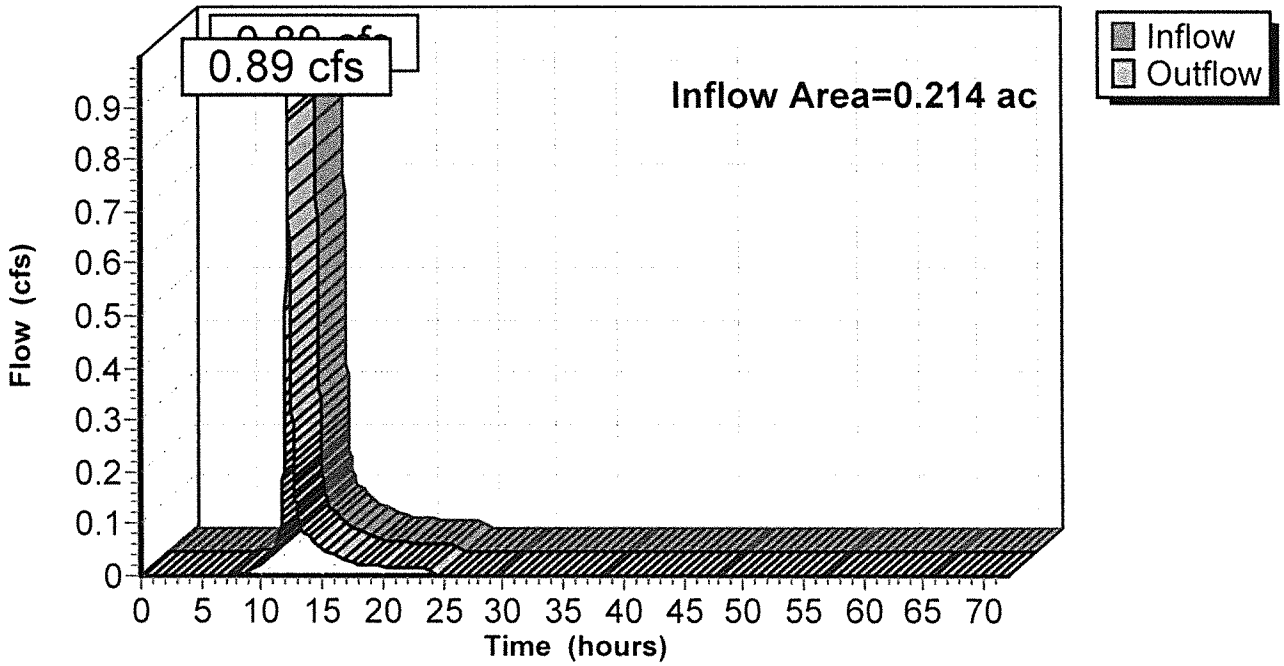
Summary for Reach DP-3:

Inflow Area =	0.214 ac,	0.00% Impervious,	Inflow Depth =	4.37"	for 100 yr. storm event
Inflow =	0.89 cfs @	12.17 hrs,	Volume=	0.078 af	
Outflow =	0.89 cfs @	12.17 hrs,	Volume=	0.078 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-3:

Hydrograph



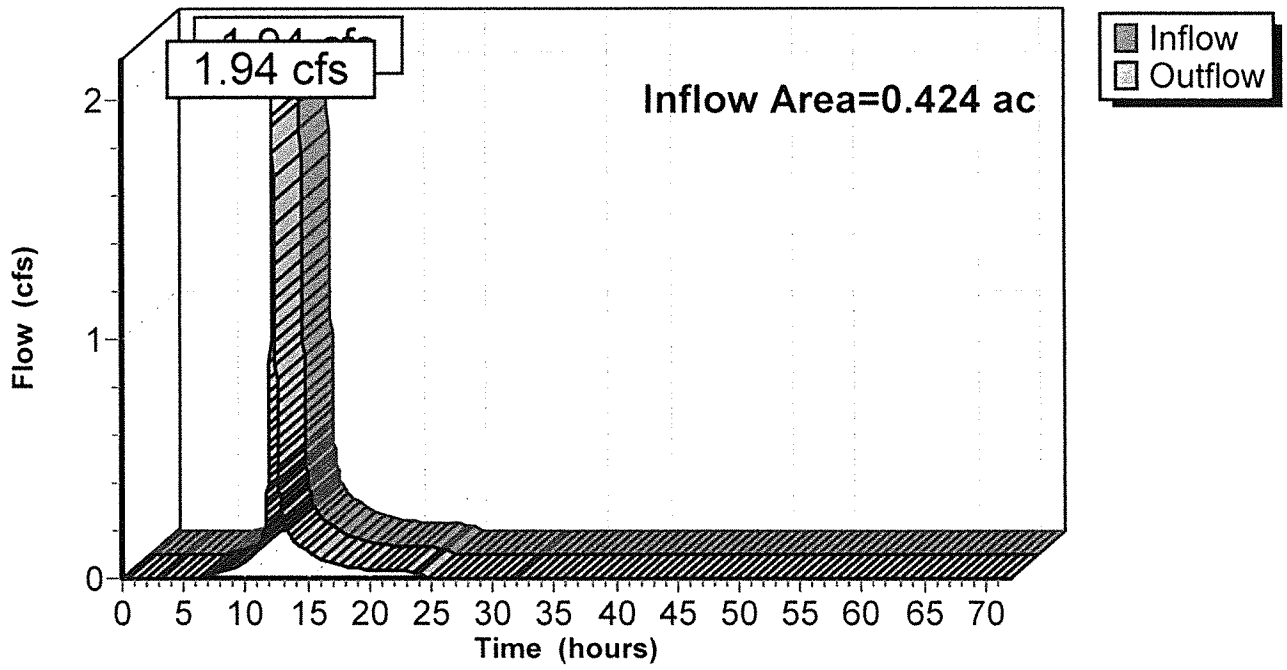
Summary for Reach DP-4:

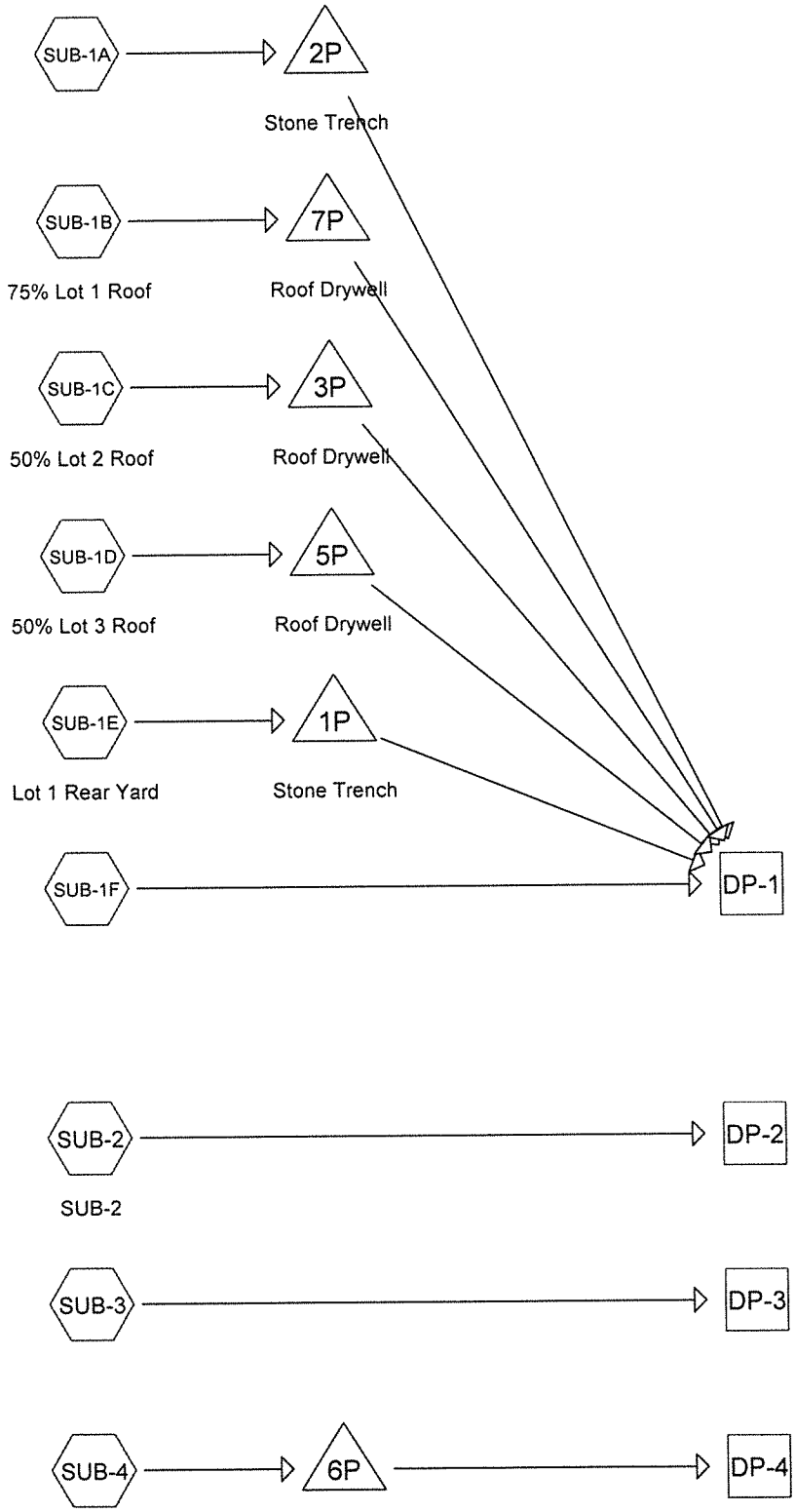
Inflow Area =	0.424 ac,	0.00% Impervious,	Inflow Depth =	5.03"	for 100 yr. storm event
Inflow =	1.94 cfs @	12.18 hrs,	Volume=	0.178 af	
Outflow =	1.94 cfs @	12.18 hrs,	Volume=	0.178 af,	Atten= 0%, Lag= 0.0 min

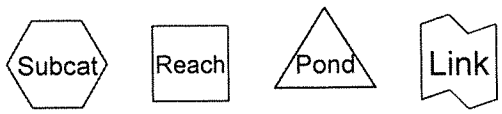
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Reach DP-4:

Hydrograph







Drainage Diagram for Proposed Conditions
Prepared by {enter your company name here}, Printed 6/13/2016
HydroCAD® 9.10 s/n 06290 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.543	77	Woods, Good, HSG D (SUB-1F, SUB-3, SUB-4)
1.075	80	>75% Grass cover, Good, HSG D (SUB-1A, SUB-1E, SUB-1F, SUB-2, SUB-3, SUB-4)
0.009	98	Driveway (SUB-1A)
0.042	98	Driveways (SUB-4)
0.036	98	Paved Driveways (SUB-2)
0.083	98	Roof (SUB-1B, SUB-1C, SUB-1D)
0.097	98	Roofs (SUB-2, SUB-3, SUB-4)
1.885		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1A: Runoff Area=1,302 sf 31.18% Impervious Runoff Depth=2.01"
Tc=5.0 min CN=86 Runoff=0.07 cfs 0.005 af

Subcatchment SUB-1B: 75% Lot 1 Roof Runoff Area=1,597 sf 100.00% Impervious Runoff Depth=3.17"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment SUB-1C: 50% Lot 2 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=3.17"
Tc=5.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment SUB-1D: 50% Lot 3 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=3.17"
Tc=5.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment SUB-1E: Lot 1 Rear Yard Runoff Area=6,307 sf 0.00% Impervious Runoff Depth=1.56"
Tc=5.0 min CN=80 Runoff=0.27 cfs 0.019 af

Subcatchment SUB-1F: Runoff Area=29,580 sf 0.00% Impervious Runoff Depth=1.42"
Flow Length=320' Tc=13.6 min CN=78 Runoff=0.87 cfs 0.080 af

Subcatchment SUB-2: SUB-2 Runoff Area=14,560 sf 24.09% Impervious Runoff Depth=1.85"
Flow Length=44' Slope=0.0120 '/' Tc=13.3 min CN=84 Runoff=0.57 cfs 0.052 af

Subcatchment SUB-3: Runoff Area=6,749 sf 7.99% Impervious Runoff Depth=1.56"
Flow Length=50' Slope=0.0200 '/' Tc=12.0 min CN=80 Runoff=0.23 cfs 0.020 af

Subcatchment SUB-4: Runoff Area=19,985 sf 17.82% Impervious Runoff Depth=1.77"
Flow Length=250' Slope=0.0120 '/' Tc=16.6 min CN=83 Runoff=0.69 cfs 0.068 af

Reach DP-1: Inflow=1.03 cfs 0.095 af
Outflow=1.03 cfs 0.095 af

Reach DP-2: Inflow=0.57 cfs 0.052 af
Outflow=0.57 cfs 0.052 af

Reach DP-3: Inflow=0.23 cfs 0.020 af
Outflow=0.23 cfs 0.020 af

Reach DP-4: Inflow=0.69 cfs 0.055 af
Outflow=0.69 cfs 0.055 af

Pond 1P: Stone Trench Peak Elev=119.92' Storage=44 cf Inflow=0.27 cfs 0.019 af
Discarded=0.00 cfs 0.004 af Primary=0.27 cfs 0.014 af Outflow=0.27 cfs 0.019 af

Pond 2P: Stone Trench Peak Elev=122.76' Storage=121 cf Inflow=0.07 cfs 0.005 af
Discarded=0.00 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.005 af

Pond 3P: Roof Drywell Peak Elev=200.62' Storage=78 cf Inflow=0.08 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 5P: Roof Drywell Peak Elev=200.62' Storage=78 cf Inflow=0.08 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 6P: Peak Elev=122.44' Storage=207 cf Inflow=0.69 cfs 0.068 af
Discarded=0.01 cfs 0.013 af Primary=0.69 cfs 0.055 af Outflow=0.69 cfs 0.068 af

Pond 7P: Roof Drywell Peak Elev=201.21' Storage=151 cf Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.010 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.266 af Average Runoff Depth = 1.69"
85.83% Pervious = 1.618 ac 14.17% Impervious = 0.267 ac

Summary for Subcatchment SUB-1A:

Runoff = 0.07 cfs @ 12.07 hrs, Volume= 0.005 af, Depth= 2.01"

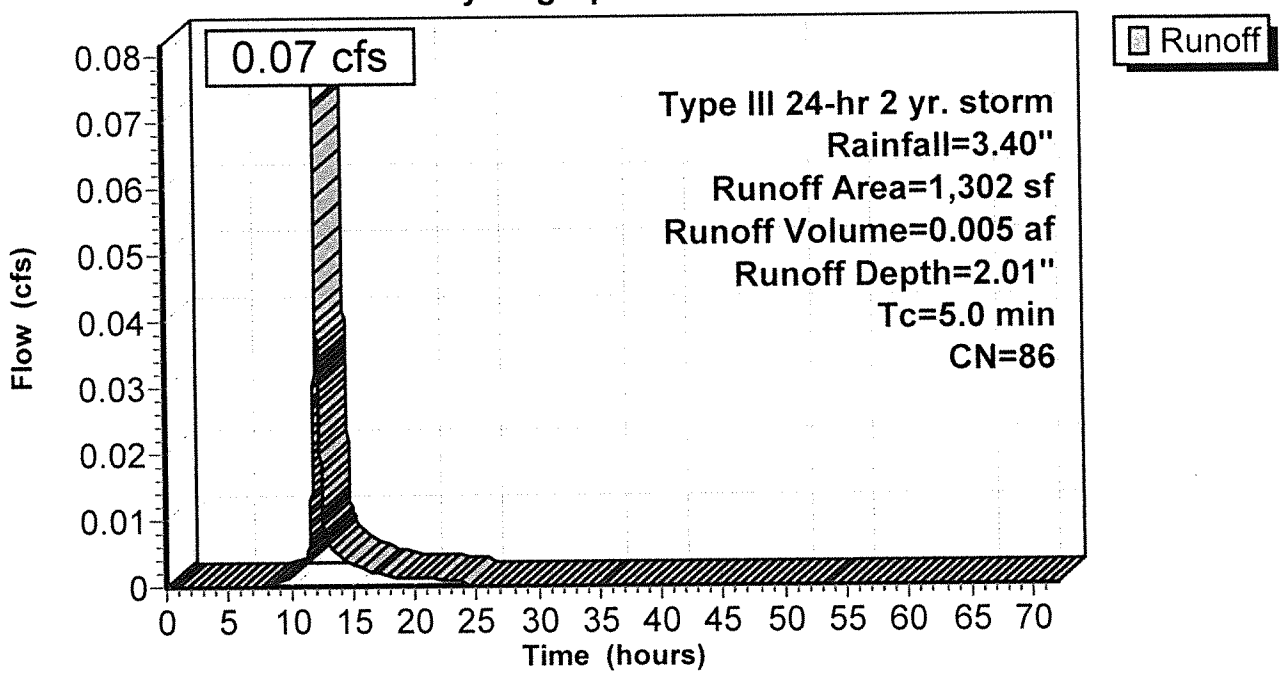
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	406	98	Driveway
	896	80	>75% Grass cover, Good, HSG D
	1,302	86	Weighted Average
	896		68.82% Pervious Area
	406		31.18% Impervious Area

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

Subcatchment SUB-1A:

Hydrograph



Summary for Subcatchment SUB-1B: 75% Lot 1 Roof

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 3.17"

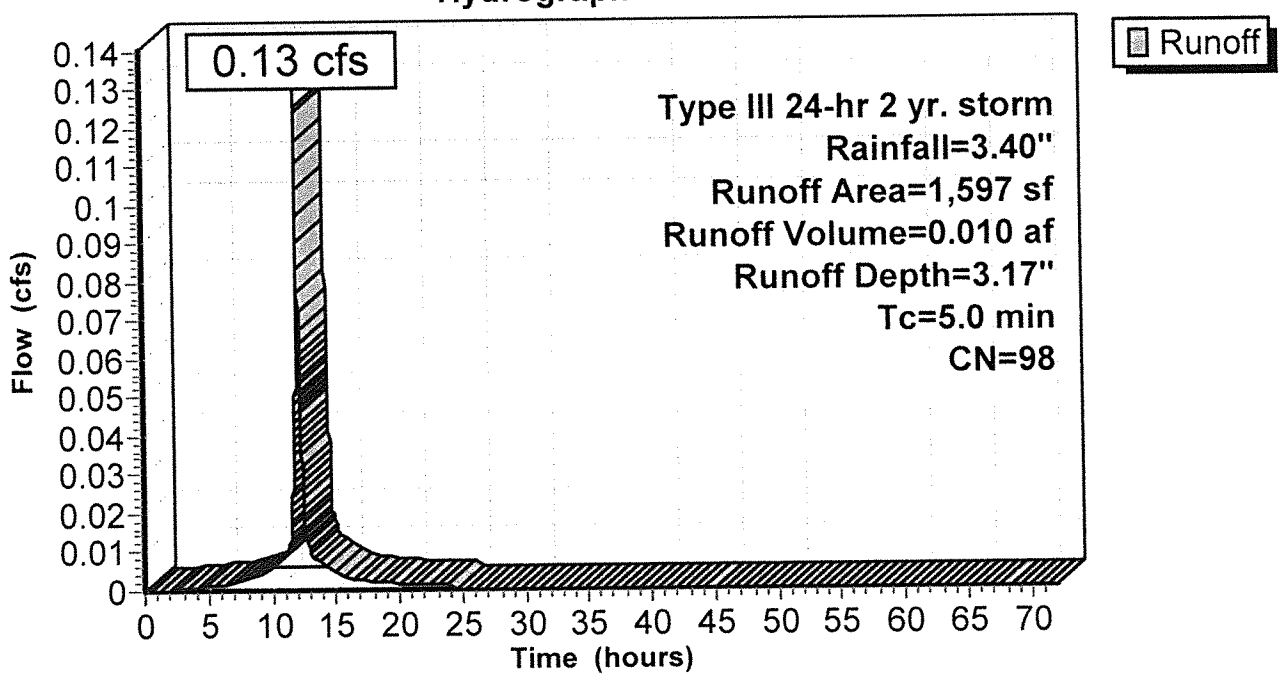
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,597	98	Roof
	1,597		100.00% Impervious Area

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

Subcatchment SUB-1B: 75% Lot 1 Roof

Hydrograph



Summary for Subcatchment SUB-1C: 50% Lot 2 Roof

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 3.17"

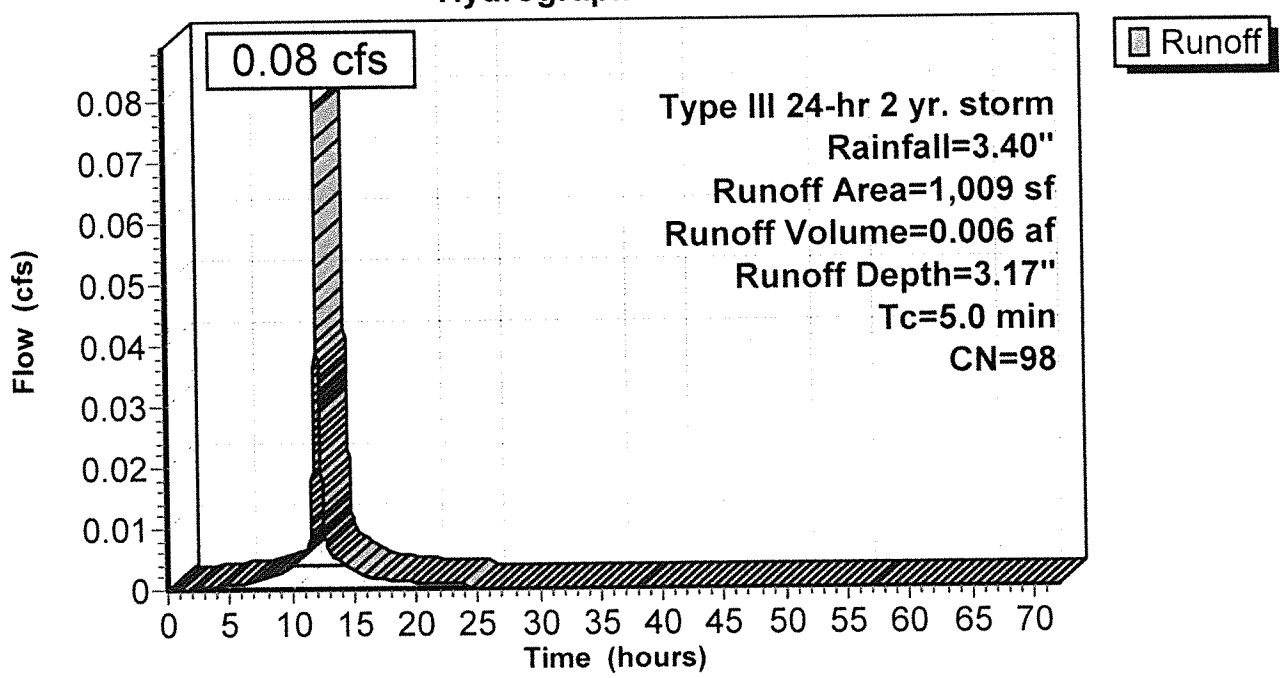
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1C: 50% Lot 2 Roof

Hydrograph



Summary for Subcatchment SUB-1D: 50% Lot 3 Roof

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 3.17"

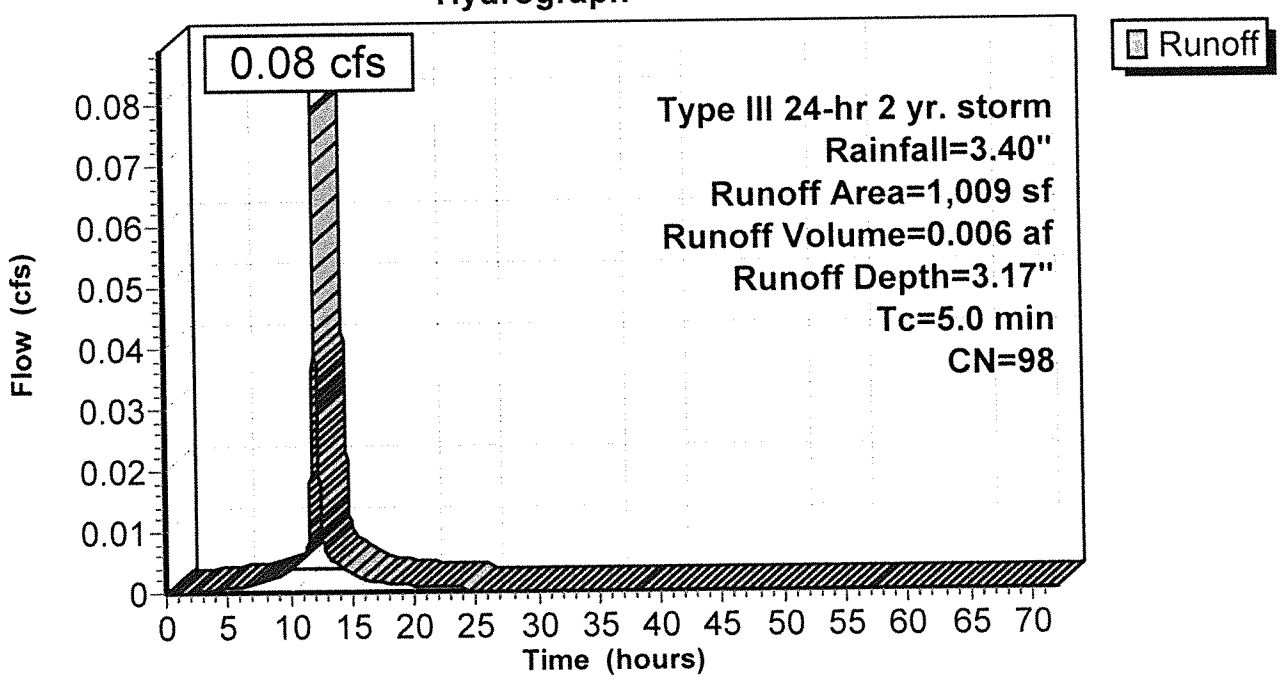
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1D: 50% Lot 3 Roof

Hydrograph



Summary for Subcatchment SUB-1E: Lot 1 Rear Yard

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af, Depth= 1.56"

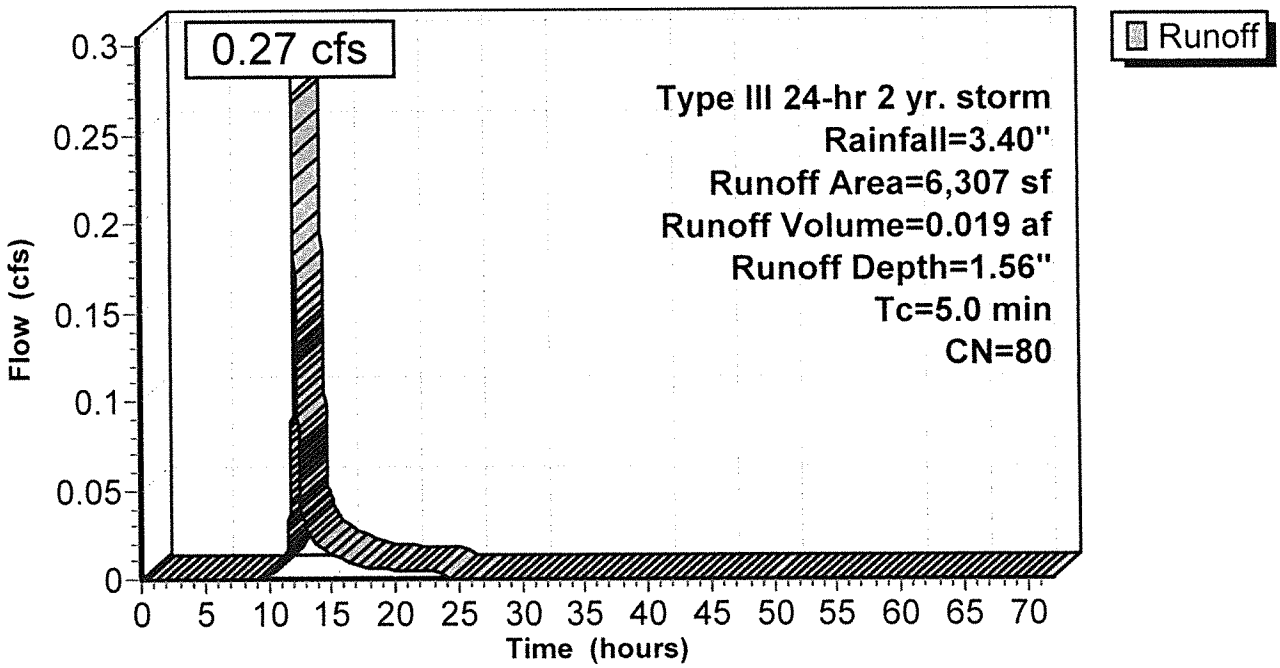
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

Area (sf)	CN	Description
6,307	80	>75% Grass cover, Good, HSG D
6,307		100.00% Pervious Area

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

Subcatchment SUB-1E: Lot 1 Rear Yard

Hydrograph



Summary for Subcatchment SUB-1F:

Runoff = 0.87 cfs @ 12.19 hrs, Volume= 0.080 af, Depth= 1.42"

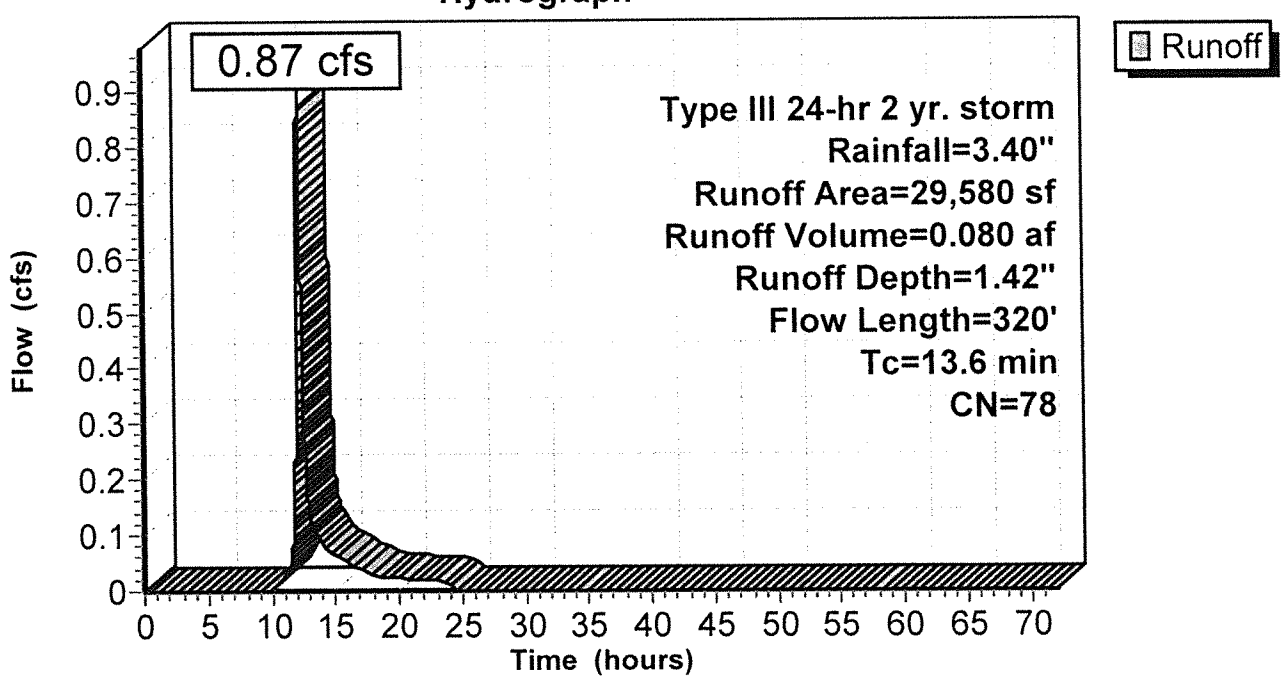
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

Area (sf)	CN	Description
9,853	80	>75% Grass cover, Good, HSG D
19,727	77	Woods, Good, HSG D
29,580	78	Weighted Average
29,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.6	270	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	320	Total			

Subcatchment SUB-1F:

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 0.57 cfs @ 12.19 hrs, Volume= 0.052 af, Depth= 1.85"

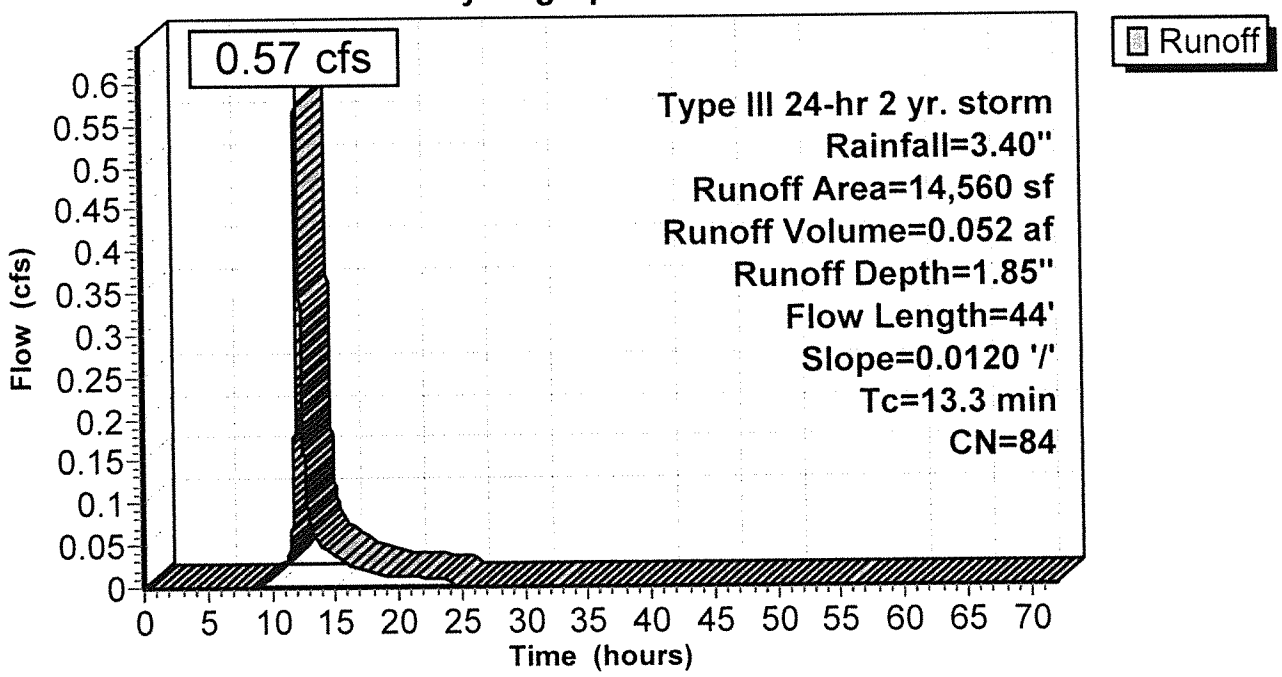
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,948	98	Roofs
*	1,560	98	Paved Driveways
	11,052	80	>75% Grass cover, Good, HSG D
	14,560	84	Weighted Average
	11,052		75.91% Pervious Area
	3,508		24.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	44	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3:

Runoff = 0.23 cfs @ 12.17 hrs, Volume= 0.020 af, Depth= 1.56"

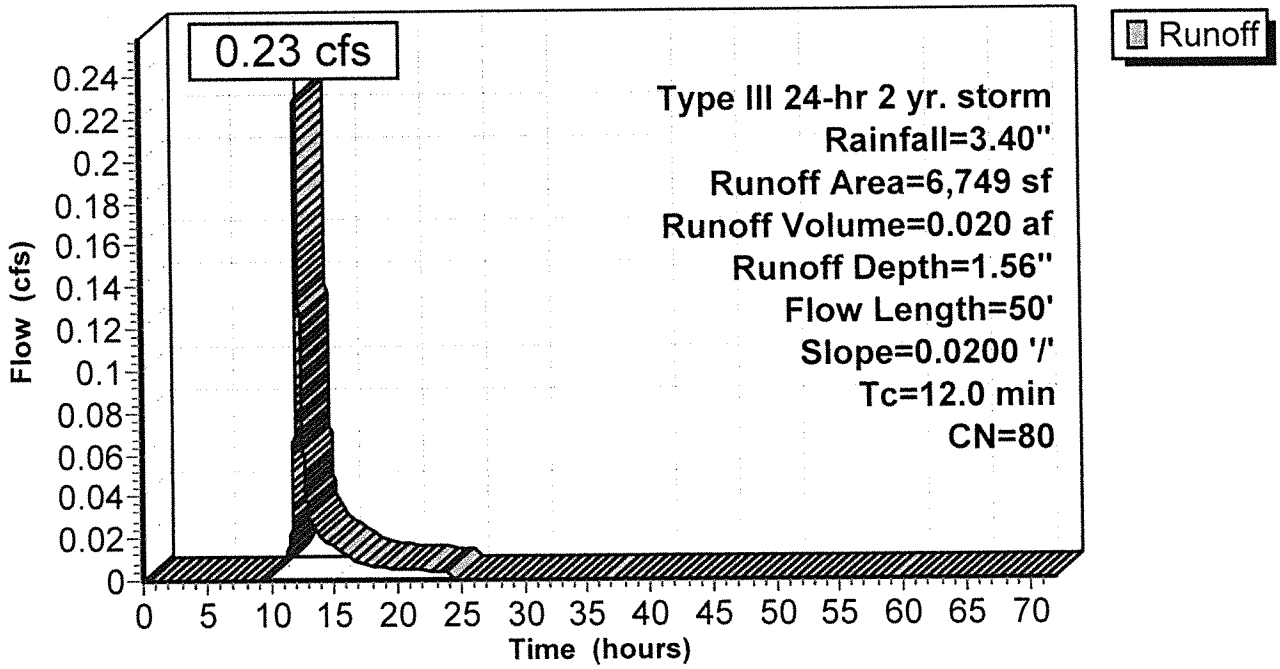
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	539	98	Roofs
	3,140	80	>75% Grass cover, Good, HSG D
	3,070	77	Woods, Good, HSG D
	6,749	80	Weighted Average
	6,210		92.01% Pervious Area
	539		7.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-3:

Hydrograph



Summary for Subcatchment SUB-4:

Runoff = 0.69 cfs @ 12.23 hrs, Volume= 0.068 af, Depth= 1.77"

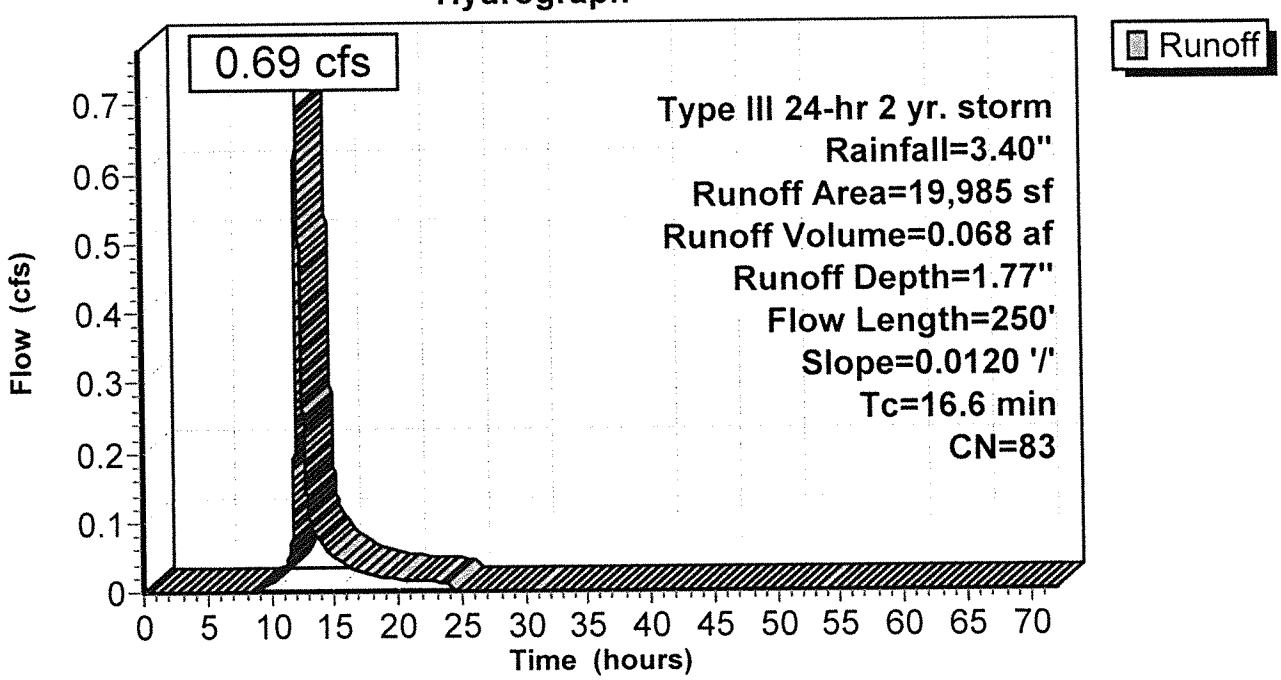
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr. storm Rainfall=3.40"

	Area (sf)	CN	Description
*	1,726	98	Roofs
*	1,836	98	Driveways
	15,563	80	>75% Grass cover, Good, HSG D
	860	77	Woods, Good, HSG D
	19,985	83	Weighted Average
	16,423		82.18% Pervious Area
	3,562		17.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.9	200	0.0120	1.76		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	250	Total			

Subcatchment SUB-4:

Hydrograph



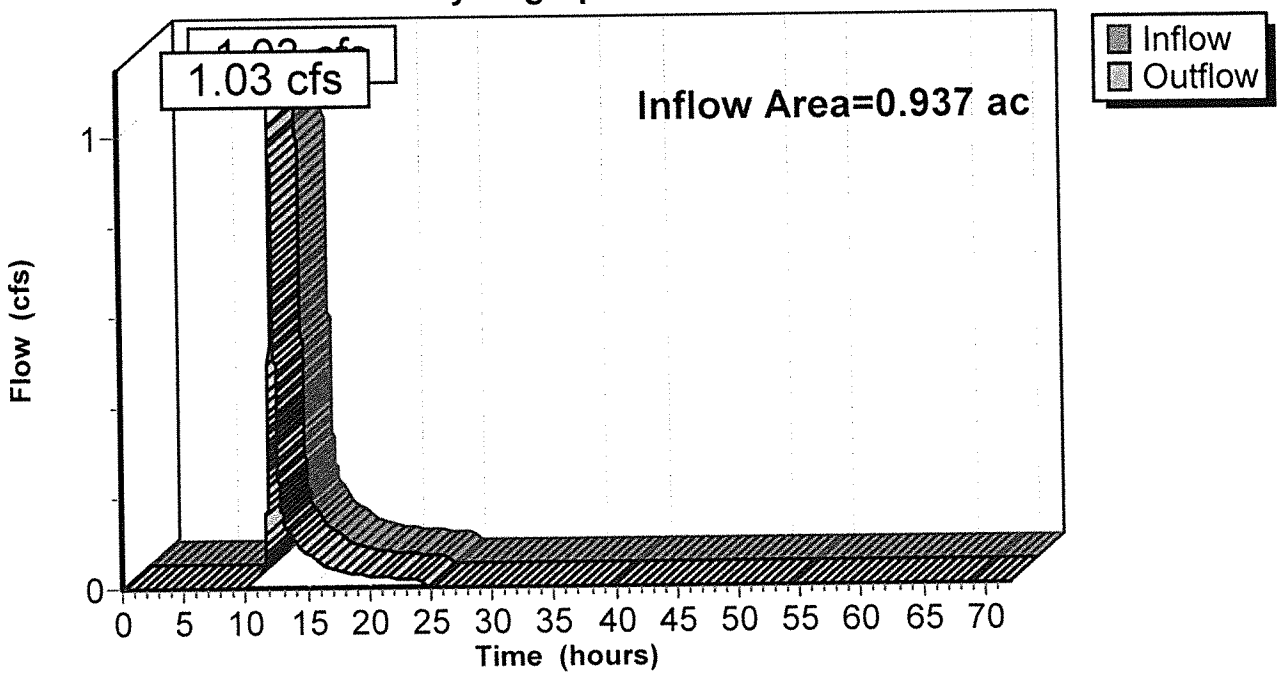
Summary for Reach DP-1:

Inflow Area =	0.937 ac,	9.85% Impervious,	Inflow Depth =	1.22"	for 2 yr. storm event
Inflow =	1.03 cfs @	12.18 hrs, Volume=	0.095 af		
Outflow =	1.03 cfs @	12.18 hrs, Volume=	0.095 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-1:

Hydrograph



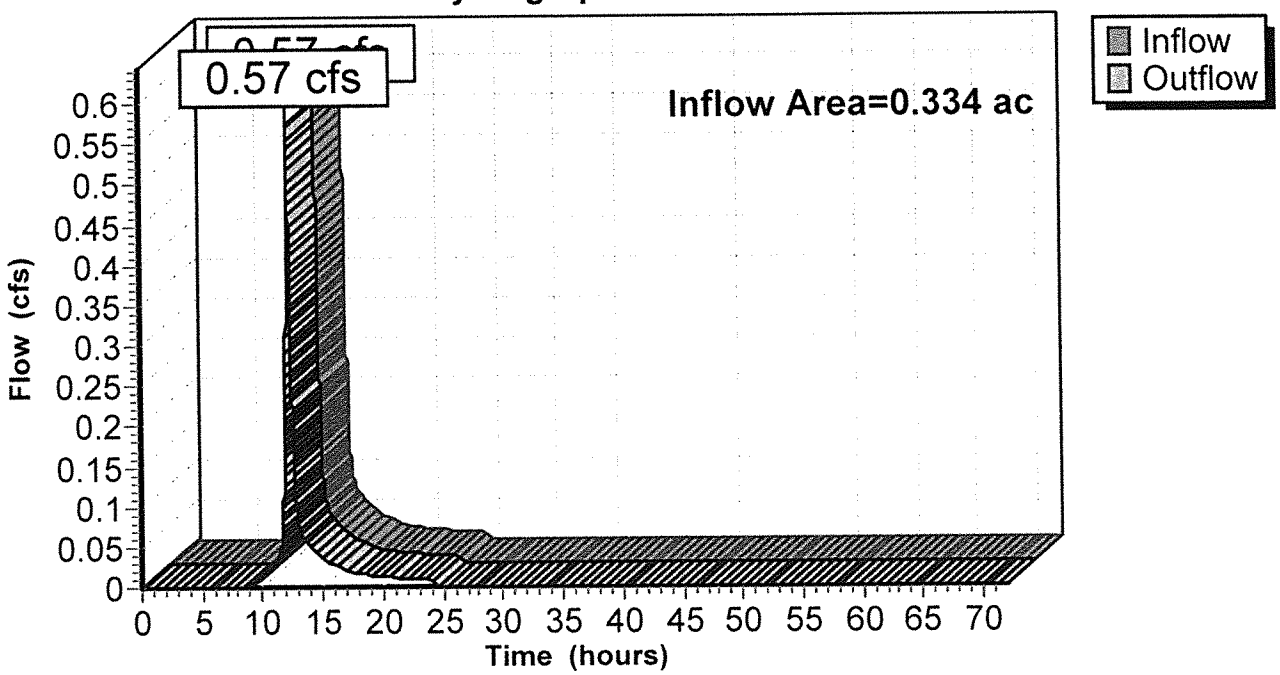
Summary for Reach DP-2:

Inflow Area = 0.334 ac, 24.09% Impervious, Inflow Depth = 1.85" for 2 yr. storm event
Inflow = 0.57 cfs @ 12.19 hrs, Volume= 0.052 af
Outflow = 0.57 cfs @ 12.19 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-2:

Hydrograph



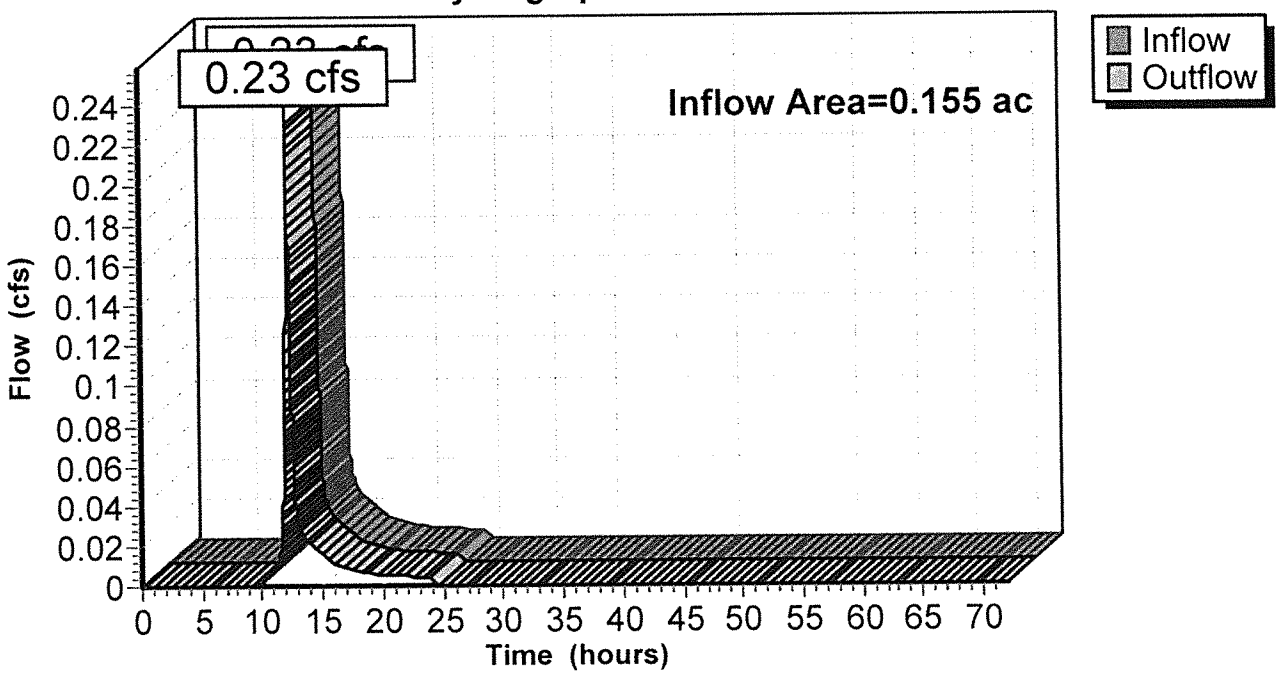
Summary for Reach DP-3:

Inflow Area =	0.155 ac,	7.99% Impervious,	Inflow Depth =	1.56"	for 2 yr. storm event
Inflow =	0.23 cfs @	12.17 hrs,	Volume=	0.020 af	
Outflow =	0.23 cfs @	12.17 hrs,	Volume=	0.020 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-3:

Hydrograph



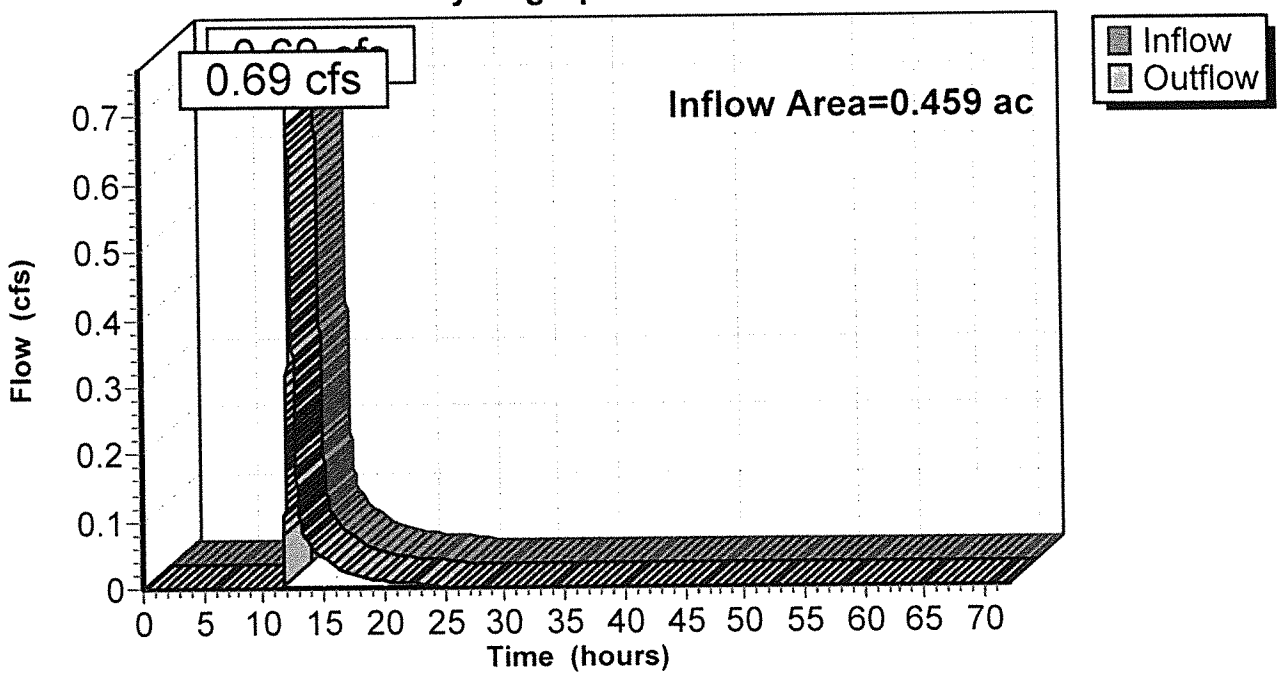
Summary for Reach DP-4:

Inflow Area =	0.459 ac, 17.82% Impervious, Inflow Depth = 1.44"	for 2 yr. storm event		
Inflow =	0.69 cfs @ 12.23 hrs, Volume=	0.055 af		
Outflow =	0.69 cfs @ 12.23 hrs, Volume=	0.055 af, Atten= 0%, Lag= 0.0 min		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-4:

Hydrograph



Summary for Pond 1P: Stone Trench

Inflow Area =	0.145 ac,	0.00% Impervious,	Inflow Depth =	1.56"	for 2 yr. storm event
Inflow =	0.27 cfs @	12.08 hrs,	Volume=	0.019 af	
Outflow =	0.27 cfs @	12.08 hrs,	Volume=	0.019 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	10.39 hrs,	Volume=	0.004 af	
Primary =	0.27 cfs @	12.08 hrs,	Volume=	0.014 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 119.92' @ 12.08 hrs Surf.Area= 120 sf Storage= 44 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 47.1 min (885.8 - 838.8)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	48 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 120 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	120	0	0
120.00	120	120	120

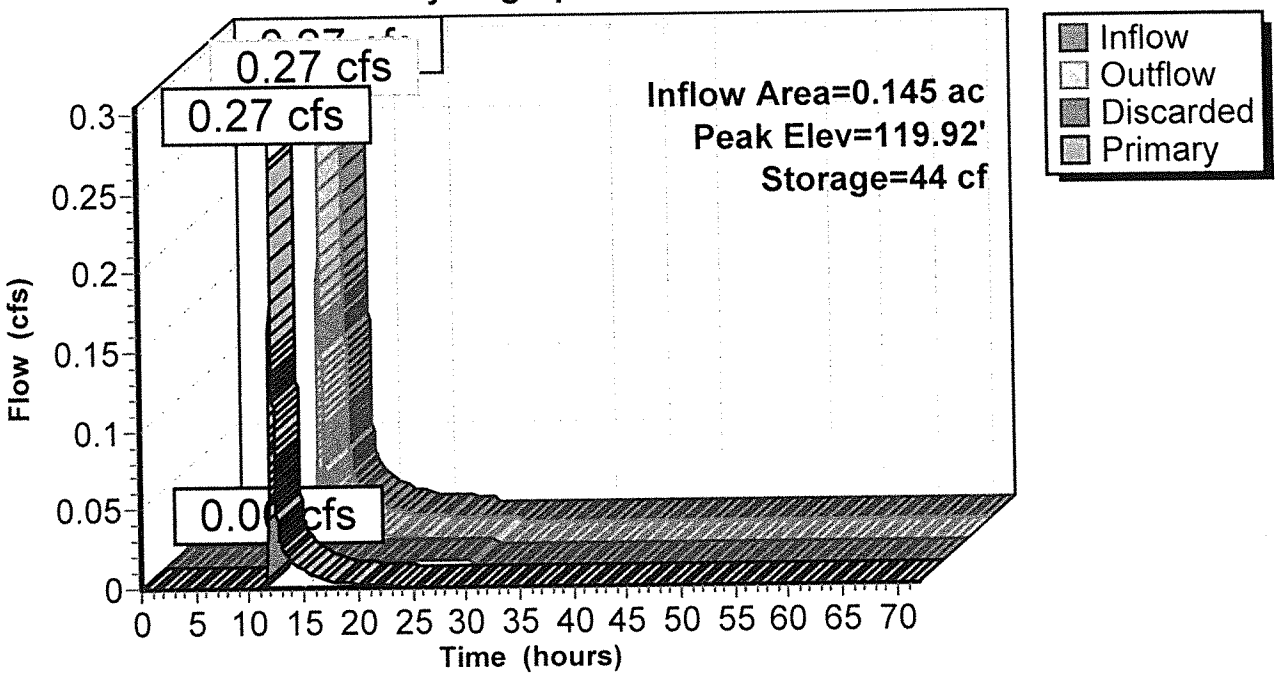
Device	Routing	Invert	Outlet Devices
#1	Primary	119.90'	**60.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 10.39 hrs HW=119.01' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.27 cfs @ 12.08 hrs HW=119.92' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.30 fps)

Pond 1P: Stone Trench

Hydrograph



Summary for Pond 2P: Stone Trench

Inflow Area =	0.030 ac, 31.18% Impervious, Inflow Depth = 2.01" for 2 yr. storm event				
Inflow =	0.07 cfs @	12.07 hrs,	Volume=	0.005 af	
Outflow =	0.00 cfs @	11.37 hrs,	Volume=	0.005 af,	Atten= 96%, Lag= 0.0 min
Discarded =	0.00 cfs @	11.37 hrs,	Volume=	0.005 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 122.76' @ 15.76 hrs Surf.Area= 110 sf Storage= 121 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 457.6 min (1,276.6 - 819.0)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	176 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	110	0	0
121.00	110	110	110
122.00	110	110	220
123.00	110	110	330
124.00	110	110	440

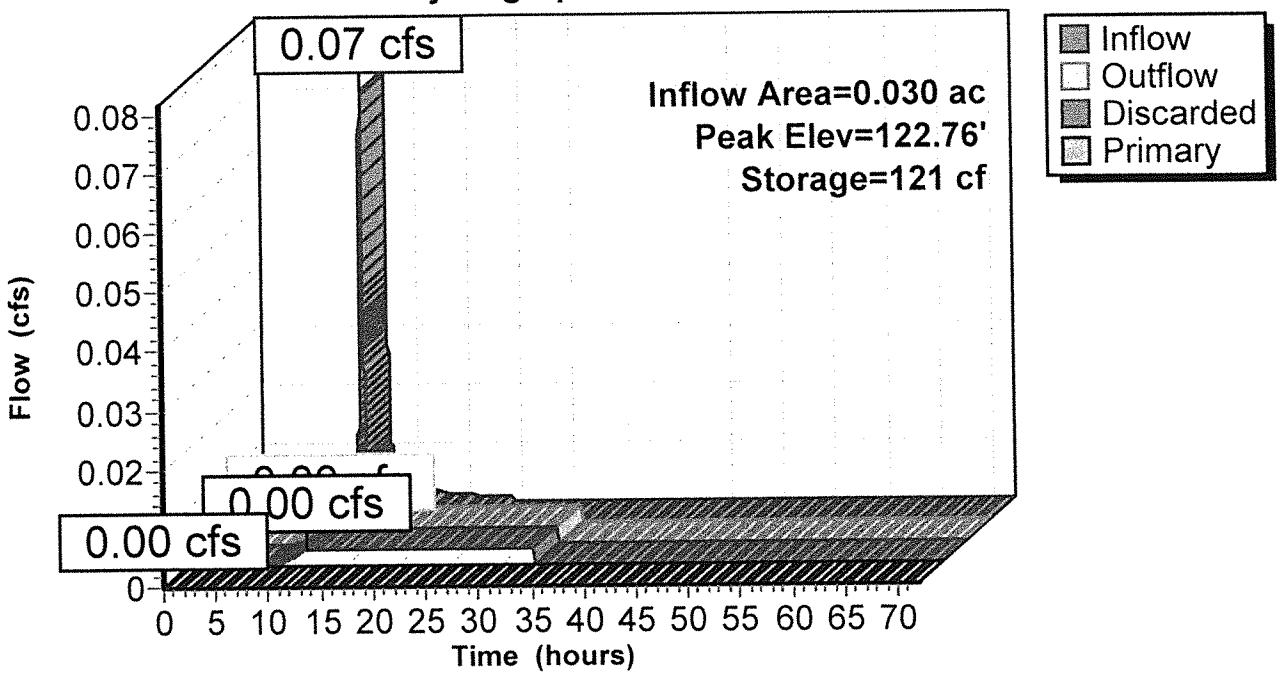
Device	Routing	Invert	Outlet Devices
#1	Primary	123.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	120.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 11.37 hrs HW=120.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.00' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Stone Trench

Hydrograph



Summary for Pond 3P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 3.17" for 2 yr. storm event				
Inflow =	0.08 cfs @	12.07 hrs,	Volume=	0.006 af	
Outflow =	0.01 cfs @	11.71 hrs,	Volume=	0.006 af,	Atten= 87%, Lag= 0.0 min
Discarded =	0.01 cfs @	11.71 hrs,	Volume=	0.006 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 200.62' @ 12.59 hrs Surf.Area= 212 sf Storage= 78 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.7 min (799.9 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2
			318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

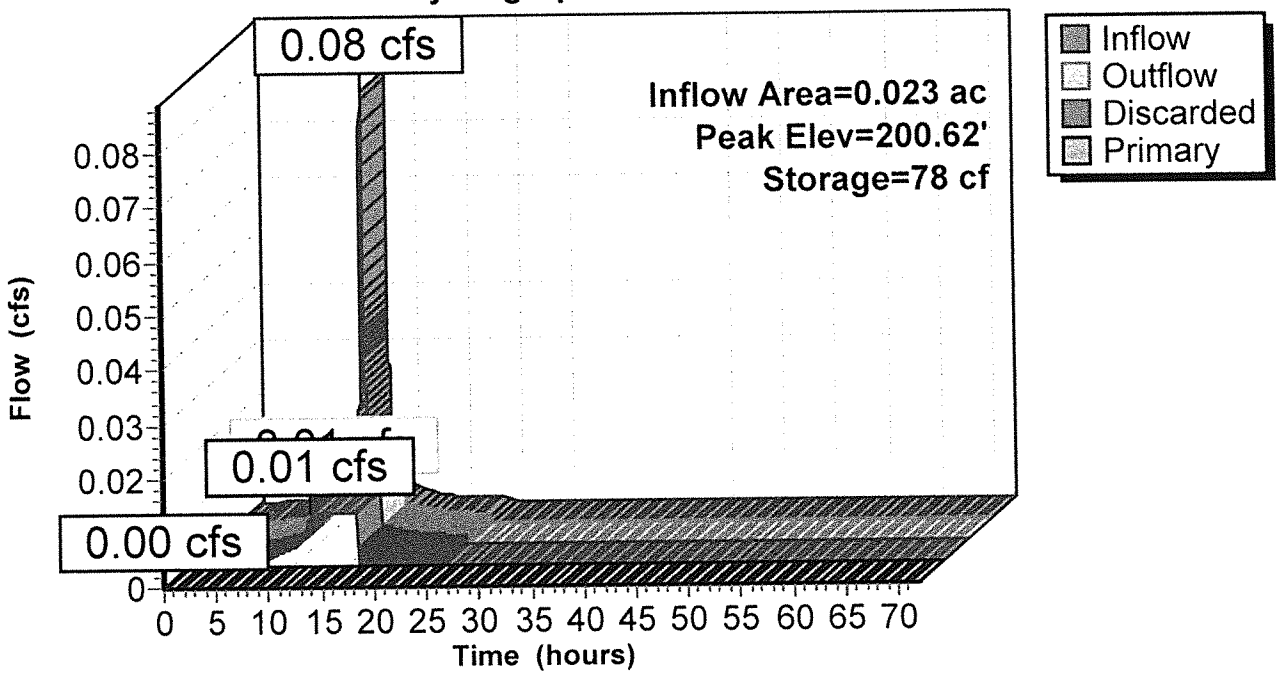
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600
			Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.71 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=200.00' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Roof Drywell

Hydrograph



Summary for Pond 5P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 3.17" for 2 yr. storm event				
Inflow =	0.08 cfs @	12.07 hrs,	Volume=	0.006 af	
Outflow =	0.01 cfs @	11.71 hrs,	Volume=	0.006 af,	Atten= 87%, Lag= 0.0 min
Discarded =	0.01 cfs @	11.71 hrs,	Volume=	0.006 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 200.62' @ 12.59 hrs Surf.Area= 212 sf Storage= 78 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.7 min (799.9 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2
			318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

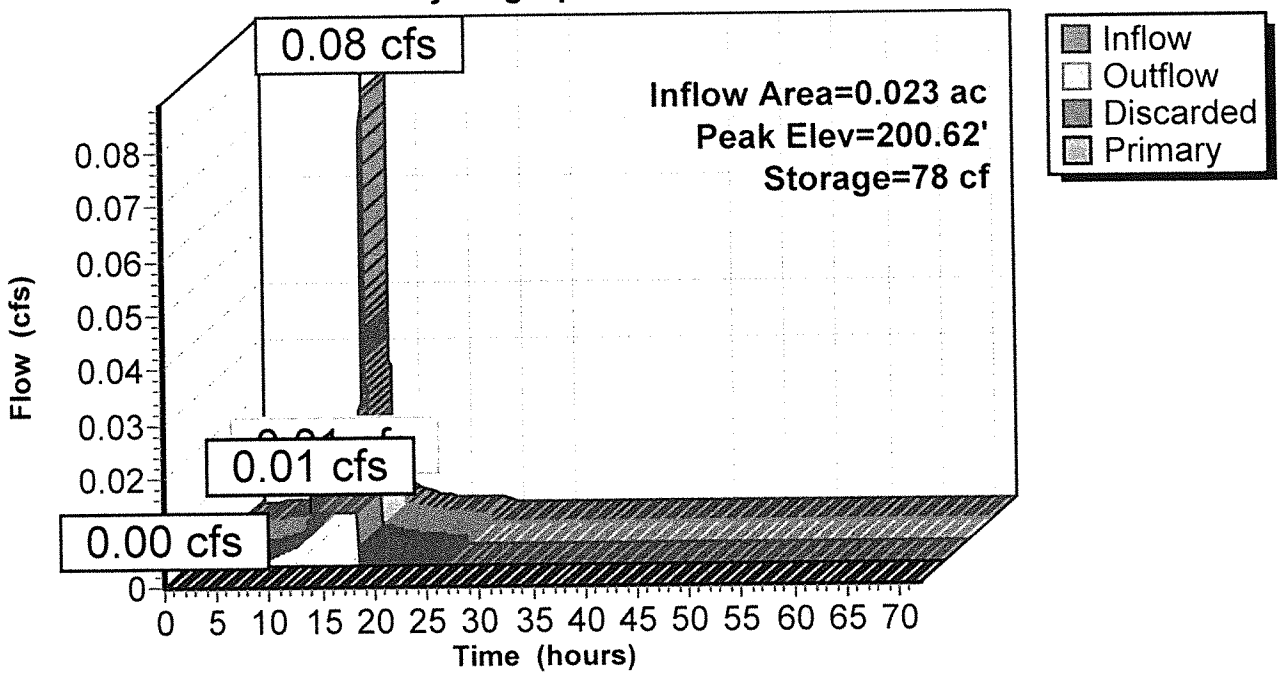
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600
			Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.71 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=200.00' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Roof Drywell

Hydrograph



Summary for Pond 6P:

Inflow Area =	0.459 ac, 17.82% Impervious, Inflow Depth = 1.77" for 2 yr. storm event				
Inflow =	0.69 cfs @	12.23 hrs,	Volume=	0.068 af	
Outflow =	0.69 cfs @	12.23 hrs,	Volume=	0.068 af,	Atten= 0%, Lag= 0.2 min
Discarded =	0.01 cfs @	12.23 hrs,	Volume=	0.013 af	
Primary =	0.69 cfs @	12.23 hrs,	Volume=	0.055 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 122.44' @ 12.23 hrs Surf.Area= 307 sf Storage= 207 cf

Plug-Flow detention time= 73.6 min calculated for 0.068 af (100% of inflow)
Center-of-Mass det. time= 73.7 min (913.7 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	121.30'	227 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.30	72	0	0
122.00	202	96	96
122.50	322	131	227

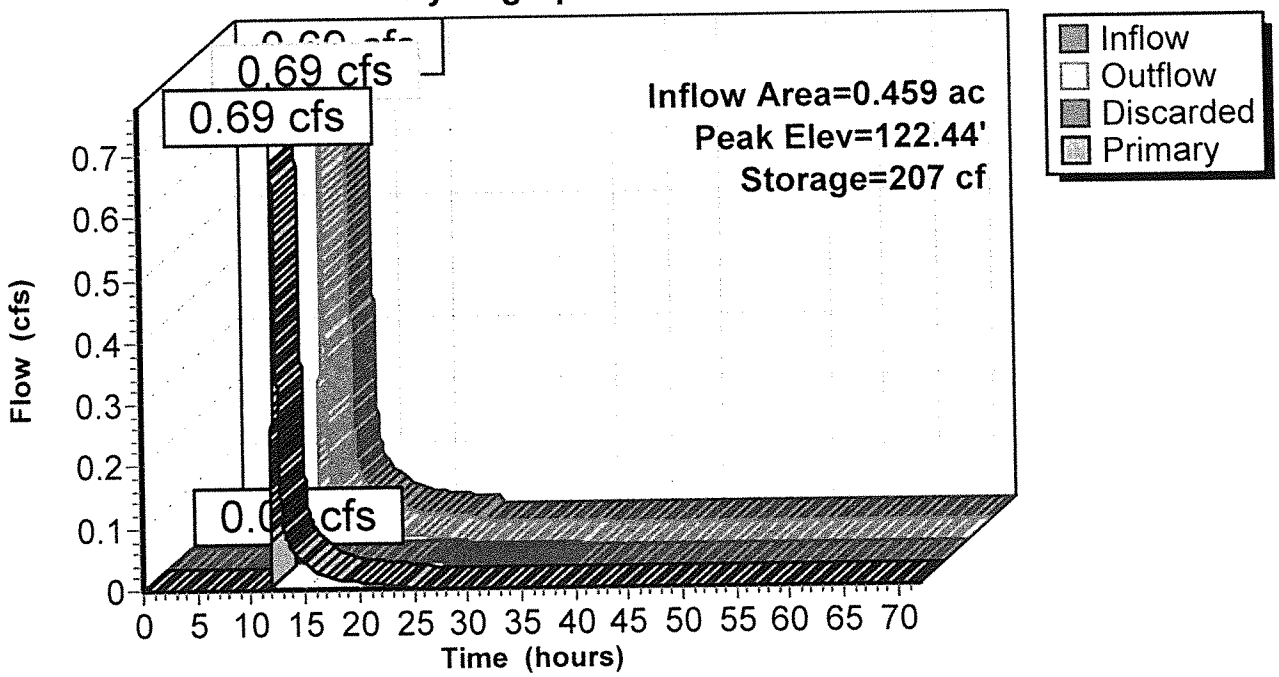
Device	Routing	Invert	Outlet Devices
#1	Primary	122.40'	**40.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	121.30'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.23 hrs HW=122.44' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.69 cfs @ 12.23 hrs HW=122.44' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 0.46 fps)

Pond 6P:

Hydrograph



Summary for Pond 7P: Roof Drywell

Inflow Area =	0.037 ac,100.00% Impervious, Inflow Depth = 3.17" for 2 yr. storm event				
Inflow =	0.13 cfs @	12.07 hrs,	Volume=	0.010 af	
Outflow =	0.01 cfs @	11.49 hrs,	Volume=	0.010 af,	Atten= 92%, Lag= 0.0 min
Discarded =	0.01 cfs @	11.49 hrs,	Volume=	0.010 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.21' @ 13.00 hrs Surf.Area= 212 sf Storage= 151 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 106.7 min (860.9 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

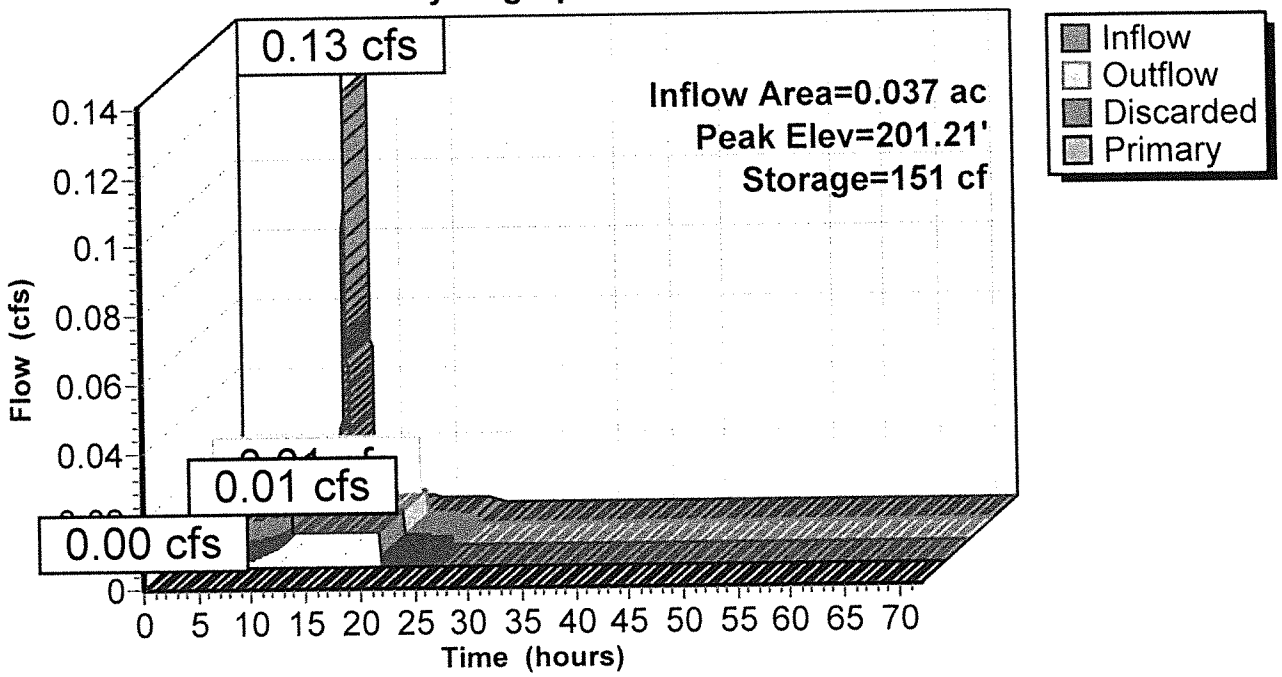
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.49 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=200.00' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 7P: Roof Drywell

Hydrograph



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1A: Runoff Area=1,302 sf 31.18% Impervious Runoff Depth=3.19"
Tc=5.0 min CN=86 Runoff=0.11 cfs 0.008 af

Subcatchment SUB-1B: 75% Lot 1 Roof Runoff Area=1,597 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment SUB-1C: 50% Lot 2 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment SUB-1D: 50% Lot 3 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment SUB-1E: Lot 1 Rear Yard Runoff Area=6,307 sf 0.00% Impervious Runoff Depth=2.63"
Tc=5.0 min CN=80 Runoff=0.46 cfs 0.032 af

Subcatchment SUB-1F: Runoff Area=29,580 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=320' Tc=13.6 min CN=78 Runoff=1.54 cfs 0.139 af

Subcatchment SUB-2: SUB-2 Runoff Area=14,560 sf 24.09% Impervious Runoff Depth=3.00"
Flow Length=44' Slope=0.0120 '/' Tc=13.3 min CN=84 Runoff=0.93 cfs 0.083 af

Subcatchment SUB-3: Runoff Area=6,749 sf 7.99% Impervious Runoff Depth=2.63"
Flow Length=50' Slope=0.0200 '/' Tc=12.0 min CN=80 Runoff=0.39 cfs 0.034 af

Subcatchment SUB-4: Runoff Area=19,985 sf 17.82% Impervious Runoff Depth=2.90"
Flow Length=250' Slope=0.0120 '/' Tc=16.6 min CN=83 Runoff=1.14 cfs 0.111 af

Reach DP-1: Inflow=1.86 cfs 0.169 af
Outflow=1.86 cfs 0.169 af

Reach DP-2: Inflow=0.93 cfs 0.083 af
Outflow=0.93 cfs 0.083 af

Reach DP-3: Inflow=0.39 cfs 0.034 af
Outflow=0.39 cfs 0.034 af

Reach DP-4: Inflow=1.13 cfs 0.098 af
Outflow=1.13 cfs 0.098 af

Pond 1P: Stone Trench Peak Elev=119.92' Storage=44 cf Inflow=0.46 cfs 0.032 af
Discarded=0.00 cfs 0.005 af Primary=0.46 cfs 0.027 af Outflow=0.46 cfs 0.032 af

Pond 2P: Stone Trench Peak Elev=123.90' Storage=172 cf Inflow=0.11 cfs 0.008 af
Discarded=0.00 cfs 0.007 af Primary=0.02 cfs 0.001 af Outflow=0.02 cfs 0.008 af

Pond 3P: Roof Drywell Peak Elev=201.01' Storage=125 cf Inflow=0.11 cfs 0.009 af
Discarded=0.01 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.009 af

Pond 5P: Roof Drywell Peak Elev=201.01' Storage=125 cf Inflow=0.11 cfs 0.009 af
Discarded=0.01 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.009 af

Pond 6P: Peak Elev=122.45' Storage=212 cf Inflow=1.14 cfs 0.111 af
Discarded=0.01 cfs 0.013 af Primary=1.13 cfs 0.098 af Outflow=1.14 cfs 0.111 af

Pond 7P: Roof Drywell Peak Elev=201.35' Storage=167 cf Inflow=0.17 cfs 0.014 af
Discarded=0.01 cfs 0.012 af Primary=0.08 cfs 0.002 af Outflow=0.09 cfs 0.014 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.438 af Average Runoff Depth = 2.79"
85.83% Pervious = 1.618 ac 14.17% Impervious = 0.267 ac

Summary for Subcatchment SUB-1A:

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 0.008 af, Depth= 3.19"

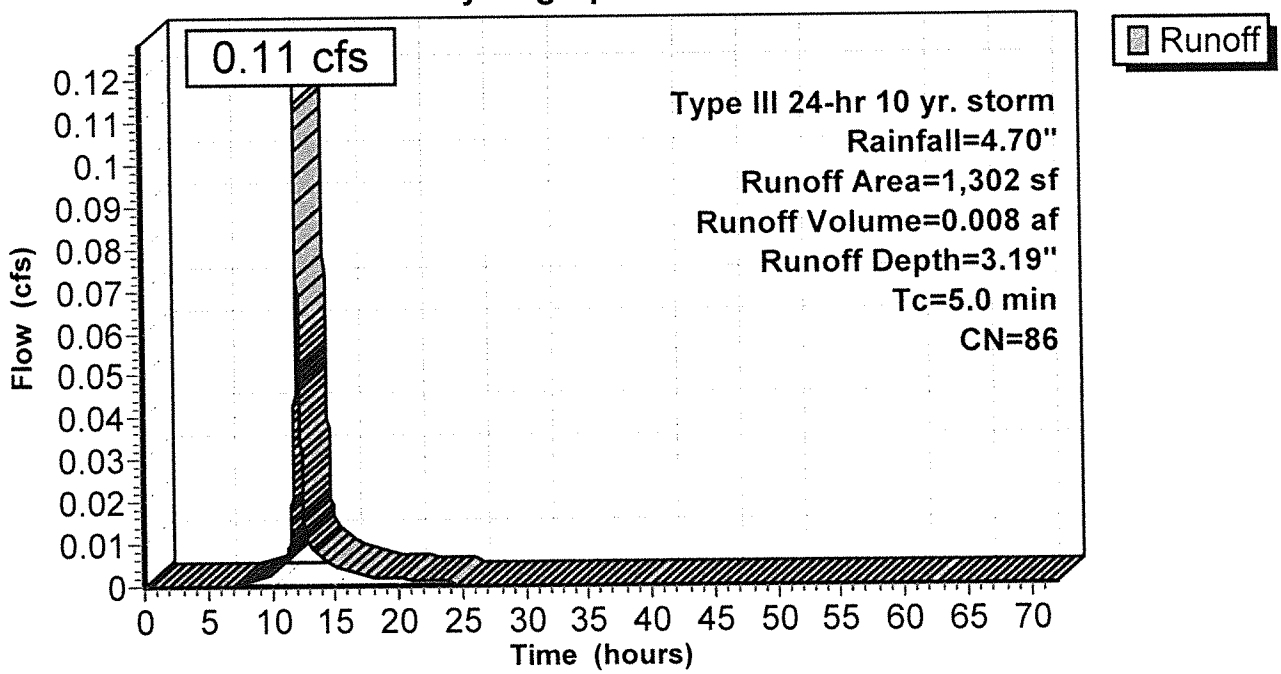
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	406	98	Driveway
	896	80	>75% Grass cover, Good, HSG D
	1,302	86	Weighted Average
	896		68.82% Pervious Area
	406		31.18% Impervious Area

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

Subcatchment SUB-1A:

Hydrograph



Summary for Subcatchment SUB-1B: 75% Lot 1 Roof

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 4.46"

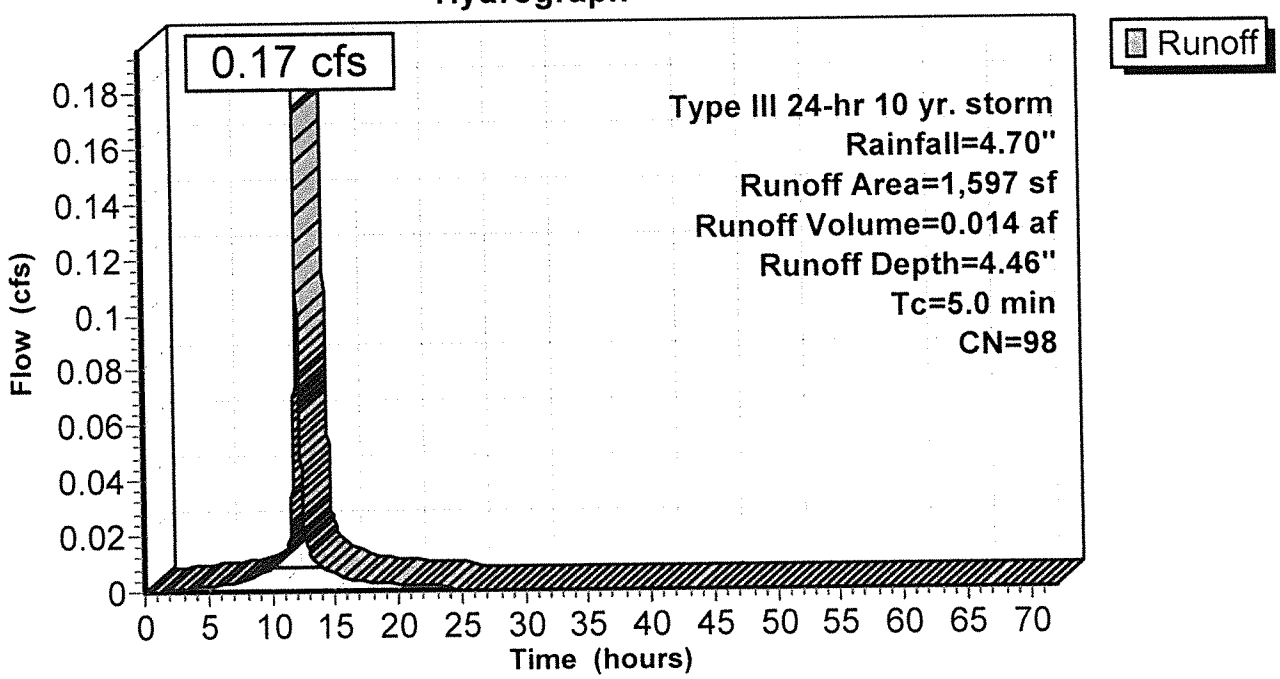
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,597	98	Roof
	1,597		100.00% Impervious Area

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

Subcatchment SUB-1B: 75% Lot 1 Roof

Hydrograph



Summary for Subcatchment SUB-1C: 50% Lot 2 Roof

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 0.009 af, Depth= 4.46"

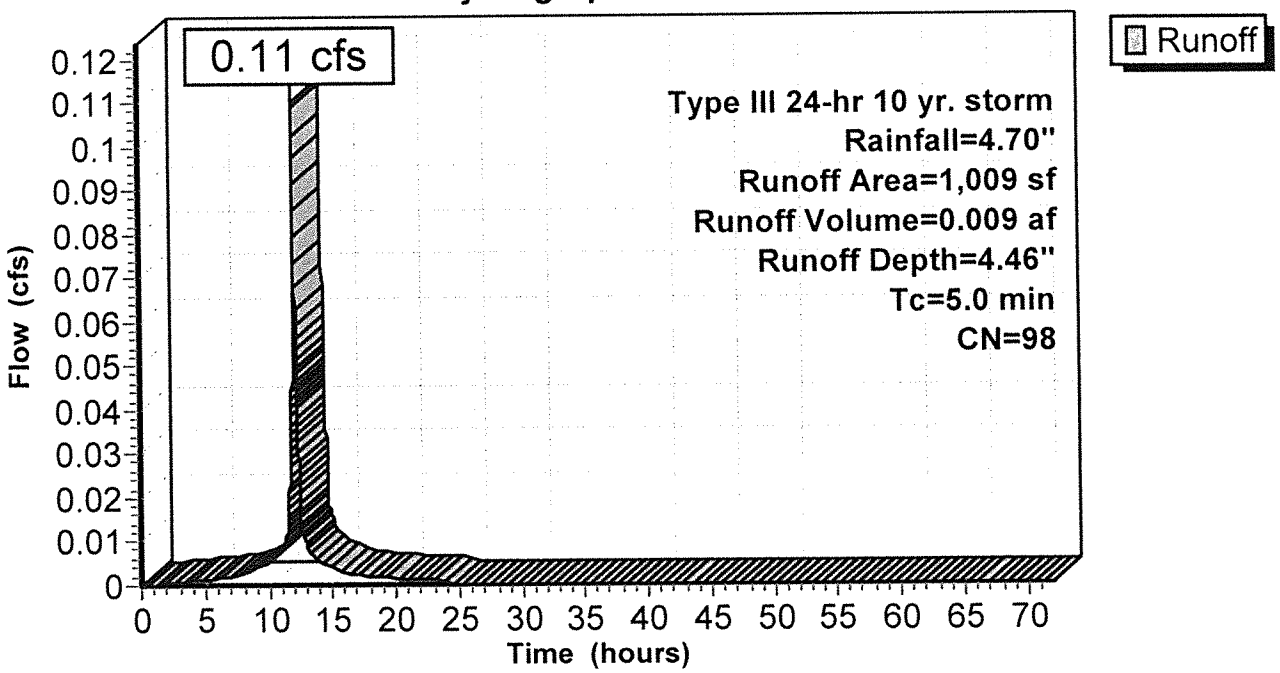
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1C: 50% Lot 2 Roof

Hydrograph



Summary for Subcatchment SUB-1D: 50% Lot 3 Roof

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 0.009 af, Depth= 4.46"

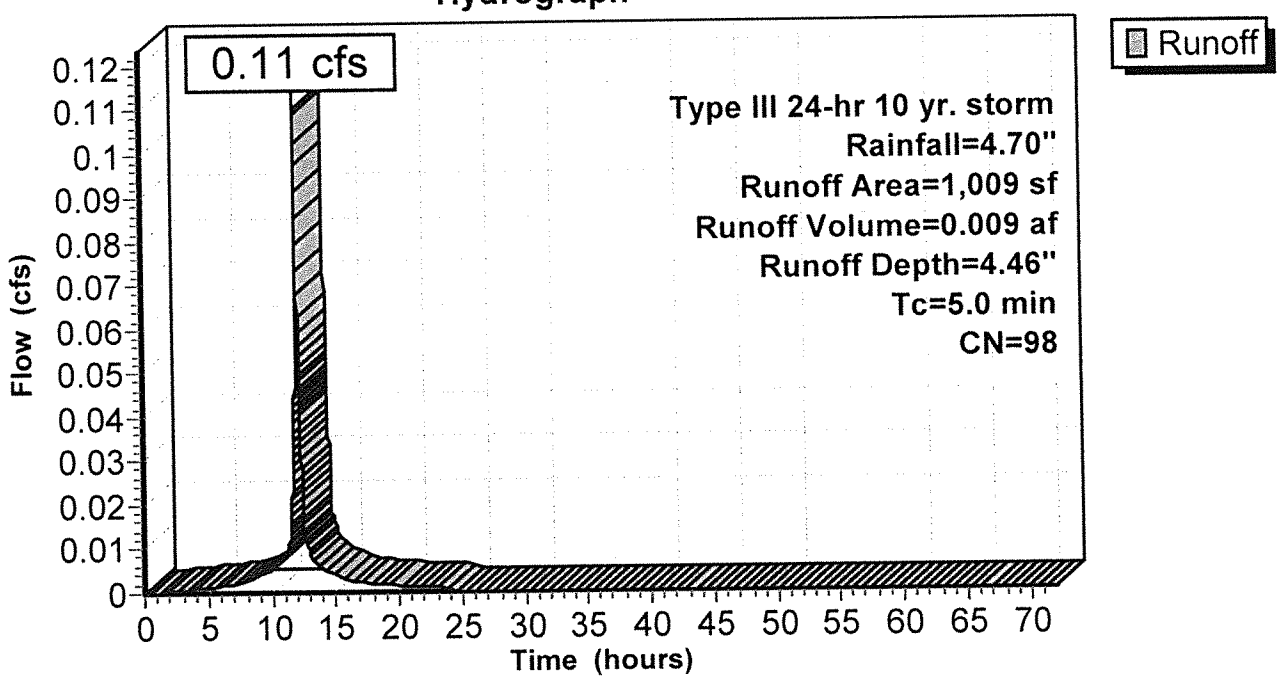
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1D: 50% Lot 3 Roof

Hydrograph



Summary for Subcatchment SUB-1E: Lot 1 Rear Yard

Runoff = 0.46 cfs @ 12.07 hrs, Volume= 0.032 af, Depth= 2.63"

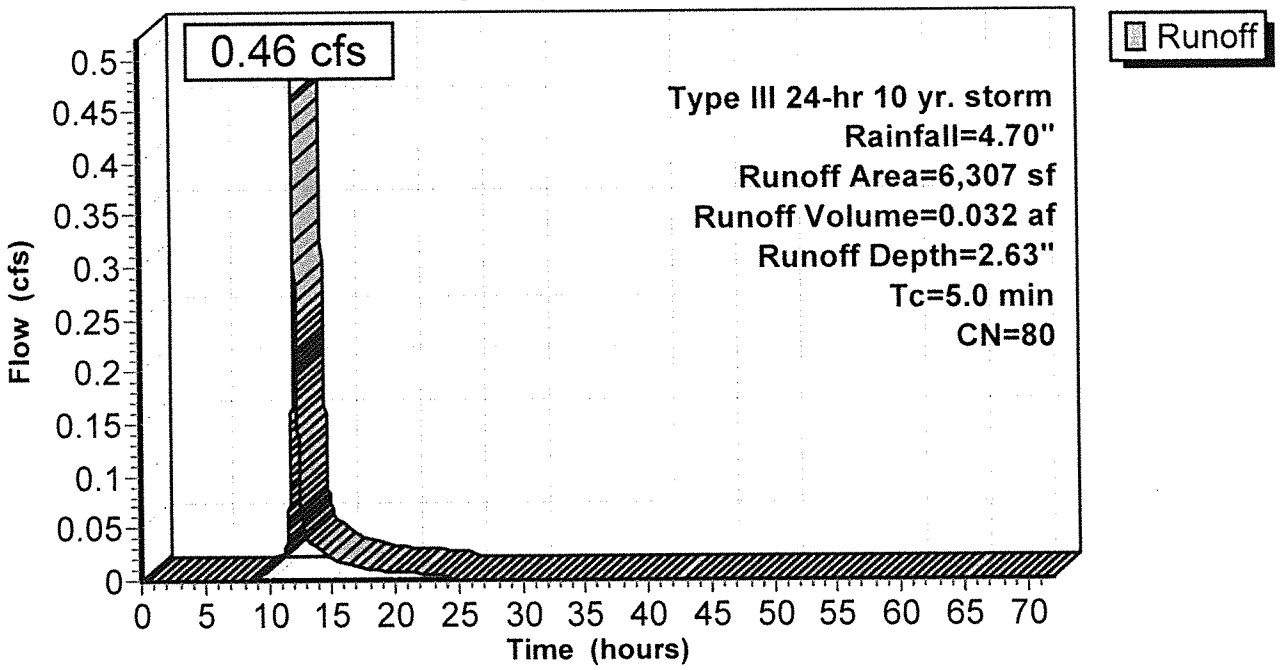
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

Area (sf)	CN	Description
6,307	80	>75% Grass cover, Good, HSG D
6,307		100.00% Pervious Area

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

Subcatchment SUB-1E: Lot 1 Rear Yard

Hydrograph



Summary for Subcatchment SUB-1F:

Runoff = 1.54 cfs @ 12.19 hrs, Volume= 0.139 af, Depth= 2.46"

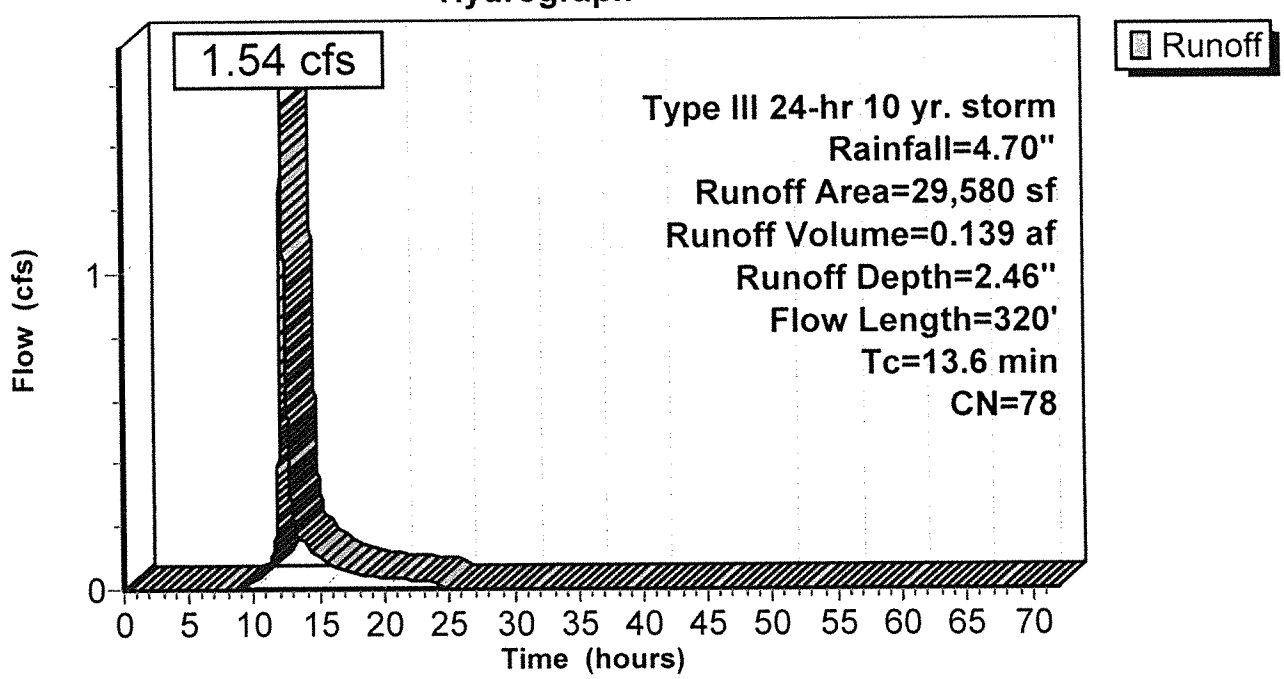
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

Area (sf)	CN	Description
9,853	80	>75% Grass cover, Good, HSG D
19,727	77	Woods, Good, HSG D
29,580	78	Weighted Average
29,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.6	270	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	320	Total			

Subcatchment SUB-1F:

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 0.93 cfs @ 12.18 hrs, Volume= 0.083 af, Depth= 3.00"

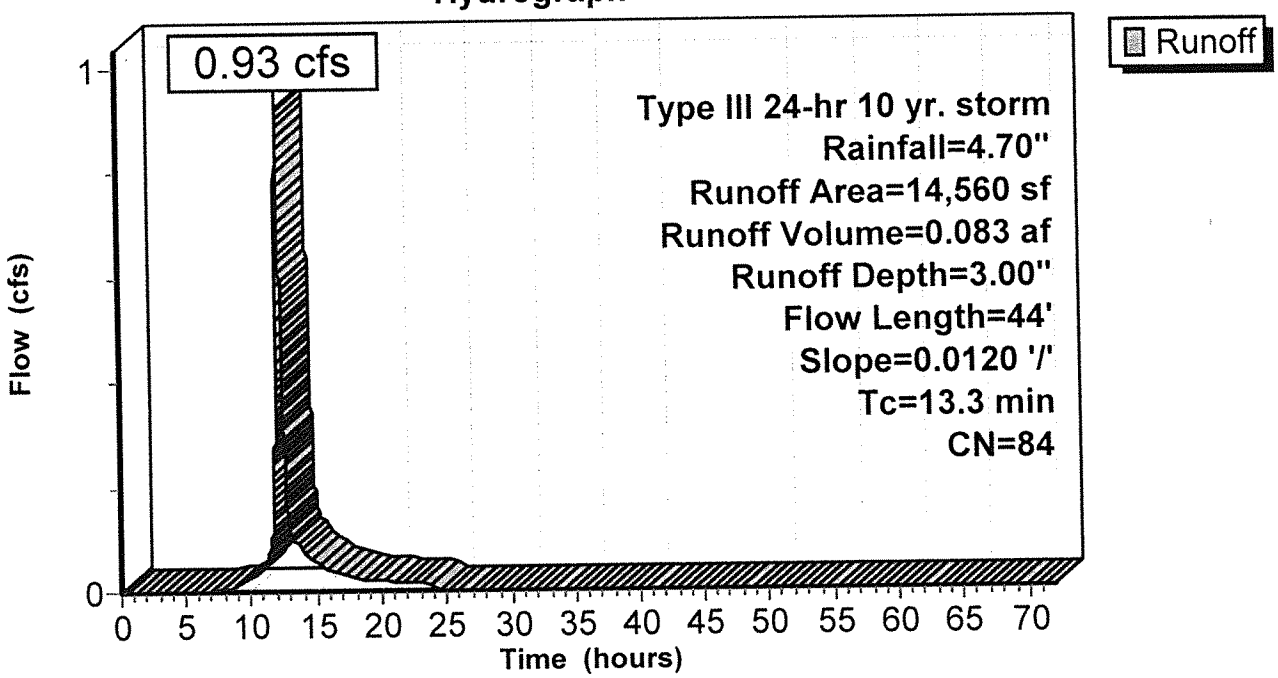
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,948	98	Roofs
*	1,560	98	Paved Driveways
	11,052	80	>75% Grass cover, Good, HSG D
	14,560	84	Weighted Average
	11,052		75.91% Pervious Area
	3,508		24.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	44	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3:

Runoff = 0.39 cfs @ 12.17 hrs, Volume= 0.034 af, Depth= 2.63"

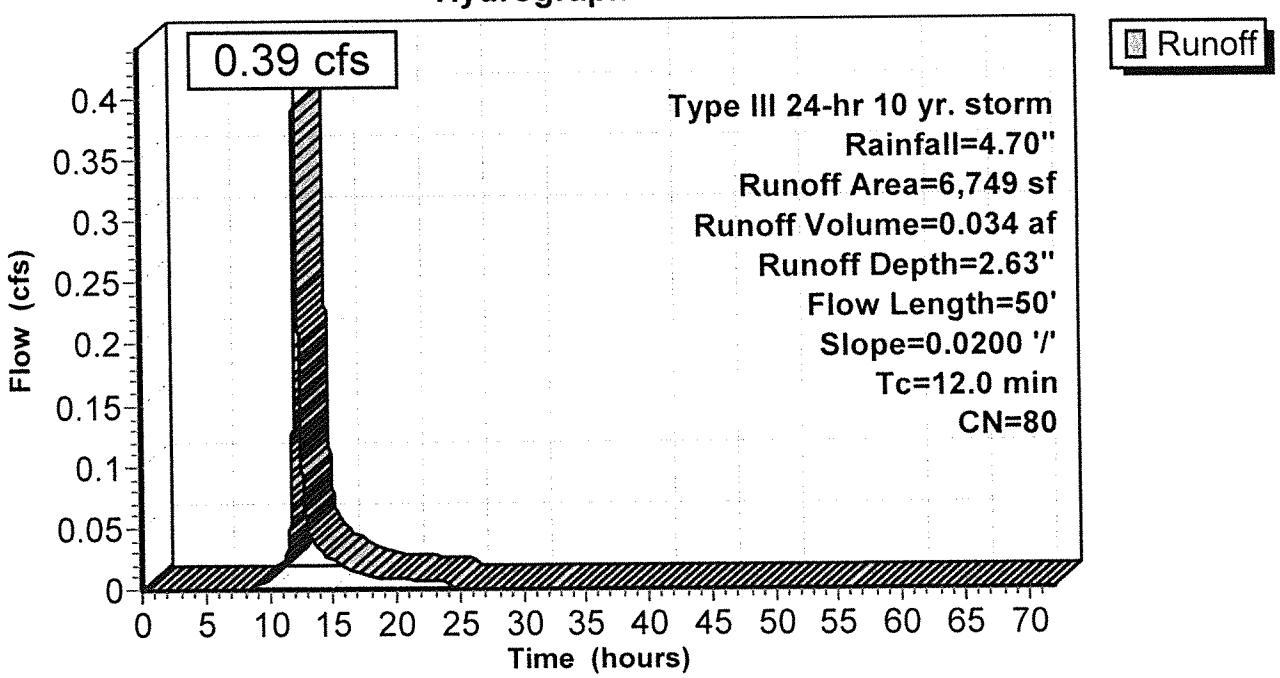
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	539	98	Roofs
	3,140	80	>75% Grass cover, Good, HSG D
	3,070	77	Woods, Good, HSG D
	6,749	80	Weighted Average
	6,210		92.01% Pervious Area
	539		7.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-3:

Hydrograph



Summary for Subcatchment SUB-4:

Runoff = 1.14 cfs @ 12.23 hrs, Volume= 0.111 af, Depth= 2.90"

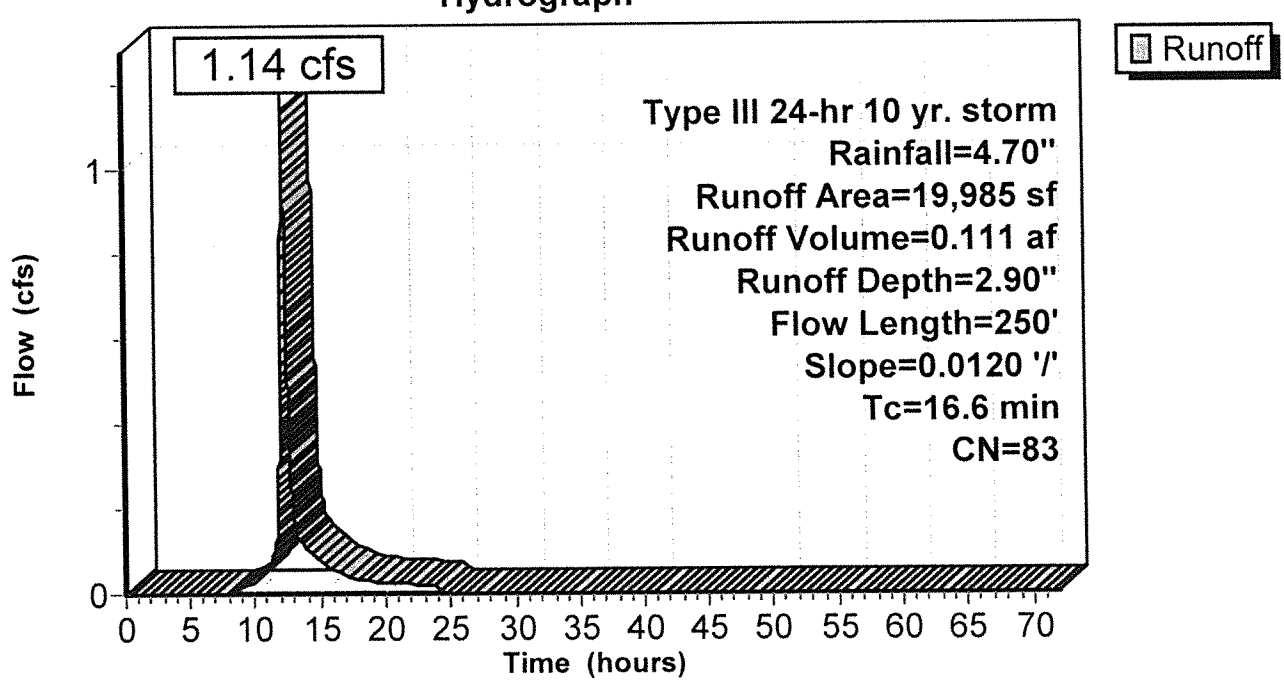
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr. storm Rainfall=4.70"

	Area (sf)	CN	Description
*	1,726	98	Roofs
*	1,836	98	Driveways
	15,563	80	>75% Grass cover, Good, HSG D
	860	77	Woods, Good, HSG D
	19,985	83	Weighted Average
	16,423		82.18% Pervious Area
	3,562		17.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.9	200	0.0120	1.76		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	250	Total			

Subcatchment SUB-4:

Hydrograph



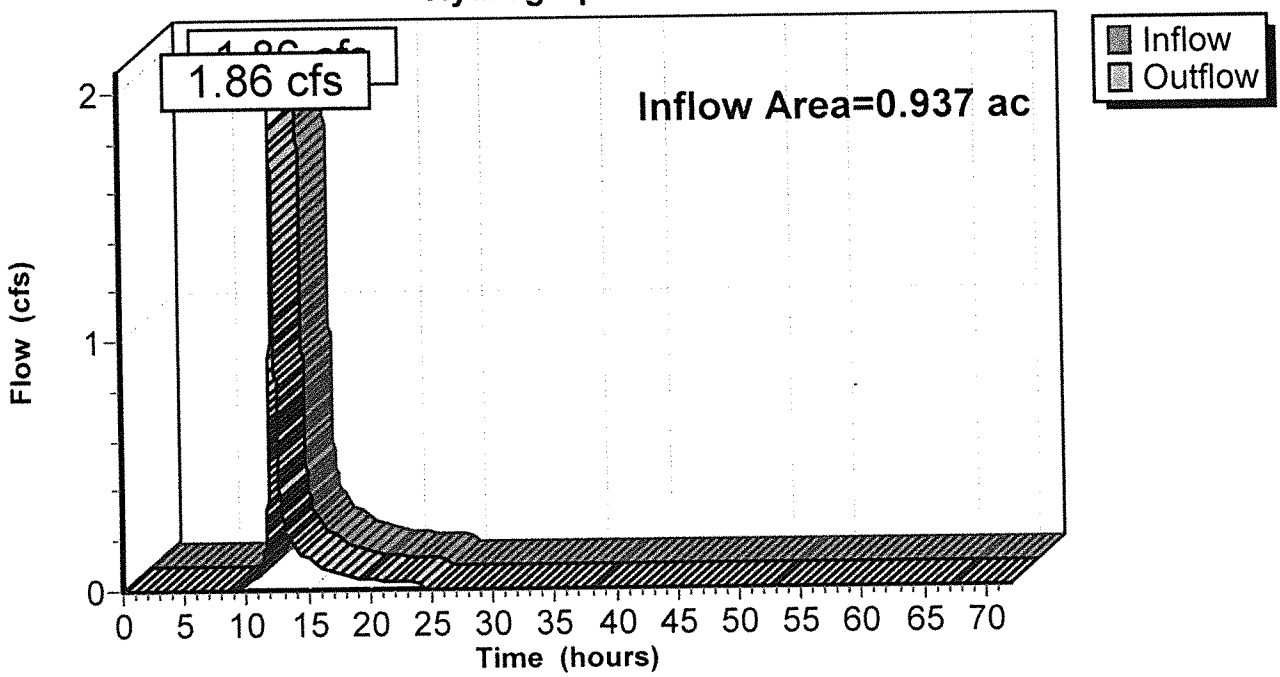
Summary for Reach DP-1:

Inflow Area =	0.937 ac,	9.85% Impervious,	Inflow Depth =	2.17"	for 10 yr. storm event
Inflow =	1.86 cfs @	12.19 hrs, Volume=	0.169 af		
Outflow =	1.86 cfs @	12.19 hrs, Volume=	0.169 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-1:

Hydrograph



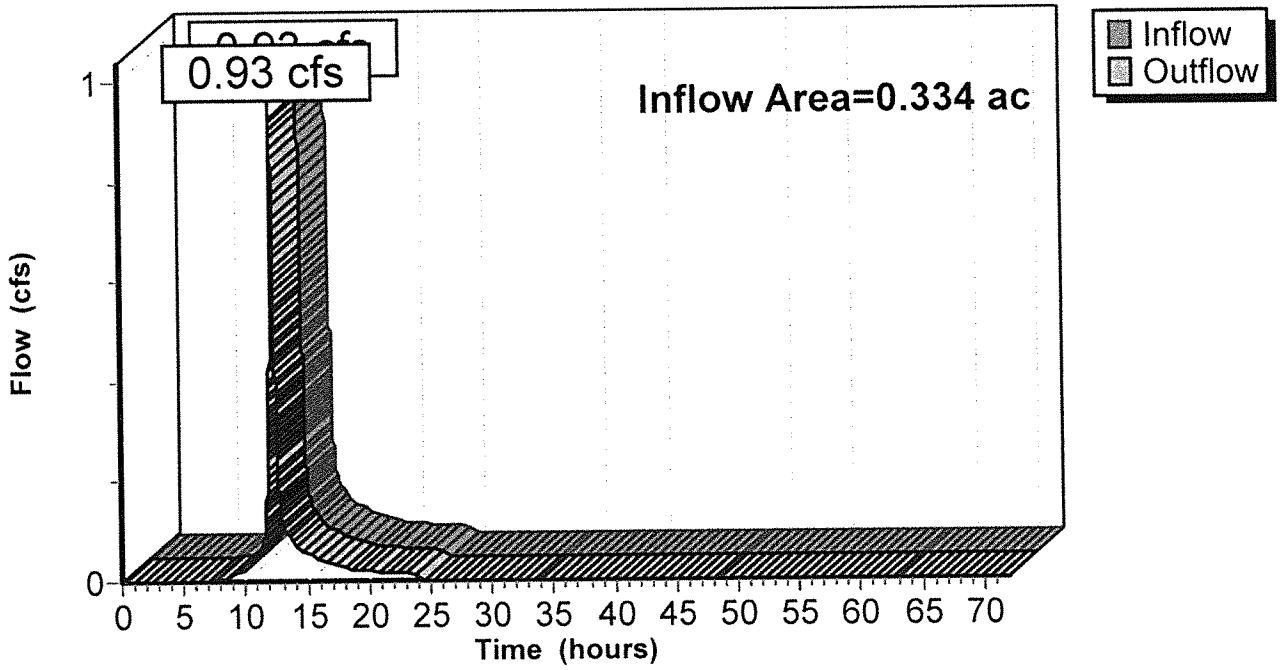
Summary for Reach DP-2:

Inflow Area = 0.334 ac, 24.09% Impervious, Inflow Depth = 3.00" for 10 yr. storm event
Inflow = 0.93 cfs @ 12.18 hrs, Volume= 0.083 af
Outflow = 0.93 cfs @ 12.18 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-2:

Hydrograph



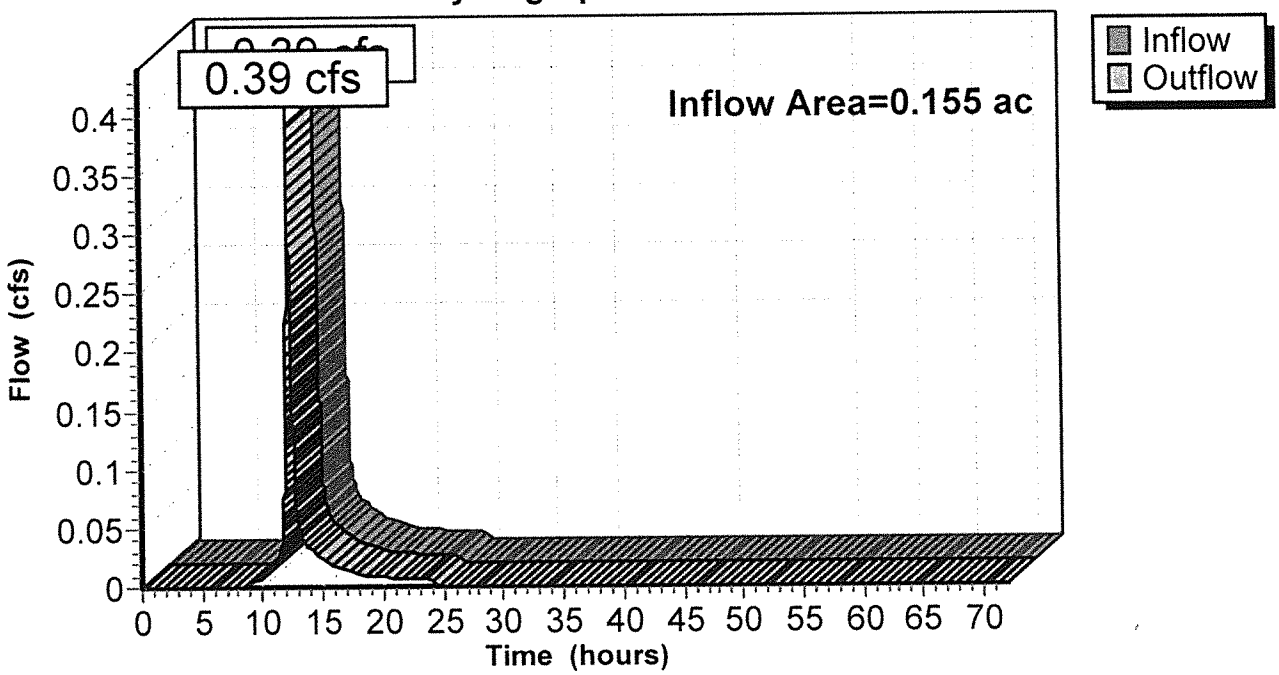
Summary for Reach DP-3:

Inflow Area =	0.155 ac,	7.99% Impervious,	Inflow Depth =	2.63"	for 10 yr. storm event
Inflow =	0.39 cfs @	12.17 hrs,	Volume=	0.034 af	
Outflow =	0.39 cfs @	12.17 hrs,	Volume=	0.034 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-3:

Hydrograph



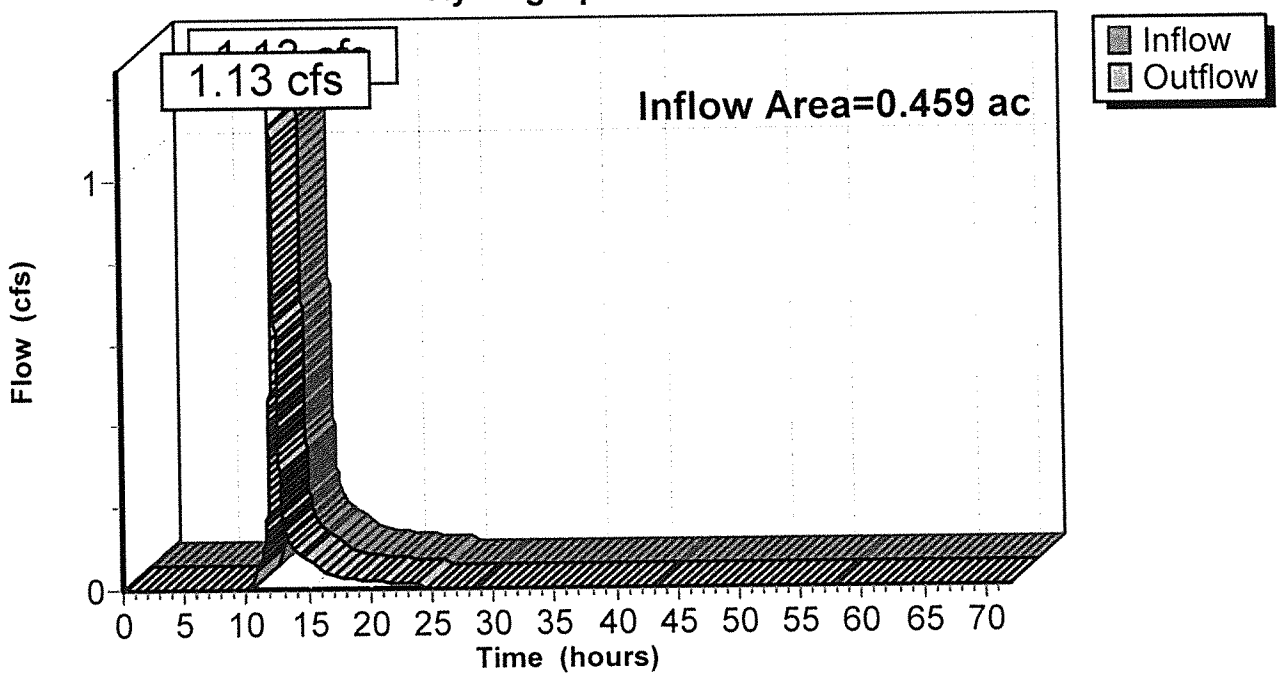
Summary for Reach DP-4:

Inflow Area =	0.459 ac,	17.82% Impervious,	Inflow Depth =	2.55"	for 10 yr. storm event
Inflow =	1.13 cfs @	12.23 hrs,	Volume=	0.098 af	
Outflow =	1.13 cfs @	12.23 hrs,	Volume=	0.098 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-4:

Hydrograph



Summary for Pond 1P: Stone Trench

Inflow Area =	0.145 ac,	0.00% Impervious,	Inflow Depth =	2.63"	for 10 yr. storm event
Inflow =	0.46 cfs @	12.07 hrs,	Volume=	0.032 af	
Outflow =	0.46 cfs @	12.08 hrs,	Volume=	0.032 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	9.19 hrs,	Volume=	0.005 af	
Primary =	0.46 cfs @	12.08 hrs,	Volume=	0.027 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 119.92' @ 12.08 hrs Surf.Area= 120 sf Storage= 44 cf

Plug-Flow detention time= 29.7 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 29.7 min (853.3 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	48 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 120 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	120	0	0
120.00	120	120	120

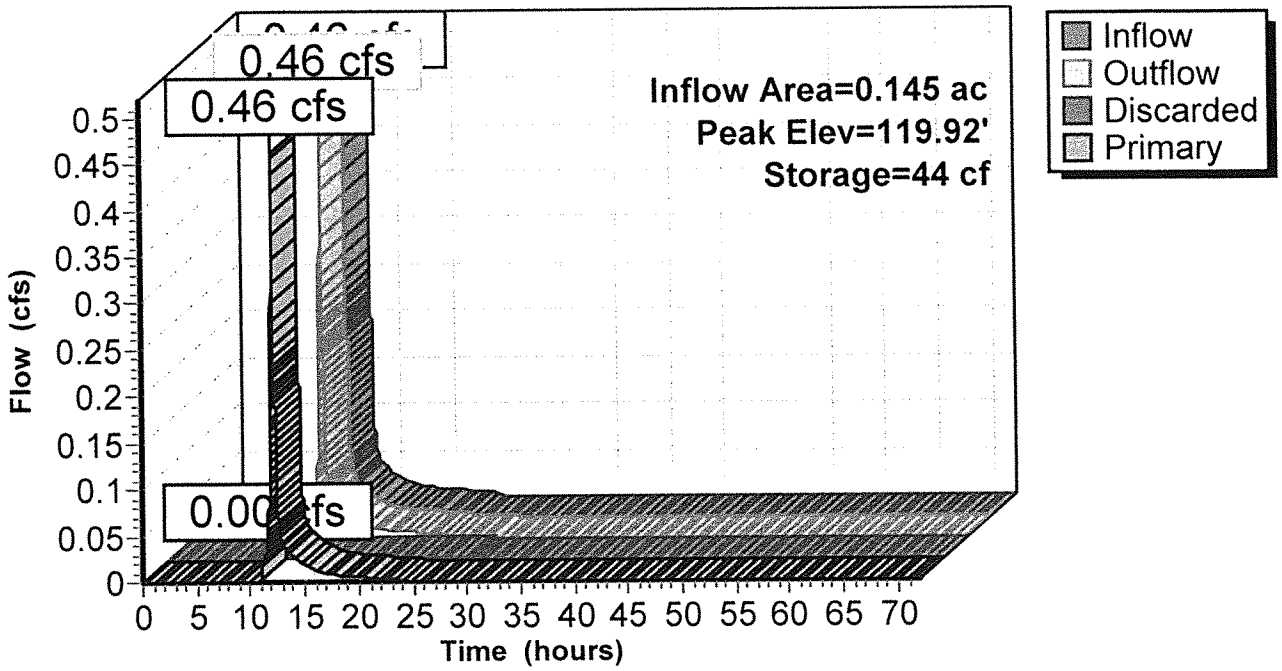
Device	Routing	Invert	Outlet Devices
#1	Primary	119.90'	**60.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 9.19 hrs HW=119.01' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.46 cfs @ 12.08 hrs HW=119.92' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.46 cfs @ 0.36 fps)

Pond 1P: Stone Trench

Hydrograph



Summary for Pond 2P: Stone Trench

Inflow Area =	0.030 ac, 31.18% Impervious, Inflow Depth = 3.19" for 10 yr. storm event				
Inflow =	0.11 cfs @	12.07 hrs,	Volume=	0.008 af	
Outflow =	0.02 cfs @	12.63 hrs,	Volume=	0.008 af,	Atten= 84%, Lag= 33.6 min
Discarded =	0.00 cfs @	10.48 hrs,	Volume=	0.007 af	
Primary =	0.02 cfs @	12.63 hrs,	Volume=	0.001 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 123.90' @ 12.63 hrs Surf.Area= 110 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 553.8 min (1,359.7 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	176 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	110	0	0
121.00	110	110	110
122.00	110	110	220
123.00	110	110	330
124.00	110	110	440

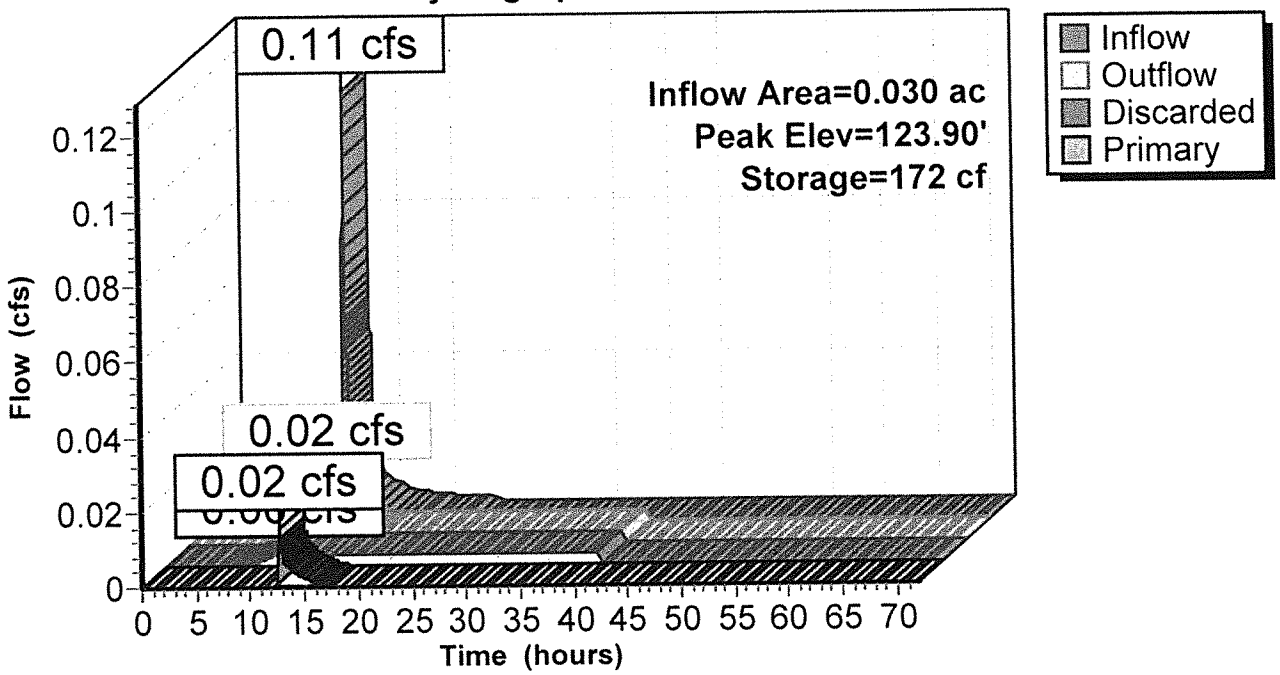
Device	Routing	Invert	Outlet Devices
#1	Primary	123.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	120.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 10.48 hrs HW=120.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 12.63 hrs HW=123.90' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.11 fps)

Pond 2P: Stone Trench

Hydrograph



Summary for Pond 3P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 4.46" for 10 yr. storm event				
Inflow =	0.11 cfs @	12.07 hrs,	Volume=	0.009 af	
Outflow =	0.01 cfs @	11.60 hrs,	Volume=	0.009 af,	Atten= 91%, Lag= 0.0 min
Discarded =	0.01 cfs @	11.60 hrs,	Volume=	0.009 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.01' @ 12.88 hrs Surf.Area= 212 sf Storage= 125 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 83.3 min (831.4 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

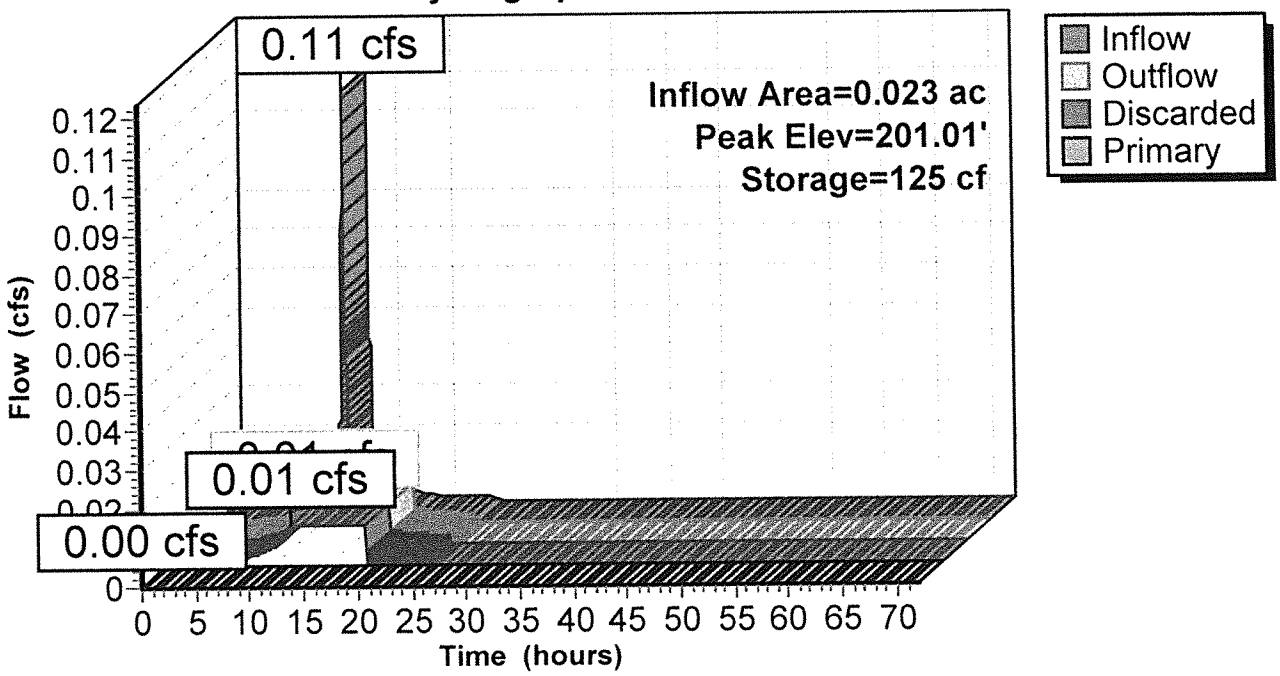
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.60 hrs HW=200.02' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=200.00' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Roof Drywell

Hydrograph



Summary for Pond 5P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 4.46" for 10 yr. storm event				
Inflow =	0.11 cfs @	12.07 hrs,	Volume=	0.009 af	
Outflow =	0.01 cfs @	11.60 hrs,	Volume=	0.009 af,	Atten= 91%, Lag= 0.0 min
Discarded =	0.01 cfs @	11.60 hrs,	Volume=	0.009 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.01' @ 12.88 hrs Surf.Area= 212 sf Storage= 125 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 83.3 min (831.4 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2
			318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

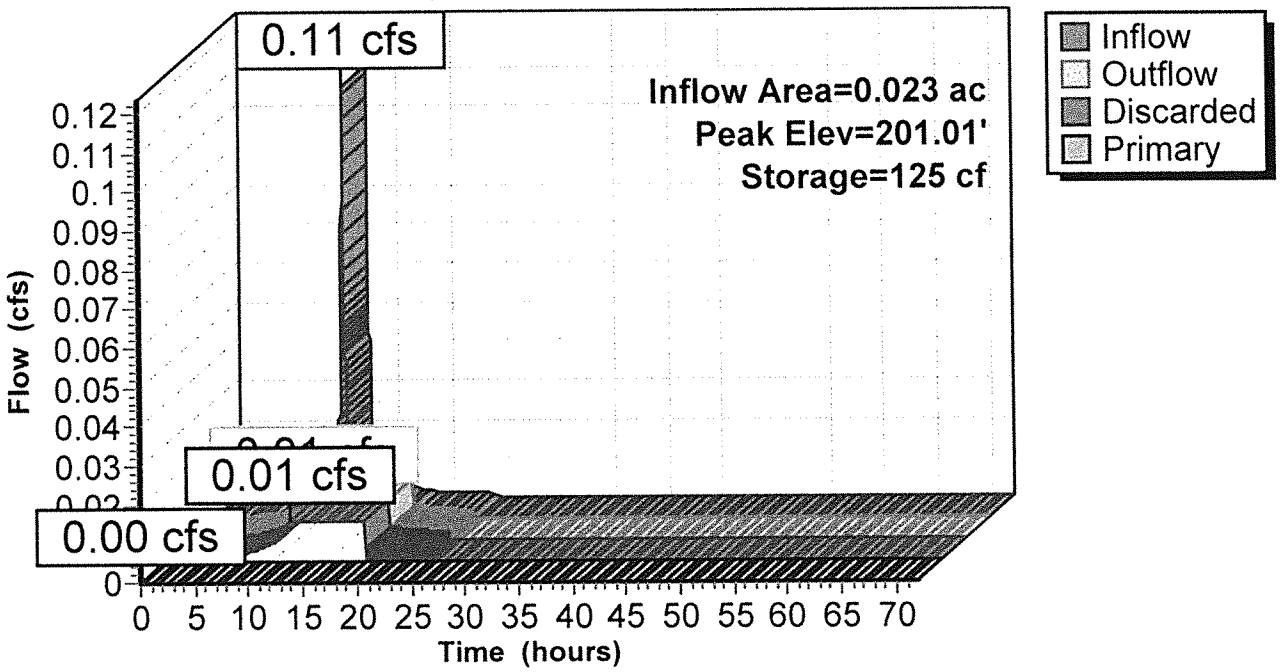
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600
			Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.60 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=200.00' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Roof Drywell

Hydrograph



Summary for Pond 6P:

Inflow Area =	0.459 ac,	17.82% Impervious,	Inflow Depth =	2.90"	for 10 yr. storm event
Inflow =	1.14 cfs @	12.23 hrs,	Volume=	0.111 af	
Outflow =	1.14 cfs @	12.23 hrs,	Volume=	0.111 af,	Atten= 0%, Lag= 0.1 min
Discarded =	0.01 cfs @	12.23 hrs,	Volume=	0.013 af	
Primary =	1.13 cfs @	12.23 hrs,	Volume=	0.098 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 122.45' @ 12.23 hrs Surf.Area= 311 sf Storage= 212 cf

Plug-Flow detention time= 48.0 min calculated for 0.111 af (100% of inflow)
Center-of-Mass det. time= 48.1 min (873.9 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	121.30'	227 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.30	72	0	0
122.00	202	96	96
122.50	322	131	227

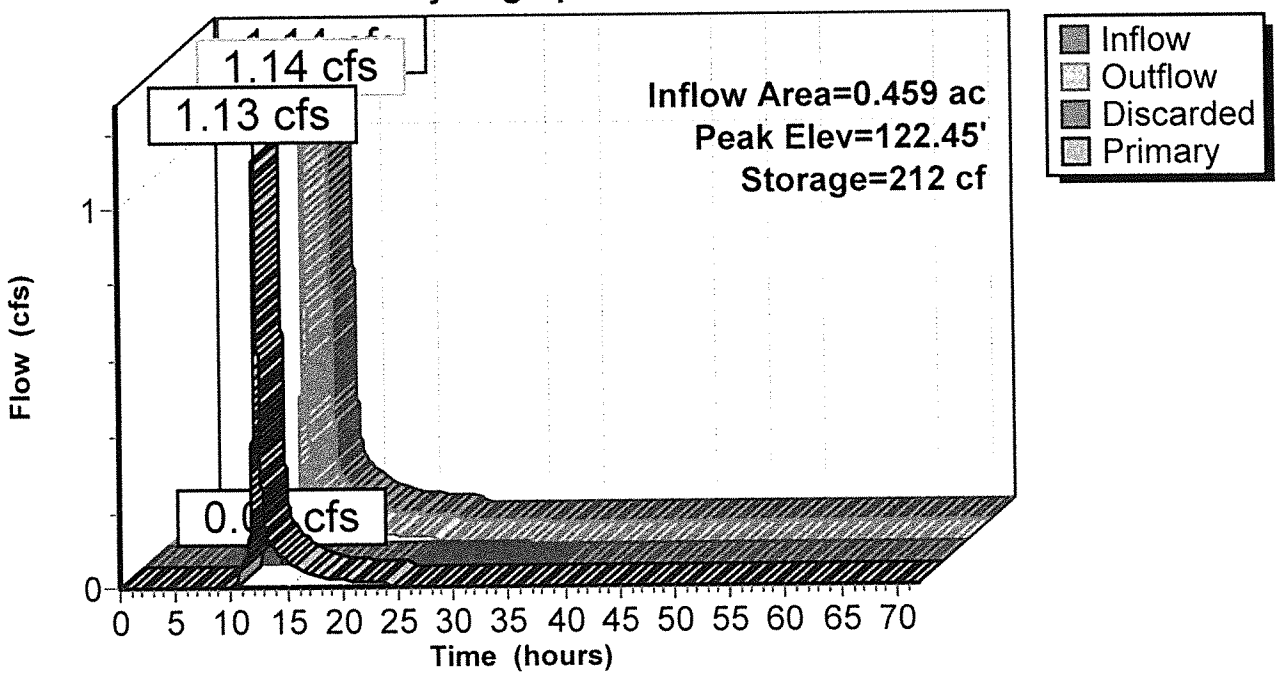
Device	Routing	Invert	Outlet Devices
#1	Primary	122.40'	**40.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	121.30'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.23 hrs HW=122.45' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.13 cfs @ 12.23 hrs HW=122.45' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 0.54 fps)

Pond 6P:

Hydrograph



Summary for Pond 7P: Roof Drywell

Inflow Area =	0.037 ac,100.00% Impervious, Inflow Depth = 4.46" for 10 yr. storm event				
Inflow =	0.17 cfs @	12.07 hrs,	Volume=	0.014 af	
Outflow =	0.09 cfs @	12.20 hrs,	Volume=	0.014 af,	Atten= 51%, Lag= 8.0 min
Discarded =	0.01 cfs @	11.01 hrs,	Volume=	0.012 af	
Primary =	0.08 cfs @	12.20 hrs,	Volume=	0.002 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.35' @ 12.20 hrs Surf.Area= 212 sf Storage= 167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 104.2 min (852.3 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

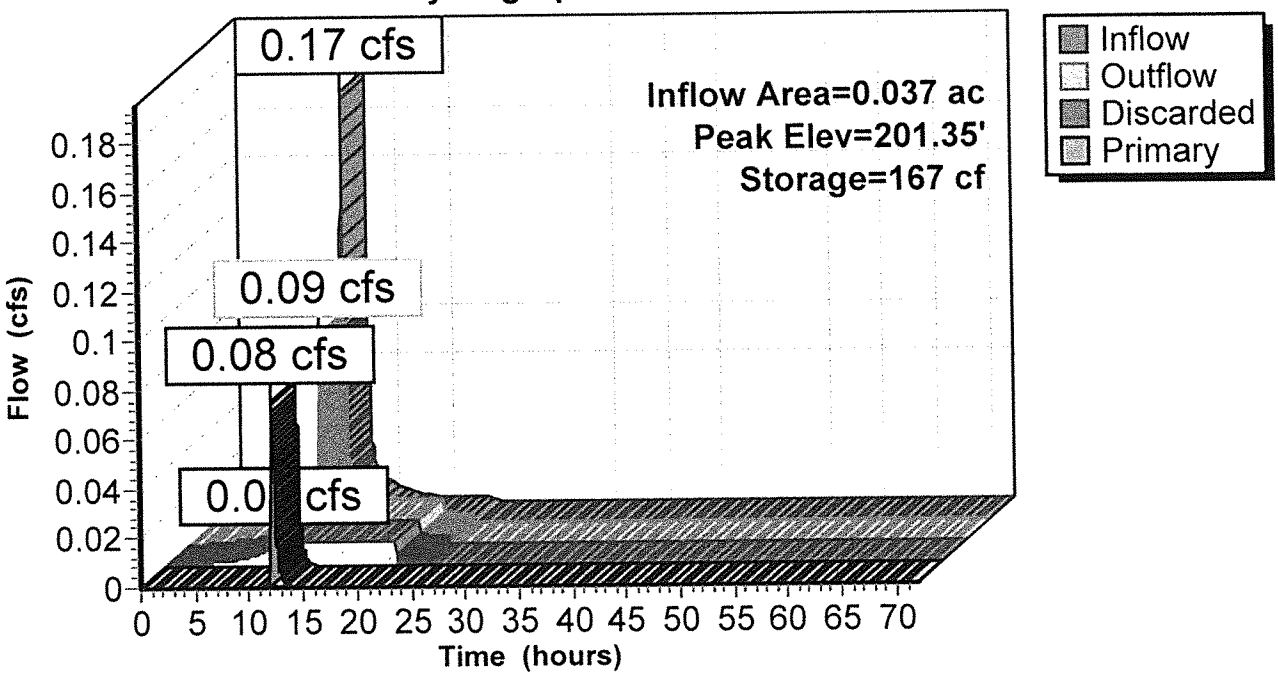
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.01 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.07 cfs @ 12.20 hrs HW=201.35' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.07 cfs @ 0.73 fps)

Pond 7P: Roof Drywell

Hydrograph



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1A: Runoff Area=1,302 sf 31.18% Impervious Runoff Depth=4.03"
Tc=5.0 min CN=86 Runoff=0.14 cfs 0.010 af

Subcatchment SUB-1B: 75% Lot 1 Roof Runoff Area=1,597 sf 100.00% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=98 Runoff=0.21 cfs 0.016 af

Subcatchment SUB-1C: 50% Lot 2 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment SUB-1D: 50% Lot 3 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment SUB-1E: Lot 1 Rear Yard Runoff Area=6,307 sf 0.00% Impervious Runoff Depth=3.42"
Tc=5.0 min CN=80 Runoff=0.60 cfs 0.041 af

Subcatchment SUB-1F: Runoff Area=29,580 sf 0.00% Impervious Runoff Depth=3.23"
Flow Length=320' Tc=13.6 min CN=78 Runoff=2.02 cfs 0.183 af

Subcatchment SUB-2: SUB-2 Runoff Area=14,560 sf 24.09% Impervious Runoff Depth=3.82"
Flow Length=44' Slope=0.0120 '/' Tc=13.3 min CN=84 Runoff=1.18 cfs 0.107 af

Subcatchment SUB-3: Runoff Area=6,749 sf 7.99% Impervious Runoff Depth=3.42"
Flow Length=50' Slope=0.0200 '/' Tc=12.0 min CN=80 Runoff=0.51 cfs 0.044 af

Subcatchment SUB-4: Runoff Area=19,985 sf 17.82% Impervious Runoff Depth=3.72"
Flow Length=250' Slope=0.0120 '/' Tc=16.6 min CN=83 Runoff=1.45 cfs 0.142 af

Reach DP-1: Inflow=2.49 cfs 0.226 af
Outflow=2.49 cfs 0.226 af

Reach DP-2: Inflow=1.18 cfs 0.107 af
Outflow=1.18 cfs 0.107 af

Reach DP-3: Inflow=0.51 cfs 0.044 af
Outflow=0.51 cfs 0.044 af

Reach DP-4: Inflow=1.44 cfs 0.128 af
Outflow=1.44 cfs 0.128 af

Pond 1P: Stone Trench Peak Elev=119.93' Storage=44 cf Inflow=0.60 cfs 0.041 af
Discarded=0.00 cfs 0.005 af Primary=0.60 cfs 0.036 af Outflow=0.60 cfs 0.041 af

Pond 2P: Stone Trench Peak Elev=123.91' Storage=172 cf Inflow=0.14 cfs 0.010 af
Discarded=0.00 cfs 0.007 af Primary=0.10 cfs 0.003 af Outflow=0.10 cfs 0.010 af

Pond 3P: Roof Drywell Peak Elev=201.30' Storage=162 cf Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.010 af

Pond 5P: Roof Drywell Peak Elev=201.30' Storage=162 cf Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.010 af

Pond 6P: Peak Elev=122.46' Storage=215 cf Inflow=1.45 cfs 0.142 af
Discarded=0.01 cfs 0.014 af Primary=1.44 cfs 0.128 af Outflow=1.45 cfs 0.142 af

Pond 7P: Roof Drywell Peak Elev=201.39' Storage=170 cf Inflow=0.21 cfs 0.016 af
Discarded=0.01 cfs 0.013 af Primary=0.17 cfs 0.004 af Outflow=0.18 cfs 0.016 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.564 af Average Runoff Depth = 3.59"
85.83% Pervious = 1.618 ac 14.17% Impervious = 0.267 ac

Summary for Subcatchment SUB-1A:

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 4.03"

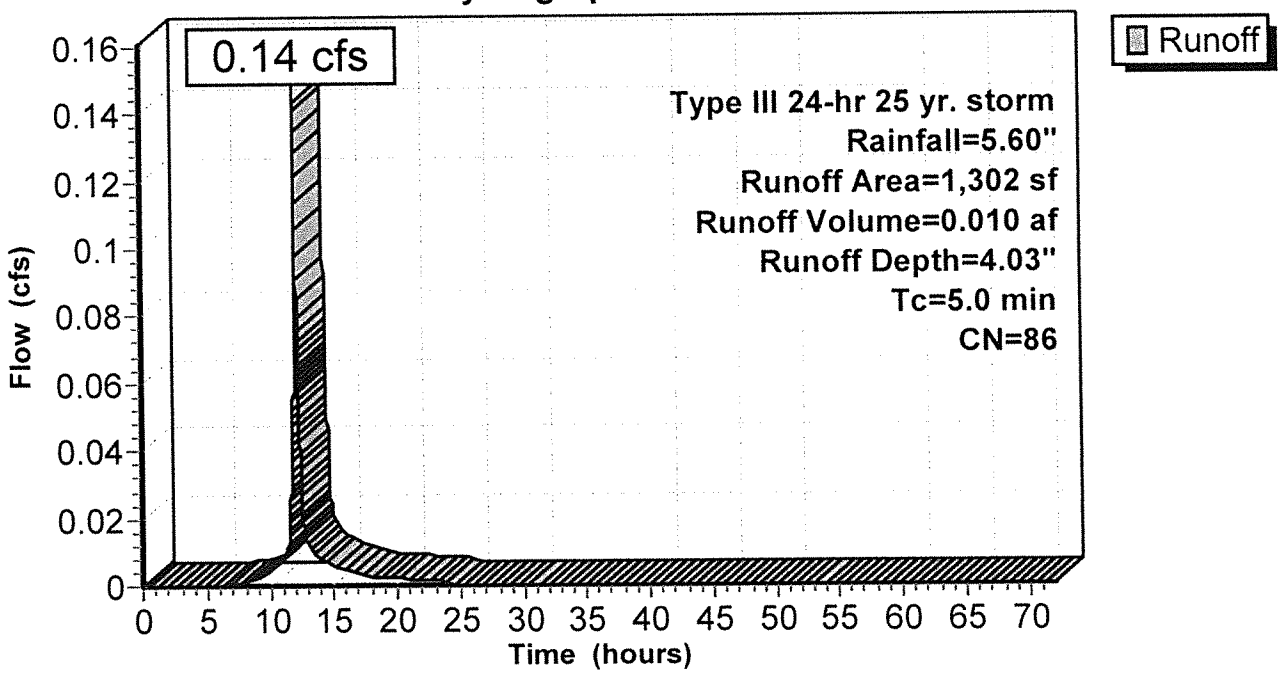
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	406	98	Driveway
	896	80	>75% Grass cover, Good, HSG D
	1,302	86	Weighted Average
	896		68.82% Pervious Area
	406		31.18% Impervious Area

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

Subcatchment SUB-1A:

Hydrograph



Summary for Subcatchment SUB-1B: 75% Lot 1 Roof

Runoff = 0.21 cfs @ 12.07 hrs, Volume= 0.016 af, Depth= 5.36"

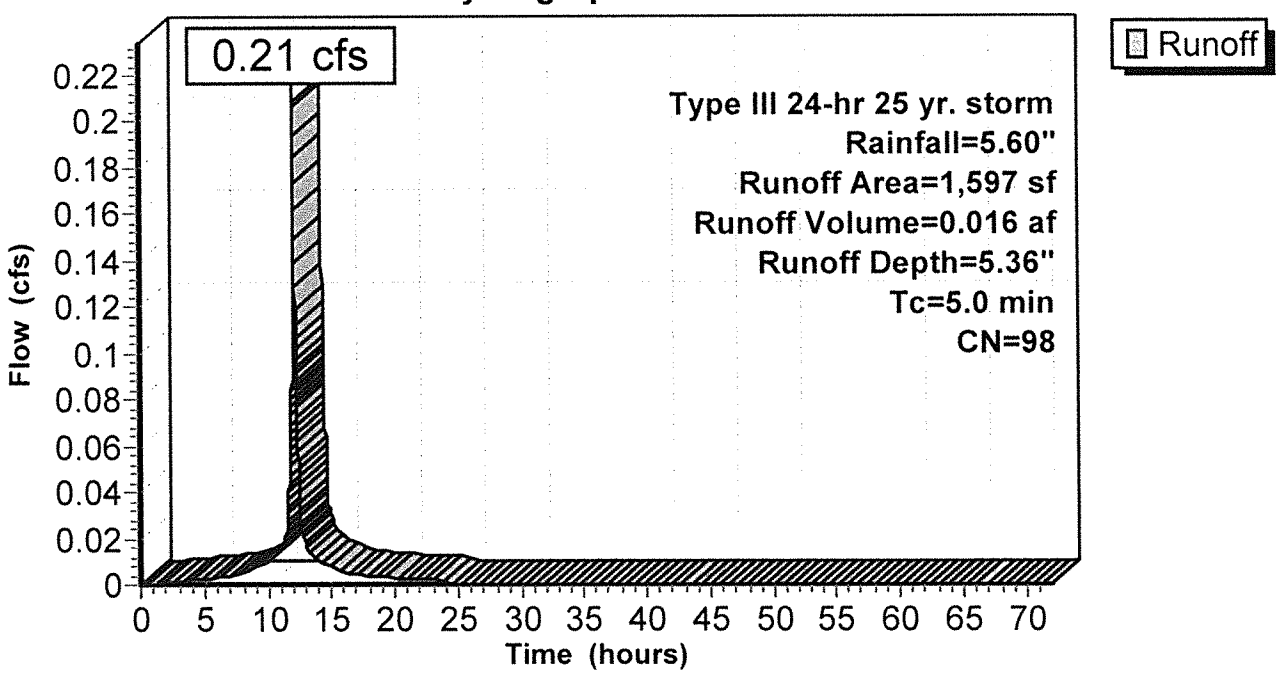
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,597	98	Roof
	1,597		100.00% Impervious Area

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

Subcatchment SUB-1B: 75% Lot 1 Roof

Hydrograph



Summary for Subcatchment SUB-1C: 50% Lot 2 Roof

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 5.36"

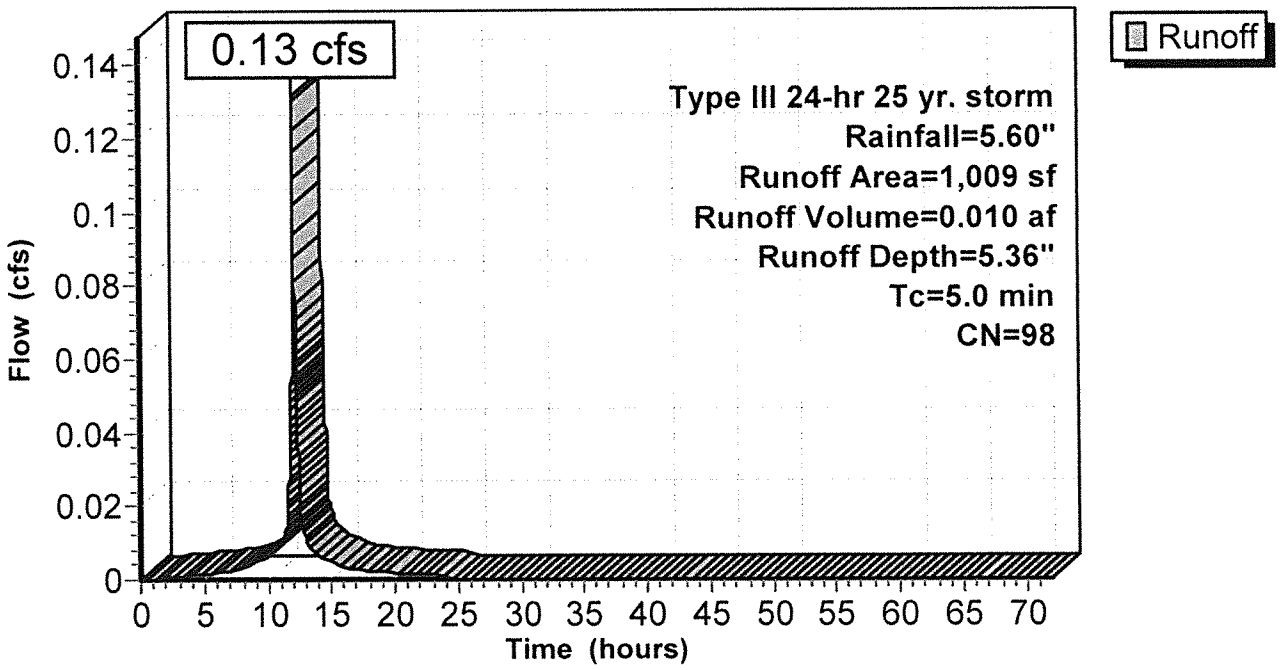
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1C: 50% Lot 2 Roof

Hydrograph



Summary for Subcatchment SUB-1D: 50% Lot 3 Roof

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 5.36"

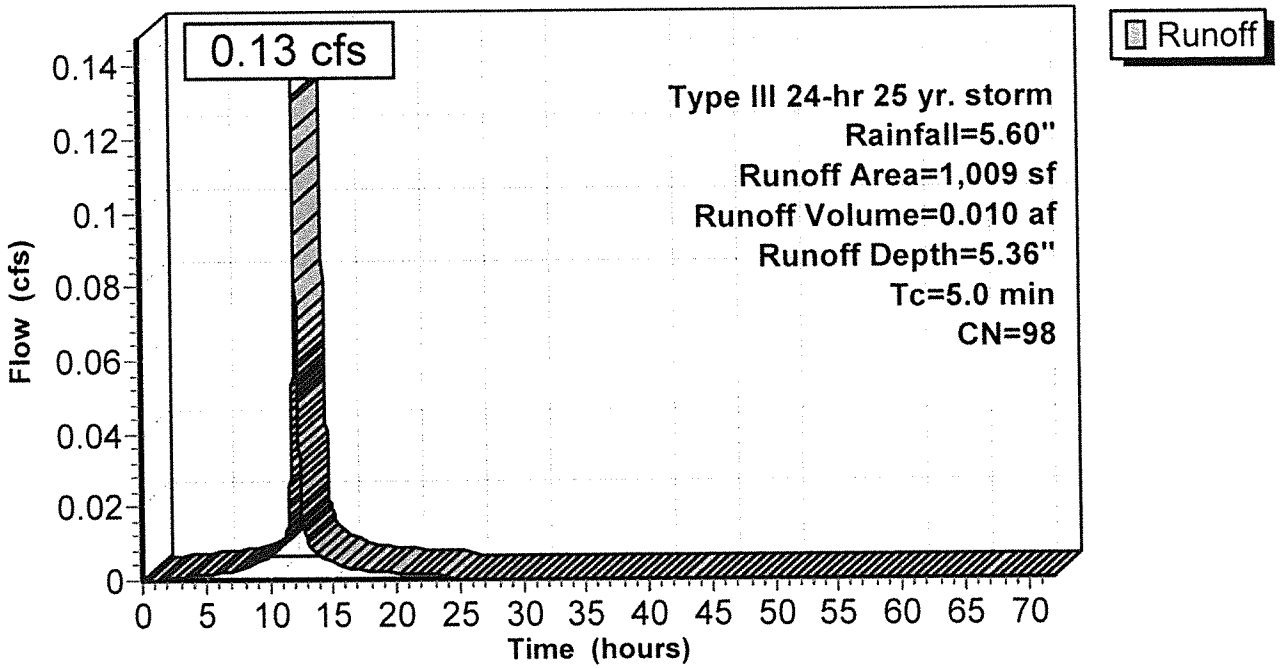
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1D: 50% Lot 3 Roof

Hydrograph



Summary for Subcatchment SUB-1E: Lot 1 Rear Yard

Runoff = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af, Depth= 3.42"

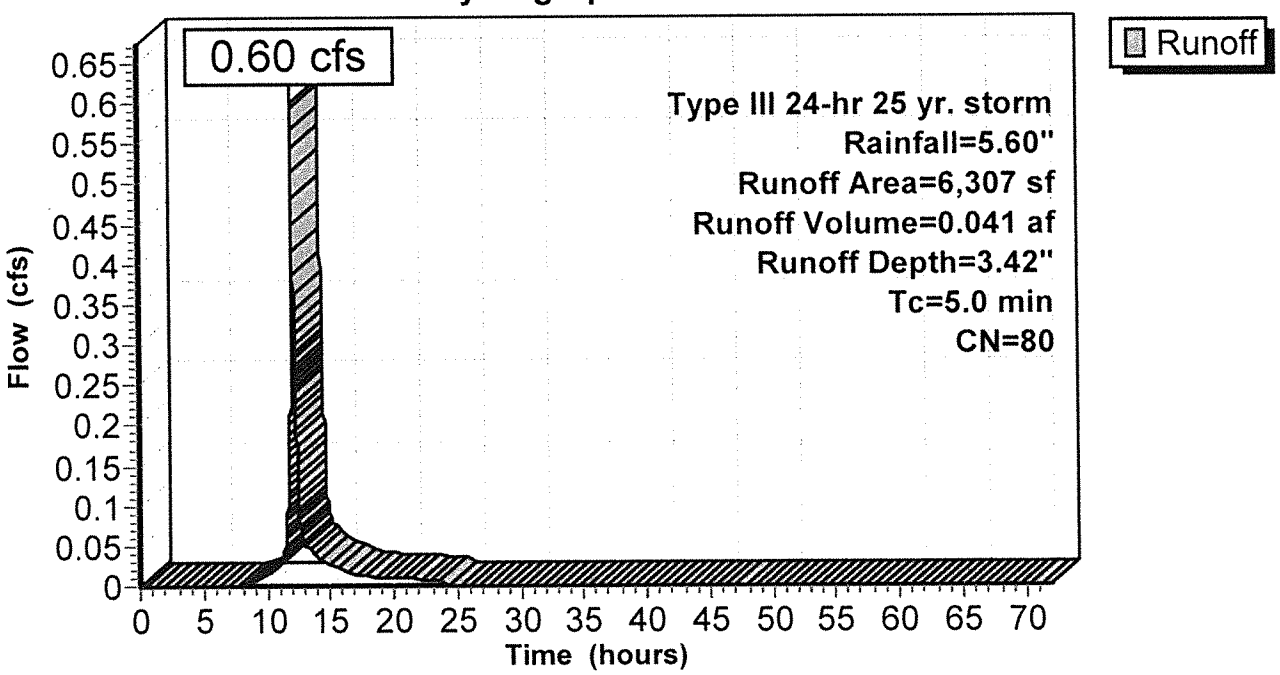
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

Area (sf)	CN	Description
6,307	80	>75% Grass cover, Good, HSG D
6,307		100.00% Pervious Area

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

Subcatchment SUB-1E: Lot 1 Rear Yard

Hydrograph



Summary for Subcatchment SUB-1F:

Runoff = 2.02 cfs @ 12.19 hrs, Volume= 0.183 af, Depth= 3.23"

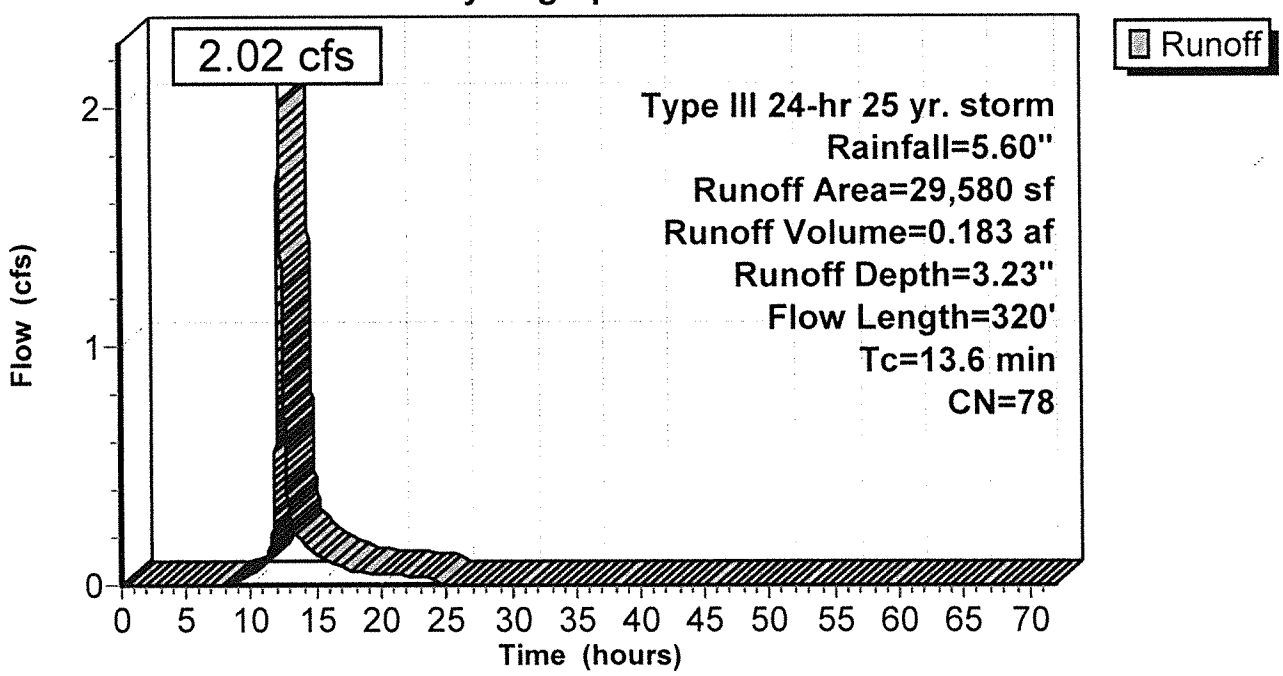
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

Area (sf)	CN	Description
9,853	80	>75% Grass cover, Good, HSG D
19,727	77	Woods, Good, HSG D
29,580	78	Weighted Average
29,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.6	270	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	320	Total			

Subcatchment SUB-1F:

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 1.18 cfs @ 12.18 hrs, Volume= 0.107 af, Depth= 3.82"

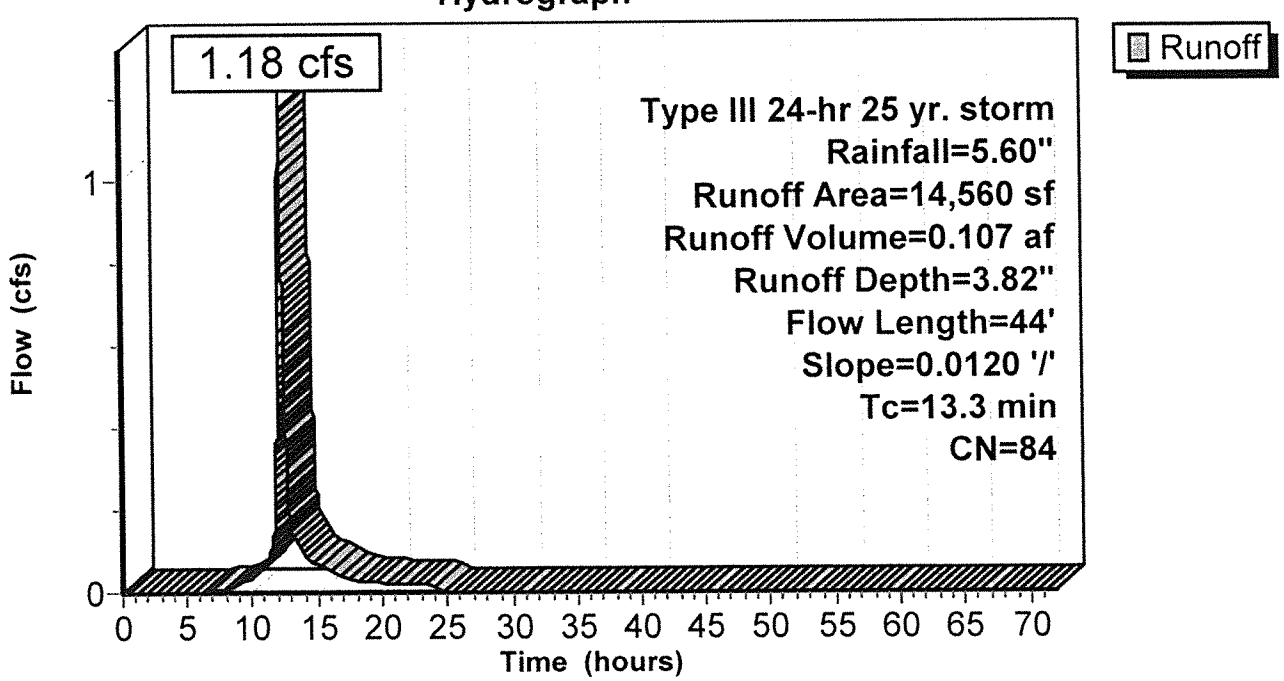
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,948	98	Roofs
*	1,560	98	Paved Driveways
	11,052	80	>75% Grass cover, Good, HSG D
	14,560	84	Weighted Average
	11,052		75.91% Pervious Area
	3,508		24.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	44	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3:

Runoff = 0.51 cfs @ 12.17 hrs, Volume= 0.044 af, Depth= 3.42"

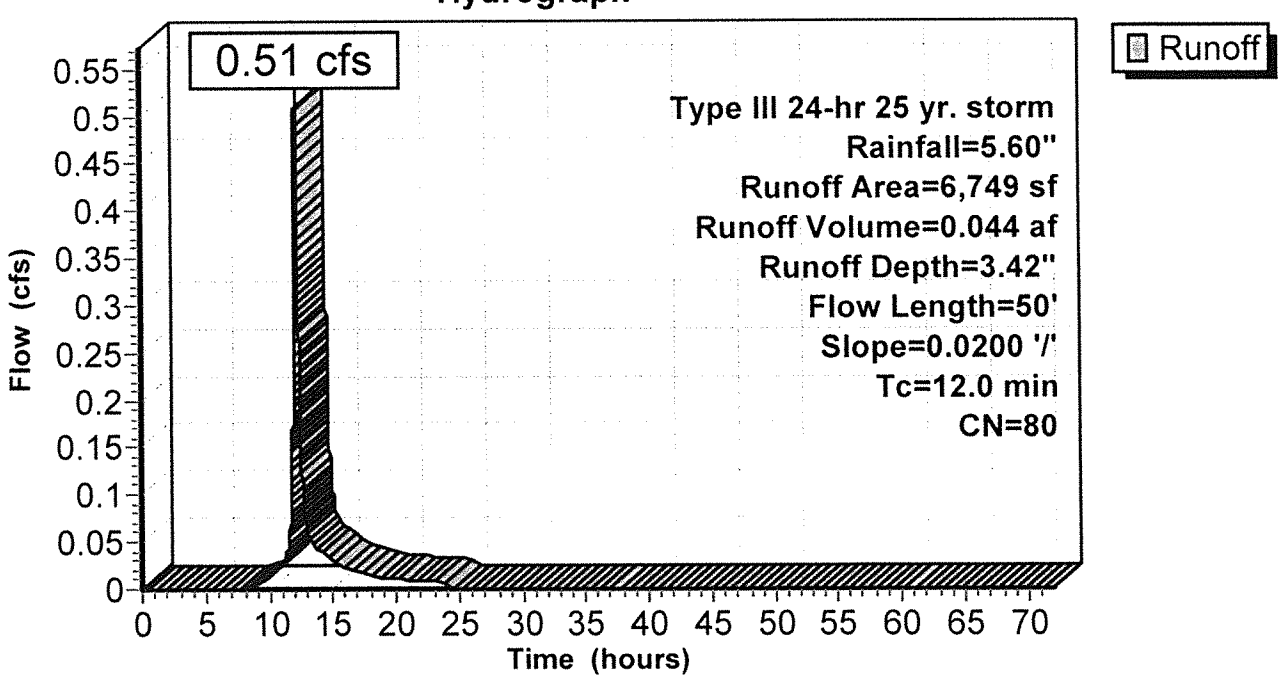
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	539	98	Roofs
	3,140	80	>75% Grass cover, Good, HSG D
	3,070	77	Woods, Good, HSG D
	6,749	80	Weighted Average
	6,210		92.01% Pervious Area
	539		7.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-3:

Hydrograph



Summary for Subcatchment SUB-4:

Runoff = 1.45 cfs @ 12.23 hrs, Volume= 0.142 af, Depth= 3.72"

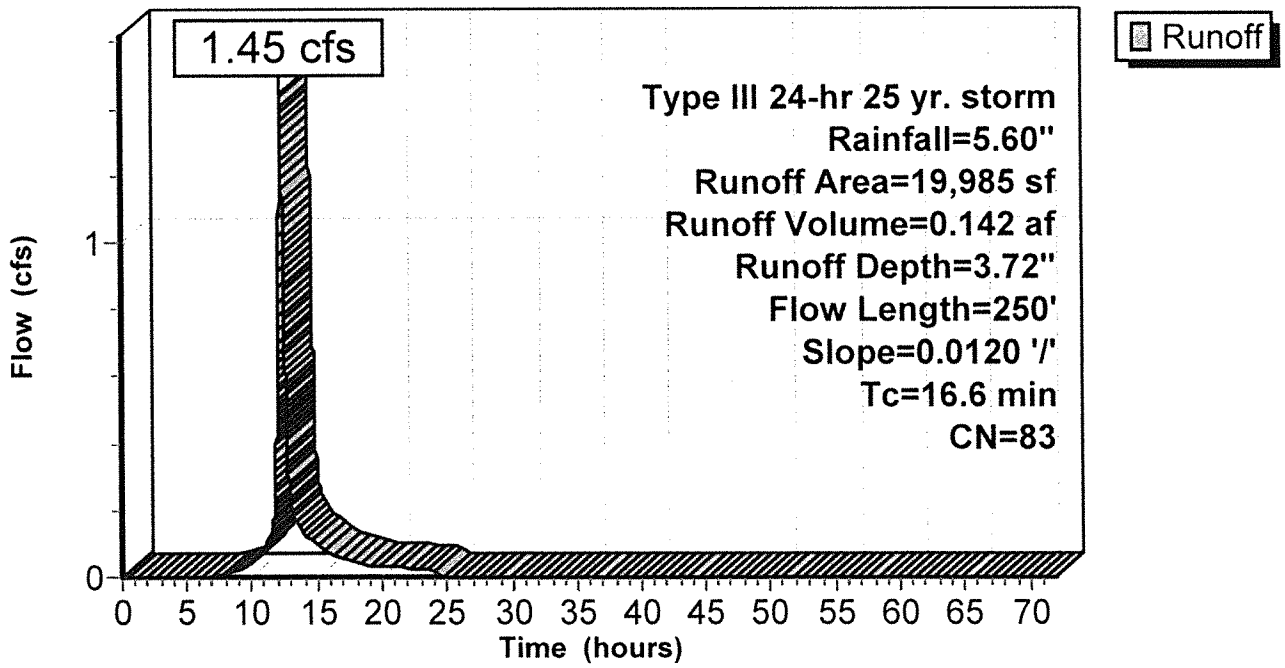
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr. storm Rainfall=5.60"

	Area (sf)	CN	Description
*	1,726	98	Roofs
*	1,836	98	Driveways
	15,563	80	>75% Grass cover, Good, HSG D
	860	77	Woods, Good, HSG D
	19,985	83	Weighted Average
	16,423		82.18% Pervious Area
	3,562		17.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.9	200	0.0120	1.76		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	250	Total			

Subcatchment SUB-4:

Hydrograph



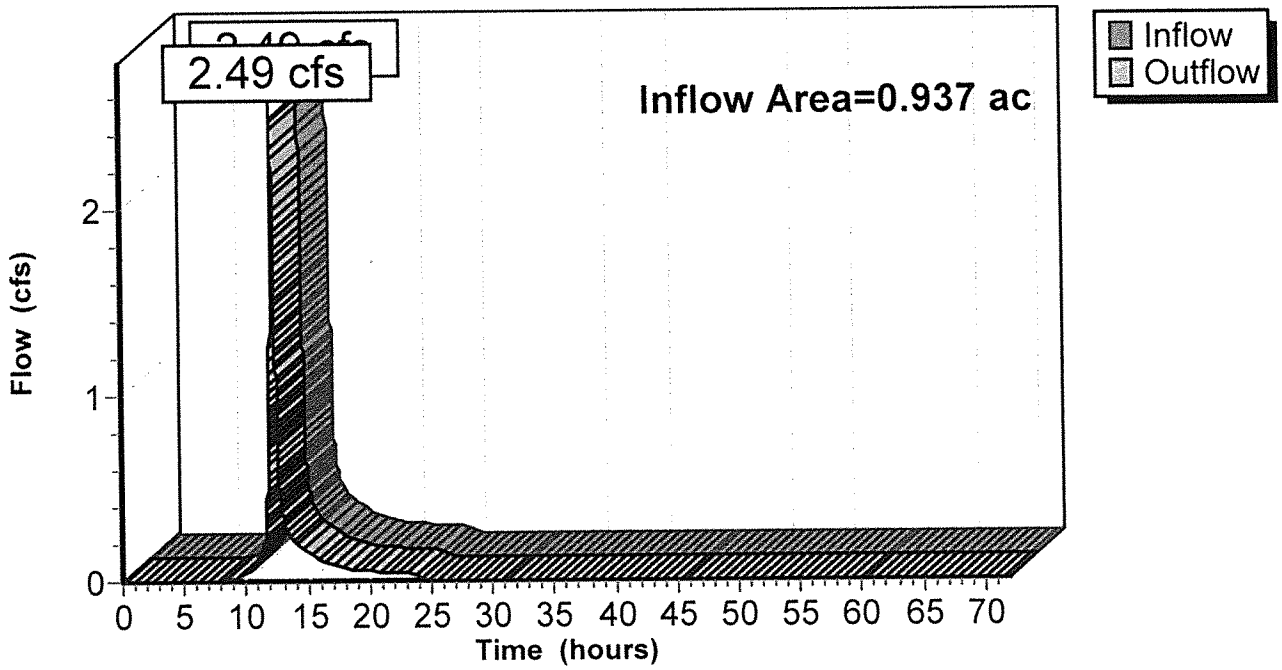
Summary for Reach DP-1:

Inflow Area =	0.937 ac,	9.85% Impervious,	Inflow Depth =	2.89"	for 25 yr. storm event
Inflow =	2.49 cfs @	12.16 hrs,	Volume=	0.226 af	
Outflow =	2.49 cfs @	12.16 hrs,	Volume=	0.226 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-1:

Hydrograph



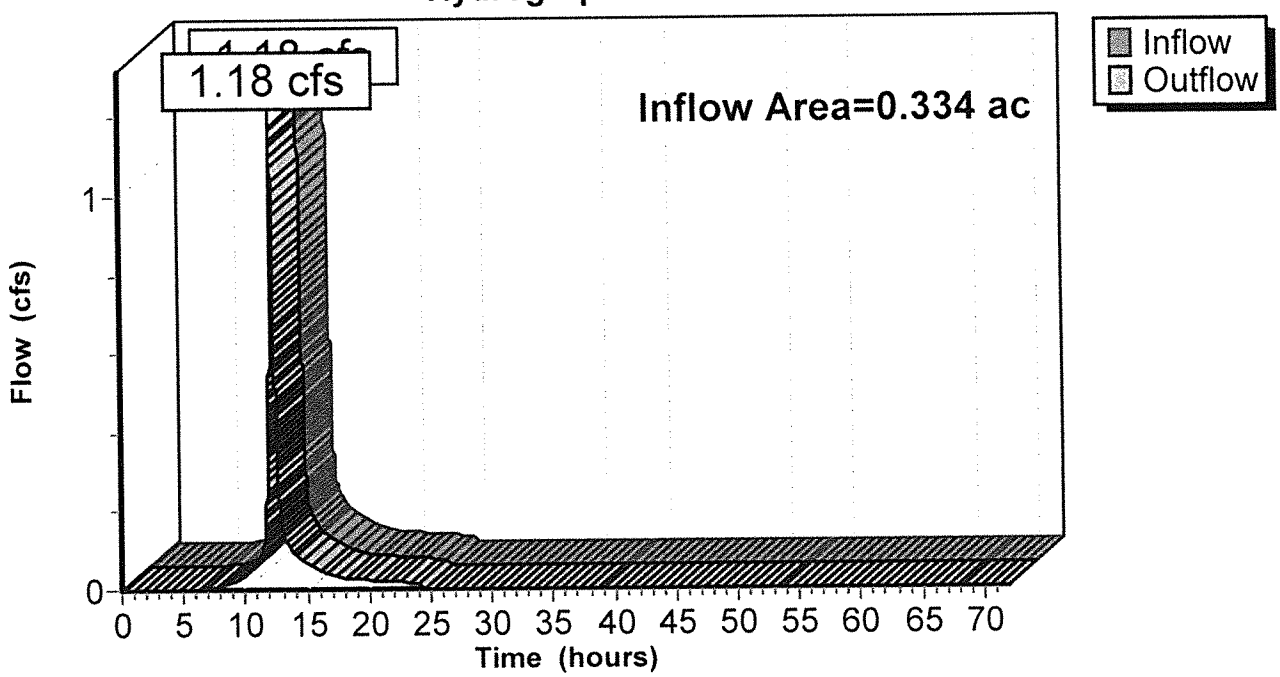
Summary for Reach DP-2:

Inflow Area =	0.334 ac,	24.09% Impervious,	Inflow Depth =	3.82"	for 25 yr. storm event
Inflow =	1.18 cfs @	12.18 hrs, Volume=	0.107 af		
Outflow =	1.18 cfs @	12.18 hrs, Volume=	0.107 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-2:

Hydrograph



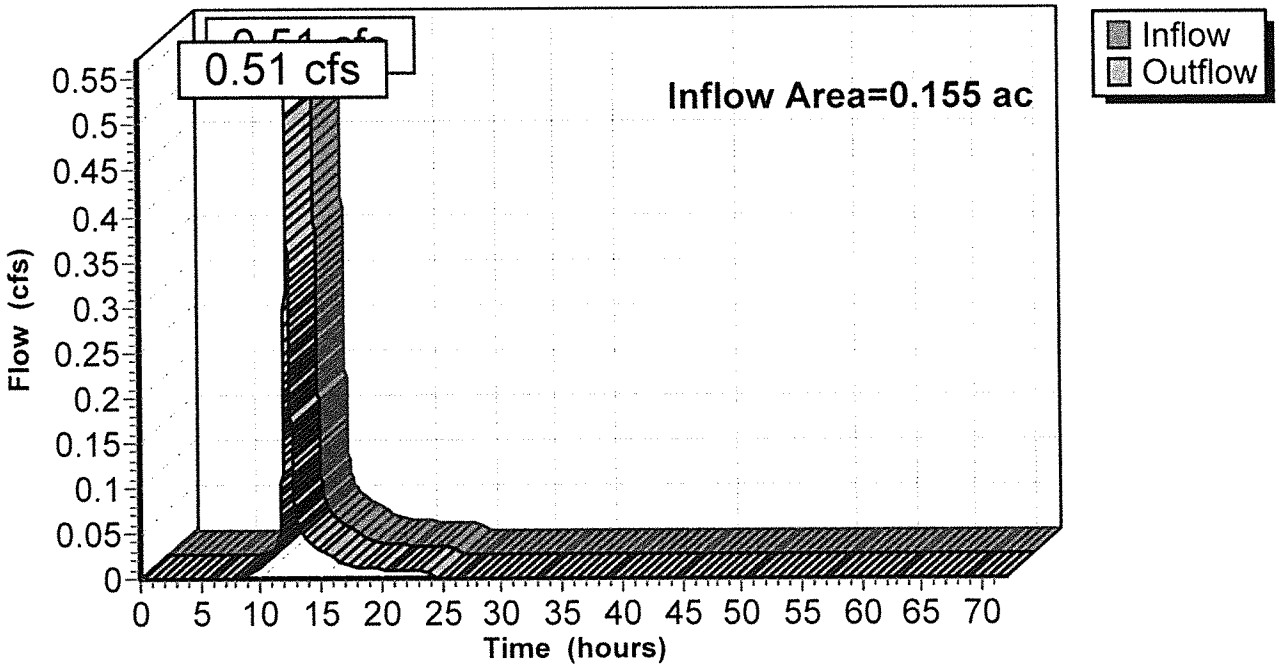
Summary for Reach DP-3:

Inflow Area =	0.155 ac,	7.99% Impervious,	Inflow Depth =	3.42"	for 25 yr. storm event
Inflow =	0.51 cfs @	12.17 hrs,	Volume=	0.044 af	
Outflow =	0.51 cfs @	12.17 hrs,	Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-3:

Hydrograph



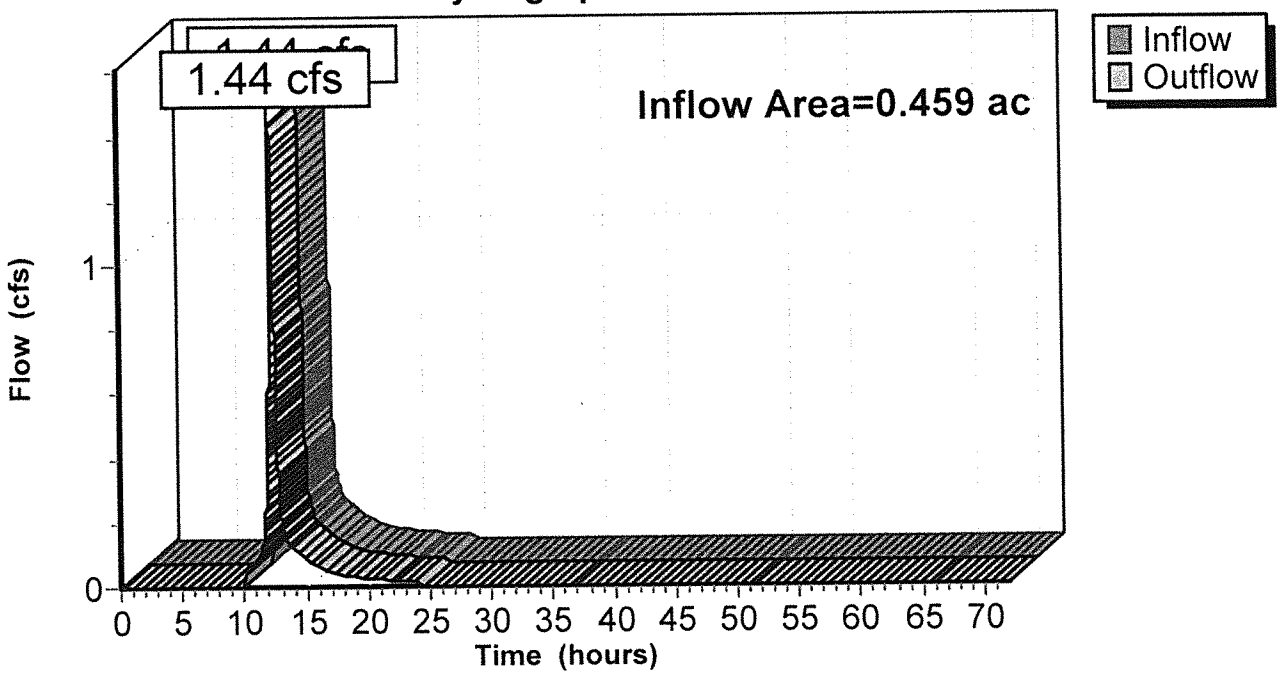
Summary for Reach DP-4:

Inflow Area =	0.459 ac, 17.82% Impervious, Inflow Depth = 3.36"	for 25 yr. storm event		
Inflow =	1.44 cfs @ 12.23 hrs, Volume=	0.128 af		
Outflow =	1.44 cfs @ 12.23 hrs, Volume=	0.128 af, Atten= 0%, Lag= 0.0 min		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-4:

Hydrograph



Summary for Pond 1P: Stone Trench

Inflow Area =	0.145 ac,	0.00% Impervious,	Inflow Depth =	3.42"	for 25 yr. storm event
Inflow =	0.60 cfs @	12.07 hrs,	Volume=	0.041 af	
Outflow =	0.60 cfs @	12.07 hrs,	Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	8.55 hrs,	Volume=	0.005 af	
Primary =	0.60 cfs @	12.07 hrs,	Volume=	0.036 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 119.93' @ 12.07 hrs Surf.Area= 120 sf Storage= 44 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.8 min (839.9 - 816.1)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	48 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 120 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	120	0	0
120.00	120	120	120

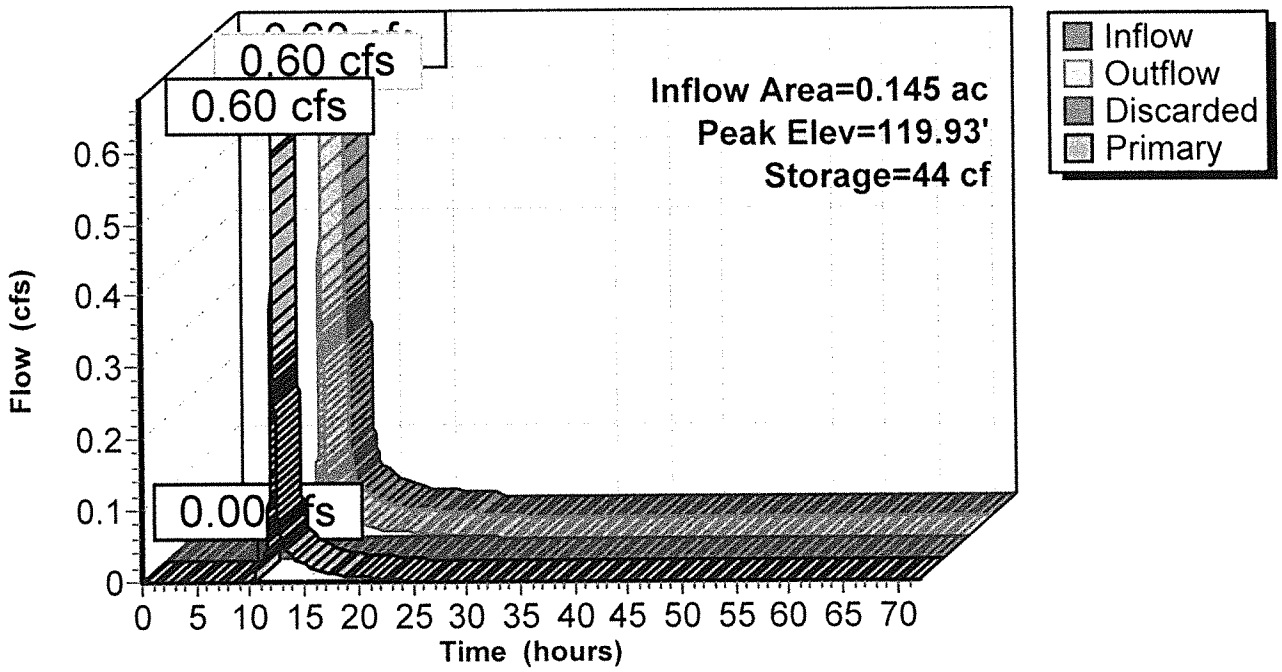
Device	Routing	Invert	Outlet Devices
#1	Primary	119.90'	**60.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 8.55 hrs HW=119.01' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.60 cfs @ 12.07 hrs HW=119.93' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.60 cfs @ 0.39 fps)

Pond 1P: Stone Trench

Hydrograph



Summary for Pond 2P: Stone Trench

Inflow Area =	0.030 ac, 31.18% Impervious, Inflow Depth = 4.03" for 25 yr. storm event				
Inflow =	0.14 cfs @	12.07 hrs,	Volume=	0.010 af	
Outflow =	0.10 cfs @	12.22 hrs,	Volume=	0.010 af,	Atten= 31%, Lag= 8.9 min
Discarded =	0.00 cfs @	9.85 hrs,	Volume=	0.007 af	
Primary =	0.10 cfs @	12.22 hrs,	Volume=	0.003 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 123.91' @ 12.22 hrs Surf.Area= 110 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 464.7 min (1,264.0 - 799.3)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	176 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	110	0	0
121.00	110	110	110
122.00	110	110	220
123.00	110	110	330
124.00	110	110	440

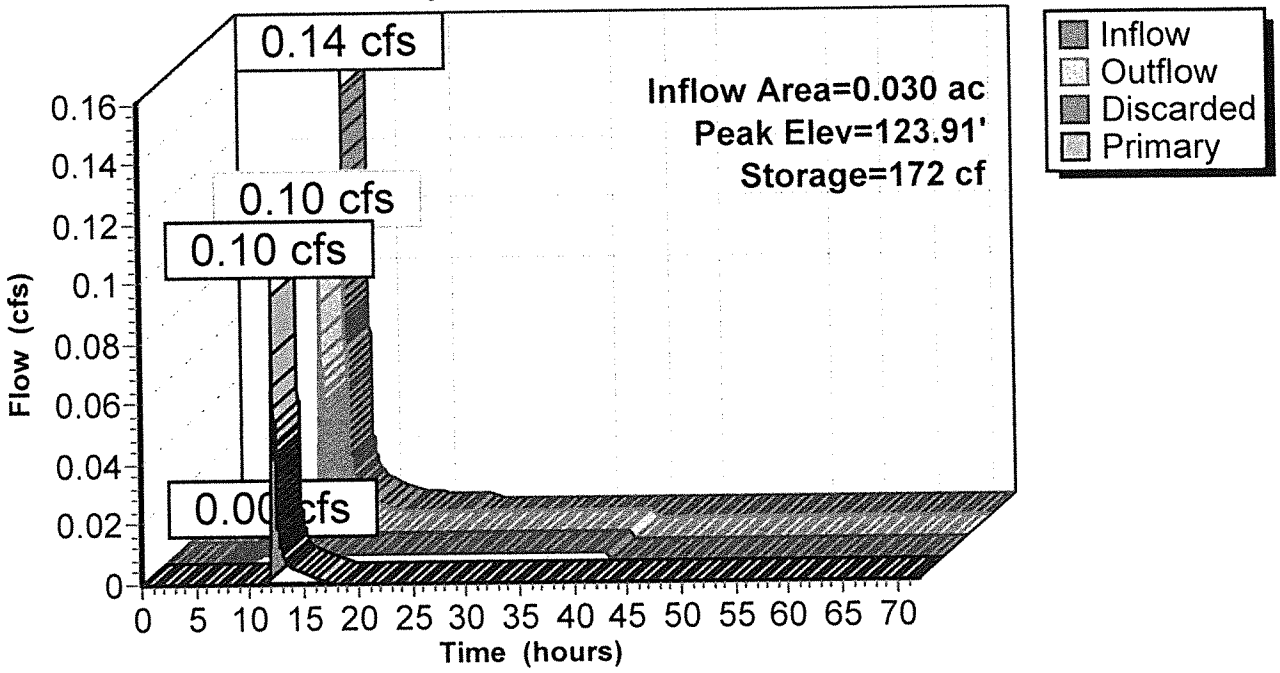
Device	Routing	Invert	Outlet Devices
#1	Primary	123.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	120.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 9.85 hrs HW=120.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.09 cfs @ 12.22 hrs HW=123.91' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.09 cfs @ 0.21 fps)

Pond 2P: Stone Trench

Hydrograph



Summary for Pond 3P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 5.36" for 25 yr. storm event				
Inflow =	0.13 cfs @	12.07 hrs,	Volume=	0.010 af	
Outflow =	0.01 cfs @	13.02 hrs,	Volume=	0.010 af,	Atten= 92%, Lag= 57.3 min
Discarded =	0.01 cfs @	11.43 hrs,	Volume=	0.010 af	
Primary =	0.00 cfs @	13.02 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.30' @ 13.02 hrs Surf.Area= 212 sf Storage= 162 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 113.9 min (859.1 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

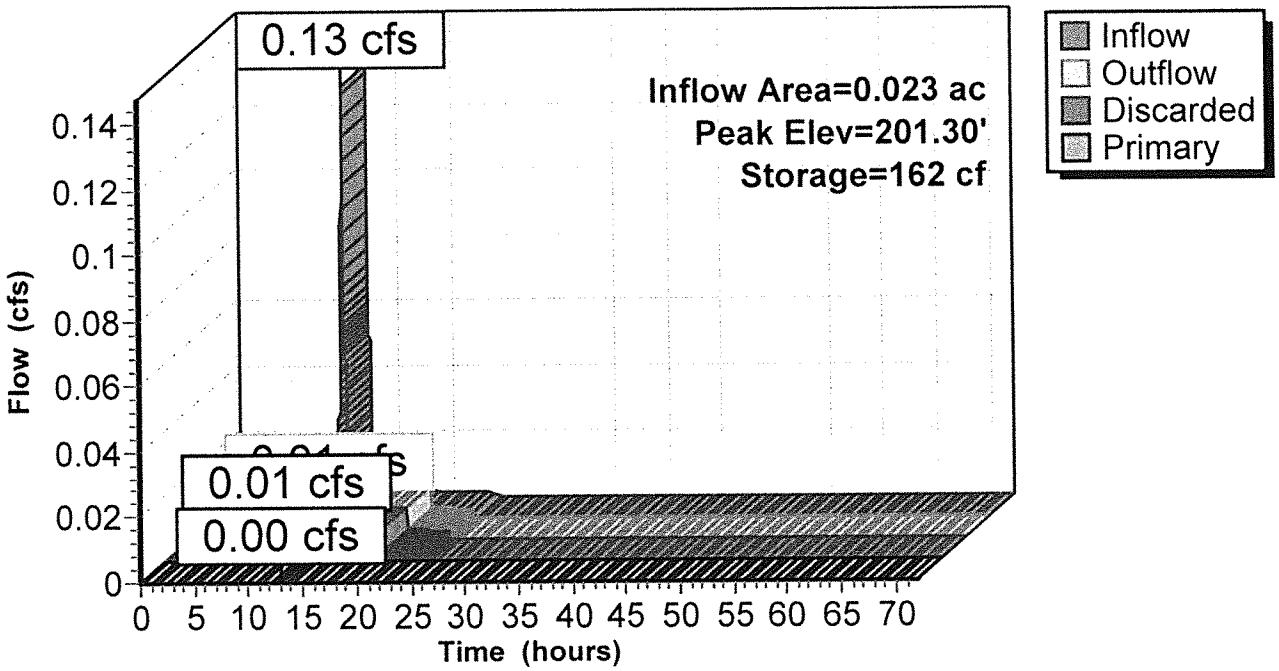
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.43 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 13.02 hrs HW=201.30' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.09 fps)

Pond 3P: Roof Drywell

Hydrograph



Summary for Pond 5P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 5.36" for 25 yr. storm event				
Inflow =	0.13 cfs @	12.07 hrs,	Volume=	0.010 af	
Outflow =	0.01 cfs @	13.02 hrs,	Volume=	0.010 af,	Atten= 92%, Lag= 57.3 min
Discarded =	0.01 cfs @	11.43 hrs,	Volume=	0.010 af	
Primary =	0.00 cfs @	13.02 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.30' @ 13.02 hrs Surf.Area= 212 sf Storage= 162 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 113.9 min (859.1 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

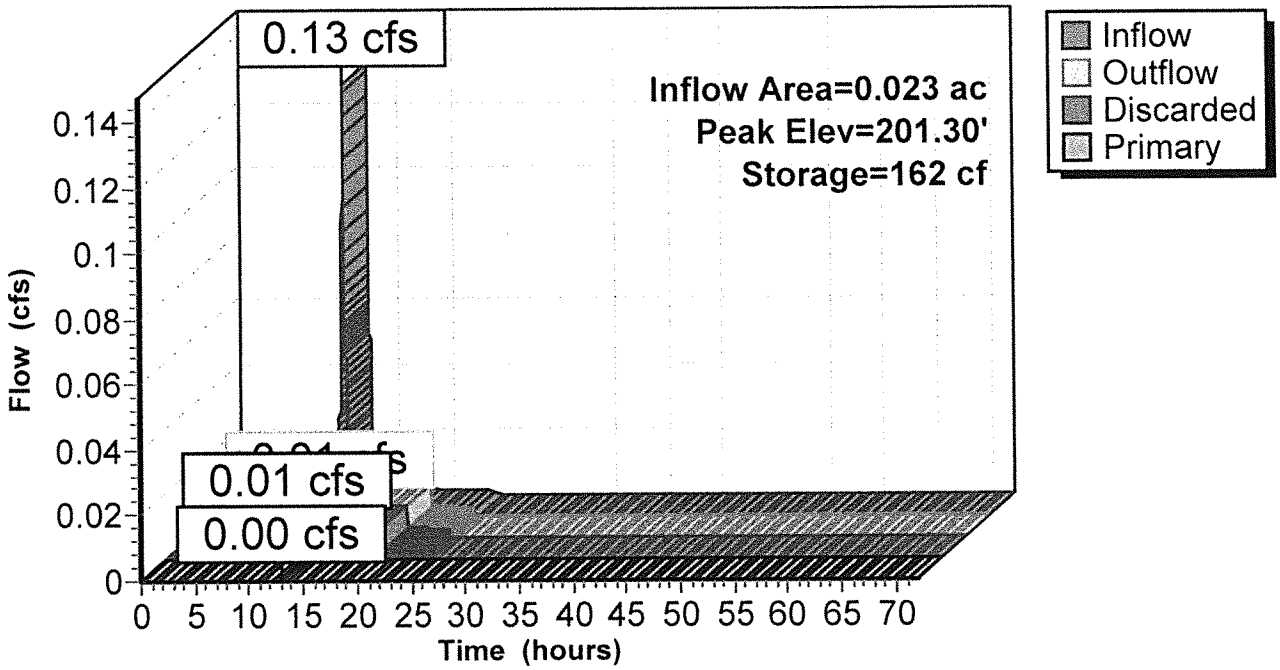
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.43 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 13.02 hrs HW=201.30' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.09 fps)

Pond 5P: Roof Drywell

Hydrograph



Summary for Pond 6P:

Inflow Area =	0.459 ac,	17.82% Impervious,	Inflow Depth =	3.72"	for 25 yr. storm event
Inflow =	1.45 cfs @	12.23 hrs,	Volume=	0.142 af	
Outflow =	1.45 cfs @	12.23 hrs,	Volume=	0.142 af,	Atten= 0%, Lag= 0.1 min
Discarded =	0.01 cfs @	12.23 hrs,	Volume=	0.014 af	
Primary =	1.44 cfs @	12.23 hrs,	Volume=	0.128 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 122.46' @ 12.23 hrs Surf.Area= 313 sf Storage= 215 cf

Plug-Flow detention time= 38.8 min calculated for 0.142 af (100% of inflow)
Center-of-Mass det. time= 38.9 min (857.7 - 818.8)

Volume	Invert	Avail.Storage	Storage Description
#1	121.30'	227 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.30	72	0	0
122.00	202	96	96
122.50	322	131	227

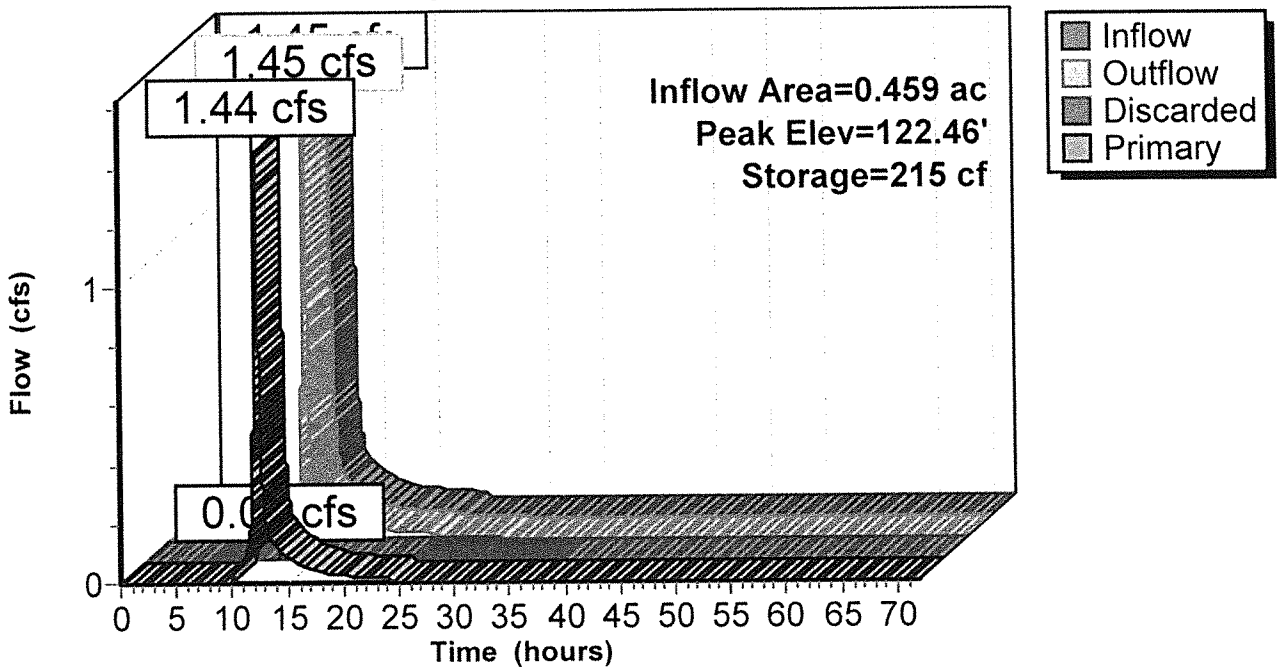
Device	Routing	Invert	Outlet Devices
#1	Primary	122.40'	**40.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	121.30'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.23 hrs HW=122.46' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.44 cfs @ 12.23 hrs HW=122.46' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.44 cfs @ 0.59 fps)

Pond 6P:

Hydrograph



Summary for Pond 7P: Roof Drywell

Inflow Area =	0.037 ac,100.00% Impervious, Inflow Depth = 5.36" for 25 yr. storm event				
Inflow =	0.21 cfs @	12.07 hrs,	Volume=	0.016 af	
Outflow =	0.18 cfs @	12.11 hrs,	Volume=	0.016 af,	Atten= 12%, Lag= 2.7 min
Discarded =	0.01 cfs @	10.57 hrs,	Volume=	0.013 af	
Primary =	0.17 cfs @	12.11 hrs,	Volume=	0.004 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.39' @ 12.11 hrs Surf.Area= 212 sf Storage= 170 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 97.0 min (842.2 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

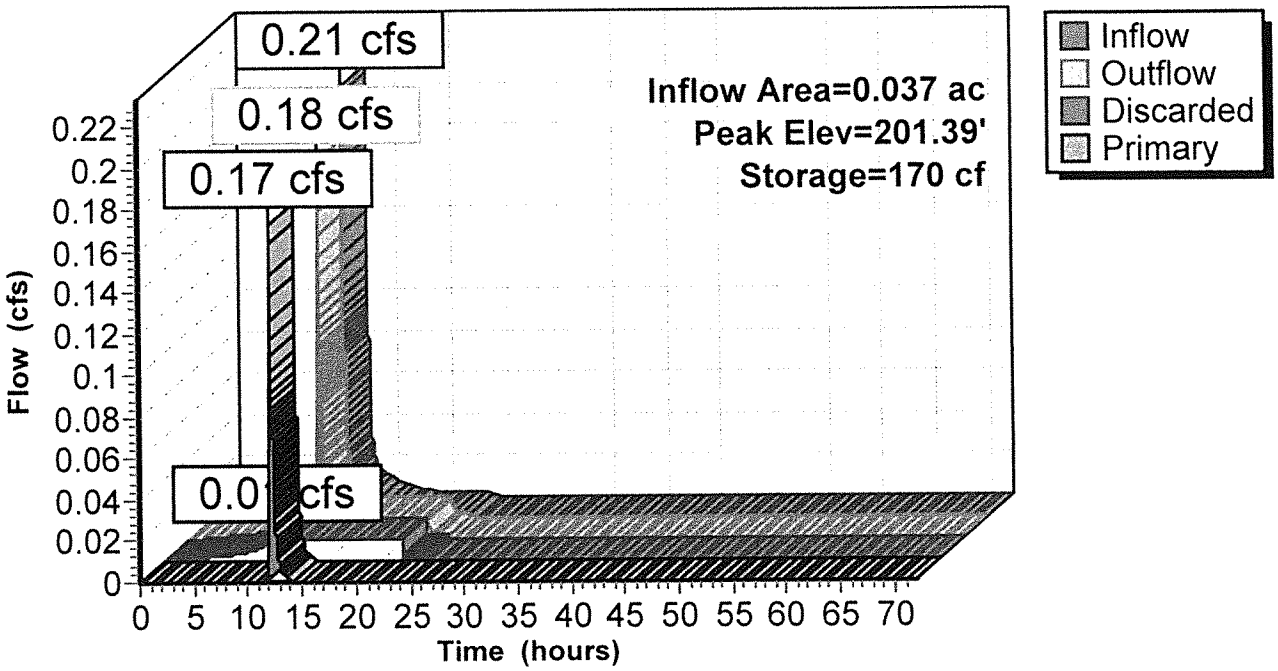
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 10.57 hrs HW=200.02' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.17 cfs @ 12.11 hrs HW=201.38' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Weir Controls 0.17 cfs @ 0.95 fps)

Pond 7P: Roof Drywell

Hydrograph



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SUB-1A: Runoff Area=1,302 sf 31.18% Impervious Runoff Depth=5.37"
Tc=5.0 min CN=86 Runoff=0.19 cfs 0.013 af

Subcatchment SUB-1B: 75% Lot 1 Roof Runoff Area=1,597 sf 100.00% Impervious Runoff Depth=6.76"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.021 af

Subcatchment SUB-1C: 50% Lot 2 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=6.76"
Tc=5.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment SUB-1D: 50% Lot 3 Roof Runoff Area=1,009 sf 100.00% Impervious Runoff Depth=6.76"
Tc=5.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment SUB-1E: Lot 1 Rear Yard Runoff Area=6,307 sf 0.00% Impervious Runoff Depth=4.69"
Tc=5.0 min CN=80 Runoff=0.82 cfs 0.057 af

Subcatchment SUB-1F: Runoff Area=29,580 sf 0.00% Impervious Runoff Depth=4.47"
Flow Length=320' Tc=13.6 min CN=78 Runoff=2.79 cfs 0.253 af

Subcatchment SUB-2: SUB-2 Runoff Area=14,560 sf 24.09% Impervious Runoff Depth=5.14"
Flow Length=44' Slope=0.0120 '/' Tc=13.3 min CN=84 Runoff=1.56 cfs 0.143 af

Subcatchment SUB-3: Runoff Area=6,749 sf 7.99% Impervious Runoff Depth=4.69"
Flow Length=50' Slope=0.0200 '/' Tc=12.0 min CN=80 Runoff=0.70 cfs 0.061 af

Subcatchment SUB-4: Runoff Area=19,985 sf 17.82% Impervious Runoff Depth=5.03"
Flow Length=250' Slope=0.0120 '/' Tc=16.6 min CN=83 Runoff=1.94 cfs 0.192 af

Reach DP-1: Inflow=3.55 cfs 0.320 af
Outflow=3.55 cfs 0.320 af

Reach DP-2: Inflow=1.56 cfs 0.143 af
Outflow=1.56 cfs 0.143 af

Reach DP-3: Inflow=0.70 cfs 0.061 af
Outflow=0.70 cfs 0.061 af

Reach DP-4: Inflow=1.93 cfs 0.178 af
Outflow=1.93 cfs 0.178 af

Pond 1P: Stone Trench Peak Elev=119.93' Storage=45 cf Inflow=0.82 cfs 0.057 af
Discarded=0.00 cfs 0.005 af Primary=0.82 cfs 0.052 af Outflow=0.82 cfs 0.057 af

Pond 2P: Stone Trench Peak Elev=123.91' Storage=172 cf Inflow=0.19 cfs 0.013 af
Discarded=0.00 cfs 0.007 af Primary=0.20 cfs 0.006 af Outflow=0.20 cfs 0.013 af

Pond 3P: Roof Drywell Peak Elev=201.34' Storage=167 cf Inflow=0.16 cfs 0.013 af
Discarded=0.01 cfs 0.012 af Primary=0.06 cfs 0.001 af Outflow=0.07 cfs 0.013 af

Pond 5P: Roof Drywell Peak Elev=201.34' Storage=167 cf Inflow=0.16 cfs 0.013 af
Discarded=0.01 cfs 0.012 af Primary=0.06 cfs 0.001 af Outflow=0.07 cfs 0.013 af

Pond 6P: Peak Elev=122.47' Storage=219 cf Inflow=1.94 cfs 0.192 af
Discarded=0.01 cfs 0.014 af Primary=1.93 cfs 0.178 af Outflow=1.94 cfs 0.192 af

Pond 7P: Roof Drywell Peak Elev=201.41' Storage=172 cf Inflow=0.26 cfs 0.021 af
Discarded=0.01 cfs 0.014 af Primary=0.25 cfs 0.006 af Outflow=0.26 cfs 0.021 af

Total Runoff Area = 1.885 ac Runoff Volume = 0.766 af Average Runoff Depth = 4.88"
85.83% Pervious = 1.618 ac 14.17% Impervious = 0.267 ac

Summary for Subcatchment SUB-1A:

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 5.37"

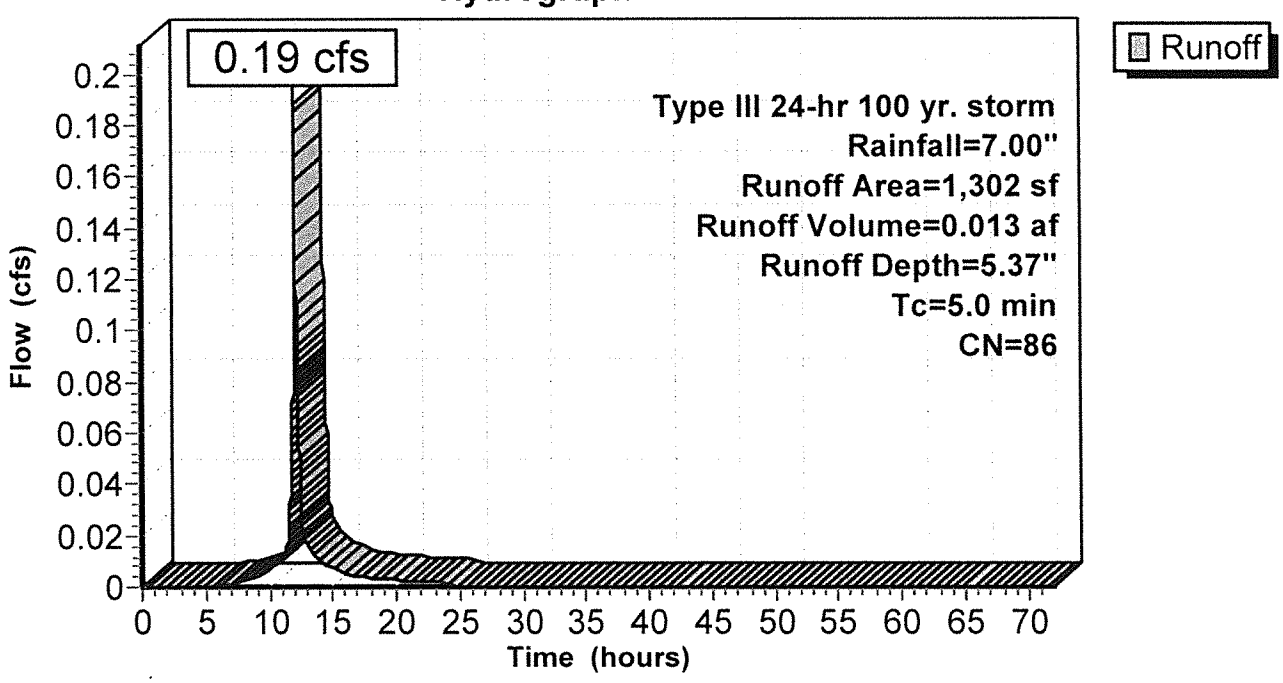
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	406	98	Driveway
	896	80	>75% Grass cover, Good, HSG D
	1,302	86	Weighted Average
	896		68.82% Pervious Area
	406		31.18% Impervious Area

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

Subcatchment SUB-1A:

Hydrograph



Summary for Subcatchment SUB-1B: 75% Lot 1 Roof

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 6.76"

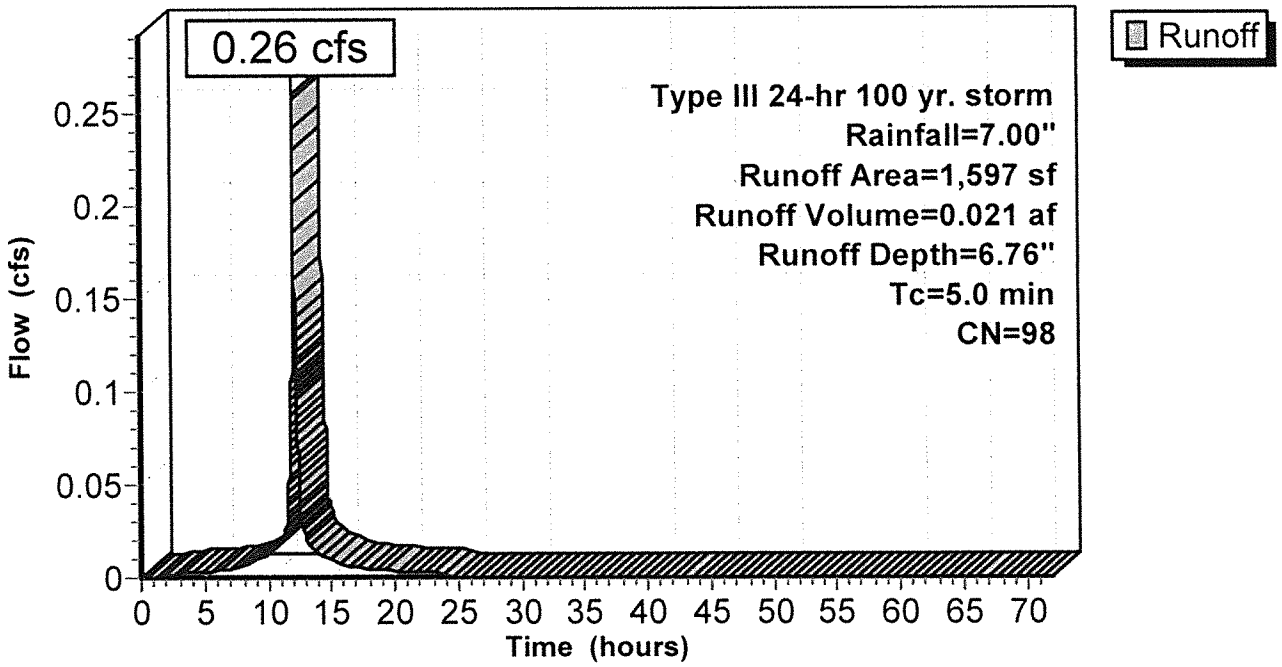
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,597	98	Roof
	1,597		100.00% Impervious Area

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

Subcatchment SUB-1B: 75% Lot 1 Roof

Hydrograph



Summary for Subcatchment SUB-1C: 50% Lot 2 Roof

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 6.76"

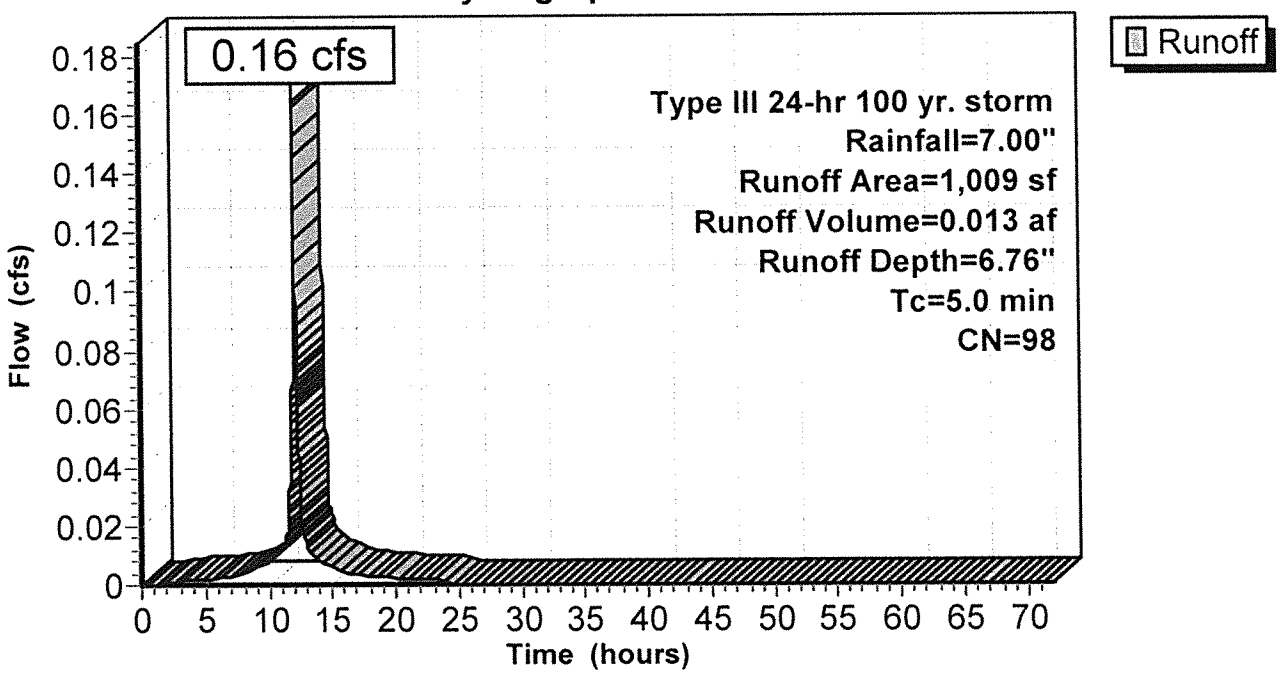
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1C: 50% Lot 2 Roof

Hydrograph



Summary for Subcatchment SUB-1D: 50% Lot 3 Roof

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 6.76"

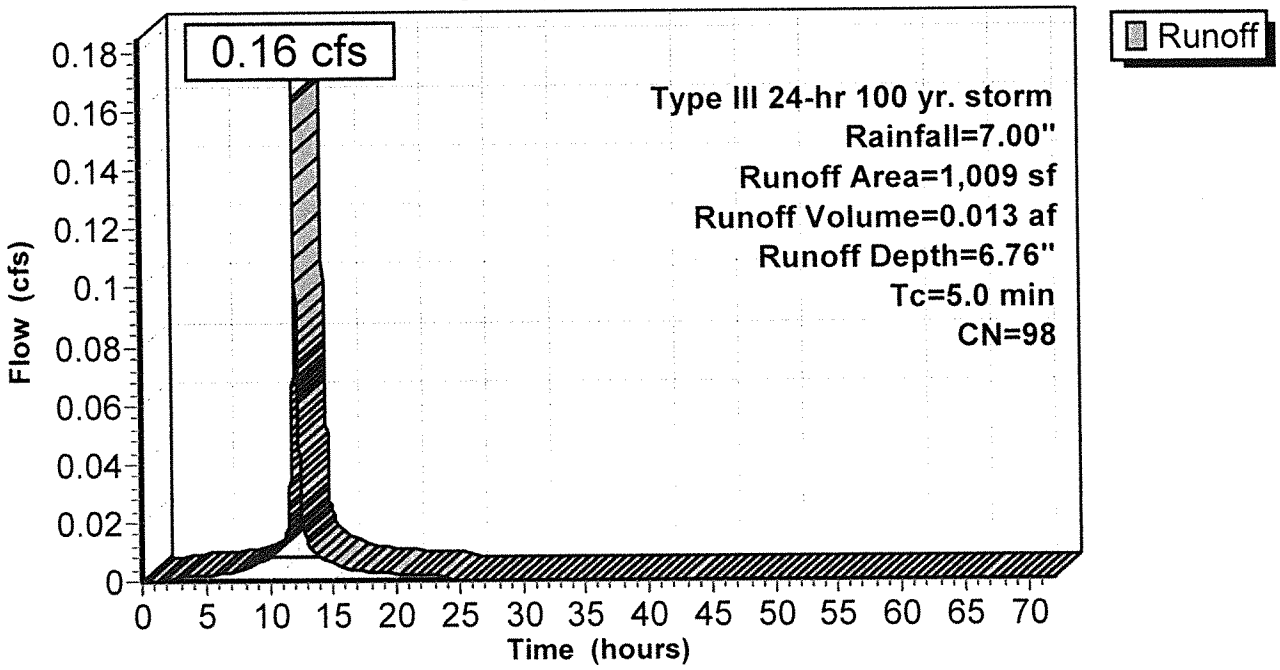
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,009	98	Roof
	1,009		100.00% Impervious Area

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

Subcatchment SUB-1D: 50% Lot 3 Roof

Hydrograph



Summary for Subcatchment SUB-1E: Lot 1 Rear Yard

Runoff = 0.82 cfs @ 12.07 hrs, Volume= 0.057 af, Depth= 4.69"

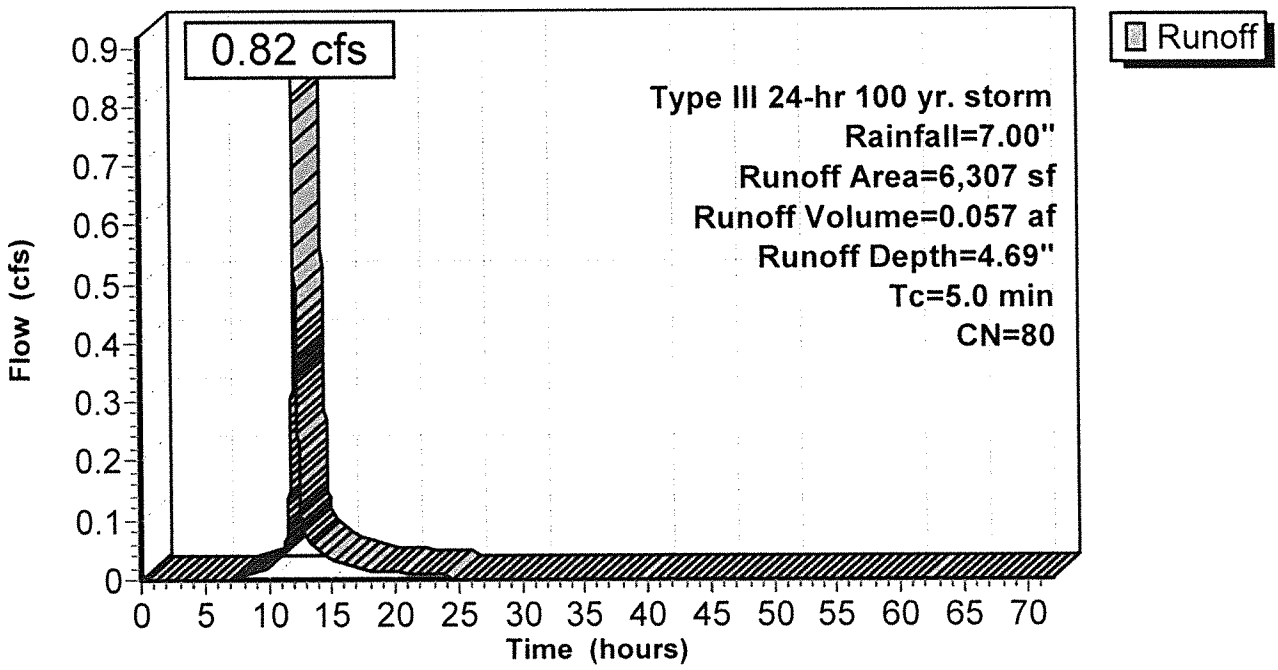
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

Area (sf)	CN	Description
6,307	80	>75% Grass cover, Good, HSG D
6,307		100.00% Pervious Area

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

Subcatchment SUB-1E: Lot 1 Rear Yard

Hydrograph



Summary for Subcatchment SUB-1F:

Runoff = 2.79 cfs @ 12.19 hrs, Volume= 0.253 af, Depth= 4.47"

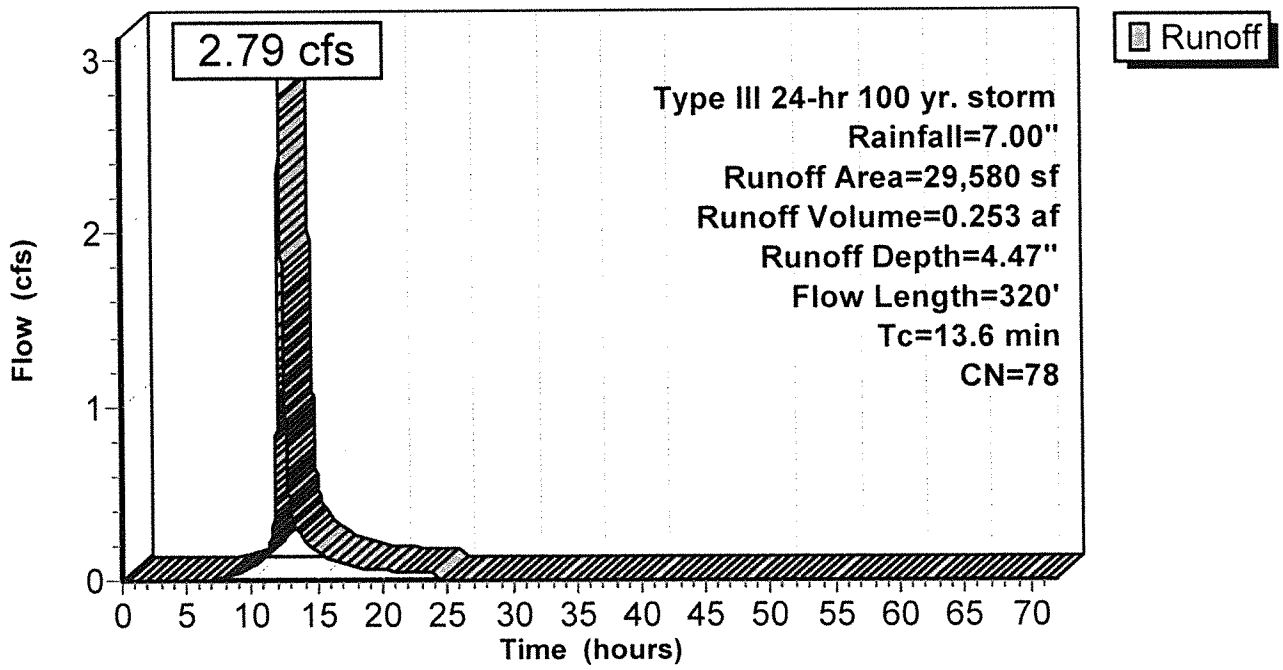
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

Area (sf)	CN	Description
9,853	80	>75% Grass cover, Good, HSG D
19,727	77	Woods, Good, HSG D
29,580	78	Weighted Average
29,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.6	270	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
13.6	320	Total			

Subcatchment SUB-1F:

Hydrograph



Summary for Subcatchment SUB-2: SUB-2

Runoff = 1.56 cfs @ 12.18 hrs, Volume= 0.143 af, Depth= 5.14"

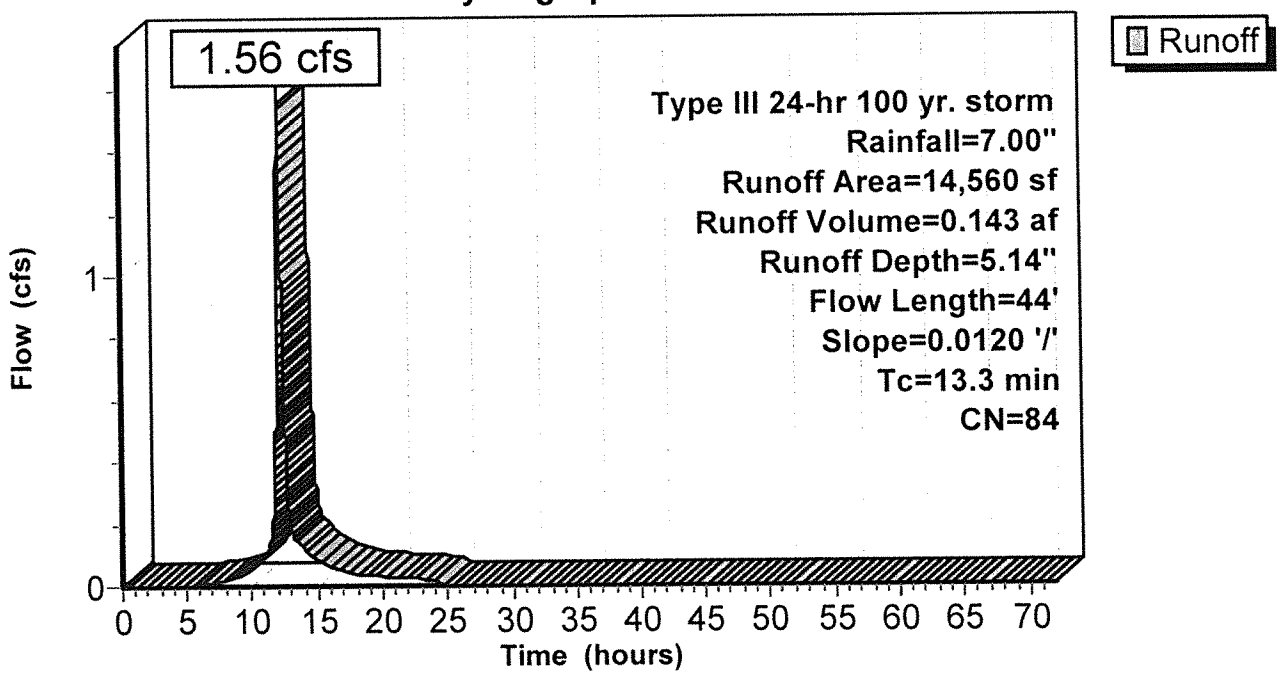
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,948	98	Roofs
*	1,560	98	Paved Driveways
	11,052	80	>75% Grass cover, Good, HSG D
	14,560	84	Weighted Average
	11,052		75.91% Pervious Area
	3,508		24.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	44	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-2: SUB-2

Hydrograph



Summary for Subcatchment SUB-3:

Runoff = 0.70 cfs @ 12.16 hrs, Volume= 0.061 af, Depth= 4.69"

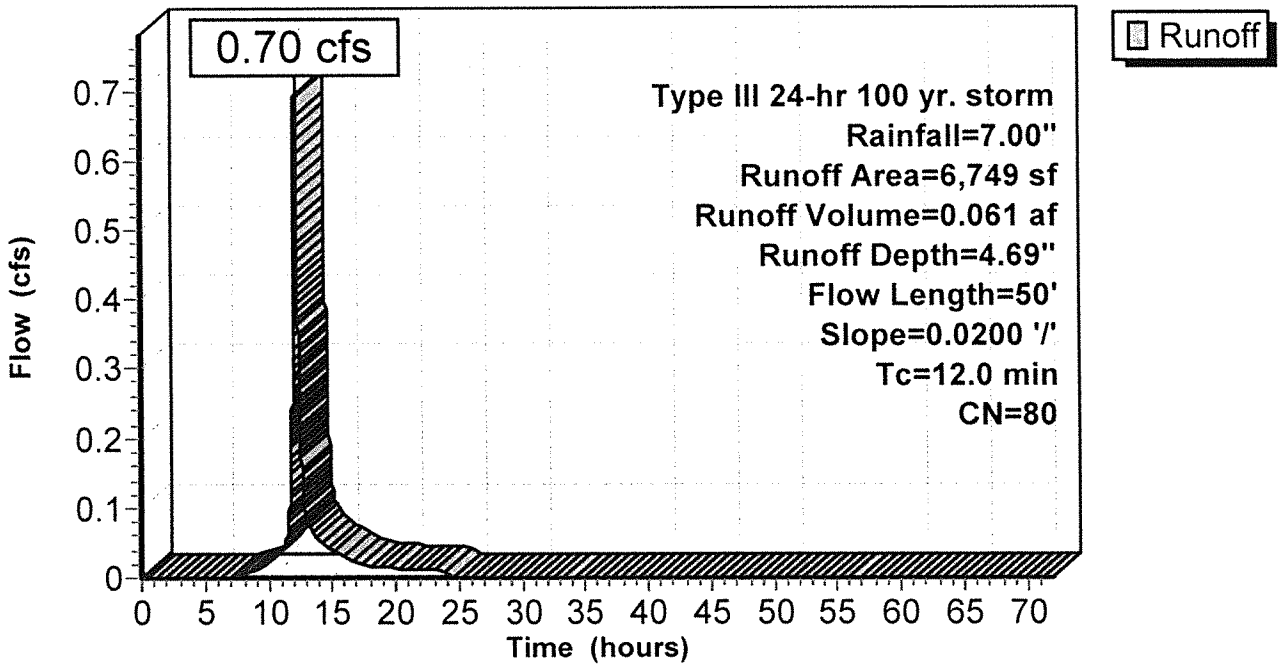
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	539	98	Roofs
	3,140	80	>75% Grass cover, Good, HSG D
	3,070	77	Woods, Good, HSG D
	6,749	80	Weighted Average
	6,210		92.01% Pervious Area
	539		7.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"

Subcatchment SUB-3:

Hydrograph



Summary for Subcatchment SUB-4:

Runoff = 1.94 cfs @ 12.23 hrs, Volume= 0.192 af, Depth= 5.03"

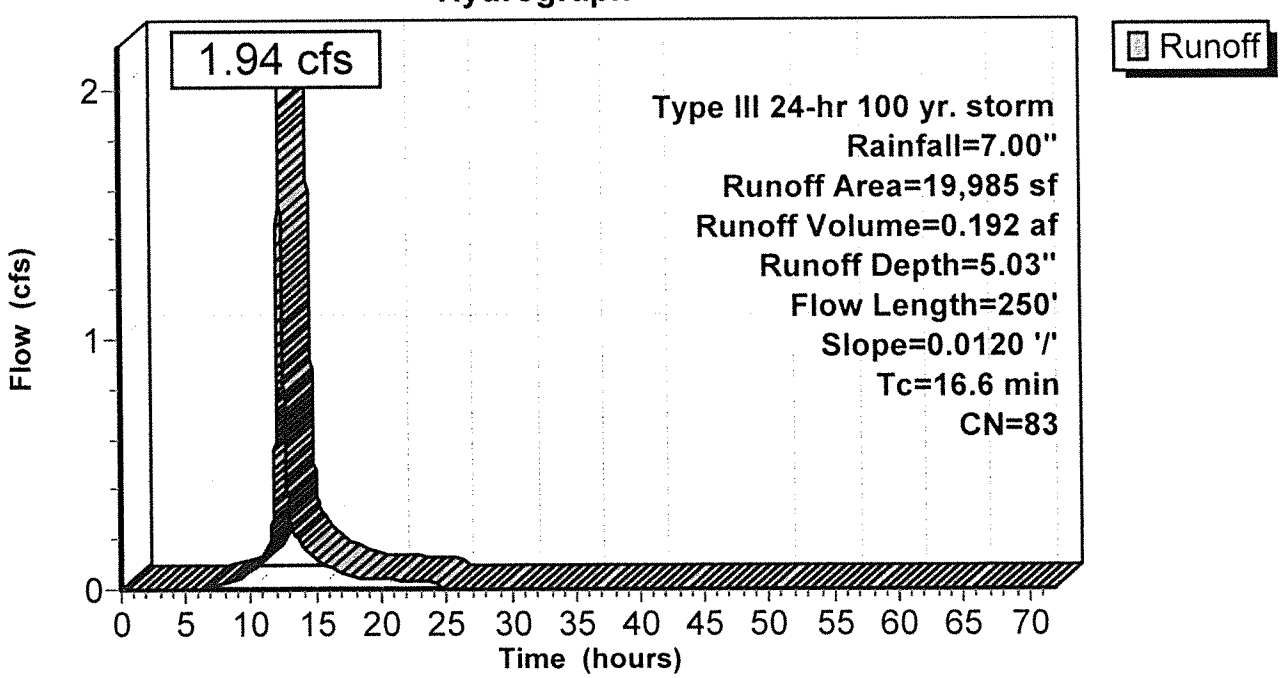
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr. storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,726	98	Roofs
*	1,836	98	Driveways
	15,563	80	>75% Grass cover, Good, HSG D
	860	77	Woods, Good, HSG D
	19,985	83	Weighted Average
	16,423		82.18% Pervious Area
	3,562		17.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
1.9	200	0.0120	1.76		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	250	Total			

Subcatchment SUB-4:

Hydrograph



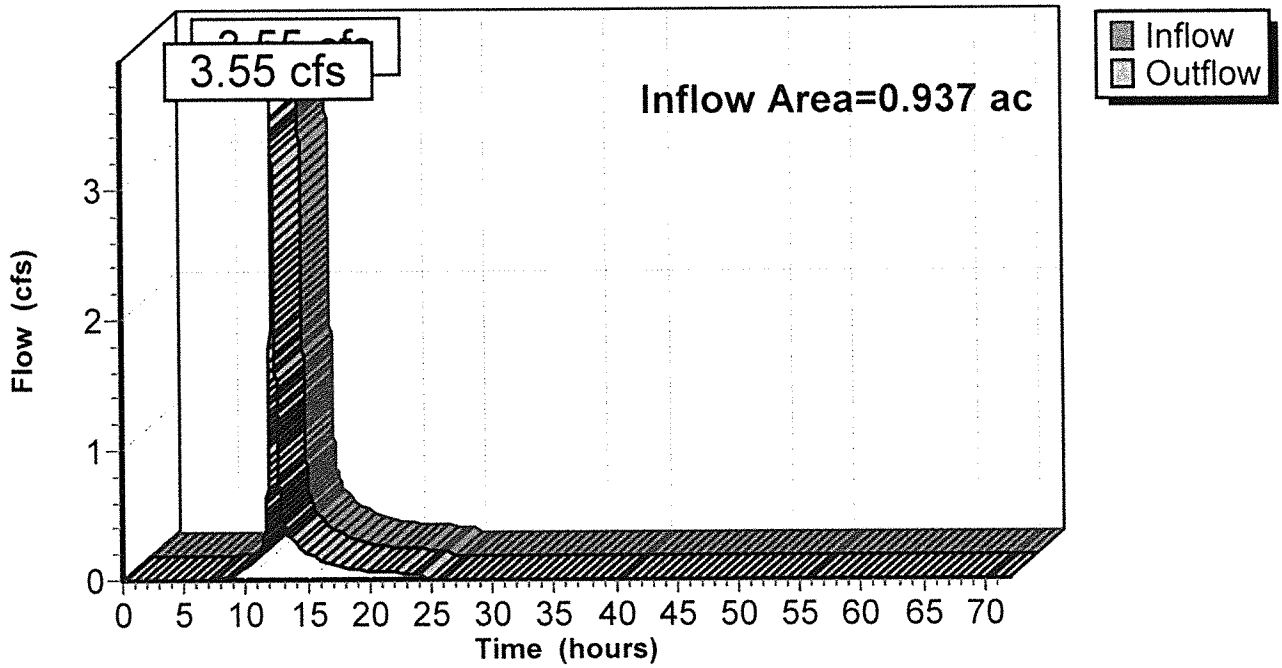
Summary for Reach DP-1:

Inflow Area =	0.937 ac,	9.85% Impervious,	Inflow Depth = 4.10"	for 100 yr. storm event
Inflow =	3.55 cfs @	12.14 hrs, Volume=	0.320 af	
Outflow =	3.55 cfs @	12.14 hrs, Volume=	0.320 af, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-1:

Hydrograph



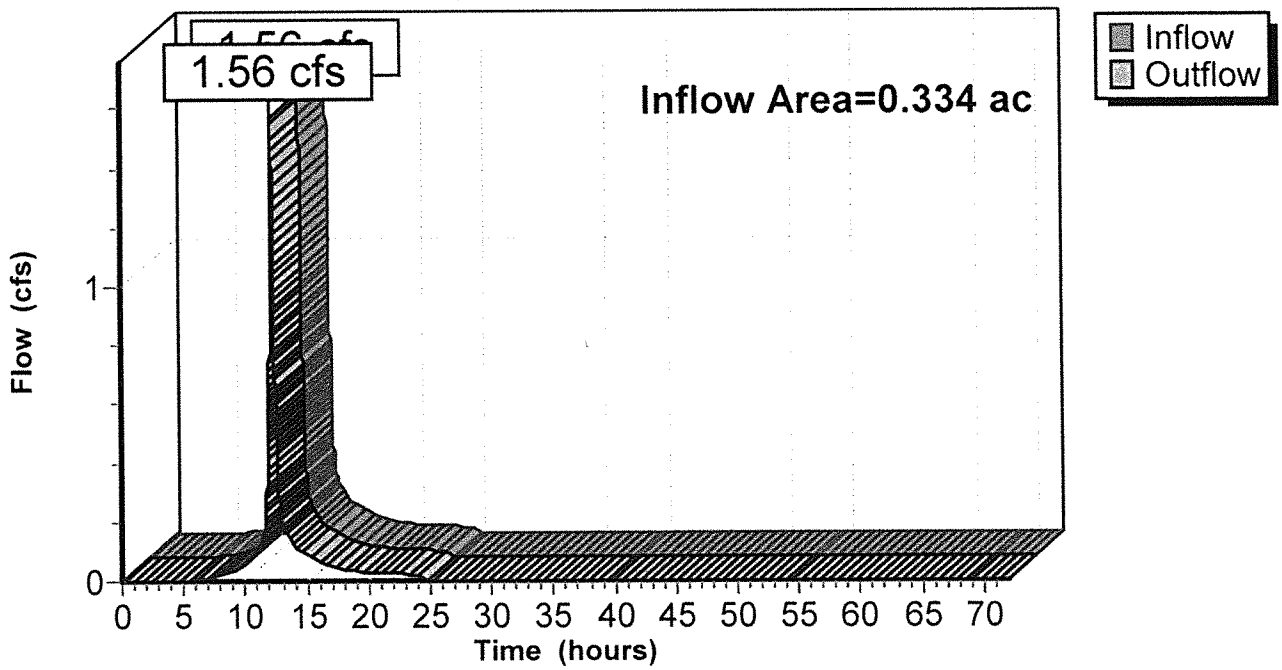
Summary for Reach DP-2:

Inflow Area = 0.334 ac, 24.09% Impervious, Inflow Depth = 5.14" for 100 yr. storm event
Inflow = 1.56 cfs @ 12.18 hrs, Volume= 0.143 af
Outflow = 1.56 cfs @ 12.18 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-2:

Hydrograph



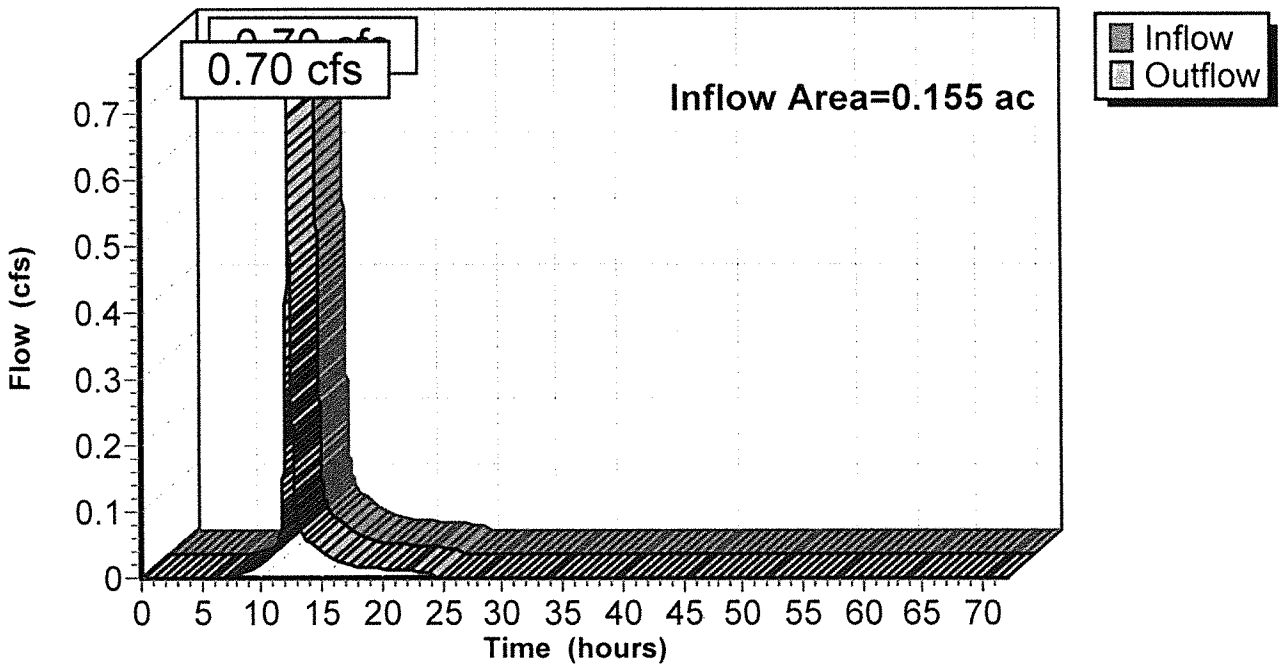
Summary for Reach DP-3:

Inflow Area = 0.155 ac, 7.99% Impervious, Inflow Depth = 4.69" for 100 yr. storm event
Inflow = 0.70 cfs @ 12.16 hrs, Volume= 0.061 af
Outflow = 0.70 cfs @ 12.16 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-3:

Hydrograph



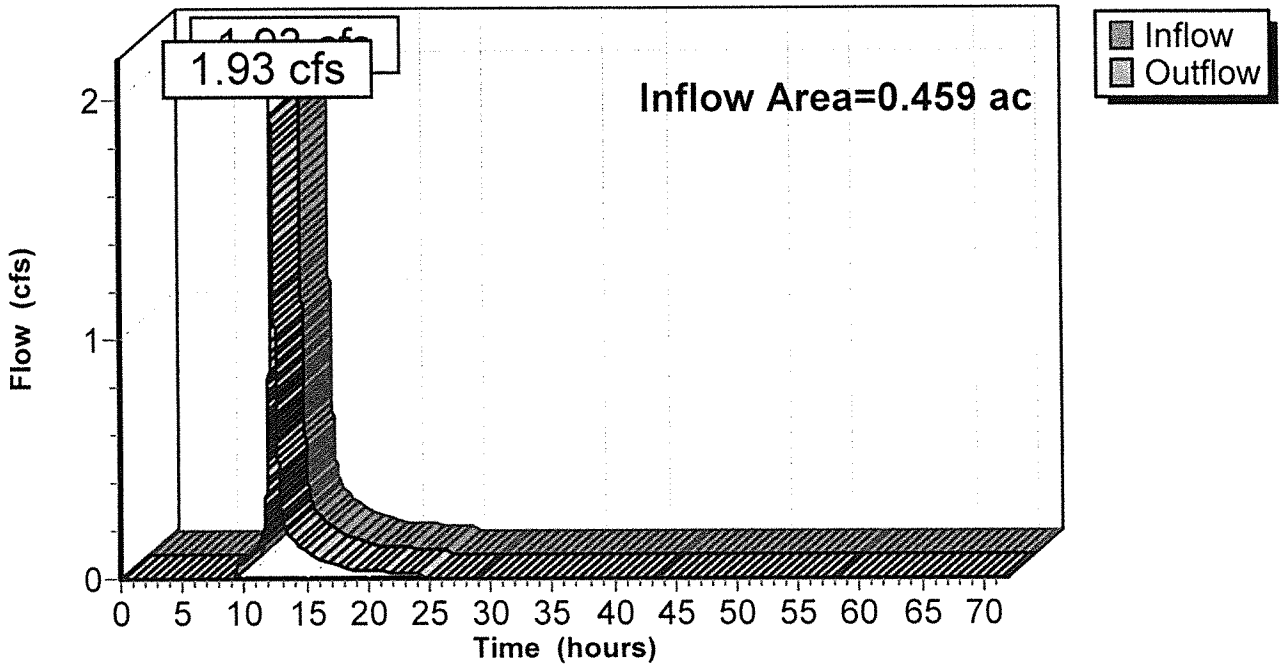
Summary for Reach DP-4:

Inflow Area = 0.459 ac, 17.82% Impervious, Inflow Depth = 4.65" for 100 yr. storm event
Inflow = 1.93 cfs @ 12.23 hrs, Volume= 0.178 af
Outflow = 1.93 cfs @ 12.23 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Reach DP-4:

Hydrograph



Summary for Pond 1P: Stone Trench

Inflow Area =	0.145 ac,	0.00% Impervious,	Inflow Depth =	4.69"	for 100 yr. storm event
Inflow =	0.82 cfs @	12.07 hrs,	Volume=	0.057 af	
Outflow =	0.82 cfs @	12.07 hrs,	Volume=	0.057 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	7.63 hrs,	Volume=	0.005 af	
Primary =	0.82 cfs @	12.07 hrs,	Volume=	0.052 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 119.93' @ 12.07 hrs Surf.Area= 120 sf Storage= 45 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.3 min (825.3 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	48 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 120 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	120	0	0
120.00	120	120	120

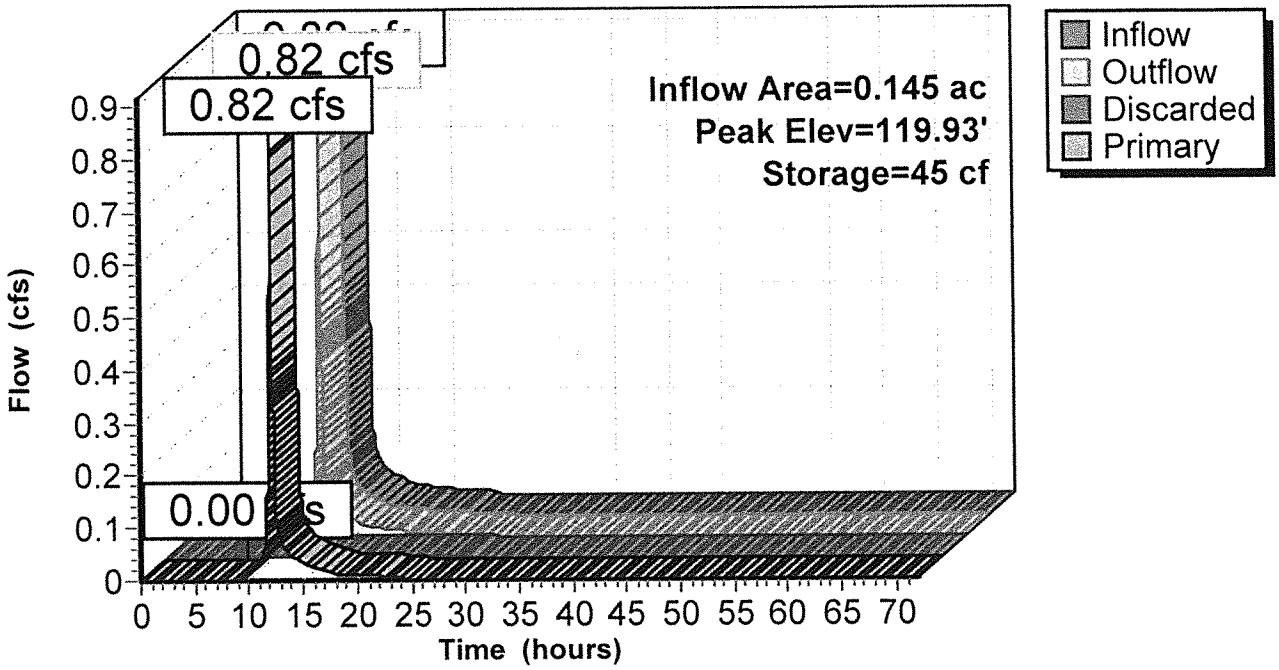
Device	Routing	Invert	Outlet Devices
#1	Primary	119.90'	**60.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 7.63 hrs HW=119.01' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.81 cfs @ 12.07 hrs HW=119.93' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.81 cfs @ 0.43 fps)

Pond 1P: Stone Trench

Hydrograph



Summary for Pond 2P: Stone Trench

Inflow Area =	0.030 ac, 31.18% Impervious, Inflow Depth = 5.37" for 100 yr. storm event				
Inflow =	0.19 cfs @	12.07 hrs,	Volume=	0.013 af	
Outflow =	0.20 cfs @	12.08 hrs,	Volume=	0.013 af,	Atten= 0%, Lag= 0.5 min
Discarded =	0.00 cfs @	9.06 hrs,	Volume=	0.007 af	
Primary =	0.20 cfs @	12.08 hrs,	Volume=	0.006 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 123.91' @ 12.08 hrs Surf.Area= 110 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 372.5 min (1,163.8 - 791.3)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	176 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	110	0	0
121.00	110	110	110
122.00	110	110	220
123.00	110	110	330
124.00	110	110	440

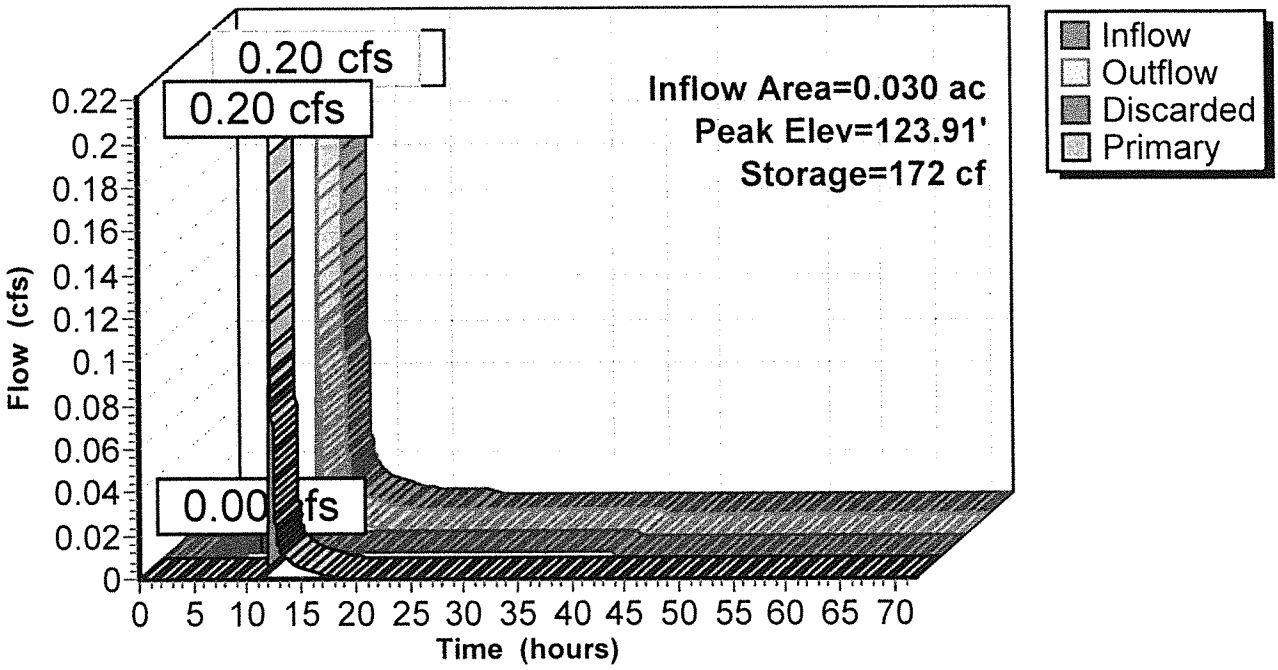
Device	Routing	Invert	Outlet Devices
#1	Primary	123.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	120.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 9.06 hrs HW=120.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.20 cfs @ 12.08 hrs HW=123.91' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.27 fps)

Pond 2P: Stone Trench

Hydrograph



Summary for Pond 3P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 6.76" for 100 yr. storm event				
Inflow =	0.16 cfs @	12.07 hrs,	Volume=	0.013 af	
Outflow =	0.07 cfs @	12.25 hrs,	Volume=	0.013 af,	Atten= 59%, Lag= 11.0 min
Discarded =	0.01 cfs @	11.13 hrs,	Volume=	0.012 af	
Primary =	0.06 cfs @	12.25 hrs,	Volume=	0.001 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.34' @ 12.25 hrs Surf.Area= 212 sf Storage= 167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 104.9 min (847.0 - 742.0)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

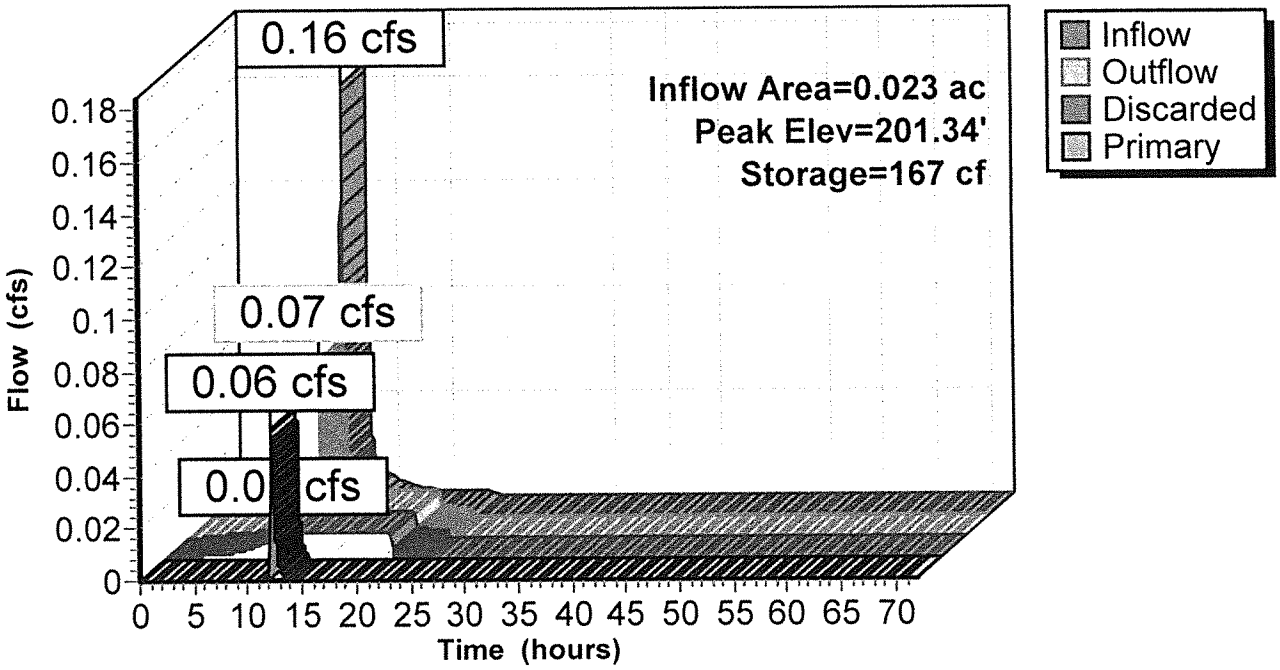
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.13 hrs HW=200.02' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.06 cfs @ 12.25 hrs HW=201.34' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.67 fps)

Pond 3P: Roof Drywell

Hydrograph



Summary for Pond 5P: Roof Drywell

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth = 6.76" for 100 yr. storm event				
Inflow =	0.16 cfs @	12.07 hrs,	Volume=	0.013 af	
Outflow =	0.07 cfs @	12.25 hrs,	Volume=	0.013 af,	Atten= 59%, Lag= 11.0 min
Discarded =	0.01 cfs @	11.13 hrs,	Volume=	0.012 af	
Primary =	0.06 cfs @	12.25 hrs,	Volume=	0.001 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.34' @ 12.25 hrs Surf.Area= 212 sf Storage= 167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 104.9 min (847.0 - 742.0)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

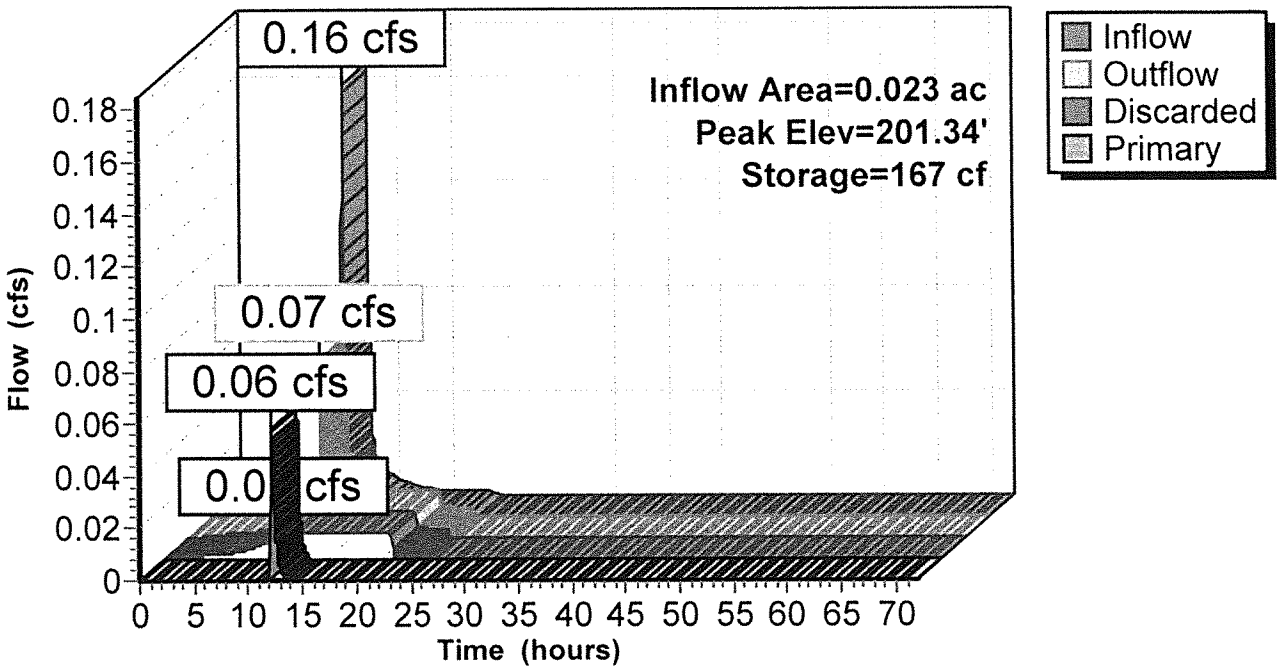
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.13 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.06 cfs @ 12.25 hrs HW=201.34' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.67 fps)

Pond 5P: Roof Drywell

Hydrograph



Summary for Pond 6P:

Inflow Area =	0.459 ac,	17.82% Impervious,	Inflow Depth =	5.03"	for 100 yr. storm event
Inflow =	1.94 cfs @	12.23 hrs,	Volume=	0.192 af	
Outflow =	1.94 cfs @	12.23 hrs,	Volume=	0.192 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.01 cfs @	12.23 hrs,	Volume=	0.014 af	
Primary =	1.93 cfs @	12.23 hrs,	Volume=	0.178 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 122.47' @ 12.23 hrs Surf.Area= 316 sf Storage= 219 cf

Plug-Flow detention time= 30.1 min calculated for 0.192 af (100% of inflow)
Center-of-Mass det. time= 30.2 min (840.4 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	121.30'	227 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.30	72	0	0
122.00	202	96	96
122.50	322	131	227

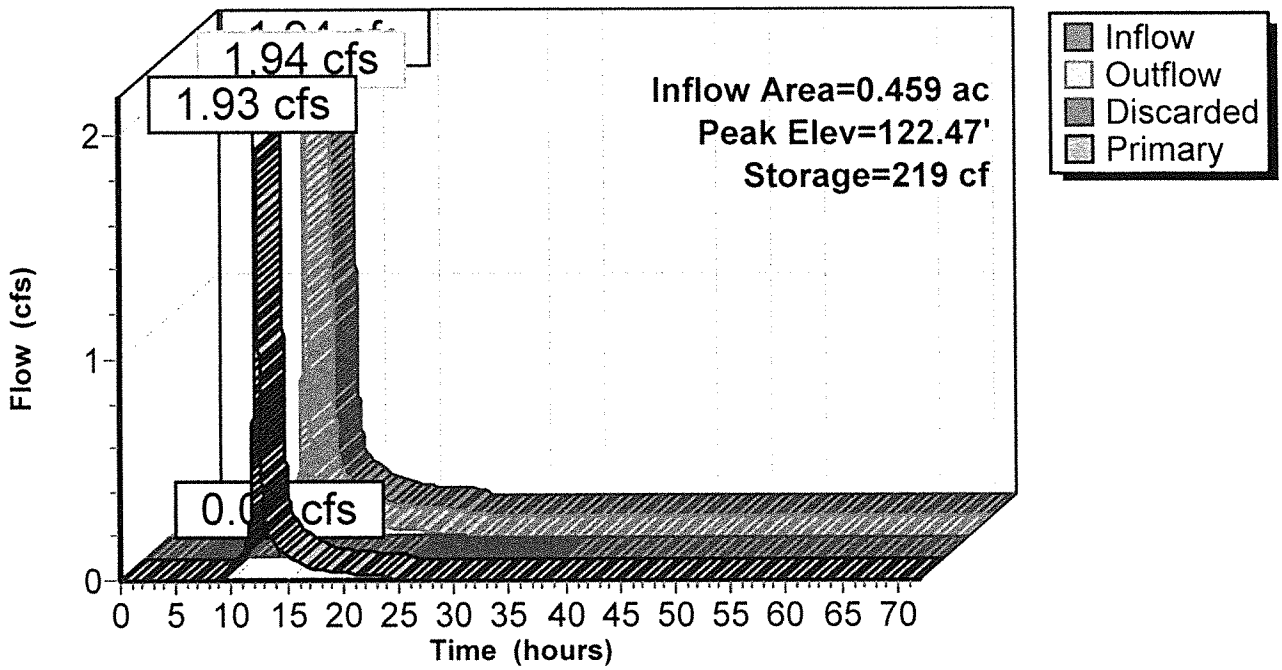
Device	Routing	Invert	Outlet Devices
#1	Primary	122.40'	**40.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	121.30'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.23 hrs HW=122.47' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.93 cfs @ 12.23 hrs HW=122.47' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.93 cfs @ 0.65 fps)

Pond 6P:

Hydrograph



Summary for Pond 7P: Roof Drywell

Inflow Area =	0.037 ac,100.00% Impervious, Inflow Depth = 6.76" for 100 yr. storm event				
Inflow =	0.26 cfs @	12.07 hrs,	Volume=	0.021 af	
Outflow =	0.26 cfs @	12.08 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.4 min
Discarded =	0.01 cfs @	9.86 hrs,	Volume=	0.014 af	
Primary =	0.25 cfs @	12.08 hrs,	Volume=	0.006 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 201.41' @ 12.08 hrs Surf.Area= 212 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 88.9 min (830.9 - 742.0)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	88 cf	**chamber** Listed below x 2 Inside #2
#2	200.00'	92 cf	**stone (Prismatic)** Listed below (Recalc) x 2 318 cf Overall - 88 cf Embedded = 230 cf x 40.0% Voids
		180 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
200.00	0
201.33	44

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
200.00	106	0	0
201.50	106	159	159

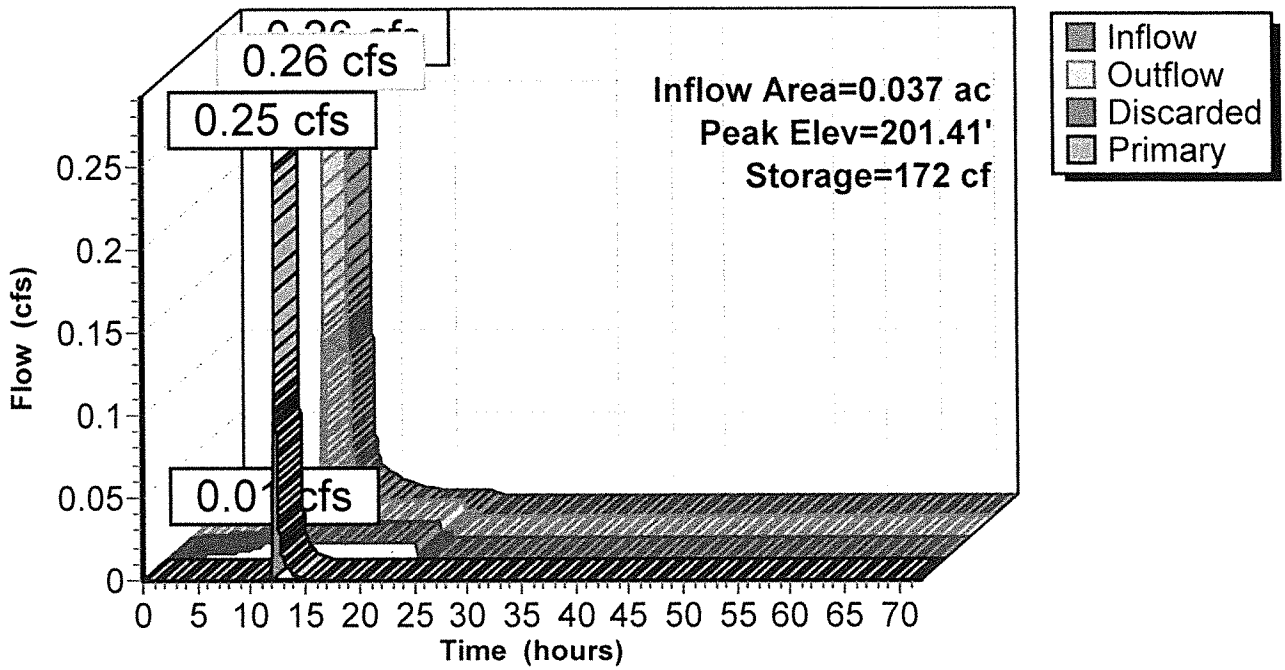
Device	Routing	Invert	Outlet Devices
#1	Primary	201.30'	**4.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	200.00'	**1.020 in/hr Exfiltration X 2.00 over Surface area**

Discarded OutFlow Max=0.01 cfs @ 9.86 hrs HW=200.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.25 cfs @ 12.08 hrs HW=201.41' TW=0.00' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.25 cfs @ 1.08 fps)

Pond 7P: Roof Drywell

Hydrograph



APPENDIX C

- Soil Test Results
- NRCS Soils Map

SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: JEFFREY M. HASSETT, P.E.
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: NOVEMBER 3, 2015

TP 1-1 APPROX. GRADE EL. 122.1

EL. 121.6	A HORIZON SANDY LOAM 10YR 3/2	6"
EL. 119.8	B HORIZON SANDY LOAM 2.5Y 5/4	28"
EL. 115.8	C1 HORIZON SANDY LOAM 2.5Y 5/4	76"
EL. 108.1	C2 HORIZON SANDY LOAM 2.5Y 5/2	168"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE: 13 MPI @ 108-126"
ESHGW: 32" (EL. 119.4)

TP 1-2 APPROX. GRADE EL. 122.4

EL. 121.9	A HORIZON SANDY LOAM 10YR 3/2	6"
EL. 120.1	B HORIZON SANDY LOAM 2.5Y 5/4	28"
EL. 116.3	C1 HORIZON SANDY LOAM 2.5Y 5/4	73"
EL. 108.6	C2 HORIZON SANDY LOAM 2.5Y 5/2	166"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE: 7 MPI @ 118-136"
ESHGW: 32" (EL. 119.7)

TP 1-3 APPROX. GRADE EL. 123.1

EL. 122.1	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 120.6	B HORIZON SANDY LOAM 2.5Y 5/4	30"
EL. 117.0	C1 HORIZON SANDY LOAM 2.5Y 5/4	73"
EL. 112.7	C2 HORIZON SANDY LOAM 2.5Y 5/2	125"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 30"
PERC. RATE: 6 MPI @ 95 - 113"
ESHGW: 30" (EL. 120.6)

TP 1-4 APPROX. GRADE EL. 123.1

EL. 122.4	A HORIZON SANDY LOAM 10YR 3/2	8"
EL. 120.9	B HORIZON SANDY LOAM 2.5Y 5/4	27"
EL. 116.4	C1 HORIZON SANDY LOAM 2.5Y 5/4	80"
EL. 109.6	C2 HORIZON SANDY LOAM 2.5Y 5/2	162"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 38"
PERC. RATE: NONE
ESHGW: 38" (EL. 119.9)

SOIL TEST DATA (TP 2-1)

SOIL TESTING AND EVALUATION BY: JEFFREY M. HASSETT, P.E.
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: NOVEMBER 3, 2015

TP 2-1 APPROX. GRADE EL. 125.5

EL. 125.0	A HORIZON SANDY LOAM 10YR 3/2	6"
EL. 123.3	B HORIZON SANDY LOAM 2.5Y 5/4	26"
EL. 120.1	C1 HORIZON SANDY LOAM 2.5Y 5/4	65"
EL. 114.9	C2 HORIZON SANDY LOAM 2.5Y 5/2	127"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 30"
PERC. RATE: ABANDONED
ESHGW: 30" (EL. 123.0)

SOIL TEST DATA (TP 2-2 THROUGH 5)

SOIL TESTING AND EVALUATION BY: STEVE HASSETT
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: DECEMBER 1, 2015

TP 2-2 APPROX. GRADE EL. 124.6

EL. 123.9	A HORIZON SANDY LOAM 10YR 3/2	8"
EL. 122.4	B HORIZON SANDY LOAM 10YR 5/4	26"
EL. 118.6	C1 HORIZON SANDY LOAM 2.5Y 5/4	72"
EL. 114.1	C2 HORIZON SANDY LOAM 2.5Y 5/2	126"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 36"
PERC. RATE: 5 MPI @ 100-118"
ESHGW: 36" (EL. 121.6)

TP 2-3 APPROX. GRADE EL. 124.9

EL. 123.9	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 122.9	B HORIZON SANDY LOAM 10YR 5/4	24"
EL. 119.2	C1 HORIZON SANDY LOAM 2.5Y 5/4	69"
EL. 114.1	C2 HORIZON SANDY LOAM 2.5Y 5/2	130"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 38"
PERC. RATE: 9 MPI @ 96-114"
ESHGW: 38" (EL. 121.7)

TP 2-4 APPROX. GRADE EL. 125.2

EL. 124.4	A HORIZON SANDY LOAM 10YR 3/2	10"
EL. 123.0	B HORIZON SANDY LOAM 10YR 5/4	26"
EL. 119.4	C1 HORIZON SANDY LOAM 2.5Y 5/4	70"
EL. 114.4	C2 HORIZON SANDY LOAM 2.5Y 5/2	130"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 34"
PERC. RATE: 30 MPI @ 102-120"
ESHGW: 34" (EL. 122.4)

TP 2-5 APPROX. GRADE EL. 125.4

EL. 124.4	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 123.4	B HORIZON SANDY LOAM 10YR 5/4	24"
EL. 119.4	C1 HORIZON SANDY LOAM 2.5Y 5/4	72"
EL. 113.7	C2 HORIZON SANDY LOAM 2.5Y 5/2	140"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE: 15 MPI @ 112-130"
ESHGW: 32" (EL. 122.7)

SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: JEFFREY M. HASSETT, P.E.
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: NOVEMBER 3, 2015

TP 3-1 APPROX. GRADE EL. 124.5

EL. 123.8	A HORIZON SANDY LOAM 10YR 3/2	8"
EL. 122.2	B HORIZON SANDY LOAM 2.5Y 5/4	28"
EL. 118.8	C1 HORIZON SANDY LOAM 2.5Y 5/4	68"
EL. 114.5	C2 HORIZON SANDY LOAM 2.5Y 5/2	120"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 33"
PERC. RATE: 25 MPI @ 96-114"
ESHGW: 33" (EL. 121.8)

TP 3-2 APPROX. GRADE EL. 124.6

EL. 124.0	A HORIZON SANDY LOAM 10YR 3/2	7"
EL. 122.4	B HORIZON SANDY LOAM 2.5Y 5/4	26"
EL. 117.8	C1 HORIZON SANDY LOAM 2.5Y 5/4	82"
EL. 113.6	C2 HORIZON SANDY LOAM 2.5Y 5/2	132"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 36"
PERC. RATE: NONE
ESHGW: 36" (EL. 121.6)

TP 3-3 APPROX. GRADE EL. 124.8

EL. 123.9	A HORIZON SANDY LOAM 10YR 3/2	11"
EL. 122.7	B HORIZON SANDY LOAM 2.5Y 5/4	25"
EL. 119.0	C1 HORIZON SANDY LOAM 2.5Y 5/4	70"
EL. 114.8	C2 HORIZON SANDY LOAM 2.5Y 5/2	120"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 37"
PERC. RATE: 8 MPI @ 94-112"
ESHGW: 37" (EL. 121.7)

TP 3-4 APPROX. GRADE EL. 124.9

EL. 124.2	A HORIZON SANDY LOAM 10YR 3/2	9"
EL. 122.8	B HORIZON SANDY LOAM 2.5Y 5/4	25"
EL. 118.7	C1 HORIZON SANDY LOAM 2.5Y 5/4	74"
EL. 113.9	C2 HORIZON SANDY LOAM 2.5Y 5/2	132"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 30"
PERC. RATE: ABANDONED @ 104-122"
ESHGW: 30" (EL. 122.4)

TP 3-5 APPROX. GRADE EL. 124.9

EL. 124.1	A HORIZON SANDY LOAM 10YR 3/2	10"
EL. 122.4	B HORIZON SANDY LOAM 2.5Y 5/4	30"
EL. 118.9	C1 HORIZON SANDY LOAM 2.5Y 5/4	72"
EL. 114.7	C2 HORIZON SANDY LOAM 2.5Y 5/2	122"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE: 11 MPI @ 98-116"
ESHGW: 32" (EL. 122.2)

SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: JEFFREY M. HASSETT, P.E.
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: NOVEMBER 2, 2015

TP 4-1 APPROX. GRADE EL. 126.3

EL. 126.1	ORGANIC	3"
EL. 125.3	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 123.8	B HORIZON SANDY LOAM 2.5Y 5/4	30"
EL. 120.8	C1 HORIZON SANDY LOAM 2.5Y 5/4	66"
EL. 116.3	C2 HORIZON SANDY LOAM 2.5Y 5/2	120"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE:
-ABANDONED @ 32-50" (11/2/15)
ESHGW: 32" (EL. 123.6)

TP 4-2 APPROX. GRADE EL. 126.3

EL. 126.1	ORGANIC	3"
EL. 125.3	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 123.8	B HORIZON SANDY LOAM 2.5Y 5/4	30"
EL. 120.9	C1 HORIZON SANDY LOAM 2.5Y 5/4	65"
EL. 115.8	C2 HORIZON SANDY LOAM 2.5Y 5/2	126"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE:
-ABANDONED @ 32-50" (11/2/15)
-40 MPI @ 108-126" (11/3/15)
ESHGW: 32" (EL. 123.6)

TP 4-3 APPROX. GRADE EL. 126.1

EL. 125.9	ORGANIC	3"
EL. 125.1	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 123.9	B HORIZON SANDY LOAM 2.5Y 5/4	26"
EL. 120.7	C1 HORIZON SANDY LOAM 2.5Y 5/4	65"
EL. 115.3	C2 HORIZON SANDY LOAM 2.5Y 5/2	130"

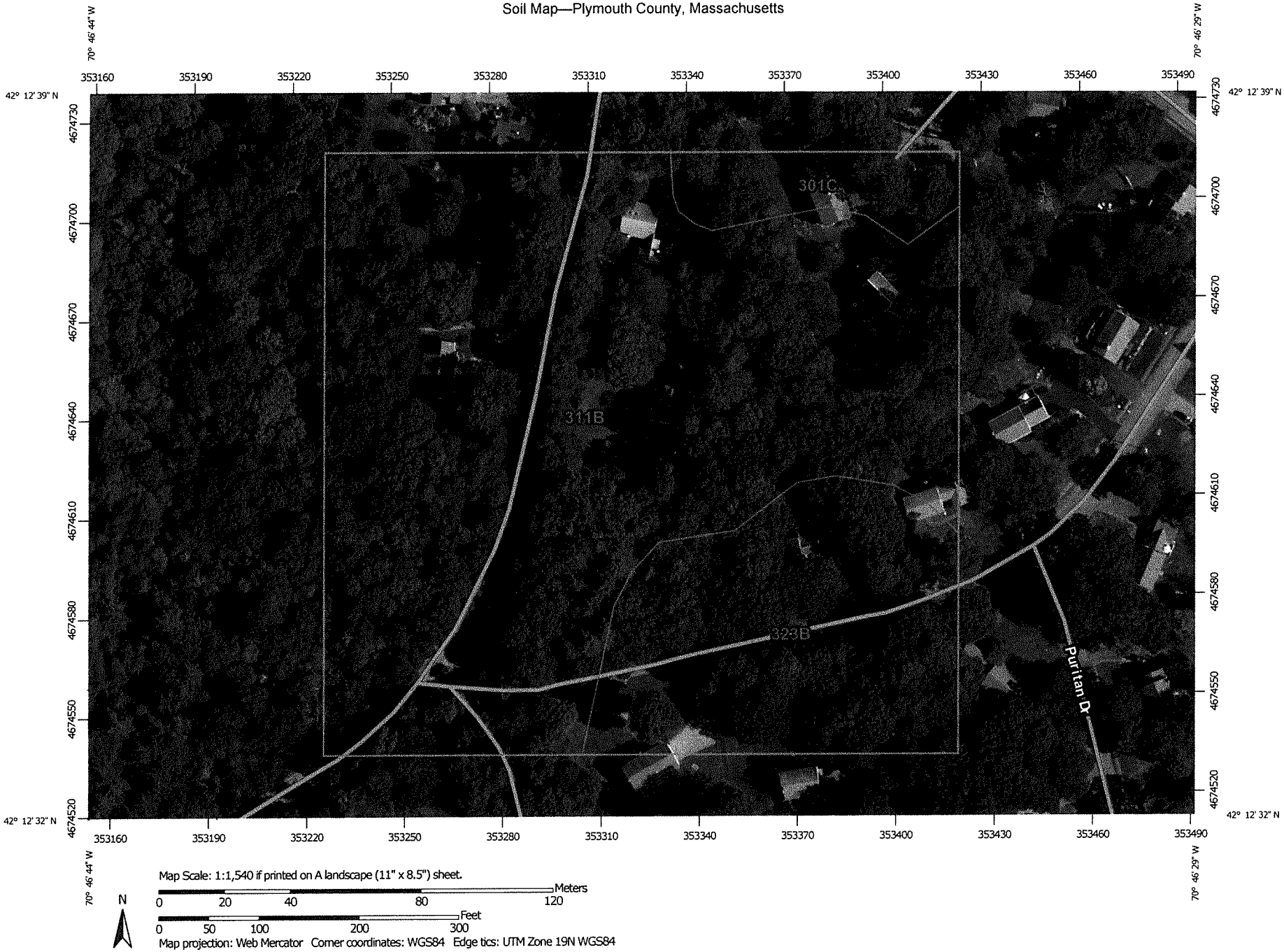
WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE:
-ABANDONED @ 36-54" (11/2/15)
-33 MPI @ 104-122" (11/3/15)
ESHGW: 32" (EL. 123.4)

TP 4-4 APPROX. GRADE EL. 125.6

EL. 125.4	ORGANIC	3"
EL. 124.6	A HORIZON SANDY LOAM 10YR 3/2	12"
EL. 123.4	B HORIZON SANDY LOAM 2.5Y 5/4	26"
EL. 120.3	C1 HORIZON SANDY LOAM 2.5Y 5/4	64"
EL. 115.3	C2 HORIZON SANDY LOAM 2.5Y 5/2	124"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 32"
PERC. RATE:
-ABANDONED @ 36-54" (11/2/15)
-35 MPI @ 80-98" (11/3/15)
ESHGW: 32" (EL. 122.9)

Soil Map—Plymouth County, Massachusetts



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

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

Date(s) aerial images were photographed: Aug 26, 2014—Sep 4, 2014

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

Map Unit Legend

Plymouth County, Massachusetts (MA023)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
301C	Montauk fine sandy loam, 8 to 15 percent slopes, very stony	0.5	5.2%
311B	Woodbridge fine sandy loam, 3 to 8 percent slopes, very stony	6.4	72.6%
323B	Poquonock sand, 3 to 8 percent slopes, very stony	2.0	22.3%
Totals for Area of Interest		**8.8**	**100.0%**

Plymouth County, Massachusetts

311B—Woodbridge fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w68g
Elevation: 0 to 240 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodbridge, very stony, and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Very Stony

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 9 inches: fine sandy loam
Bw1 - 9 to 20 inches: fine sandy loam
Bw2 - 20 to 32 inches: fine sandy loam
Cd - 32 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 19 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D

Minor Components

Ridgebury, very stony

Percent of map unit: 8 percent
Landform: Depressions, ground moraines, hills, drainageways, drumlins
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave

Paxton, very stony

Percent of map unit: 7 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear

Newfields, extremely stony

Percent of map unit: 2 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

Plymouth County, Massachusetts

323B—Poquonock sand, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: bcz7
Elevation: 0 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Poquonock, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poquonock, Very Stony

Setting

Landform: Drumlins, ground moraines, till plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy eolian deposits and/or glaciofluvial deposits over coarse-loamy lodgment till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: sand
E - 4 to 5 inches: sand
Bs - 5 to 7 inches: loamy sand
Bw - 7 to 26 inches: sand
BC - 26 to 35 inches: loamy sand
2Cd1 - 35 to 49 inches: gravelly sandy loam
2Cd2 - 49 to 71 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 22 to 35 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Birchwood, very stony

Percent of map unit: 8 percent
Landform: Till plains, drumlins, ground moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave

Mattapoisett, extremely stony

Percent of map unit: 7 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Montauk, very stony

Percent of map unit: 3 percent
Landform: Ground moraines, till plains, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex

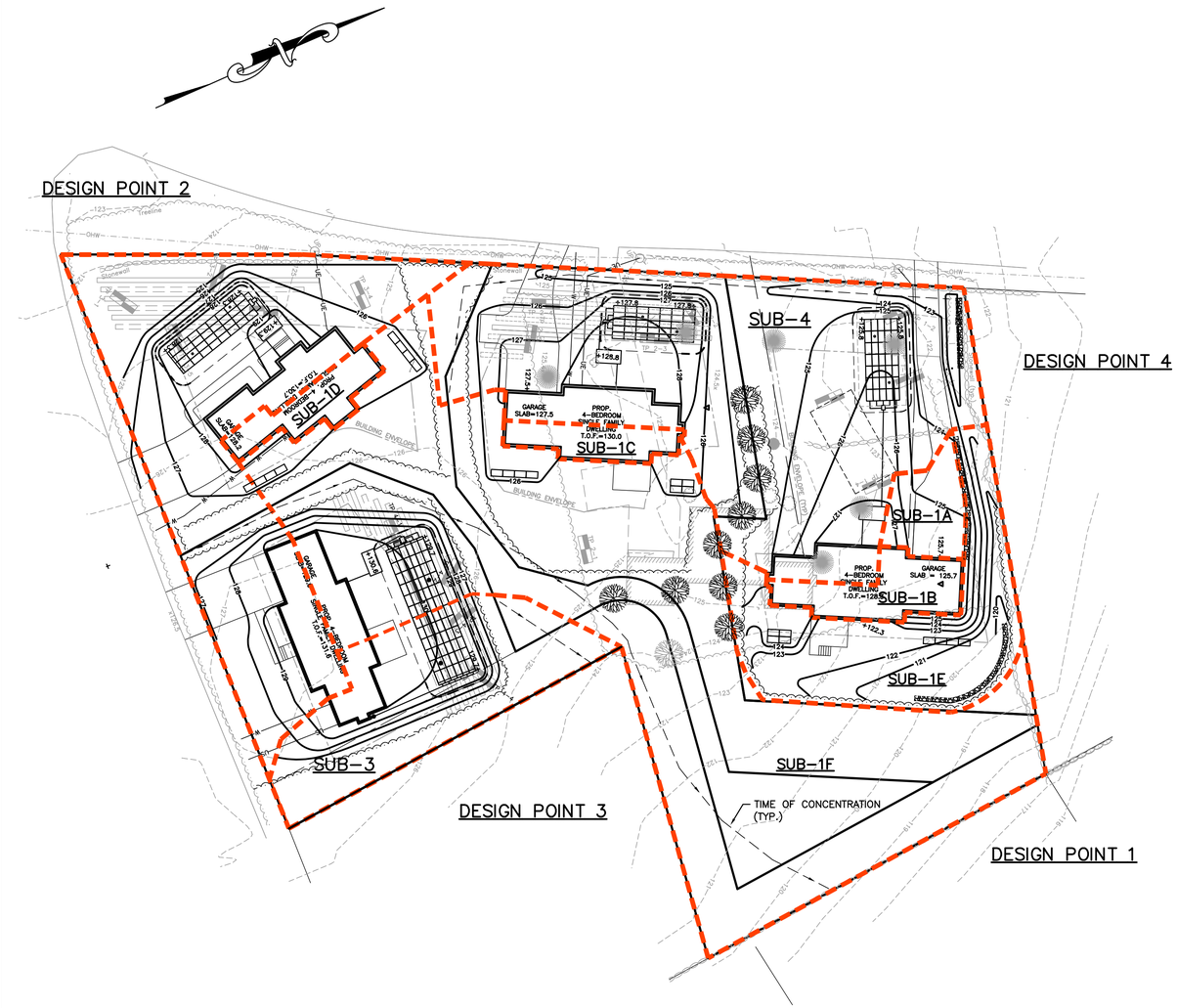
Scituate, very stony

Percent of map unit: 2 percent
Landform: Ridges, drumlins
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

PRE-DEVELOPMENT



POST-DEVELOPMENT

30' 0 20' 30'

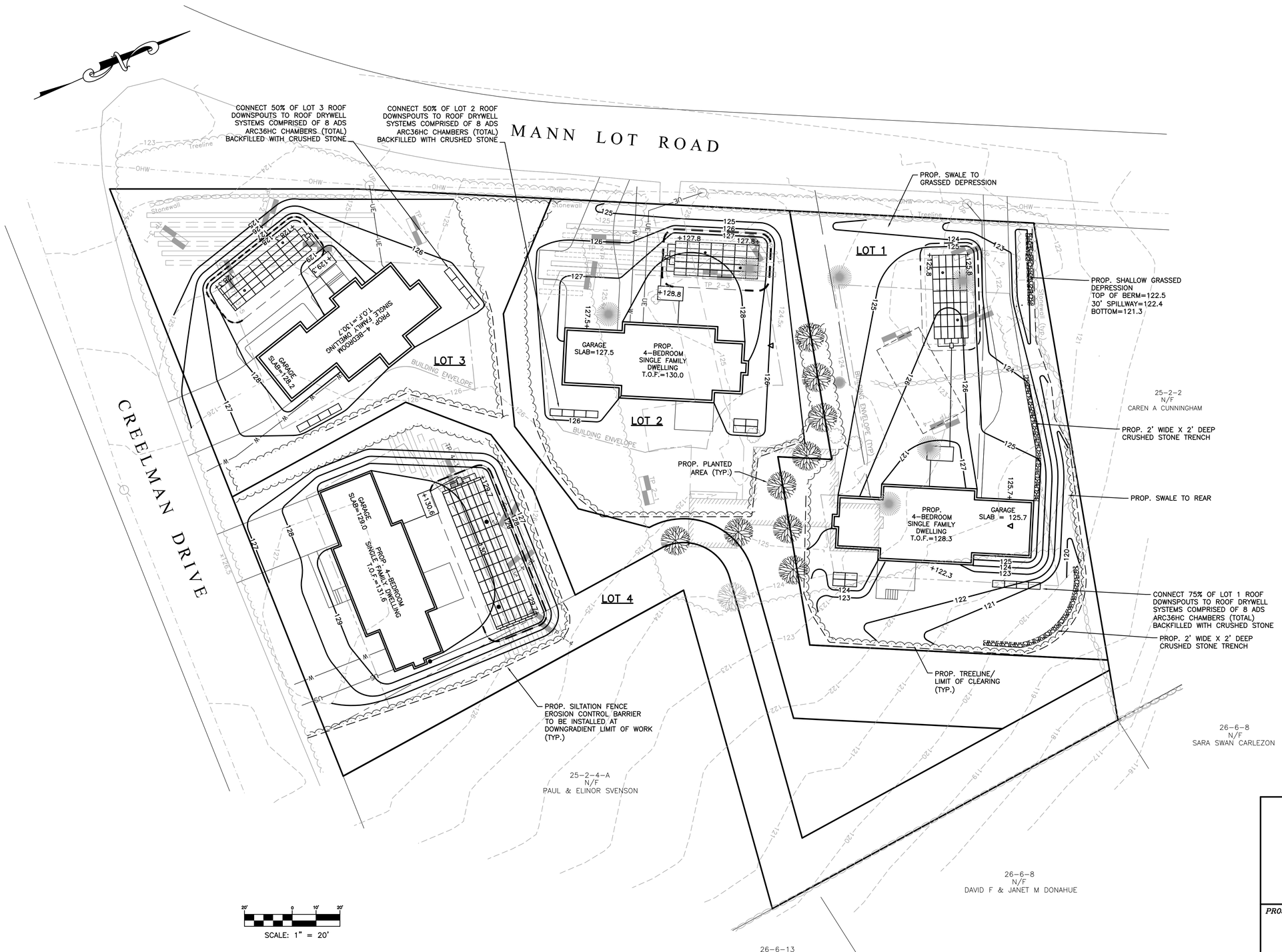
SCALE: 1" = 30'

PREPARED BY:

MORSE ENGINEERING CO., INC.
19 UNION STREET
P.O. BOX 92
SCITUATE, MA 02066
(781) 545-0895

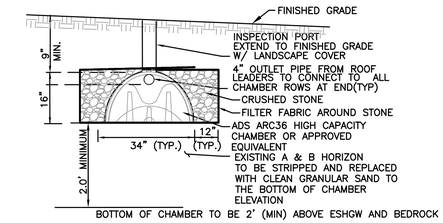
42.12N
70.44W

PROJECT: 4 SINGLE FAMILY ANR LOTS OFF OF MANN LOT ROAD & CREELMAN DRIVE (PORTION OF PARCEL: 25-2-3 & 25-2-4) SCITUATE, MASSACHUSETTS	DESIGN: JMH
	JOB NO: 15-136
	DATE: 6/13/16
OWNER: CREEL-MANN REALTY TRUST 17 NEW DRIFTWAY SCITUATE, MA 02066	REV:
PLAN TITLE: WATERSHED DELINEATION PLAN	SHEET: WS-1



ROOF DRYWELL SYSTEM DETAIL

SCALE: N.T.S.

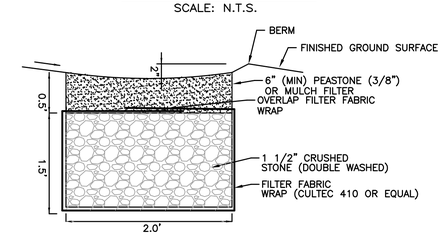


ROOF DRYWELL NOTES:

1. ALL ROOF LEADERS SHALL BE EQUIPPED WITH DOWNSPOUT STRAINERS AND OVERFLOW RELIEF TO SURFACE.
2. NO CONSTRUCTION ACTIVITY (TRAFFIC) SHALL BE ALLOWED OVER THE ROOF DRYWELL AREA.
3. ALL ROOF LEADERS FROM THE STRUCTURES SHALL BE DIRECTED TO THE SUBSURFACE ROOF DRYWELL SYSTEMS.
4. THE SUBSURFACE DRYWELL SYSTEM SHALL BE LOCATED A MINIMUM OF 10' FROM THE FOUNDATION, 10' FROM PROPERTY LINES & 25' FROM SEPTIC LEACHING FIELDS.
5. BACKFILL CHAMBERS WITH WASHED CRUSHED STONE FOR 1.0' AROUND.
6. THE CONTRACTOR SHALL EXCAVATE TESTPITS DURING CONSTRUCTION IN THE VICINITY OF THE ROOF DRYWELLS TO VERIFY SEPARATION TO GROUNDWATER. TESTPITS SHALL BE WITNESSED BY A LICENED DEP SOIL EVALUATOR.

CRUSHED STONE TRENCH

SCALE: N.T.S.



PREPARED BY:
MORSE ENGINEERING CO., INC.
19 UNION STREET
P.O. BOX 92
SCITUATE, MA 02066
(781) 545-0895

PROJECT:	4 SINGLE FAMILY ANR LOTS OFF OF MANN LOT ROAD & CREELMAN DRIVE (PORTION OF PARCEL: 25-2-3 & 25-2-4) SCITUATE, MASSACHUSETTS
OWNER:	CREEL-MANN REALTY TRUST 17 NEW DRIFTWAY SCITUATE, MA 02066
PLAN TITLE:	PLAN TO ACCOMPANY STORMWATER PERMIT APPLICATION
DESIGN:	JMH
JOB NO:	15-136
DATE:	6/13/16
REV:	
SHEET:	1 OF 1