

**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 25-Year Rainfall=6.43"

Prepared by Stonefield Engineering & Design

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**Summary for Reach SW-1: Rear Wall Swale (SW-1)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 3.15" for 25-Year event  
Inflow = 6.64 cfs @ 12.31 hrs, Volume= 32,629 cf  
Outflow = 6.63 cfs @ 12.31 hrs, Volume= 32,629 cf, Atten= 0%, Lag= 0.1 min  
Routed to Reach SW-2 : Rear Wall Swale (SW-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 3.91 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

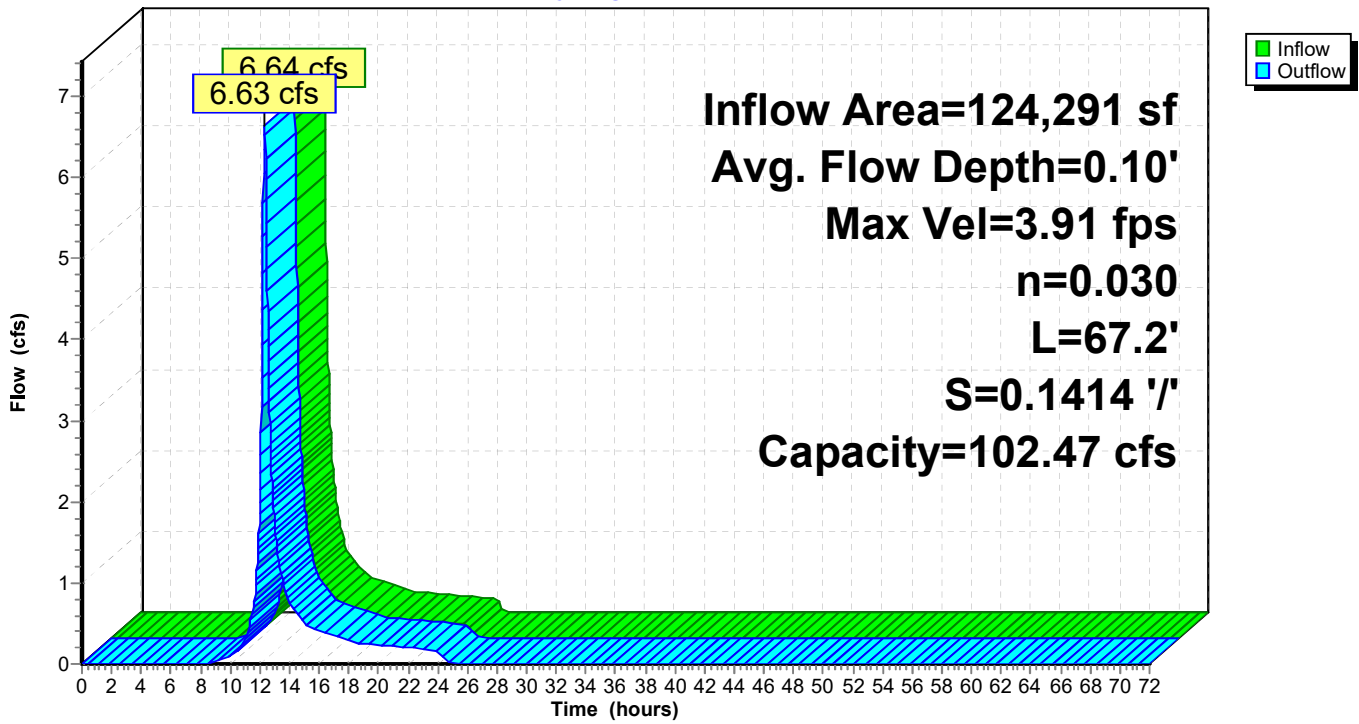
Peak Storage= 114 cf @ 12.31 hrs  
Average Depth at Peak Storage= 0.10', Surface Width= 17.59'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 102.47 cfs

17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 ' / ' Top Width= 20.00'  
Length= 67.2' Slope= 0.1414 ' / '  
Inlet Invert= 389.50', Outlet Invert= 380.00'



Reach SW-1: Rear Wall Swale (SW-1)

Hydrograph



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**Summary for Reach SW-2: Rear Wall Swale (SW-2)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 3.15" for 25-Year event  
Inflow = 6.63 cfs @ 12.31 hrs, Volume= 32,629 cf  
Outflow = 6.63 cfs @ 12.31 hrs, Volume= 32,629 cf, Atten= 0%, Lag= 0.2 min  
Routed to Reach SW-3 : Rear Wall Swale (SW-3)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 3.11 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 0.97 fps, Avg. Travel Time= 1.0 min

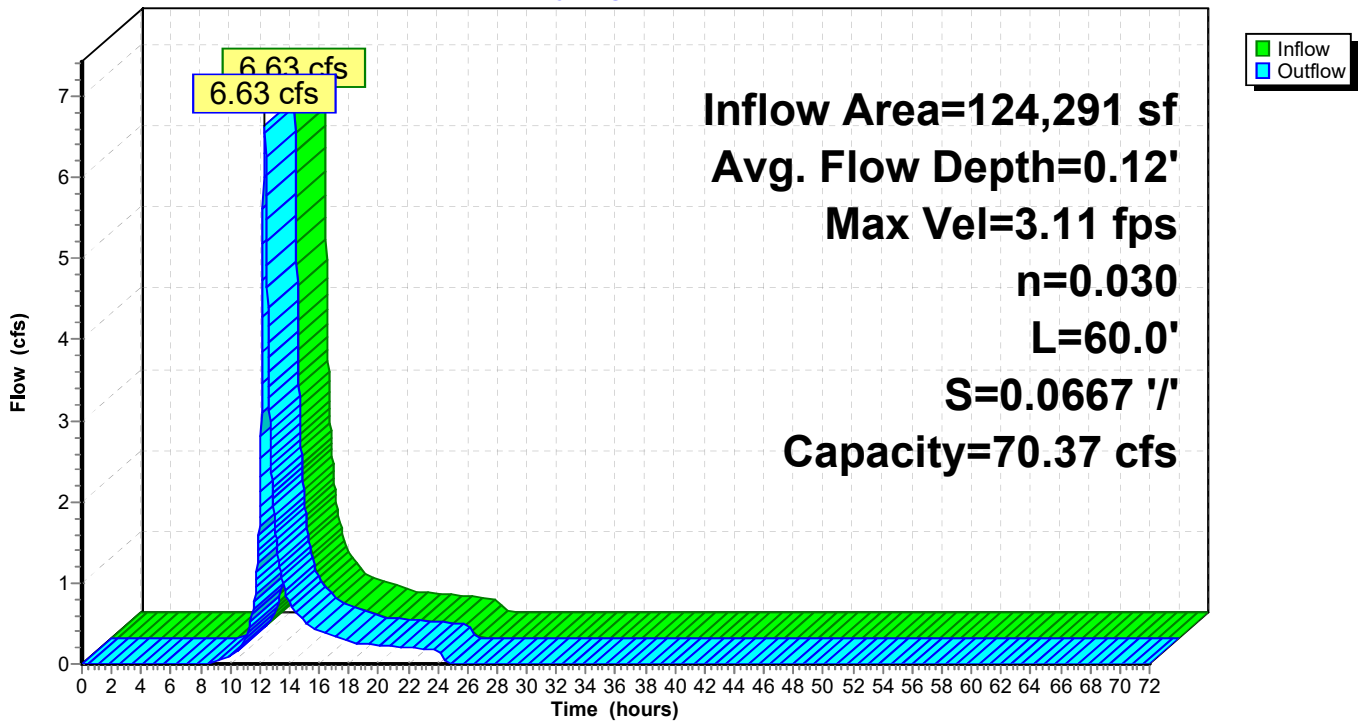
Peak Storage= 128 cf @ 12.31 hrs  
Average Depth at Peak Storage= 0.12', Surface Width= 17.74'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 70.37 cfs

17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 ' / ' Top Width= 20.00'  
Length= 60.0' Slope= 0.0667 ' / '  
Inlet Invert= 380.00', Outlet Invert= 376.00'



Reach SW-2: Rear Wall Swale (SW-2)

Hydrograph



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**Summary for Reach SW-3: Rear Wall Swale (SW-3)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 3.15" for 25-Year event  
Inflow = 6.63 cfs @ 12.31 hrs, Volume= 32,629 cf  
Outflow = 6.63 cfs @ 12.32 hrs, Volume= 32,629 cf, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 2.46 fps, Min. Travel Time= 0.9 min  
Avg. Velocity = 0.75 fps, Avg. Travel Time= 2.9 min

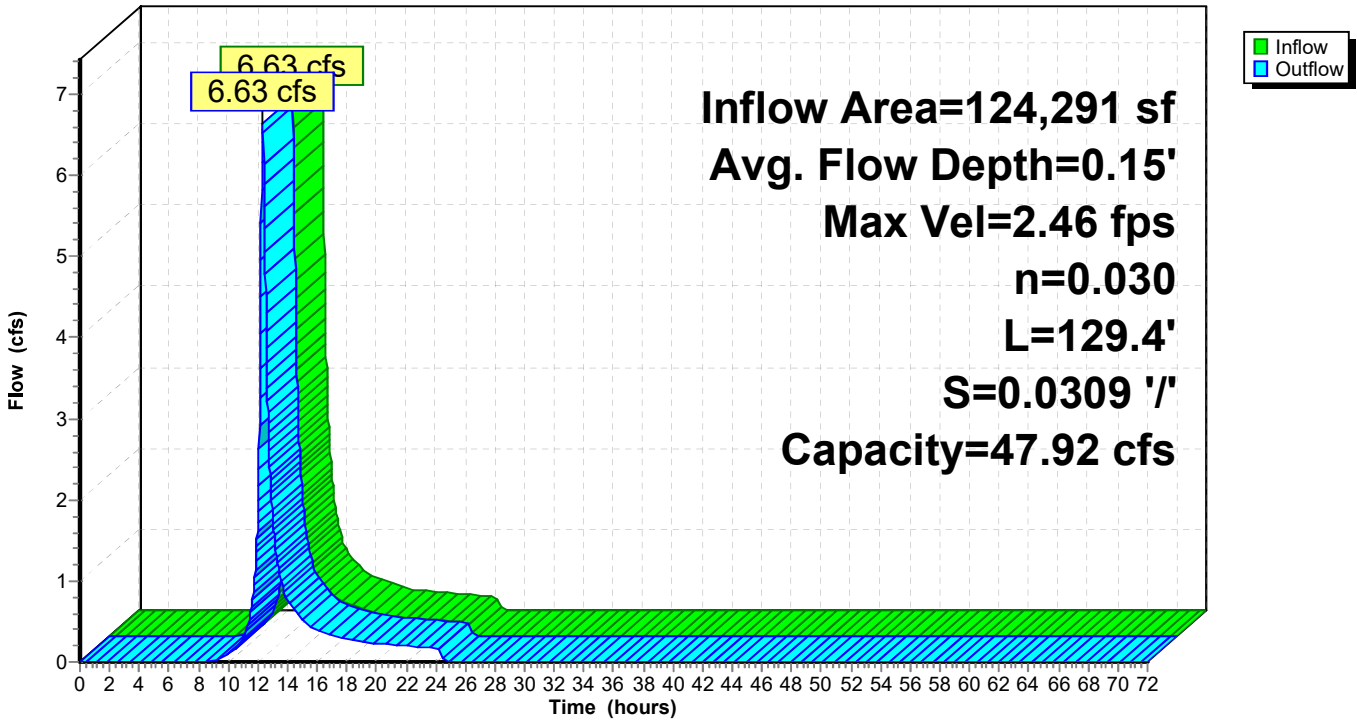
Peak Storage= 349 cf @ 12.32 hrs  
Average Depth at Peak Storage= 0.15', Surface Width= 17.93'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 47.92 cfs

17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 '/' Top Width= 20.00'  
Length= 129.4' Slope= 0.0309 '/'  
Inlet Invert= 376.00', Outlet Invert= 372.00'



Reach SW-3: Rear Wall Swale (SW-3)

Hydrograph



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**Summary for Pond A: Above Ground Bioretention Area (A)**

Inflow Area = 44,336 sf, 43.87% Impervious, Inflow Depth = 4.71" for 25-Year event  
 Inflow = 4.53 cfs @ 12.16 hrs, Volume= 17,396 cf  
 Outflow = 3.17 cfs @ 12.25 hrs, Volume= 17,396 cf, Atten= 30%, Lag= 5.2 min  
 Discarded = 0.03 cfs @ 12.25 hrs, Volume= 3,564 cf  
 Primary = 3.14 cfs @ 12.25 hrs, Volume= 13,832 cf  
 Routed to Pond B : Above Ground Bioretention Area (B)  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Pond B : Above Ground Bioretention Area (B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 Peak Elev= 329.87' @ 12.25 hrs Surf.Area= 2,269 sf Storage= 3,532 cf

Plug-Flow detention time= 173.5 min calculated for 17,392 cf (100% of inflow)  
 Center-of-Mass det. time= 173.8 min ( 960.0 - 786.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	328.00'	7,803 cf	<b>Above Ground Bioretention Area (A) (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
328.00	1,530	162.0	0	0	1,530
329.00	1,910	176.9	1,716	1,716	1,966
330.00	2,325	192.7	2,114	3,831	2,466
331.00	2,764	208.1	2,541	6,372	2,997
331.50	2,962	213.8	1,431	7,803	3,215

Device	Routing	Invert	Outlet Devices
#1	Primary	326.50'	<b>12.0" Round Culvert</b> L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 326.50' / 325.86' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	329.00'	<b>20.0" W x 6.0" H Vert. Low Flow</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	330.23'	<b>32.0" x 32.0" Horiz. Overflow Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	331.00'	<b>10.0' long x 7.0' breadth Emergency Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73

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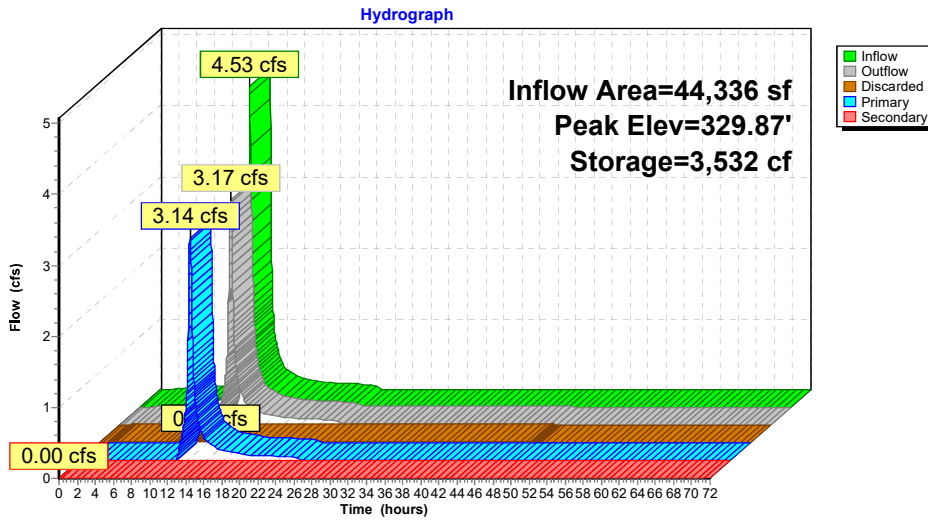
#5 Discarded 328.00' 2.78  
**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 310.00'  
Phase-In= 0.01'

**Discarded OutFlow** Max=0.03 cfs @ 12.25 hrs HW=329.87' (Free Discharge)  
↳ **5=Exfiltration** ( Controls 0.03 cfs)

**Primary OutFlow** Max=3.13 cfs @ 12.25 hrs HW=329.87' TW=317.58' (Dynamic Tailwater)  
↳ **1=Culvert** (Passes 3.13 cfs of 6.10 cfs potential flow)  
↳ **2=Low Flow** (Orifice Controls 3.13 cfs @ 3.76 fps)  
↳ **3=Overflow Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=328.00' TW=315.00' (Dynamic Tailwater)  
↳ **4=Emergency Spillway** ( Controls 0.00 cfs)

**Pond A: Above Ground Bioretention Area (A)**





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**Summary for Pond B: Above Ground Bioretention Area (B)**

Inflow Area = 87,333 sf, 55.22% Impervious, Inflow Depth = 3.61" for 25-Year event  
 Inflow = 6.61 cfs @ 12.16 hrs, Volume= 26,297 cf  
 Outflow = 3.85 cfs @ 12.48 hrs, Volume= 26,297 cf, Atten= 42%, Lag= 19.0 min  
 Discarded = 0.05 cfs @ 12.48 hrs, Volume= 2,068 cf  
 Primary = 3.80 cfs @ 12.48 hrs, Volume= 24,228 cf  
 Routed to Link POI-1 : POI-1 Existing Drainage Within Valley Road  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link POI-1 : POI-1 Existing Drainage Within Valley Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 Peak Elev= 317.99' @ 12.48 hrs Surf.Area= 2,829 sf Storage= 6,412 cf

Plug-Flow detention time= 43.9 min calculated for 26,289 cf (100% of inflow)  
 Center-of-Mass det. time= 44.0 min ( 851.1 - 807.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	315.00'	11,202 cf	<b>Above Ground Bioretention Area (A) (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
315.00	1,499	165.1	0	0	1,499
316.00	1,923	188.6	1,707	1,707	2,184
317.00	2,373	210.7	2,144	3,851	2,914
318.00	2,836	232.0	2,601	6,452	3,696
319.00	3,284	250.9	3,057	9,509	4,461
319.50	3,491	258.4	1,693	11,202	4,791

Device	Routing	Invert	Outlet Devices
#1	Primary	314.04'	<b>12.0" Round Culvert</b> L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 314.04' / 313.74' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	315.30'	<b>10.0" W x 3.0" H Vert. Low Flow</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.35'	<b>11.0" W x 5.0" H Vert. Control Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	318.40'	<b>32.0" x 32.0" Horiz. Overflow Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	319.00'	<b>10.0' long x 8.0' breadth Emergency Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00

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5.50

Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70  
2.74

#6 Discarded 315.00' **0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 310.00'  
Phase-In= 0.01'

**Discarded OutFlow** Max=0.05 cfs @ 12.48 hrs HW=317.99' (Free Discharge)

↳ **6=Exfiltration** ( Controls 0.05 cfs)

**Primary OutFlow** Max=3.80 cfs @ 12.48 hrs HW=317.99' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 3.80 cfs of 7.02 cfs potential flow)

↳ **2=Low Flow** (Orifice Controls 1.61 cfs @ 7.70 fps)

↳ **3=Control Orifice** (Orifice Controls 2.20 cfs @ 5.75 fps)

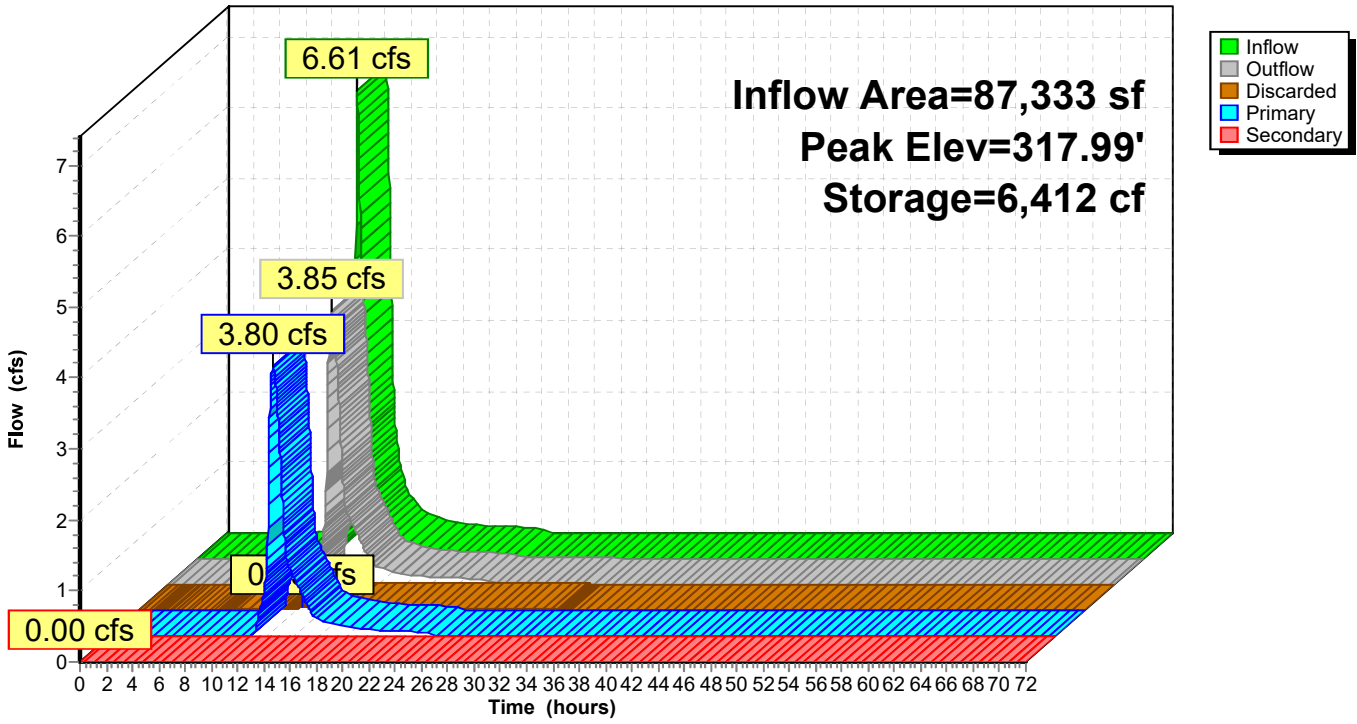
↳ **4=Overflow Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=315.00' TW=0.00' (Dynamic Tailwater)

↳ **5=Emergency Spillway** ( Controls 0.00 cfs)

Pond B: Above Ground Bioretention Area (B)

Hydrograph



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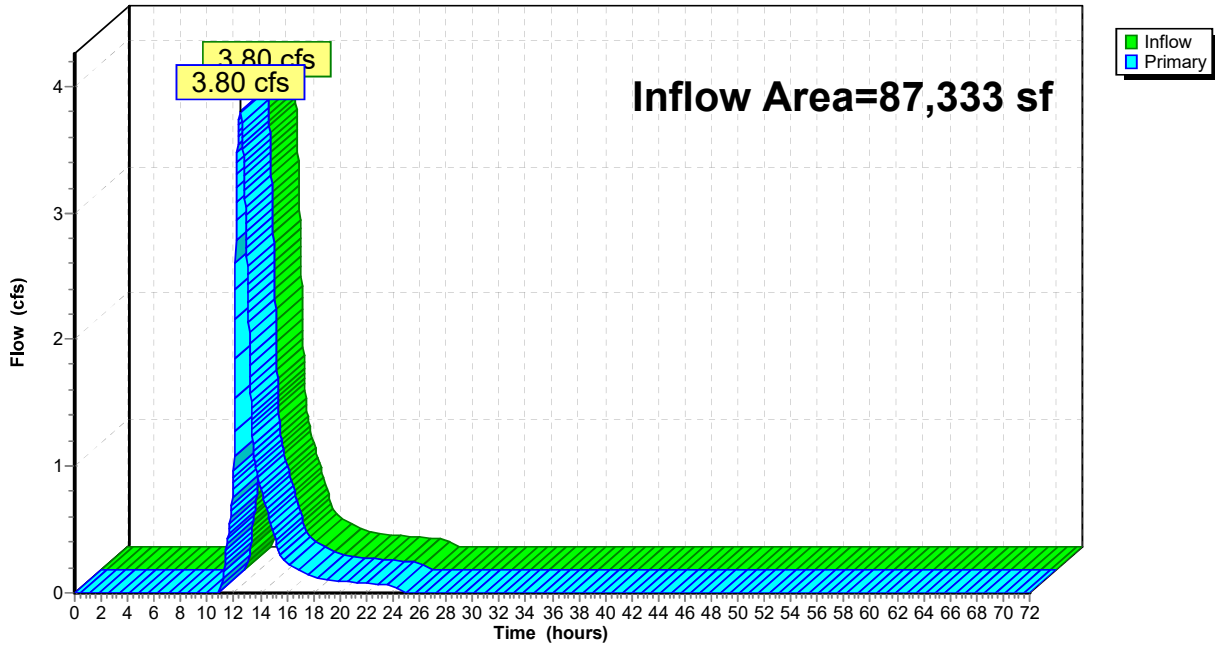
**Summary for Link POI-1: POI-1 Existing Drainage Within Valley Road**

Inflow Area = 87,333 sf, 55.22% Impervious, Inflow Depth = 3.33" for 25-Year event  
Inflow = 3.80 cfs @ 12.48 hrs, Volume= 24,228 cf  
Primary = 3.80 cfs @ 12.48 hrs, Volume= 24,228 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

**Link POI-1: POI-1 Existing Drainage Within Valley Road**

Hydrograph



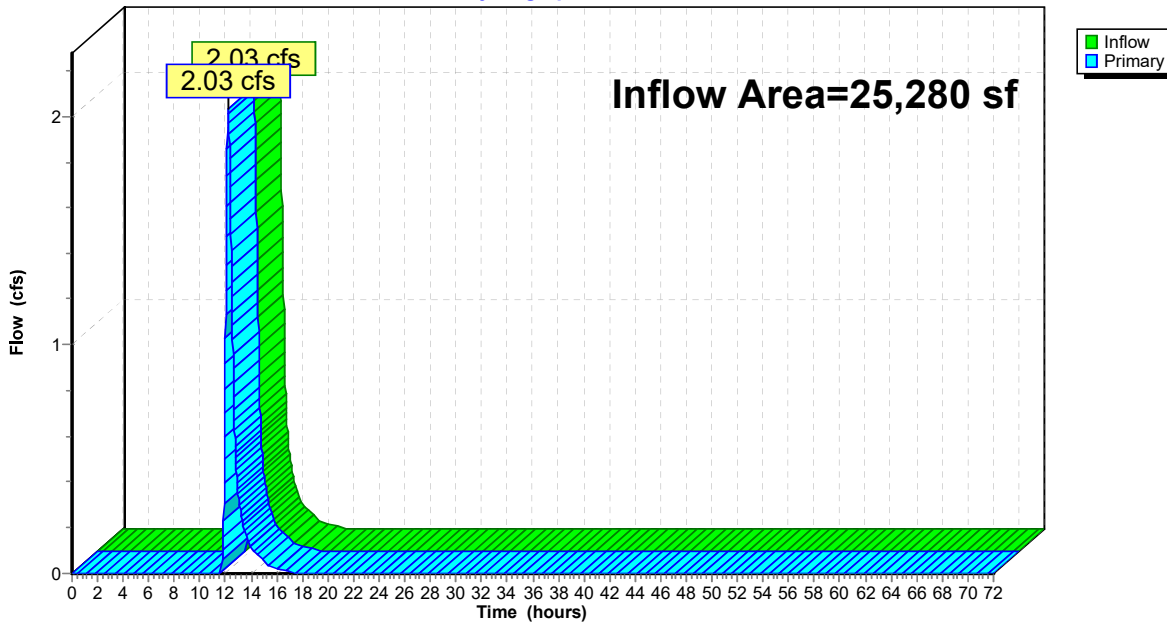
**Summary for Link PPV: Pervious Pavement Systems**

Inflow Area = 25,280 sf, 99.23% Impervious, Inflow Depth = 2.70" for 25-Year event  
Inflow = 2.03 cfs @ 12.21 hrs, Volume= 5,685 cf  
Primary = 2.03 cfs @ 12.21 hrs, Volume= 5,685 cf, Atten= 0%, Lag= 0.0 min  
Routed to Pond B : Above Ground Bioretention Area (B)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

**Link PPV: Pervious Pavement Systems**

Hydrograph



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**Summary for Link PPV-A: Pervious Pavement System Building A**

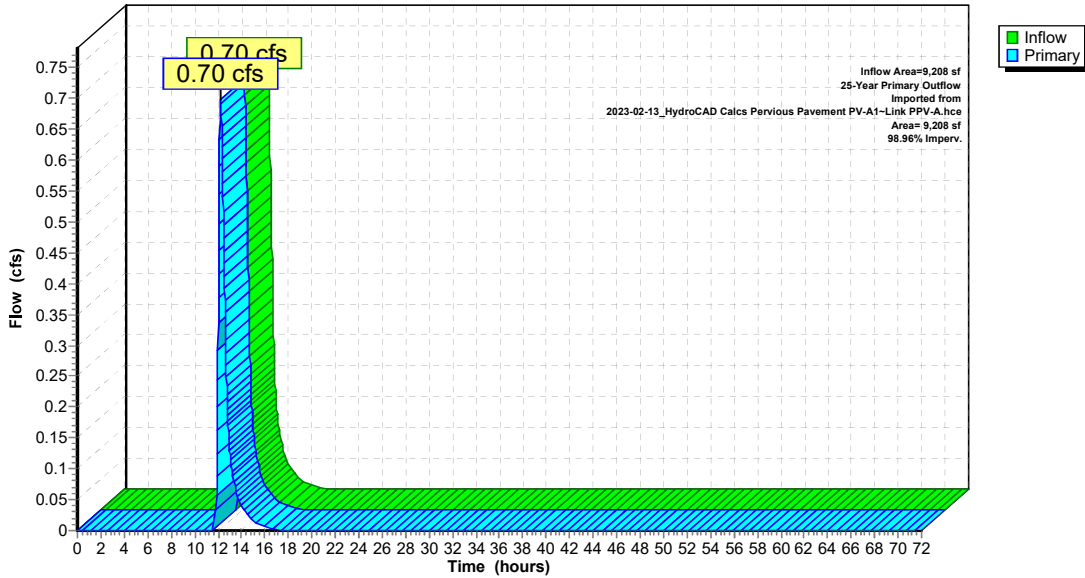
Inflow Area = 9,208 sf, 98.96% Impervious, Inflow Depth = 2.58" for 25-Year event  
Inflow = 0.70 cfs @ 12.21 hrs, Volume= 1,982 cf  
Primary = 0.70 cfs @ 12.21 hrs, Volume= 1,982 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

25-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-A1~Link PPV-A.hce

**Link PPV-A: Pervious Pavement System Building A**

Hydrograph



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**Summary for Link PPV-B: Pervious Pavement System Building B**

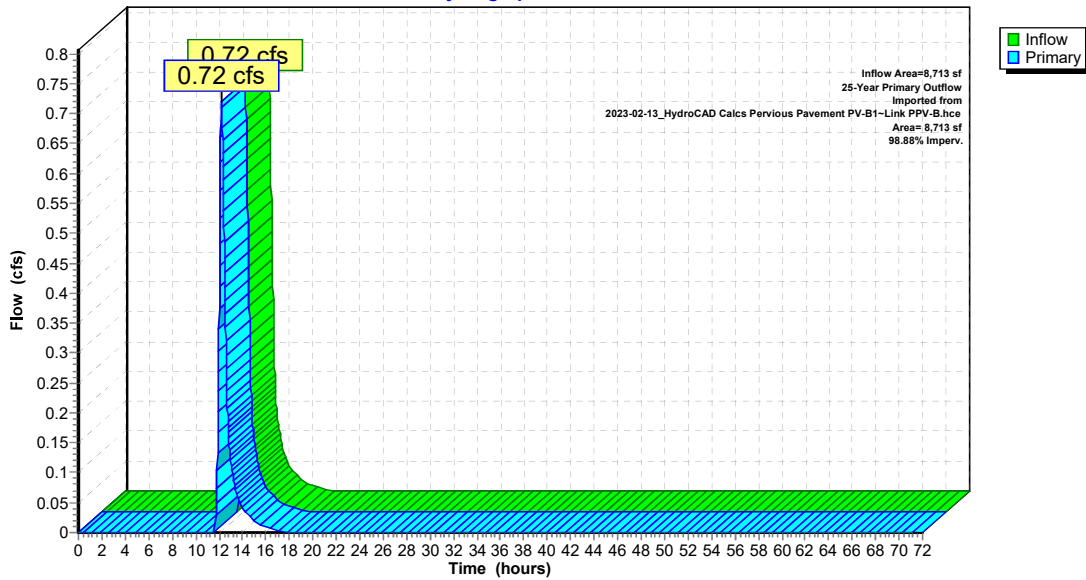
Inflow Area = 8,713 sf, 98.88% Impervious, Inflow Depth = 2.76" for 25-Year event  
Inflow = 0.72 cfs @ 12.20 hrs, Volume= 2,004 cf  
Primary = 0.72 cfs @ 12.20 hrs, Volume= 2,004 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

25-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-B1~Link PPV-B.hce

**Link PPV-B: Pervious Pavement System Building B**

Hydrograph



### Summary for Link PPV-C: Pervious Pavement System Building C

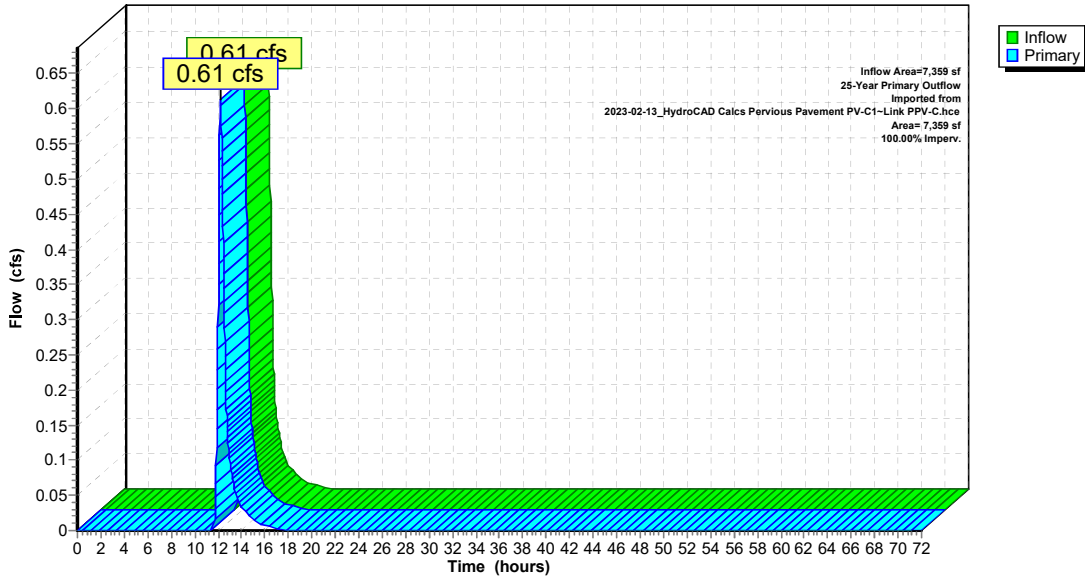
Inflow Area = 7,359 sf, 100.00% Impervious, Inflow Depth = 2.77" for 25-Year event  
Inflow = 0.61 cfs @ 12.20 hrs, Volume= 1,700 cf  
Primary = 0.61 cfs @ 12.20 hrs, Volume= 1,700 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

25-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-C1~Link PPV-C.hce

### Link PPV-C: Pervious Pavement System Building C

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**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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

**Subcatchment E-1A: EXISTING DRAINAGE TO LOT 13**

Runoff Area=91,865 sf 0.00% Impervious Runoff Depth=5.24"  
 Flow Length=424' Tc=12.9 min CN=72/0 Runoff=10.10 cfs 40,134 cf

**Subcatchment E-1B: EXISTING DRAINAGE UNDETAINED TO ROADWAY**

Runoff Area=108,912 sf 0.00% Impervious Runoff Depth=5.00"  
 Flow Length=281' Tc=12.6 min CN=70/0 Runoff=11.55 cfs 45,394 cf

**Subcatchment P-1A: Proposed Drainage to Bioretention Area B1**

Runoff Area=17,717 sf 20.82% Impervious Runoff Depth=6.66"  
 Flow Length=99' Tc=6.0 min CN=80/98 Runoff=2.96 cfs 9,834 cf

**Subcatchment P-1B: Proposed Drainage to Bioretention Area A.1**

Runoff Area=5,136 sf 13.92% Impervious Runoff Depth=5.89"  
 Flow Length=173' Tc=13.4 min CN=74/98 Runoff=0.60 cfs 2,520 cf

**Subcatchment P-1C: Proposed Drainage to Bioretention Area A.2**

Runoff Area=39,200 sf 47.79% Impervious Runoff Depth=6.87"  
 Flow Length=305' Tc=8.7 min CN=74/98 Runoff=5.93 cfs 22,435 cf

**Subcatchment P-1E: Proposed Drainage Undetained to Valley Road**

Runoff Area=124,291 sf 0.00% Impervious Runoff Depth=5.00"  
 Flow Length=518' Tc=20.9 min CN=70/0 Runoff=10.56 cfs 51,804 cf

**Reach SW-1: Rear Wall Swale (SW-1)**

Avg. Flow Depth=0.13' Max Vel=4.69 fps Inflow=10.56 cfs 51,804 cf  
 n=0.030 L=67.2' S=0.1414 '/' Capacity=102.47 cfs Outflow=10.56 cfs 51,804 cf

**Reach SW-2: Rear Wall Swale (SW-2)**

Avg. Flow Depth=0.16' Max Vel=3.73 fps Inflow=10.56 cfs 51,804 cf  
 n=0.030 L=60.0' S=0.0667 '/' Capacity=70.37 cfs Outflow=10.57 cfs 51,804 cf

**Reach SW-3: Rear Wall Swale (SW-3)**

Avg. Flow Depth=0.20' Max Vel=2.94 fps Inflow=10.57 cfs 51,804 cf  
 n=0.030 L=129.4' S=0.0309 '/' Capacity=47.92 cfs Outflow=10.55 cfs 51,804 cf

**Pond A: Above Ground Bioretention Area (A)**

Peak Elev=330.27' Storage=4,476 cf Inflow=6.47 cfs 24,954 cf  
 Discarded=0.03 cfs 3,642 cf Primary=4.33 cfs 21,312 cf Secondary=0.00 cfs 0 cf Outflow=4.36 cfs 24,954 cf

**Pond B: Above Ground Bioretention Area (B)**

Peak Elev=318.57' Storage=8,150 cf Inflow=8.70 cfs 40,569 cf  
 Discarded=0.05 cfs 2,270 cf Primary=6.91 cfs 38,299 cf Secondary=0.00 cfs 0 cf Outflow=6.96 cfs 40,569 cf

**2023-02-14\_HydroCAD Calcs (POI-1)**

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NOAA 24-hr D 100-Year Rainfall=8.62"

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**Link POI-1: POI-1 Existing Drainage Within Valley Road**

Inflow=6.91 cfs 38,299 cf  
Primary=6.91 cfs 38,299 cf

**Link PPV: Pervious Pavement Systems**

Inflow=2.56 cfs 9,423 cf  
Primary=2.56 cfs 9,423 cf

- Link** 100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-A1~Link PPV-A.hce Inflow=0.89 cfs 3,309 cf  
Area= 9,208 sf 98.96% Imperv. Primary=0.89 cfs 3,309 cf
- Link** 100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-B1~Link PPV-B.hce Inflow=0.91 cfs 3,311 cf  
Area= 8,713 sf 98.88% Imperv. Primary=0.91 cfs 3,311 cf
- Link** 100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-C1~Link PPV-C.hce Inflow=0.77 cfs 2,803 cf  
Area= 7,359 sf 100.00% Imperv. Primary=0.77 cfs 2,803 cf

**Total Runoff Area = 387,121 sf Runoff Volume = 172,120 cf Average Runoff Depth = 5.34"**  
**94.02% Pervious = 363,984 sf 5.98% Impervious = 23,137 sf**

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**Summary for Subcatchment E-1A: EXISTING DRAINAGE TO LOT 13**

Runoff = 10.10 cfs @ 12.21 hrs, Volume= 40,134 cf, Depth= 5.24"  
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NOAA 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
66,518	70	Woods, Good, HSG C
20,121	74	>75% Grass cover, Good, HSG C
5,226	98	Water Surface, 0% imp, HSG C
91,865	72	Weighted Average
91,865	72	100.00% Pervious Area

**2023-02-14\_HydroCAD Calcs (POI-1)**

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NOAA 24-hr D 100-Year Rainfall=8.62"

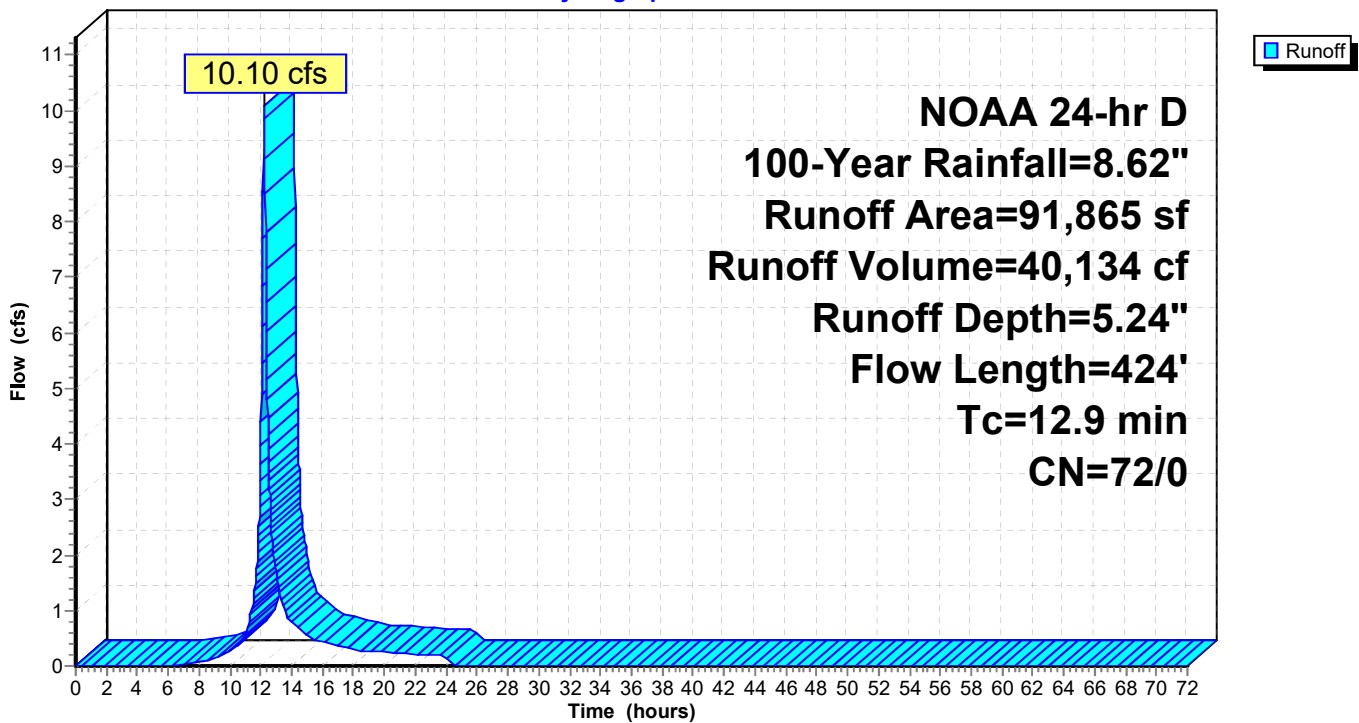
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	73	0.0260	0.18		<b>Sheet Flow, B1-B2</b> Grass: Short n= 0.150 P2= 3.47"
0.6	52	0.0370	1.35		<b>Shallow Concentrated Flow, B2-B3</b> Short Grass Pasture Kv= 7.0 fps
1.5	98	0.0255	1.12		<b>Shallow Concentrated Flow, B3-B4</b> Short Grass Pasture Kv= 7.0 fps
0.6	37	0.0243	1.09		<b>Shallow Concentrated Flow, B4-B5</b> Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0243	1.09		<b>Shallow Concentrated Flow, B5-B6</b> Short Grass Pasture Kv= 7.0 fps
0.6	23	0.0087	0.65		<b>Shallow Concentrated Flow, B6-B7</b> Short Grass Pasture Kv= 7.0 fps
0.2	15	0.0400	1.40		<b>Shallow Concentrated Flow, B7-B8</b> Short Grass Pasture Kv= 7.0 fps
1.1	45	0.0100	0.70		<b>Shallow Concentrated Flow, B8-B9</b> Short Grass Pasture Kv= 7.0 fps
1.2	47	0.0083	0.64		<b>Shallow Concentrated Flow, B-9-B10</b> Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0166	0.90		<b>Shallow Concentrated Flow, B10-B11</b> Short Grass Pasture Kv= 7.0 fps
12.9	424	Total			

Subcatchment E-1A: EXISTING DRAINAGE TO LOT 13

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Subcatchment E-1B: EXISTING DRAINAGE UNDETAINED TO ROADWAY**

Runoff = 11.55 cfs @ 12.20 hrs, Volume= 45,394 cf, Depth= 5.00"  
 Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.62"

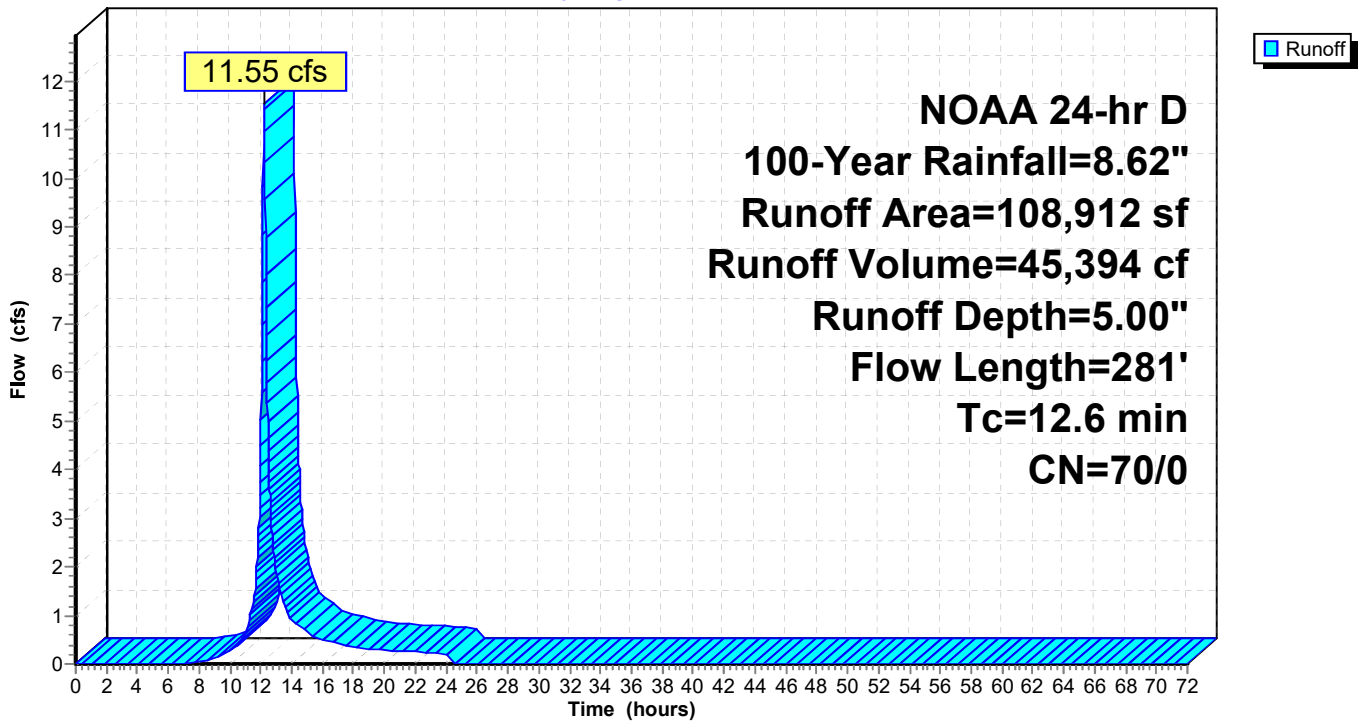
Area (sf)	CN	Description
108,912	70	Woods, Good, HSG C
108,912	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		<b>Sheet Flow, A1-A2</b> Grass: Short n= 0.150 P2= 3.47"
1.5	68	0.0111	0.74		<b>Shallow Concentrated Flow, A2-A3</b> Short Grass Pasture Kv= 7.0 fps
1.6	95	0.0200	0.99		<b>Shallow Concentrated Flow, A3-A4</b> Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0200	0.99		<b>Shallow Concentrated Flow, A4-A5</b> Short Grass Pasture Kv= 7.0 fps
12.6	281	Total			

**Subcatchment E-1B: EXISTING DRAINAGE UNDETAINED TO ROADWAY**

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Subcatchment P-1A: Proposed Drainage to Bioretention Area B1**

Runoff = 2.96 cfs @ 12.13 hrs, Volume= 9,834 cf, Depth= 6.66"  
 Routed to Pond B : Above Ground Bioretention Area (B)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
14,029	80	>75% Grass cover, Good, HSG D
* 3,688	98	Impervious Area
17,717	84	Weighted Average
14,029	80	79.18% Pervious Area
3,688	98	20.82% Impervious Area

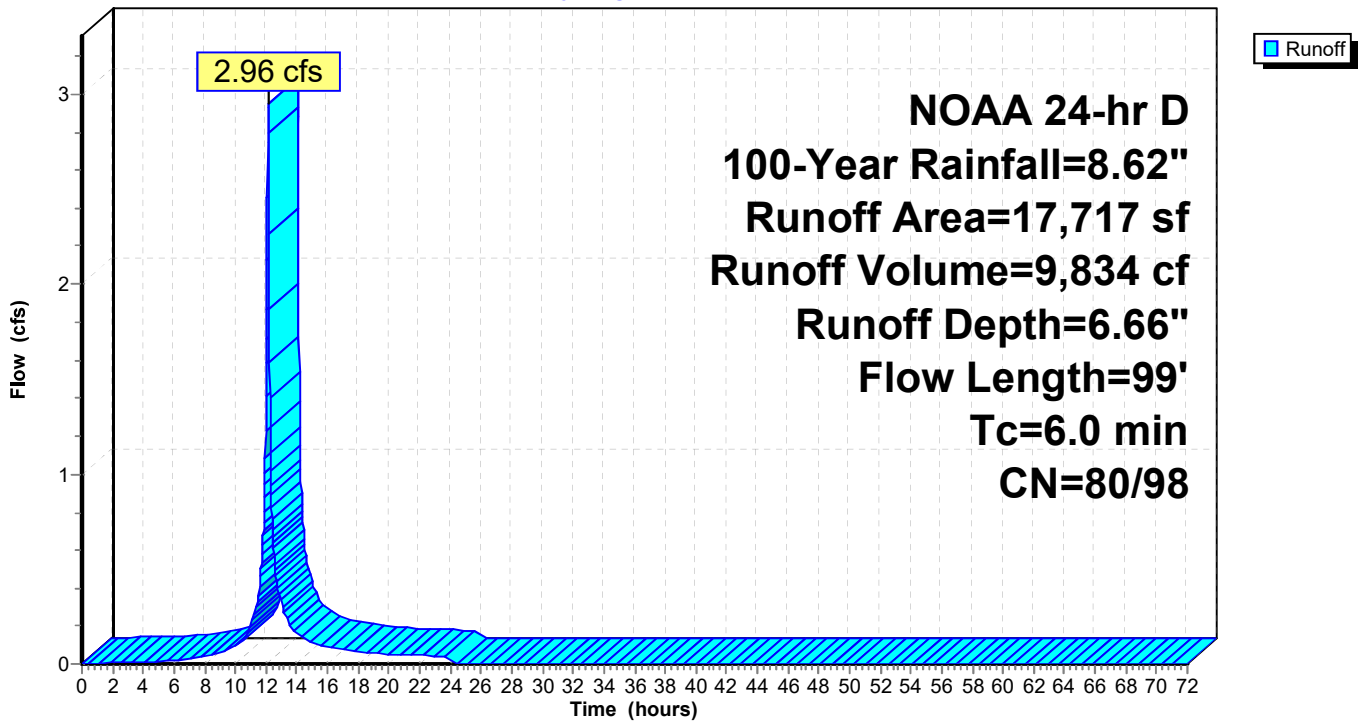
  

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	19	0.0157	0.12		<b>Sheet Flow, A1-A2</b> Grass: Short n= 0.150 P2= 3.47"
0.5	25	0.0120	0.77		<b>Shallow Concentrated Flow, A2-A3</b> Short Grass Pasture Kv= 7.0 fps
0.8	37	0.0108	0.73		<b>Shallow Concentrated Flow, A3-A4</b> Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0333	1.28		<b>Shallow Concentrated Flow, A4-A5</b> Short Grass Pasture Kv= 7.0 fps
1.8					<b>Direct Entry, To Meet Minimum</b>
6.0	99	Total			



Subcatchment P-1A: Proposed Drainage to Bioretention Area B1

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Subcatchment P-1B: Proposed Drainage to Bioretention Area A.1**

Runoff = 0.60 cfs @ 12.21 hrs, Volume= 2,520 cf, Depth= 5.89"  
 Routed to Pond A : Above Ground Bioretention Area (A)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.62"

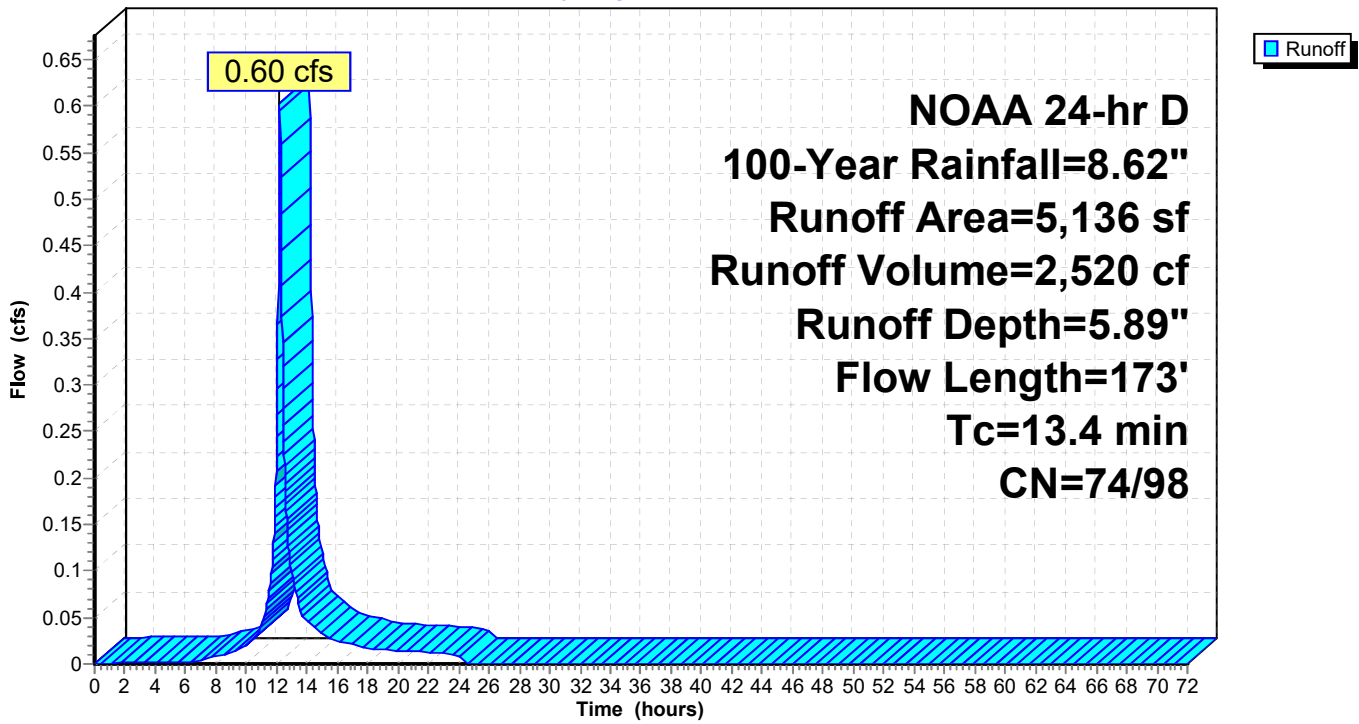
Area (sf)	CN	Description
* 715	98	Impervious Area
4,421	74	>75% Grass cover, Good, HSG C
5,136	77	Weighted Average
4,421	74	86.08% Pervious Area
715	98	13.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	44	0.0045	0.08		<b>Sheet Flow, B1-B2</b> Grass: Short n= 0.150 P2= 3.47"
0.8	22	0.0044	0.46		<b>Shallow Concentrated Flow, B2-B3</b> Short Grass Pasture Kv= 7.0 fps
0.8	22	0.0044	0.46		<b>Shallow Concentrated Flow, B3-B4</b> Short Grass Pasture Kv= 7.0 fps
1.2	30	0.0033	0.40		<b>Shallow Concentrated Flow, B4-B5</b> Short Grass Pasture Kv= 7.0 fps
1.2	30	0.0033	0.40		<b>Shallow Concentrated Flow, B5-B6</b> Short Grass Pasture Kv= 7.0 fps
0.5	25	0.0120	0.77		<b>Shallow Concentrated Flow, B6-B7</b> Short Grass Pasture Kv= 7.0 fps
13.4	173	Total			

Subcatchment P-1B: Proposed Drainage to Bioretention Area A.1

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Subcatchment P-1C: Proposed Drainage to Bioretention Area A.2**

Runoff = 5.93 cfs @ 12.16 hrs, Volume= 22,435 cf, Depth= 6.87"  
 Routed to Pond A : Above Ground Bioretention Area (A)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.62"

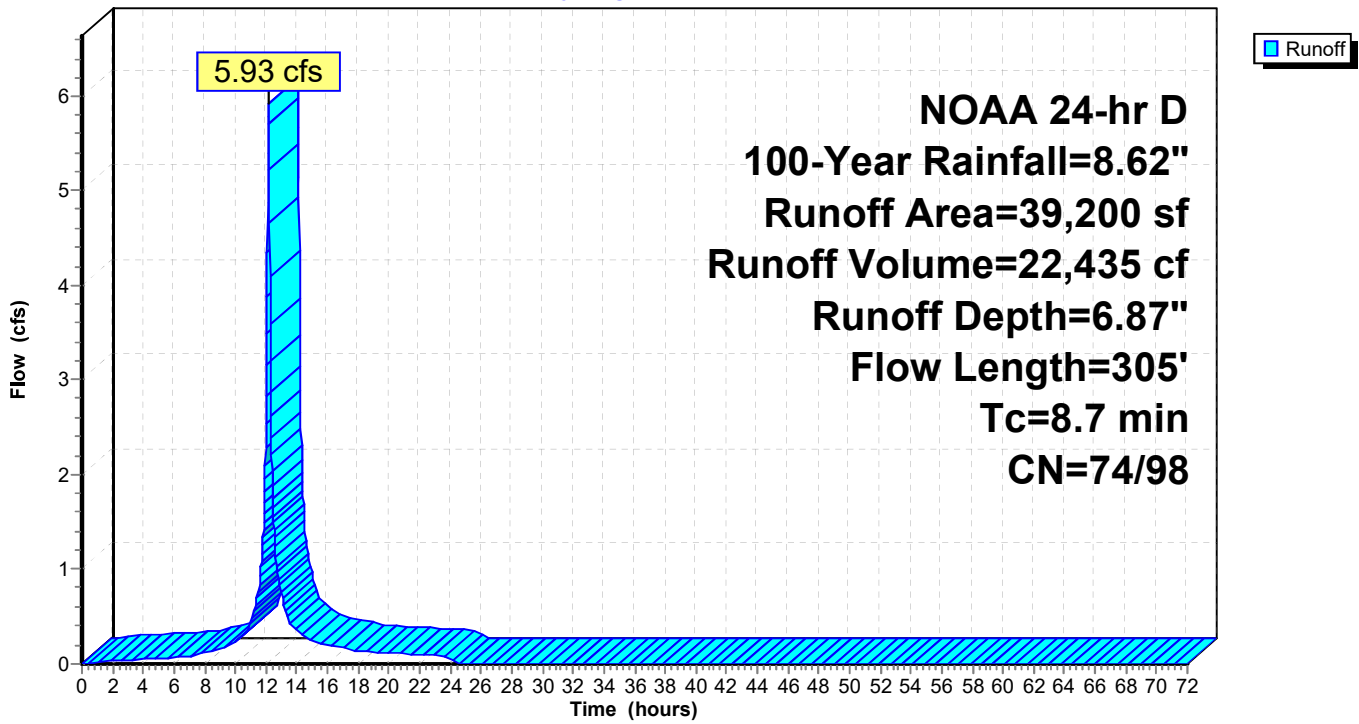
Area (sf)	CN	Description
18,734	98	Paved parking, HSG C
20,466	74	>75% Grass cover, Good, HSG C
39,200	85	Weighted Average
20,466	74	52.21% Pervious Area
18,734	98	47.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	61	0.0254	0.18		<b>Sheet Flow, C1-C2</b> Grass: Short n= 0.150 P2= 3.47"
0.3	24	0.0033	1.17		<b>Shallow Concentrated Flow, C2-C3</b> Paved Kv= 20.3 fps
0.9	77	0.0052	1.46		<b>Shallow Concentrated Flow, C3-C4</b> Paved Kv= 20.3 fps
1.0	90	0.0055	1.51		<b>Shallow Concentrated Flow, C4-C5</b> Paved Kv= 20.3 fps
0.7	53	0.0038	1.25		<b>Shallow Concentrated Flow, C5-C6</b> Paved Kv= 20.3 fps
8.7	305	Total			

Subcatchment P-1C: Proposed Drainage to Bioretention Area A.2

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

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**Summary for Subcatchment P-1E: Proposed Drainage Undetained to Valley Road**

Runoff = 10.56 cfs @ 12.30 hrs, Volume= 51,804 cf, Depth= 5.00"  
 Routed to Reach SW-1 : Rear Wall Swale (SW-1)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.62"

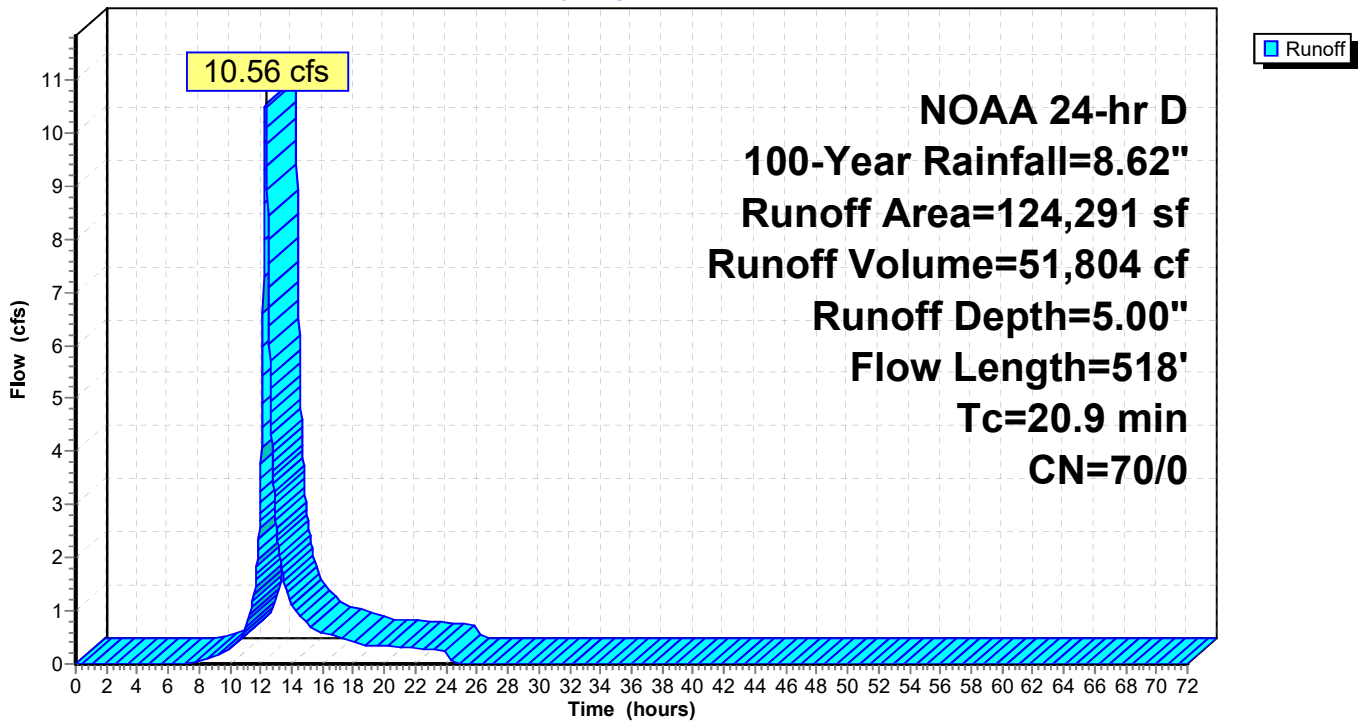
Area (sf)	CN	Description
124,291	70	Woods, Good, HSG C
124,291	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0201	0.18		<b>Sheet Flow, E1-E2</b> Grass: Short n= 0.150 P2= 3.47"
1.5	68	0.0111	0.74		<b>Shallow Concentrated Flow, E2-E3</b> Short Grass Pasture Kv= 7.0 fps
1.6	95	0.0200	0.99		<b>Shallow Concentrated Flow, E3-E4</b> Short Grass Pasture Kv= 7.0 fps
0.7	37	0.0162	0.89		<b>Shallow Concentrated Flow, E3-E4</b> Short Grass Pasture Kv= 7.0 fps
1.6	60	0.0083	0.64		<b>Shallow Concentrated Flow, E5-E6</b> Short Grass Pasture Kv= 7.0 fps
3.5	96	0.0042	0.45		<b>Shallow Concentrated Flow, E6-E7</b> Short Grass Pasture Kv= 7.0 fps
1.8	39	0.0026	0.36		<b>Shallow Concentrated Flow, E7-E8</b> Short Grass Pasture Kv= 7.0 fps
0.8	23	0.0043	0.46		<b>Shallow Concentrated Flow, E8-E9</b> Short Grass Pasture Kv= 7.0 fps
20.9	518	Total			

Subcatchment P-1E: Proposed Drainage Undetained to Valley Road

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Reach SW-1: Rear Wall Swale (SW-1)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 5.00" for 100-Year event  
Inflow = 10.56 cfs @ 12.30 hrs, Volume= 51,804 cf  
Outflow = 10.56 cfs @ 12.31 hrs, Volume= 51,804 cf, Atten= 0%, Lag= 0.1 min  
Routed to Reach SW-2 : Rear Wall Swale (SW-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 4.69 fps, Min. Travel Time= 0.2 min  
Avg. Velocity = 1.40 fps, Avg. Travel Time= 0.8 min

Peak Storage= 151 cf @ 12.31 hrs  
Average Depth at Peak Storage= 0.13', Surface Width= 17.78'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 102.47 cfs

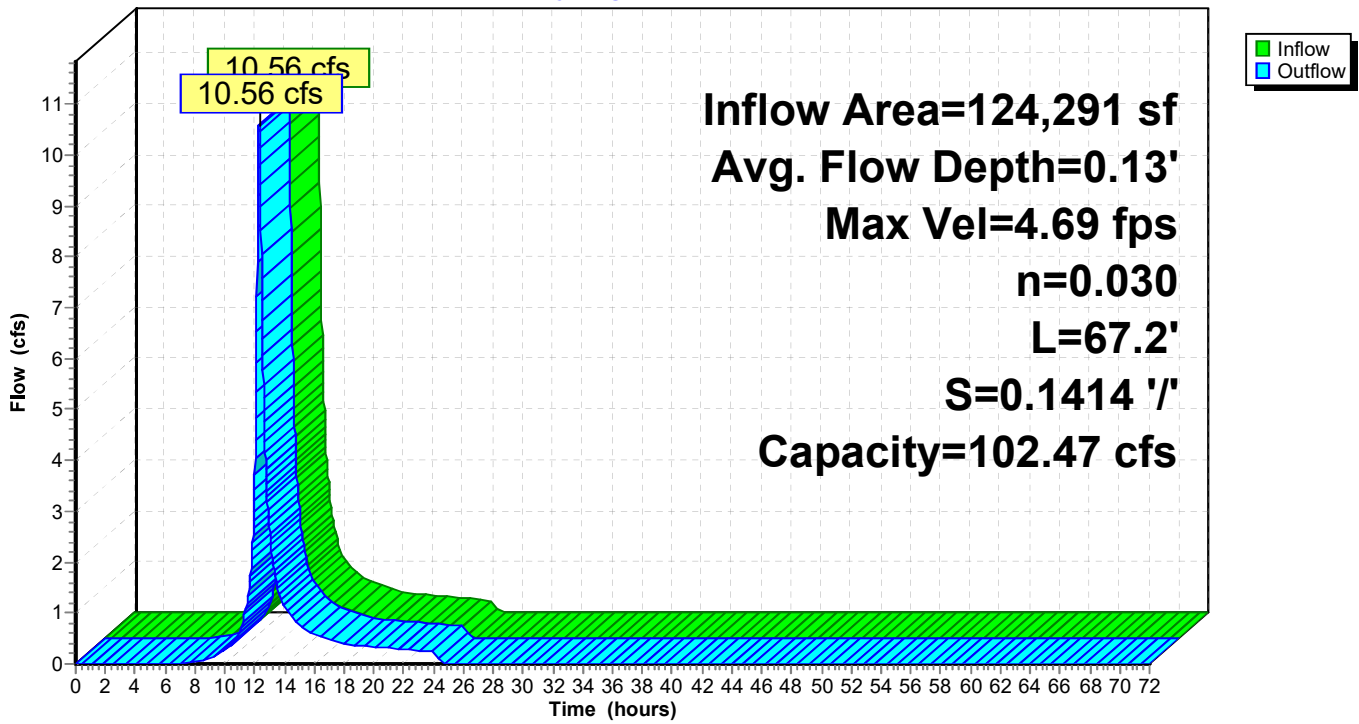
17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 '1' Top Width= 20.00'  
Length= 67.2' Slope= 0.1414 '1'  
Inlet Invert= 389.50', Outlet Invert= 380.00'





Reach SW-1: Rear Wall Swale (SW-1)

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Reach SW-2: Rear Wall Swale (SW-2)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 5.00" for 100-Year event  
Inflow = 10.56 cfs @ 12.31 hrs, Volume= 51,804 cf  
Outflow = 10.57 cfs @ 12.31 hrs, Volume= 51,804 cf, Atten= 0%, Lag= 0.1 min  
Routed to Reach SW-3 : Rear Wall Swale (SW-3)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 3.73 fps, Min. Travel Time= 0.3 min  
Avg. Velocity = 1.11 fps, Avg. Travel Time= 0.9 min

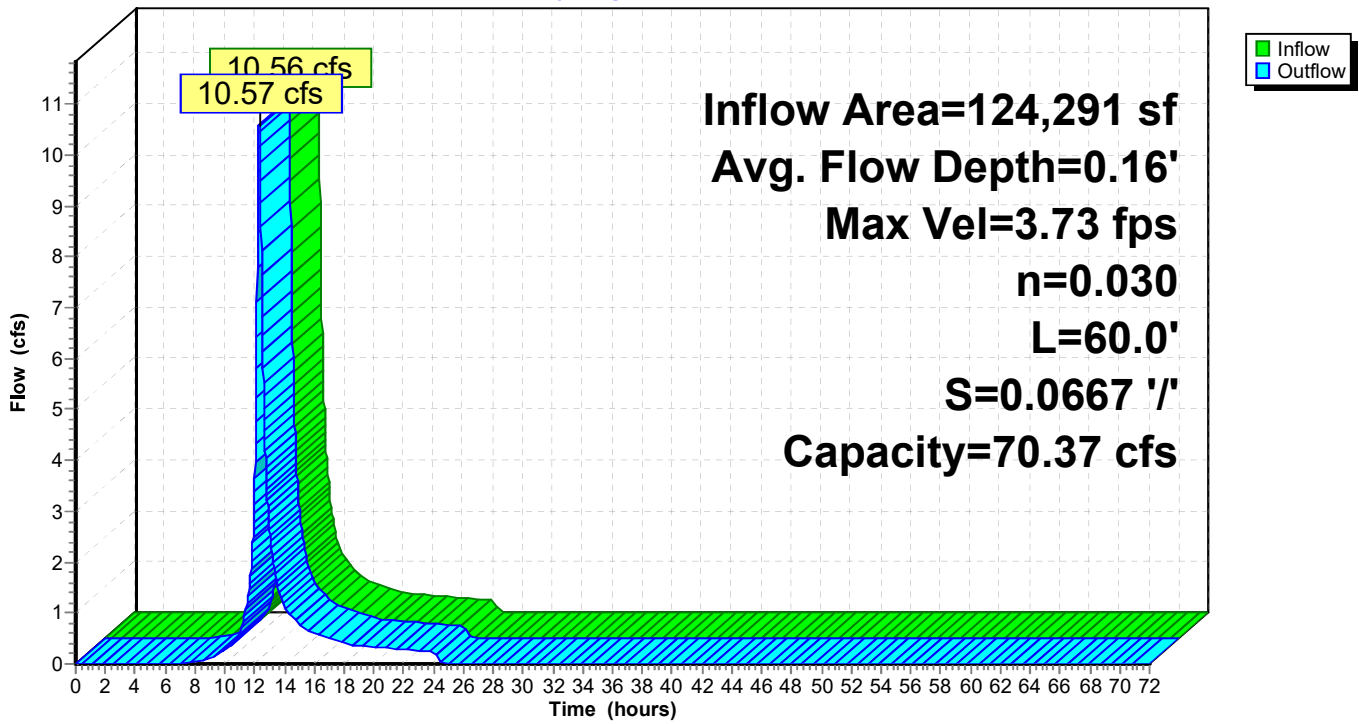
Peak Storage= 170 cf @ 12.31 hrs  
Average Depth at Peak Storage= 0.16', Surface Width= 17.97'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 70.37 cfs

17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 ' / ' Top Width= 20.00'  
Length= 60.0' Slope= 0.0667 ' / '  
Inlet Invert= 380.00', Outlet Invert= 376.00'



Reach SW-2: Rear Wall Swale (SW-2)

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

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**Summary for Reach SW-3: Rear Wall Swale (SW-3)**

Inflow Area = 124,291 sf, 0.00% Impervious, Inflow Depth = 5.00" for 100-Year event  
Inflow = 10.57 cfs @ 12.31 hrs, Volume= 51,804 cf  
Outflow = 10.55 cfs @ 12.32 hrs, Volume= 51,804 cf, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
Max. Velocity= 2.94 fps, Min. Travel Time= 0.7 min  
Avg. Velocity = 0.86 fps, Avg. Travel Time= 2.5 min

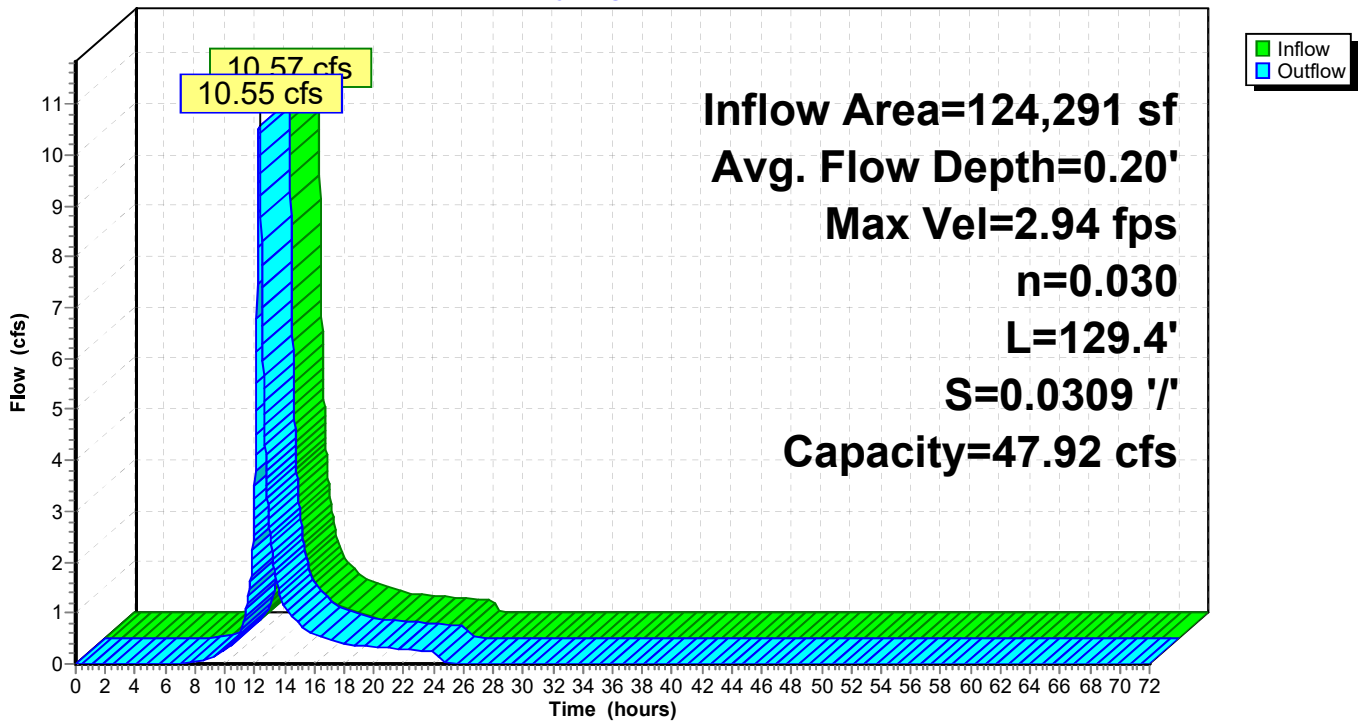
Peak Storage= 464 cf @ 12.32 hrs  
Average Depth at Peak Storage= 0.20', Surface Width= 18.22'  
Bank-Full Depth= 0.50' Flow Area= 9.3 sf, Capacity= 47.92 cfs

17.00' x 0.50' deep channel, n= 0.030 Short grass  
Side Slope Z-value= 3.0 '/' Top Width= 20.00'  
Length= 129.4' Slope= 0.0309 '/'  
Inlet Invert= 376.00', Outlet Invert= 372.00'



Reach SW-3: Rear Wall Swale (SW-3)

Hydrograph



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**Summary for Pond A: Above Ground Bioretention Area (A)**

Inflow Area = 44,336 sf, 43.87% Impervious, Inflow Depth = 6.75" for 100-Year event  
 Inflow = 6.47 cfs @ 12.16 hrs, Volume= 24,954 cf  
 Outflow = 4.36 cfs @ 12.25 hrs, Volume= 24,954 cf, Atten= 33%, Lag= 5.6 min  
 Discarded = 0.03 cfs @ 12.25 hrs, Volume= 3,642 cf  
 Primary = 4.33 cfs @ 12.25 hrs, Volume= 21,312 cf  
 Routed to Pond B : Above Ground Bioretention Area (B)  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Pond B : Above Ground Bioretention Area (B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 Peak Elev= 330.27' @ 12.25 hrs Surf.Area= 2,440 sf Storage= 4,476 cf

Plug-Flow detention time= 131.1 min calculated for 24,948 cf (100% of inflow)  
 Center-of-Mass det. time= 131.5 min ( 912.1 - 780.6 )

Volume	Invert	Avail.Storage	Storage Description			
#1	328.00'	7,803 cf	<b>Above Ground Bioretention Area (A) (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
328.00	1,530	162.0	0	0	1,530	
329.00	1,910	176.9	1,716	1,716	1,966	
330.00	2,325	192.7	2,114	3,831	2,466	
331.00	2,764	208.1	2,541	6,372	2,997	
331.50	2,962	213.8	1,431	7,803	3,215	

Device	Routing	Invert	Outlet Devices																
#1	Primary	326.50'	<b>12.0" Round Culvert</b> L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 326.50' / 325.86' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf																
#2	Device 1	329.00'	<b>20.0" W x 6.0" H Vert. Low Flow</b> C= 0.600 Limited to weir flow at low heads																
#3	Device 1	330.23'	<b>32.0" x 32.0" Horiz. Overflow Grate</b> C= 0.600 Limited to weir flow at low heads																
#4	Secondary	331.00'	<b>10.0' long x 7.0' breadth Emergency Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.65 2.66 2.68 2.70 2.73																

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#5 Discarded 328.00' 2.78  
**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 310.00'  
Phase-In= 0.01'

**Discarded OutFlow** Max=0.03 cfs @ 12.25 hrs HW=330.27' (Free Discharge)

↳5=Exfiltration ( Controls 0.03 cfs)

**Primary OutFlow** Max=4.31 cfs @ 12.25 hrs HW=330.27' TW=318.41' (Dynamic Tailwater)

↳1=Culvert (Passes 4.31 cfs of 6.49 cfs potential flow)

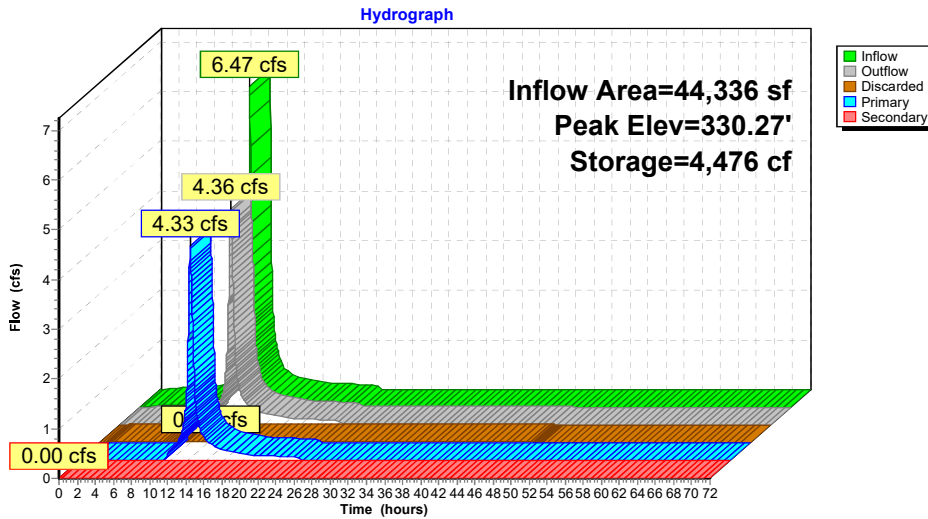
↳2=Low Flow (Orifice Controls 4.04 cfs @ 4.85 fps)

↳3=Overflow Grate (Weir Controls 0.27 cfs @ 0.65 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=328.00' TW=315.00' (Dynamic Tailwater)

↳4=Emergency Spillway ( Controls 0.00 cfs)

**Pond A: Above Ground Bioretention Area (A)**



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**Summary for Pond B: Above Ground Bioretention Area (B)**

Inflow Area = 87,333 sf, 55.22% Impervious, Inflow Depth = 5.57" for 100-Year event  
 Inflow = 8.70 cfs @ 12.16 hrs, Volume= 40,569 cf  
 Outflow = 6.96 cfs @ 12.35 hrs, Volume= 40,569 cf, Atten= 20%, Lag= 11.9 min  
 Discarded = 0.05 cfs @ 12.35 hrs, Volume= 2,270 cf  
 Primary = 6.91 cfs @ 12.35 hrs, Volume= 38,299 cf  
 Routed to Link POI-1 : POI-1 Existing Drainage Within Valley Road  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link POI-1 : POI-1 Existing Drainage Within Valley Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
 Peak Elev= 318.57' @ 12.35 hrs Surf.Area= 3,089 sf Storage= 8,150 cf

Plug-Flow detention time= 37.5 min calculated for 40,558 cf (100% of inflow)  
 Center-of-Mass det. time= 37.6 min ( 837.5 - 800.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	315.00'	11,202 cf	<b>Above Ground Bioretention Area (A) (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
315.00	1,499	165.1	0	0	1,499
316.00	1,923	188.6	1,707	1,707	2,184
317.00	2,373	210.7	2,144	3,851	2,914
318.00	2,836	232.0	2,601	6,452	3,696
319.00	3,284	250.9	3,057	9,509	4,461
319.50	3,491	258.4	1,693	11,202	4,791

Device	Routing	Invert	Outlet Devices
#1	Primary	314.04'	<b>12.0" Round Culvert</b> L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 314.04' / 313.74' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	315.30'	<b>10.0" W x 3.0" H Vert. Low Flow</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.35'	<b>11.0" W x 5.0" H Vert. Control Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	318.40'	<b>32.0" x 32.0" Horiz. Overflow Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	319.00'	<b>10.0' long x 8.0' breadth Emergency Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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5.50  
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70  
2.74  
#6 Discarded 315.00' **0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 310.00'  
Phase-In= 0.01'

**Discarded OutFlow** Max=0.05 cfs @ 12.35 hrs HW=318.57' (Free Discharge)

↳ **6=Exfiltration** ( Controls 0.05 cfs)

**Primary OutFlow** Max=6.90 cfs @ 12.35 hrs HW=318.57' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 6.90 cfs of 7.59 cfs potential flow)

↳ **2=Low Flow** (Orifice Controls 1.78 cfs @ 8.54 fps)

↳ **3=Control Orifice** (Orifice Controls 2.61 cfs @ 6.83 fps)

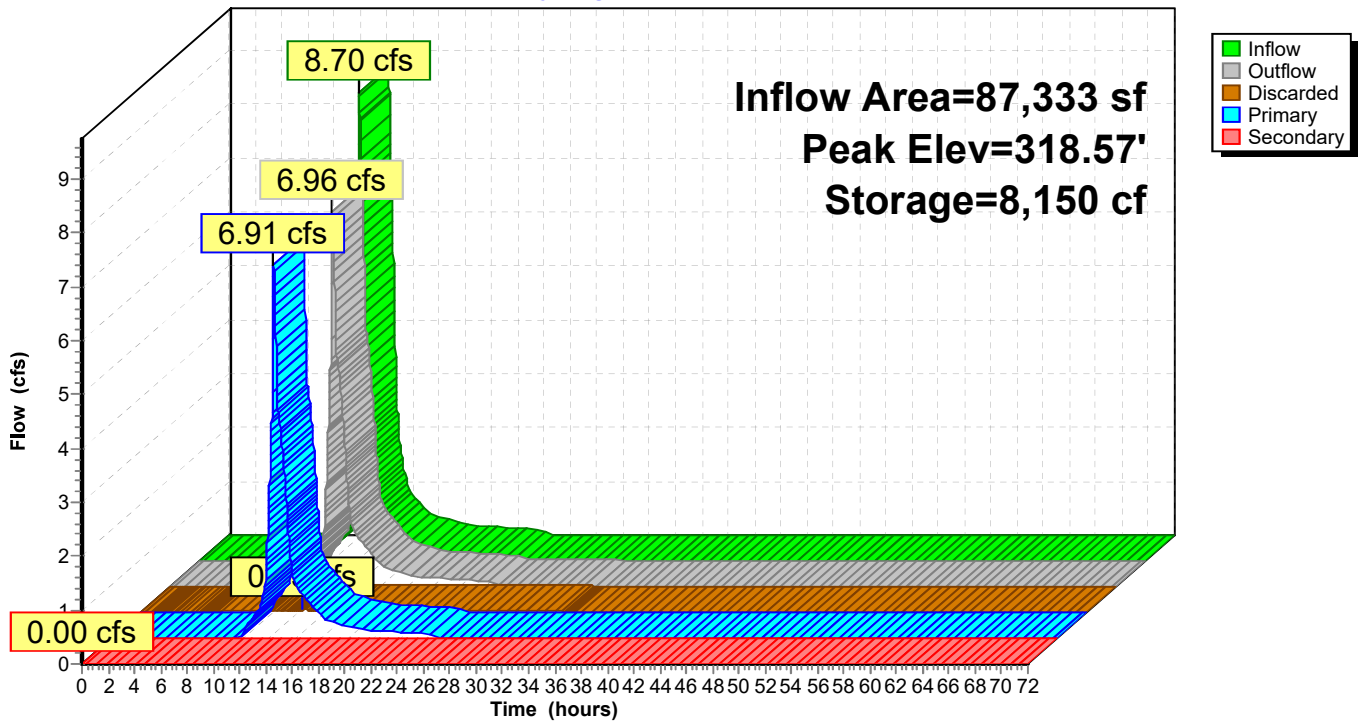
↳ **4=Overflow Grate** (Weir Controls 2.51 cfs @ 1.36 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=315.00' TW=0.00' (Dynamic Tailwater)

↳ **5=Emergency Spillway** ( Controls 0.00 cfs)

Pond B: Above Ground Bioretention Area (B)

Hydrograph



**2023-02-14\_HydroCAD Calcs (POI-1)**

NOAA 24-hr D 100-Year Rainfall=8.62"

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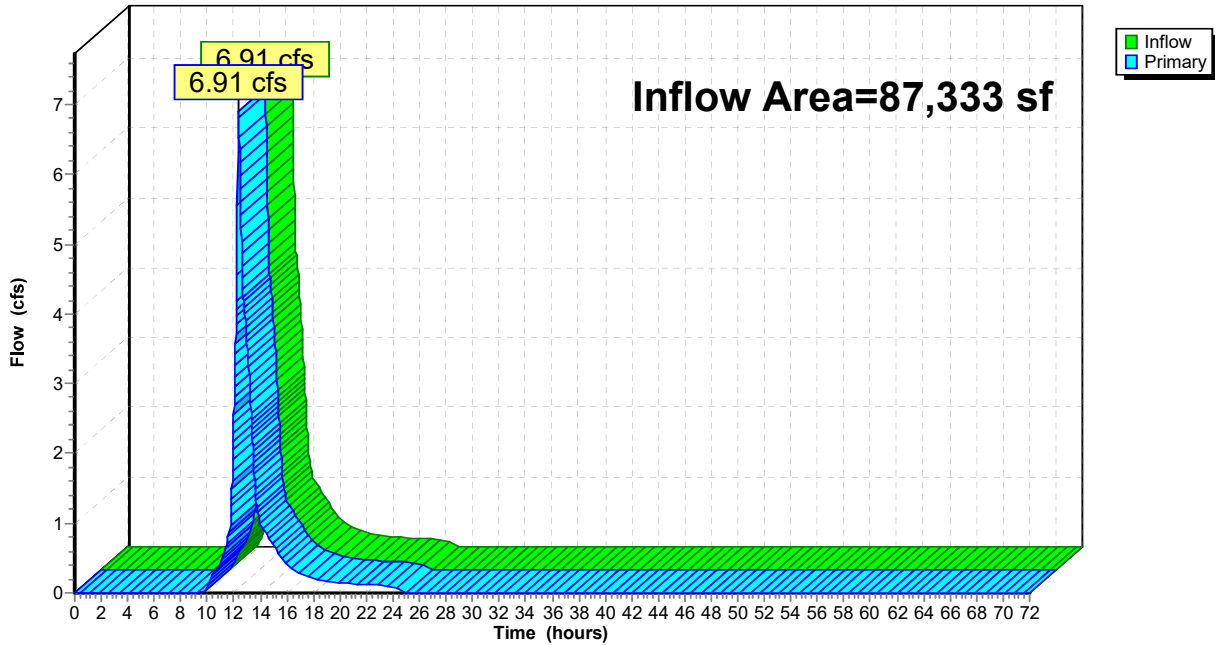
**Summary for Link POI-1: POI-1 Existing Drainage Within Valley Road**

Inflow Area = 87,333 sf, 55.22% Impervious, Inflow Depth = 5.26" for 100-Year event  
Inflow = 6.91 cfs @ 12.35 hrs, Volume= 38,299 cf  
Primary = 6.91 cfs @ 12.35 hrs, Volume= 38,299 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

**Link POI-1: POI-1 Existing Drainage Within Valley Road**

Hydrograph



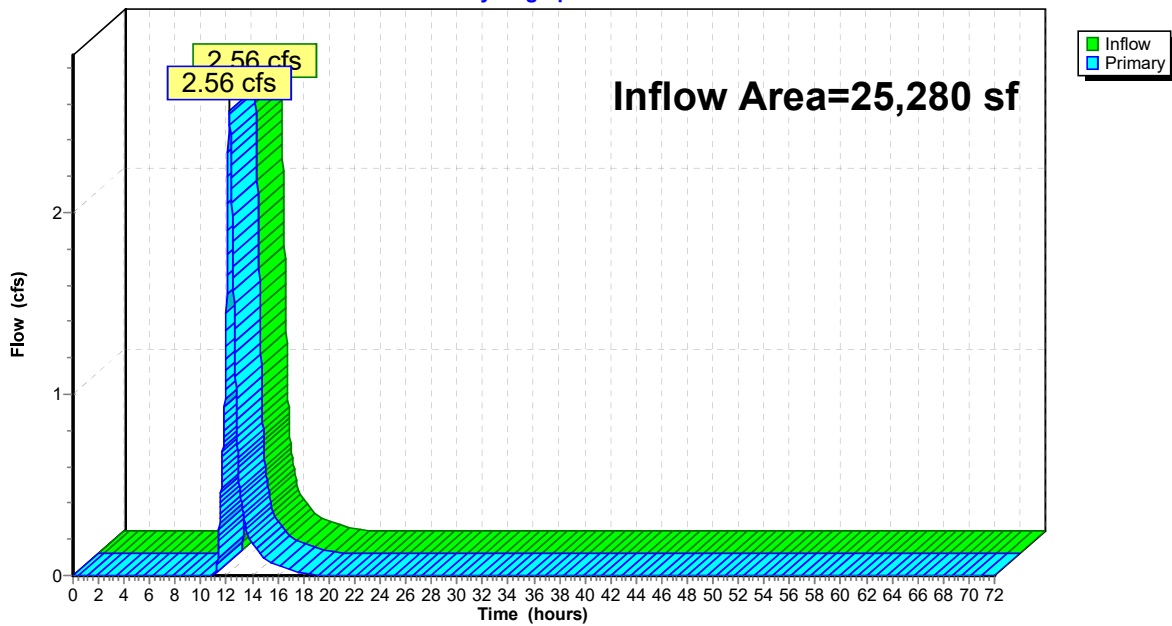
### Summary for Link PPV: Pervious Pavement Systems

Inflow Area = 25,280 sf, 99.23% Impervious, Inflow Depth = 4.47" for 100-Year event  
Inflow = 2.56 cfs @ 12.21 hrs, Volume= 9,423 cf  
Primary = 2.56 cfs @ 12.21 hrs, Volume= 9,423 cf, Atten= 0%, Lag= 0.0 min  
Routed to Pond B : Above Ground Bioretention Area (B)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

### Link PPV: Pervious Pavement Systems

Hydrograph



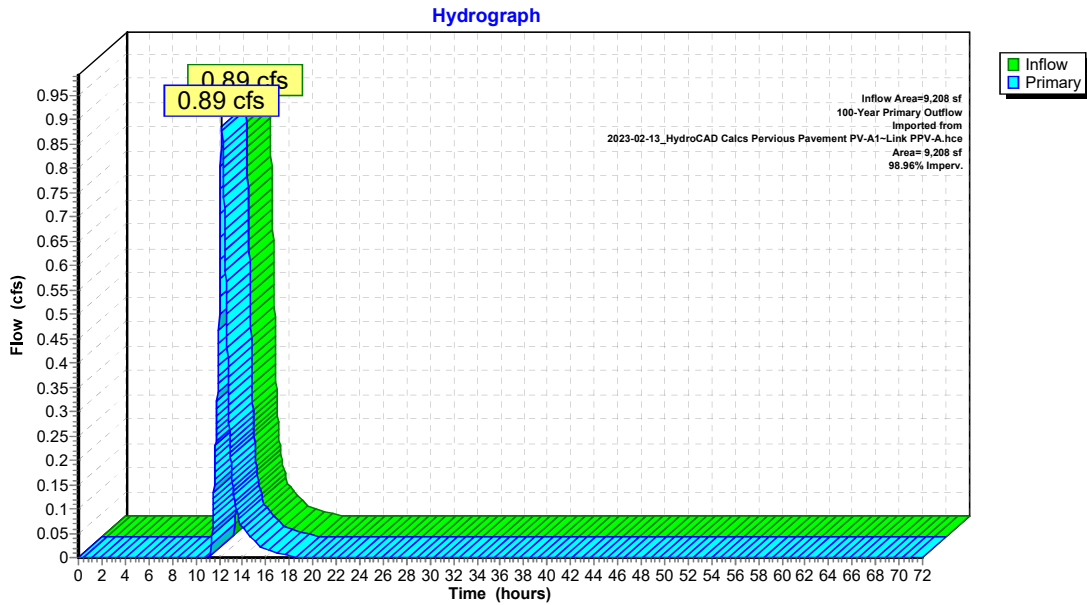
### Summary for Link PPV-A: Pervious Pavement System Building A

Inflow Area = 9,208 sf, 98.96% Impervious, Inflow Depth = 4.31" for 100-Year event  
Inflow = 0.89 cfs @ 12.22 hrs, Volume= 3,309 cf  
Primary = 0.89 cfs @ 12.22 hrs, Volume= 3,309 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-A1~Link PPV-A.hce

### Link PPV-A: Pervious Pavement System Building A



**2023-02-14\_HydroCAD Calcs (POI-1)**

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NOAA 24-hr D 100-Year Rainfall=8.62"

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**Summary for Link PPV-B: Pervious Pavement System Building B**

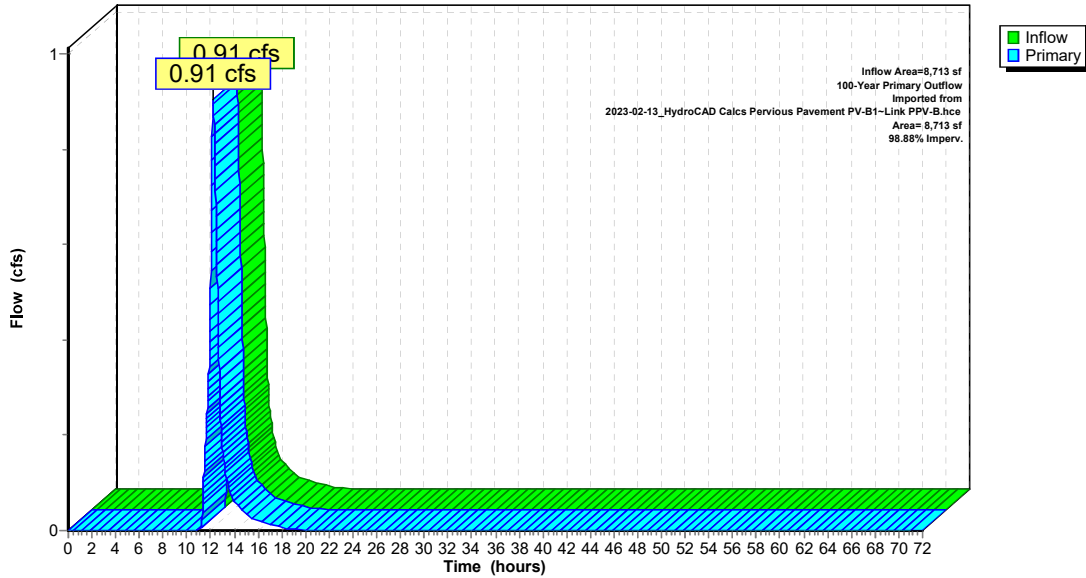
Inflow Area = 8,713 sf, 98.88% Impervious, Inflow Depth = 4.56" for 100-Year event  
Inflow = 0.91 cfs @ 12.21 hrs, Volume= 3,311 cf  
Primary = 0.91 cfs @ 12.21 hrs, Volume= 3,311 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-B1~Link PPV-B.hce

**Link PPV-B: Pervious Pavement System Building B**

Hydrograph



### Summary for Link PPV-C: Pervious Pavement System Building C

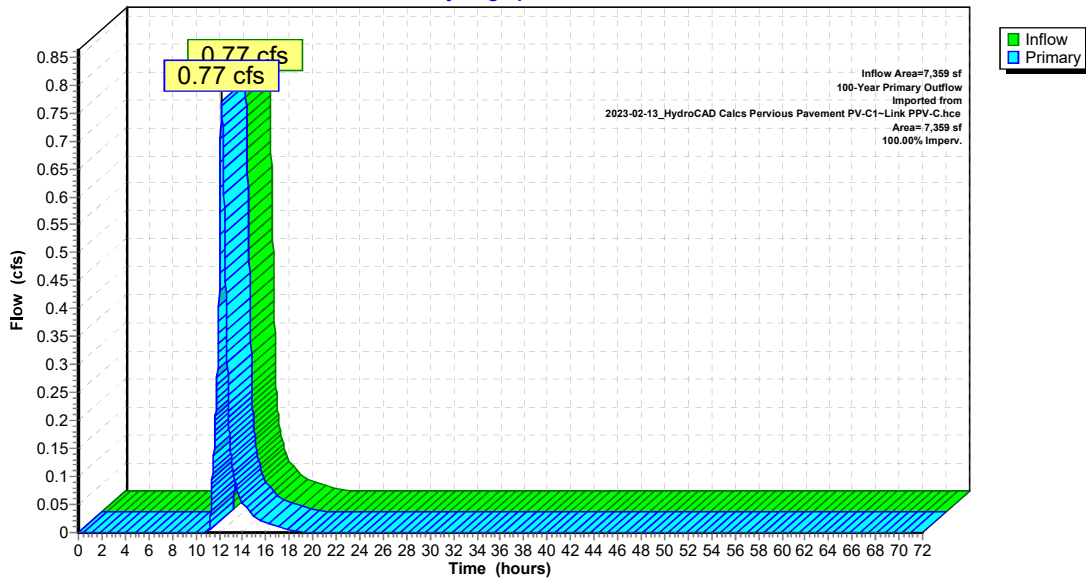
Inflow Area = 7,359 sf, 100.00% Impervious, Inflow Depth = 4.57" for 100-Year event  
Inflow = 0.77 cfs @ 12.21 hrs, Volume= 2,803 cf  
Primary = 0.77 cfs @ 12.21 hrs, Volume= 2,803 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link PPV : Pervious Pavement Systems

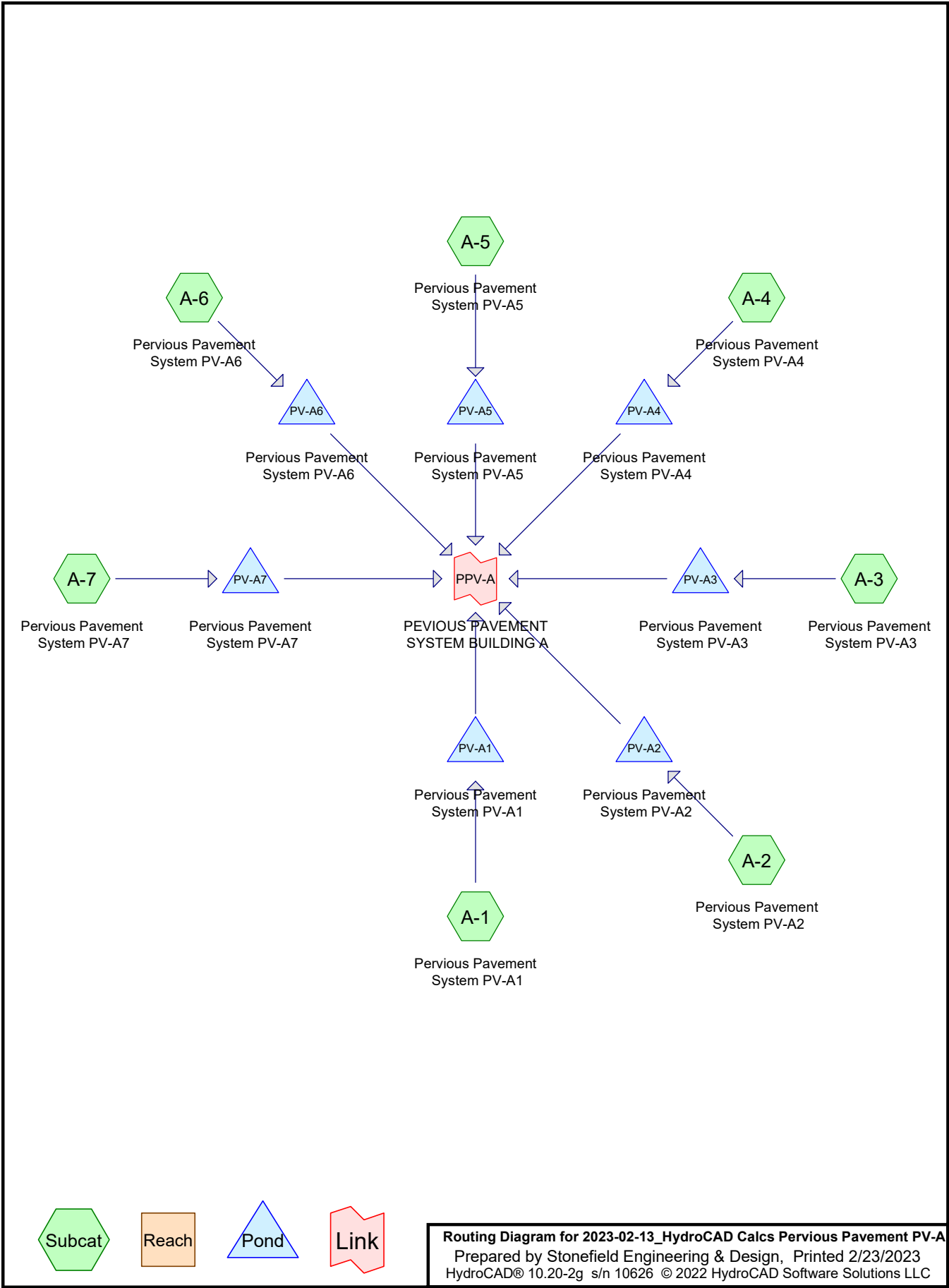
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

100-Year Primary Outflow Imported from 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-C1~Link PPV-C.hce

### Link PPV-C: Pervious Pavement System Building C

Hydrograph





**Routing Diagram for 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-A**  
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# 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-A1

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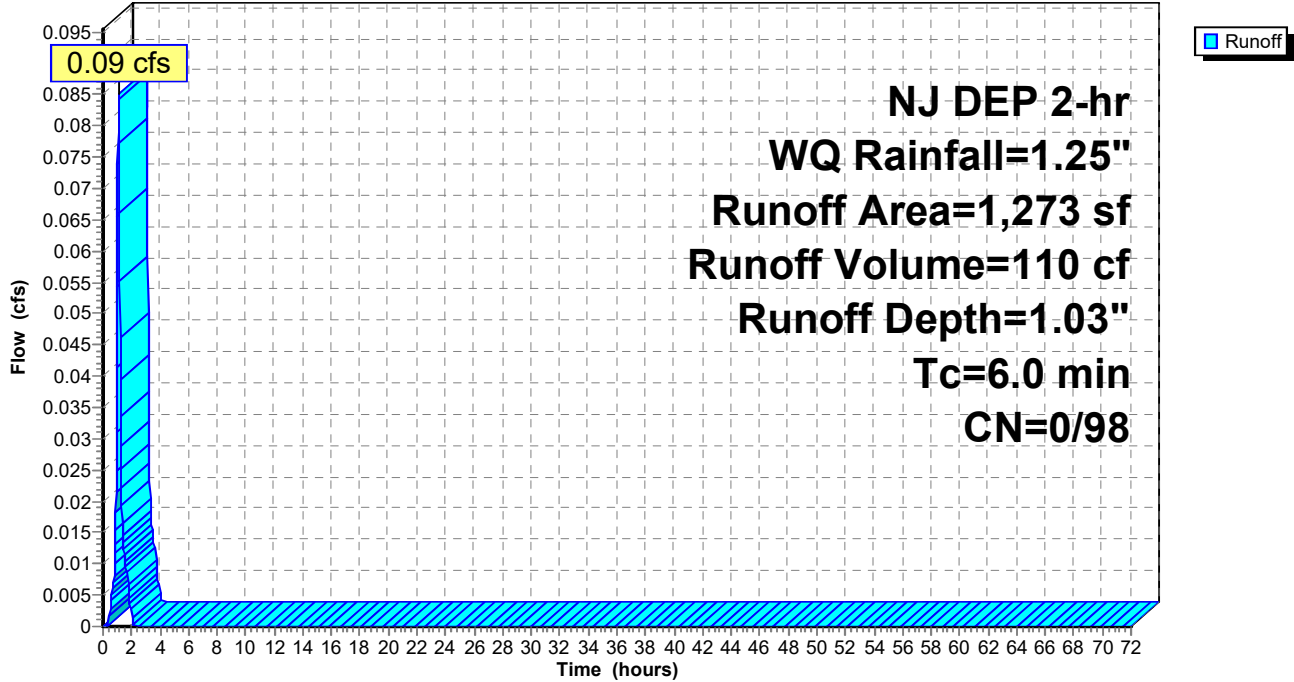
Page 2

## Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQ	NJ DEP 2-hr		Default	2.00	1	1.25	2
2	2-Year	NOAA 24-hr	D	Default	24.00	1	3.47	2
3	10-Year	NOAA 24-hr	D	Default	24.00	1	5.23	2
4	25-Year	NOAA 24-hr	D	Default	24.00	1	6.43	2
5	100-Year	NOAA 24-hr	D	Default	24.00	1	8.62	2

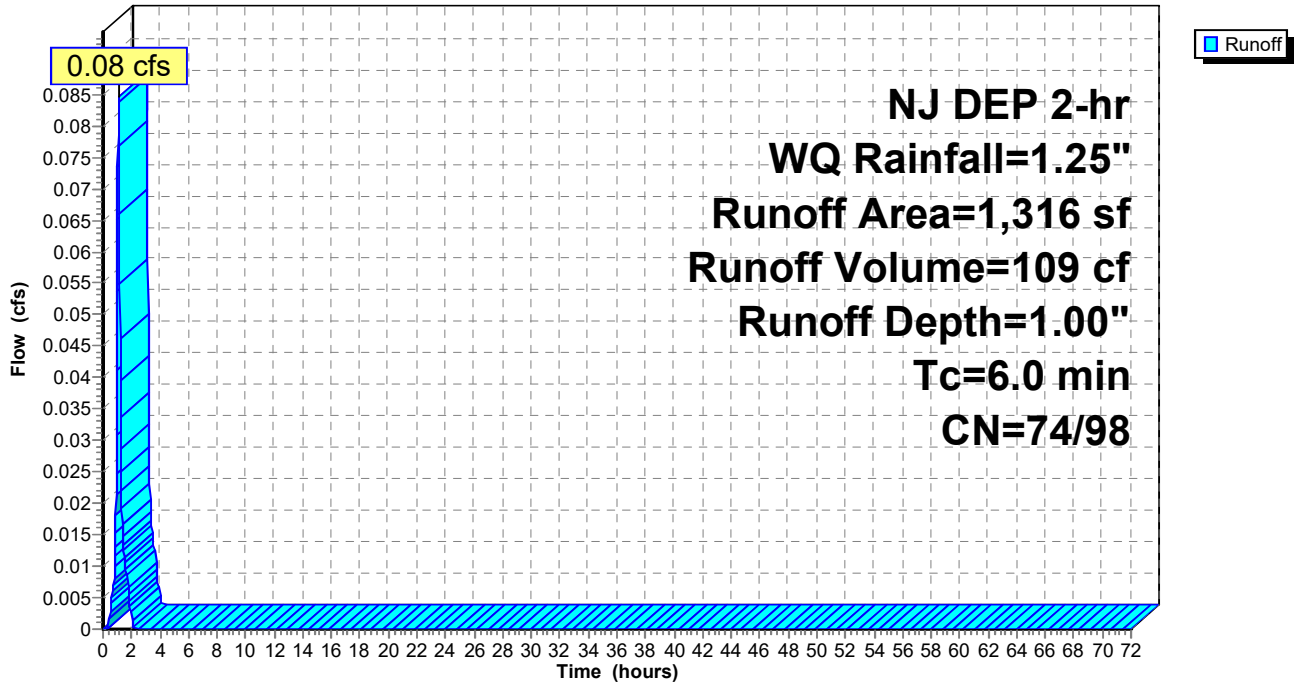
**Subcatchment A-1: Pervious Pavement System PV-A1**

Hydrograph



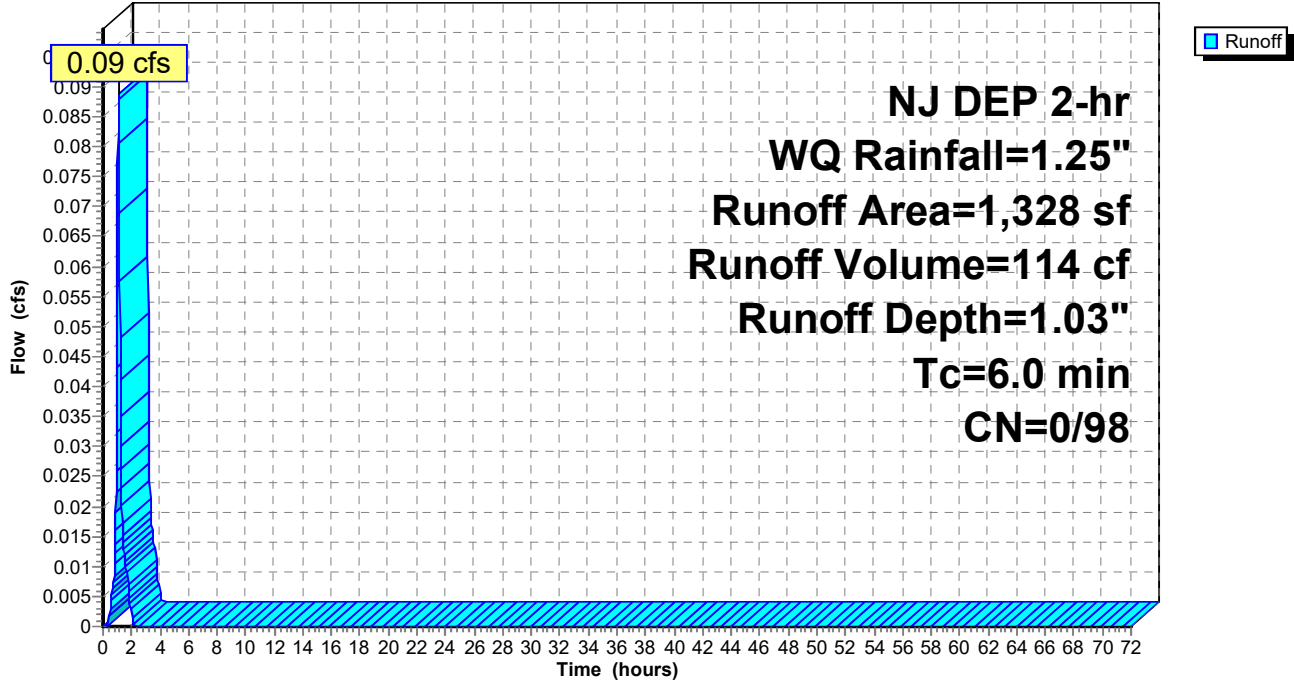
**Subcatchment A-2: Pervious Pavement System PV-A2**

Hydrograph



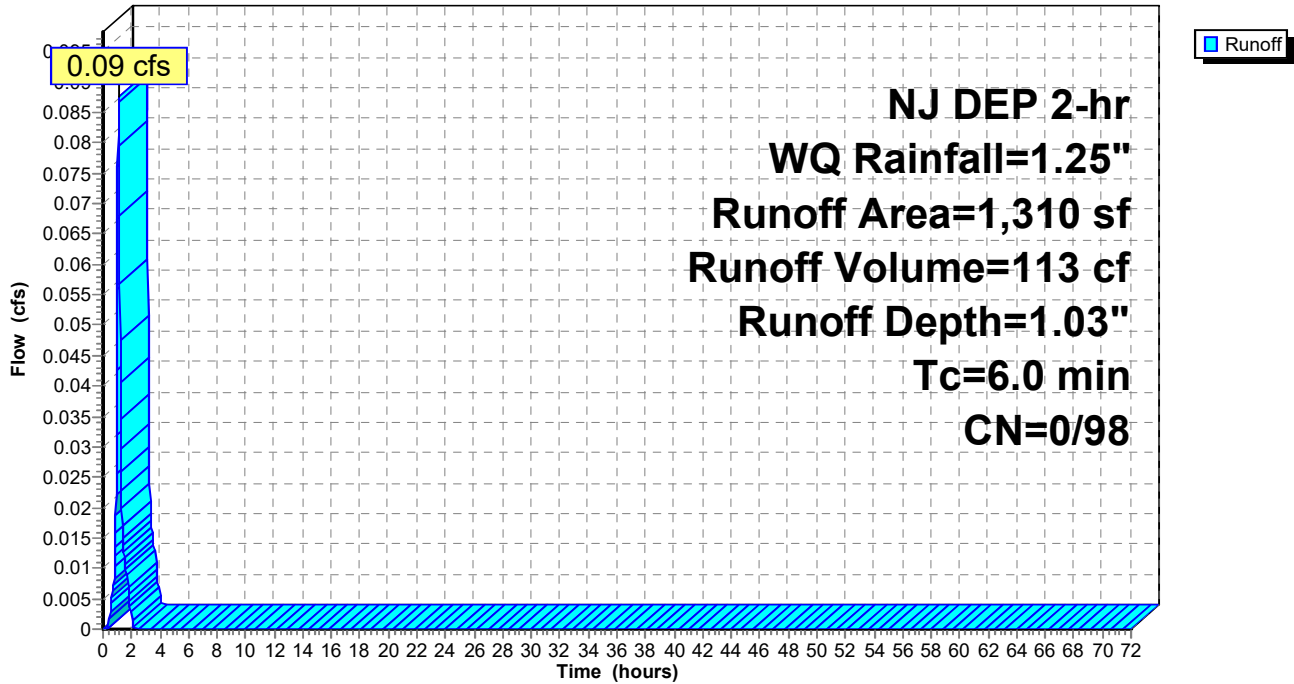
**Subcatchment A-3: Pervious Pavement System PV-A3**

Hydrograph

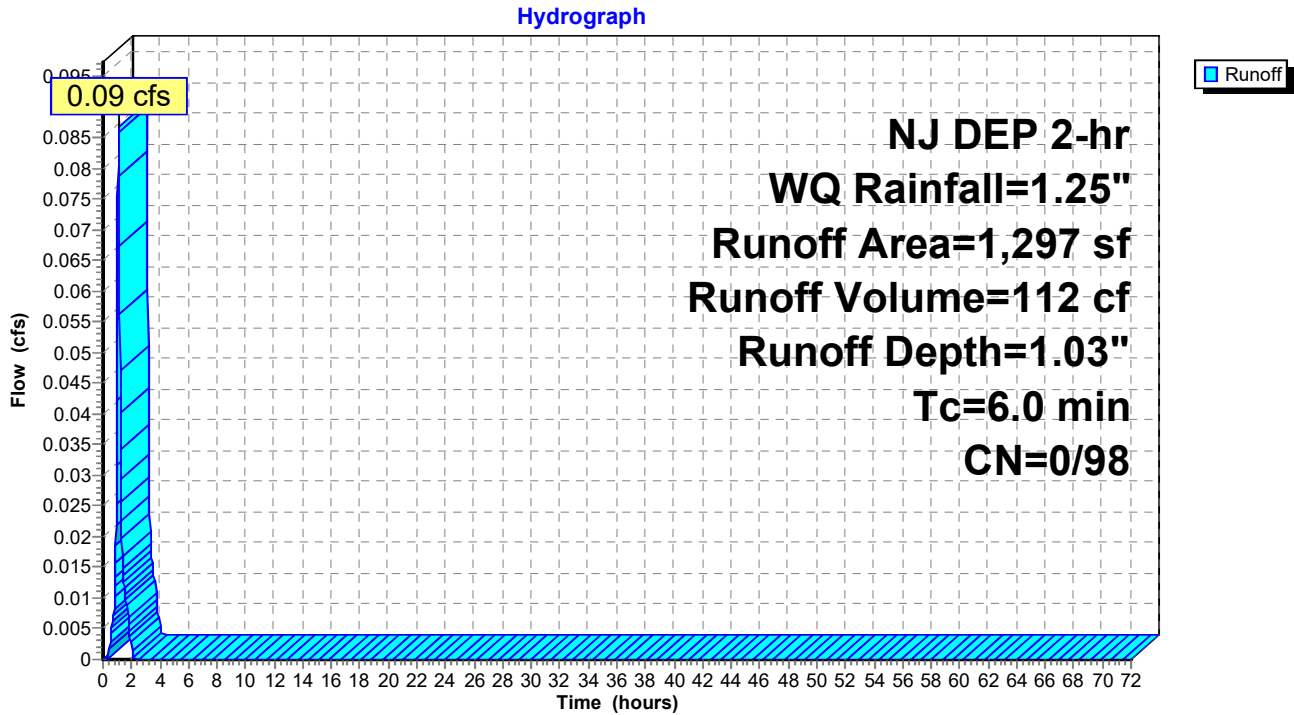


**Subcatchment A-4: Pervious Pavement System PV-A4**

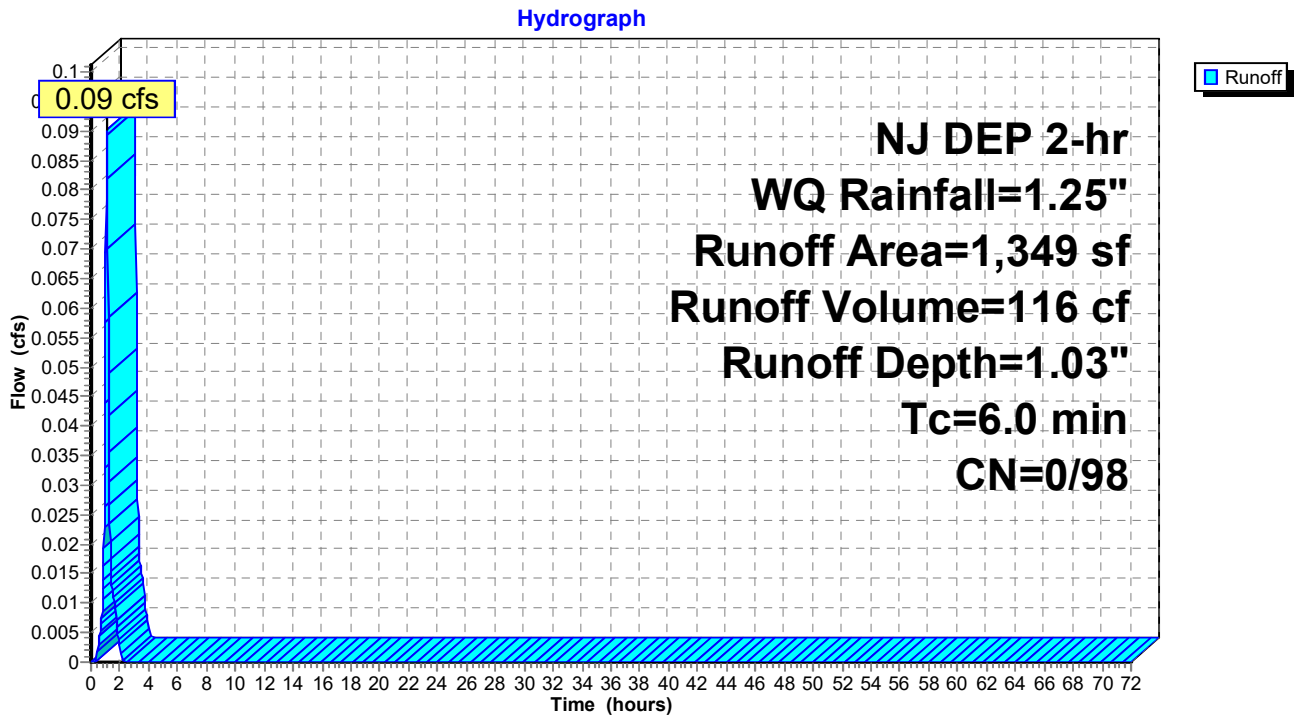
Hydrograph



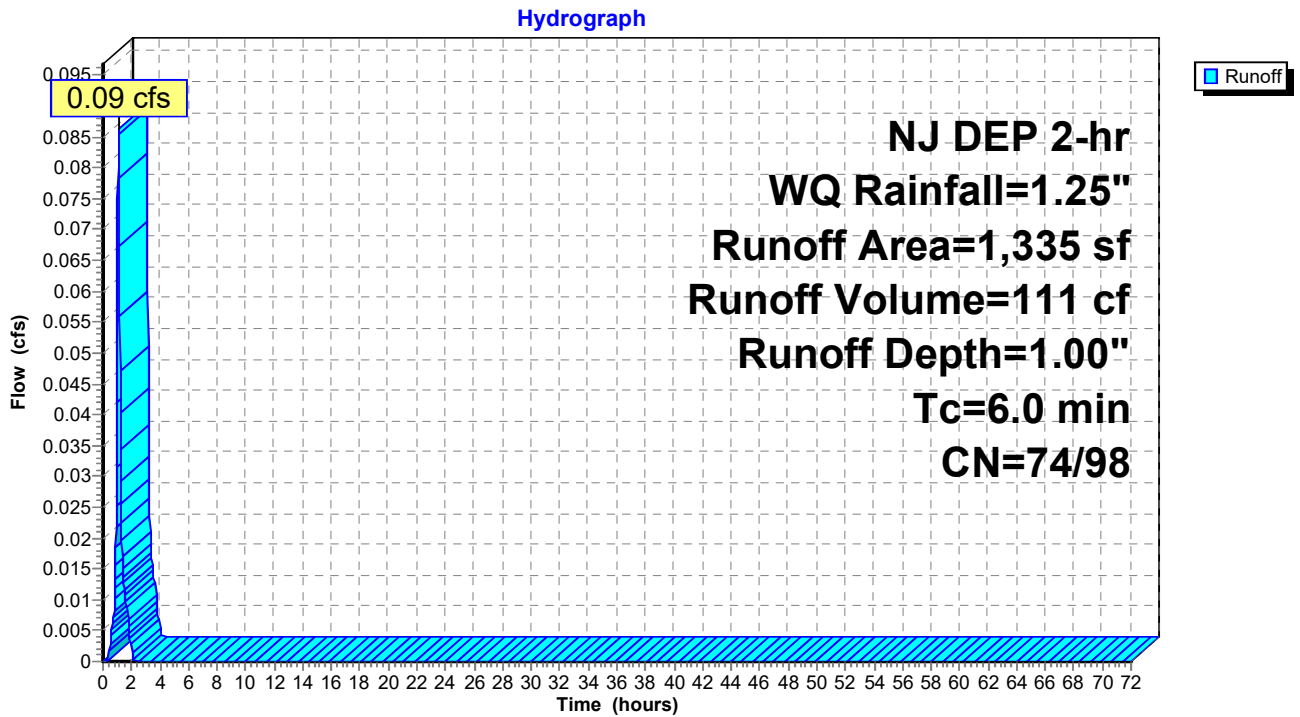
**Subcatchment A-5: Pervious Pavement System PV-A5**



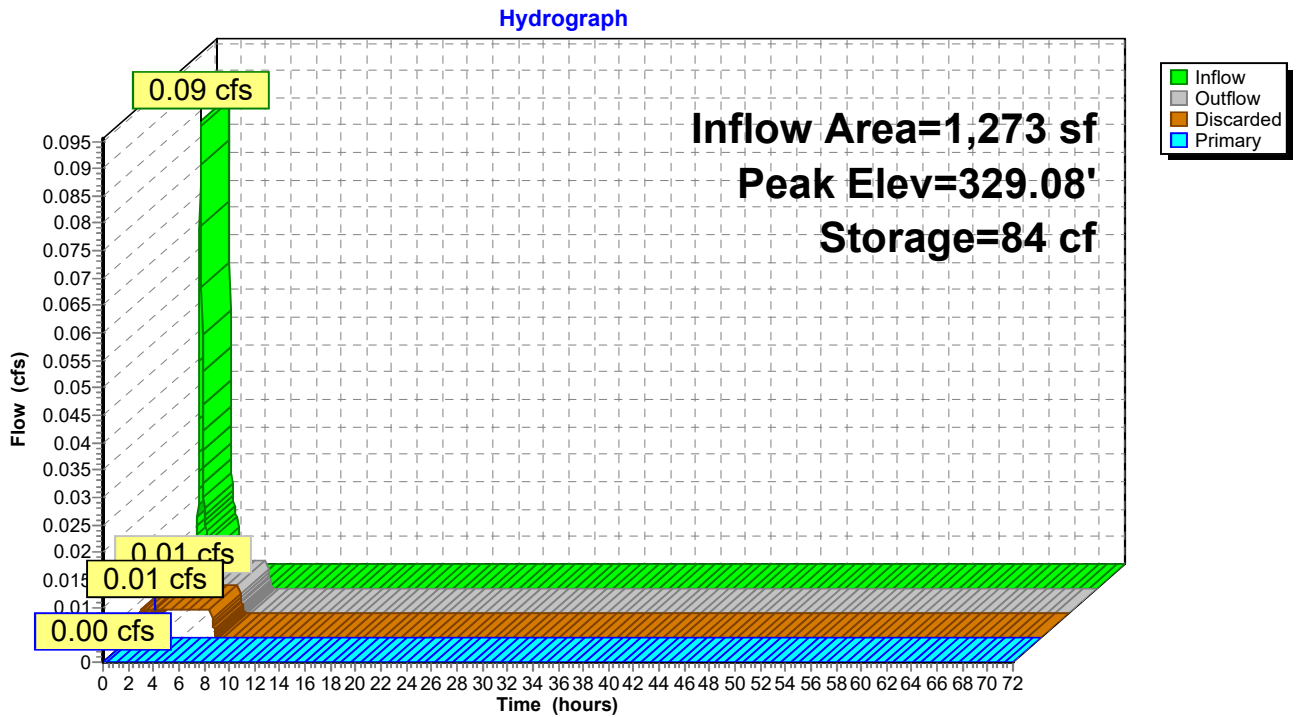
**Subcatchment A-6: Pervious Pavement System PV-A6**



**Subcatchment A-7: Pervious Pavement System PV-A7**

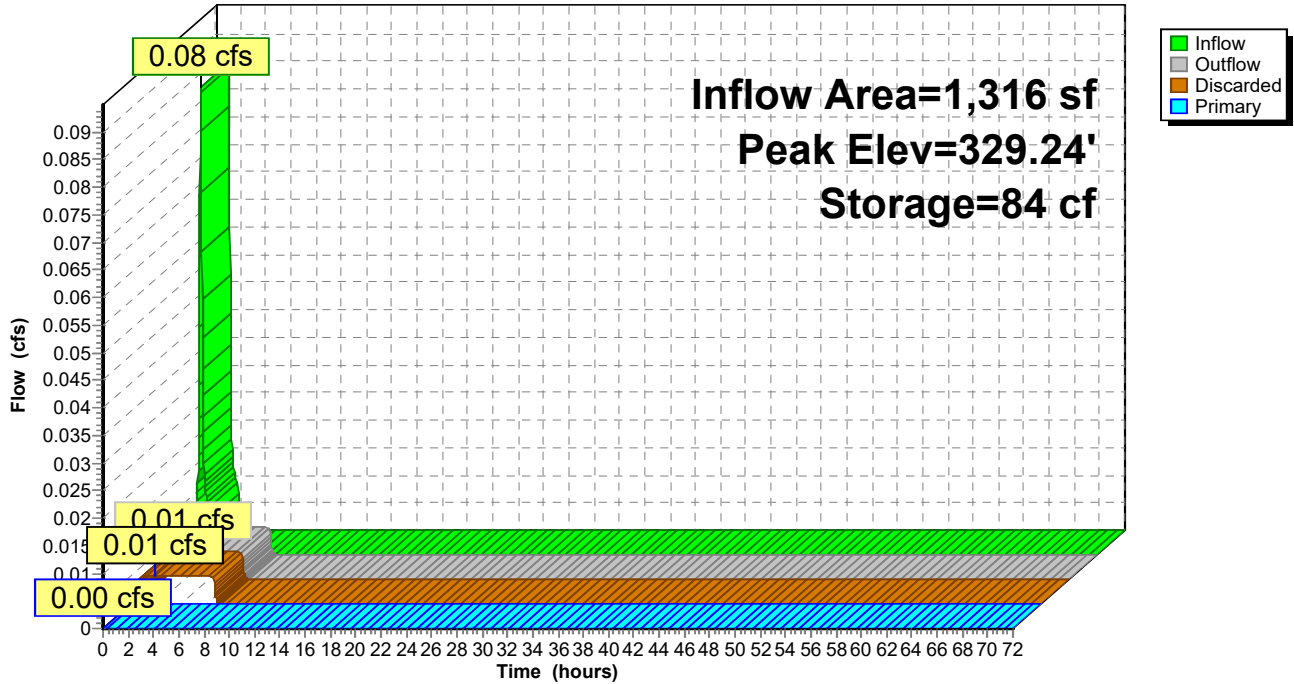


**Pond PV-A1: Pervious Pavement System PV-A1**



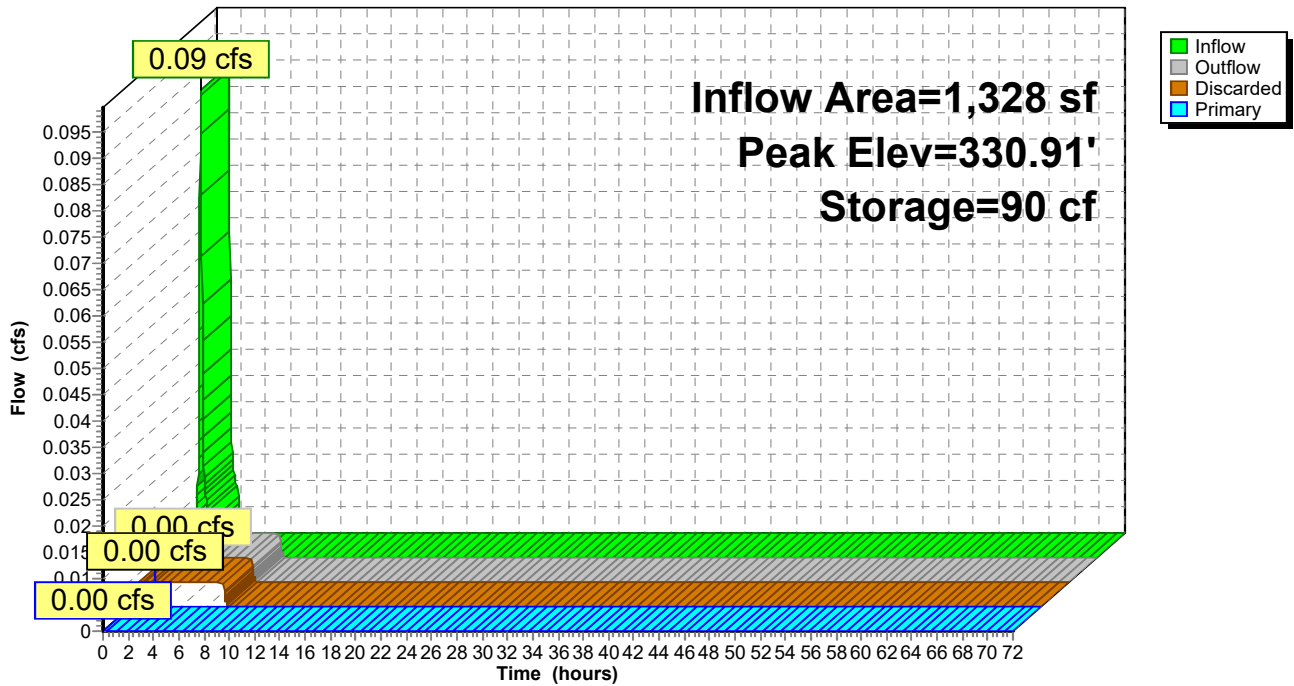
**Pond PV-A2: Pervious Pavement System PV-A2**

Hydrograph



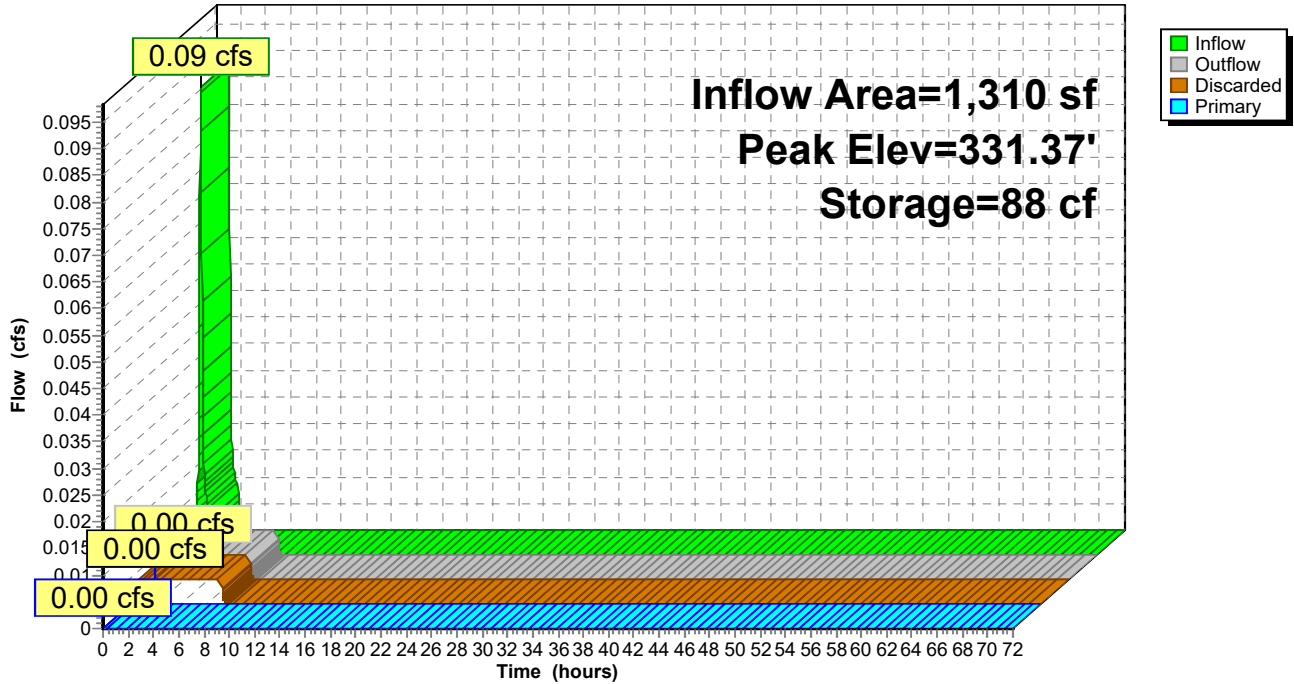
**Pond PV-A3: Pervious Pavement System PV-A3**

Hydrograph



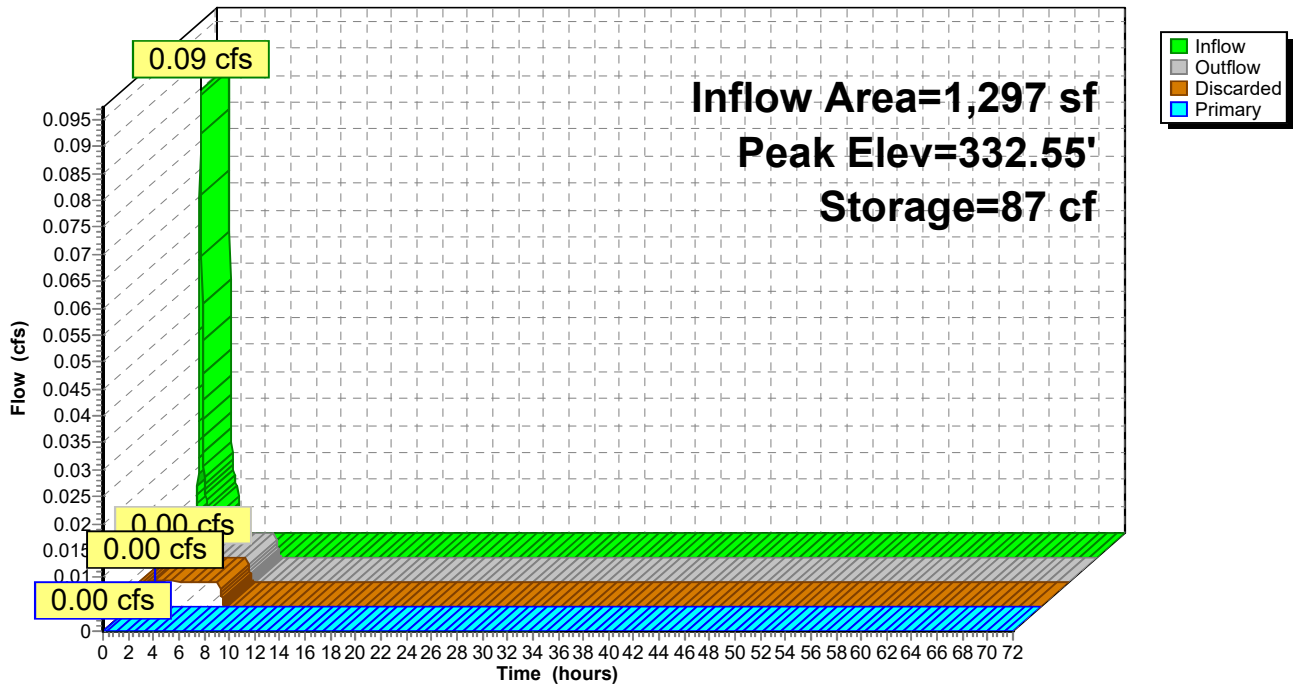
**Pond PV-A4: Pervious Pavement System PV-A4**

Hydrograph

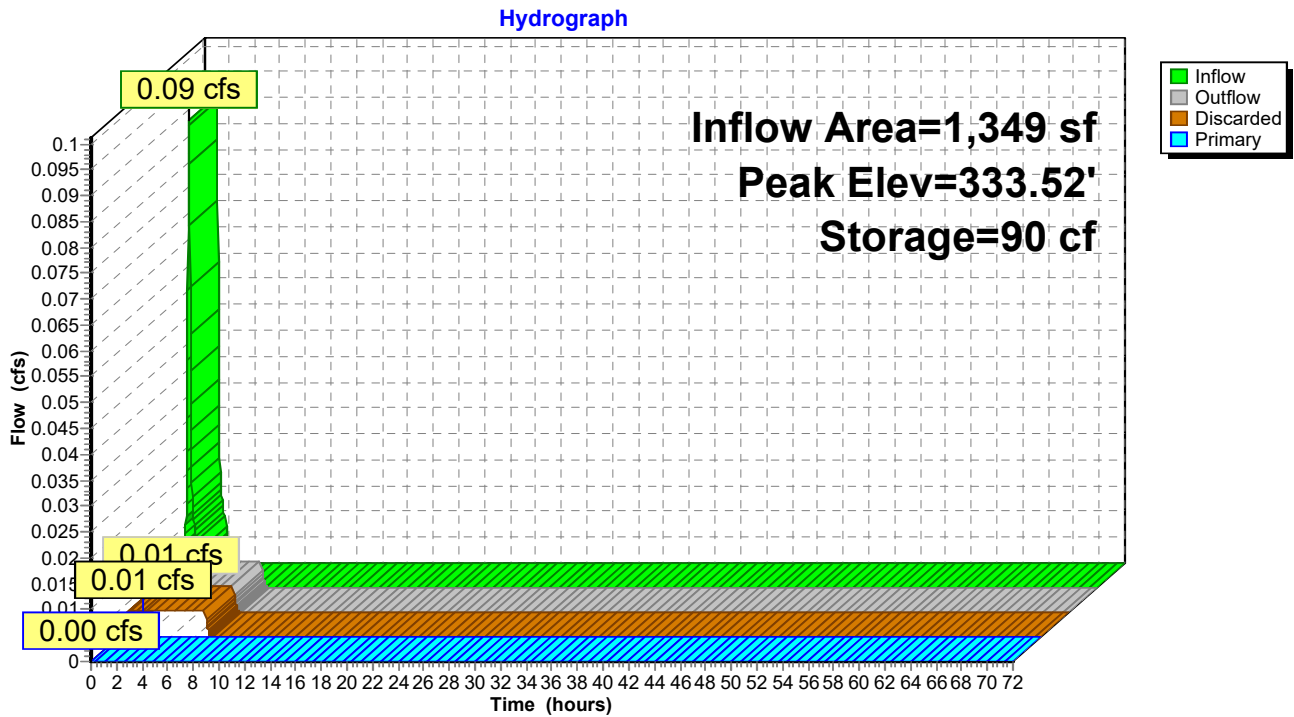


**Pond PV-A5: Pervious Pavement System PV-A5**

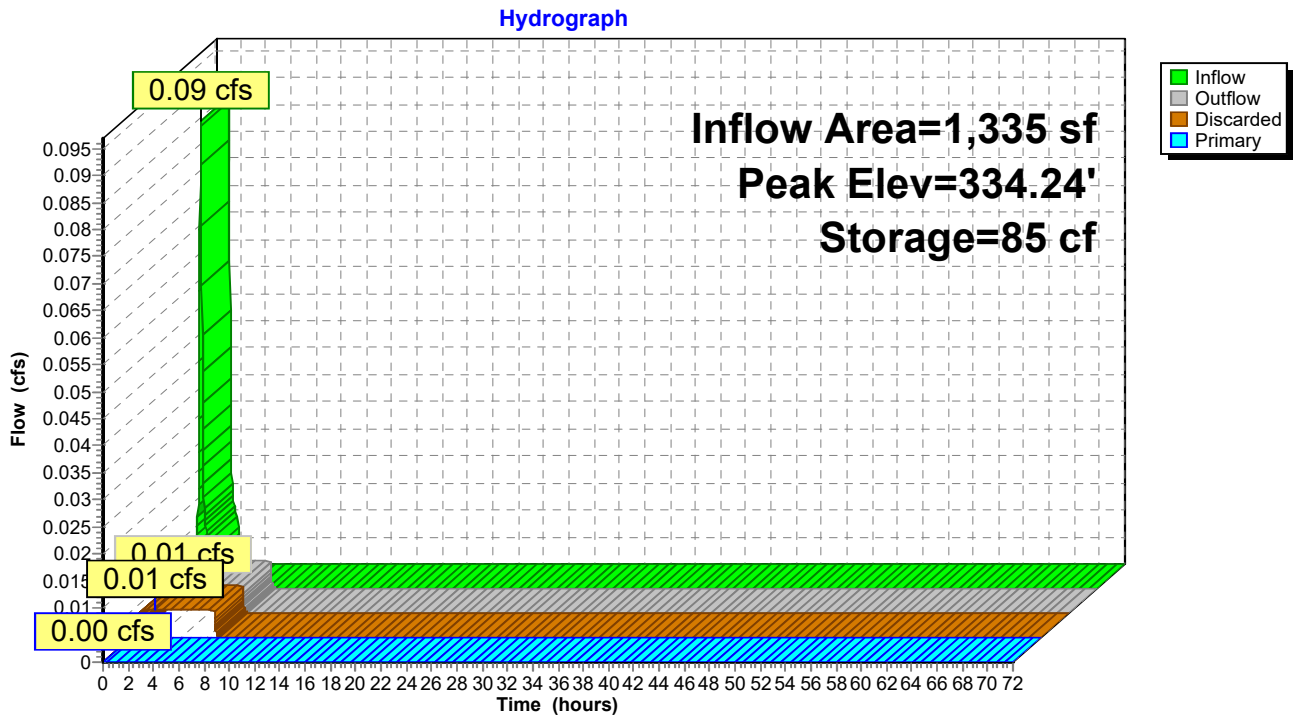
Hydrograph



**Pond PV-A6: Pervious Pavement System PV-A6**

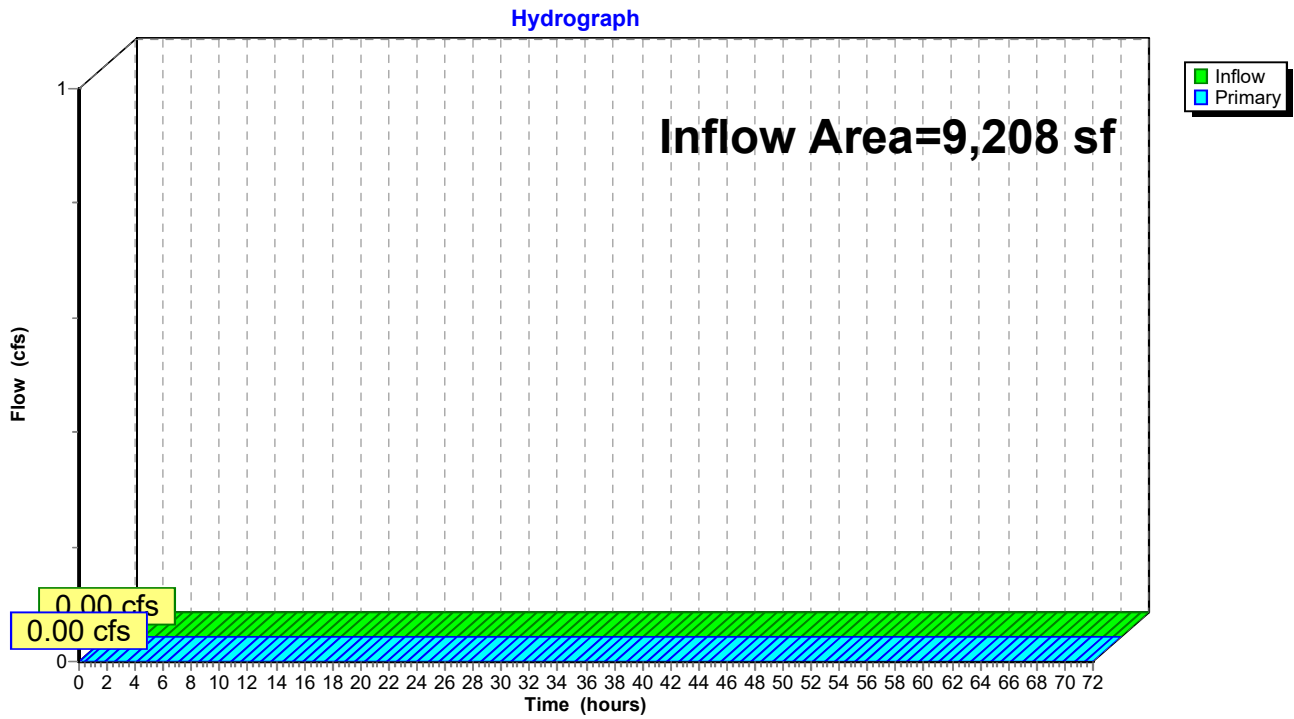


**Pond PV-A7: Pervious Pavement System PV-A7**



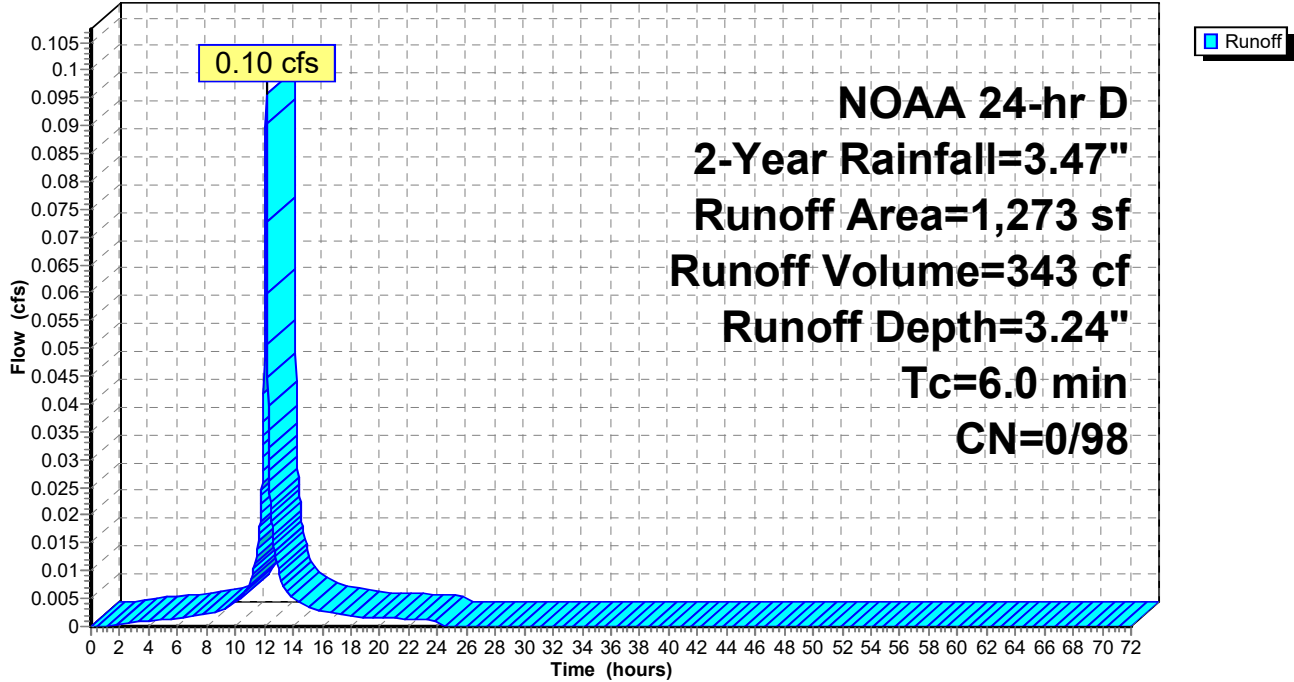


### Link PPV-A: PVIOUS PAVEMENT SYSTEM BUILDING A



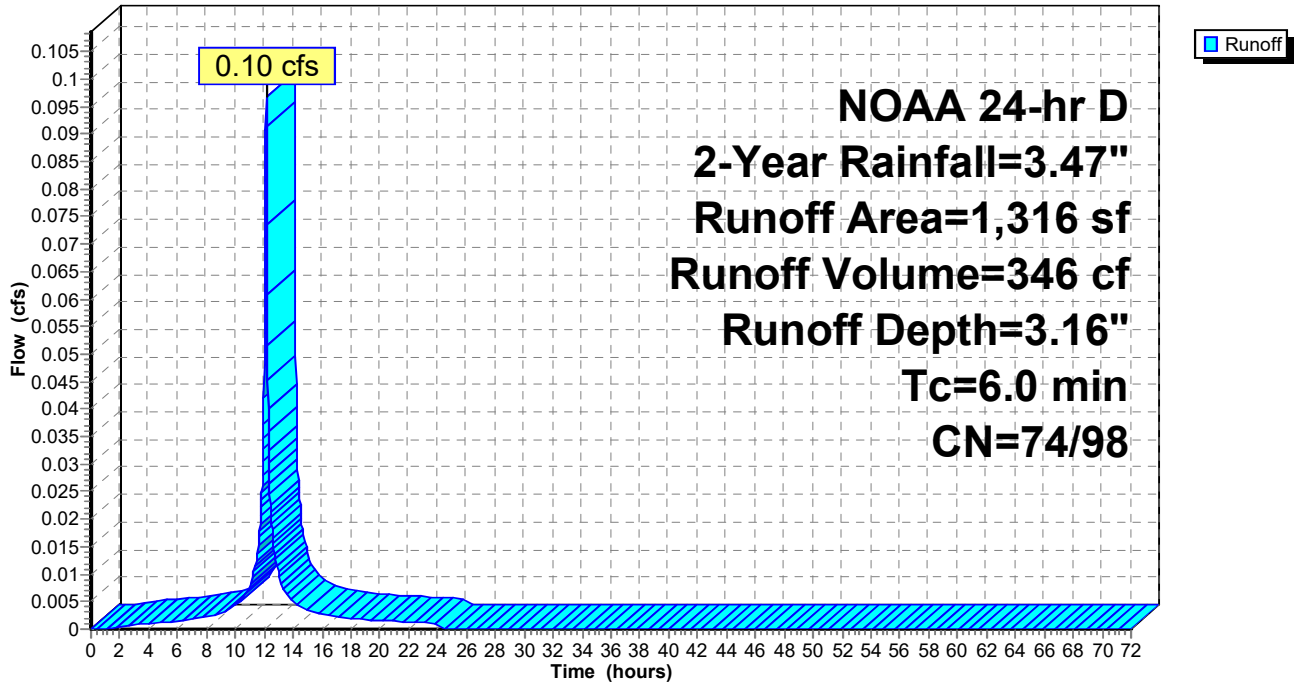
**Subcatchment A-1: Pervious Pavement System PV-A1**

Hydrograph



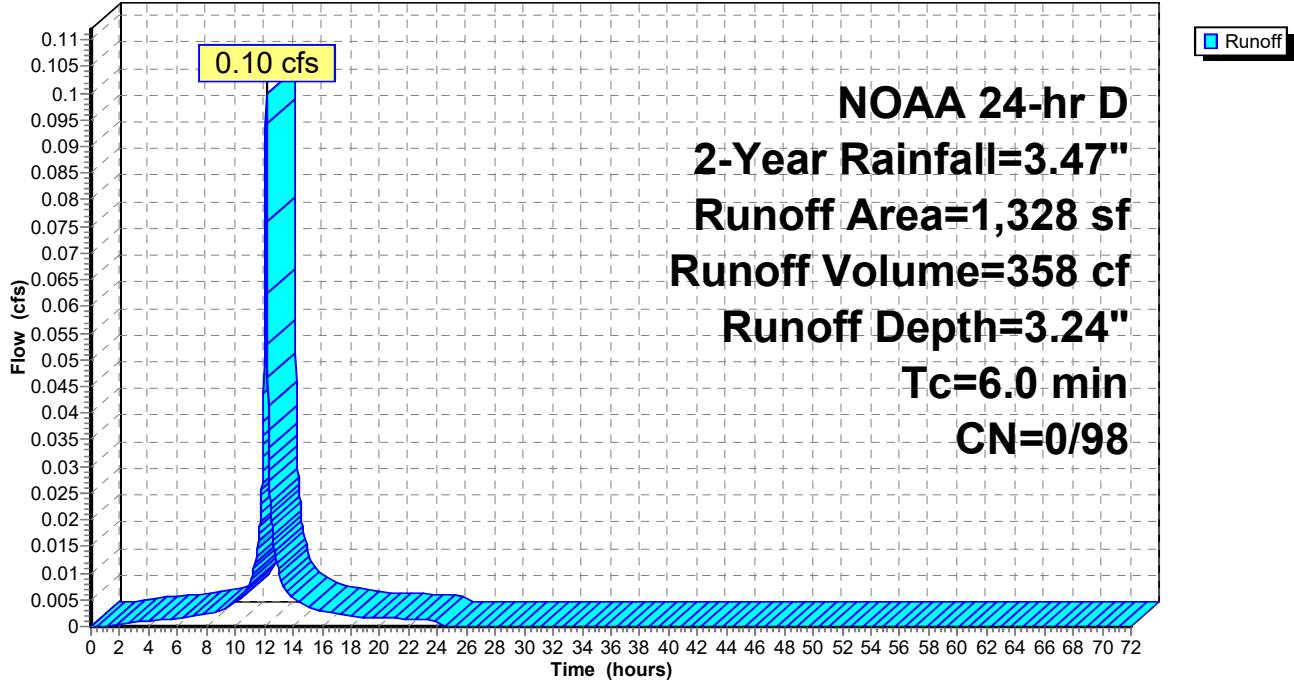
**Subcatchment A-2: Pervious Pavement System PV-A2**

Hydrograph



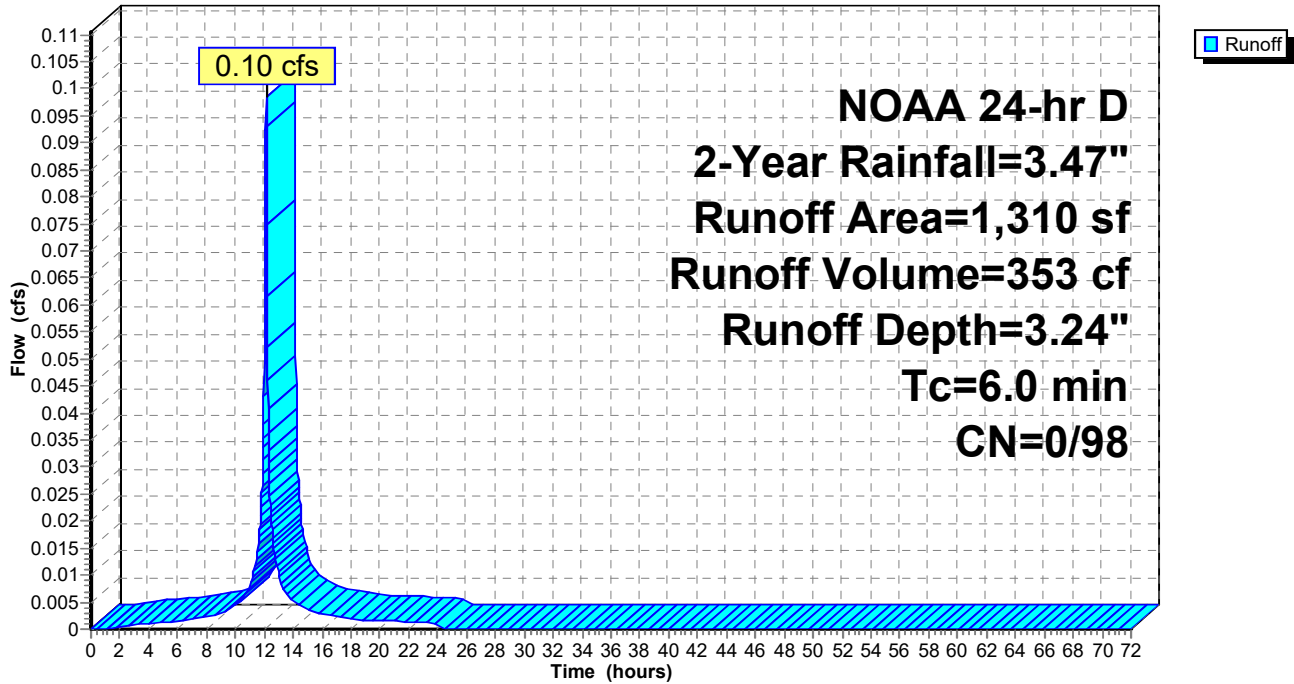
**Subcatchment A-3: Pervious Pavement System PV-A3**

Hydrograph



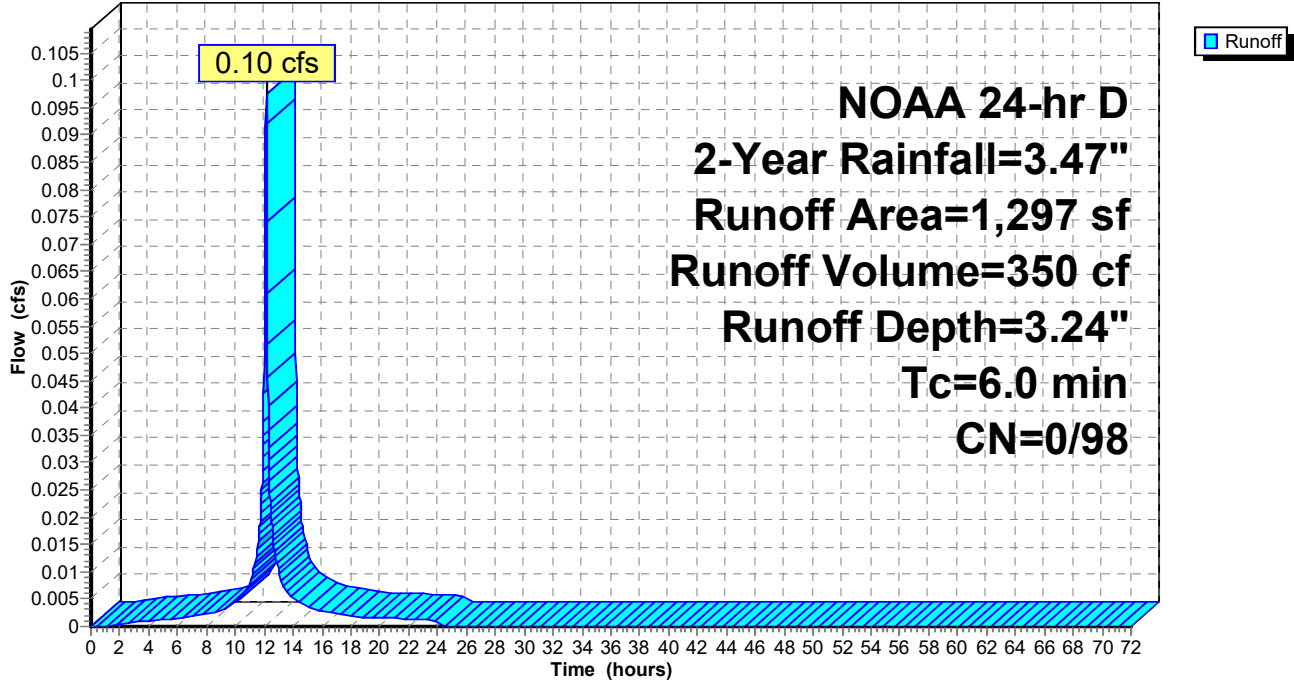
**Subcatchment A-4: Pervious Pavement System PV-A4**

Hydrograph



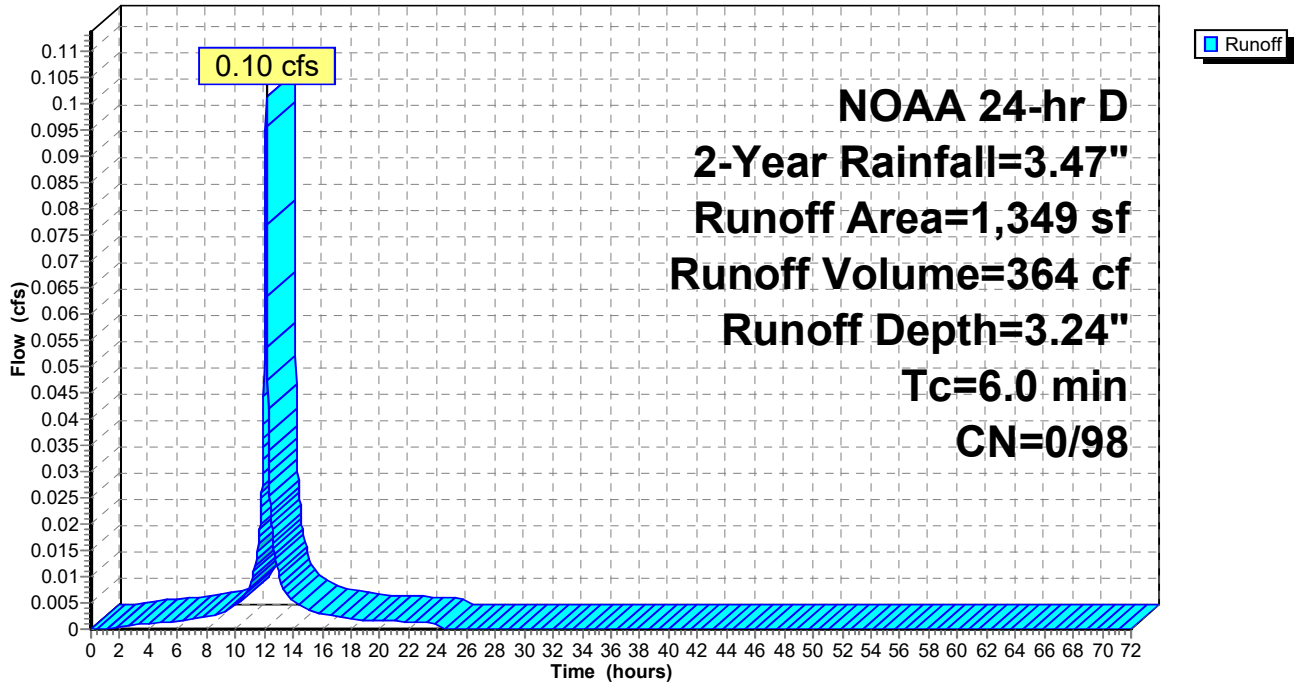
### Subcatchment A-5: Pervious Pavement System PV-A5

Hydrograph

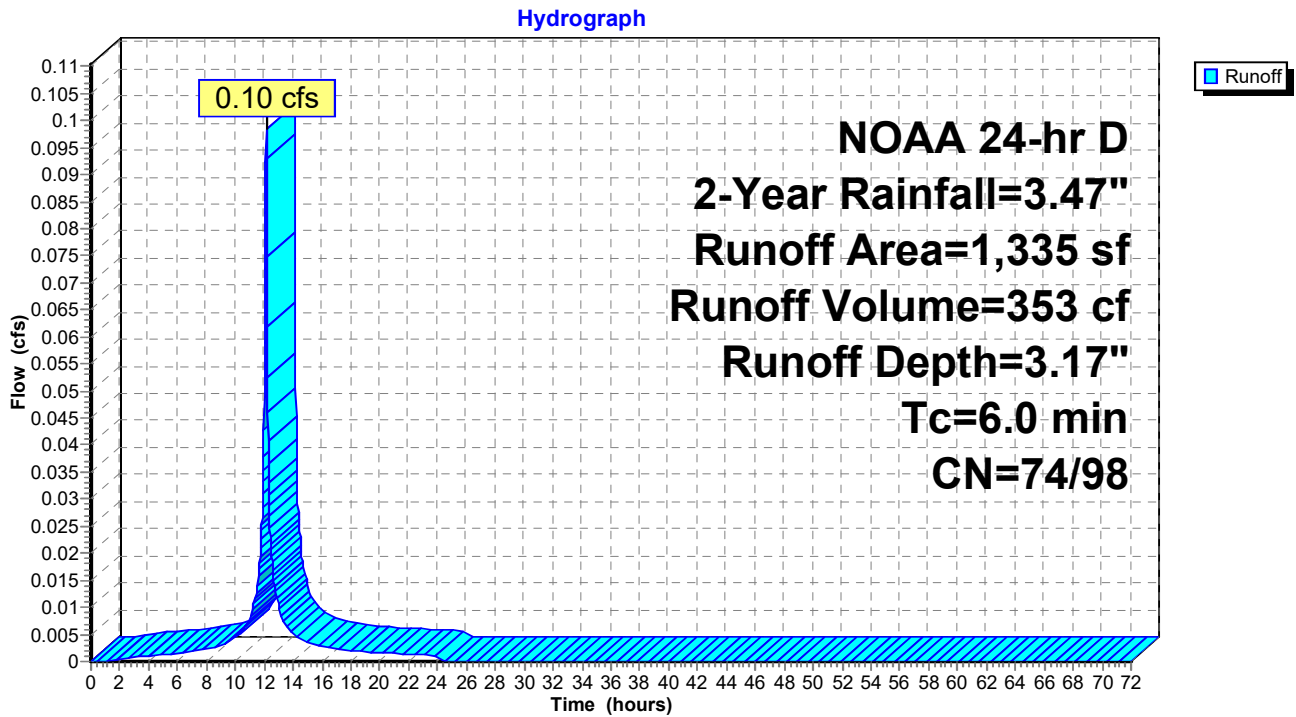


### Subcatchment A-6: Pervious Pavement System PV-A6

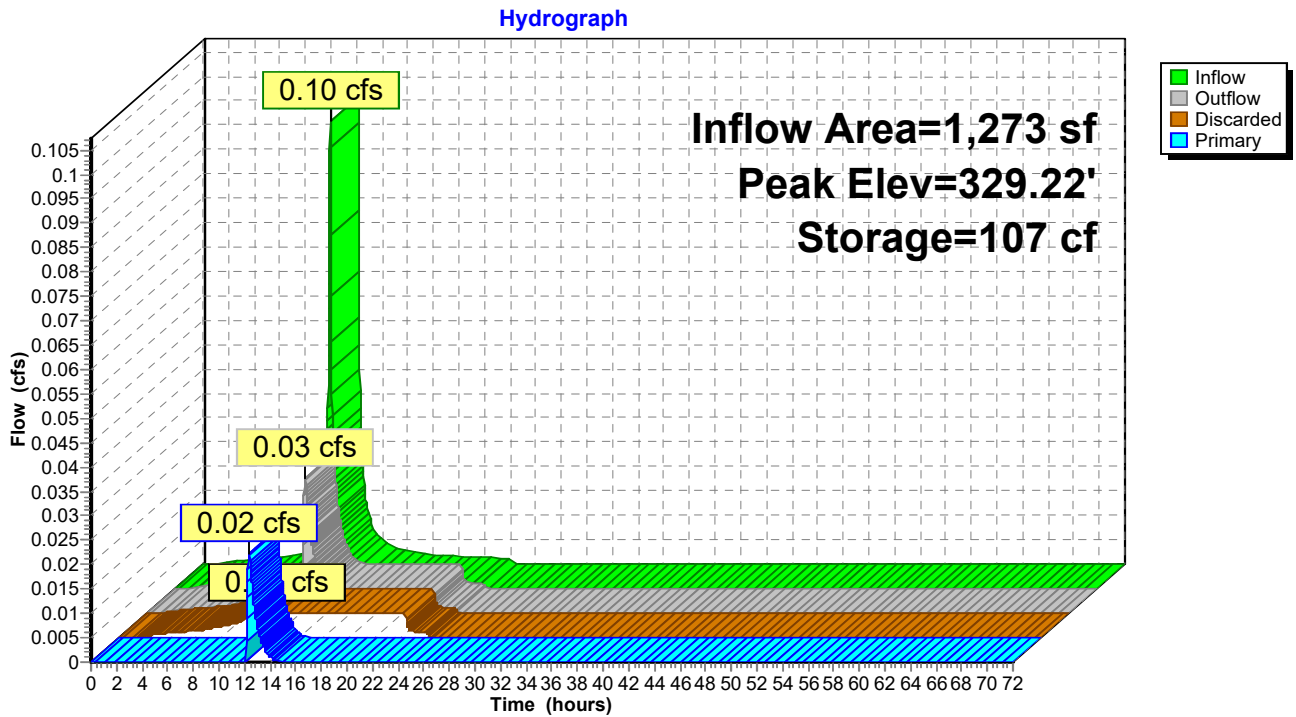
Hydrograph



**Subcatchment A-7: Pervious Pavement System PV-A7**

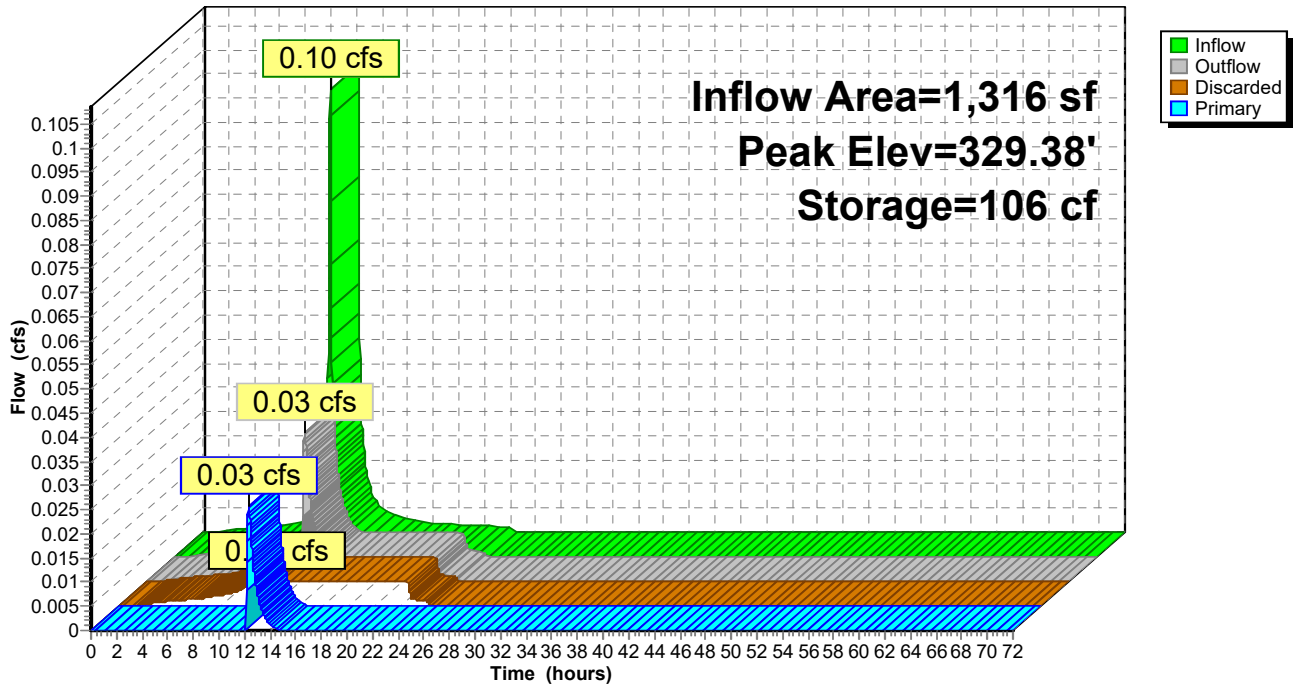


**Pond PV-A1: Pervious Pavement System PV-A1**



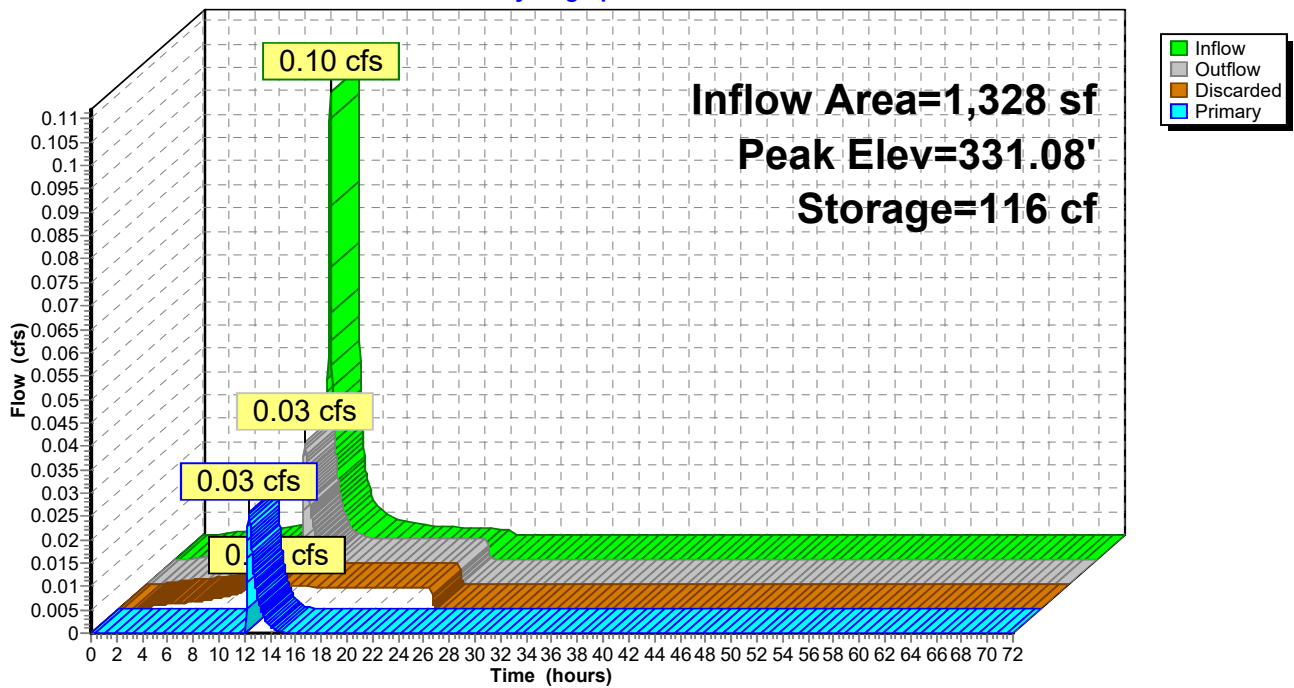
### Pond PV-A2: Pervious Pavement System PV-A2

Hydrograph



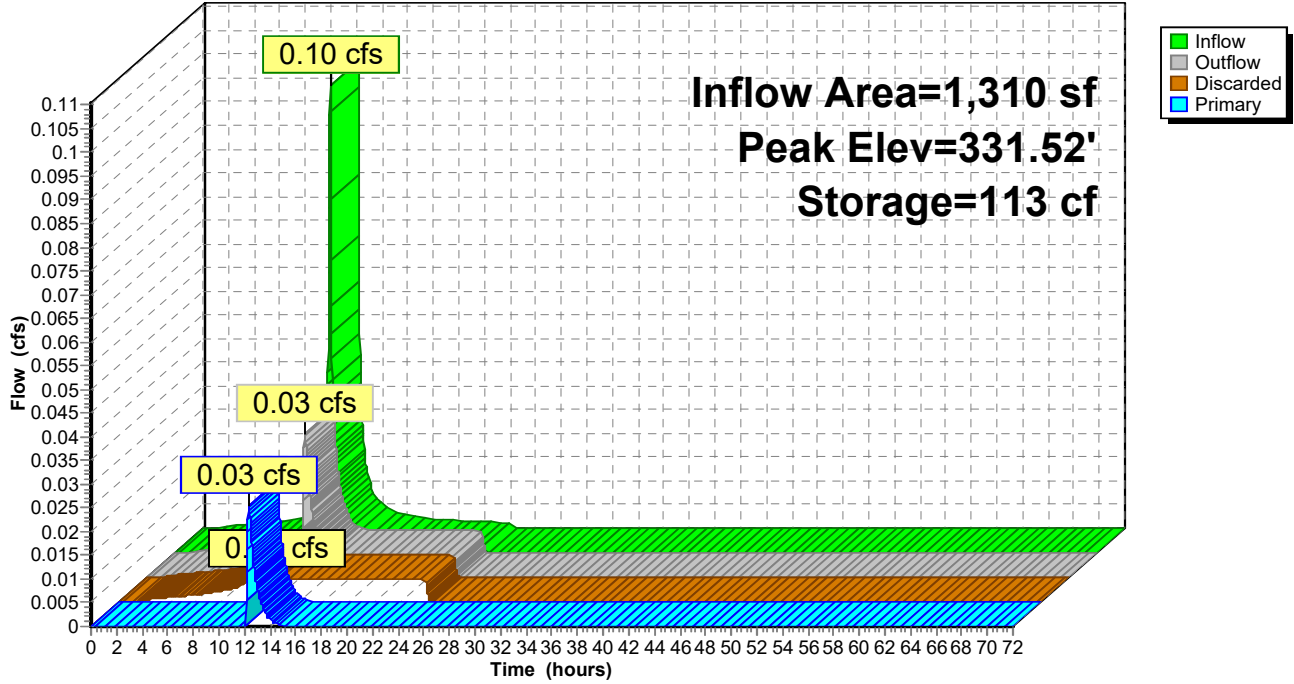
### Pond PV-A3: Pervious Pavement System PV-A3

Hydrograph



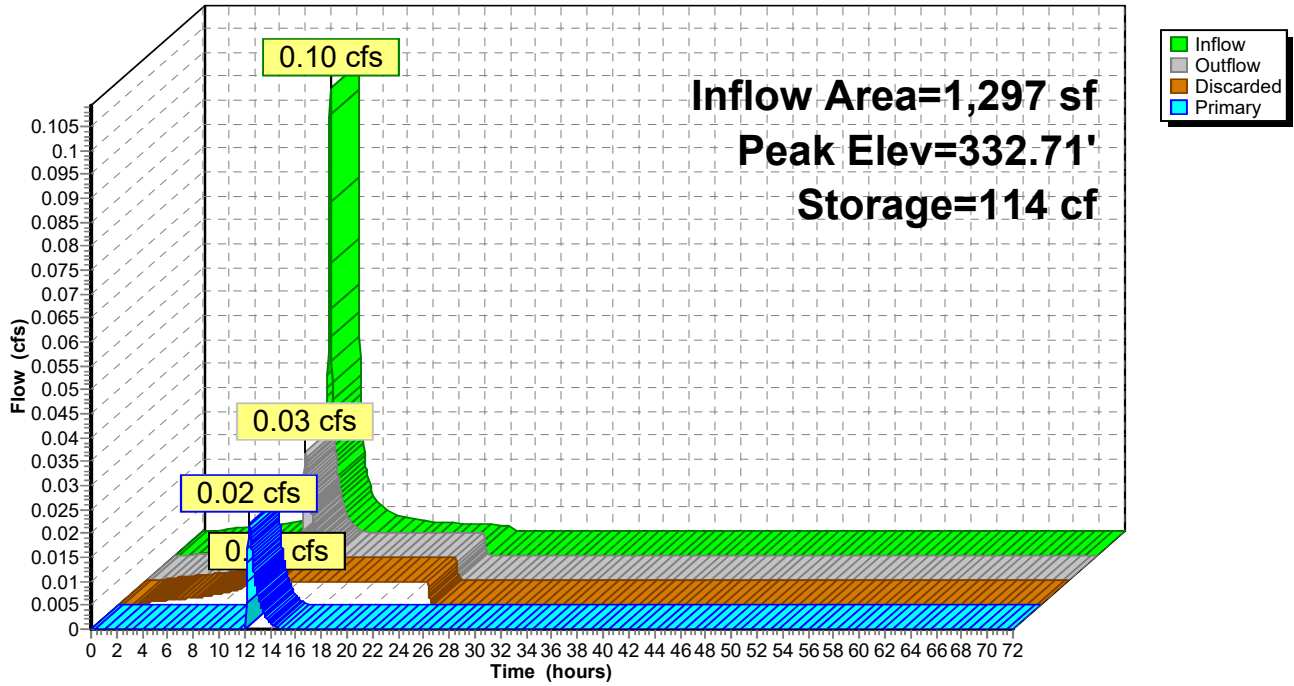
**Pond PV-A4: Pervious Pavement System PV-A4**

Hydrograph



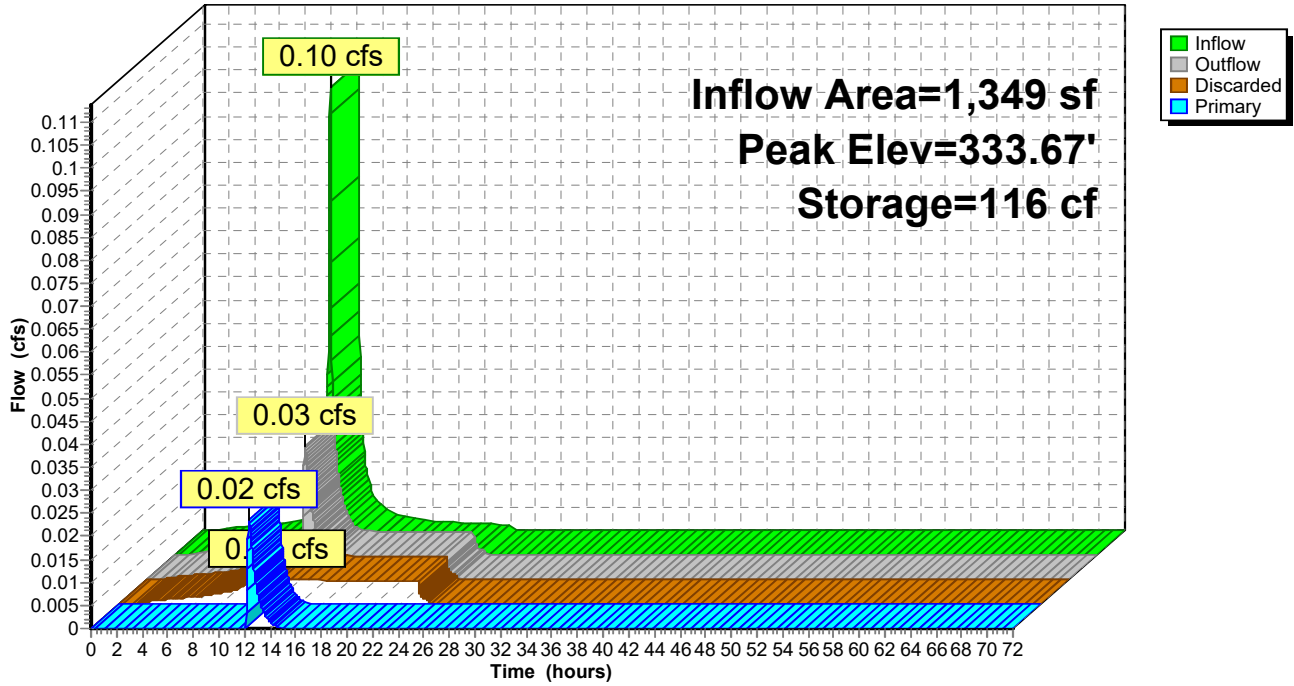
**Pond PV-A5: Pervious Pavement System PV-A5**

Hydrograph



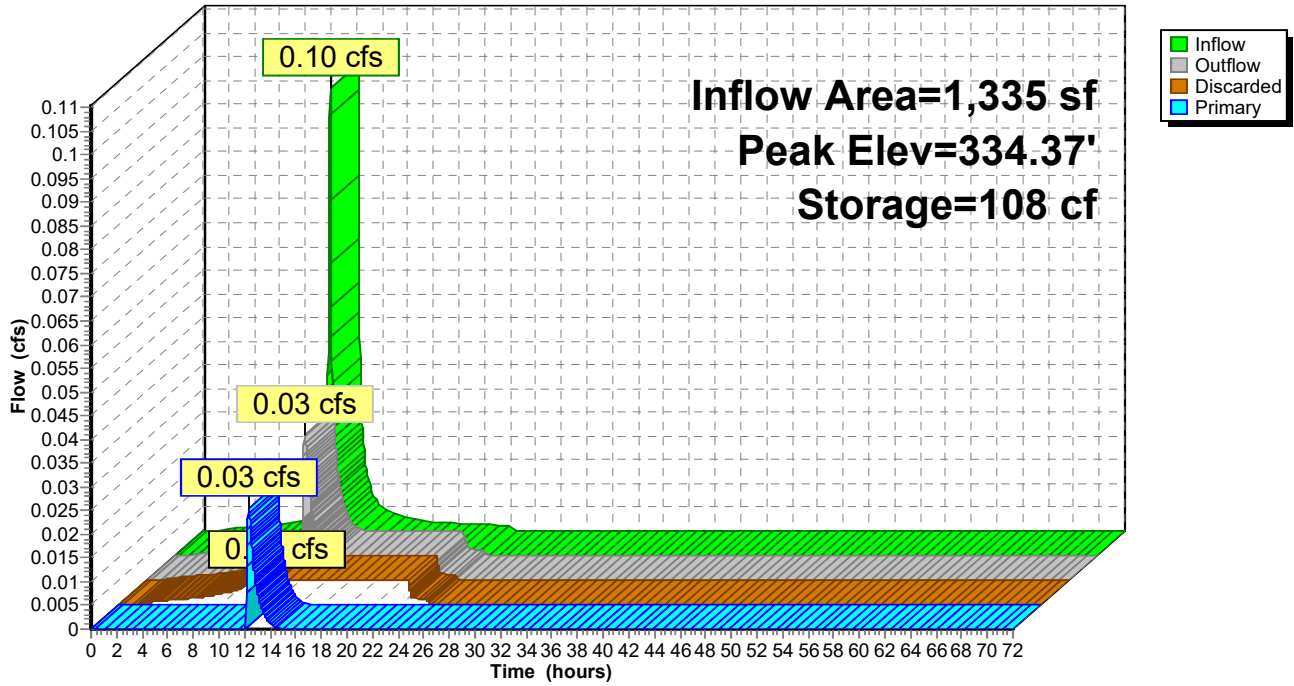
**Pond PV-A6: Pervious Pavement System PV-A6**

Hydrograph



**Pond PV-A7: Pervious Pavement System PV-A7**

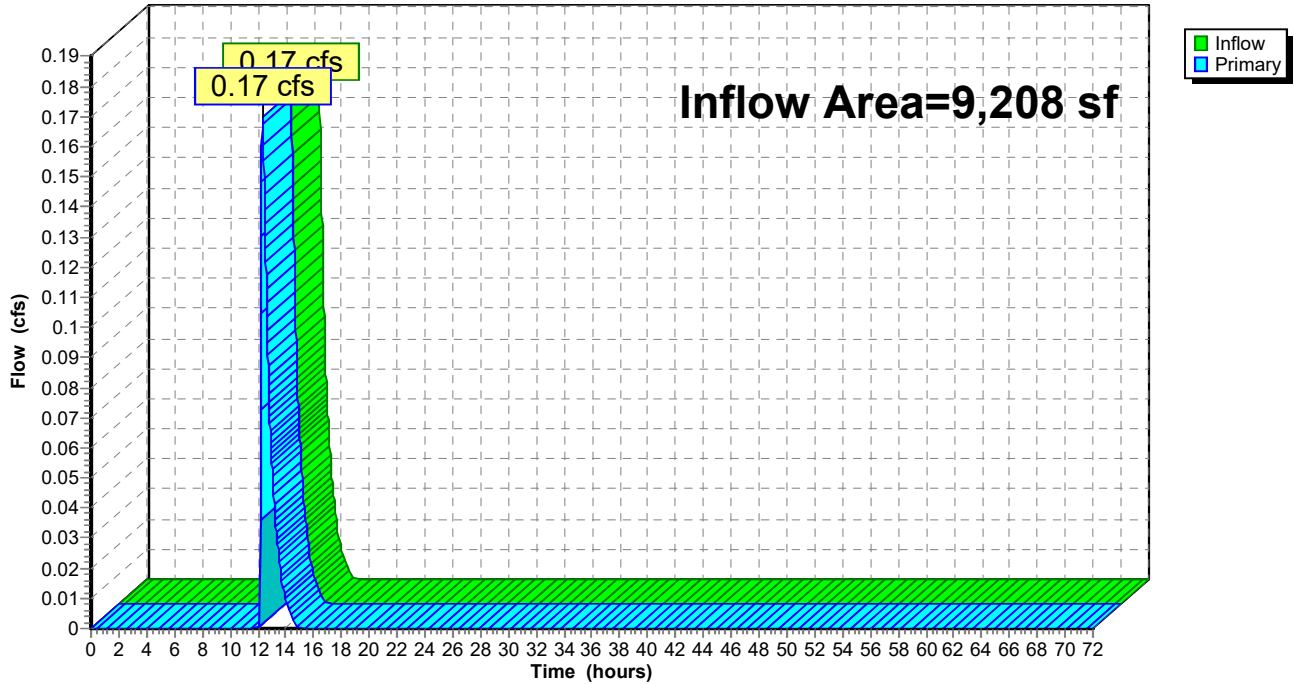
Hydrograph



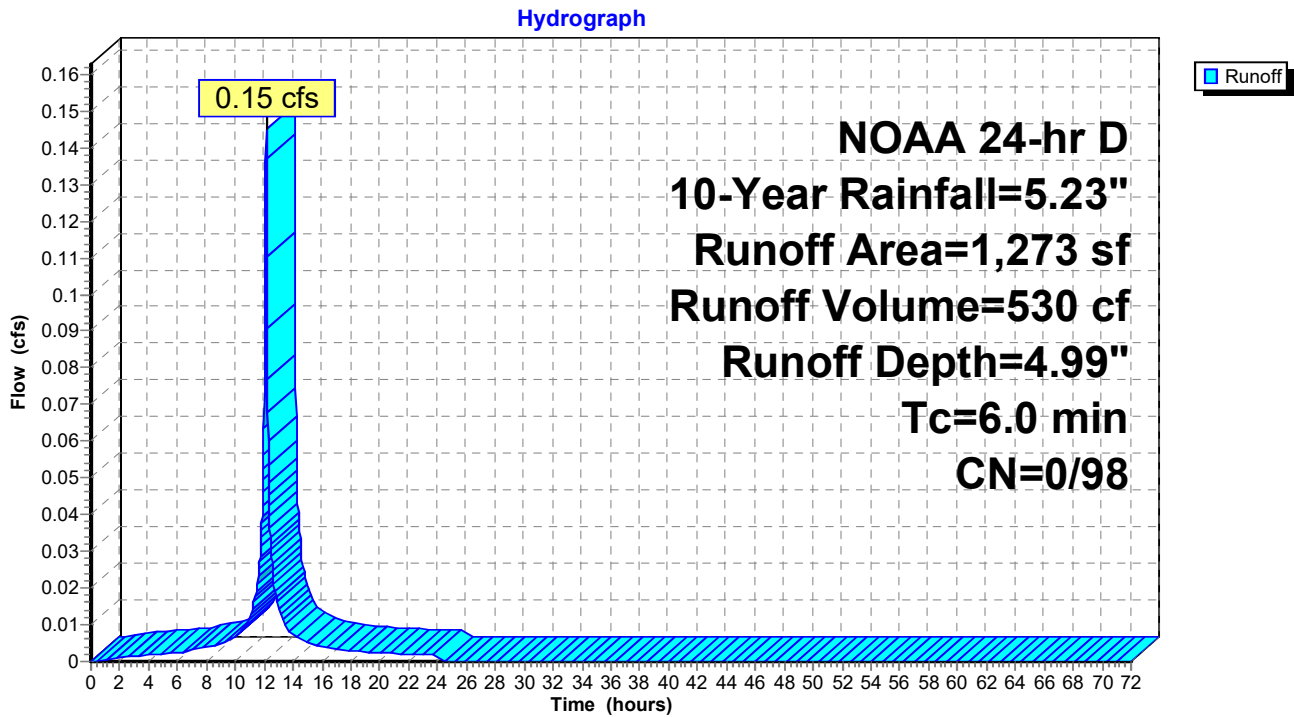


### Link PPV-A: PVIOUS PAVEMENT SYSTEM BUILDING A

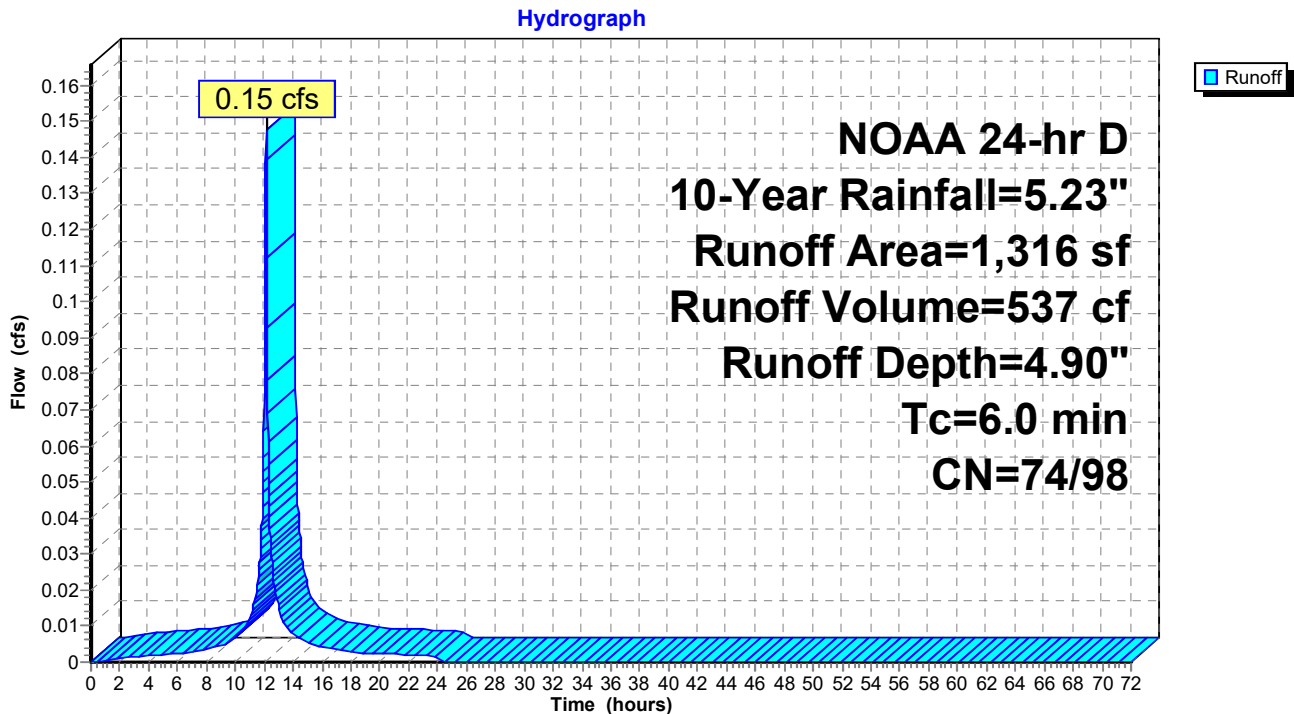
Hydrograph



### Subcatchment A-1: Pervious Pavement System PV-A1

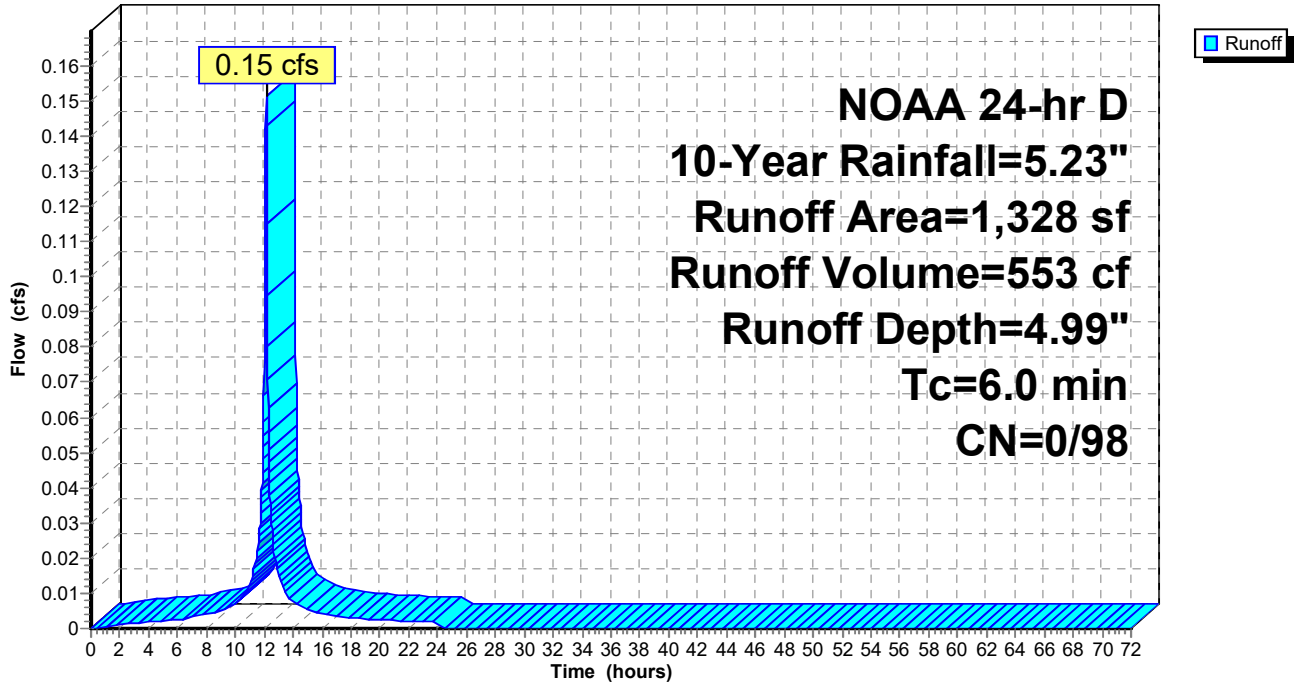


### Subcatchment A-2: Pervious Pavement System PV-A2



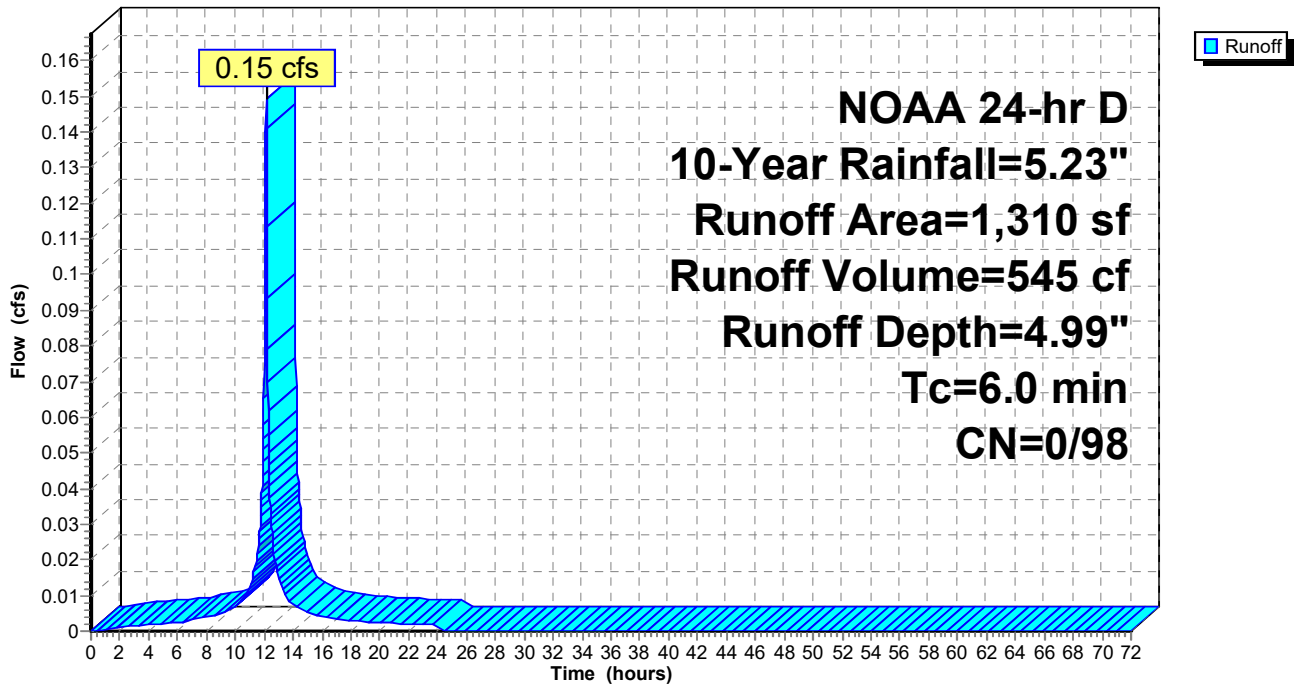
**Subcatchment A-3: Pervious Pavement System PV-A3**

Hydrograph



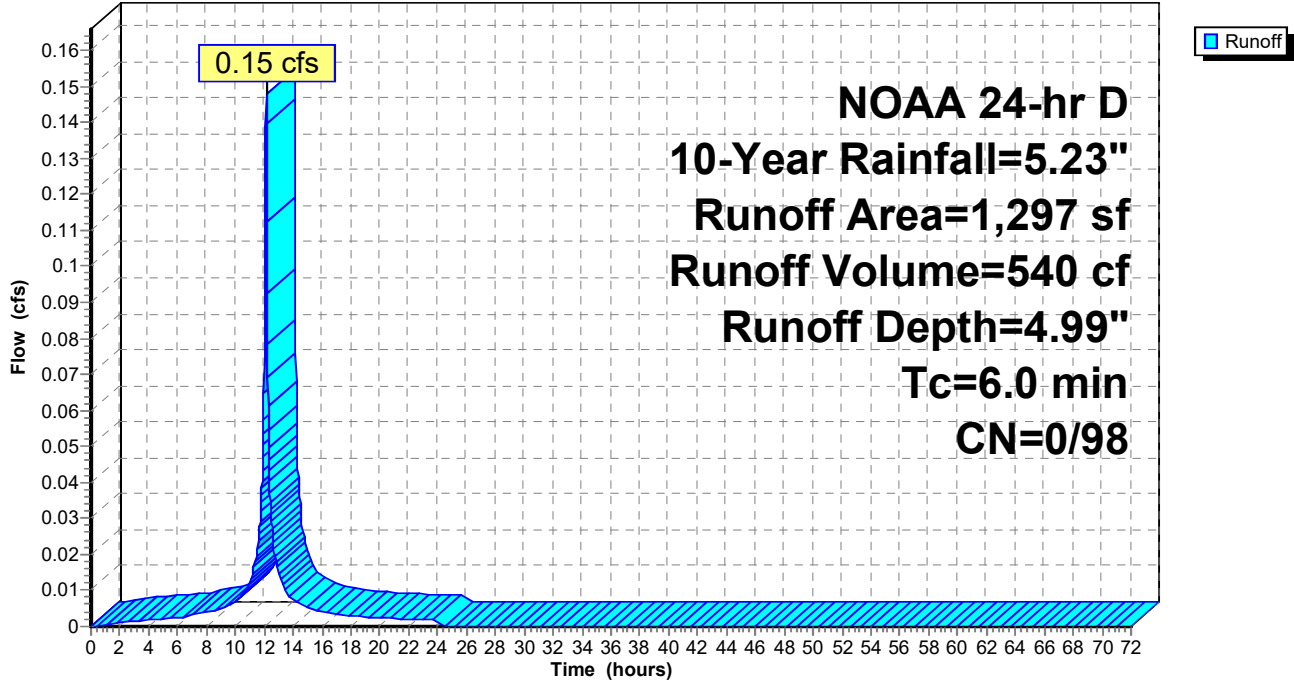
**Subcatchment A-4: Pervious Pavement System PV-A4**

Hydrograph



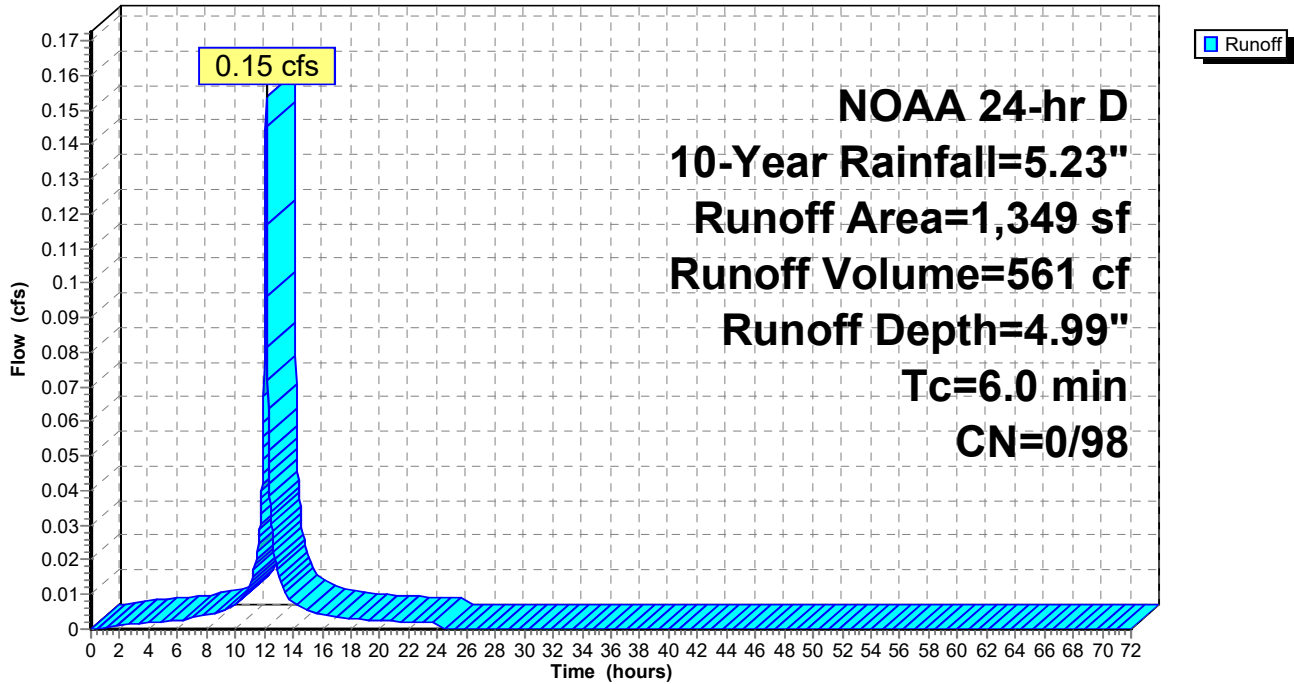
**Subcatchment A-5: Pervious Pavement System PV-A5**

Hydrograph

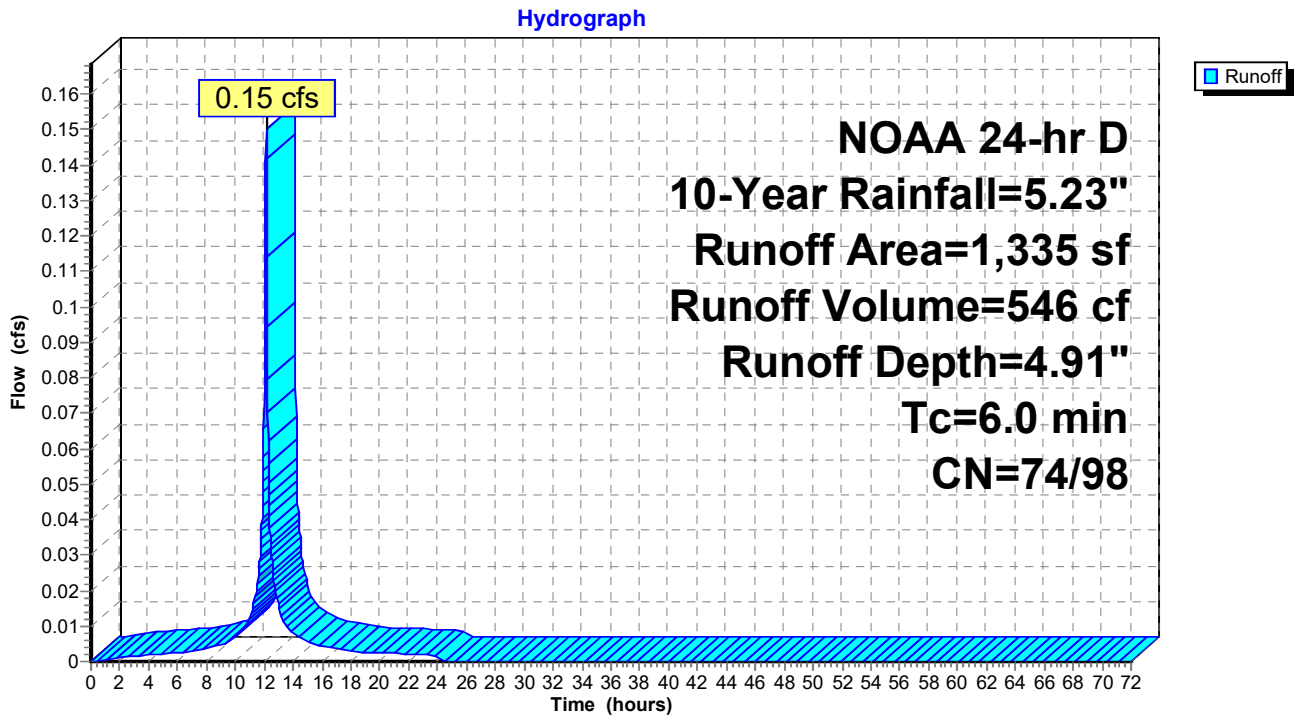


**Subcatchment A-6: Pervious Pavement System PV-A6**

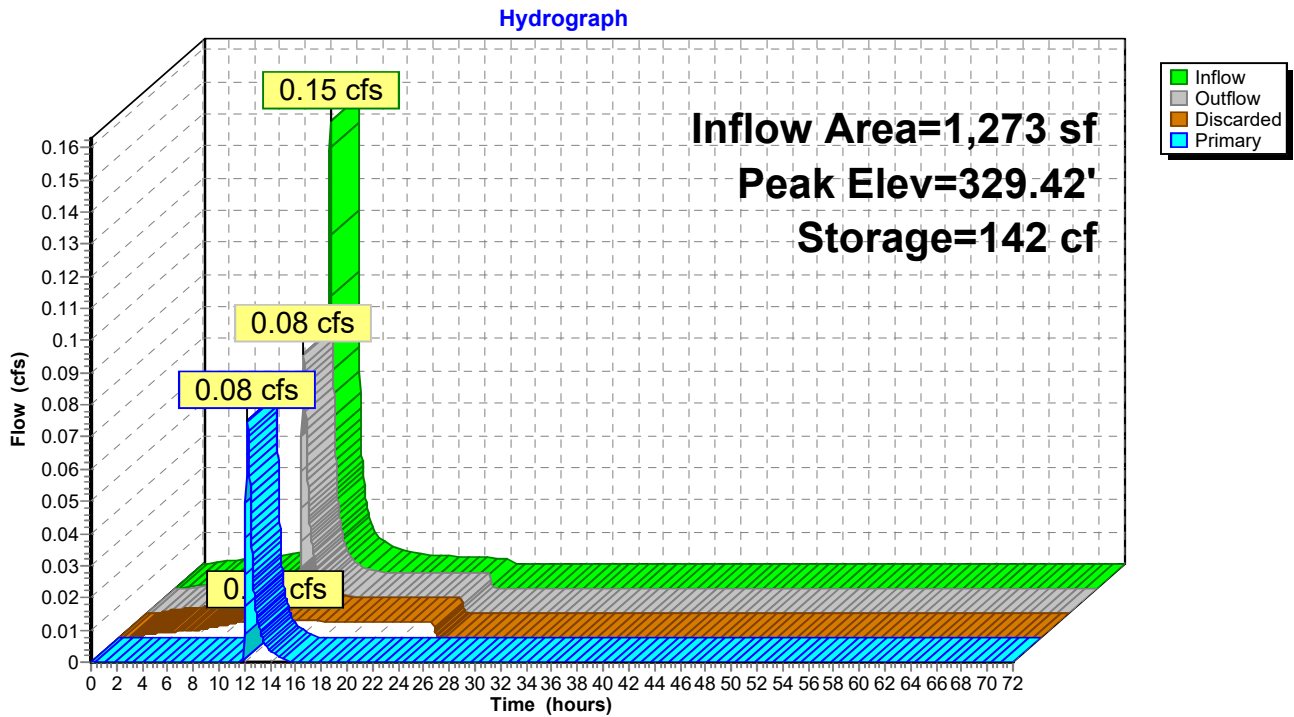
Hydrograph



**Subcatchment A-7: Pervious Pavement System PV-A7**

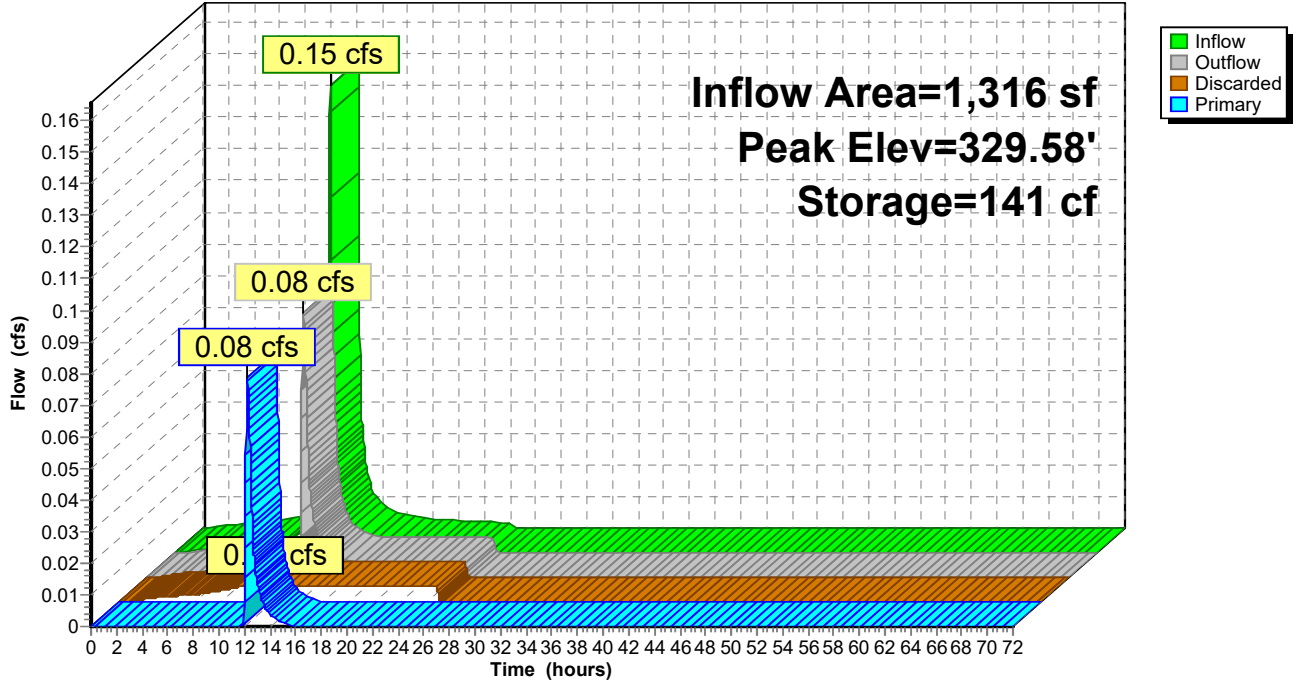


**Pond PV-A1: Pervious Pavement System PV-A1**



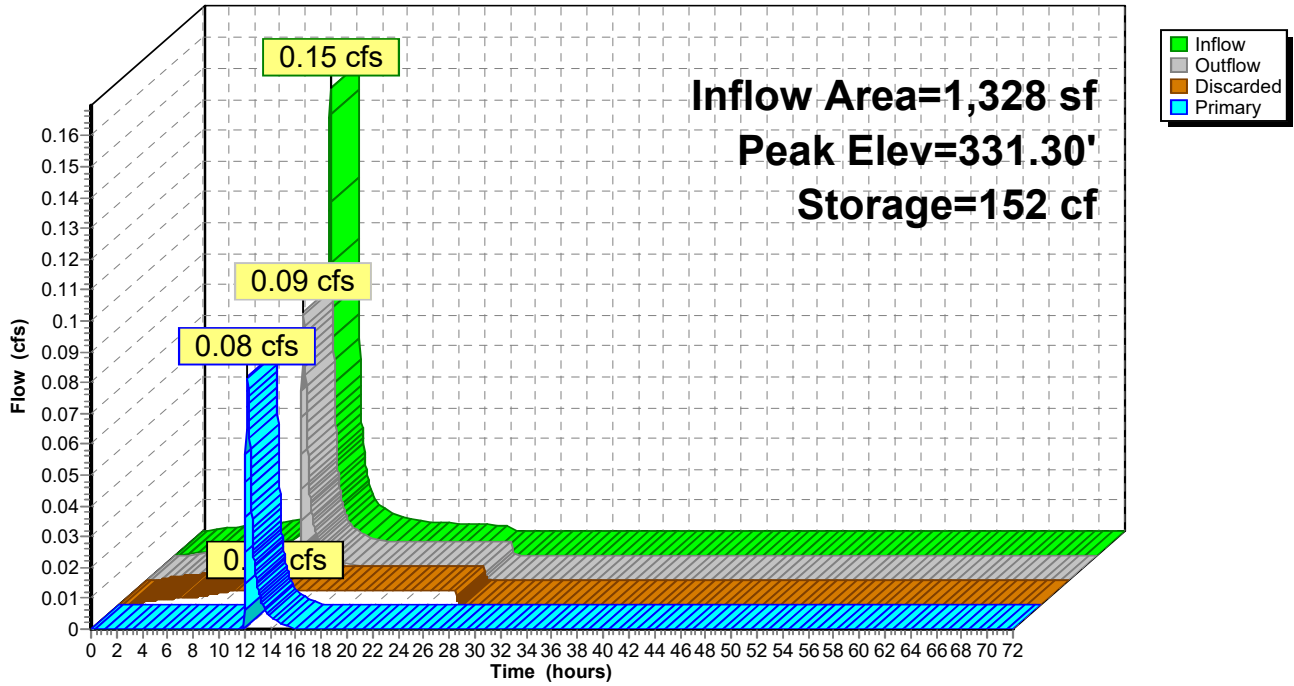
**Pond PV-A2: Pervious Pavement System PV-A2**

Hydrograph



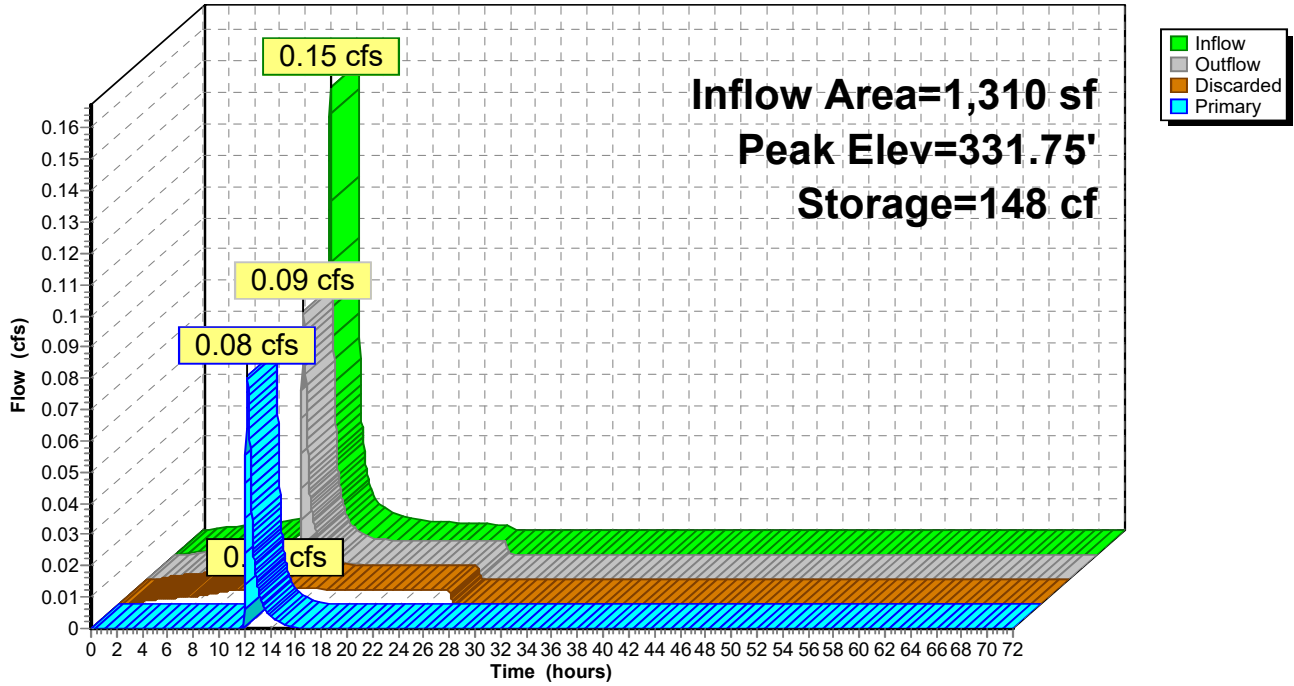
**Pond PV-A3: Pervious Pavement System PV-A3**

Hydrograph



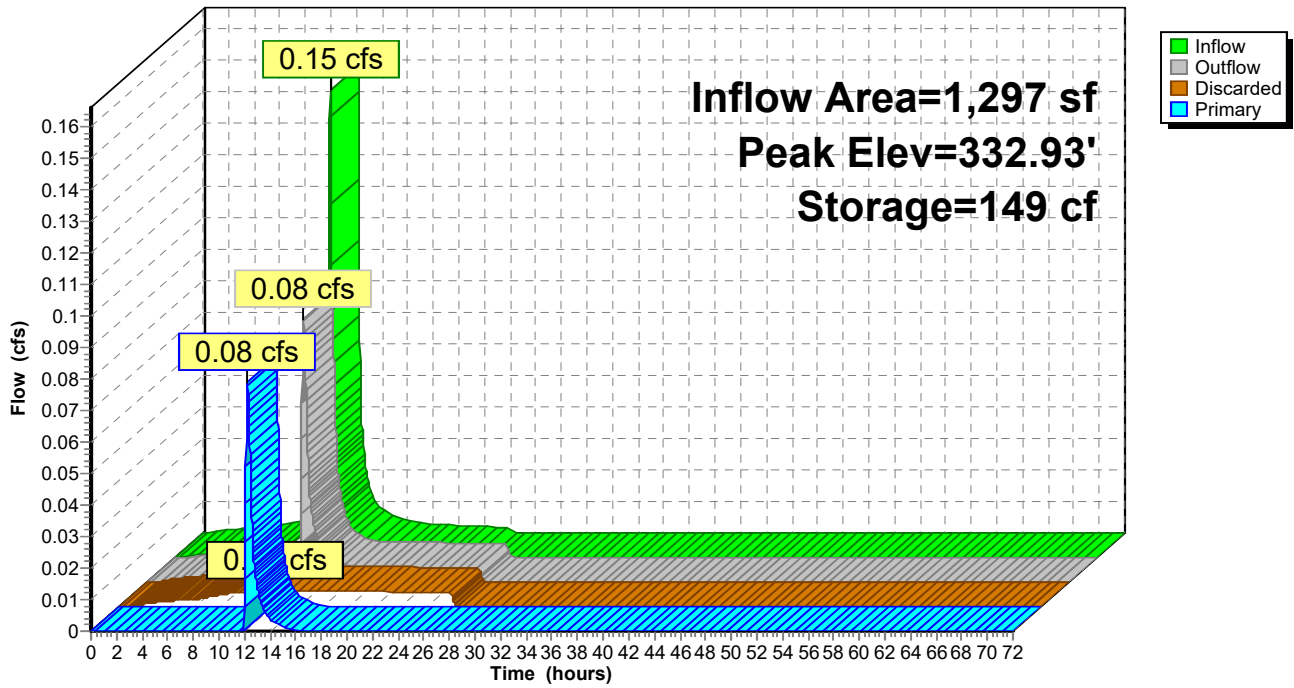
**Pond PV-A4: Pervious Pavement System PV-A4**

Hydrograph



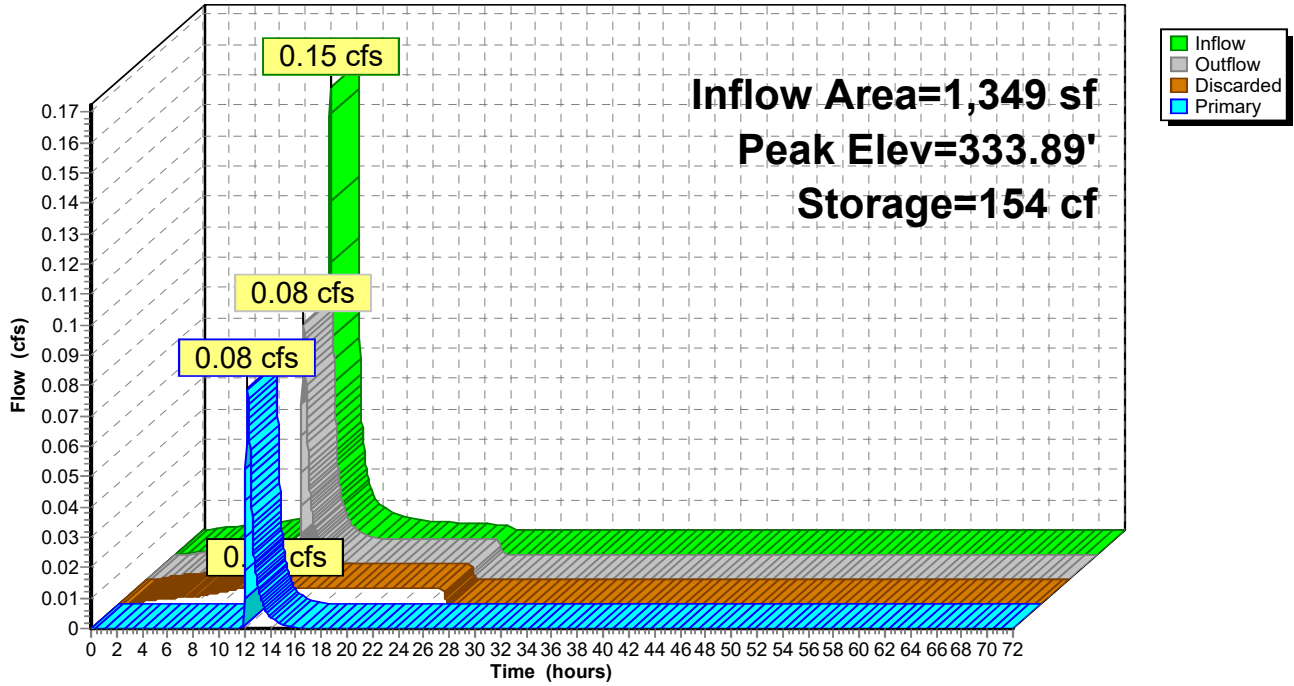
**Pond PV-A5: Pervious Pavement System PV-A5**

Hydrograph



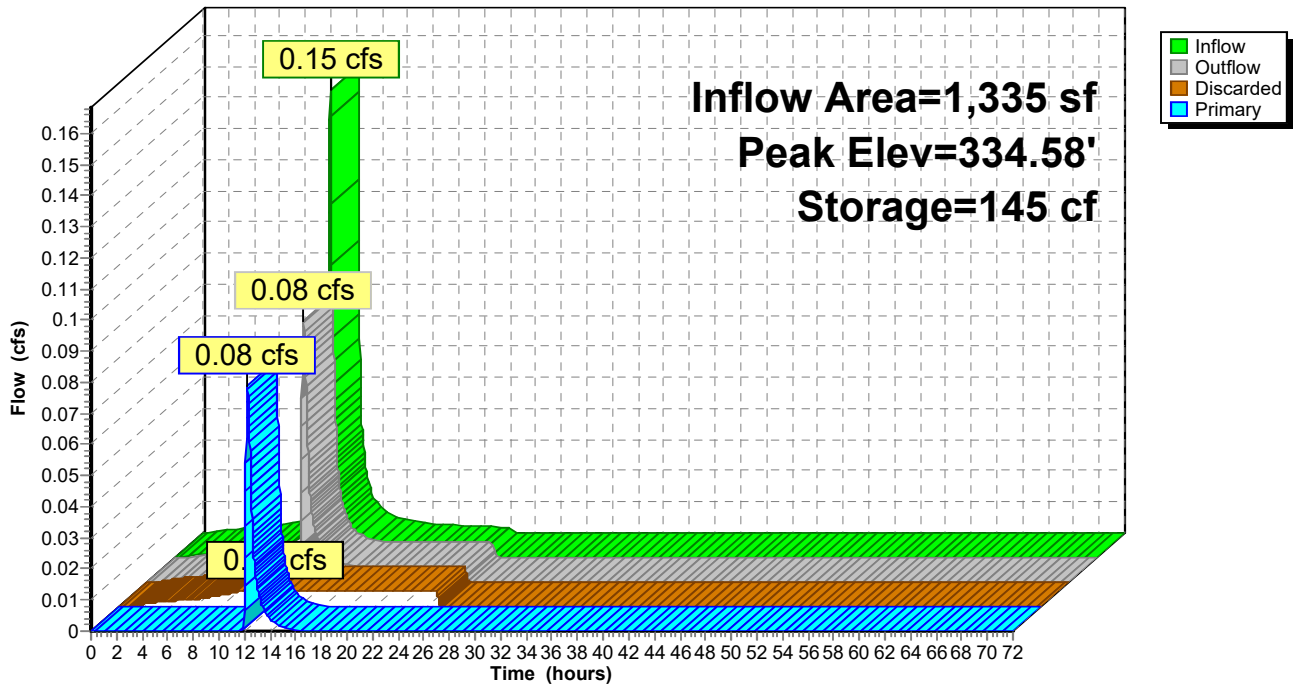
**Pond PV-A6: Pervious Pavement System PV-A6**

Hydrograph



**Pond PV-A7: Pervious Pavement System PV-A7**

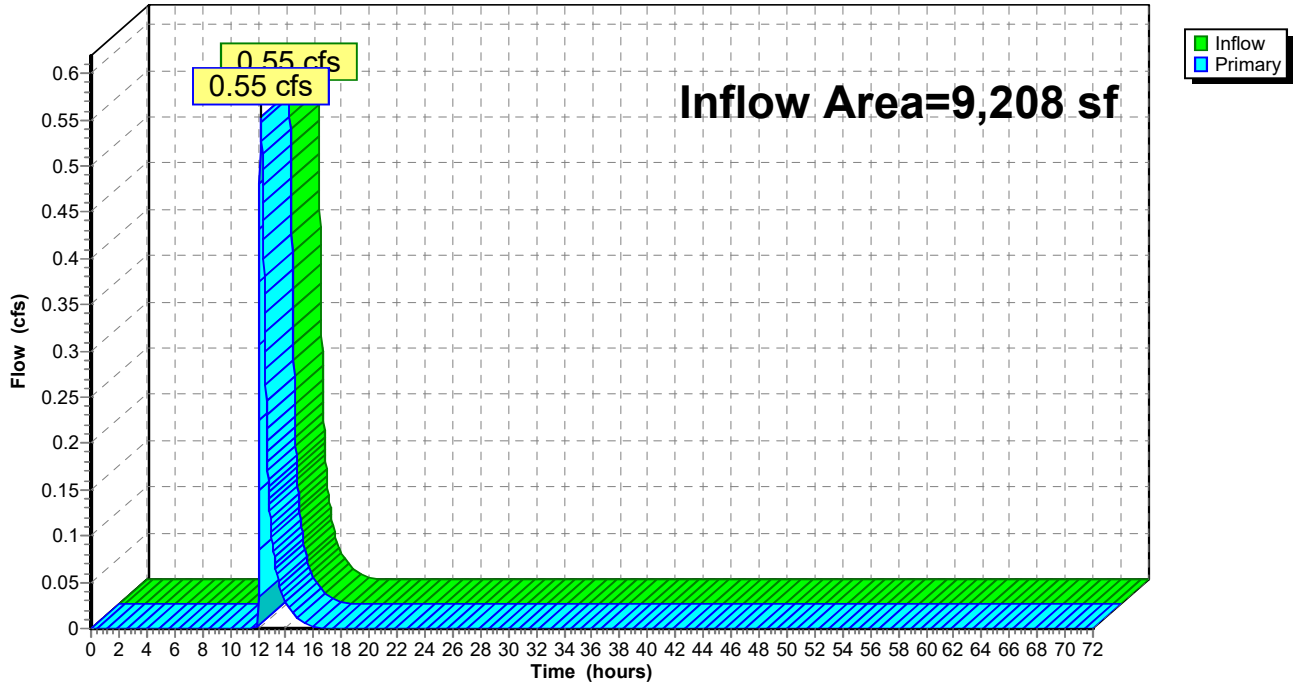
Hydrograph



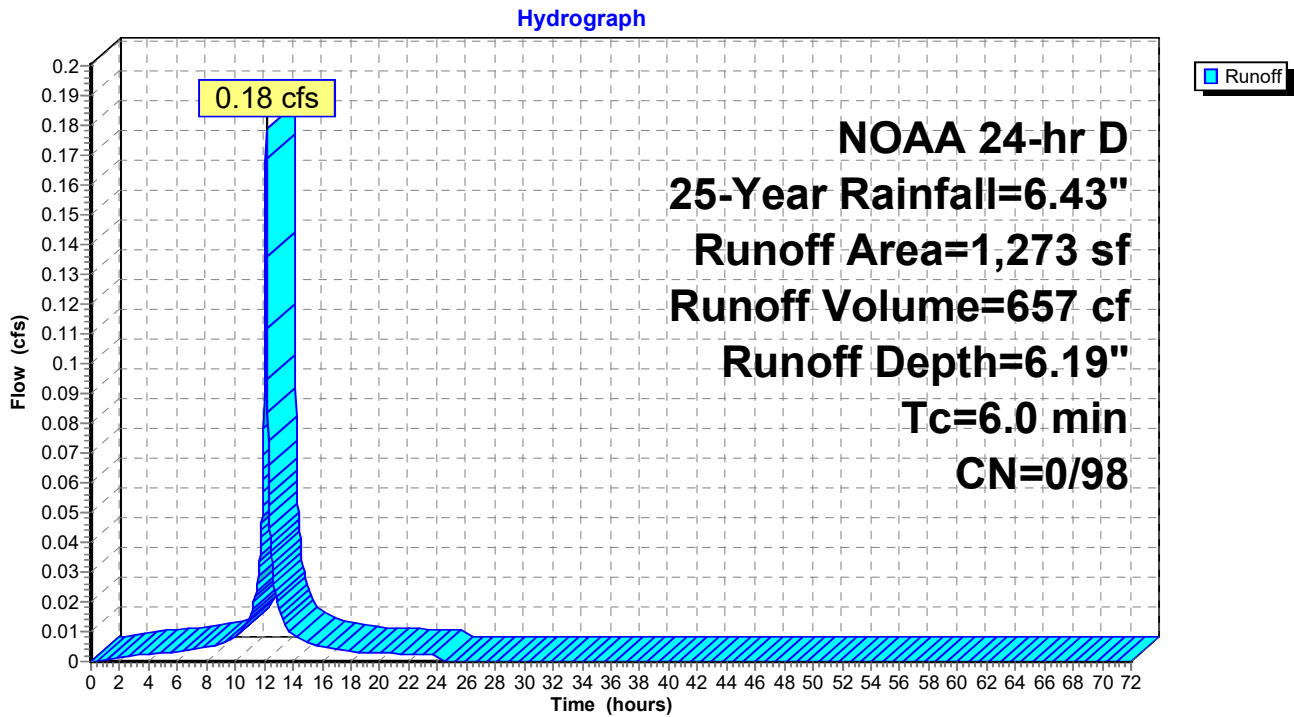


### Link PPV-A: PVIOUS PAVEMENT SYSTEM BUILDING A

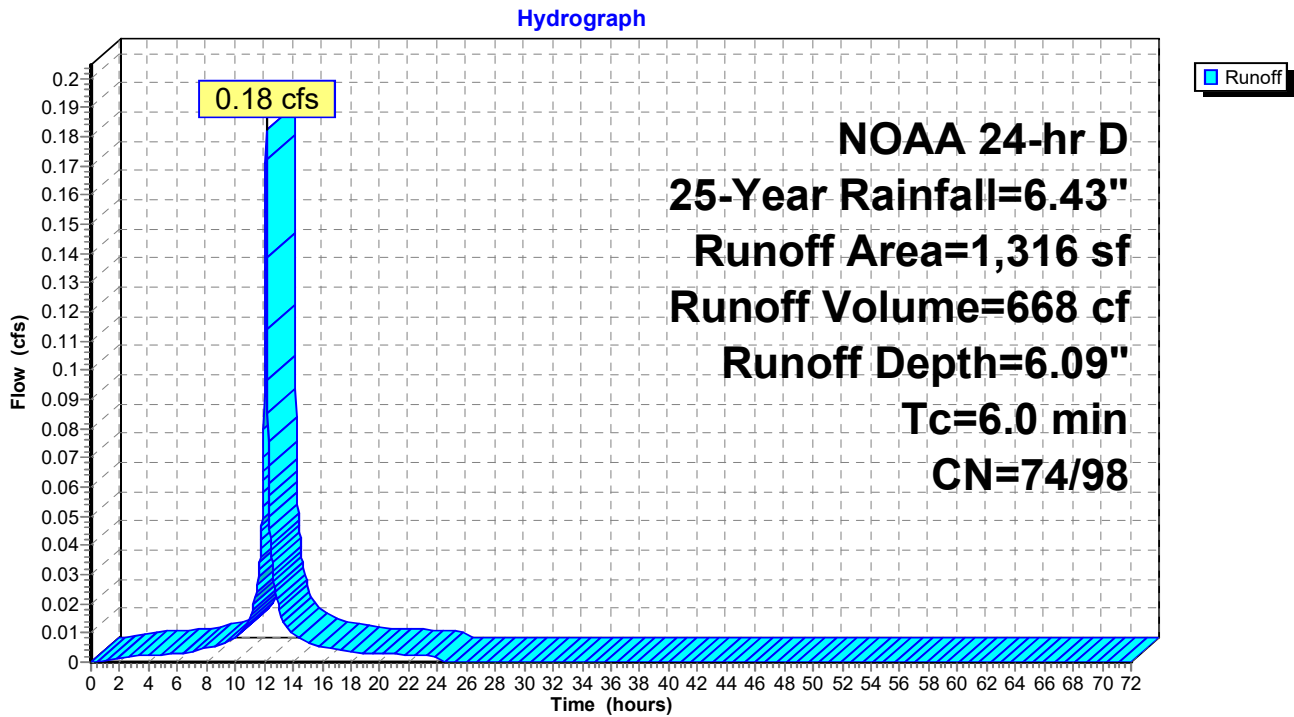
Hydrograph



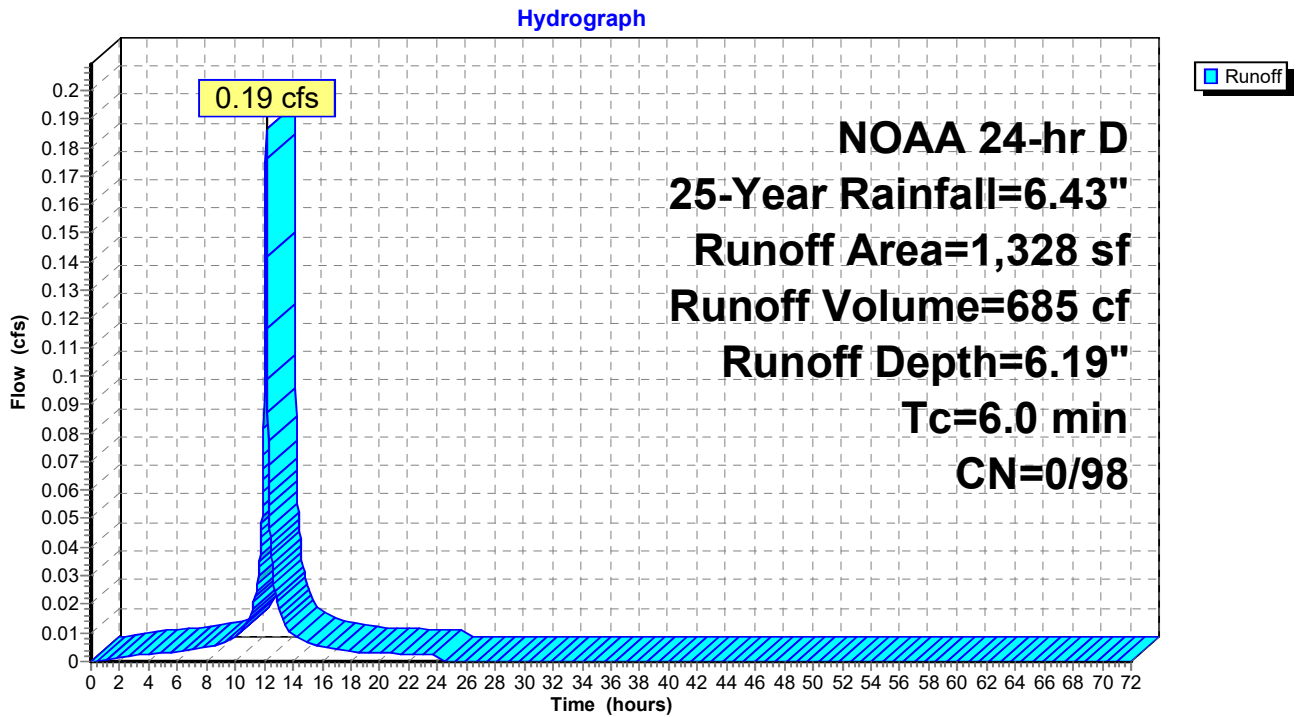
### Subcatchment A-1: Pervious Pavement System PV-A1



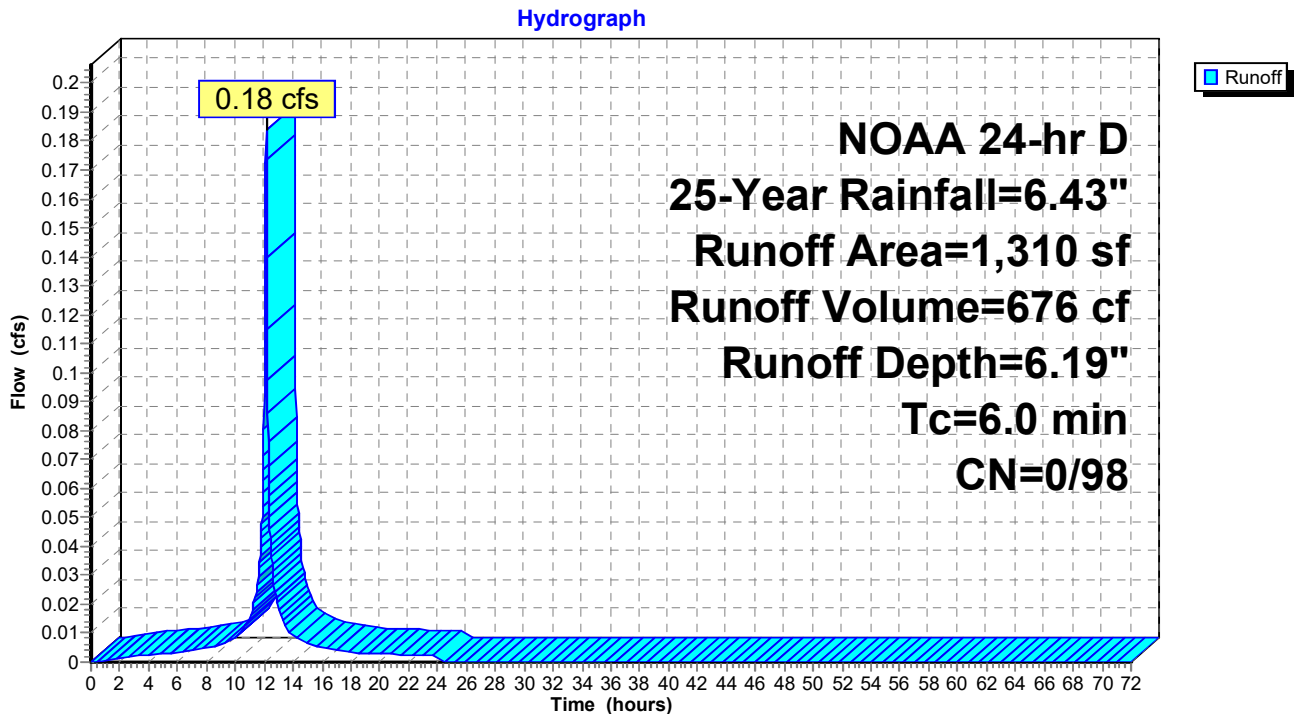
### Subcatchment A-2: Pervious Pavement System PV-A2



### Subcatchment A-3: Pervious Pavement System PV-A3

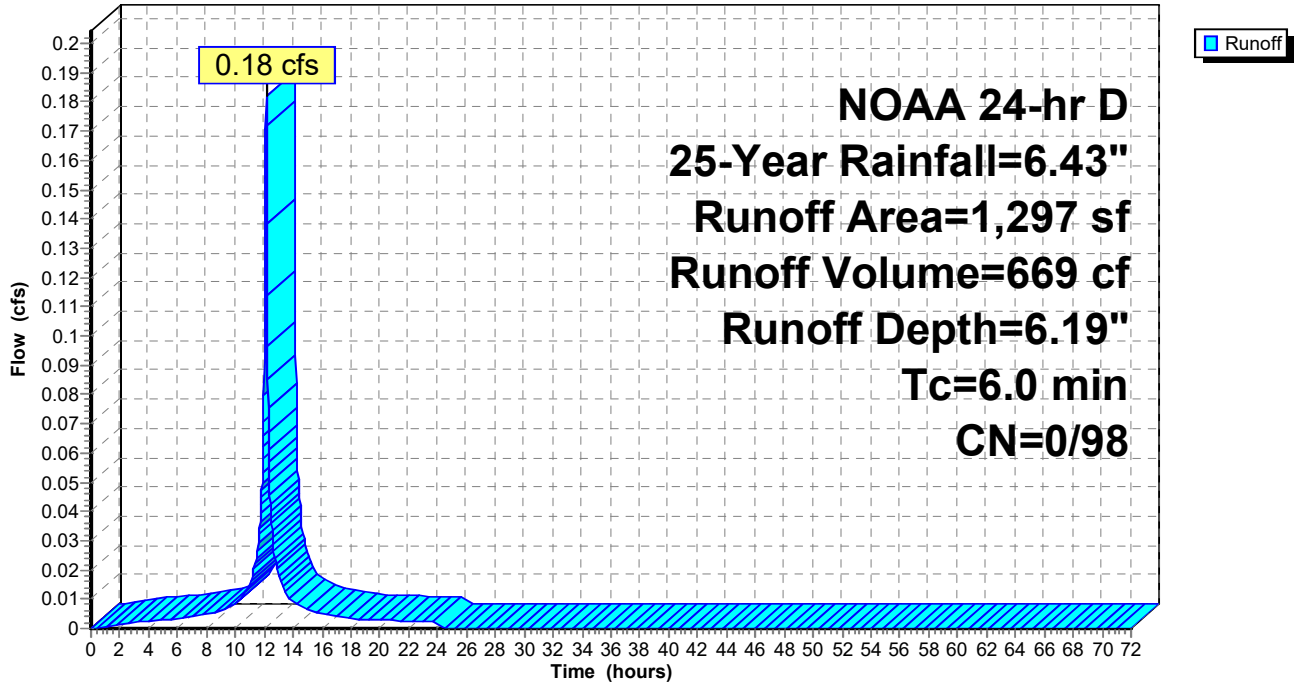


### Subcatchment A-4: Pervious Pavement System PV-A4



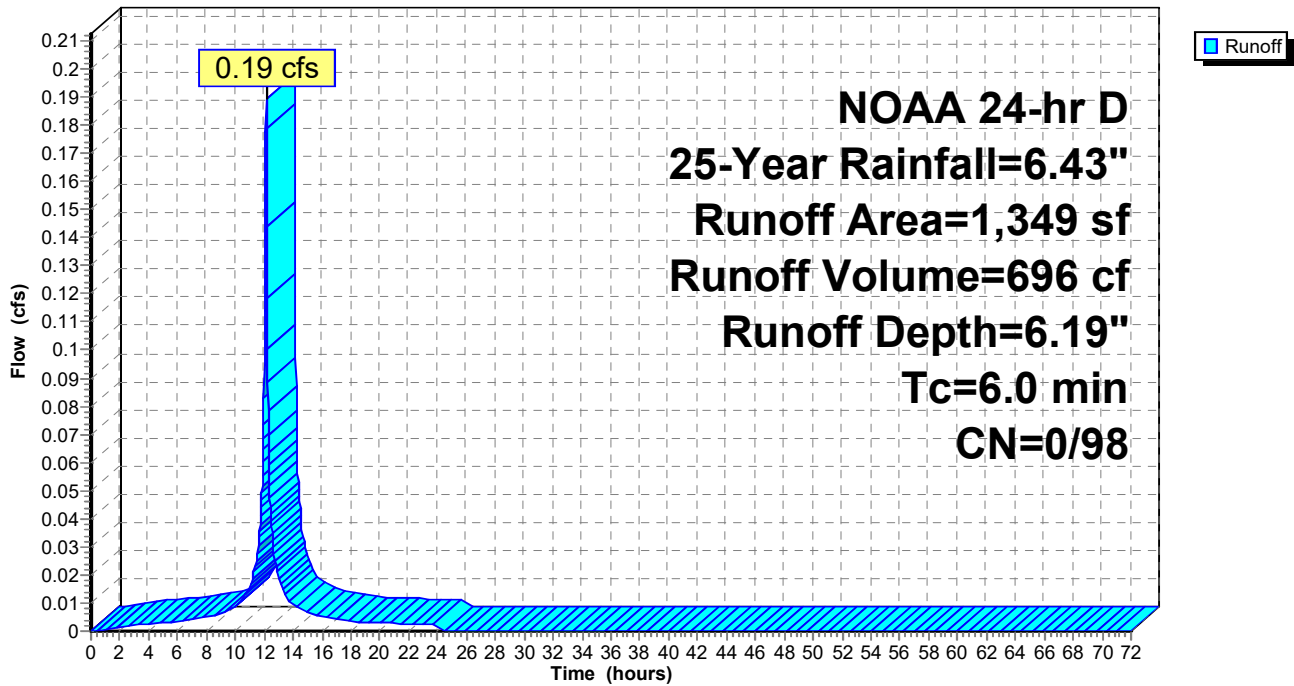
**Subcatchment A-5: Pervious Pavement System PV-A5**

Hydrograph

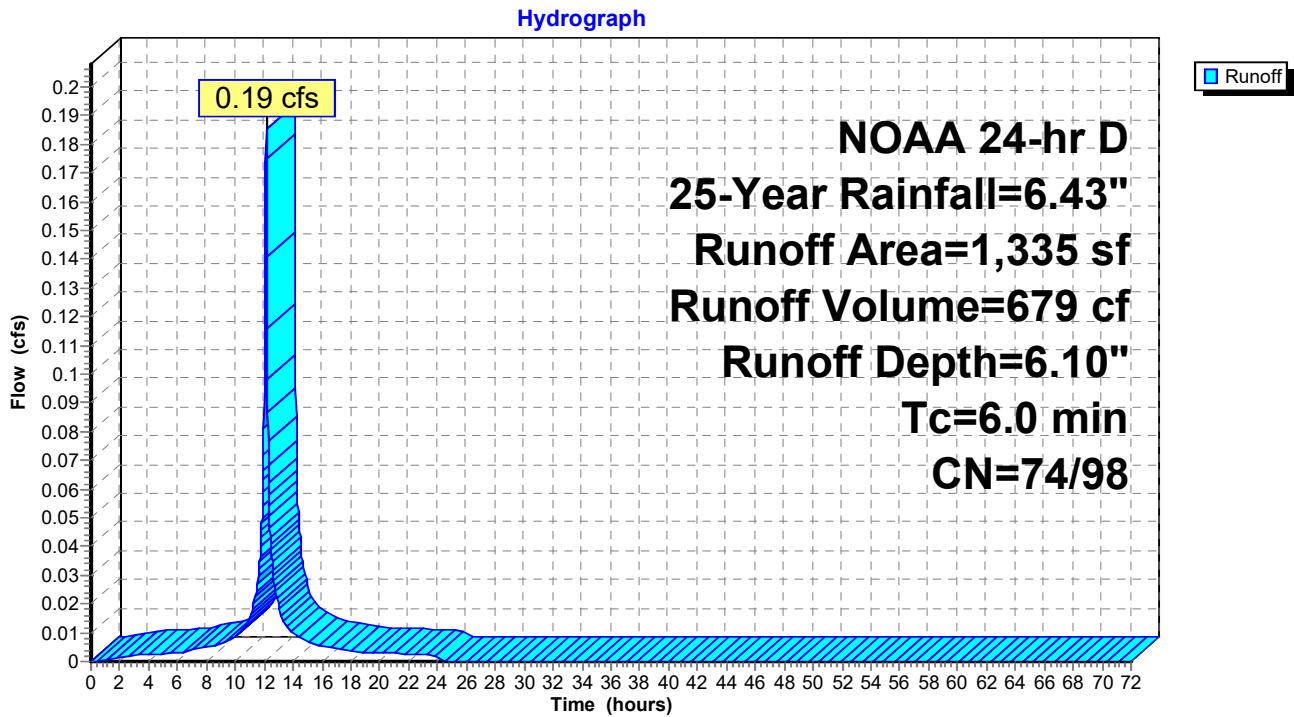


**Subcatchment A-6: Pervious Pavement System PV-A6**

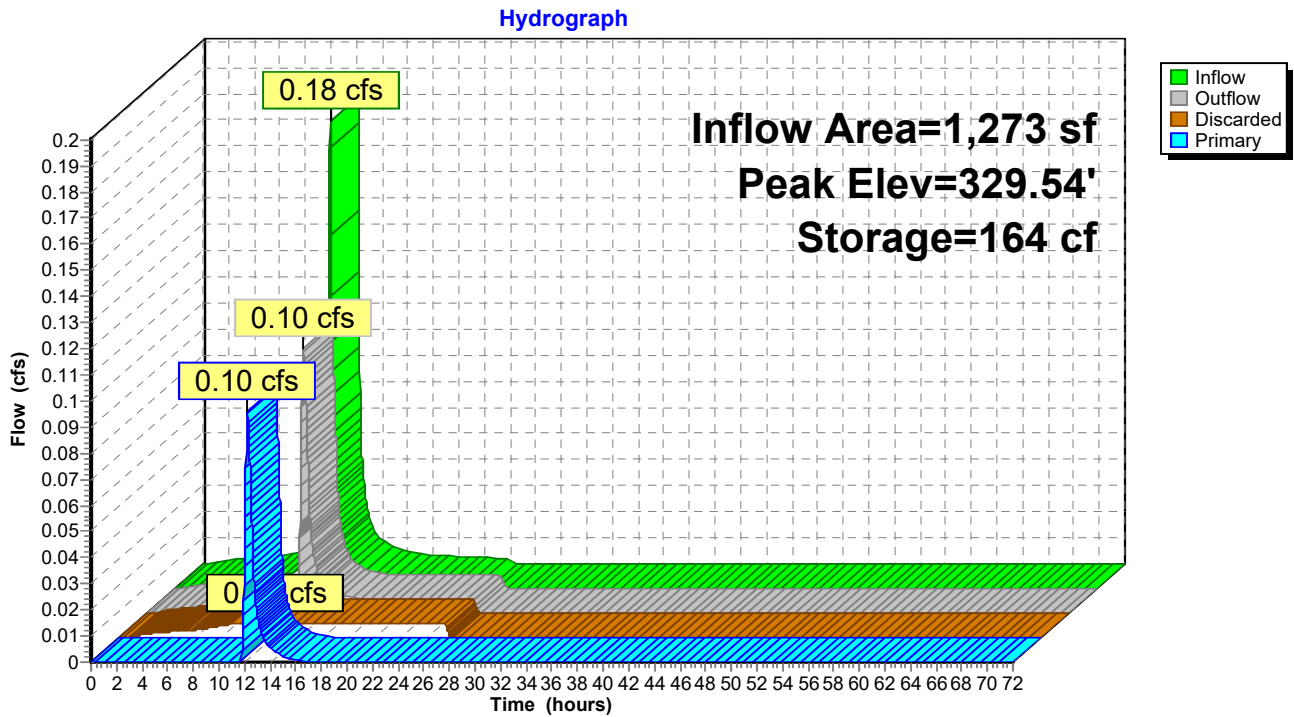
Hydrograph



**Subcatchment A-7: Pervious Pavement System PV-A7**

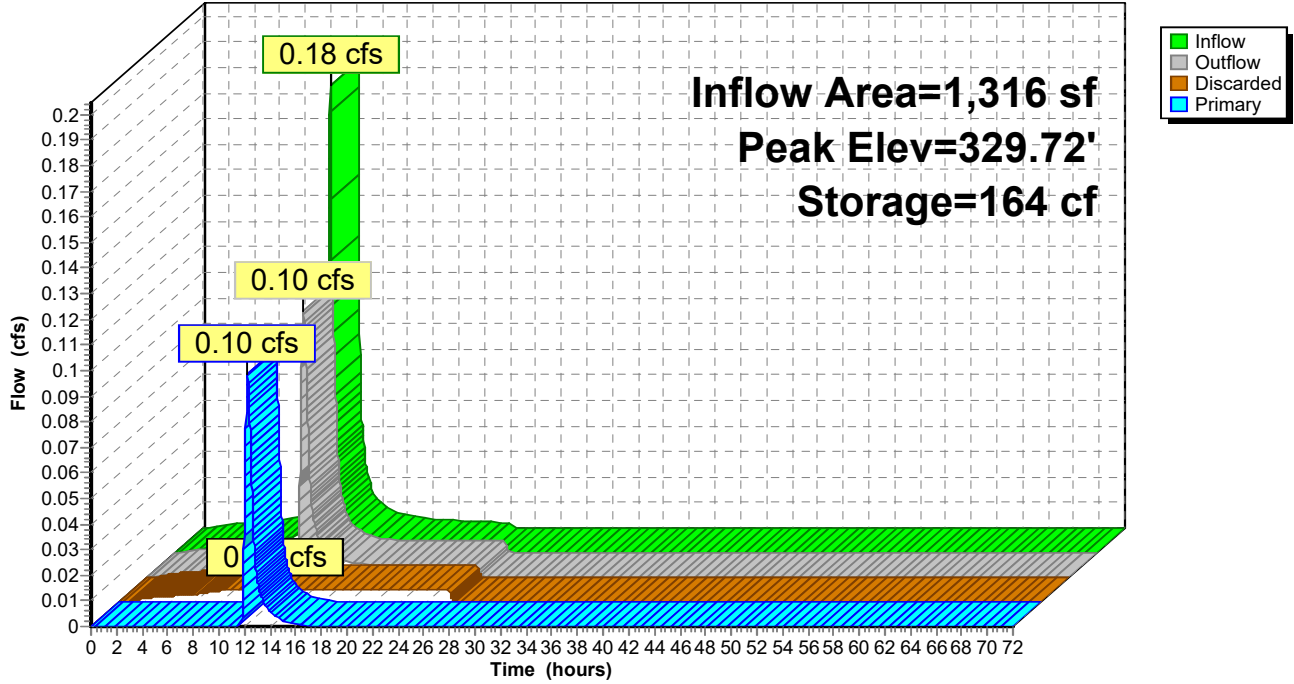


**Pond PV-A1: Pervious Pavement System PV-A1**



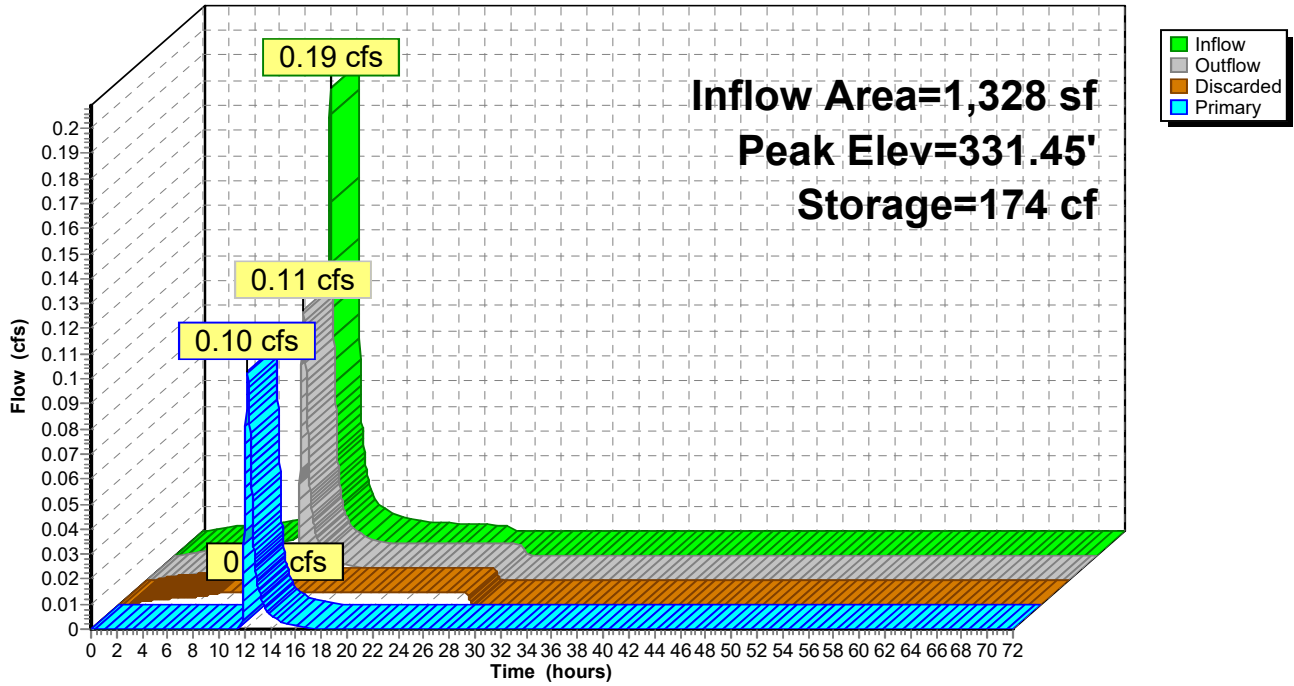
**Pond PV-A2: Pervious Pavement System PV-A2**

Hydrograph



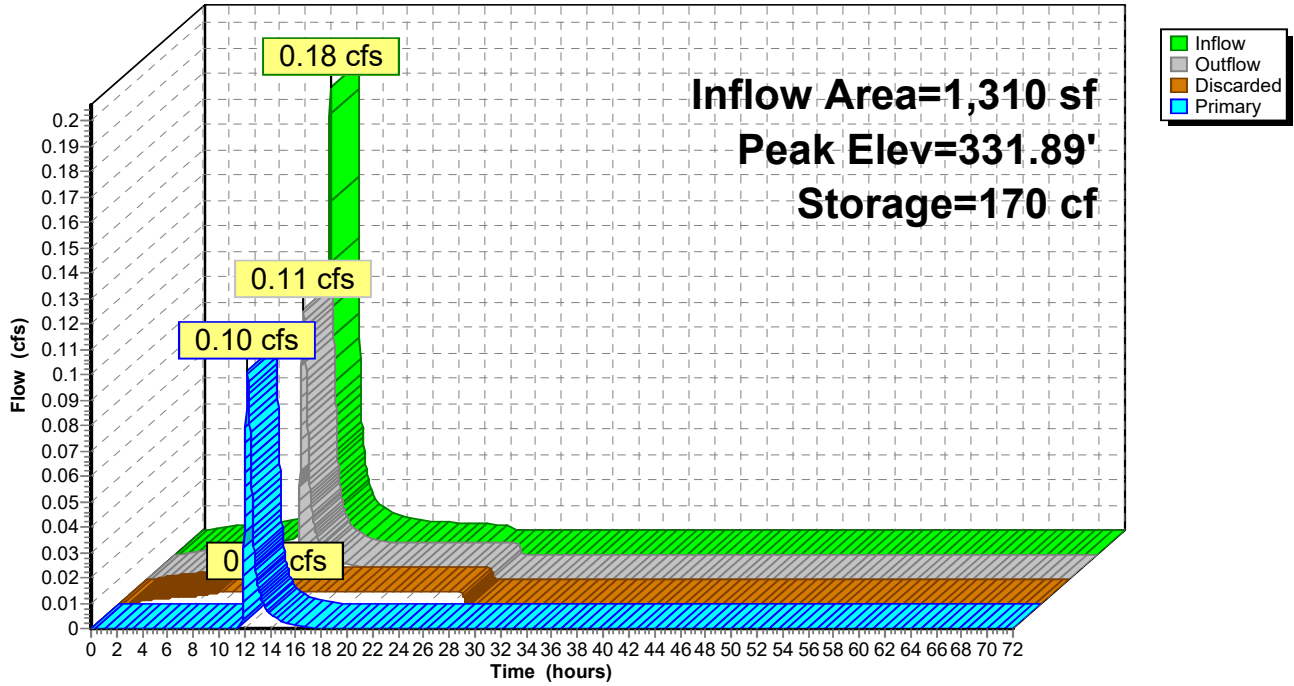
**Pond PV-A3: Pervious Pavement System PV-A3**

Hydrograph



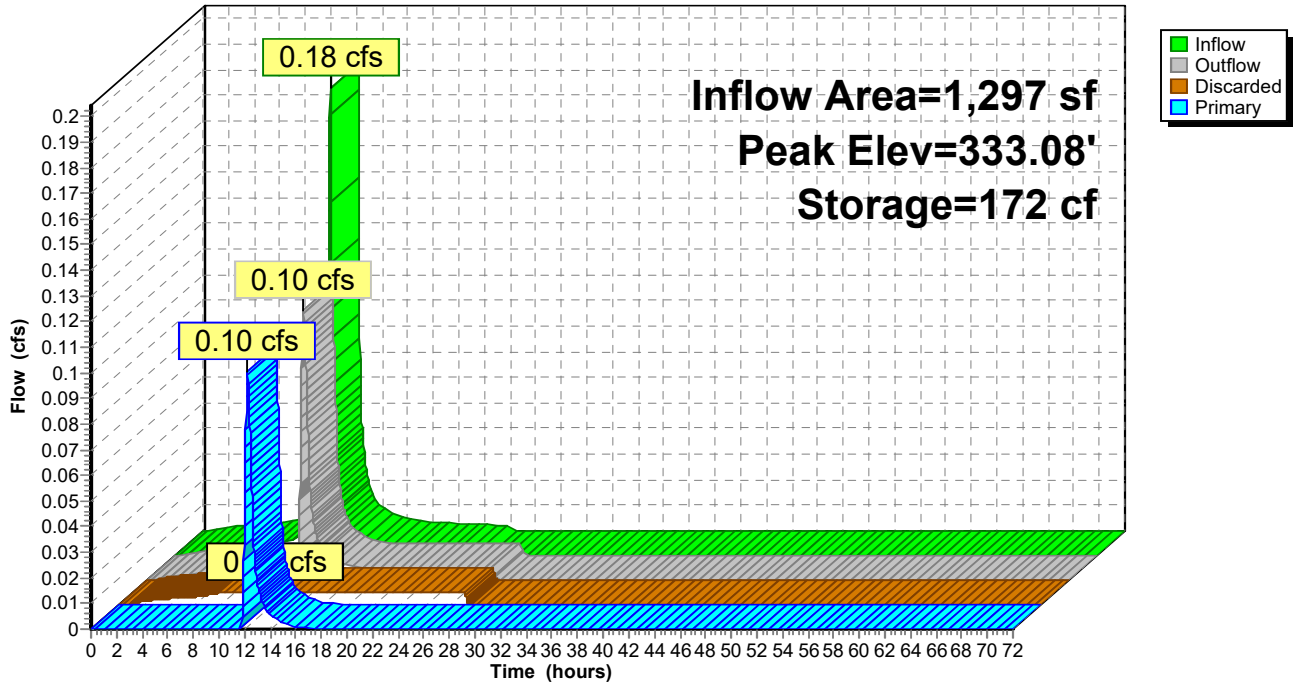
**Pond PV-A4: Pervious Pavement System PV-A4**

Hydrograph



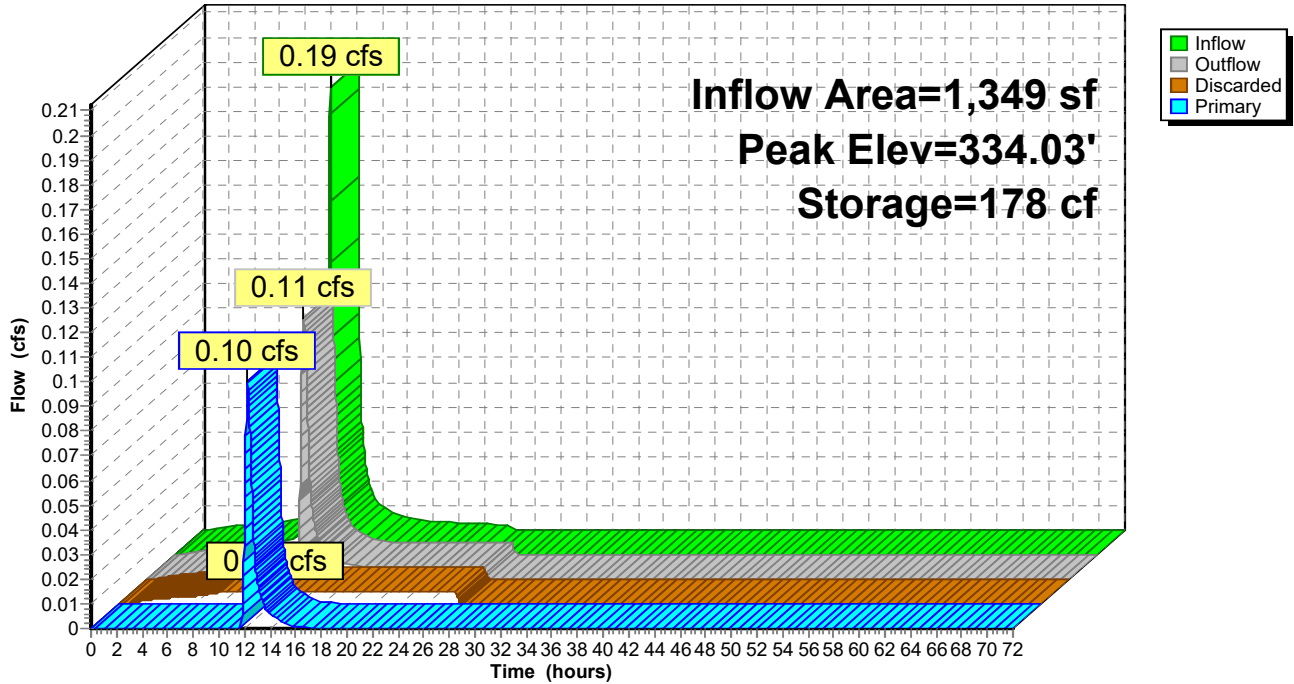
**Pond PV-A5: Pervious Pavement System PV-A5**

Hydrograph



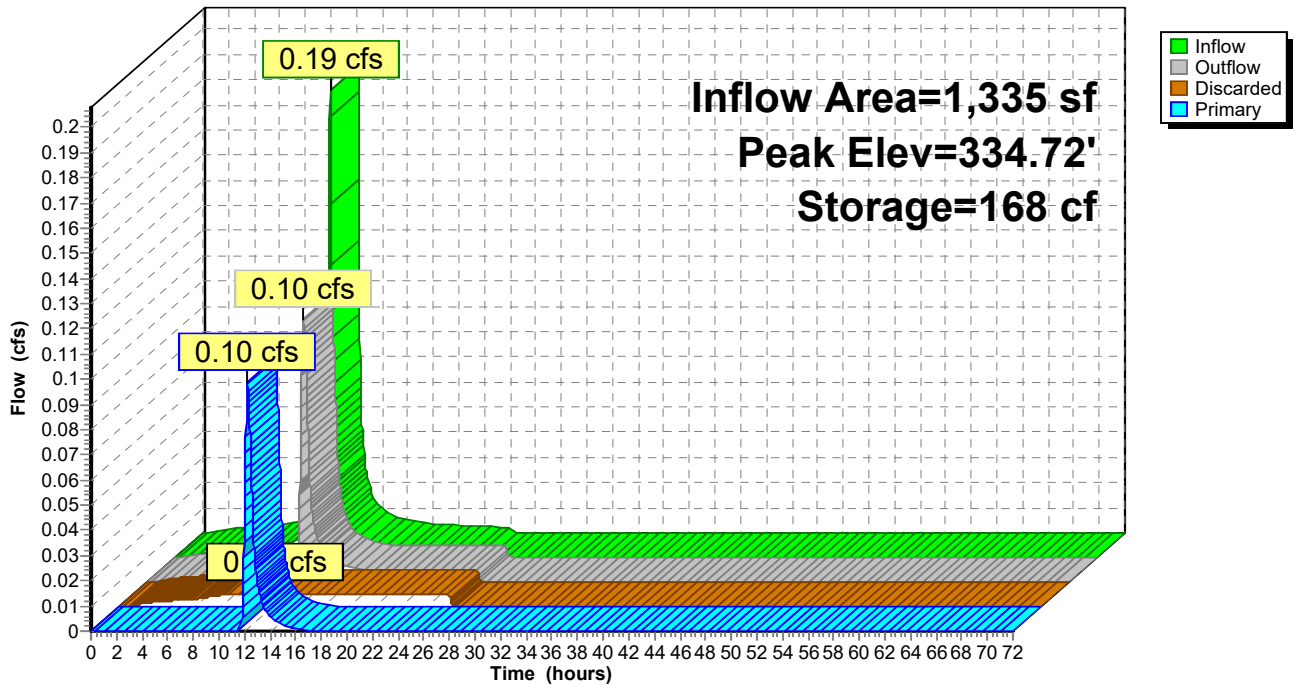
**Pond PV-A6: Pervious Pavement System PV-A6**

Hydrograph



**Pond PV-A7: Pervious Pavement System PV-A7**

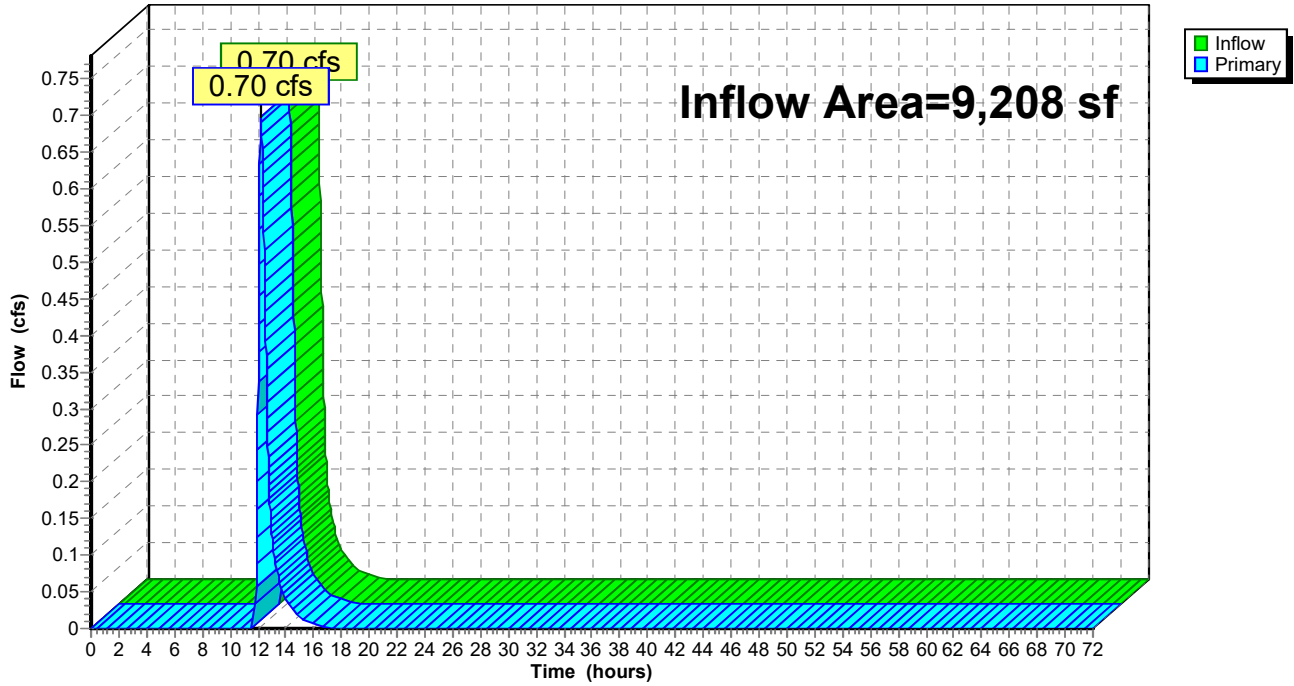
Hydrograph



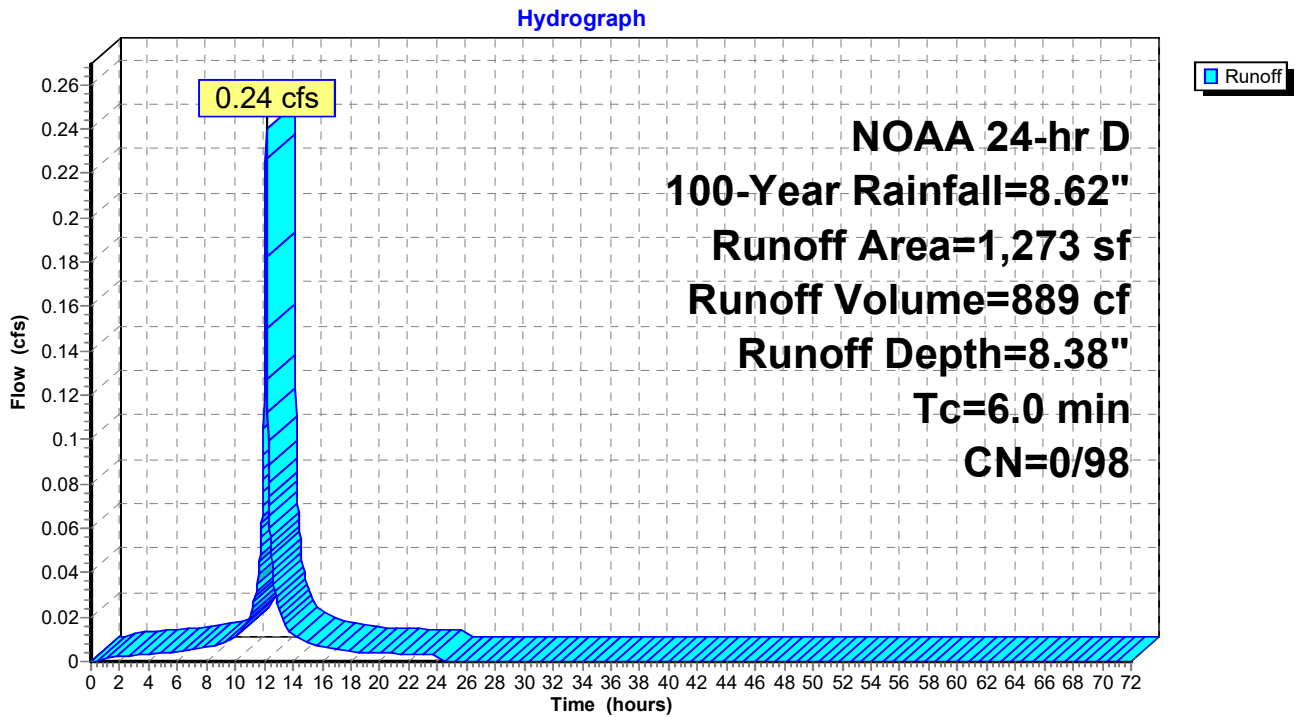


### Link PPV-A: PVIOUS PAVEMENT SYSTEM BUILDING A

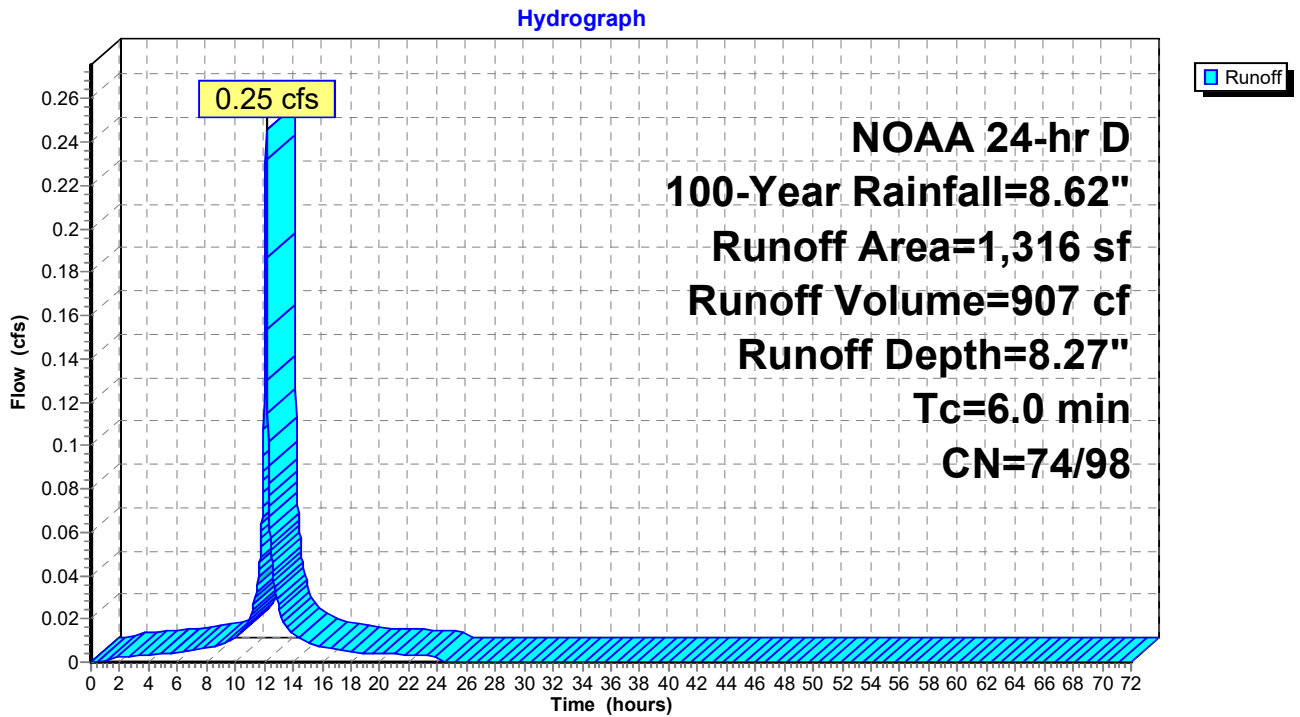
Hydrograph



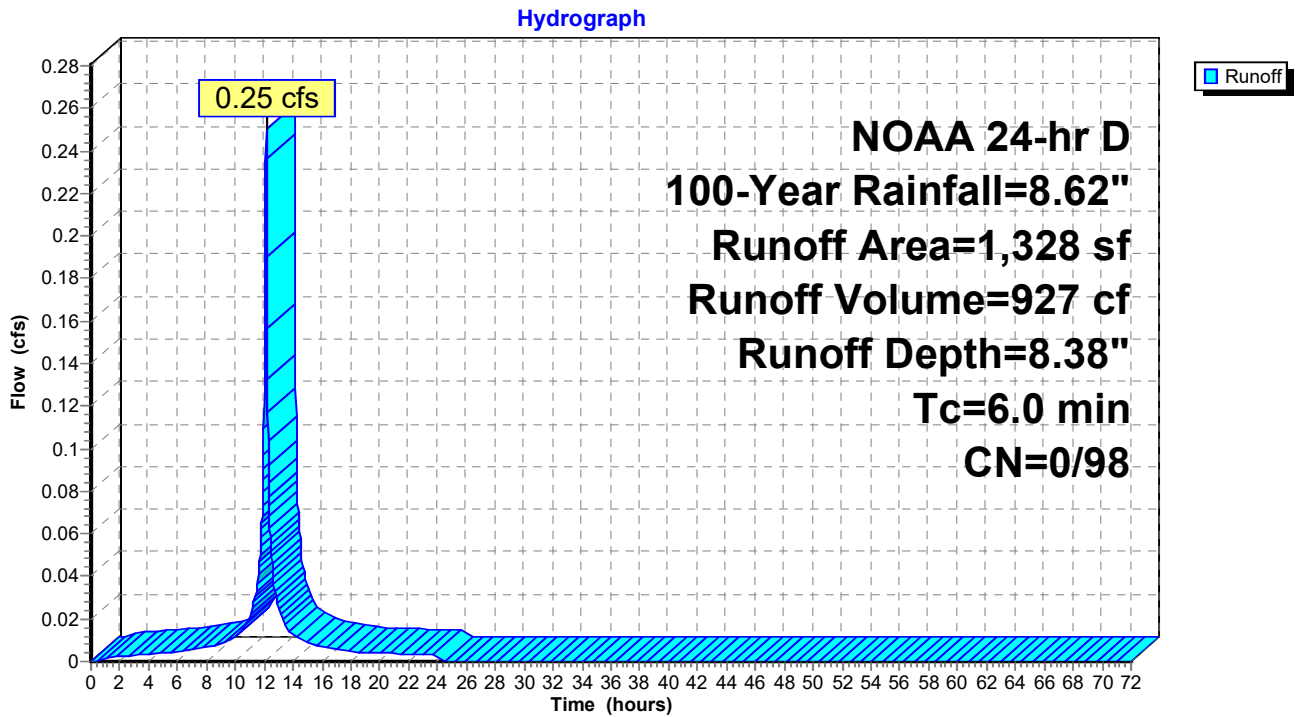
### Subcatchment A-1: Pervious Pavement System PV-A1



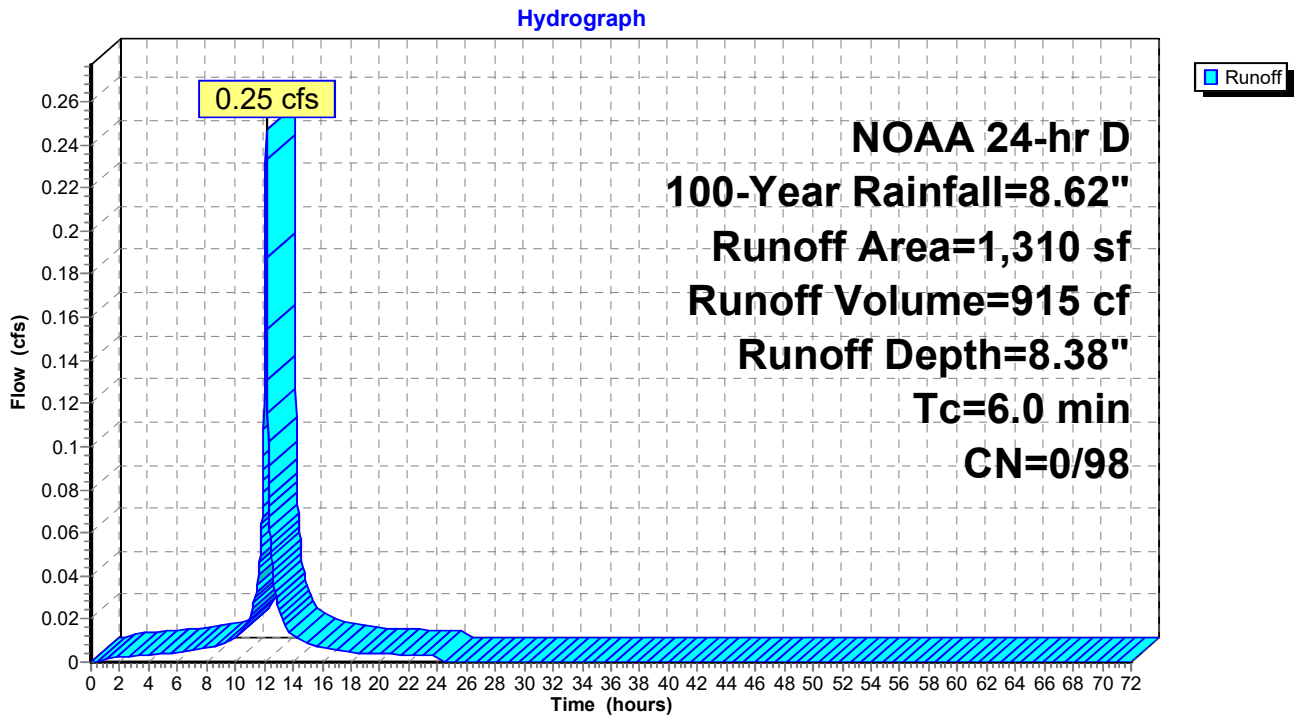
### Subcatchment A-2: Pervious Pavement System PV-A2



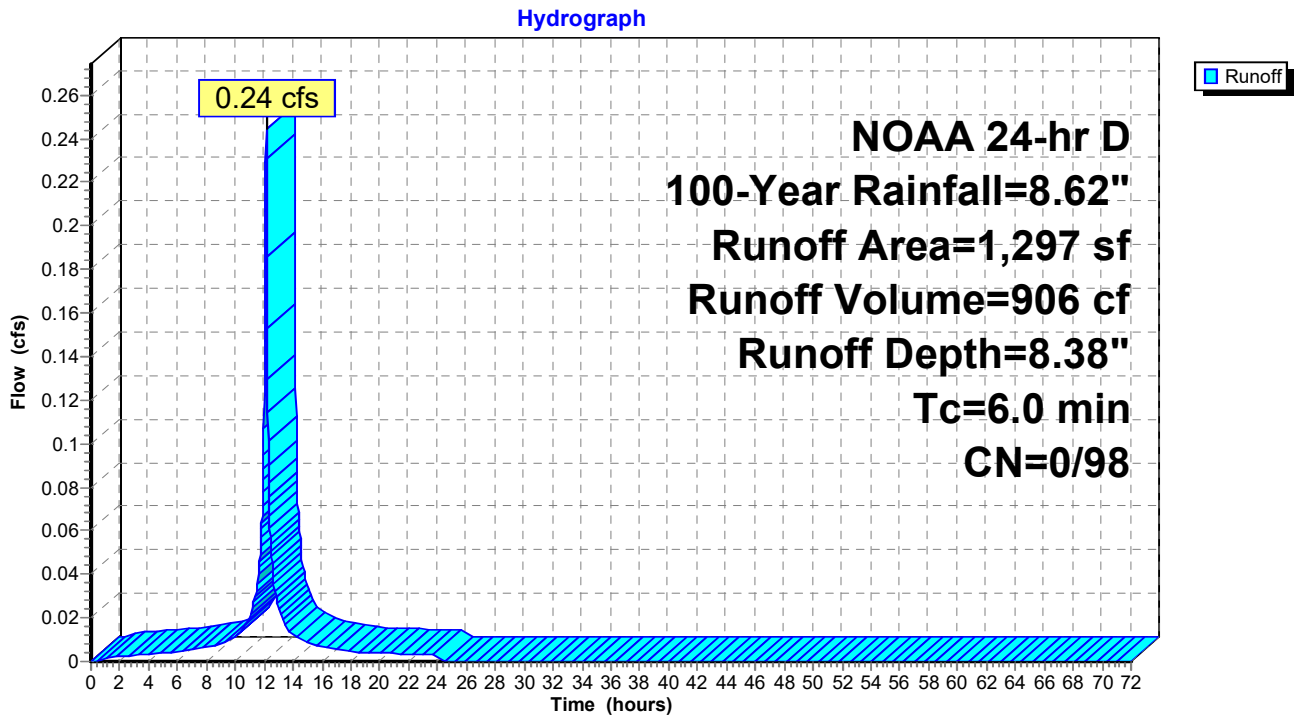
**Subcatchment A-3: Pervious Pavement System PV-A3**



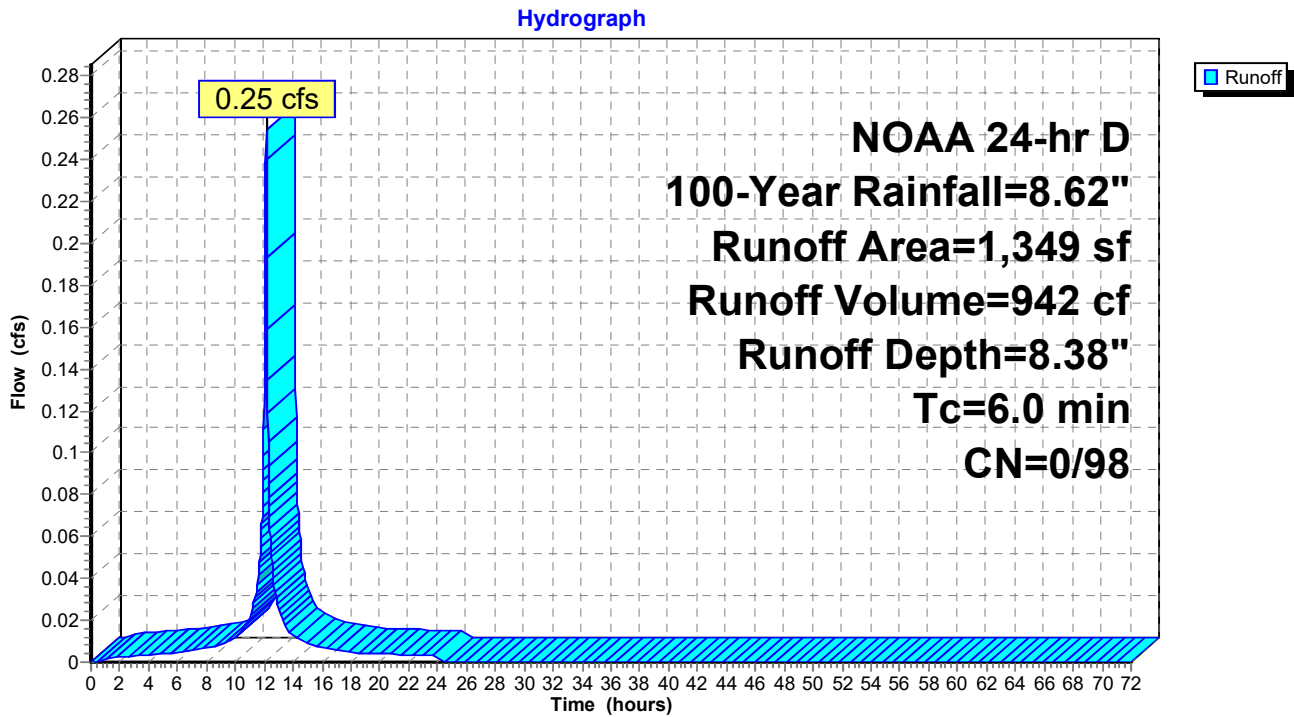
**Subcatchment A-4: Pervious Pavement System PV-A4**



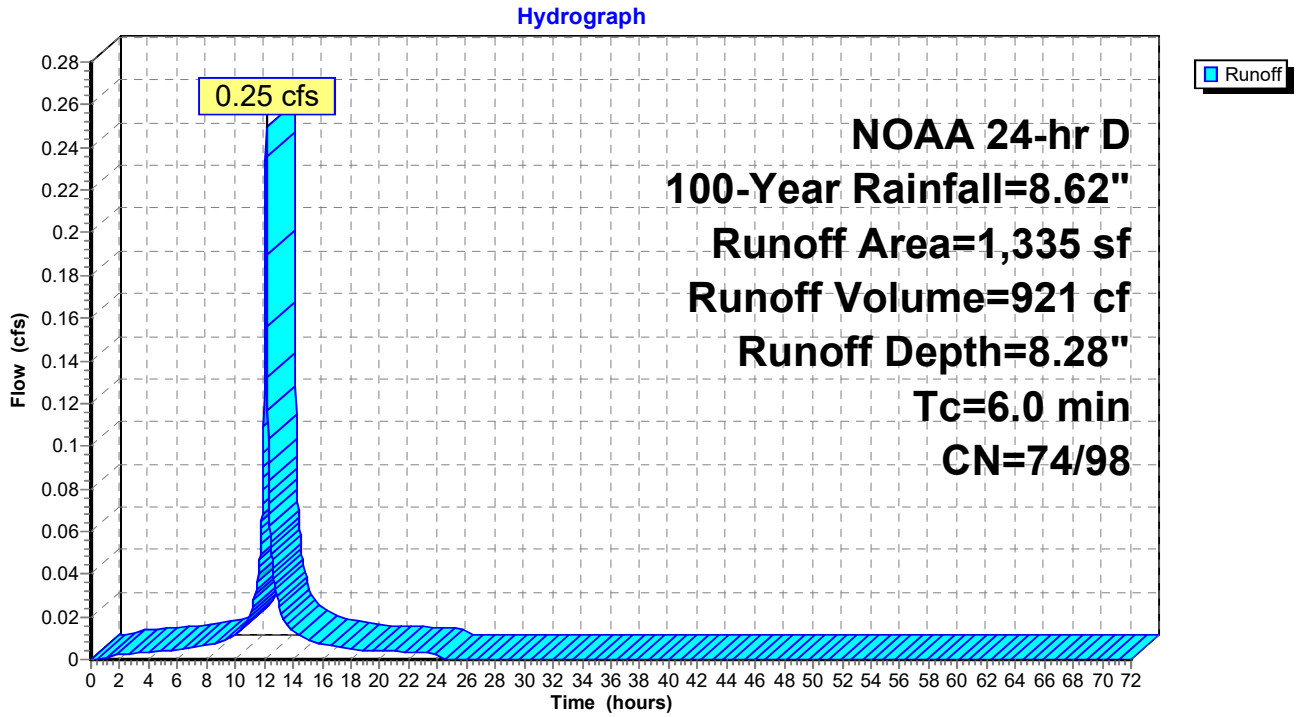
### Subcatchment A-5: Pervious Pavement System PV-A5



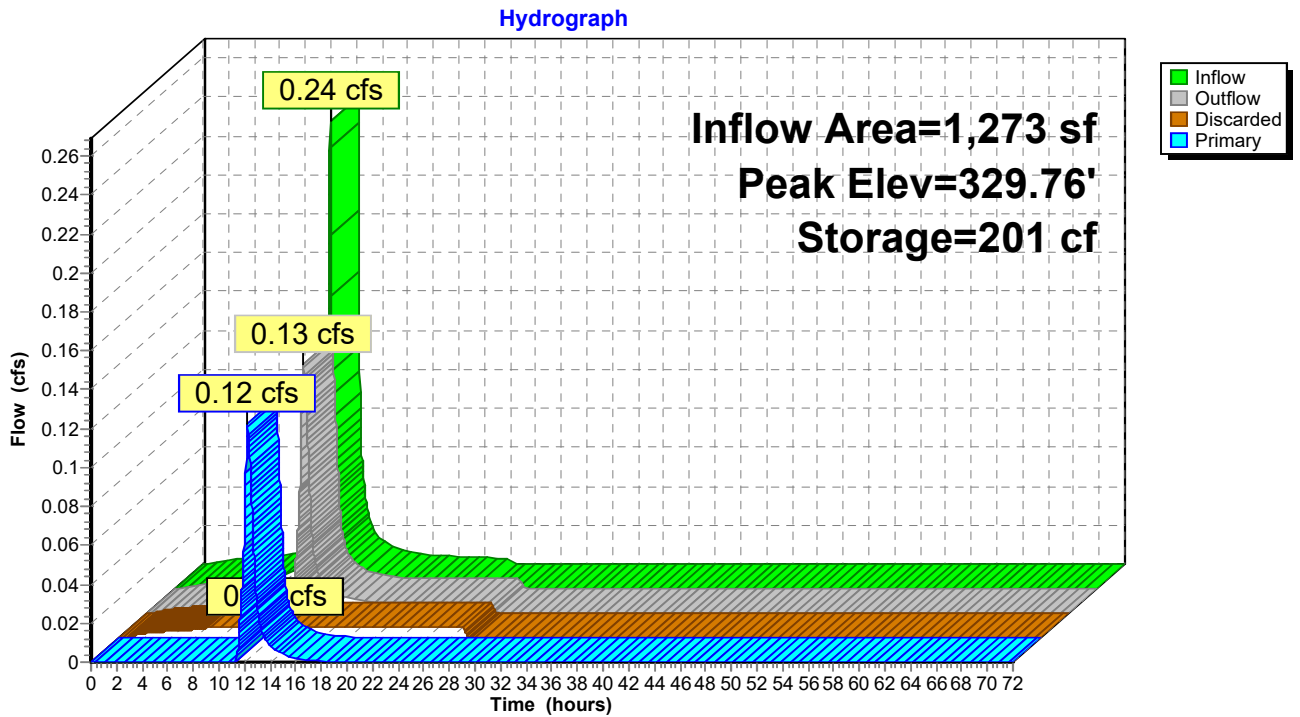
### Subcatchment A-6: Pervious Pavement System PV-A6



**Subcatchment A-7: Pervious Pavement System PV-A7**

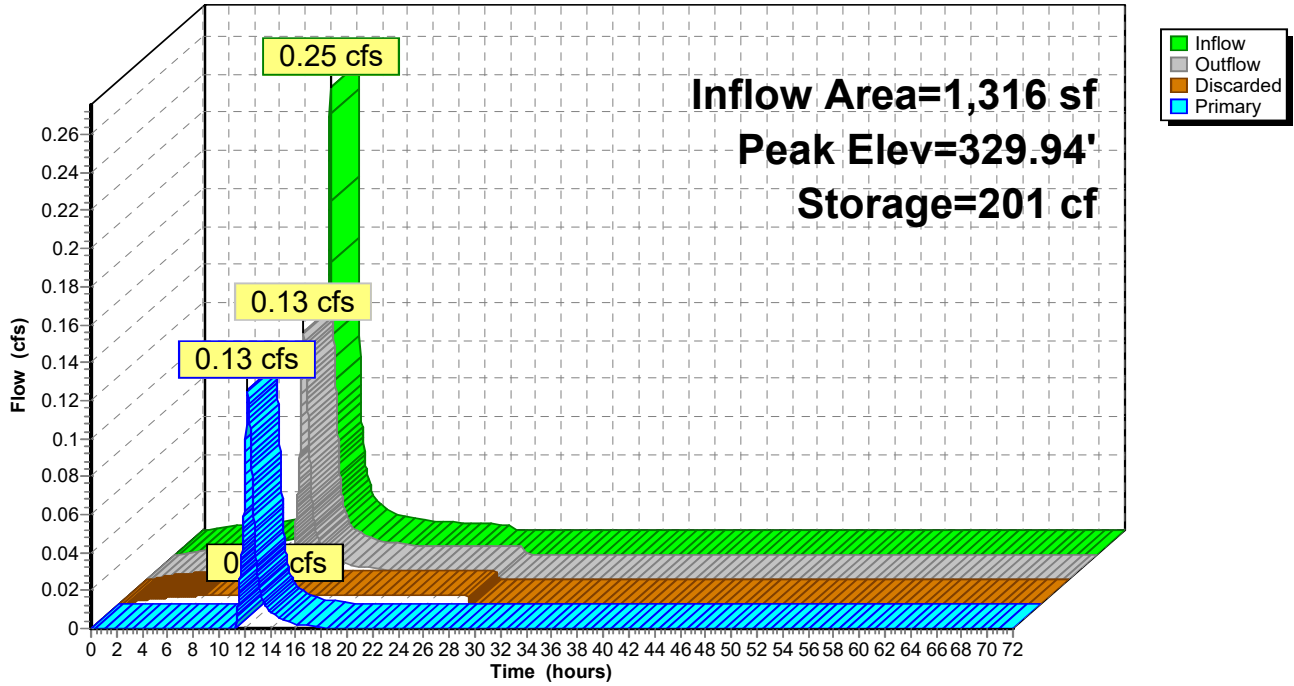


**Pond PV-A1: Pervious Pavement System PV-A1**



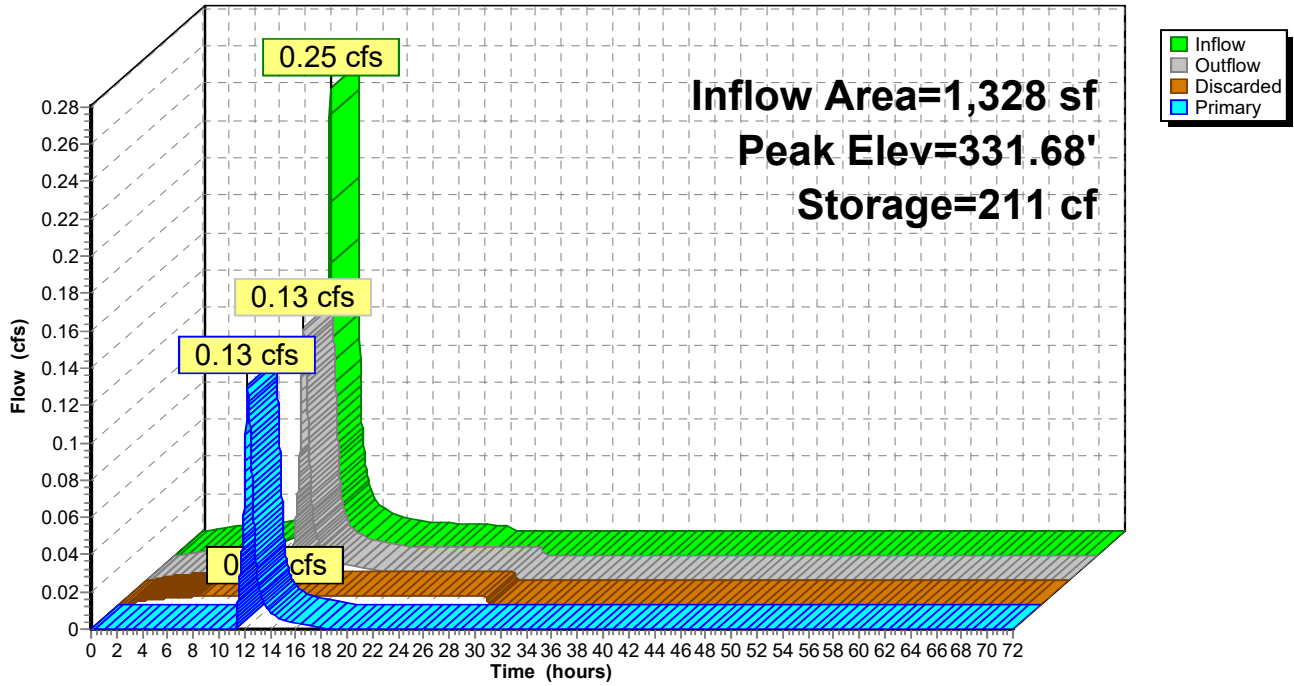
**Pond PV-A2: Pervious Pavement System PV-A2**

Hydrograph



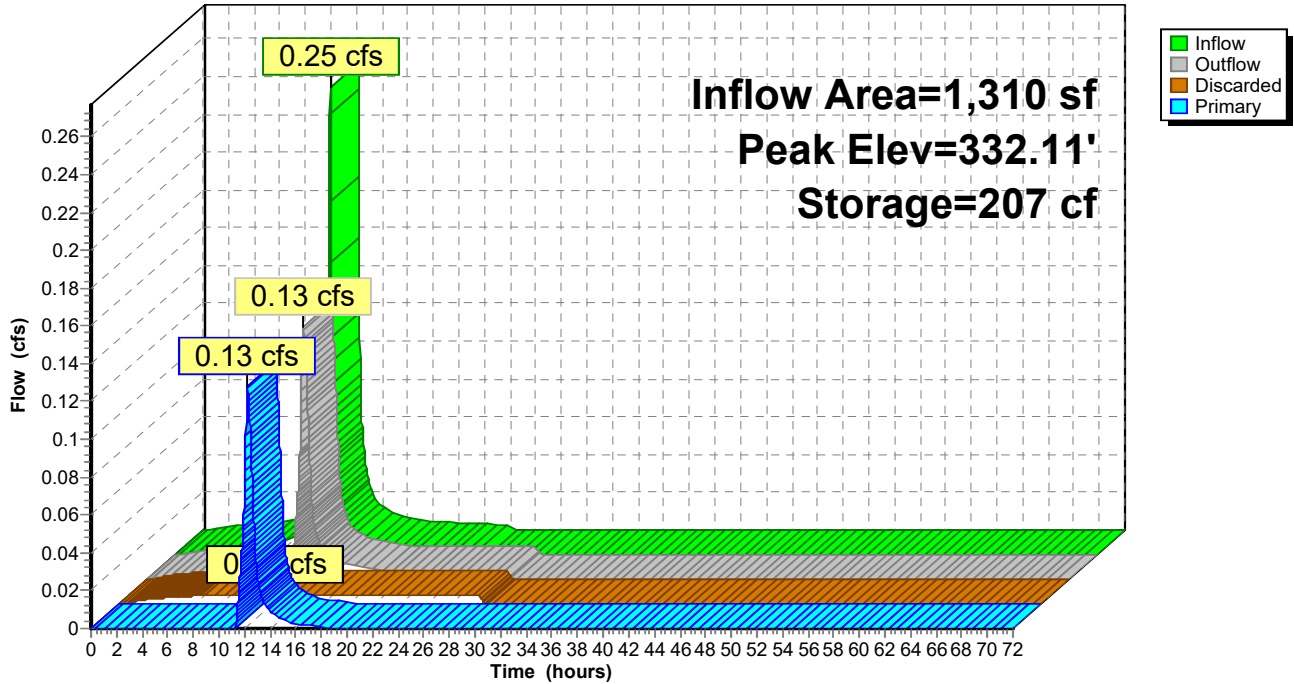
**Pond PV-A3: Pervious Pavement System PV-A3**

Hydrograph



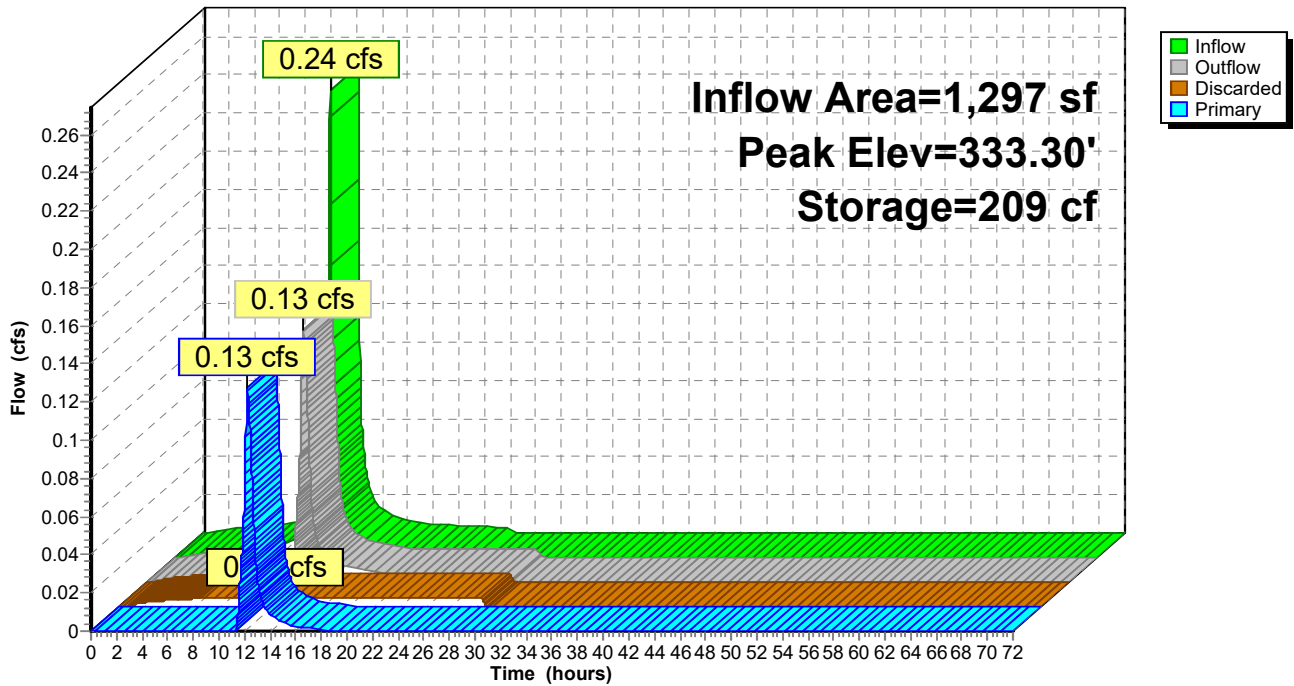
**Pond PV-A4: Pervious Pavement System PV-A4**

Hydrograph



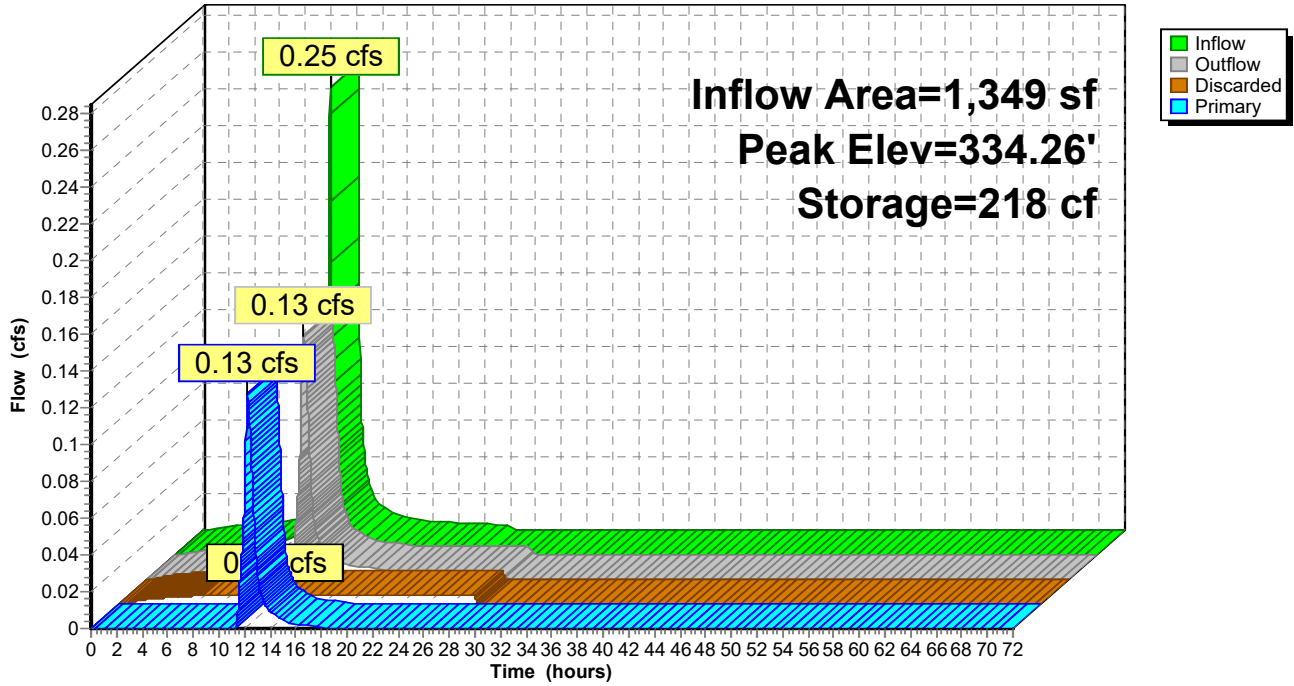
**Pond PV-A5: Pervious Pavement System PV-A5**

Hydrograph



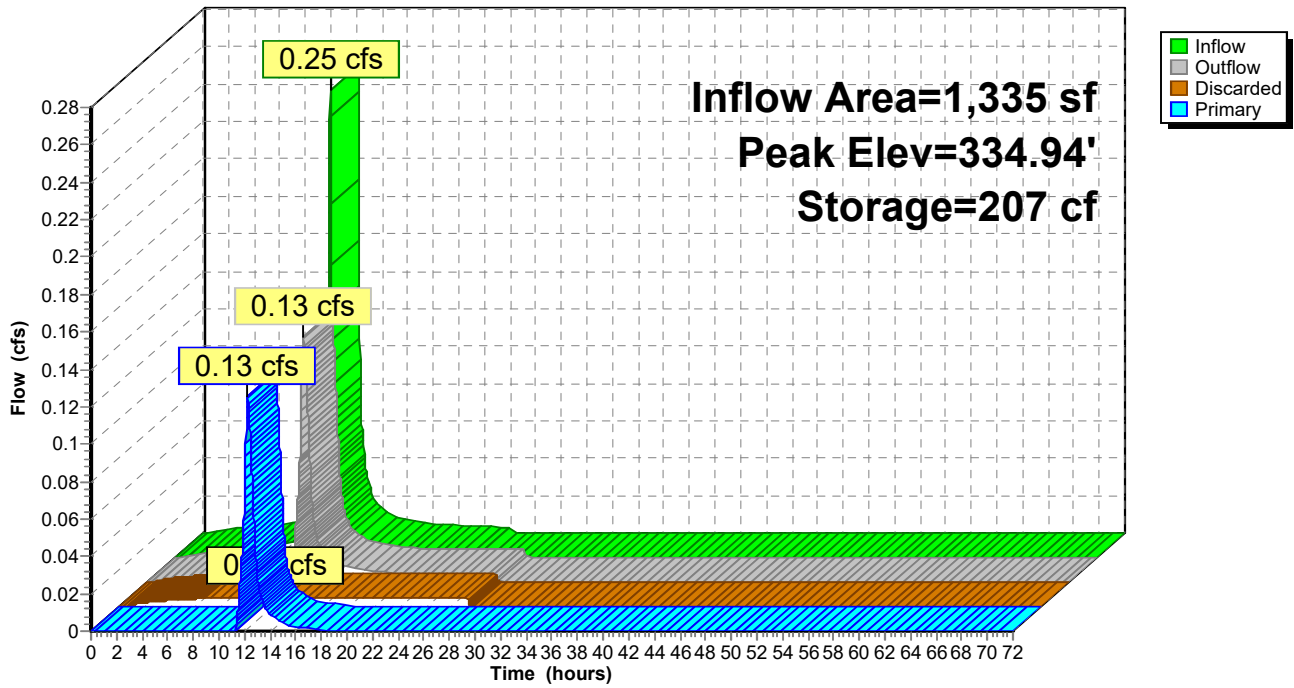
**Pond PV-A6: Pervious Pavement System PV-A6**

Hydrograph



**Pond PV-A7: Pervious Pavement System PV-A7**

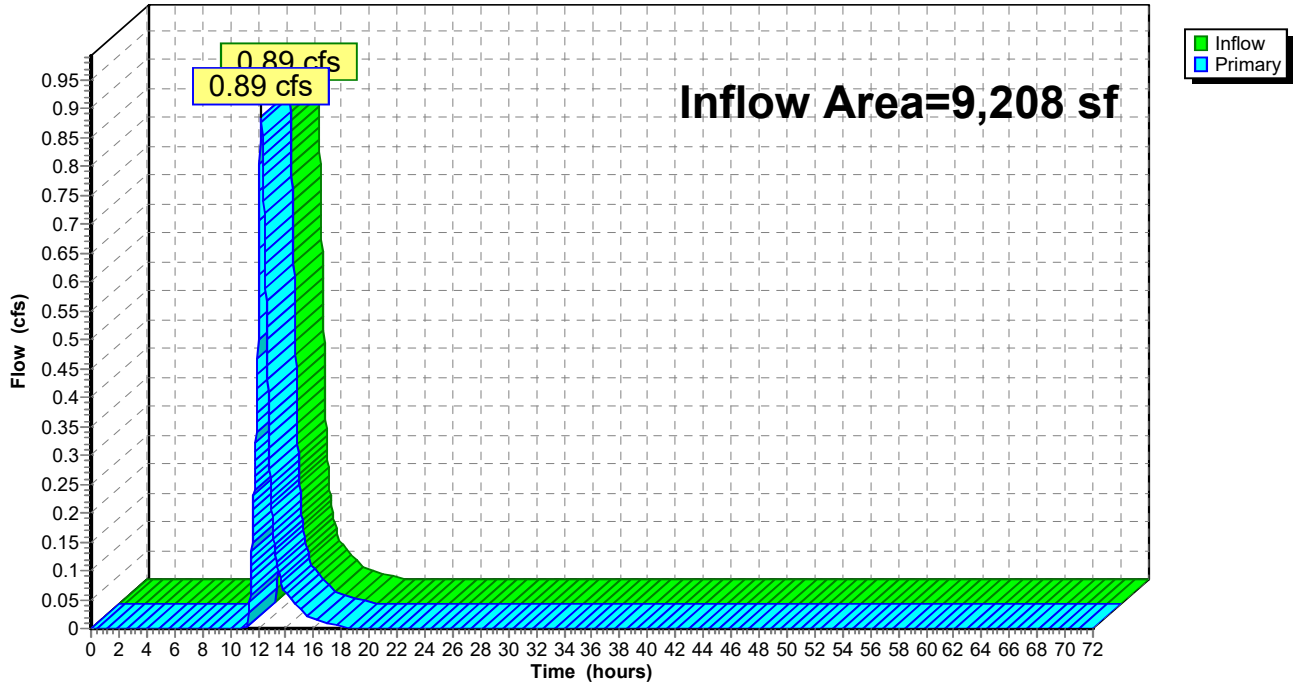
Hydrograph

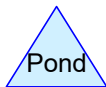
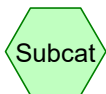
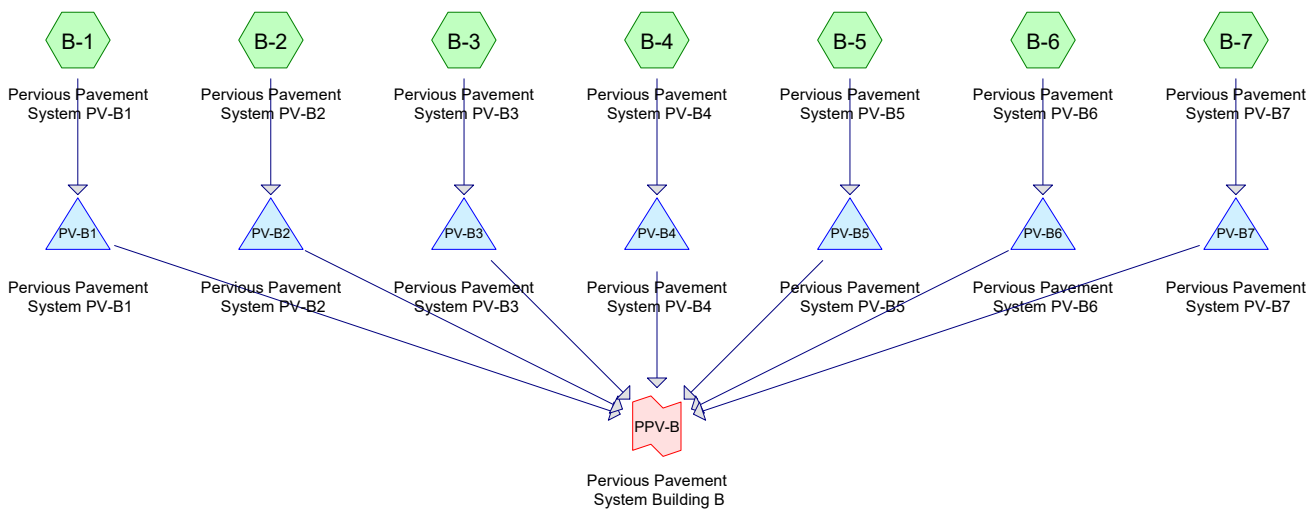




### Link PPV-A: PVIOUS PAVEMENT SYSTEM BUILDING A

Hydrograph





**Routing Diagram for 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-B**  
 Prepared by Stonefield Engineering & Design, Printed 2/23/2023  
 HydroCAD® 10.20-2g s/n 10626 © 2022 HydroCAD Software Solutions LLC

# 2023-02-13\_HydroCAD Calcs Pervious Pavement PV-B1

Prepared by Stonefield Engineering & Design

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Printed 2/23/2023

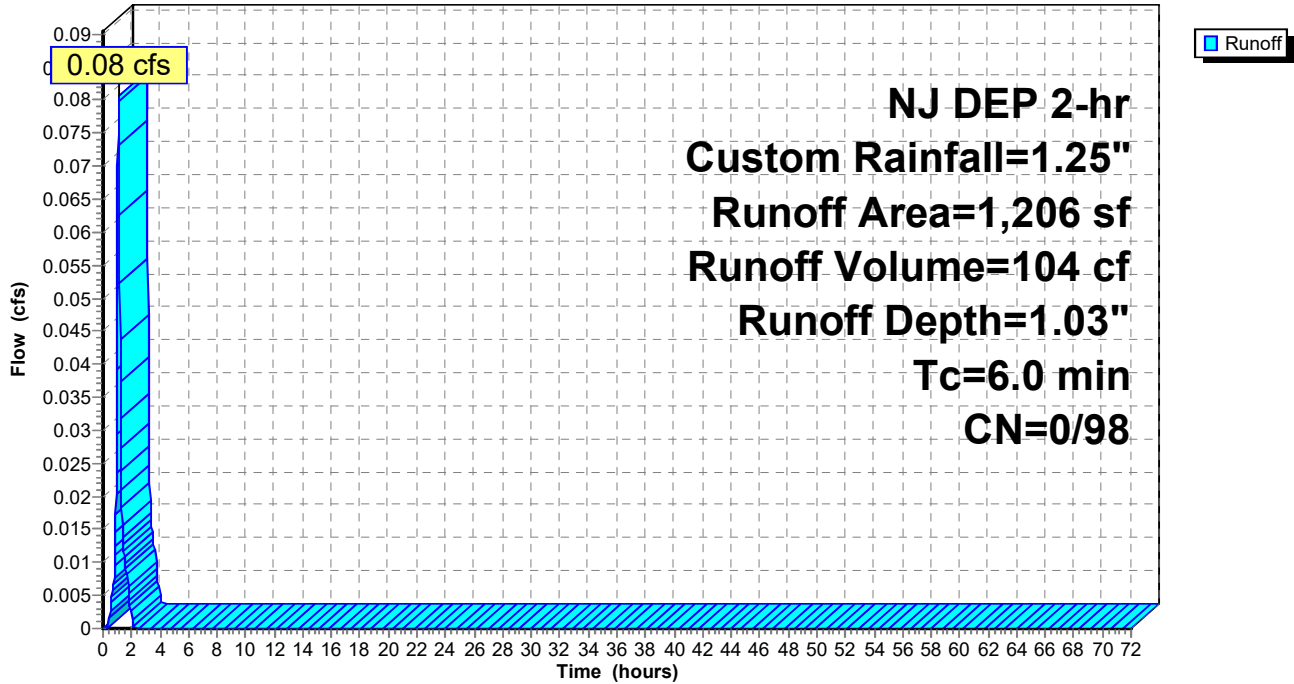
Page 2

## Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Custom	NJ DEP 2-hr		Default	2.00	1	1.25	2
2	WQ	NJ DEP 2-hr		Default	2.00	1	1.25	2
3	2-Year	NOAA 24-hr	D	Default	24.00	1	3.47	2
4	10-Year	NOAA 24-hr	D	Default	24.00	1	5.23	2
5	25-Year	NOAA 24-hr	D	Default	24.00	1	6.43	2
6	100-Year	NOAA 24-hr	D	Default	24.00	1	8.62	2

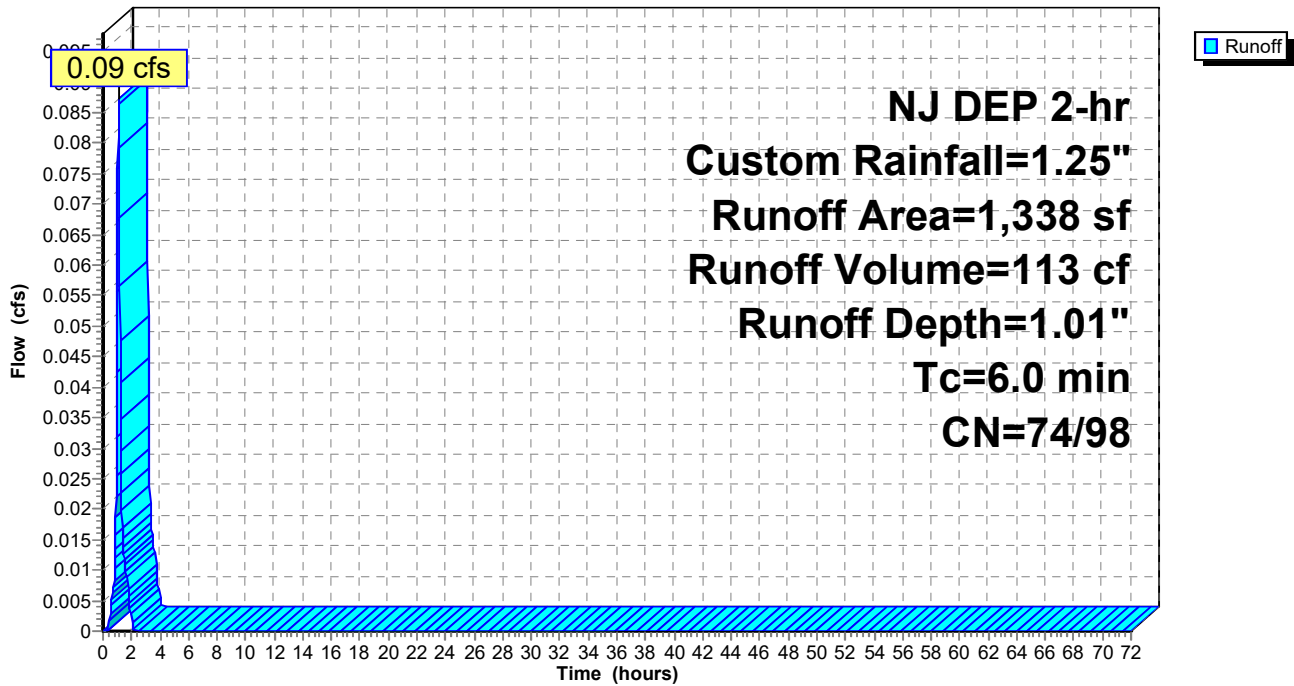
**Subcatchment B-1: Pervious Pavement System PV-B1**

Hydrograph



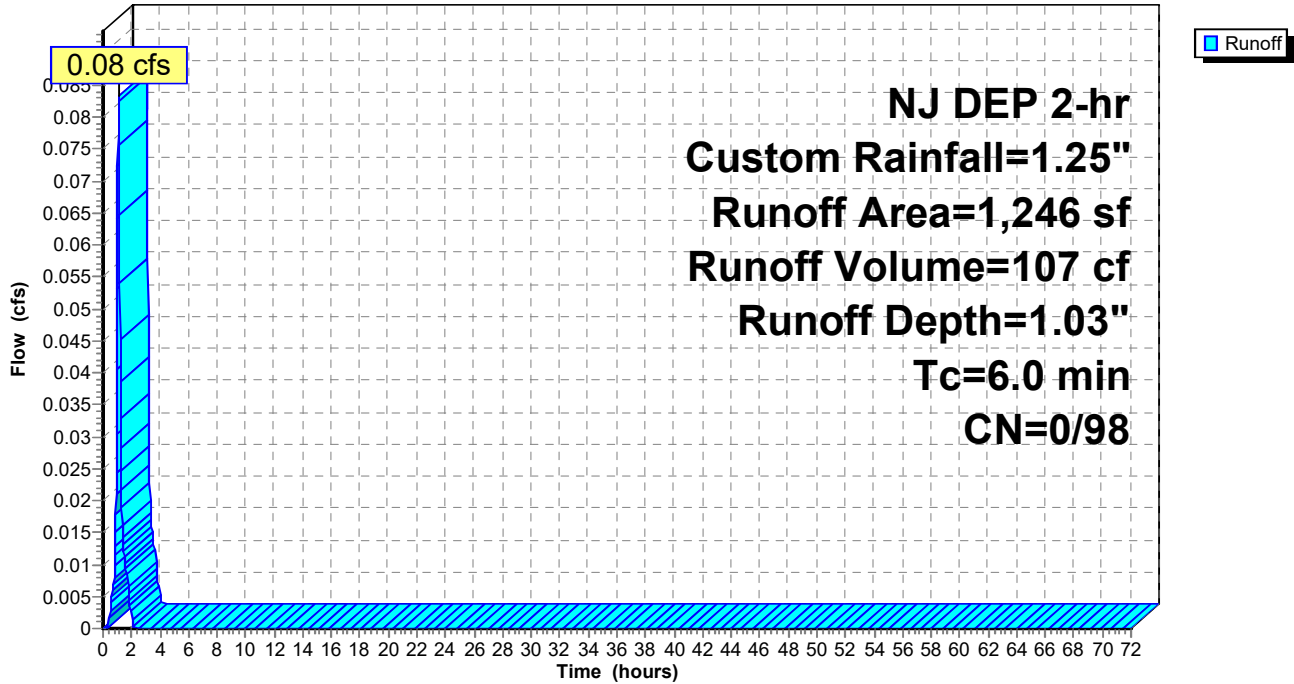
**Subcatchment B-2: Pervious Pavement System PV-B2**

Hydrograph



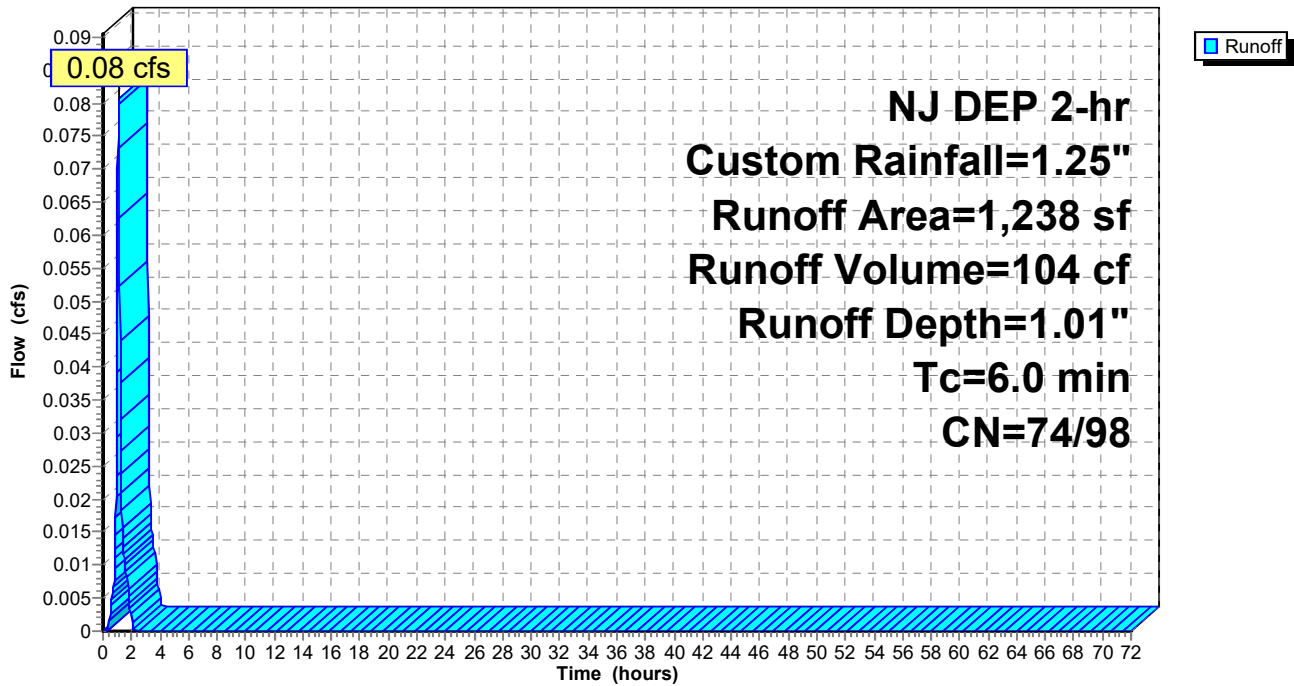
**Subcatchment B-3: Pervious Pavement System PV-B3**

Hydrograph



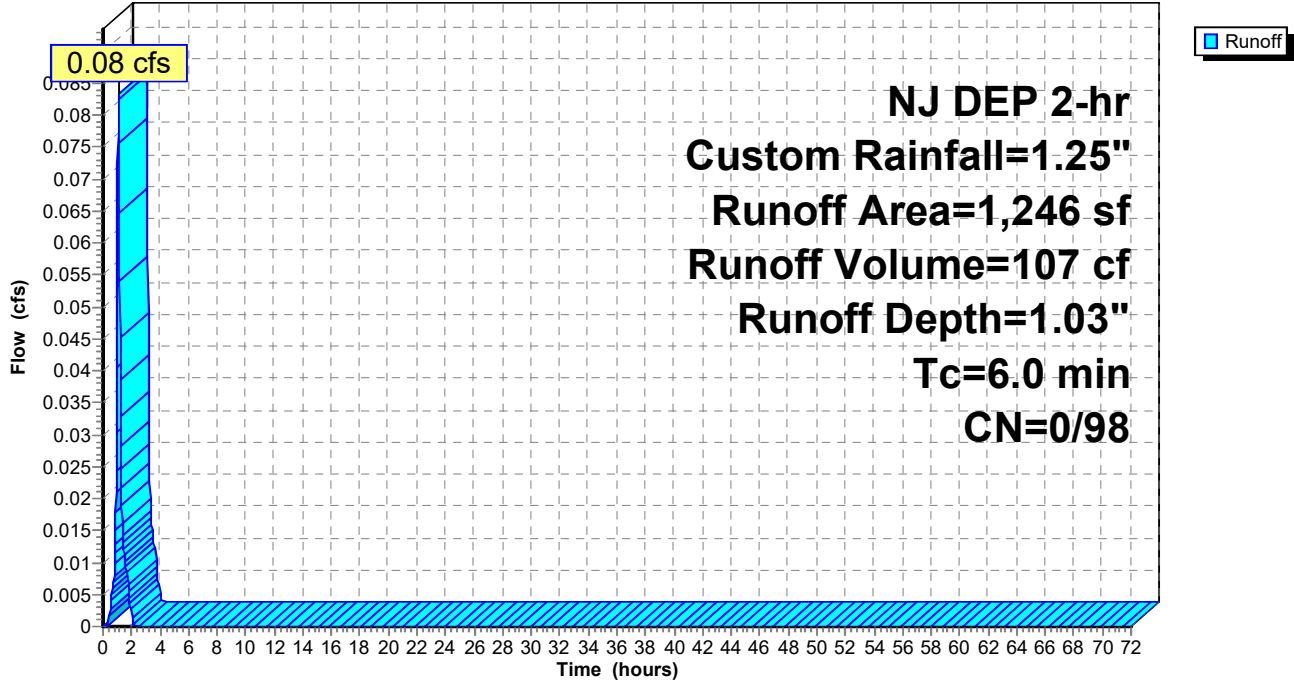
**Subcatchment B-4: Pervious Pavement System PV-B4**

Hydrograph



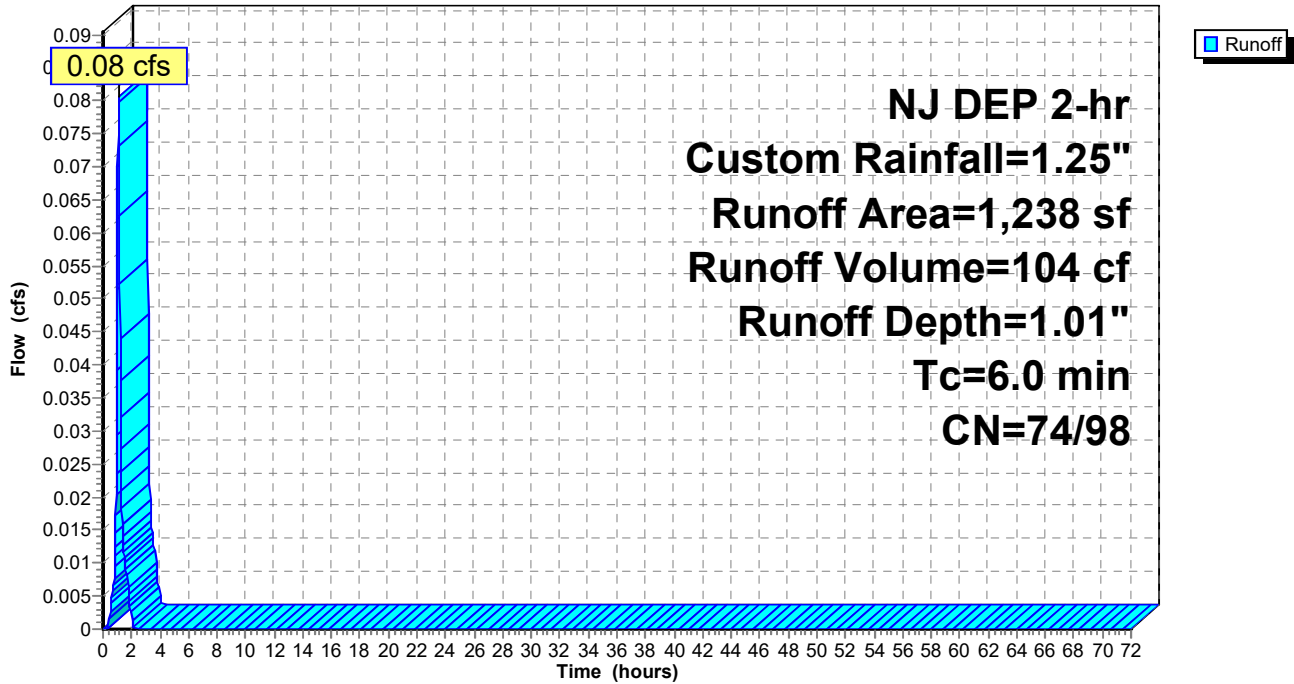
**Subcatchment B-5: Pervious Pavement System PV-B5**

Hydrograph

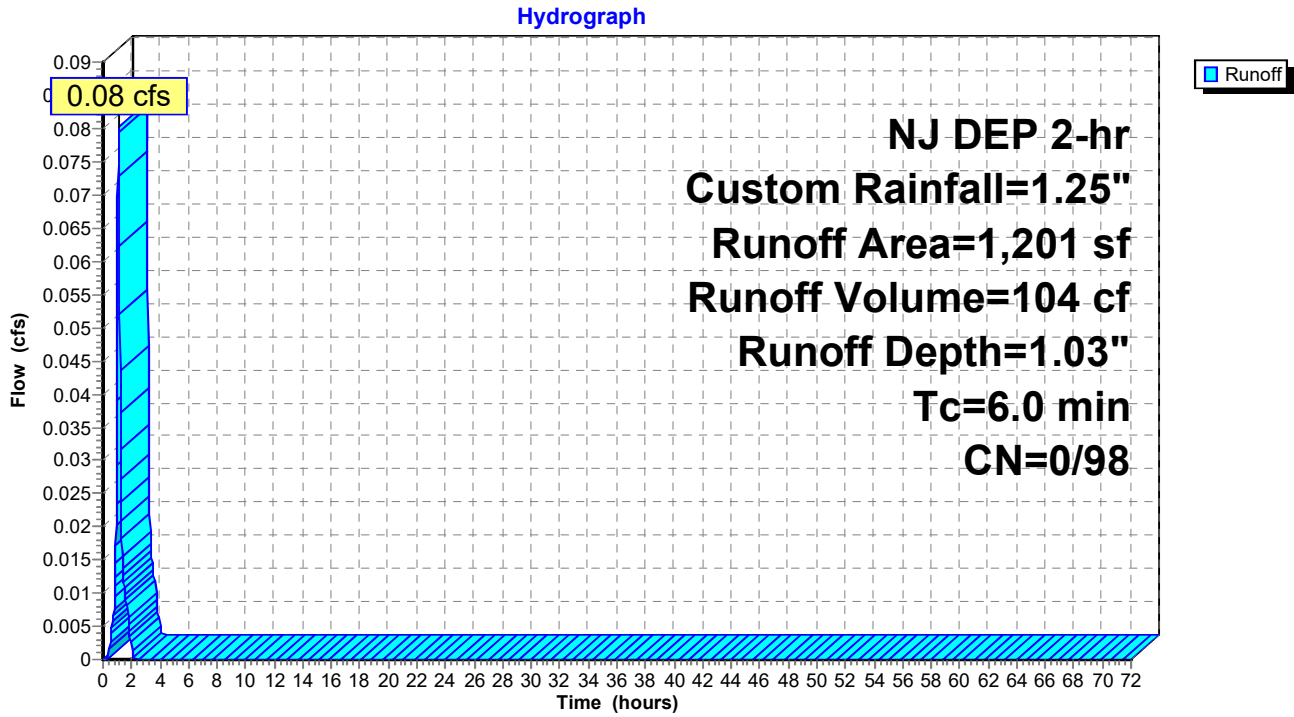


**Subcatchment B-6: Pervious Pavement System PV-B6**

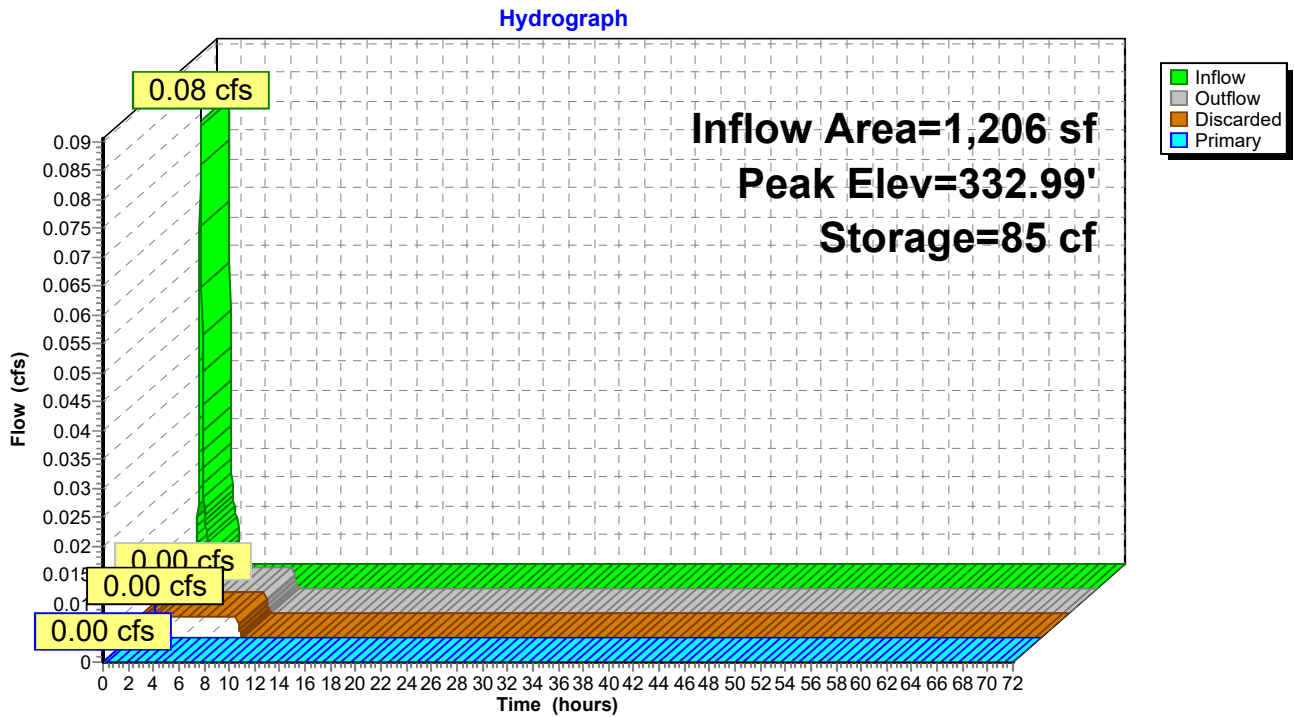
Hydrograph



**Subcatchment B-7: Pervious Pavement System PV-B7**

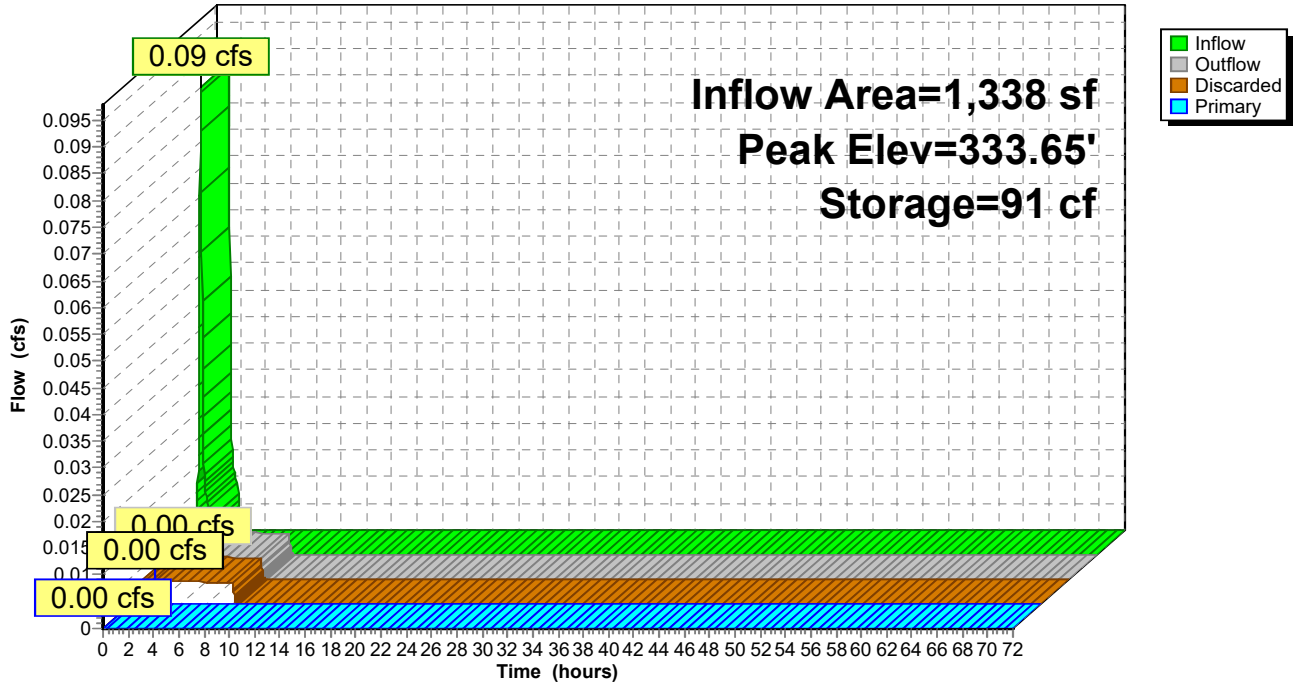


**Pond PV-B1: Pervious Pavement System PV-B1**



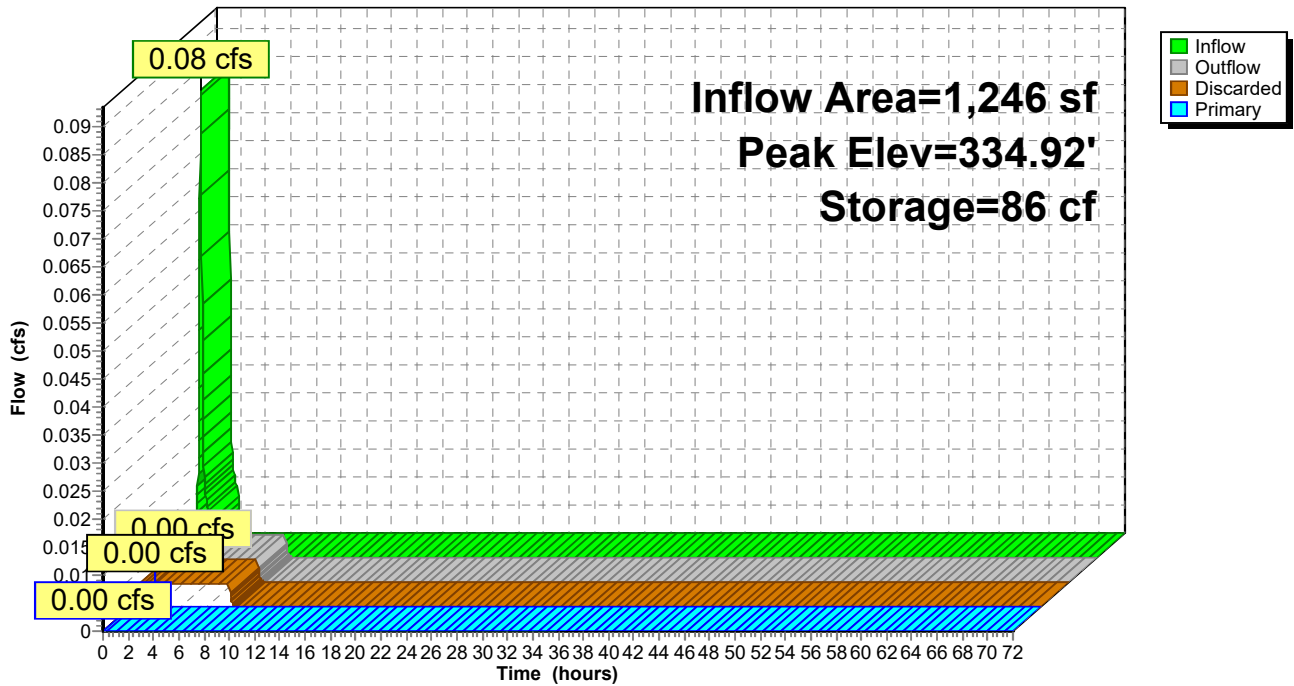
**Pond PV-B2: Pervious Pavement System PV-B2**

Hydrograph



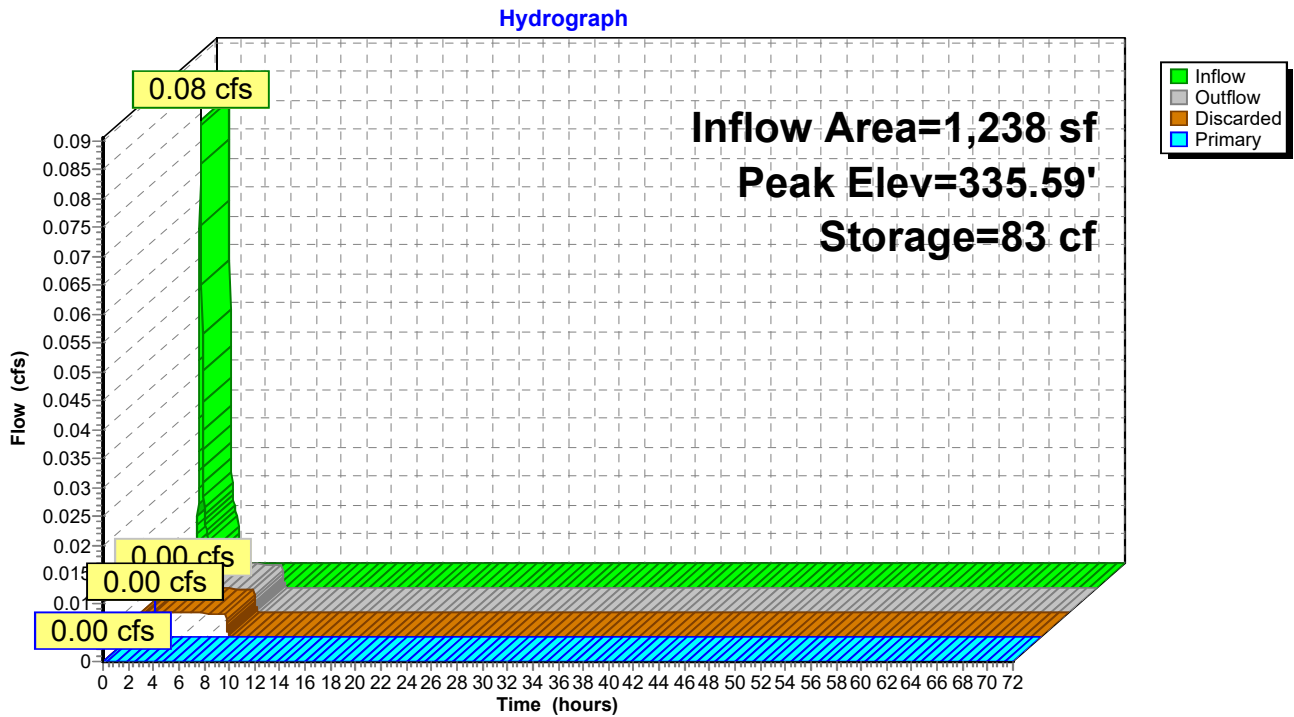
**Pond PV-B3: Pervious Pavement System PV-B3**

Hydrograph

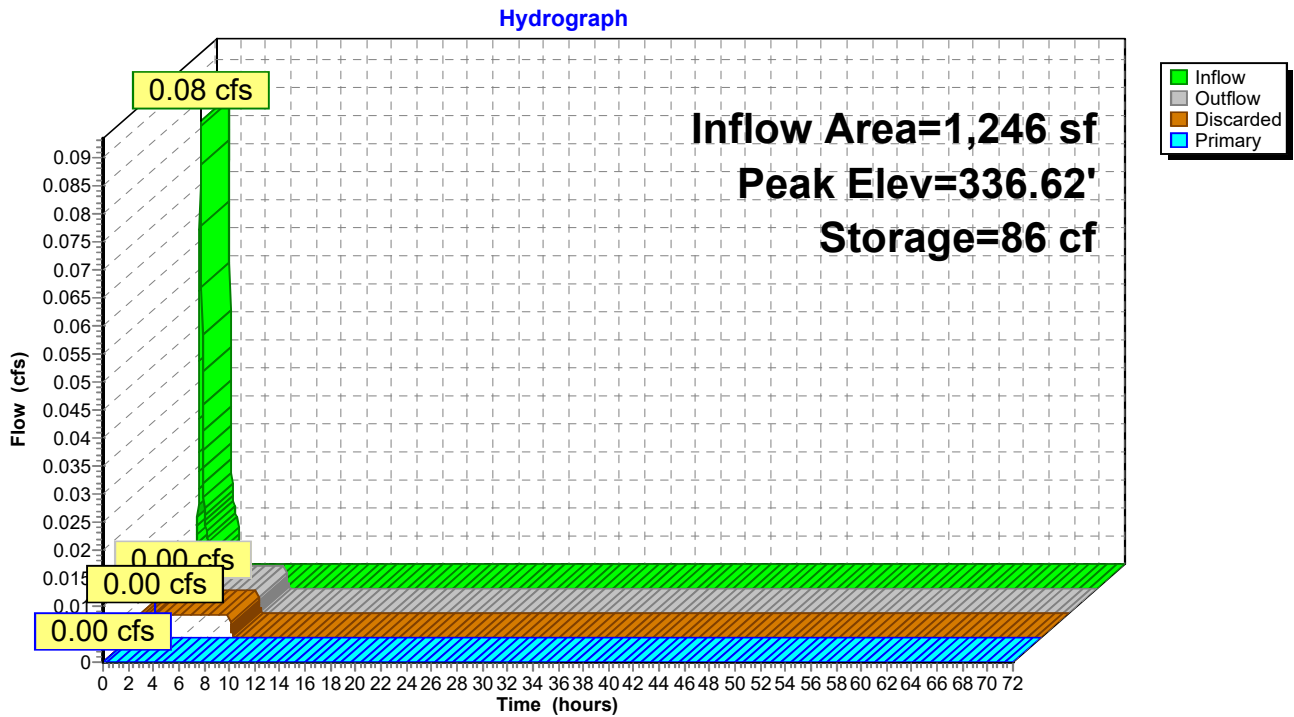




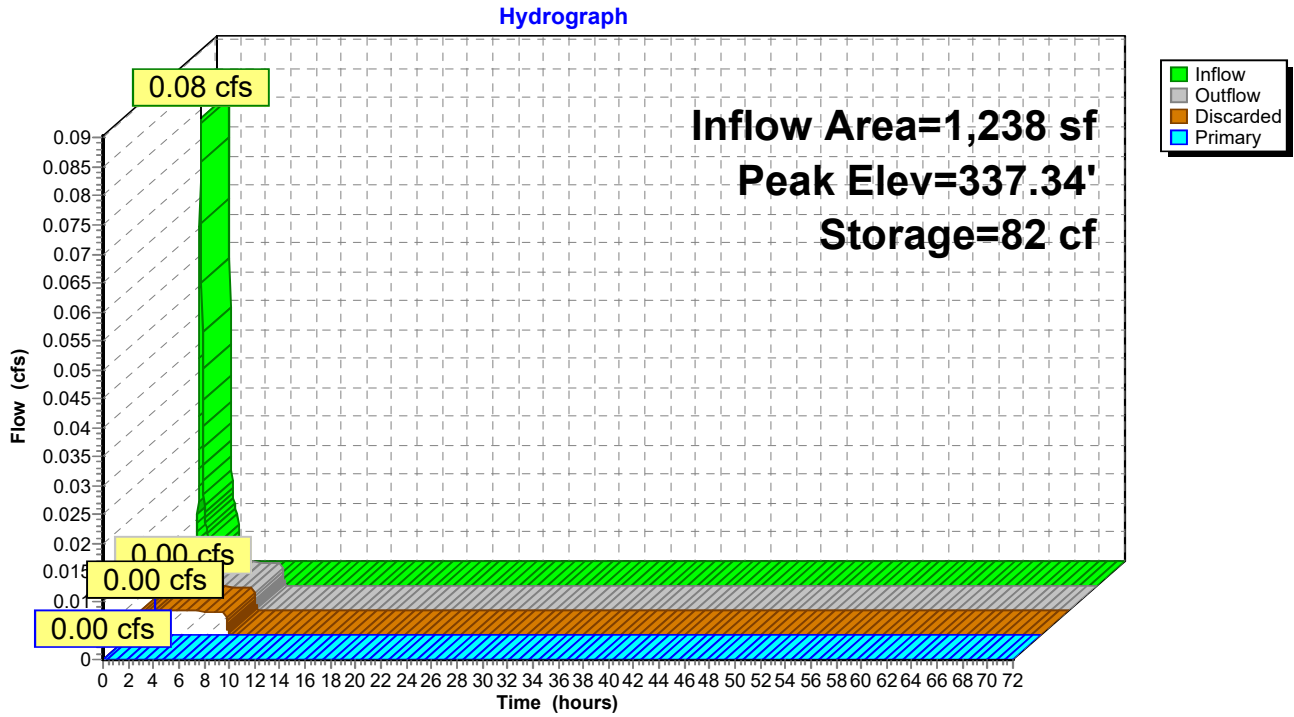
**Pond PV-B4: Pervious Pavement System PV-B4**



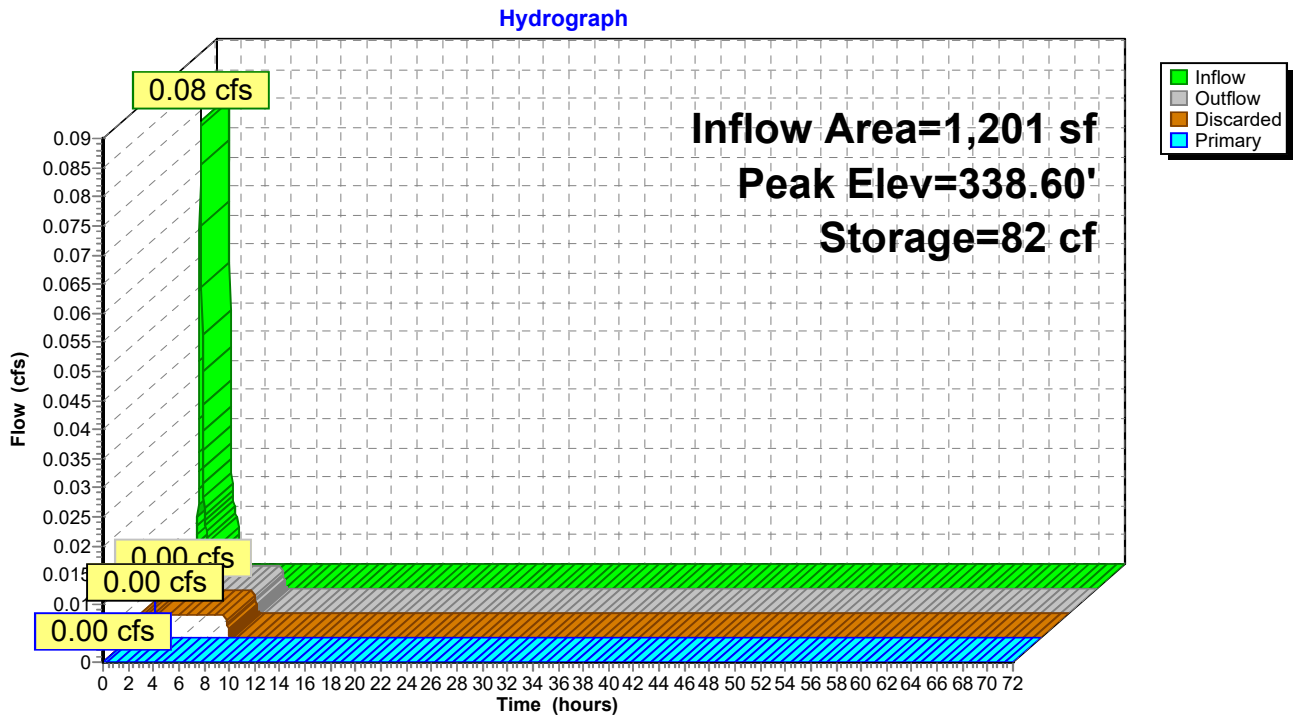
**Pond PV-B5: Pervious Pavement System PV-B5**



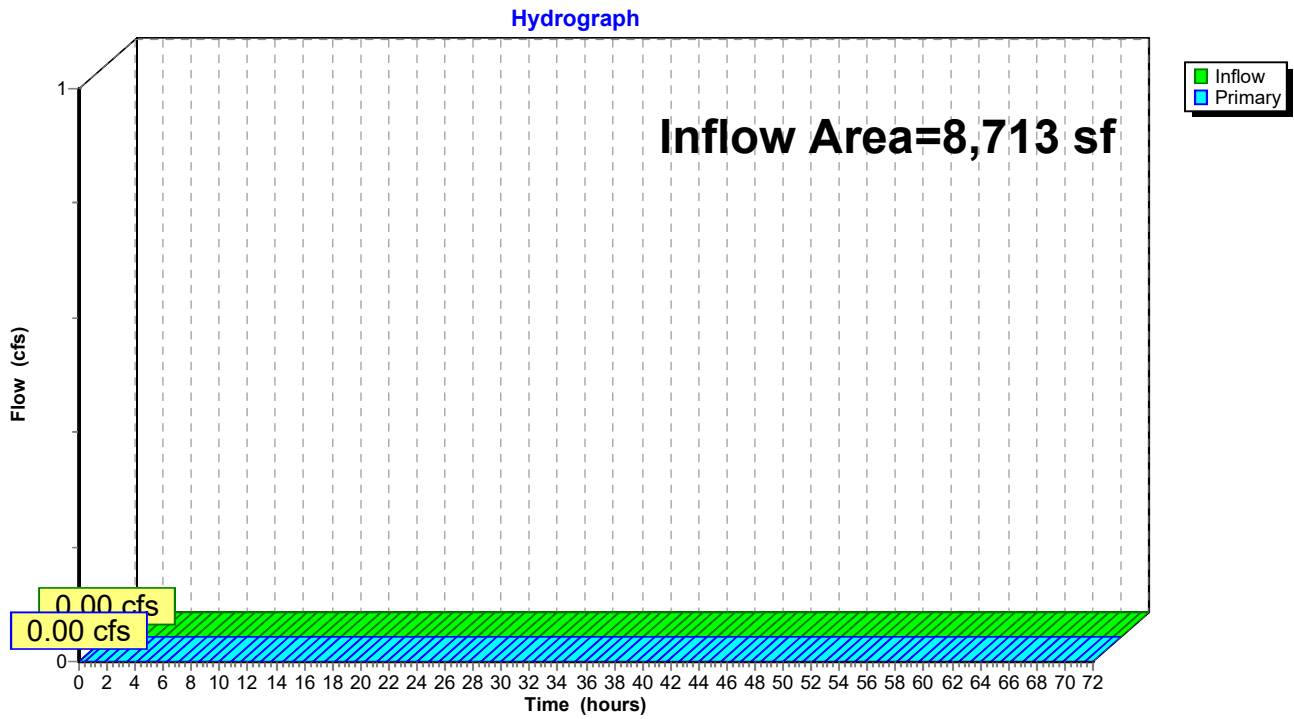
**Pond PV-B6: Pervious Pavement System PV-B6**



**Pond PV-B7: Pervious Pavement System PV-B7**

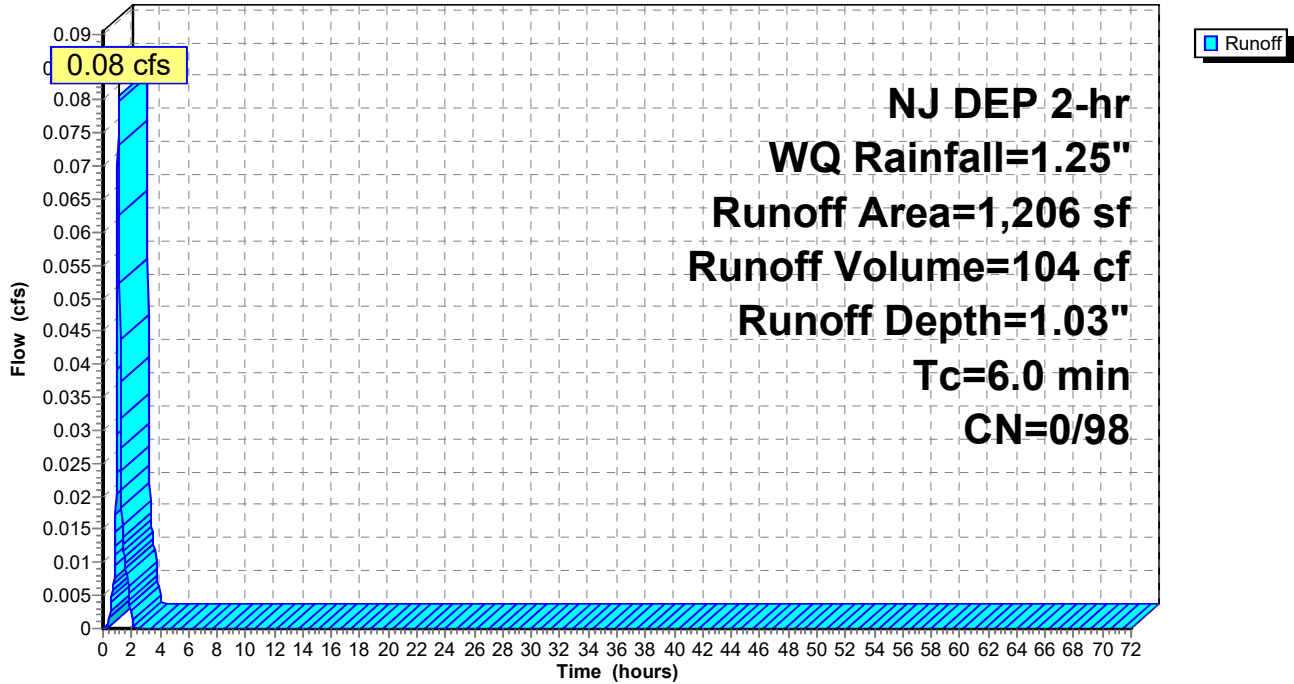


### Link PPV-B: Pervious Pavement System Building B



**Subcatchment B-1: Pervious Pavement System PV-B1**

Hydrograph



**Subcatchment B-2: Pervious Pavement System PV-B2**

Hydrograph

