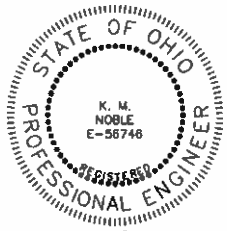
PROGRESSIVE AUTO
RETAINING WALL WEST
8000 HILLS AND DALES ROAD
MASSILLON, OHIO 44646
STARK COUNTY

STORMWATER MANAGEMENT REPORT



Kevin M. Noble

SIGNATURE DATE

12/15/20

DECEMBER 2020

Prepared by:

Scheeser*Buckley*Mayfield, LLC.
1540 Corporate Woods Parkway
Uniontown, Ohio 44685
Kevin Noble, P.E.
(330) 526-2714

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RETAINING WALL WEST
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SBM 20007

SECTION ONE

STORMWATER MANAGEMENT FACILITY SUMMARY WORKSHEET

1. GENERAL INFORMATION

a. Project Name: Progressive Auto Massillon – Retaining wall west

b. Calculations Completed By: Scheeser*Buckley*Mayfield, LLC.

c. Phone : (330) 526-2714

d. Date: December 2020

e. Total Project Acreage: 0.3 acres

2. STORM INFORMATION

ITEM	PREDEVELOPED CONDITIONS	POST DEVELOPED CONDITIONS
a. Weighted Runoff Curve Number (CN)	85	85

3. PREDEVELOPED DRAINAGE INFORMATION = 4.1 acres

Sub-Area No.	Area (Acres)	Weighted CN	Time of conc.(min)	Travel time (hrs)
#1	4.1	85	37.2	0

4. DEVELOPED DRAINAGE INFORMATION = 4.1 acres

Sub-Area No.	Area (Acres)	Weighted CN	Time of conc.(min)	Travel time (hrs)
#1	4.1	85	37.2	0

5. COMPUTATIONS SUMMARY

STORM FREQ (YEARS)	PREDEV PEAK DISCHARGE (CFS)	DEVELOPED RUNOFF (CFS)	INCREASE IN RUNOFF (CFS)					
1	2.59	2.59	0					
2	3.40	3.40	0					
5	4.97	4.97	0					
10	6.34	6.34	0					
25	8.48	8.48	0					
50	10.35	10.35	0					
100	12.42	12.42	0					

- This project will have a no net increase in stormwater runoff.

STORMWATER SYSTEM SUMMARY

ITEM	DESCRIPTION
TOTAL SITE DEVELOPMENT	0.3 ACRES
TOTAL ACREAGE TO BE DISTURBED FOR CONSTRUCTION	0.3 ACRES
ONSITE SOIL TYPE	"C" TYPE – CANFIELD SILT LOAM "C" TYPE – RAVENNA SILT LOAM
PRE-CONSTRUCTION RUNOFF COEFFICIENT	85 – PARKING, BUILDING, AND GRASS
POST CONSTRUCTION RUNOFF COEFFICIENT	85 – PARKING, BUILDING, AND GRASS

Comments:

The area between the church's drive to Hills & Dale and the steep embankment area where the new retaining wall will be located slopes gently towards the retaining wall. To address this, the plans include a infiltration trench system with a 6" perforated pipe that would pick up any of that overland runoff and runoff from the 12' wide drive. This collected runoff is being discharged into the same drainage ditch that the storm water sheet flows into today. The project will not increase stormwater runoff as the existing steep embankment area is approximately 15' wide and its' steep slope allows for minimal water infiltration. This steep slope is being replaced with a 12' wide concrete or asphalt drive. There may be a small reduction in flow rates as the time of concentration will be increased slightly when comparing overall sheet flow through the parking lot and water infiltration through the infiltration trench system.

This project will not divert surface water from the existing watershed.

See the attached supporting calculations additional information.

SECTION TWO

Soil Map—Stark County, Ohio
(Progressive Auto - Retaining Wall)

Map Scale: 1:1,380 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Stark County, Ohio
Survey Area Data: Version 17, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 25, 2014—Mar 21, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdB	Canfield silt loam, 2 to 6 percent slopes	3.9	94.8%
ReB	Ravenna silt loam, 2 to 6 percent slopes	0.2	5.2%
Totals for Area of Interest		**4.1**	**100.0%**

SECTION THREE

NOAA Atlas 14, Volume 2, Version 3
Location name: Massillon, Ohio, USA*
Latitude: 40.7946°, Longitude: -81.5228°
Elevation: 943.41 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.323 (0.295□0.354)	0.385 (0.352□0.422)	0.467 (0.425□0.511)	0.529 (0.480□0.579)	0.608 (0.550□0.664)	0.669 (0.603□0.730)	0.727 (0.653□0.792)	0.786 (0.703□0.857)	0.866 (0.770□0.942)	0.924 (0.817□1.00)
10-min	0.501 (0.458□0.550)	0.602 (0.549□0.659)	0.726 (0.660□0.795)	0.817 (0.742□0.893)	0.930 (0.842□1.02)	1.01 (0.914□1.11)	1.09 (0.982□1.19)	1.17 (1.05□1.28)	1.27 (1.13□1.38)	1.35 (1.19□1.46)
15-min	0.615 (0.561□0.675)	0.736 (0.671□0.806)	0.891 (0.811□0.976)	1.00 (0.912□1.10)	1.15 (1.04□1.25)	1.25 (1.13□1.37)	1.36 (1.22□1.48)	1.46 (1.31□1.59)	1.59 (1.41□1.73)	1.68 (1.49□1.83)
30-min	0.813 (0.743□0.893)	0.985 (0.898□1.08)	1.22 (1.11□1.34)	1.40 (1.27□1.53)	1.62 (1.47□1.77)	1.79 (1.62□1.96)	1.96 (1.76□2.14)	2.13 (1.91□2.32)	2.35 (2.09□2.56)	2.52 (2.23□2.74)
60-min	0.993 (0.907□1.09)	1.21 (1.10□1.32)	1.53 (1.39□1.68)	1.78 (1.61□1.94)	2.11 (1.90□2.30)	2.36 (2.13□2.58)	2.62 (2.36□2.86)	2.89 (2.59□3.15)	3.26 (2.90□3.54)	3.54 (3.13□3.85)
2-hr	1.14 (1.03□1.25)	1.38 (1.25□1.52)	1.78 (1.61□1.96)	2.10 (1.90□2.30)	2.57 (2.31□2.81)	2.96 (2.66□3.24)	3.38 (3.03□3.69)	3.84 (3.42□4.18)	4.50 (3.98□4.89)	5.06 (4.45□5.50)
3-hr	1.21 (1.09□1.33)	1.46 (1.33□1.62)	1.88 (1.70□2.07)	2.22 (2.00□2.45)	2.72 (2.45□2.99)	3.14 (2.81□3.44)	3.60 (3.21□3.94)	4.11 (3.64□4.48)	4.84 (4.26□5.26)	5.46 (4.77□5.93)
6-hr	1.46 (1.32□1.63)	1.76 (1.59□1.96)	2.24 (2.02□2.49)	2.64 (2.38□2.93)	3.24 (2.91□3.59)	3.75 (3.35□4.14)	4.32 (3.83□4.75)	4.94 (4.36□5.42)	5.86 (5.12□6.41)	6.65 (5.76□7.26)
12-hr	1.73 (1.57□1.93)	2.08 (1.89□2.32)	2.61 (2.37□2.91)	3.08 (2.78□3.42)	3.77 (3.39□4.18)	4.37 (3.91□4.83)	5.04 (4.48□5.55)	5.78 (5.10□6.34)	6.89 (6.02□7.54)	7.84 (6.80□8.57)
24-hr	2.04 (1.86□2.24)	2.44 (2.23□2.69)	3.04 (2.78□3.35)	3.56 (3.24□3.91)	4.34 (3.92□4.76)	5.01 (4.50□5.48)	5.75 (5.13□6.28)	6.57 (5.80□7.17)	7.80 (6.78□8.51)	8.85 (7.59□9.66)
2-day	2.35 (2.16□2.58)	2.81 (2.58□3.09)	3.46 (3.18□3.80)	4.02 (3.68□4.41)	4.85 (4.41□5.31)	5.56 (5.02□6.08)	6.33 (5.67□6.92)	7.17 (6.36□7.85)	8.41 (7.34□9.21)	9.45 (8.14□10.4)
3-day	2.51 (2.32□2.75)	3.00 (2.76□3.28)	3.67 (3.38□4.01)	4.25 (3.89□4.63)	5.08 (4.64□5.54)	5.78 (5.25□6.30)	6.54 (5.89□7.13)	7.36 (6.57□8.03)	8.58 (7.55□9.36)	9.61 (8.36□10.5)
4-day	2.68 (2.47□2.91)	3.19 (2.94□3.47)	3.89 (3.59□4.22)	4.47 (4.11□4.85)	5.32 (4.86□5.76)	6.01 (5.48□6.52)	6.76 (6.12□7.33)	7.56 (6.79□8.20)	8.75 (7.77□9.51)	9.77 (8.58□10.6)
7-day	3.20 (2.97□3.46)	3.81 (3.53□4.11)	4.60 (4.26□4.98)	5.26 (4.87□5.69)	6.21 (5.71□6.70)	6.99 (6.40□7.54)	7.82 (7.11□8.43)	8.69 (7.86□9.38)	9.92 (8.88□10.7)	10.9 (9.69□11.8)
10-day	3.69 (3.43□3.97)	4.37 (4.07□4.70)	5.23 (4.87□5.63)	5.93 (5.51□6.37)	6.90 (6.39□7.41)	7.69 (7.08□8.25)	8.49 (7.79□9.12)	9.33 (8.51□10.0)	10.5 (9.49□11.3)	11.4 (10.2□12.3)
20-day	5.15 (4.83□5.49)	6.08 (5.71□6.49)	7.18 (6.72□7.66)	8.02 (7.51□8.57)	9.15 (8.54□9.77)	10.0 (9.33□10.7)	10.9 (10.1□11.6)	11.7 (10.9□12.6)	12.9 (11.8□13.8)	13.7 (12.6□14.7)
30-day	6.46 (6.06□6.87)	7.61 (7.15□8.10)	8.87 (8.32□9.44)	9.84 (9.21□10.5)	11.1 (10.4□11.8)	12.1 (11.2□12.8)	13.0 (12.1□13.8)	13.9 (12.9□14.8)	15.0 (13.9□16.0)	15.9 (14.6□17.0)
45-day	8.27 (7.79□8.76)	9.69 (9.14□10.3)	11.1 (10.5□11.8)	12.2 (11.5□13.0)	13.6 (12.8□14.4)	14.6 (13.7□15.5)	15.6 (14.6□16.6)	16.5 (15.4□17.6)	17.7 (16.4□18.8)	18.5 (17.2□19.7)
60-day	9.99 (9.45□10.5)	11.7 (11.1□12.4)	13.3 (12.6□14.1)	14.5 (13.8□15.4)	16.1 (15.2□17.0)	17.1 (16.2□18.1)	18.2 (17.1□19.2)	19.1 (18.0□20.2)	20.2 (19.0□21.5)	21.0 (19.7□22.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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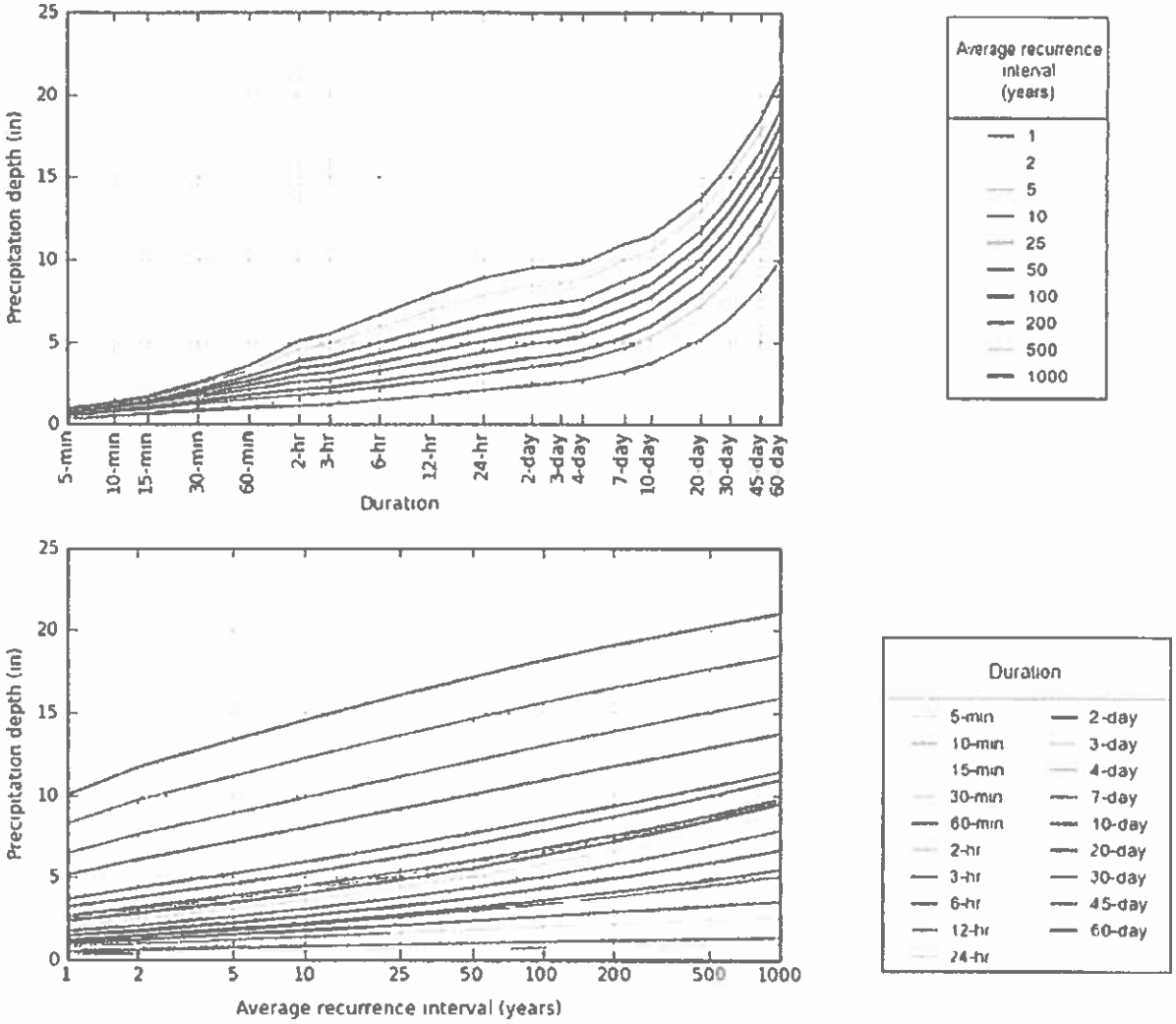
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude 40 7946°, Longitude -81 5228°



NOAA Atlas 14, Volume 2, Version 3

Created (GMT) Thu Feb 6 13 01 43 2020

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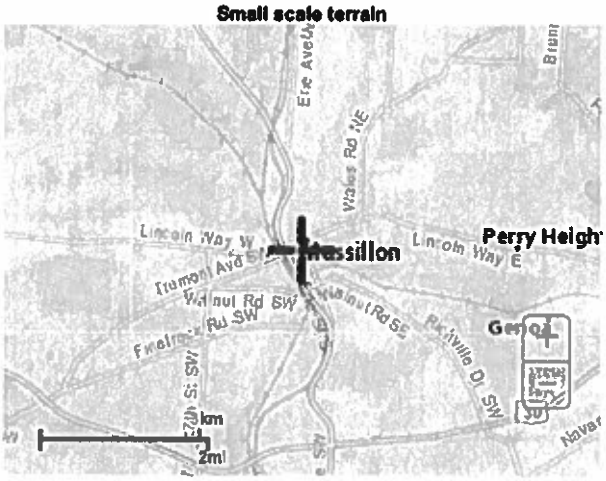
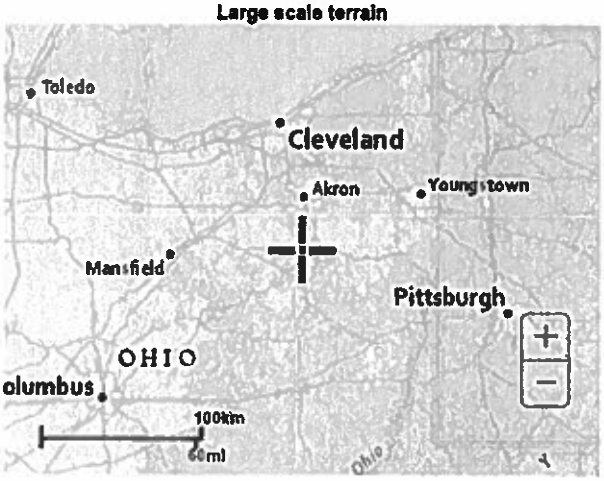
Maps & aerials

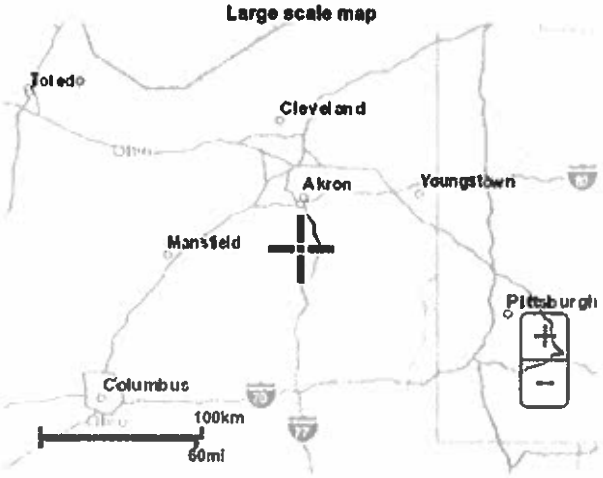
Small scale terrain



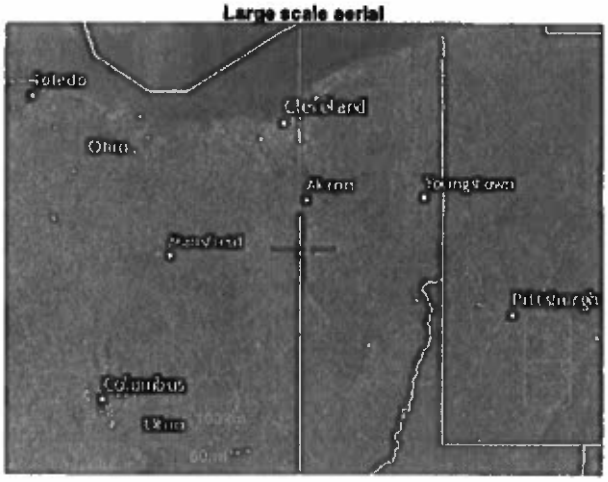
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

SECTION FOUR

Rainfall Events Listing

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	2.10	2
2	2-Year	Type II 24-hr		Default	24.00	1	2.43	2
3	5-Year	Type II 24-hr		Default	24.00	1	3.04	2
4	10-Year	Type II 24-hr		Default	24.00	1	3.55	2
5	25-Year	Type II 24-hr		Default	24.00	1	4.33	2
6	50-Year	Type II 24-hr		Default	24.00	1	5.00	2
7	100-Year	Type II 24-hr		Default	24.00	1	5.74	2

Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

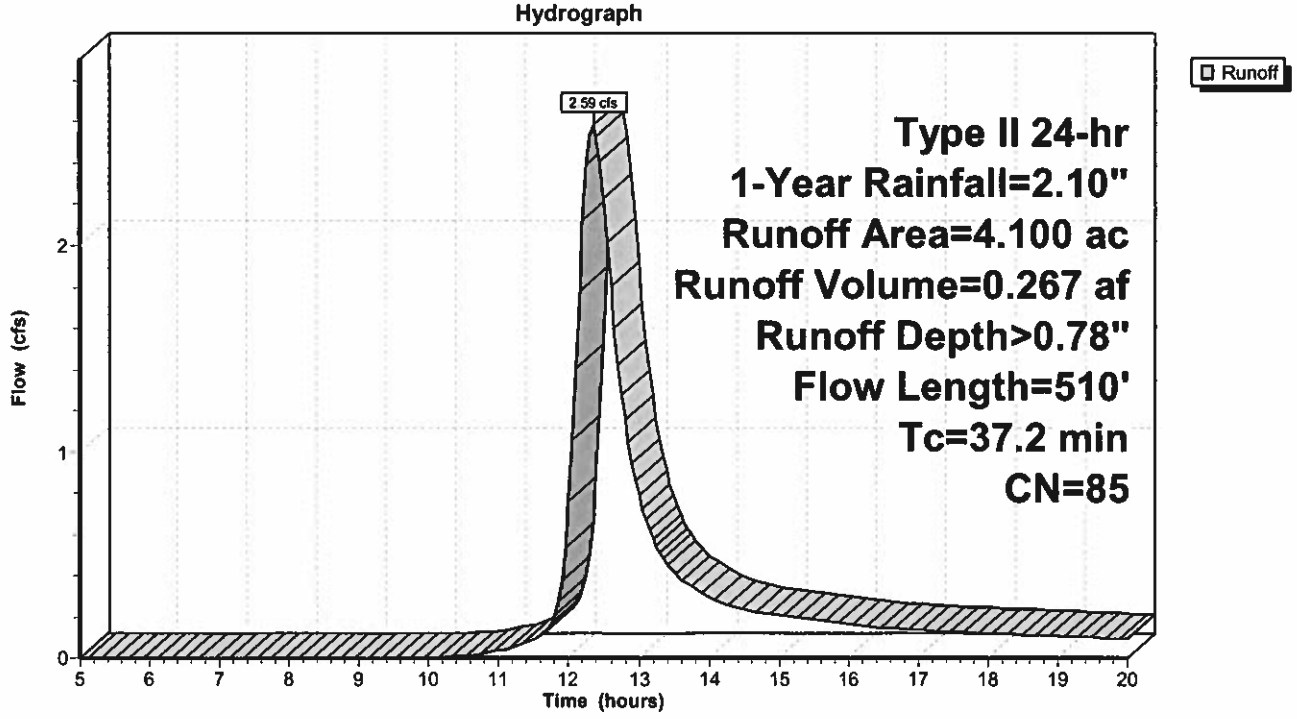
Runoff = 2.59 cfs @ 12.35 hrs, Volume= 0.267 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.10"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

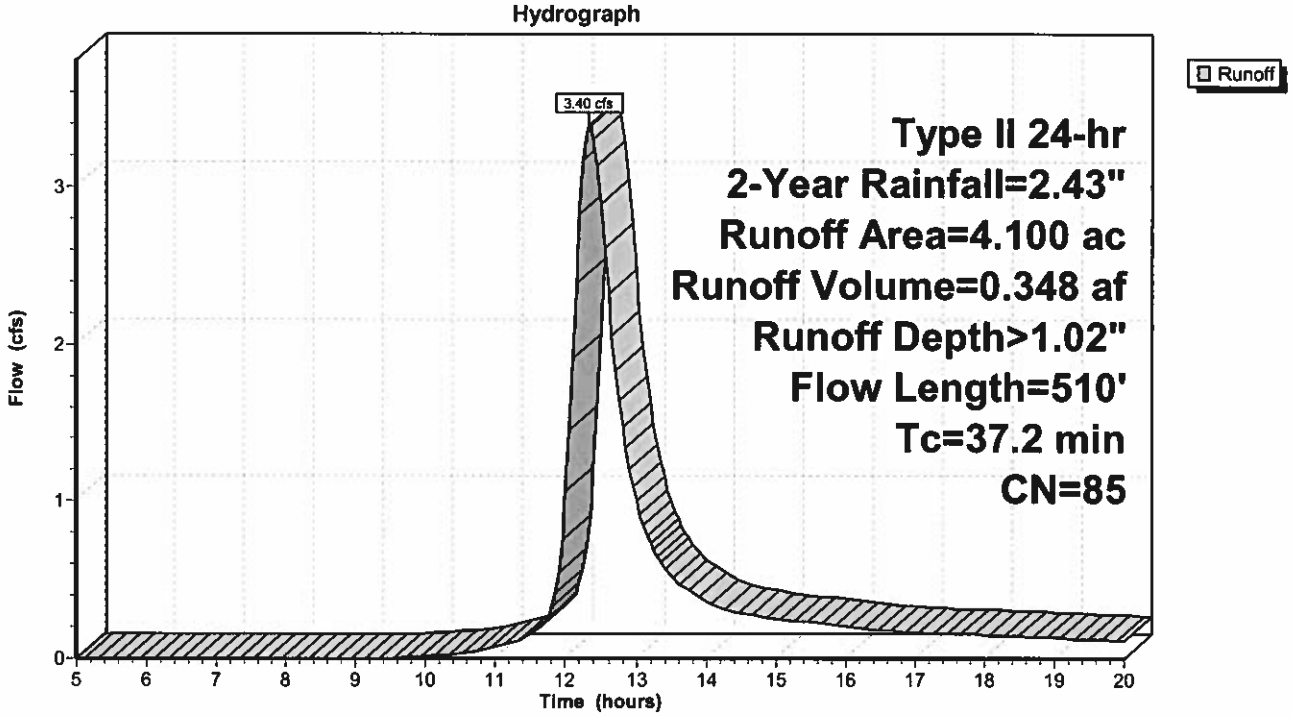
Runoff = 3.40 cfs @ 12.34 hrs, Volume= 0.348 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.43"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

[47] Hint: Peak is 117% of capacity of segment #3

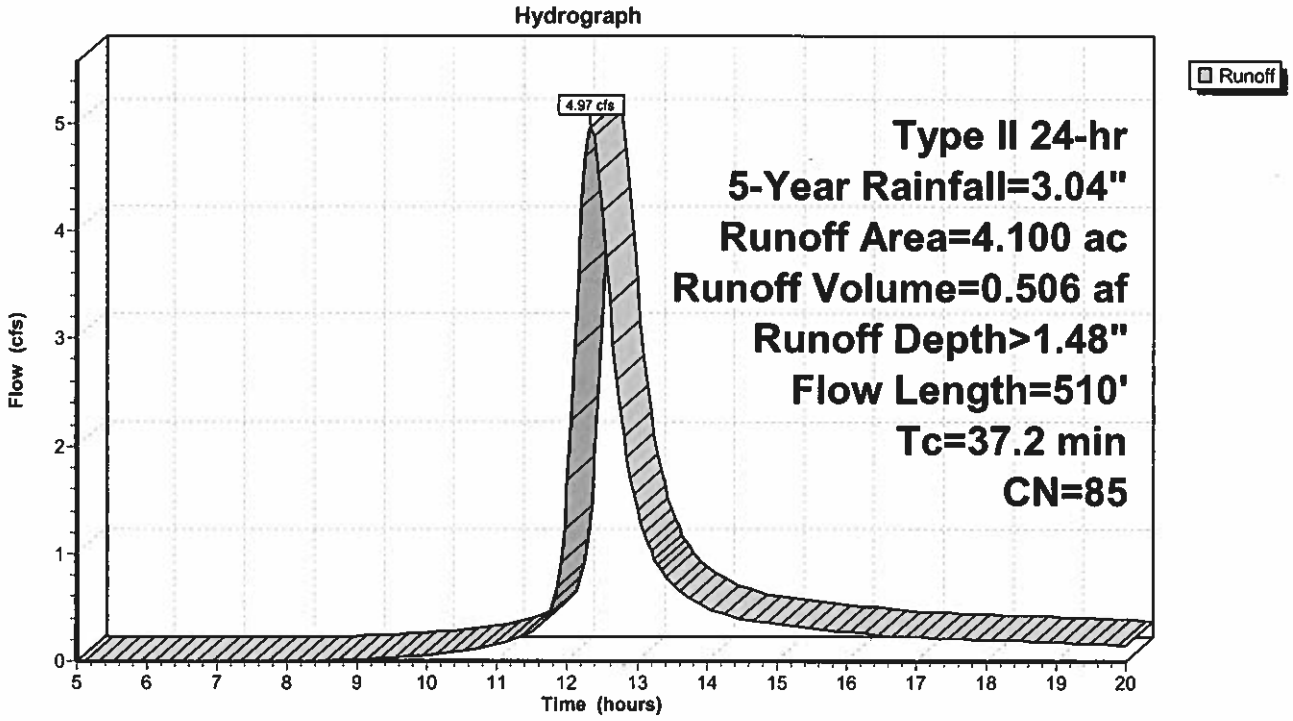
Runoff = 4.97 cfs @ 12.33 hrs, Volume= 0.506 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.04"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

[47] Hint: Peak is 149% of capacity of segment #3

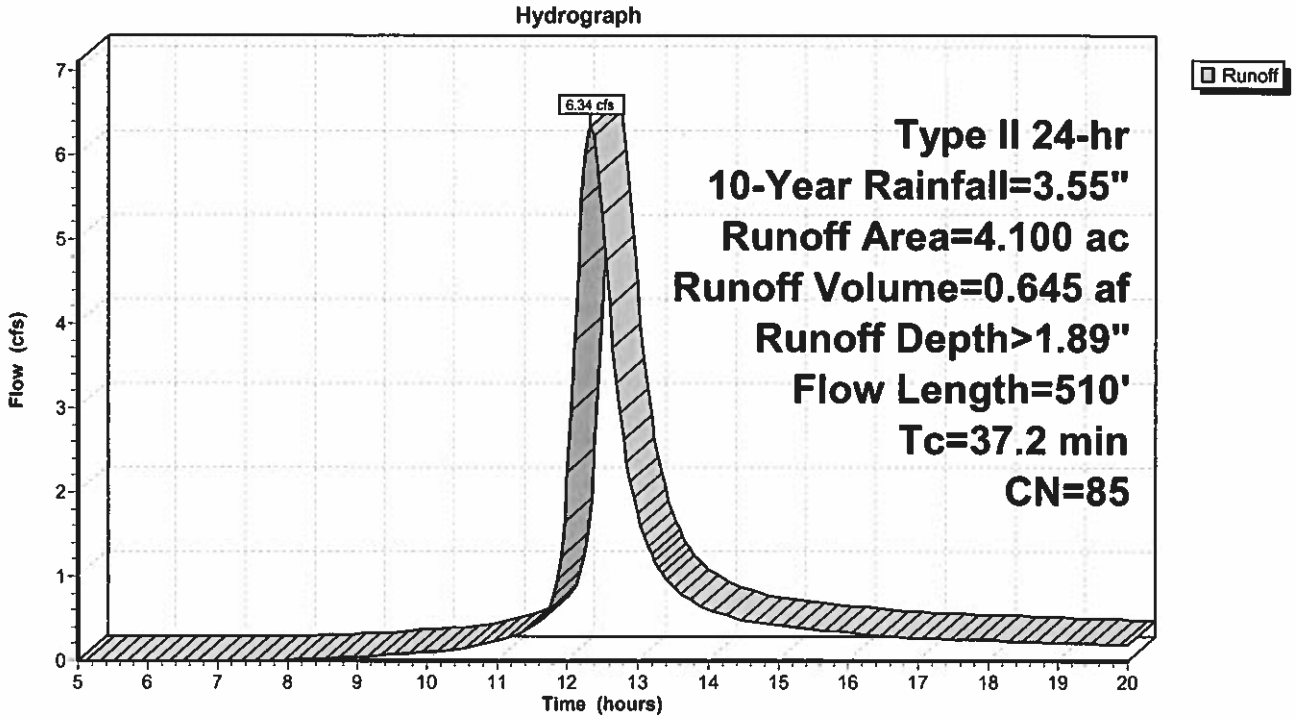
Runoff = 6.34 cfs @ 12.33 hrs, Volume= 0.645 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.55"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

[47] Hint: Peak is 200% of capacity of segment #3

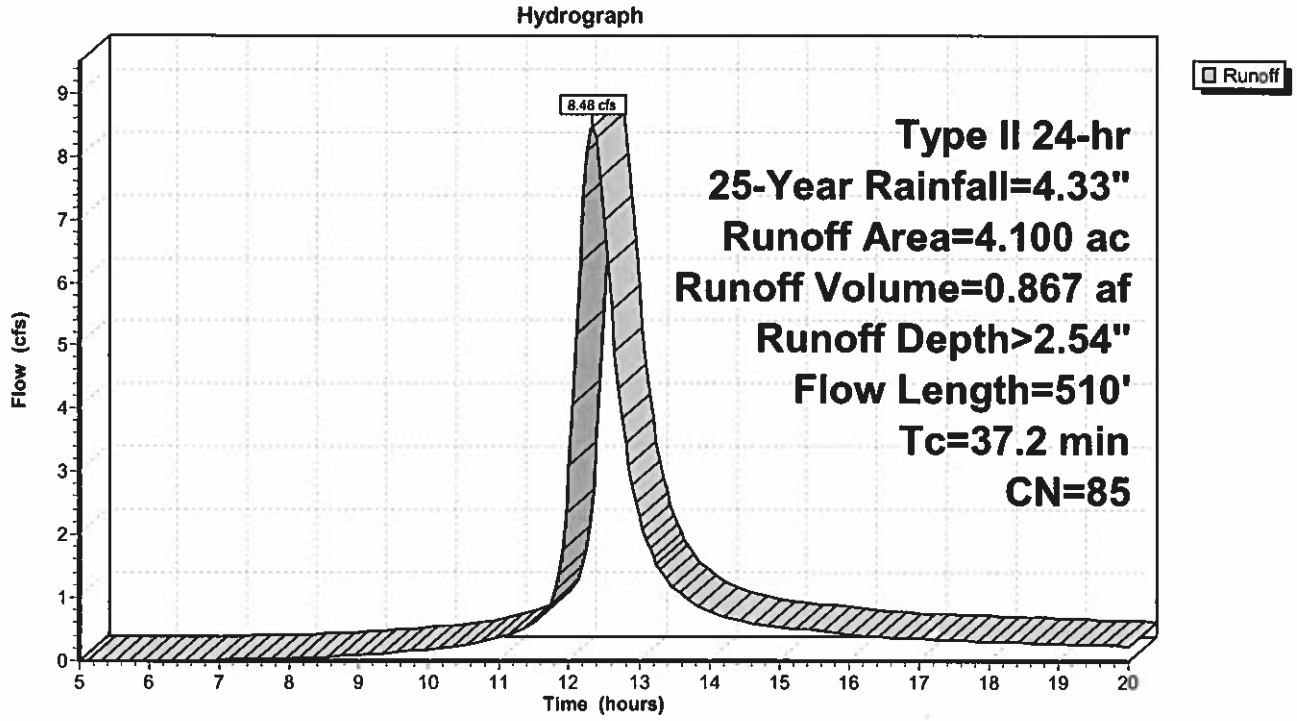
Runoff = 8.48 cfs @ 12.33 hrs, Volume= 0.867 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.33"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

[47] Hint: Peak is 244% of capacity of segment #3

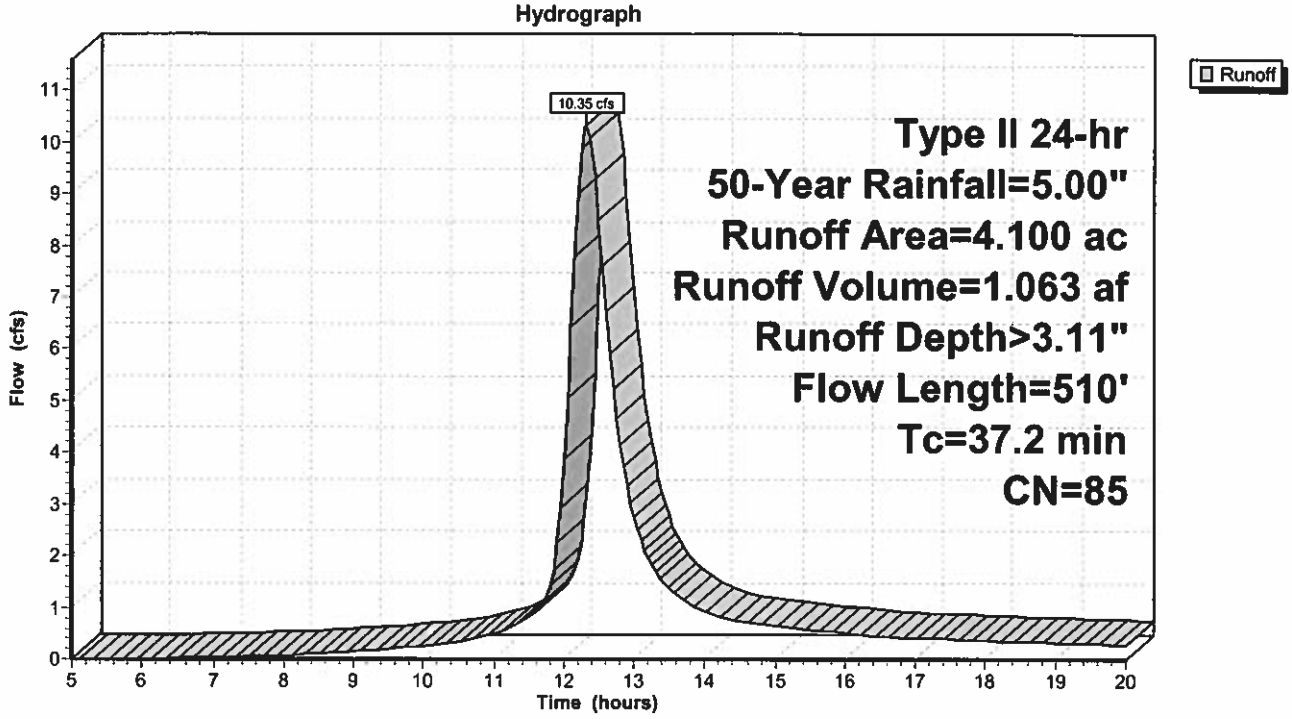
Runoff = 10.35 cfs @ 12.32 hrs, Volume= 1.063 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.00"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



Summary for Subcatchment EX1: PREDEVELOPED CONDITIONS

[47] Hint: Peak is 292% of capacity of segment #3

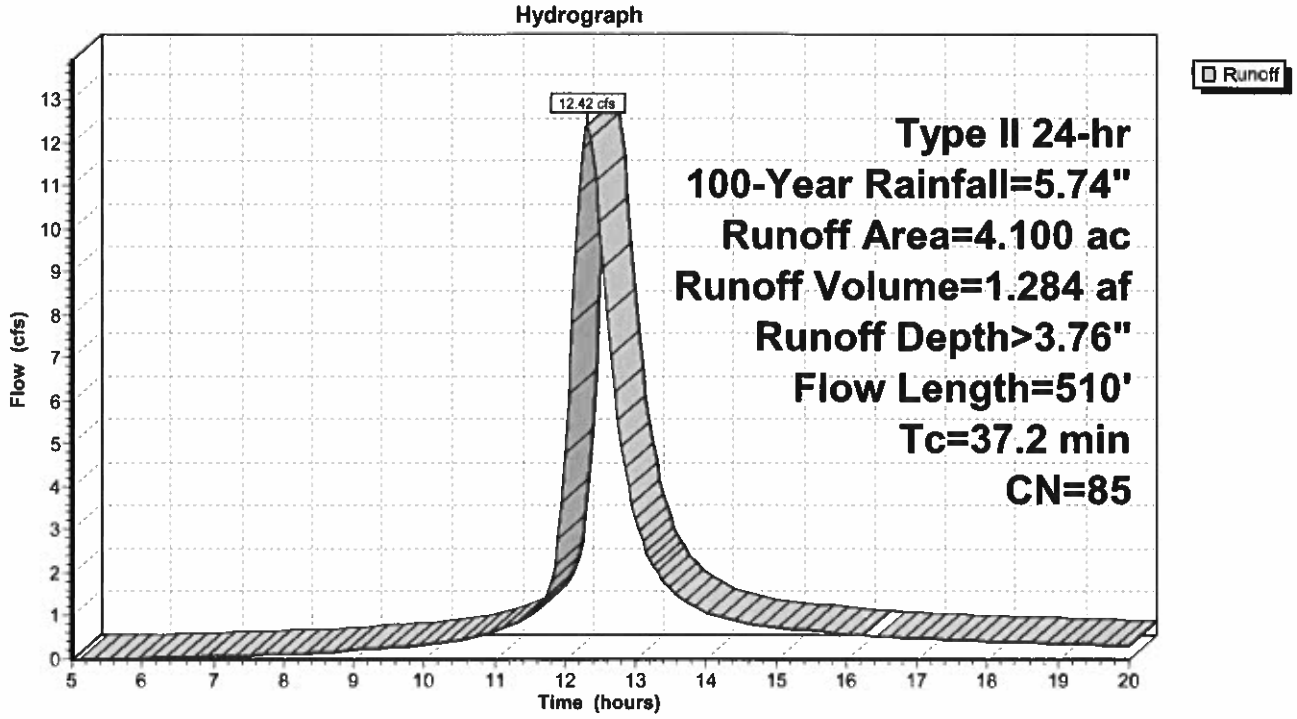
Runoff = 12.42 cfs @ 12.32 hrs, Volume= 1.284 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.74"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Steep Hillside
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass - PT A to B** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale - PT B to C** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet - PT C to D** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment EX1: PREDEVELOPED CONDITIONS



SECTION FIVE

Rainfall Events Listing

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	2.10	2
2	2-Year	Type II 24-hr		Default	24.00	1	2.43	2
3	5-Year	Type II 24-hr		Default	24.00	1	3.04	2
4	10-Year	Type II 24-hr		Default	24.00	1	3.55	2
5	25-Year	Type II 24-hr		Default	24.00	1	4.33	2
6	50-Year	Type II 24-hr		Default	24.00	1	5.00	2
7	100-Year	Type II 24-hr		Default	24.00	1	5.74	2

Summary for Subcatchment 12S: DEVELOPED CONDITIONS

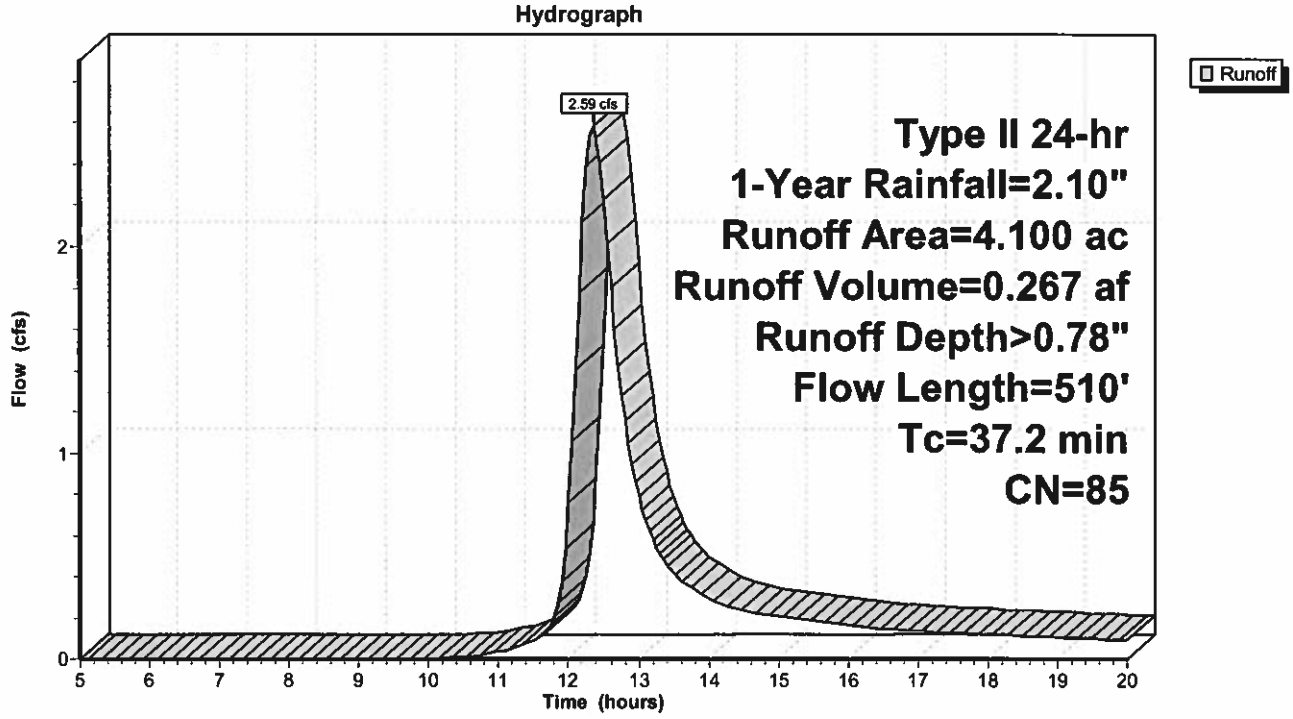
Runoff = 2.59 cfs @ 12.35 hrs, Volume= 0.267 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.10"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

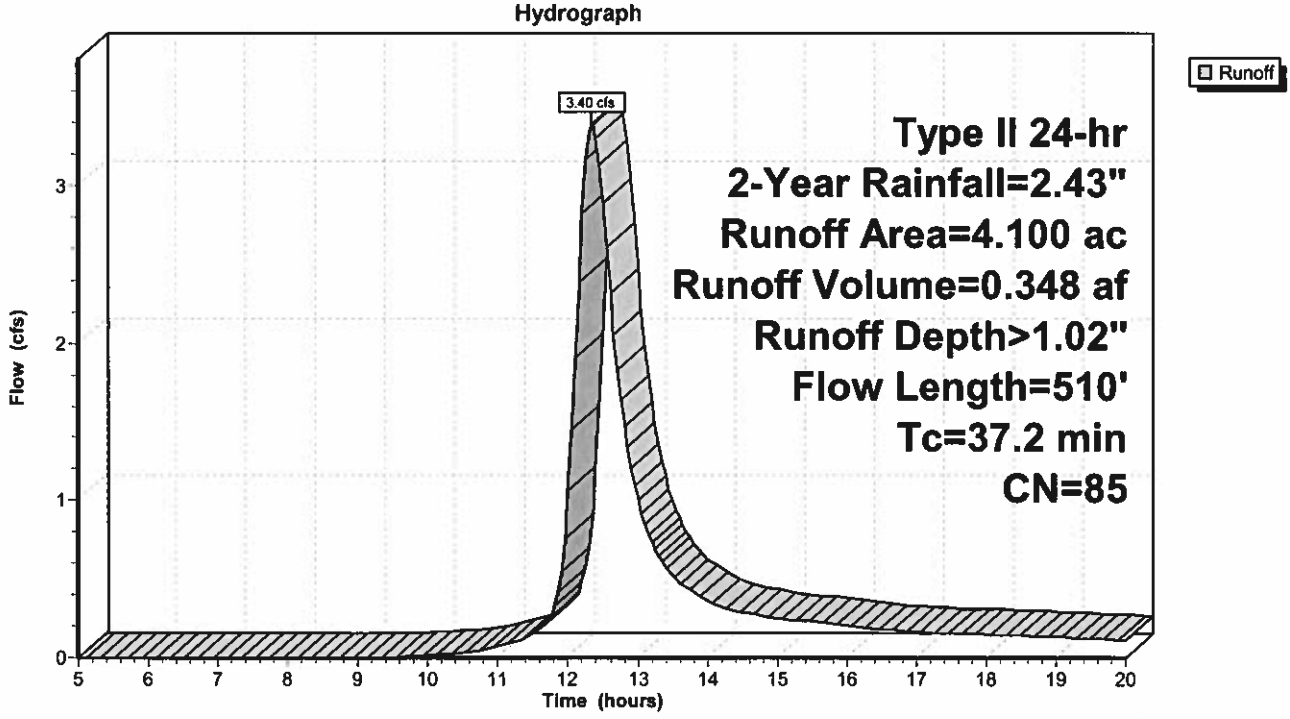
Runoff = 3.40 cfs @ 12.34 hrs, Volume= 0.348 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.43"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

[47] Hint: Peak is 117% of capacity of segment #3

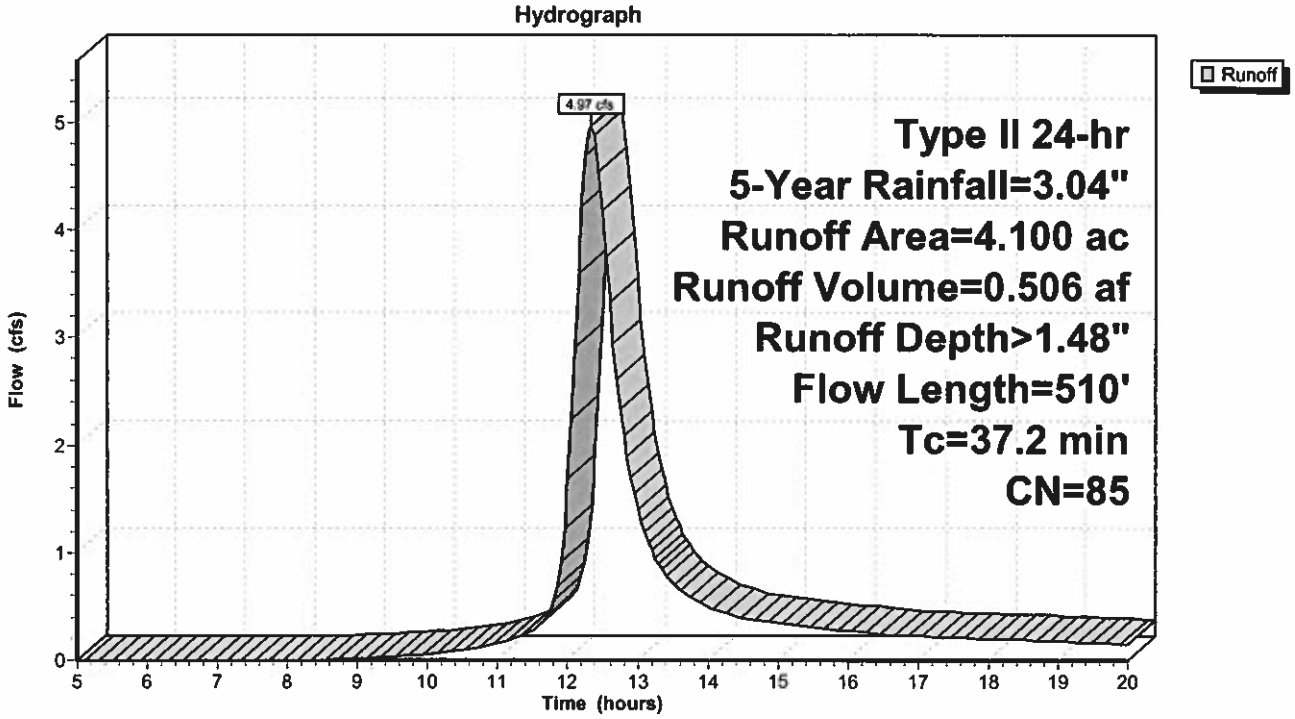
Runoff = 4.97 cfs @ 12.33 hrs, Volume= 0.506 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.04"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

[47] Hint: Peak is 149% of capacity of segment #3

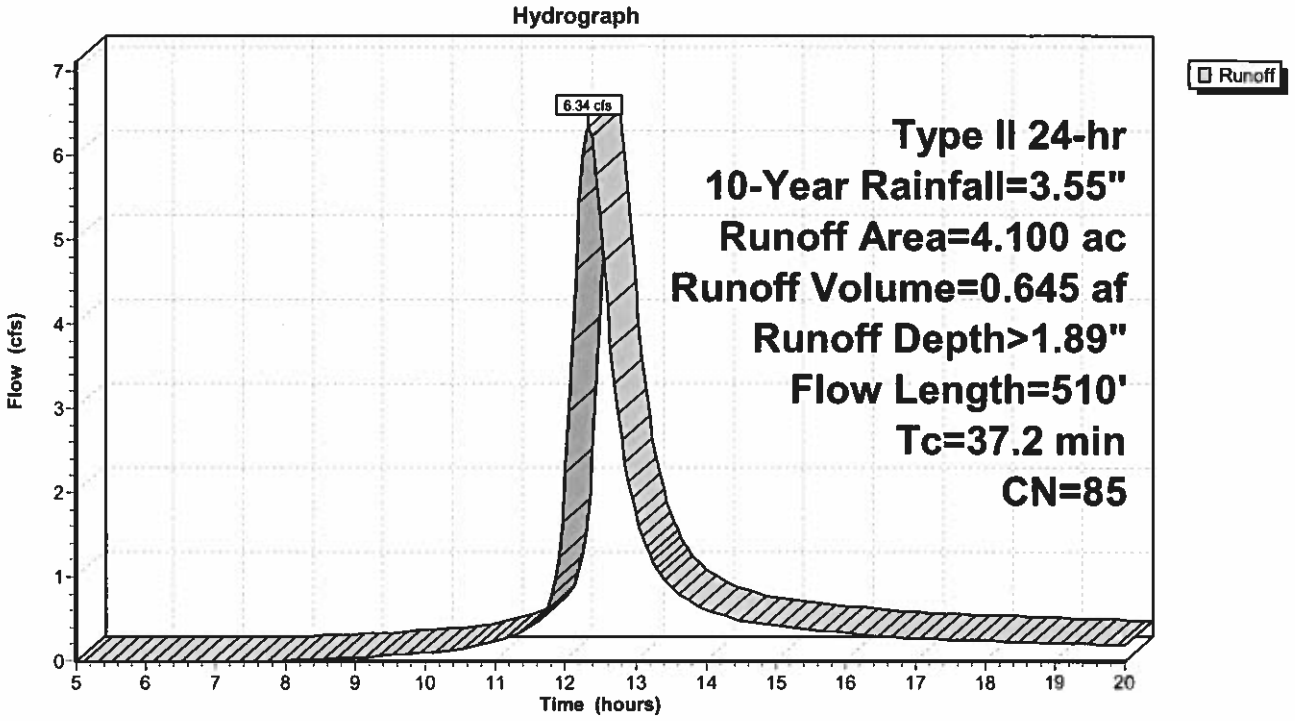
Runoff = 6.34 cfs @ 12.33 hrs, Volume= 0.645 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.55"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

[47] Hint: Peak is 200% of capacity of segment #3

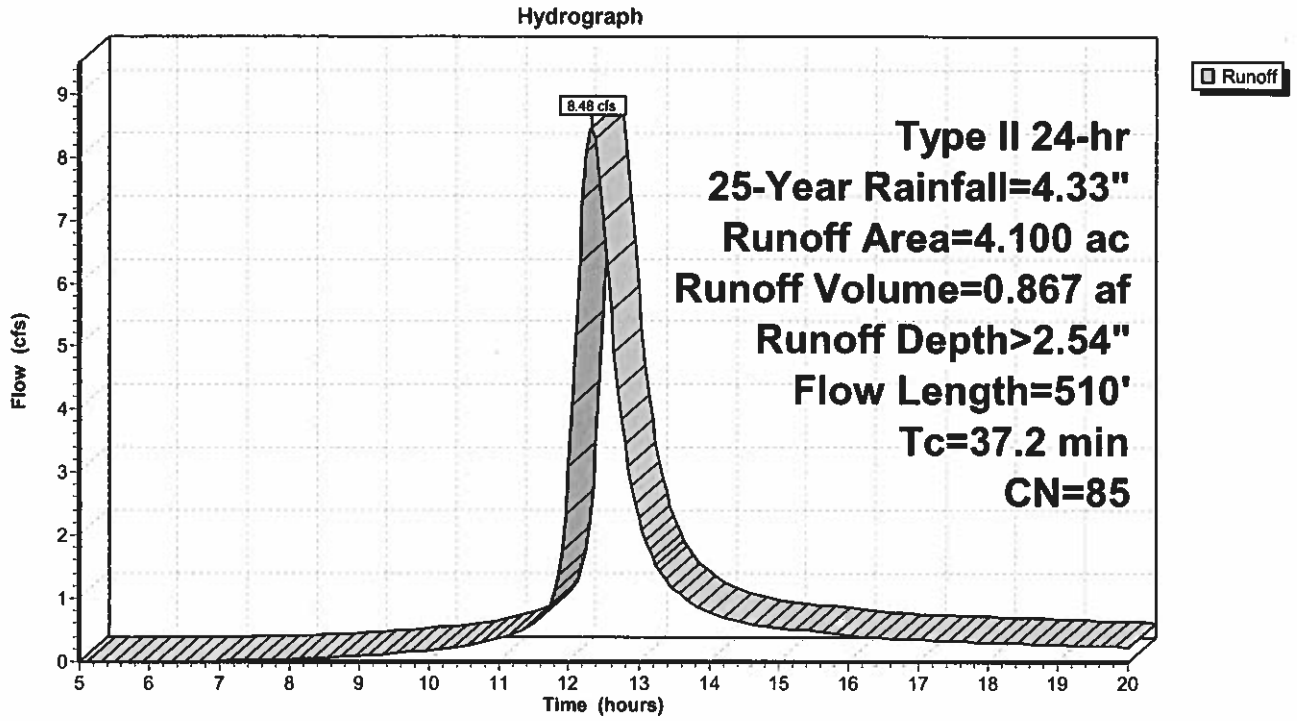
Runoff = 8.48 cfs @ 12.33 hrs, Volume= 0.867 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.33"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

[47] Hint: Peak is 244% of capacity of segment #3

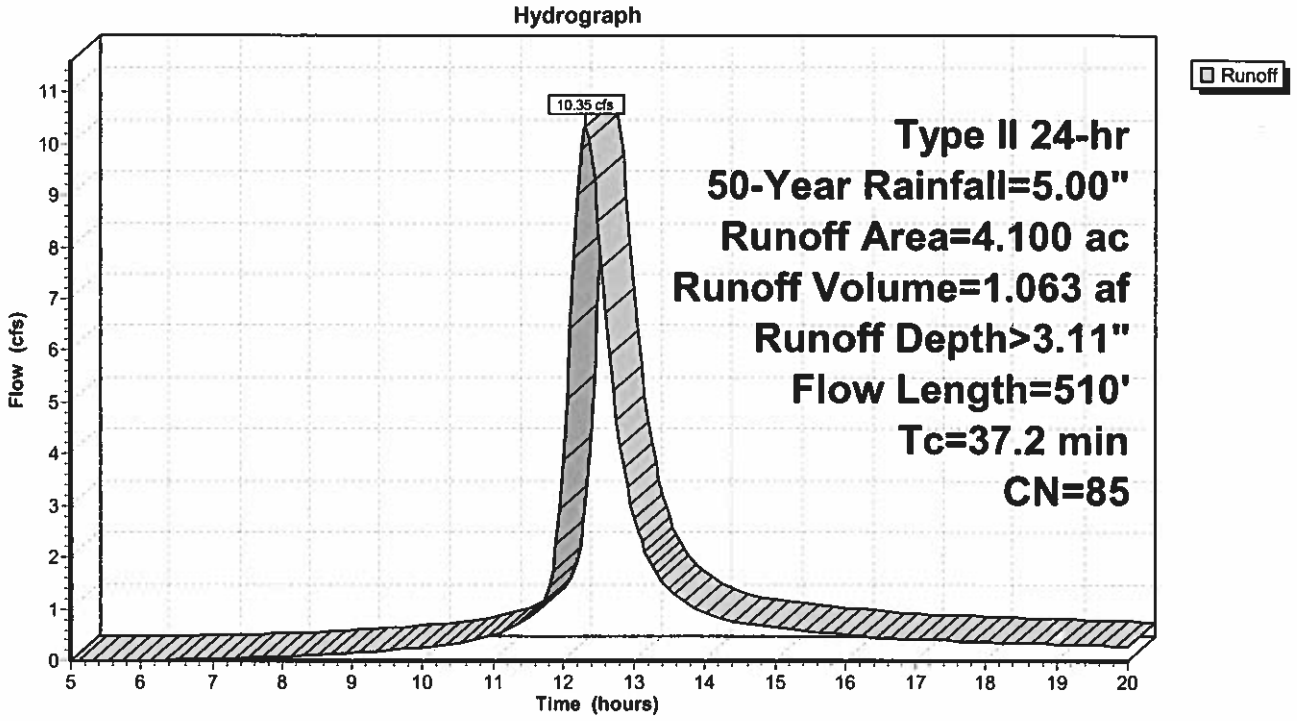
Runoff = 10.35 cfs @ 12.32 hrs, Volume= 1.063 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.00"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS



Summary for Subcatchment 12S: DEVELOPED CONDITIONS

[47] Hint: Peak is 292% of capacity of segment #3

Runoff = 12.42 cfs @ 12.32 hrs, Volume= 1.284 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.74"

	Area (ac)	CN	Description
	1.600	98	Paved parking, HSG C
	2.300	74	>75% Grass cover, Good, HSG C
*	0.200	98	Retaining wall and 12' wide drive
	4.100	85	Weighted Average
	2.300		56.10% Pervious Area
	1.800		43.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	300	0.0100	0.14		**Sheet Flow, Overland flow thru grass** Grass: Short n= 0.150 P2= 2.43"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow, Overland to swale** Woodland Kv= 5.0 fps
0.4	110	0.0100	4.25	4.25	**Channel Flow, swale to outltet** Area= 1.0 sf Perim= 1.0' r= 1.00' n= 0.035 Earth, dense weeds
37.2	510	Total			

Subcatchment 12S: DEVELOPED CONDITIONS