

432 Cony Road
P.O. Box 4687
Augusta, ME 04330



(207) 623-9475
Fax (207) 623-0016
1-800-244-9475

February 13, 2015

City of Augusta
Mr. Lionel Cayer, City Engineer
One City Center
Augusta, Maine 04330

Subject: Stormwater Report
Shuman Family Second LLC.
79 Western Avenue

Dear Lionel,

E.S. Coffin Engineering & Surveying has completed the hydrologic calculations for Shuman Family Second LLC., who is proposing to expand their existing Subaru display area onto lot #32 shown on tax map #16 in the City of Augusta tax maps at 480 Western Avenue in Augusta. The expansion involves creating vehicle display area on the land (1.1 acres) located on the west side of Charlie's Collision Center.

This project is unique in that stormwater from this parcel along with from the Collision Center parcel is directed to a filter pond located in the rear (north side) of the Charlie's Public Wholesale parcel, located on the opposite side of Western Avenue. Prior to the DOT expansion project for Western Avenue, the Greater Augusta Utility District (GAUD) agreed to be the owner of a new 15" diameter pipe flowing south to north across Western Avenue. Runoff from the two parcels on the south side of Western Avenue is sent through a series of pipes and catch basins until it reaches the existing filter pond. The filter pond was originally designed to handle these flows so no pond modifications will be needed. The City of Augusta's Land Use Ordinance states that the amount of flow (stormwater) in the post-development condition must be equal to or less than the flow in the pre-development condition for the 2-, 10- and 25-year peak storm events.

Modeling assumptions: The "Hydro-Cad" computer program was used to determine the peak storm water runoff for the pre- and post-development conditions. Hydro-Cad is a storm water modeling system, which utilizes the TR-20 method developed by the Soil Conservation Service (SCS).

The design assumptions used for this project are:

Design storm: 24 hour, Type III rainfall distribution.

Rainfall: 24-hour precipitation values from U.S. Weather Bureau Technical Release No. 40:

2-year storm = 3.0 inches
10-year storm = 4.4 inches
25-year storm = 5.1 inches

Site specific parameters for the project are listed below:

Soils: Soils information to determine the hydrologic soil group for the site is derived from the Soil Survey of Kennebec County by the United States Department of Agriculture Soil Conservation Service. The soils and hydrologic group are listed below:

<u>Soil Classification</u>	<u>Hydrologic Group</u>
Paxton-Charlton (PeB)	"C"

Ground Cover:

Pre-Development: The existing watershed ground cover is modeled as impervious, lawn and woods.

Post-Development: The proposed watershed ground cover is impervious, lawn and woods.

<u>Cover Description</u>	<u>Curve Number:</u>
Impervious	98
Lawn "C"	74
Woods "C"	70

Results:

The project will result in an increase of 27,565 sf of impervious area. These results are shown on the Hydro Cad output sheets enclosed at the end of the report. Runoff from this entire parcel in the pre-development state flows into the municipal stormwater system along Western Avenue. This amount of flow going into the municipal system is greatly reduced in the post-development condition. The project has been modeled utilizing two distinct points (SP1 & SP2) where SP1 represents flow going into the municipal system and SP2 represents flow being sent to the filter pond behind Public Wholesale.

Pre-development:

The hydrologic study evaluates a portion of the parcel that includes: impervious (9,230 sf), lawn (31,550 sf) and woods (8,605 sf) and is broken down into four drainage areas (see plan entitled "PRE"). The peak flows for the 2-, 10- and 25-year events (see node labeled "SP1") in the pre-development condition are 1.04 cfs (cubic feet per second), 2.11 cfs and 2.68 cfs. The peak flows (see node labeled "SP2") in the pre-development condition are all zero as no runoff from the site currently goes to the filter pond behind Charlie's Public Wholesale..

Post Development:

The proposed site (see plan entitled "C-1") will be comprised of impervious area (36,795 sf) and lawn (12,590 sf). The post-development is broken down into four drainage areas and is shown on the plan entitled "POST". Summary tables showing the input values and resulting peak flows for subcatchments and reaches are also included at the end of the report. In the post development condition, the 2-, 10- and 25-year events for "SP1" yield 0.55 cfs, 1.02 cfs and 1.26 cfs. The peak flows for the 2-, 10- and 25-year events for "SP2" in the post-development condition are 2.49 cfs, 3.76 cfs and 4.40 cfs, respectively. See tables below for results.

PRE- & POST-DEVELOPMENT HYDROLOGIC RESULTS IN MUNICIPAL SYSTEM (SP1)			
<u>Event</u>	<u>Pre-Develop.</u>	<u>Post-Develop.</u>	<u>Difference</u>
2 year	1.04 cfs	0.55 cfs	- 0.49 cfs
10 year	2.11 cfs	1.02 cfs	- 1.09 cfs
25 year	2.68 cfs	1.26 cfs	- 1.42 cfs

PRE- & POST-DEVELOPMENT HYDROLOGIC RESULTS IN FILTER POND (SP2)			
<u>Event</u>	<u>Pre-Develop.</u>	<u>Post-Develop.</u>	<u>Difference</u>
2 year	0.00 cfs	2.49 cfs	+ 2.49 cfs
10 year	0.00 cfs	3.76 cfs	+ 3.76 cfs
25 year	0.00 cfs	4.40 cfs	+ 4.40 cfs

Conclusion:

By comparing the node labeled "SP1", which depicts runoff going into the municipal stormwater system along Western Avenue, the results show that there will be a decrease in flow for the three peak storm events. SP2 shows an increase in flow for all three peak storm events, but this runoff goes to the existing filter pond, which is designed to accommodate these flows. The project complies with the stormwater regulations mentioned in the Land Use Ordinance and if you should have any questions or concerns, please do not hesitate to contact me at 623-9475.

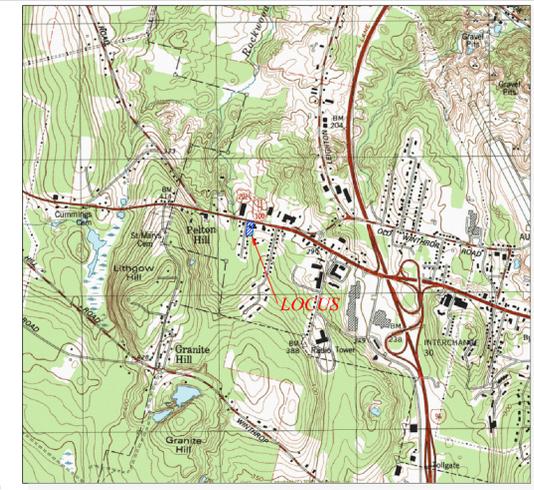
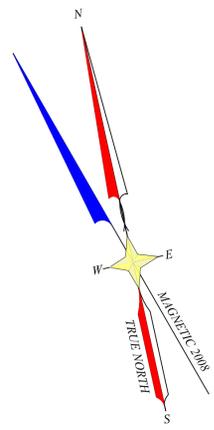
Respectfully submitted,



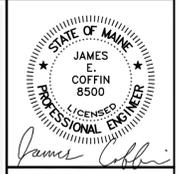
James E. Coffin, PE



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LOCUS MAP
AUGUSTA
USGS QUAD SHEET
SCALE 1"=2000'



E.S. COFFIN
PLANNING
ENGINEERING & SURVEYING, INC.
432 Camp Road, P.O. Box 4087, Augusta, Maine 04330
Ph: (207) 625-9473 Fax: (207) 625-9002 Toll Free: 1-800-544-0473

LEGEND

- IRON ROD FOUND
- IRON PIPE FOUND
- UTILITY POLE
- GUY ANCHOR
- OVERHEAD UTILITY LINE
- BELOW GROUND ELECTRIC LIGHT ON CONCRETE BASE
- LIGHT
- HYDRANT
- WATER VALVE
- UNDERGROUND WATER LINE
- SIGN
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SURVEYED LINE
- STOCKADE FENCE
- WIRE FENCE
- GUARDRAIL
- STONE WALL
- CATCH BASIN
- STORM PIPE
- SANITARY MANHOLE
- SANITARY LINE
- SETBACK
- CONIFEROUS TREE
- DECIDUOUS TREE
- VEGETATION
- M.D.O.T. RETAINING WALL (DESIGN)
- M.D.O.T. EDGE OF PAVEMENT (DESIGN)
- M.D.O.T. CATCH BASIN (DESIGN)
- M.D.O.T. STORMWATER PIPE (DESIGN)

LANDSCAPING NOTES

Plantings per 100' (Total 610 lf)

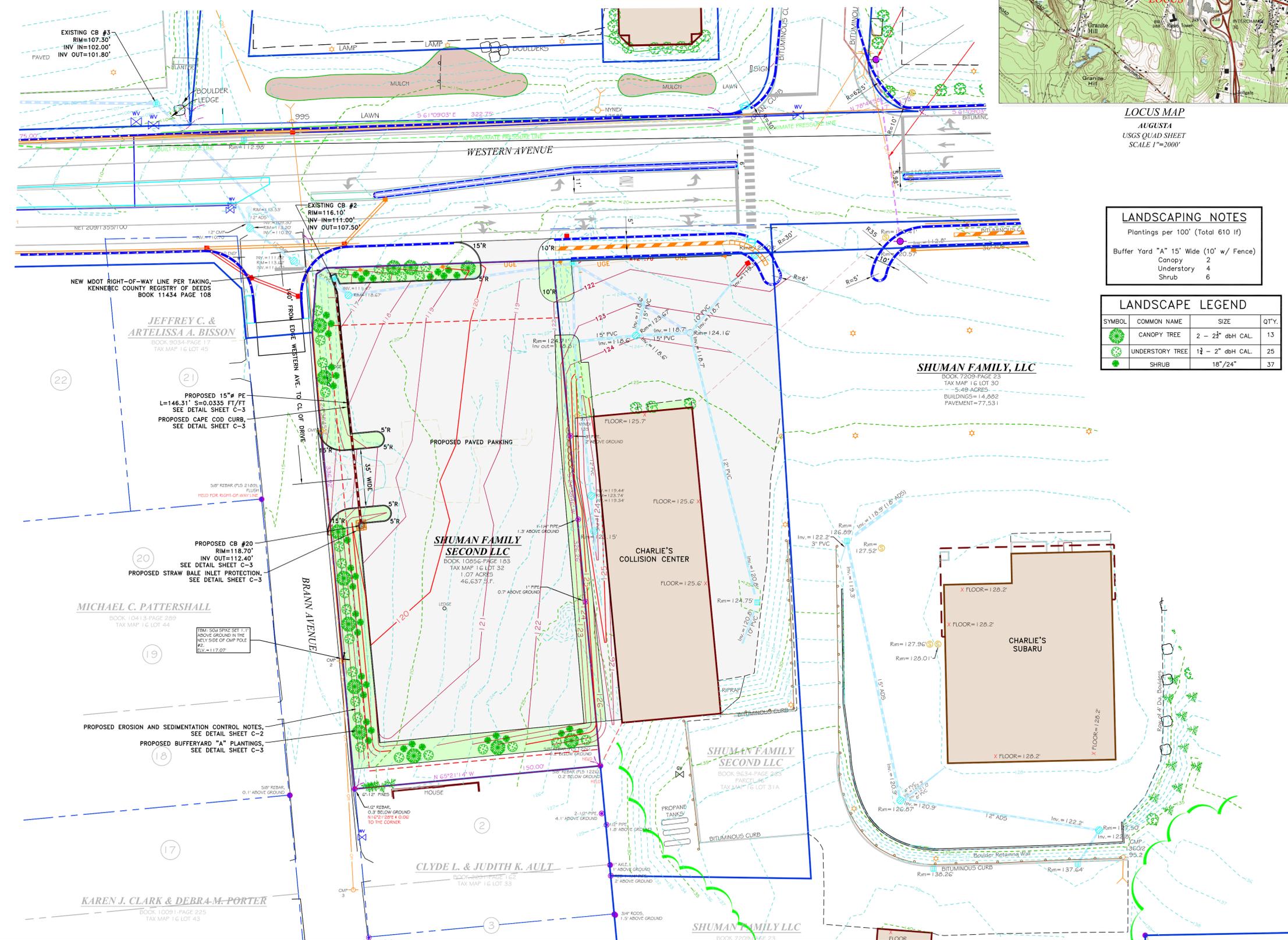
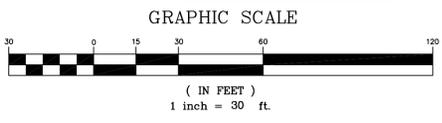
Buffer Yard "A" 15' Wide (10' w/ Fence)

- Canopy 2
- Understory 4
- Shrub 6

LANDSCAPE LEGEND

SYMBOL	COMMON NAME	SIZE	QTY.
○	CANOPY TREE	2 - 2 1/2" dbH CAL.	13
○	UNDERSTORY TREE	1 1/2 - 2" dbH CAL.	25
○	SHRUB	18" / 24"	37

- GENERAL SITE INFORMATION:**
- OWNER: SHUMAN FAMILY SECOND LLC
 - ZONE: REGIONAL BUSINESS DISTRICT (CC)
 - MAP #16 LOT 32
 - DEED: BOOK 10856 PAGE 183
 - LOT SIZE: 46,637 SF
 - EXISTING IMPERVIOUS COVERAGE: 9,060 SF
 - PROPOSED IMPERVIOUS COVERAGE
80% MAX ALLOWED: 37,310 SF
ACTUAL NEW IMPERVIOUS: 36,205 SF
 - DISTURBED AREA = 42,392 SF
 - PARKING SPACES REQUIRED:
0 SPACES (NO BUILDING)



NO.	REVISIONS	DATE
1	ADD GRASS STRIP & EDIT AREAS	2/12/15

PROPOSED SITE PLAN

CLIENT PROJECT: SHUMAN FAMILY SECOND LLC
CHARLIE'S SUBARU VEHICLE DISPLAY EXPANSION

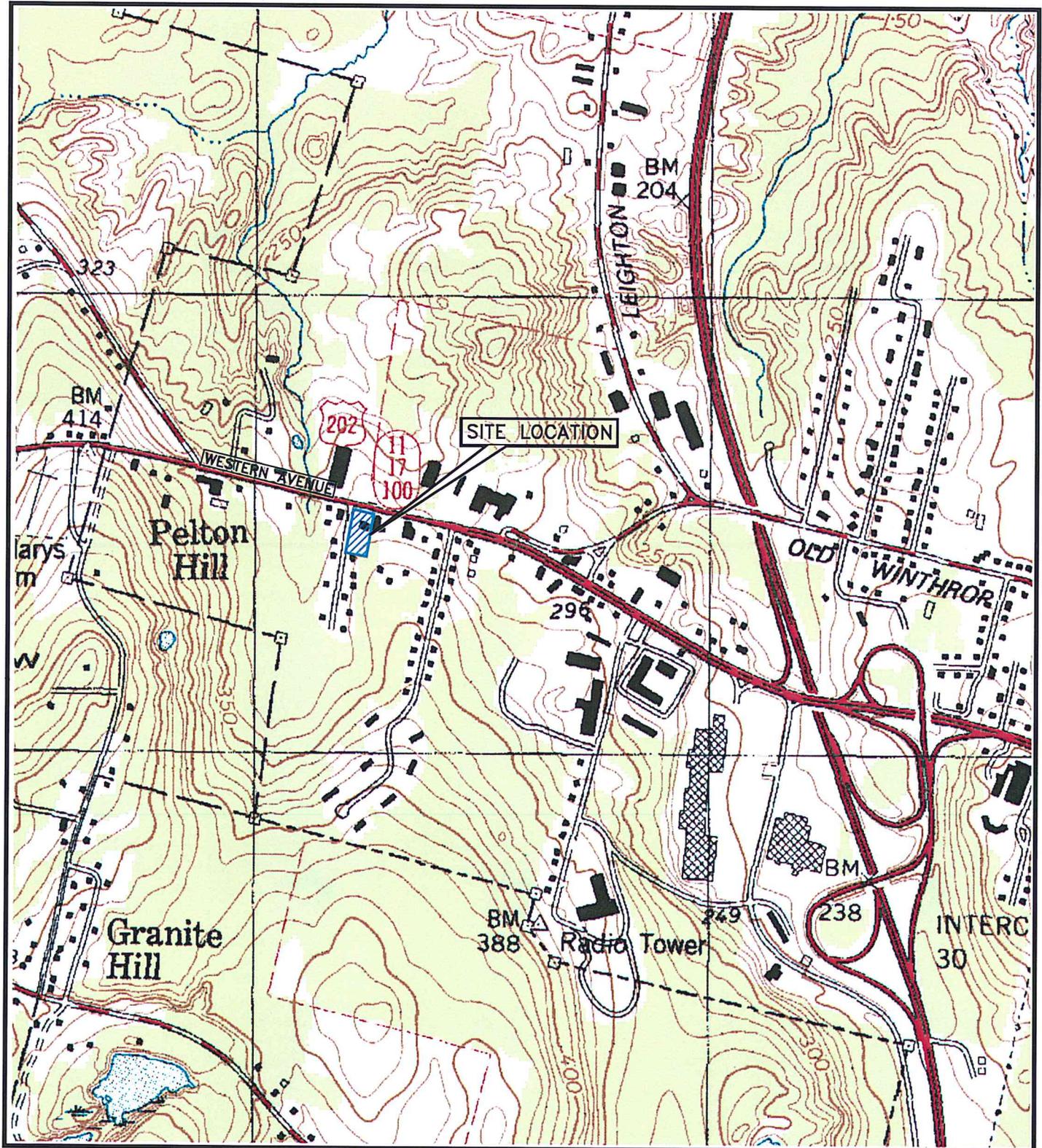
LOCATION: 480 WESTERN AVENUE
TOWN: AUGUSTA COUNTY: KENNEBEC STATE: MAINE

SCALE: 1 INCH=30 FEET
DRAWN BY: TCH
CHECKED BY: JEC

DATE: FEBRUARY 6, 2015

PROJ. NO. 2011-234

C-1



LOCATION MAP
SCALE: 1"=1000'

SLM

CLIENT/PROJECT:
SHUMAN FAMILY SECOND LLC
CHARLIE'S SUBARU VEHICLE DISPLAY EXPANSION

LOCATION: 480 WESTERN AVENUE

TOWN: AUGUSTA COUNTY: KENNEBEC STATE: MAINE



SHEET TITLE:
SITE LOCATION MAP

SCALE: 1" = 1000'

DATE: FEBRUARY 6, 2015

PROJ. NO. 2015-020



CW

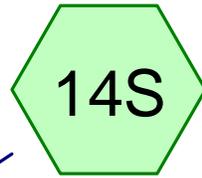


SP1

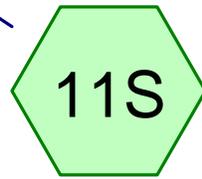
Study Point #1



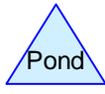
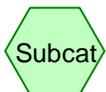
CW



CW



CW



Routing Diagram for Charlie's CW PRE-Development
Prepared by Microsoft, Printed 2/12/2015
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Charlie's CW PRE-Development

Type III 24-hr 2-Year Event Rainfall=3.00"

Prepared by Microsoft

Printed 2/12/2015

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Page 2

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW

Runoff Area=40,200 sf 11.17% Impervious Runoff Depth>0.92"
Flow Length=164' Tc=13.2 min CN=76 Runoff=0.82 cfs 0.071 af

Subcatchment 12S: CW

Runoff Area=2,940 sf 37.93% Impervious Runoff Depth>1.34"
Flow Length=165' Tc=7.5 min CN=83 Runoff=0.11 cfs 0.008 af

Subcatchment 13S: CW

Runoff Area=5,255 sf 50.14% Impervious Runoff Depth>1.55"
Flow Length=133' Tc=1.3 min CN=86 Runoff=0.26 cfs 0.016 af

Subcatchment 14S: CW

Runoff Area=990 sf 100.00% Impervious Runoff Depth>2.59"
Flow Length=93' Slope=0.0290 1' Tc=1.0 min CN=98 Runoff=0.07 cfs 0.005 af

Reach SP1: Study Point #1

Inflow=1.04 cfs 0.099 af
Outflow=1.04 cfs 0.099 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.099 af Average Runoff Depth = 1.05"
81.31% Pervious = 0.922 ac 18.69% Impervious = 0.212 ac

Summary for Subcatchment 11S: CW

Runoff = 0.82 cfs @ 12.20 hrs, Volume= 0.071 af, Depth> 0.92"

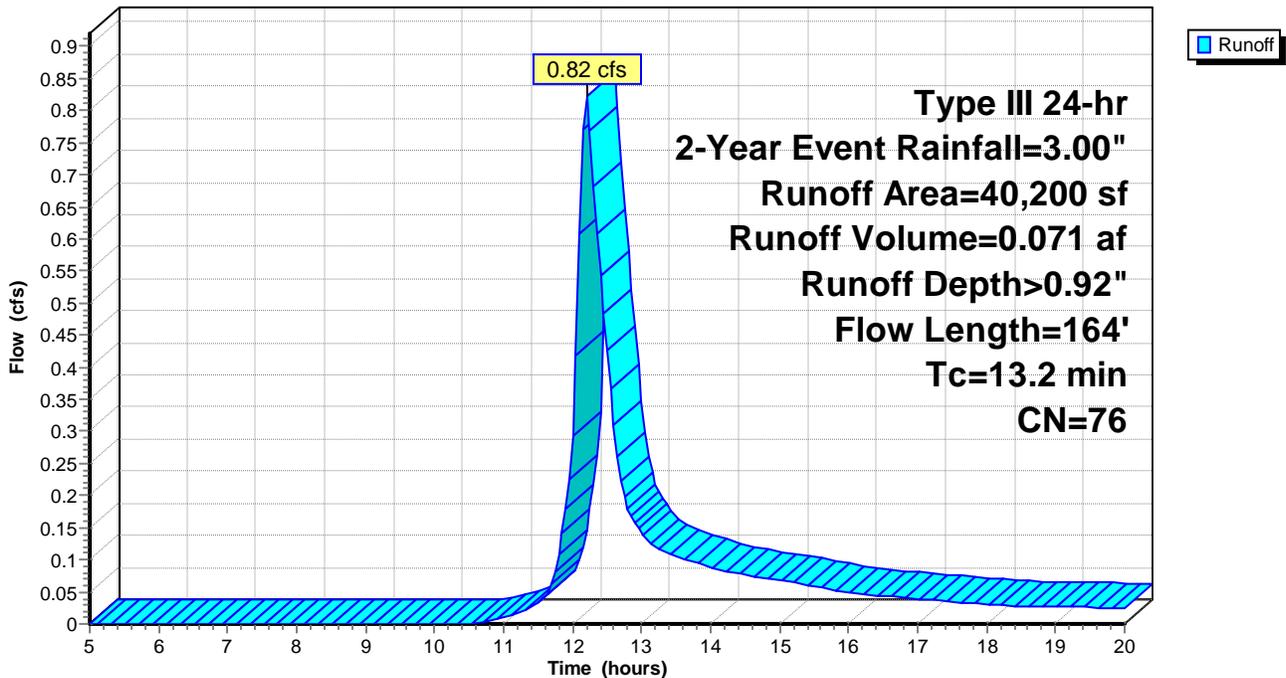
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,490	98	Paved parking, HSG C
27,105	74	>75% Grass cover, Good, HSG C
8,605	70	Woods, Good, HSG C
40,200	76	Weighted Average
35,710		88.83% Pervious Area
4,490		11.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	92	0.0652	0.12		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	72	0.0833	4.33		Shallow Concentrated Flow, BC
					Grassed Waterway Kv= 15.0 fps
13.2	164	Total			

Subcatchment 11S: CW

Hydrograph



Summary for Subcatchment 12S: CW

Runoff = 0.11 cfs @ 12.11 hrs, Volume= 0.008 af, Depth> 1.34"

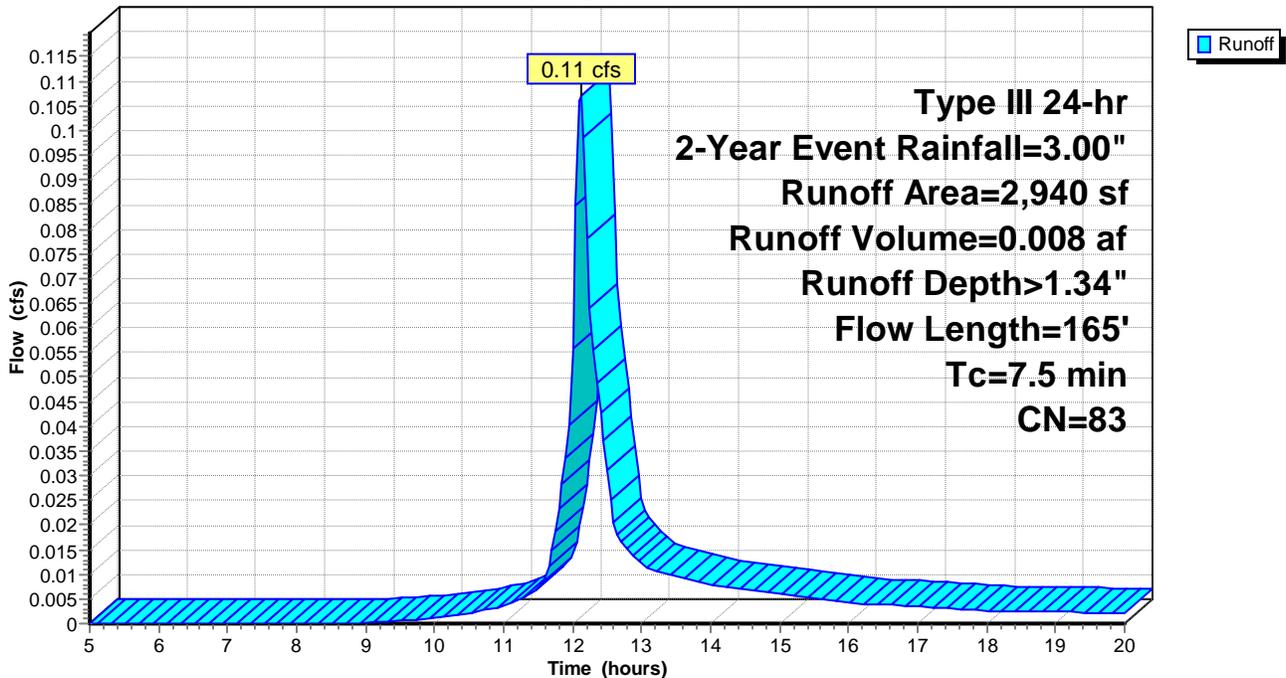
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,115	98	Paved parking, HSG C
1,825	74	>75% Grass cover, Good, HSG C
2,940	83	Weighted Average
1,825		62.07% Pervious Area
1,115		37.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0480	0.23		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.00"
0.4	65	0.0210	2.94		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
7.5	165	Total			

Subcatchment 12S: CW

Hydrograph



Summary for Subcatchment 13S: CW

Runoff = 0.26 cfs @ 12.02 hrs, Volume= 0.016 af, Depth> 1.55"

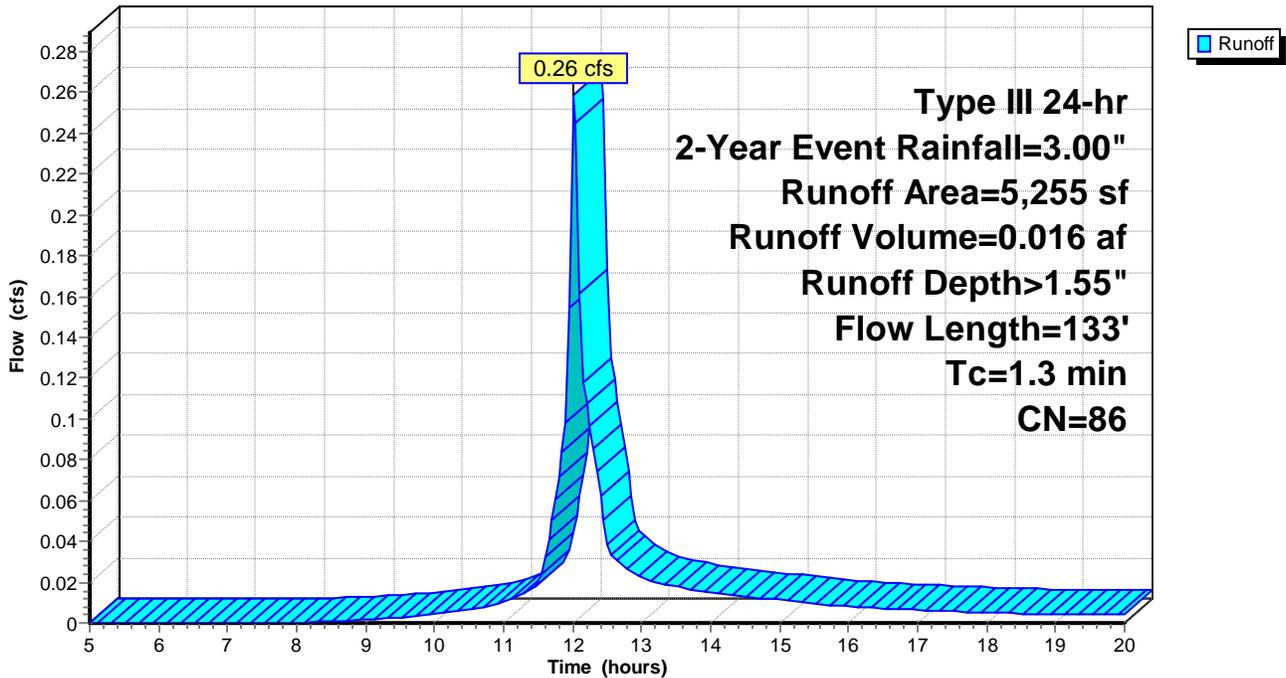
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,635	98	Paved parking, HSG C
2,620	74	>75% Grass cover, Good, HSG C
5,255	86	Weighted Average
2,620		49.86% Pervious Area
2,635		50.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	25	0.1000	1.92		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.9	75	0.0233	1.34		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.2	33	0.0303	2.61		Shallow Concentrated Flow, CD Grassed Waterway Kv= 15.0 fps
1.3	133	Total			

Subcatchment 13S: CW

Hydrograph



Summary for Subcatchment 14S: CW

Runoff = 0.07 cfs @ 12.01 hrs, Volume= 0.005 af, Depth> 2.59"

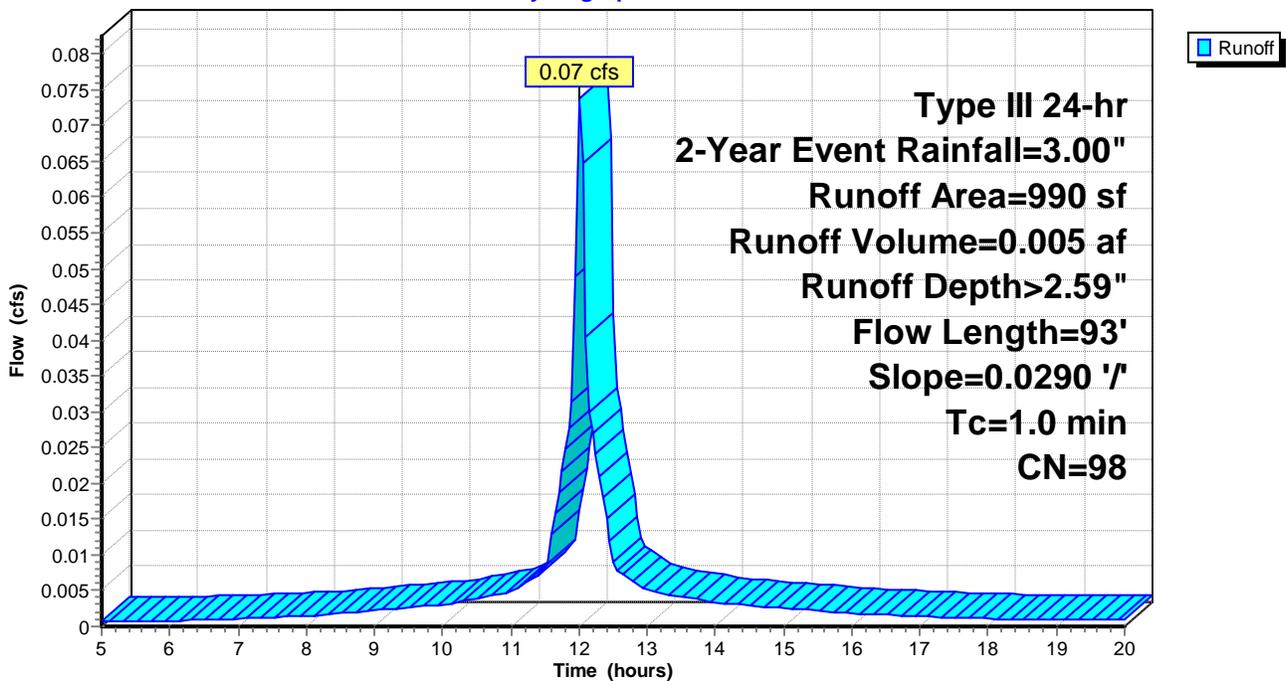
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
990	98	Paved parking, HSG C
990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0290	1.52		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 14S: CW

Hydrograph

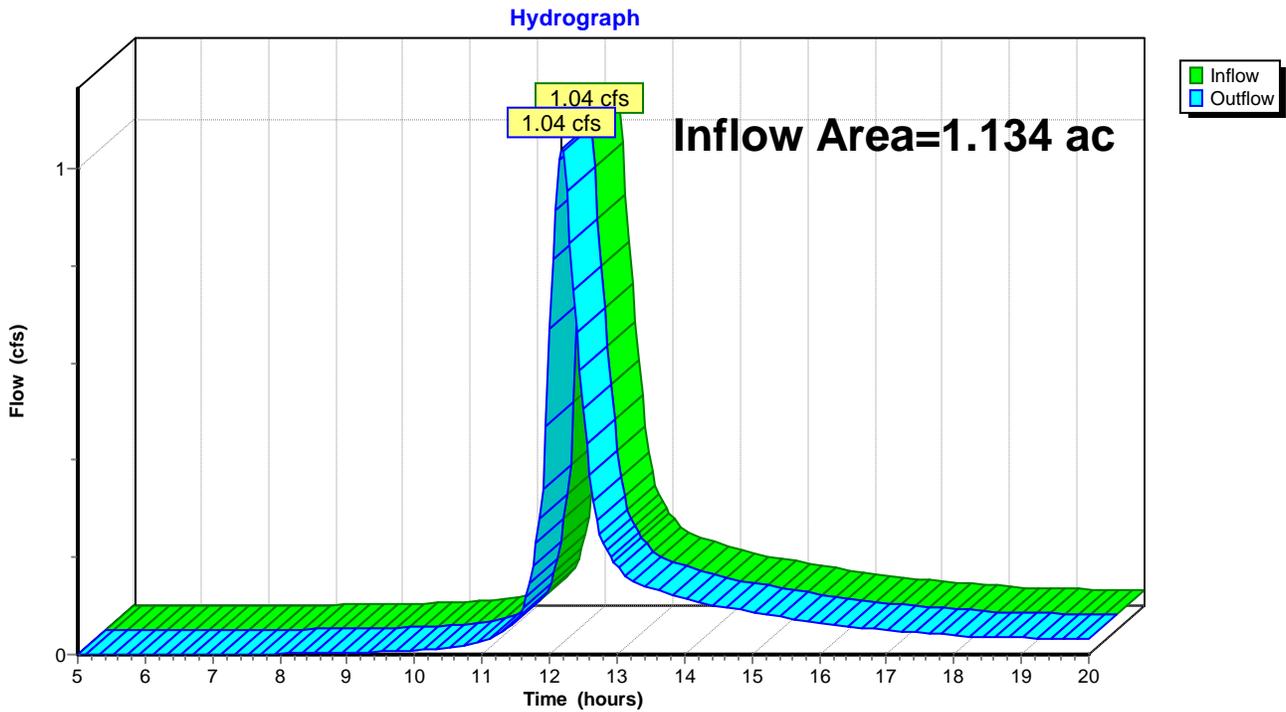


Summary for Reach SP1: Study Point #1

Inflow Area = 1.134 ac, 18.69% Impervious, Inflow Depth > 1.05" for 2-Year Event event
Inflow = 1.04 cfs @ 12.18 hrs, Volume= 0.099 af
Outflow = 1.04 cfs @ 12.18 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1



Charlie's CW PRE-Development

Type III 24-hr 10-Year Event Rainfall=4.40"

Prepared by Microsoft

Printed 2/12/2015

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW

Runoff Area=40,200 sf 11.17% Impervious Runoff Depth>1.89"
Flow Length=164' Tc=13.2 min CN=76 Runoff=1.73 cfs 0.146 af

Subcatchment 12S: CW

Runoff Area=2,940 sf 37.93% Impervious Runoff Depth>2.47"
Flow Length=165' Tc=7.5 min CN=83 Runoff=0.20 cfs 0.014 af

Subcatchment 13S: CW

Runoff Area=5,255 sf 50.14% Impervious Runoff Depth>2.74"
Flow Length=133' Tc=1.3 min CN=86 Runoff=0.45 cfs 0.028 af

Subcatchment 14S: CW

Runoff Area=990 sf 100.00% Impervious Runoff Depth>3.87"
Flow Length=93' Slope=0.0290 1' Tc=1.0 min CN=98 Runoff=0.11 cfs 0.007 af

Reach SP1: Study Point #1

Inflow=2.11 cfs 0.194 af
Outflow=2.11 cfs 0.194 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.194 af Average Runoff Depth = 2.06"
81.31% Pervious = 0.922 ac 18.69% Impervious = 0.212 ac

Summary for Subcatchment 11S: CW

Runoff = 1.73 cfs @ 12.19 hrs, Volume= 0.146 af, Depth> 1.89"

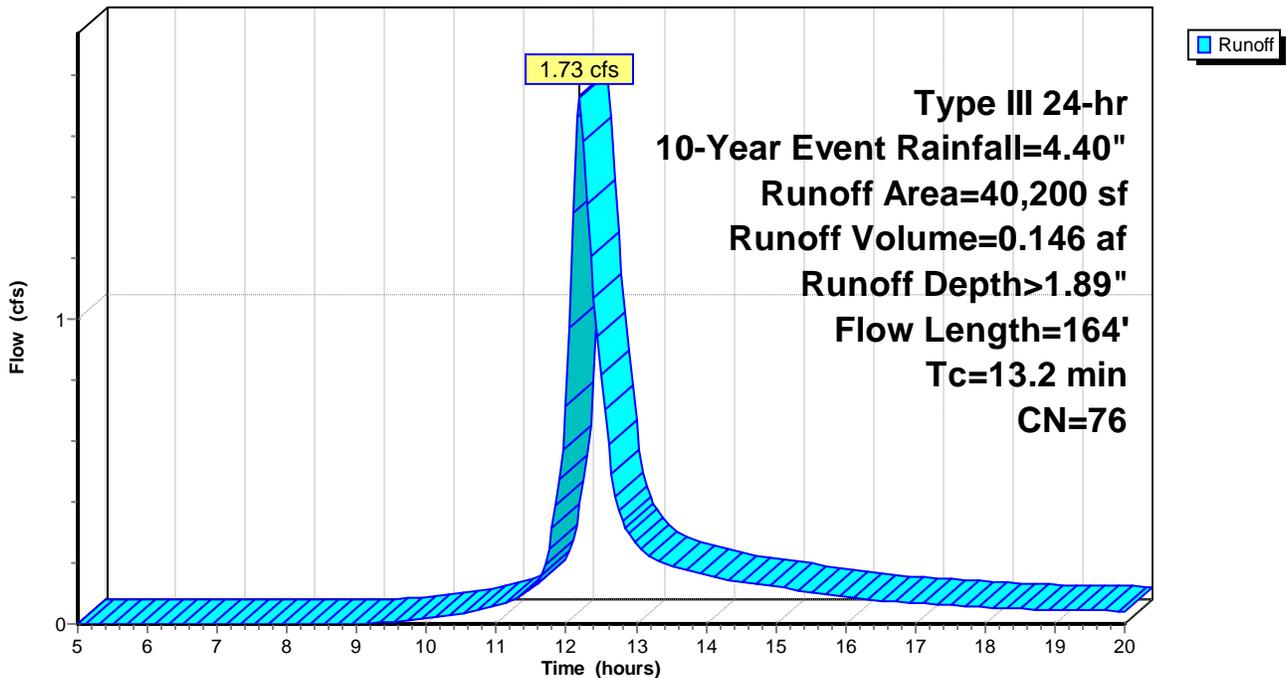
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,490	98	Paved parking, HSG C
27,105	74	>75% Grass cover, Good, HSG C
8,605	70	Woods, Good, HSG C
40,200	76	Weighted Average
35,710		88.83% Pervious Area
4,490		11.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	92	0.0652	0.12		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	72	0.0833	4.33		Shallow Concentrated Flow, BC
					Grassed Waterway Kv= 15.0 fps
13.2	164	Total			

Subcatchment 11S: CW

Hydrograph



Summary for Subcatchment 12S: CW

Runoff = 0.20 cfs @ 12.11 hrs, Volume= 0.014 af, Depth> 2.47"

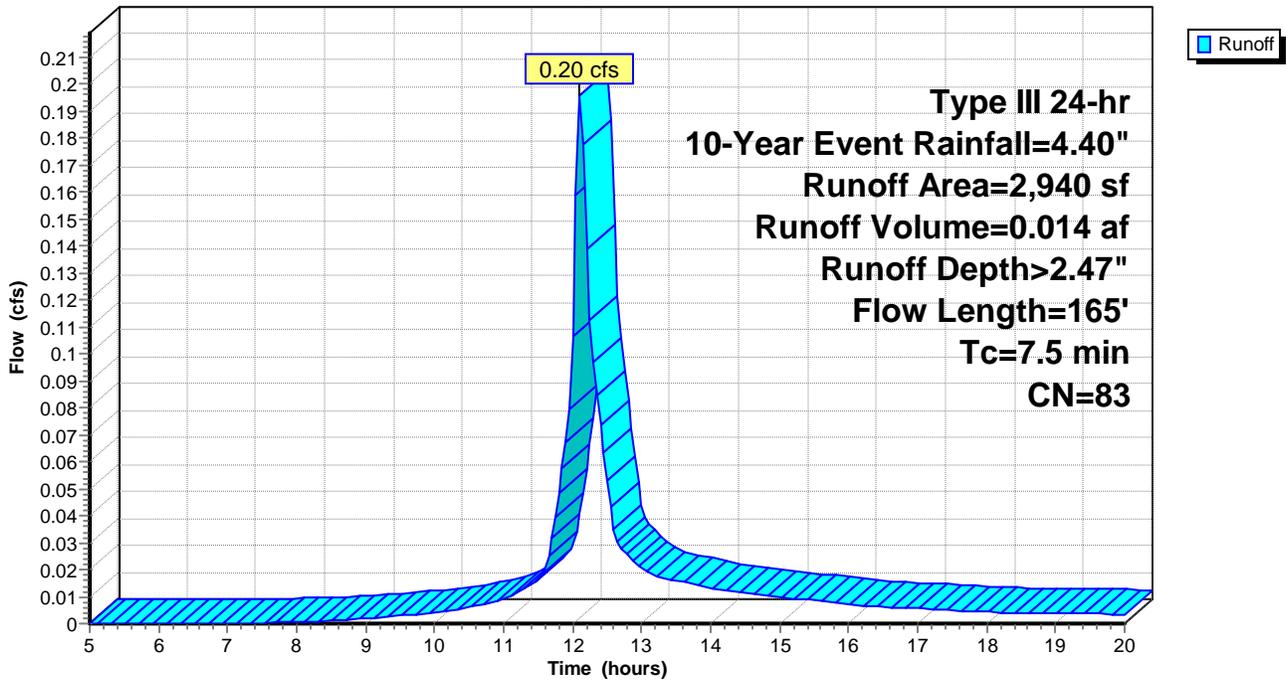
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,115	98	Paved parking, HSG C
1,825	74	>75% Grass cover, Good, HSG C
2,940	83	Weighted Average
1,825		62.07% Pervious Area
1,115		37.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0480	0.23		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.00"
0.4	65	0.0210	2.94		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
7.5	165	Total			

Subcatchment 12S: CW

Hydrograph



Summary for Subcatchment 13S: CW

Runoff = 0.45 cfs @ 12.02 hrs, Volume= 0.028 af, Depth> 2.74"

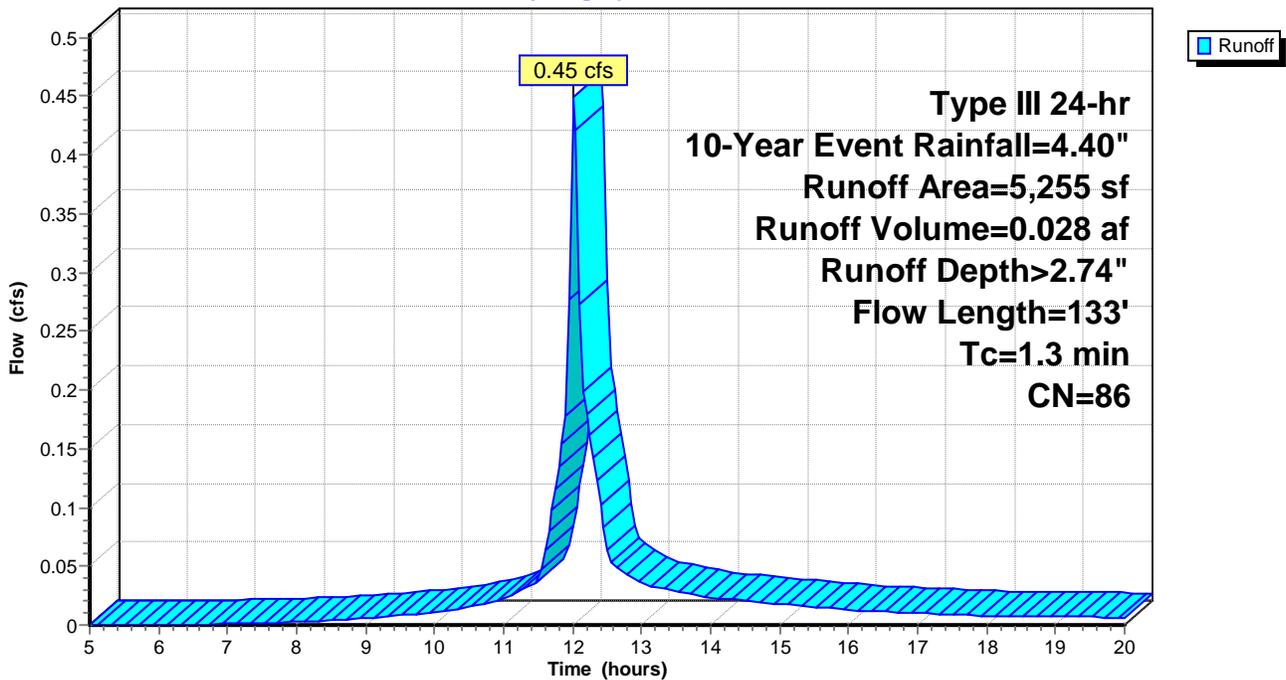
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,635	98	Paved parking, HSG C
2,620	74	>75% Grass cover, Good, HSG C
5,255	86	Weighted Average
2,620		49.86% Pervious Area
2,635		50.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	25	0.1000	1.92		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.9	75	0.0233	1.34		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.2	33	0.0303	2.61		Shallow Concentrated Flow, CD Grassed Waterway Kv= 15.0 fps
1.3	133	Total			

Subcatchment 13S: CW

Hydrograph



Summary for Subcatchment 14S: CW

Runoff = 0.11 cfs @ 12.01 hrs, Volume= 0.007 af, Depth> 3.87"

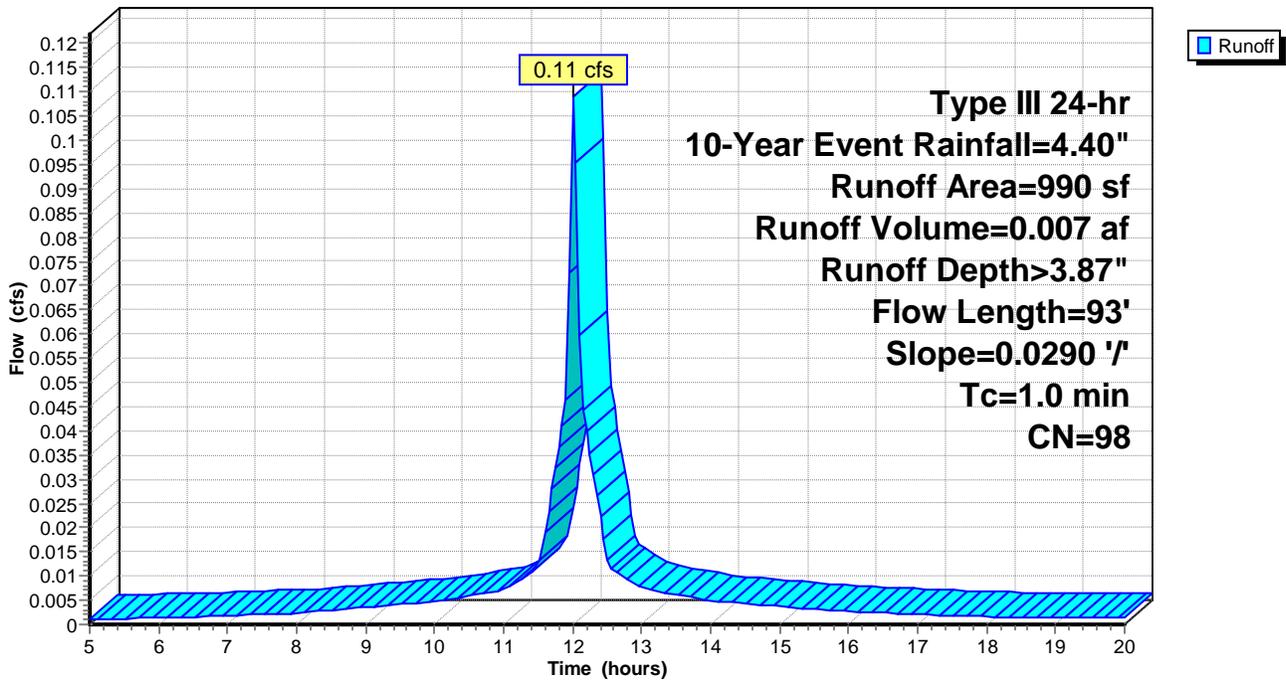
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
990	98	Paved parking, HSG C
990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0290	1.52		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 14S: CW

Hydrograph

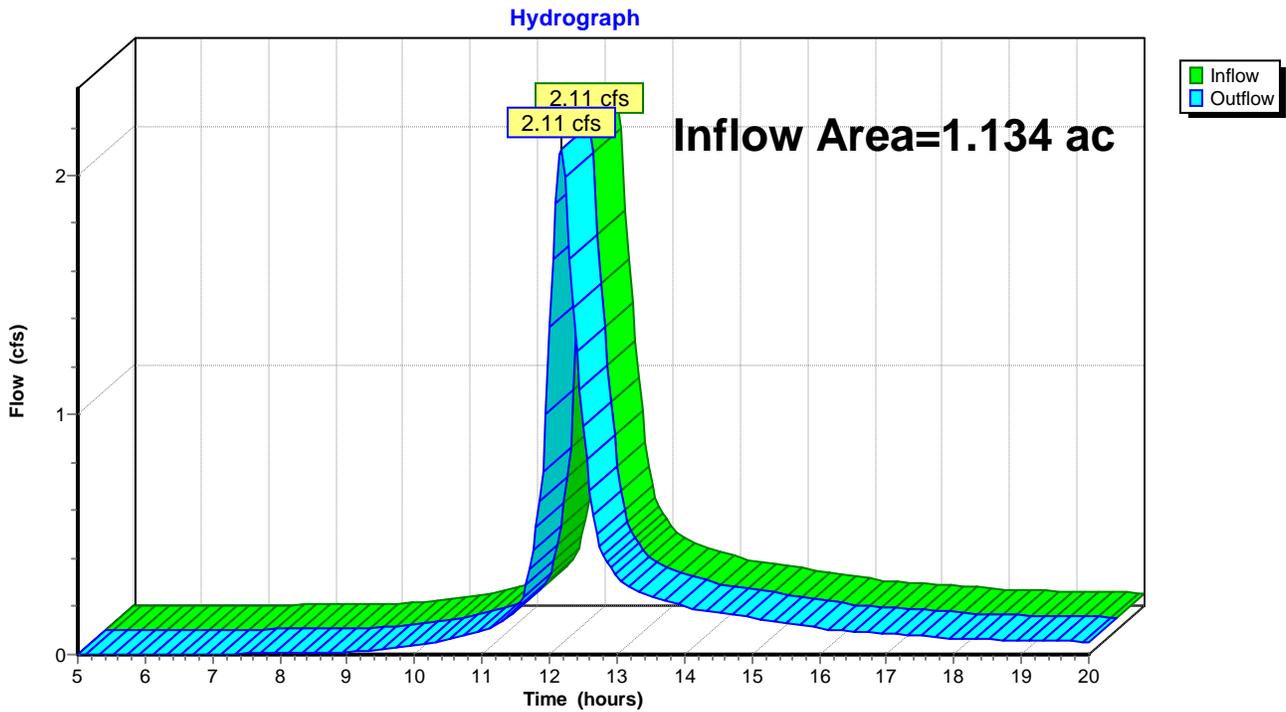


Summary for Reach SP1: Study Point #1

Inflow Area = 1.134 ac, 18.69% Impervious, Inflow Depth > 2.06" for 10-Year Event event
Inflow = 2.11 cfs @ 12.18 hrs, Volume= 0.194 af
Outflow = 2.11 cfs @ 12.18 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1



Charlie's CW PRE-Development

Type III 24-hr 25-Year Event Rainfall=5.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW

Runoff Area=40,200 sf 11.17% Impervious Runoff Depth>2.43"
Flow Length=164' Tc=13.2 min CN=76 Runoff=2.22 cfs 0.187 af

Subcatchment 12S: CW

Runoff Area=2,940 sf 37.93% Impervious Runoff Depth>3.06"
Flow Length=165' Tc=7.5 min CN=83 Runoff=0.24 cfs 0.017 af

Subcatchment 13S: CW

Runoff Area=5,255 sf 50.14% Impervious Runoff Depth>3.36"
Flow Length=133' Tc=1.3 min CN=86 Runoff=0.55 cfs 0.034 af

Subcatchment 14S: CW

Runoff Area=990 sf 100.00% Impervious Runoff Depth>4.51"
Flow Length=93' Slope=0.0290 1' Tc=1.0 min CN=98 Runoff=0.13 cfs 0.009 af

Reach SP1: Study Point #1

Inflow=2.68 cfs 0.246 af
Outflow=2.68 cfs 0.246 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.246 af Average Runoff Depth = 2.61"
81.31% Pervious = 0.922 ac 18.69% Impervious = 0.212 ac

Summary for Subcatchment 11S: CW

Runoff = 2.22 cfs @ 12.19 hrs, Volume= 0.187 af, Depth> 2.43"

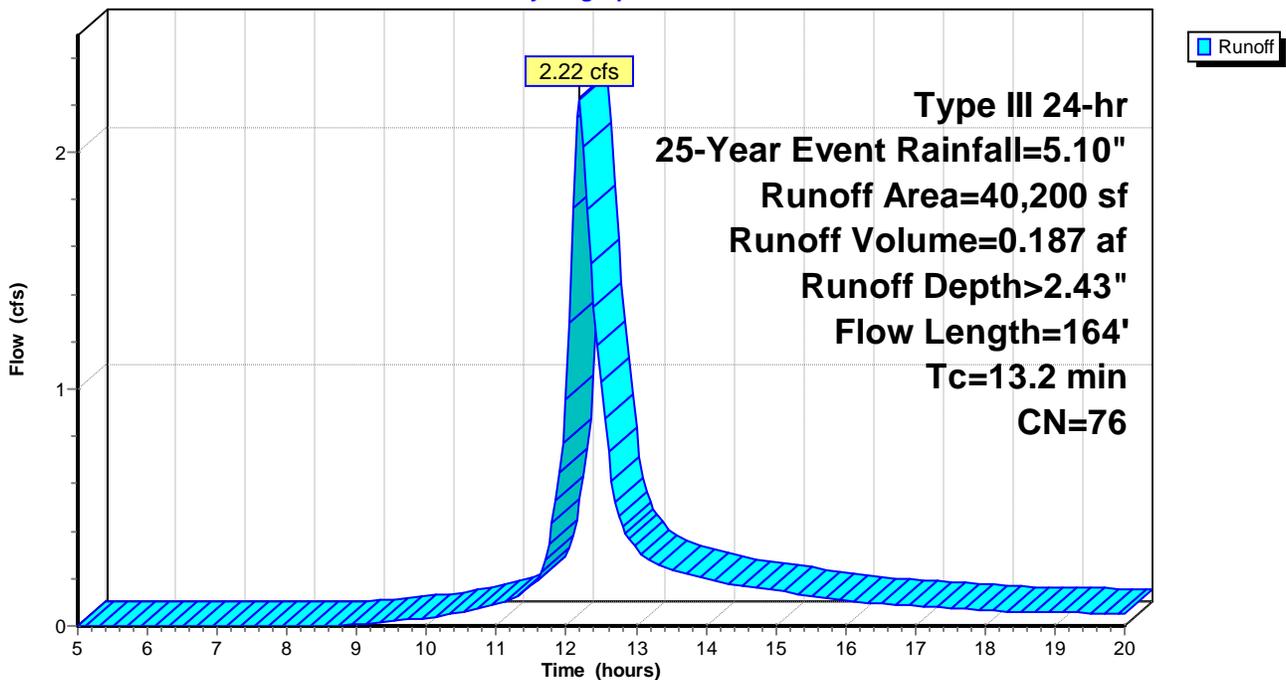
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,490	98	Paved parking, HSG C
27,105	74	>75% Grass cover, Good, HSG C
8,605	70	Woods, Good, HSG C
40,200	76	Weighted Average
35,710		88.83% Pervious Area
4,490		11.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	92	0.0652	0.12		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	72	0.0833	4.33		Shallow Concentrated Flow, BC
					Grassed Waterway Kv= 15.0 fps
13.2	164	Total			

Subcatchment 11S: CW

Hydrograph



Summary for Subcatchment 12S: CW

Runoff = 0.24 cfs @ 12.11 hrs, Volume= 0.017 af, Depth> 3.06"

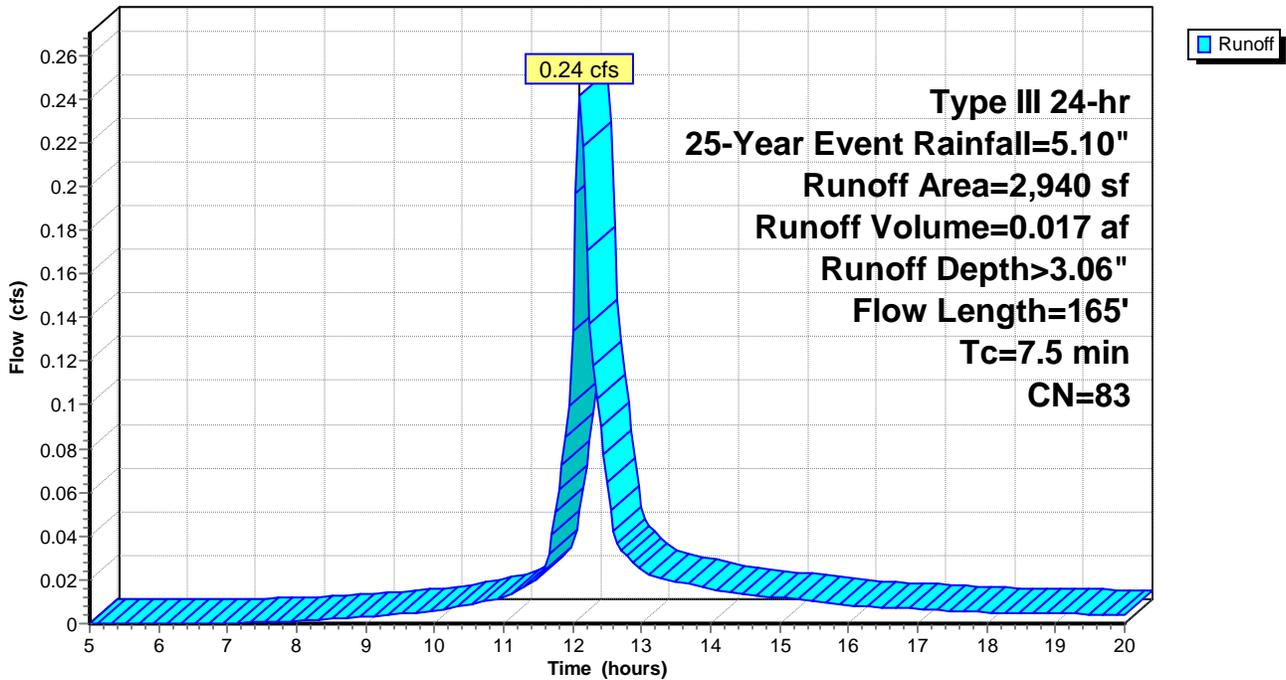
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,115	98	Paved parking, HSG C
1,825	74	>75% Grass cover, Good, HSG C
2,940	83	Weighted Average
1,825		62.07% Pervious Area
1,115		37.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0480	0.23		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.4	65	0.0210	2.94		Shallow Concentrated Flow, BC Paved Kv= 20.3 fps
7.5	165	Total			

Subcatchment 12S: CW

Hydrograph



Summary for Subcatchment 13S: CW

Runoff = 0.55 cfs @ 12.02 hrs, Volume= 0.034 af, Depth> 3.36"

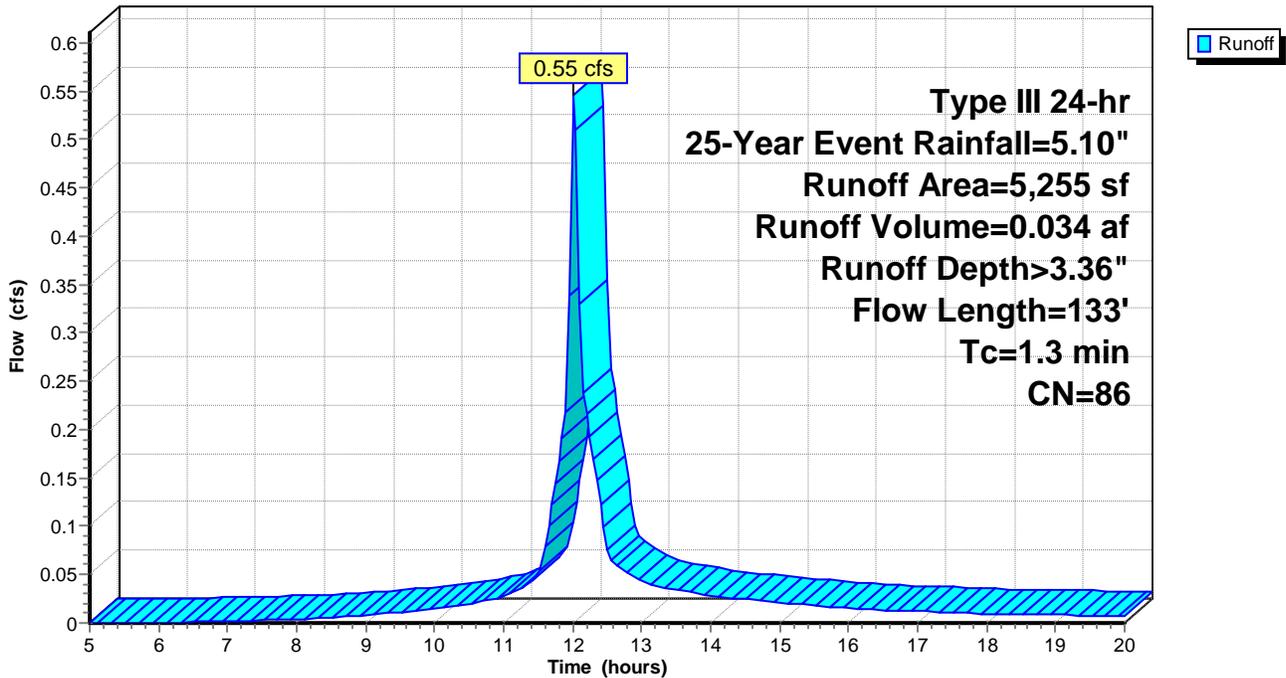
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,635	98	Paved parking, HSG C
2,620	74	>75% Grass cover, Good, HSG C
5,255	86	Weighted Average
2,620		49.86% Pervious Area
2,635		50.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	25	0.1000	1.92		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.9	75	0.0233	1.34		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.2	33	0.0303	2.61		Shallow Concentrated Flow, CD Grassed Waterway Kv= 15.0 fps
1.3	133	Total			

Subcatchment 13S: CW

Hydrograph



Summary for Subcatchment 14S: CW

Runoff = 0.13 cfs @ 12.01 hrs, Volume= 0.009 af, Depth> 4.51"

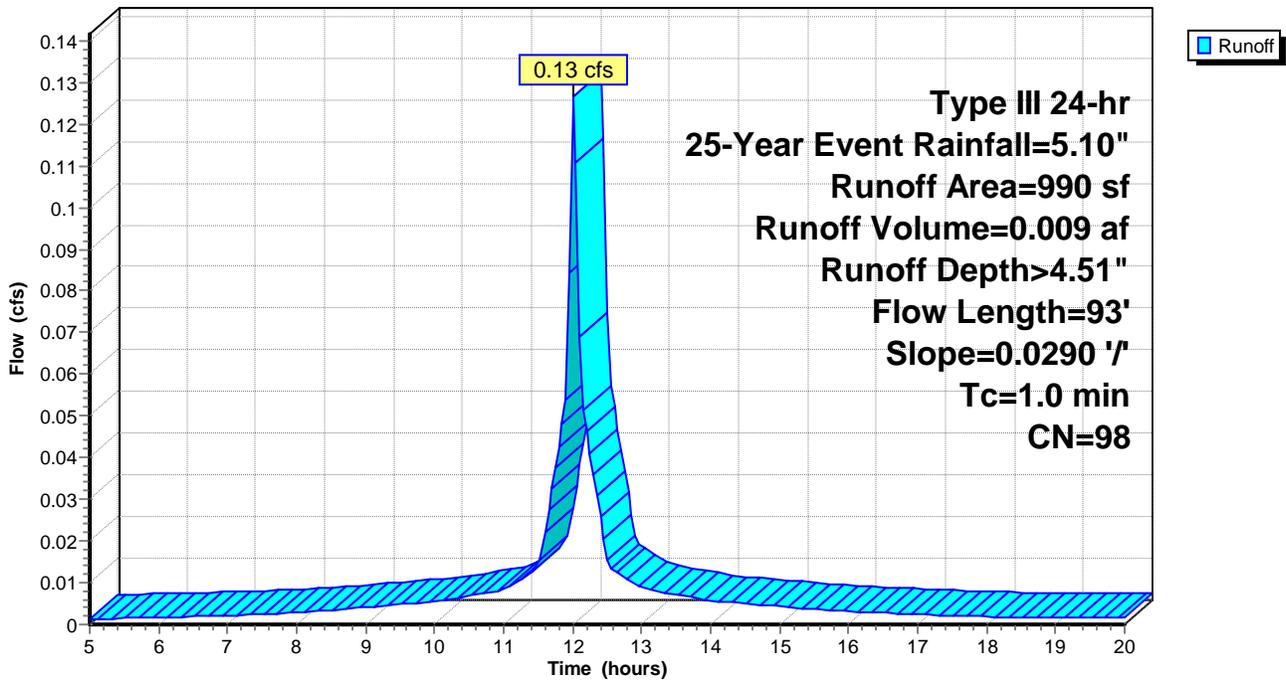
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
990	98	Paved parking, HSG C
990		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0290	1.52		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 14S: CW

Hydrograph

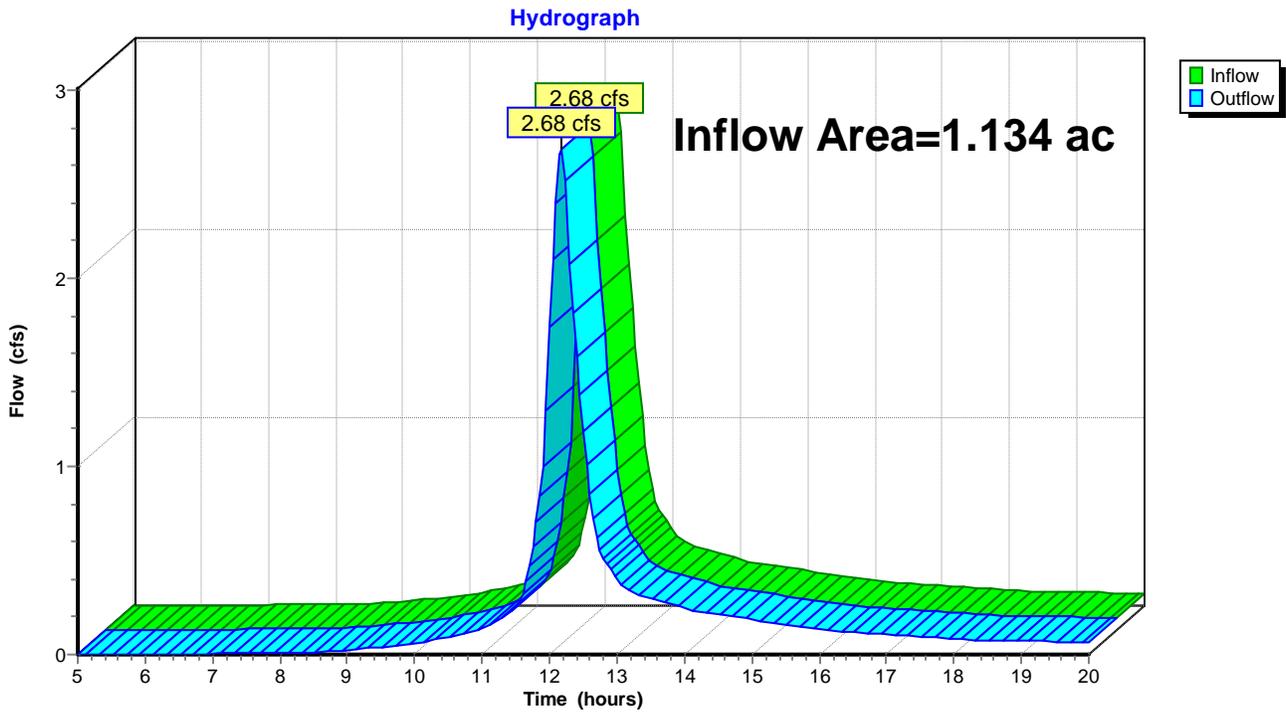


Summary for Reach SP1: Study Point #1

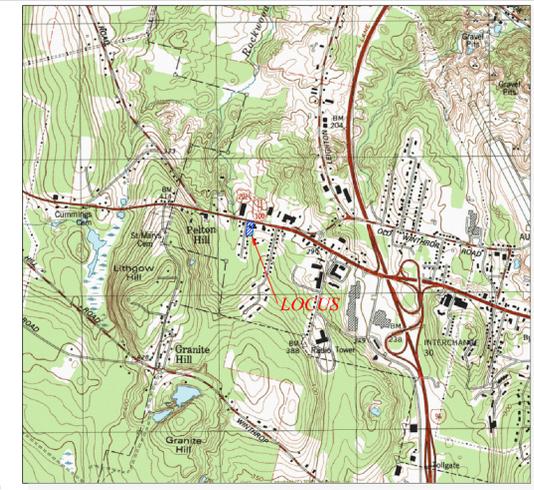
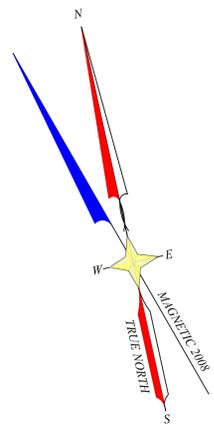
Inflow Area = 1.134 ac, 18.69% Impervious, Inflow Depth > 2.61" for 25-Year Event event
Inflow = 2.68 cfs @ 12.17 hrs, Volume= 0.246 af
Outflow = 2.68 cfs @ 12.17 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1



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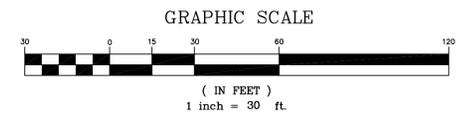
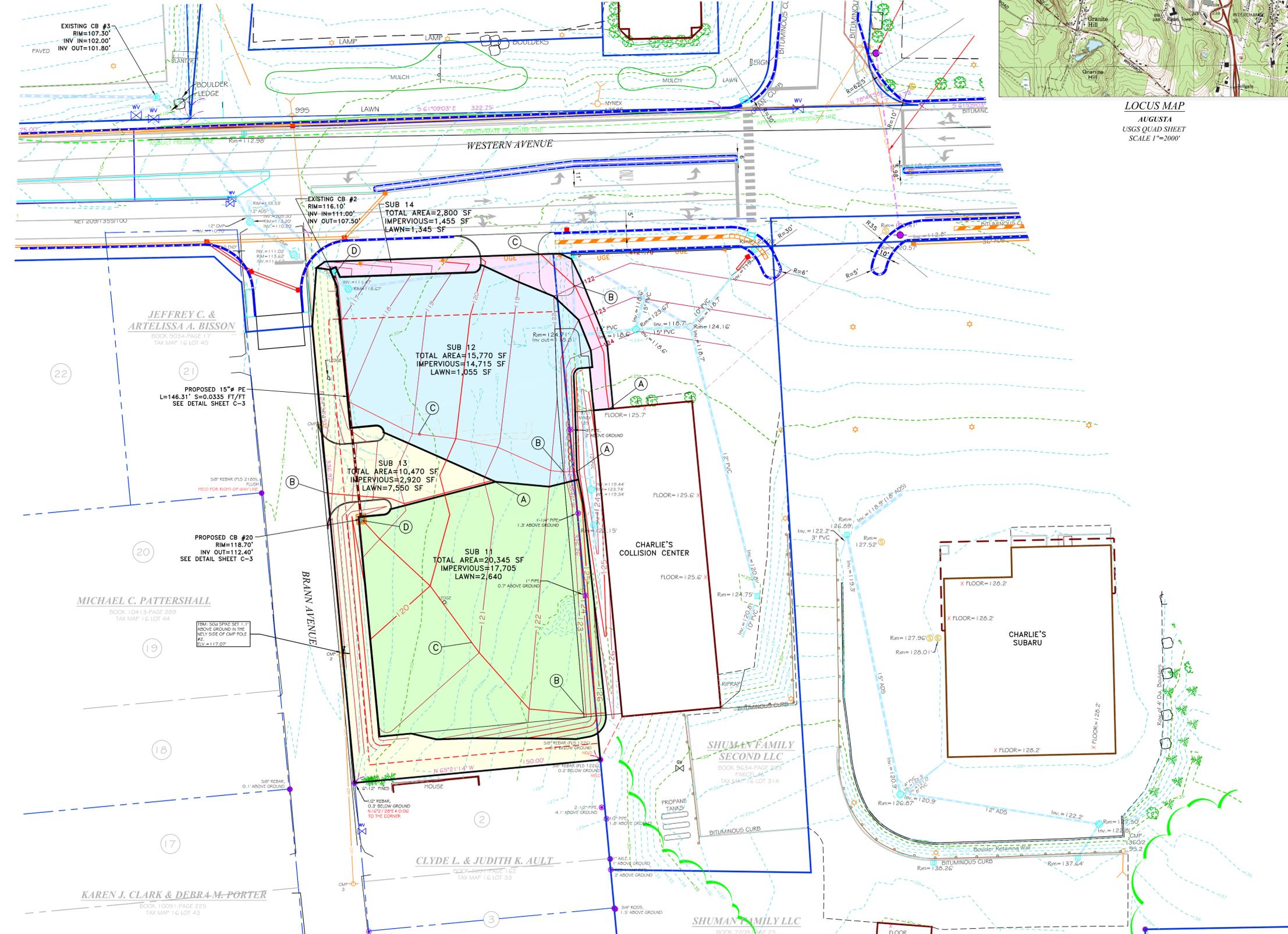
LOCUS MAP
 AUGUSTA
 USGS QUAD SHEET
 SCALE 1"=2000'



E.S. COFFIN
 P.L.L.C.
 ENGINEERING & SURVEYING, INC.
 432 Camp Road, P.O. Box 4087, Augusta, Maine 04330
 Ph: (207) 625-9473 Fax: (207) 625-9002 Toll Free: 1-800-244-0473

LEGEND

- IRON ROD FOUND
- IRON PIPE FOUND
- UTILITY POLE
- GUY ANCHOR
- OVERHEAD UTILITY LINE
- BELOW GROUND ELECTRIC LINE
- LIGHT ON CONCRETE BASE
- LIGHT
- HYDRANT
- WATER VALVE
- UNDERGROUND WATER LINE
- SIGN
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SURVEYED LINE
- STOCKADE FENCE
- WIRE FENCE
- GUARDRAIL
- STONE WALL
- CATCH BASIN
- STORM PIPE
- SANITARY MANHOLE
- SANITARY LINE
- SETBACK
- CONIFEROUS TREE
- DECIDUOUS TREE
- VEGETATION
- M.D.O.T. RETAINING WALL (DESIGN)
- M.D.O.T. EDGE OF PAVEMENT (DESIGN)
- M.D.O.T. CATCH BASIN (DESIGN)
- M.D.O.T. STORMWATER PIPE (DESIGN)



NO.	REVISIONS	DATE

CLIENT PROJECT: SHUMAN FAMILY SECOND LLC
 CHARLIE'S SUBARU VEHICLE DISPLAY EXPANSION

LOCATION: 480 WESTERN AVENUE
 TOWN: AUGUSTA COUNTY: KENNEBEC STATE: MAINE

PROJ. NO.: 2011-234

SHEET TITLE: POST-DEVELOPMENT PLAN

SCALE: 1 INCH=30 FEET

DRAWN BY: TCH
CHECKED BY: JEC

DATE: FEBRUARY 6, 2015

POST



CW



CW



Study Point #1



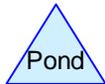
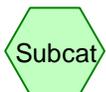
CW



CW



Study Point #2



Routing Diagram for Charlie's CW Post-Development
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Charlie's CW Post-Development

Type III 24-hr 2-Year Event Rainfall=3.00"

Prepared by Microsoft

Printed 2/12/2015

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW Runoff Area=20,345 sf 87.02% Impervious Runoff Depth>2.32"
Flow Length=200' Tc=2.3 min CN=95 Runoff=1.39 cfs 0.090 af

Subcatchment 12S: CW Runoff Area=15,770 sf 93.31% Impervious Runoff Depth>2.41"
Flow Length=225' Tc=2.0 min CN=96 Runoff=1.10 cfs 0.073 af

Subcatchment 13S: CW Runoff Area=10,470 sf 27.89% Impervious Runoff Depth>1.22"
Flow Length=102' Slope=0.0529 '/ Tc=0.9 min CN=81 Runoff=0.41 cfs 0.024 af

Subcatchment 14S: CW Runoff Area=2,800 sf 51.96% Impervious Runoff Depth>1.55"
Flow Length=107' Tc=0.8 min CN=86 Runoff=0.14 cfs 0.008 af

Reach SP1: Study Point #1 Inflow=0.55 cfs 0.033 af
Outflow=0.55 cfs 0.033 af

Reach SP2: Study Point #2 Inflow=2.49 cfs 0.163 af
Outflow=2.49 cfs 0.163 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.196 af Average Runoff Depth = 2.07"
25.49% Pervious = 0.289 ac 74.51% Impervious = 0.845 ac

Charlie's CW Post-Development

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Type III 24-hr 2-Year Event Rainfall=3.00"

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Summary for Subcatchment 11S: CW

Runoff = 1.39 cfs @ 12.04 hrs, Volume= 0.090 af, Depth> 2.32"

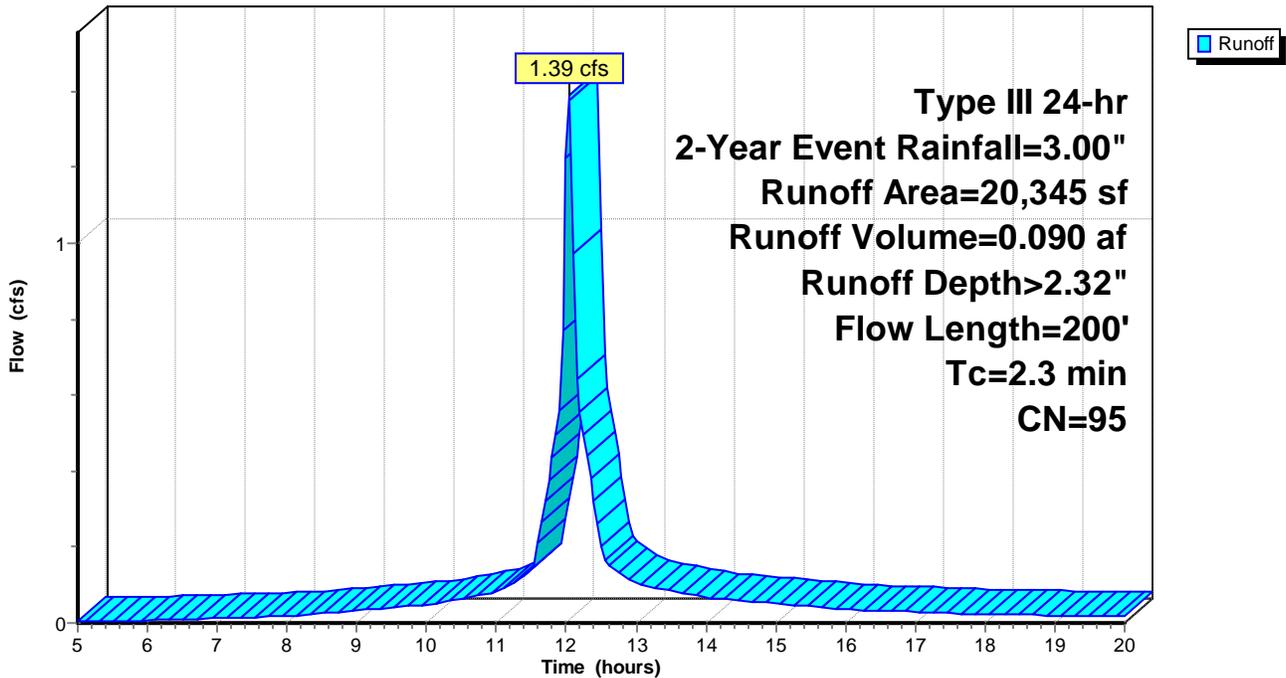
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
17,705	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
20,345	95	Weighted Average
2,640		12.98% Pervious Area
17,705		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	13	0.3333	0.34		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	87	0.0230	1.37		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.6	100	0.0200	2.87		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
2.3	200	Total			

Subcatchment 11S: CW

Hydrograph



Charlie's CW Post-Development

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Type III 24-hr 2-Year Event Rainfall=3.00"

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Summary for Subcatchment 12S: CW

Runoff = 1.10 cfs @ 12.03 hrs, Volume= 0.073 af, Depth> 2.41"

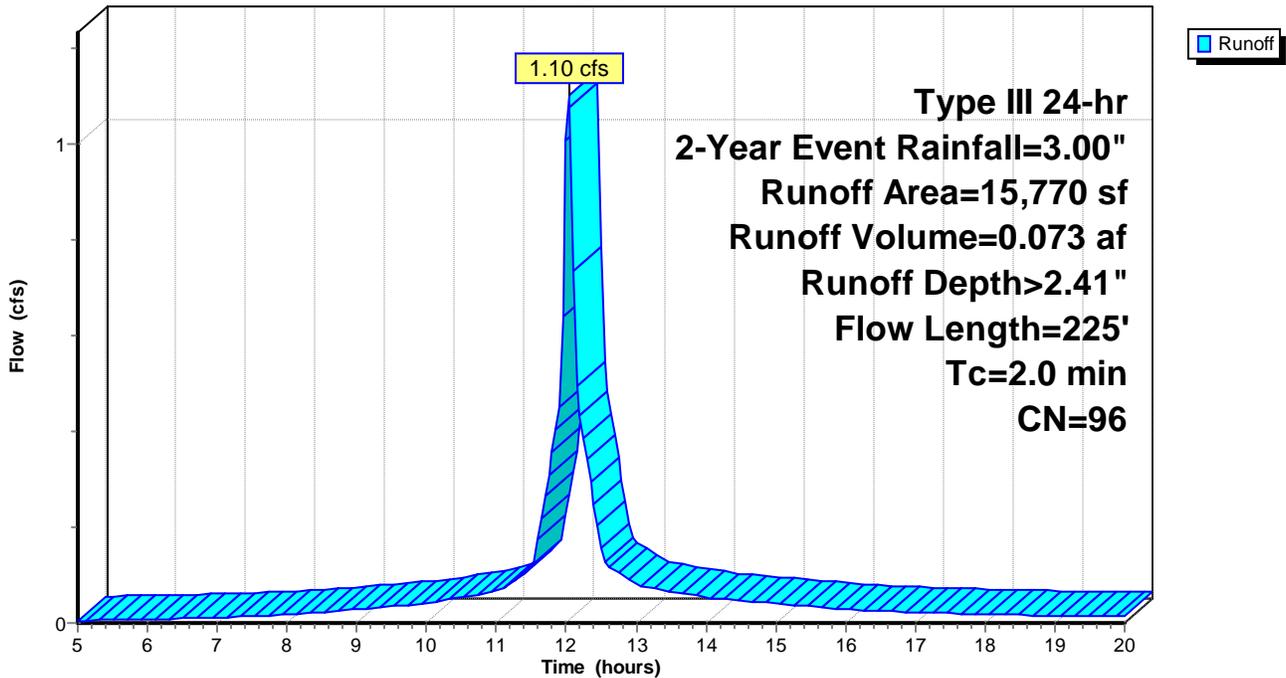
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
14,715	98	Paved parking, HSG C
1,055	74	>75% Grass cover, Good, HSG C
15,770	96	Weighted Average
1,055		6.69% Pervious Area
14,715		93.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	8	0.3333	0.31		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.9	92	0.0402	1.73		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.7	125	0.0240	3.14		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
2.0	225	Total			

Subcatchment 12S: CW

Hydrograph



Charlie's CW Post-Development

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Type III 24-hr 2-Year Event Rainfall=3.00"

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Summary for Subcatchment 13S: CW

Runoff = 0.41 cfs @ 12.02 hrs, Volume= 0.024 af, Depth> 1.22"

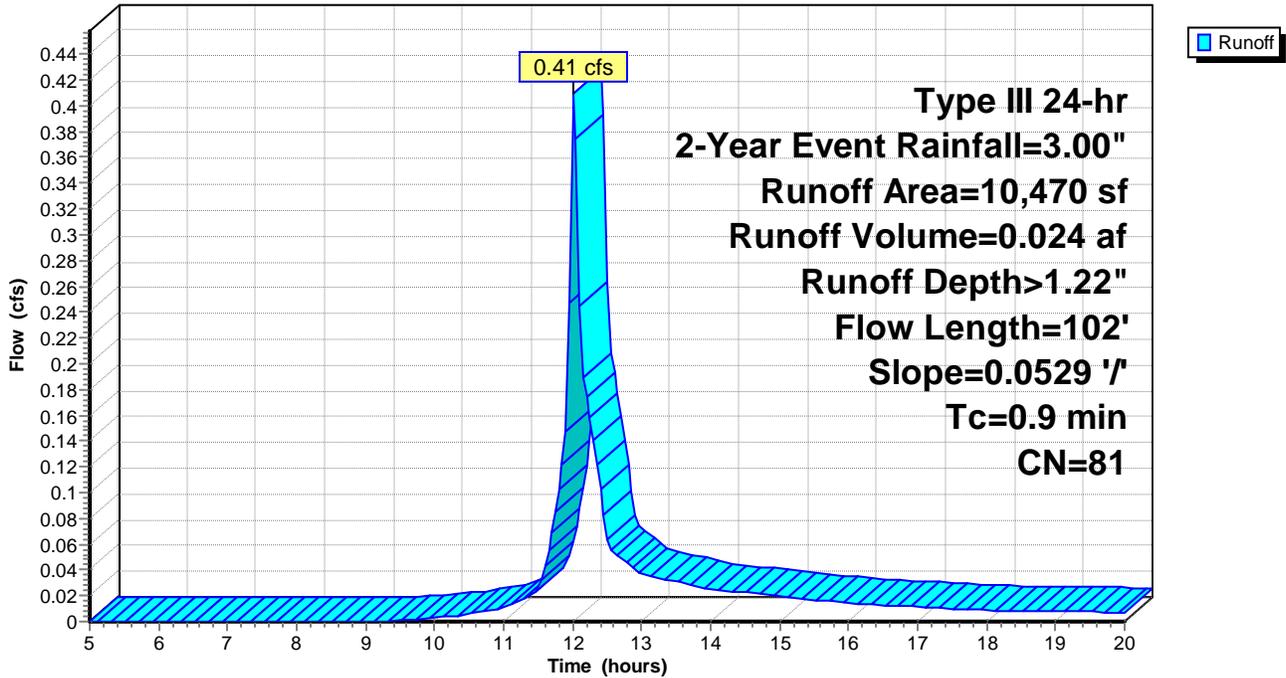
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,920	98	Paved parking, HSG C
7,550	74	>75% Grass cover, Good, HSG C
10,470	81	Weighted Average
7,550		72.11% Pervious Area
2,920		27.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	102	0.0529	1.97		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 13S: CW

Hydrograph



Charlie's CW Post-Development

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Type III 24-hr 2-Year Event Rainfall=3.00"

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Summary for Subcatchment 14S: CW

Runoff = 0.14 cfs @ 12.01 hrs, Volume= 0.008 af, Depth> 1.55"

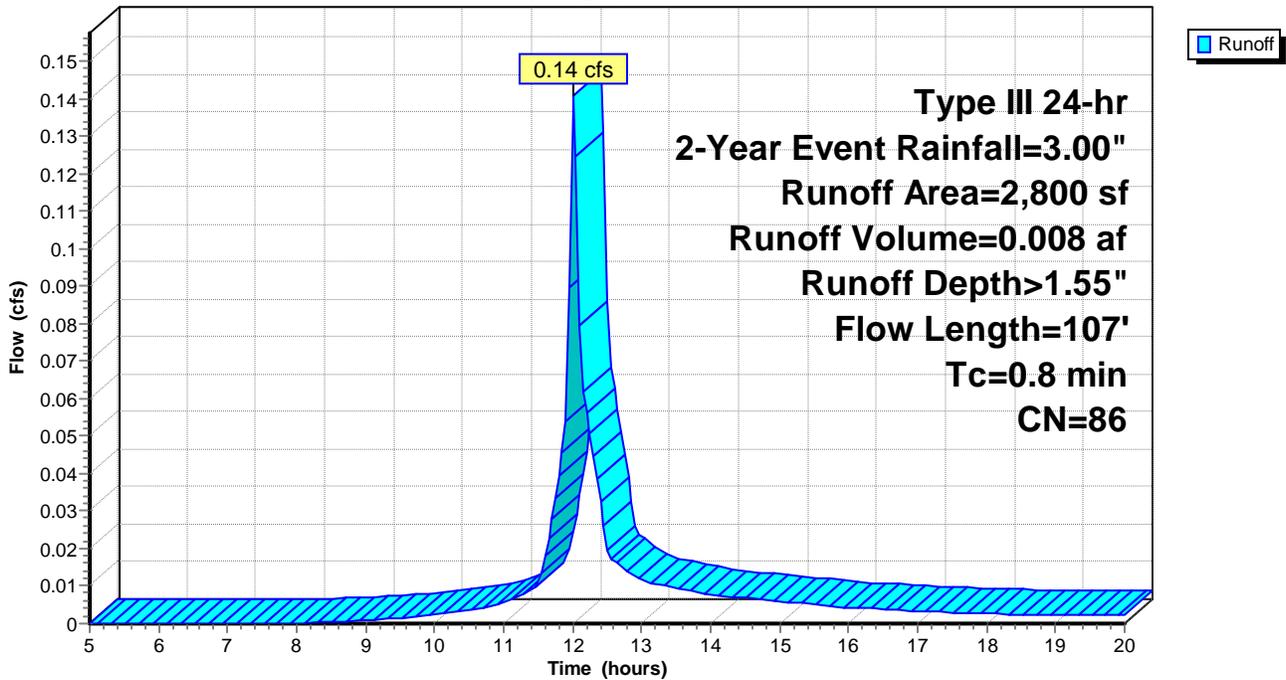
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,455	98	Paved parking, HSG C
1,345	74	>75% Grass cover, Good, HSG C
2,800	86	Weighted Average
1,345		48.04% Pervious Area
1,455		51.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	79	0.0468	1.79		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.1	28	0.0464	3.23		Shallow Concentrated Flow, BC Grassed Waterway Kv= 15.0 fps
0.8	107	Total			

Subcatchment 14S: CW

Hydrograph

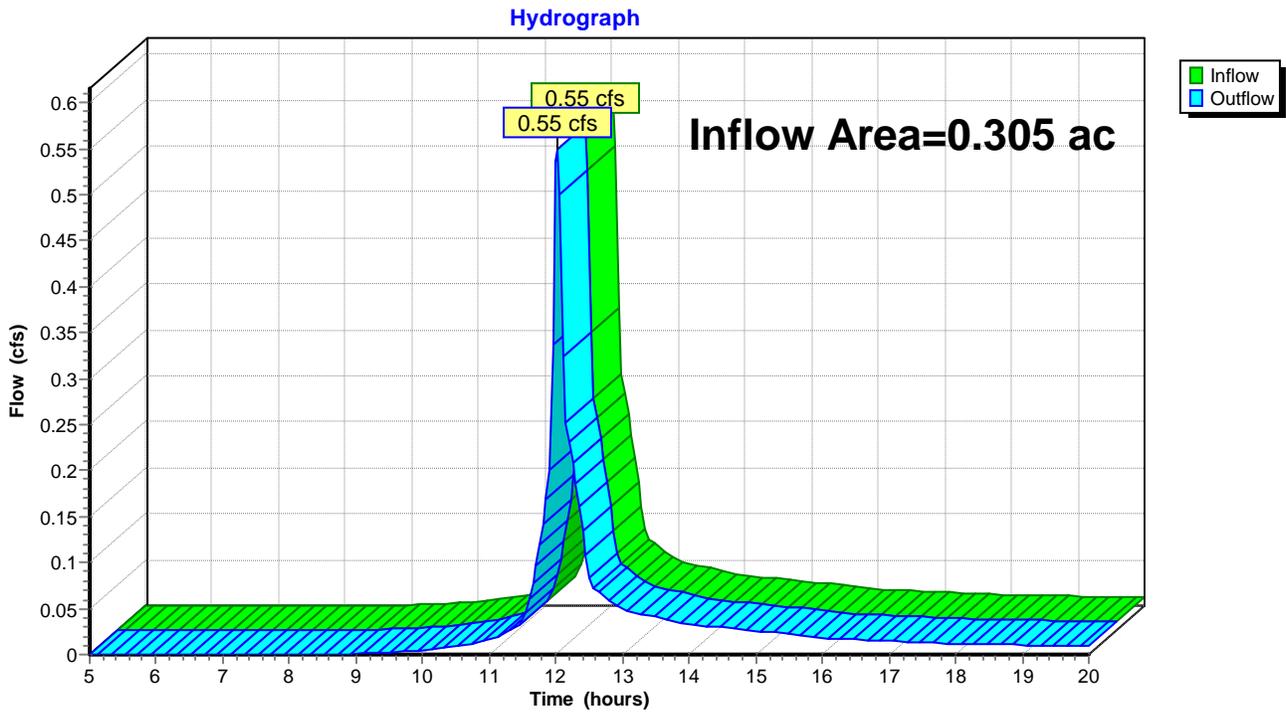


Summary for Reach SP1: Study Point #1

Inflow Area = 0.305 ac, 32.97% Impervious, Inflow Depth > 1.29" for 2-Year Event event
Inflow = 0.55 cfs @ 12.02 hrs, Volume= 0.033 af
Outflow = 0.55 cfs @ 12.02 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1

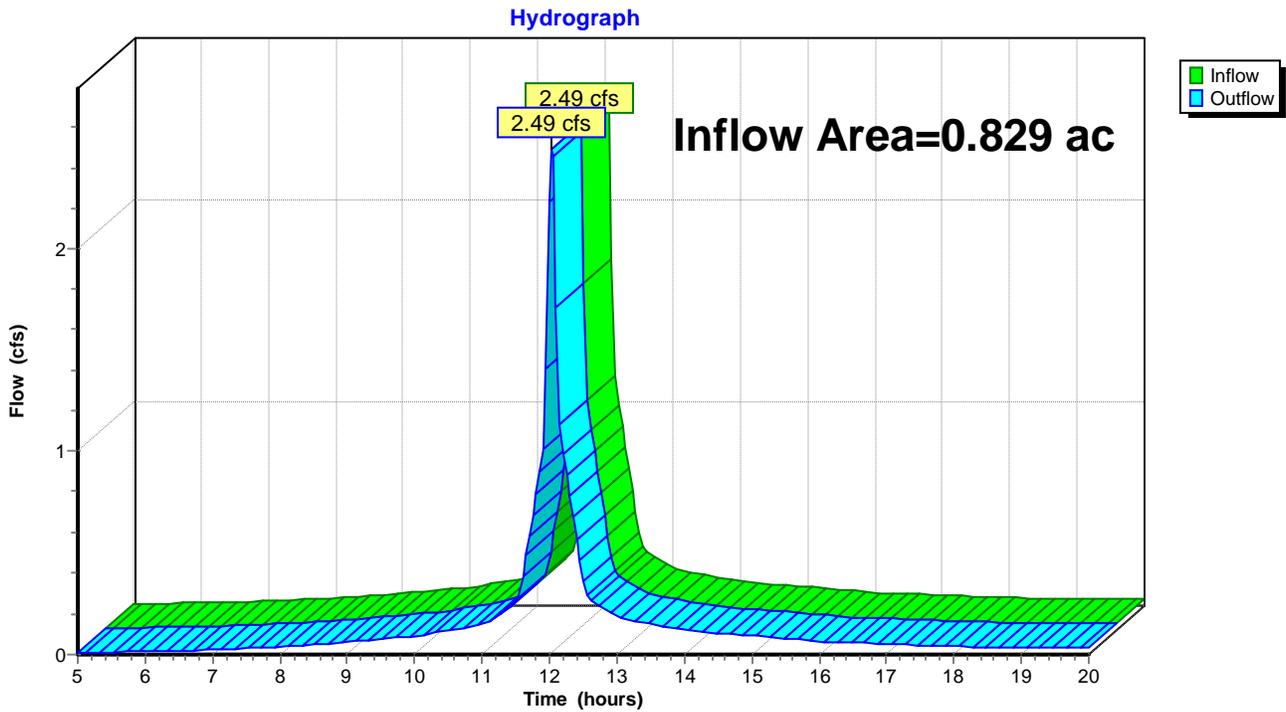


Summary for Reach SP2: Study Point #2

Inflow Area = 0.829 ac, 89.77% Impervious, Inflow Depth > 2.36" for 2-Year Event event
Inflow = 2.49 cfs @ 12.04 hrs, Volume= 0.163 af
Outflow = 2.49 cfs @ 12.04 hrs, Volume= 0.163 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP2: Study Point #2



Charlie's CW Post-Development

Type III 24-hr 10-Year Event Rainfall=4.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW Runoff Area=20,345 sf 87.02% Impervious Runoff Depth>3.61"
Flow Length=200' Tc=2.3 min CN=95 Runoff=2.11 cfs 0.140 af

Subcatchment 12S: CW Runoff Area=15,770 sf 93.31% Impervious Runoff Depth>3.70"
Flow Length=225' Tc=2.0 min CN=96 Runoff=1.66 cfs 0.112 af

Subcatchment 13S: CW Runoff Area=10,470 sf 27.89% Impervious Runoff Depth>2.30"
Flow Length=102' Slope=0.0529 '/ Tc=0.9 min CN=81 Runoff=0.78 cfs 0.046 af

Subcatchment 14S: CW Runoff Area=2,800 sf 51.96% Impervious Runoff Depth>2.74"
Flow Length=107' Tc=0.8 min CN=86 Runoff=0.24 cfs 0.015 af

Reach SP1: Study Point #1 Inflow=1.02 cfs 0.061 af
Outflow=1.02 cfs 0.061 af

Reach SP2: Study Point #2 Inflow=3.76 cfs 0.252 af
Outflow=3.76 cfs 0.252 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.313 af Average Runoff Depth = 3.31"
25.49% Pervious = 0.289 ac 74.51% Impervious = 0.845 ac

Charlie's CW Post-Development

Type III 24-hr 10-Year Event Rainfall=4.40"

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Summary for Subcatchment 11S: CW

Runoff = 2.11 cfs @ 12.04 hrs, Volume= 0.140 af, Depth> 3.61"

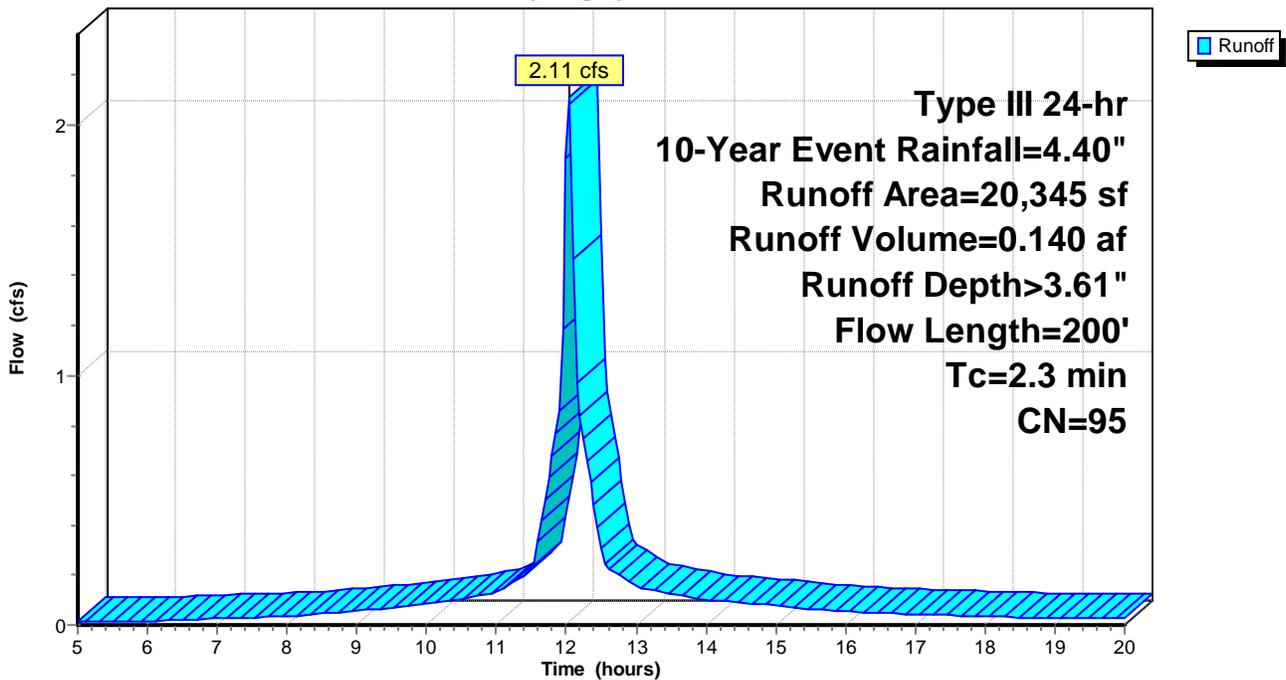
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
17,705	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
20,345	95	Weighted Average
2,640		12.98% Pervious Area
17,705		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	13	0.3333	0.34		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
1.1	87	0.0230	1.37		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.6	100	0.0200	2.87		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
2.3	200	Total			

Subcatchment 11S: CW

Hydrograph



Summary for Subcatchment 12S: CW

Runoff = 1.66 cfs @ 12.03 hrs, Volume= 0.112 af, Depth> 3.70"

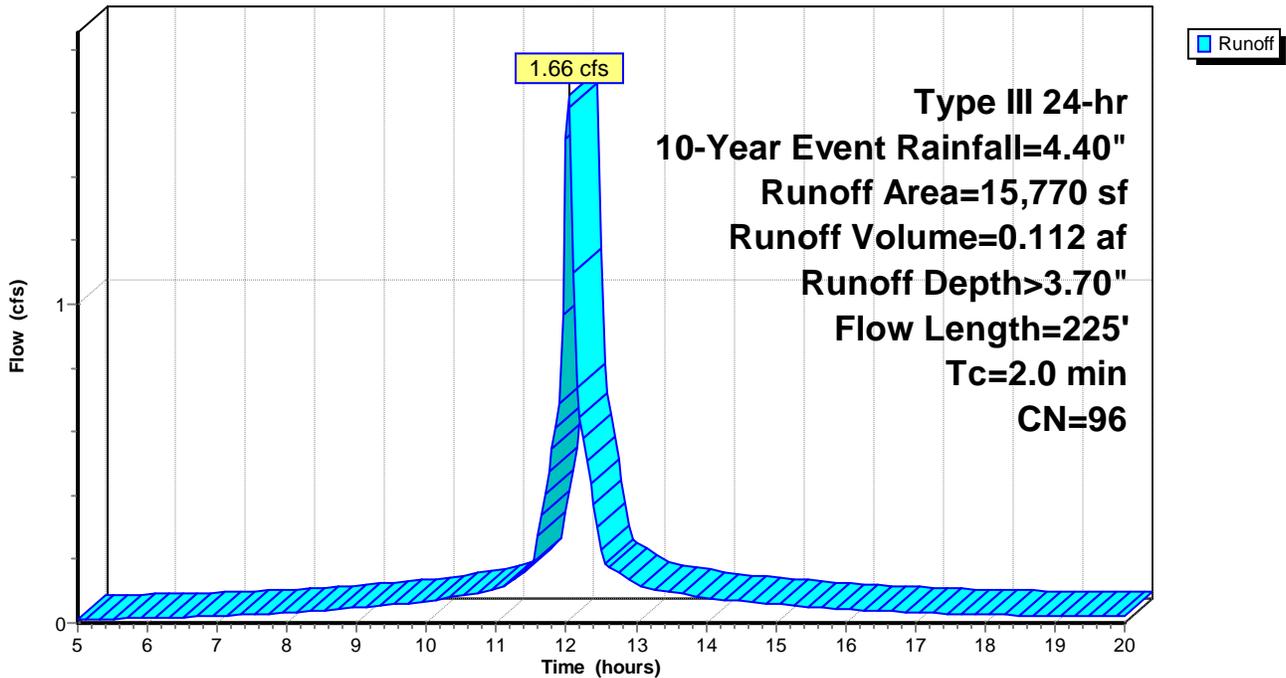
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
14,715	98	Paved parking, HSG C
1,055	74	>75% Grass cover, Good, HSG C
15,770	96	Weighted Average
1,055		6.69% Pervious Area
14,715		93.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	8	0.3333	0.31		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.9	92	0.0402	1.73		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.7	125	0.0240	3.14		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
2.0	225	Total			

Subcatchment 12S: CW

Hydrograph



Charlie's CW Post-Development

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Type III 24-hr 10-Year Event Rainfall=4.40"

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Summary for Subcatchment 13S: CW

Runoff = 0.78 cfs @ 12.02 hrs, Volume= 0.046 af, Depth> 2.30"

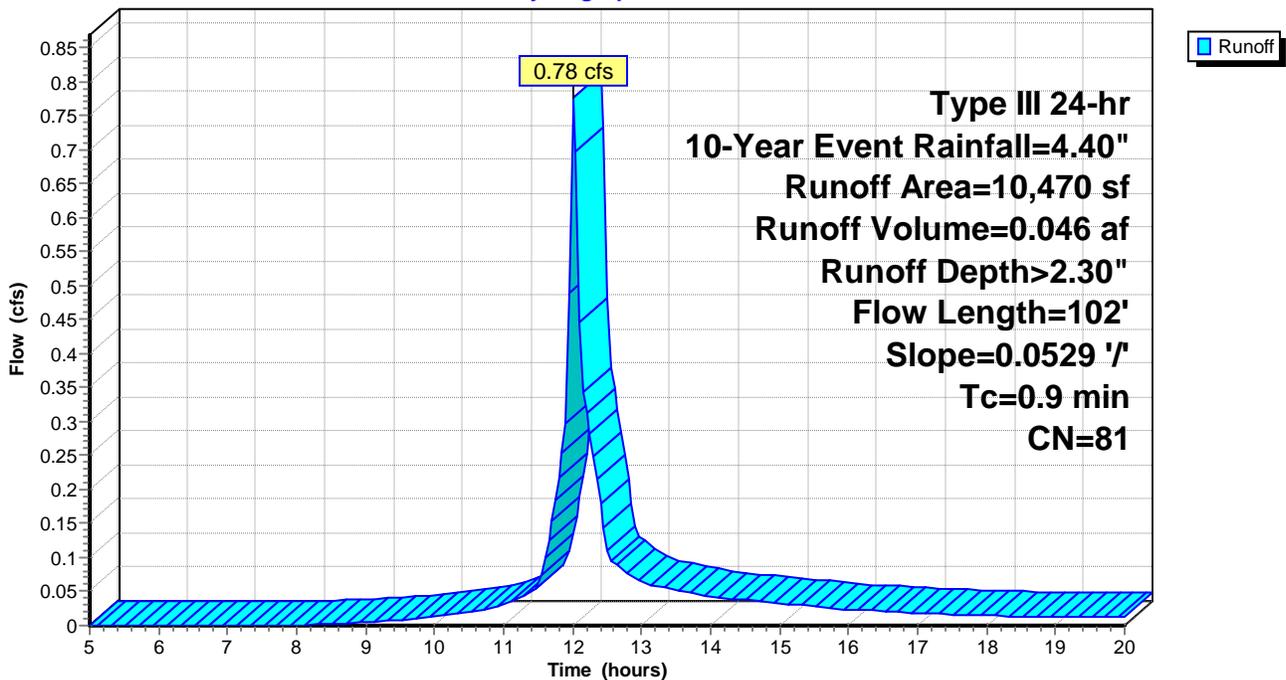
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,920	98	Paved parking, HSG C
7,550	74	>75% Grass cover, Good, HSG C
10,470	81	Weighted Average
7,550		72.11% Pervious Area
2,920		27.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	102	0.0529	1.97		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 13S: CW

Hydrograph



Summary for Subcatchment 14S: CW

Runoff = 0.24 cfs @ 12.01 hrs, Volume= 0.015 af, Depth> 2.74"

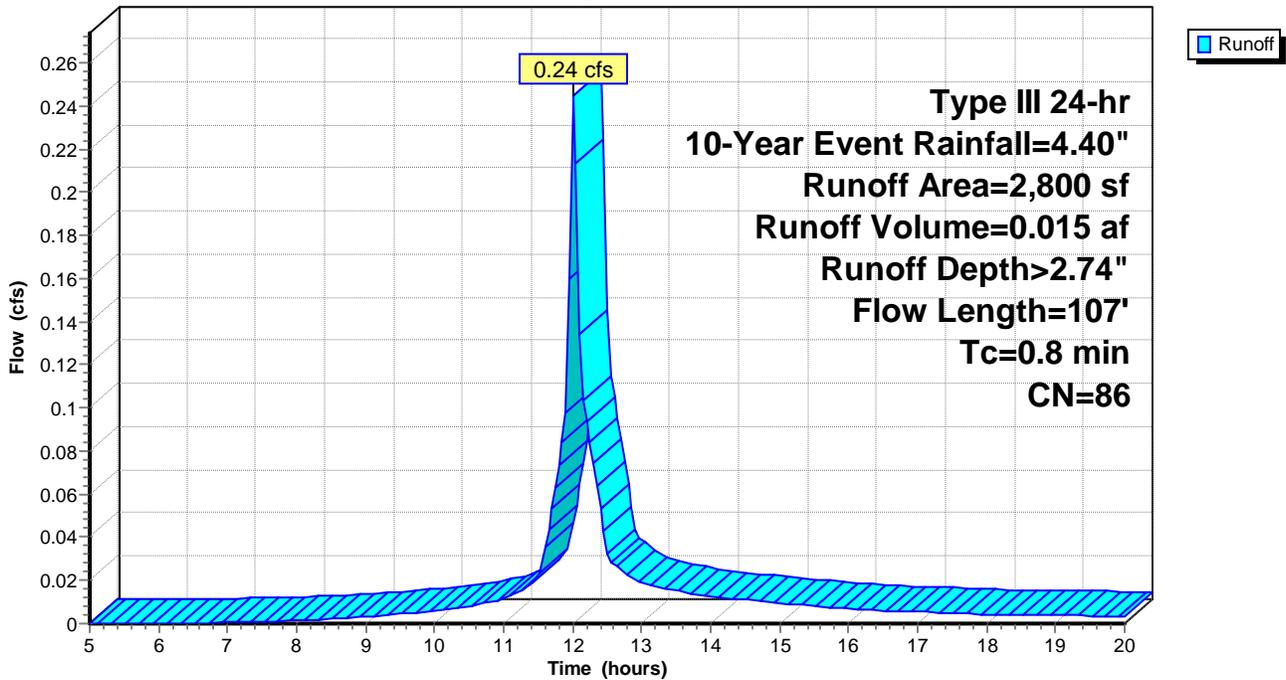
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,455	98	Paved parking, HSG C
1,345	74	>75% Grass cover, Good, HSG C
2,800	86	Weighted Average
1,345		48.04% Pervious Area
1,455		51.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	79	0.0468	1.79		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.1	28	0.0464	3.23		Shallow Concentrated Flow, BC Grassed Waterway Kv= 15.0 fps
0.8	107	Total			

Subcatchment 14S: CW

Hydrograph

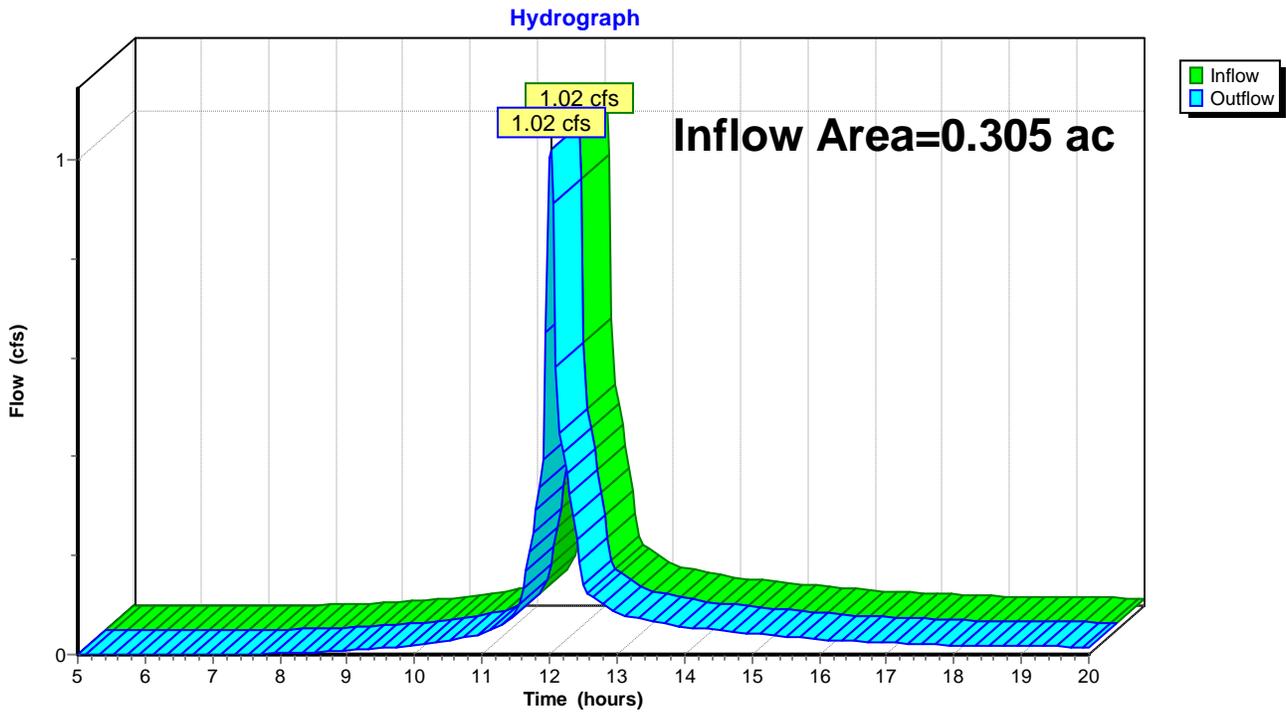


Summary for Reach SP1: Study Point #1

Inflow Area = 0.305 ac, 32.97% Impervious, Inflow Depth > 2.39" for 10-Year Event event
Inflow = 1.02 cfs @ 12.01 hrs, Volume= 0.061 af
Outflow = 1.02 cfs @ 12.01 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1

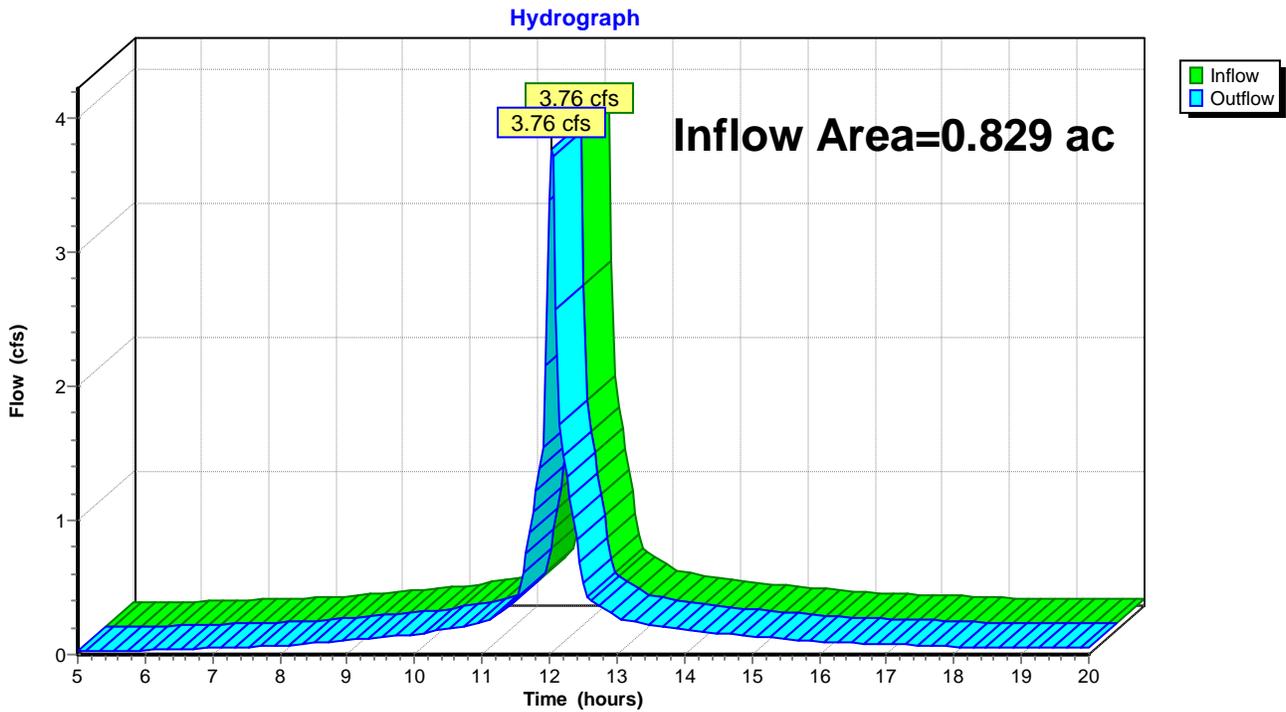


Summary for Reach SP2: Study Point #2

Inflow Area = 0.829 ac, 89.77% Impervious, Inflow Depth > 3.65" for 10-Year Event event
Inflow = 3.76 cfs @ 12.04 hrs, Volume= 0.252 af
Outflow = 3.76 cfs @ 12.04 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP2: Study Point #2



Charlie's CW Post-Development

Type III 24-hr 25-Year Event Rainfall=5.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 11S: CW Runoff Area=20,345 sf 87.02% Impervious Runoff Depth>4.25"
Flow Length=200' Tc=2.3 min CN=95 Runoff=2.47 cfs 0.166 af

Subcatchment 12S: CW Runoff Area=15,770 sf 93.31% Impervious Runoff Depth>4.35"
Flow Length=225' Tc=2.0 min CN=96 Runoff=1.93 cfs 0.131 af

Subcatchment 13S: CW Runoff Area=10,470 sf 27.89% Impervious Runoff Depth>2.88"
Flow Length=102' Slope=0.0529 '/ Tc=0.9 min CN=81 Runoff=0.97 cfs 0.058 af

Subcatchment 14S: CW Runoff Area=2,800 sf 51.96% Impervious Runoff Depth>3.36"
Flow Length=107' Tc=0.8 min CN=86 Runoff=0.30 cfs 0.018 af

Reach SP1: Study Point #1 Inflow=1.26 cfs 0.076 af
Outflow=1.26 cfs 0.076 af

Reach SP2: Study Point #2 Inflow=4.40 cfs 0.297 af
Outflow=4.40 cfs 0.297 af

Total Runoff Area = 1.134 ac Runoff Volume = 0.372 af Average Runoff Depth = 3.94"
25.49% Pervious = 0.289 ac 74.51% Impervious = 0.845 ac

Summary for Subcatchment 11S: CW

Runoff = 2.47 cfs @ 12.04 hrs, Volume= 0.166 af, Depth> 4.25"

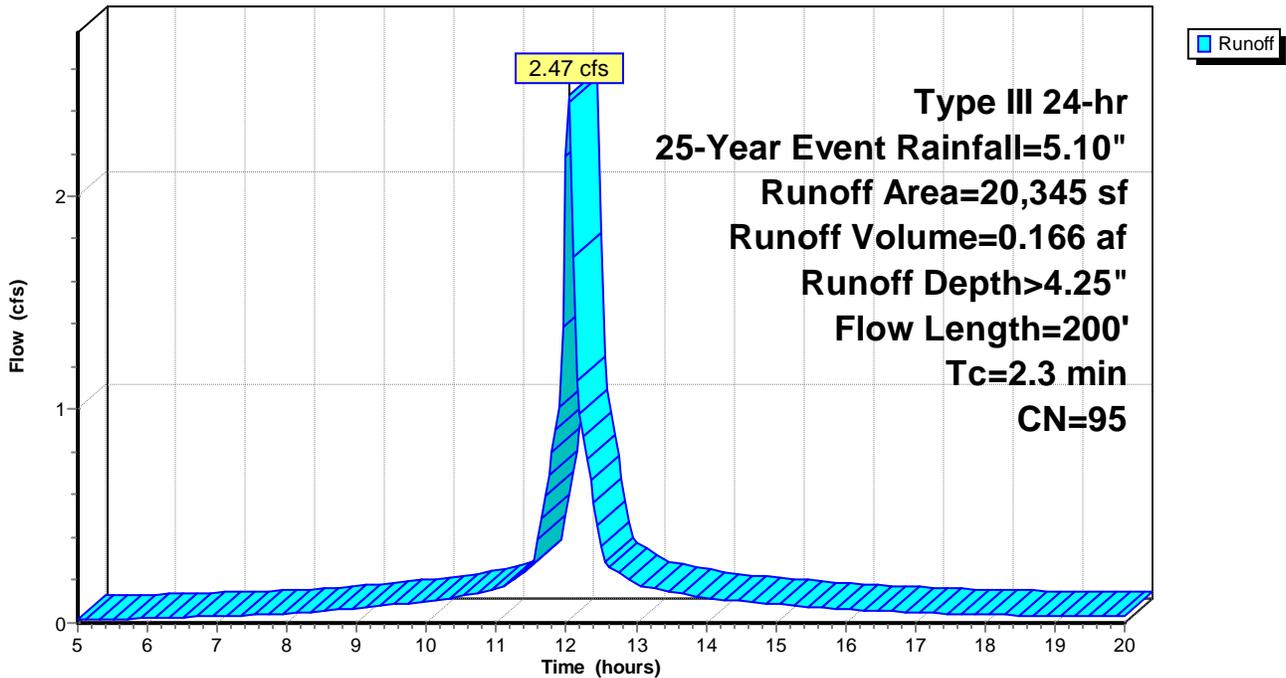
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
17,705	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
20,345	95	Weighted Average
2,640		12.98% Pervious Area
17,705		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	13	0.3333	0.34		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.00"
1.1	87	0.0230	1.37		Sheet Flow, BC
					Smooth surfaces n= 0.011 P2= 3.00"
0.6	100	0.0200	2.87		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
2.3	200	Total			

Subcatchment 11S: CW

Hydrograph



Summary for Subcatchment 12S: CW

Runoff = 1.93 cfs @ 12.03 hrs, Volume= 0.131 af, Depth> 4.35"

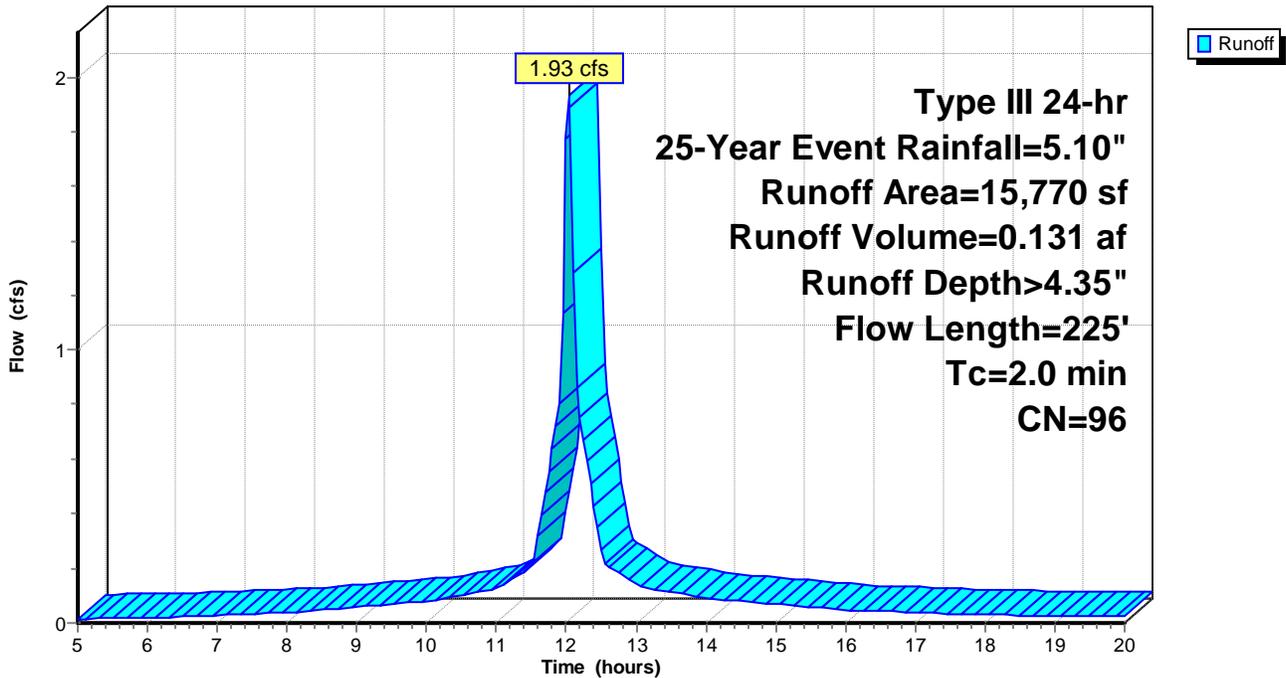
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
14,715	98	Paved parking, HSG C
1,055	74	>75% Grass cover, Good, HSG C
15,770	96	Weighted Average
1,055		6.69% Pervious Area
14,715		93.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	8	0.3333	0.31		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.9	92	0.0402	1.73		Sheet Flow, BC Smooth surfaces n= 0.011 P2= 3.00"
0.7	125	0.0240	3.14		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
2.0	225	Total			

Subcatchment 12S: CW

Hydrograph



Charlie's CW Post-Development

Type III 24-hr 25-Year Event Rainfall=5.10"

Prepared by Microsoft

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Summary for Subcatchment 13S: CW

Runoff = 0.97 cfs @ 12.01 hrs, Volume= 0.058 af, Depth> 2.88"

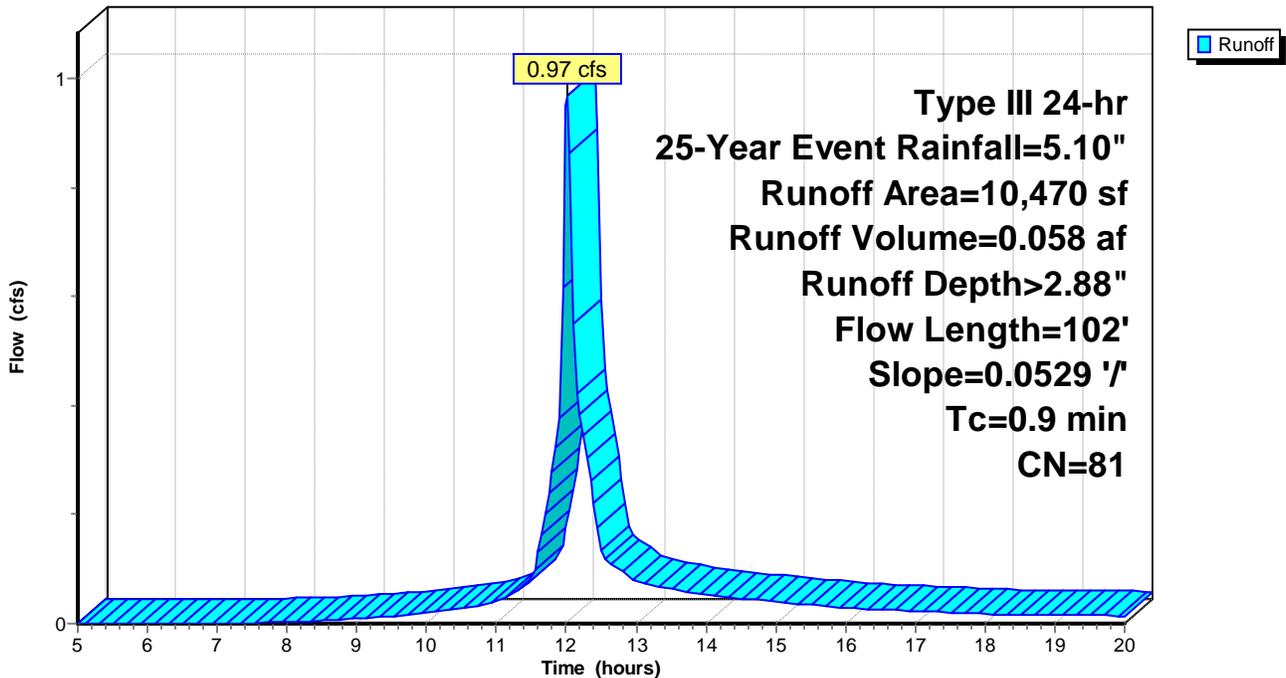
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,920	98	Paved parking, HSG C
7,550	74	>75% Grass cover, Good, HSG C
10,470	81	Weighted Average
7,550		72.11% Pervious Area
2,920		27.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	102	0.0529	1.97		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 13S: CW

Hydrograph



Summary for Subcatchment 14S: CW

Runoff = 0.30 cfs @ 12.01 hrs, Volume= 0.018 af, Depth> 3.36"

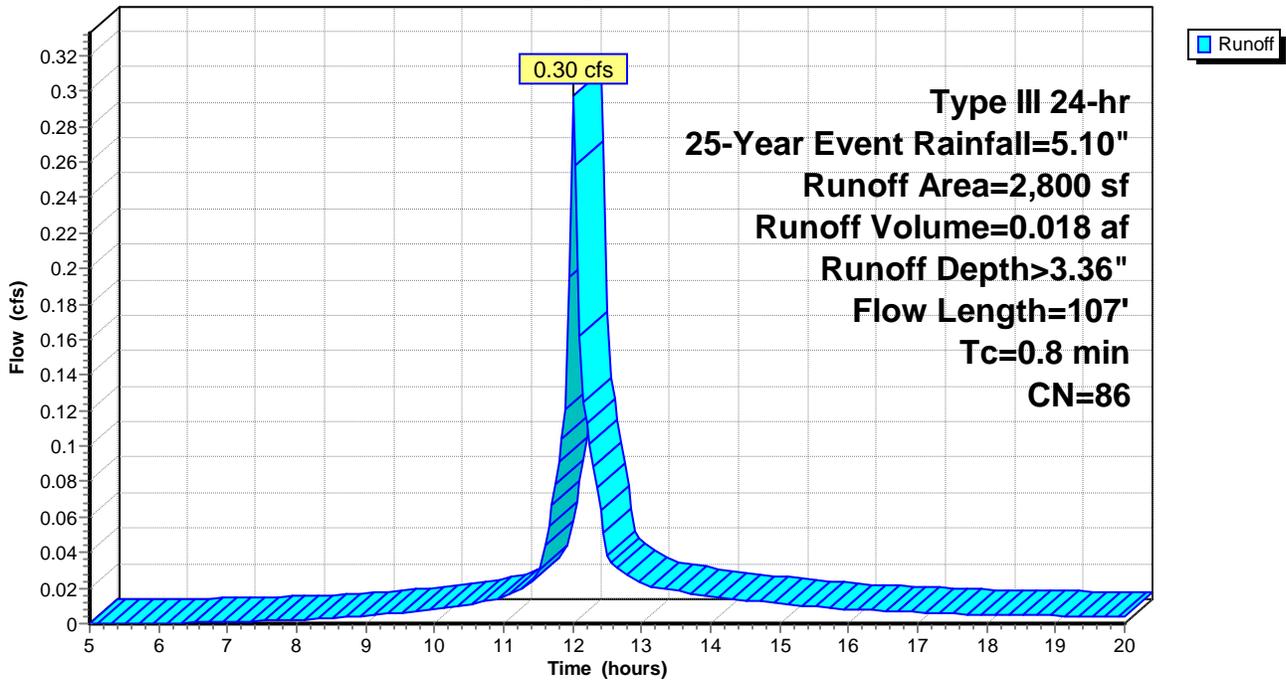
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,455	98	Paved parking, HSG C
1,345	74	>75% Grass cover, Good, HSG C
2,800	86	Weighted Average
1,345		48.04% Pervious Area
1,455		51.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	79	0.0468	1.79		Sheet Flow, AB Smooth surfaces n= 0.011 P2= 3.00"
0.1	28	0.0464	3.23		Shallow Concentrated Flow, BC Grassed Waterway Kv= 15.0 fps
0.8	107	Total			

Subcatchment 14S: CW

Hydrograph

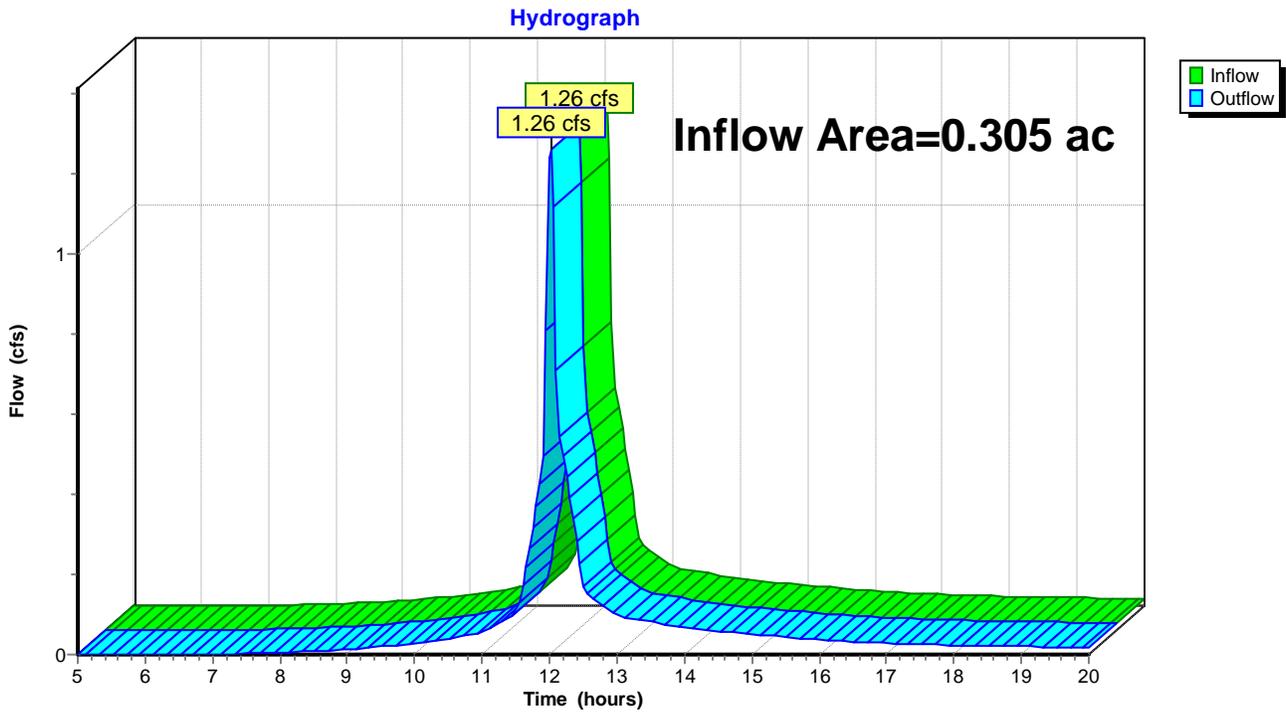


Summary for Reach SP1: Study Point #1

Inflow Area = 0.305 ac, 32.97% Impervious, Inflow Depth > 2.98" for 25-Year Event event
Inflow = 1.26 cfs @ 12.01 hrs, Volume= 0.076 af
Outflow = 1.26 cfs @ 12.01 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP1: Study Point #1

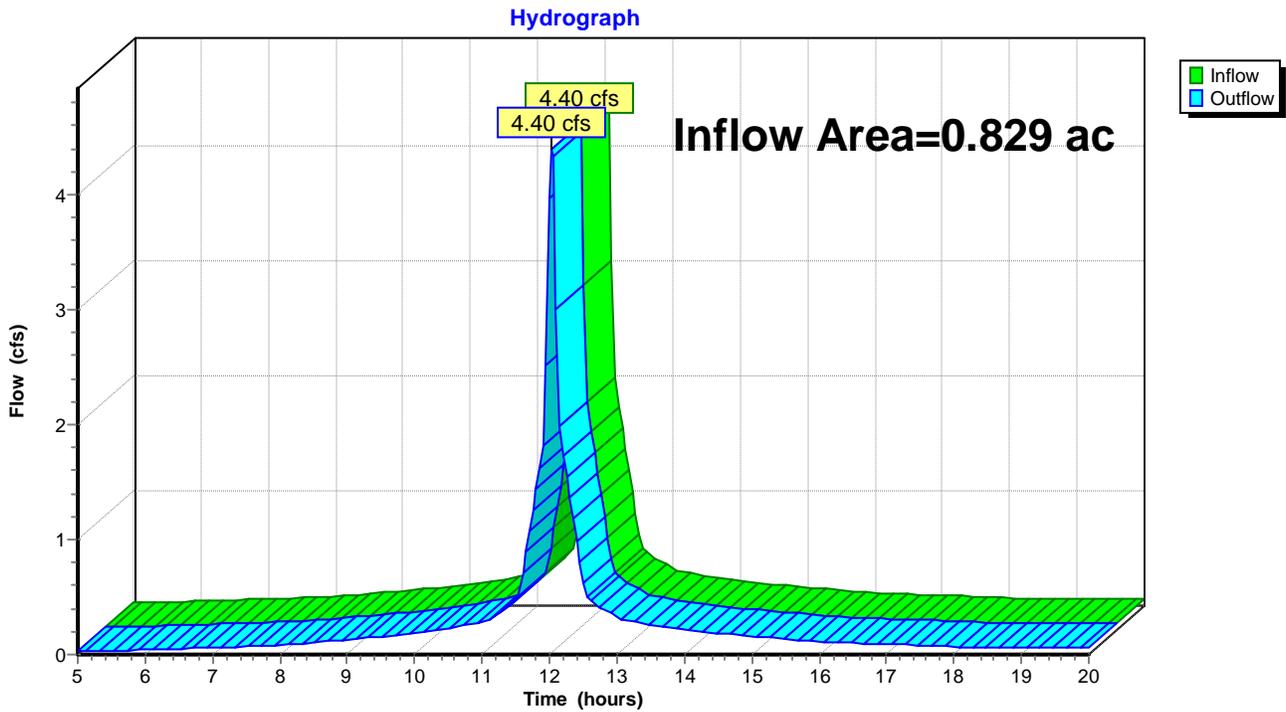


Summary for Reach SP2: Study Point #2

Inflow Area = 0.829 ac, 89.77% Impervious, Inflow Depth > 4.30" for 25-Year Event event
Inflow = 4.40 cfs @ 12.04 hrs, Volume= 0.297 af
Outflow = 4.40 cfs @ 12.04 hrs, Volume= 0.297 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach SP2: Study Point #2



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