

Ministers Estates

39 Sunset Rock Road
Andover, Massachusetts

SUPPLEMENTAL INFORMATION

For
Drainage Report

Prepared For:

MINSTERS LANE, LLC

42 School Street
Andover, MA 01810



Daniel Koravos, P.E.

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Ministers Estates

Andover, Massachusetts

Pre-Development vs. Post-Development Drainage Summary Tables

Point #1 (A)

Design Storm	Peak Flow Rate		
	Pre-Dev. (cfs)	Post-Dev. (cfs)	Δ (cfs)
2	0.0	0.0	0.0
10	0.0	0.0	0.0
25	0.1	0.2	0.1 ¹
100	0.6	0.7	0.1 ¹

Point #2 (B)

Design Storm	Peak Flow Rate		
	Pre-Dev. (cfs)	Post-Dev. (cfs)	Δ (cfs)
2	0.5	0.0	0.5
10	2.9	2.9	0.0
25	5.0	4.4	(0.6)
100	8.6	5.7	(2.9)

¹An increase of this magnitude is negligible and considered to be zero.

Point #3 (C)

Design Storm	Peak Flow Rate		
	Pre-Dev. (cfs)	Post-Dev. (cfs)	Δ (cfs)
2	0.0	0.0	0.0
10	0.0	0.0	0.0
25	0.0	0.0	0.0
100	0.2	0.1	(0.1)

Point #4 (D)

Design Storm	Peak Flow Rate		
	Pre-Dev. (cfs)	Post-Dev. (cfs)	Δ (cfs)
2	0.0	0.0	0.0
10	0.1	0.0	(0.1)
25	0.2	0.1	(0.1)
100	1.0	1.1	0.1 ¹

¹An increase of this magnitude is negligible and considered to be zero.

Point #5 (E)

Design Storm	Peak Flow Rate		
	Pre-Dev. (cfs)	Post-Dev. (cfs)	Δ (cfs)
2	0.0	0.0	0.0
10	0.1	0.1	0.0
25	0.4	0.3	(0.1)
100	1.3	0.7	(0.6)

Inlet Capacity Analysis (Catch Basin #3)

Orifice Flow:

$$Q = C A (2gh)^{1/2}$$

Where: Q = capacity (cfs)
C = 0.60 constant
A = area in square feet (4.2 sf for Double Inlet 5520M; See detail on Sheet 7 of the Plan Set)
g = 32.2 constant
h = depth in feet

$$Q = 0.6 \times 4.2 \times (2 \times 32.2 \times 0.5)^{1/2} = 14.3 \text{ cfs}$$

Assume 50% Clogging Factor: $Q = 50\% \times 14.6 = \underline{\underline{7.2 \text{ cfs} > 7.1 \text{ cfs (25-Yr flow)}}$

Storm Drain Calculations

i. *Runoff and Mitigation Design Calculations*

25-Year Design Storm Event – Detail



See Following Pages

Pre-Development

Post-Development



Pre A

POINT #1



Post A



Infiltration Basin



A-1



Grassed Channel



A-2



Pre B

POINT #2



Post B



Level Spreader



Infiltration Tr #1



Inlet



Ditch



B-1



B-2



Pre C

POINT #3



Post C



Infiltration Tr #2



Post C



Pre D

POINT #4



Post D



Infiltration Tr #3



Post D



Pre E

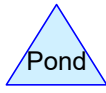
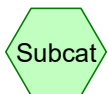
POINT #5



Post E



Post E



Routing Diagram for 42305 Rev 2025-07-28
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-yr	NOAA 24-hr	A	Default	24.00	1	6.2	2

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NOAA 24-hr A 25-yr Rainfall=6.2"

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Summary for Pond 1P: Level Spreader

Inflow Area = 1.634 ac, 16.98% Impervious, Inflow Depth = 1.8" for 25-yr event
 Inflow = 4.4 cfs @ 12.34 hrs, Volume= 0.244 af
 Outflow = 4.4 cfs @ 12.34 hrs, Volume= 0.238 af, Atten= 1%, Lag= 0.4 min
 Primary = 4.4 cfs @ 12.34 hrs, Volume= 0.238 af
 Routed to Link B25 : Post B

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 3
 Peak Elev= 208.13' @ 12.34 hrs Surf.Area= 987 sf Storage= 511 cf

Plug-Flow detention time= 6.7 min calculated for 0.238 af (97% of inflow)
 Center-of-Mass det. time= 1.8 min (773.6 - 771.9)

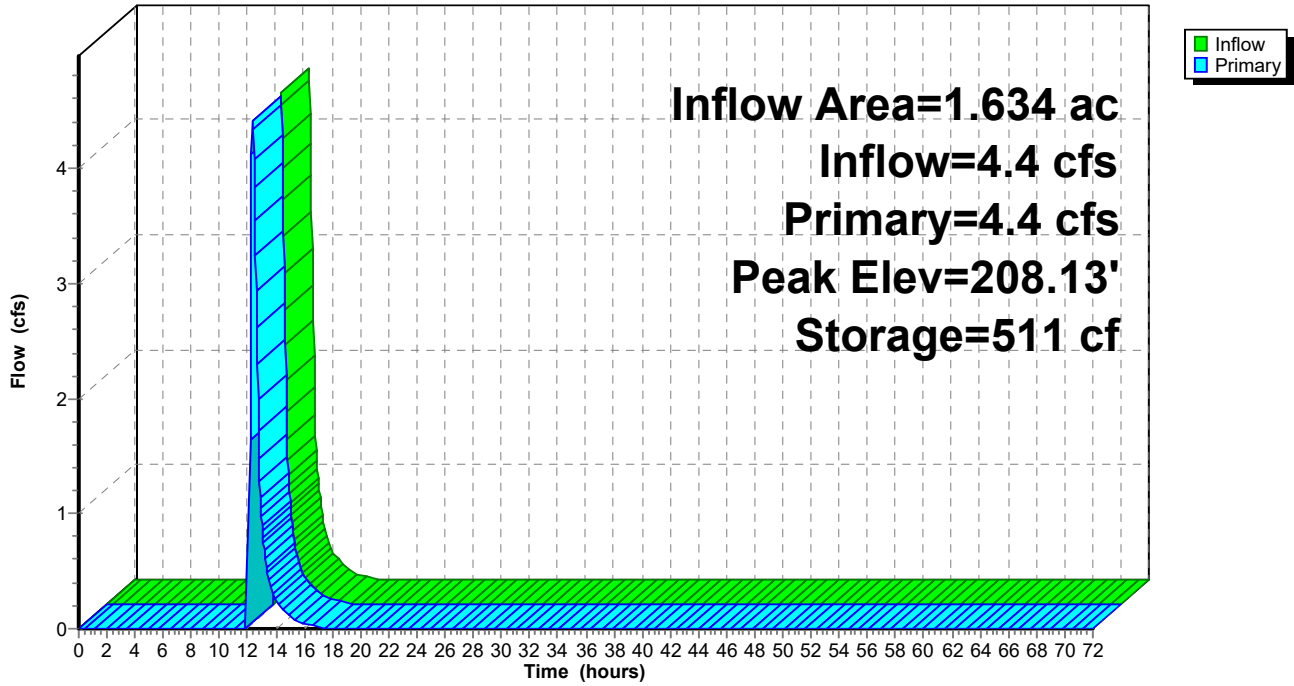
Volume	Invert	Avail.Storage	Storage Description
#1	207.50'	581 cf	8.00'W x 80.00'L x 0.70'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Primary	208.00'	40.0' long + 3.0 ' SideZ 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

Primary OutFlow Max=4.4 cfs @ 12.34 hrs HW=208.13' (Free Discharge)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 4.4 cfs @ 0.84 fps)

Pond 1P: Level Spreader

Hydrograph



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Summary for Subcatchment A01: Pre A

Runoff = 0.1 cfs @ 12.57 hrs, Volume= 0.024 af, Depth= 0.3"

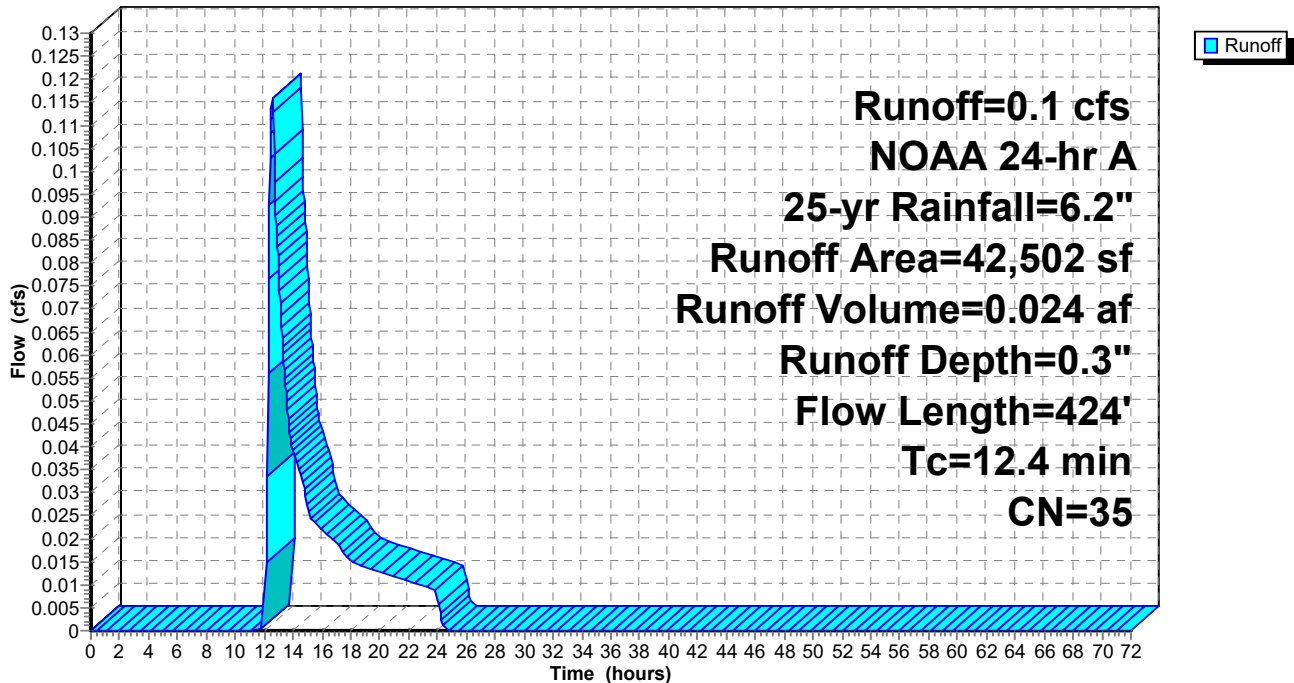
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
33,802	30	Woods, Good, HSG A
8,700	55	Woods, Good, HSG B
42,502	35	Weighted Average
42,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
2.2	181	0.0750	1.37		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.6	73	0.1900	2.18		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	120	0.0750	1.37		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.4	424	Total			

Subcatchment A01: Pre A

Hydrograph



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Summary for Subcatchment A02: Pre B

Runoff = 5.0 cfs @ 12.23 hrs, Volume= 0.332 af, Depth= 1.8"

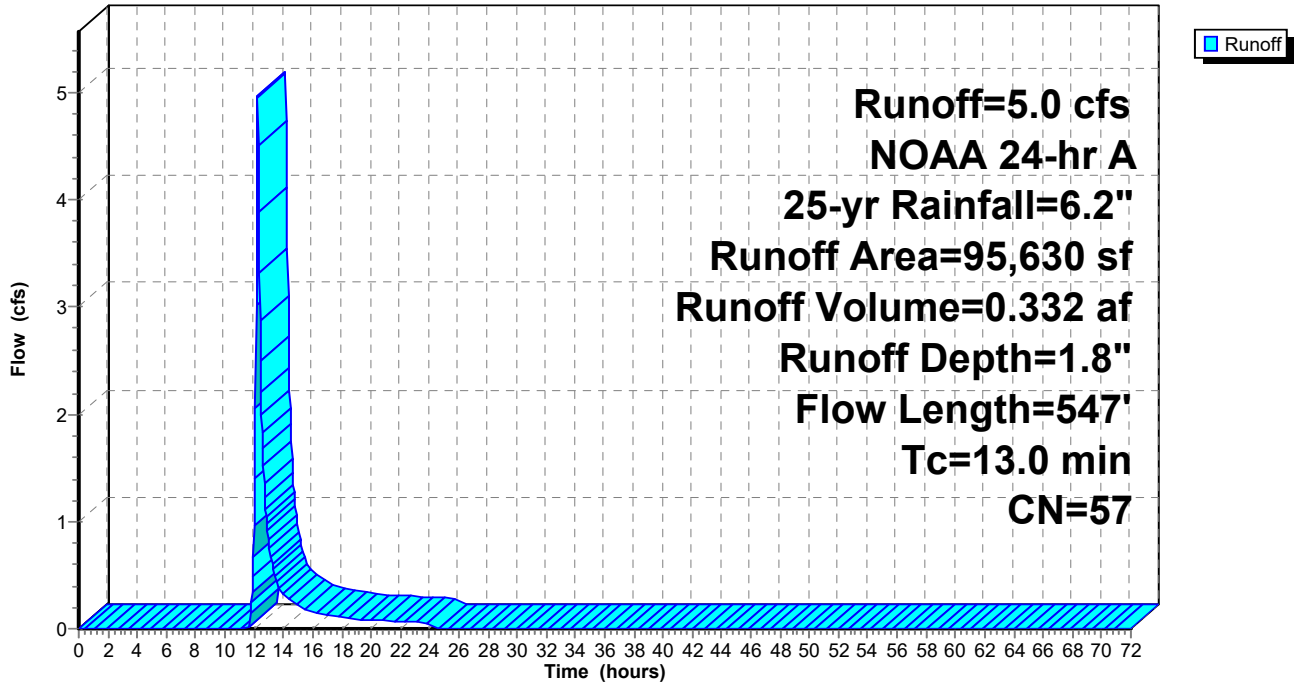
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
452	98	Roofs, HSG A
246	98	Paved parking, HSG B
2,752	98	Paved parking, HSG A
* 995	98	Paved parking, HSG B
589	98	Paved parking, HSG C
26,841	30	Woods, Good, HSG A
23,696	55	Woods, Good, HSG B
19,684	70	Woods, Good, HSG C
20,375	70	1/2 acre lots, 25% imp, HSG B
95,630	57	Weighted Average
85,502		89.41% Pervious Area
10,128		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.1"
2.3	132	0.0380	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.0	365	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	547	Total			

Subcatchment A02: Pre B

Hydrograph



Summary for Subcatchment A03: Pre C

Runoff = 0.0 cfs @ 12.57 hrs, Volume= 0.008 af, Depth= 0.2"

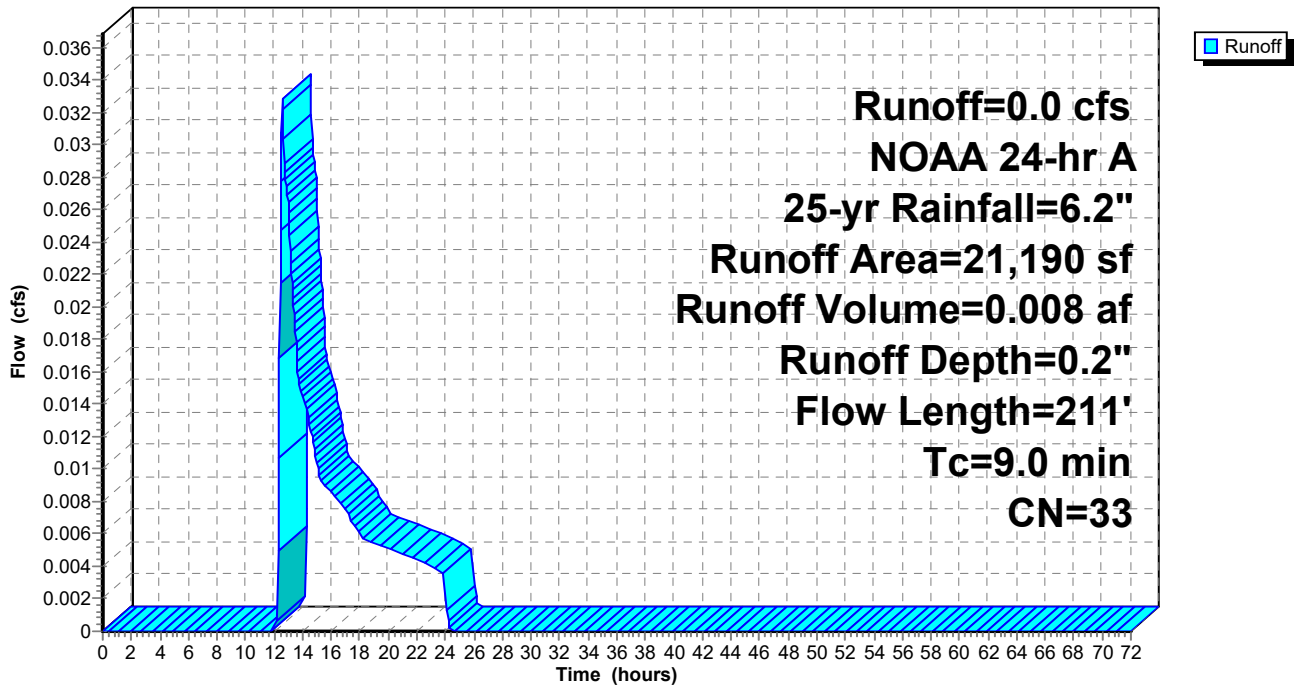
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
808	98	Roofs, HSG A
20,382	30	Woods, Good, HSG A
21,190	33	Weighted Average
20,382		96.19% Pervious Area
808		3.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0800	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
1.8	161	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.0	211	Total			

Subcatchment A03: Pre C

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Summary for Subcatchment A04: Pre D

Runoff = 0.2 cfs @ 12.30 hrs, Volume= 0.035 af, Depth= 0.5"
Routed to nonexistent node 91L

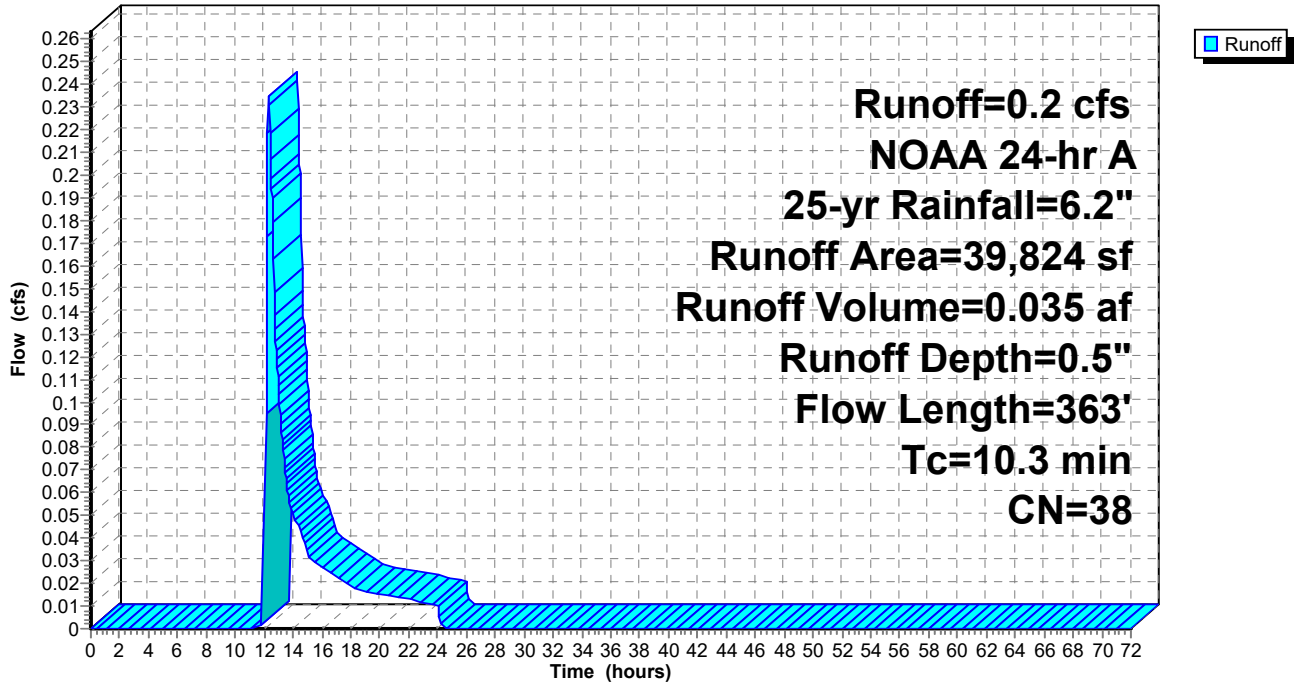
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
278	98	Roofs, HSG A
574	98	Roofs, HSG B
27,837	30	Woods, Good, HSG A
11,135	55	Woods, Good, HSG B
39,824	38	Weighted Average
38,972		97.86% Pervious Area
852		2.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
2.1	142	0.0490	1.11		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	171	0.1290	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.3	363	Total			

Subcatchment A04: Pre D

Hydrograph



Summary for Subcatchment A05: Pre E

Runoff = 0.4 cfs @ 12.26 hrs, Volume= 0.044 af, Depth= 0.6"

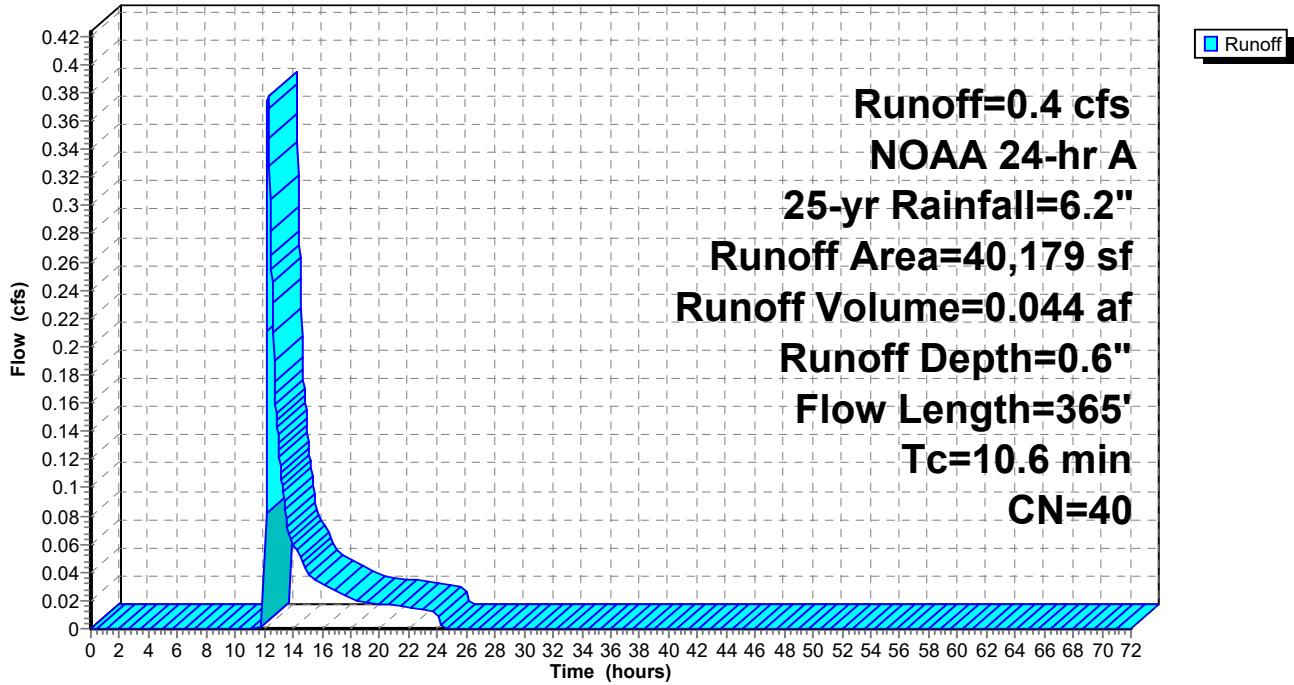
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
24,091	30	Woods, Good, HSG A
16,088	55	Woods, Good, HSG B
40,179	40	Weighted Average
40,179		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0800	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
1.5	109	0.0550	1.17		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.9	206	0.1260	1.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.6	365	Total			

Subcatchment A05: Pre E

Hydrograph



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Summary for Subcatchment B11: A-2

Runoff = 7.1 cfs @ 12.22 hrs, Volume= 0.466 af, Depth= 4.2"
 Routed to Reach B12 : Grassed Channel

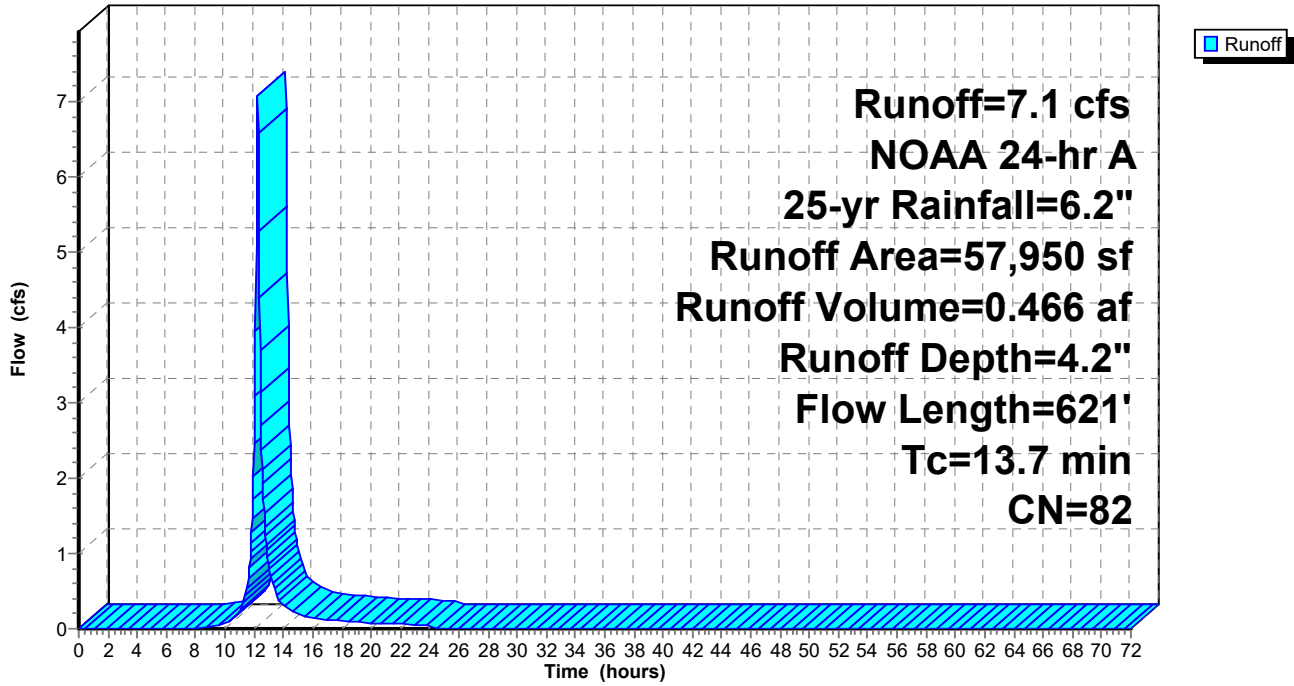
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
11,250	98	Paved parking, HSG A
7,293	98	Paved parking, HSG B
* 177	98	Paved parking, HSG A (Sidewalk)
* 887	98	Paved parking, HSG B (Sidewalk)
7,131	68	<50% Grass cover, Poor, HSG A
27,405	79	<50% Grass cover, Poor, HSG B
3,807	55	Woods, Good, HSG B
57,950	82	Weighted Average
38,343		66.17% Pervious Area
19,607		33.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
1.9	197	0.0600	1.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	339	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	35	0.0460	12.65	9.9	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010
13.7	621	Total			

Subcatchment B11: A-2

Hydrograph



Summary for Reach B12: Grassed Channel

Inflow Area = 1.330 ac, 33.83% Impervious, Inflow Depth = 4.2" for 25-yr event
 Inflow = 7.1 cfs @ 12.22 hrs, Volume= 0.466 af
 Outflow = 6.9 cfs @ 12.26 hrs, Volume= 0.466 af, Atten= 2%, Lag= 2.5 min
 Routed to Pond B14 : Infiltration Basin

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Max. Velocity= 1.30 fps, Min. Travel Time= 1.4 min
 Avg. Velocity = 0.30 fps, Avg. Travel Time= 6.1 min

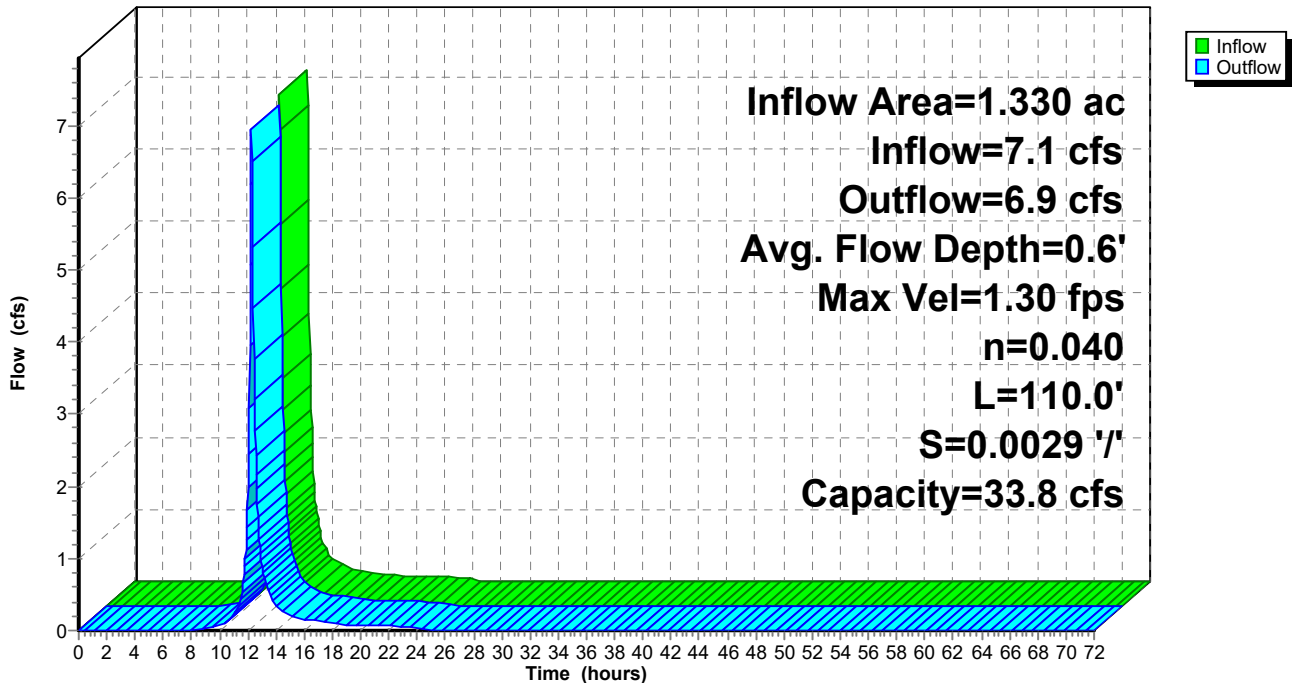
Peak Storage= 593 cf @ 12.23 hrs
 Average Depth at Peak Storage= 0.6' , Surface Width= 10.0'
 Bank-Full Depth= 1.5' Flow Area= 15.8 sf, Capacity= 33.8 cfs

7.50' x 1.50' deep channel, n= 0.040 Earth, dense weeds
 Side Slope Z-value= 2.0 '/' Top Width= 13.50'
 Length= 110.0' Slope= 0.0029 '/'
 Inlet Invert= 207.30', Outlet Invert= 206.98'



Reach B12: Grassed Channel

Hydrograph



Summary for Subcatchment B13: A-1

Runoff = 2.8 cfs @ 12.21 hrs, Volume= 0.175 af, Depth= 2.2"
Routed to Pond B14 : Infiltration Basin

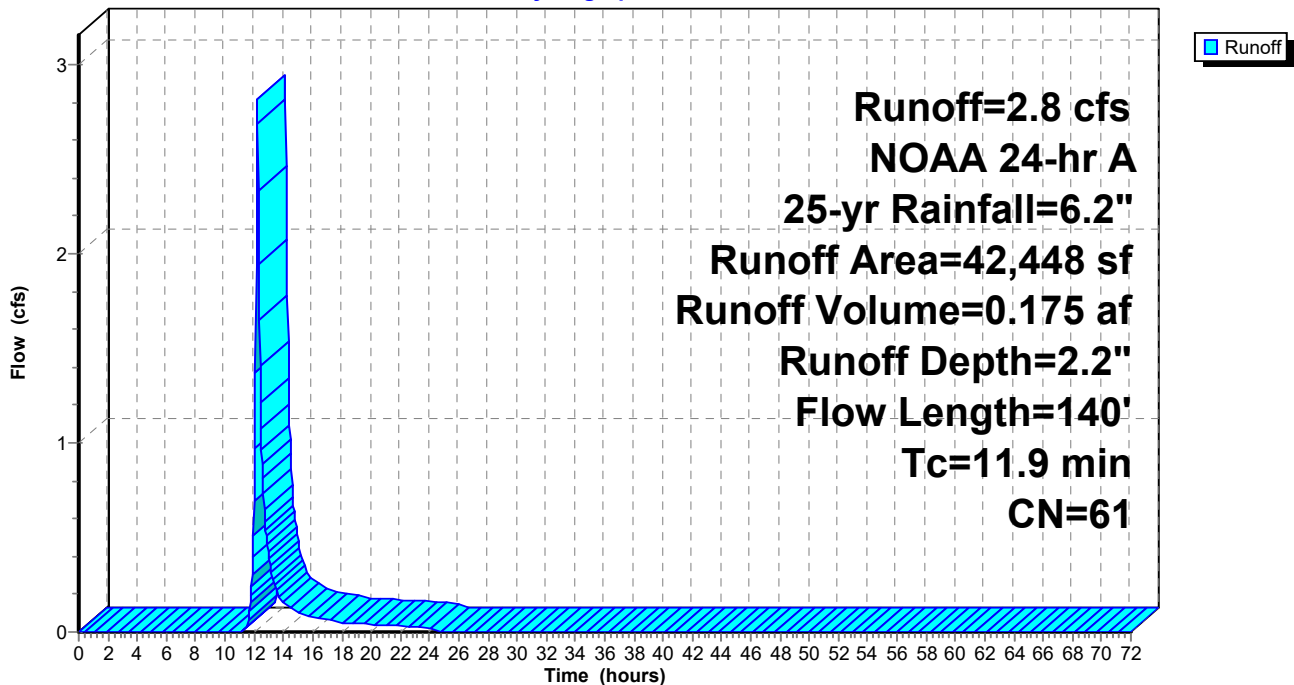
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
29,613	68	<50% Grass cover, Poor, HSG A
2,332	79	<50% Grass cover, Poor, HSG B
7,463	30	Woods, Good, HSG A
3,040	55	Woods, Good, HSG B
42,448	61	Weighted Average
42,448		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.1"
0.5	58	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	32	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.9	140	Total			

Subcatchment B13: A-1

Hydrograph



Summary for Pond B14: Infiltration Basin

Inflow Area = 2.305 ac, 19.53% Impervious, Inflow Depth = 3.3" for 25-yr event
 Inflow = 9.6 cfs @ 12.24 hrs, Volume= 0.641 af
 Outflow = 0.6 cfs @ 13.65 hrs, Volume= 0.641 af, Atten= 93%, Lag= 84.2 min
 Discarded = 0.4 cfs @ 13.65 hrs, Volume= 0.589 af
 Primary = 0.2 cfs @ 13.65 hrs, Volume= 0.052 af
 Routed to Link B15 : Post A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Peak Elev= 207.09' @ 13.65 hrs Surf.Area= 7,297 sf Storage= 17,344 cf

Plug-Flow detention time= 458.0 min calculated for 0.641 af (100% of inflow)
 Center-of-Mass det. time= 458.2 min (1,270.5 - 812.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	203.50'	28,324 cf	Custom Stage Data (Conic) Listed below		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
203.50	1,497	0	0	1,497	
204.00	3,158	1,138	1,138	3,160	
206.00	5,444	8,499	9,637	5,492	
208.00	8,848	14,155	23,792	8,948	
208.50	9,280	4,532	28,324	9,411	

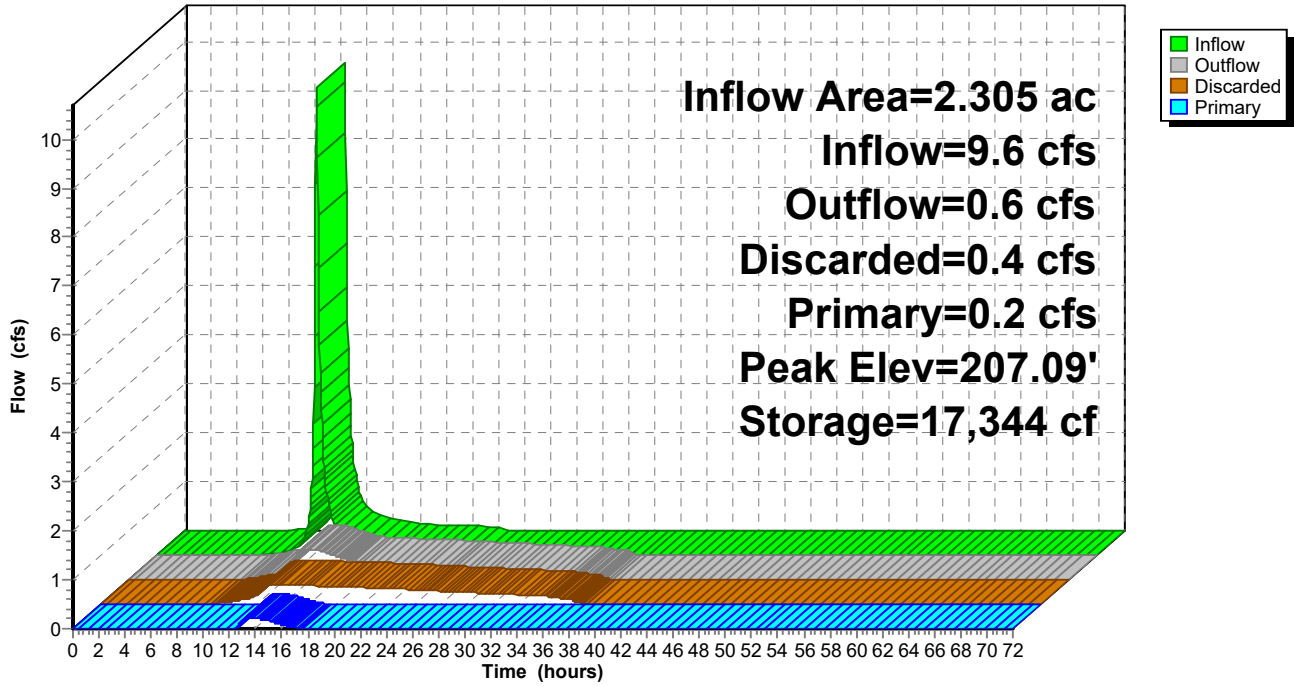
Device	Routing	Invert	Outlet Devices		
#1	Discarded	203.50'	2.400 in/hr Exfiltration over Surface area		
#2	Primary	201.00'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 201.00' / 200.00' S= 0.0200 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf		
#3	Device 2	206.65'	4.0" Vert. Orifice/Grate	C= 0.600	Limited to weir flow at low heads
#4	Device 2	207.71'	5.0" Vert. Orifice/Grate	C= 0.600	Limited to weir flow at low heads

Discarded OutFlow Max=0.4 cfs @ 13.65 hrs HW=207.09' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.4 cfs)

Primary OutFlow Max=0.2 cfs @ 13.65 hrs HW=207.09' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.2 cfs of 8.9 cfs potential flow)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.2 cfs @ 2.51 fps)
 ↑ **4=Orifice/Grate** (Controls 0.0 cfs)

Pond B14: Infiltration Basin

Hydrograph



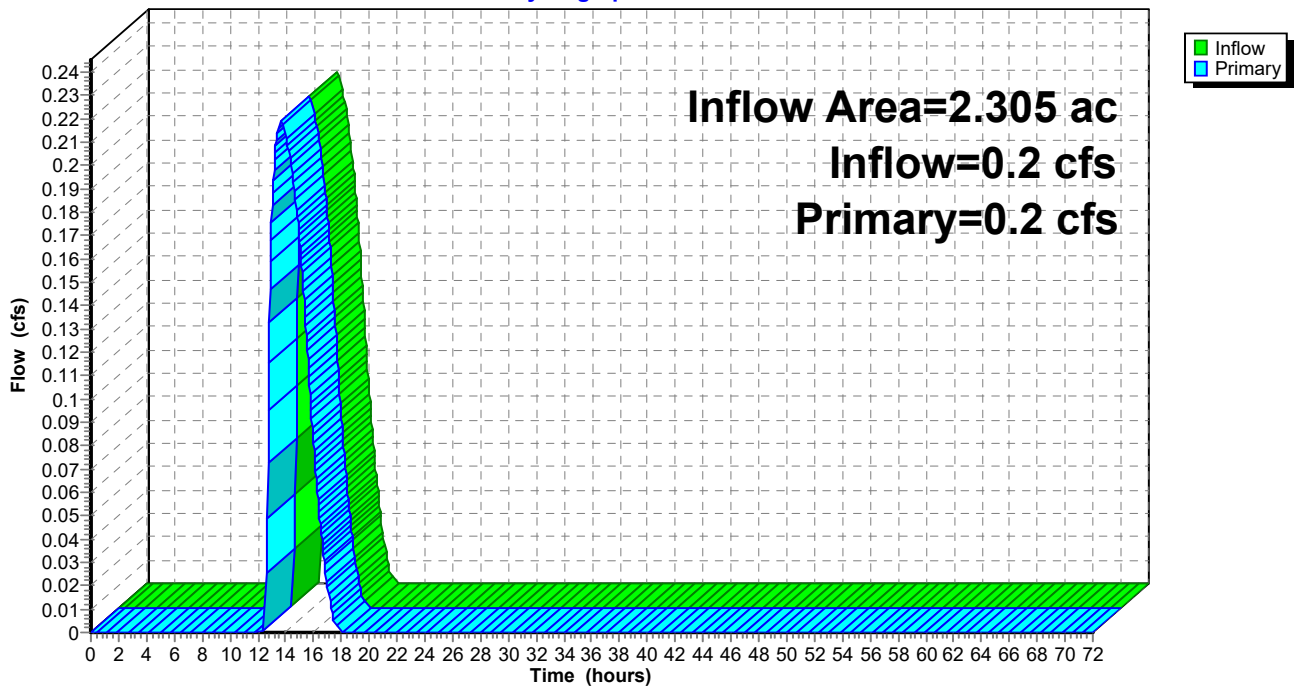
Summary for Link B15: Post A

Inflow Area = 2.305 ac, 19.53% Impervious, Inflow Depth = 0.3" for 25-yr event
Inflow = 0.2 cfs @ 13.65 hrs, Volume= 0.052 af
Primary = 0.2 cfs @ 13.65 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs

Link B15: Post A

Hydrograph



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Summary for Subcatchment B20: B-1

Runoff = 4.2 cfs @ 12.25 hrs, Volume= 0.289 af, Depth= 3.2"
Routed to Reach B22 : Ditch

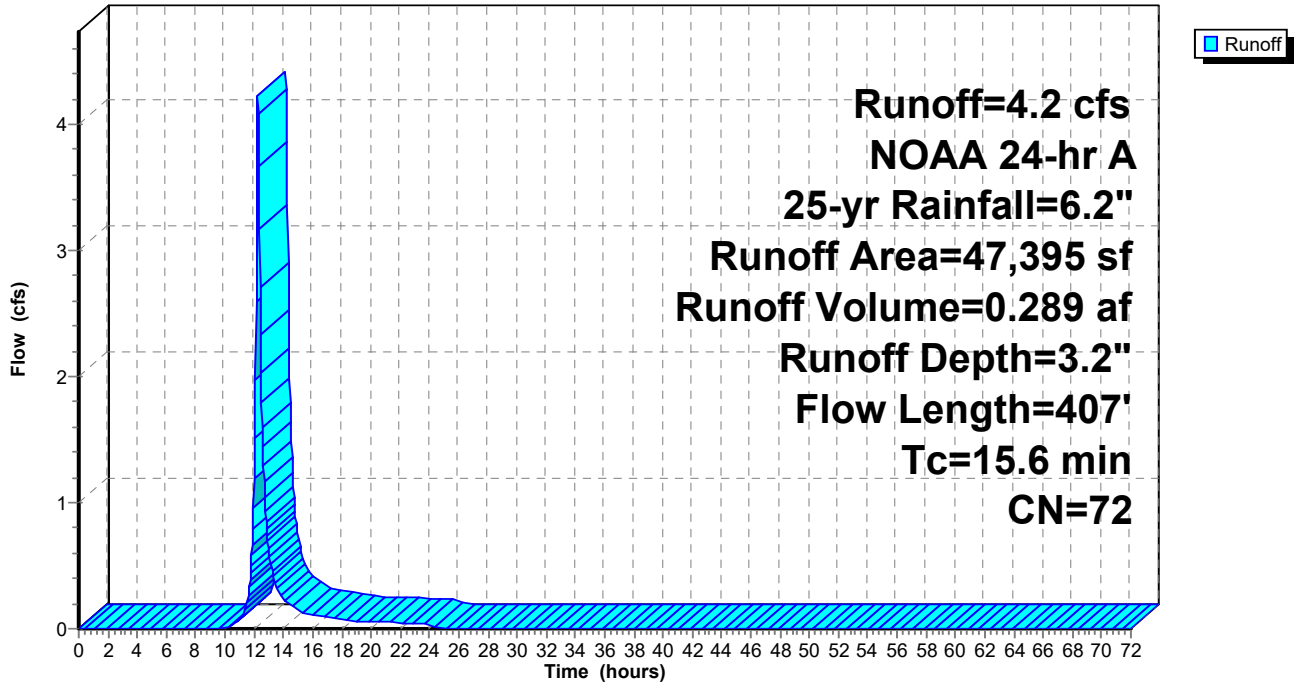
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
3,893	98	Paved parking, HSG A
501	98	Paved parking, HSG C
* 454	98	Paved parking, HSG A Sdwk
* 107	98	Paved parking, HSG C Sdwk
10,314	68	<50% Grass cover, Poor, HSG A
3,533	79	<50% Grass cover, Poor, HSG B
975	86	<50% Grass cover, Poor, HSG C
0	30	Woods, Good, HSG A
4,163	55	Woods, Good, HSG B
23,455	70	1/2 acre lots, 25% imp, HSG B
47,395	72	Weighted Average
36,576		77.17% Pervious Area
10,819		22.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
2.7	242	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	115	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.6	407	Total			

Subcatchment B20: B-1

Hydrograph



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Summary for Subcatchment B21: B-2

Runoff = 3.2 cfs @ 12.16 hrs, Volume= 0.172 af, Depth= 3.8"
Routed to Reach B22 : Ditch

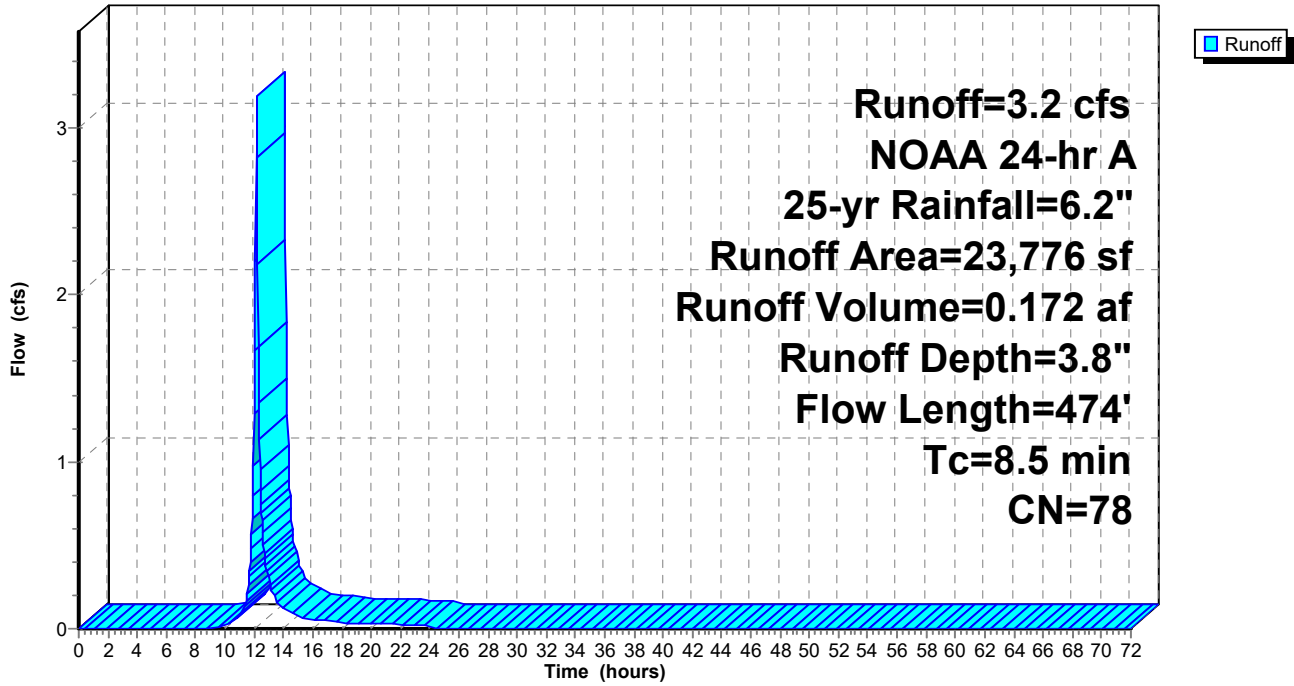
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
* 1,075	98	Paved parking, HSG C (Pvmt.)
* 188	98	Paved parking, HSG C (Sdwk.)
5,197	68	<50% Grass cover, Poor, HSG A
206	79	<50% Grass cover, Poor, HSG B
11,142	86	<50% Grass cover, Poor, HSG C
470	30	Woods, Good, HSG A
52	55	Woods, Good, HSG B
5,446	70	Woods, Good, HSG C
23,776	78	Weighted Average
22,513		94.69% Pervious Area
1,263		5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0800	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.1"
1.2	134	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	35	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.9	120	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	135	0.0600	6.78	13.6	Channel Flow, Area= 2.0 sf Perim= 3.8' r= 0.53' n= 0.035 Earth, dense weeds
8.5	474	Total			

Subcatchment B21: B-2

Hydrograph



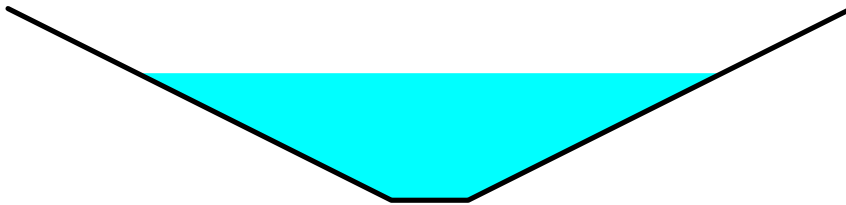
Summary for Reach B22: Ditch

Inflow Area = 1.634 ac, 16.98% Impervious, Inflow Depth = 3.4" for 25-yr event
 Inflow = 6.8 cfs @ 12.20 hrs, Volume= 0.461 af
 Outflow = 6.7 cfs @ 12.21 hrs, Volume= 0.461 af, Atten= 1%, Lag= 1.1 min
 Routed to Pond B23 : Inlet

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Max. Velocity= 3.82 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 1.34 fps, Avg. Travel Time= 1.7 min

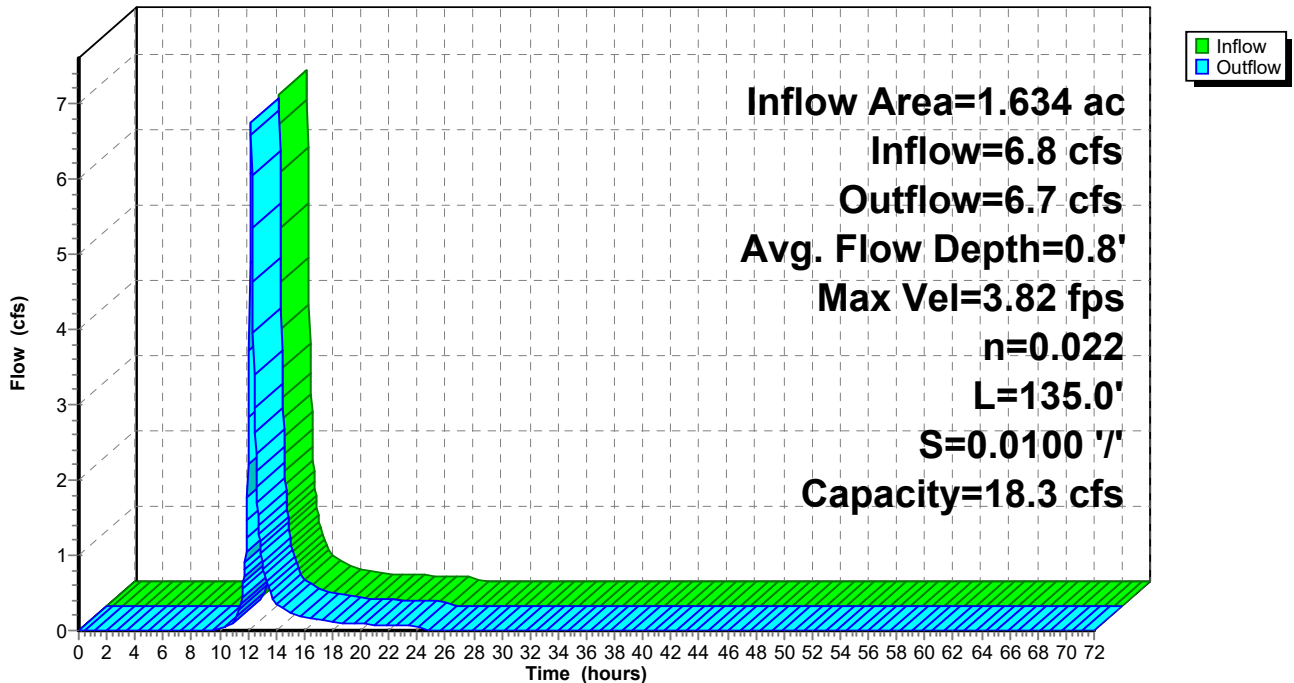
Peak Storage= 241 cf @ 12.20 hrs
 Average Depth at Peak Storage= 0.8' , Surface Width= 3.8'
 Bank-Full Depth= 1.3' Flow Area= 3.8 sf, Capacity= 18.3 cfs

0.50' x 1.25' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 2.0 ' / ' Top Width= 5.50'
 Length= 135.0' Slope= 0.0100 ' / '
 Inlet Invert= 216.00', Outlet Invert= 214.65'



Reach B22: Ditch

Hydrograph



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Summary for Pond B23: Inlet

Inflow Area = 1.634 ac, 16.98% Impervious, Inflow Depth = 3.4" for 25-yr event
Inflow = 6.7 cfs @ 12.21 hrs, Volume= 0.461 af
Outflow = 6.7 cfs @ 12.23 hrs, Volume= 0.461 af, Atten= 1%, Lag= 0.7 min
Primary = 6.7 cfs @ 12.23 hrs, Volume= 0.461 af
Routed to Pond B24 : Infiltration Tr #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
Peak Elev= 209.62' @ 12.23 hrs Surf.Area= 245 sf Storage= 122 cf
Flood Elev= 211.50' Surf.Area= 645 sf Storage= 935 cf

Plug-Flow detention time= 0.5 min calculated for 0.460 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (814.4 - 813.9)

Volume	Invert	Avail.Storage	Storage Description
#1	209.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

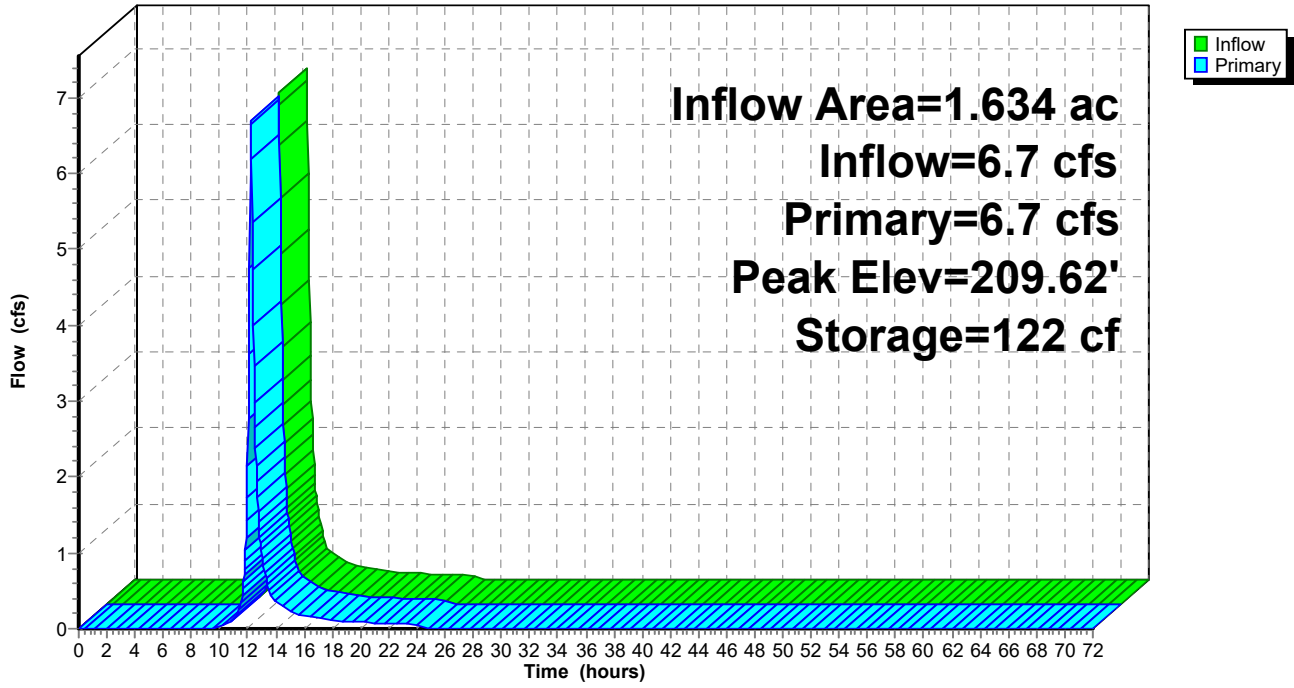
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
209.00	150	0	0
210.00	305	228	228
211.00	525	415	643
211.50	645	293	935

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.6 cfs @ 12.23 hrs HW=209.61' (Free Discharge)
↑**1=Orifice/Grate** (Orifice Controls 6.6 cfs @ 3.75 fps)

Pond B23: Inlet

Hydrograph



Summary for Pond B24: Infiltration Tr #1

Inflow Area = 1.634 ac, 16.98% Impervious, Inflow Depth = 3.4" for 25-yr event
 Inflow = 6.7 cfs @ 12.23 hrs, Volume= 0.461 af
 Outflow = 5.2 cfs @ 12.34 hrs, Volume= 0.461 af, Atten= 22%, Lag= 6.7 min
 Discarded = 0.1 cfs @ 11.16 hrs, Volume= 0.210 af
 Primary = 4.4 cfs @ 12.34 hrs, Volume= 0.244 af
 Routed to Pond 1P : Level Spreader
 Tertiary = 0.6 cfs @ 12.34 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Peak Elev= 210.13' @ 12.34 hrs Surf.Area= 2,400 sf Storage= 5,405 cf

Plug-Flow detention time= 154.9 min calculated for 0.460 af (100% of inflow)
 Center-of-Mass det. time= 155.0 min (969.3 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	204.80'	5,857 cf	30.00'W x 80.00'L x 6.30'H Prismatic 15,120 cf Overall - 478 cf Embedded = 14,642 cf x 40.0% Voids
#2	205.30'	478 cf	24.0" Round Pipe Storage x 2 Inside #1 L= 76.0' S= 0.0050 '/'
		6,335 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	204.80'	2.400 in/hr Exfiltration over Surface area
#2	Primary	208.50'	6.0" Vert. Orifice X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Tertiary	209.70'	10.0" Vert. Orifice/Grate X 2 rows with 12.0" cc spacing C= 0.600 Limited to weir flow at low heads

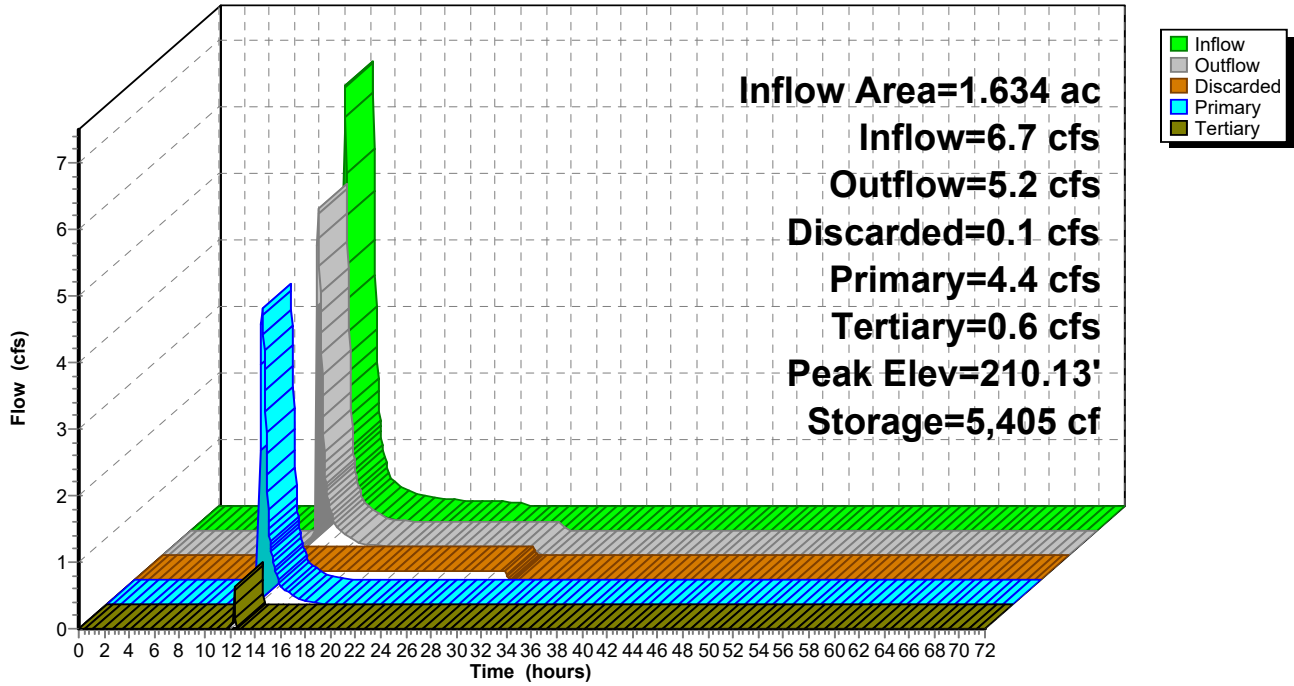
Discarded OutFlow Max=0.1 cfs @ 11.16 hrs HW=204.87' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.4 cfs @ 12.34 hrs HW=210.11' (Free Discharge)
 ↑2=Orifice (Orifice Controls 4.4 cfs @ 5.62 fps)

Tertiary OutFlow Max=0.6 cfs @ 12.34 hrs HW=210.11' (Free Discharge)
 ↑3=Orifice/Grate (Orifice Controls 0.6 cfs @ 2.19 fps)

Pond B24: Infiltration Tr #1

Hydrograph



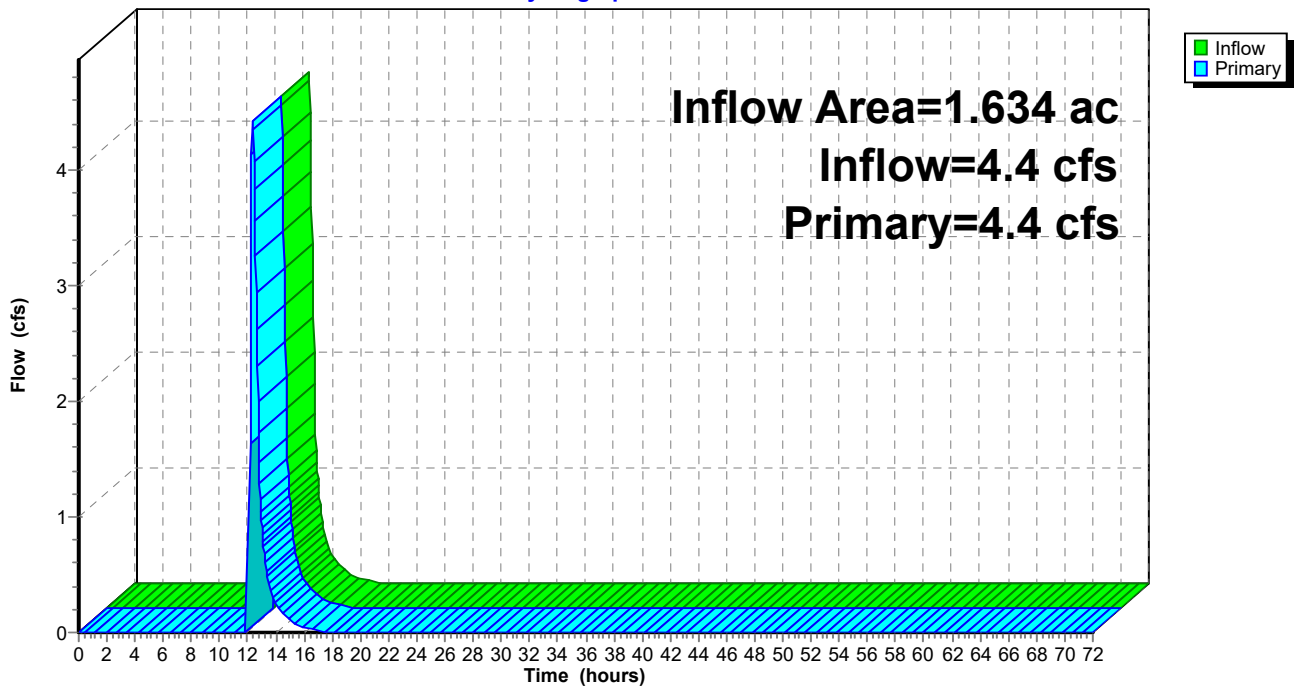
Summary for Link B25: Post B

Inflow Area = 1.634 ac, 16.98% Impervious, Inflow Depth = 1.7" for 25-yr event
Inflow = 4.4 cfs @ 12.34 hrs, Volume= 0.238 af
Primary = 4.4 cfs @ 12.34 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs

Link B25: Post B

Hydrograph



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Summary for Subcatchment B33: Post C

Runoff = 2.2 cfs @ 12.16 hrs, Volume= 0.114 af, Depth= 2.4"
Routed to Pond B34 : Infiltration Tr #2

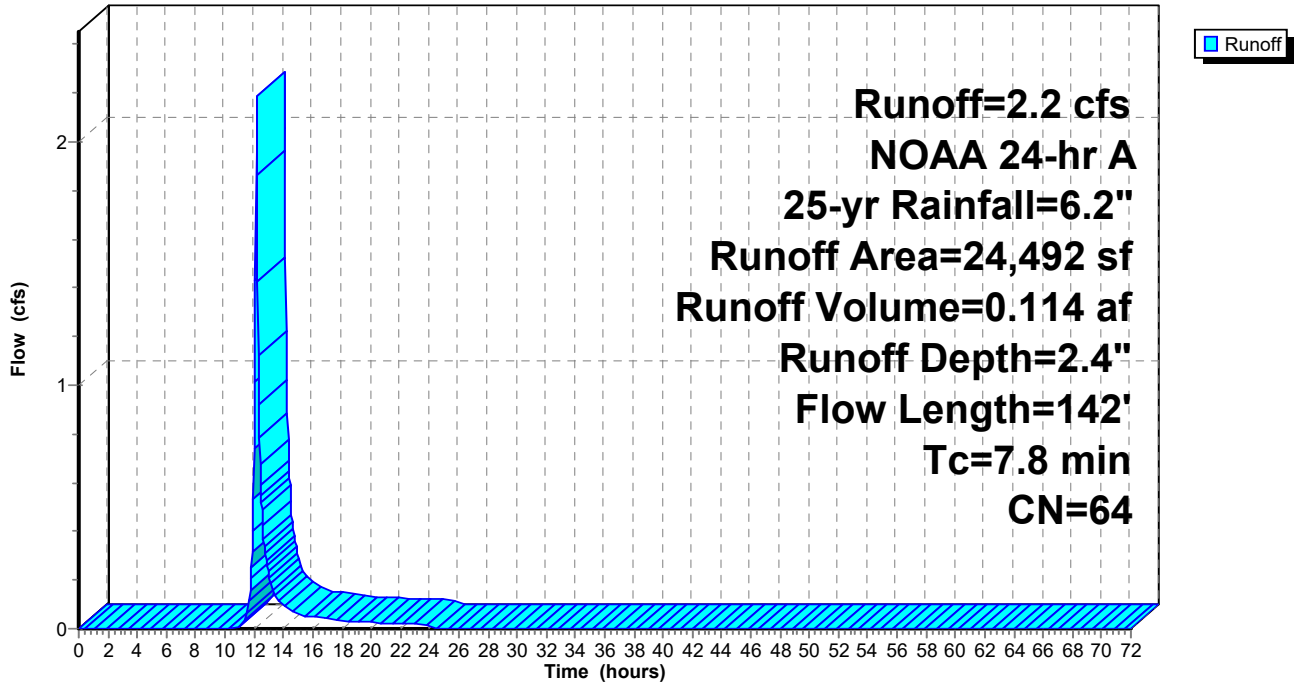
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
3,010	98	Paved parking, HSG A
16,368	68	<50% Grass cover, Poor, HSG A
5,060	30	Woods, Good, HSG A
54	55	Woods, Good, HSG B
24,492	64	Weighted Average
21,482		87.71% Pervious Area
3,010		12.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0300	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.1"
0.3	41	0.1200	2.42		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	51	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.8	142	Total			

Subcatchment B33: Post C

Hydrograph



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Summary for Pond B34: Infiltration Tr #2

Inflow Area = 0.562 ac, 12.29% Impervious, Inflow Depth = 2.4" for 25-yr event
 Inflow = 2.2 cfs @ 12.16 hrs, Volume= 0.114 af
 Outflow = 0.2 cfs @ 11.84 hrs, Volume= 0.114 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.2 cfs @ 11.84 hrs, Volume= 0.114 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link B35 : Post C

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Peak Elev= 208.72' @ 13.34 hrs Surf.Area= 2,800 sf Storage= 2,438 cf

Plug-Flow detention time= 142.8 min calculated for 0.114 af (100% of inflow)
 Center-of-Mass det. time= 142.7 min (967.9 - 825.2)

Volume	Invert	Avail.Storage	Storage Description
#1	206.60'	4,418 cf	14.00'W x 200.00'L x 4.00'H Prismaoid 11,200 cf Overall - 154 cf Embedded = 11,046 cf x 40.0% Voids
#2	207.50'	154 cf	12.0" Round Pipe Storage Inside #1 L= 196.0' S= 0.0050 '/'
		4,572 cf	Total Available Storage

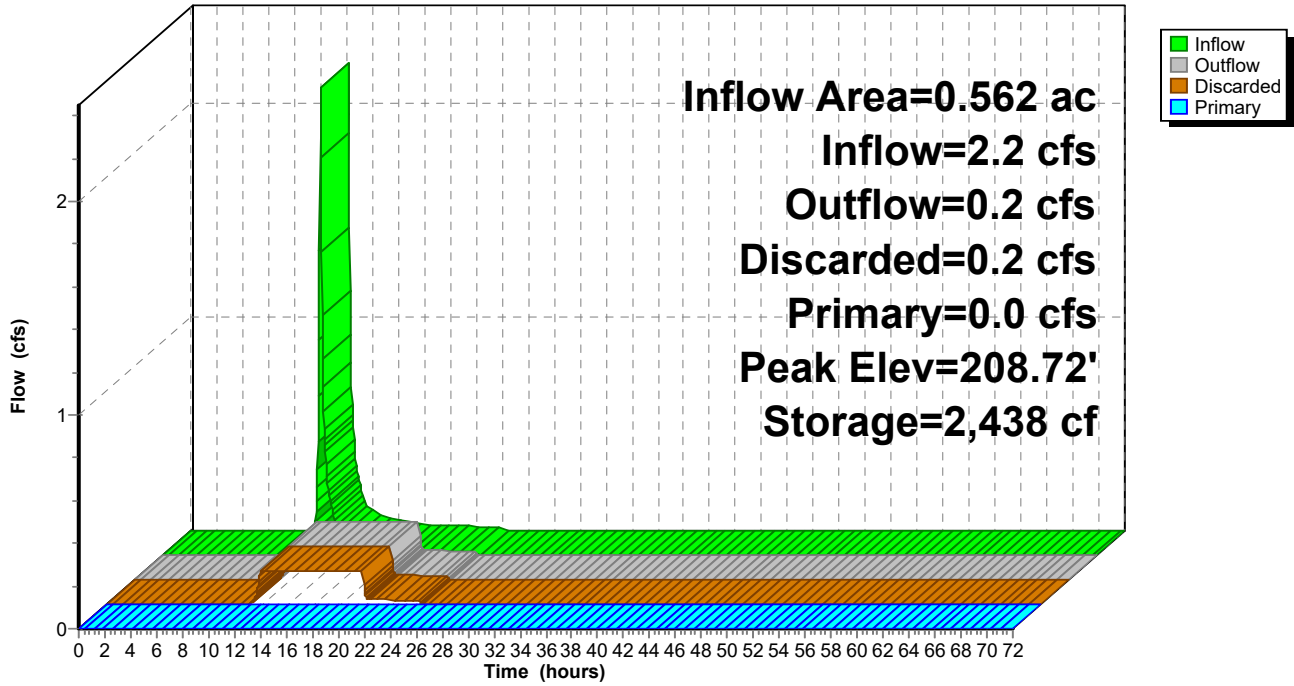
Device	Routing	Invert	Outlet Devices
#1	Discarded	206.60'	2.400 in/hr Exfiltration over Surface area
#2	Primary	210.30'	6.0" Horiz. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 11.84 hrs HW=206.65' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=206.60' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.0 cfs)

Pond B34: Infiltration Tr #2

Hydrograph



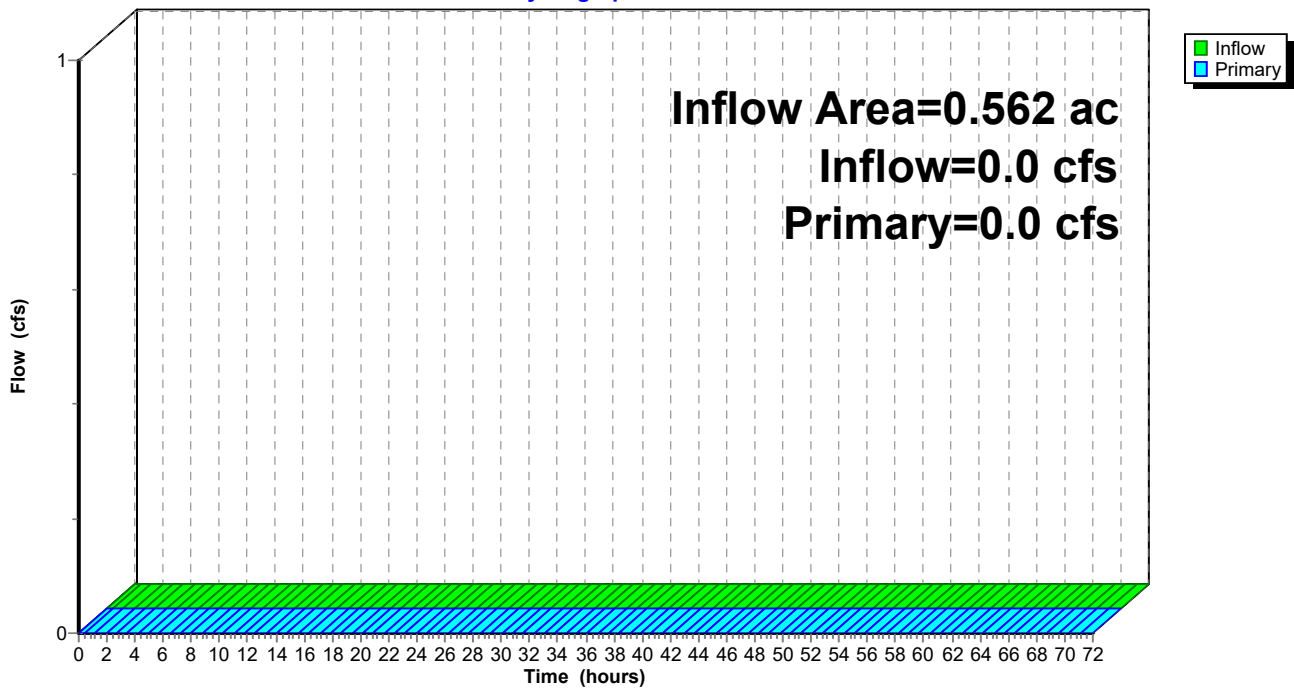
Summary for Link B35: Post C

Inflow Area = 0.562 ac, 12.29% Impervious, Inflow Depth = 0.0" for 25-yr event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 92L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs

Link B35: Post C

Hydrograph



Summary for Subcatchment B43: Post D

Runoff = 0.9 cfs @ 12.19 hrs, Volume= 0.055 af, Depth= 1.7"
Routed to Pond B44 : Infiltration Tr #3

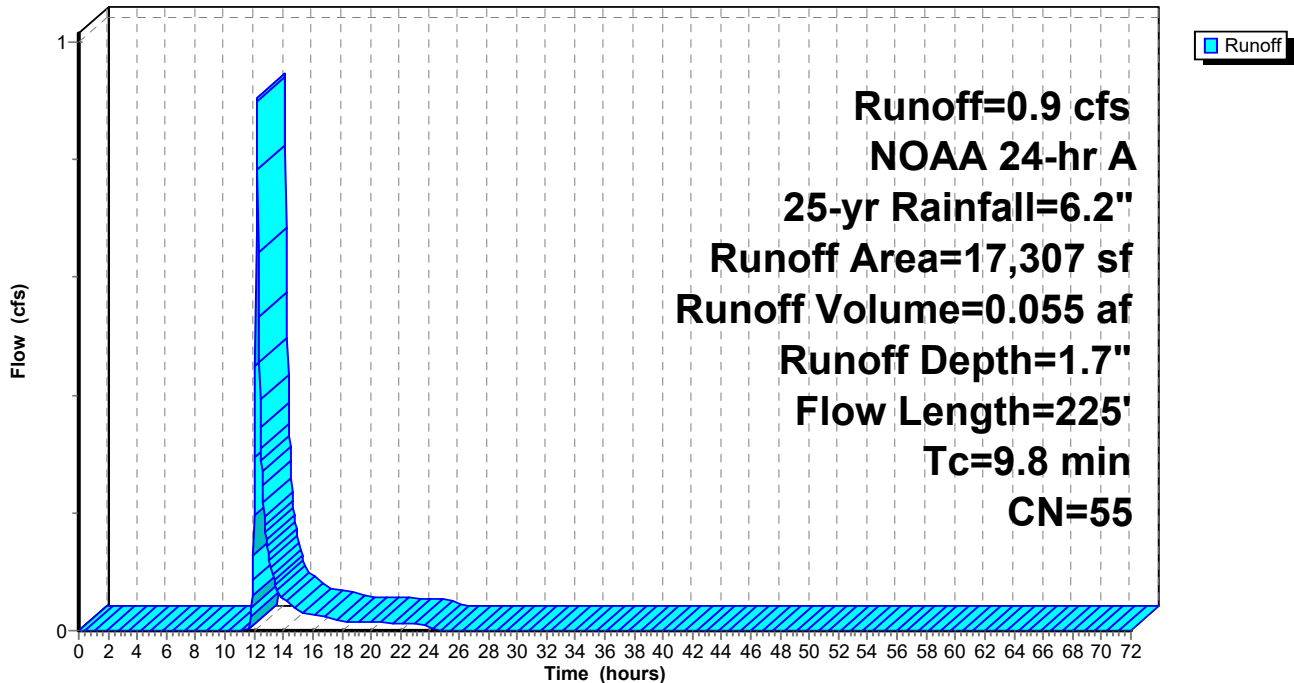
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
11,278	68	<50% Grass cover, Poor, HSG A
46	79	<50% Grass cover, Poor, HSG B
5,983	30	Woods, Good, HSG A
17,307	55	Weighted Average
17,307		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.1"
0.9	75	0.0430	1.45		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	100	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.8	225	Total			

Subcatchment B43: Post D

Hydrograph



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Summary for Pond B44: Infiltration Tr #3

Inflow Area = 0.397 ac, 0.00% Impervious, Inflow Depth = 1.7" for 25-yr event
 Inflow = 0.9 cfs @ 12.19 hrs, Volume= 0.055 af
 Outflow = 0.2 cfs @ 12.74 hrs, Volume= 0.055 af, Atten= 80%, Lag= 33.0 min
 Discarded = 0.0 cfs @ 11.92 hrs, Volume= 0.048 af
 Primary = 0.1 cfs @ 12.74 hrs, Volume= 0.006 af
 Routed to Link B45 : Post D

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
 Peak Elev= 206.71' @ 12.72 hrs Surf.Area= 800 sf Storage= 1,064 cf

Plug-Flow detention time= 222.0 min calculated for 0.055 af (100% of inflow)
 Center-of-Mass det. time= 221.9 min (1,067.4 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1	203.50'	1,176 cf	10.00'W x 80.00'L x 3.75'H Prismaoid 3,000 cf Overall - 60 cf Embedded = 2,940 cf x 40.0% Voids
#2	204.50'	60 cf	12.0" Round Pipe Storage Inside #1 L= 76.0' S= 0.0050 '/'
		1,236 cf	Total Available Storage

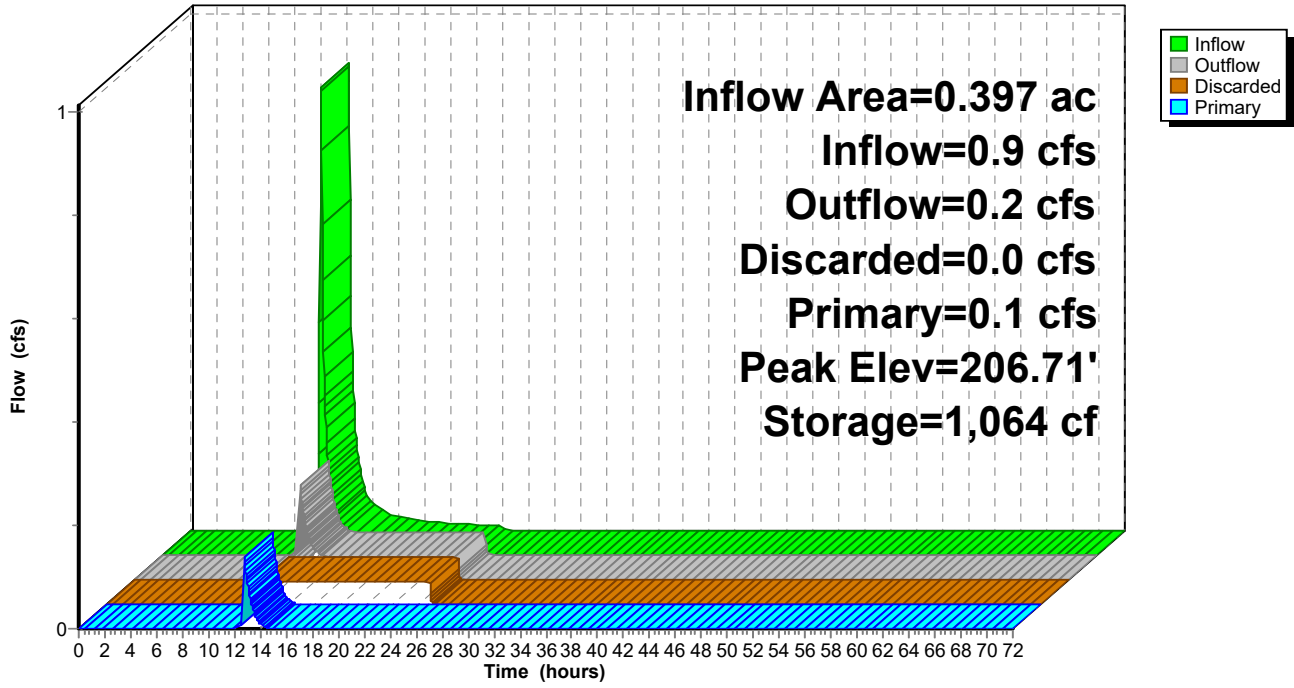
Device	Routing	Invert	Outlet Devices
#1	Discarded	203.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	206.66'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 11.92 hrs HW=203.54' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 12.74 hrs HW=206.71' (Free Discharge)
 ↑**2=Orifice/Grate** (Weir Controls 0.1 cfs @ 0.75 fps)

Pond B44: Infiltration Tr #3

Hydrograph



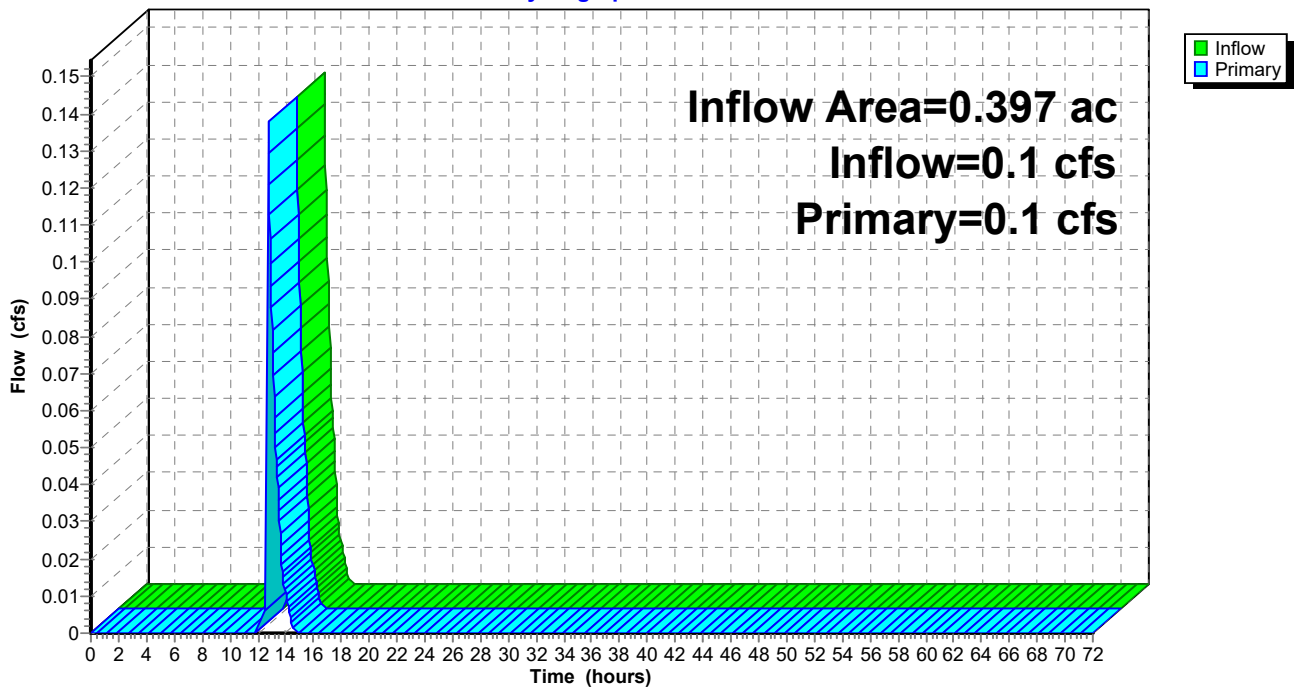
Summary for Link B45: Post D

Inflow Area = 0.397 ac, 0.00% Impervious, Inflow Depth = 0.2" for 25-yr event
Inflow = 0.1 cfs @ 12.74 hrs, Volume= 0.006 af
Primary = 0.1 cfs @ 12.74 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 92L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs

Link B45: Post D

Hydrograph



Summary for Subcatchment B54: Post E

Runoff = 0.3 cfs @ 12.15 hrs, Volume= 0.018 af, Depth= 1.0"
Routed to Link B55 : Post E

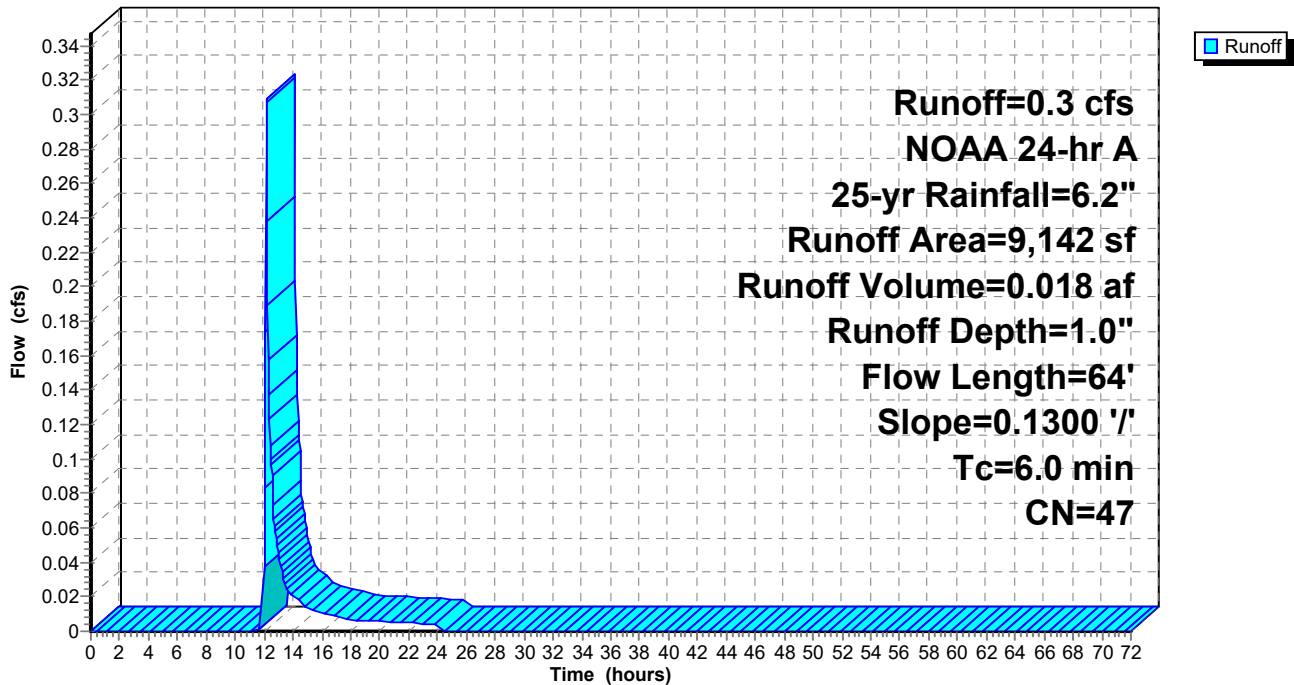
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
NOAA 24-hr A 25-yr Rainfall=6.2"

Area (sf)	CN	Description
4,207	68	<50% Grass cover, Poor, HSG A
4,935	30	Woods, Good, HSG A
9,142	47	Weighted Average
9,142		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	32	0.1300	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.1"
0.3	32	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.4	64	Total, Increased to minimum Tc = 6.0 min			

Subcatchment B54: Post E

Hydrograph



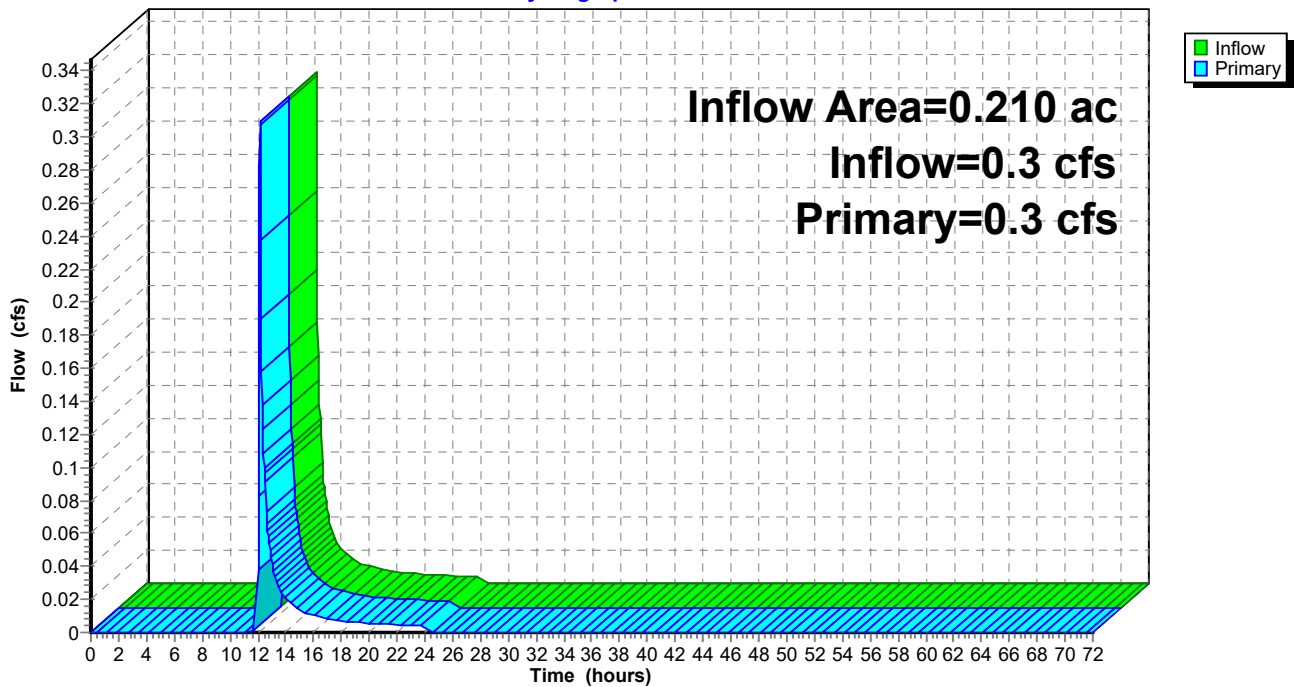
Summary for Link B55: Post E

Inflow Area = 0.210 ac, 0.00% Impervious, Inflow Depth = 1.0" for 25-yr event
Inflow = 0.3 cfs @ 12.15 hrs, Volume= 0.018 af
Primary = 0.3 cfs @ 12.15 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs

Link B55: Post E

Hydrograph



- ii. *Runoff and Mitigation Design Summary Calculations*
2, 10, 25 & 100-Year Design Storm Events Summary Calculations



See Following Pages

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Level Spreader	Peak Elev=207.50' Storage=0 cf Inflow=0.0 cfs 0.000 af Outflow=0.0 cfs 0.000 af
SubcatchmentA01: Pre A	Runoff Area=42,502 sf 0.00% Impervious Runoff Depth=0.0" Flow Length=424' Tc=12.4 min CN=35 Runoff=0.0 cfs 0.000 af
SubcatchmentA02: Pre B	Runoff Area=95,630 sf 10.59% Impervious Runoff Depth=0.3" Flow Length=547' Tc=13.0 min CN=57 Runoff=0.5 cfs 0.057 af
SubcatchmentA03: Pre C	Runoff Area=21,190 sf 3.81% Impervious Runoff Depth=0.0" Flow Length=211' Tc=9.0 min CN=33 Runoff=0.0 cfs 0.000 af
SubcatchmentA04: Pre D	Runoff Area=39,824 sf 2.14% Impervious Runoff Depth=0.0" Flow Length=363' Tc=10.3 min CN=38 Runoff=0.0 cfs 0.000 af
SubcatchmentA05: Pre E	Runoff Area=40,179 sf 0.00% Impervious Runoff Depth=0.0" Flow Length=365' Tc=10.6 min CN=40 Runoff=0.0 cfs 0.000 af
SubcatchmentB11: A-2	Runoff Area=57,950 sf 33.83% Impervious Runoff Depth=1.5" Flow Length=621' Tc=13.7 min CN=82 Runoff=2.6 cfs 0.171 af
Reach B12: Grassed Channel	Avg. Flow Depth=0.3' Max Vel=0.92 fps Inflow=2.6 cfs 0.171 af n=0.040 L=110.0' S=0.0029 '/' Capacity=33.8 cfs Outflow=2.6 cfs 0.171 af
SubcatchmentB13: A-1	Runoff Area=42,448 sf 0.00% Impervious Runoff Depth=0.4" Flow Length=140' Tc=11.9 min CN=61 Runoff=0.4 cfs 0.036 af
Pond B14: Infiltration Basin	Peak Elev=204.88' Storage=4,867 cf Inflow=3.0 cfs 0.207 af Discarded=0.2 cfs 0.207 af Primary=0.0 cfs 0.000 af Outflow=0.2 cfs 0.207 af
Link B15: Post A	Inflow=0.0 cfs 0.000 af Primary=0.0 cfs 0.000 af
SubcatchmentB20: B-1	Runoff Area=47,395 sf 22.83% Impervious Runoff Depth=0.9" Flow Length=407' Tc=15.6 min CN=72 Runoff=1.2 cfs 0.084 af
SubcatchmentB21: B-2	Runoff Area=23,776 sf 5.31% Impervious Runoff Depth=1.3" Flow Length=474' Tc=8.5 min CN=78 Runoff=1.1 cfs 0.058 af
Reach B22: Ditch	Avg. Flow Depth=0.5' Max Vel=2.80 fps Inflow=2.0 cfs 0.142 af n=0.022 L=135.0' S=0.0100 '/' Capacity=18.3 cfs Outflow=2.0 cfs 0.142 af
Pond B23: Inlet	Peak Elev=209.25' Storage=43 cf Inflow=2.0 cfs 0.142 af Outflow=2.0 cfs 0.142 af
Pond B24: Infiltration Tr #1	Peak Elev=208.00' Storage=3,359 cf Inflow=2.0 cfs 0.142 af Discarded=0.1 cfs 0.142 af Primary=0.0 cfs 0.000 af Tertiary=0.0 cfs 0.000 af Outflow=0.1 cfs 0.142 af

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Link B25: Post B

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB33: Post C

Runoff Area=24,492 sf 12.29% Impervious Runoff Depth=0.6"
Flow Length=142' Tc=7.8 min CN=64 Runoff=0.4 cfs 0.026 af

Pond B34: Infiltration Tr #2

Peak Elev=206.76' Storage=183 cf Inflow=0.4 cfs 0.026 af
Discarded=0.2 cfs 0.026 af Primary=0.0 cfs 0.000 af Outflow=0.2 cfs 0.026 af

Link B35: Post C

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB43: Post D

Runoff Area=17,307 sf 0.00% Impervious Runoff Depth=0.3"
Flow Length=225' Tc=9.8 min CN=55 Runoff=0.1 cfs 0.008 af

Pond B44: Infiltration Tr #3

Peak Elev=203.57' Storage=21 cf Inflow=0.1 cfs 0.008 af
Discarded=0.0 cfs 0.008 af Primary=0.0 cfs 0.000 af Outflow=0.0 cfs 0.008 af

Link B45: Post D

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB54: Post E

Runoff Area=9,142 sf 0.00% Impervious Runoff Depth=0.1"
Flow Length=64' Slope=0.1300 '/' Tc=6.0 min CN=47 Runoff=0.0 cfs 0.001 af

Link B55: Post E

Inflow=0.0 cfs 0.001 af
Primary=0.0 cfs 0.001 af

**Total Runoff Area = 10.602 ac Runoff Volume = 0.441 af Average Runoff Depth = 0.5"
89.93% Pervious = 9.535 ac 10.07% Impervious = 1.067 ac**

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Level Spreader	Peak Elev=208.10' Storage=479 cf Inflow=2.9 cfs 0.138 af Outflow=2.9 cfs 0.129 af
SubcatchmentA01: Pre A	Runoff Area=42,502 sf 0.00% Impervious Runoff Depth=0.1" Flow Length=424' Tc=12.4 min CN=35 Runoff=0.0 cfs 0.007 af
SubcatchmentA02: Pre B	Runoff Area=95,630 sf 10.59% Impervious Runoff Depth=1.1" Flow Length=547' Tc=13.0 min CN=57 Runoff=2.9 cfs 0.208 af
SubcatchmentA03: Pre C	Runoff Area=21,190 sf 3.81% Impervious Runoff Depth=0.0" Flow Length=211' Tc=9.0 min CN=33 Runoff=0.0 cfs 0.002 af
SubcatchmentA04: Pre D	Runoff Area=39,824 sf 2.14% Impervious Runoff Depth=0.2" Flow Length=363' Tc=10.3 min CN=38 Runoff=0.1 cfs 0.014 af
SubcatchmentA05: Pre E	Runoff Area=40,179 sf 0.00% Impervious Runoff Depth=0.2" Flow Length=365' Tc=10.6 min CN=40 Runoff=0.1 cfs 0.019 af
SubcatchmentB11: A-2	Runoff Area=57,950 sf 33.83% Impervious Runoff Depth=3.1" Flow Length=621' Tc=13.7 min CN=82 Runoff=5.3 cfs 0.347 af
Reach B12: Grassed Channel	Avg. Flow Depth=0.5' Max Vel=1.18 fps Inflow=5.3 cfs 0.347 af n=0.040 L=110.0' S=0.0029 '/' Capacity=33.8 cfs Outflow=5.2 cfs 0.347 af
SubcatchmentB13: A-1	Runoff Area=42,448 sf 0.00% Impervious Runoff Depth=1.4" Flow Length=140' Tc=11.9 min CN=61 Runoff=1.8 cfs 0.114 af
Pond B14: Infiltration Basin	Peak Elev=206.41' Storage=12,553 cf Inflow=6.9 cfs 0.461 af Discarded=0.3 cfs 0.461 af Primary=0.0 cfs 0.000 af Outflow=0.3 cfs 0.461 af
Link B15: Post A	Inflow=0.0 cfs 0.000 af Primary=0.0 cfs 0.000 af
SubcatchmentB20: B-1	Runoff Area=47,395 sf 22.83% Impervious Runoff Depth=2.2" Flow Length=407' Tc=15.6 min CN=72 Runoff=3.0 cfs 0.203 af
SubcatchmentB21: B-2	Runoff Area=23,776 sf 5.31% Impervious Runoff Depth=2.8" Flow Length=474' Tc=8.5 min CN=78 Runoff=2.3 cfs 0.126 af
Reach B22: Ditch	Avg. Flow Depth=0.7' Max Vel=3.50 fps Inflow=4.8 cfs 0.329 af n=0.022 L=135.0' S=0.0100 '/' Capacity=18.3 cfs Outflow=4.8 cfs 0.329 af
Pond B23: Inlet	Peak Elev=209.46' Storage=85 cf Inflow=4.8 cfs 0.329 af Outflow=4.8 cfs 0.329 af
Pond B24: Infiltration Tr #1	Peak Elev=209.32' Storage=4,629 cf Inflow=4.8 cfs 0.329 af Discarded=0.1 cfs 0.191 af Primary=2.9 cfs 0.138 af Tertiary=0.0 cfs 0.000 af Outflow=3.0 cfs 0.329 af

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Link B25: Post B

Inflow=2.9 cfs 0.129 af
Primary=2.9 cfs 0.129 af

SubcatchmentB33: Post C

Runoff Area=24,492 sf 12.29% Impervious Runoff Depth=1.6"
Flow Length=142' Tc=7.8 min CN=64 Runoff=1.4 cfs 0.076 af

Pond B34: Infiltration Tr #2

Peak Elev=207.81' Storage=1,357 cf Inflow=1.4 cfs 0.076 af
Discarded=0.2 cfs 0.076 af Primary=0.0 cfs 0.000 af Outflow=0.2 cfs 0.076 af

Link B35: Post C

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB43: Post D

Runoff Area=17,307 sf 0.00% Impervious Runoff Depth=1.0"
Flow Length=225' Tc=9.8 min CN=55 Runoff=0.5 cfs 0.033 af

Pond B44: Infiltration Tr #3

Peak Elev=205.45' Storage=651 cf Inflow=0.5 cfs 0.033 af
Discarded=0.0 cfs 0.033 af Primary=0.0 cfs 0.000 af Outflow=0.0 cfs 0.033 af

Link B45: Post D

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB54: Post E

Runoff Area=9,142 sf 0.00% Impervious Runoff Depth=0.6"
Flow Length=64' Slope=0.1300 '/' Tc=6.0 min CN=47 Runoff=0.1 cfs 0.010 af

Link B55: Post E

Inflow=0.1 cfs 0.010 af
Primary=0.1 cfs 0.010 af

**Total Runoff Area = 10.602 ac Runoff Volume = 1.160 af Average Runoff Depth = 1.3"
89.93% Pervious = 9.535 ac 10.07% Impervious = 1.067 ac**

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Level Spreader	Peak Elev=208.13' Storage=511 cf Inflow=4.4 cfs 0.244 af Outflow=4.4 cfs 0.238 af
SubcatchmentA01: Pre A	Runoff Area=42,502 sf 0.00% Impervious Runoff Depth=0.3" Flow Length=424' Tc=12.4 min CN=35 Runoff=0.1 cfs 0.024 af
SubcatchmentA02: Pre B	Runoff Area=95,630 sf 10.59% Impervious Runoff Depth=1.8" Flow Length=547' Tc=13.0 min CN=57 Runoff=5.0 cfs 0.332 af
SubcatchmentA03: Pre C	Runoff Area=21,190 sf 3.81% Impervious Runoff Depth=0.2" Flow Length=211' Tc=9.0 min CN=33 Runoff=0.0 cfs 0.008 af
SubcatchmentA04: Pre D	Runoff Area=39,824 sf 2.14% Impervious Runoff Depth=0.5" Flow Length=363' Tc=10.3 min CN=38 Runoff=0.2 cfs 0.035 af
SubcatchmentA05: Pre E	Runoff Area=40,179 sf 0.00% Impervious Runoff Depth=0.6" Flow Length=365' Tc=10.6 min CN=40 Runoff=0.4 cfs 0.044 af
SubcatchmentB11: A-2	Runoff Area=57,950 sf 33.83% Impervious Runoff Depth=4.2" Flow Length=621' Tc=13.7 min CN=82 Runoff=7.1 cfs 0.466 af
Reach B12: Grassed Channel	Avg. Flow Depth=0.6' Max Vel=1.30 fps Inflow=7.1 cfs 0.466 af n=0.040 L=110.0' S=0.0029 '/' Capacity=33.8 cfs Outflow=6.9 cfs 0.466 af
SubcatchmentB13: A-1	Runoff Area=42,448 sf 0.00% Impervious Runoff Depth=2.2" Flow Length=140' Tc=11.9 min CN=61 Runoff=2.8 cfs 0.175 af
Pond B14: Infiltration Basin	Peak Elev=207.09' Storage=17,344 cf Inflow=9.6 cfs 0.641 af Discarded=0.4 cfs 0.589 af Primary=0.2 cfs 0.052 af Outflow=0.6 cfs 0.641 af
Link B15: Post A	Inflow=0.2 cfs 0.052 af Primary=0.2 cfs 0.052 af
SubcatchmentB20: B-1	Runoff Area=47,395 sf 22.83% Impervious Runoff Depth=3.2" Flow Length=407' Tc=15.6 min CN=72 Runoff=4.2 cfs 0.289 af
SubcatchmentB21: B-2	Runoff Area=23,776 sf 5.31% Impervious Runoff Depth=3.8" Flow Length=474' Tc=8.5 min CN=78 Runoff=3.2 cfs 0.172 af
Reach B22: Ditch	Avg. Flow Depth=0.8' Max Vel=3.82 fps Inflow=6.8 cfs 0.461 af n=0.022 L=135.0' S=0.0100 '/' Capacity=18.3 cfs Outflow=6.7 cfs 0.461 af
Pond B23: Inlet	Peak Elev=209.62' Storage=122 cf Inflow=6.7 cfs 0.461 af Outflow=6.7 cfs 0.461 af
Pond B24: Infiltration Tr #1	Peak Elev=210.13' Storage=5,405 cf Inflow=6.7 cfs 0.461 af Discarded=0.1 cfs 0.210 af Primary=4.4 cfs 0.244 af Tertiary=0.6 cfs 0.007 af Outflow=5.2 cfs 0.461 af

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Link B25: Post B

Inflow=4.4 cfs 0.238 af
Primary=4.4 cfs 0.238 af

SubcatchmentB33: Post C

Runoff Area=24,492 sf 12.29% Impervious Runoff Depth=2.4"
Flow Length=142' Tc=7.8 min CN=64 Runoff=2.2 cfs 0.114 af

Pond B34: Infiltration Tr #2

Peak Elev=208.72' Storage=2,438 cf Inflow=2.2 cfs 0.114 af
Discarded=0.2 cfs 0.114 af Primary=0.0 cfs 0.000 af Outflow=0.2 cfs 0.114 af

Link B35: Post C

Inflow=0.0 cfs 0.000 af
Primary=0.0 cfs 0.000 af

SubcatchmentB43: Post D

Runoff Area=17,307 sf 0.00% Impervious Runoff Depth=1.7"
Flow Length=225' Tc=9.8 min CN=55 Runoff=0.9 cfs 0.055 af

Pond B44: Infiltration Tr #3

Peak Elev=206.71' Storage=1,064 cf Inflow=0.9 cfs 0.055 af
Discarded=0.0 cfs 0.048 af Primary=0.1 cfs 0.006 af Outflow=0.2 cfs 0.055 af

Link B45: Post D

Inflow=0.1 cfs 0.006 af
Primary=0.1 cfs 0.006 af

SubcatchmentB54: Post E

Runoff Area=9,142 sf 0.00% Impervious Runoff Depth=1.0"
Flow Length=64' Slope=0.1300 '/' Tc=6.0 min CN=47 Runoff=0.3 cfs 0.018 af

Link B55: Post E

Inflow=0.3 cfs 0.018 af
Primary=0.3 cfs 0.018 af

Total Runoff Area = 10.602 ac Runoff Volume = 1.732 af Average Runoff Depth = 2.0"
89.93% Pervious = 9.535 ac 10.07% Impervious = 1.067 ac

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Level Spreader	Peak Elev=208.15' Storage=534 cf Inflow=5.7 cfs 0.384 af Outflow=5.7 cfs 0.373 af
SubcatchmentA01: Pre A	Runoff Area=42,502 sf 0.00% Impervious Runoff Depth=0.8" Flow Length=424' Tc=12.4 min CN=35 Runoff=0.6 cfs 0.066 af
SubcatchmentA02: Pre B	Runoff Area=95,630 sf 10.59% Impervious Runoff Depth=3.0" Flow Length=547' Tc=13.0 min CN=57 Runoff=8.6 cfs 0.552 af
SubcatchmentA03: Pre C	Runoff Area=21,190 sf 3.81% Impervious Runoff Depth=0.6" Flow Length=211' Tc=9.0 min CN=33 Runoff=0.2 cfs 0.026 af
SubcatchmentA04: Pre D	Runoff Area=39,824 sf 2.14% Impervious Runoff Depth=1.1" Flow Length=363' Tc=10.3 min CN=38 Runoff=1.0 cfs 0.082 af
SubcatchmentA05: Pre E	Runoff Area=40,179 sf 0.00% Impervious Runoff Depth=1.3" Flow Length=365' Tc=10.6 min CN=40 Runoff=1.3 cfs 0.097 af
SubcatchmentB11: A-2	Runoff Area=57,950 sf 33.83% Impervious Runoff Depth=5.9" Flow Length=621' Tc=13.7 min CN=82 Runoff=9.8 cfs 0.652 af
Reach B12: Grassed Channel	Avg. Flow Depth=0.7' Max Vel=1.45 fps Inflow=9.8 cfs 0.652 af n=0.040 L=110.0' S=0.0029 '/' Capacity=33.8 cfs Outflow=9.6 cfs 0.652 af
SubcatchmentB13: A-1	Runoff Area=42,448 sf 0.00% Impervious Runoff Depth=3.5" Flow Length=140' Tc=11.9 min CN=61 Runoff=4.6 cfs 0.281 af
Pond B14: Infiltration Basin	Peak Elev=208.08' Storage=24,532 cf Inflow=13.9 cfs 0.933 af Discarded=0.5 cfs 0.707 af Primary=0.7 cfs 0.225 af Outflow=1.2 cfs 0.933 af
Link B15: Post A	Inflow=0.7 cfs 0.225 af Primary=0.7 cfs 0.225 af
SubcatchmentB20: B-1	Runoff Area=47,395 sf 22.83% Impervious Runoff Depth=4.7" Flow Length=407' Tc=15.6 min CN=72 Runoff=6.2 cfs 0.427 af
SubcatchmentB21: B-2	Runoff Area=23,776 sf 5.31% Impervious Runoff Depth=5.4" Flow Length=474' Tc=8.5 min CN=78 Runoff=4.5 cfs 0.246 af
Reach B22: Ditch	Avg. Flow Depth=1.0' Max Vel=4.19 fps Inflow=9.9 cfs 0.673 af n=0.022 L=135.0' S=0.0100 '/' Capacity=18.3 cfs Outflow=9.8 cfs 0.673 af
Pond B23: Inlet	Peak Elev=210.28' Storage=320 cf Inflow=9.8 cfs 0.673 af Outflow=9.6 cfs 0.673 af
Pond B24: Infiltration Tr #1	Peak Elev=211.02' Storage=6,253 cf Inflow=9.6 cfs 0.673 af Discarded=0.1 cfs 0.233 af Primary=5.7 cfs 0.384 af Tertiary=2.8 cfs 0.056 af Outflow=8.7 cfs 0.673 af

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Link B25: Post B

Inflow=5.7 cfs 0.373 af
Primary=5.7 cfs 0.373 af

SubcatchmentB33: Post C

Runoff Area=24,492 sf 12.29% Impervious Runoff Depth=3.8"
Flow Length=142' Tc=7.8 min CN=64 Runoff=3.4 cfs 0.178 af

Pond B34: Infiltration Tr #2

Peak Elev=210.34' Storage=4,276 cf Inflow=3.4 cfs 0.178 af
Discarded=0.2 cfs 0.174 af Primary=0.1 cfs 0.004 af Outflow=0.3 cfs 0.178 af

Link B35: Post C

Inflow=0.1 cfs 0.004 af
Primary=0.1 cfs 0.004 af

SubcatchmentB43: Post D

Runoff Area=17,307 sf 0.00% Impervious Runoff Depth=2.8"
Flow Length=225' Tc=9.8 min CN=55 Runoff=1.6 cfs 0.093 af

Pond B44: Infiltration Tr #3

Peak Elev=206.99' Storage=1,151 cf Inflow=1.6 cfs 0.093 af
Discarded=0.0 cfs 0.056 af Primary=1.1 cfs 0.037 af Outflow=1.2 cfs 0.093 af

Link B45: Post D

Inflow=1.1 cfs 0.037 af
Primary=1.1 cfs 0.037 af

SubcatchmentB54: Post E

Runoff Area=9,142 sf 0.00% Impervious Runoff Depth=2.0"
Flow Length=64' Slope=0.1300 '/' Tc=6.0 min CN=47 Runoff=0.7 cfs 0.034 af

Link B55: Post E

Inflow=0.7 cfs 0.034 af
Primary=0.7 cfs 0.034 af

**Total Runoff Area = 10.602 ac Runoff Volume = 2.733 af Average Runoff Depth = 3.1"
89.93% Pervious = 9.535 ac 10.07% Impervious = 1.067 ac**