

Appendix D
Engineer's Report

CARMINAWOOD
DESIGN

ENGINEER'S REPORT

for

Solar Development
1050 New Road
Town of Amherst, Erie County, New York

Prepared for

NED-New Energy Solar 8, LLC

166 Taylor Road
Buffalo, NY 14043

Prepared by

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September 2023



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Section 1 - Location & Description

This project proposes the installation of a 22.0 acre solar field on a vacant 42.8 acre site in the Town of Amherst. Construction shall include the installation of a stone access road and electrical infrastructure. The site is currently undeveloped and consists of an agricultural field, woods, and overgrown brush/grass. No wetlands exist on site. The proposed site development area to be disturbed for this project is approximately 1.0 acres.

Section 2 - Storm Sewer Service

The project limits of the existing site currently sheet drains towards an irrigation ditch with bisects the site along the east and west line. The site is very flat, and the ditch has a high point approximately in the middle of the site. The eastern half of the site drains to an existing roadside ditch and storm sewer system in New Road. The western half of the site drains to an existing ditch that drains from south to north. The site ultimately drains northwest towards Tonawanda Creek.

The New York State Department of Environmental Conservation (NYSDEC) does not consider solar panels that are installed on post systems elevated off the ground (which the proposed panels are) as impervious cover per a memo issued in February of 2020 by the NYSDEC Department of Water. The proposed post mounted solar panels will be installed along the existing site and installed so that rainwater will shed off the panels and sheet flow along the existing vegetated ground surface as it currently does.

Although the existing and proposed hydrology of the project area will not be altered due to the installation of the solar panels, this project will require a NYSDEC SPDES permit since construction includes the installation of a stone access driveway and electrical infrastructure. Installation of these site features will require minimal site work to match existing topography, no substantial earthwork (i.e. clearing or cut/filling) is proposed in the area of the solar panels. The post development land cover will be closer to a grass covered open space once the panels have been installed.

Design Criteria:

Detention: not required

Water Quality Volume (WQv): not required

Runoff Reduction Volume (RRv): not required

RUNOFF SUMMARY

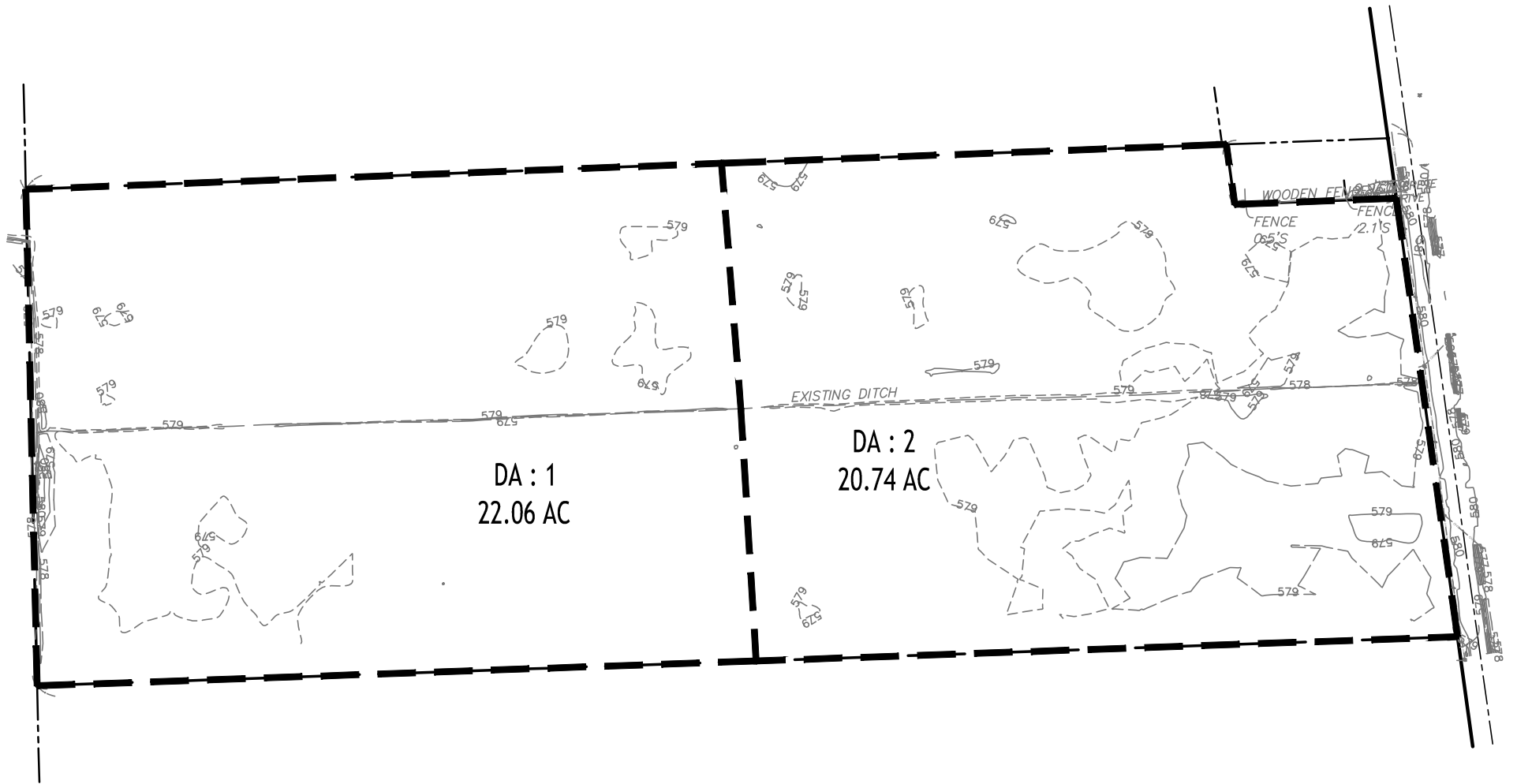
DA -1

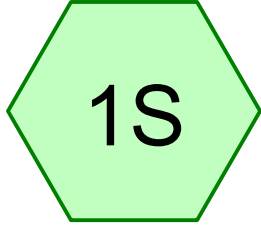
EVENT	EX. RUNOFF (cfs)	PRO. RUNOFF (cfs)	RESULT (cfs)
1-year	13.20	9.57	-3.63
10-year	32.36	27.29	-5.07
100-year	56.22	50.59	-5.63

DA -2

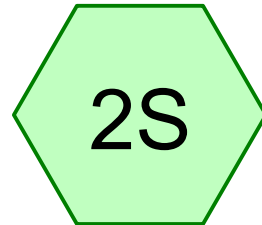
EVENT	EX. RUNOFF (cfs)	PRO. RUNOFF (cfs)	RESULT (cfs)
1-year	12.41	9.00	-3.41
10-year	30.43	25.66	-4.87
100-year	52.85	47.56	-5.29

Attachment A
Storm Drainage Calculations

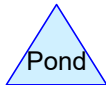
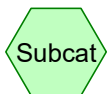




DA 1 - PRE



DA 2 - PRE



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type II 24-hr		Default	24.00	1	1.88	2
2	10-year	Type II 24-hr		Default	24.00	1	3.31	2
3	100-year	Type II 24-hr		Default	24.00	1	5.01	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
38.600	89	Row crops, straight row, Good, HSG D (1S, 2S)
4.200	77	Woods, Good, HSG D (1S, 2S)
42.800	88	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
42.800	HSG D	1S, 2S
0.000	Other	
42.800		TOTAL AREA

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Ground Covers (selected 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	0.000	38.600	0.000	38.600	Row crops, straight row, Good	1S, 2S
0.000	0.000	0.000	4.200	0.000	4.200	Woods, Good	1S, 2S
0.000	0.000	0.000	42.800	0.000	42.800	TOTAL AREA	

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Type II 24-hr 1-year Rainfall=1.88"

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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

Subcatchment1S: DA 1 - PRE Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>0.86"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=13.20 cfs 1.580 af

Subcatchment2S: DA 2 - PRE Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>0.86"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=12.41 cfs 1.485 af

Total Runoff Area = 42.800 ac Runoff Volume = 3.065 af Average Runoff Depth = 0.86"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 1-year Rainfall=1.88"

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Summary for Subcatchment 1S: DA 1 - PRE

[47] Hint: Peak is 377% of capacity of segment #2

Runoff = 13.20 cfs @ 12.39 hrs, Volume= 1.580 af, Depth> 0.86"

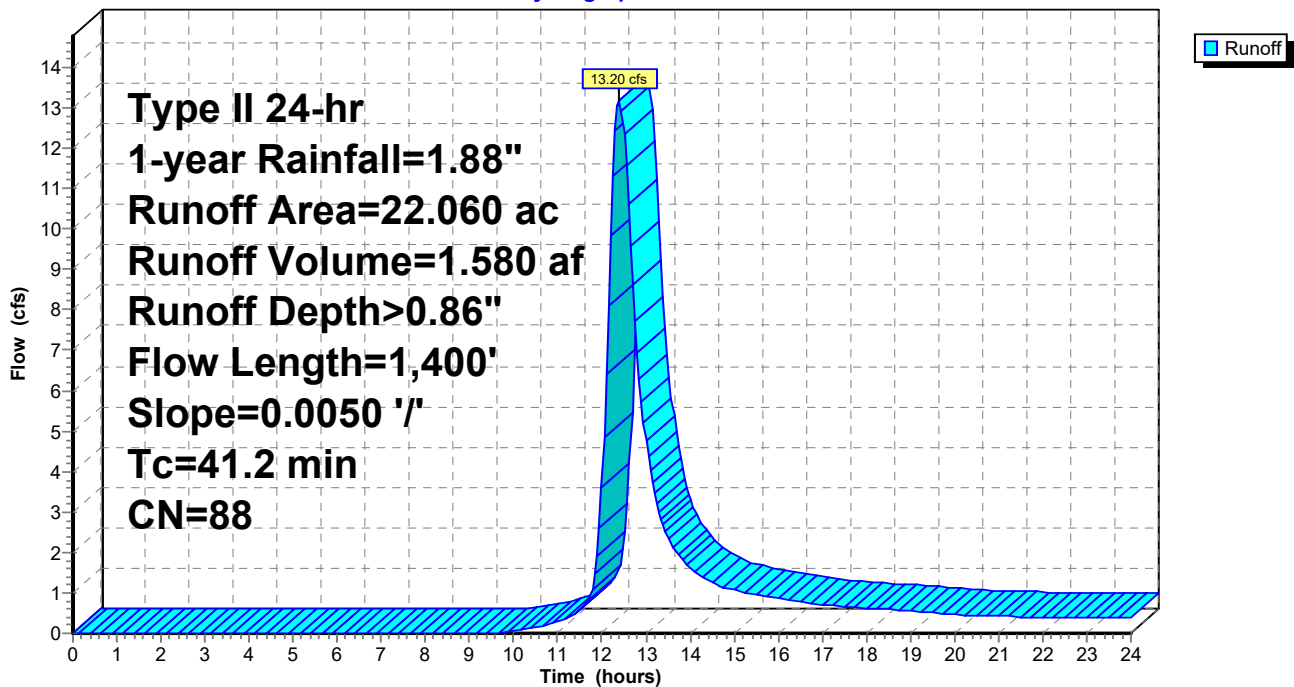
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=1.88"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
20.290	89	Row crops, straight row, Good, HSG D
22.060	88	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 1S: DA 1 - PRE

Hydrograph



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Type II 24-hr 1-year Rainfall=1.88"

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Summary for Subcatchment 2S: DA 2 - PRE

[47] Hint: Peak is 354% of capacity of segment #2

Runoff = 12.41 cfs @ 12.39 hrs, Volume= 1.485 af, Depth> 0.86"

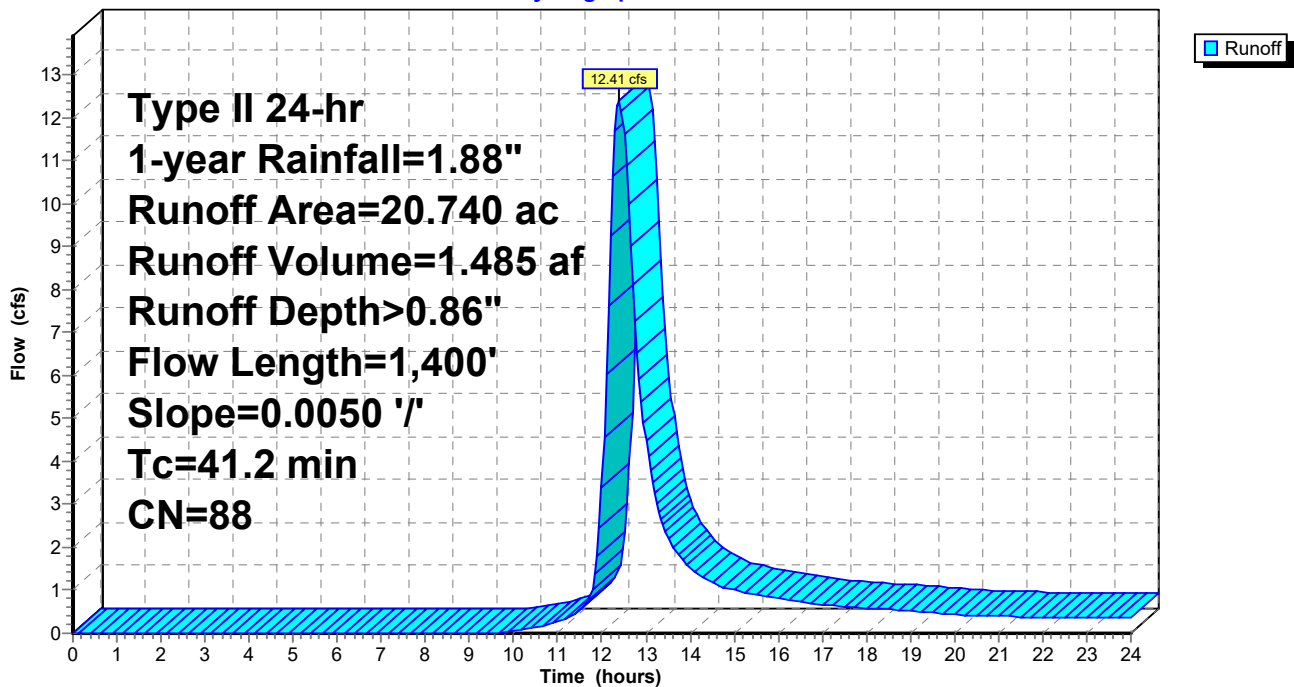
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1-year Rainfall=1.88"

Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
18.310	89	Row crops, straight row, Good, HSG D
20.740	88	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 2S: DA 2 - PRE

Hydrograph



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Type II 24-hr 10-year Rainfall=3.31"

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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

Subcatchment1S: DA 1 - PRE Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>2.08"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=32.36 cfs 3.816 af

Subcatchment2S: DA 2 - PRE Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>2.08"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=30.43 cfs 3.587 af

Total Runoff Area = 42.800 ac Runoff Volume = 7.403 af Average Runoff Depth = 2.08"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 10-year Rainfall=3.31"

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Summary for Subcatchment 1S: DA 1 - PRE

[47] Hint: Peak is 924% of capacity of segment #2

Runoff = 32.36 cfs @ 12.38 hrs, Volume= 3.816 af, Depth> 2.08"

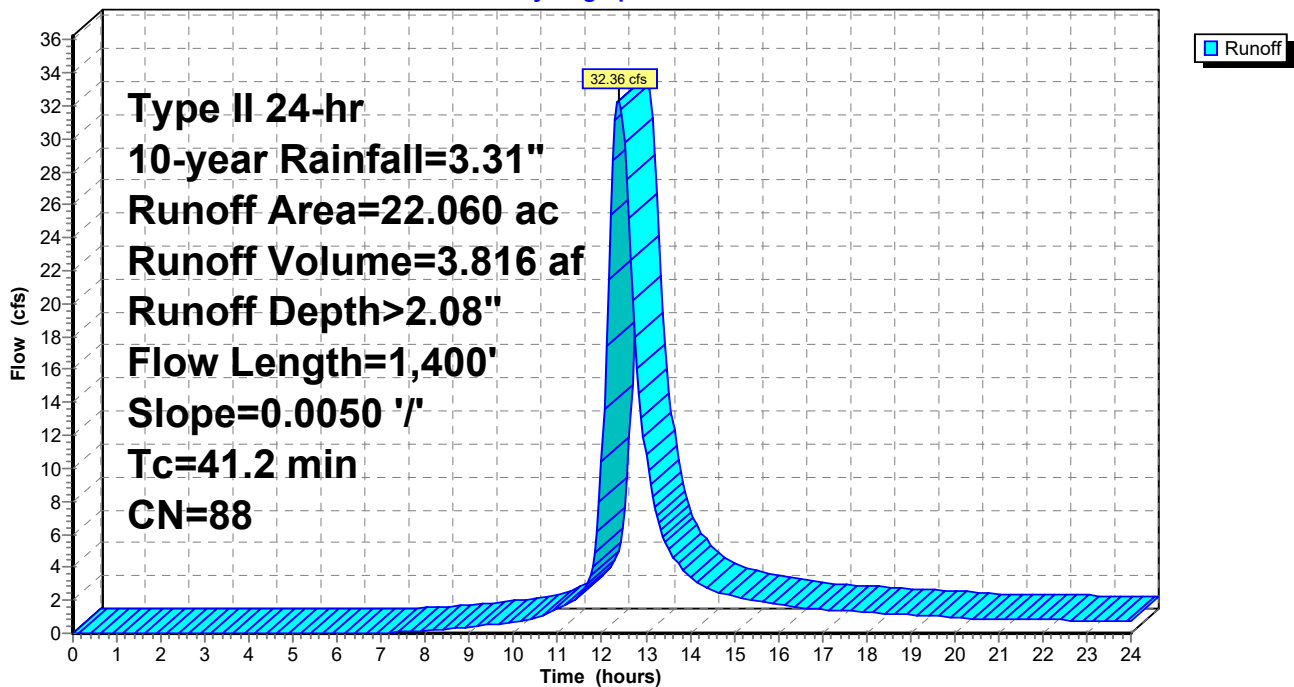
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.31"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
20.290	89	Row crops, straight row, Good, HSG D
22.060	88	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 1S: DA 1 - PRE

Hydrograph



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Type II 24-hr 10-year Rainfall=3.31"

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Summary for Subcatchment 2S: DA 2 - PRE

[47] Hint: Peak is 869% of capacity of segment #2

Runoff = 30.43 cfs @ 12.38 hrs, Volume= 3.587 af, Depth> 2.08"

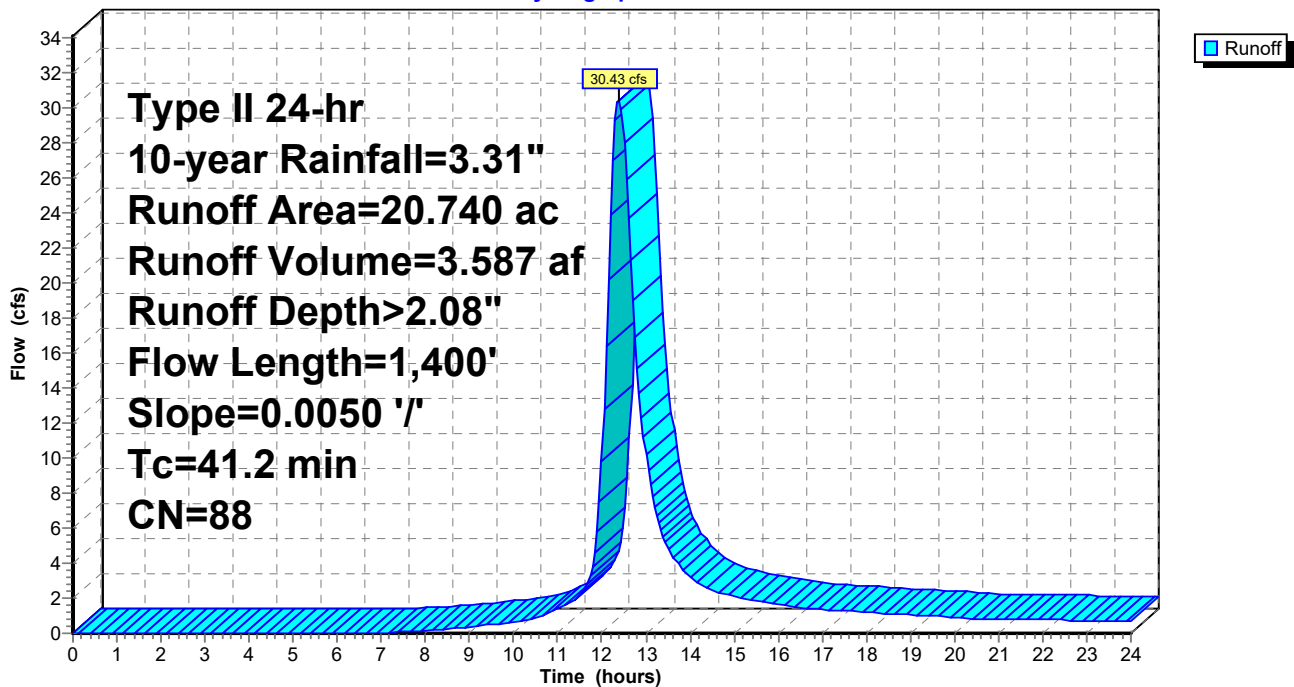
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-year Rainfall=3.31"

Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
18.310	89	Row crops, straight row, Good, HSG D
20.740	88	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 2S: DA 2 - PRE

Hydrograph



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Type II 24-hr 100-year Rainfall=5.01"

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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

Subcatchment1S: DA 1 - PRE Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>3.65"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=56.22 cfs 6.702 af

Subcatchment2S: DA 2 - PRE Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>3.65"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=88 Runoff=52.85 cfs 6.301 af

Total Runoff Area = 42.800 ac Runoff Volume = 13.004 af Average Runoff Depth = 3.65"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 100-year Rainfall=5.01"

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Summary for Subcatchment 1S: DA 1 - PRE

[47] Hint: Peak is 1605% of capacity of segment #2

Runoff = 56.22 cfs @ 12.37 hrs, Volume= 6.702 af, Depth> 3.65"

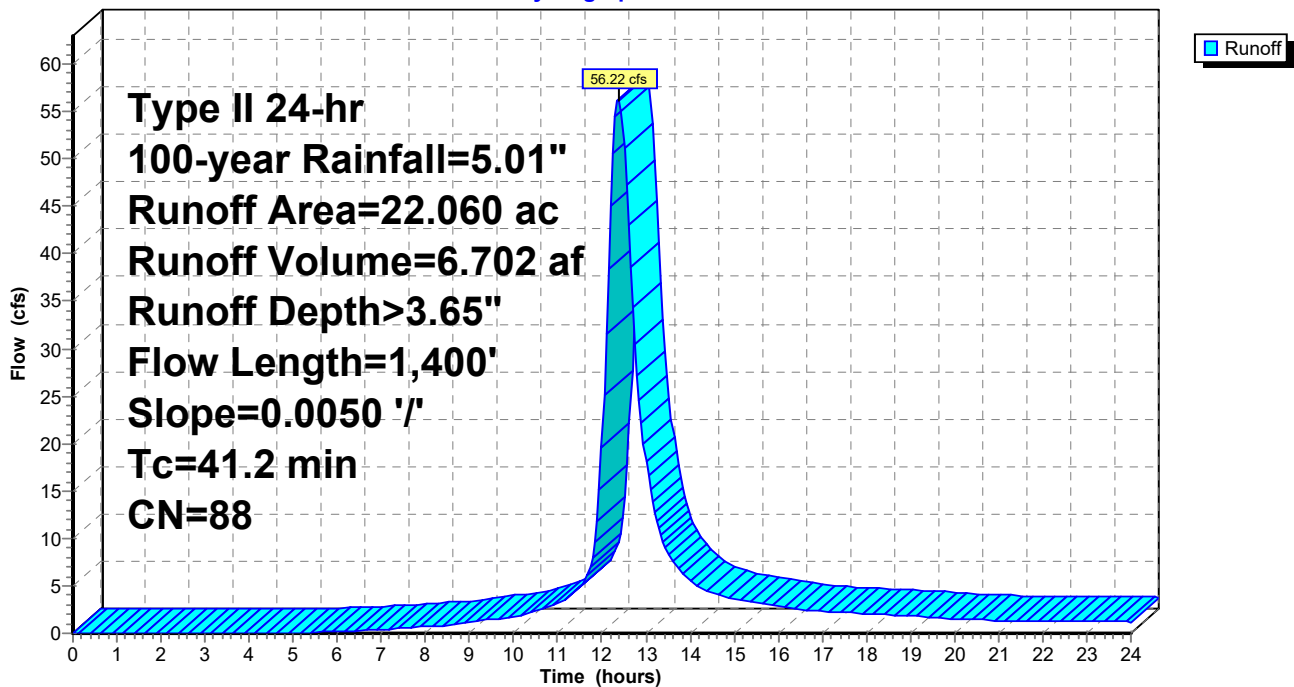
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.01"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
20.290	89	Row crops, straight row, Good, HSG D
22.060	88	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 1S: DA 1 - PRE

Hydrograph



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Type II 24-hr 100-year Rainfall=5.01"

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Summary for Subcatchment 2S: DA 2 - PRE

[47] Hint: Peak is 1509% of capacity of segment #2

Runoff = 52.85 cfs @ 12.37 hrs, Volume= 6.301 af, Depth> 3.65"

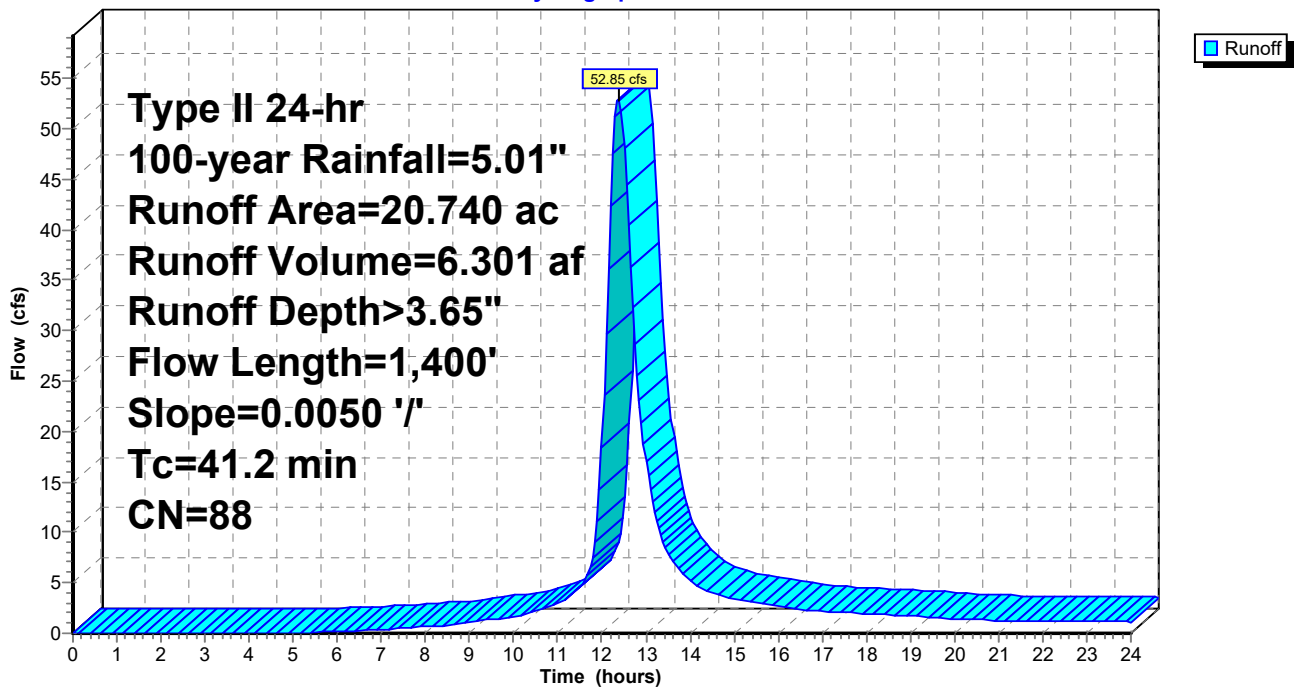
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-year Rainfall=5.01"

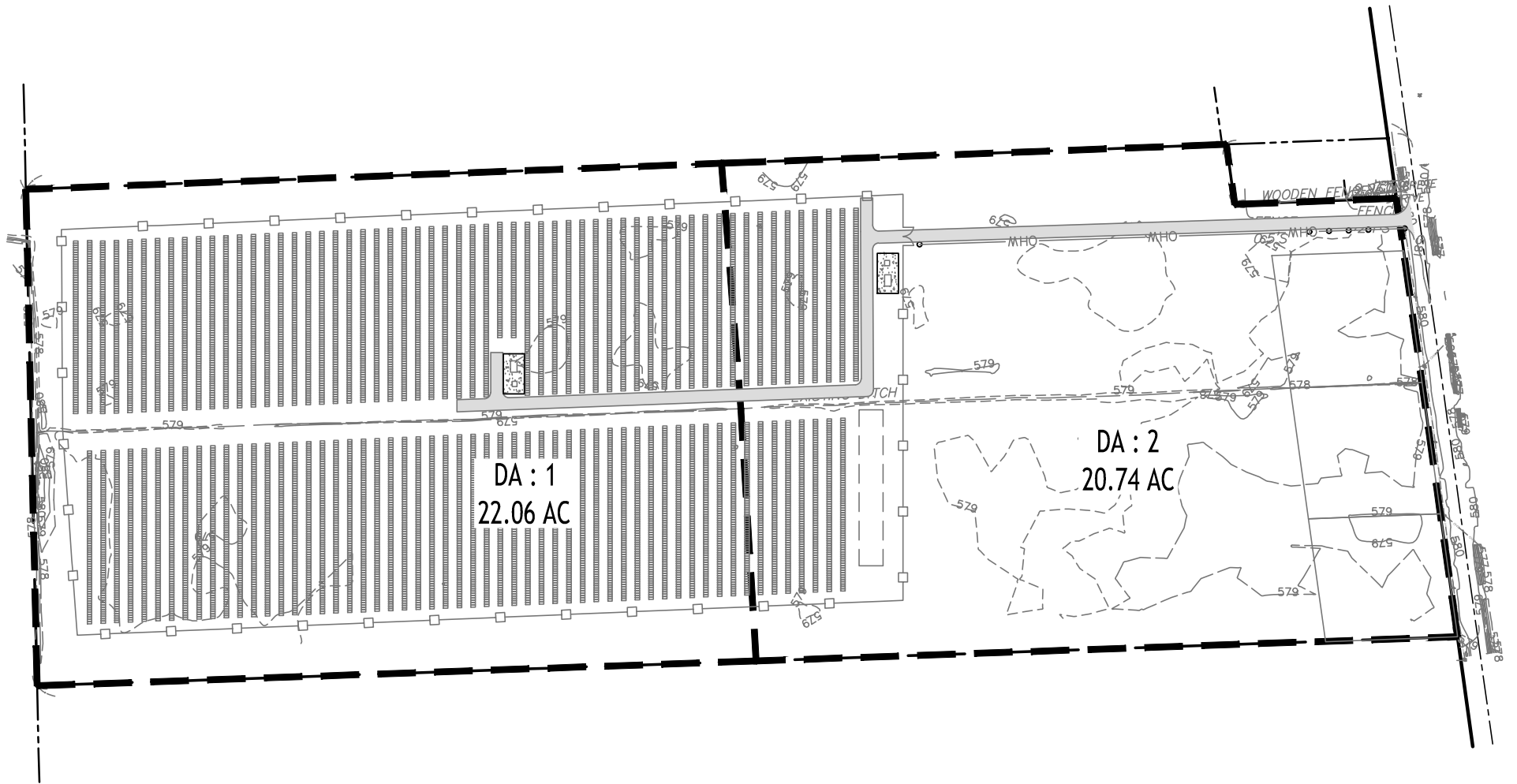
Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
18.310	89	Row crops, straight row, Good, HSG D
20.740	88	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 2S: DA 2 - PRE

Hydrograph





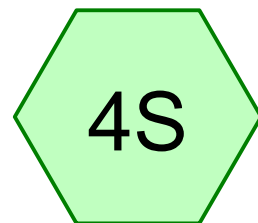
 **POST-DEVELOPMENT DRAINAGE MAP**
 SCALE: 1" = 250'

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

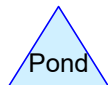
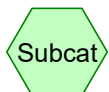




DA 1 - POST



DA 2 - POST



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type II 24-hr		Default	24.00	1	1.88	2
2	10-year	Type II 24-hr		Default	24.00	1	3.31	2
3	100-year	Type II 24-hr		Default	24.00	1	5.01	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
37.600	84	50-75% Grass cover, Fair, HSG D (3S, 4S)
1.000	96	Gravel surface, HSG D (3S, 4S)
4.200	77	Woods, Good, HSG D (3S, 4S)
42.800	84	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
42.800	HSG D	3S, 4S
0.000	Other	
42.800		TOTAL AREA

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Ground Covers (selected 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	0.000	37.600	0.000	37.600	50-75% Grass cover, Fair	3S, 4S
0.000	0.000	0.000	1.000	0.000	1.000	Gravel surface	3S, 4S
0.000	0.000	0.000	4.200	0.000	4.200	Woods, Good	3S, 4S
0.000	0.000	0.000	42.800	0.000	42.800	TOTAL AREA	

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Type II 24-hr 1-year Rainfall=1.88"

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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

Subcatchment3S: DA 1 - POST Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>0.65"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=9.57 cfs 1.197 af

Subcatchment4S: DA 2 - POST Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>0.65"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=9.00 cfs 1.126 af

Total Runoff Area = 42.800 ac Runoff Volume = 2.323 af Average Runoff Depth = 0.65"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 1-year Rainfall=1.88"

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Summary for Subcatchment 3S: DA 1 - POST

[47] Hint: Peak is 273% of capacity of segment #2

Runoff = 9.57 cfs @ 12.41 hrs, Volume= 1.197 af, Depth> 0.65"

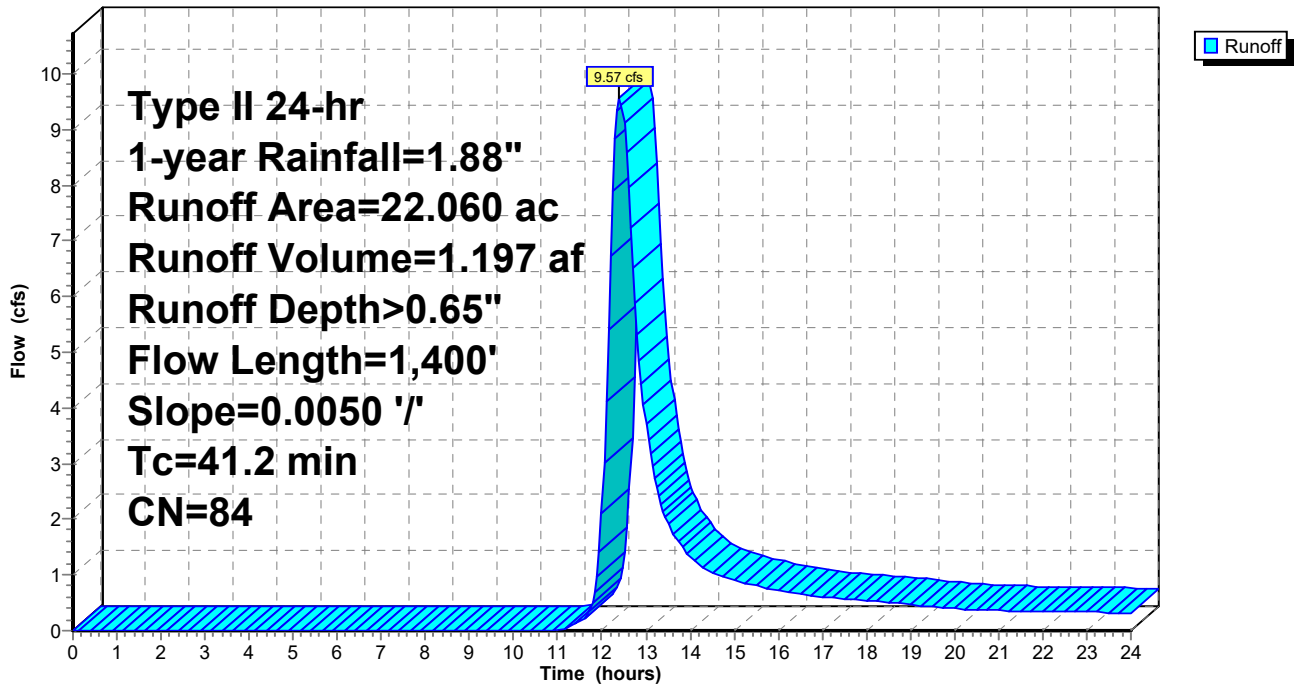
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1-year Rainfall=1.88"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
19.990	84	50-75% Grass cover, Fair, HSG D
0.300	96	Gravel surface, HSG D
22.060	84	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 3S: DA 1 - POST

Hydrograph



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Type II 24-hr 1-year Rainfall=1.88"

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Summary for Subcatchment 4S: DA 2 - POST

[47] Hint: Peak is 257% of capacity of segment #2

Runoff = 9.00 cfs @ 12.41 hrs, Volume= 1.126 af, Depth> 0.65"

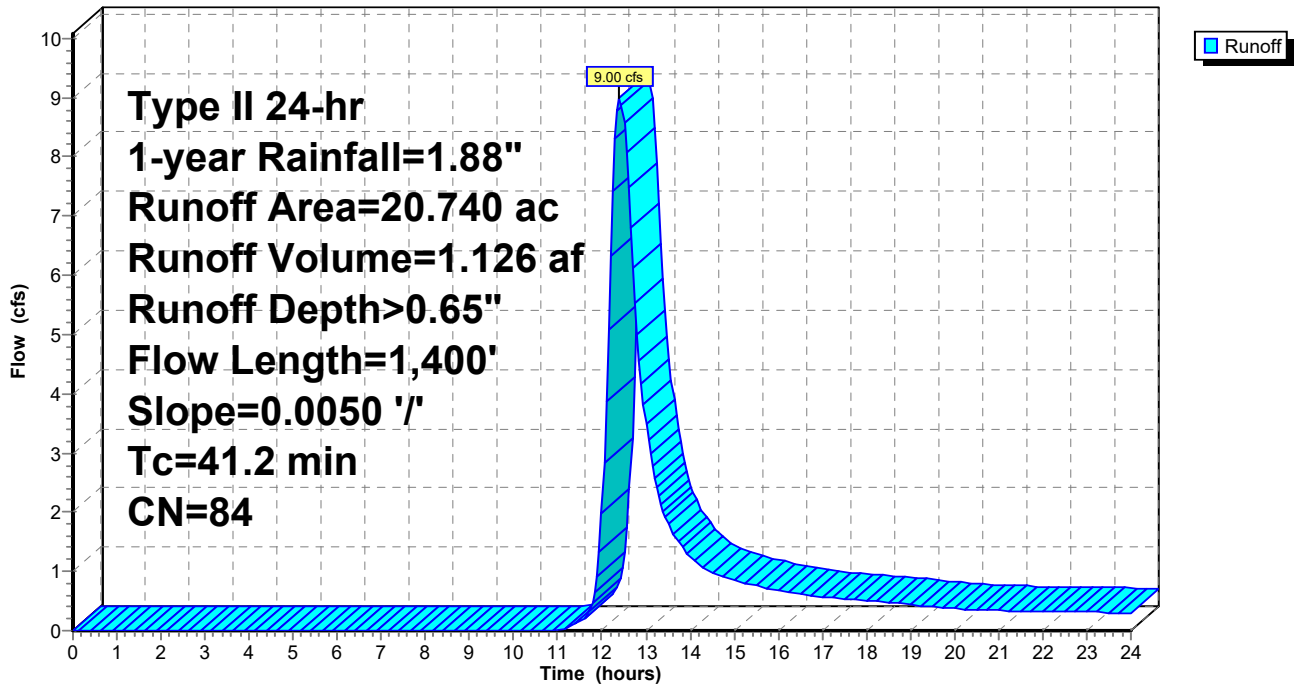
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=1.88"

Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
17.610	84	50-75% Grass cover, Fair, HSG D
0.700	96	Gravel surface, HSG D
20.740	84	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 4S: DA 2 - POST

Hydrograph



23-4086 HYDROLOGY

Type II 24-hr 10-year Rainfall=3.31"

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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

Subcatchment3S: DA 1 - POST Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>1.76"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=27.29 cfs 3.228 af

Subcatchment4S: DA 2 - POST Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>1.76"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=25.66 cfs 3.034 af

Total Runoff Area = 42.800 ac Runoff Volume = 6.262 af Average Runoff Depth = 1.76"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 10-year Rainfall=3.31"

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Summary for Subcatchment 3S: DA 1 - POST

[47] Hint: Peak is 779% of capacity of segment #2

Runoff = 27.29 cfs @ 12.39 hrs, Volume= 3.228 af, Depth> 1.76"

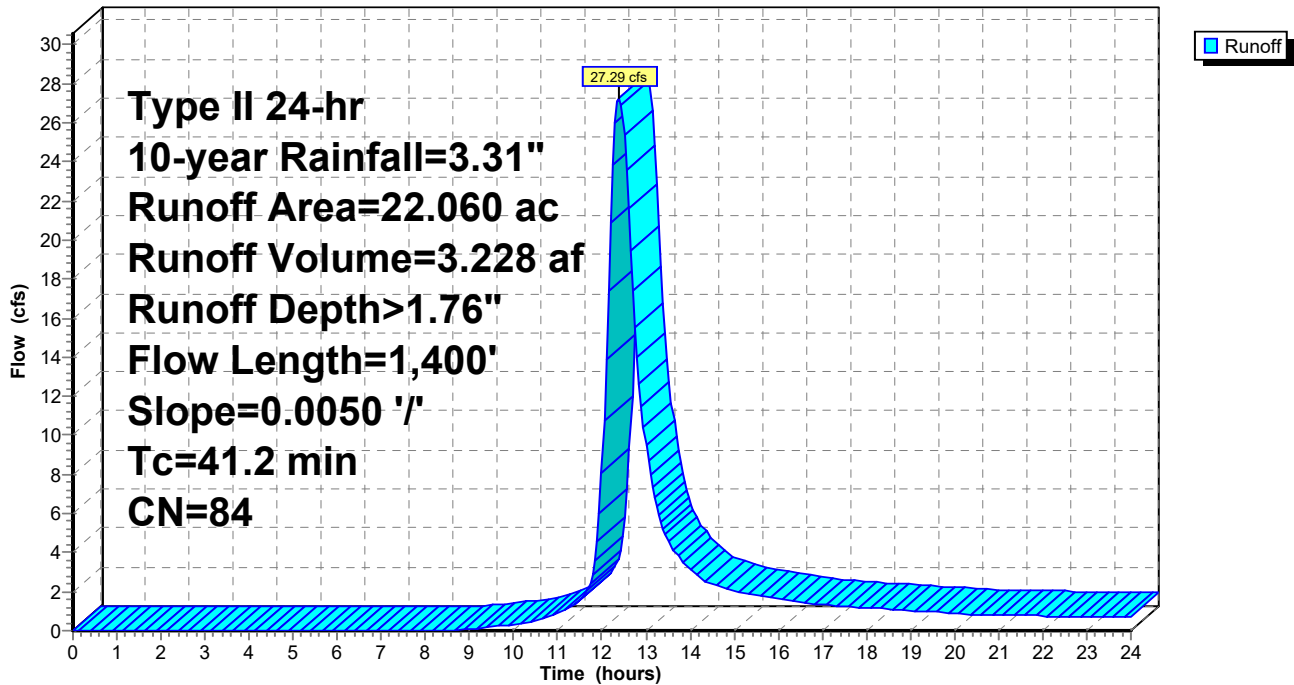
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-year Rainfall=3.31"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
19.990	84	50-75% Grass cover, Fair, HSG D
0.300	96	Gravel surface, HSG D
22.060	84	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 3S: DA 1 - POST

Hydrograph



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Type II 24-hr 10-year Rainfall=3.31"

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Summary for Subcatchment 4S: DA 2 - POST

[47] Hint: Peak is 733% of capacity of segment #2

Runoff = 25.66 cfs @ 12.39 hrs, Volume= 3.034 af, Depth> 1.76"

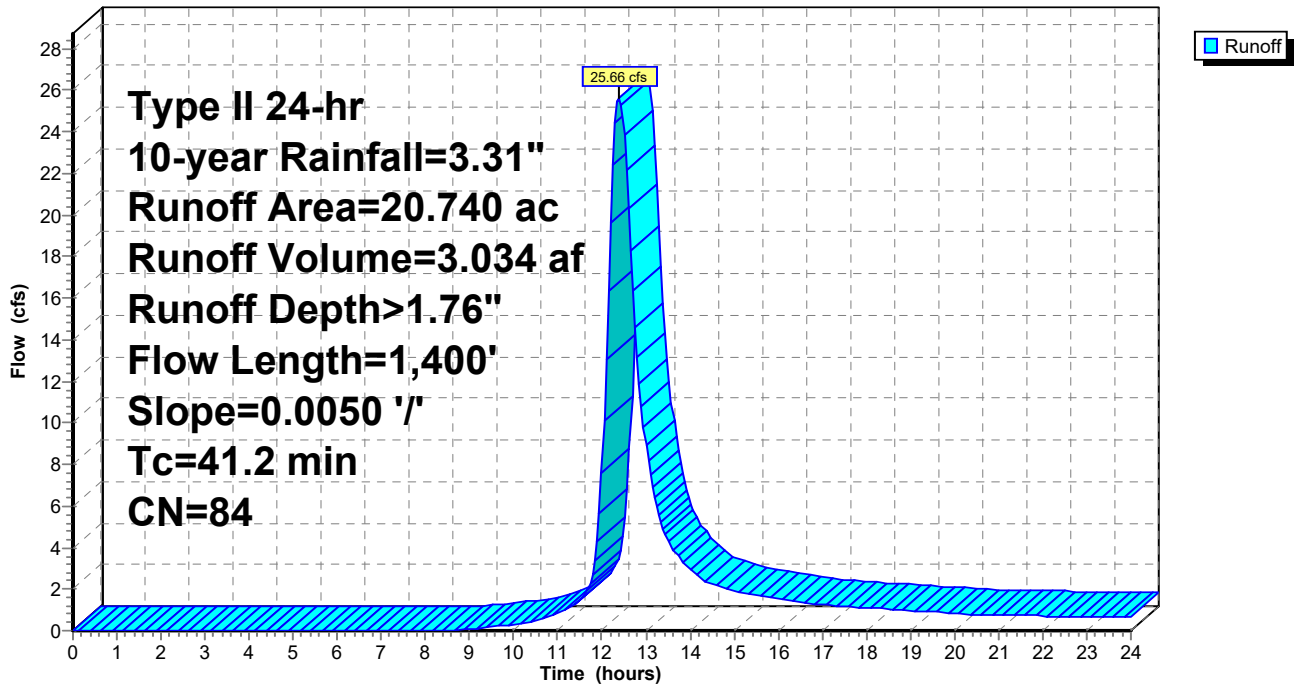
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.31"

Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
17.610	84	50-75% Grass cover, Fair, HSG D
0.700	96	Gravel surface, HSG D
20.740	84	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 4S: DA 2 - POST

Hydrograph



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Type II 24-hr 100-year Rainfall=5.01"

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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

Subcatchment3S: DA 1 - POST Runoff Area=22.060 ac 0.00% Impervious Runoff Depth>3.25"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=50.59 cfs 5.971 af

Subcatchment4S: DA 2 - POST Runoff Area=20.740 ac 0.00% Impervious Runoff Depth>3.25"
Flow Length=1,400' Slope=0.0050 '/' Tc=41.2 min CN=84 Runoff=47.56 cfs 5.614 af

Total Runoff Area = 42.800 ac Runoff Volume = 11.585 af Average Runoff Depth = 3.25"
100.00% Pervious = 42.800 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 100-year Rainfall=5.01"

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Summary for Subcatchment 3S: DA 1 - POST

[47] Hint: Peak is 1444% of capacity of segment #2

Runoff = 50.59 cfs @ 12.38 hrs, Volume= 5.971 af, Depth> 3.25"

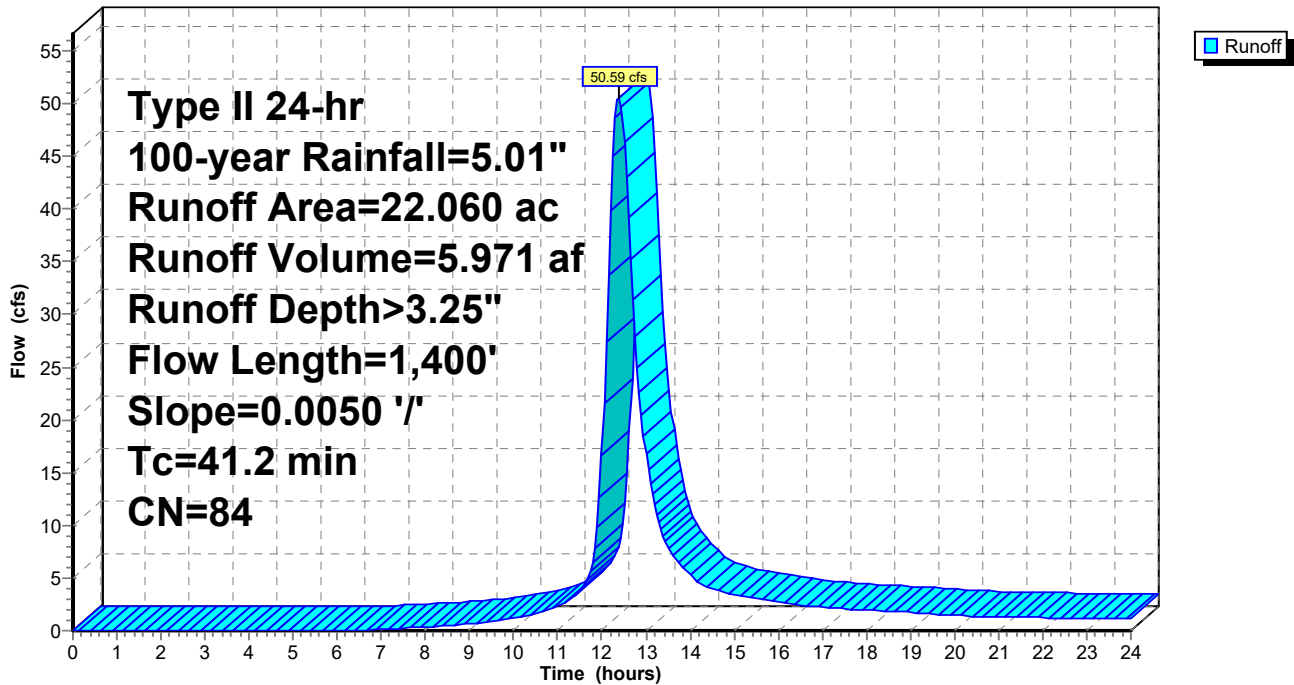
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.01"

Area (ac)	CN	Description
1.770	77	Woods, Good, HSG D
19.990	84	50-75% Grass cover, Fair, HSG D
0.300	96	Gravel surface, HSG D
22.060	84	Weighted Average
22.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 3S: DA 1 - POST

Hydrograph



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Type II 24-hr 100-year Rainfall=5.01"

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Summary for Subcatchment 4S: DA 2 - POST

[47] Hint: Peak is 1358% of capacity of segment #2

Runoff = 47.56 cfs @ 12.38 hrs, Volume= 5.614 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-year Rainfall=5.01"

Area (ac)	CN	Description
2.430	77	Woods, Good, HSG D
17.610	84	50-75% Grass cover, Fair, HSG D
0.700	96	Gravel surface, HSG D
20.740	84	Weighted Average
20.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	200	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.24"
5.7	1,200	0.0050	3.50	3.50	Channel Flow, Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.030
41.2	1,400	Total			

Subcatchment 4S: DA 2 - POST

Hydrograph

