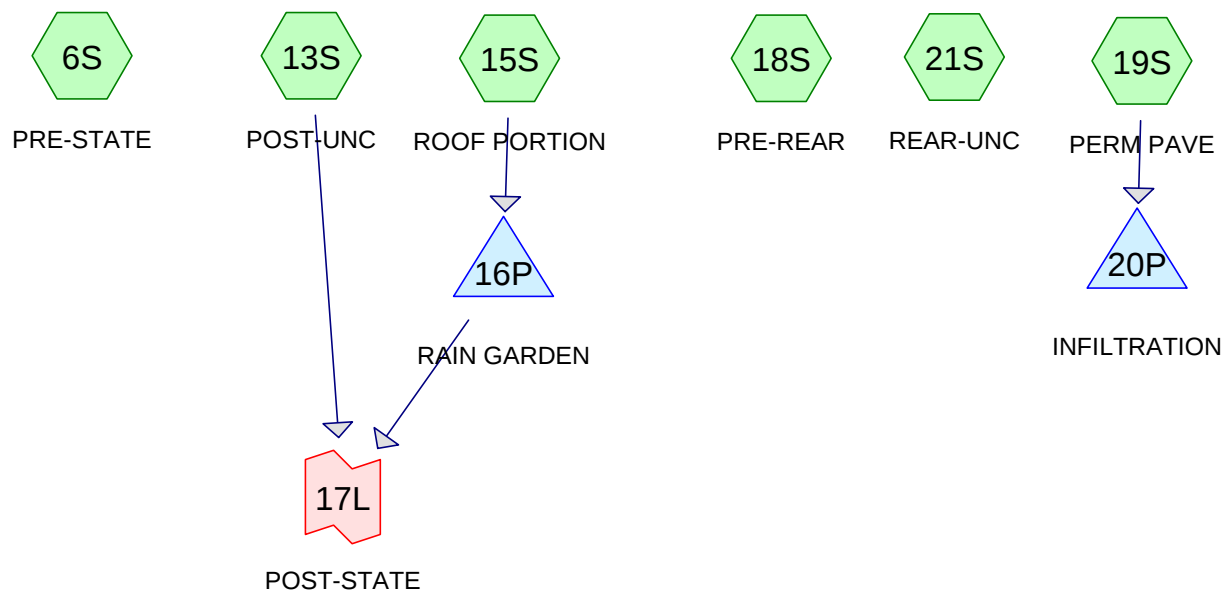


Routing Diagram for 151 STATE

Prepared by Principe Engineering, Inc, Printed 8/22/2024
HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

151 STATE

Prepared by Principe Engineering, Inc

Printed 8/22/2024

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type III 24-hr		Default	24.00	1	2.70	2
2	10-yr	Type III 24-hr		Default	24.00	1	4.90	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.10	2
4	100-yr	Type III 24-hr		Default	24.00	1	8.70	2

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Printed 8/22/2024

Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.065	74	>75% Grass cover, Good, HSG C (13S, 15S, 18S)
0.312	98	Paved parking, HSG C (6S, 13S, 18S, 19S, 21S)
0.254	98	Roofs, HSG C (6S, 13S, 15S)
0.631	96	TOTAL AREA

151 STATE

Prepared by Principe Engineering, Inc

Printed 8/22/2024

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.631	HSG C	6S, 13S, 15S, 18S, 19S, 21S
0.000	HSG D	
0.000	Other	
0.631		TOTAL AREA

151 STATE

Prepared by Principe Engineering, Inc

Printed 8/22/2024

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Page 5

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.065	0.000	0.000	0.065	>75% Grass cover, Good	13S, 15S, 18S
0.000	0.000	0.312	0.000	0.000	0.312	Paved parking	6S, 13S, 18S, 19S, 21S
0.000	0.000	0.254	0.000	0.000	0.254	Roofs	6S, 13S, 15S
0.000	0.000	0.631	0.000	0.000	0.631	TOTAL AREA	

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 6

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: PRE-STATE	Runoff Area=12,106 sf 100.00% Impervious Runoff Depth>2.47" Tc=6.0 min CN=98 Runoff=0.72 cfs 0.057 af
Subcatchment 13S: POST-UNC	Runoff Area=10,527 sf 86.29% Impervious Runoff Depth>2.16" Tc=6.0 min CN=95 Runoff=0.58 cfs 0.043 af
Subcatchment 15S: ROOF PORTION	Runoff Area=1,579 sf 77.71% Impervious Runoff Depth>1.97" Tc=6.0 min CN=93 Runoff=0.08 cfs 0.006 af
Subcatchment 18S: PRE-REAR	Runoff Area=1,646 sf 36.63% Impervious Runoff Depth>1.21" Tc=6.0 min CN=83 Runoff=0.05 cfs 0.004 af
Subcatchment 19S: PERM PAVE	Runoff Area=1,520 sf 100.00% Impervious Runoff Depth>2.47" Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af
Subcatchment 21S: REAR-UNC	Runoff Area=126 sf 100.00% Impervious Runoff Depth>2.47" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Pond 16P: RAIN GARDEN	Peak Elev=52.71' Storage=89 cf Inflow=0.08 cfs 0.006 af Discarded=0.00 cfs 0.002 af Primary=0.06 cfs 0.002 af Outflow=0.06 cfs 0.004 af
Pond 20P: INFILTRATION	Peak Elev=53.15' Storage=78 cf Inflow=0.09 cfs 0.007 af Outflow=0.02 cfs 0.007 af
Link 17L: POST-STATE	Inflow=0.58 cfs 0.046 af Primary=0.58 cfs 0.046 af

Total Runoff Area = 0.631 ac Runoff Volume = 0.118 af Average Runoff Depth = 2.24"
10.32% Pervious = 0.065 ac 89.68% Impervious = 0.566 ac

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 7

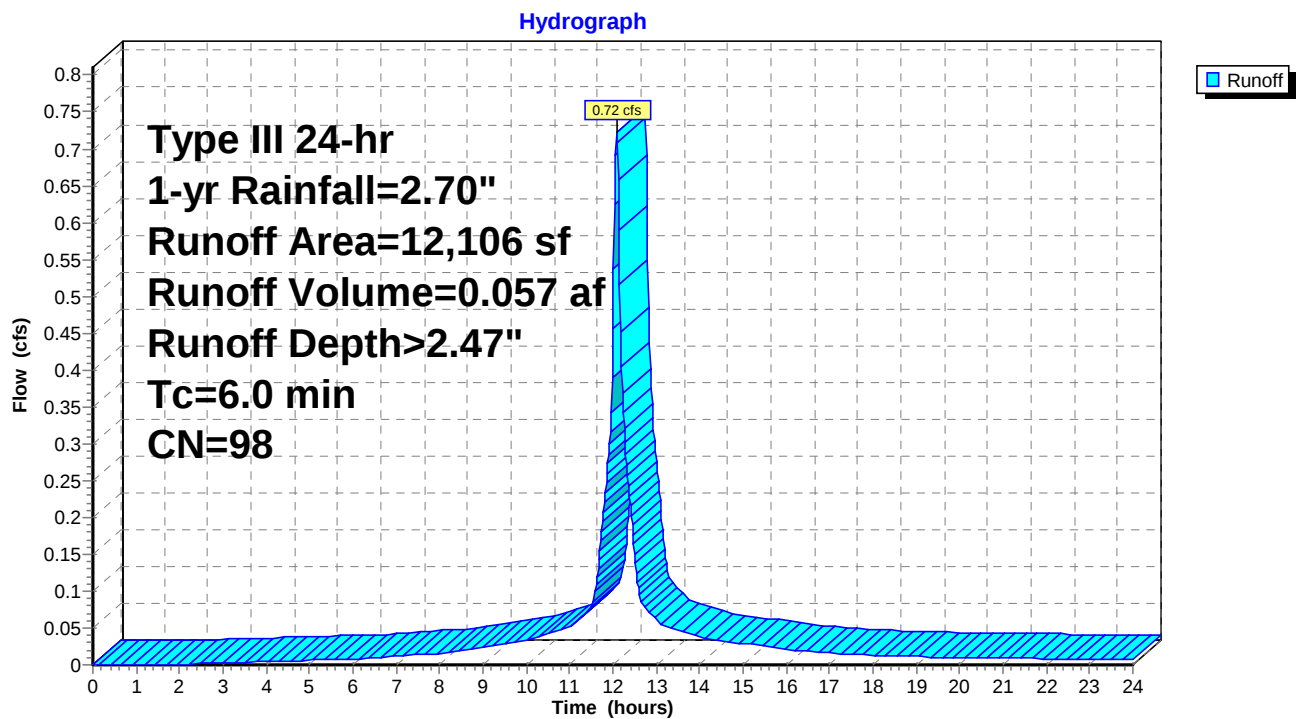
Summary for Subcatchment 6S: PRE-STATE

Runoff = 0.72 cfs @ 12.08 hrs, Volume= 0.057 af, Depth> 2.47"
Routed to nonexistent node 2P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
5,533	98	Roofs, HSG C
6,573	98	Paved parking, HSG C
12,106	98	Weighted Average
12,106	98	100.00% Impervious Area

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

Subcatchment 6S: PRE-STATE

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 8

Summary for Subcatchment 13S: POST-UNC

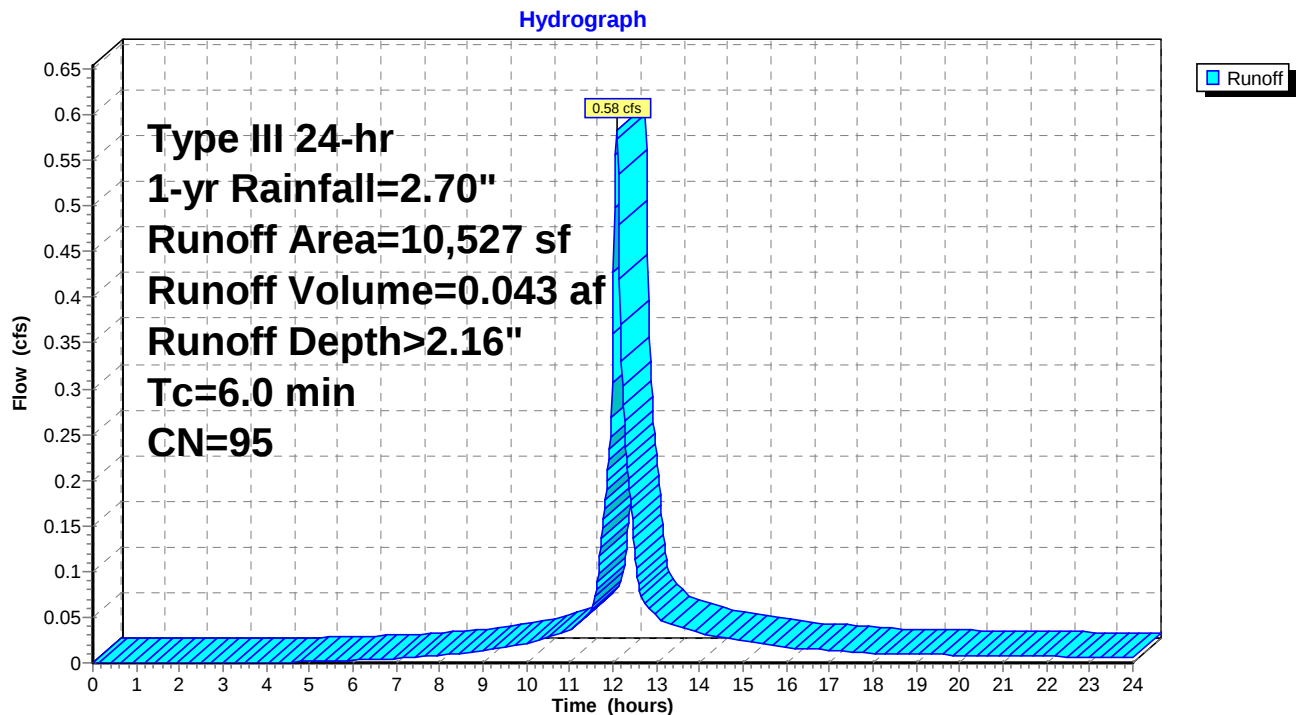
Runoff = 0.58 cfs @ 12.08 hrs, Volume= 0.043 af, Depth> 2.16"
Routed to Link 17L : POST-STATE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
4,306	98	Roofs, HSG C
1,443	74	>75% Grass cover, Good, HSG C
4,778	98	Paved parking, HSG C
10,527	95	Weighted Average
1,443	74	13.71% Pervious Area
9,084	98	86.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 1

Subcatchment 13S: POST-UNC



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 9

Summary for Subcatchment 15S: ROOF PORTION

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.006 af, Depth> 1.97"
Routed to Pond 16P : RAIN GARDEN

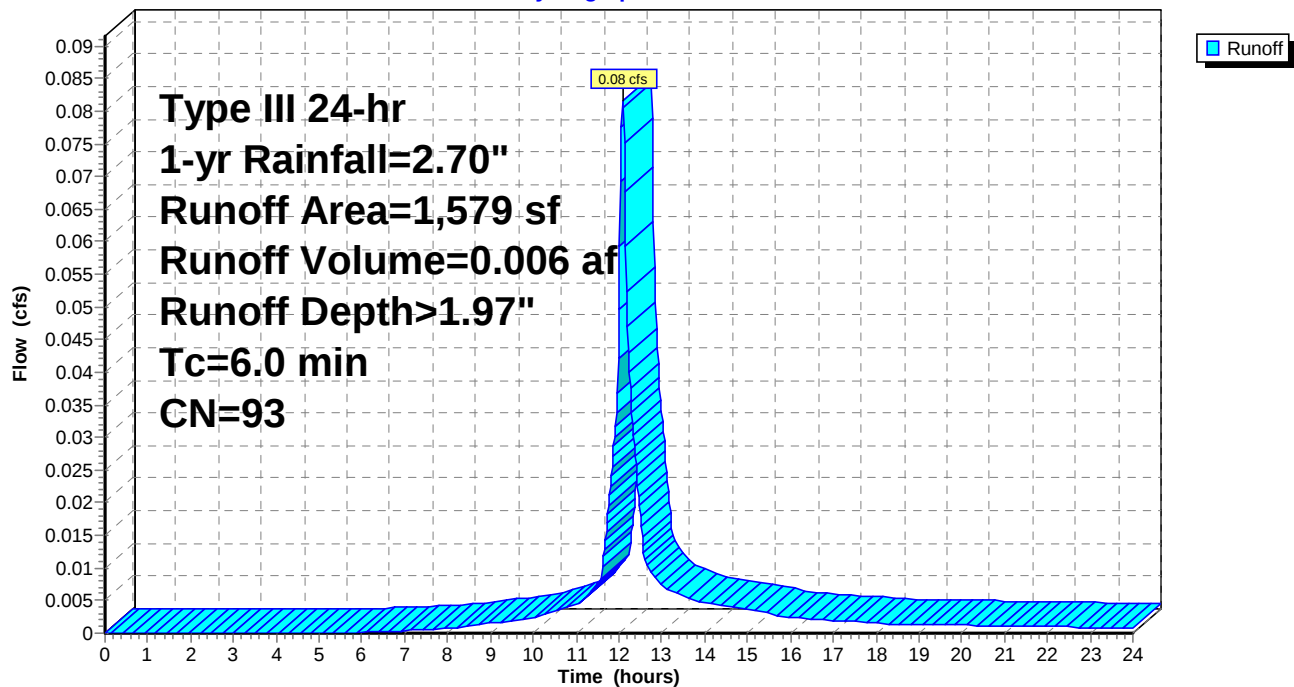
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
1,227	98	Roofs, HSG C
352	74	>75% Grass cover, Good, HSG C
1,579	93	Weighted Average
352	74	22.29% Pervious Area
1,227	98	77.71% Impervious Area

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

Subcatchment 15S: ROOF PORTION

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 10

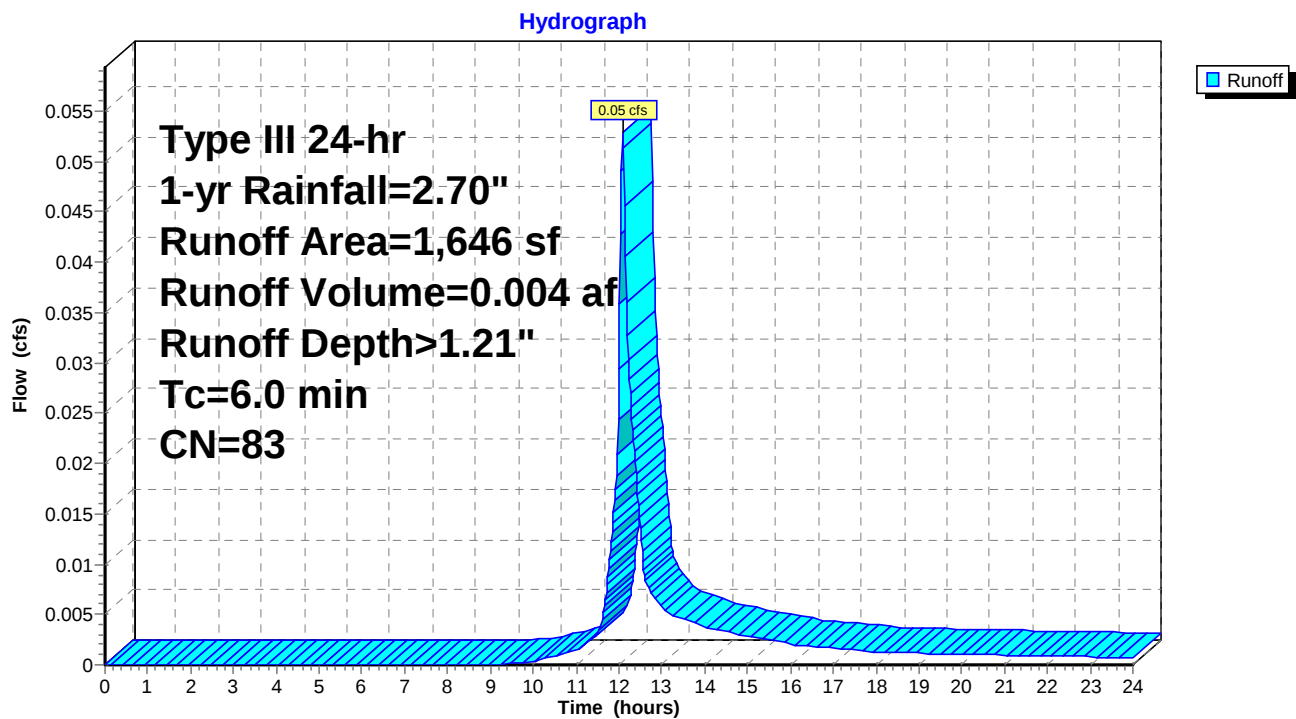
Summary for Subcatchment 18S: PRE-REAR

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
1,043	74	>75% Grass cover, Good, HSG C
603	98	Paved parking, HSG C
1,646	83	Weighted Average
1,043	74	63.37% Pervious Area
603	98	36.63% Impervious Area

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

Subcatchment 18S: PRE-REAR

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 11

Summary for Subcatchment 19S: PERM PAVE

Runoff = 0.09 cfs @ 12.08 hrs, Volume= 0.007 af, Depth> 2.47"
Routed to Pond 20P : INFILTRATION

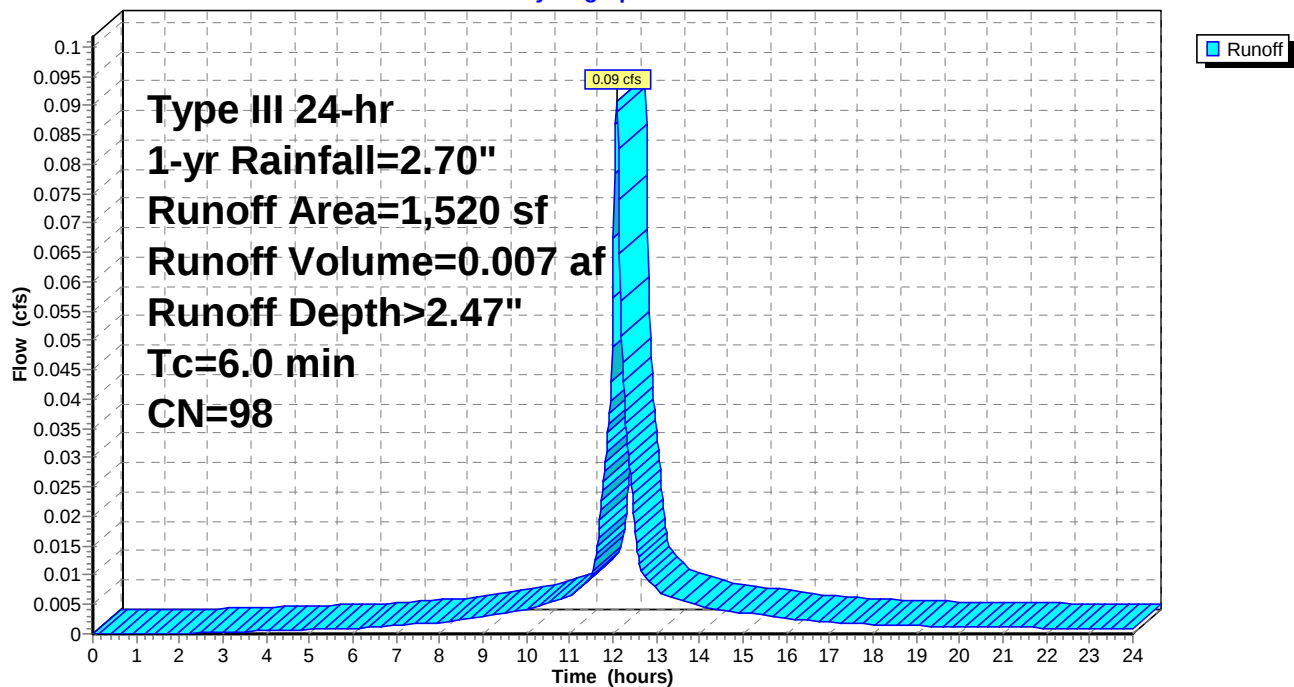
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
1,520	98	Paved parking, HSG C
1,520	98	100.00% Impervious Area

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

Subcatchment 19S: PERM PAVE

Hydrograph



Summary for Subcatchment 21S: REAR-UNC

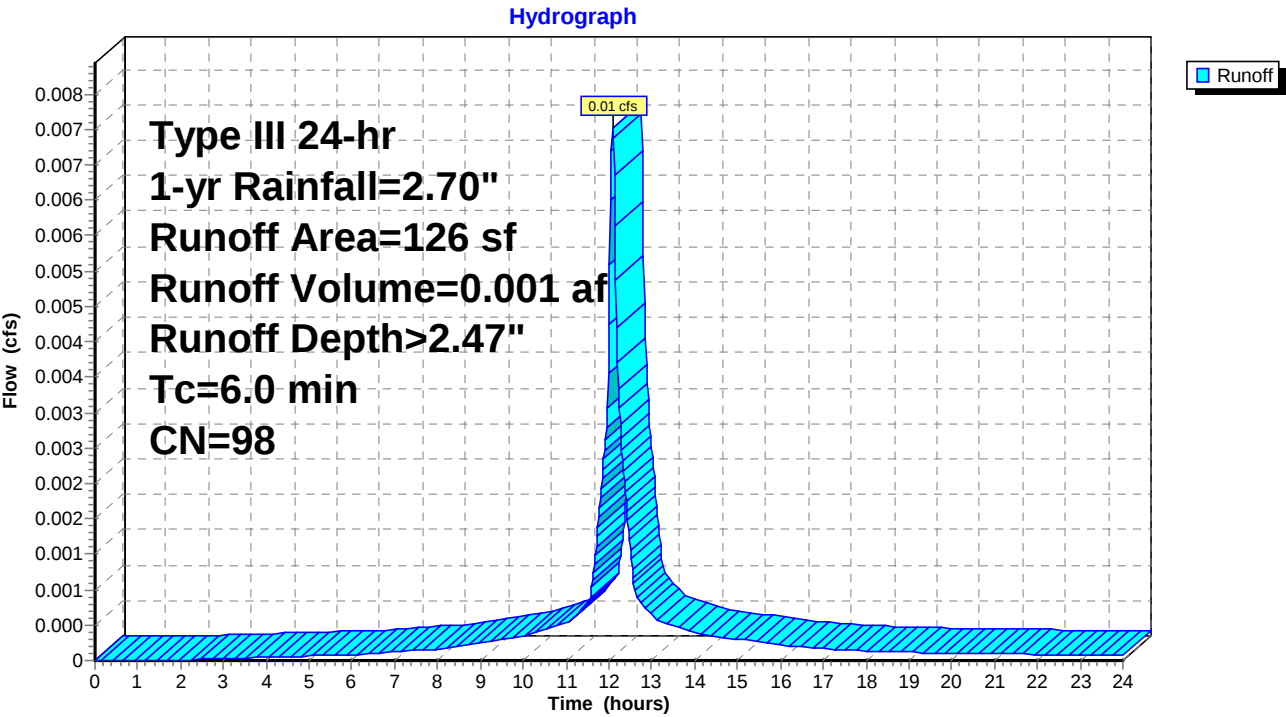
Runoff = 0.01 cfs @ 12.08 hrs, Volume= 0.001 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-yr Rainfall=2.70"

Area (sf)	CN	Description
126	98	Paved parking, HSG C
126	98	100.00% Impervious Area

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

Subcatchment 21S: REAR-UNC



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 13

Summary for Pond 16P: RAIN GARDEN

Inflow Area = 0.036 ac, 77.71% Impervious, Inflow Depth > 1.97" for 1-yr event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.006 af
 Outflow = 0.06 cfs @ 12.17 hrs, Volume= 0.004 af, Atten= 27%, Lag= 4.8 min
 Discarded = 0.00 cfs @ 12.17 hrs, Volume= 0.002 af
 Primary = 0.06 cfs @ 12.17 hrs, Volume= 0.002 af
 Routed to Link 17L : POST-STATE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 52.71' @ 12.17 hrs Surf.Area= 172 sf Storage= 89 cf

Plug-Flow detention time= 172.8 min calculated for 0.004 af (75% of inflow)
 Center-of-Mass det. time= 87.3 min (885.4 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	145 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	79	0	0
53.00	211	145	145

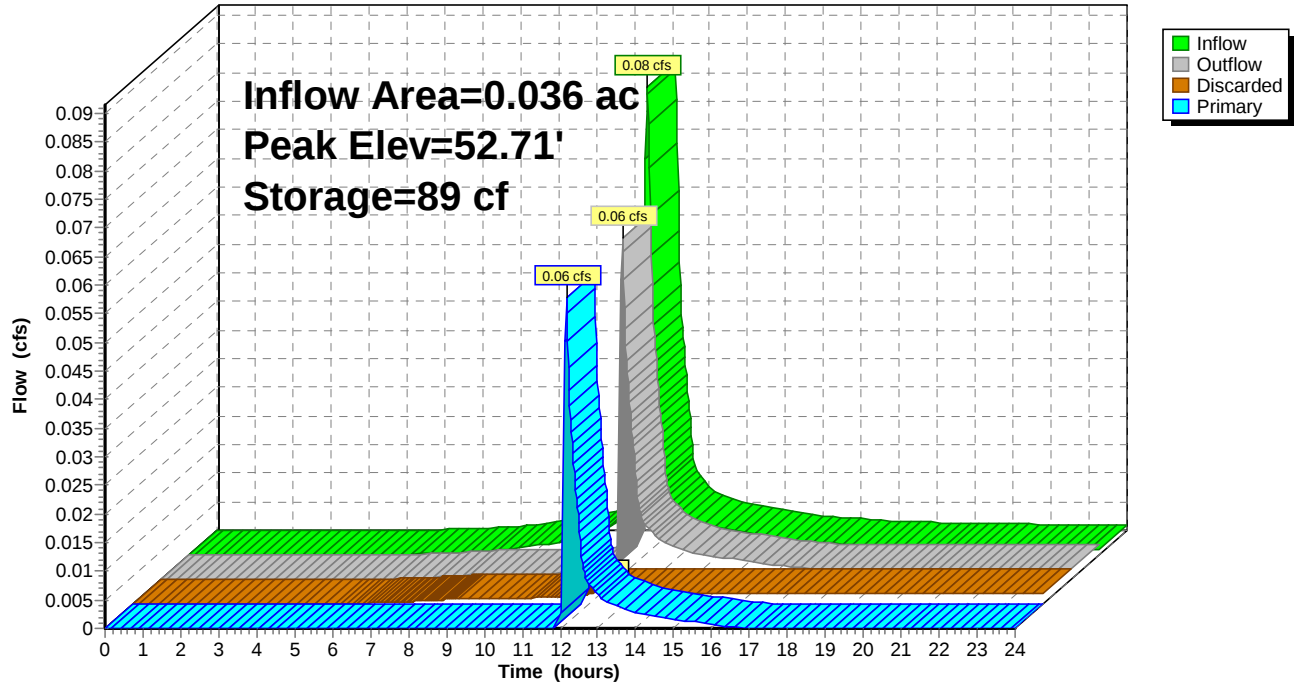
Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	0.500 in/hr Exfiltration over Surface area
#2	Primary	52.67'	3.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.17 hrs HW=52.71' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 12.17 hrs HW=52.71' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.51 fps)

Pond 16P: RAIN GARDEN

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

Page 15

Summary for Pond 20P: INFILTRATION

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth > 2.47" for 1-yr event
 Inflow = 0.09 cfs @ 12.08 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.76 hrs, Volume= 0.007 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.76 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 53.15' @ 12.52 hrs Surf.Area= 1,520 sf Storage= 78 cf

Plug-Flow detention time= 25.2 min calculated for 0.007 af (100% of inflow)
 Center-of-Mass det. time= 24.7 min (784.3 - 759.6)

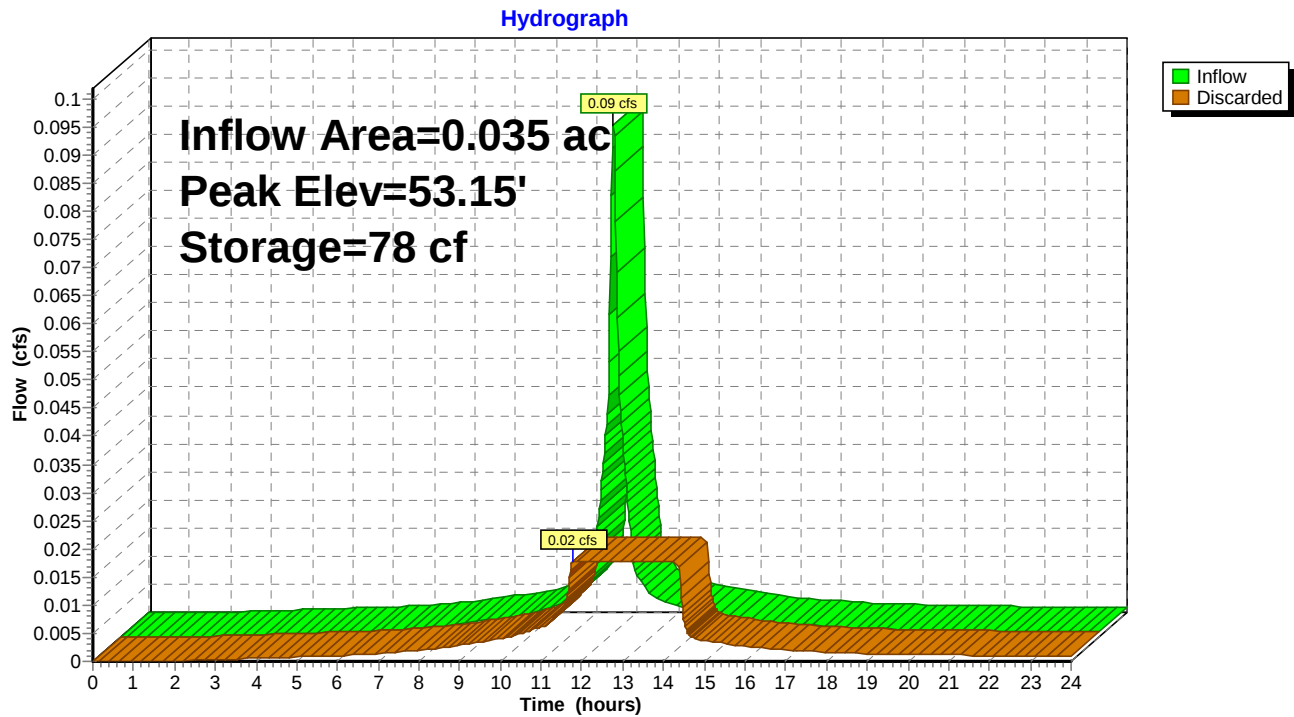
Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	502 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,520 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	1,520	0	0
54.00	1,520	1,520	1,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	0.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.76 hrs HW=53.01' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 20P: INFILTRATION



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 1-yr Rainfall=2.70"

Printed 8/22/2024

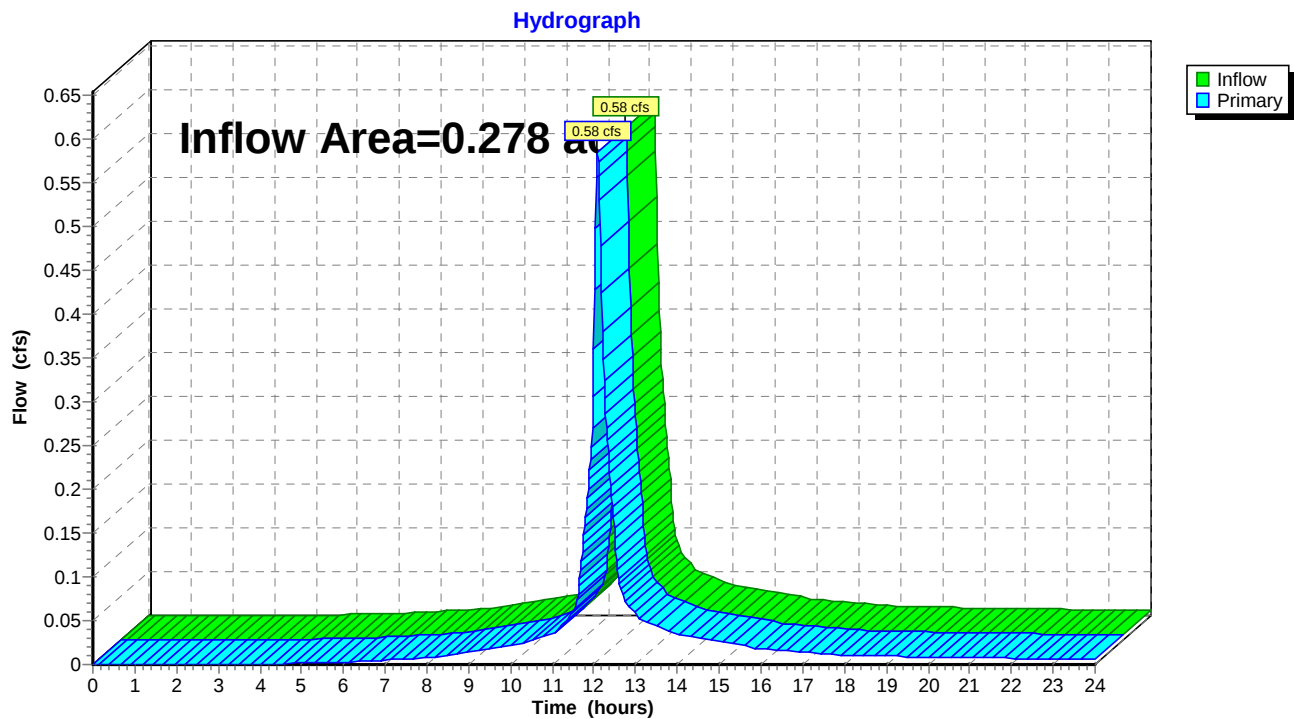
Page 17

Summary for Link 17L: POST-STATE

Inflow Area = 0.278 ac, 85.17% Impervious, Inflow Depth > 1.97" for 1-yr event
Inflow = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af
Primary = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 17L: POST-STATE



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 18

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

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

Subcatchment 6S: PRE-STATE	Runoff Area=12,106 sf 100.00% Impervious Runoff Depth>4.66" Tc=6.0 min CN=98 Runoff=1.33 cfs 0.108 af
Subcatchment 13S: POST-UNC	Runoff Area=10,527 sf 86.29% Impervious Runoff Depth>4.32" Tc=6.0 min CN=95 Runoff=1.12 cfs 0.087 af
Subcatchment 15S: ROOF PORTION	Runoff Area=1,579 sf 77.71% Impervious Runoff Depth>4.10" Tc=6.0 min CN=93 Runoff=0.16 cfs 0.012 af
Subcatchment 18S: PRE-REAR	Runoff Area=1,646 sf 36.63% Impervious Runoff Depth>3.08" Tc=6.0 min CN=83 Runoff=0.14 cfs 0.010 af
Subcatchment 19S: PERM PAVE	Runoff Area=1,520 sf 100.00% Impervious Runoff Depth>4.66" Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af
Subcatchment 21S: REAR-UNC	Runoff Area=126 sf 100.00% Impervious Runoff Depth>4.66" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Pond 16P: RAIN GARDEN	Peak Elev=52.74' Storage=95 cf Inflow=0.16 cfs 0.012 af Discarded=0.00 cfs 0.003 af Primary=0.16 cfs 0.008 af Outflow=0.16 cfs 0.011 af
Pond 20P: INFILTRATION	Peak Elev=53.38' Storage=192 cf Inflow=0.17 cfs 0.014 af Outflow=0.02 cfs 0.014 af
Link 17L: POST-STATE	Inflow=1.28 cfs 0.095 af Primary=1.28 cfs 0.095 af

Total Runoff Area = 0.631 ac Runoff Volume = 0.232 af Average Runoff Depth = 4.40"
10.32% Pervious = 0.065 ac 89.68% Impervious = 0.566 ac

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 19

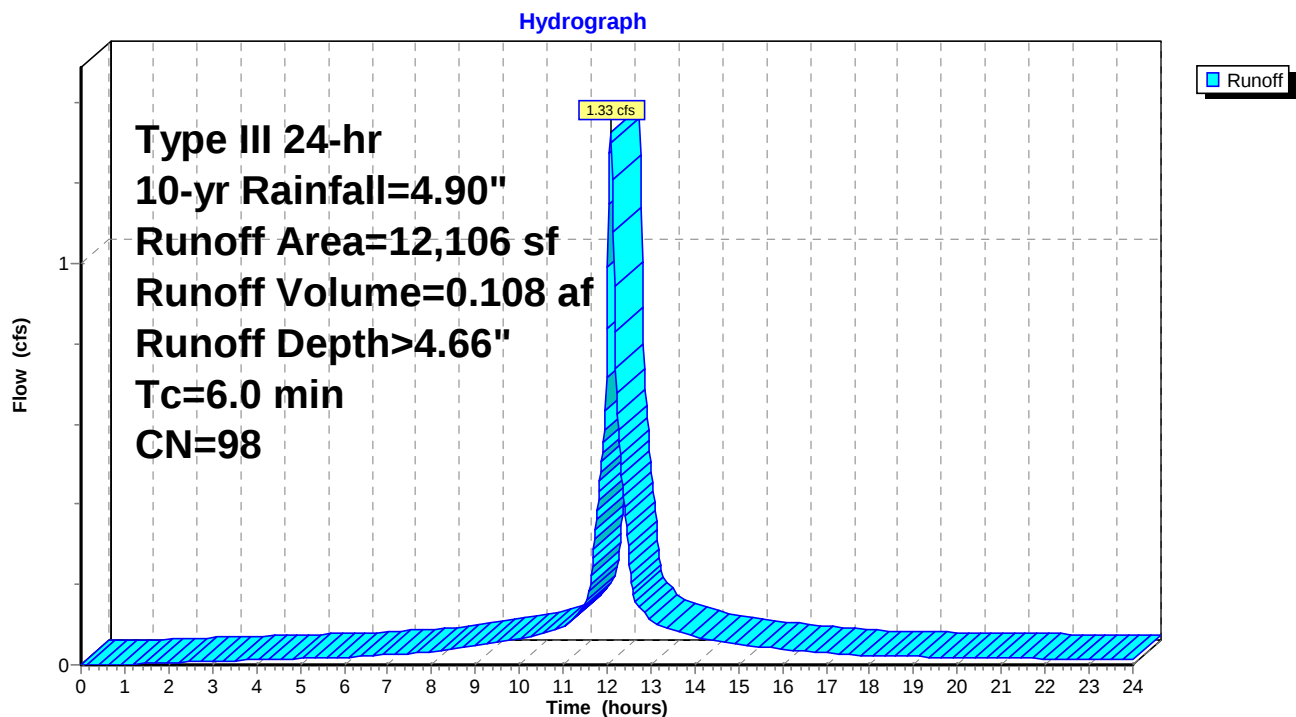
Summary for Subcatchment 6S: PRE-STATE

Runoff = 1.33 cfs @ 12.08 hrs, Volume= 0.108 af, Depth> 4.66"
Routed to nonexistent node 2P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
5,533	98	Roofs, HSG C
6,573	98	Paved parking, HSG C
12,106	98	Weighted Average
12,106	98	100.00% Impervious Area

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

Subcatchment 6S: PRE-STATE

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 20

Summary for Subcatchment 13S: POST-UNC

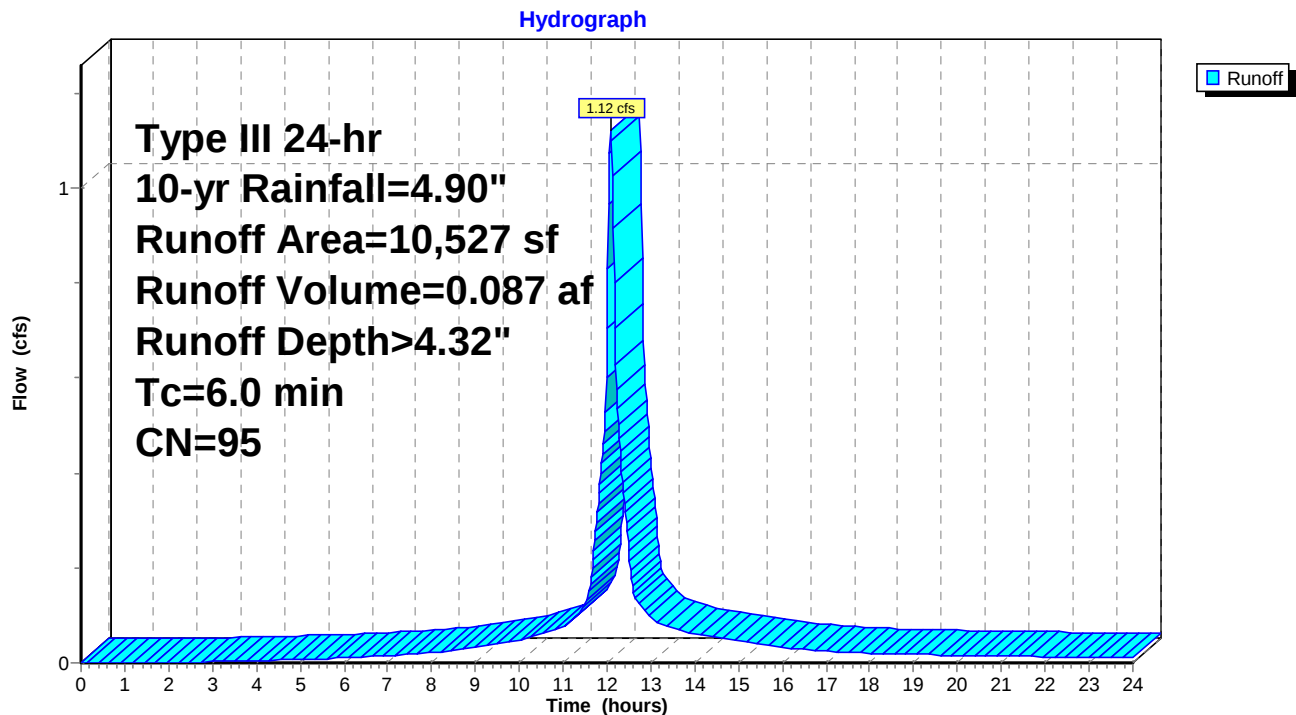
Runoff = 1.12 cfs @ 12.08 hrs, Volume= 0.087 af, Depth> 4.32"
Routed to Link 17L : POST-STATE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
4,306	98	Roofs, HSG C
1,443	74	>75% Grass cover, Good, HSG C
4,778	98	Paved parking, HSG C
10,527	95	Weighted Average
1,443	74	13.71% Pervious Area
9,084	98	86.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 1

Subcatchment 13S: POST-UNC



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 21

Summary for Subcatchment 15S: ROOF PORTION

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 0.012 af, Depth> 4.10"
Routed to Pond 16P : RAIN GARDEN

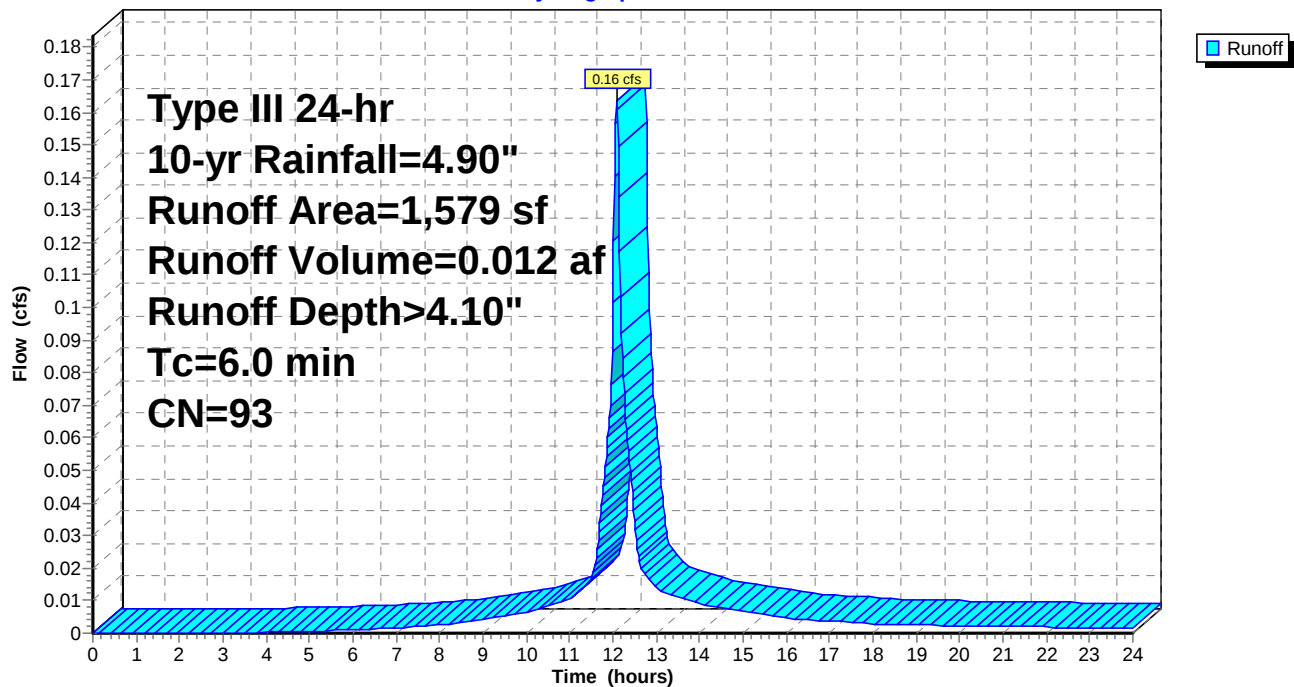
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
1,227	98	Roofs, HSG C
352	74	>75% Grass cover, Good, HSG C
1,579	93	Weighted Average
352	74	22.29% Pervious Area
1,227	98	77.71% Impervious Area

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

Subcatchment 15S: ROOF PORTION

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 22

Summary for Subcatchment 18S: PRE-REAR

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 3.08"

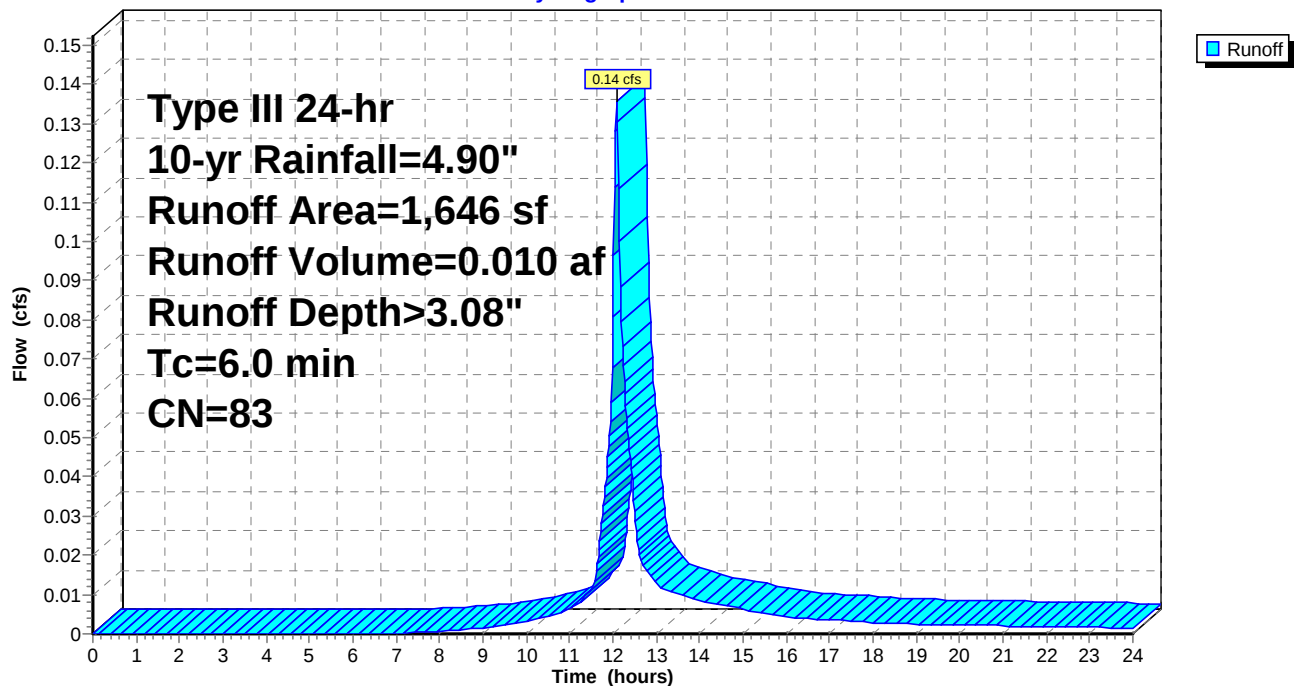
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
1,043	74	>75% Grass cover, Good, HSG C
603	98	Paved parking, HSG C
1,646	83	Weighted Average
1,043	74	63.37% Pervious Area
603	98	36.63% Impervious Area

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

Subcatchment 18S: PRE-REAR

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 23

Summary for Subcatchment 19S: PERM PAVE

Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Depth> 4.66"
Routed to Pond 20P : INFILTRATION

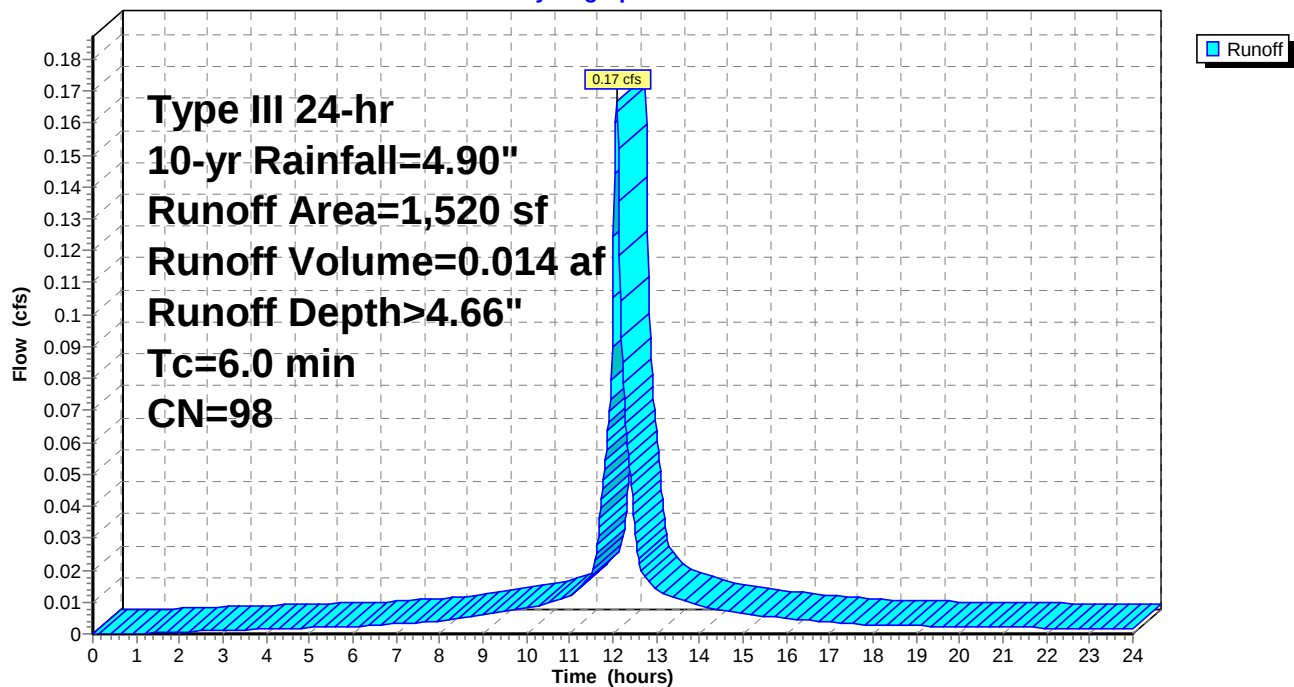
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
1,520	98	Paved parking, HSG C
1,520	98	100.00% Impervious Area

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

Subcatchment 19S: PERM PAVE

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 24

Summary for Subcatchment 21S: REAR-UNC

Runoff = 0.01 cfs @ 12.08 hrs, Volume= 0.001 af, Depth> 4.66"

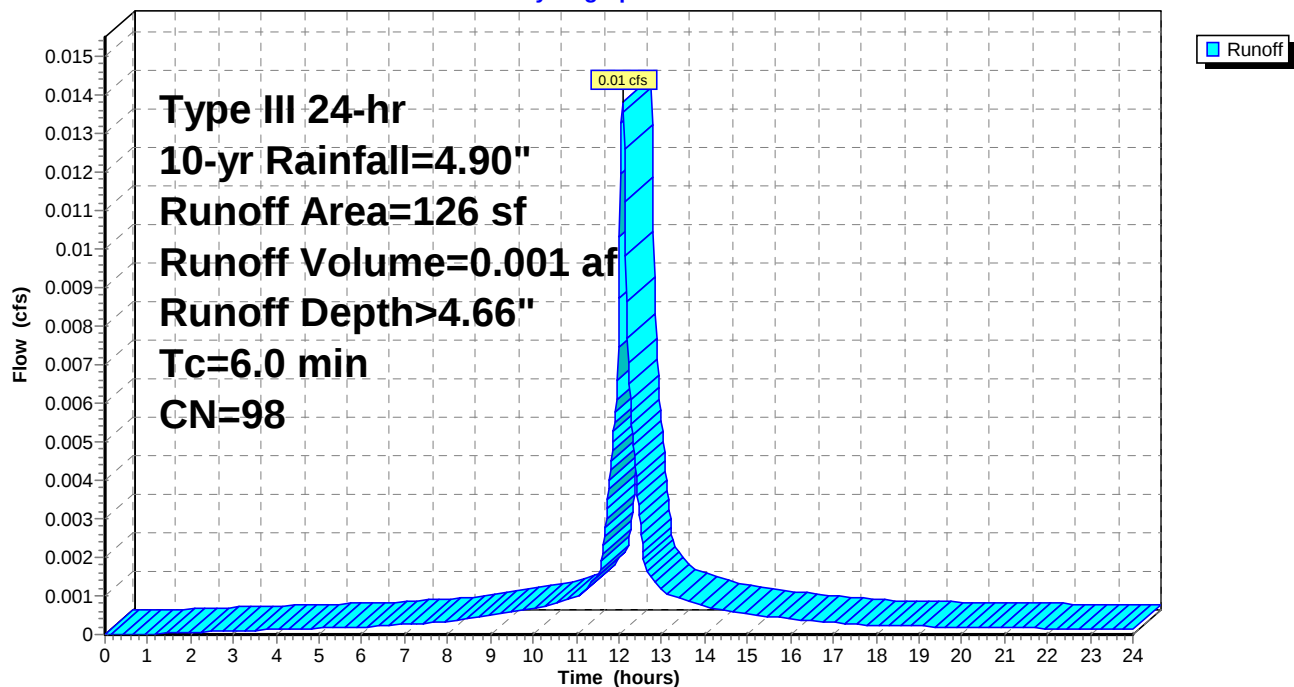
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
126	98	Paved parking, HSG C
126	98	100.00% Impervious Area

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

Subcatchment 21S: REAR-UNC

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 25

Summary for Pond 16P: RAIN GARDEN

Inflow Area = 0.036 ac, 77.71% Impervious, Inflow Depth > 4.10" for 10-yr event
 Inflow = 0.16 cfs @ 12.08 hrs, Volume= 0.012 af
 Outflow = 0.16 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 2%, Lag= 0.9 min
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.003 af
 Primary = 0.16 cfs @ 12.10 hrs, Volume= 0.008 af
 Routed to Link 17L : POST-STATE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 52.74' @ 12.10 hrs Surf.Area= 177 sf Storage= 95 cf

Plug-Flow detention time= 97.7 min calculated for 0.011 af (85% of inflow)
 Center-of-Mass det. time= 34.3 min (812.6 - 778.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	145 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

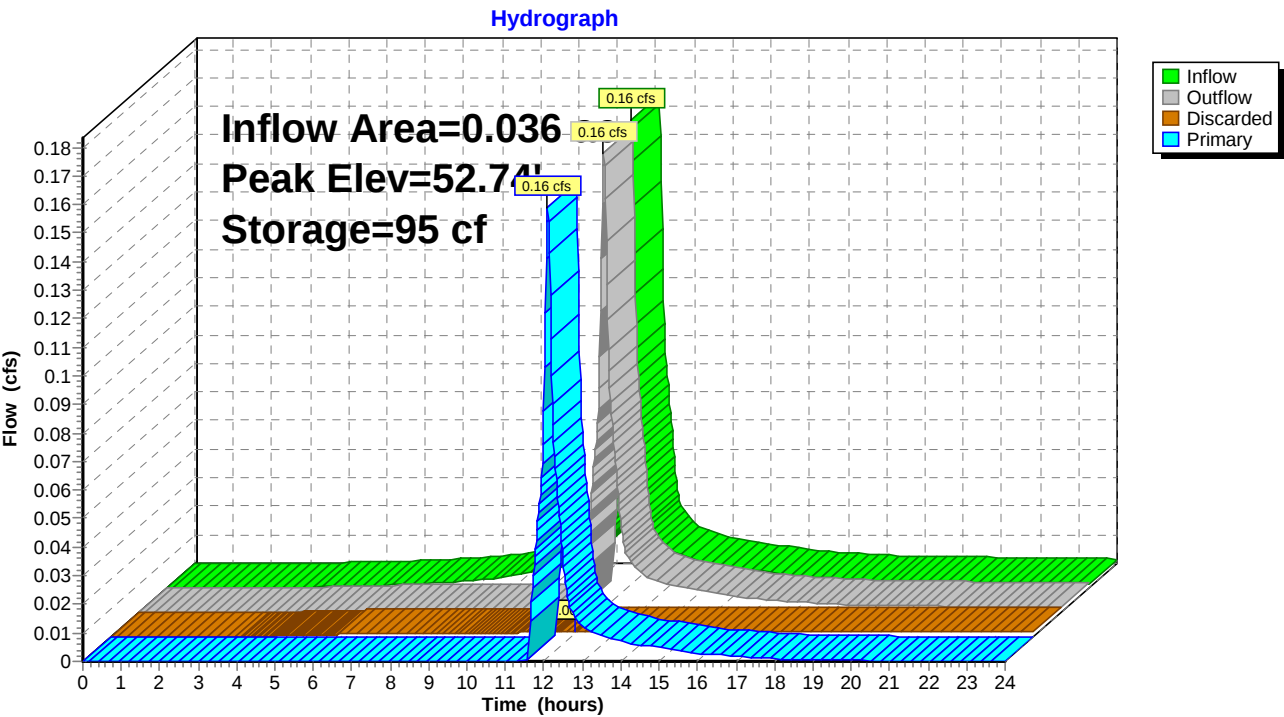
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	79	0	0
53.00	211	145	145

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	0.500 in/hr Exfiltration over Surface area
#2	Primary	52.67'	3.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=52.74' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.16 cfs @ 12.10 hrs HW=52.74' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.16 cfs @ 0.73 fps)

Pond 16P: RAIN GARDEN



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=4.90"

Printed 8/22/2024

Page 27

Summary for Pond 20P: INFILTRATION

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth > 4.66" for 10-yr event
 Inflow = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.52 hrs, Volume= 0.014 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.52 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 53.38' @ 12.77 hrs Surf.Area= 1,520 sf Storage= 192 cf

Plug-Flow detention time= 72.3 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 71.8 min (819.6 - 747.8)

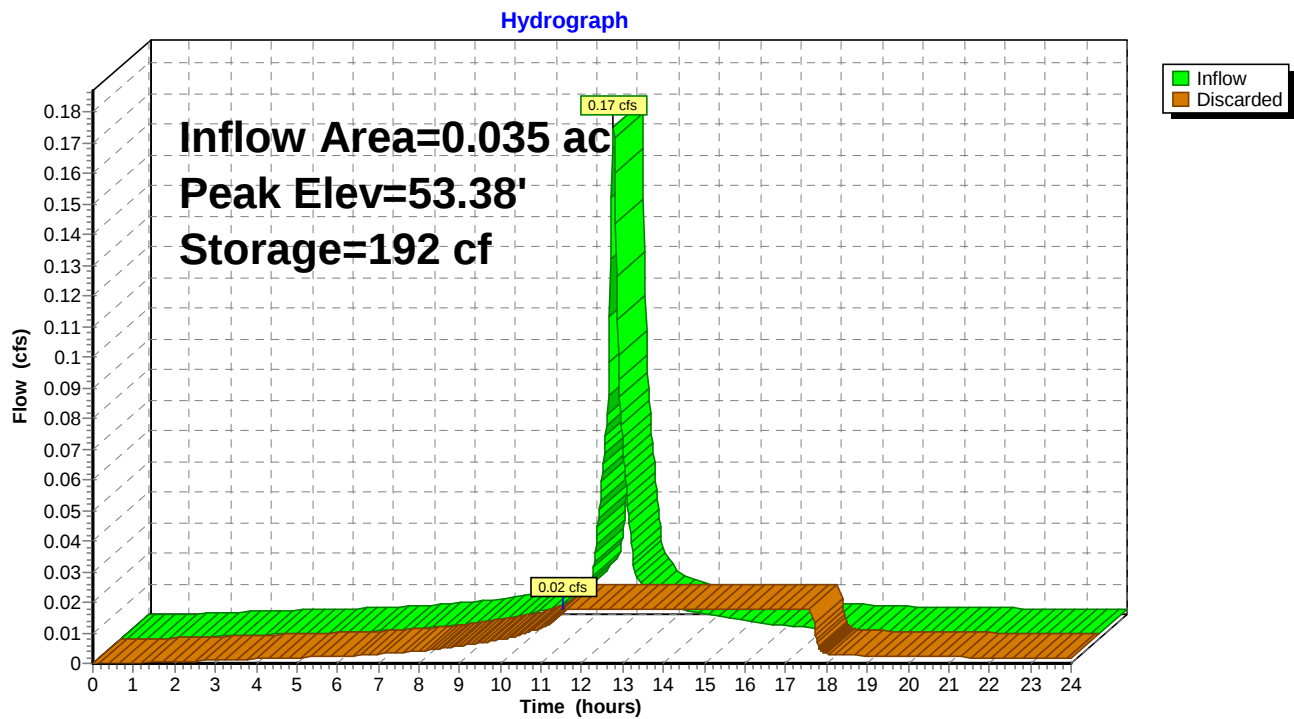
Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	502 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,520 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	1,520	0	0
54.00	1,520	1,520	1,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	0.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.52 hrs HW=53.01' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

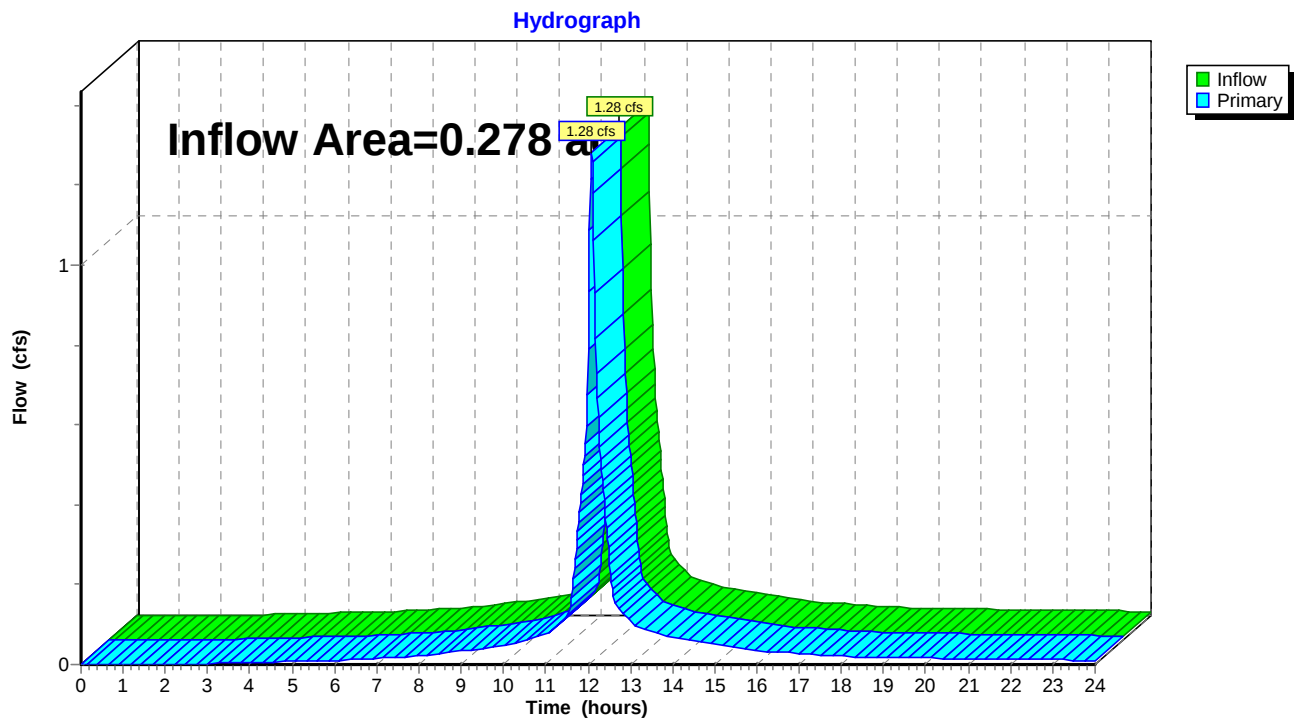
Pond 20P: INFILTRATION



Summary for Link 17L: POST-STATE

Inflow Area = 0.278 ac, 85.17% Impervious, Inflow Depth > 4.09" for 10-yr event
Inflow = 1.28 cfs @ 12.09 hrs, Volume= 0.095 af
Primary = 1.28 cfs @ 12.09 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 17L: POST-STATE

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 30

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: PRE-STATE	Runoff Area=12,106 sf 100.00% Impervious Runoff Depth>5.86" Tc=6.0 min CN=98 Runoff=1.66 cfs 0.136 af
Subcatchment 13S: POST-UNC	Runoff Area=10,527 sf 86.29% Impervious Runoff Depth>5.51" Tc=6.0 min CN=95 Runoff=1.41 cfs 0.111 af
Subcatchment 15S: ROOF PORTION	Runoff Area=1,579 sf 77.71% Impervious Runoff Depth>5.28" Tc=6.0 min CN=93 Runoff=0.21 cfs 0.016 af
Subcatchment 18S: PRE-REAR	Runoff Area=1,646 sf 36.63% Impervious Runoff Depth>4.18" Tc=6.0 min CN=83 Runoff=0.18 cfs 0.013 af
Subcatchment 19S: PERM PAVE	Runoff Area=1,520 sf 100.00% Impervious Runoff Depth>5.86" Tc=6.0 min CN=98 Runoff=0.21 cfs 0.017 af
Subcatchment 21S: REAR-UNC	Runoff Area=126 sf 100.00% Impervious Runoff Depth>5.86" Tc=6.0 min CN=98 Runoff=0.02 cfs 0.001 af
Pond 16P: RAIN GARDEN	Peak Elev=52.76' Storage=97 cf Inflow=0.21 cfs 0.016 af Discarded=0.00 cfs 0.003 af Primary=0.20 cfs 0.011 af Outflow=0.20 cfs 0.014 af
Pond 20P: INFILTRATION	Peak Elev=53.52' Storage=263 cf Inflow=0.21 cfs 0.017 af Outflow=0.02 cfs 0.017 af
Link 17L: POST-STATE	Inflow=1.61 cfs 0.122 af Primary=1.61 cfs 0.122 af

Total Runoff Area = 0.631 ac Runoff Volume = 0.294 af Average Runoff Depth = 5.59"
10.32% Pervious = 0.065 ac 89.68% Impervious = 0.566 ac

Summary for Subcatchment 6S: PRE-STATE

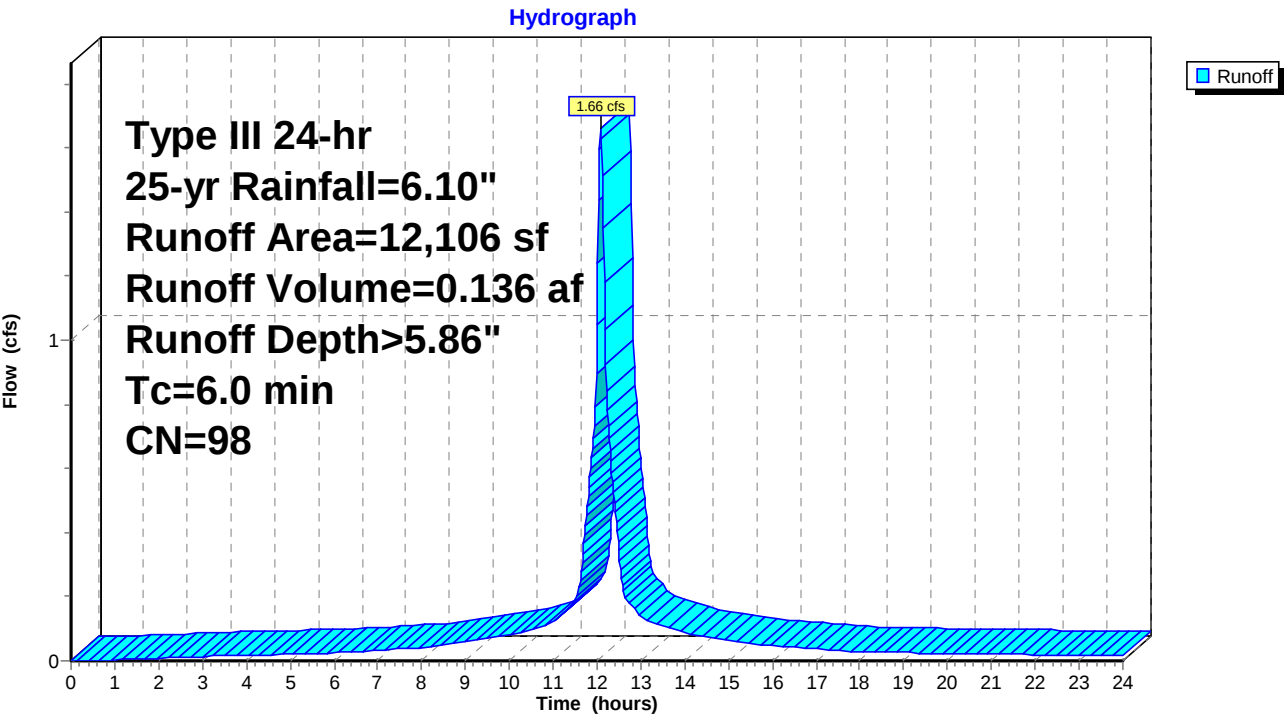
Runoff = 1.66 cfs @ 12.08 hrs, Volume= 0.136 af, Depth> 5.86"
Routed to nonexistent node 2P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
5,533	98	Roofs, HSG C
6,573	98	Paved parking, HSG C
12,106	98	Weighted Average
12,106	98	100.00% Impervious Area

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

Subcatchment 6S: PRE-STATE



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 32

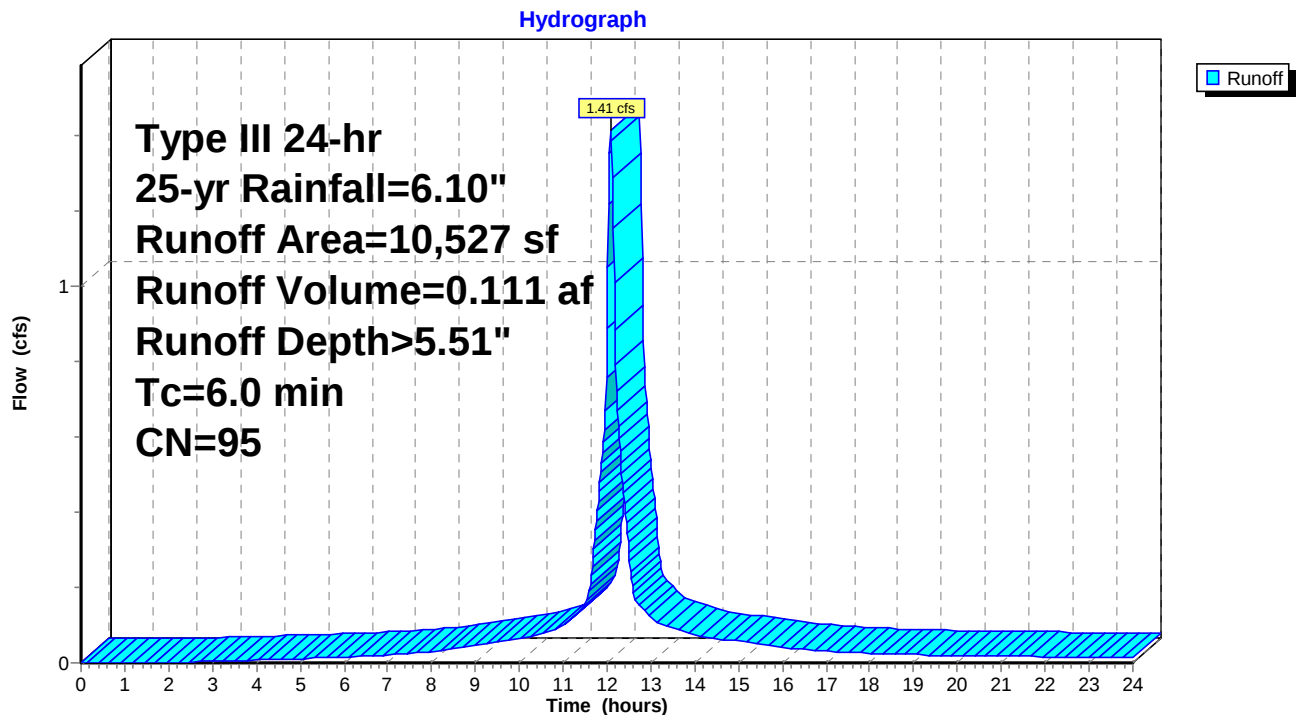
Summary for Subcatchment 13S: POST-UNC

Runoff = 1.41 cfs @ 12.08 hrs, Volume= 0.111 af, Depth> 5.51"
Routed to Link 17L : POST-STATE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
4,306	98	Roofs, HSG C
1,443	74	>75% Grass cover, Good, HSG C
4,778	98	Paved parking, HSG C
10,527	95	Weighted Average
1,443	74	13.71% Pervious Area
9,084	98	86.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 1

Subcatchment 13S: POST-UNC

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 33

Summary for Subcatchment 15S: ROOF PORTION

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af, Depth> 5.28"
Routed to Pond 16P : RAIN GARDEN

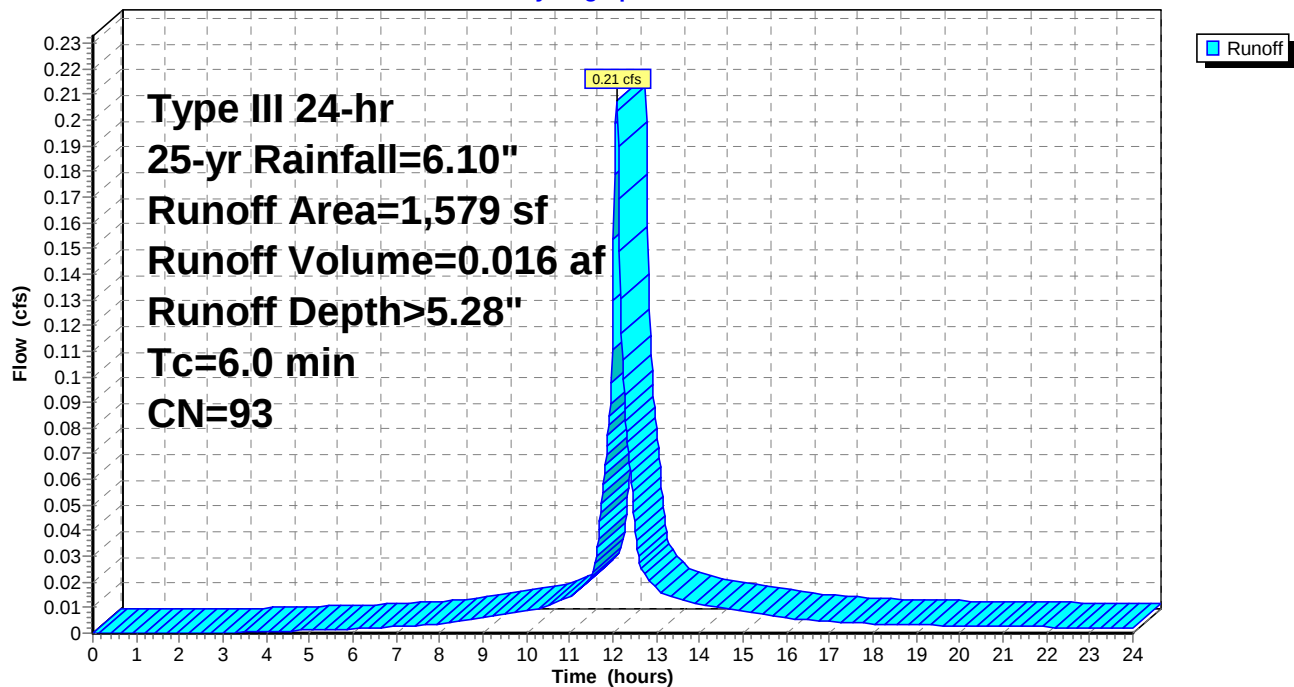
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
1,227	98	Roofs, HSG C
352	74	>75% Grass cover, Good, HSG C
1,579	93	Weighted Average
352	74	22.29% Pervious Area
1,227	98	77.71% Impervious Area

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

Subcatchment 15S: ROOF PORTION

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 34

Summary for Subcatchment 18S: PRE-REAR

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 4.18"

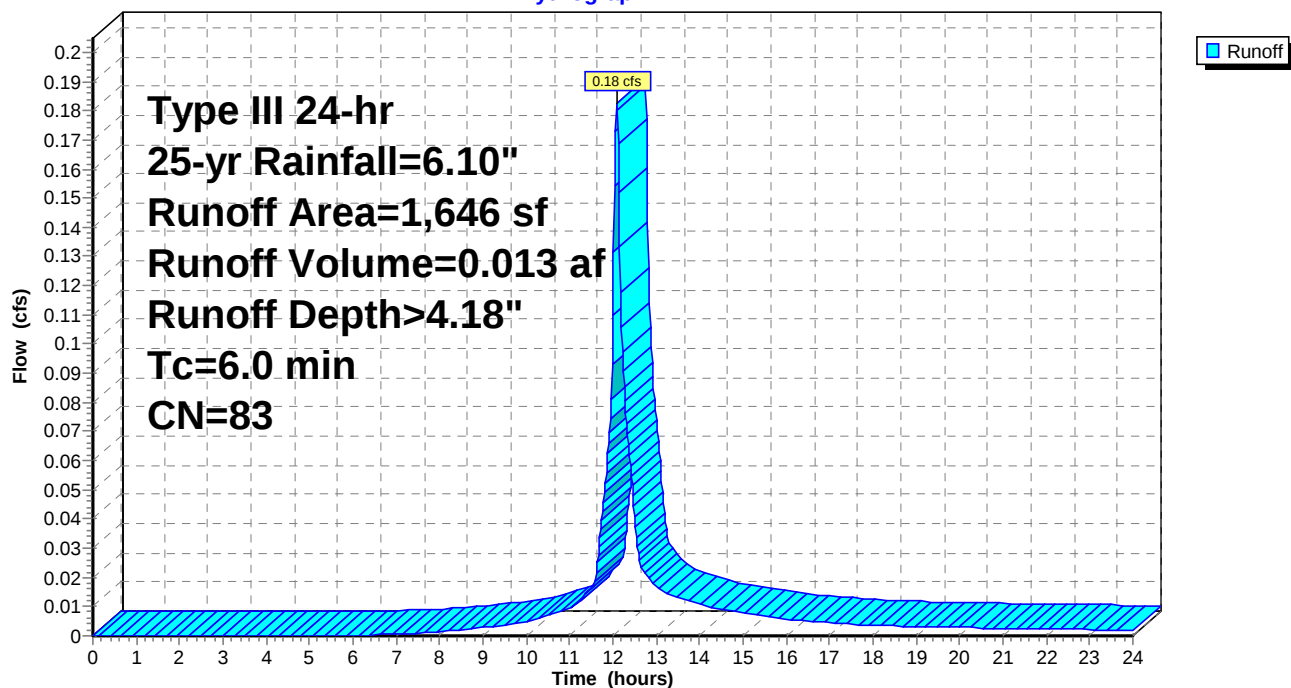
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
1,043	74	>75% Grass cover, Good, HSG C
603	98	Paved parking, HSG C
1,646	83	Weighted Average
1,043	74	63.37% Pervious Area
603	98	36.63% Impervious Area

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

Subcatchment 18S: PRE-REAR

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 35

Summary for Subcatchment 19S: PERM PAVE

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af, Depth> 5.86"
Routed to Pond 20P : INFILTRATION

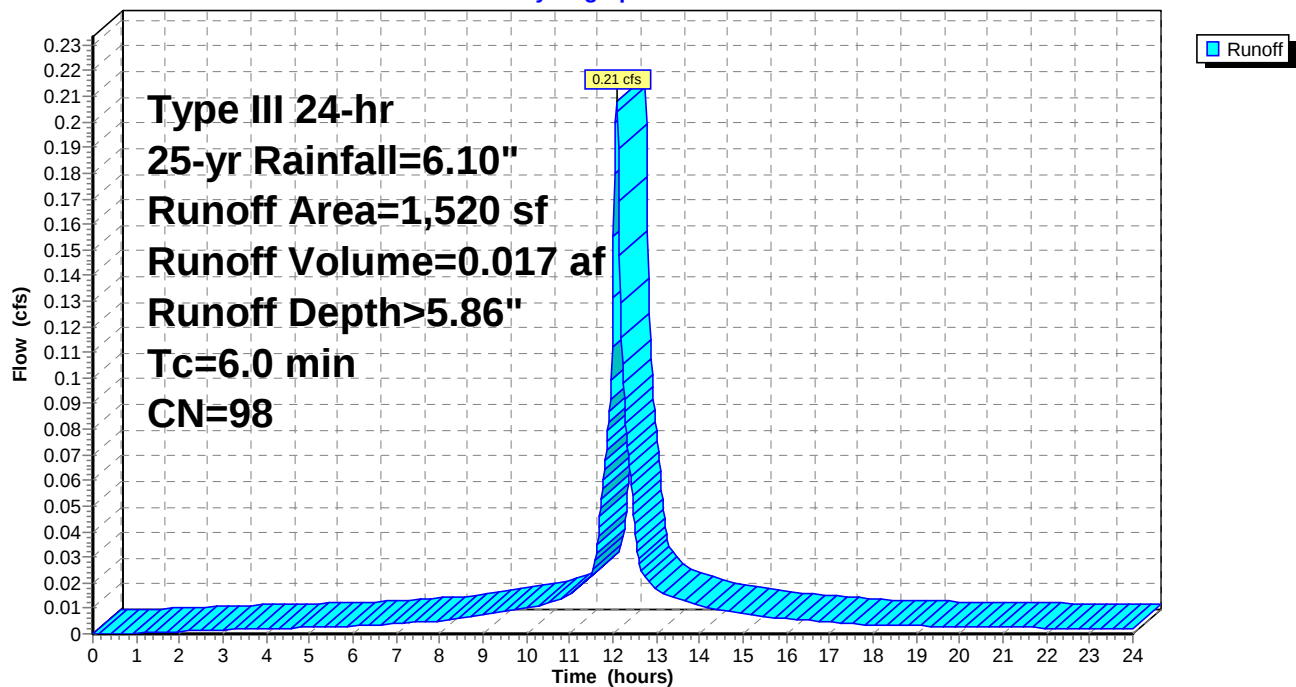
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
1,520	98	Paved parking, HSG C
1,520	98	100.00% Impervious Area

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

Subcatchment 19S: PERM PAVE

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 36

Summary for Subcatchment 21S: REAR-UNC

Runoff = 0.02 cfs @ 12.08 hrs, Volume= 0.001 af, Depth> 5.86"

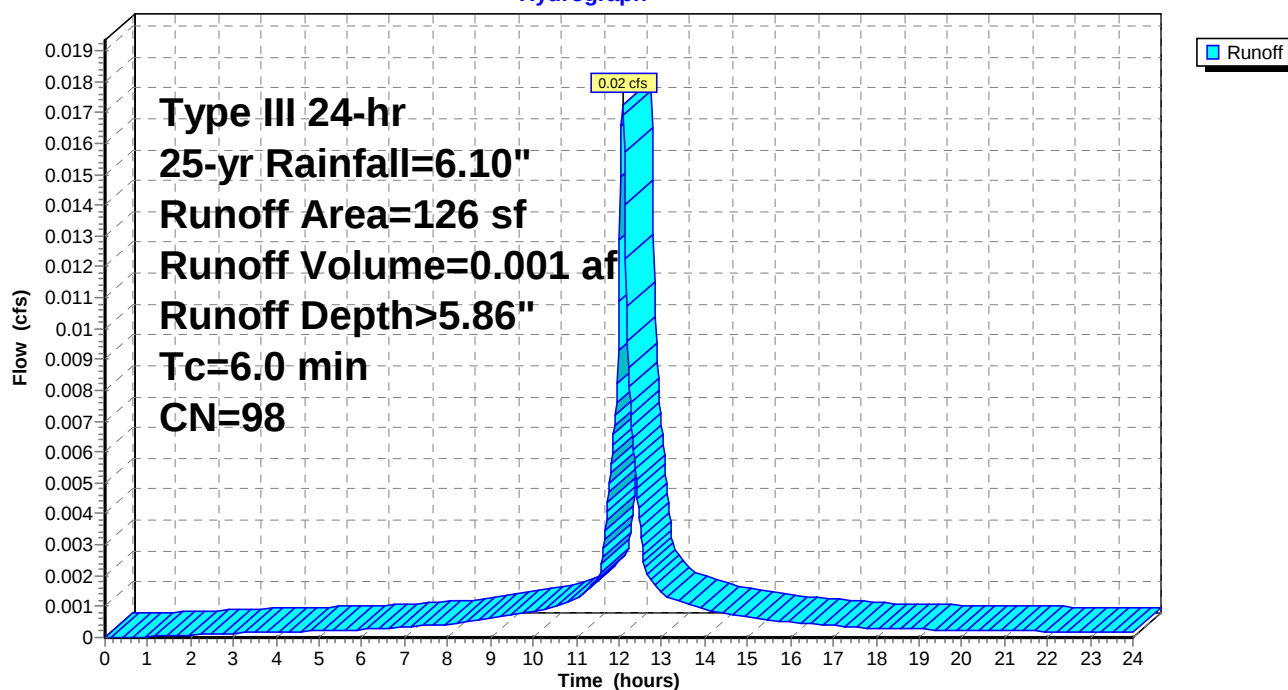
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-yr Rainfall=6.10"

Area (sf)	CN	Description
126	98	Paved parking, HSG C
126	98	100.00% Impervious Area

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

Subcatchment 21S: REAR-UNC

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 37

Summary for Pond 16P: RAIN GARDEN

Inflow Area = 0.036 ac, 77.71% Impervious, Inflow Depth > 5.28" for 25-yr event
 Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af
 Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Atten= 2%, Lag= 0.9 min
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.003 af
 Primary = 0.20 cfs @ 12.10 hrs, Volume= 0.011 af
 Routed to Link 17L : POST-STATE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 52.76' @ 12.10 hrs Surf.Area= 179 sf Storage= 97 cf

Plug-Flow detention time= 85.0 min calculated for 0.014 af (88% of inflow)

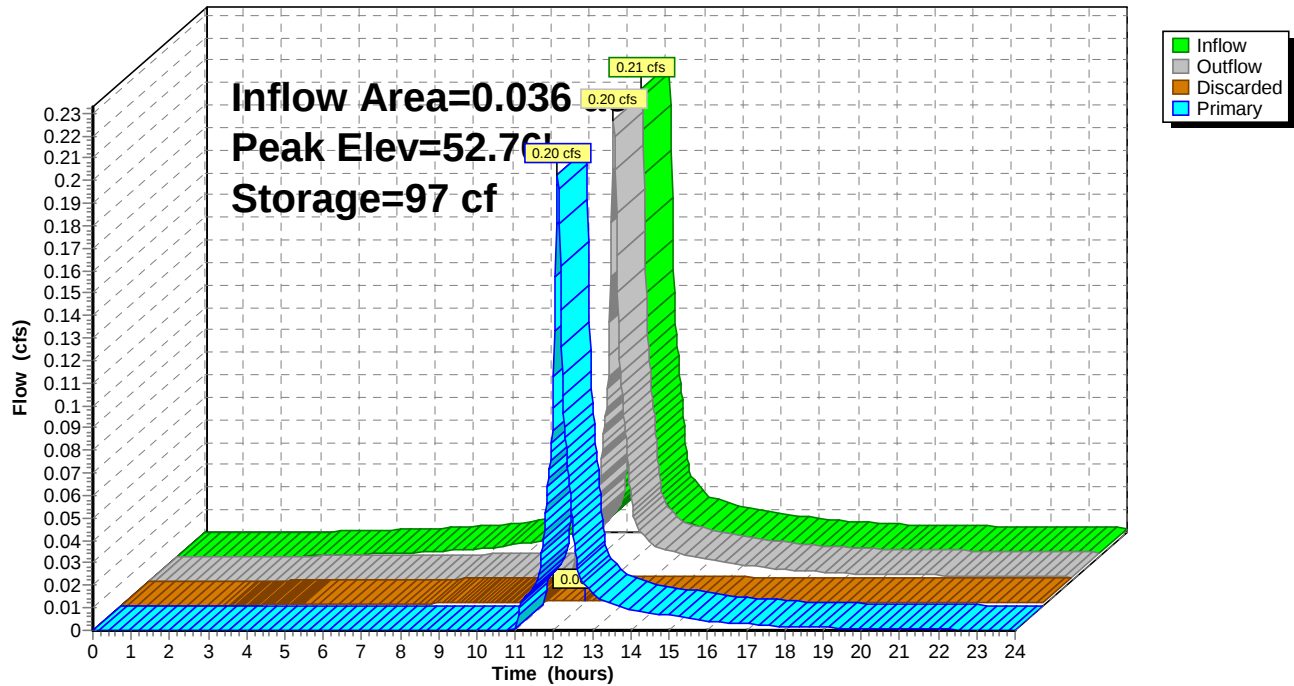
Center-of-Mass det. time= 30.2 min (802.2 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	145 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	79	0	0
53.00	211	145	145

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	0.500 in/hr Exfiltration over Surface area
#2	Primary	52.67'	3.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=52.76' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)**Primary OutFlow** Max=0.20 cfs @ 12.10 hrs HW=52.76' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.79 fps)

Pond 16P: RAIN GARDEN**Hydrograph**

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-yr Rainfall=6.10"

Printed 8/22/2024

Page 39

Summary for Pond 20P: INFILTRATION

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth > 5.86" for 25-yr event
 Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af
 Outflow = 0.02 cfs @ 11.28 hrs, Volume= 0.017 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.28 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 53.52' @ 12.99 hrs Surf.Area= 1,520 sf Storage= 263 cf

Plug-Flow detention time= 105.4 min calculated for 0.017 af (100% of inflow)
 Center-of-Mass det. time= 104.8 min (849.2 - 744.4)

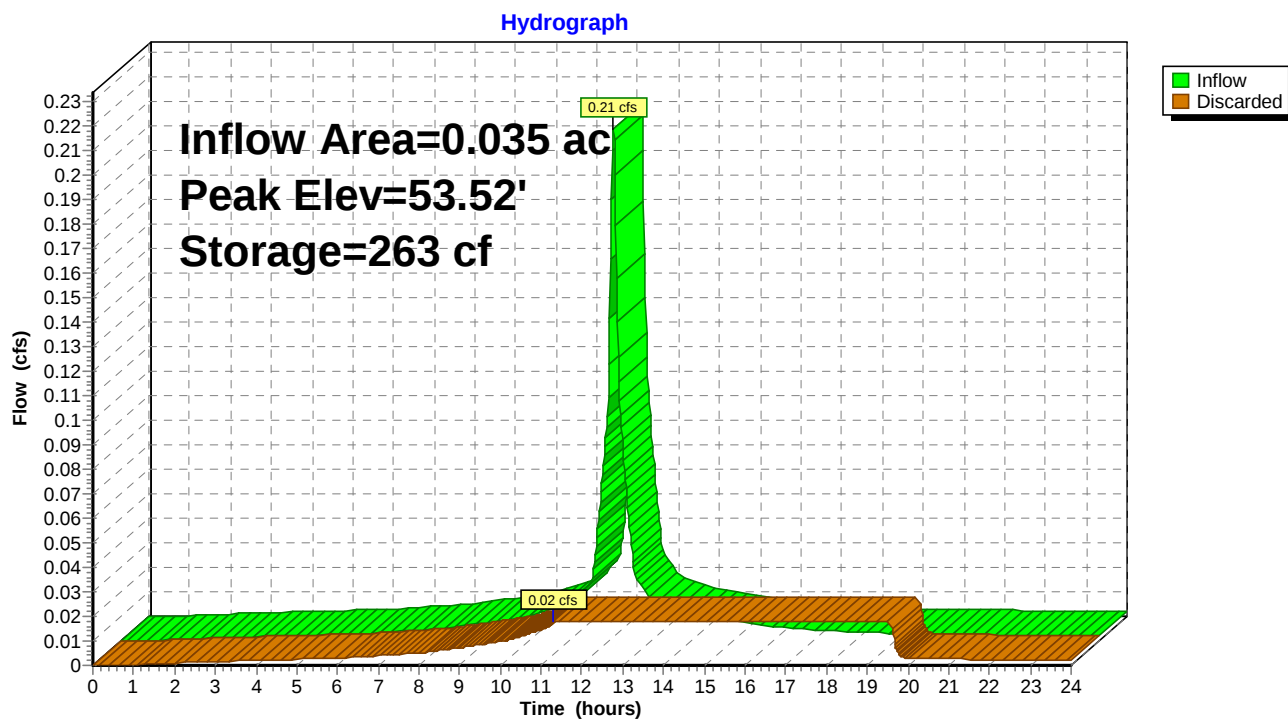
Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	502 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,520 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	1,520	0	0
54.00	1,520	1,520	1,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	0.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 11.28 hrs HW=53.01' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

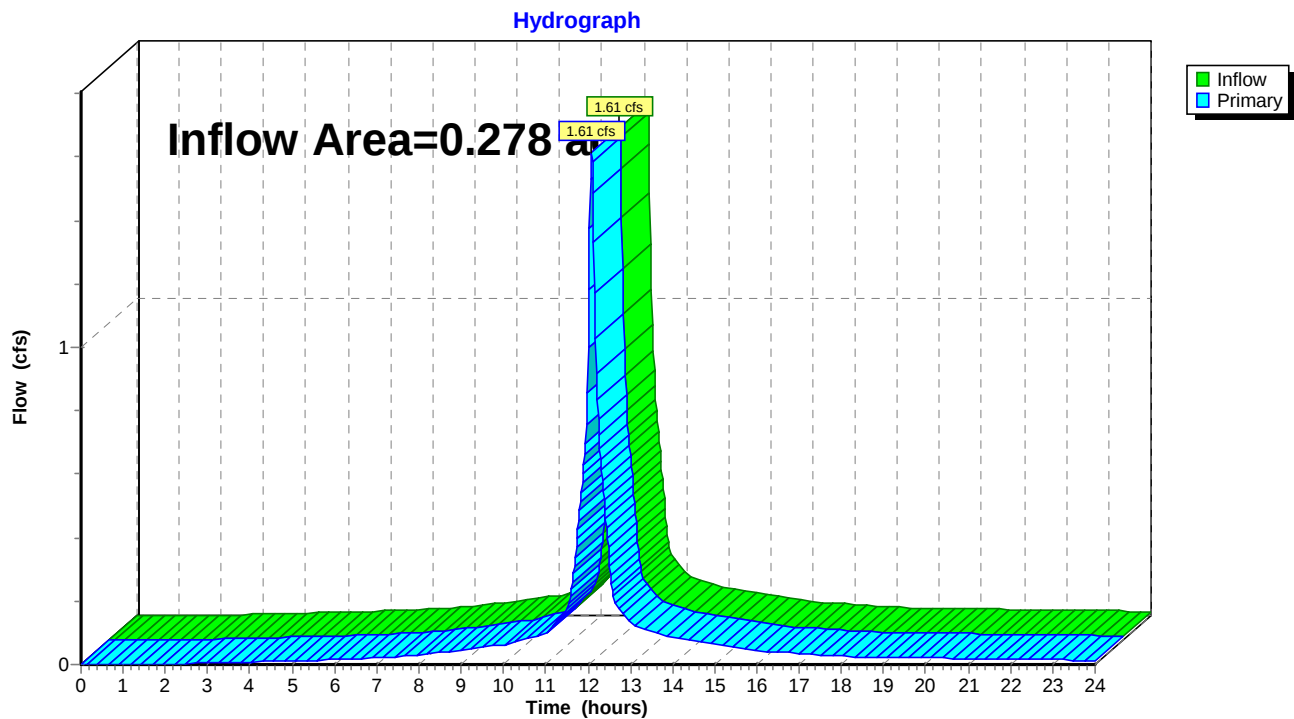
Pond 20P: INFILTRATION



Summary for Link 17L: POST-STATE

Inflow Area = 0.278 ac, 85.17% Impervious, Inflow Depth > 5.27" for 25-yr event
Inflow = 1.61 cfs @ 12.09 hrs, Volume= 0.122 af
Primary = 1.61 cfs @ 12.09 hrs, Volume= 0.122 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 17L: POST-STATE

151 STATE

Type III 24-hr 100-yr Rainfall=8.70"

Prepared by Principe Engineering, Inc

Printed 8/22/2024

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Page 42

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 6S: PRE-STATE	Runoff Area=12,106 sf 100.00% Impervious Runoff Depth>8.45" Tc=6.0 min CN=98 Runoff=2.37 cfs 0.196 af
Subcatchment 13S: POST-UNC	Runoff Area=10,527 sf 86.29% Impervious Runoff Depth>8.09" Tc=6.0 min CN=95 Runoff=2.04 cfs 0.163 af
Subcatchment 15S: ROOF PORTION	Runoff Area=1,579 sf 77.71% Impervious Runoff Depth>7.85" Tc=6.0 min CN=93 Runoff=0.30 cfs 0.024 af
Subcatchment 18S: PRE-REAR	Runoff Area=1,646 sf 36.63% Impervious Runoff Depth>6.64" Tc=6.0 min CN=83 Runoff=0.28 cfs 0.021 af
Subcatchment 19S: PERM PAVE	Runoff Area=1,520 sf 100.00% Impervious Runoff Depth>8.45" Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af
Subcatchment 21S: REAR-UNC	Runoff Area=126 sf 100.00% Impervious Runoff Depth>8.45" Tc=6.0 min CN=98 Runoff=0.02 cfs 0.002 af
Pond 16P: RAIN GARDEN	Peak Elev=52.78' Storage=102 cf Inflow=0.30 cfs 0.024 af Discarded=0.00 cfs 0.003 af Primary=0.30 cfs 0.019 af Outflow=0.30 cfs 0.022 af
Pond 20P: INFILTRATION	Peak Elev=53.87' Storage=438 cf Inflow=0.30 cfs 0.025 af Outflow=0.02 cfs 0.024 af
Link 17L: POST-STATE	Inflow=2.33 cfs 0.182 af Primary=2.33 cfs 0.182 af

Total Runoff Area = 0.631 ac Runoff Volume = 0.430 af Average Runoff Depth = 8.17"
10.32% Pervious = 0.065 ac 89.68% Impervious = 0.566 ac

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 43

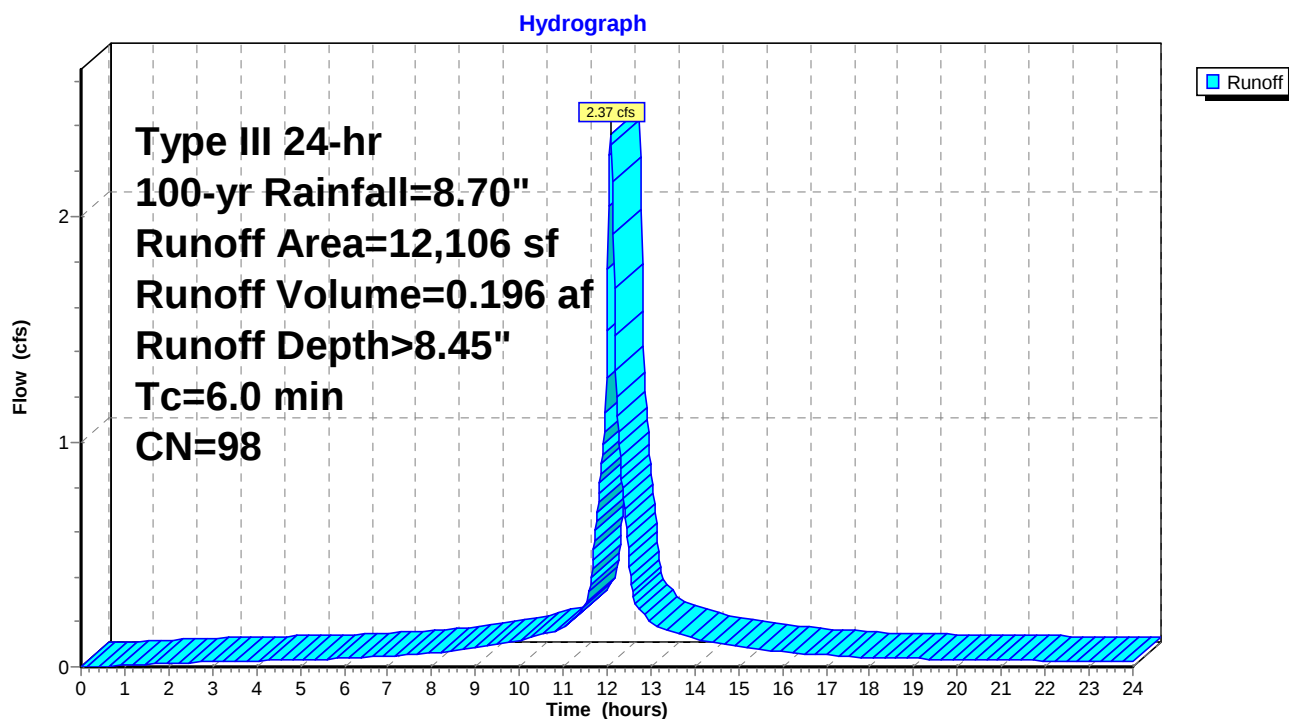
Summary for Subcatchment 6S: PRE-STATE

Runoff = 2.37 cfs @ 12.08 hrs, Volume= 0.196 af, Depth> 8.45"
Routed to nonexistent node 2P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
5,533	98	Roofs, HSG C
6,573	98	Paved parking, HSG C
12,106	98	Weighted Average
12,106	98	100.00% Impervious Area

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

Subcatchment 6S: PRE-STATE

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 44

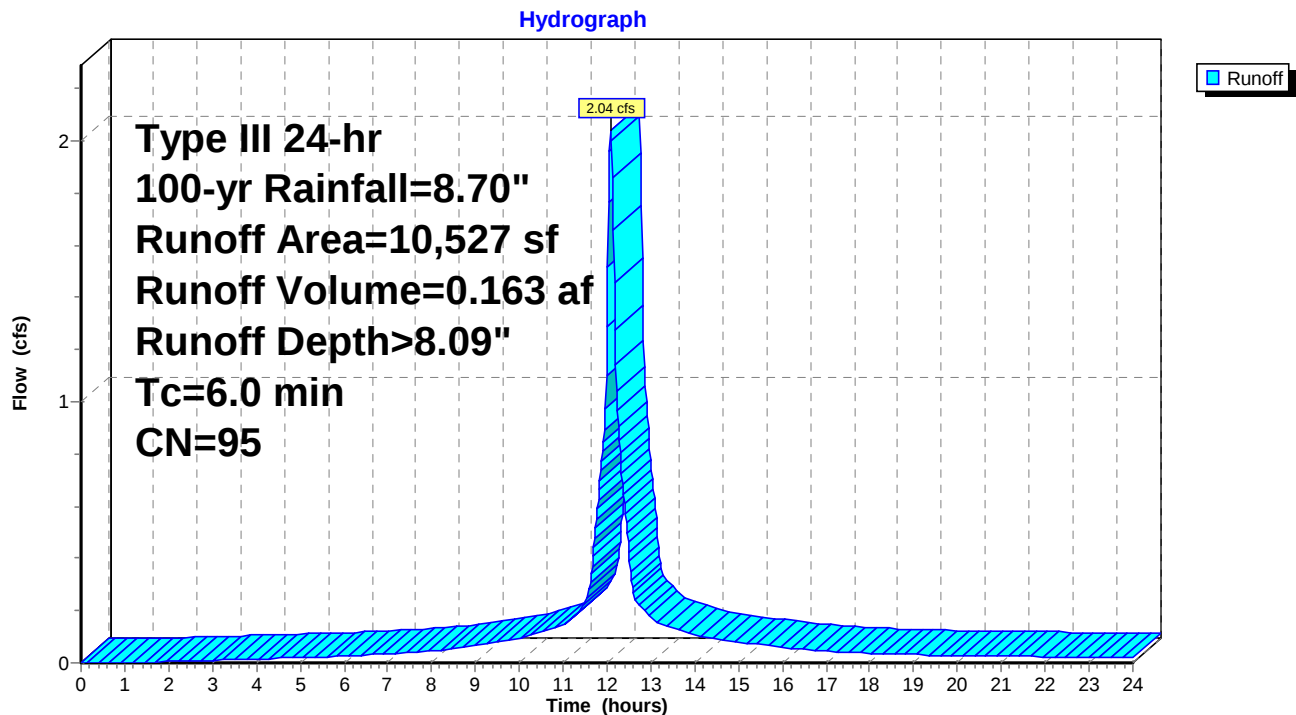
Summary for Subcatchment 13S: POST-UNC

Runoff = 2.04 cfs @ 12.08 hrs, Volume= 0.163 af, Depth> 8.09"
Routed to Link 17L : POST-STATE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
4,306	98	Roofs, HSG C
1,443	74	>75% Grass cover, Good, HSG C
4,778	98	Paved parking, HSG C
10,527	95	Weighted Average
1,443	74	13.71% Pervious Area
9,084	98	86.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 1

Subcatchment 13S: POST-UNC

151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 45

Summary for Subcatchment 15S: ROOF PORTION

Runoff = 0.30 cfs @ 12.08 hrs, Volume= 0.024 af, Depth> 7.85"
Routed to Pond 16P : RAIN GARDEN

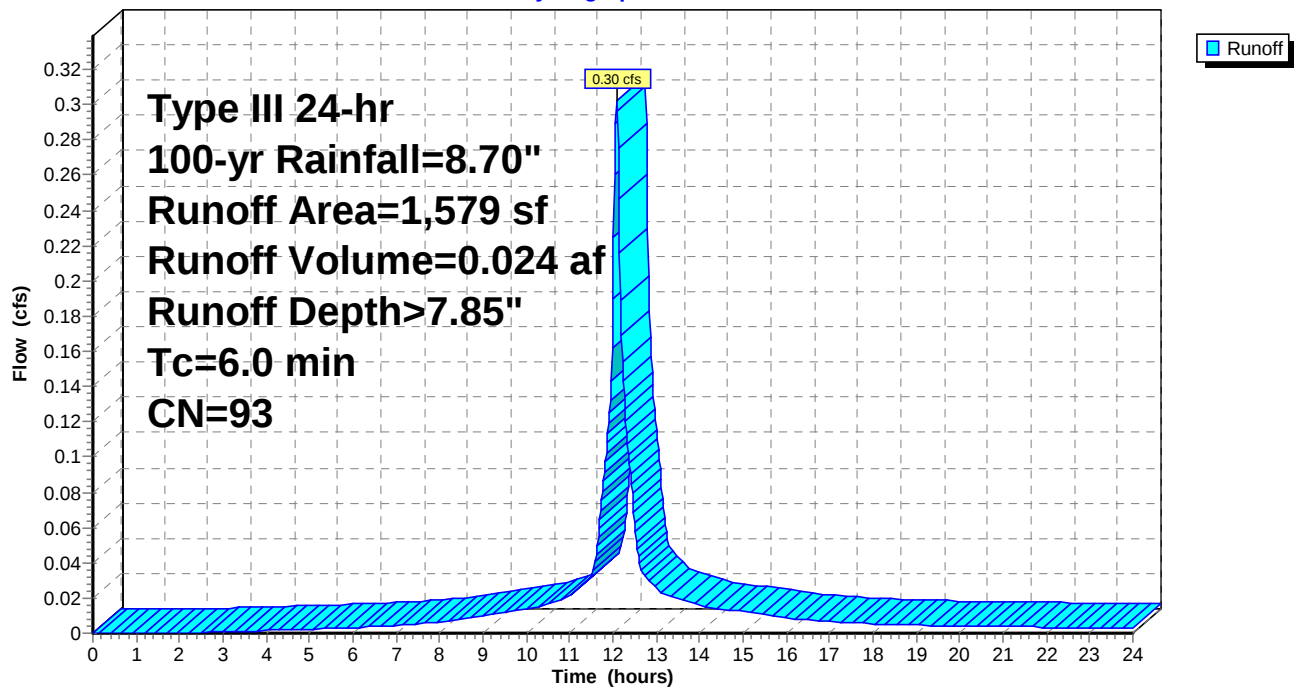
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
1,227	98	Roofs, HSG C
352	74	>75% Grass cover, Good, HSG C
1,579	93	Weighted Average
352	74	22.29% Pervious Area
1,227	98	77.71% Impervious Area

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

Subcatchment 15S: ROOF PORTION

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 46

Summary for Subcatchment 18S: PRE-REAR

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Depth> 6.64"

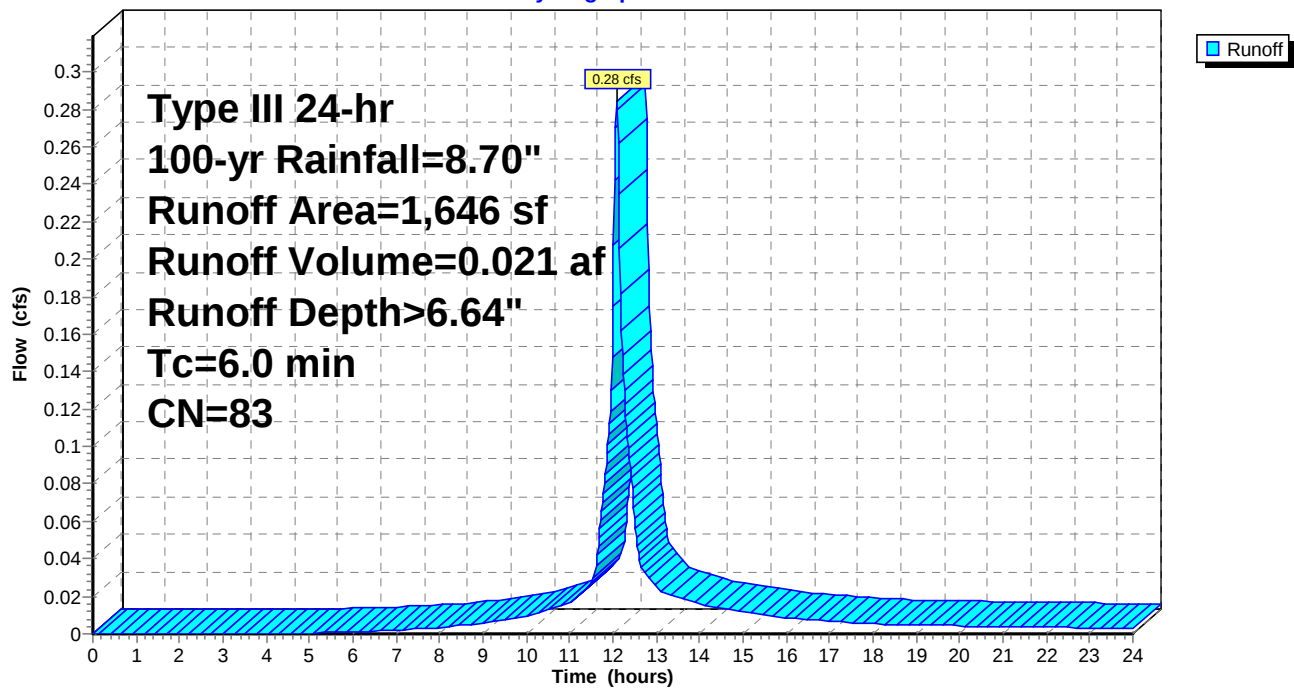
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
1,043	74	>75% Grass cover, Good, HSG C
603	98	Paved parking, HSG C
1,646	83	Weighted Average
1,043	74	63.37% Pervious Area
603	98	36.63% Impervious Area

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

Subcatchment 18S: PRE-REAR

Hydrograph



Summary for Subcatchment 19S: PERM PAVE

Runoff = 0.30 cfs @ 12.08 hrs, Volume= 0.025 af, Depth> 8.45"
 Routed to Pond 20P : INFILTRATION

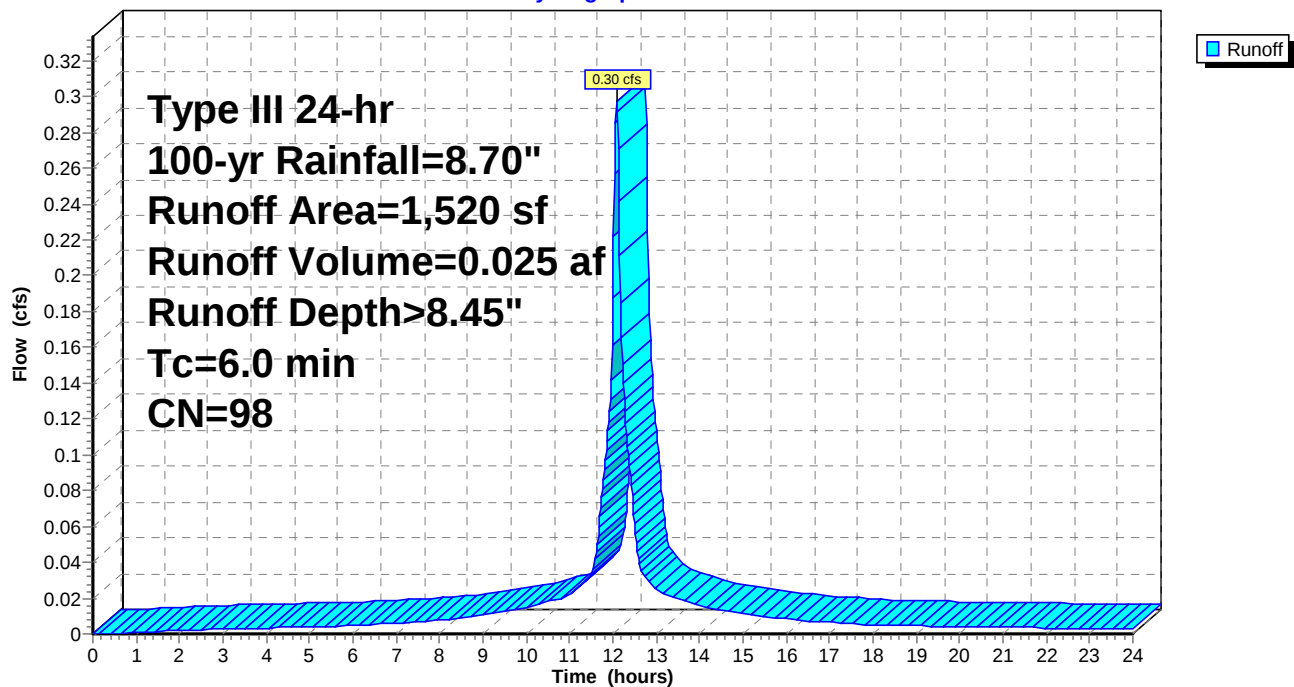
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
1,520	98	Paved parking, HSG C
1,520	98	100.00% Impervious Area

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

Subcatchment 19S: PERM PAVE

Hydrograph



Summary for Subcatchment 21S: REAR-UNC

Runoff = 0.02 cfs @ 12.08 hrs, Volume= 0.002 af, Depth> 8.45"

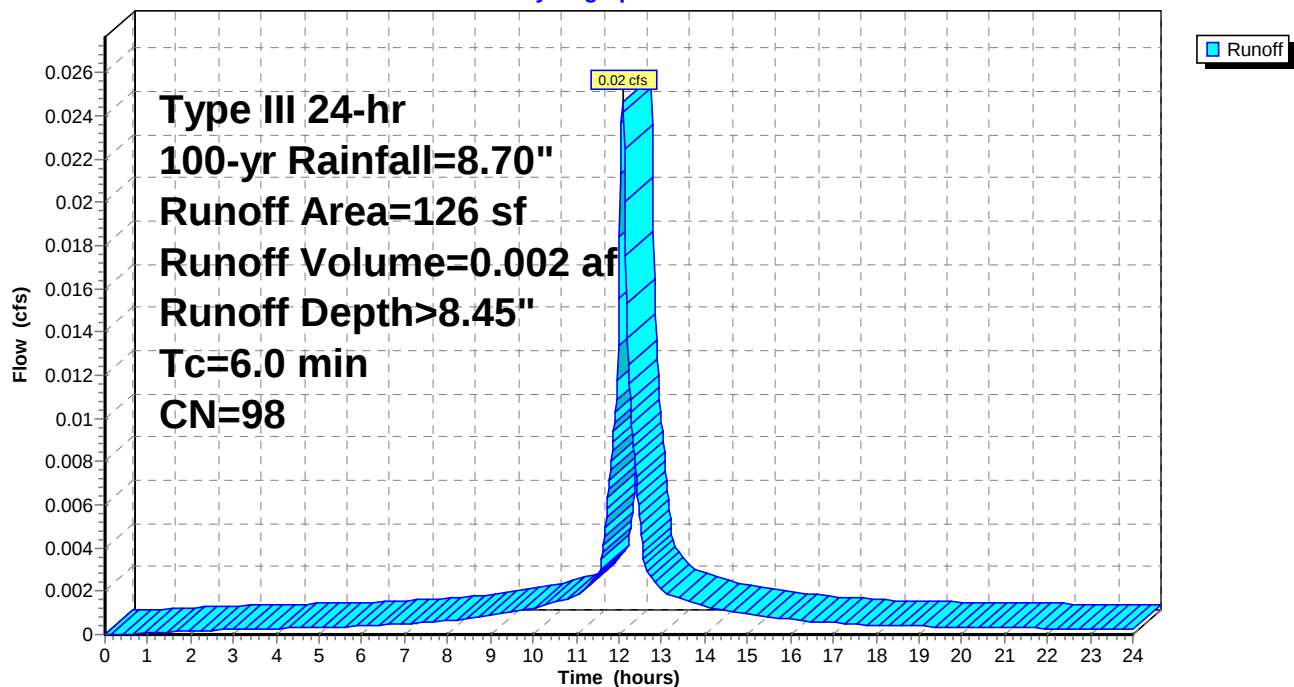
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-yr Rainfall=8.70"

Area (sf)	CN	Description
126	98	Paved parking, HSG C
126	98	100.00% Impervious Area

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

Subcatchment 21S: REAR-UNC

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 49

Summary for Pond 16P: RAIN GARDEN

Inflow Area = 0.036 ac, 77.71% Impervious, Inflow Depth > 7.85" for 100-yr event
 Inflow = 0.30 cfs @ 12.08 hrs, Volume= 0.024 af
 Outflow = 0.30 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 1%, Lag= 0.8 min
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.003 af
 Primary = 0.30 cfs @ 12.10 hrs, Volume= 0.019 af
 Routed to Link 17L : POST-STATE

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 52.78' @ 12.10 hrs Surf.Area= 182 sf Storage= 102 cf

Plug-Flow detention time= 68.3 min calculated for 0.022 af (92% of inflow)
 Center-of-Mass det. time= 26.9 min (789.6 - 762.8)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	145 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	79	0	0
53.00	211	145	145

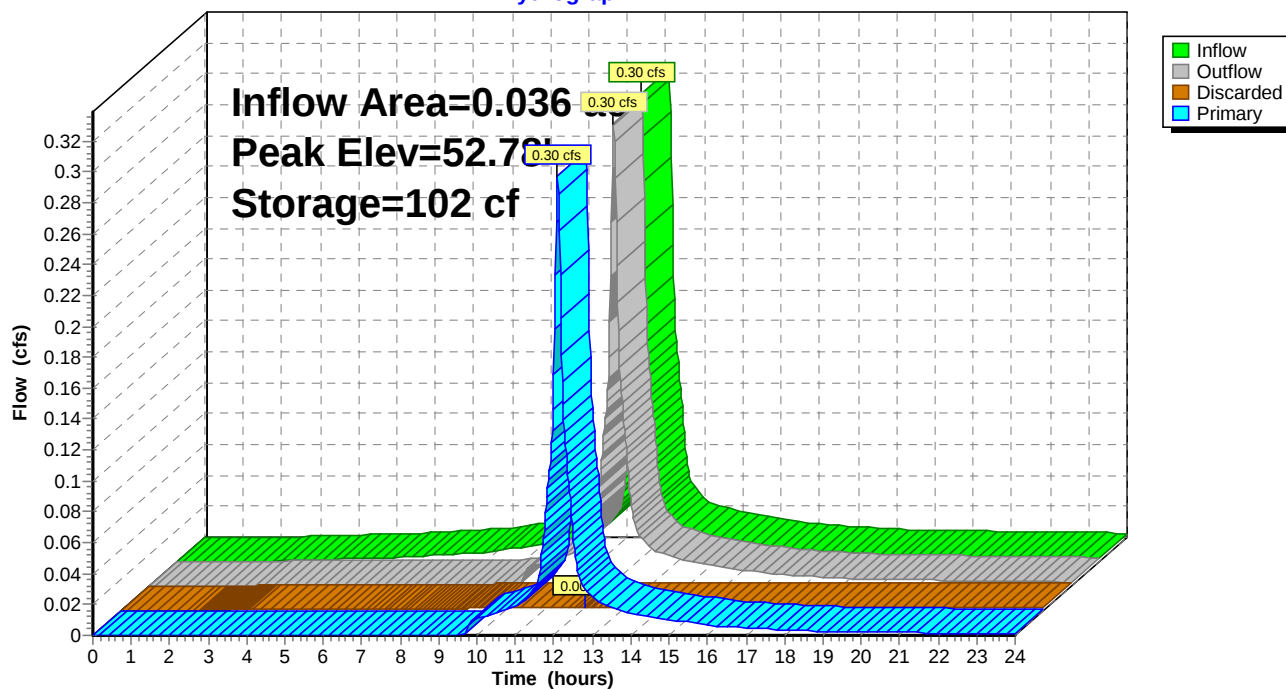
Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	0.500 in/hr Exfiltration over Surface area
#2	Primary	52.67'	3.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=52.78' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.30 cfs @ 12.10 hrs HW=52.78' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.89 fps)

Pond 16P: RAIN GARDEN

Hydrograph



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 51

Summary for Pond 20P: INFILTRATION

Inflow Area = 0.035 ac, 100.00% Impervious, Inflow Depth > 8.45" for 100-yr event
 Inflow = 0.30 cfs @ 12.08 hrs, Volume= 0.025 af
 Outflow = 0.02 cfs @ 10.56 hrs, Volume= 0.024 af, Atten= 94%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 10.56 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 53.87' @ 13.74 hrs Surf.Area= 1,520 sf Storage= 438 cf

Plug-Flow detention time= 195.0 min calculated for 0.024 af (98% of inflow)
 Center-of-Mass det. time= 185.1 min (924.7 - 739.7)

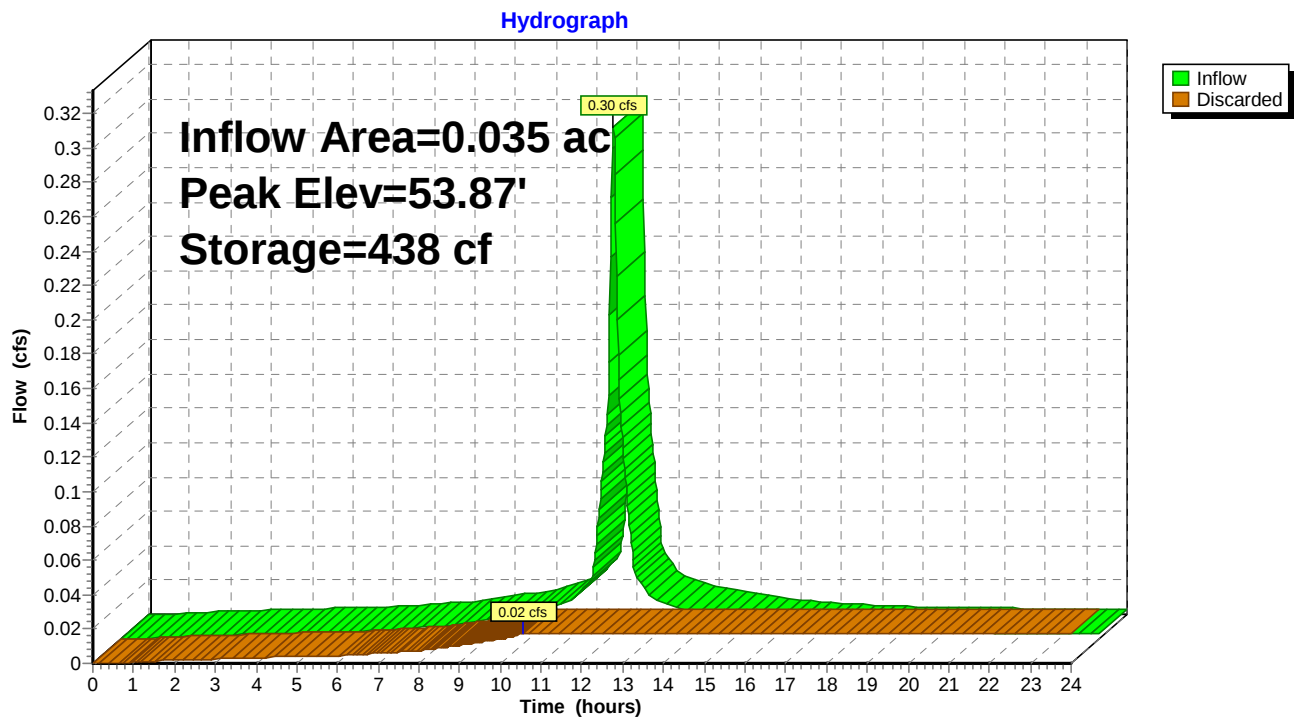
Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	502 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,520 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	1,520	0	0
54.00	1,520	1,520	1,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	0.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 10.56 hrs HW=53.01' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 20P: INFILTRATION



151 STATE

Prepared by Principe Engineering, Inc

HydroCAD® 10.20-5b s/n 08247 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=8.70"

Printed 8/22/2024

Page 53

Summary for Link 17L: POST-STATE

Inflow Area = 0.278 ac, 85.17% Impervious, Inflow Depth > 7.85" for 100-yr event
Inflow = 2.33 cfs @ 12.09 hrs, Volume= 0.182 af
Primary = 2.33 cfs @ 12.09 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 17L: POST-STATE

