STORMWATER REPORT

COREY'S WAY MODIFIED SUBDIVISION
HINGHAM, MA

FEBRUARY 25, 2010

Applicant:

Shepard Investments, LLC
c/o Robert Shepard
37 Derby Street
Suite One
Hingham, MA 02043

Locus:

213 Cushing Street
Hingham, MA

COMMONWEALTH OF MASSACHUSETTS
GREGORY
CIVIL
NO. 37219
REGISTERED
PROFESSIONAL ENGINEER

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Engineer of Record:

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PART I
INTRODUCTION

1.0 Project Narrative

The site consists of two single family residential lots having an address of 213 Cushing Street in Hingham, MA. The site is a vacant site, predominantly wooded, located on the west side of Cushing Street approximately 350' south of LeClair Drive.

The project proposes to create frontage for two buildable lots by modifying an old subdivision plan that was approved in 1965, but was never constructed. The proposed work will be kept 100 feet from a BVW that is currently approved under an ORAD. The BVW is located in the back wester portions of the site.

The proposed activities are entirely located in a FEMA flood zone "Zone X". Work residing within the "Zone X" simply means the work is not located in the 100' year flood plain. The "Zone AE" simply means that any area of the site within this zone is located in the 100' year flood plain. The "AE" designation means that the flood zone is not subject to the hazards of wave action, and the 54 designation means that the flood waters of the flood zone will rise to an elevation 54 feet above mean sea level. The current FEMA Map 25023C0084J, dated July 17, 2012, located in Appendix A confirms that construction proposed for the project is not within the 100 year flood plain.

The general topographic lay of the site consists of steep grades from glaciated outwash moraines sloping from the central regions of the site to the wetland area. Some portions of the site had ledge outcropping but only to a minor extent.

The proposed project will provide safety to the occupants of the proposed dwellings as well as mitigating measures to bring the current condition into compliance.

1.1 Regulatory Jurisdiction

The proposed activities fall under the jurisdiction of the Town of Hingham's Rules and regulations for the subdivision of land as well as subdivision control law.

The site is located in the Residence C Zoning district.

The site is partly located in the Town of Hingham Accord Pond Watershed and Aquifer Protection District The project is not located near an ORW, ACEC, NHESP, or Zone A. The project is located in a Zone II Aquifer Protection District, as mapped by the DEP. The pertinent figures that serve to verify the above claims can be found in Appendix A of this report. Since the project is not proposing work in the jurisdiction of the Conservation Commission, the project is not subject to the DEP Stormwater management policy.

PART II

RUNOFF ANALYSIS AND PERFORMANCE STANDARDS

EROSION CONTROL

1.1 Definition of Standard

Chapter 1 in Volume 1 of the Massachusetts Stormwater Management Policy defines Standard 1 as the following:

No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

1.2 Explanation of Standard

It is important to note that Standard 1 does allow direct discharges into waters and wetlands of the Commonwealth provided the discharge is adequately treated. The term "*adequately treated*" refers to the implementation of stormwater management systems that are specifically designed to achieve sediment and contaminate removal rates that adequately protect groundwater, surface waters and wetlands in accordance with all applicable statutes, regulations, permits, and approvals, and the 10 applicable BMP Standards of the Stormwater Management Policy.

The last portion of the definition of Standard 1 addresses erosion into the waters and wetlands of the Commonwealth. This part of the definition is merely stating that there must be no wearing away or erosion of soil or land surface in excess of natural conditions. Outfalls must be designed to protect the ground surface area between the outfall and the receiving water form scour and erosion. This is typically accomplished by using riprap aprons, level spreaders or other protective devices lending themselves to the site specific characteristics of the outfall. The DEP Stormwater Handbook states the evaluation of scour or erosion should be based upon velocities generated from the 2 year 24 hour storm for sheet flow conditions.

1.3 Identification of Outfalls

The outfalls proposing discharges into wetlands or water ways of the Commonwealth for this project are identified as follows:

Outfall 1: Overland discharge from a portion of the existing watershed discharging to Cushing Street. (To Design Point 1).

Outfall 2: Discharge from Drywell 1 overflow pipe and overland flow from undisturbed areas of the watershed. (To Design Point 2).

Outfall 3: Discharge from Drywell 3 overflow pipe and overland flow from undisturbed areas of the watershed. (To Design Point 3).

Outfall 4: Discharge from Drywell 4, no overflow pipe associated with this drywell, just overland flow from undisturbed areas of the watershed. (To Design Point 5).

Outfall 5: Discharge to IVW. No alterations to the watershed are proposed, hence no proposed new outfalls are proposed. (To Design Point 5).

1.4 Treatments at Outfalls

The treatment provided at the outfalls of reducing or eliminating the discharge and their associated velocities of the stormwater below the thresholds of the velocities capable of causing erosion to the soil types present on site. A sandy soil type having an 8% slope is capable of resisting erosion up to velocities of 4 FPS. The stormwater runoff analysis concludes the exit velocities from these outfalls area less than 4 FPS as the highest discharge velocity of the outfall is only .1 FPS and that is from the 2 yr storm. This discharge is to Design Point 1 which is over a paved surface and stabilized surface. All other outfalls have a zero discharge and all outfalls are outside the 100' buffer to the wetland, hence the project meets the performance standards for erosion control. The following is an excerpt from the DEP Stormwater Handbook found in Vol. 1 Chptr. 2 Pgs 2&3:

> Stormwater Discharge Velocity: Determine maximum discharge or velocity at each outlet for all conveyances. The maximum discharge or velocity is dependent on the size of the conveyance. Include gravitational forces in the computations when proposing to discharge stormwater above the receiving practice. Tailwater conditions in the receiving wetland must also be factored into the analysis. For sheet flow, the maximum velocity to evaluate is the runoff from the 2-year 24-hour storm. Engineers shall select an accepted method to determine maximum velocity.
>
> Ability of Ground Surface to Resist Erosion: Determine ability of ground or lining materials to resist erosion from the velocity computed in part (a). Banks opposite a stormwater discharge point may need to be evaluated to assess their ability to resist scour when banks are close to the outlets (e.g., a narrow stream channel). This may be done by performing computations to estimate the size/weight of stone or bioengineered materials needed to resist the force of water or comparing the discharge velocity against a "permissible velocity table" that provides information on the ability of different types of materials/vegetation to resist shear.

The references that follow include several different computational methods and permissible velocity tables that are acceptable.

Channel Slope	Lining[1]	Permissible Velocity (feet/second)
0 - 5%	Tall fescue Kentucky bluegrass	5
	Grass-legume mixture	4
	Red fescue Redtop Sericea lespedeza Annual lespedeza Small grains	2.5
5 - 10%	Tall fescue Kentucky bluegrass	4
	Grass-legume mixture	3
Greater Than 10%	Tall fescue Kentucky bluegrass	3

1.5 Conclusion

Standard 1 has been achieved as the project has implemented and designed BMP stormwater control structures capable of treating the stormwater to the levels prescribed in the other applicable BMP Standards of the Stormwater Management Policy even though they are not required. The BMP structures have been designed to recharge most the prescribed water volumes associated with the soil types present on the site.

Erosion control measures have been achieved through the use of the following approved BMP Structures:

Source Reduction
BMP infiltration trenches
Recharge structures

The above control structures were designed in accordance with the provisions of the Massachusetts Stormwater Management Policy to ensure that erosion problems do not occur.

STORMWATER RUNOFF ANALYSIS

2.1 Definition of Standard

Chapter 1 in Volume 1 of the Massachusetts Stormwater Management Policy defines Standard 2 as the following:

Stormwater management systems shall be designed so that the post development peak discharge rates are equal to the pre development rates.

2.2 Explanation of Standard

The DEP's definition is quite clear, the project can't increase the stormwater discharges off site in the proposed condition from those of the existing condition. However the DEP doesn't hold applicants to this standard if the receiving waters are tidal. This issue is not applicable to this project as the receiving waters are all inland. The rainfall distributions used in the hydrologic model are the rainfall distributions of Technical Paper 40.

2.3 Description of Soils Present On-Site

Soils are classified into one of four hydrologic soil groups (HSG's) in order to give a general indication of the infiltration rate for the soil type. The HSG's are A, B, C and D, and range from soils that have very high infiltration rates and low runoff potential, to soils that have very low infiltration rates and high runoff potential. Hydrologic Group A soils have very good infiltration characteristics and produce low levels of stormwater runoff. Group B soils produce moderately higher levels of stormwater runoff. Group C soils have poor infiltration characteristics and produce high levels of stormwater runoff. Group D soils produce the highest levels of stormwater runoff and have the poorest levels of infiltration. For a more complete description of the HSG's, refer to Technical Release 55 (TR-55) issued by The Soil Conservation Service (SCS).

Hydrologic soil group boundaries in Massachusetts were delineated by the Soil Conservation Service and are mapped on soil survey maps for each county. The soil boundaries of these maps were superimposed over the boundaries of the site and are illustrated on the watershed plans in Appendix C. The SCS soil maps revealed very sandy outwash soil conditions and igneous and metamorphic rock outcrops. A soil divide exists on the site dividing the lot in half running front to back where the Canton Rock Outcrop-Hollis Complex (HSG B) soil abuts the Quonset Complex soil. The hydrologic model used a HSG type A in conjunction with the vegetative cover conditions to produce a runoff curve number (RCN). The hydrologic model uses these RCN's to estimate the amount of surface runoff that will be produced by various onsite soil and vegetated cover conditions. Significant ledge outcroppings were also factored into the RCN computations.

2.4 Description of Vegetative Covers Present On-Site

The existing topographic cover of the site consists mostly of mature trees growing up around the a few ledge out crops. The tree cover varies from good to poor throughout the site but is predominantly a good tree cover condition. The average tree cover could thus be described as being in a "Good" condition. The existing lawn area was marginally maintained as these lawn area reside at the limits of the site boundaries. The topographic cover was determined by field survey and site visits, and is identified by descriptions found in Table 2-2 of TR-55.

2.5 Description of On-Site Subcatchment Divides

subcatchment Divides or Drainage Divides as they are sometimes referred to as are limits of watershed boundaries. Small watersheds such as the ones that exist on the site are tributary areas for which stormwater runoff will discharge to a specific point of interest. The drainage divides are illustrated on the watershed plans found in Appendix C and are further described in sections 2.270 &2.271 of this report.

2.6 Design points

A design point is a down gradient point of interest such as an abutting property line, or a resource area for which the pre development and post development stormwater discharge rates are obtained and compared. A typical stormwater analysis will consist of three design storms, the 2, 10 and 100 year storms. The post development stormwater discharge rates at each of the design point in the analysis must be less than or equal to the stormwater discharge rates of the pre development condition for the 2 and 10 year design storm events. The post development discharge may exceed the pre development condition in the 100 year storm event, if it is obvious that a flooding condition will not occur.

This analysis has five design points as identified below:

Design Point 1: This is the discharge to Cushing Street. (It assess the impact of runoff coming off the site to Cushing Street.

Design Point 2: This is the discharge crossing the northerly property line via overland flow. (It assess the impact of runoff discharging to the abutter to the north.)

Design Point 3: This is the discharge to the southerly property line via the wetland.

Design Point 4: This is the discharge to the westerly property line via the wetland.

Design Point 5: This is the discharge to the IVW in the westerly portion of the site.

2.7 Pre Development Condition

The pre development condition consists of 5 watershed areas referred to as PRE 1, PRE 2, PRE 3, PRE 4 and PRE 5. These watershed areas discharge to the corresponding design points identified above. The analysis has obtained the peak rates of runoff at these design points from the predevelopment calculations preformed in this analysis which are compared with the peak rates of discharge of the post development condition.

2.8 Post Development Condition

The post development condition consists of eight watershed areas. These watershed areas are named PST 1, PST 2, PST 2A, PST 3, PST 3A, PST 3B, PST 4, PST 5, PST 6, and PST 7. Watershed PST 1, 2, 3, 4, & 5 discharge to the corresponding Design Points 1, 2, 3, 4, & 5 just like in the predevelopment portion of the analysis. The other subcatchment areas do not directly discharge to any of the design points as they are captured by the proposed drainage system and are then treated and recharged on site. The stormwater discharges generated by the 2, 10, and the 100 year design storms are retained by the proposed subsurface stormwater recharge system. The remaining watersheds tributary to each of the three described design points are un-contaminated by pavement and are thus considered clean. These three post development watersheds that are tributary to their respective design points have been

reduced in size as a result of the area intercepted and captured by the proposed sub surface stormwater recharge system. The peak discharge rates have been mitigated as the post development peak discharge rates at each design point are less than or equal to those of the pre development condition.

The watershed plans located in Appendix "C" of this report clearly identify the subcatchment areas for both the pre and the post development condition and their associated design points to illustrate that the performance standards required by BMP Standard 2 have been satisfied.

2.9 Hydrologic Analysis Calculations

Format

The calculations of this report were generated by HydroCAD software. HydroCAD is a Computer Aided Design system for modeling the hydrology and hydraulics of stormwater runoff. It analysis runoff by a method which is based largely on the hydrology techniques developed by the Soil Conservation Service (SCS/NRCS) also known as TR-20, combined with other hydrology and hydraulics calculations. For a given rainfall event, these techniques are used to generate hydrographs throughout a watershed. Typically, this allows the engineer to verify that a given drainage system is adequate for the drainage areas that will ultimately be routed through that drainage system and will also determine the post development runoff impacts of the pre and post development conditions. The regulations require that the analysis be modeled with the TR-20 method, thus the HydroCAD software conforms to the stormwater bylaw.

SCS Unit Hydrograph Method

The SCS unit hydrograph procedure (also known as the TR-20 runoff method) generates a runoff hydrograph by the following basic steps: (For brevity, the following is a simplified description.)

1) A rainfall distribution is selected which indicates how the stormwater depth will be distributed over time. This is usually a standardized distribution, such as the SCS Type III storm, and often has a standardized duration of 24 hours.

2) The design storm rainfall depth is determined from rainfall distribution maps produced by the Cornell Method, based on the return period being modeled. Combined with the rainfall distribution, this specifies the cumulative rainfall depth at all times during the storm.

3) Based on the Time-of-Concentration, the storm is divided into "bursts" of equal duration. For each burst, the SCS runoff equation and the average Curve Number are used to determine the portion of that burst that will appear as runoff.

4) A Unit Hydrograph, in conjunction with the Time-of-Concentration, is used to determine how the runoff from a single burst is distributed over time. The result is a complete runoff hydrograph for a single burst.

5) Individual hydrographs are added together for all bursts in the storm, yielding the complete runoff hydrograph for the storm.
For a Tc of 7.5 minutes, the burst duration is 1 minute, so a 24-hour storm will consist of 1440 bursts. If each burst involves a unit hydrograph of 100 coordinates, then 140,000 coordinates must be summed to produce the composite hydrograph.

2.10 Summary of Hydrologic Analysis Results

Comparative discharge charts

The tables listed below illustrate how the peak discharges for the three design storms have been mitigated for the design points of the analysis.

DESIGN POINT 1
CUSHING STREET
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.15	0.17
10	0.74	0.46
100	2.11	1.45

DESIGN POINT 2
NORTHERLY PROPERTY LINE
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.08	0.04
10	0.50	0.26
100	1.55	0.88

DESIGN POINT 3
SOUTHERRLY PROPERTY LINE
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.00	0.00
10	0.00	0.00
100	0.04	0.03

Comparative discharge charts

The tables listed below illustrate how the peak discharges for the three design storms have been mitigated for the design points of the analysis.

DESIGN POINT 1
CUSHING STREET
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.15	0.17
10	0.74	0.46
100	2.11	1.45

DESIGN POINT 2
NORTHERLY PROPERTY LINE
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.08	0.04
10	0.50	0.26
100	1.55	0.88

DESIGN POINT 3
SOUTHERRLY PROPERTY LINE
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.00	0.00
10	0.00	0.00
100	0.04	0.03

DESIGN POINT 4
WESTERRLY PROPERTY LINE
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.00	0.000
10	0.00	0.001
100	0.07	0.017

DESIGN POINT 5
ON SITE IVW
PEAK DISCHARGE RATES

Storm Frequency T-year Interval	Pre-Development Conditions (cfs)	Post-Development Conditions (cfs)
2	0.00	0.00
10	0.01	0.01
100	0.20	0.20

Comparative Total Discharge Volume Charts
The tables listed below illustrate how the discharge volumes of runoff for the three design storms have been mitigated for the design points of the analysis.

DESIGN POINT 1
CUSHING STREET
TOTAL DISCHARGE VOLUMES

Storm Frequency T-year Interval	Pre-Development Conditions (AF)	Post-Development Conditions (AF)
2	0.260	0.193
10	0.452	0.361
100	0.908	0.773

DESIGN POINT 2
NORTHERLY PROPERTY LINE
TOTAL DISCHARGE VOLUMES

Storm Frequency T-year Interval	Pre-Development Conditions (AF)	Post-Development Conditions (AF)
2	0.013	0.007
10	0.045	0.024
100	0.118	0.062

DESIGN POINT 3
SOUTHERRLY PROPERTY LINE
TOTAL DISCHARGE VOLUMES

Storm Frequency T-year Interval	Pre-Development Conditions (AF)	Post-Development Conditions (AF)
2	0.000	0.000
10	0.000	0.000
100	0.019	0.014

DESIGN POINT 4
WESTERRLY PROPERTY LINE
TOTAL DISCHARGE VOLUMES

Storm Frequency T-year Interval	Pre-Development Conditions (AF)	Post-Development Conditions (AF)
2	0.000	0.000
10	0.001	0.000
100	0.017	0.000

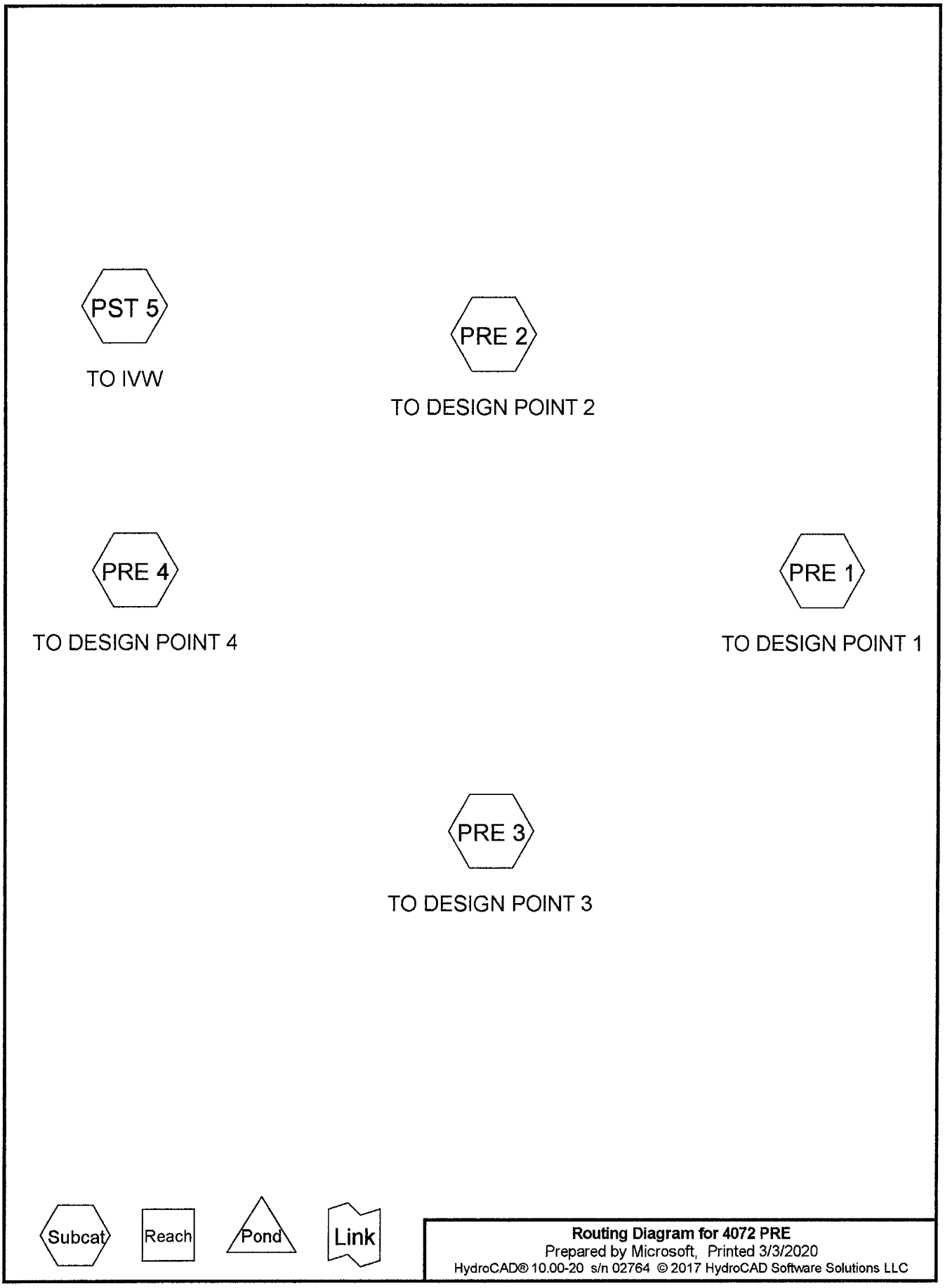
DESIGN POINT 5
ON SITE IVW
TOTAL DISCHARGE VOLUMES

Storm Frequency T-year Interval	Pre-Development Conditions (AF)	Post-Development Conditions (AF)
2	0.000	0.000
10	0.004	0.004
100	0.034	0.034

The results of this analysis indicate that the proposed drainage system will reduce the peak flow and volume of discharge of stormwater off site to below that of the pre development condition. These reductions are shown for the 2-year, 10-year, and 100-year rainfall events. The results shown above satisfy the requirements of DEP Stormwater Management Regulations and the performance standards prescribed in the Hingham Rules and Regulations Governing the Subdivision of Land.

2.11 Pre Development Analysis Calculations

PRE DEVELOPMENT ANALYSIS CALCULATIONS



Routing Diagram for 4072 PRE
Prepared by Microsoft, Printed 3/3/2020
HydroCAD® 10.00-20 s/n 02764 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.210	68	<50% Grass cover, Poor, HSG A (PRE 1)
0.157	39	>75% Grass cover, Good, HSG A (PRE 1)
0.202	61	>75% Grass cover, Good, HSG B (PRE 1)
0.071	72	Dirt roads, HSG A (PRE 1)
0.009	82	Dirt roads, HSG B (PRE 1)
0.023	98	Paved parking, HSG A (PRE 1)
0.031	98	Unconnected roofs, HSG A (PRE 1)
0.047	78	WETLAND (PST 5)
0.041	36	Woods, Fair, HSG A (PRE 1, PRE 2, PRE 4)
0.180	60	Woods, Fair, HSG B (PRE 1, PRE 2)
2.559	30	Woods, Good, HSG A (PRE 1, PRE 2, PRE 3, PRE 4, PST 5)
0.709	55	Woods, Good, HSG B (PRE 2, PST 5)
0.412	45	Woods, Poor, HSG A (PRE 1, PRE 3, PRE 4)
0.087	66	Woods, Poor, HSG B (PRE 1, PRE 2)
4.737	**42**	**TOTAL AREA**

2 YEAR STORM

Summary for Subcatchment PRE 1: TO DESIGN POINT 1

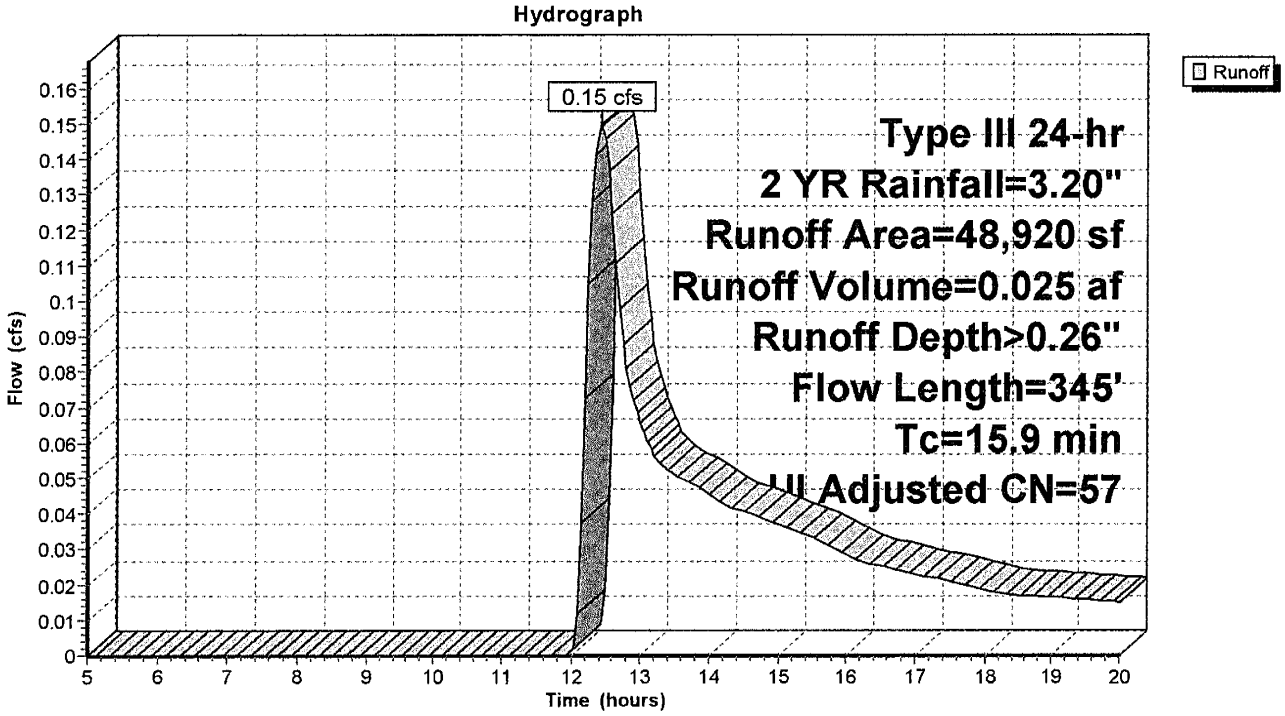
Runoff = 0.15 cfs @ 12.44 hrs, Volume= 0.025 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Adj	Description
6,838	39		>75% Grass cover, Good, HSG A
8,789	61		>75% Grass cover, Good, HSG B
9,144	68		<50% Grass cover, Poor, HSG A
993	98		Paved parking, HSG A
1,356	98		Unconnected roofs, HSG A
3,080	72		Dirt roads, HSG A
410	82		Dirt roads, HSG B
721	36		Woods, Fair, HSG A
2,935	60		Woods, Fair, HSG B
98	30		Woods, Good, HSG A
11,315	45		Woods, Poor, HSG A
3,241	66		Woods, Poor, HSG B
48,920	58	57	Weighted Average, UI Adjusted
46,571			95.20% Pervious Area
2,349			4.80% Impervious Area
1,356			57.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0132	0.06		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.2	252	0.0459	3.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
0.1	43	0.0738	5.51		**Shallow Concentrated Flow, SEG 3** Paved Kv= 20.3 fps
15.9	345	Total			

Subcatchment PRE 1: TO DESIGN POINT 1



Summary for Subcatchment PRE 2: TO DESIGN POINT 2

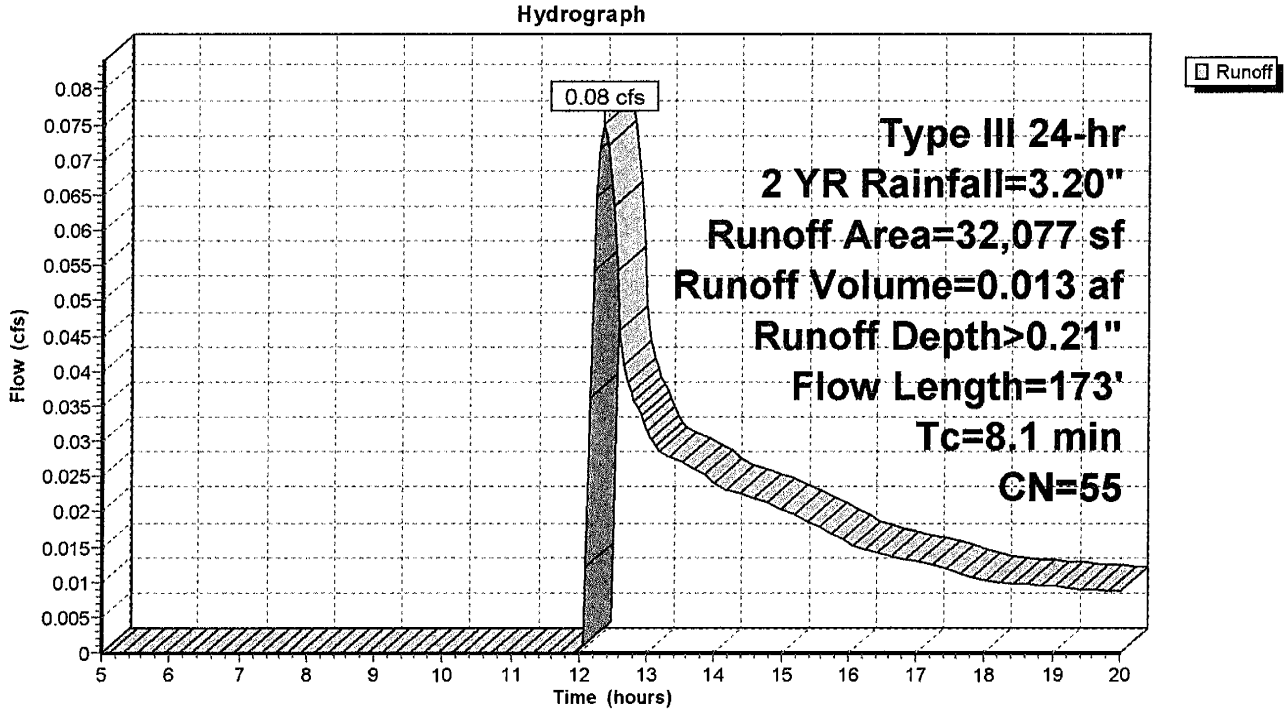
Runoff = 0.08 cfs @ 12.37 hrs, Volume= 0.013 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
130	36	Woods, Fair, HSG A
4,905	60	Woods, Fair, HSG B
580	30	Woods, Good, HSG A
25,919	55	Woods, Good, HSG B
543	66	Woods, Poor, HSG B
32,077	55	Weighted Average
32,077		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	123	0.1580	1.99		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
8.1	173	Total			

Subcatchment PRE 2: TO DESIGN POINT 2



Summary for Subcatchment PRE 3: TO DESIGN POINT 3

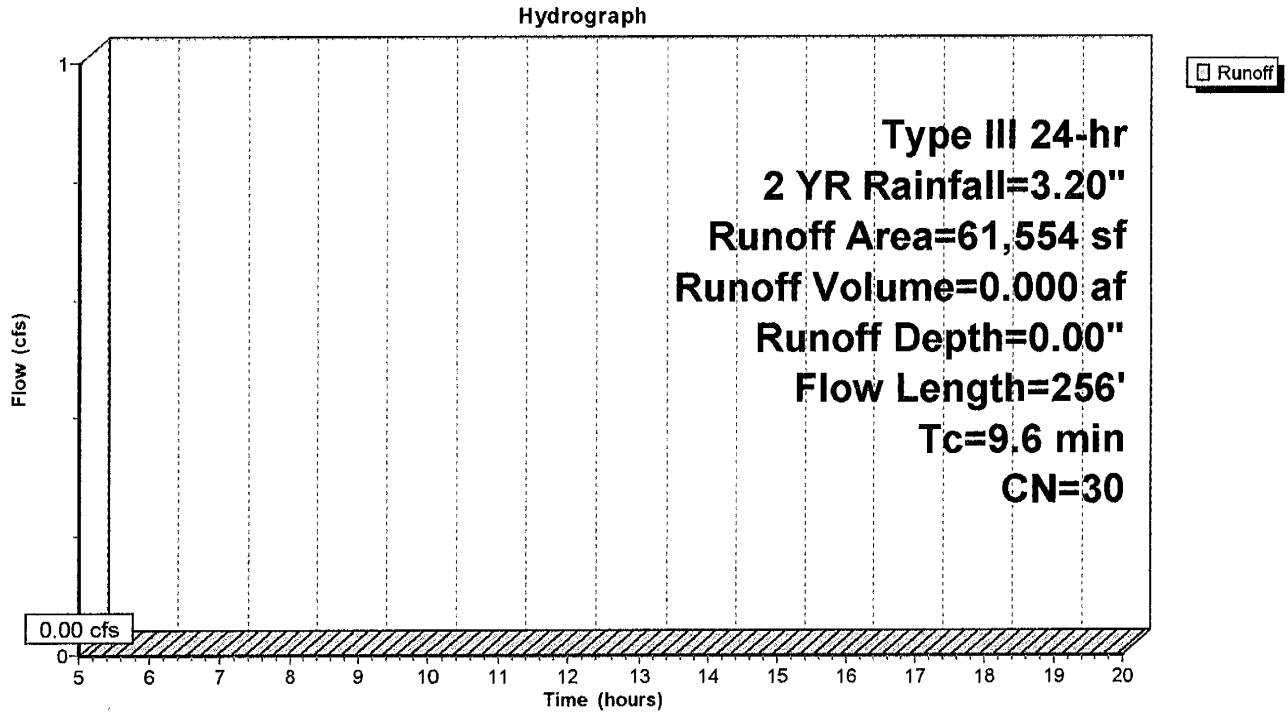
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
60,812	30	Woods, Good, HSG A
742	45	Woods, Poor, HSG A
61,554	30	Weighted Average
61,554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0686	0.11		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	206	0.1045	1.62		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
9.6	256	Total			

Subcatchment PRE 3: TO DESIGN POINT 3



Summary for Subcatchment PRE 4: TO DESIGN POINT 4

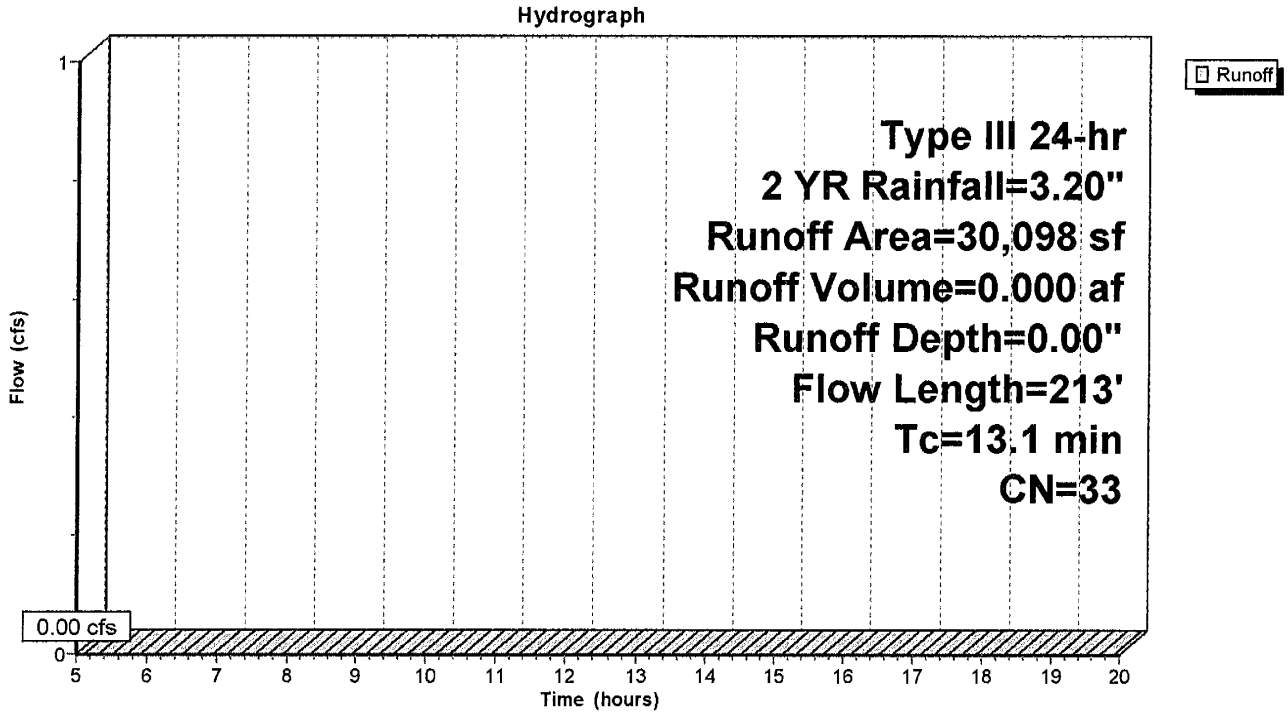
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
935	36	Woods, Fair, HSG A
23,290	30	Woods, Good, HSG A
5,873	45	Woods, Poor, HSG A
30,098	33	Weighted Average
30,098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PRE 4: TO DESIGN POINT 4



Summary for Subcatchment PST 5: TO IVW

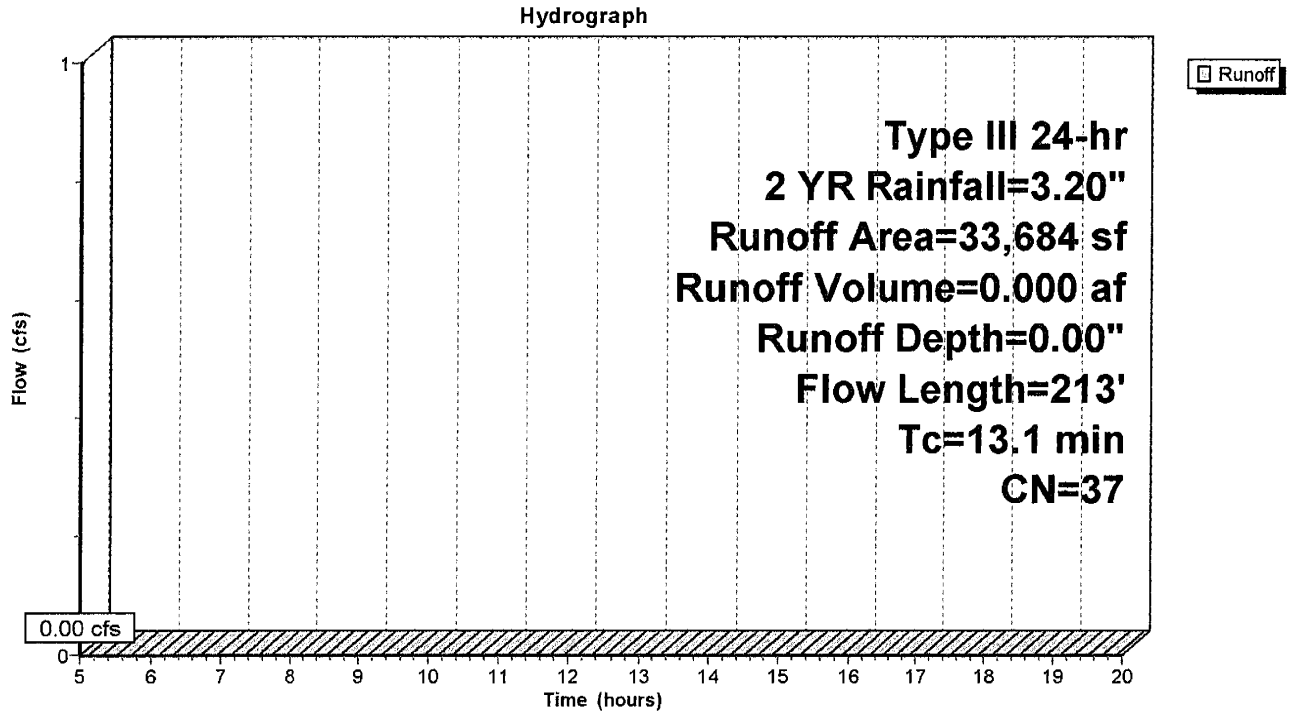
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,680	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,684	37	Weighted Average
	33,684		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



10 YEAR STORM

Summary for Subcatchment PRE 1: TO DESIGN POINT 1

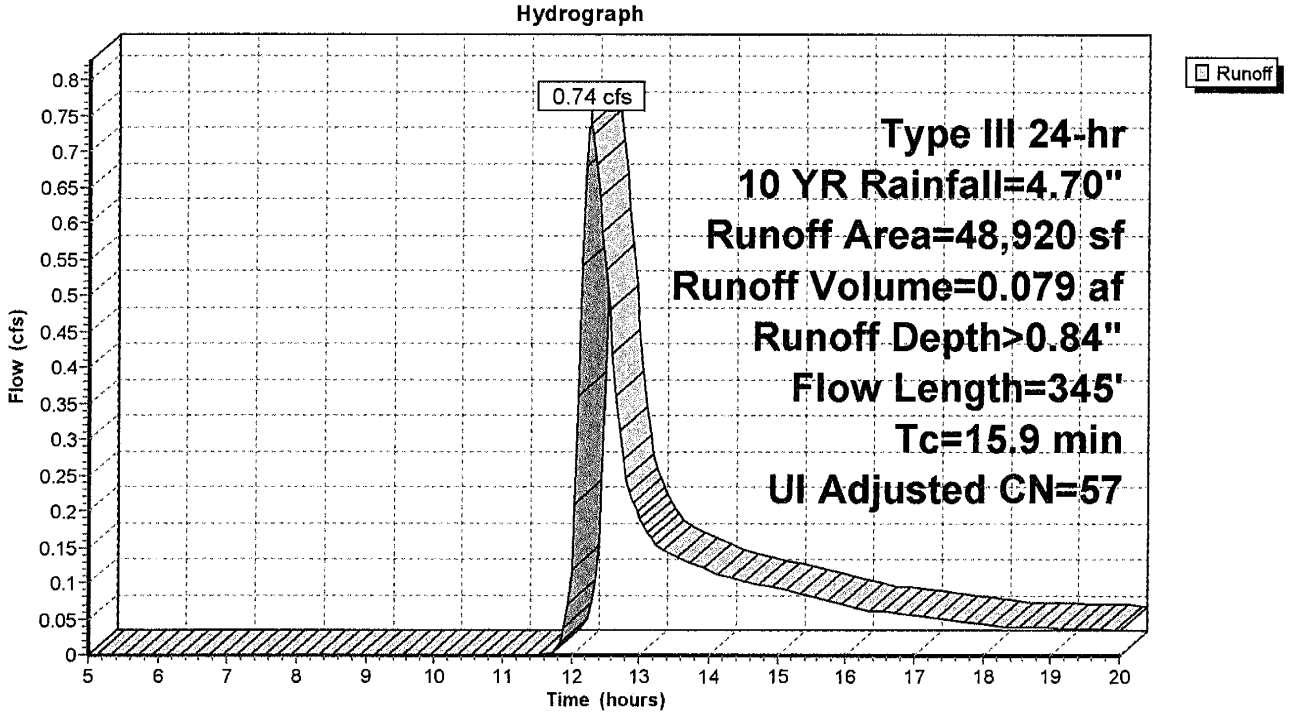
Runoff = 0.74 cfs @ 12.27 hrs, Volume= 0.079 af, Depth> 0.84"

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

Area (sf)	CN	Adj	Description
6,838	39		>75% Grass cover, Good, HSG A
8,789	61		>75% Grass cover, Good, HSG B
9,144	68		<50% Grass cover, Poor, HSG A
993	98		Paved parking, HSG A
1,356	98		Unconnected roofs, HSG A
3,080	72		Dirt roads, HSG A
410	82		Dirt roads, HSG B
721	36		Woods, Fair, HSG A
2,935	60		Woods, Fair, HSG B
98	30		Woods, Good, HSG A
11,315	45		Woods, Poor, HSG A
3,241	66		Woods, Poor, HSG B
48,920	58	57	Weighted Average, UI Adjusted
46,571			95.20% Pervious Area
2,349			4.80% Impervious Area
1,356			57.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0132	0.06		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.2	252	0.0459	3.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
0.1	43	0.0738	5.51		**Shallow Concentrated Flow, SEG 3** Paved Kv= 20.3 fps
15.9	345	Total			

Subcatchment PRE 1: TO DESIGN POINT 1



Summary for Subcatchment PRE 2: TO DESIGN POINT 2

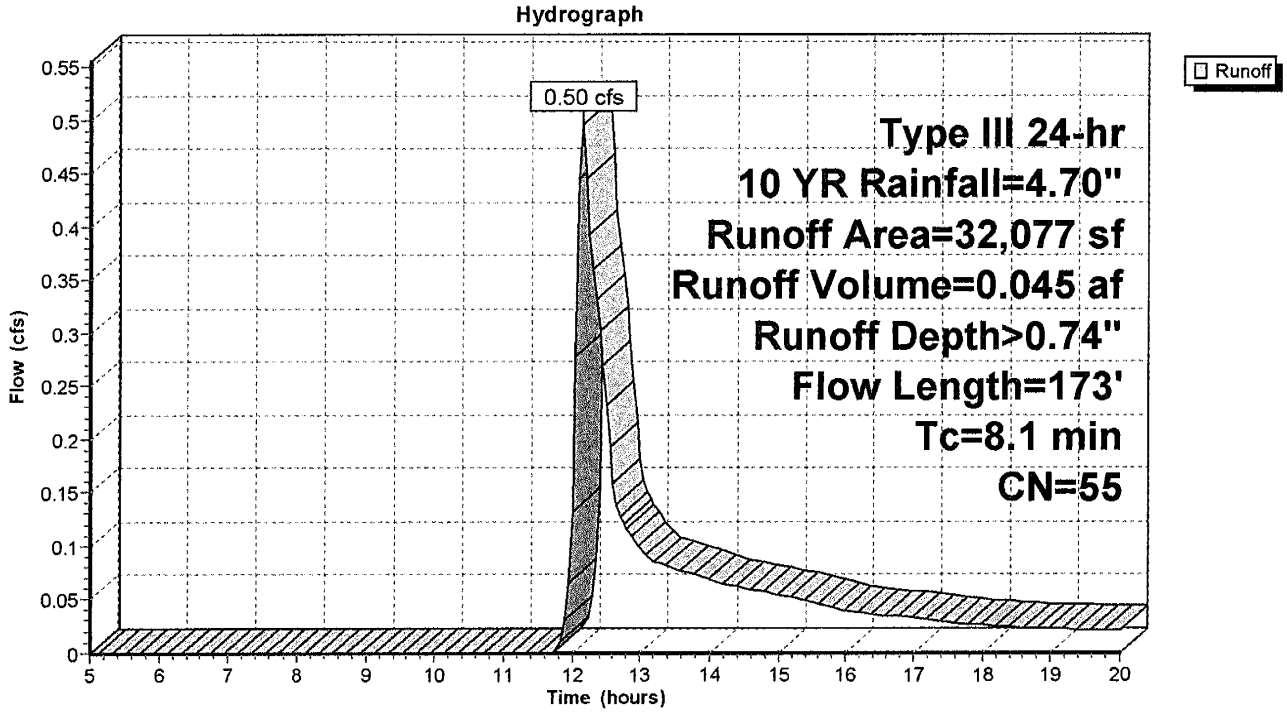
Runoff = 0.50 cfs @ 12.15 hrs, Volume= 0.045 af, Depth> 0.74"

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

Area (sf)	CN	Description
130	36	Woods, Fair, HSG A
4,905	60	Woods, Fair, HSG B
580	30	Woods, Good, HSG A
25,919	55	Woods, Good, HSG B
543	66	Woods, Poor, HSG B
32,077	55	Weighted Average
32,077		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	123	0.1580	1.99		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
8.1	173	Total			

Subcatchment PRE 2: TO DESIGN POINT 2



Summary for Subcatchment PRE 3: TO DESIGN POINT 3

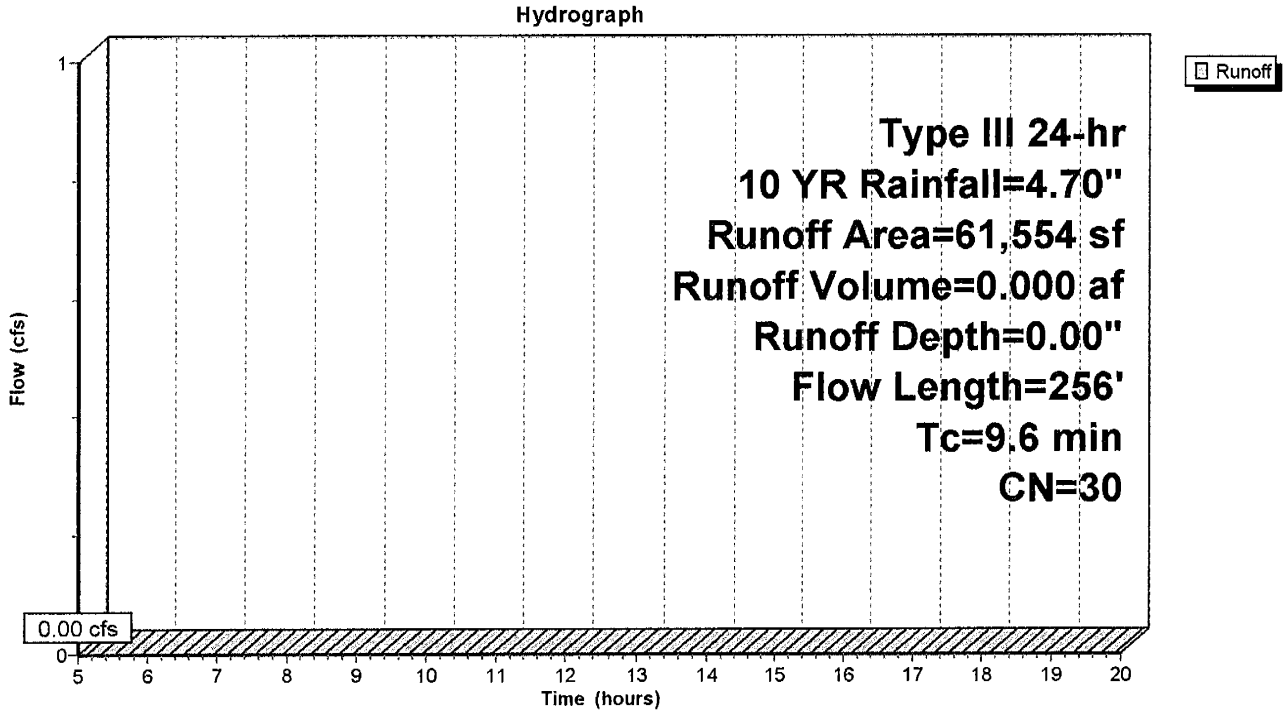
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

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

Area (sf)	CN	Description
60,812	30	Woods, Good, HSG A
742	45	Woods, Poor, HSG A
61,554	30	Weighted Average
61,554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0686	0.11		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	206	0.1045	1.62		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
9.6	256	Total			

Subcatchment PRE 3: TO DESIGN POINT 3



Summary for Subcatchment PRE 4: TO DESIGN POINT 4

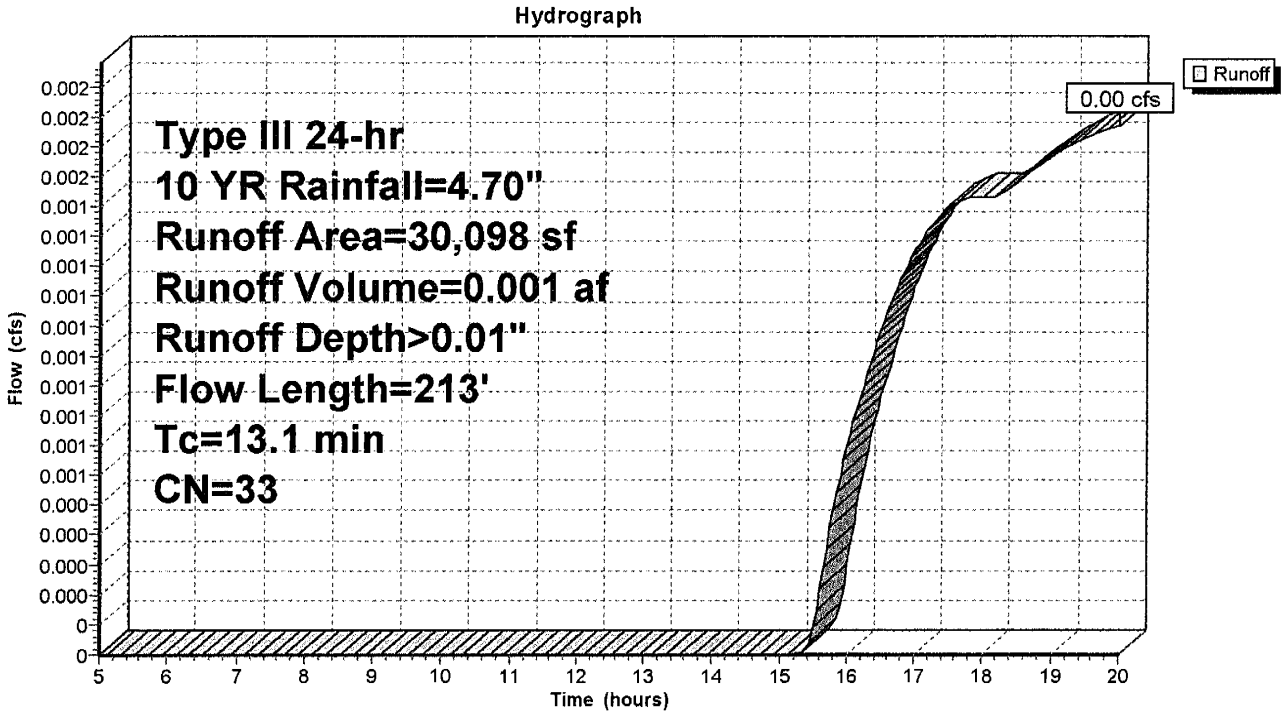
Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.01"

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

Area (sf)	CN	Description
935	36	Woods, Fair, HSG A
23,290	30	Woods, Good, HSG A
5,873	45	Woods, Poor, HSG A
30,098	33	Weighted Average
30,098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PRE 4: TO DESIGN POINT 4



Summary for Subcatchment PST 5: TO IVW

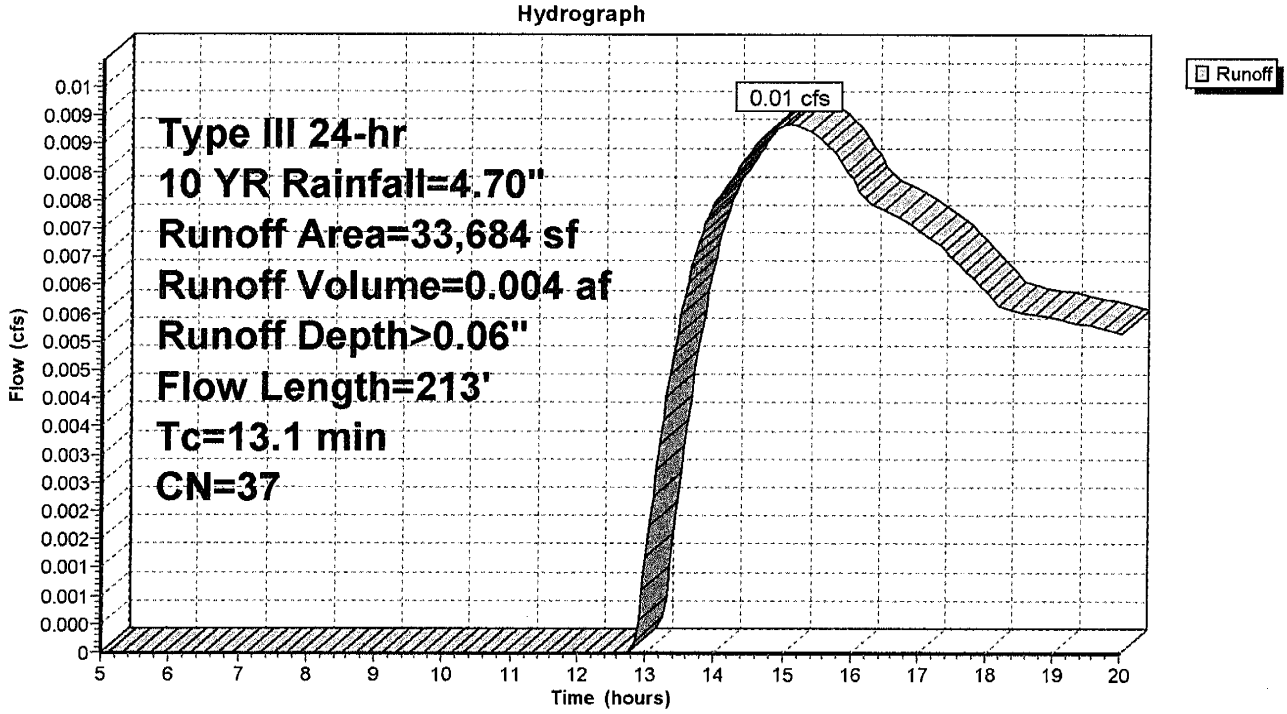
Runoff = 0.01 cfs @ 15.07 hrs, Volume= 0.004 af, Depth> 0.06"

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

	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,680	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,684	37	Weighted Average
	33,684		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



100 YEAR STORM

Summary for Subcatchment PRE 1: TO DESIGN POINT 1

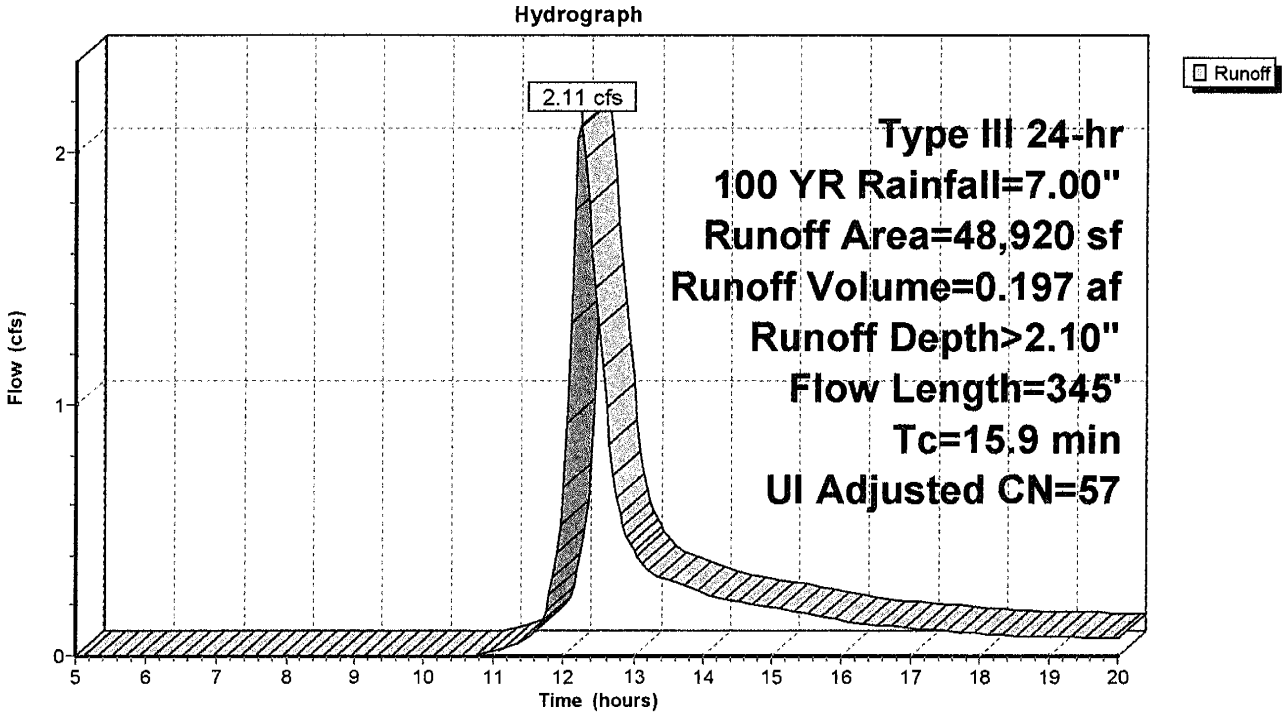
Runoff = 2.11 cfs @ 12.24 hrs, Volume= 0.197 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Adj	Description
6,838	39		>75% Grass cover, Good, HSG A
8,789	61		>75% Grass cover, Good, HSG B
9,144	68		<50% Grass cover, Poor, HSG A
993	98		Paved parking, HSG A
1,356	98		Unconnected roofs, HSG A
3,080	72		Dirt roads, HSG A
410	82		Dirt roads, HSG B
721	36		Woods, Fair, HSG A
2,935	60		Woods, Fair, HSG B
98	30		Woods, Good, HSG A
11,315	45		Woods, Poor, HSG A
3,241	66		Woods, Poor, HSG B
48,920	58	57	Weighted Average, UI Adjusted
46,571			95.20% Pervious Area
2,349			4.80% Impervious Area
1,356			57.73% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0132	0.06		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.2	252	0.0459	3.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
0.1	43	0.0738	5.51		**Shallow Concentrated Flow, SEG 3** Paved Kv= 20.3 fps
15.9	345	Total			

Subcatchment PRE 1: TO DESIGN POINT 1



Summary for Subcatchment PRE 2: TO DESIGN POINT 2

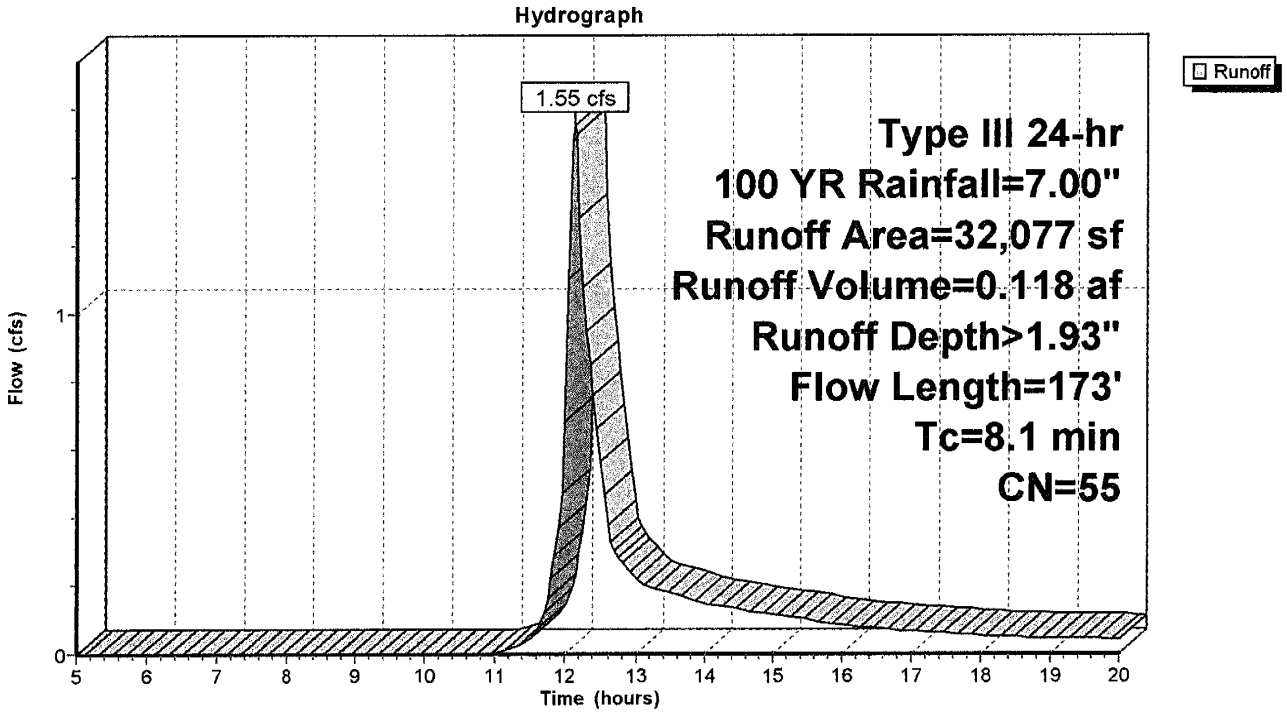
Runoff = 1.55 cfs @ 12.13 hrs, Volume= 0.118 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
130	36	Woods, Fair, HSG A
4,905	60	Woods, Fair, HSG B
580	30	Woods, Good, HSG A
25,919	55	Woods, Good, HSG B
543	66	Woods, Poor, HSG B
32,077	55	Weighted Average
32,077		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	123	0.1580	1.99		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
8.1	173	Total			

Subcatchment PRE 2: TO DESIGN POINT 2



Summary for Subcatchment PRE 3: TO DESIGN POINT 3

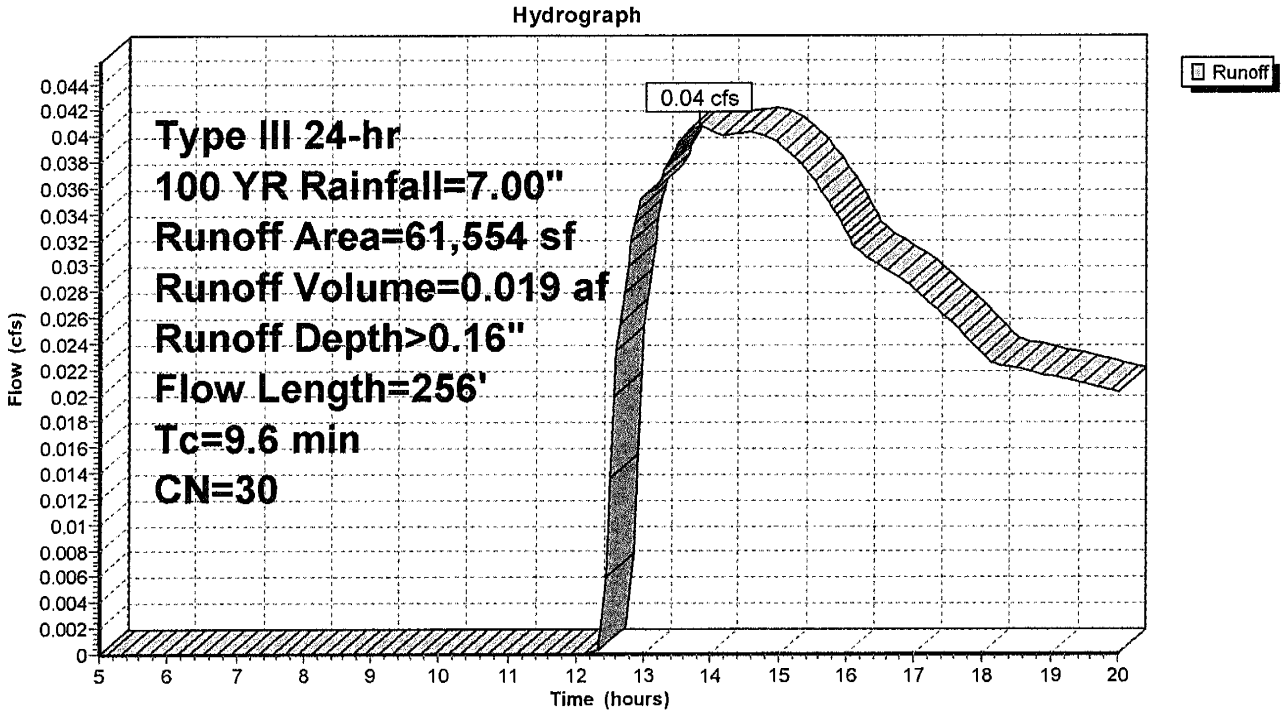
Runoff = 0.04 cfs @ 13.83 hrs, Volume= 0.019 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
60,812	30	Woods, Good, HSG A
742	45	Woods, Poor, HSG A
61,554	30	Weighted Average
61,554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0686	0.11		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	206	0.1045	1.62		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
9.6	256	Total			

Subcatchment PRE 3: TO DESIGN POINT 3



Summary for Subcatchment PRE 4: TO DESIGN POINT 4

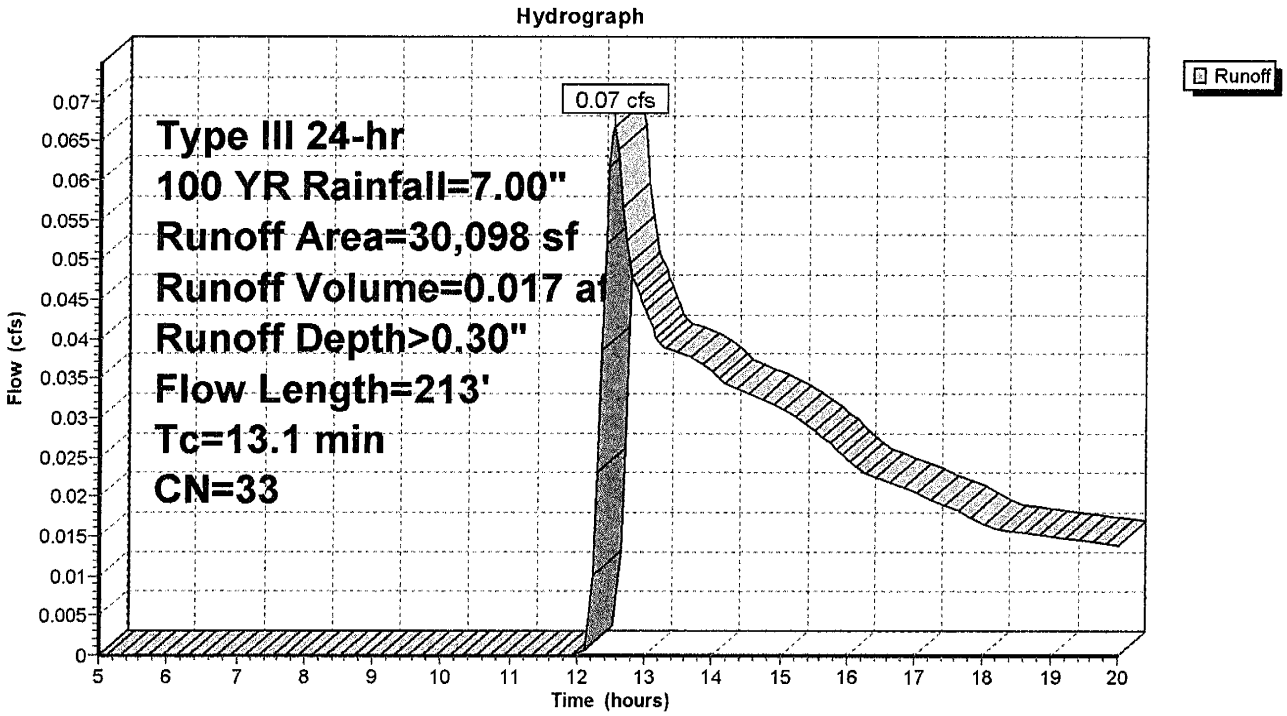
Runoff = 0.07 cfs @ 12.52 hrs, Volume= 0.017 af, Depth> 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
935	36	Woods, Fair, HSG A
23,290	30	Woods, Good, HSG A
5,873	45	Woods, Poor, HSG A
30,098	33	Weighted Average
30,098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PRE 4: TO DESIGN POINT 4



Summary for Subcatchment PST 5: TO IVW

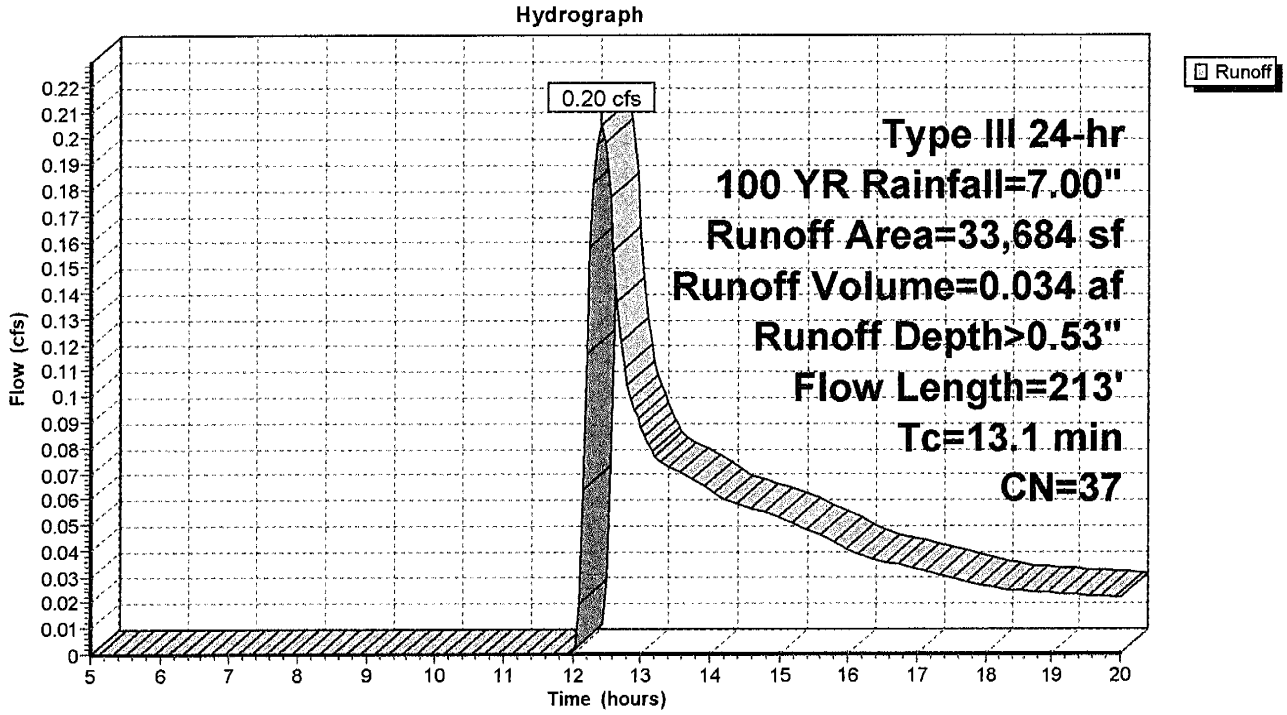
Runoff = 0.20 cfs @ 12.42 hrs, Volume= 0.034 af, Depth> 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

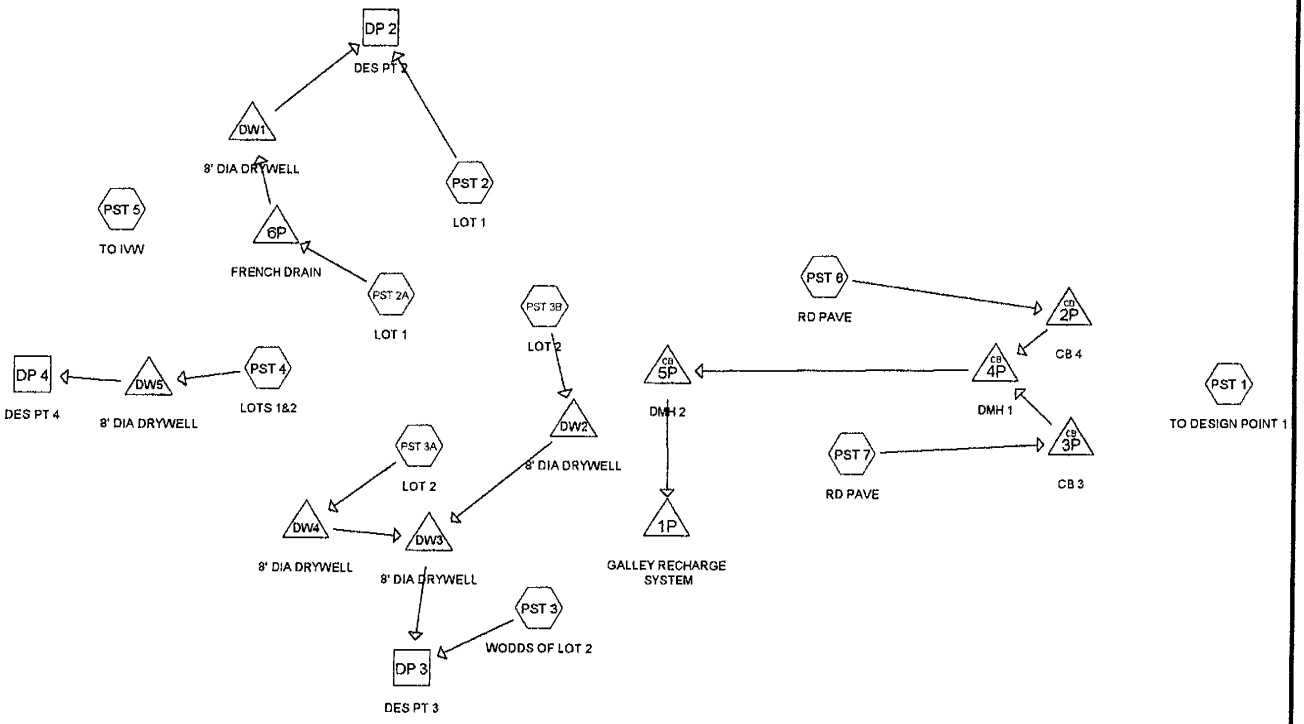
	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,680	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,684	37	Weighted Average
	33,684		100.00% Pervious Area

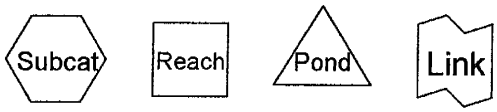
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



POST DEVELOPMENT ANALYSIS CALCULATIONS





Routing Diagram for 4072 PST
Prepared by Microsoft, Printed 3/3/2020
HydroCAD® 10.00-20 s/n 02764 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.005	39	>75% Grass cover, Good, HSG A (PST 1, PST 2A, PST 3A, PST 3B, PST 4, PST 6)
0.579	61	>75% Grass cover, Good, HSG B (PST 1, PST 2A, PST 6)
0.323	98	Paved parking, HSG A (PST 1, PST 3B, PST 6, PST 7)
0.147	98	Roofs, HSG A (PST 2A, PST 3A, PST 3B, PST 4, PST 6)
0.047	78	WETLAND (PST 5)
2.137	30	Woods, Good, HSG A (PST 1, PST 2, PST 3, PST 4, PST 5)
0.499	55	Woods, Good, HSG B (PST 1, PST 2, PST 4, PST 5)
4.737	**46**	**TOTAL AREA**

2 YEAR STORM

Summary for Subcatchment PST 1: TO DESIGN POINT 1

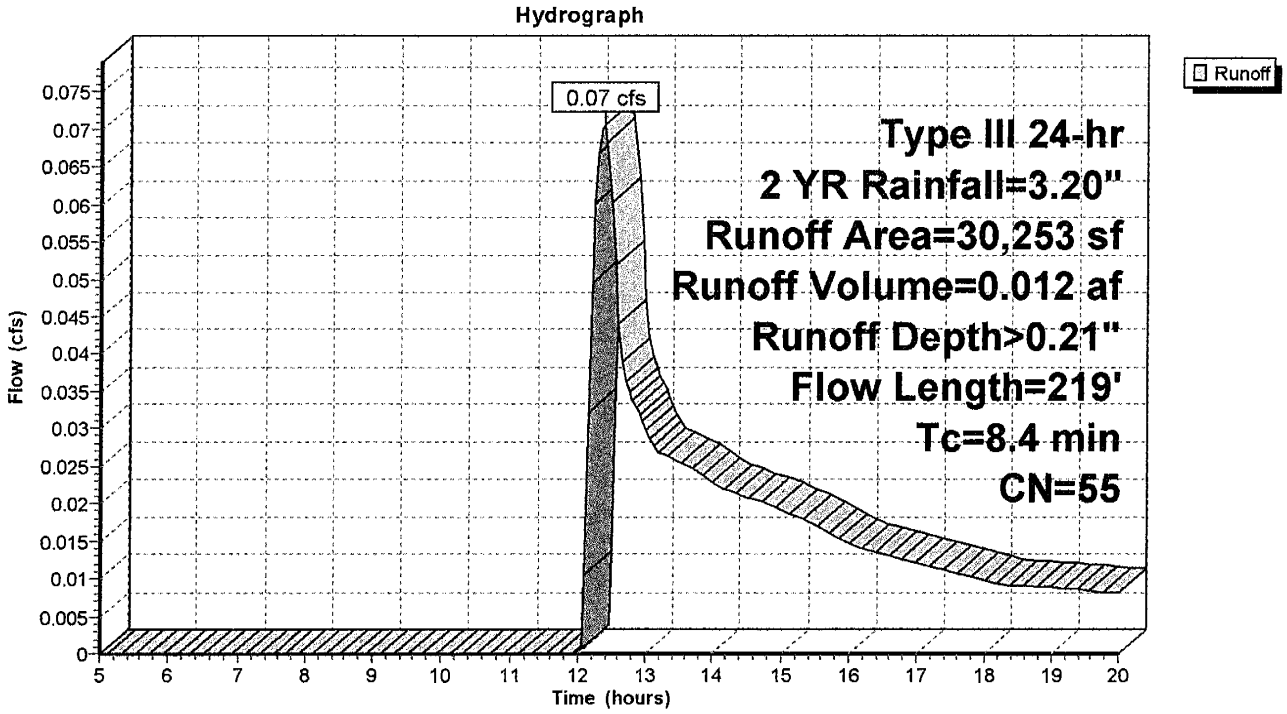
Runoff = 0.07 cfs @ 12.37 hrs, Volume= 0.012 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
15,392	39	>75% Grass cover, Good, HSG A
10,032	61	>75% Grass cover, Good, HSG B
4,661	98	Paved parking, HSG A
141	30	Woods, Good, HSG A
27	55	Woods, Good, HSG B
30,253	55	Weighted Average
25,592		84.59% Pervious Area
4,661		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0230	0.11		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.6	169	0.1011	5.12		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
8.4	219	Total			

Subcatchment PST 1: TO DESIGN POINT 1



Summary for Subcatchment PST 2: LOT 1

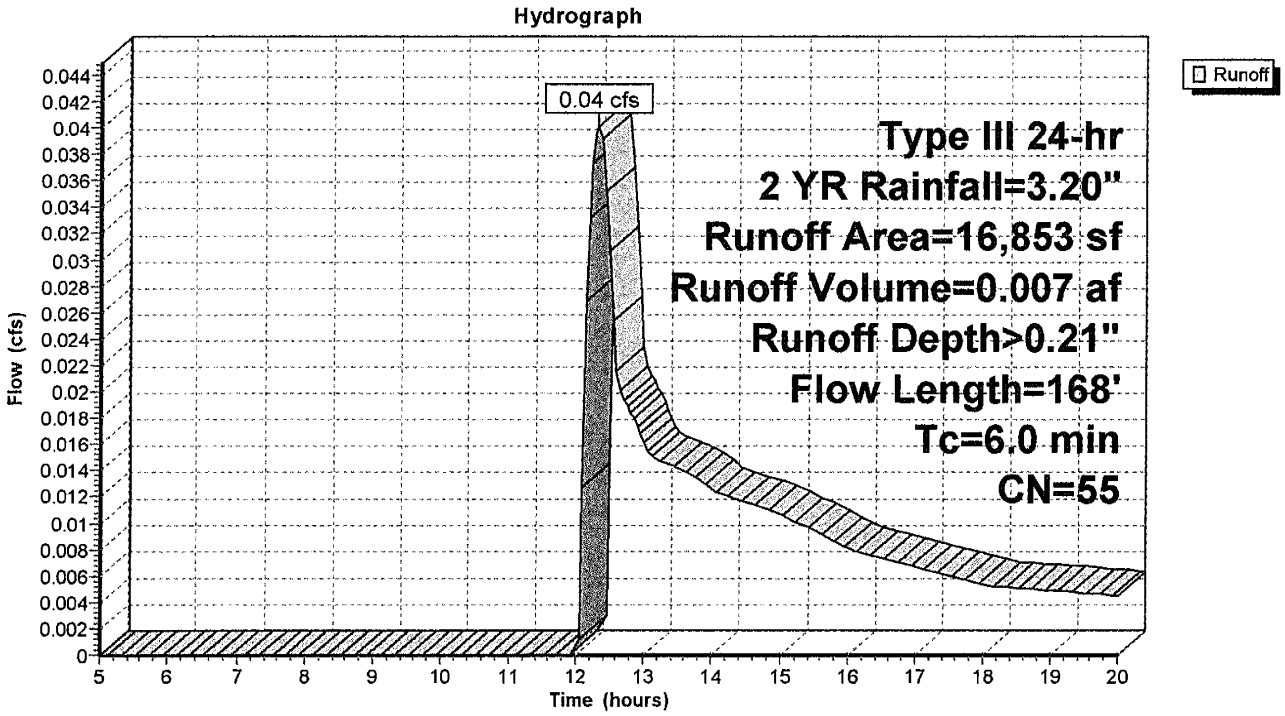
Runoff = 0.04 cfs @ 12.33 hrs, Volume= 0.007 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
183	30	Woods, Good, HSG A
16,670	55	Woods, Good, HSG B
16,853	55	Weighted Average
16,853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2: LOT 1



Summary for Subcatchment PST 2A: LOT 1

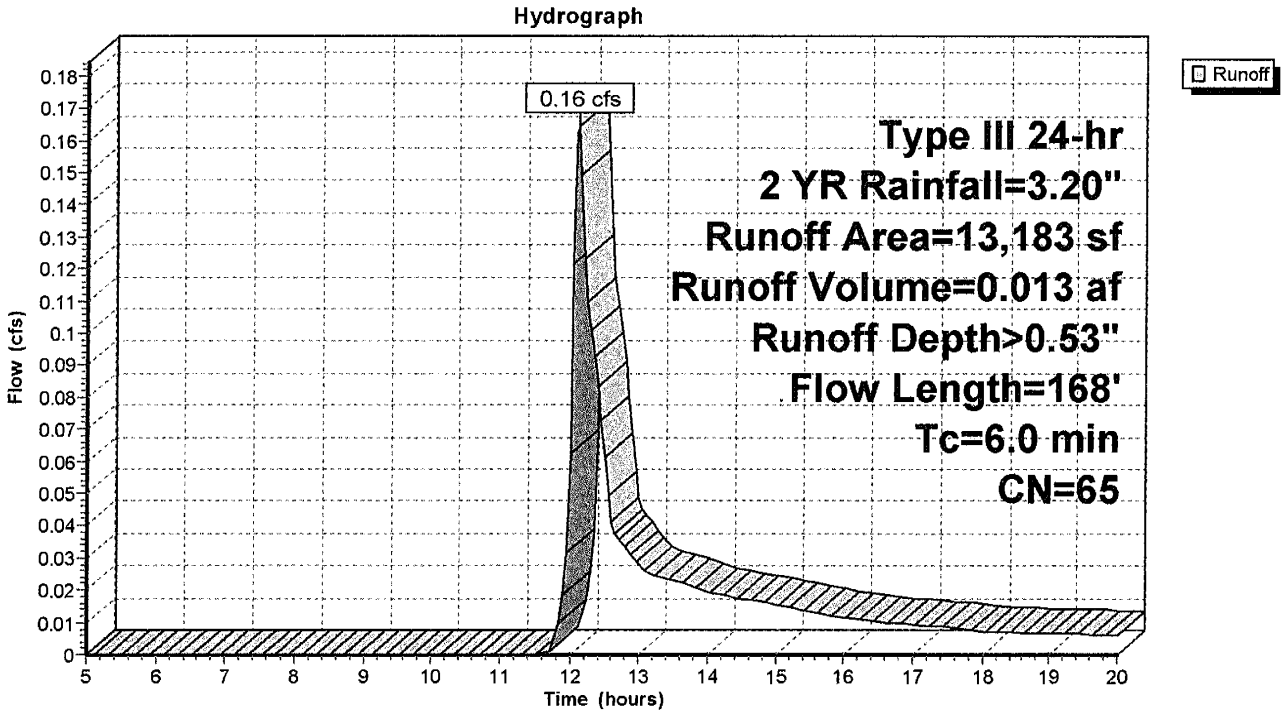
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.013 af, Depth> 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

	Area (sf)	CN	Description
	355	39	>75% Grass cover, Good, HSG A
	11,228	61	>75% Grass cover, Good, HSG B
*	1,600	98	Roofs, HSG A
	13,183	65	Weighted Average
	11,583		87.86% Pervious Area
	1,600		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2A: LOT 1



Summary for Subcatchment PST 3: WODDS OF LOT 2

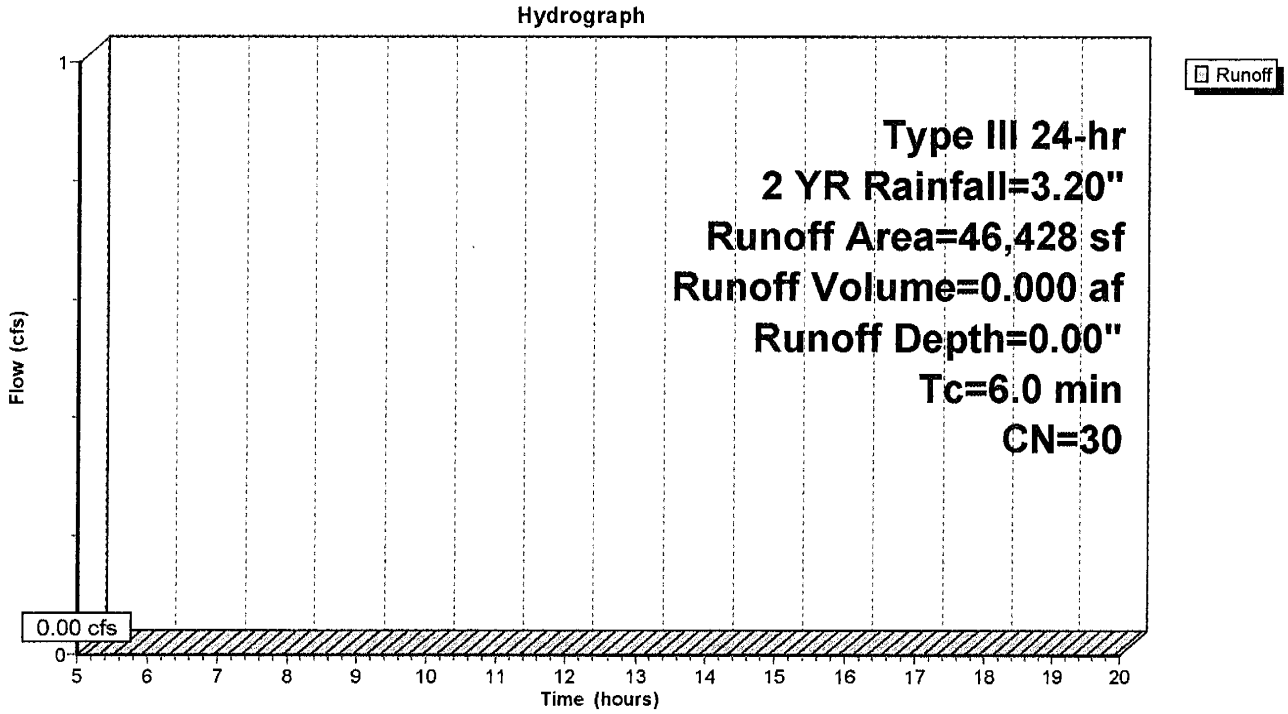
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
46,428	30	Woods, Good, HSG A
46,428		100.00% Pervious Area

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

Subcatchment PST 3: WODDS OF LOT 2



Summary for Subcatchment PST 3A: LOT 2

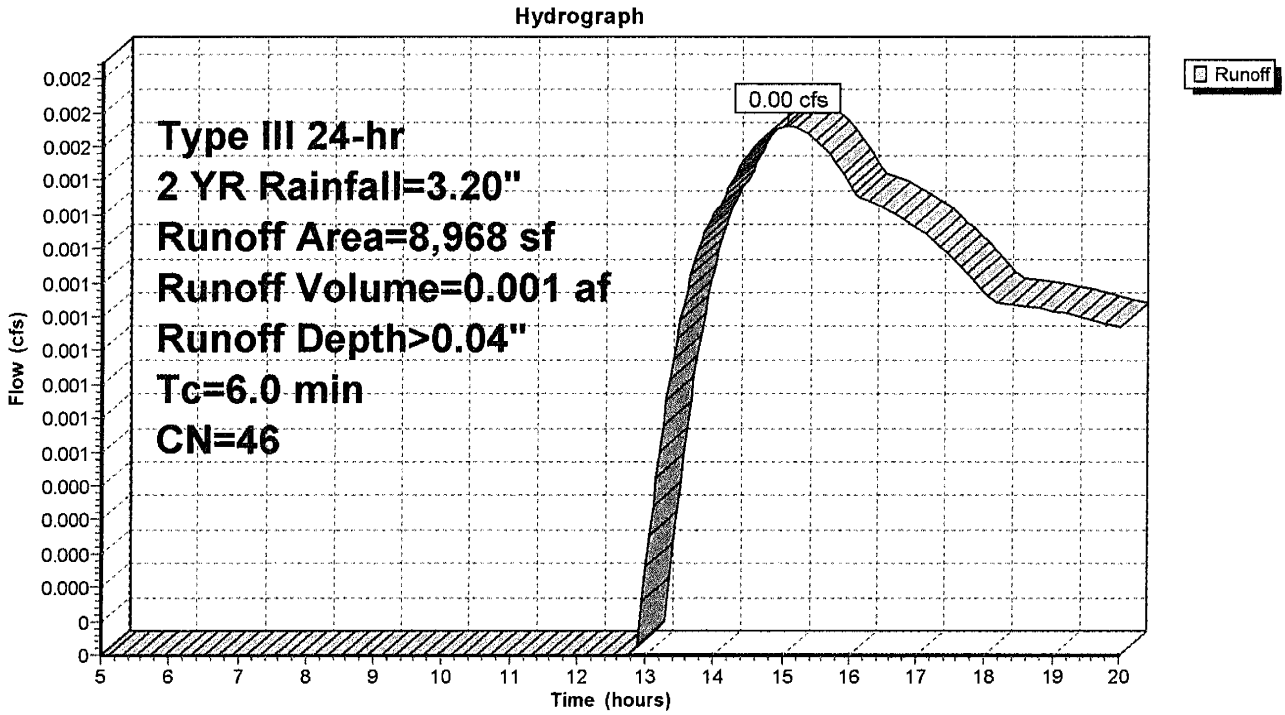
Runoff = 0.00 cfs @ 15.05 hrs, Volume= 0.001 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
7,900	39	>75% Grass cover, Good, HSG A
1,068	98	Roofs, HSG A
8,968	46	Weighted Average
7,900		88.09% Pervious Area
1,068		11.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3A: LOT 2



Summary for Subcatchment PST 3B: LOT 2

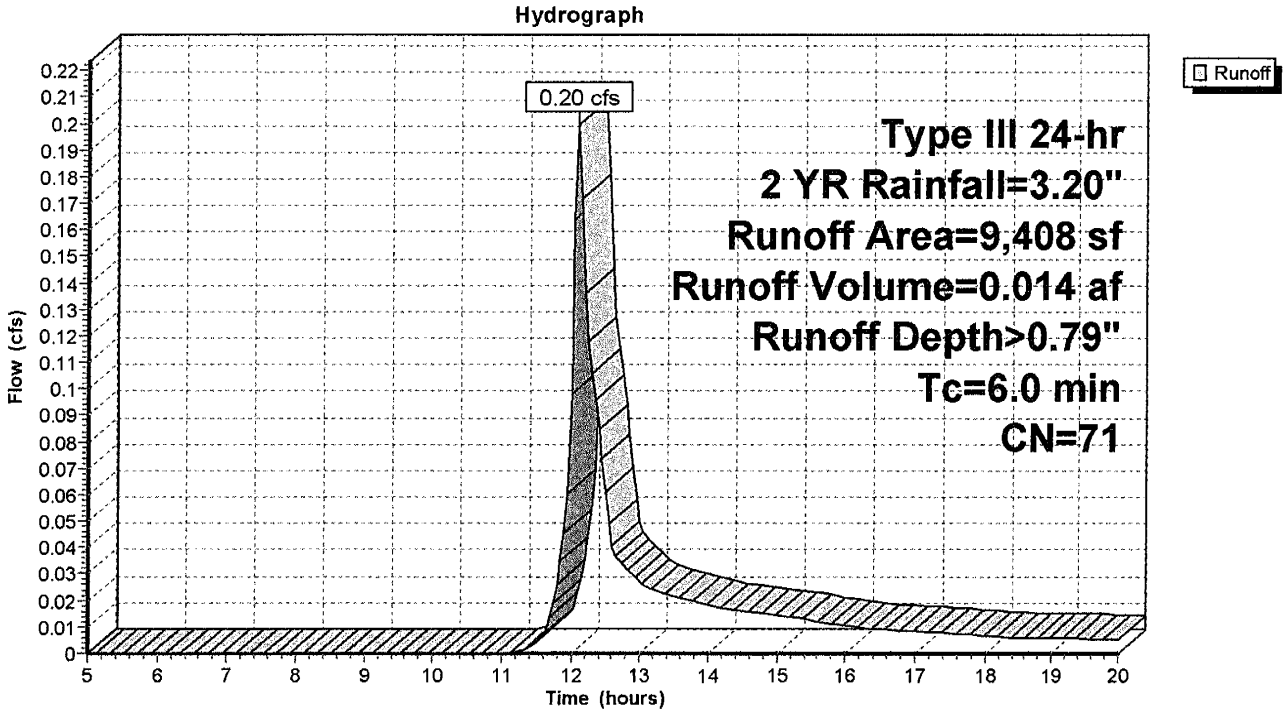
Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
4,358	39	>75% Grass cover, Good, HSG A
3,990	98	Paved parking, HSG A
1,060	98	Roofs, HSG A
9,408	71	Weighted Average
4,358		46.32% Pervious Area
5,050		53.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3B: LOT 2



Summary for Subcatchment PST 4: LOTS 1&2

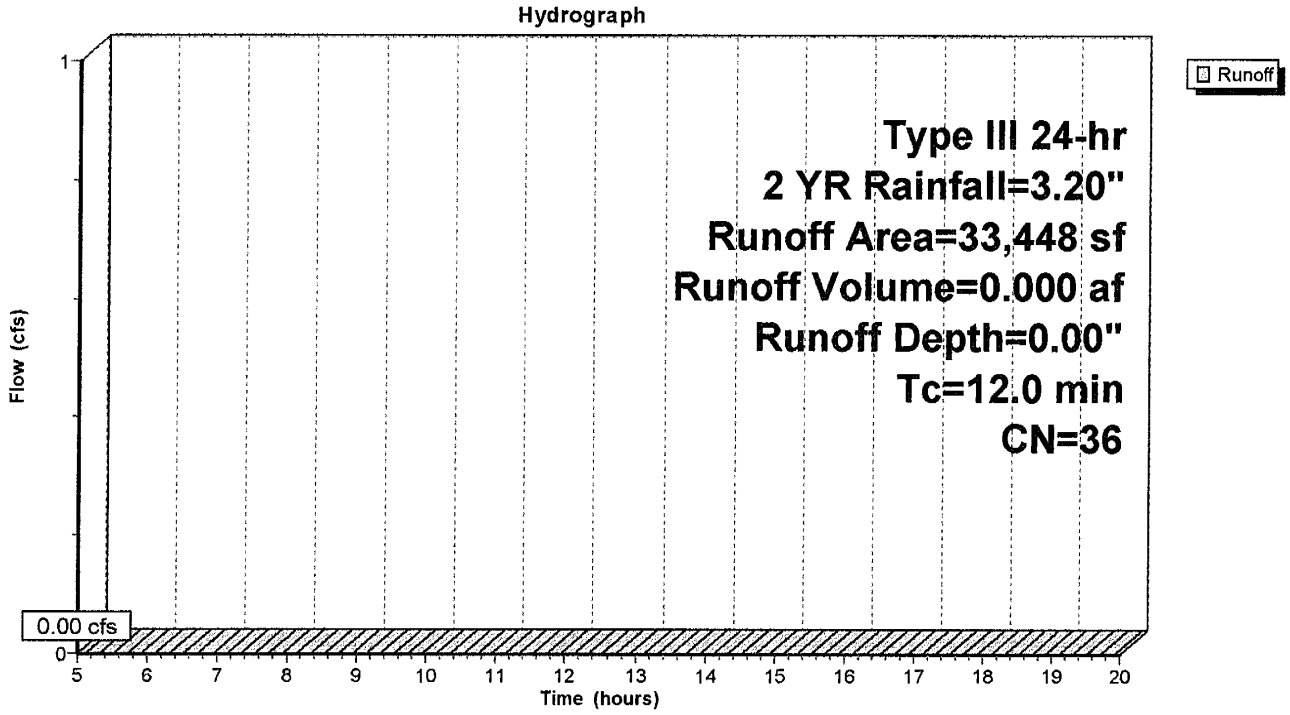
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
12,645	39	>75% Grass cover, Good, HSG A
1,081	98	Roofs, HSG A
19,654	30	Woods, Good, HSG A
68	55	Woods, Good, HSG B
33,448	36	Weighted Average
32,367		96.77% Pervious Area
1,081		3.23% Impervious Area

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

Subcatchment PST 4: LOTS 1&2



Summary for Subcatchment PST 5: TO IVW

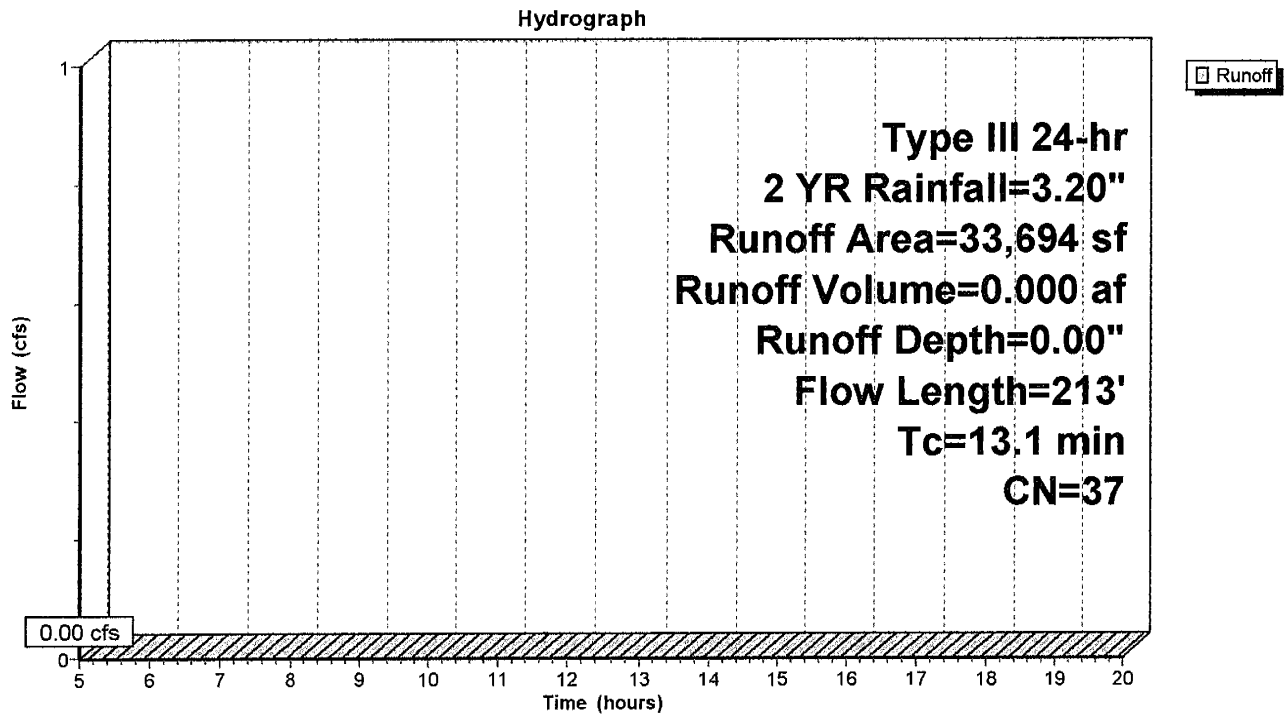
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,690	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,694	37	Weighted Average
	33,694		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



Summary for Subcatchment PST 6: RD PAVE

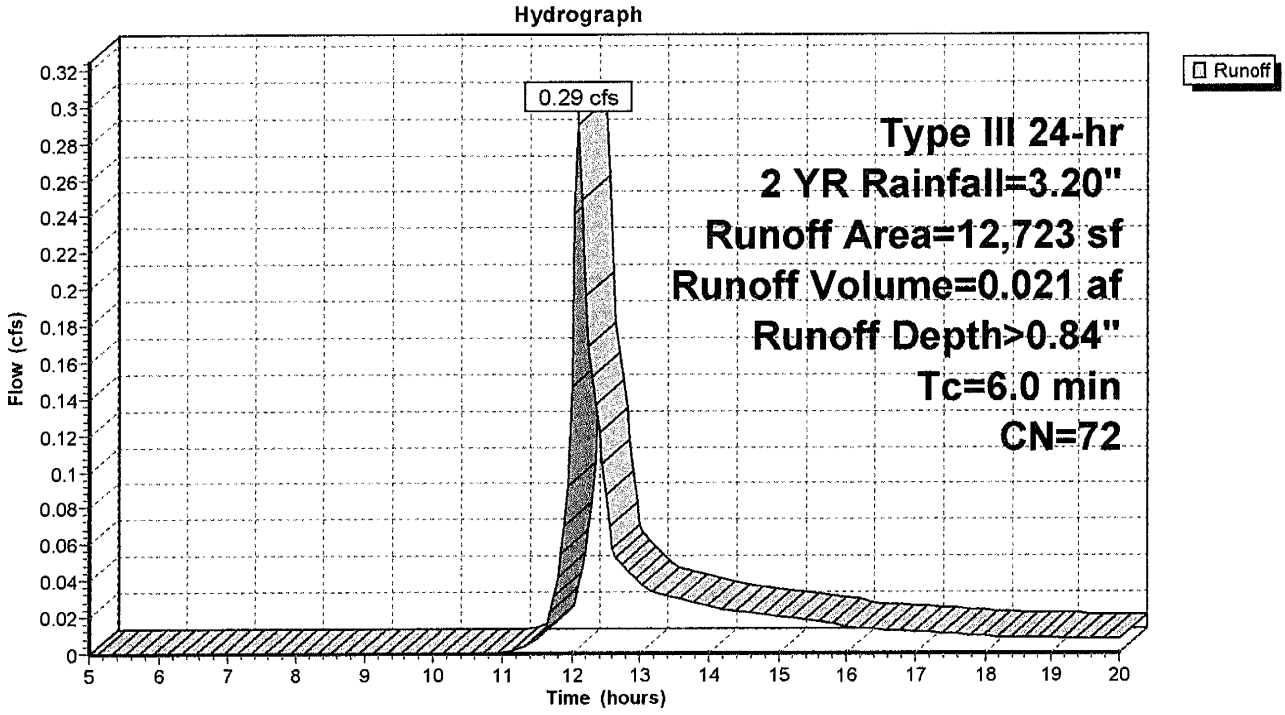
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.021 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
1,600	98	Roofs, HSG A
3,113	39	>75% Grass cover, Good, HSG A
3,950	61	>75% Grass cover, Good, HSG B
4,060	98	Paved parking, HSG A
12,723	72	Weighted Average
7,063		55.51% Pervious Area
5,660		44.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 6: RD PAVE



Summary for Subcatchment PST 7: RD PAVE

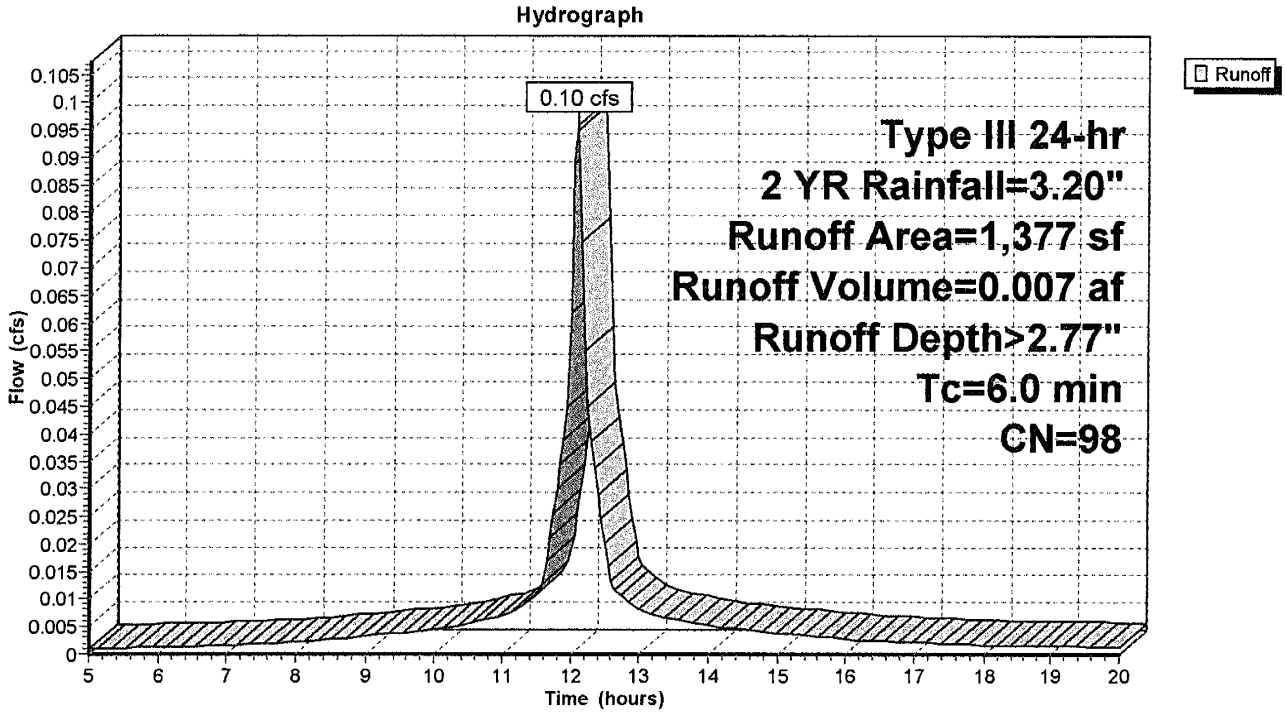
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
1,377	98	Paved parking, HSG A
1,377		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 7: RD PAVE



Summary for Reach DP 2: DES PT 2

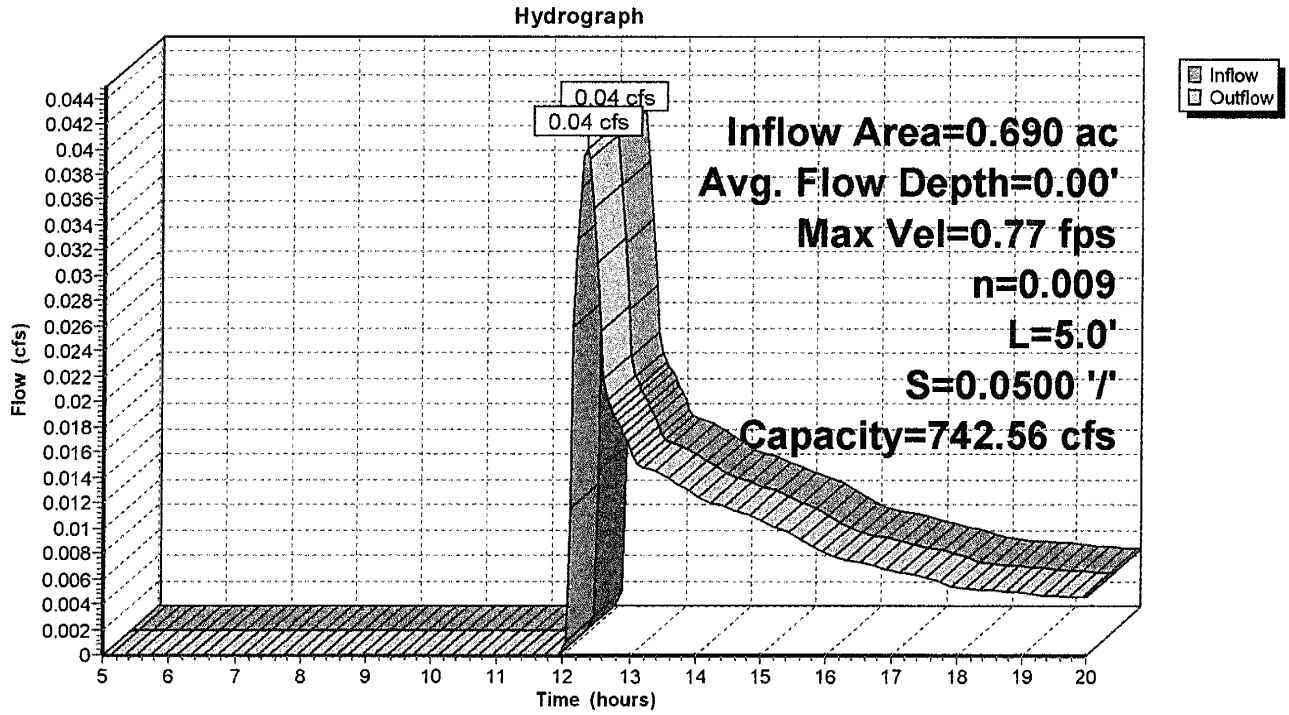
Inflow Area = 0.690 ac, 5.33% Impervious, Inflow Depth > 0.12" for 2 YR event
Inflow = 0.04 cfs @ 12.33 hrs, Volume= 0.007 af
Outflow = 0.04 cfs @ 12.34 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.77 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 2: DES PT 2



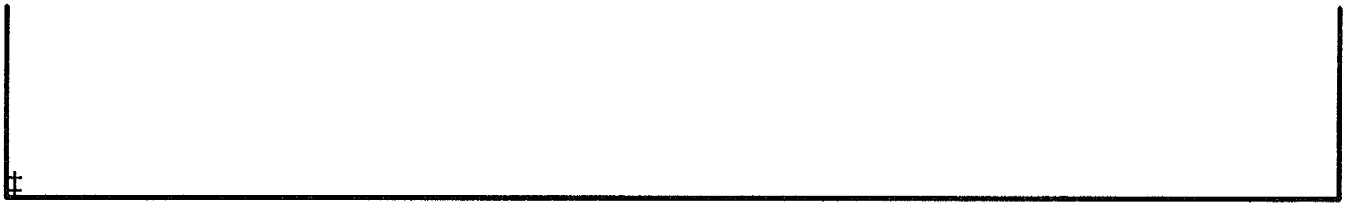
Summary for Reach DP 3: DES PT 3

Inflow Area = 1.488 ac, 9.44% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

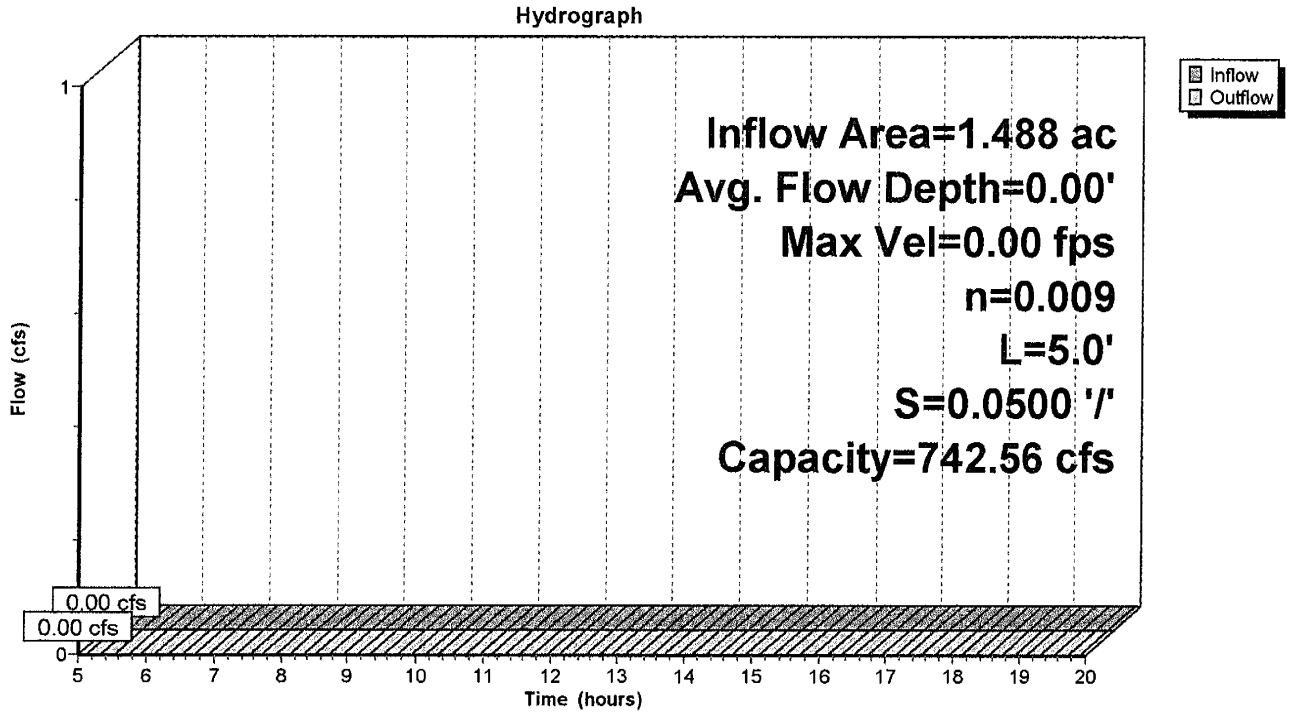
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'



Reach DP 3: DES PT 3



Summary for Reach DP 4: DES PT 4

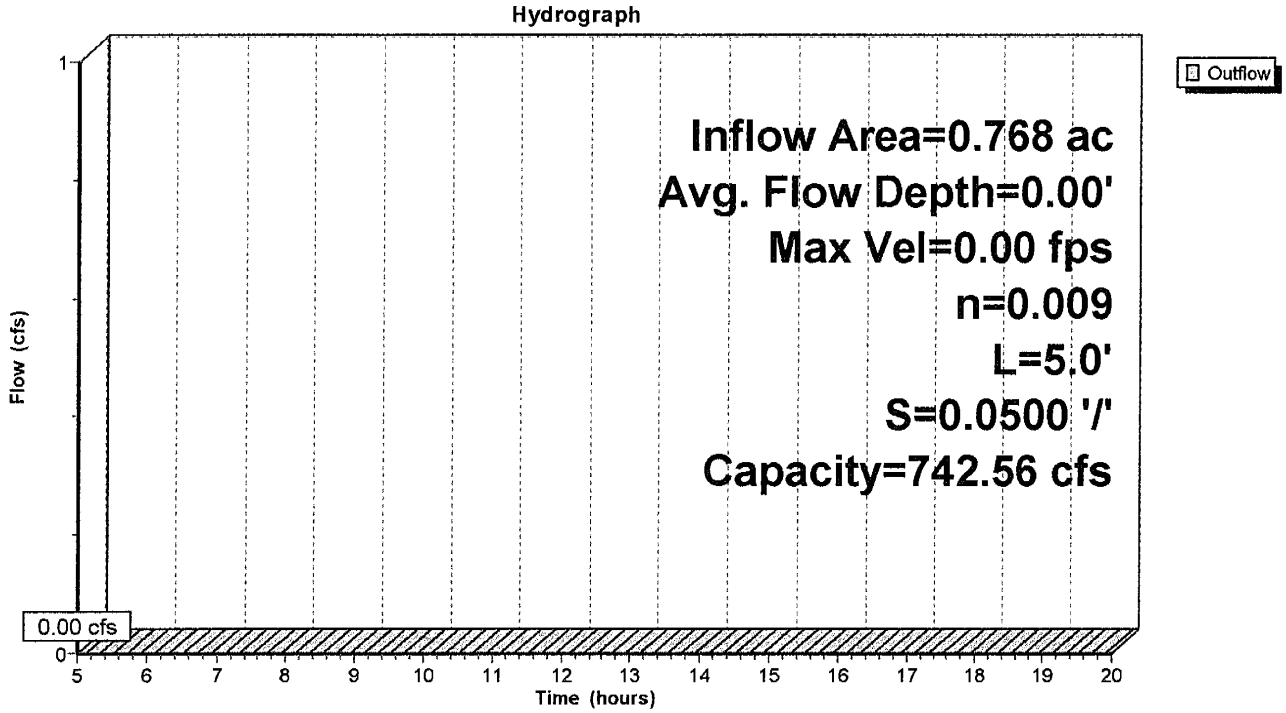
Inflow Area = 0.768 ac, 3.23% Impervious, Inflow Depth = 0.00" for 2 YR event
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 4: DES PT 4



Summary for Pond 1P: GALLEY RECHARGE SYSTEM

Inflow Area =	0.324 ac,	49.91% Impervious,	Inflow Depth >	1.03"	for 2 YR event
Inflow =	0.38 cfs @	12.10 hrs,	Volume=	0.028 af	
Outflow =	0.14 cfs @	12.42 hrs,	Volume=	0.028 af,	Atten= 63%, Lag= 19.3 min
Discarded =	0.14 cfs @	12.42 hrs,	Volume=	0.028 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 70.61' @ 12.42 hrs Surf.Area= 680 sf Storage= 195 cf

Plug-Flow detention time= 8.5 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (809.0 - 801.0)

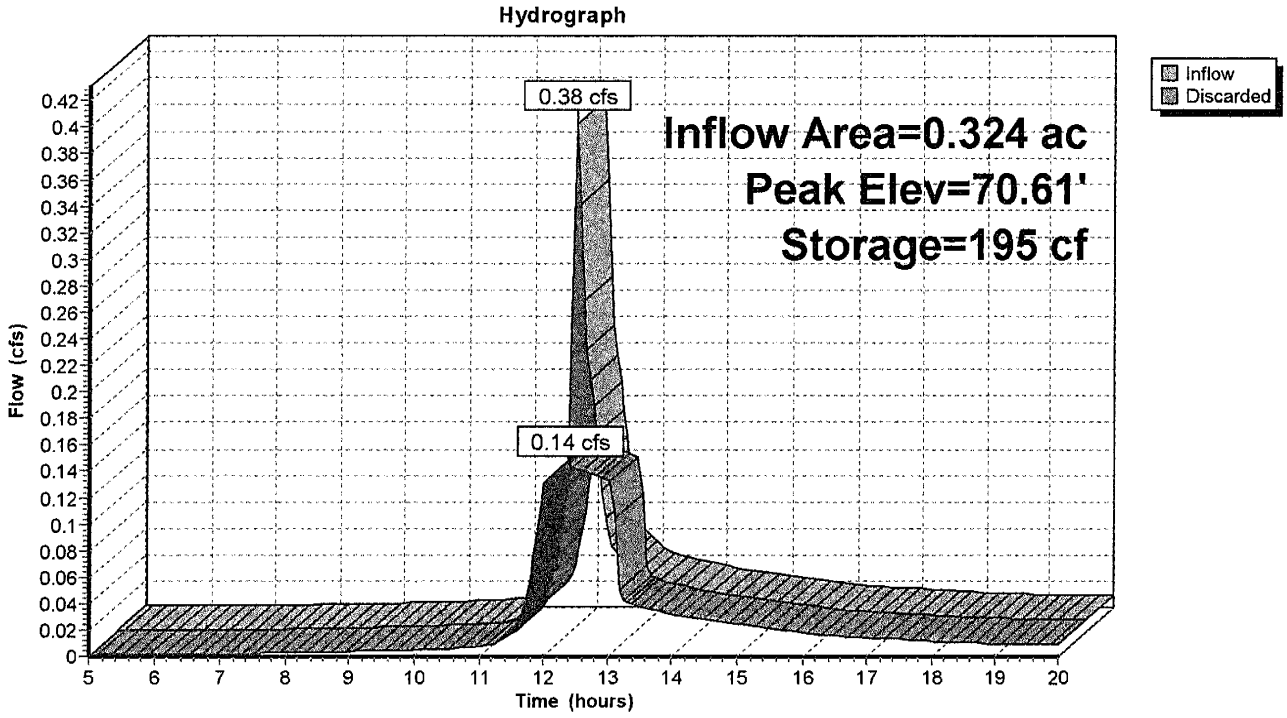
Volume	Invert	Avail.Storage	Storage Description
#1A	69.89'	1,498 cf	**8.50'W x 80.00'L x 7.25'H Field A** 4,930 cf Overall - 1,184 cf Embedded = 3,746 cf x 40.0% Voids
#2A	70.89'	881 cf	**Concrete Galley 4x4x4.25** x 19 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		2,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.89'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.00'

Discarded OutFlow Max=0.14 cfs @ 12.42 hrs HW=70.61' (Free Discharge)
└**1=Exfiltration** (Controls 0.14 cfs)

Pond 1P: GALLEY RECHARGE SYSTEM



Summary for Pond 2P: CB 4

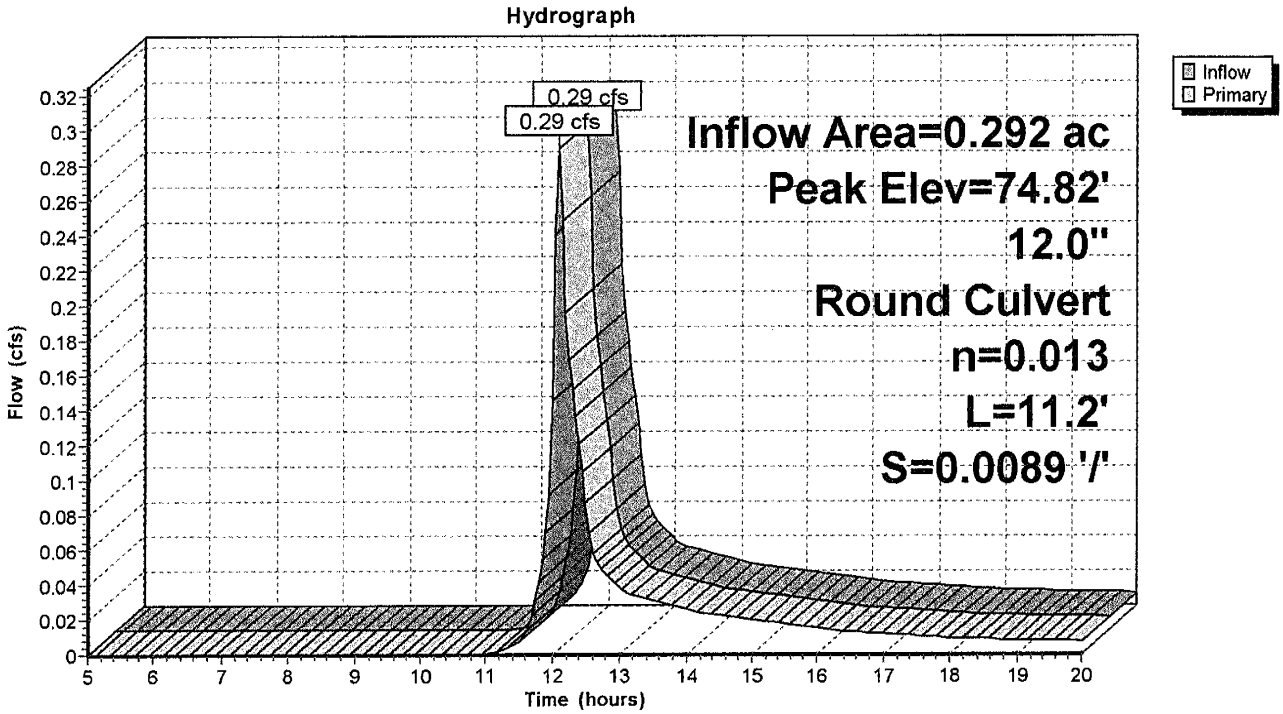
Inflow Area =	0.292 ac, 44.49% Impervious, Inflow Depth > 0.84" for 2 YR event				
Inflow =	0.29 cfs @	12.10 hrs, Volume=	0.021 af		
Outflow =	0.29 cfs @	12.10 hrs, Volume=	0.021 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.29 cfs @	12.10 hrs, Volume=	0.021 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.82' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.51'	**12.0" Round Culvert** L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.51' / 74.41' S= 0.0089 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.10 hrs HW=74.82' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.29 cfs @ 2.07 fps)

Pond 2P: CB 4



Summary for Pond 3P: CB 3

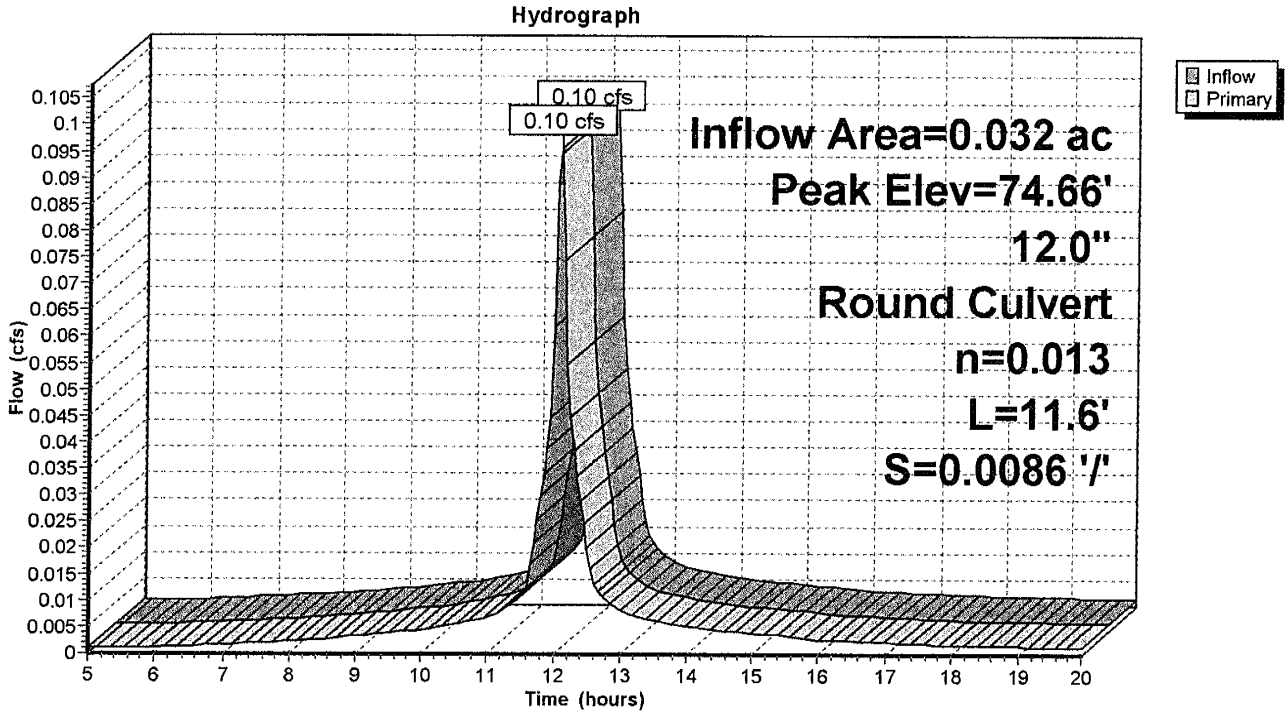
Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 2.77" for 2 YR event				
Inflow =	0.10 cfs @	12.09 hrs,	Volume=	0.007 af	
Outflow =	0.10 cfs @	12.09 hrs,	Volume=	0.007 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.10 cfs @	12.09 hrs,	Volume=	0.007 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.66' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.49'	**12.0" Round Culvert** L= 11.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.49' / 74.39' S= 0.0086 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.09 cfs @ 12.09 hrs HW=74.66' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.09 cfs @ 1.60 fps)

Pond 3P: CB 3



Summary for Pond 4P: DMH 1

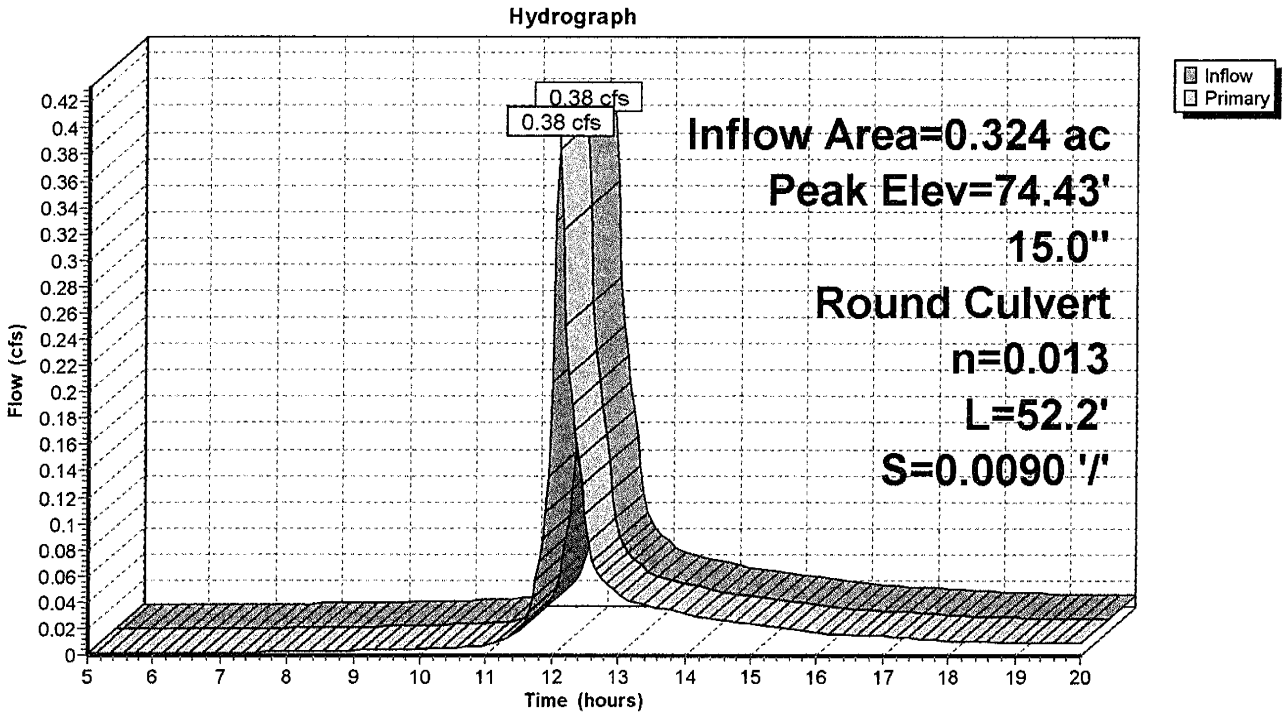
Inflow Area =	0.324 ac,	49.91% Impervious,	Inflow Depth >	1.03"	for 2 YR event
Inflow =	0.38 cfs @	12.10 hrs, Volume=	0.028 af		
Outflow =	0.38 cfs @	12.10 hrs, Volume=	0.028 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.38 cfs @	12.10 hrs, Volume=	0.028 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.43' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.11'	**15.0" Round Culvert** L= 52.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.11' / 73.64' S= 0.0090 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.38 cfs @ 12.10 hrs HW=74.43' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.38 cfs @ 1.53 fps)

Pond 4P: DMH 1



Summary for Pond 5P: DMH 2

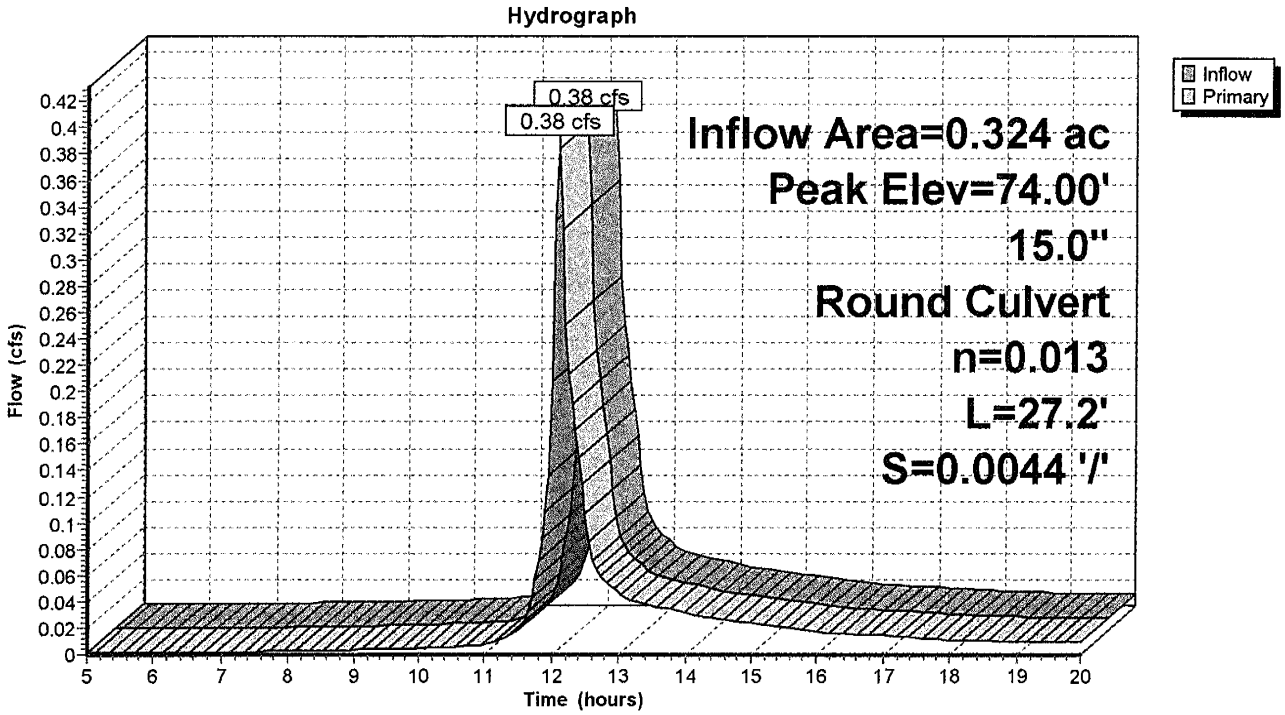
Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 1.03" for 2 YR event				
Inflow =	0.38 cfs @ 12.10 hrs, Volume=	0.028 af			
Outflow =	0.38 cfs @ 12.10 hrs, Volume=	0.028 af, Atten= 0%, Lag= 0.0 min			
Primary =	0.38 cfs @ 12.10 hrs, Volume=	0.028 af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.00' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.64'	**15.0" Round Culvert** L= 27.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.64' / 73.52' S= 0.0044 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.38 cfs @ 12.10 hrs HW=74.00' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.38 cfs @ 1.98 fps)

Pond 5P: DMH 2



Summary for Pond 6P: FRENCH DRAIN

Inflow Area =	0.303 ac, 12.14% Impervious, Inflow Depth > 0.53" for 2 YR event				
Inflow =	0.16 cfs @	12.11 hrs,	Volume=	0.013 af	
Outflow =	0.11 cfs @	12.26 hrs,	Volume=	0.013 af,	Atten= 34%, Lag= 9.0 min
Discarded =	0.11 cfs @	12.26 hrs,	Volume=	0.013 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.12' @ 12.26 hrs Surf.Area= 560 sf Storage= 26 cf

Plug-Flow detention time= 1.4 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (843.9 - 842.7)

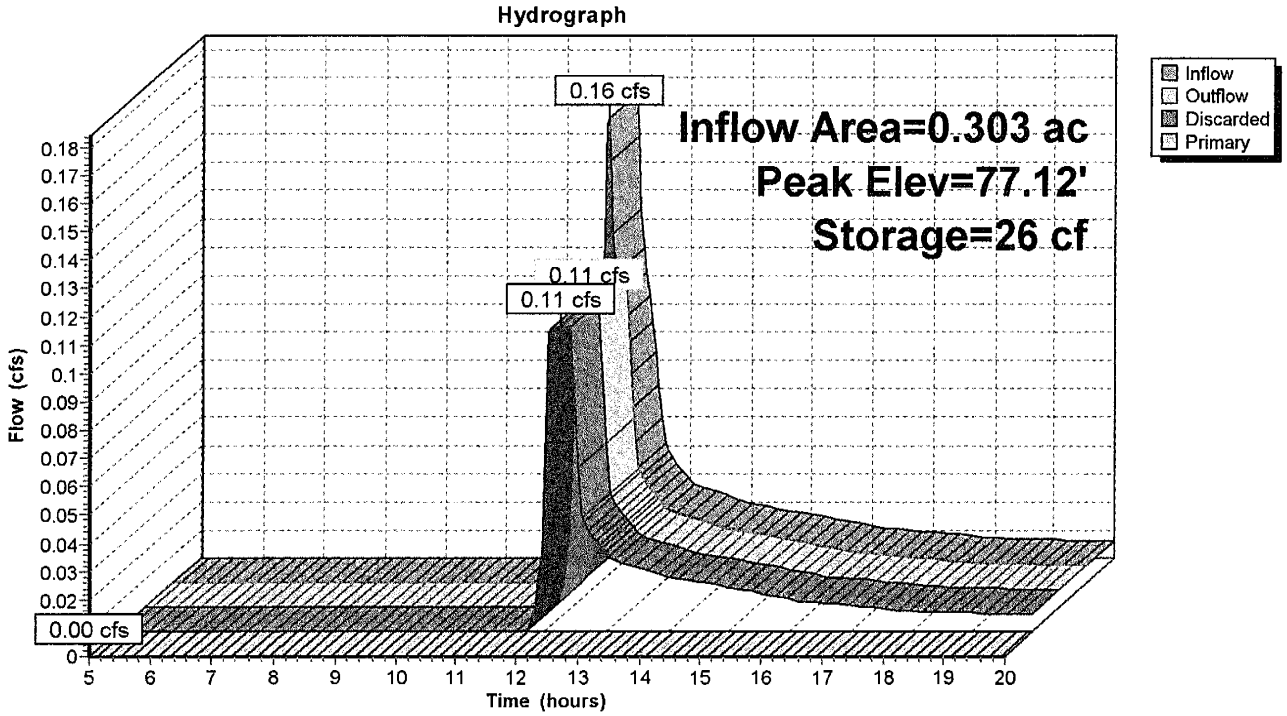
Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	448 cf	**2.00'W x 280.00'L x 2.00'H Prismatoid** 1,120 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 65.00'
#2	Primary	78.80'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.11 cfs @ 12.26 hrs HW=77.12' (Free Discharge)
└**1=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=77.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: FRENCH DRAIN



Summary for Pond DW1: 8' DIA DRYWELL

Inflow Area =	0.303 ac, 12.14% Impervious, Inflow Depth = 0.00" for 2 YR event				
Inflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Outflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min		
Discarded =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 70.00' @ 5.00 hrs Surf.Area= 201 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

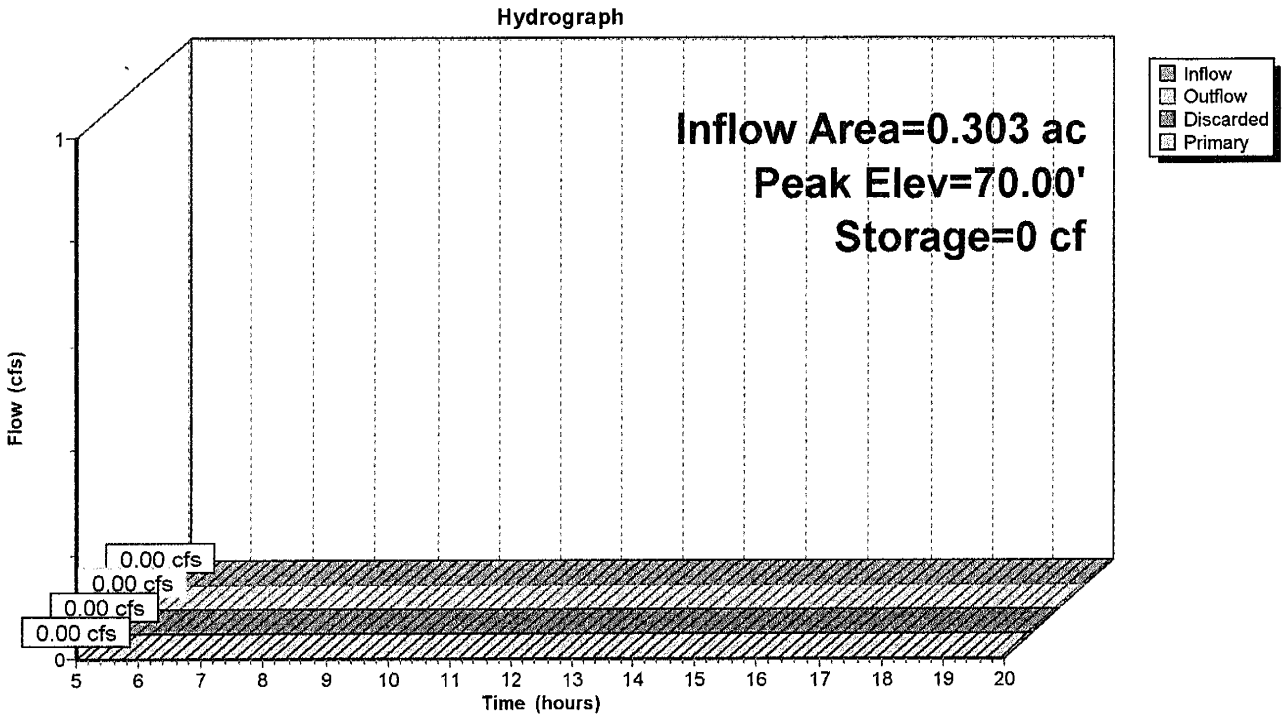
Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	72.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	77.00'	**4.0" Round Culvert** L= 12.6' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.00' S= 0.0794 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.04 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW1: 8' DIA DRYWELL



Summary for Pond DW2: 8' DIA DRYWELL

Inflow Area =	0.216 ac, 53.68% Impervious, Inflow Depth > 0.79" for 2 YR event				
Inflow =	0.20 cfs @	12.10 hrs,	Volume=	0.014 af	
Outflow =	0.05 cfs @	12.53 hrs,	Volume=	0.014 af,	Atten= 73%, Lag= 25.3 min
Discarded =	0.05 cfs @	12.53 hrs,	Volume=	0.014 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.01' @ 12.53 hrs Surf.Area= 251 sf Storage= 162 cf

Plug-Flow detention time= 27.0 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 26.5 min (852.3 - 825.8)

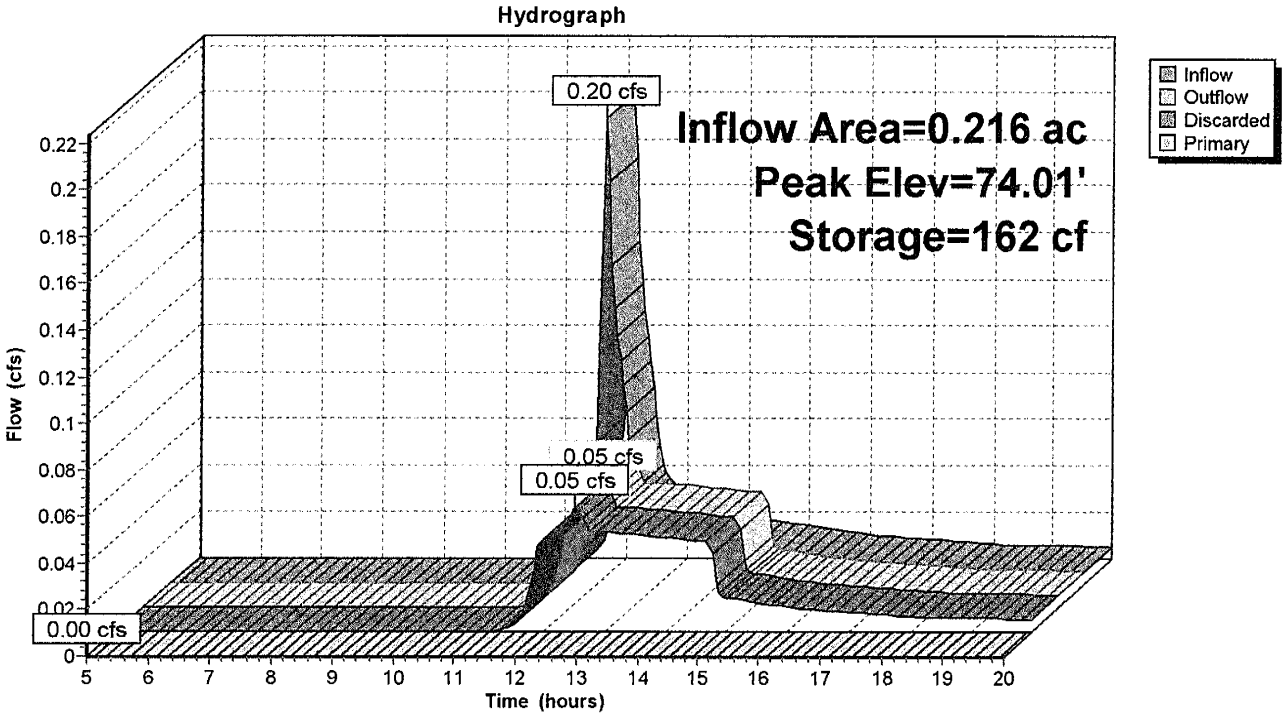
Volume	Invert	Avail.Storage	Storage Description
#1	72.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	74.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	72.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	79.00'	**4.0" Round Culvert** L= 135.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.00' / 66.50' S= 0.0926 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.05 cfs @ 12.53 hrs HW=74.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=72.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW2: 8' DIA DRYWELL



Summary for Pond DW3: 8' DIA DRYWELL

Inflow Area =	0.422 ac, 33.29% Impervious, Inflow Depth = 0.00" for 2 YR event				
Inflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Outflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min		
Discarded =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.50' @ 5.00 hrs Surf.Area= 201 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

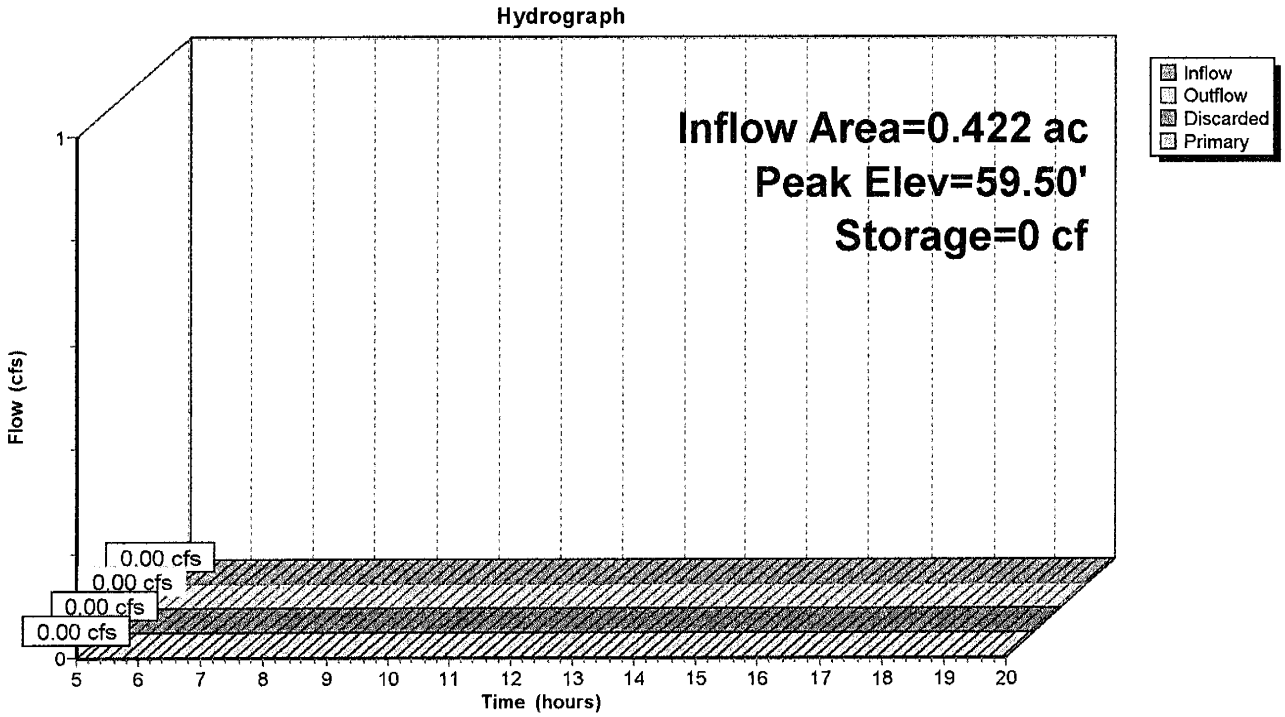
Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	61.50'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.50'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	66.50'	**4.0" Round Culvert** L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 66.50' / 66.00' S= 0.0263 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=59.50' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.04 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=59.50' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond DW3: 8' DIA DRYWELL



Summary for Pond DW4: 8' DIA DRYWELL

Inflow Area =	0.206 ac,	11.91% Impervious,	Inflow Depth >	0.04"	for 2 YR event
Inflow =	0.00 cfs @	15.05 hrs,	Volume=	0.001 af	
Outflow =	0.00 cfs @	15.10 hrs,	Volume=	0.001 af,	Atten= 0%, Lag= 2.9 min
Discarded =	0.00 cfs @	15.10 hrs,	Volume=	0.001 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 63.00' @ 15.10 hrs Surf.Area= 201 sf Storage= 0 cf

Plug-Flow detention time= 2.7 min calculated for 0.001 af (99% of inflow)
Center-of-Mass det. time= 1.6 min (985.3 - 983.7)

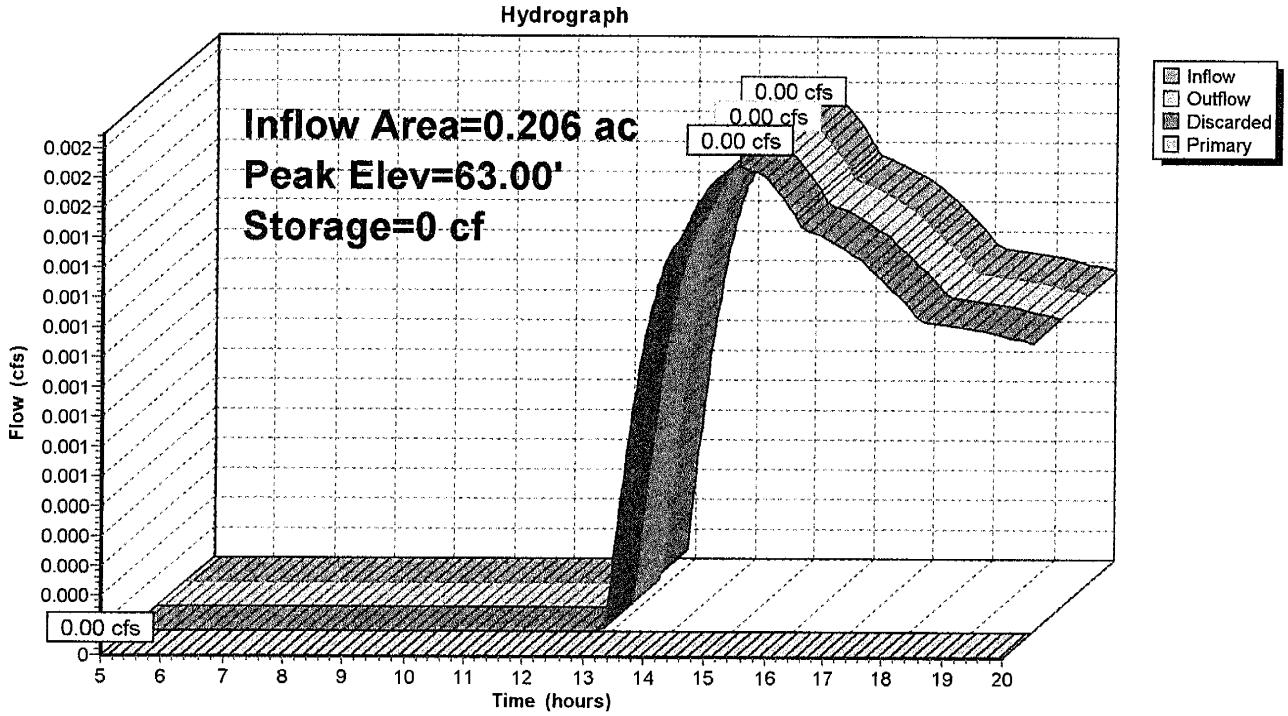
Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	65.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	70.00'	**4.0" Round Culvert** L= 77.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 66.50' S= 0.0455 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.04 cfs @ 15.10 hrs HW=63.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=63.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW4: 8' DIA DRYWELL



Summary for Pond DW5: 8' DIA DRYWELL

Inflow Area =	0.768 ac,	3.23% Impervious,	Inflow Depth =	0.00"	for 2 YR event
Inflow =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	
Outflow =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.00' @ 5.00 hrs Surf.Area= 201 sf Storage= 0 cf

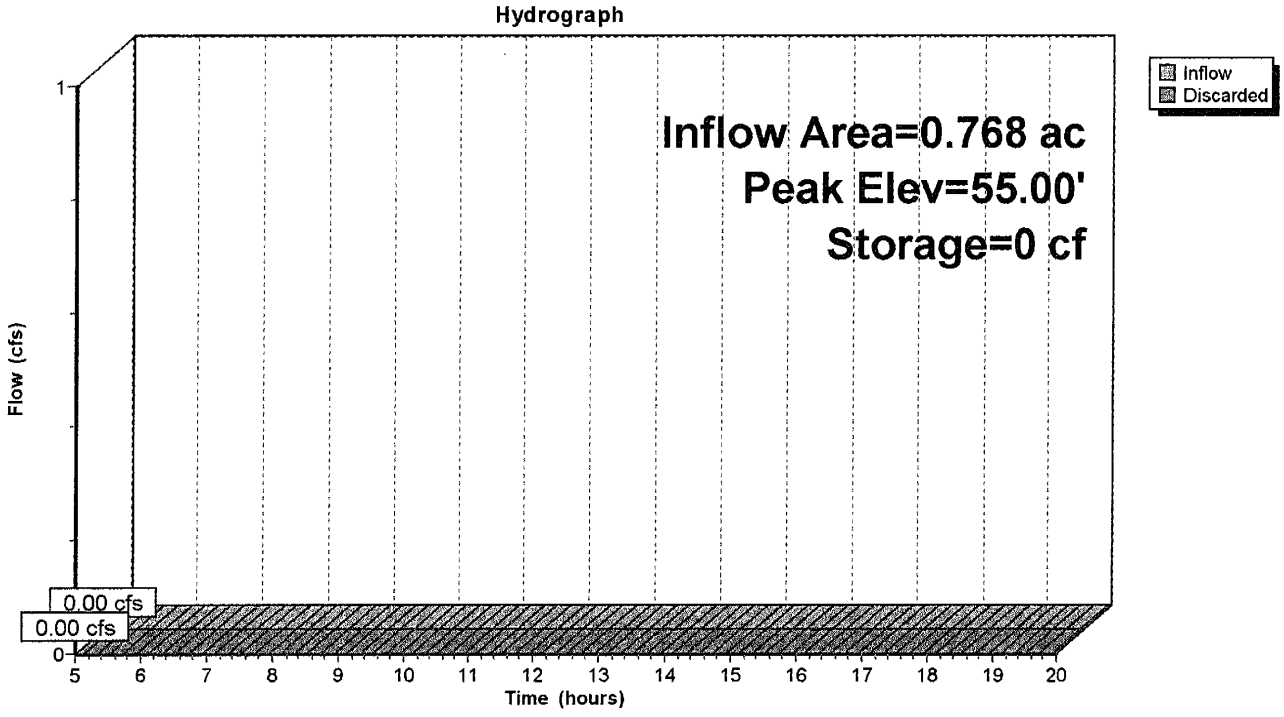
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	57.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.00'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.04 cfs potential flow)

Pond DW5: 8' DIA DRYWELL



10 YEAR STORM

Summary for Subcatchment PST 1: TO DESIGN POINT 1

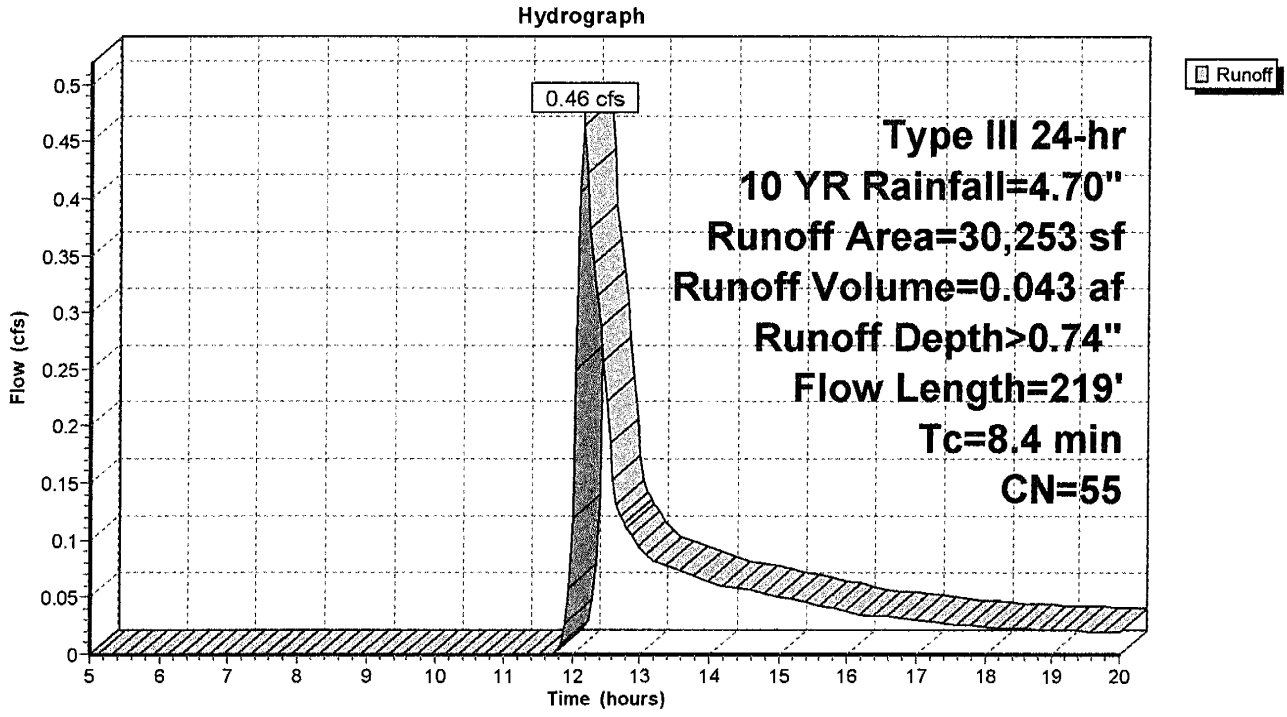
Runoff = 0.46 cfs @ 12.15 hrs, Volume= 0.043 af, Depth> 0.74"

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

Area (sf)	CN	Description
15,392	39	>75% Grass cover, Good, HSG A
10,032	61	>75% Grass cover, Good, HSG B
4,661	98	Paved parking, HSG A
141	30	Woods, Good, HSG A
27	55	Woods, Good, HSG B
30,253	55	Weighted Average
25,592		84.59% Pervious Area
4,661		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0230	0.11		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.6	169	0.1011	5.12		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
8.4	219	Total			

Subcatchment PST 1: TO DESIGN POINT 1



Summary for Subcatchment PST 2: LOT 1

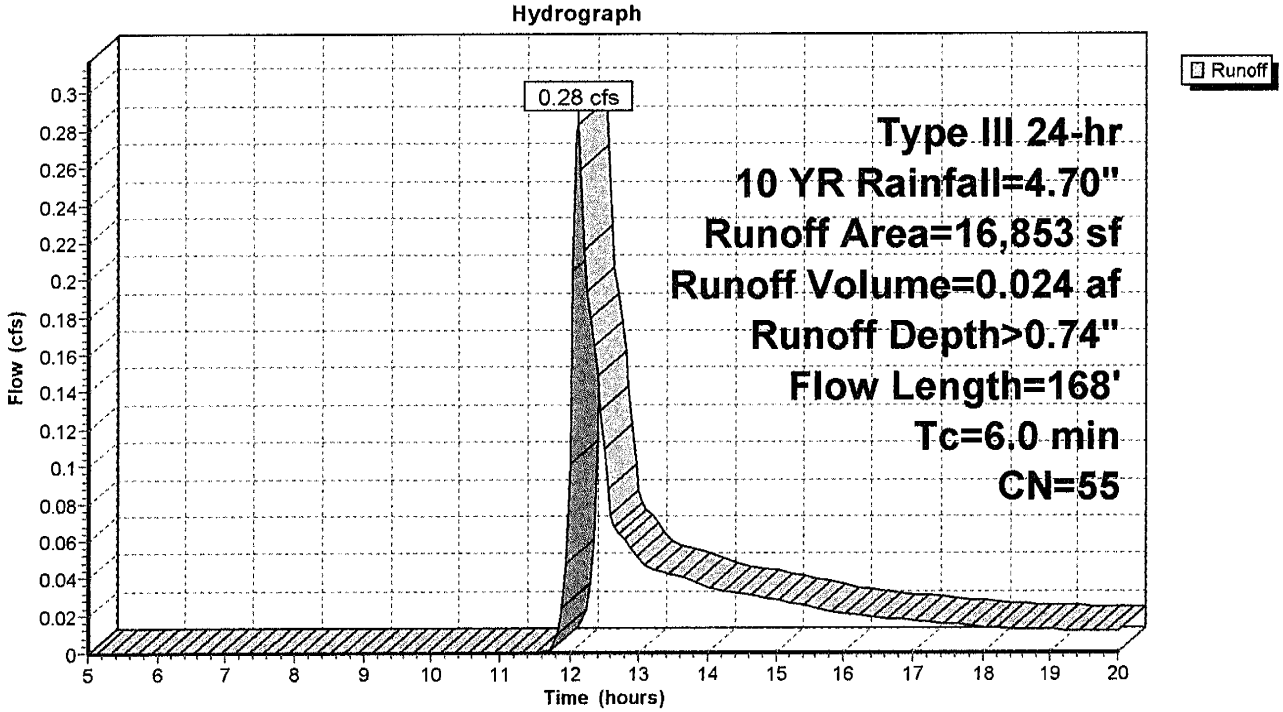
Runoff = 0.28 cfs @ 12.11 hrs, Volume= 0.024 af, Depth> 0.74"

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

Area (sf)	CN	Description
183	30	Woods, Good, HSG A
16,670	55	Woods, Good, HSG B
16,853	55	Weighted Average
16,853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2: LOT 1



Summary for Subcatchment PST 2A: LOT 1

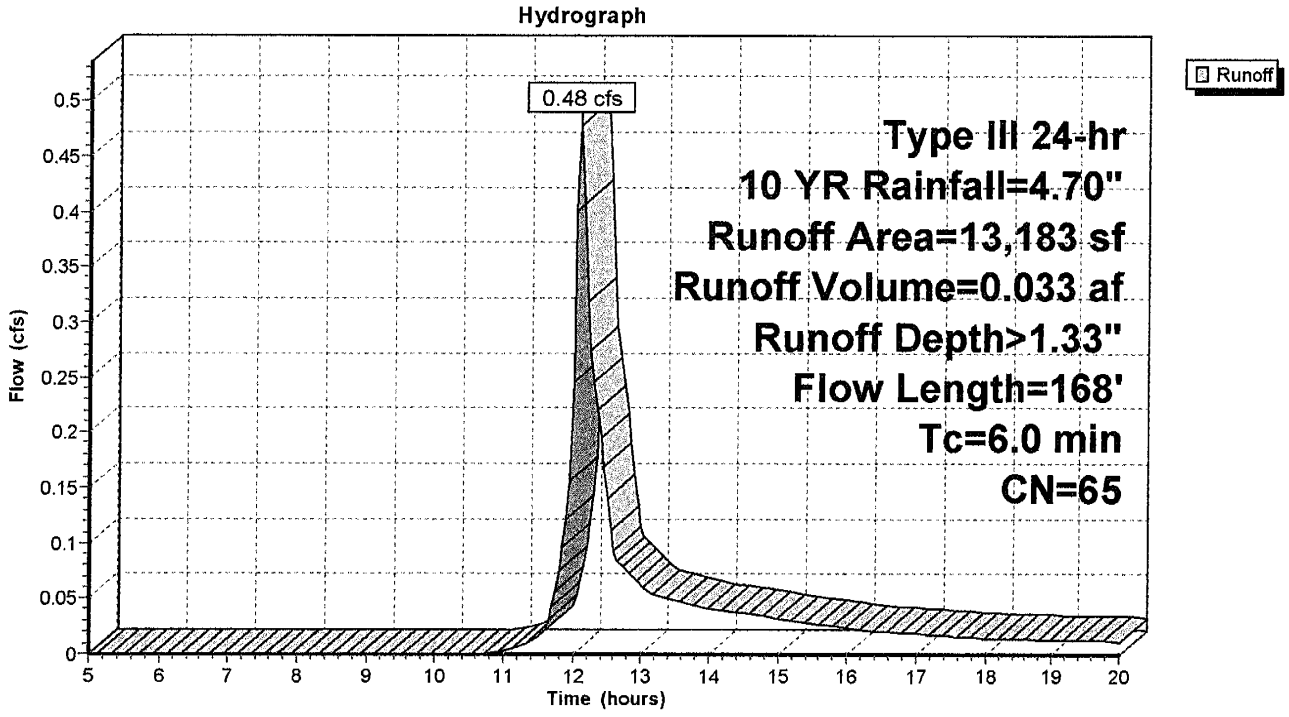
Runoff = 0.48 cfs @ 12.10 hrs, Volume= 0.033 af, Depth> 1.33"

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

	Area (sf)	CN	Description
	355	39	>75% Grass cover, Good, HSG A
	11,228	61	>75% Grass cover, Good, HSG B
*	1,600	98	Roofs, HSG A
	13,183	65	Weighted Average
	11,583		87.86% Pervious Area
	1,600		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2A: LOT 1



Summary for Subcatchment PST 3: WODDS OF LOT 2

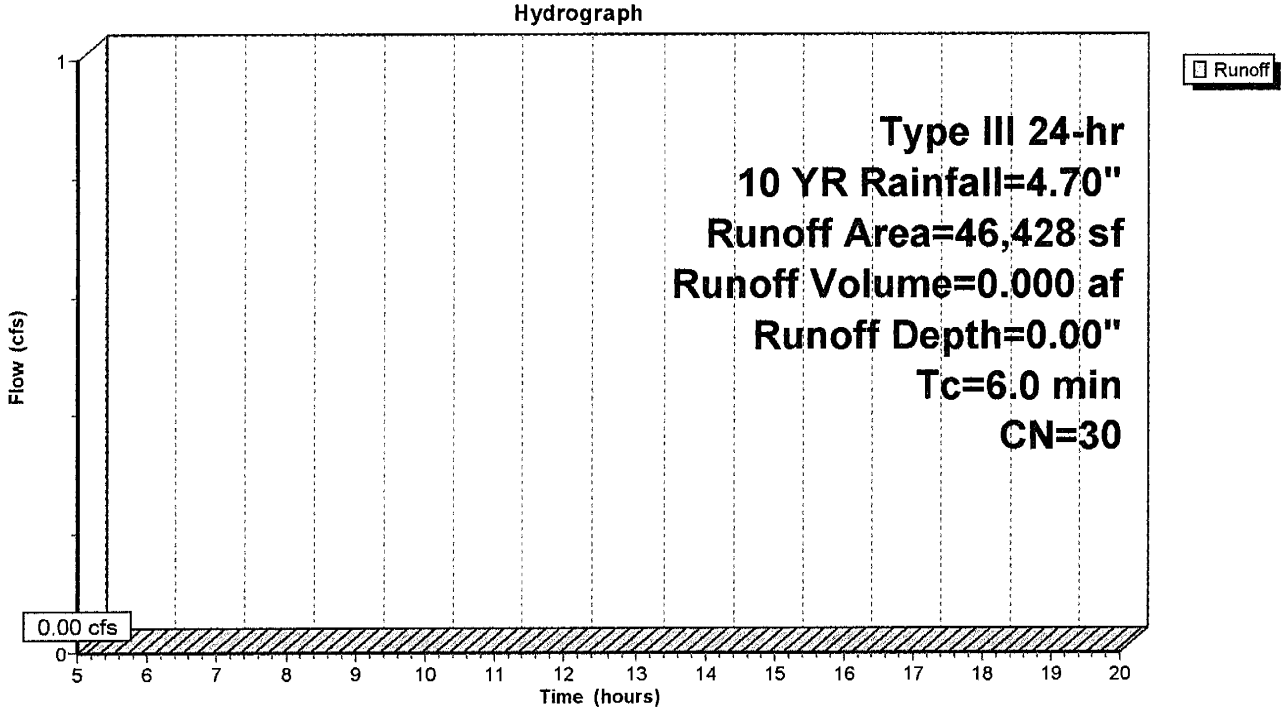
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

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

Area (sf)	CN	Description
46,428	30	Woods, Good, HSG A
46,428		100.00% Pervious Area

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

Subcatchment PST 3: WODDS OF LOT 2



Summary for Subcatchment PST 3A: LOT 2

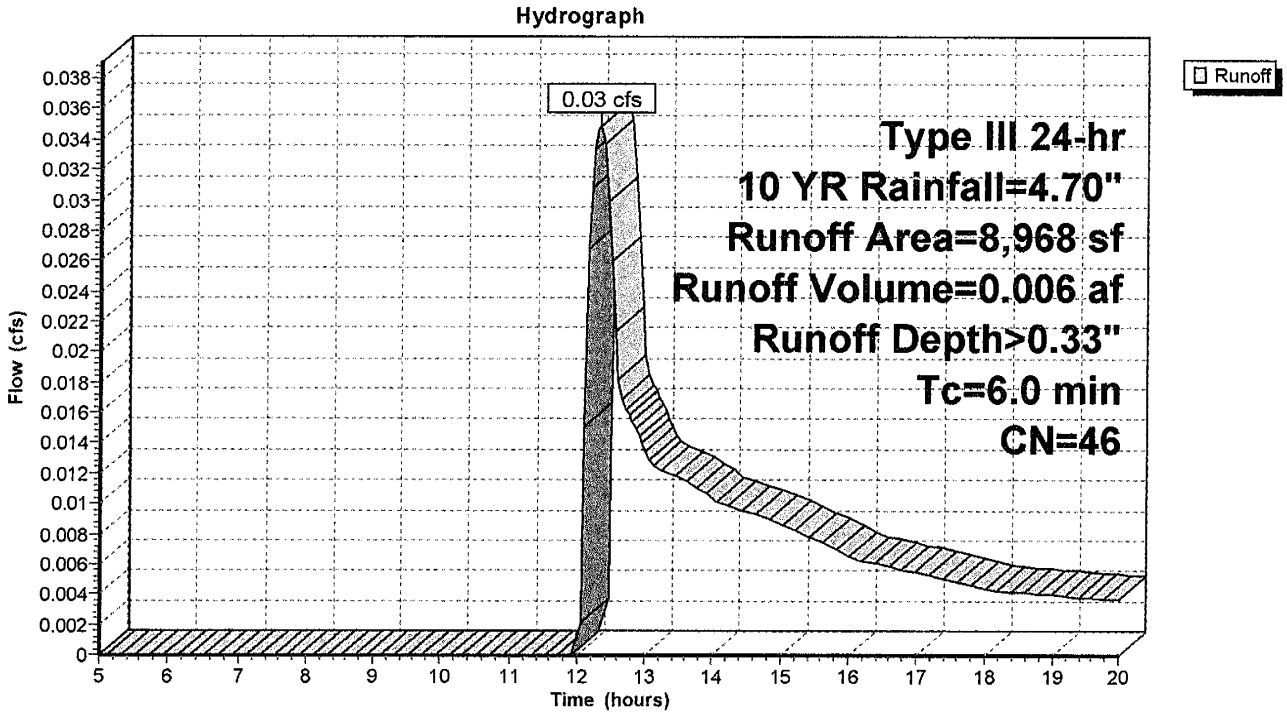
Runoff = 0.03 cfs @ 12.32 hrs, Volume= 0.006 af, Depth> 0.33"

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

Area (sf)	CN	Description
7,900	39	>75% Grass cover, Good, HSG A
1,068	98	Roofs, HSG A
8,968	46	Weighted Average
7,900		88.09% Pervious Area
1,068		11.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3A: LOT 2



Summary for Subcatchment PST 3B: LOT 2

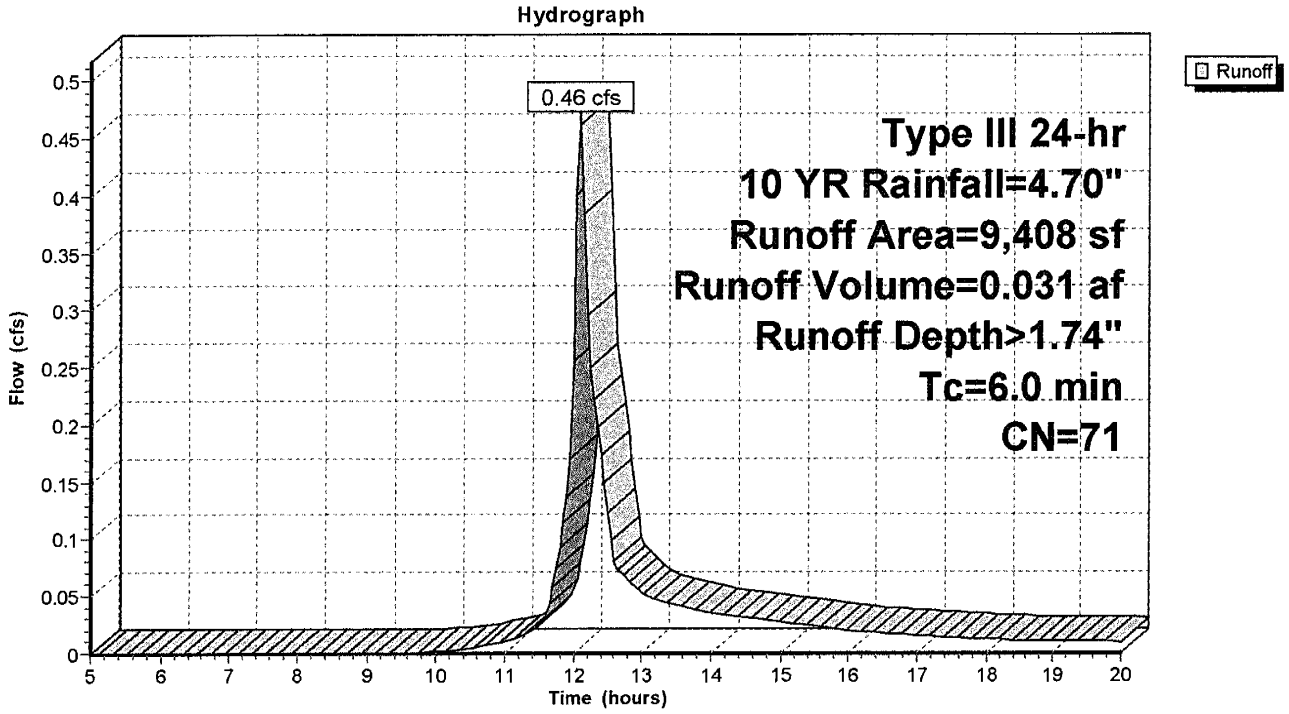
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.031 af, Depth> 1.74"

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

Area (sf)	CN	Description
4,358	39	>75% Grass cover, Good, HSG A
3,990	98	Paved parking, HSG A
1,060	98	Roofs, HSG A
9,408	71	Weighted Average
4,358		46.32% Pervious Area
5,050		53.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3B: LOT 2



Summary for Subcatchment PST 4: LOTS 1&2

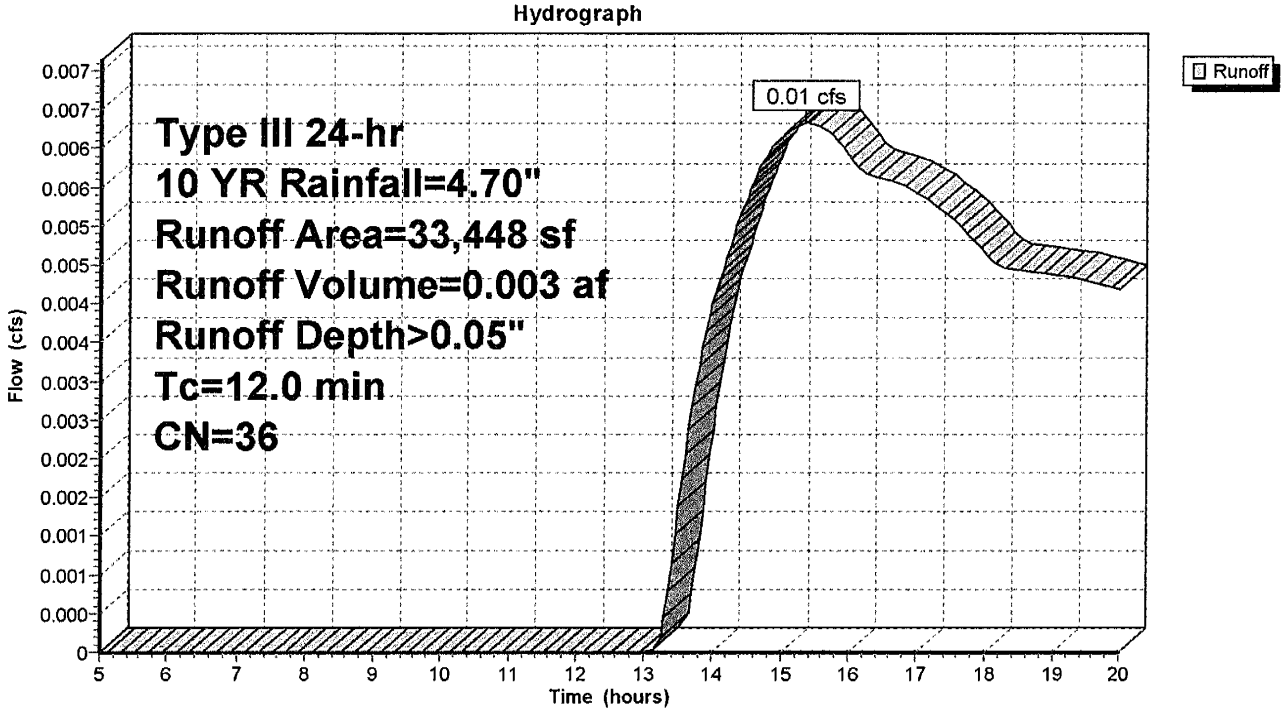
Runoff = 0.01 cfs @ 15.37 hrs, Volume= 0.003 af, Depth> 0.05"

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

Area (sf)	CN	Description
12,645	39	>75% Grass cover, Good, HSG A
1,081	98	Roofs, HSG A
19,654	30	Woods, Good, HSG A
68	55	Woods, Good, HSG B
33,448	36	Weighted Average
32,367		96.77% Pervious Area
1,081		3.23% Impervious Area

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

Subcatchment PST 4: LOTS 1&2



Summary for Subcatchment PST 5: TO IVW

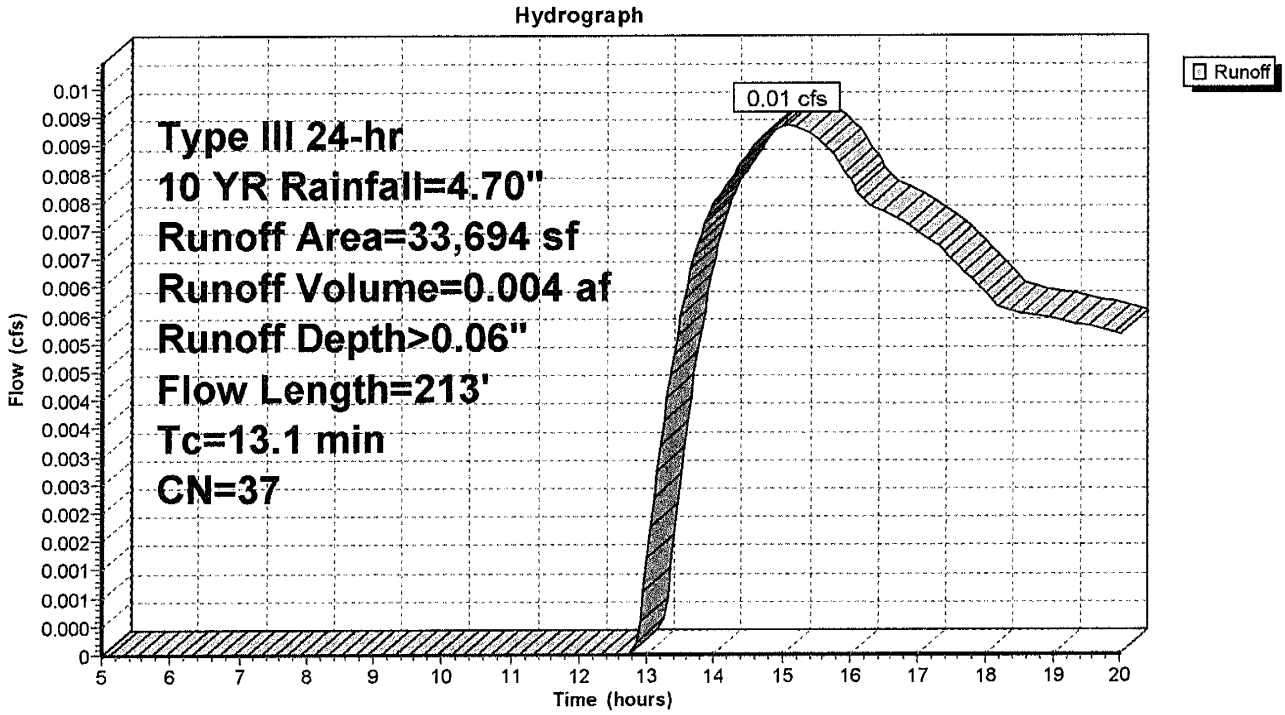
Runoff = 0.01 cfs @ 15.07 hrs, Volume= 0.004 af, Depth> 0.06"

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

	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,690	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,694	37	Weighted Average
	33,694		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



Summary for Subcatchment PST 6: RD PAVE

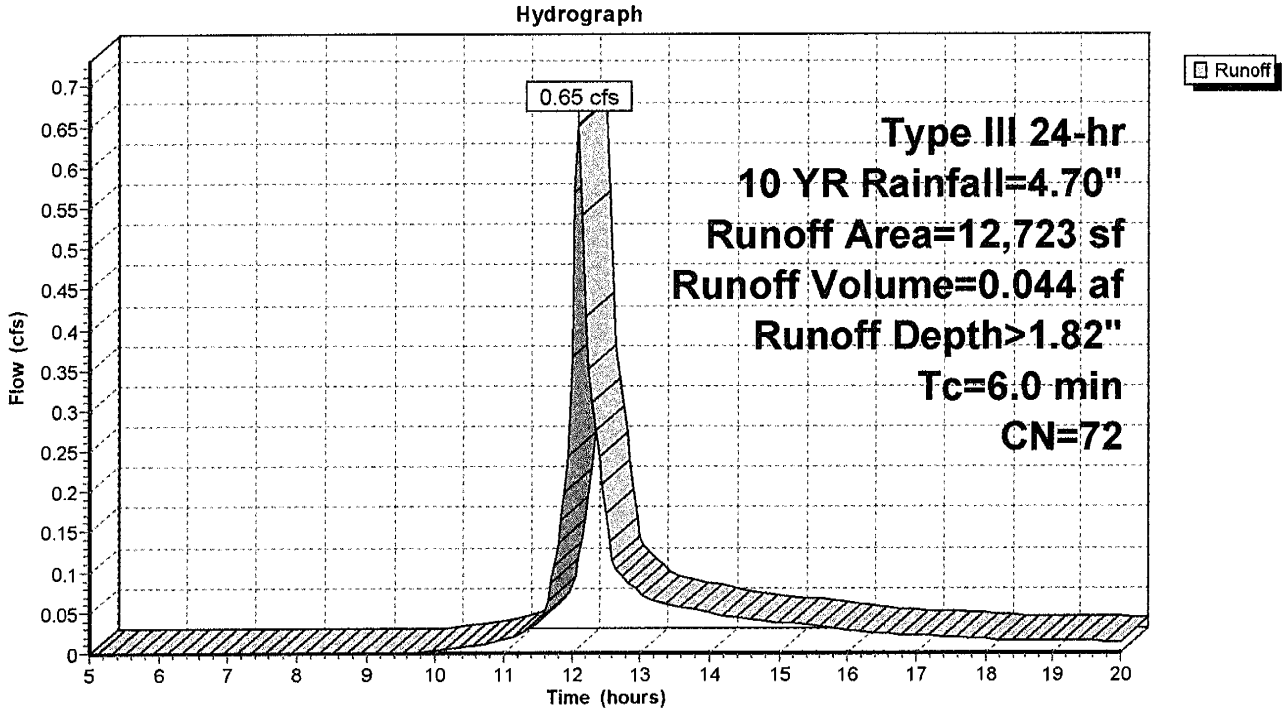
Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.044 af, Depth> 1.82"

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

Area (sf)	CN	Description
1,600	98	Roofs, HSG A
3,113	39	>75% Grass cover, Good, HSG A
3,950	61	>75% Grass cover, Good, HSG B
4,060	98	Paved parking, HSG A
12,723	72	Weighted Average
7,063		55.51% Pervious Area
5,660		44.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 6: RD PAVE



Summary for Subcatchment PST 7: RD PAVE

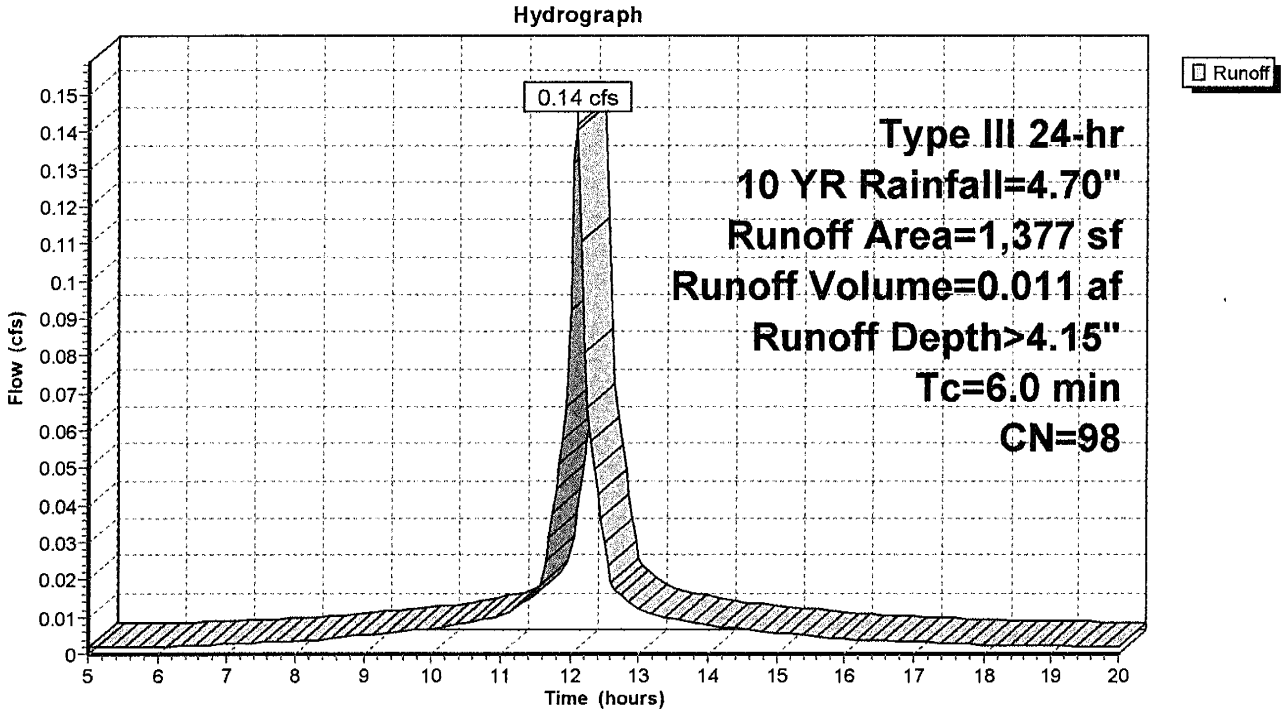
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.15"

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

Area (sf)	CN	Description
1,377	98	Paved parking, HSG A
1,377		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 7: RD PAVE



Summary for Reach DP 2: DES PT 2

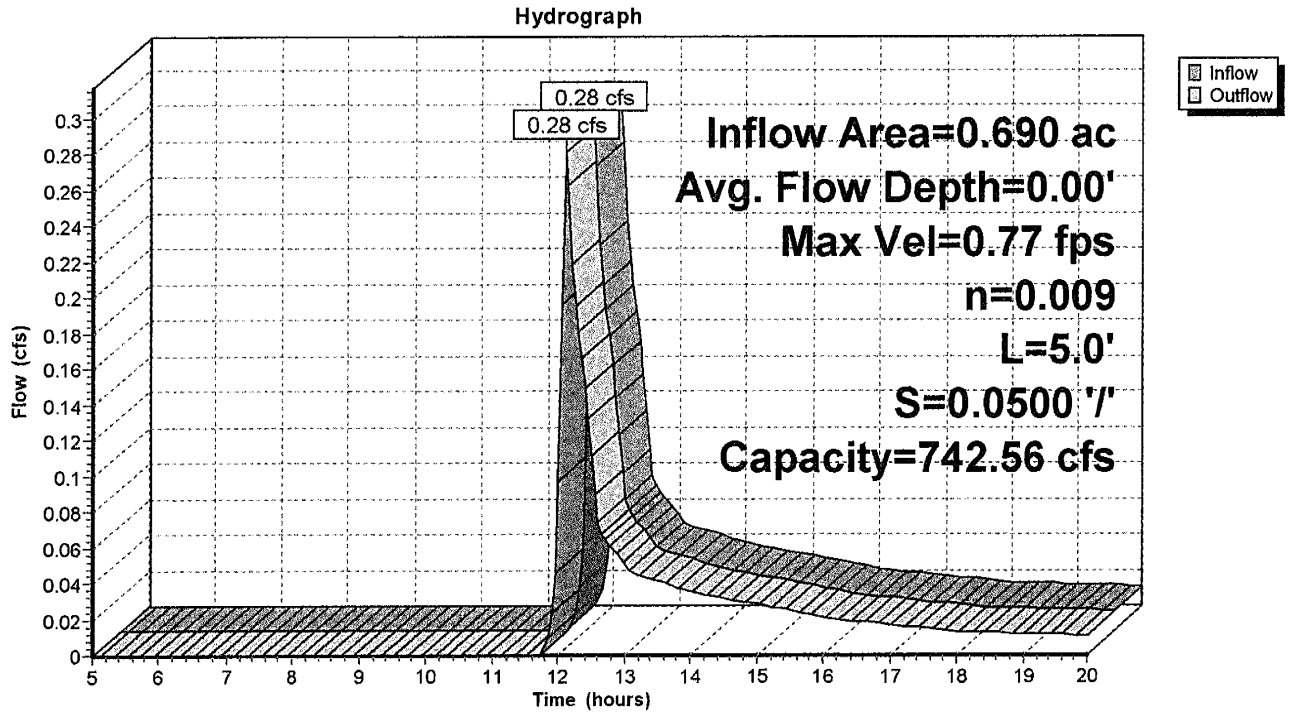
Inflow Area = 0.690 ac, 5.33% Impervious, Inflow Depth > 0.41" for 10 YR event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.024 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.77 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 2: DES PT 2



Summary for Reach DP 3: DES PT 3

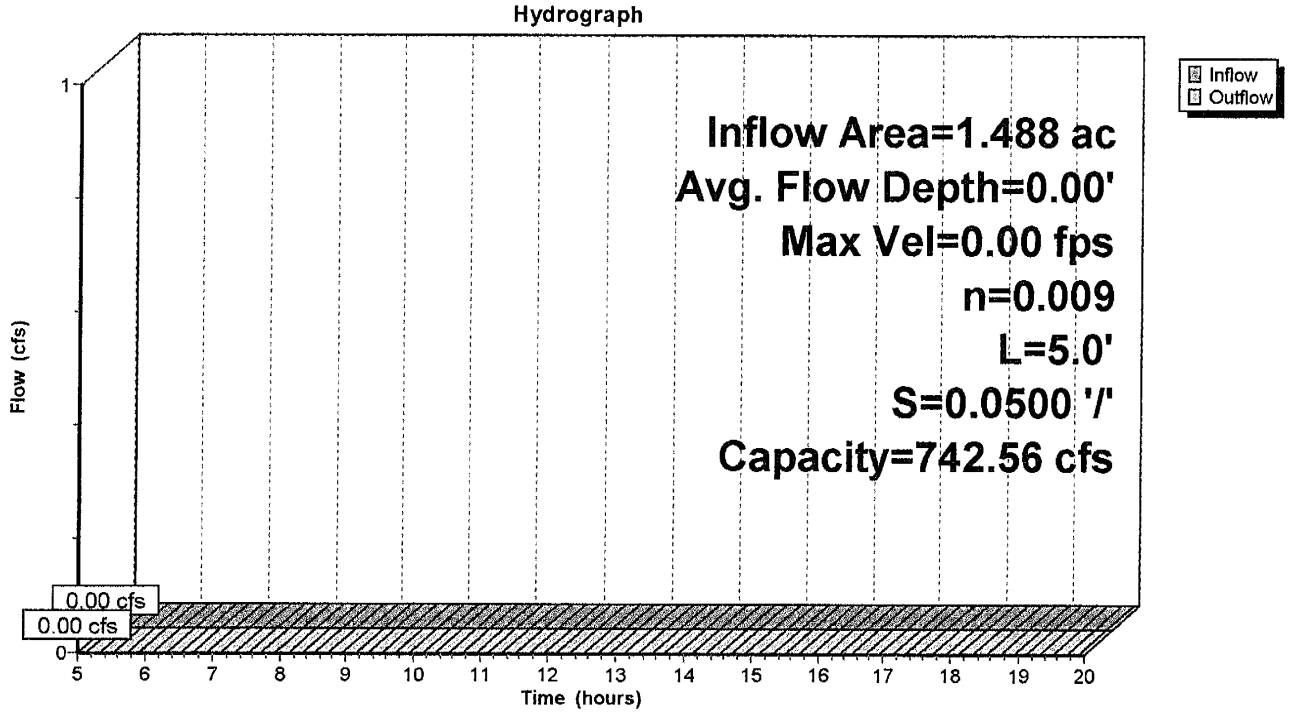
Inflow Area = 1.488 ac, 9.44% Impervious, Inflow Depth = 0.00" for 10 YR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 3: DES PT 3



Summary for Reach DP 4: DES PT 4

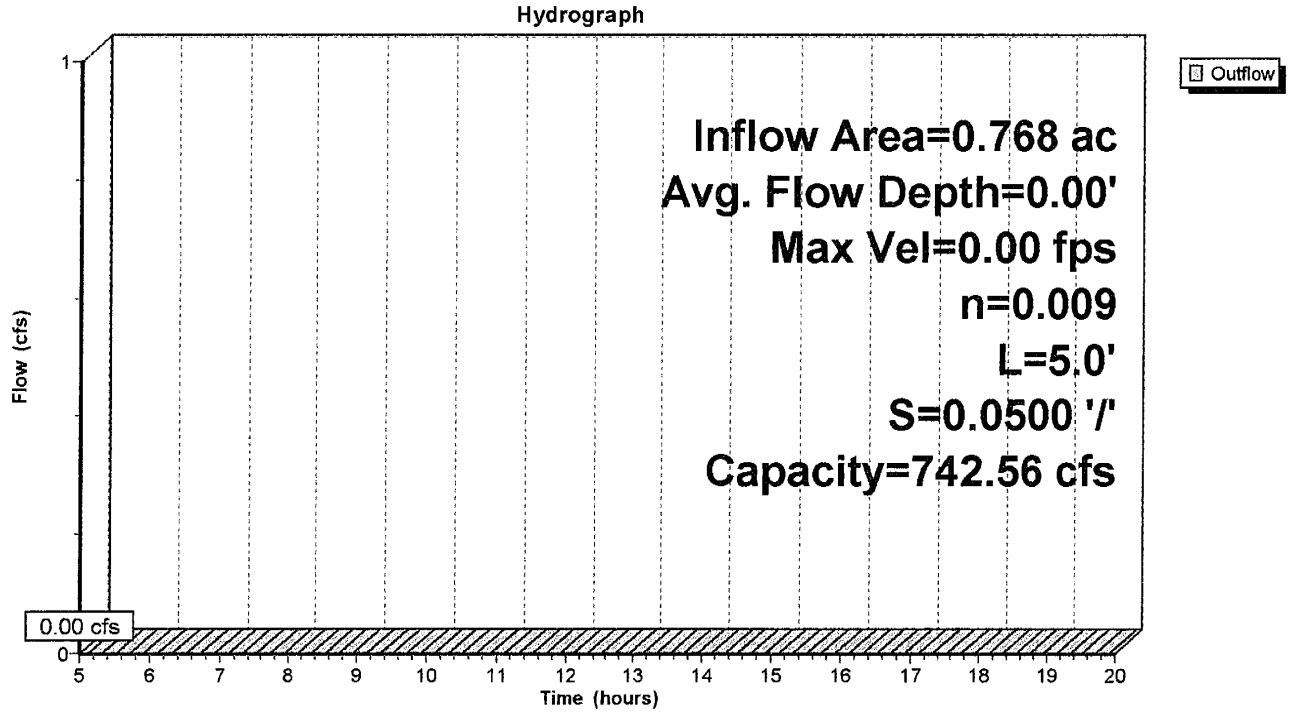
Inflow Area = 0.768 ac, 3.23% Impervious, Inflow Depth = 0.00" for 10 YR event
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 4: DES PT 4



Summary for Pond 1P: GALLEY RECHARGE SYSTEM

Inflow Area =	0.324 ac,	49.91% Impervious,	Inflow Depth >	2.04"	for 10 YR event
Inflow =	0.79 cfs @	12.09 hrs, Volume=	0.055 af		
Outflow =	0.16 cfs @	12.55 hrs, Volume=	0.055 af,	Atten= 79%,	Lag= 27.4 min
Discarded =	0.16 cfs @	12.55 hrs, Volume=	0.055 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 71.92' @ 12.55 hrs Surf.Area= 680 sf Storage= 681 cf

Plug-Flow detention time= 29.7 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 29.3 min (821.3 - 792.0)

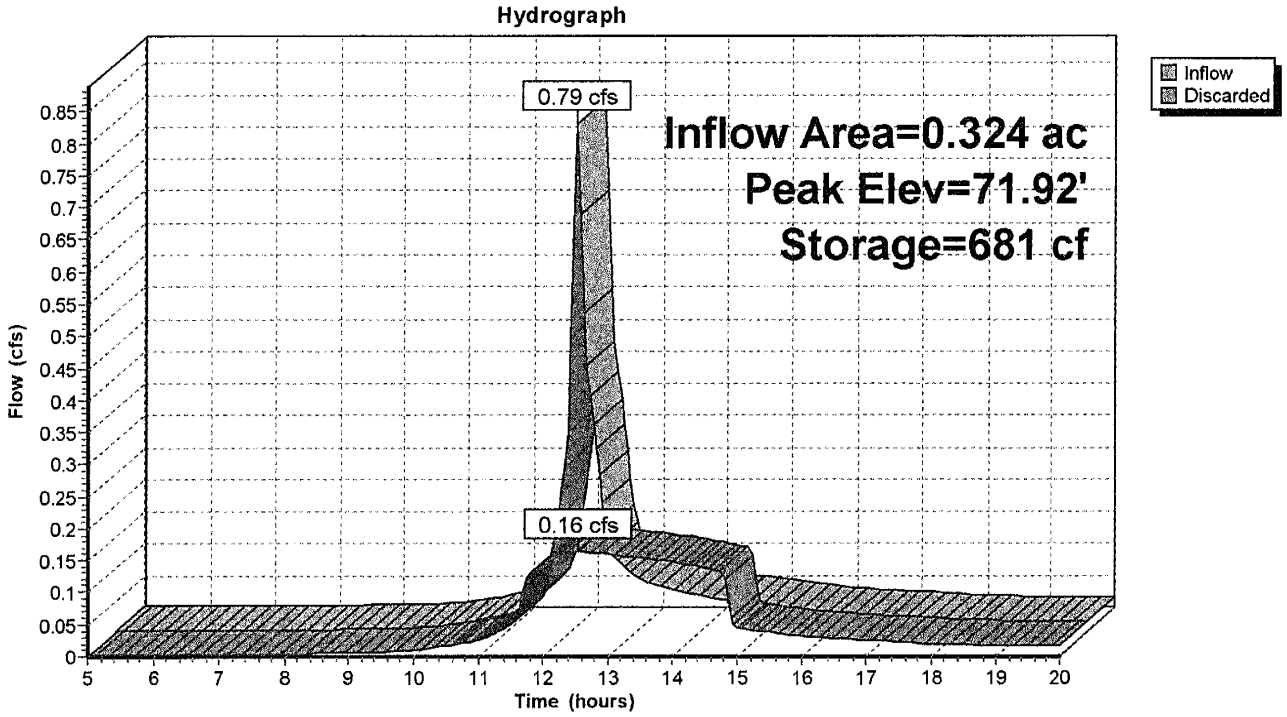
Volume	Invert	Avail.Storage	Storage Description
#1A	69.89'	1,498 cf	**8.50'W x 80.00'L x 7.25'H Field A** 4,930 cf Overall - 1,184 cf Embedded = 3,746 cf x 40.0% Voids
#2A	70.89'	881 cf	**Concrete Galley 4x4x4.25** x 19 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		2,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.89'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.00'

Discarded OutFlow Max=0.16 cfs @ 12.55 hrs HW=71.92' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.16 cfs)

Pond 1P: GALLEY RECHARGE SYSTEM



Summary for Pond 2P: CB 4

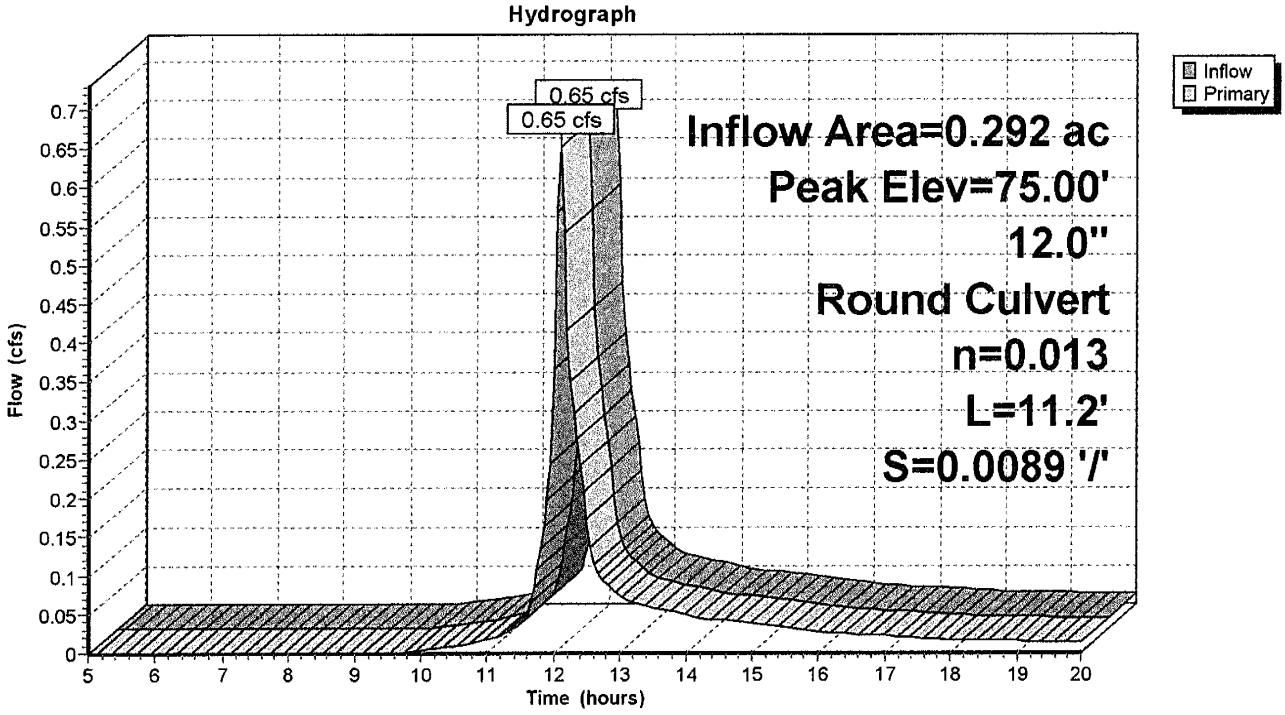
Inflow Area =	0.292 ac, 44.49% Impervious, Inflow Depth > 1.82" for 10 YR event				
Inflow =	0.65 cfs @	12.10 hrs, Volume=	0.044 af		
Outflow =	0.65 cfs @	12.10 hrs, Volume=	0.044 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.65 cfs @	12.10 hrs, Volume=	0.044 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.00' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.51'	**12.0" Round Culvert** L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.51' / 74.41' S= 0.0089 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.65 cfs @ 12.10 hrs HW=75.00' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.65 cfs @ 2.46 fps)

Pond 2P: CB 4



Summary for Pond 3P: CB 3

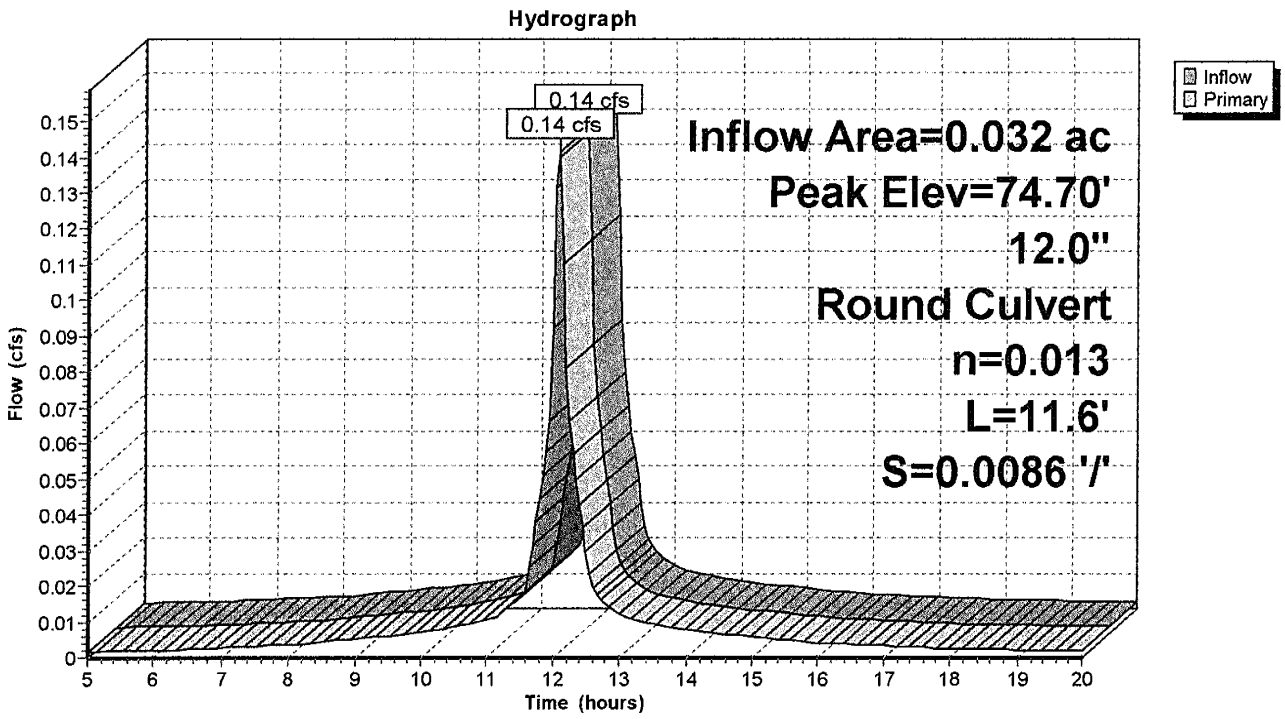
Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 4.15" for 10 YR event				
Inflow =	0.14 cfs @	12.09 hrs,	Volume=	0.011 af	
Outflow =	0.14 cfs @	12.09 hrs,	Volume=	0.011 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.14 cfs @	12.09 hrs,	Volume=	0.011 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.70' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.49'	**12.0" Round Culvert** L= 11.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.49' / 74.39' S= 0.0086 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.09 hrs HW=74.70' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.14 cfs @ 1.75 fps)

Pond 3P: CB 3



Summary for Pond 4P: DMH 1

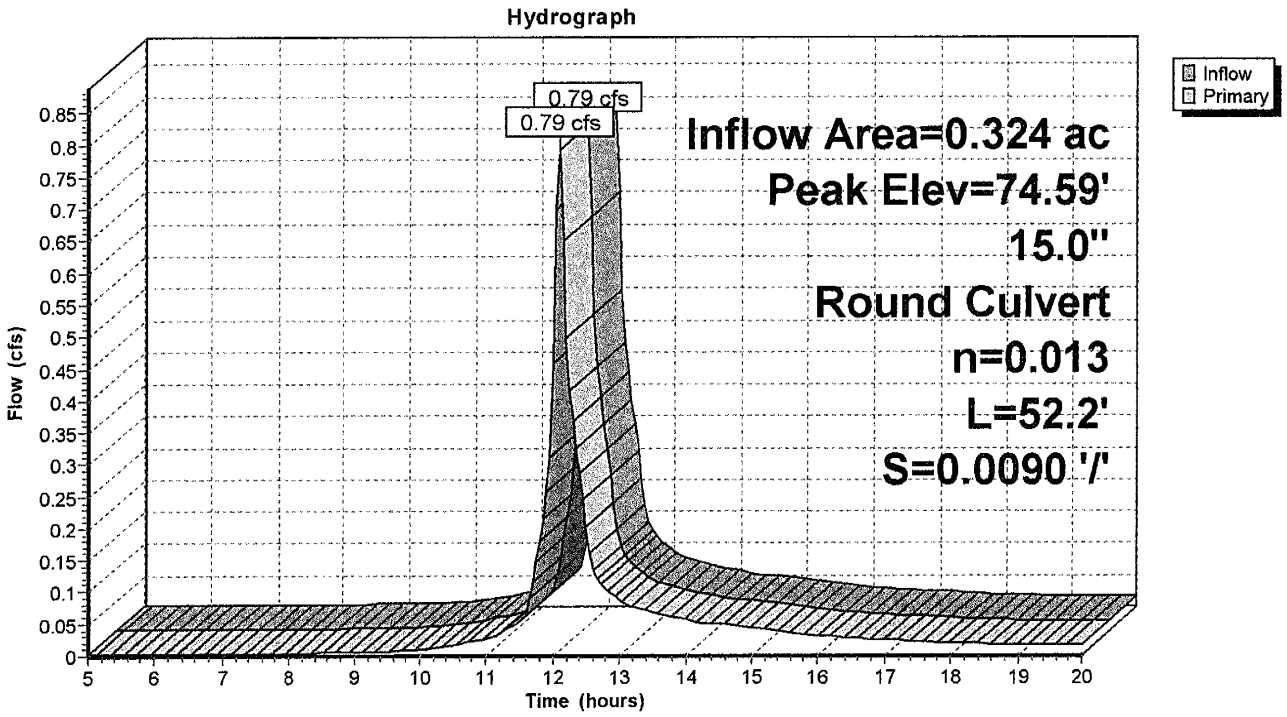
Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event				
Inflow =	0.79 cfs @ 12.09 hrs, Volume=	0.055 af			
Outflow =	0.79 cfs @ 12.09 hrs, Volume=	0.055 af, Atten= 0%, Lag= 0.0 min			
Primary =	0.79 cfs @ 12.09 hrs, Volume=	0.055 af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.59' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.11'	**15.0" Round Culvert** L= 52.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.11' / 73.64' S= 0.0090 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.78 cfs @ 12.09 hrs HW=74.58' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.78 cfs @ 1.85 fps)

Pond 4P: DMH 1



Summary for Pond 5P: DMH 2

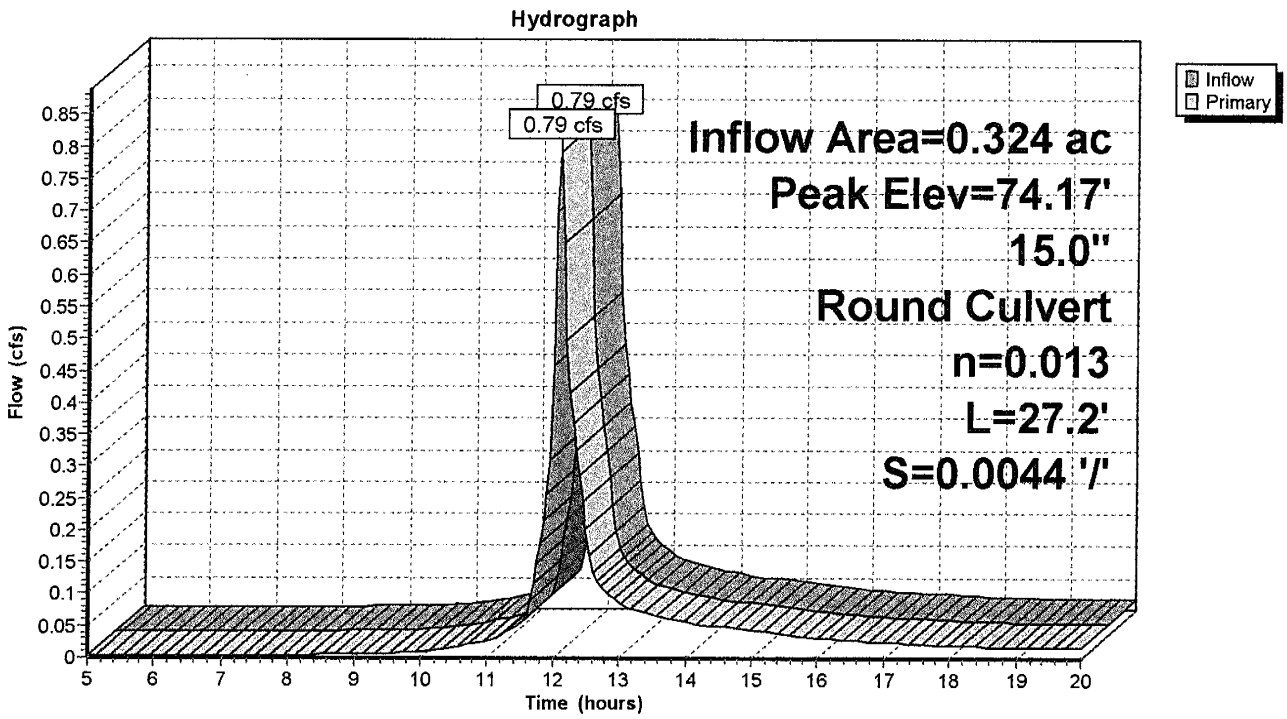
Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event				
Inflow =	0.79 cfs @	12.09 hrs,	Volume=	0.055 af	
Outflow =	0.79 cfs @	12.09 hrs,	Volume=	0.055 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.79 cfs @	12.09 hrs,	Volume=	0.055 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.17' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.64'	**15.0" Round Culvert** L= 27.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.64' / 73.52' S= 0.0044 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.78 cfs @ 12.09 hrs HW=74.17' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.78 cfs @ 2.36 fps)

Pond 5P: DMH 2



Summary for Pond 6P: FRENCH DRAIN

Inflow Area =	0.303 ac,	12.14% Impervious,	Inflow Depth >	1.33"	for 10 YR event
Inflow =	0.48 cfs @	12.10 hrs,	Volume=	0.033 af	
Outflow =	0.12 cfs @	12.54 hrs,	Volume=	0.033 af,	Atten= 75%, Lag= 26.1 min
Discarded =	0.12 cfs @	12.54 hrs,	Volume=	0.033 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.53' @ 12.54 hrs Surf.Area= 560 sf Storage= 342 cf

Plug-Flow detention time= 18.3 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 18.2 min (838.6 - 820.4)

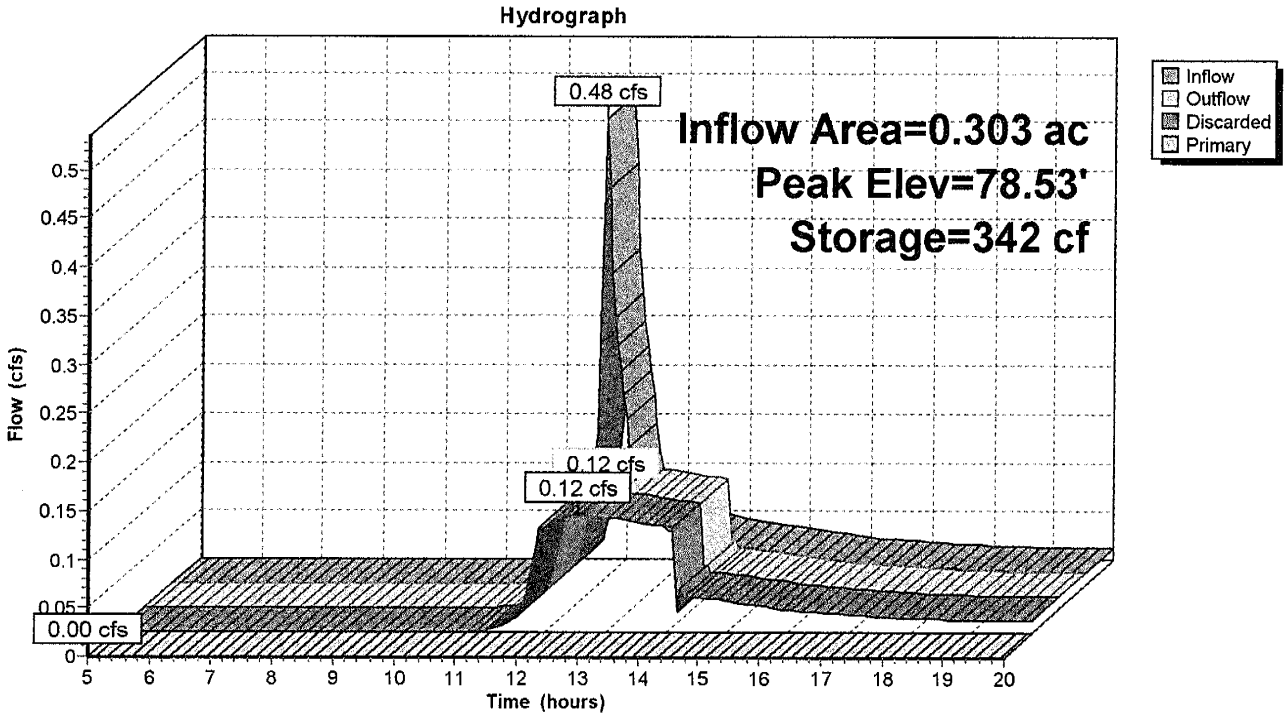
Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	448 cf	**2.00'W x 280.00'L x 2.00'H Prismatoid** 1,120 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 65.00'
#2	Primary	78.80'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.12 cfs @ 12.54 hrs HW=78.53' (Free Discharge)
└**1=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=77.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: FRENCH DRAIN



Summary for Pond DW1: 8' DIA DRYWELL

Inflow Area =	0.303 ac, 12.14% Impervious, Inflow Depth = 0.00" for 10 YR event				
Inflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Outflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min		
Discarded =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 70.00' @ 5.00 hrs Surf.Area= 201 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

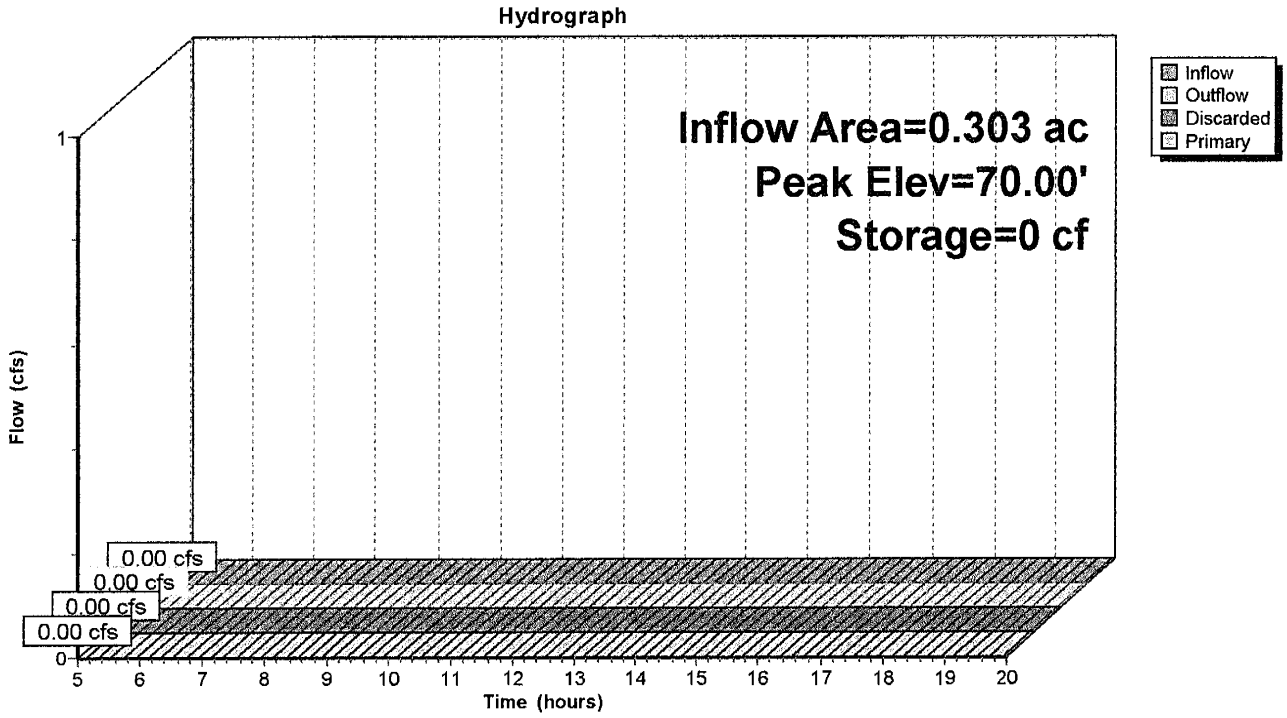
Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	72.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	77.00'	**4.0" Round Culvert** L= 12.6' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.00' S= 0.0794 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.04 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW1: 8' DIA DRYWELL



Summary for Pond DW2: 8' DIA DRYWELL

Inflow Area =	0.216 ac, 53.68% Impervious, Inflow Depth > 1.74" for 10 YR event				
Inflow =	0.46 cfs @	12.10 hrs,	Volume=	0.031 af	
Outflow =	0.06 cfs @	12.86 hrs,	Volume=	0.031 af,	Atten= 87%, Lag= 45.7 min
Discarded =	0.06 cfs @	12.86 hrs,	Volume=	0.031 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.69' @ 12.86 hrs Surf.Area= 251 sf Storage= 513 cf

Plug-Flow detention time= 81.9 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 81.2 min (889.2 - 808.0)

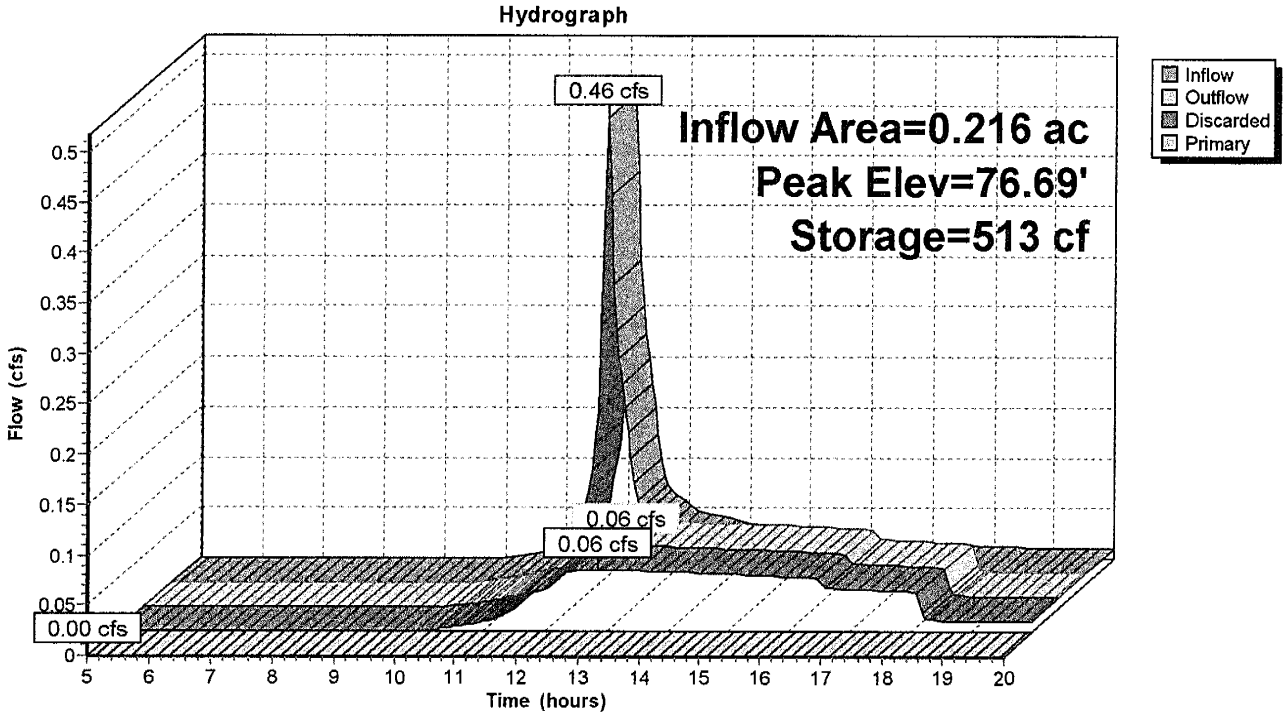
Volume	Invert	Avail.Storage	Storage Description
#1	72.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	74.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	72.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	79.00'	**4.0" Round Culvert** L= 135.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.00' / 66.50' S= 0.0926 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.06 cfs @ 12.86 hrs HW=76.69' (Free Discharge)
└**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=72.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW2: 8' DIA DRYWELL



Summary for Pond DW3: 8' DIA DRYWELL

Inflow Area =	0.422 ac, 33.29% Impervious, Inflow Depth = 0.00" for 10 YR event				
Inflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Outflow =	0.00 cfs @	5.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min		
Discarded =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.50' @ 5.00 hrs Surf.Area= 201 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

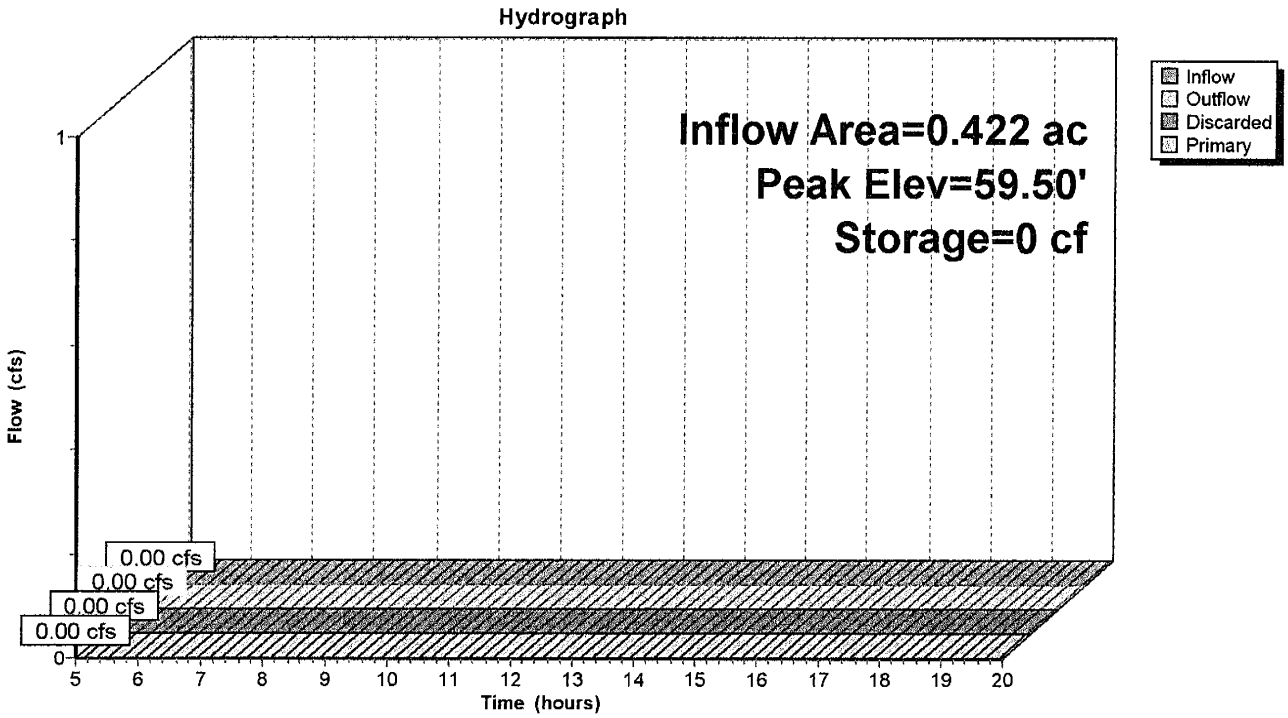
Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	61.50'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.50'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	66.50'	**4.0" Round Culvert** L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 66.50' / 66.00' S= 0.0263 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=59.50' (Free Discharge)
└─**1=Exfiltration** (Passes 0.00 cfs of 0.04 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=59.50' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Pond DW3: 8' DIA DRYWELL



Summary for Pond DW4: 8' DIA DRYWELL

Inflow Area =	0.206 ac, 11.91% Impervious, Inflow Depth > 0.33" for 10 YR event				
Inflow =	0.03 cfs @	12.32 hrs,	Volume=	0.006 af	
Outflow =	0.03 cfs @	12.37 hrs,	Volume=	0.006 af,	Atten= 2%, Lag= 2.8 min
Discarded =	0.03 cfs @	12.37 hrs,	Volume=	0.006 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 63.07' @ 12.37 hrs Surf.Area= 201 sf Storage= 6 cf

Plug-Flow detention time= 2.8 min calculated for 0.006 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (885.3 - 883.3)

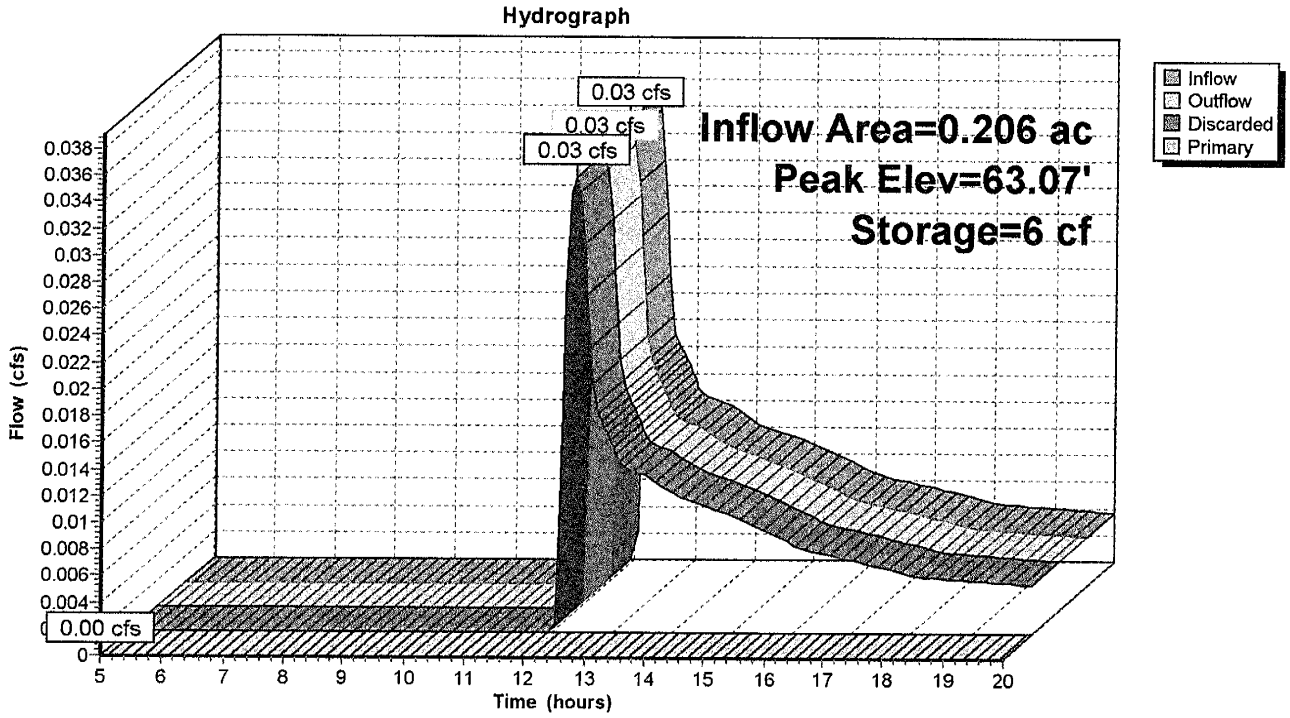
Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	65.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	70.00'	**4.0" Round Culvert** L= 77.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 66.50' S= 0.0455 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.04 cfs @ 12.37 hrs HW=63.07' (Free Discharge)
└**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=63.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW4: 8' DIA DRYWELL



Summary for Pond DW5: 8' DIA DRYWELL

Inflow Area =	0.768 ac,	3.23% Impervious,	Inflow Depth > 0.05"	for 10 YR event
Inflow =	0.01 cfs @	15.37 hrs, Volume=	0.003 af	
Outflow =	0.01 cfs @	15.42 hrs, Volume=	0.003 af,	Atten= 0%, Lag= 2.8 min
Discarded =	0.01 cfs @	15.42 hrs, Volume=	0.003 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.01' @ 15.42 hrs Surf.Area= 201 sf Storage= 1 cf

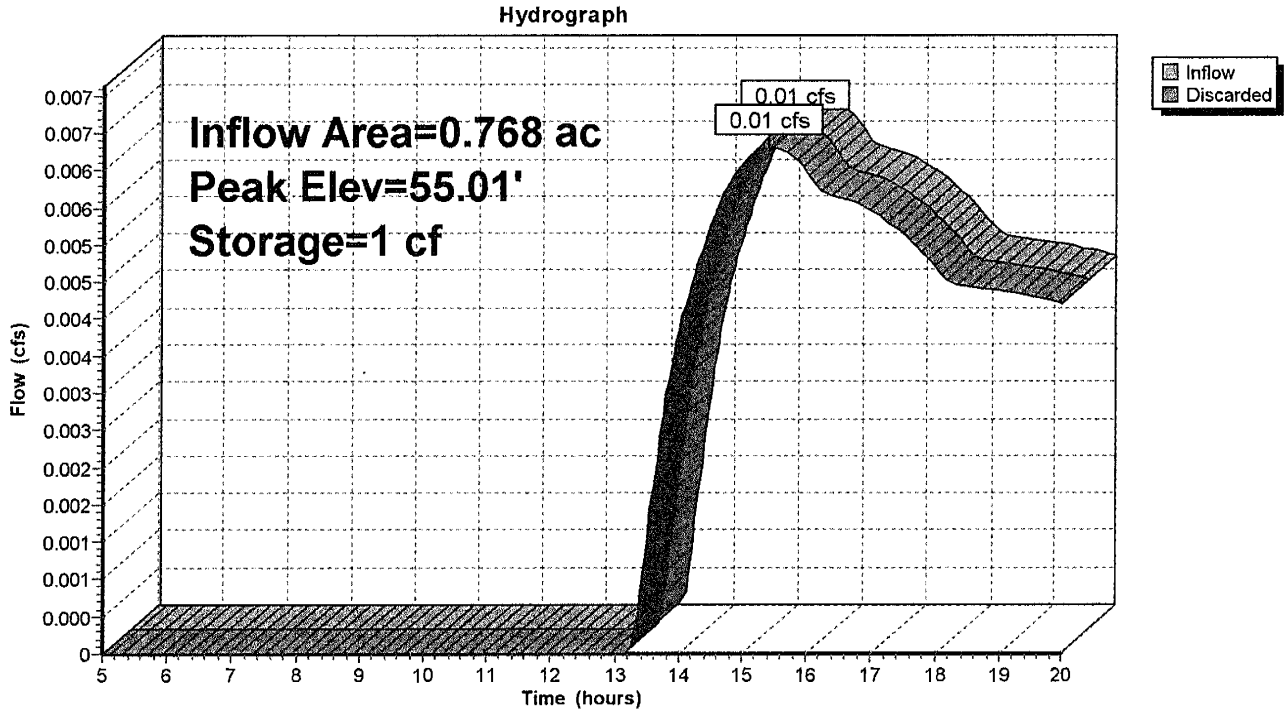
Plug-Flow detention time= 2.7 min calculated for 0.003 af (99% of inflow)
Center-of-Mass det. time= 1.5 min (1,002.6 - 1,001.1)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	57.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.00'

Discarded OutFlow Max=0.04 cfs @ 15.42 hrs HW=55.01' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Pond DW5: 8' DIA DRYWELL



100 YEAR STORM

Summary for Subcatchment PST 1: TO DESIGN POINT 1

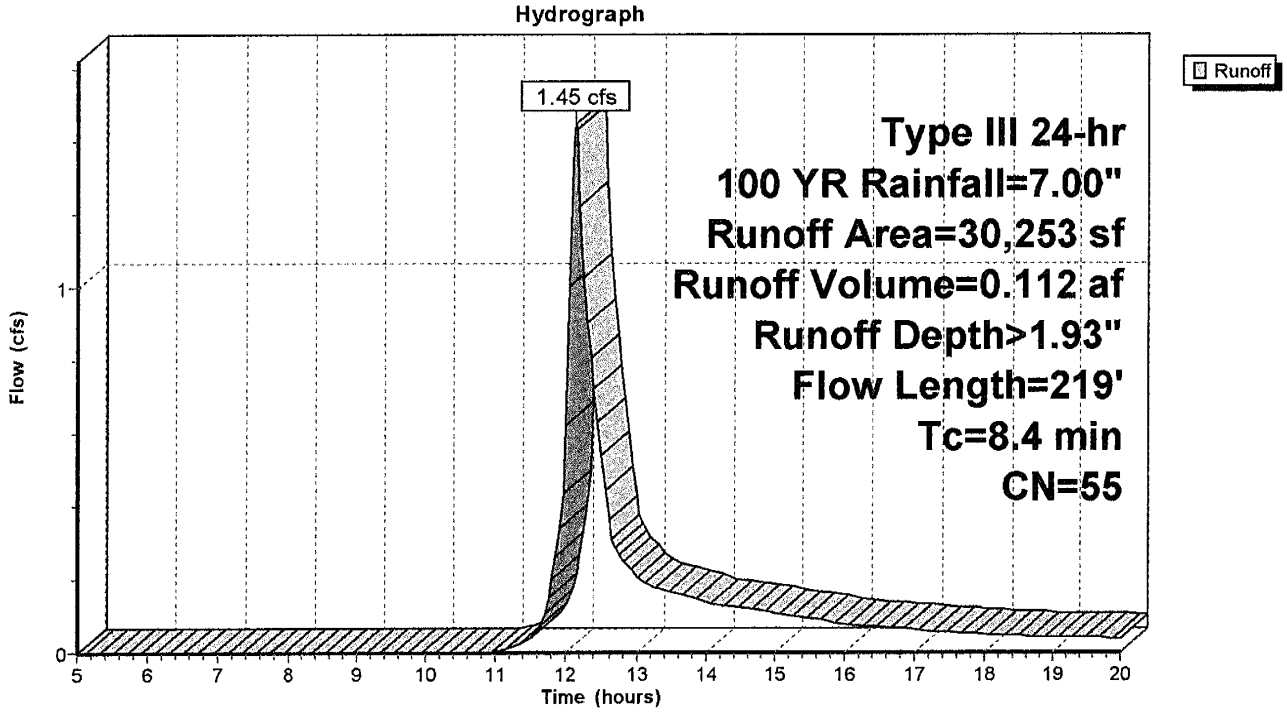
Runoff = 1.45 cfs @ 12.13 hrs, Volume= 0.112 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
15,392	39	>75% Grass cover, Good, HSG A
10,032	61	>75% Grass cover, Good, HSG B
4,661	98	Paved parking, HSG A
141	30	Woods, Good, HSG A
27	55	Woods, Good, HSG B
30,253	55	Weighted Average
25,592		84.59% Pervious Area
4,661		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0230	0.11		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.6	169	0.1011	5.12		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
8.4	219	Total			

Subcatchment PST 1: TO DESIGN POINT 1



Summary for Subcatchment PST 2: LOT 1

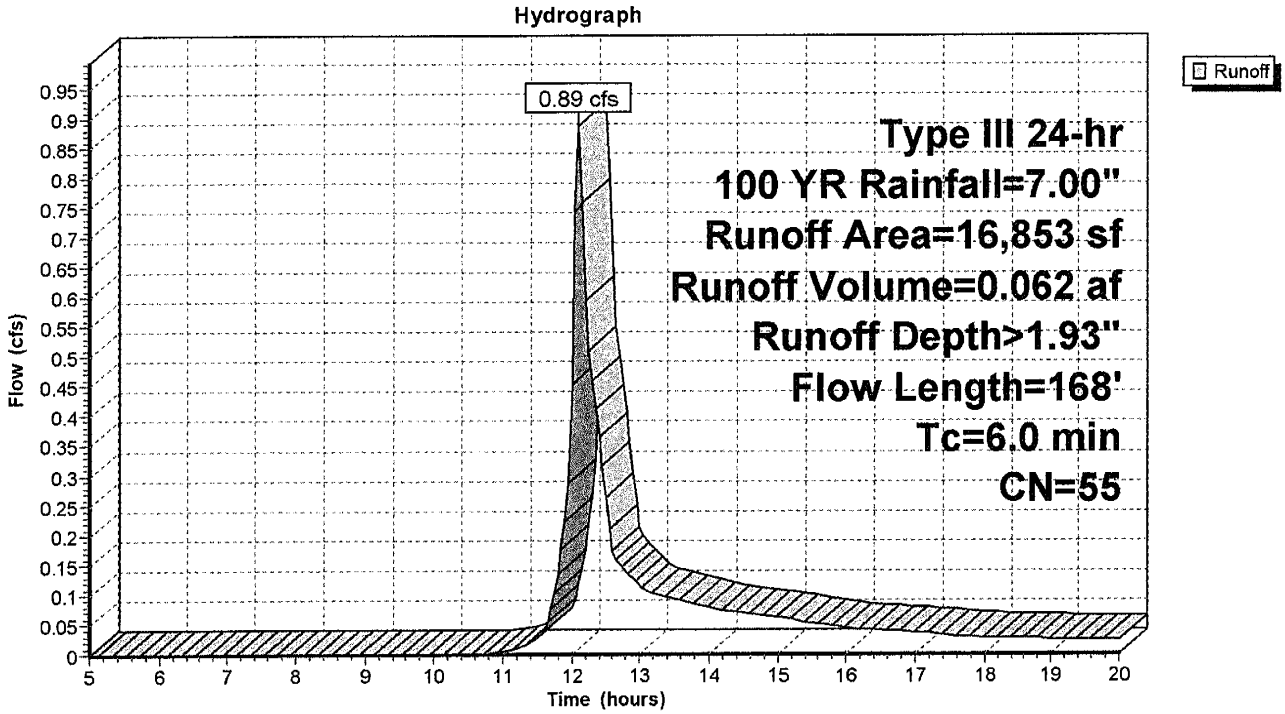
Runoff = 0.89 cfs @ 12.10 hrs, Volume= 0.062 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
183	30	Woods, Good, HSG A
16,670	55	Woods, Good, HSG B
16,853	55	Weighted Average
16,853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2: LOT 1



Summary for Subcatchment PST 2A: LOT 1

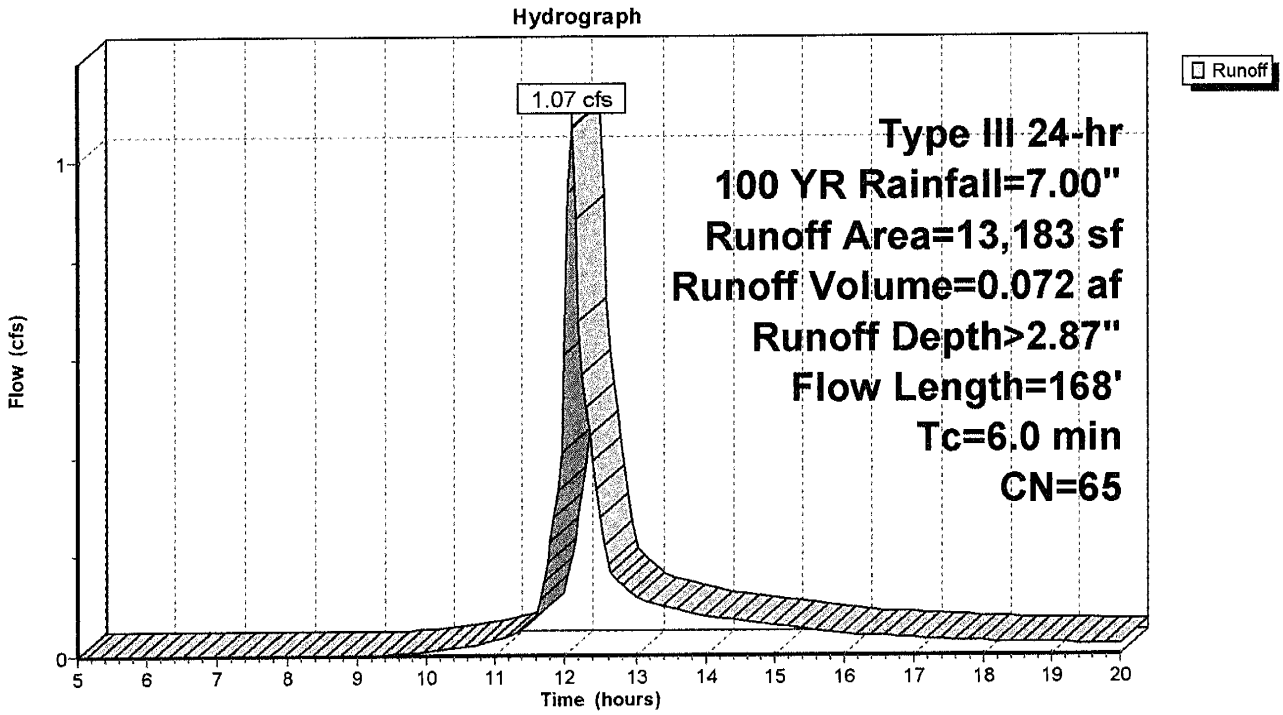
Runoff = 1.07 cfs @ 12.10 hrs, Volume= 0.072 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

	Area (sf)	CN	Description
	355	39	>75% Grass cover, Good, HSG A
	11,228	61	>75% Grass cover, Good, HSG B
*	1,600	98	Roofs, HSG A
	13,183	65	Weighted Average
	11,583		87.86% Pervious Area
	1,600		12.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0900	0.19		**Sheet Flow, SEG 1** Grass: Dense n= 0.240 P2= 3.20"
0.4	118	0.1145	5.45		**Shallow Concentrated Flow, SEG 2** Unpaved Kv= 16.1 fps
1.1					**Direct Entry,**
6.0	168	Total			

Subcatchment PST 2A: LOT 1



Summary for Subcatchment PST 3: WODDS OF LOT 2

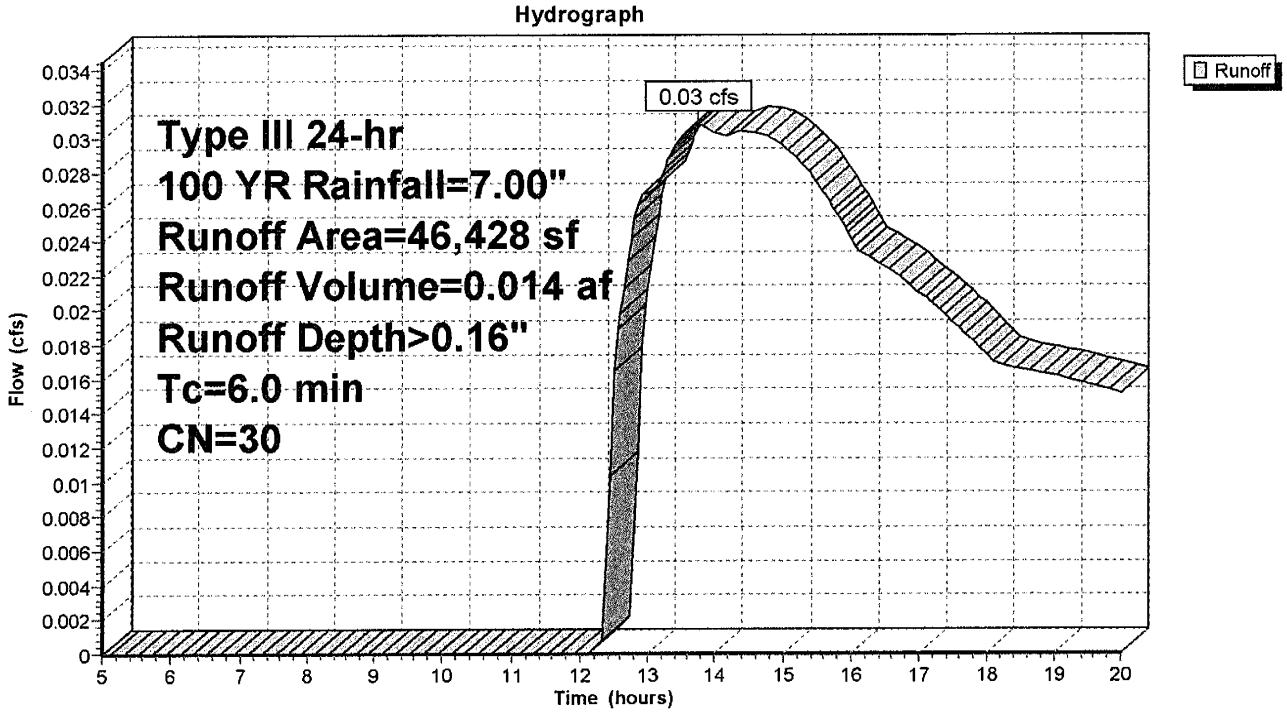
Runoff = 0.03 cfs @ 13.77 hrs, Volume= 0.014 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
46,428	30	Woods, Good, HSG A
46,428		100.00% Pervious Area

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

Subcatchment PST 3: WODDS OF LOT 2



Summary for Subcatchment PST 3A: LOT 2

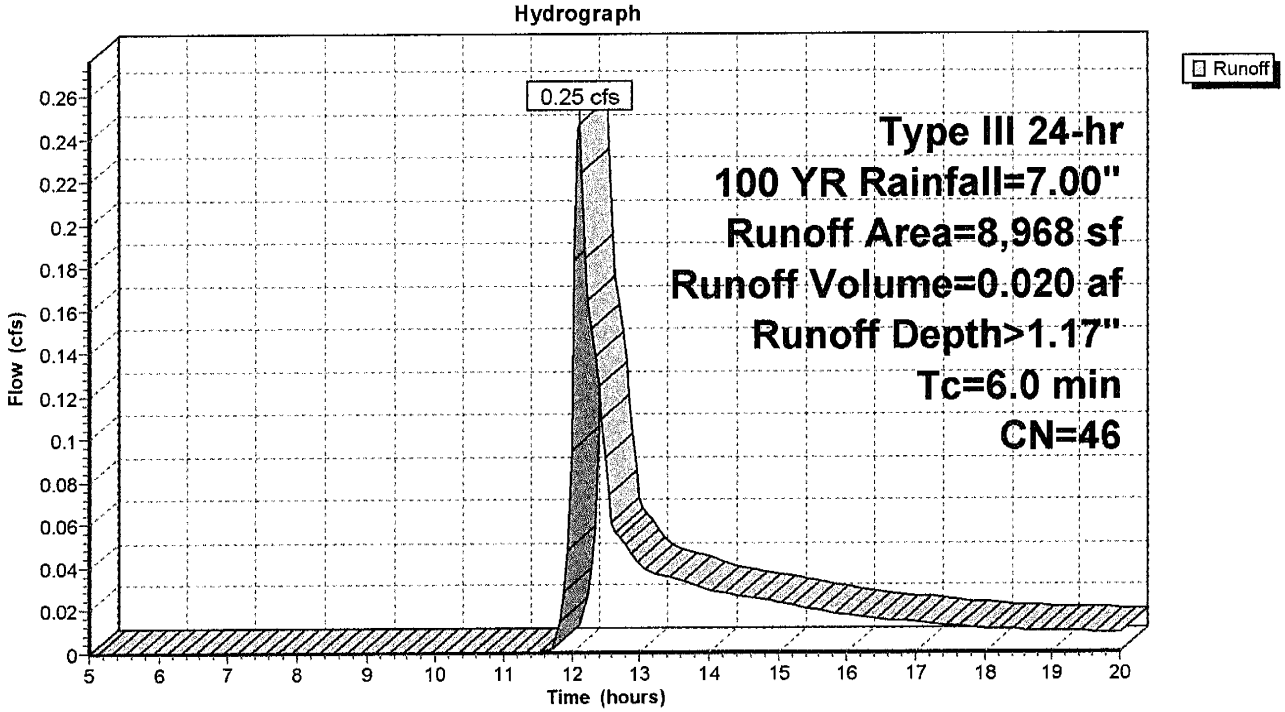
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.020 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
7,900	39	>75% Grass cover, Good, HSG A
1,068	98	Roofs, HSG A
8,968	46	Weighted Average
7,900		88.09% Pervious Area
1,068		11.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3A: LOT 2



Summary for Subcatchment PST 3B: LOT 2

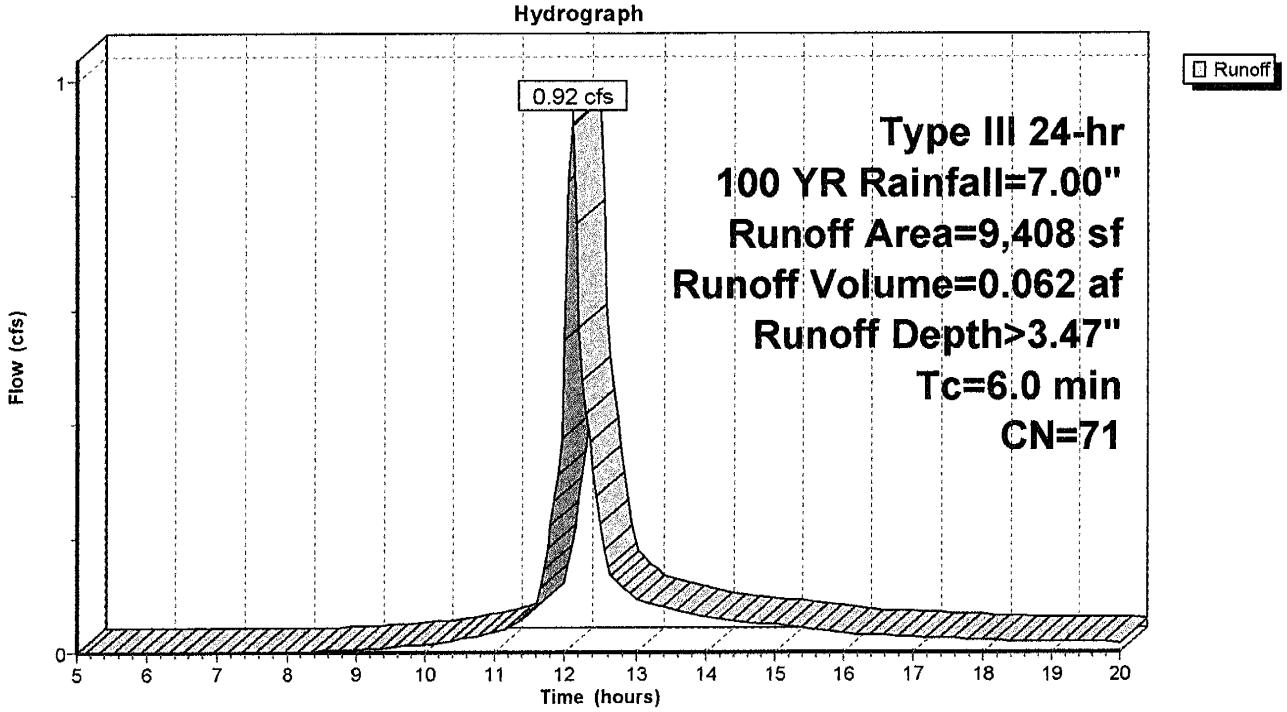
Runoff = 0.92 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
4,358	39	>75% Grass cover, Good, HSG A
3,990	98	Paved parking, HSG A
1,060	98	Roofs, HSG A
9,408	71	Weighted Average
4,358		46.32% Pervious Area
5,050		53.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 3B: LOT 2



Summary for Subcatchment PST 4: LOTS 1&2

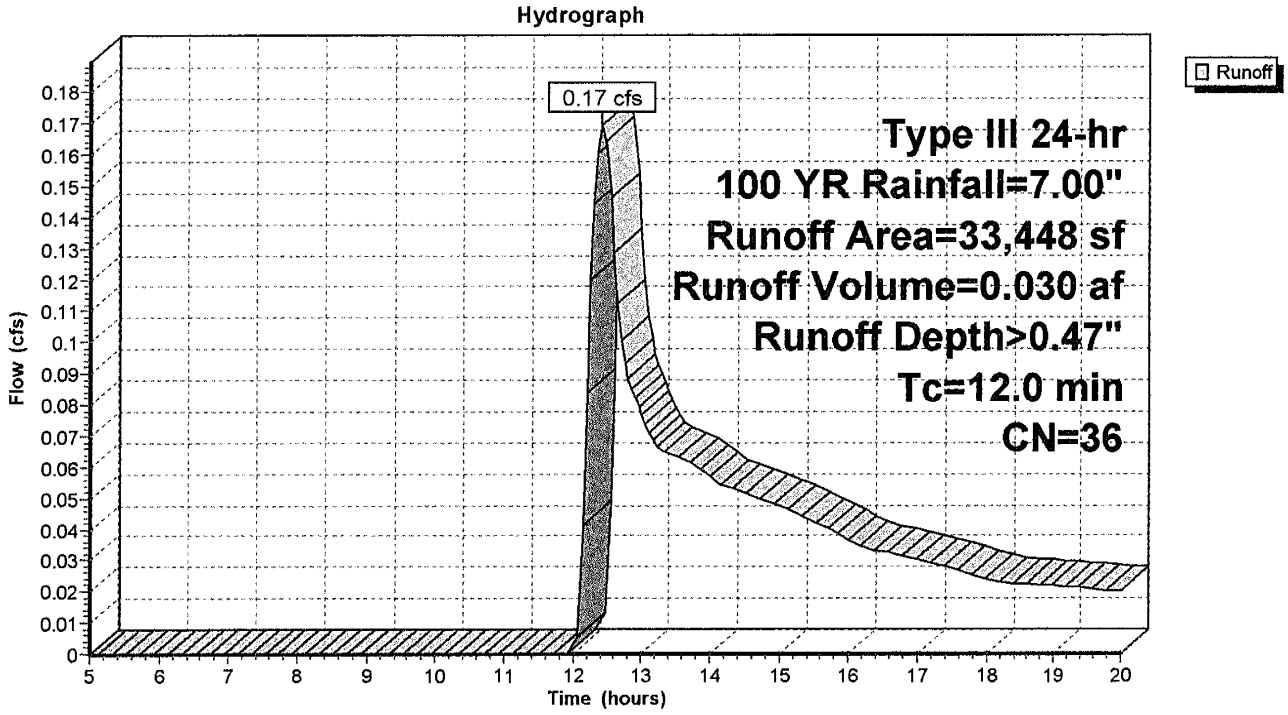
Runoff = 0.17 cfs @ 12.42 hrs, Volume= 0.030 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
12,645	39	>75% Grass cover, Good, HSG A
1,081	98	Roofs, HSG A
19,654	30	Woods, Good, HSG A
68	55	Woods, Good, HSG B
33,448	36	Weighted Average
32,367		96.77% Pervious Area
1,081		3.23% Impervious Area

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

Subcatchment PST 4: LOTS 1&2



Summary for Subcatchment PST 5: TO IVW

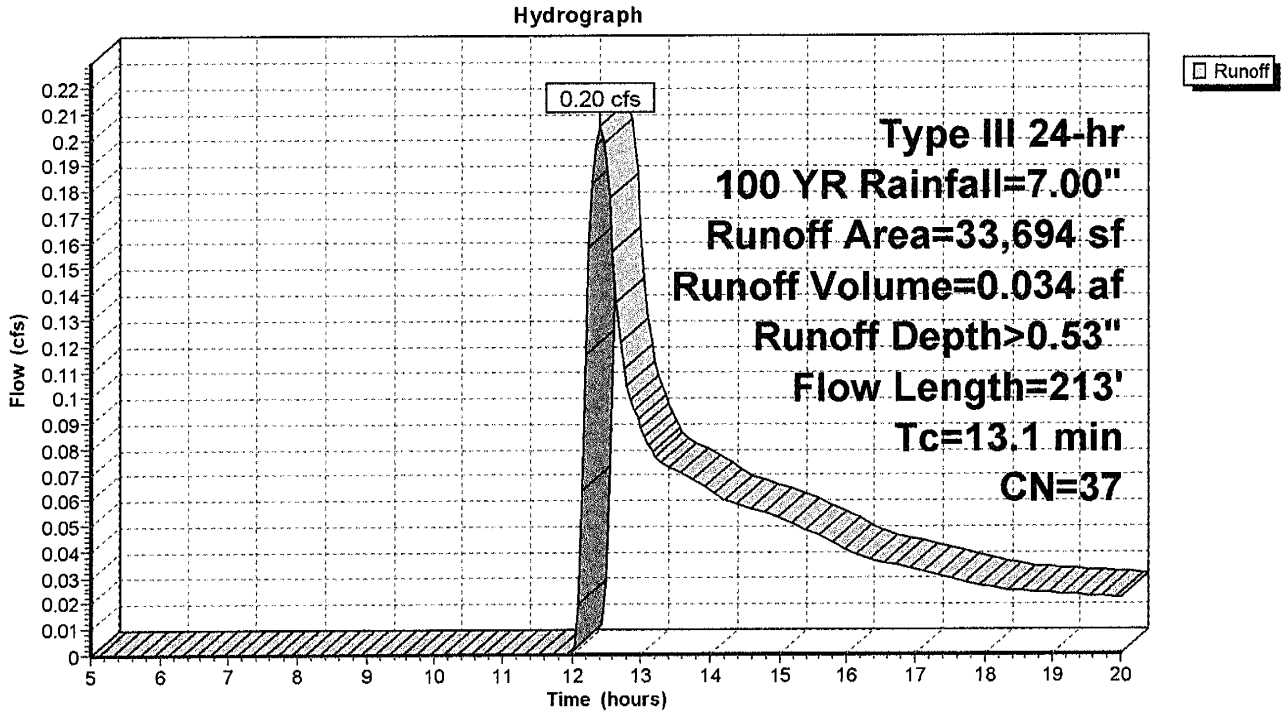
Runoff = 0.20 cfs @ 12.42 hrs, Volume= 0.034 af, Depth> 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

	Area (sf)	CN	Description
*	2,039	78	WETLAND
	26,690	30	Woods, Good, HSG A
	4,965	55	Woods, Good, HSG B
	33,694	37	Weighted Average
	33,694		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	46	0.0217	0.07		**Sheet Flow, SEG 1** Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	167	0.0880	1.48		**Shallow Concentrated Flow, SEG 2** Woodland Kv= 5.0 fps
13.1	213	Total			

Subcatchment PST 5: TO IVW



Summary for Subcatchment PST 6: RD PAVE

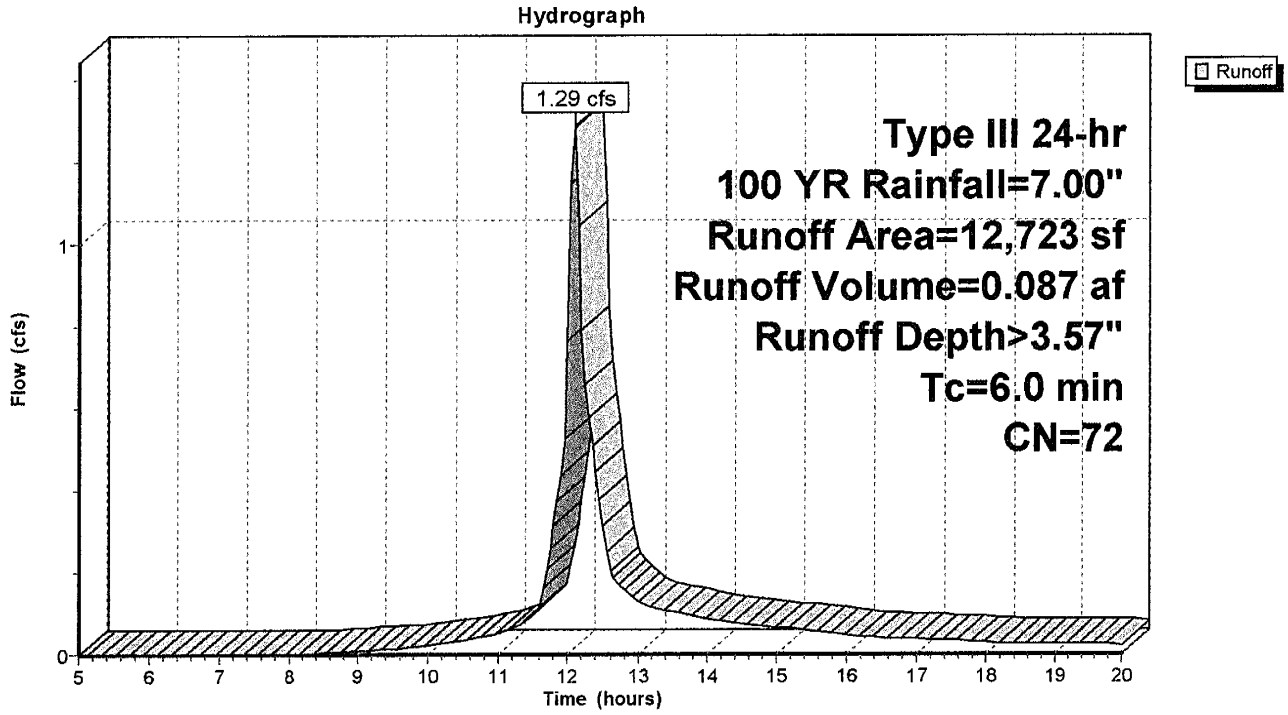
Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.087 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
1,600	98	Roofs, HSG A
3,113	39	>75% Grass cover, Good, HSG A
3,950	61	>75% Grass cover, Good, HSG B
4,060	98	Paved parking, HSG A
12,723	72	Weighted Average
7,063		55.51% Pervious Area
5,660		44.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 6: RD PAVE



Summary for Subcatchment PST 7: RD PAVE

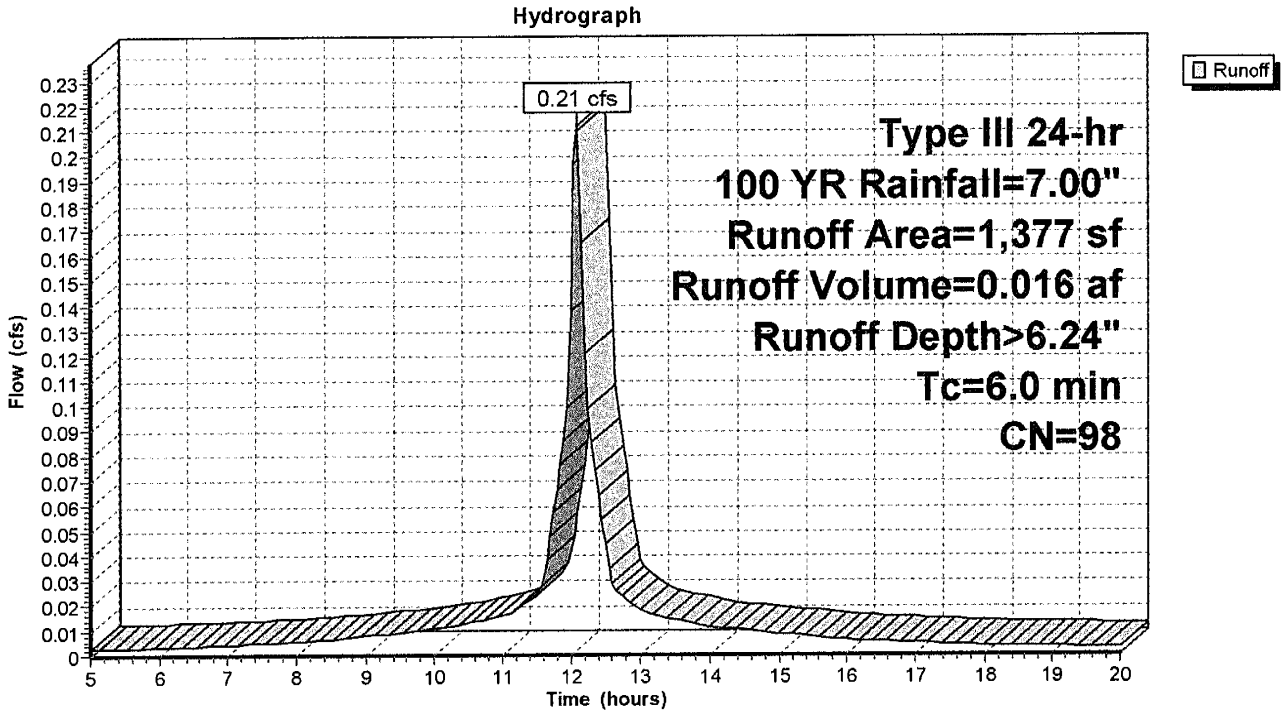
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
1,377	98	Paved parking, HSG A
1,377		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Subcatchment PST 7: RD PAVE



Summary for Reach DP 2: DES PT 2

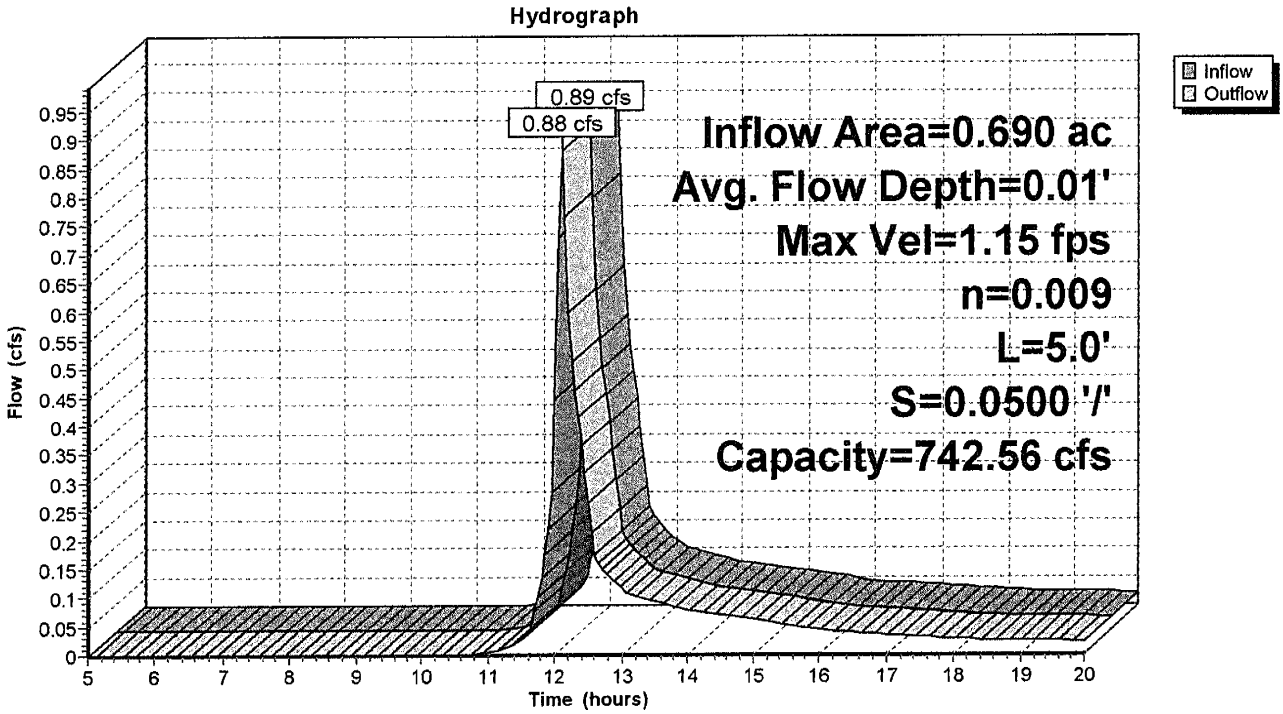
Inflow Area = 0.690 ac, 5.33% Impervious, Inflow Depth > 1.08" for 100 YR event
Inflow = 0.89 cfs @ 12.10 hrs, Volume= 0.062 af
Outflow = 0.88 cfs @ 12.10 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.15 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 2: DES PT 2



Summary for Reach DP 3: DES PT 3

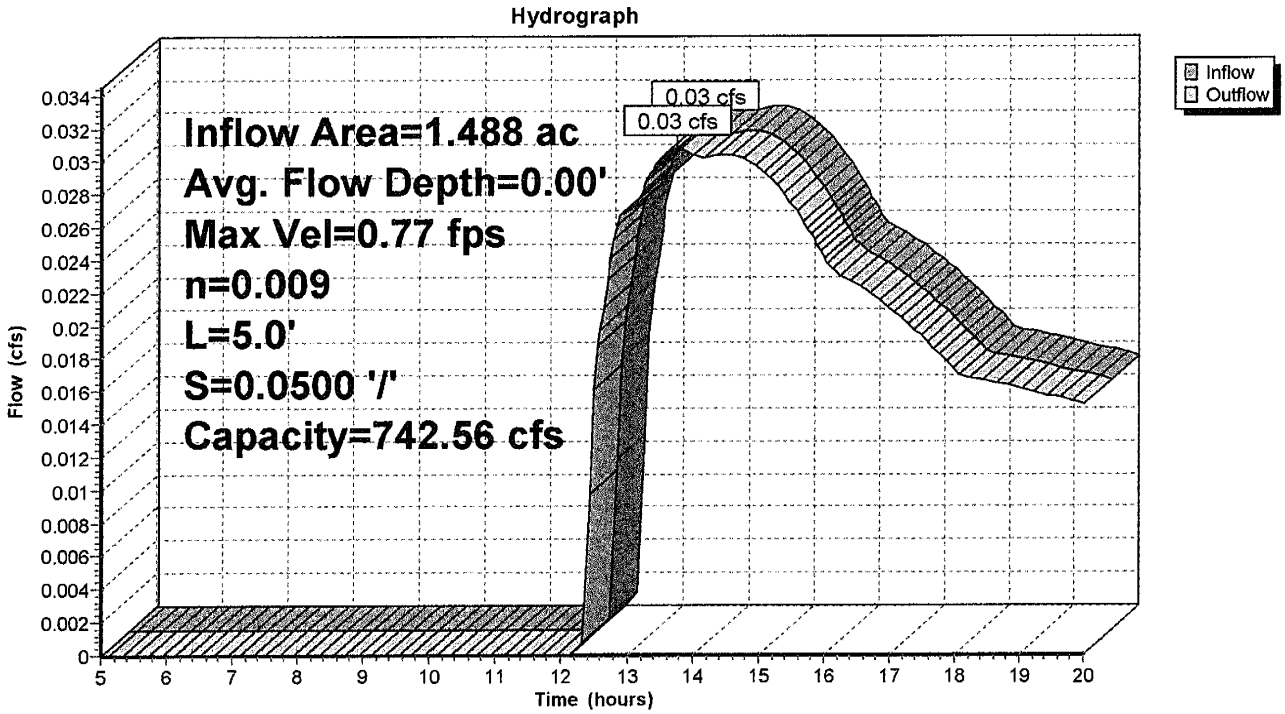
Inflow Area = 1.488 ac, 9.44% Impervious, Inflow Depth > 0.12" for 100 YR event
Inflow = 0.03 cfs @ 13.77 hrs, Volume= 0.014 af
Outflow = 0.03 cfs @ 13.78 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.77 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 13.77 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 3: DES PT 3



Summary for Reach DP 4: DES PT 4

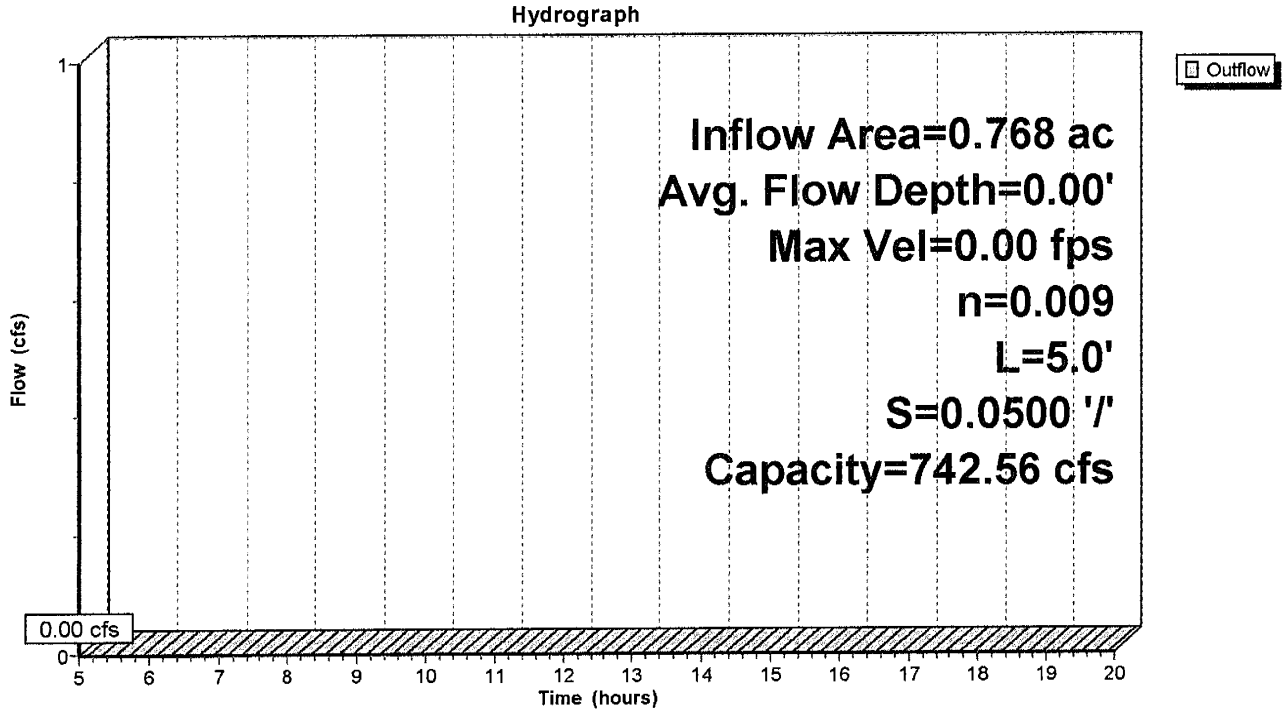
Inflow Area = 0.768 ac, 3.23% Impervious, Inflow Depth = 0.00" for 100 YR event
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.30' Flow Area= 45.0 sf, Capacity= 742.56 cfs

150.00' x 0.30' deep channel, n= 0.009 PVC, smooth interior
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 65.25', Outlet Invert= 65.00'

Reach DP 4: DES PT 4



Summary for Pond 1P: GALLEY RECHARGE SYSTEM

Inflow Area =	0.324 ac,	49.91% Impervious,	Inflow Depth >	3.83"	for 100 YR event
Inflow =	1.50 cfs @	12.09 hrs,	Volume=	0.103 af	
Outflow =	0.20 cfs @	12.68 hrs,	Volume=	0.103 af,	Atten= 86%, Lag= 35.3 min
Discarded =	0.20 cfs @	12.68 hrs,	Volume=	0.103 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.37' @ 12.68 hrs Surf.Area= 680 sf Storage= 1,649 cf

Plug-Flow detention time= 72.3 min calculated for 0.103 af (100% of inflow)
Center-of-Mass det. time= 71.6 min (853.3 - 781.7)

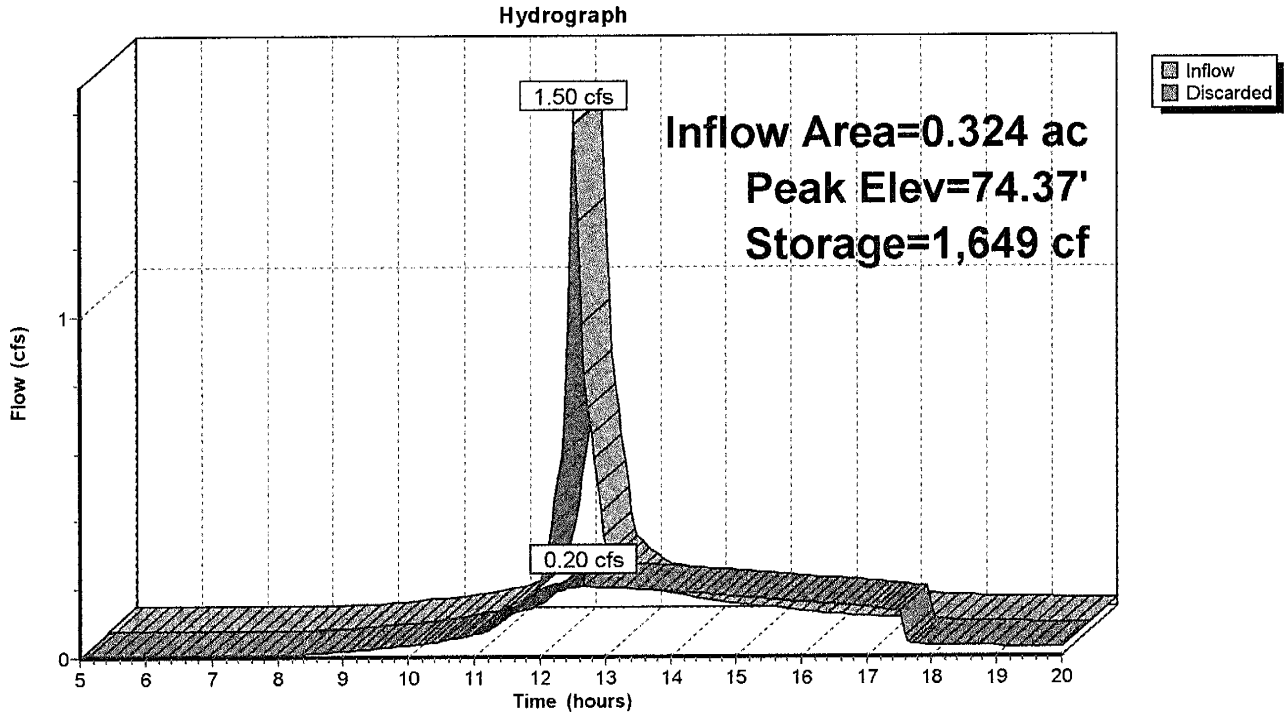
Volume	Invert	Avail.Storage	Storage Description
#1A	69.89'	1,498 cf	**8.50'W x 80.00'L x 7.25'H Field A** 4,930 cf Overall - 1,184 cf Embedded = 3,746 cf x 40.0% Voids
#2A	70.89'	881 cf	**Concrete Galley 4x4x4.25** x 19 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		2,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.89'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.00'

Discarded OutFlow Max=0.20 cfs @ 12.68 hrs HW=74.37' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Pond 1P: GALLEY RECHARGE SYSTEM



Summary for Pond 2P: CB 4

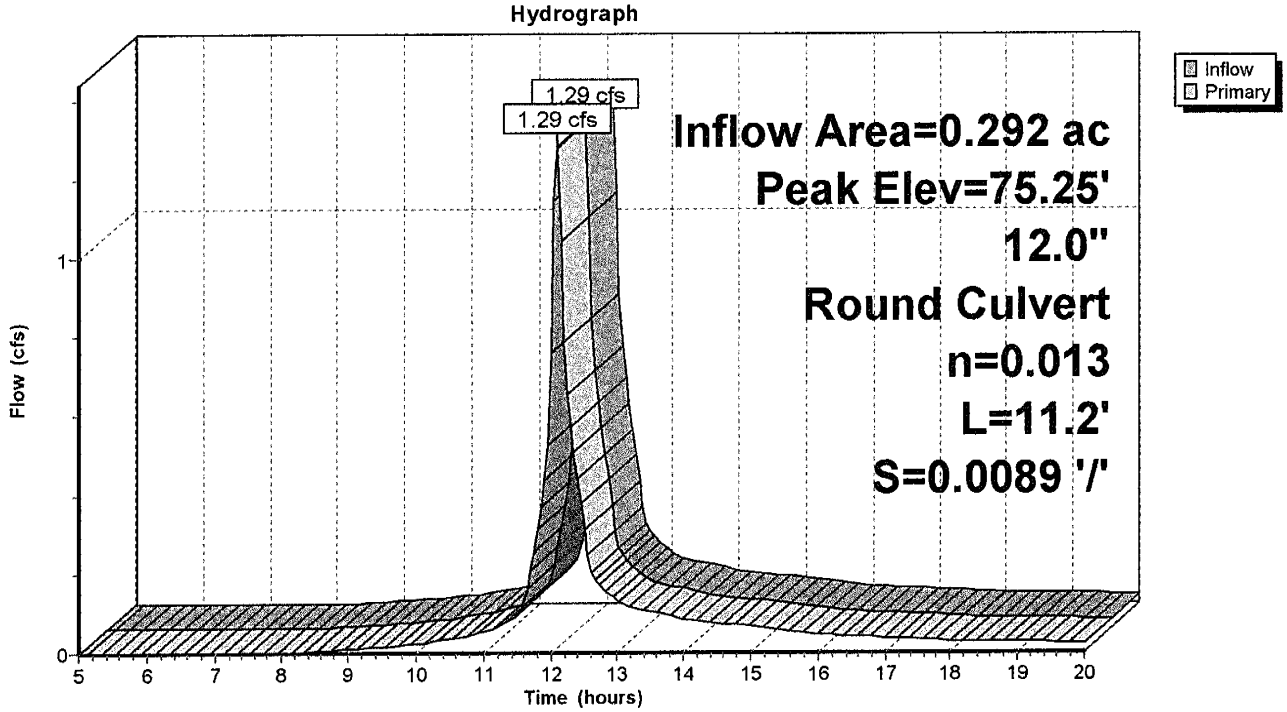
Inflow Area =	0.292 ac, 44.49% Impervious, Inflow Depth > 3.57" for 100 YR event				
Inflow =	1.29 cfs @ 12.09 hrs, Volume=	0.087 af			
Outflow =	1.29 cfs @ 12.09 hrs, Volume=	0.087 af, Atten= 0%, Lag= 0.0 min			
Primary =	1.29 cfs @ 12.09 hrs, Volume=	0.087 af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.25' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.51'	**12.0" Round Culvert** L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.51' / 74.41' S= 0.0089 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.26 cfs @ 12.09 hrs HW=75.24' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.26 cfs @ 2.86 fps)

Pond 2P: CB 4



Summary for Pond 3P: CB 3

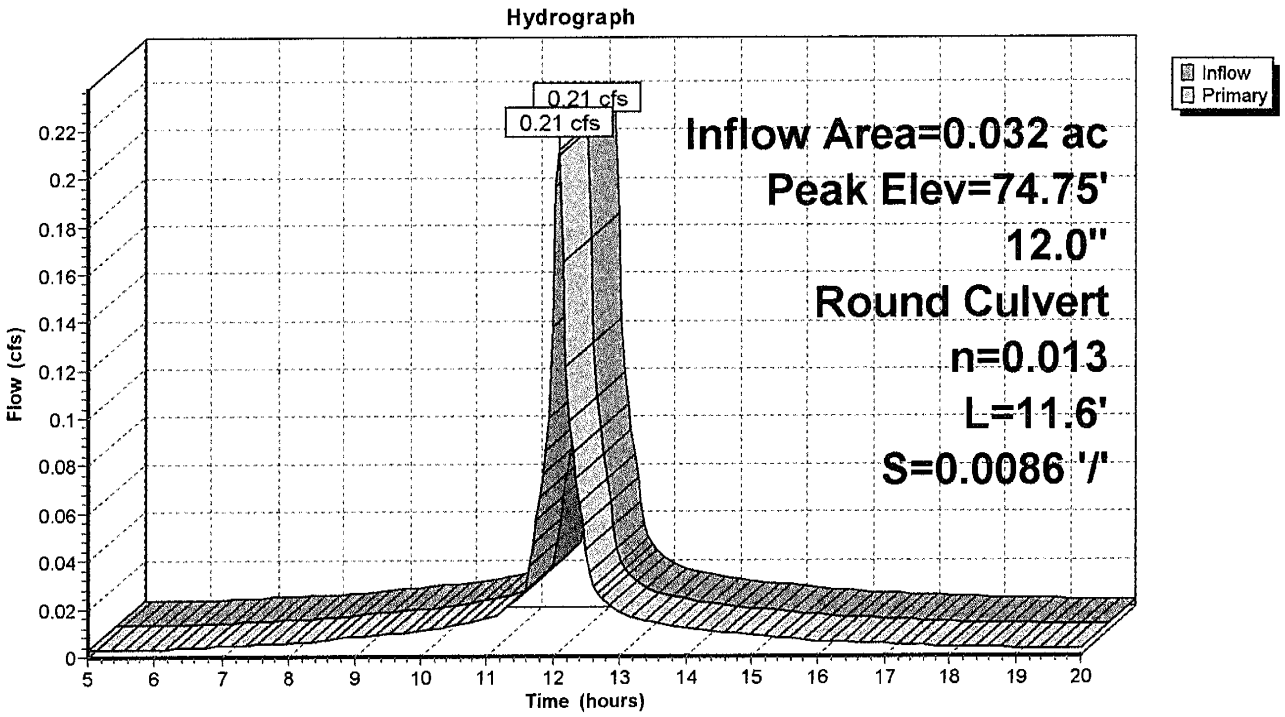
Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 6.24" for 100 YR event				
Inflow =	0.21 cfs @ 12.09 hrs, Volume=	0.016 af			
Outflow =	0.21 cfs @ 12.09 hrs, Volume=	0.016 af, Atten= 0%, Lag= 0.0 min			
Primary =	0.21 cfs @ 12.09 hrs, Volume=	0.016 af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.75' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.49'	**12.0" Round Culvert** L= 11.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.49' / 74.39' S= 0.0086 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=74.75' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.21 cfs @ 1.92 fps)

Pond 3P: CB 3



Summary for Pond 4P: DMH 1

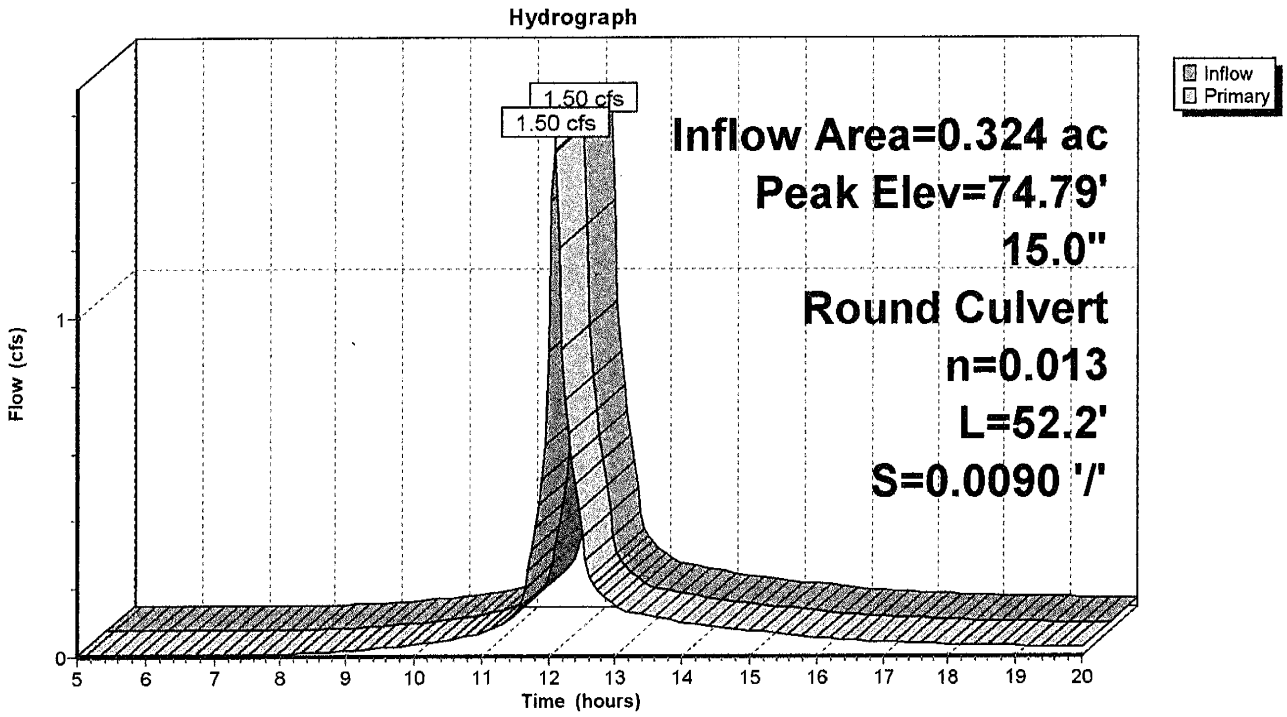
Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event				
Inflow =	1.50 cfs @ 12.09 hrs, Volume=	0.103 af			
Outflow =	1.50 cfs @ 12.09 hrs, Volume=	0.103 af, Atten= 0%, Lag= 0.0 min			
Primary =	1.50 cfs @ 12.09 hrs, Volume=	0.103 af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.79' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.11'	**15.0" Round Culvert** L= 52.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.11' / 73.64' S= 0.0090 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.47 cfs @ 12.09 hrs HW=74.78' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.47 cfs @ 2.20 fps)

Pond 4P: DMH 1



Summary for Pond 5P: DMH 2

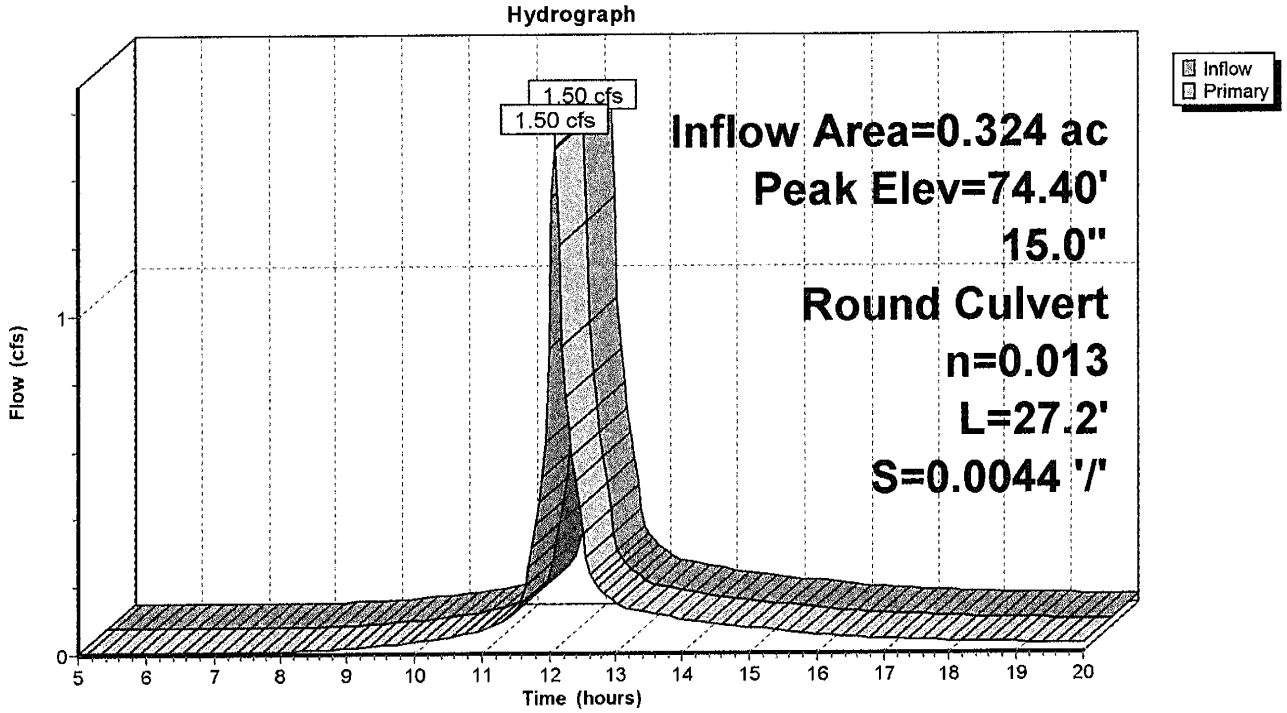
Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event				
Inflow =	1.50 cfs @	12.09 hrs, Volume=	0.103 af		
Outflow =	1.50 cfs @	12.09 hrs, Volume=	0.103 af, Atten= 0%, Lag= 0.0 min		
Primary =	1.50 cfs @	12.09 hrs, Volume=	0.103 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.40' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.64'	**15.0" Round Culvert** L= 27.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.64' / 73.52' S= 0.0044 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.47 cfs @ 12.09 hrs HW=74.39' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.47 cfs @ 2.76 fps)

Pond 5P: DMH 2



Summary for Pond 6P: FRENCH DRAIN

Inflow Area =	0.303 ac,	12.14% Impervious,	Inflow Depth >	2.87"	for 100 YR event
Inflow =	1.07 cfs @	12.10 hrs,	Volume=	0.072 af	
Outflow =	1.06 cfs @	12.14 hrs,	Volume=	0.072 af,	Atten= 1%, Lag= 2.6 min
Discarded =	0.12 cfs @	12.14 hrs,	Volume=	0.054 af	
Primary =	0.93 cfs @	12.14 hrs,	Volume=	0.018 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.92' @ 12.14 hrs Surf.Area= 560 sf Storage= 429 cf

Plug-Flow detention time= 20.3 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 20.1 min (823.2 - 803.1)

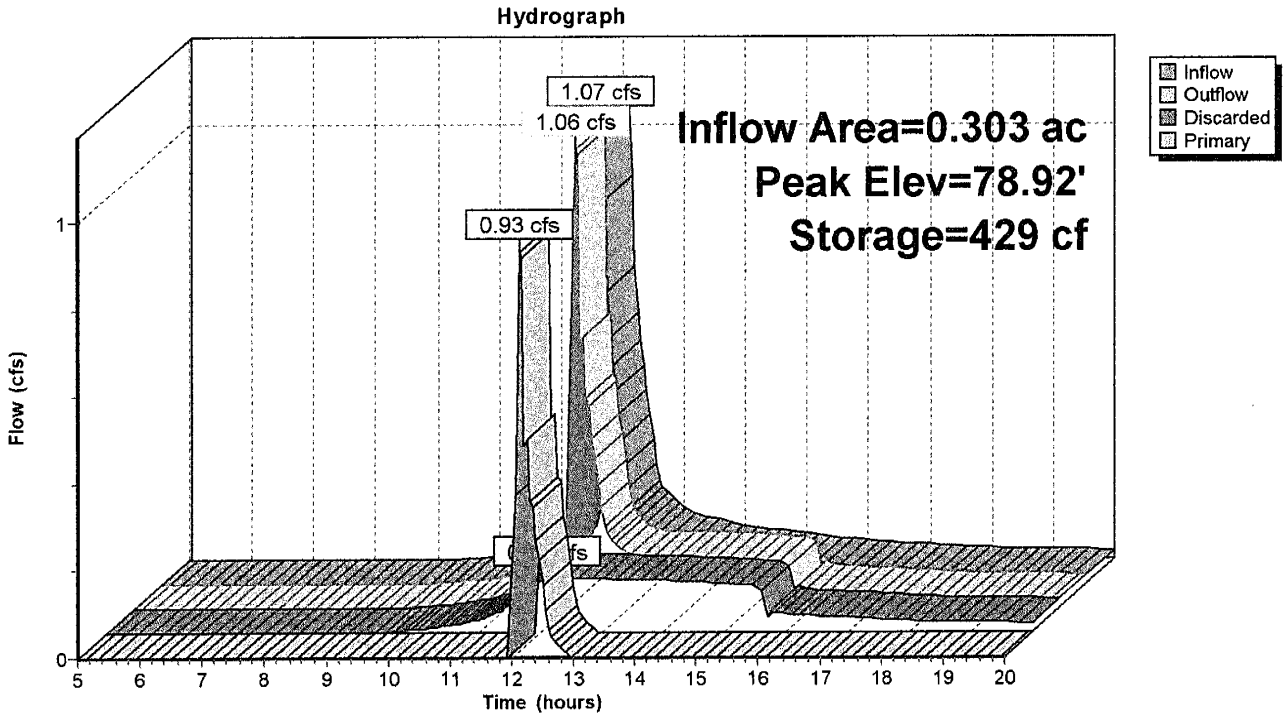
Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	448 cf	**2.00'W x 280.00'L x 2.00'H Prismatoid** 1,120 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 65.00'
#2	Primary	78.80'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.12 cfs @ 12.14 hrs HW=78.91' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=0.88 cfs @ 12.14 hrs HW=78.91' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.88 cfs @ 0.78 fps)

Pond 6P: FRENCH DRAIN



Summary for Pond DW1: 8' DIA DRYWELL

Inflow Area =	0.303 ac,	12.14% Impervious,	Inflow Depth =	0.72"	for 100 YR event
Inflow =	0.93 cfs @	12.14 hrs,	Volume=	0.018 af	
Outflow =	0.07 cfs @	12.61 hrs,	Volume=	0.018 af,	Atten= 93%, Lag= 28.3 min
Discarded =	0.07 cfs @	12.61 hrs,	Volume=	0.018 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.65' @ 12.61 hrs Surf.Area= 251 sf Storage= 638 cf

Plug-Flow detention time= 98.2 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 98.1 min (834.3 - 736.2)

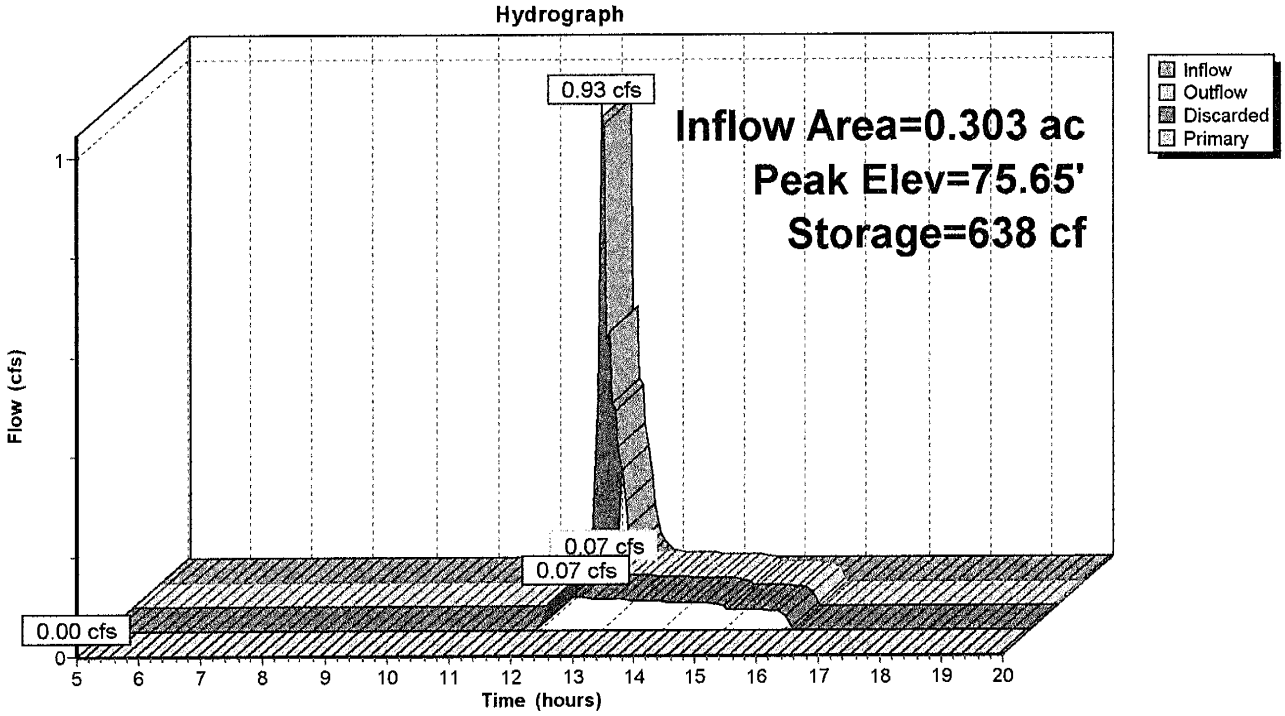
Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	72.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	77.00'	**4.0" Round Culvert** L= 12.6' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.00' S= 0.0794 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.07 cfs @ 12.61 hrs HW=75.64' (Free Discharge)
└**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond DW1: 8' DIA DRYWELL



Summary for Pond DW2: 8' DIA DRYWELL

Inflow Area =	0.216 ac, 53.68% Impervious, Inflow Depth > 3.47" for 100 YR event				
Inflow =	0.92 cfs @	12.09 hrs,	Volume=	0.062 af	
Outflow =	0.37 cfs @	12.35 hrs,	Volume=	0.059 af,	Atten= 59%, Lag= 15.4 min
Discarded =	0.07 cfs @	12.35 hrs,	Volume=	0.048 af	
Primary =	0.30 cfs @	12.35 hrs,	Volume=	0.011 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 79.69' @ 12.35 hrs Surf.Area= 251 sf Storage= 905 cf

Plug-Flow detention time= 110.6 min calculated for 0.059 af (94% of inflow)
Center-of-Mass det. time= 90.2 min (882.8 - 792.6)

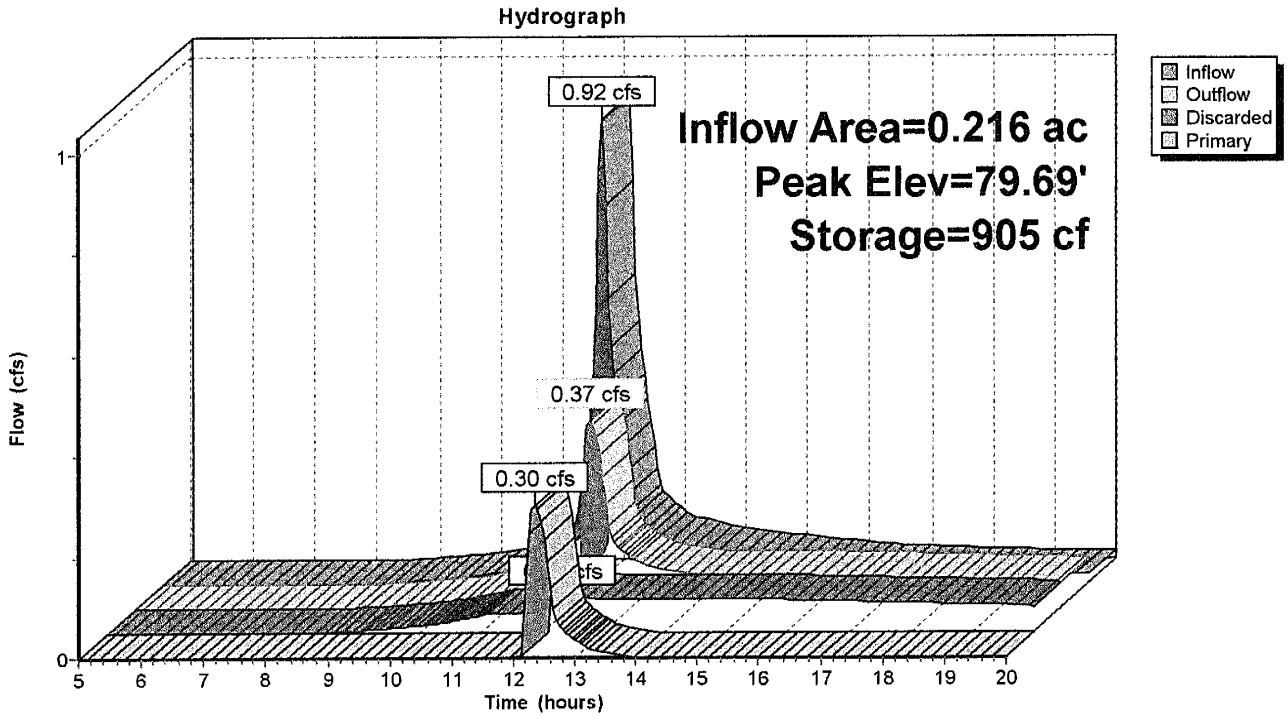
Volume	Invert	Avail.Storage	Storage Description
#1	72.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	74.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	72.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 56.00'
#2	Primary	79.00'	**4.0" Round Culvert** L= 135.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.00' / 66.50' S= 0.0926 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.07 cfs @ 12.35 hrs HW=79.69' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.30 cfs @ 12.35 hrs HW=79.69' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.30 cfs @ 3.49 fps)

Pond DW2: 8' DIA DRYWELL



Summary for Pond DW3: 8' DIA DRYWELL

Inflow Area =	0.422 ac, 33.29% Impervious, Inflow Depth = 0.32" for 100 YR event				
Inflow =	0.30 cfs @	12.35 hrs,	Volume=	0.011 af	
Outflow =	0.07 cfs @	12.71 hrs,	Volume=	0.011 af,	Atten= 76%, Lag= 21.6 min
Discarded =	0.07 cfs @	12.71 hrs,	Volume=	0.011 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 62.40' @ 12.71 hrs Surf.Area= 251 sf Storage= 278 cf

Plug-Flow detention time= 43.8 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 43.8 min (796.5 - 752.7)

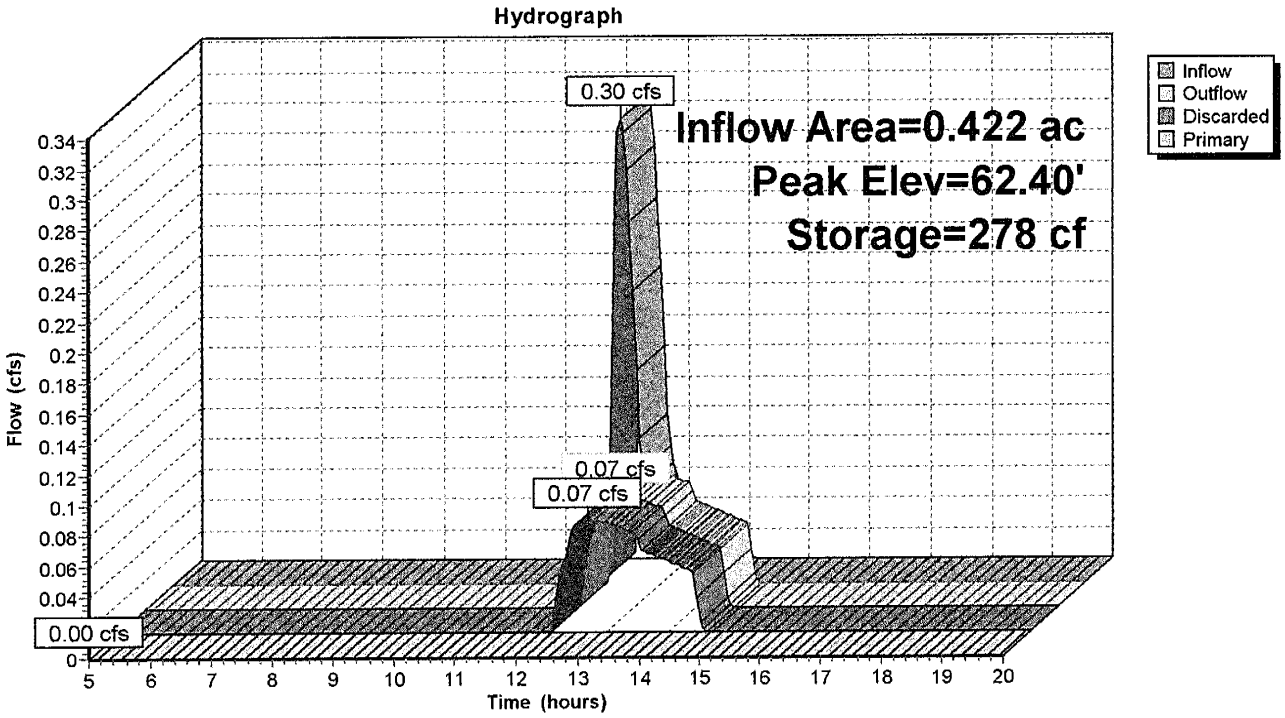
Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	61.50'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.50'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	66.50'	**4.0" Round Culvert** L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 66.50' / 66.00' S= 0.0263 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.07 cfs @ 12.71 hrs HW=62.40' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=59.50' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond DW3: 8' DIA DRYWELL



Summary for Pond DW4: 8' DIA DRYWELL

Inflow Area =	0.206 ac,	11.91% Impervious,	Inflow Depth >	1.17"	for 100 YR event
Inflow =	0.25 cfs @	12.11 hrs,	Volume=	0.020 af	
Outflow =	0.06 cfs @	12.62 hrs,	Volume=	0.020 af,	Atten= 76%, Lag= 30.3 min
Discarded =	0.06 cfs @	12.62 hrs,	Volume=	0.020 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 65.44' @ 12.62 hrs Surf.Area= 251 sf Storage= 218 cf

Plug-Flow detention time= 32.8 min calculated for 0.020 af (100% of inflow)
Center-of-Mass det. time= 32.2 min (874.7 - 842.5)

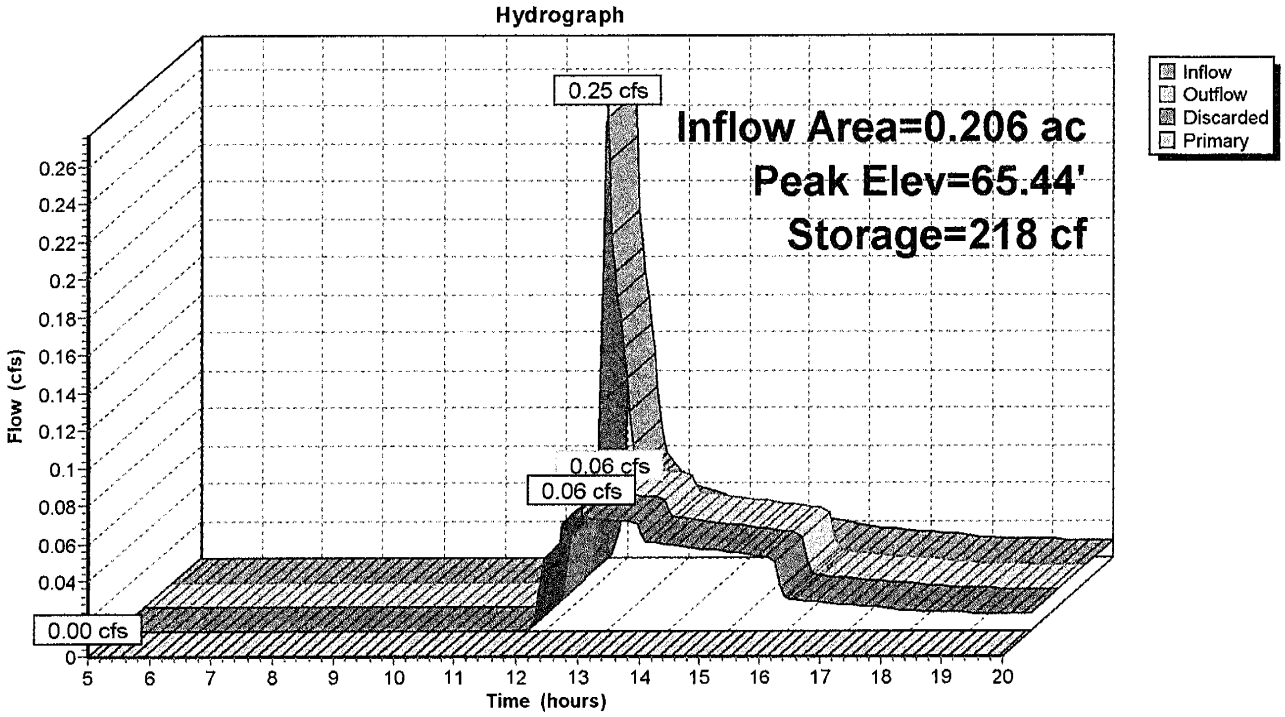
Volume	Invert	Avail.Storage	Storage Description
#1	63.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	65.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.00'
#2	Primary	70.00'	**4.0" Round Culvert** L= 77.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 66.50' S= 0.0455 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Discarded OutFlow Max=0.06 cfs @ 12.62 hrs HW=65.43' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=63.00' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond DW4: 8' DIA DRYWELL



Summary for Pond DW5: 8' DIA DRYWELL

Inflow Area =	0.768 ac,	3.23% Impervious,	Inflow Depth >	0.47" for 100 YR event
Inflow =	0.17 cfs @	12.42 hrs, Volume=	0.030 af	
Outflow =	0.07 cfs @	13.13 hrs, Volume=	0.030 af,	Atten= 59%, Lag= 42.6 min
Discarded =	0.07 cfs @	13.13 hrs, Volume=	0.030 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 57.22' @ 13.13 hrs Surf.Area= 251 sf Storage= 189 cf

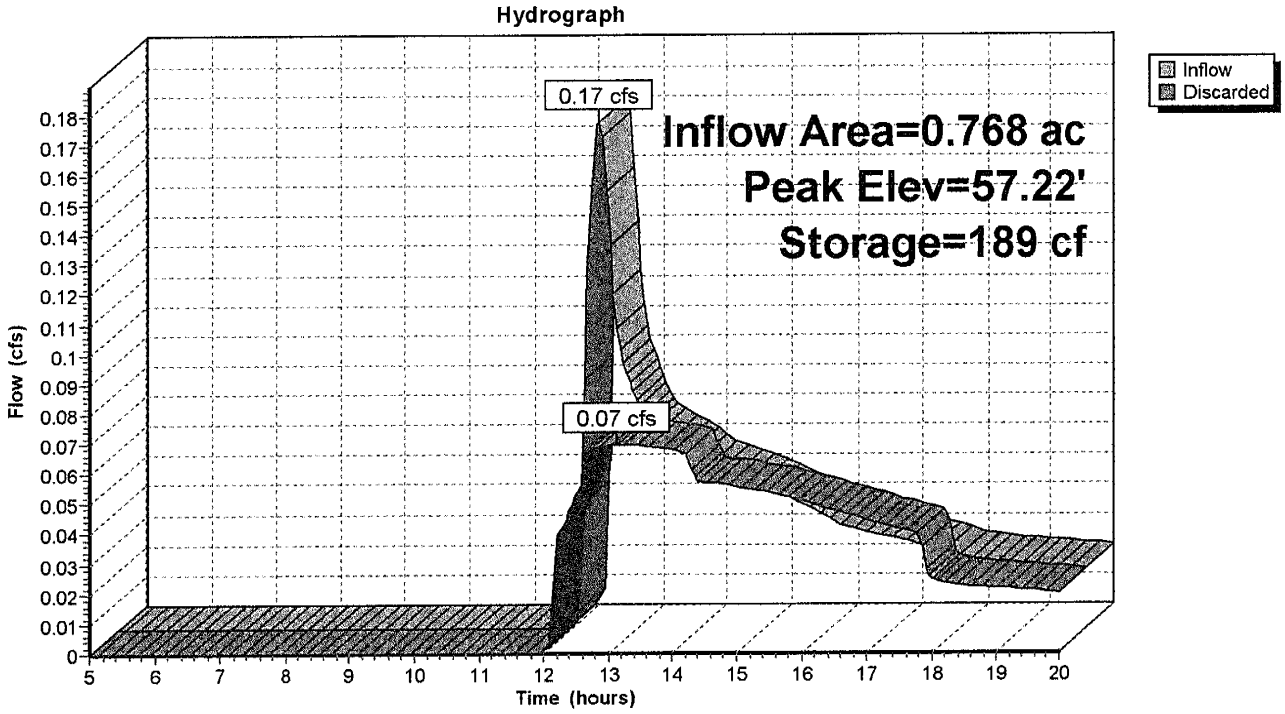
Plug-Flow detention time= 30.8 min calculated for 0.030 af (100% of inflow)
Center-of-Mass det. time= 30.0 min (919.9 - 889.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	643 cf	**16.00'D x 8.00'H Vertical Cone/Cylinder** 1,608 cf Overall x 40.0% Voids
#2	57.00'	302 cf	**8.00'D x 6.00'H Vertical Cone/Cylinder**
		945 cf	Total Available Storage

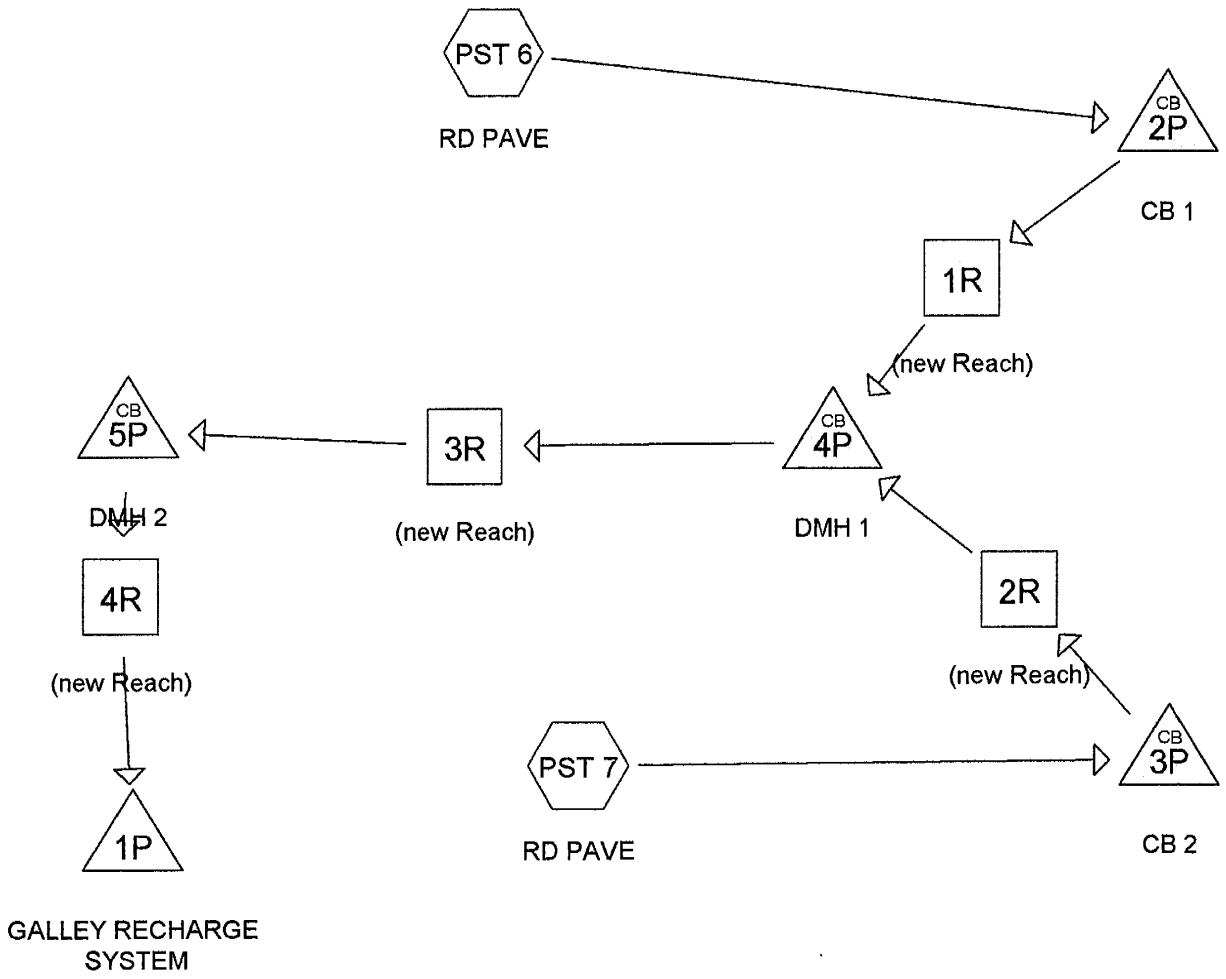
Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.00'

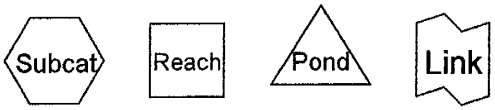
Discarded OutFlow Max=0.07 cfs @ 13.13 hrs HW=57.22' (Free Discharge)
└**1=Exfiltration** (Controls 0.07 cfs)

Pond DW5: 8' DIA DRYWELL



PIPE SIZING ANALYSIS





Routing Diagram for 4072 PIPE SIZES
Prepared by Microsoft, Printed 3/3/2020
HydroCAD® 10.00-20 s/n 02764 © 2017 HydroCAD Software Solutions LLC

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1R	74.51	74.41	11.2	0.0089	0.013	12.0	0.0	0.0
2	2R	74.49	74.39	11.9	0.0084	0.013	12.0	0.0	0.0
3	3R	74.11	73.64	52.2	0.0090	0.013	15.0	0.0	0.0
4	4R	73.52	73.35	27.2	0.0062	0.013	15.0	0.0	0.0
5	2P	74.51	74.50	1.0	0.0100	0.013	12.0	0.0	0.0
6	3P	74.49	74.48	1.0	0.0100	0.013	12.0	0.0	0.0
7	4P	74.12	74.11	1.0	0.0100	0.013	15.0	0.0	0.0
8	5P	73.53	73.52	1.0	0.0100	0.013	15.0	0.0	0.0

Summary for Subcatchment PST 6: RD PAVE

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.044 af, Depth> 1.82"

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

Area (sf)	CN	Description
1,600	98	Roofs, HSG A
3,113	39	>75% Grass cover, Good, HSG A
3,950	61	>75% Grass cover, Good, HSG B
4,060	98	Paved parking, HSG A
12,723	72	Weighted Average
7,063		55.51% Pervious Area
5,660		44.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Summary for Subcatchment PST 7: RD PAVE

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.15"

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

Area (sf)	CN	Description
1,377	98	Paved parking, HSG A
1,377		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

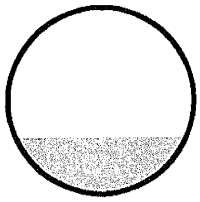
Summary for Reach 1R: (new Reach)

Inflow Area = 0.292 ac, 44.49% Impervious, Inflow Depth > 1.82" for 10 YR event
Inflow = 0.65 cfs @ 12.10 hrs, Volume= 0.044 af
Outflow = 0.65 cfs @ 12.10 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.37 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 11.2' Slope= 0.0089 '/'
Inlet Invert= 74.51', Outlet Invert= 74.41'



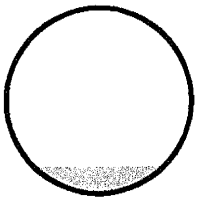
Summary for Reach 2R: (new Reach)

Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 4.15" for 10 YR event				
Inflow =	0.14 cfs @	12.09 hrs, Volume=	0.011 af		
Outflow =	0.14 cfs @	12.09 hrs, Volume=	0.011 af, Atten= 0%, Lag= 0.2 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.07 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 0.3 min

Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.27 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 11.9' Slope= 0.0084 '/'
Inlet Invert= 74.49', Outlet Invert= 74.39'



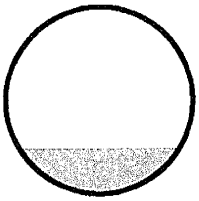
Summary for Reach 3R: (new Reach)

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event				
Inflow =	0.79 cfs @	12.10 hrs, Volume=	0.055 af		
Outflow =	0.78 cfs @	12.10 hrs, Volume=	0.055 af, Atten= 1%, Lag= 0.4 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.44 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.7 min

Peak Storage= 12 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.13 cfs

15.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 52.2' Slope= 0.0090 '/'
Inlet Invert= 74.11', Outlet Invert= 73.64'



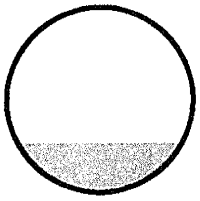
Summary for Reach 4R: (new Reach)

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event			
Inflow =	0.78 cfs @ 12.10 hrs, Volume=	0.055 af		
Outflow =	0.78 cfs @ 12.11 hrs, Volume=	0.055 af, Atten= 1%, Lag= 0.2 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.01 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 0.4 min

Peak Storage= 7 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.11 cfs

15.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 27.2' Slope= 0.0062 '/'
Inlet Invert= 73.52', Outlet Invert= 73.35'



Summary for Pond 1P: GALLEY RECHARGE SYSTEM

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event			
Inflow =	0.78 cfs @ 12.11 hrs, Volume=	0.055 af		
Outflow =	0.16 cfs @ 12.57 hrs, Volume=	0.055 af, Atten= 79%, Lag= 27.7 min		
Discarded =	0.16 cfs @ 12.57 hrs, Volume=	0.055 af		

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

Peak Elev= 71.92' @ 12.57 hrs Surf.Area= 680 sf Storage= 680 cf

Plug-Flow detention time= 29.7 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 29.3 min (822.4 - 793.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.89'	1,498 cf	**8.50'W x 80.00'L x 7.25'H Field A** 4,930 cf Overall - 1,184 cf Embedded = 3,746 cf x 40.0% Voids
#2A	70.89'	881 cf	**Concrete Galley 4x4x4.25** x 19 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		2,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.89'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.00'

Discarded OutFlow Max=0.16 cfs @ 12.57 hrs HW=71.92' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.16 cfs)

Summary for Pond 2P: CB 1

Inflow Area =	0.292 ac, 44.49% Impervious, Inflow Depth > 1.82" for 10 YR event			
Inflow =	0.65 cfs @	12.10 hrs, Volume=	0.044 af	
Outflow =	0.65 cfs @	12.10 hrs, Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.65 cfs @	12.10 hrs, Volume=	0.044 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.05' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.51'	**12.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.51' / 74.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.65 cfs @ 12.10 hrs HW=75.05' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.65 cfs @ 2.19 fps)

Summary for Pond 3P: CB 2

Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 4.15" for 10 YR event			
Inflow =	0.14 cfs @	12.09 hrs, Volume=	0.011 af	
Outflow =	0.14 cfs @	12.09 hrs, Volume=	0.011 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.14 cfs @	12.09 hrs, Volume=	0.011 af	

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

Peak Elev= 74.73' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.49'	**12.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.49' / 74.48' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.09 hrs HW=74.72' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.14 cfs @ 1.49 fps)

Summary for Pond 4P: DMH 1

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event				
Inflow =	0.79 cfs @	12.10 hrs, Volume=	0.055 af		
Outflow =	0.79 cfs @	12.10 hrs, Volume=	0.055 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.79 cfs @	12.10 hrs, Volume=	0.055 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.67' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.12'	**15.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.12' / 74.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.78 cfs @ 12.10 hrs HW=74.67' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.78 cfs @ 2.22 fps)

Summary for Pond 5P: DMH 2

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 2.04" for 10 YR event				
Inflow =	0.78 cfs @	12.10 hrs, Volume=	0.055 af		
Outflow =	0.78 cfs @	12.10 hrs, Volume=	0.055 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.78 cfs @	12.10 hrs, Volume=	0.055 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.08' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.53'	**15.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.53' / 73.52' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.78 cfs @ 12.10 hrs HW=74.08' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.78 cfs @ 2.21 fps)

Summary for Subcatchment PST 6: RD PAVE

Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.087 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
1,600	98	Roofs, HSG A
3,113	39	>75% Grass cover, Good, HSG A
3,950	61	>75% Grass cover, Good, HSG B
4,060	98	Paved parking, HSG A
12,723	72	Weighted Average
7,063		55.51% Pervious Area
5,660		44.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

Summary for Subcatchment PST 7: RD PAVE

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
1,377	98	Paved parking, HSG A
1,377		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 MINUTE MIN**

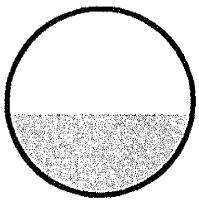
Summary for Reach 1R: (new Reach)

Inflow Area = 0.292 ac, 44.49% Impervious, Inflow Depth > 3.57" for 100 YR event
Inflow = 1.29 cfs @ 12.09 hrs, Volume= 0.087 af
Outflow = 1.28 cfs @ 12.09 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.37 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 11.2' Slope= 0.0089 '/'
Inlet Invert= 74.51', Outlet Invert= 74.41'



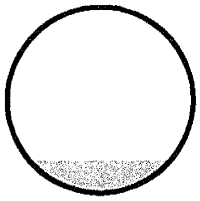
Summary for Reach 2R: (new Reach)

Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 6.24" for 100 YR event				
Inflow =	0.21 cfs @	12.09 hrs, Volume=	0.016 af		
Outflow =	0.21 cfs @	12.09 hrs, Volume=	0.016 af, Atten= 0%, Lag= 0.1 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.27 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 11.9' Slope= 0.0084 '/'
Inlet Invert= 74.49', Outlet Invert= 74.39'



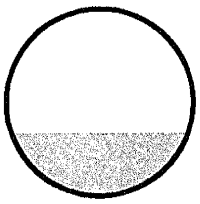
Summary for Reach 3R: (new Reach)

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event				
Inflow =	1.49 cfs @	12.09 hrs, Volume=	0.103 af		
Outflow =	1.48 cfs @	12.10 hrs, Volume=	0.103 af, Atten= 1%, Lag= 0.3 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.13 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 0.6 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.13 cfs

15.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 52.2' Slope= 0.0090 '/'
Inlet Invert= 74.11', Outlet Invert= 73.64'



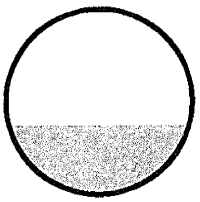
Summary for Reach 4R: (new Reach)

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event			
Inflow =	1.48 cfs @ 12.10 hrs, Volume=	0.103 af		
Outflow =	1.48 cfs @ 12.10 hrs, Volume=	0.103 af, Atten= 1%, Lag= 0.2 min		

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 0.4 min

Peak Storage= 11 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.11 cfs

15.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 27.2' Slope= 0.0062 '/'
Inlet Invert= 73.52', Outlet Invert= 73.35'



Summary for Pond 1P: GALLEY RECHARGE SYSTEM

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event			
Inflow =	1.48 cfs @ 12.10 hrs, Volume=	0.103 af		
Outflow =	0.20 cfs @ 12.70 hrs, Volume=	0.103 af, Atten= 86%, Lag= 35.8 min		
Discarded =	0.20 cfs @ 12.70 hrs, Volume=	0.103 af		

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

Peak Elev= 74.37' @ 12.70 hrs Surf.Area= 680 sf Storage= 1,648 cf

Plug-Flow detention time= 72.1 min calculated for 0.103 af (100% of inflow)
Center-of-Mass det. time= 71.7 min (854.3 - 782.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.89'	1,498 cf	**8.50'W x 80.00'L x 7.25'H Field A** 4,930 cf Overall - 1,184 cf Embedded = 3,746 cf x 40.0% Voids
#2A	70.89'	881 cf	**Concrete Galley 4x4x4.25** x 19 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		2,380 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.89'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 62.00'

Discarded OutFlow Max=0.20 cfs @ 12.70 hrs HW=74.37' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Summary for Pond 2P: CB 1

Inflow Area =	0.292 ac, 44.49% Impervious, Inflow Depth > 3.57" for 100 YR event				
Inflow =	1.29 cfs @	12.09 hrs,	Volume=	0.087 af	
Outflow =	1.29 cfs @	12.09 hrs,	Volume=	0.087 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.29 cfs @	12.09 hrs,	Volume=	0.087 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.51'	**12.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.51' / 74.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.26 cfs @ 12.09 hrs HW=75.30' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.26 cfs @ 2.63 fps)

Summary for Pond 3P: CB 2

Inflow Area =	0.032 ac,100.00% Impervious, Inflow Depth > 6.24" for 100 YR event				
Inflow =	0.21 cfs @	12.09 hrs,	Volume=	0.016 af	
Outflow =	0.21 cfs @	12.09 hrs,	Volume=	0.016 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.21 cfs @	12.09 hrs,	Volume=	0.016 af	

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

Peak Elev= 74.78' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.49'	**12.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.49' / 74.48' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=74.78' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.21 cfs @ 1.64 fps)

Summary for Pond 4P: DMH 1

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event				
Inflow =	1.49 cfs @	12.09 hrs, Volume=	0.103 af		
Outflow =	1.49 cfs @	12.09 hrs, Volume=	0.103 af,	Atten= 0%,	Lag= 0.0 min
Primary =	1.49 cfs @	12.09 hrs, Volume=	0.103 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.91' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	74.12'	**15.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.12' / 74.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.47 cfs @ 12.09 hrs HW=74.90' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.47 cfs @ 2.62 fps)

Summary for Pond 5P: DMH 2

Inflow Area =	0.324 ac, 49.91% Impervious, Inflow Depth > 3.83" for 100 YR event				
Inflow =	1.48 cfs @	12.10 hrs, Volume=	0.103 af		
Outflow =	1.48 cfs @	12.10 hrs, Volume=	0.103 af,	Atten= 0%,	Lag= 0.0 min
Primary =	1.48 cfs @	12.10 hrs, Volume=	0.103 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 74.31' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.53'	**15.0" Round Culvert** L= 1.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.53' / 73.52' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.23 sf

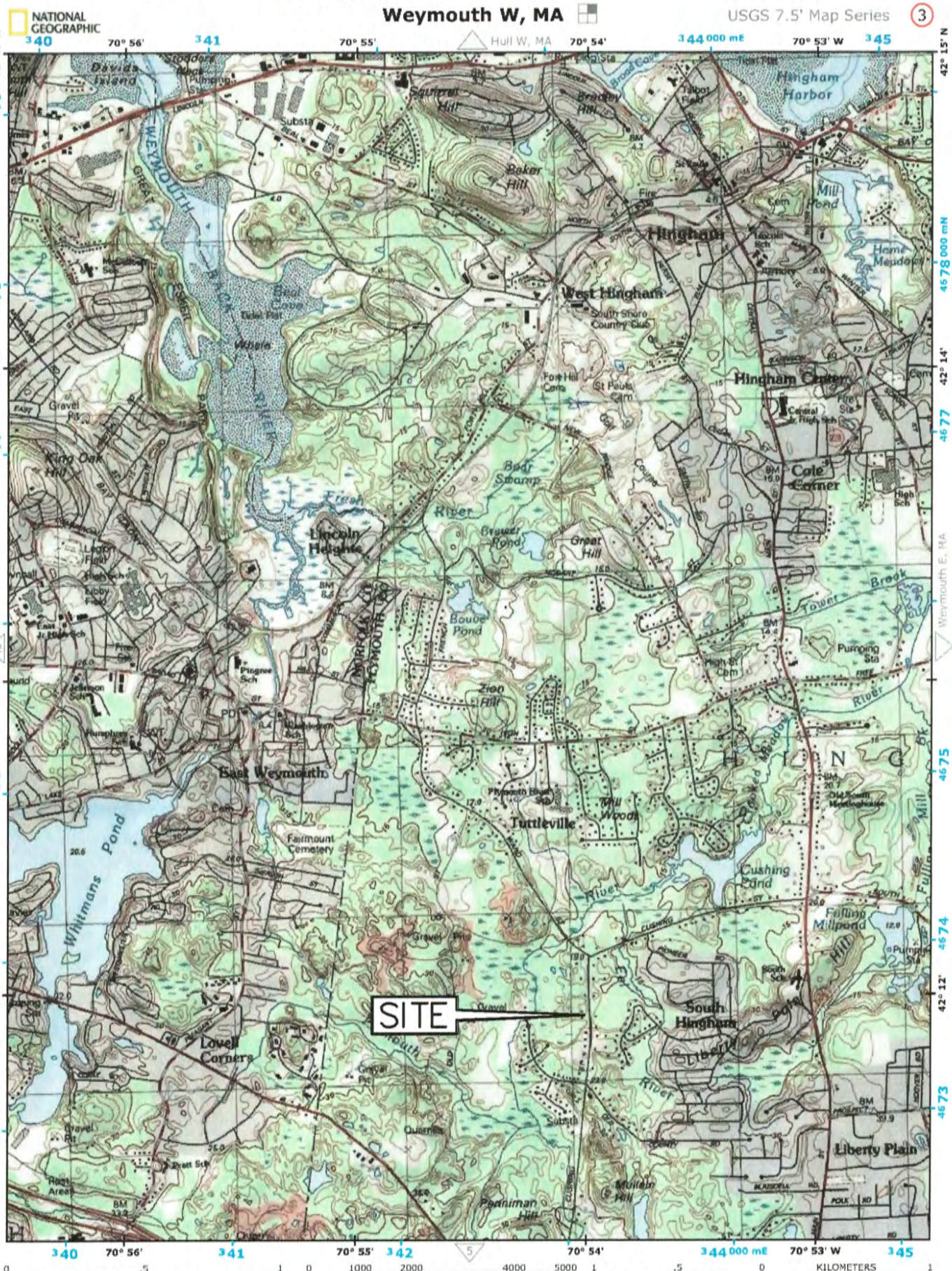
Primary OutFlow Max=1.48 cfs @ 12.10 hrs HW=74.31' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.48 cfs @ 2.62 fps)

PART III
APPENDICIES

APPENDIX A

LOCUS MAP

COREY'S WAY
HINGHAM, MA



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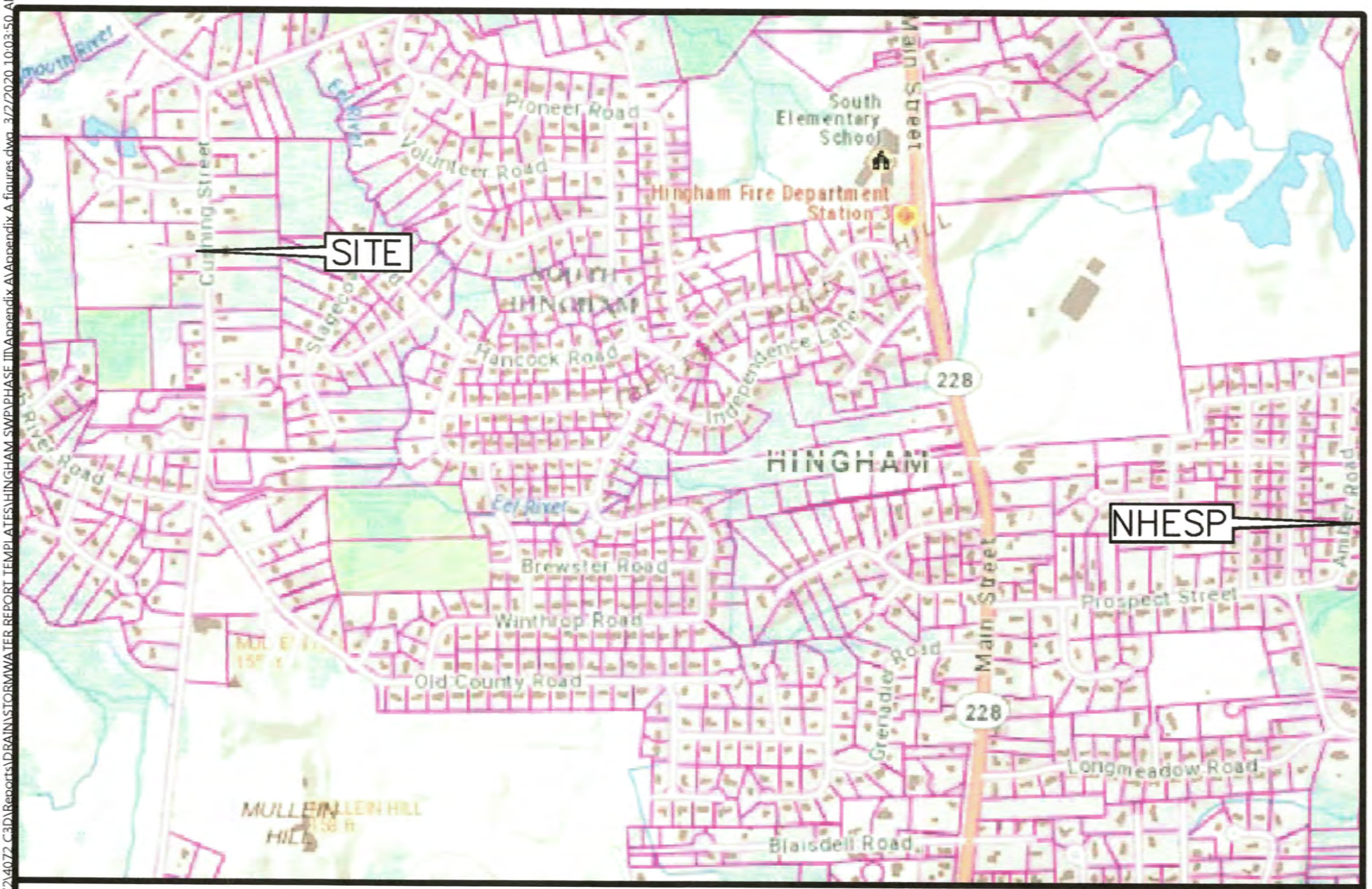

NHESP MAP

COREY'S WAY
HINGHAM, MA

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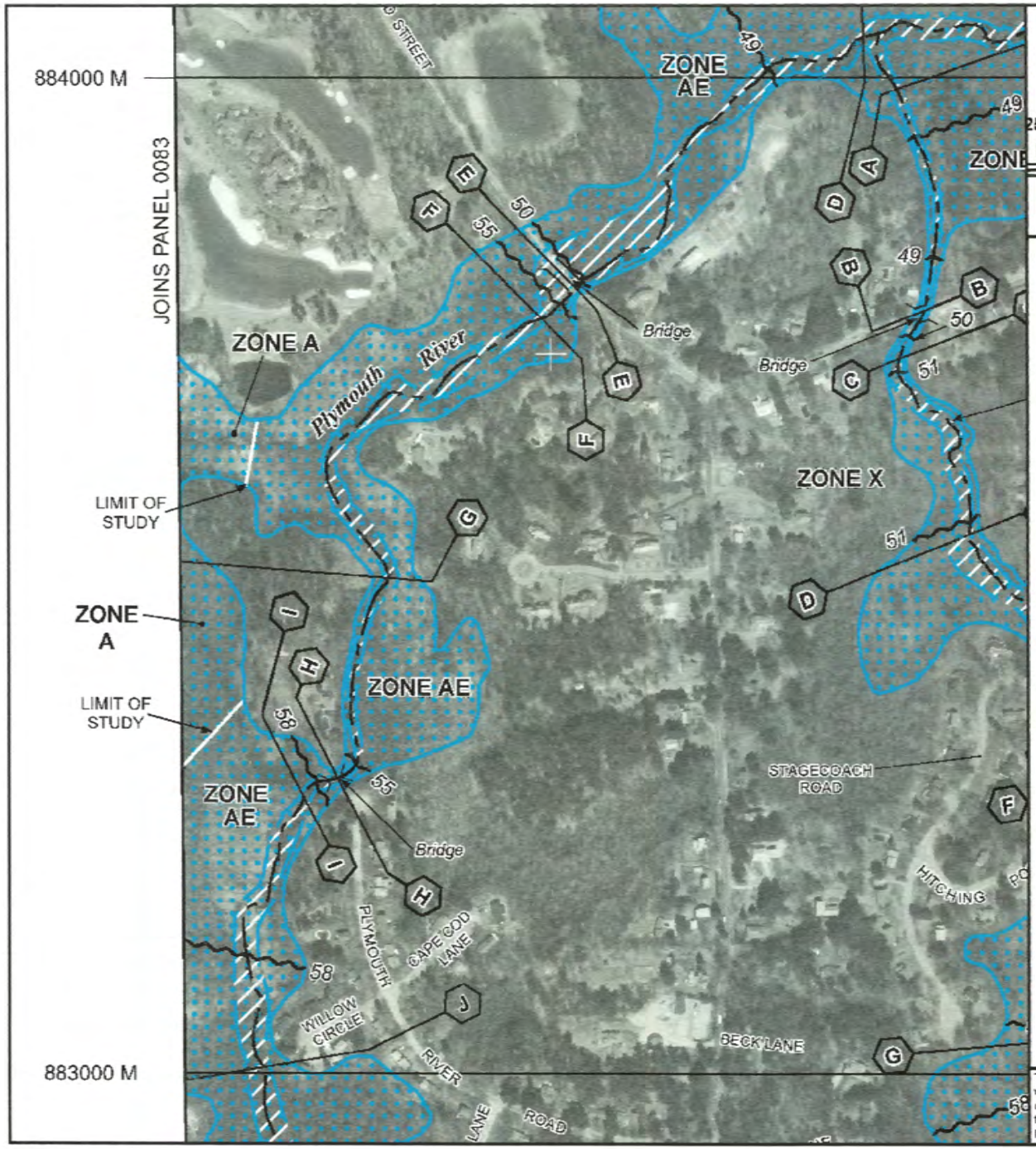


MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0084J

FIRM

FLOOD INSURANCE RATE MAP

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 84 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HINGHAM, TOWN OF	250268	0084	J

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

MAP NUMBER
25023C0084J

EFFECTIVE DATE
JULY 17, 2012

Federal Emergency Management Agency

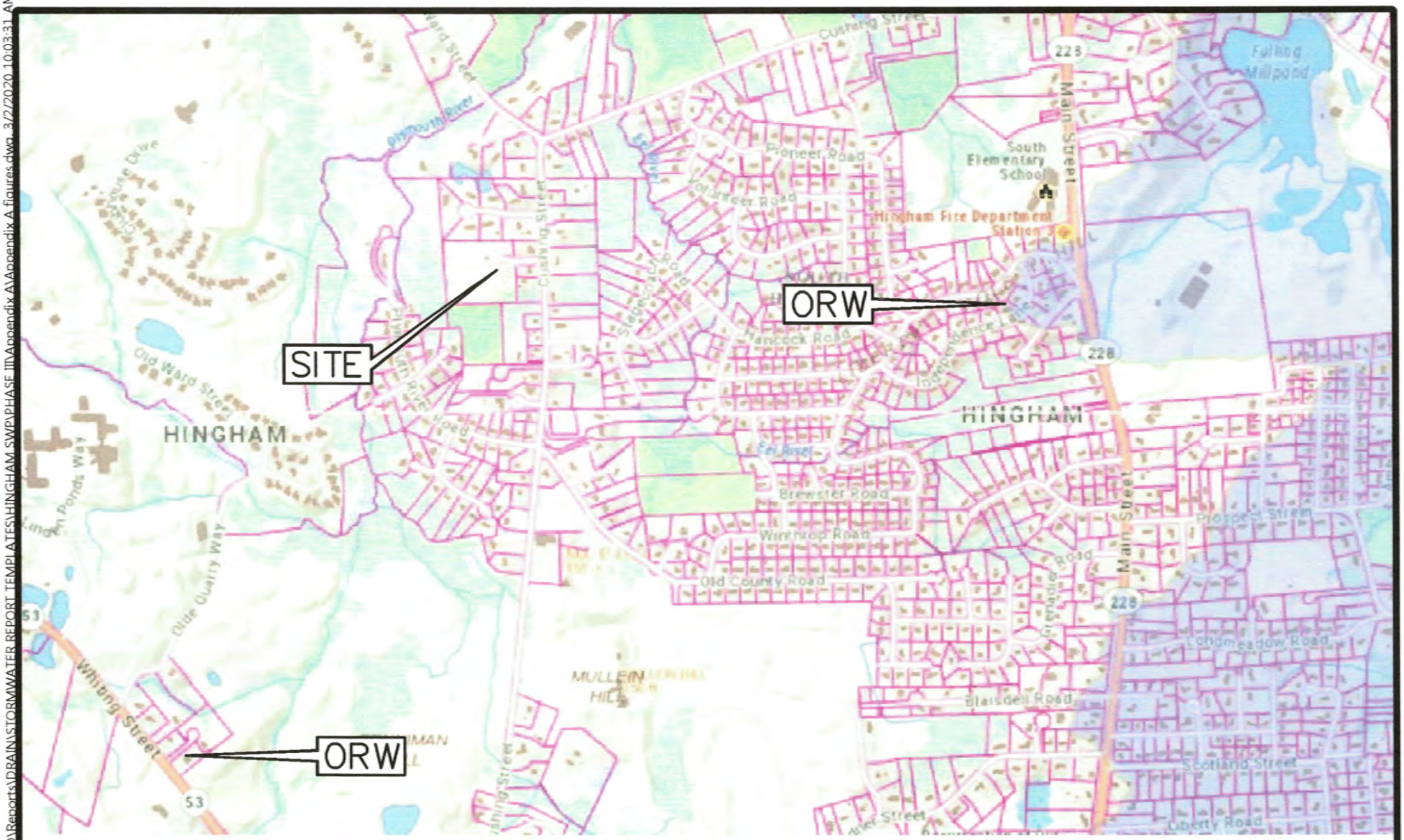
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

ACEC STATEWIDE MAP

Massachusetts Areas of Critical Environmental Concern (ACECs)

1 Bourne Back River
2 Canoe River Aquifer
3 Central Nashua River Valley
4 Cranberry Brook
5 Ellisville Harbor
6 Fowl Meadow, Ponkapoag Bog
7 Golden Hills
8 Herring River Watershed
9 Hinsdale Flats Watershed
10 Hockomock Swamp
11 Inner Cape Cod Bay
12 Kampoosa Bog
13 Karner Brook Watershed
14 Miscoe, Warren and Whitehall Watersheds
15 Neponset River Estuary
16 Parker River/Essex Bay
17 Petapawag
18 Pleasant Bay
19 Pocasset River
20 Rumney Marshes
21 Sandy Neck/Barnstable Harbor
22 Schenob Brook
23 Squannassit
24 Waquoit Bay
25 Weir River
26 Wellfleet Harbor
27 Westborough Cedar Swamp
28 Weymouth Back River

ACEC PROGRAM
Executive Office of Environmental Affairs
Department of Environmental Management
251 Causeway Street, Suite 600-700
Boston, Massachusetts 02114
617-626-1250 www.state.ma.us/dem/programs/acec



ORW MAP

COREY'S WAY
HINGHAM, MA

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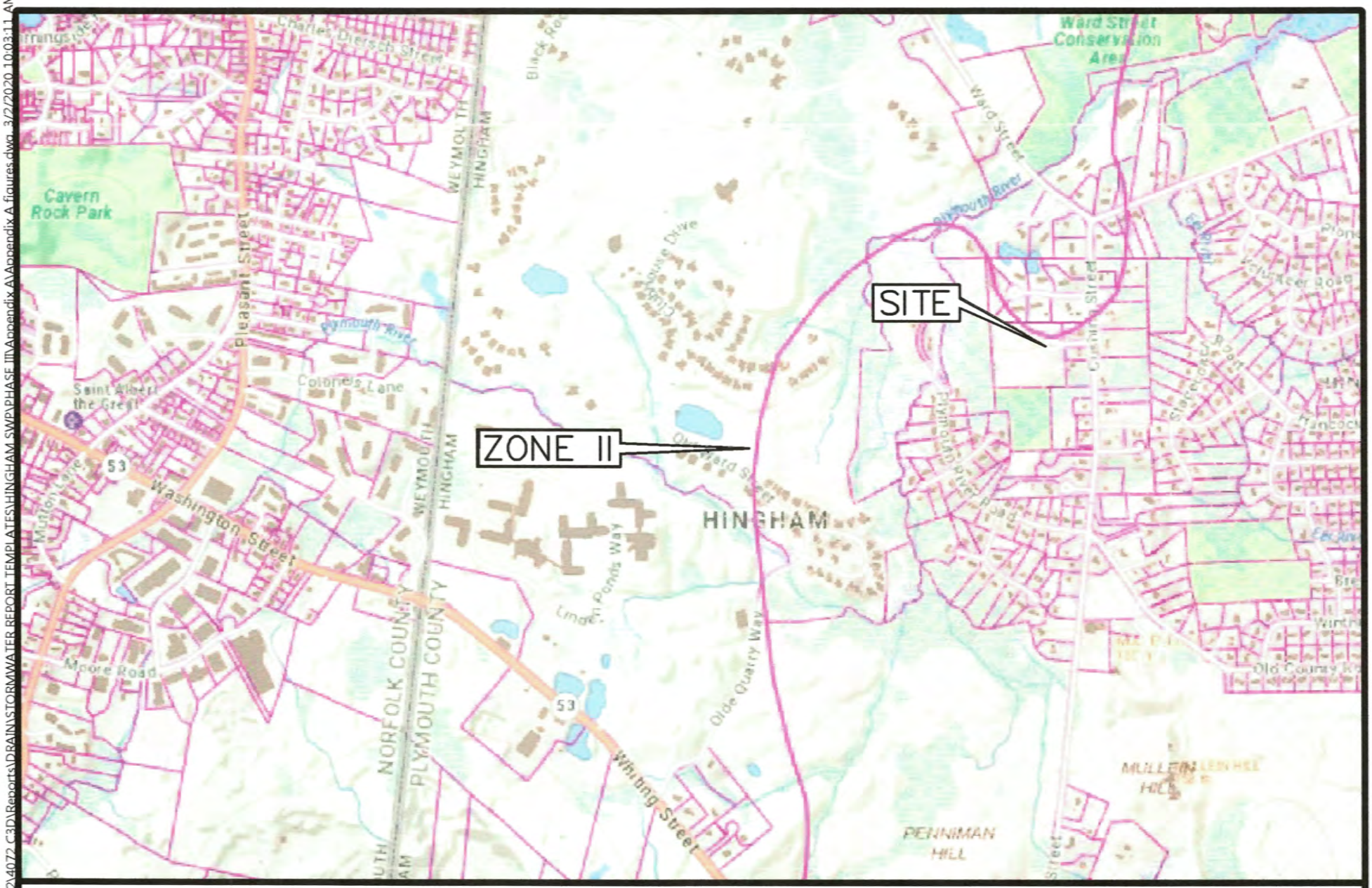

ZONE II MAP

COREY'S WAY
HINGHAM, MA

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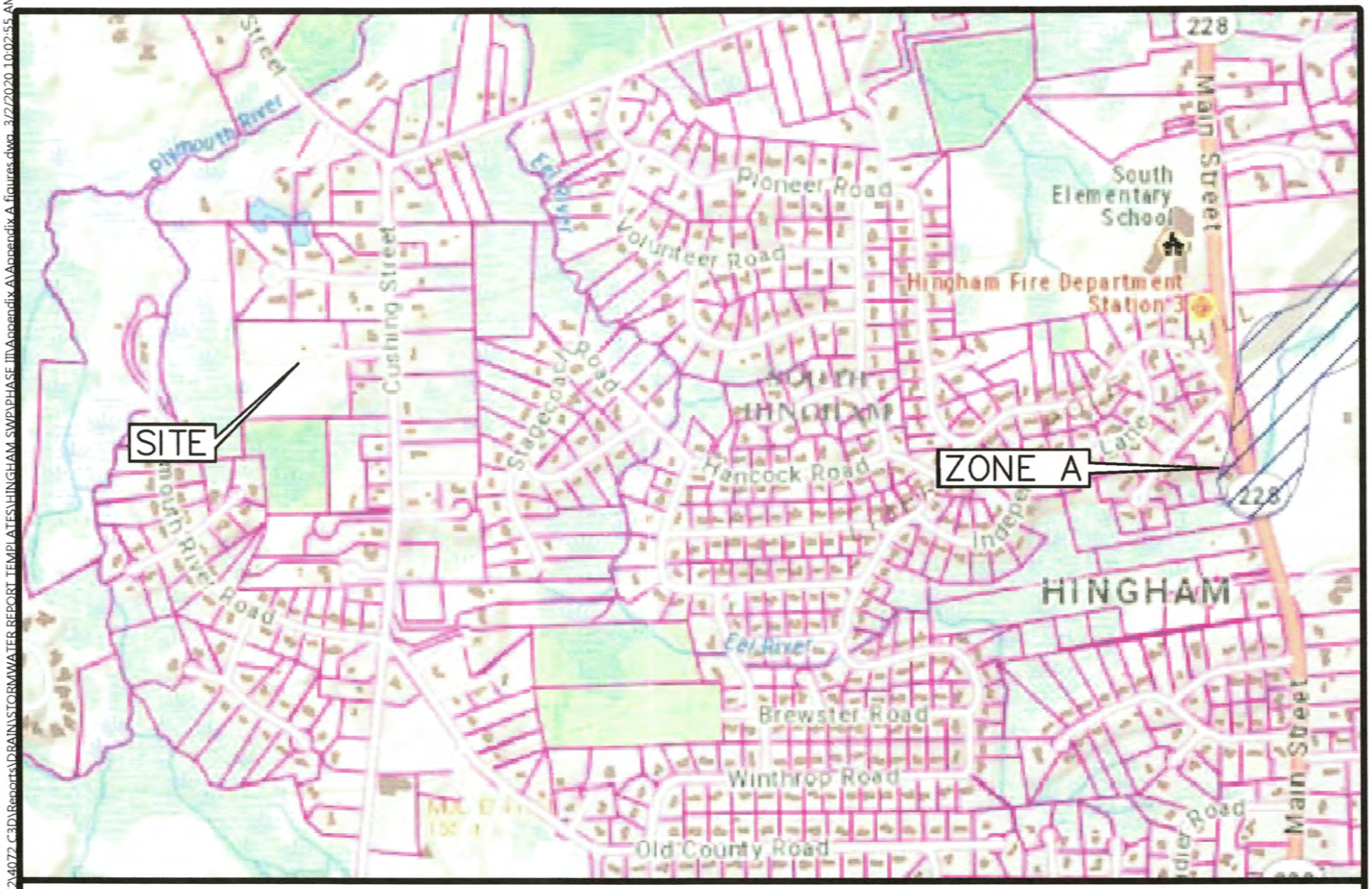

ZONE A MAP

COREY'S WAY
HINGHAM, MA

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4.06: continued

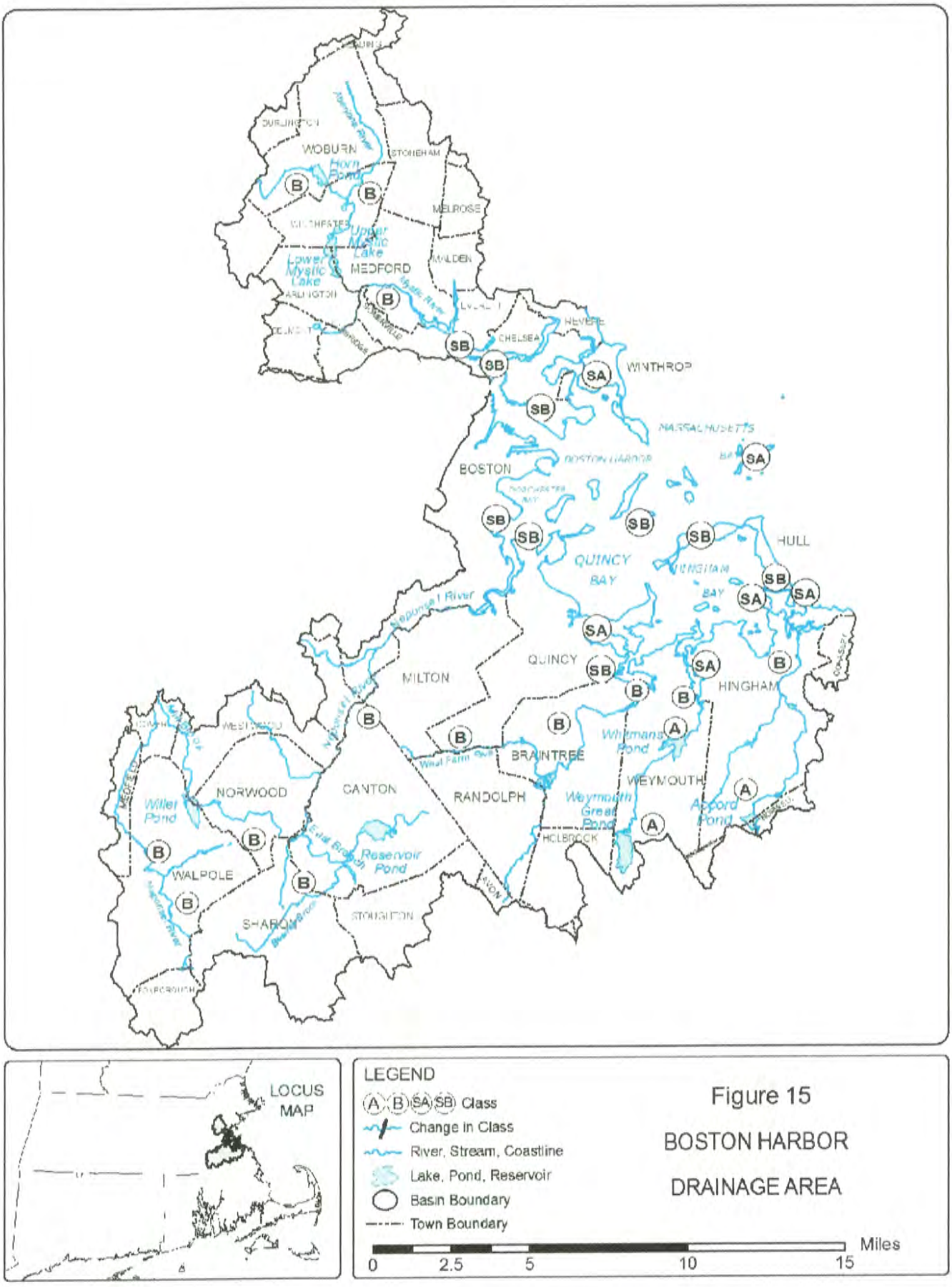


Figure 15

BOSTON HARBOR

DRAINAGE AREA

4.06: continued

TABLE 15
BOSTON HARBOR DRAINAGE AREA (continued)

BOUNDARY	MILE POINT	CLASS	QUALIFIERS
Weymouth Back River	-	SA* B*	Shellfishing Warm Water Outstanding Resource Water
Weir River	-	SA* B*	Shellfishing Outstanding Resource Water
Fresh River	-	B	Warm Water
Cranberry Brook	-	B	Outstanding Resource Water
Cranberry Pond			
Source to outlet in Braintree	-	B	Outstanding Resource Water
Bouve Pond and Brewer Pond in Hingham	-	B	Warm Water Outstanding Resource Water
Straits Pond in Hull and Cohasset	-	B	Warm Water Outstanding Resource Water
Great Pond			
Source to outlet in Braintree and tributaries thereto	-	A	Public Water Supply
Upper Reservoir of Great Pond			
Source to outlet in Braintree and tributaries thereto	-	A	Public Water Supply
Whitmans Pond			
Source to outlet in Weymouth and tributaries thereto	-	A	Public Water Supply
Richardi Reservoir			

4.06: continued

TABLE 15
BOSTON HARBOR DRAINAGE AREA (continued)

BOUNDARY	MILE POINT	CLASS	QUALIFIERS
Accord Pond			
Source to outlet in Hingham and tributaries thereto	-	A	Public Water Supply
Accord Brook			
Outlet of Accord Pond to water supply intake and tributaries thereto	-	A	Public Water Supply

* Marine waters Class SA or SB as designated; fresh waters Class B.

APPENDIX B

Soil Map—Plymouth County, Massachusetts
(COREY'S WAY HINGHAM, MA)

Map Scale: 1:2,780 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

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:
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 12, Sep 12, 2019

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

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2t2q9	Freetown muck, 0 to 1 percent slopes	12.0	30.0%
2w82d	Canton-Chatfield-Rock outcrop complex, 15 to 35 percent slopes, very stony	0.3	0.7%
2w82g	Canton-Chatfield-Rock outcrop complex, 8 to 15 percent slopes, very stony	7.7	19.2%
bqtk	Quonset sandy loam, 3 to 8 percent slopes	19.8	49.5%
bqtl	Quonset sandy loam, 8 to 15 percent slopes	0.2	0.5%
Totals for Area of Interest		**40.0**	**100.0%**

Plymouth County, Massachusetts

bqtk—Quonset sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: bqtk
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

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

Description of Quonset

Setting

Landform: Eskers, deltas, terraces, kames, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oa - 1 to 2 inches: highly decomposed plant material
A - 2 to 4 inches: sandy loam
Bw1 - 4 to 7 inches: channery sandy loam
Bw2 - 7 to 14 inches: channery loamy sand
BC - 14 to 22 inches: very channery loamy sand
C - 22 to 65 inches: extremely channery sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Warwick
Percent of map unit: 8 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Deerfield
Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Hinckley
Percent of map unit: 4 percent
Landform: Outwash deltas, eskers, terraces, kames
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Canton
Percent of map unit: 3 percent
Landform: Ridges, till plains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 12, Sep 12, 2019

Plymouth County, Massachusetts

2t2q9—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Marshes, bogs, kettles, depressions, depressions, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 5 percent
Landform: Bogs, swamps, marshes, kettles, depressions, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 12, Sep 12, 2019

Plymouth County, Massachusetts

2w82g—Canton-Chatfield-Rock outcrop complex, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w82g
Elevation: 0 to 260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, very stony, and similar soils: 40 percent
Chatfield, very stony, and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Very Stony

Setting

Landform: Hills, ridges, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 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 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills, ridges
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 10 percent
Landform: Hills, ground moraines, moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

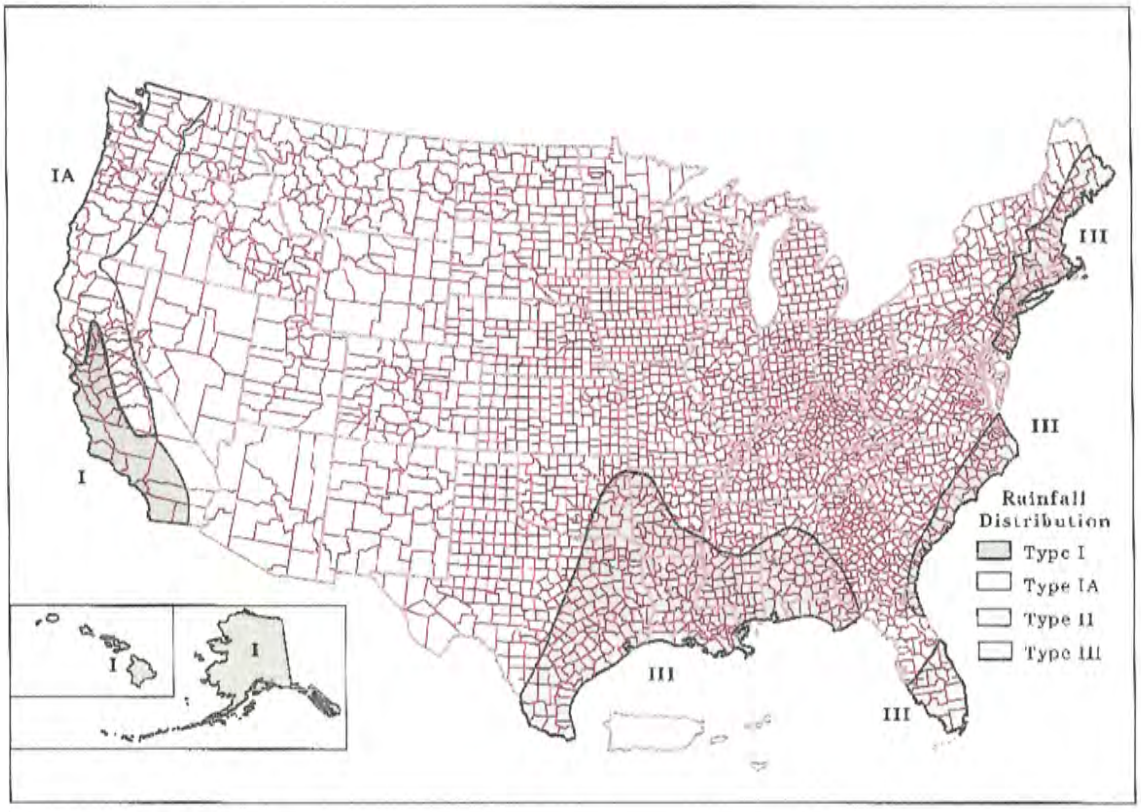
Hollis, very stony

Percent of map unit: 5 percent
Landform: Hills, ridges
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 12, Sep 12, 2019

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



Rainfall data sources

This section lists the most current 24-hour rainfall data published by the National Weather Service (NWS) for various parts of the country. Because NWS Technical Paper 40 (TP-40) is out of print, the 24-hour rainfall maps for areas east of the 105th meridian are included here as figures B-3 through B-8. For the area generally west of the 105th meridian, TP-40 has been superseded by NOAA Atlas 2, the Precipitation-Frequency Atlas of the Western United States, published by the National Ocean and Atmospheric Administration.

East of 105th meridian

Hershfield, D.M. 1961. Rainfall frequency atlas of the United States for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 40. Washington, DC. 155 p.

West of 105th meridian

Miller, J.F., R.H. Frederick, and R.J. Tracey. 1973. Precipitation-frequency atlas of the Western United States. Vol. I Montana; Vol. II, Wyoming; Vol III, Colorado; Vol. IV, New Mexico; Vol V, Idaho; Vol. VI, Utah; Vol. VII, Nevada; Vol. VIII, Arizona; Vol. IX, Washington; Vol. X, Oregon; Vol. XI, California. U.S. Dept. of Commerce, National Weather Service, NOAA Atlas 2. Silver Spring, MD.

Alaska

Miller, John F. 1963. Probable maximum precipitation and rainfall-frequency data for Alaska for areas to 400 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. of Commerce, Weather Bur. Tech. Pap. No. 47. Washington, DC. 69 p.

Hawaii

Weather Bureau. 1962. Rainfall-frequency atlas of the Hawaiian Islands for areas to 200 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 43. Washington, DC. 60 p.

Puerto Rico and Virgin Islands

Weather Bureau. 1961. Generalized estimates of probable maximum precipitation and rainfall-frequency data for Puerto Rico and Virgin Islands for areas to 400 square miles, durations to 24 hours, and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 42. Washington, DC. 94 P.

Figure B-3 2-year, 24-hr rainfall

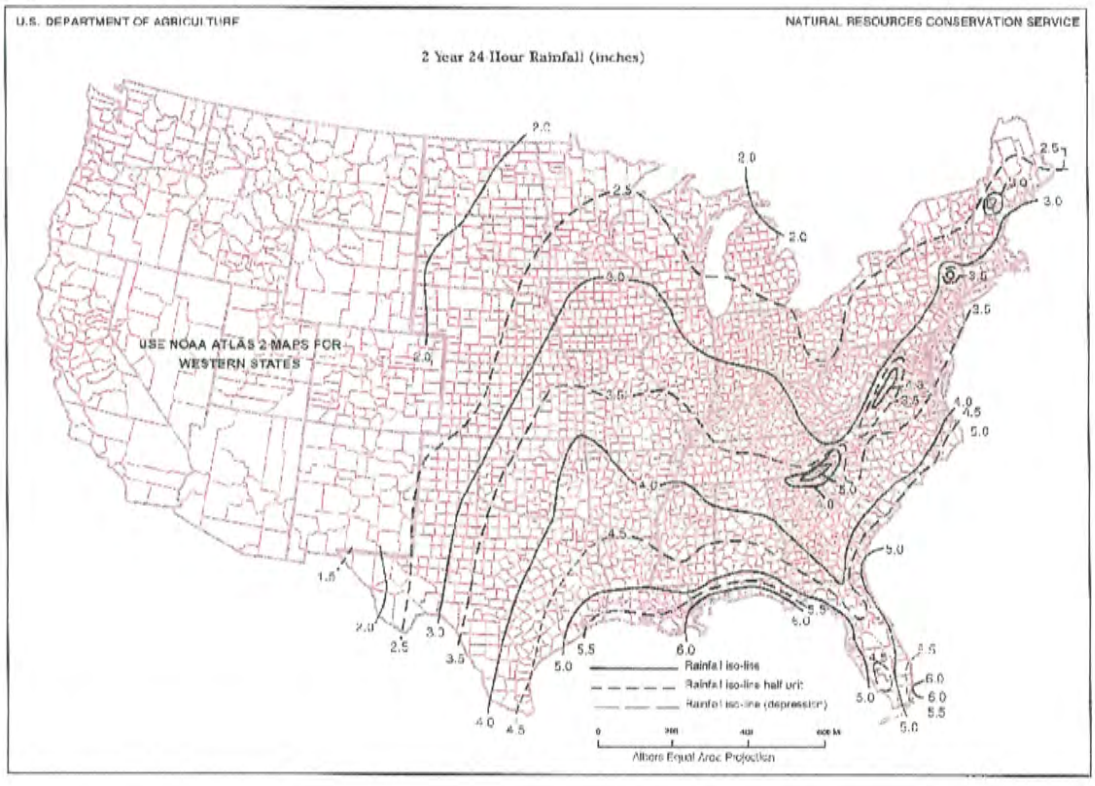


Figure B-4 5-year, 24-hour rainfall

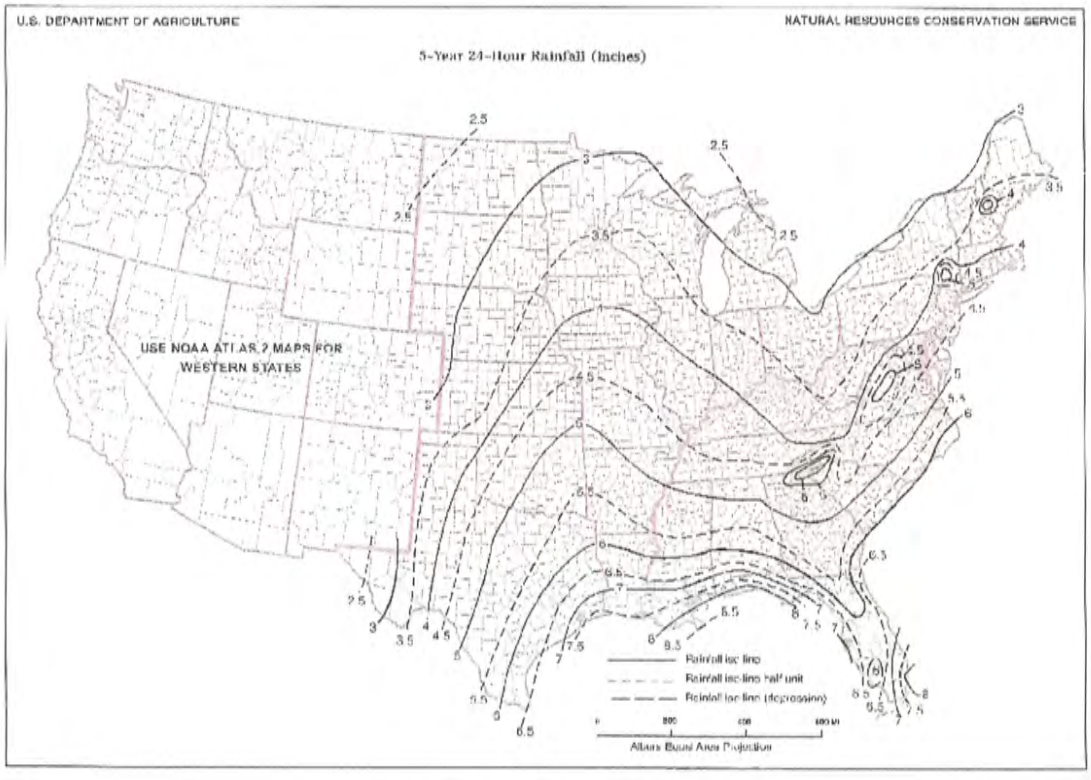


Figure B-5 10-year, 24-hour rainfall

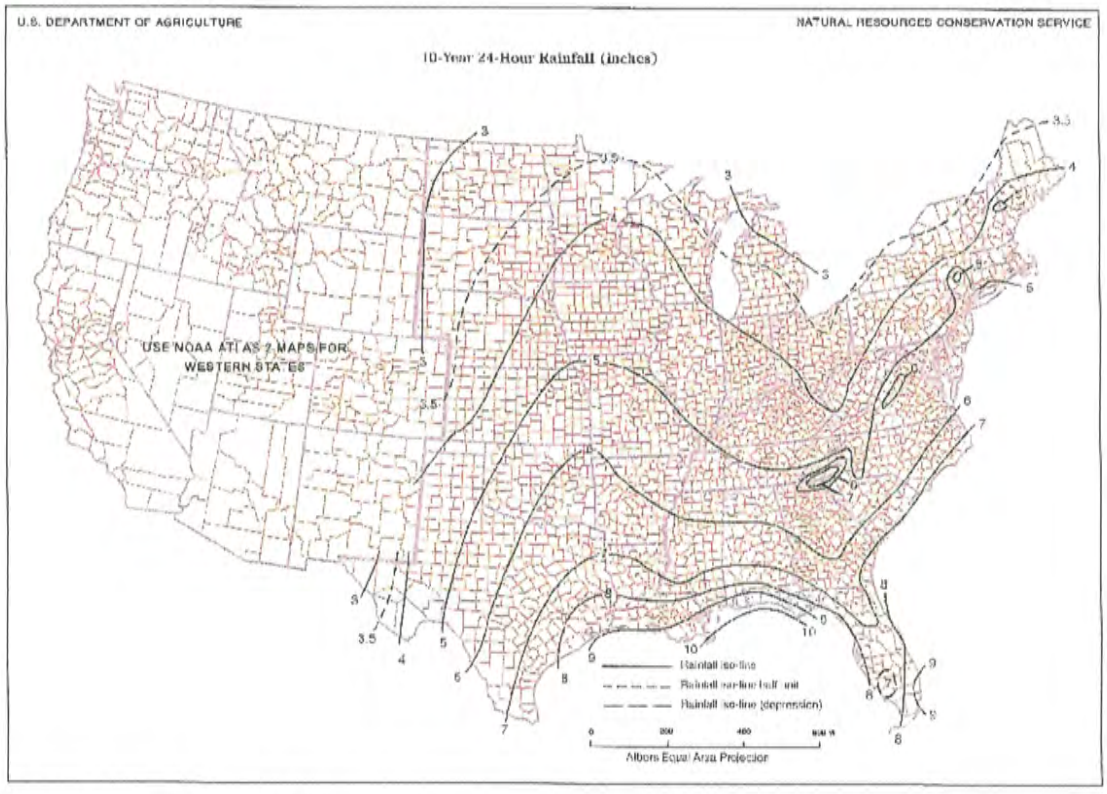


Figure B-6 25-year, 24-hour rainfall

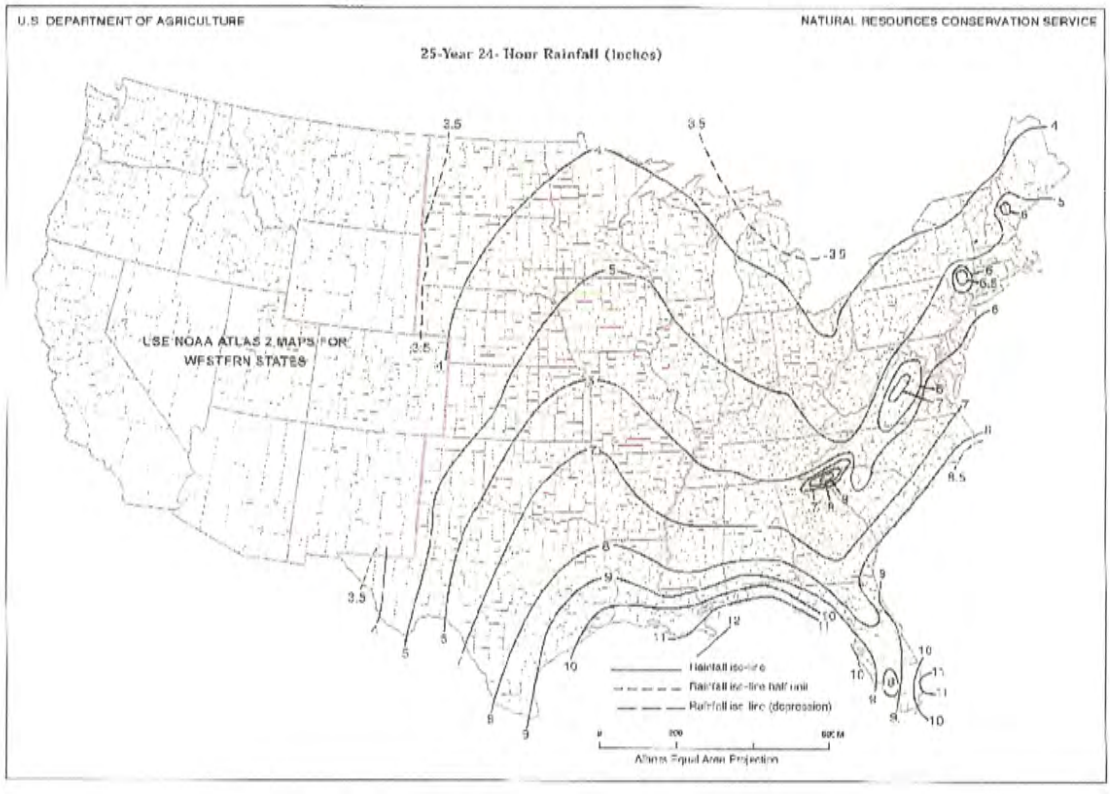


Figure B-7 50-year, 24-hour rainfall

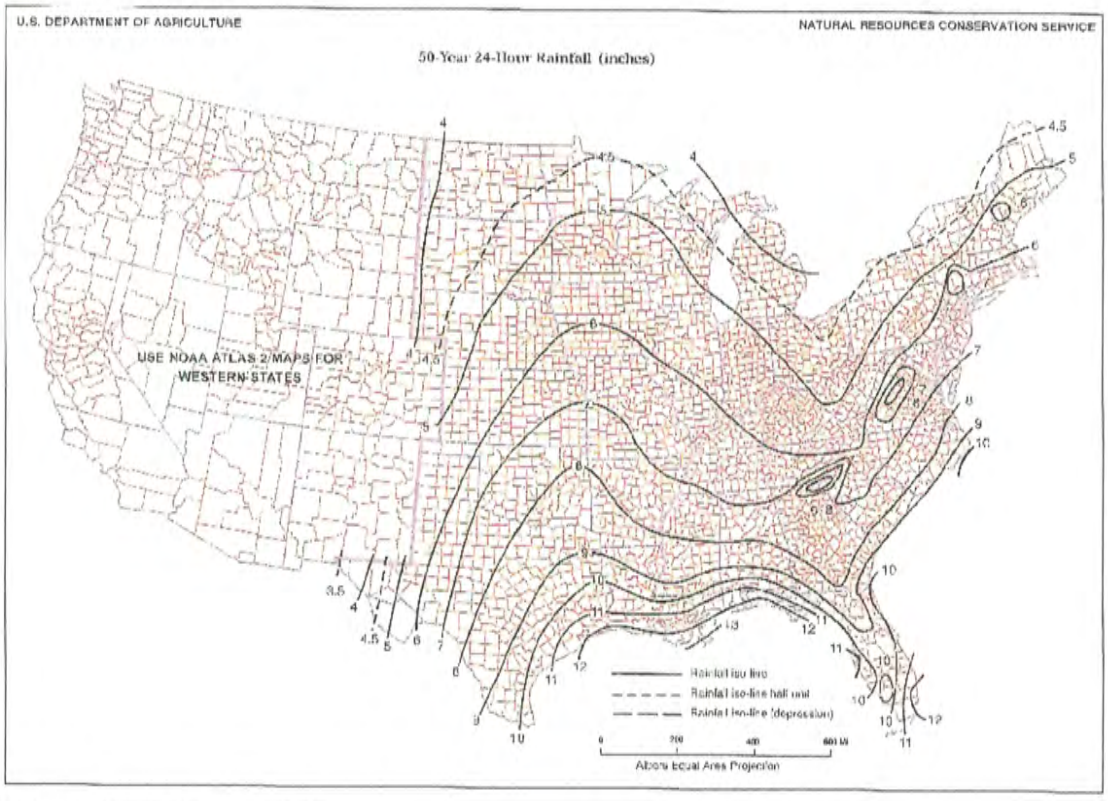
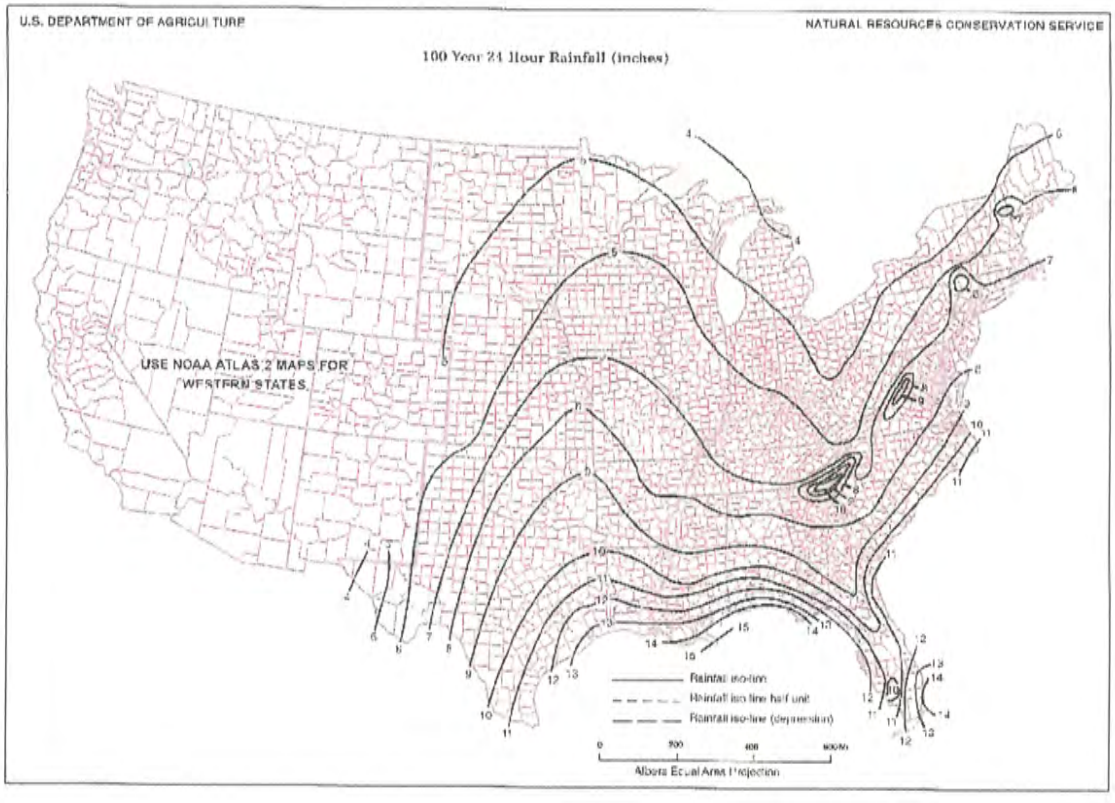


Figure B-8 100-year, 24-hour rainfall



APPENDIX C