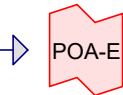


Existing 100-yr Runoff:
0.231 ac-ft (10,062 CF)



Existing

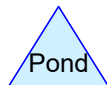
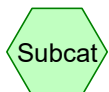
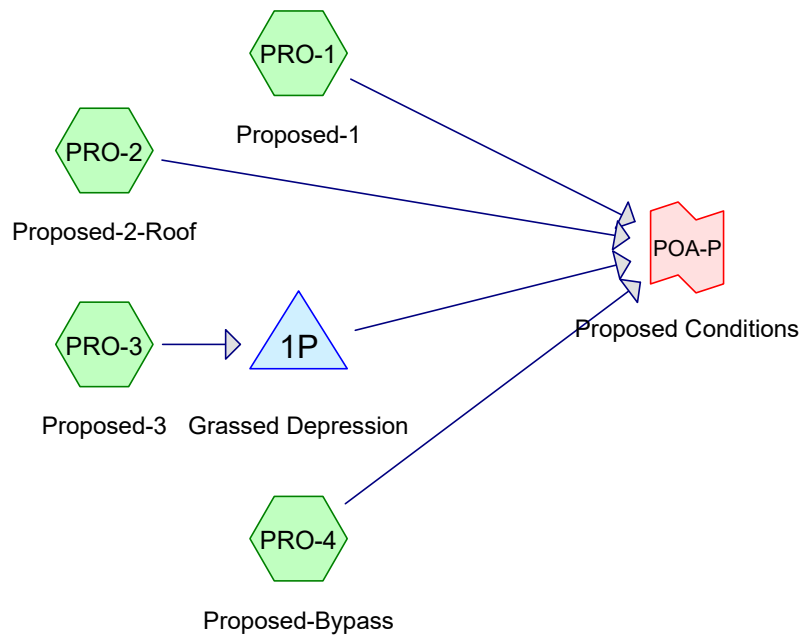


Existing Conditions

Proposed 100-yr Runoff:
0.274 ac-ft (11,935 CF)

Runoff (Pre vs Post):
1,873 CF to be
Captured

Provided Storage below
Spillway: 1,920 CF >
1,873 CF



Routing Diagram for Grandview-HYD-EX and PR

Prepared by GHD, Inc, Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Printed 7/2/2026

Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.70	2
2	10-yr	Type III 24-hr		Default	24.00	1	5.84	2
3	50-yr	Type III 24-hr		Default	24.00	1	8.17	2
4	100-yr	Type III 24-hr		Default	24.00	1	9.23	2

Grandview-HYD-EX and PR*Type III 24-hr 2-yr Rainfall=3.70"*

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 5

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EX: Existing	Runoff Area=19,186 sf 0.00% Impervious Runoff Depth>1.51" Tc=6.0 min CN=76 Runoff=0.75 cfs 0.055 af
Subcatchment PRO-1: Proposed-1	Runoff Area=4,427 sf 5.33% Impervious Runoff Depth>2.19" Tc=6.0 min CN=85 Runoff=0.26 cfs 0.019 af
Subcatchment PRO-2: Proposed-2-Roof	Runoff Area=1,325 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment PRO-3: Proposed-3	Runoff Area=7,567 sf 27.01% Impervious Runoff Depth>2.73" Tc=6.0 min CN=91 Runoff=0.53 cfs 0.040 af
Subcatchment PRO-4: Proposed-Bypass	Runoff Area=5,910 sf 0.00% Impervious Runoff Depth>1.44" Tc=6.0 min CN=75 Runoff=0.22 cfs 0.016 af
Pond 1P: Grassed Depression	Peak Elev=382.20' Storage=1,364 cf Inflow=0.53 cfs 0.040 af Discarded=0.01 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.008 af
Link POA-E: Existing Conditions	Inflow=0.75 cfs 0.055 af Primary=0.75 cfs 0.055 af
Link POA-P: Proposed Conditions	Inflow=0.58 cfs 0.044 af Primary=0.58 cfs 0.044 af
Total Runoff Area = 0.882 ac Runoff Volume = 0.139 af Average Runoff Depth = 1.89" 90.62% Pervious = 0.799 ac 9.38% Impervious = 0.083 ac	

Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.70"

Printed 7/2/2026

Page 6

Summary for Subcatchment EX: Existing

Runoff = 0.75 cfs @ 12.10 hrs, Volume= 0.055 af, Depth> 1.51"

Routed to Link POA-E : Existing Conditions

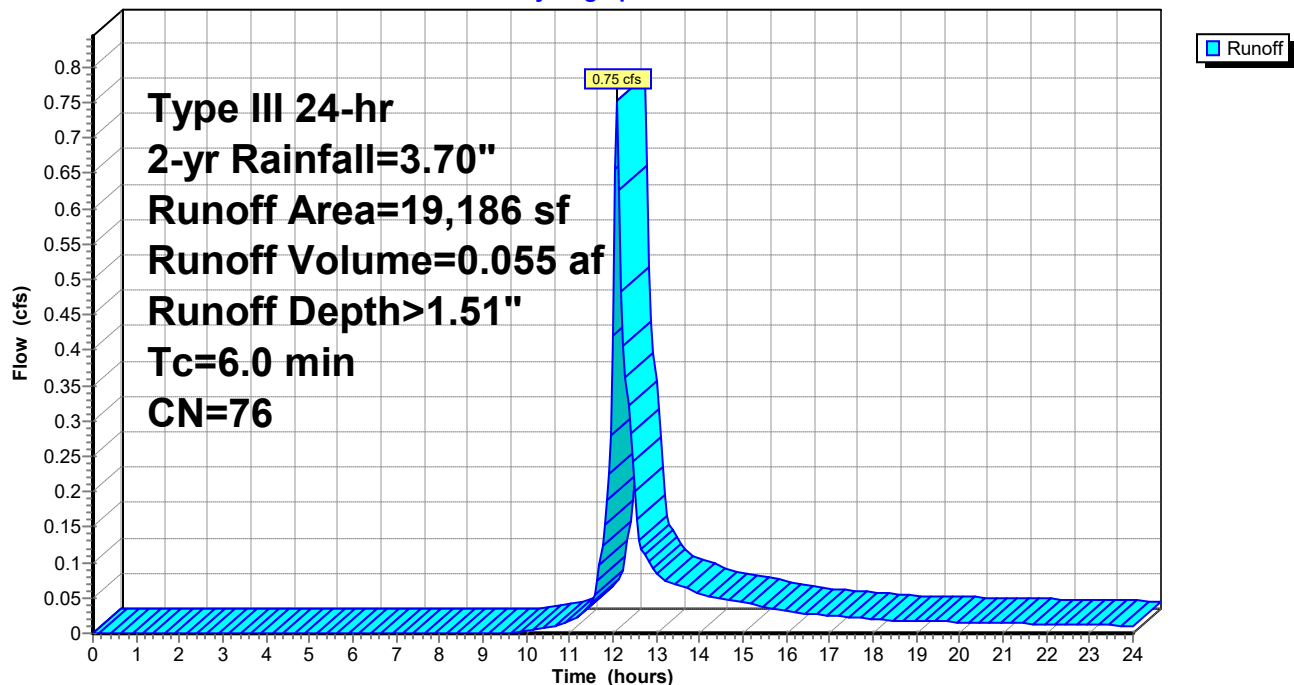
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
3,738	71	Meadow, non-grazed, HSG C
3,823	89	Gravel roads, HSG C
11,625	73	Woods, Fair, HSG C
19,186	76	Weighted Average
19,186		100.00% Pervious Area

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

Subcatchment EX: Existing

Hydrograph



Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.70"

Printed 7/2/2026

Page 7

Summary for Subcatchment PRO-1: Proposed-1

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 2.19"
Routed to Link POA-P : Proposed Conditions

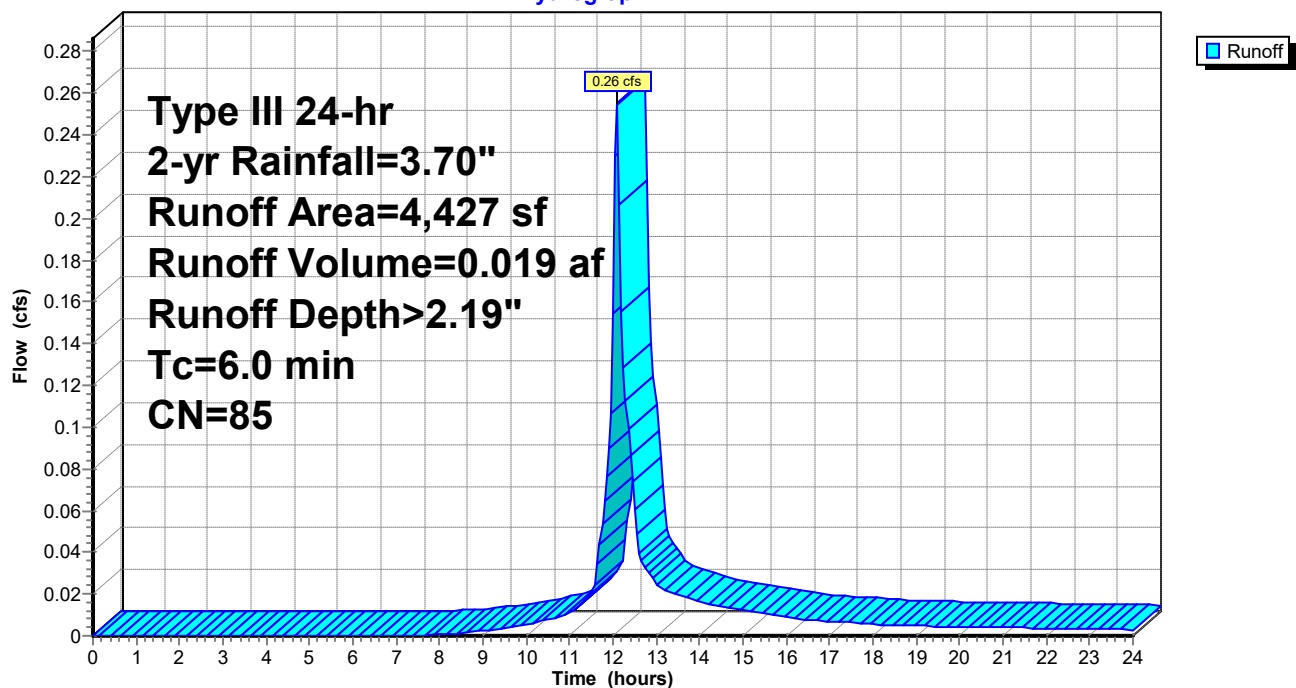
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
1,149	71	Meadow, non-grazed, HSG C
3,042	89	Gravel roads, HSG C
* 236	98	Conc Apron, HSG C
4,427	85	Weighted Average
4,191		94.67% Pervious Area
236		5.33% Impervious Area

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

Subcatchment PRO-1: Proposed-1

Hydrograph



Summary for Subcatchment PRO-2: Proposed-2-Roof

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 3.46"
 Routed to Link POA-P : Proposed Conditions

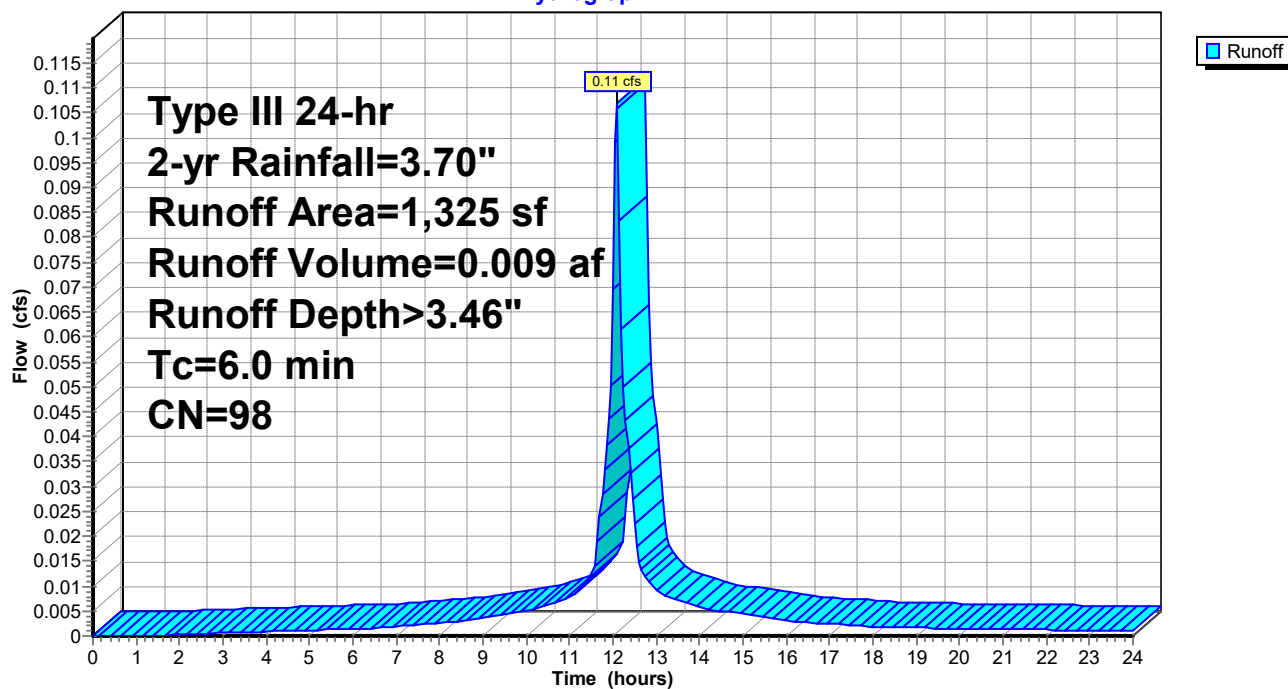
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
1,325	98	Roofs, HSG C
1,325		100.00% Impervious Area

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

Subcatchment PRO-2: Proposed-2-Roof

Hydrograph



Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.70"

Printed 7/2/2026

Page 9

Summary for Subcatchment PRO-3: Proposed-3

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Depth> 2.73"
Routed to Pond 1P : Grassed Depression

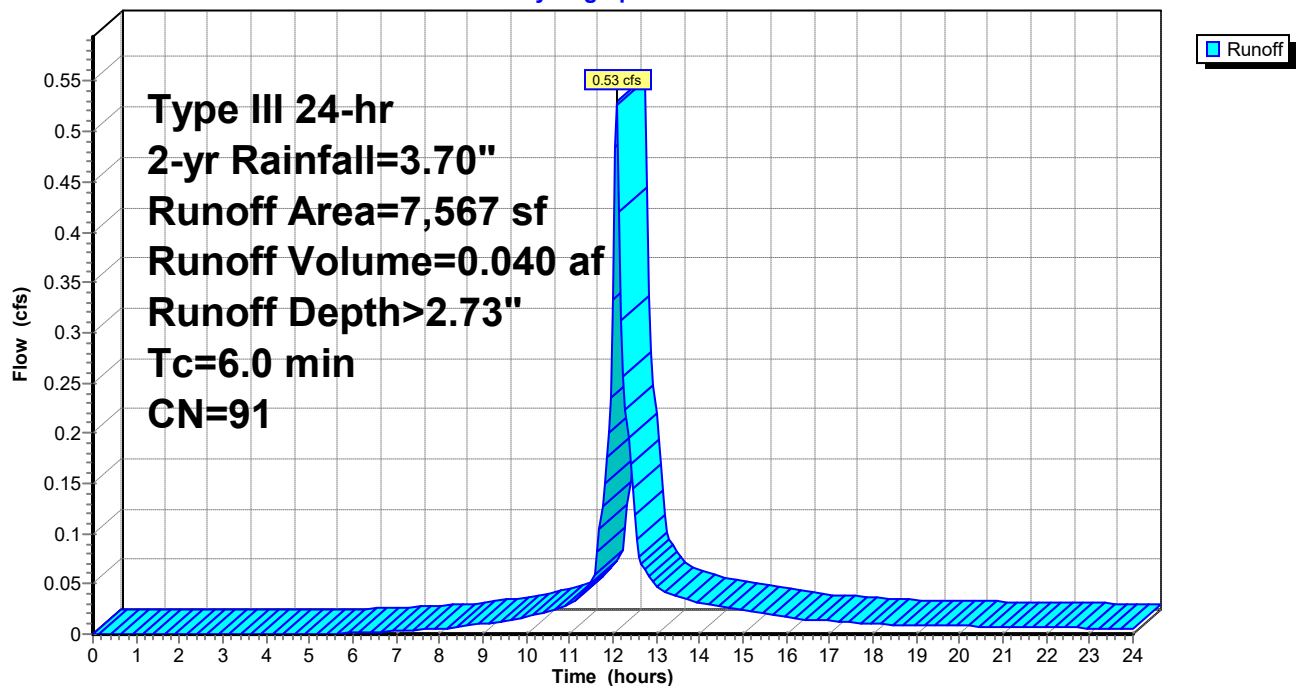
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
343	71	Meadow, non-grazed, HSG C
5,180	89	Gravel roads, HSG C
* 161	98	Conc Apron, HSG C
1,883	98	Water Surface, HSG C
7,567	91	Weighted Average
5,523		72.99% Pervious Area
2,044		27.01% Impervious Area

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

Subcatchment PRO-3: Proposed-3

Hydrograph



Summary for Subcatchment PRO-4: Proposed-Bypass

Runoff = 0.22 cfs @ 12.10 hrs, Volume= 0.016 af, Depth> 1.44"
 Routed to Link POA-P : Proposed Conditions

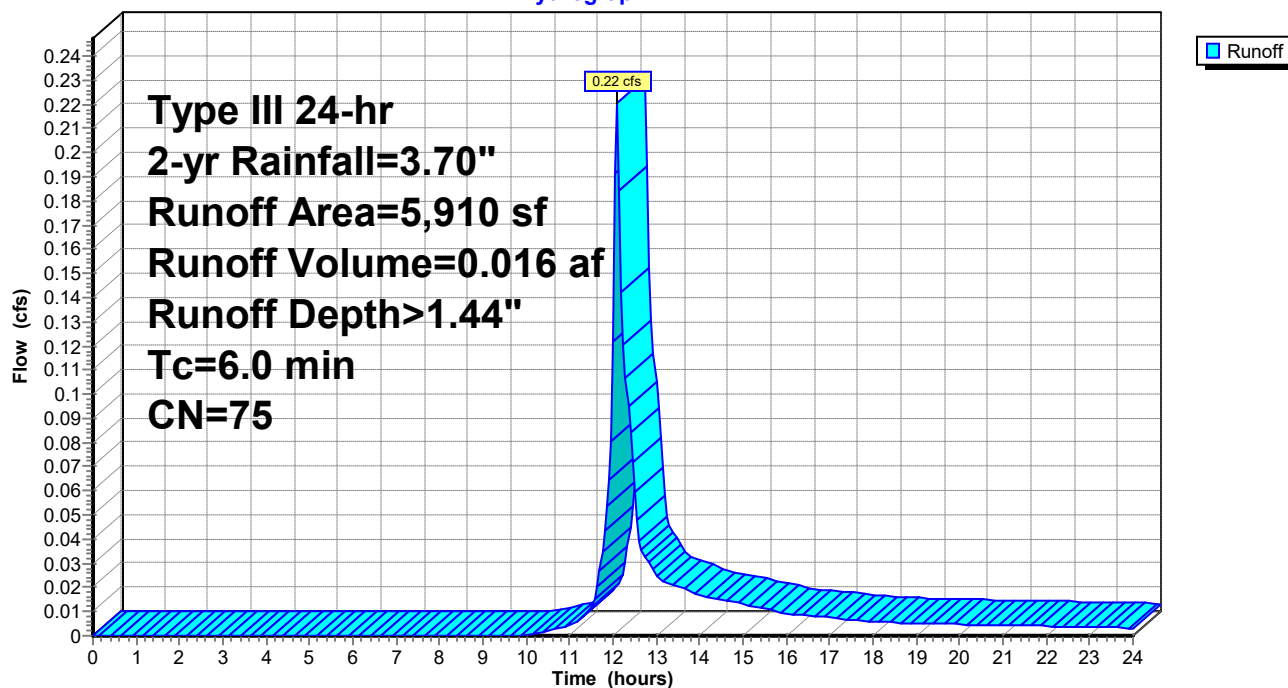
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
4,476	71	Meadow, non-grazed, HSG C
1,434	89	Gravel roads, HSG C
5,910	75	Weighted Average
5,910		100.00% Pervious Area

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

Subcatchment PRO-4: Proposed-Bypass

Hydrograph



Grandview-HYD-EX and PR

Type III 24-hr 2-yr Rainfall=3.70"

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 11

Summary for Pond 1P: Grassed Depression

Inflow Area = 0.174 ac, 27.01% Impervious, Inflow Depth > 2.73" for 2-yr event
 Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
 Outflow = 0.01 cfs @ 21.01 hrs, Volume= 0.008 af, Atten= 99%, Lag= 535.5 min
 Discarded = 0.01 cfs @ 21.01 hrs, Volume= 0.008 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link POA-P : Proposed Conditions

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 382.20' @ 21.01 hrs Surf.Area= 1,255 sf Storage= 1,364 cf

Plug-Flow detention time= 370.8 min calculated for 0.008 af (21% of inflow)
 Center-of-Mass det. time= 206.6 min (1,003.3 - 796.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	379.99'	2,583 cf	Grassed Depression (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.99	1	0.0	0	0
380.00	1,133	40.0	2	2
381.16	1,133	40.0	526	528
381.17	1,133	25.0	3	531
381.49	1,133	25.0	91	621
381.50	856	100.0	10	631
382.00	1,133	100.0	497	1,129
382.50	1,443	100.0	644	1,773
382.60	1,507	100.0	148	1,920
383.00	1,805	100.0	662	2,583

Device	Routing	Invert	Outlet Devices
#1	Primary	382.60'	5.0' long + 1.0 ' SideZ x 10.0' breadth Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	379.99'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 378.50' Phase-In= 0.01'

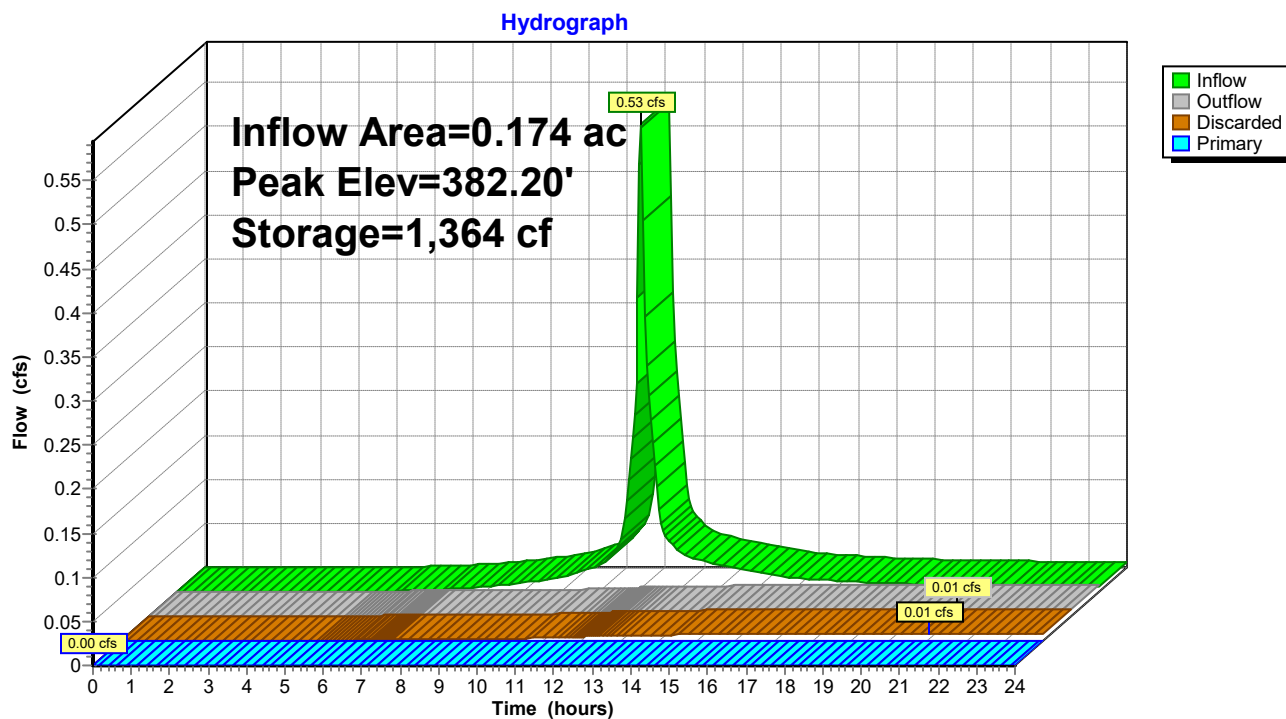
Discarded OutFlow Max=0.01 cfs @ 21.01 hrs HW=382.20' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.01 cfs)

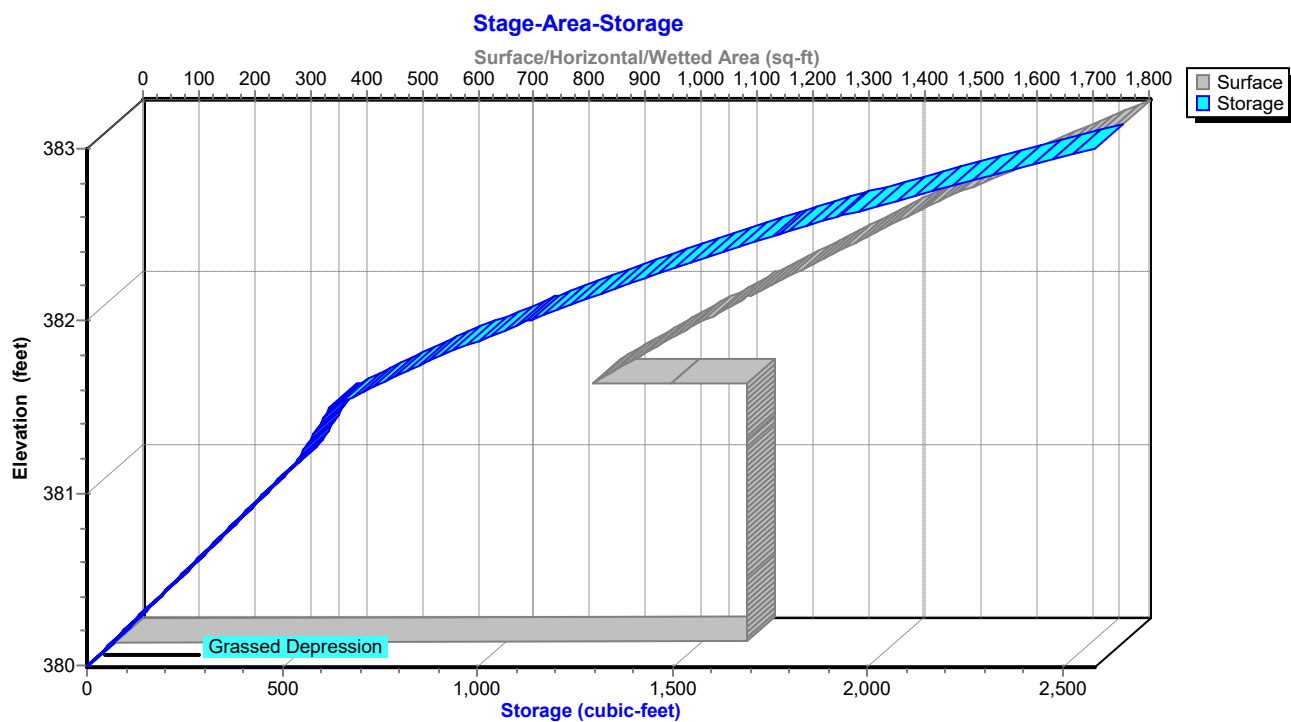
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=379.99' (Free Discharge)

↑ **1=Spillway** (Controls 0.00 cfs)

Pond 1P: Grassed Depression



Pond 1P: Grassed Depression



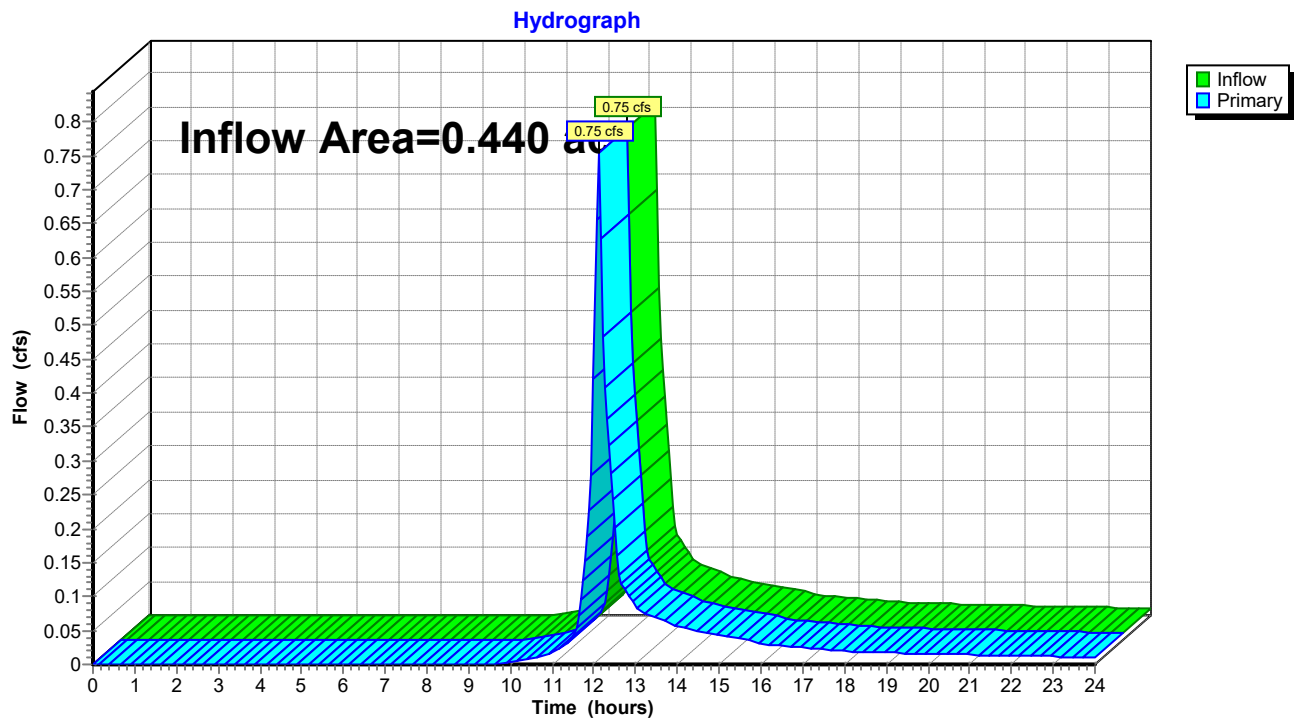
Summary for Link POA-E: Existing Conditions

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 1.51" for 2-yr event

Inflow = 0.75 cfs @ 12.10 hrs, Volume= 0.055 af

Primary = 0.75 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link POA-E: Existing Conditions

Summary for Link POA-P: Proposed Conditions

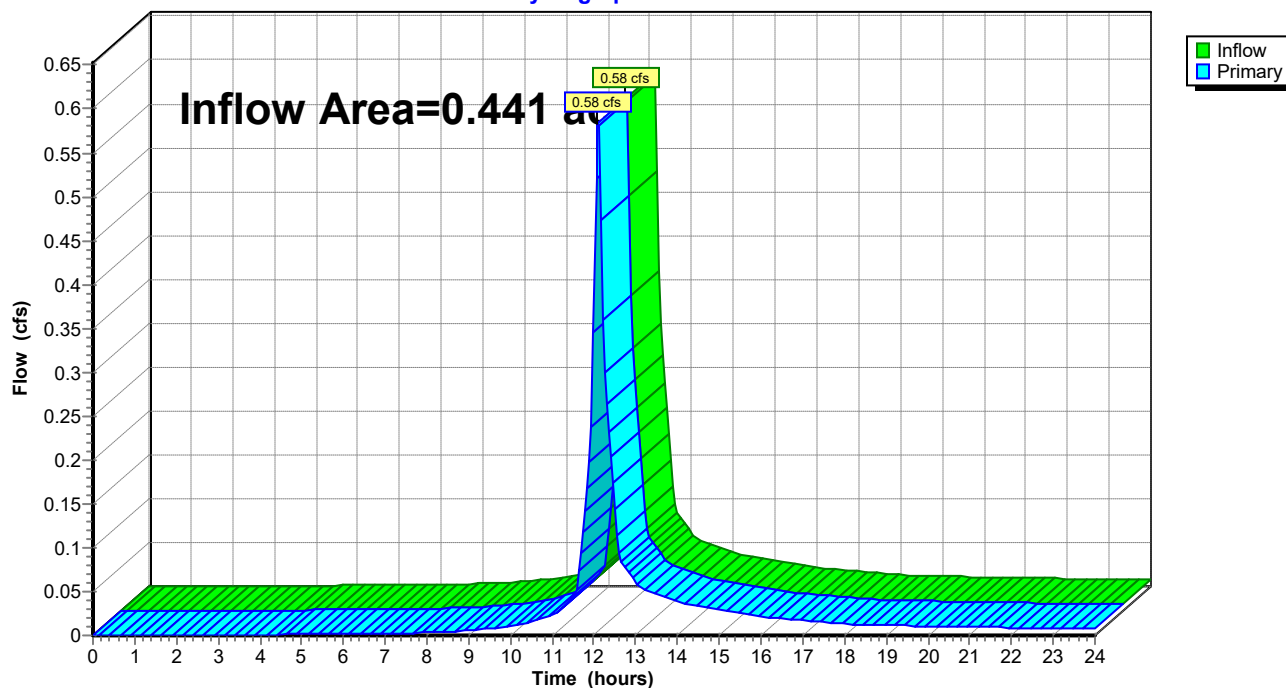
Inflow Area = 0.441 ac, 18.75% Impervious, Inflow Depth > 1.19" for 2-yr event

Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.044 af

Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

0.011 ac-ft runoff reduction
Pre vs. Post

Link POA-P: Proposed Conditions**Hydrograph**

Grandview-HYD-EX and PR*Type III 24-hr 10-yr Rainfall=5.84"*

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 15

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EX: Existing	Runoff Area=19,186 sf 0.00% Impervious Runoff Depth>3.24" Tc=6.0 min CN=76 Runoff=1.64 cfs 0.119 af
Subcatchment PRO-1: Proposed-1	Runoff Area=4,427 sf 5.33% Impervious Runoff Depth>4.15" Tc=6.0 min CN=85 Runoff=0.48 cfs 0.035 af
Subcatchment PRO-2: Proposed-2-Roof	Runoff Area=1,325 sf 100.00% Impervious Runoff Depth>5.60" Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af
Subcatchment PRO-3: Proposed-3	Runoff Area=7,567 sf 27.01% Impervious Runoff Depth>4.80" Tc=6.0 min CN=91 Runoff=0.91 cfs 0.069 af
Subcatchment PRO-4: Proposed-Bypass	Runoff Area=5,910 sf 0.00% Impervious Runoff Depth>3.14" Tc=6.0 min CN=75 Runoff=0.49 cfs 0.036 af
Pond 1P: Grassed Depression	Peak Elev=382.63' Storage=1,962 cf Inflow=0.91 cfs 0.069 af Discarded=0.01 cfs 0.011 af Primary=0.06 cfs 0.015 af Outflow=0.07 cfs 0.025 af
Link POA-E: Existing Conditions	Inflow=1.64 cfs 0.119 af Primary=1.64 cfs 0.119 af
Link POA-P: Proposed Conditions	Inflow=1.14 cfs 0.100 af Primary=1.14 cfs 0.100 af
Total Runoff Area = 0.882 ac Runoff Volume = 0.273 af Average Runoff Depth = 3.72" 90.62% Pervious = 0.799 ac 9.38% Impervious = 0.083 ac	

Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-yr Rainfall=5.84"

Printed 7/2/2026

Page 16

Summary for Subcatchment EX: Existing

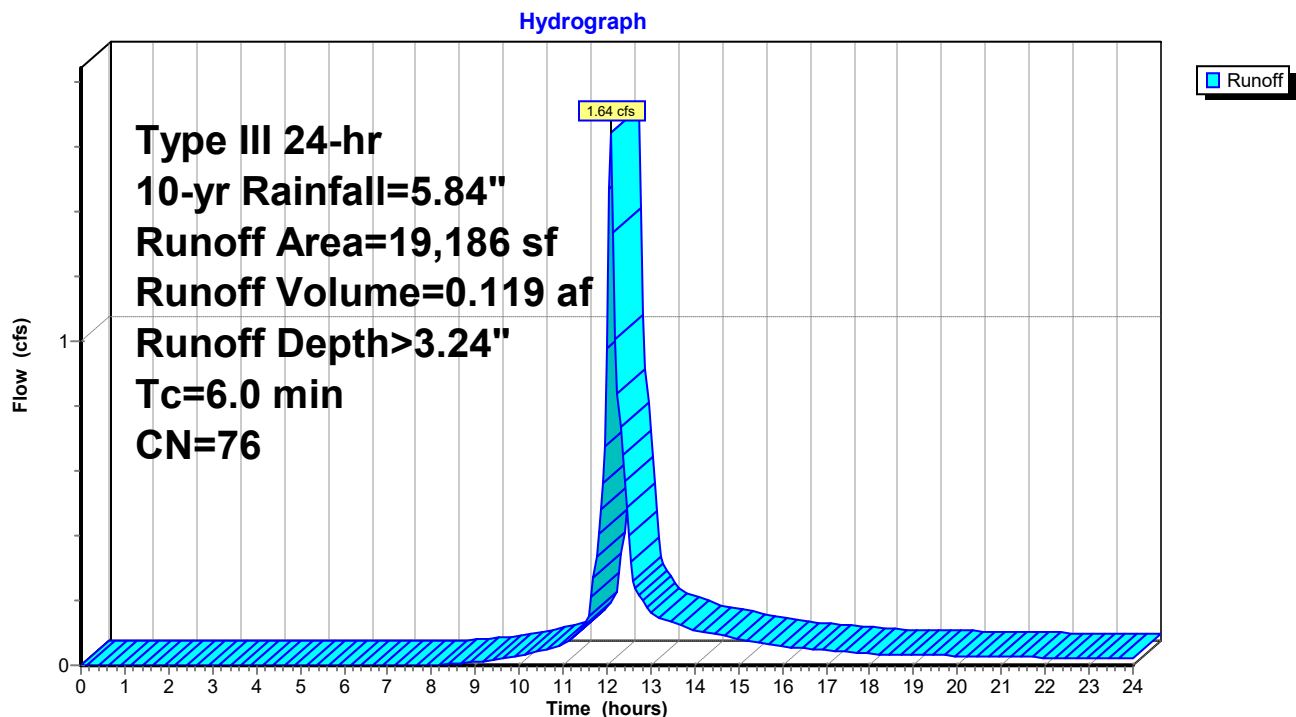
Runoff = 1.64 cfs @ 12.09 hrs, Volume= 0.119 af, Depth> 3.24"
Routed to Link POA-E : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.84"

Area (sf)	CN	Description
3,738	71	Meadow, non-grazed, HSG C
3,823	89	Gravel roads, HSG C
11,625	73	Woods, Fair, HSG C
19,186	76	Weighted Average
19,186		100.00% Pervious Area

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

Subcatchment EX: Existing



Summary for Subcatchment PRO-1: Proposed-1

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 4.15"
 Routed to Link POA-P : Proposed Conditions

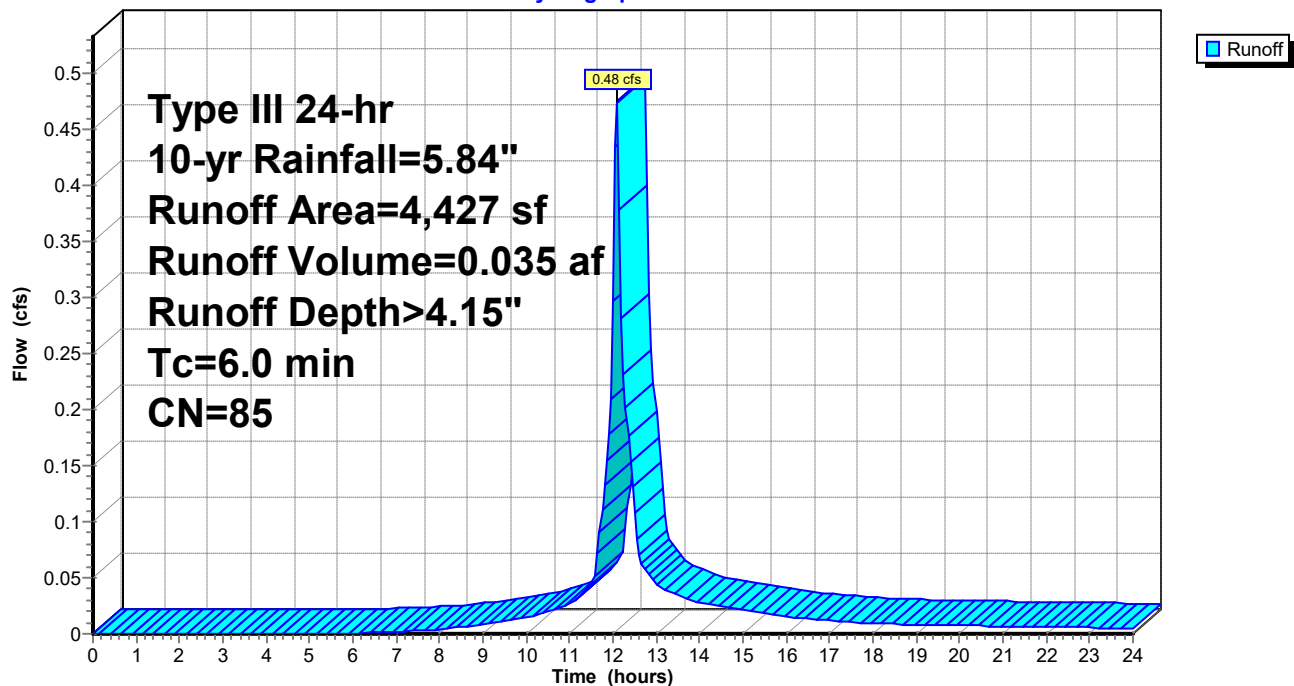
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=5.84"

Area (sf)	CN	Description
1,149	71	Meadow, non-grazed, HSG C
3,042	89	Gravel roads, HSG C
* 236	98	Conc Apron, HSG C
4,427	85	Weighted Average
4,191		94.67% Pervious Area
236		5.33% Impervious Area

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

Subcatchment PRO-1: Proposed-1

Hydrograph



Summary for Subcatchment PRO-2: Proposed-2-Roof

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 5.60"
 Routed to Link POA-P : Proposed Conditions

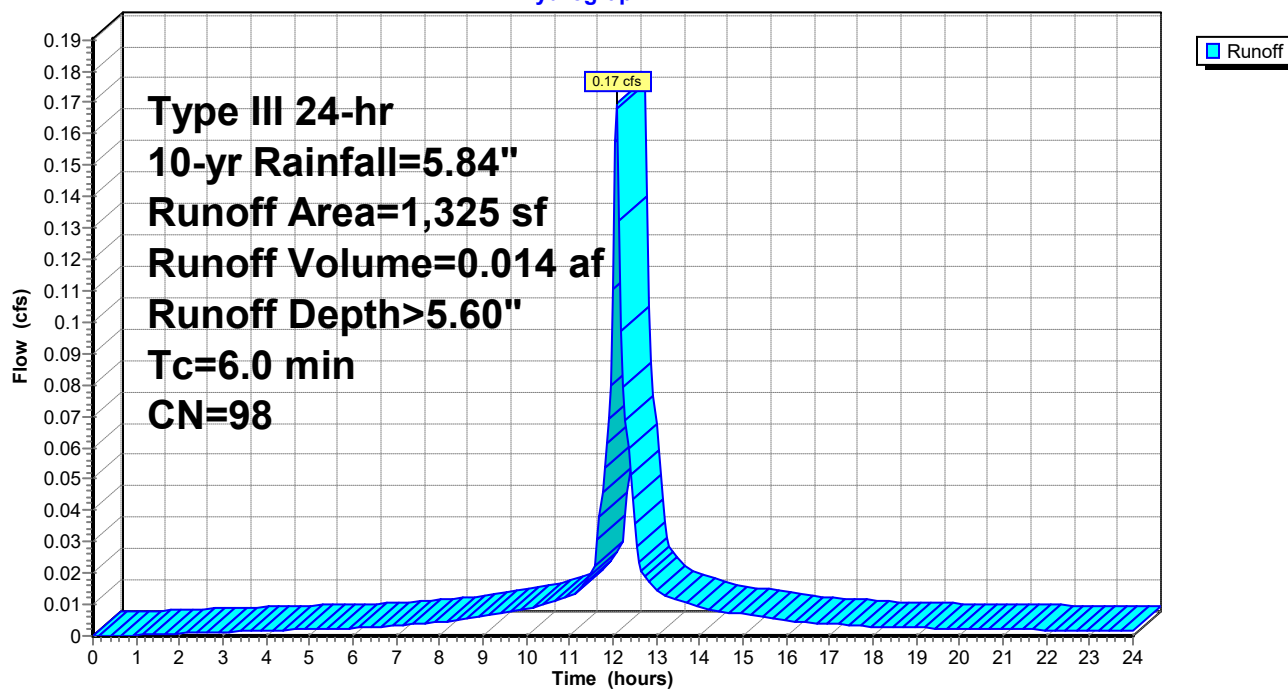
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=5.84"

Area (sf)	CN	Description
1,325	98	Roofs, HSG C
1,325		100.00% Impervious Area

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

Subcatchment PRO-2: Proposed-2-Roof

Hydrograph



Summary for Subcatchment PRO-3: Proposed-3

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 4.80"
 Routed to Pond 1P : Grassed Depression

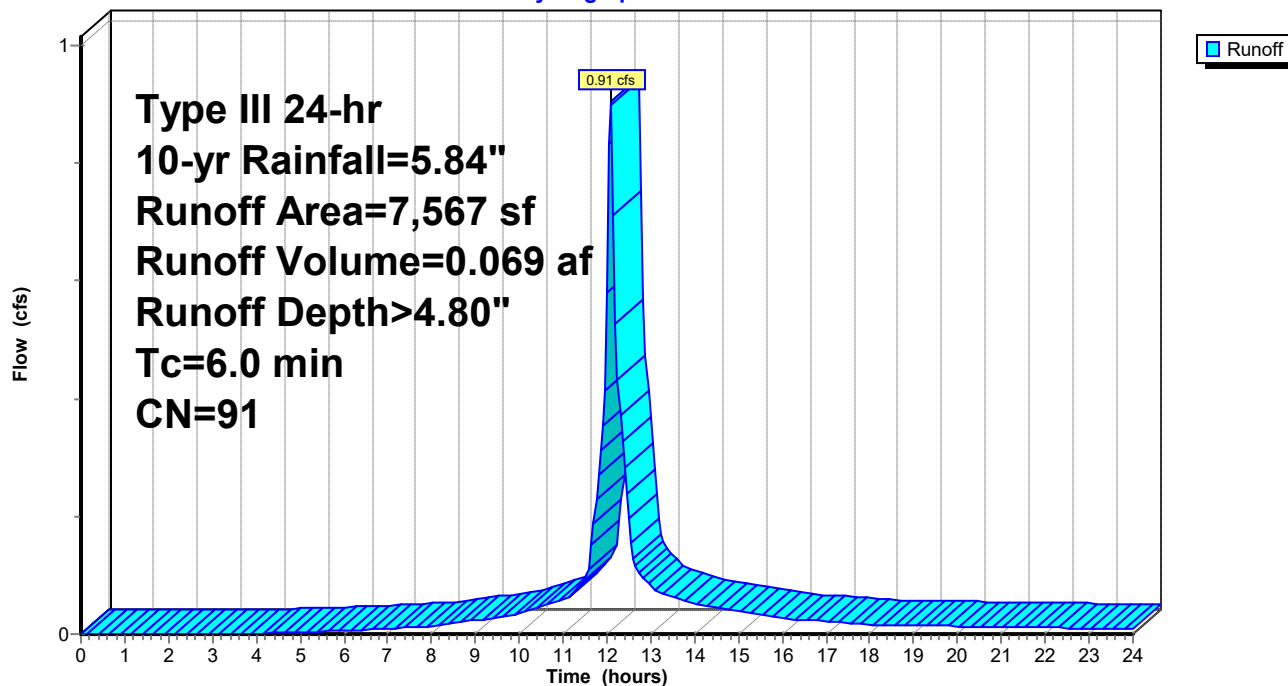
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=5.84"

Area (sf)	CN	Description
343	71	Meadow, non-grazed, HSG C
5,180	89	Gravel roads, HSG C
* 161	98	Conc Apron, HSG C
1,883	98	Water Surface, HSG C
7,567	91	Weighted Average
5,523		72.99% Pervious Area
2,044		27.01% Impervious Area

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

Subcatchment PRO-3: Proposed-3

Hydrograph



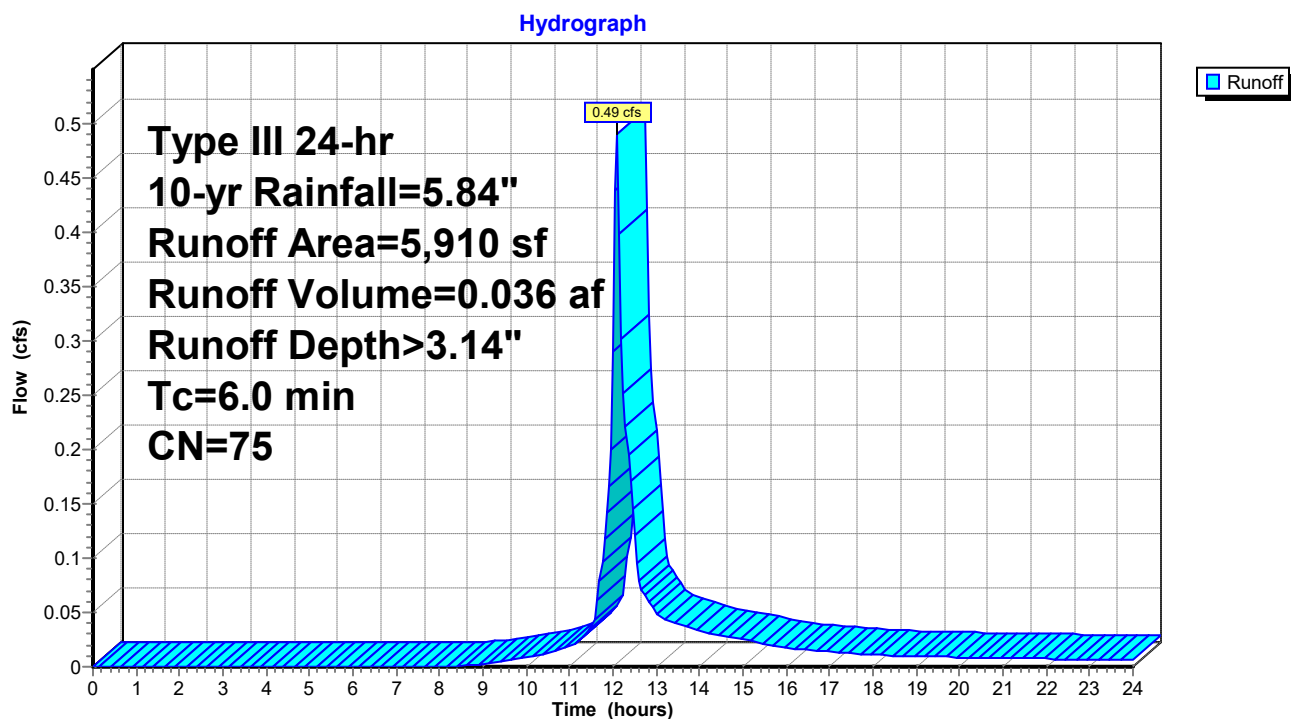
Summary for Subcatchment PRO-4: Proposed-Bypass

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.036 af, Depth> 3.14"
 Routed to Link POA-P : Proposed Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=5.84"

Area (sf)	CN	Description
4,476	71	Meadow, non-grazed, HSG C
1,434	89	Gravel roads, HSG C
5,910	75	Weighted Average
5,910		100.00% Pervious Area

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

Subcatchment PRO-4: Proposed-Bypass

Grandview-HYD-EX and PR

Type III 24-hr 10-yr Rainfall=5.84"

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 21

Summary for Pond 1P: Grassed Depression

Inflow Area = 0.174 ac, 27.01% Impervious, Inflow Depth > 4.80" for 10-yr event
 Inflow = 0.91 cfs @ 12.09 hrs, Volume= 0.069 af
 Outflow = 0.07 cfs @ 13.12 hrs, Volume= 0.025 af, Atten= 92%, Lag= 61.6 min
 Discarded = 0.01 cfs @ 13.12 hrs, Volume= 0.011 af
 Primary = 0.06 cfs @ 13.12 hrs, Volume= 0.015 af
 Routed to Link POA-P : Proposed Conditions

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 382.63' @ 13.12 hrs Surf.Area= 1,527 sf Storage= 1,962 cf

Plug-Flow detention time= 298.0 min calculated for 0.025 af (37% of inflow)
 Center-of-Mass det. time= 161.2 min (942.7 - 781.4)

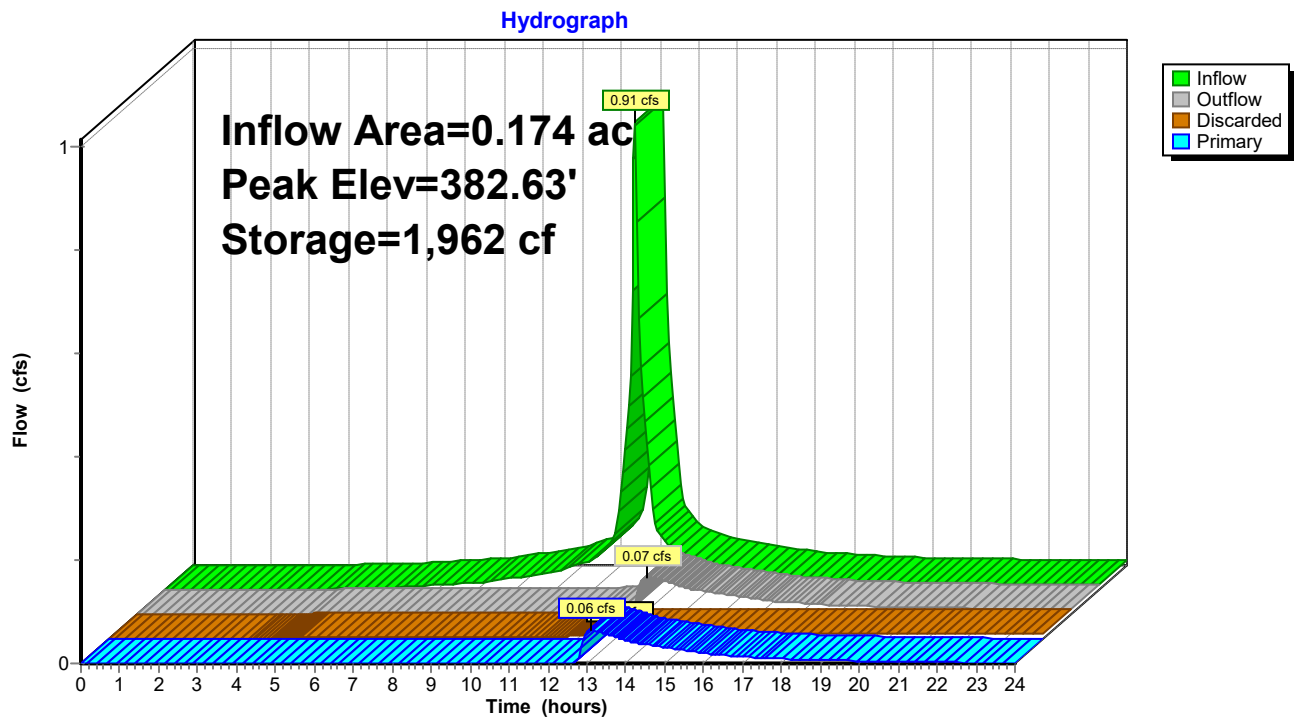
Volume	Invert	Avail.Storage	Storage Description	
#1	379.99'	2,583 cf	Grassed Depression (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.99	1	0.0	0	0
380.00	1,133	40.0	2	2
381.16	1,133	40.0	526	528
381.17	1,133	25.0	3	531
381.49	1,133	25.0	91	621
381.50	856	100.0	10	631
382.00	1,133	100.0	497	1,129
382.50	1,443	100.0	644	1,773
382.60	1,507	100.0	148	1,920
383.00	1,805	100.0	662	2,583

Device	Routing	Invert	Outlet Devices
#1	Primary	382.60'	5.0' long + 1.0 ' SideZ x 10.0' breadth Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	379.99'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 378.50' Phase-In= 0.01'

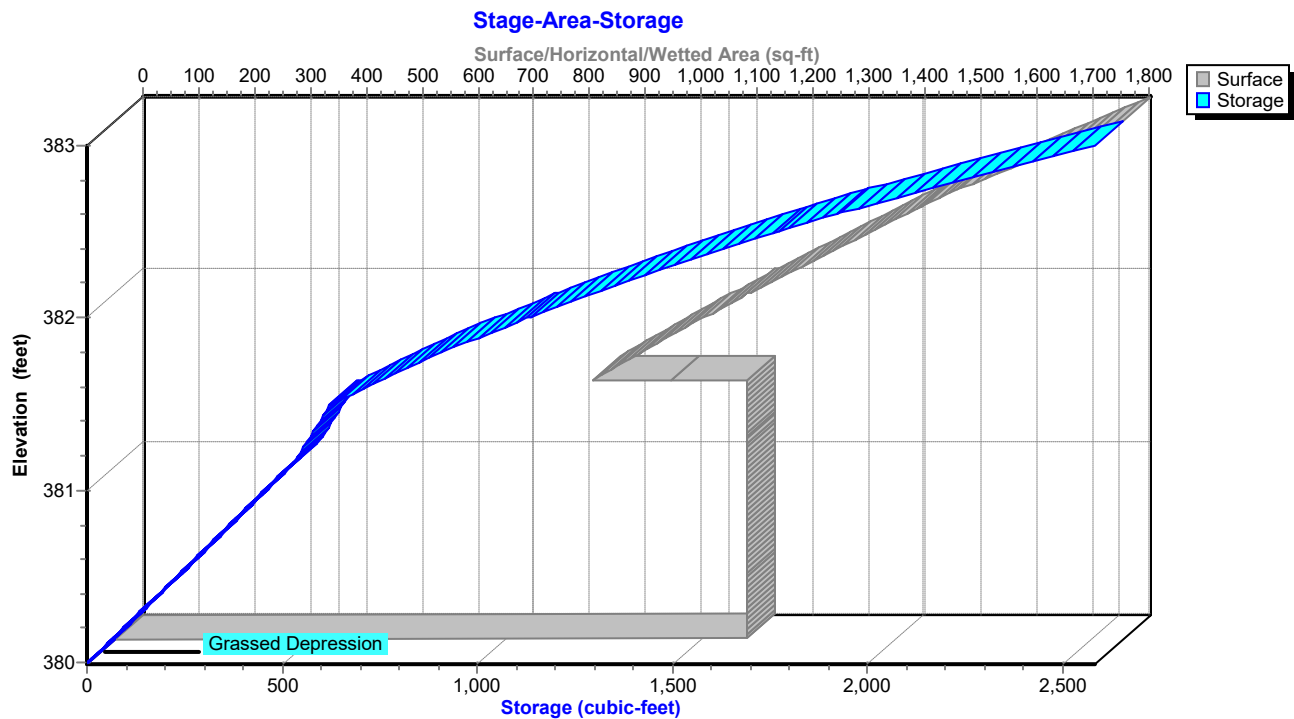
Discarded OutFlow Max=0.01 cfs @ 13.12 hrs HW=382.63' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.06 cfs @ 13.12 hrs HW=382.63' (Free Discharge)
 ↑ **1=Spillway** (Weir Controls 0.06 cfs @ 0.41 fps)

Pond 1P: Grassed Depression



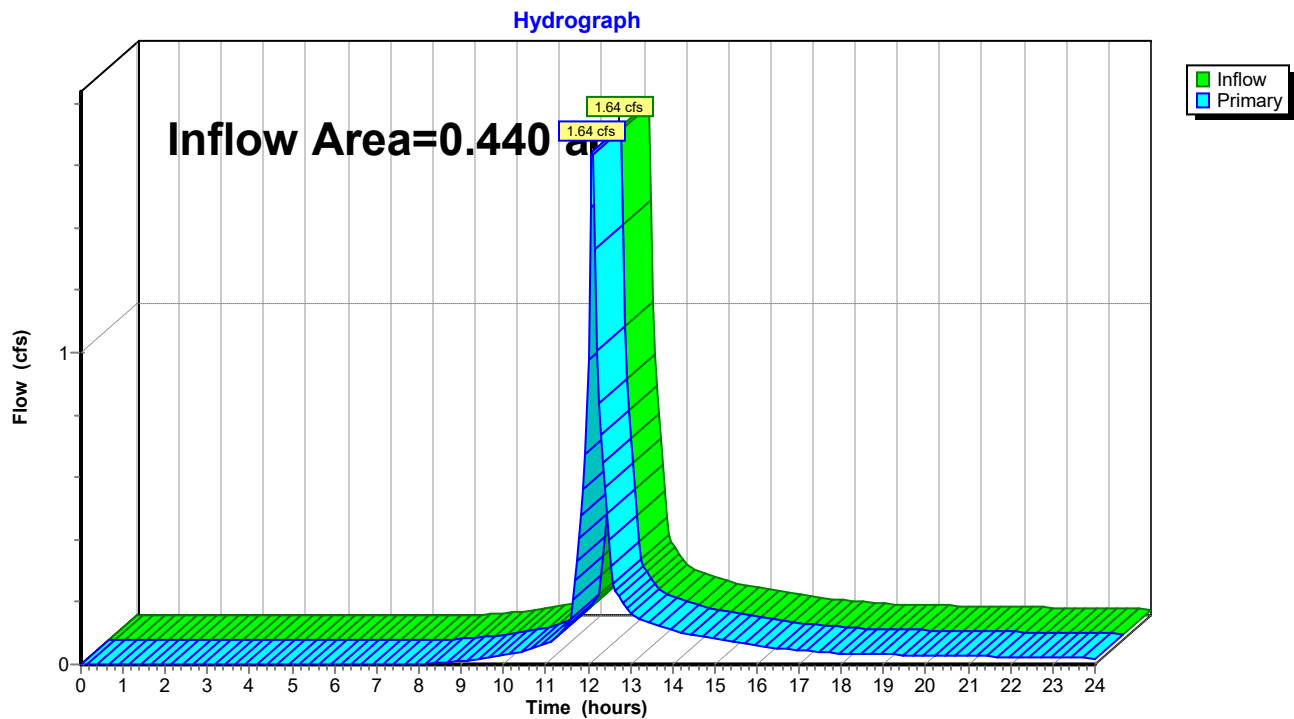
Pond 1P: Grassed Depression



Summary for Link POA-E: Existing Conditions

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 3.24" for 10-yr event
Inflow = 1.64 cfs @ 12.09 hrs, Volume= 0.119 af
Primary = 1.64 cfs @ 12.09 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link POA-E: Existing Conditions

Summary for Link POA-P: Proposed Conditions

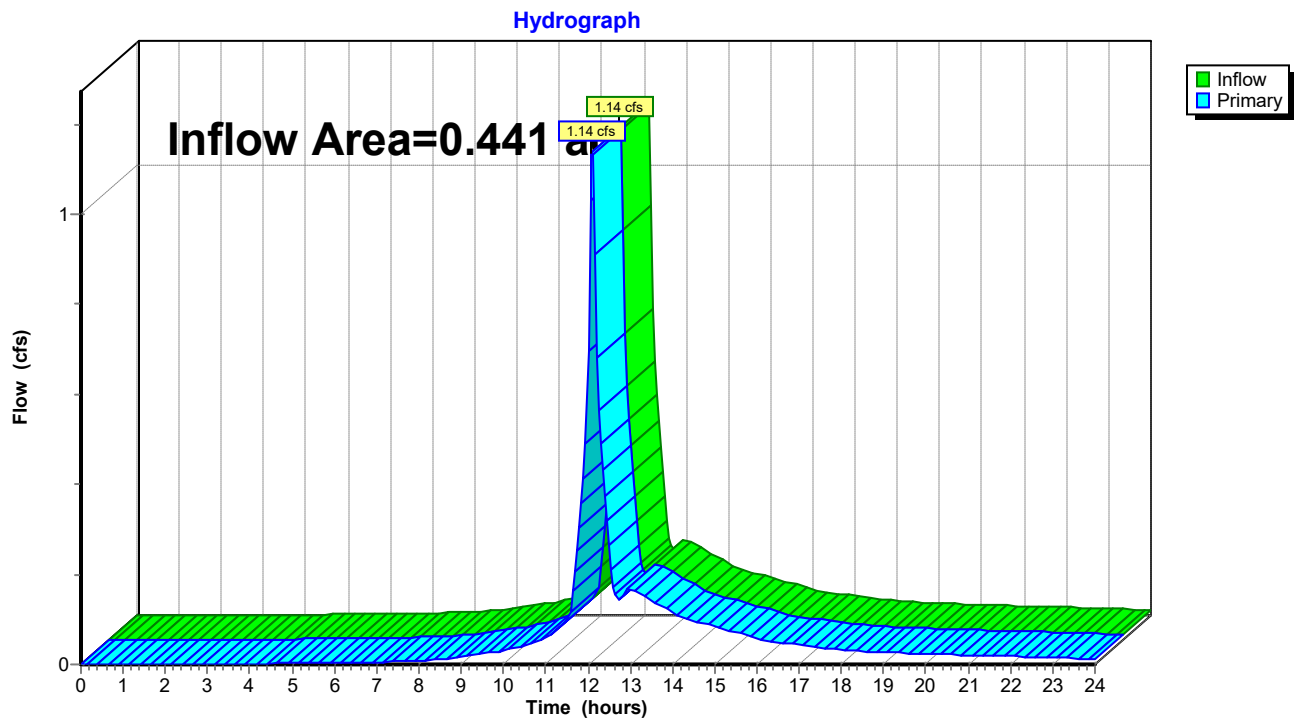
Inflow Area = 0.441 ac, 18.75% Impervious, Inflow Depth > 2.71" for 10-yr event

Inflow = 1.14 cfs @ 12.09 hrs, Volume= 0.100 af

Primary = 1.14 cfs @ 12.09 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

0.019 ac-ft runoff reduction
Pre vs. Post

Link POA-P: Proposed Conditions

Grandview-HYD-EX and PR*Type III 24-hr 50-yr Rainfall=8.17"*

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 25

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EX: Existing	Runoff Area=19,186 sf 0.00% Impervious Runoff Depth>5.31" Tc=6.0 min CN=76 Runoff=2.67 cfs 0.195 af
Subcatchment PRO-1: Proposed-1	Runoff Area=4,427 sf 5.33% Impervious Runoff Depth>6.37" Tc=6.0 min CN=85 Runoff=0.72 cfs 0.054 af
Subcatchment PRO-2: Proposed-2-Roof	Runoff Area=1,325 sf 100.00% Impervious Runoff Depth>7.93" Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af
Subcatchment PRO-3: Proposed-3	Runoff Area=7,567 sf 27.01% Impervious Runoff Depth>7.09" Tc=6.0 min CN=91 Runoff=1.31 cfs 0.103 af
Subcatchment PRO-4: Proposed-Bypass	Runoff Area=5,910 sf 0.00% Impervious Runoff Depth>5.19" Tc=6.0 min CN=75 Runoff=0.81 cfs 0.059 af
Pond 1P: Grassed Depression	Peak Elev=382.74' Storage=2,136 cf Inflow=1.31 cfs 0.103 af Discarded=0.01 cfs 0.011 af Primary=0.66 cfs 0.047 af Outflow=0.67 cfs 0.058 af
Link POA-E: Existing Conditions	Inflow=2.67 cfs 0.195 af Primary=2.67 cfs 0.195 af
Link POA-P: Proposed Conditions	Inflow=1.76 cfs 0.180 af Primary=1.76 cfs 0.180 af
Total Runoff Area = 0.882 ac Runoff Volume = 0.430 af Average Runoff Depth = 5.85" 90.62% Pervious = 0.799 ac 9.38% Impervious = 0.083 ac	

Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 50-yr Rainfall=8.17"

Printed 7/2/2026

Page 26

Summary for Subcatchment EX: Existing

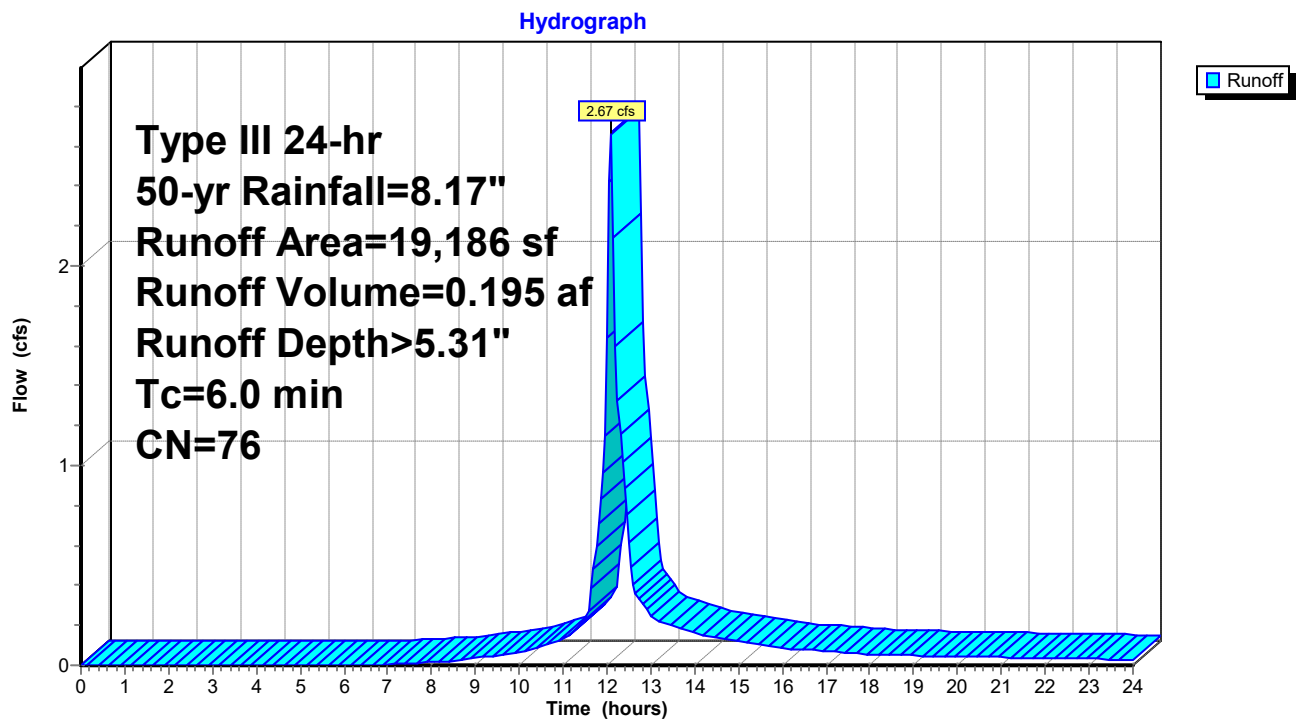
Runoff = 2.67 cfs @ 12.09 hrs, Volume= 0.195 af, Depth> 5.31"
Routed to Link POA-E : Existing Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.17"

Area (sf)	CN	Description
3,738	71	Meadow, non-grazed, HSG C
3,823	89	Gravel roads, HSG C
11,625	73	Woods, Fair, HSG C
19,186	76	Weighted Average
19,186		100.00% Pervious Area

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

Subcatchment EX: Existing



Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 50-yr Rainfall=8.17"

Printed 7/2/2026

Page 27

Summary for Subcatchment PRO-1: Proposed-1

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 6.37"
Routed to Link POA-P : Proposed Conditions

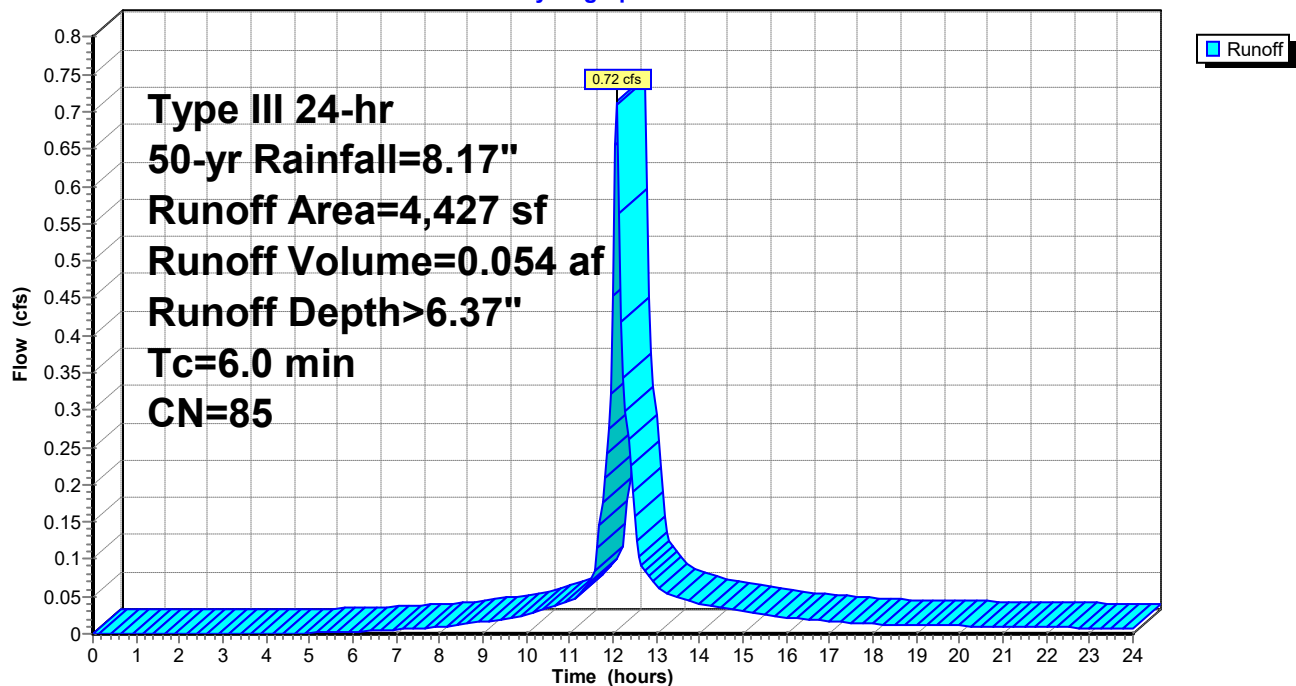
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.17"

Area (sf)	CN	Description
1,149	71	Meadow, non-grazed, HSG C
3,042	89	Gravel roads, HSG C
* 236	98	Conc Apron, HSG C
4,427	85	Weighted Average
4,191		94.67% Pervious Area
236		5.33% Impervious Area

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

Subcatchment PRO-1: Proposed-1

Hydrograph



Summary for Subcatchment PRO-2: Proposed-2-Roof

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 7.93"
 Routed to Link POA-P : Proposed Conditions

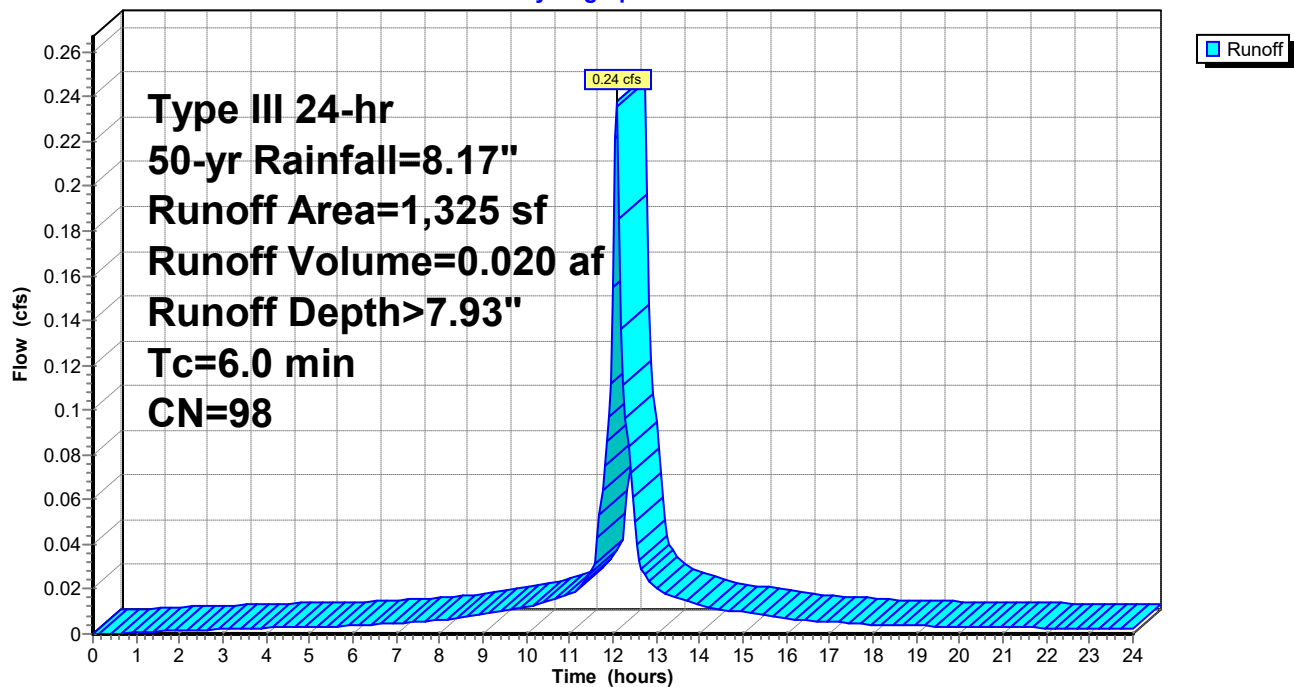
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-yr Rainfall=8.17"

Area (sf)	CN	Description
1,325	98	Roofs, HSG C
1,325		100.00% Impervious Area

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

Subcatchment PRO-2: Proposed-2-Roof

Hydrograph



Summary for Subcatchment PRO-3: Proposed-3

Runoff = 1.31 cfs @ 12.09 hrs, Volume= 0.103 af, Depth> 7.09"
 Routed to Pond 1P : Grassed Depression

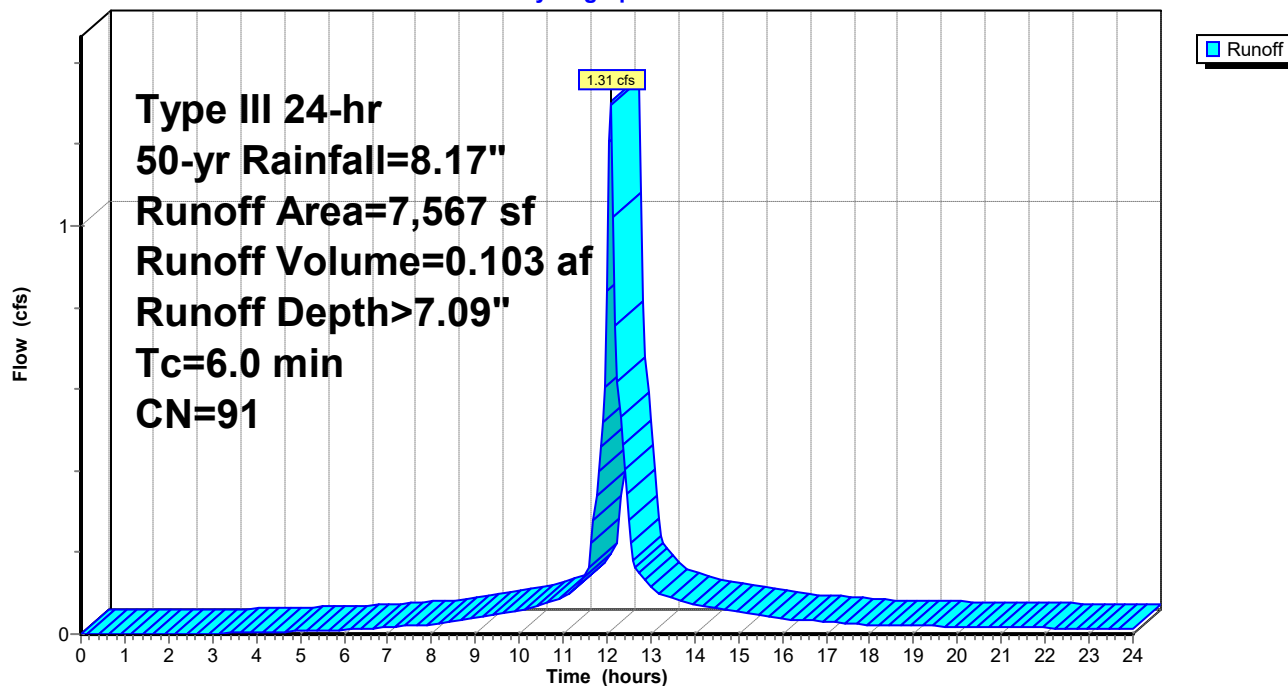
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-yr Rainfall=8.17"

Area (sf)	CN	Description
343	71	Meadow, non-grazed, HSG C
5,180	89	Gravel roads, HSG C
* 161	98	Conc Apron, HSG C
1,883	98	Water Surface, HSG C
7,567	91	Weighted Average
5,523		72.99% Pervious Area
2,044		27.01% Impervious Area

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

Subcatchment PRO-3: Proposed-3

Hydrograph



Summary for Subcatchment PRO-4: Proposed-Bypass

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.059 af, Depth> 5.19"
 Routed to Link POA-P : Proposed Conditions

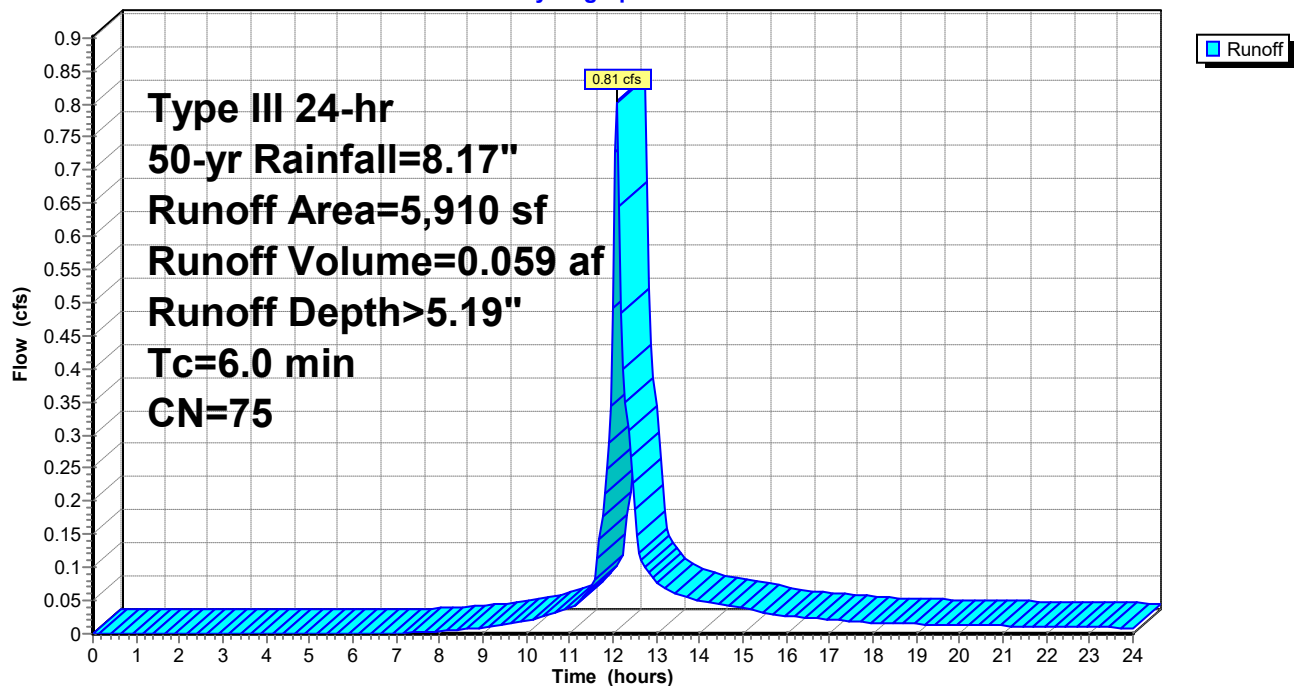
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-yr Rainfall=8.17"

Area (sf)	CN	Description
4,476	71	Meadow, non-grazed, HSG C
1,434	89	Gravel roads, HSG C
5,910	75	Weighted Average
5,910		100.00% Pervious Area

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

Subcatchment PRO-4: Proposed-Bypass

Hydrograph



Grandview-HYD-EX and PR

Type III 24-hr 50-yr Rainfall=8.17"

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 31

Summary for Pond 1P: Grassed Depression

Inflow Area = 0.174 ac, 27.01% Impervious, Inflow Depth > 7.09" for 50-yr event
 Inflow = 1.31 cfs @ 12.09 hrs, Volume= 0.103 af
 Outflow = 0.67 cfs @ 12.24 hrs, Volume= 0.058 af, Atten= 49%, Lag= 9.3 min
 Discarded = 0.01 cfs @ 12.24 hrs, Volume= 0.011 af
 Primary = 0.66 cfs @ 12.24 hrs, Volume= 0.047 af
 Routed to Link POA-P : Proposed Conditions

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 382.74' @ 12.24 hrs Surf.Area= 1,610 sf Storage= 2,136 cf

Plug-Flow detention time= 201.7 min calculated for 0.058 af (57% of inflow)
 Center-of-Mass det. time= 94.6 min (866.2 - 771.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	379.99'	2,583 cf	Grassed Depression (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.99	1	0.0	0	0
380.00	1,133	40.0	2	2
381.16	1,133	40.0	526	528
381.17	1,133	25.0	3	531
381.49	1,133	25.0	91	621
381.50	856	100.0	10	631
382.00	1,133	100.0	497	1,129
382.50	1,443	100.0	644	1,773
382.60	1,507	100.0	148	1,920
383.00	1,805	100.0	662	2,583

Device	Routing	Invert	Outlet Devices
#1	Primary	382.60'	5.0' long + 1.0 ' SideZ x 10.0' breadth Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	379.99'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 378.50' Phase-In= 0.01'

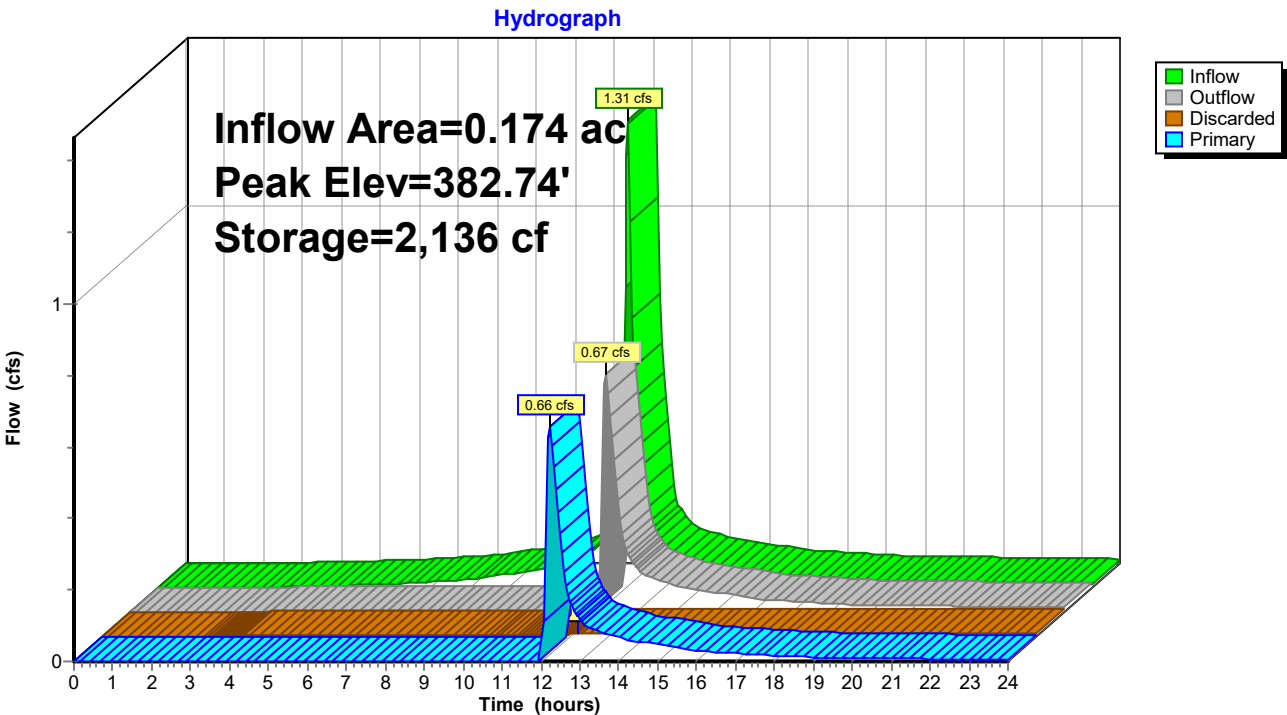
Discarded OutFlow Max=0.01 cfs @ 12.24 hrs HW=382.74' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.01 cfs)

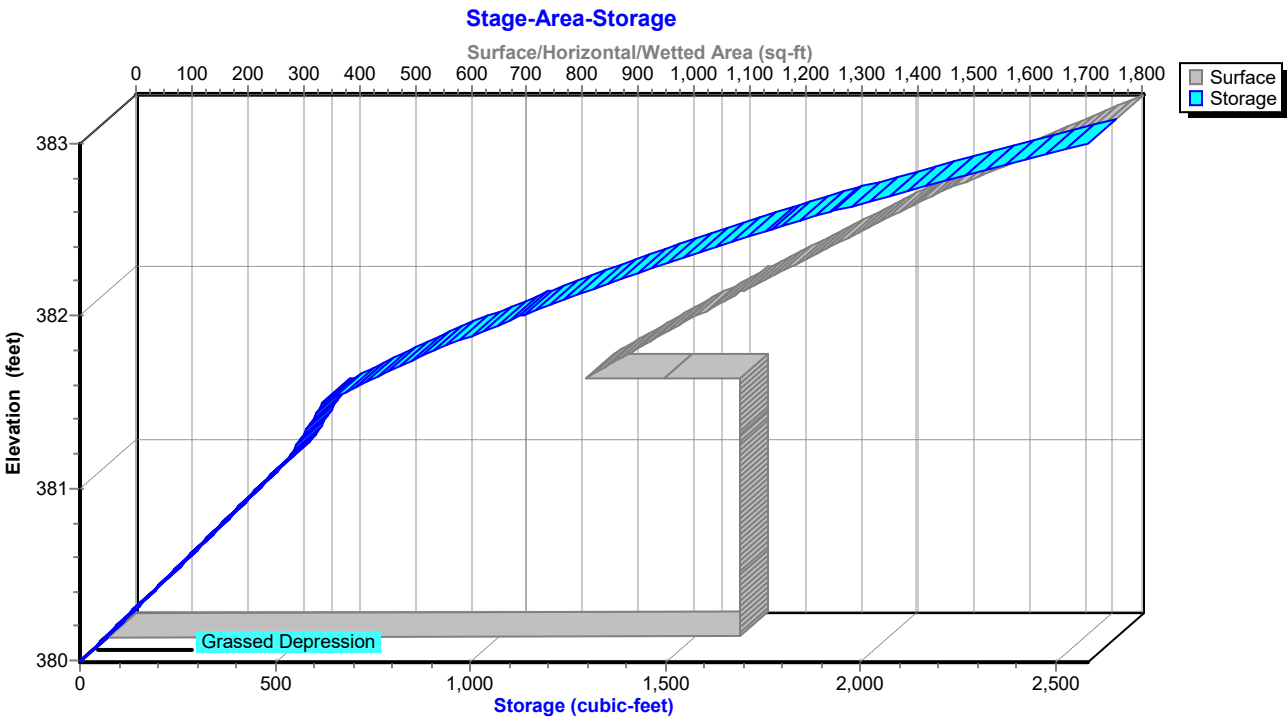
Primary OutFlow Max=0.65 cfs @ 12.24 hrs HW=382.74' (Free Discharge)

↑ **1=Spillway** (Weir Controls 0.65 cfs @ 0.92 fps)

Pond 1P: Grassed Depression



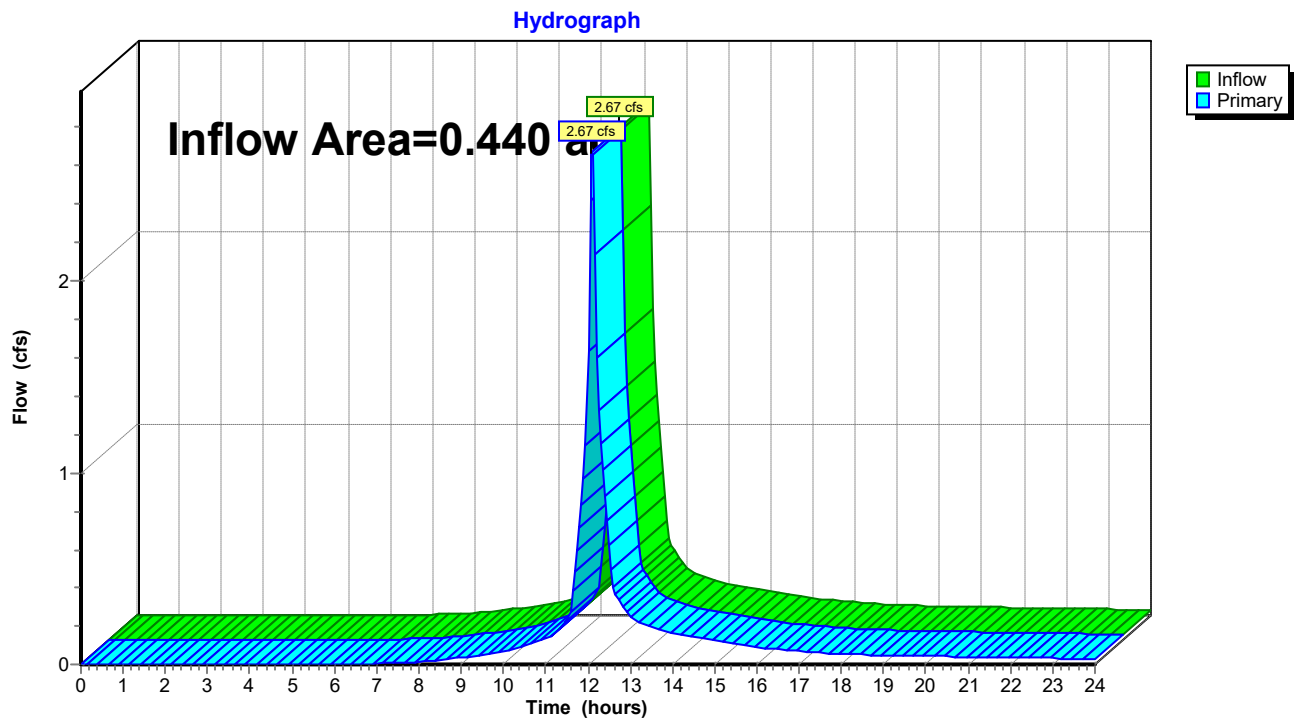
Pond 1P: Grassed Depression



Summary for Link POA-E: Existing Conditions

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 5.31" for 50-yr event
Inflow = 2.67 cfs @ 12.09 hrs, Volume= 0.195 af
Primary = 2.67 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

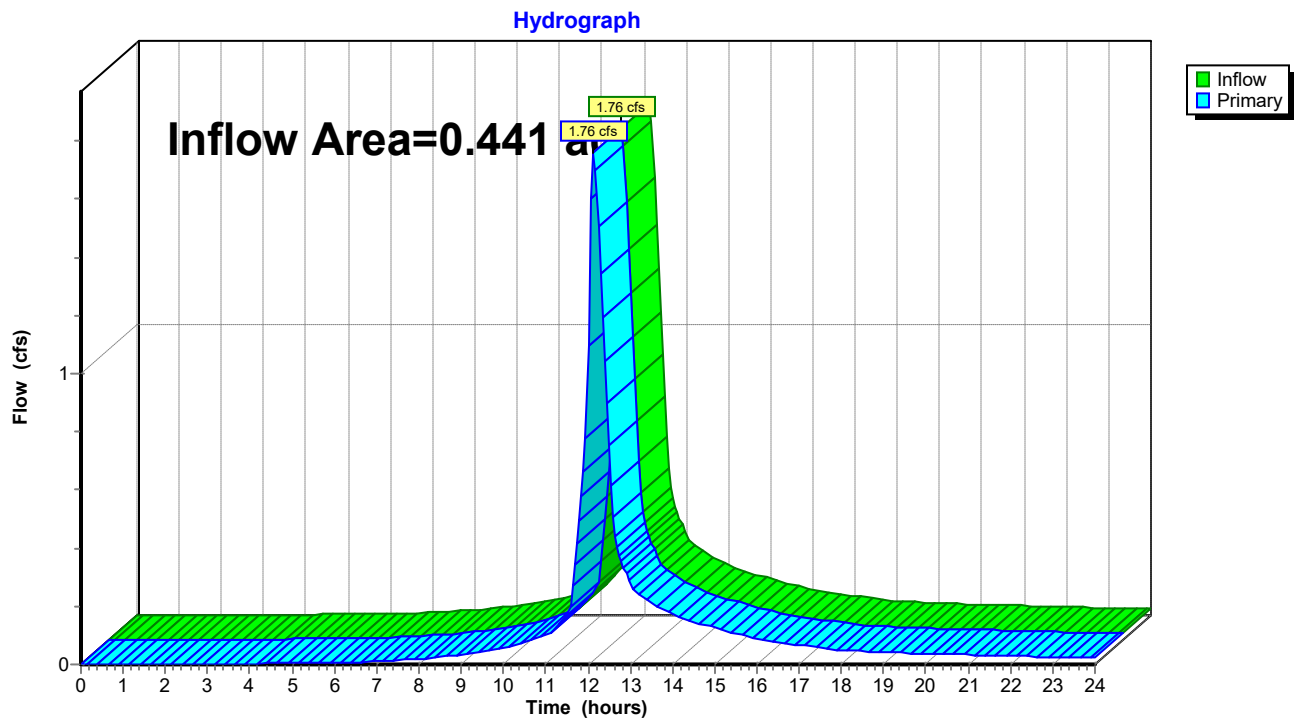
Link POA-E: Existing Conditions

Summary for Link POA-P: Proposed Conditions

Inflow Area = 0.441 ac, 18.75% Impervious, Inflow Depth > 4.89" for 50-yr event
Inflow = 1.76 cfs @ 12.12 hrs, Volume= 0.180 af
Primary = 1.76 cfs @ 12.12 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

0.015 ac-ft runoff reduction
Pre vs. Post

Link POA-P: Proposed Conditions

Grandview-HYD-EX and PR*Type III 24-hr 100-yr Rainfall=9.23"*

Prepared by GHD, Inc

Printed 7/2/2026

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Page 35

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EX: Existing Runoff Area=19,186 sf 0.00% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=76 Runoff=3.14 cfs 0.231 af

Subcatchment PRO-1: Proposed-1 Runoff Area=4,427 sf 5.33% Impervious Runoff Depth>7.40"
Tc=6.0 min CN=85 Runoff=0.82 cfs 0.063 af

Subcatchment PRO-2: Proposed-2-Roof Runoff Area=1,325 sf 100.00% Impervious Runoff Depth>8.98"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.023 af

Subcatchment PRO-3: Proposed-3 Runoff Area=7,567 sf 27.01% Impervious Runoff Depth>8.14"
Tc=6.0 min CN=91 Runoff=1.49 cfs 0.118 af

Subcatchment PRO-4: Proposed-Bypass Runoff Area=5,910 sf 0.00% Impervious Runoff Depth>6.16"
Tc=6.0 min CN=75 Runoff=0.95 cfs 0.070 af

Pond 1P: Grassed Depression Peak Elev=382.79' Storage=2,226 cf Inflow=1.49 cfs 0.118 af
Discarded=0.01 cfs 0.012 af Primary=1.09 cfs 0.062 af Outflow=1.10 cfs 0.074 af

Link POA-E: Existing Conditions Inflow=3.14 cfs 0.231 af
Primary=3.14 cfs 0.231 af

Link POA-P: Proposed Conditions Inflow=2.78 cfs 0.217 af
Primary=2.78 cfs 0.217 af

Total Runoff Area = 0.882 ac Runoff Volume = 0.503 af Average Runoff Depth = 6.85"
90.62% Pervious = 0.799 ac 9.38% Impervious = 0.083 ac

Grandview-HYD-EX and PR

Prepared by GHD, Inc

HydroCAD® 10.20-5c s/n 07447 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-yr Rainfall=9.23"

Printed 7/2/2026

Page 36

Summary for Subcatchment EX: Existing

Runoff = 3.14 cfs @ 12.09 hrs, Volume= 0.231 af, Depth> 6.28"

Routed to Link POA-E : Existing Conditions

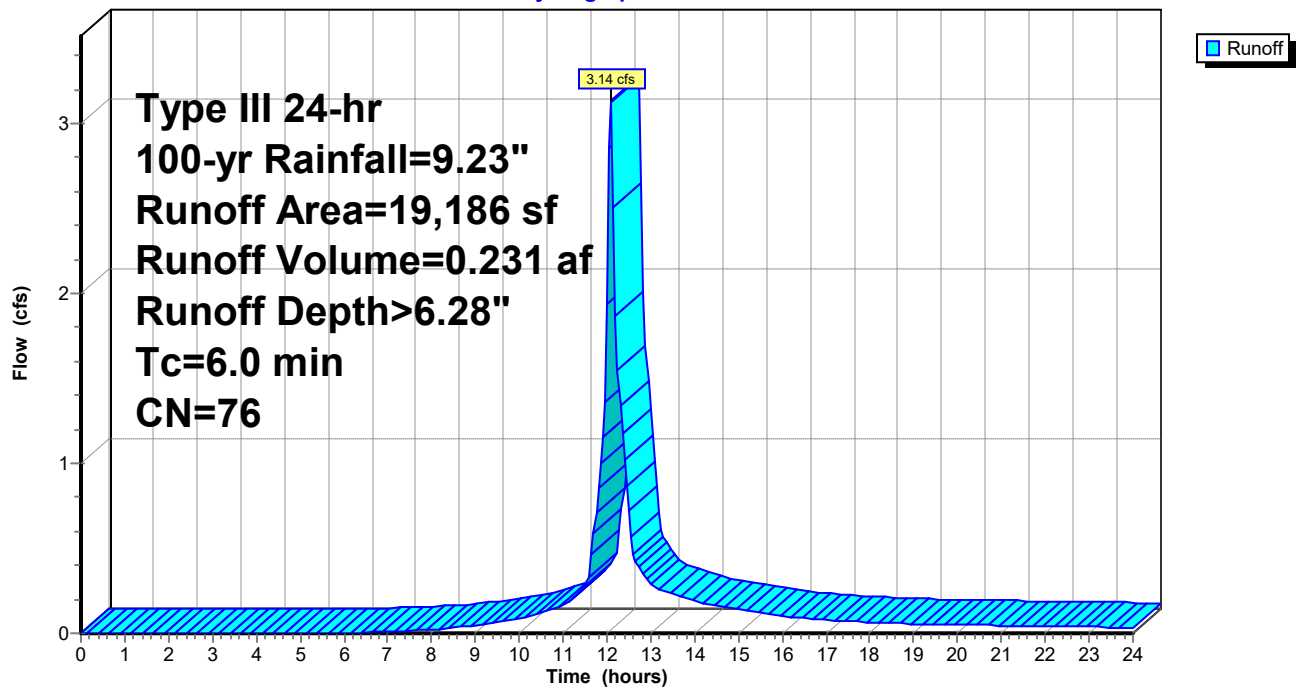
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=9.23"

Area (sf)	CN	Description
3,738	71	Meadow, non-grazed, HSG C
3,823	89	Gravel roads, HSG C
11,625	73	Woods, Fair, HSG C
19,186	76	Weighted Average
19,186		100.00% Pervious Area

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

Subcatchment EX: Existing

Hydrograph



Summary for Subcatchment PRO-1: Proposed-1

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.063 af, Depth> 7.40"
 Routed to Link POA-P : Proposed Conditions

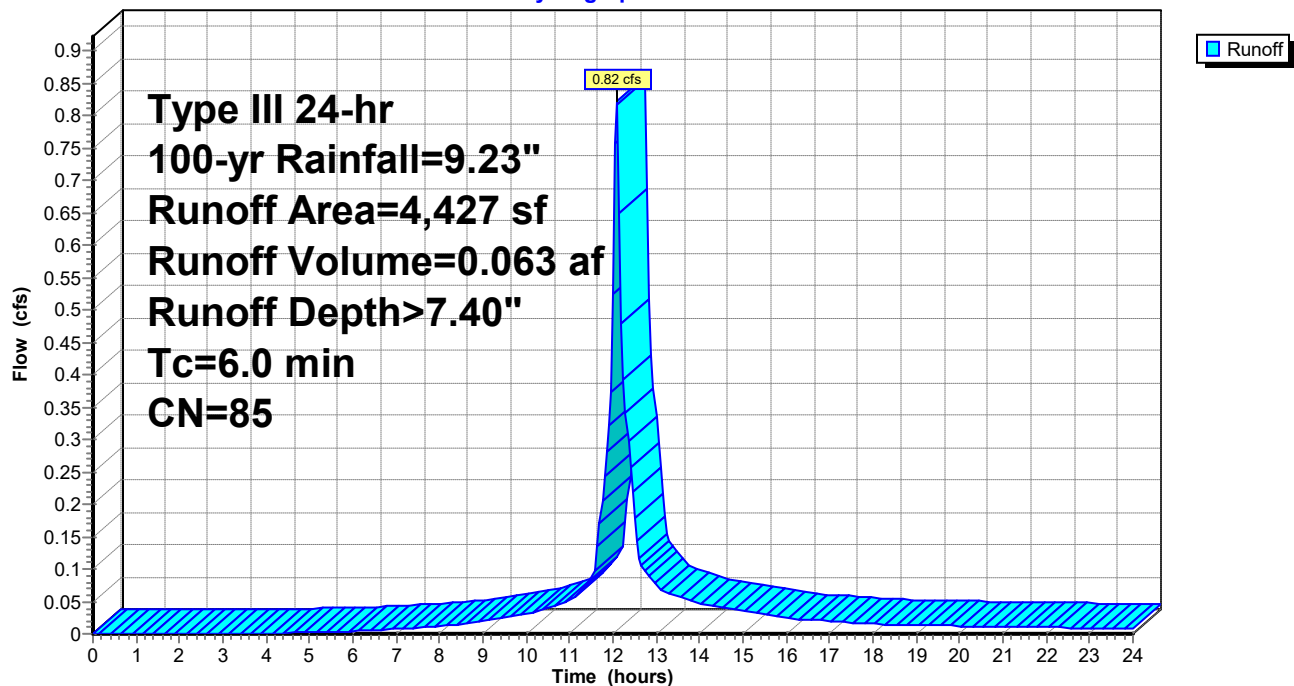
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=9.23"

Area (sf)	CN	Description
1,149	71	Meadow, non-grazed, HSG C
3,042	89	Gravel roads, HSG C
* 236	98	Conc Apron, HSG C
4,427	85	Weighted Average
4,191		94.67% Pervious Area
236		5.33% Impervious Area

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

Subcatchment PRO-1: Proposed-1

Hydrograph



Summary for Subcatchment PRO-2: Proposed-2-Roof

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 8.98"
 Routed to Link POA-P : Proposed Conditions

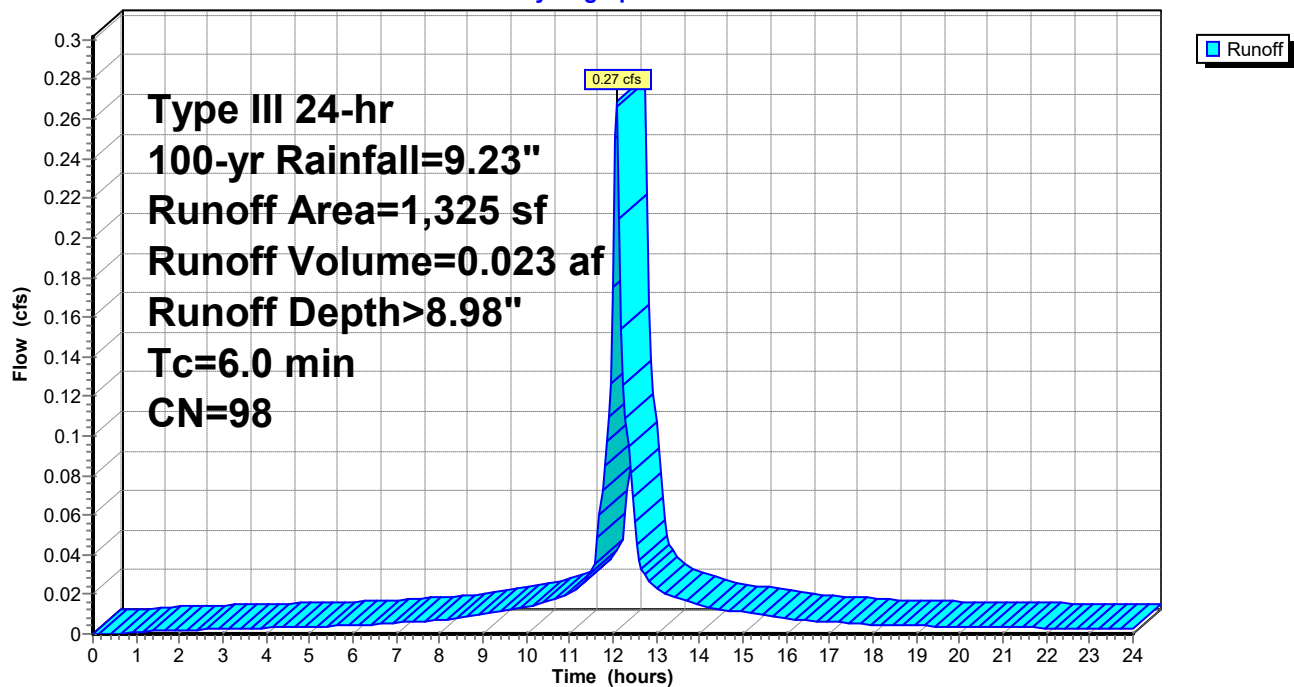
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=9.23"

Area (sf)	CN	Description
1,325	98	Roofs, HSG C
1,325		100.00% Impervious Area

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

Subcatchment PRO-2: Proposed-2-Roof

Hydrograph



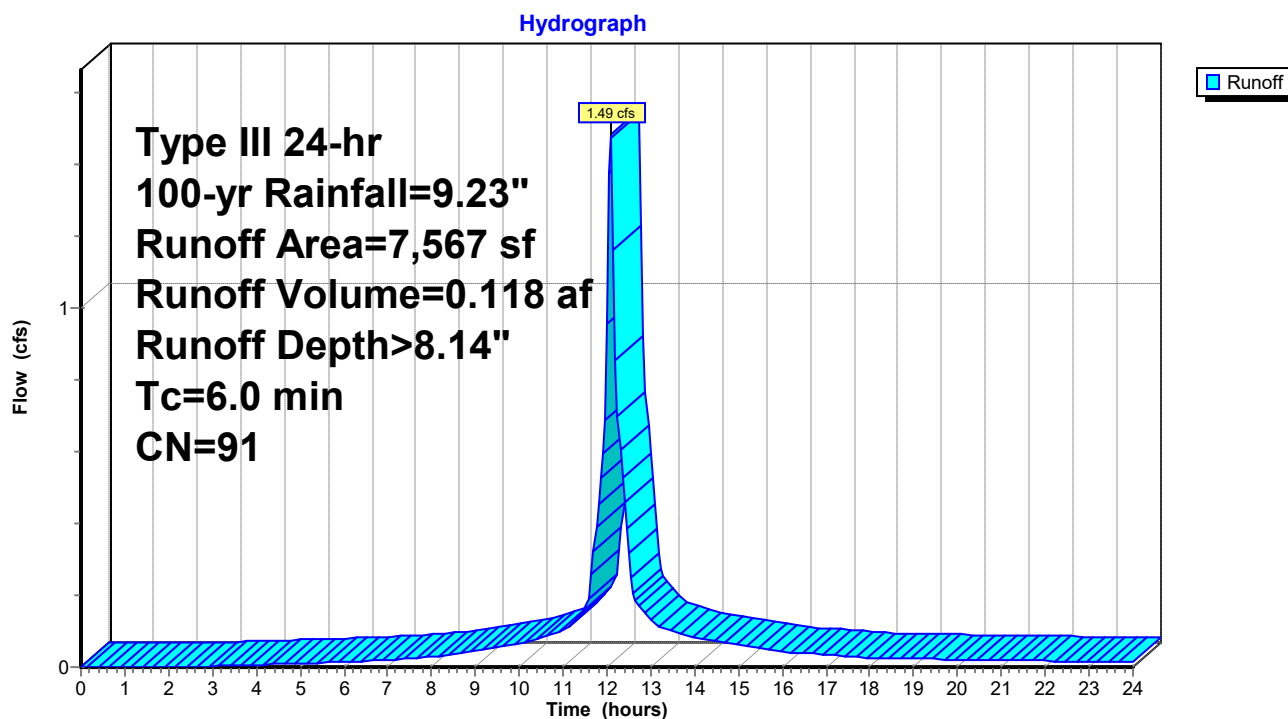
Summary for Subcatchment PRO-3: Proposed-3

Runoff = 1.49 cfs @ 12.09 hrs, Volume= 0.118 af, Depth> 8.14"
 Routed to Pond 1P : Grassed Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=9.23"

Area (sf)	CN	Description
343	71	Meadow, non-grazed, HSG C
5,180	89	Gravel roads, HSG C
* 161	98	Conc Apron, HSG C
1,883	98	Water Surface, HSG C
7,567	91	Weighted Average
5,523		72.99% Pervious Area
2,044		27.01% Impervious Area

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

Subcatchment PRO-3: Proposed-3

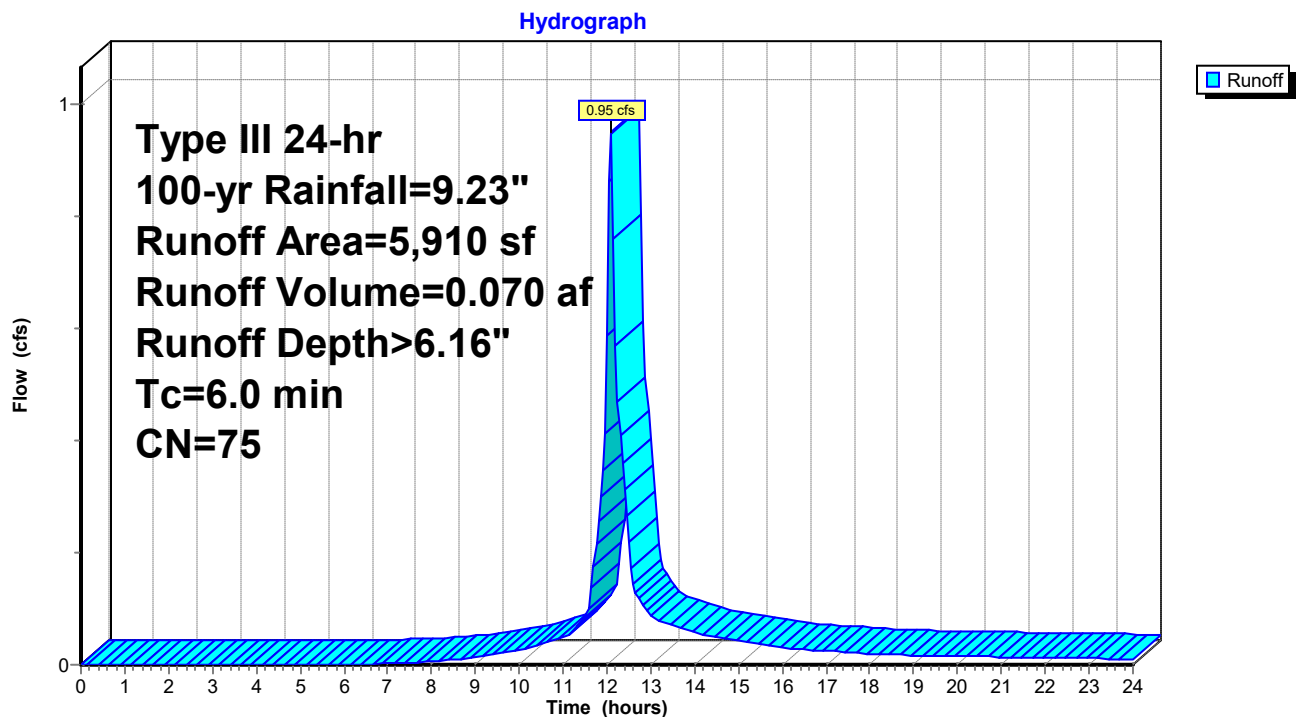
Summary for Subcatchment PRO-4: Proposed-Bypass

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.070 af, Depth> 6.16"
 Routed to Link POA-P : Proposed Conditions

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=9.23"

Area (sf)	CN	Description
4,476	71	Meadow, non-grazed, HSG C
1,434	89	Gravel roads, HSG C
5,910	75	Weighted Average
5,910		100.00% Pervious Area

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

Subcatchment PRO-4: Proposed-Bypass

Summary for Pond 1P: Grassed Depression

Inflow Area = 0.174 ac, 27.01% Impervious, Inflow Depth > 8.14" for 100-yr event
 Inflow = 1.49 cfs @ 12.09 hrs, Volume= 0.118 af
 Outflow = 1.10 cfs @ 12.17 hrs, Volume= 0.074 af, Atten= 26%, Lag= 5.1 min
 Discarded = 0.01 cfs @ 12.17 hrs, Volume= 0.012 af
 Primary = 1.09 cfs @ 12.17 hrs, Volume= 0.062 af
 Routed to Link POA-P : Proposed Conditions

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 382.79' @ 12.17 hrs Surf.Area= 1,651 sf Storage= 2,226 cf

Plug-Flow detention time= 184.7 min calculated for 0.073 af (62% of inflow)
 Center-of-Mass det. time= 84.0 min (852.3 - 768.3)

Volume	Invert	Avail.Storage	Storage Description
#1	379.99'	2,583 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.99	1	0.0	0	0
380.00	1,133	40.0	2	2
381.16	1,133	40.0	526	528
381.17	1,133	25.0	3	531
381.49	1,133	25.0	91	621
381.50	856	100.0	10	631
382.00	1,133	100.0	497	1,129
382.50	1,443	100.0	644	1,773
382.60	1,507	100.0	148	1,920
383.00	1,805	100.0	662	2,583

Device	Routing	Invert	Outlet Devices
#1	Primary	382.60'	5.0' long + 1.0 ' SideZ x 10.0' breadth Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	379.99'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 378.50' Phase-In= 0.01'

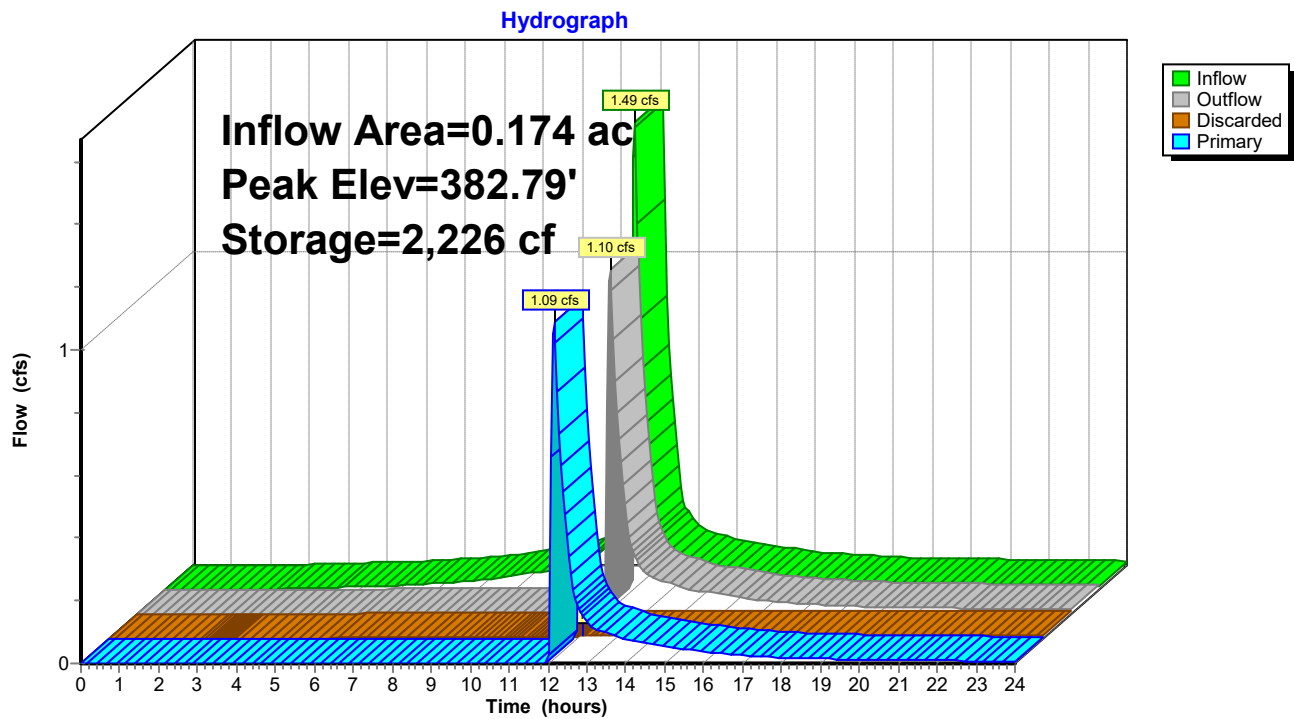
Discarded OutFlow Max=0.01 cfs @ 12.17 hrs HW=382.79' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.01 cfs)

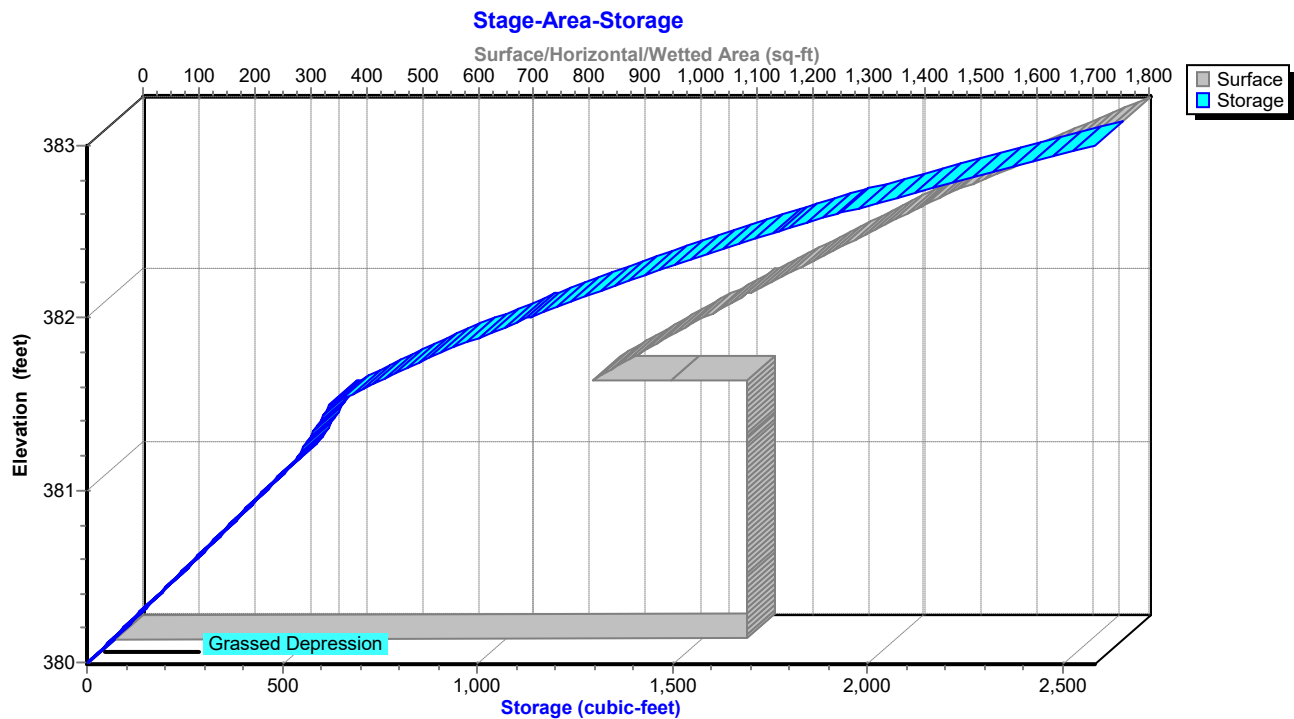
Primary OutFlow Max=1.04 cfs @ 12.17 hrs HW=382.79' (Free Discharge)

↑ **1=Spillway** (Weir Controls 1.04 cfs @ 1.07 fps)

Pond 1P: Grassed Depression



Pond 1P: Grassed Depression



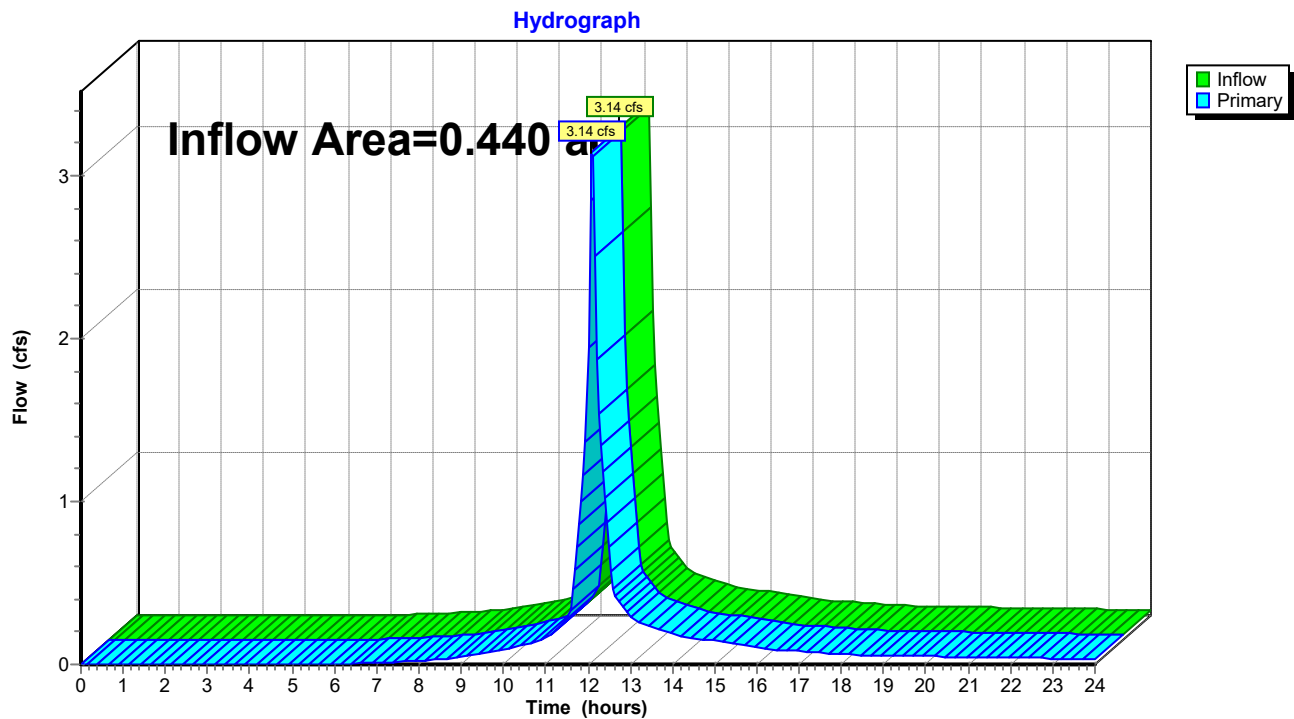
Summary for Link POA-E: Existing Conditions

Inflow Area = 0.440 ac, 0.00% Impervious, Inflow Depth > 6.28" for 100-yr event

Inflow = 3.14 cfs @ 12.09 hrs, Volume= 0.231 af

Primary = 3.14 cfs @ 12.09 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link POA-E: Existing Conditions

Summary for Link POA-P: Proposed Conditions

Inflow Area = 0.441 ac, 18.75% Impervious, Inflow Depth > 5.90" for 100-yr event

Inflow = 2.78 cfs @ 12.12 hrs, Volume= 0.217 af

Primary = 2.78 cfs @ 12.12 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

0.014 ac-ft runoff reduction
Pre vs. Post

Link POA-P: Proposed Conditions