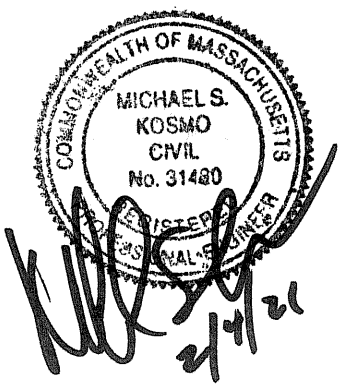
EVERETT M
BROOKS
COMPANY

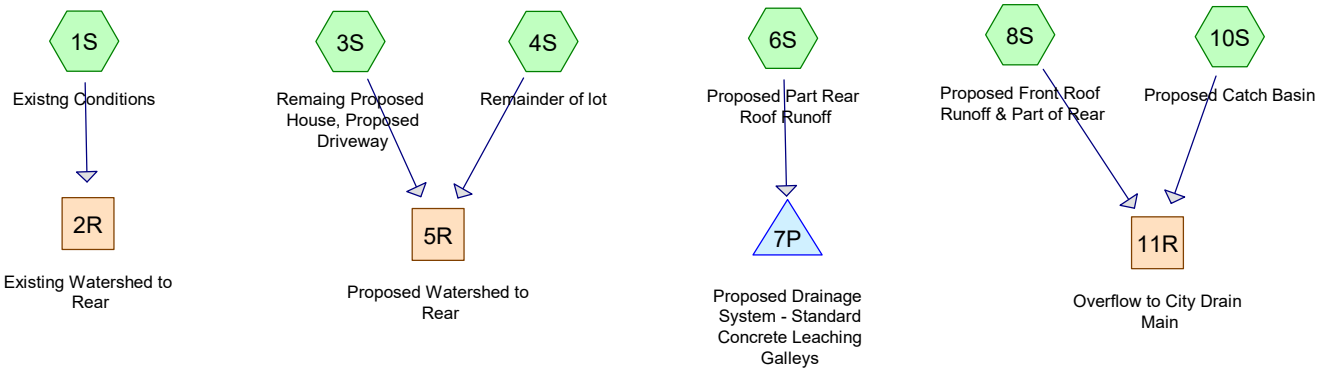
PROJECT ADDRESS: 41 Washington St
Newton, MA
PROJECT NO.: 26100
SHEET: OF:
CALCULATIONS BY: ES DATE: 8/26/20
REVISED: 2/4/21
CHECKED BY: MSK DATE: 2/4/21

Drainage Summary – Peak Storm Flow

	Existing Conditions	Proposed Conditions
100- Year Storm Event	2.30 cfs	1.40 cfs



SURVEYORS & ENGINEERS
49 Lexington Street West Newton, MA 02465 (617) 527-8750 Fax: (617) 332-1578 www.everettbrooks.com



Subcat Reach Pond Link

Drainage Diagram for 26100_41 Washington St, Newton - Pre-Post 2-4-21

Prepared by {enter your company name here} 2/4/2021

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: Existng Conditions Runoff Area=0.274 ac Runoff Depth=6.60"
Flow Length=145' Tc=3.0 min CN=82 Runoff=2.30 cfs 0.151 af

Subcatchment 3S: Remaing Proposed House, Proposed Drive Runoff Area=0.014 ac Runoff Depth=8.54"
Flow Length=145' Tc=3.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 4S: Remainder of lot Runoff Area=0.146 ac Runoff Depth=6.36"
Tc=0.0 min CN=80 Runoff=1.29 cfs 0.077 af

Subcatchment 6S: Proposed Part Rear Roof Runoff Runoff Area=0.027 ac Runoff Depth=8.54"
Flow Length=150' Tc=3.0 min CN=98 Runoff=0.26 cfs 0.019 af

Subcatchment 8S: Proposed Front Roof Runoff & Part of Rear Runoff Area=0.024 ac Runoff Depth=8.54"
Flow Length=150' Tc=3.0 min CN=98 Runoff=0.23 cfs 0.017 af

Subcatchment 10S: Proposed Catch Basin Runoff Area=0.216 ac Runoff Depth=6.60"
Flow Length=120' Tc=3.0 min CN=82 Runoff=1.81 cfs 0.119 af

Reach 2R: Existing Watershed to Rear Inflow=2.30 cfs 0.151 af
Outflow=2.30 cfs 0.151 af

Reach 5R: Proposed Watershed to Rear Inflow=1.40 cfs 0.087 af
Outflow=1.40 cfs 0.087 af

Reach 11R: Overflow to City Drain Main Inflow=2.04 cfs 0.136 af
Outflow=2.04 cfs 0.136 af

Pond 7P: Proposed Drainage System - Stan Peak Elev=111.12' Storage=0.011 af Inflow=0.26 cfs 0.019 af
Outflow=0.01 cfs 0.010 af

Total Runoff Area = 0.701 ac Runoff Volume = 0.393 af Average Runoff Depth = 6.73"

Subcatchment 1S: Existng Conditions

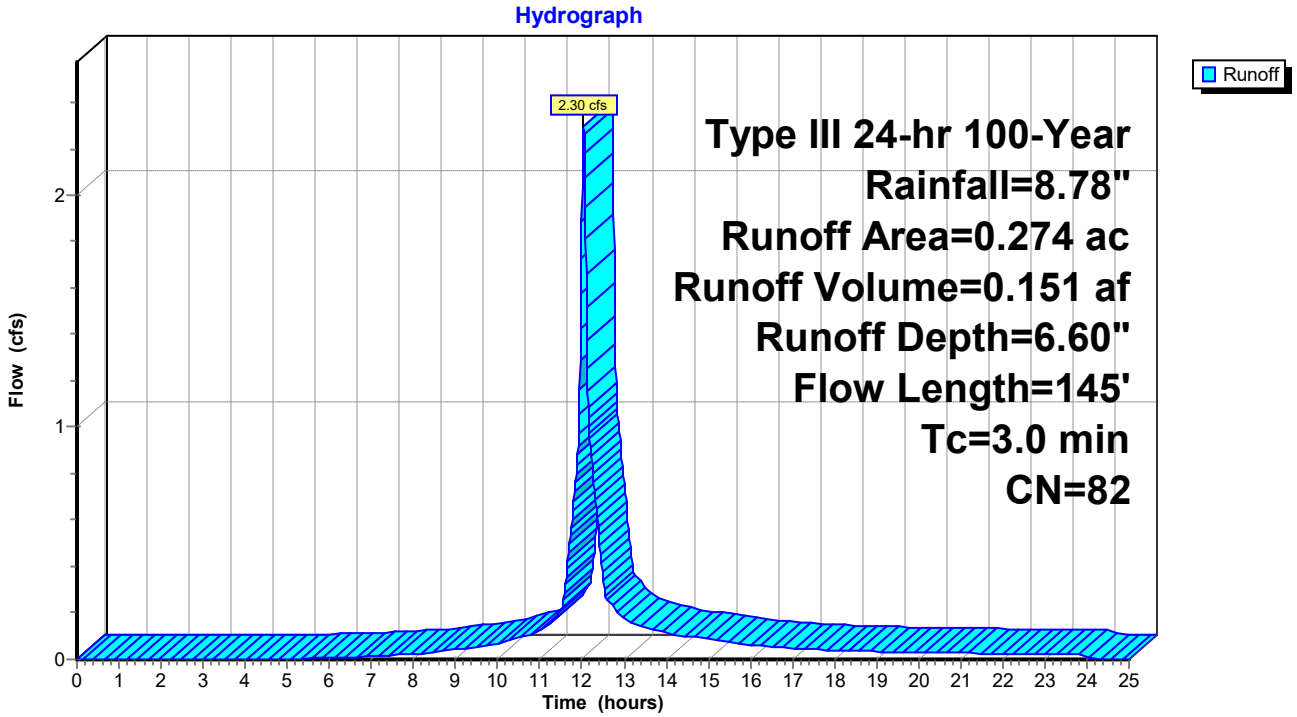
Runoff = 2.30 cfs @ 12.04 hrs, Volume= 0.151 af, Depth= 6.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.274	82	Woods/ Grass

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	145	0.0860	1.1		**Lag/CN Method,**
2.2	145	Total, Increased to minimum Tc = 3.0 min			

Subcatchment 1S: Existng Conditions



Subcatchment 3S: Remaing Proposed House, Proposed Driveway

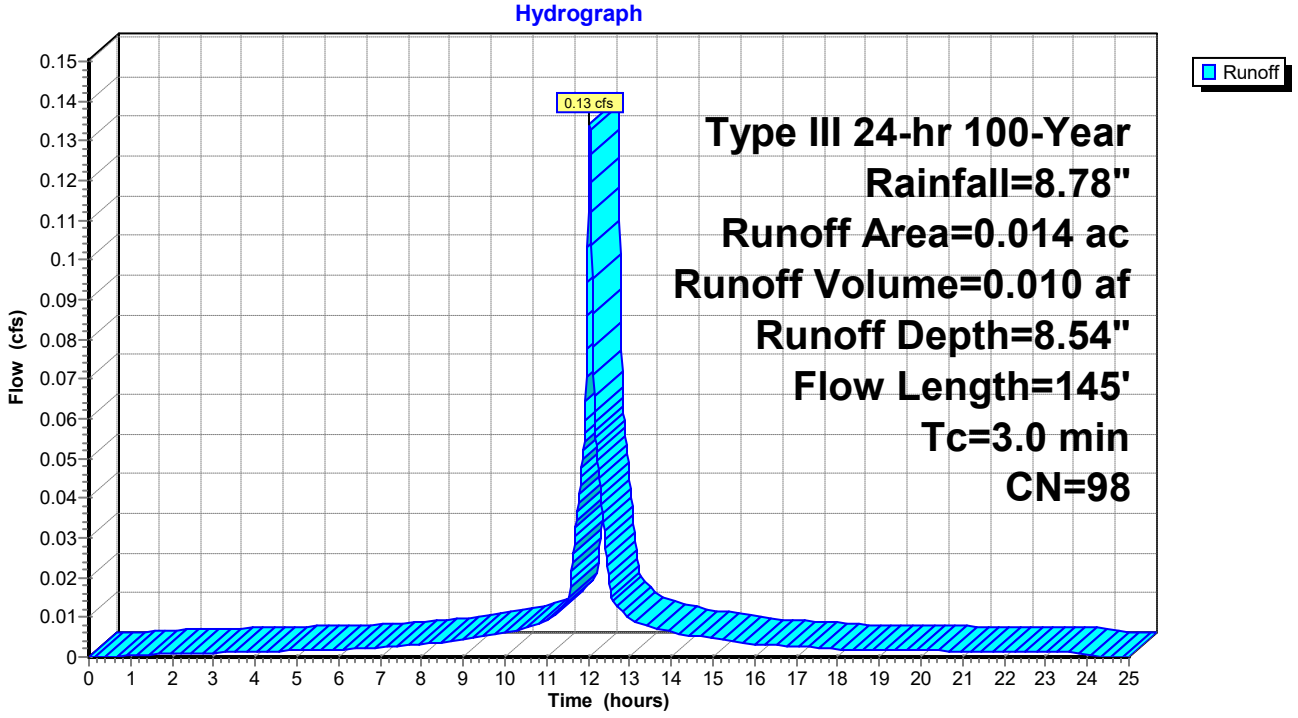
Runoff = 0.13 cfs @ 12.04 hrs, Volume= 0.010 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.002	98	Remaining House & Steps
0.012	98	Remaining Prop Walks, Walls
0.000	98	Remaining Prop Drive
0.014	98	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	145	0.0860	2.2		**Lag/CN Method,**
1.1	145	Total, Increased to minimum Tc = 3.0 min			

Subcatchment 3S: Remaing Proposed House, Proposed Driveway



Subcatchment 4S: Remainder of lot

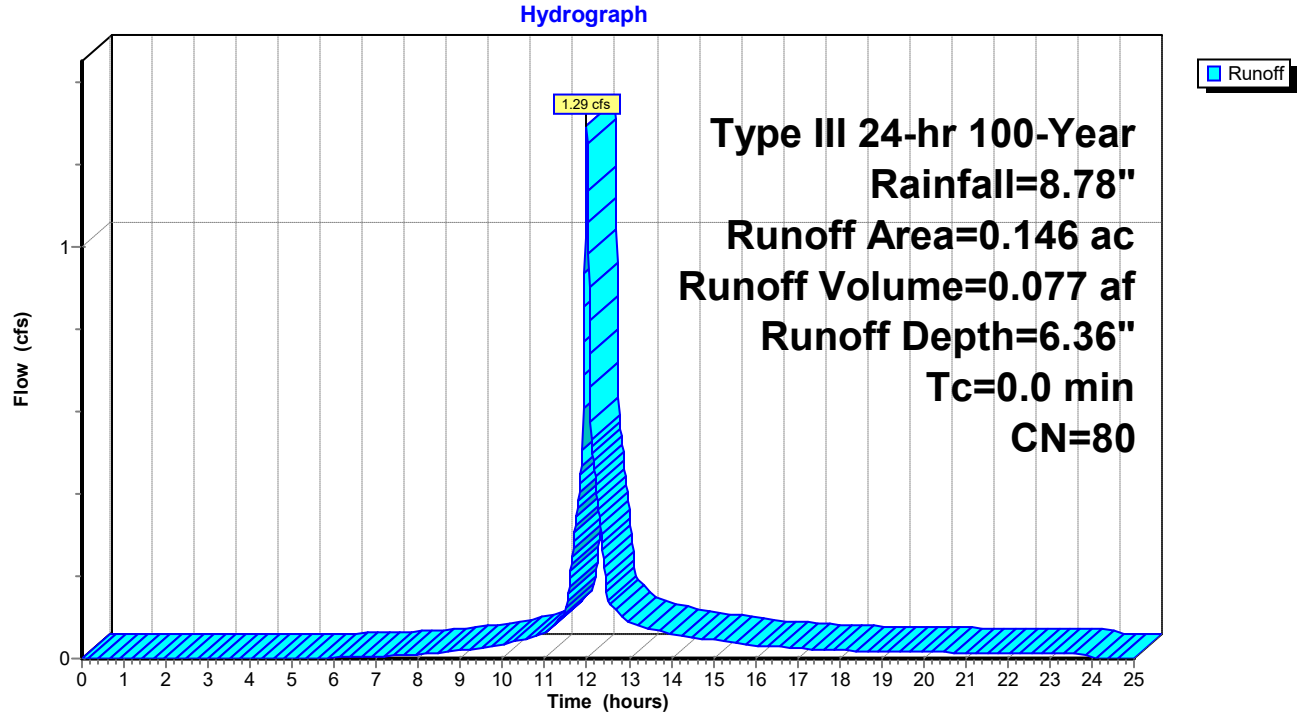
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.29 cfs @ 12.00 hrs, Volume= 0.077 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.146	80	Remainder of Plantings/ Lawn

Subcatchment 4S: Remainder of lot



Subcatchment 6S: Proposed Part Rear Roof Runoff

The rear roof runoff area shall be collected by gutters and directed to proposed drainage system #1.

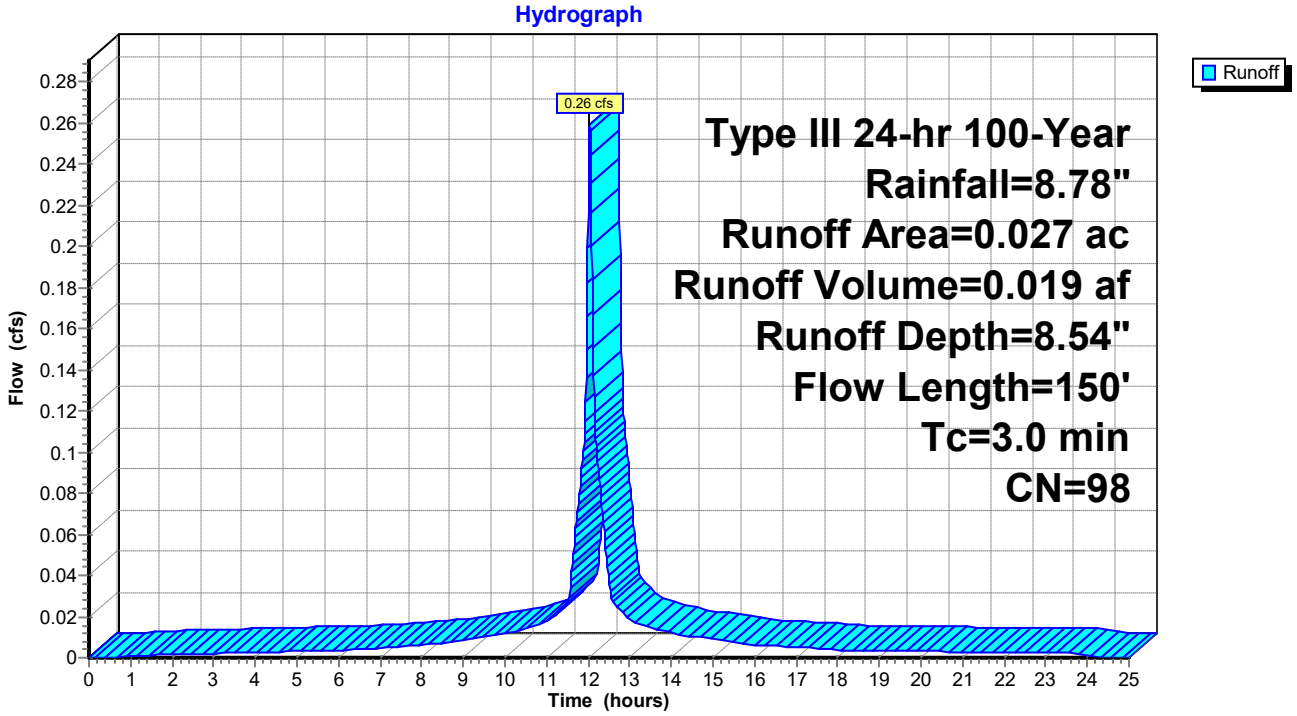
Runoff = 0.26 cfs @ 12.04 hrs, Volume= 0.019 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.027	98	Roof Area Hatched

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	150	0.2500	3.8		**Lag/CN Method,**
0.7	150	Total, Increased to minimum Tc = 3.0 min			

Subcatchment 6S: Proposed Part Rear Roof Runoff



Subcatchment 8S: Proposed Front Roof Runoff & Part of Rear

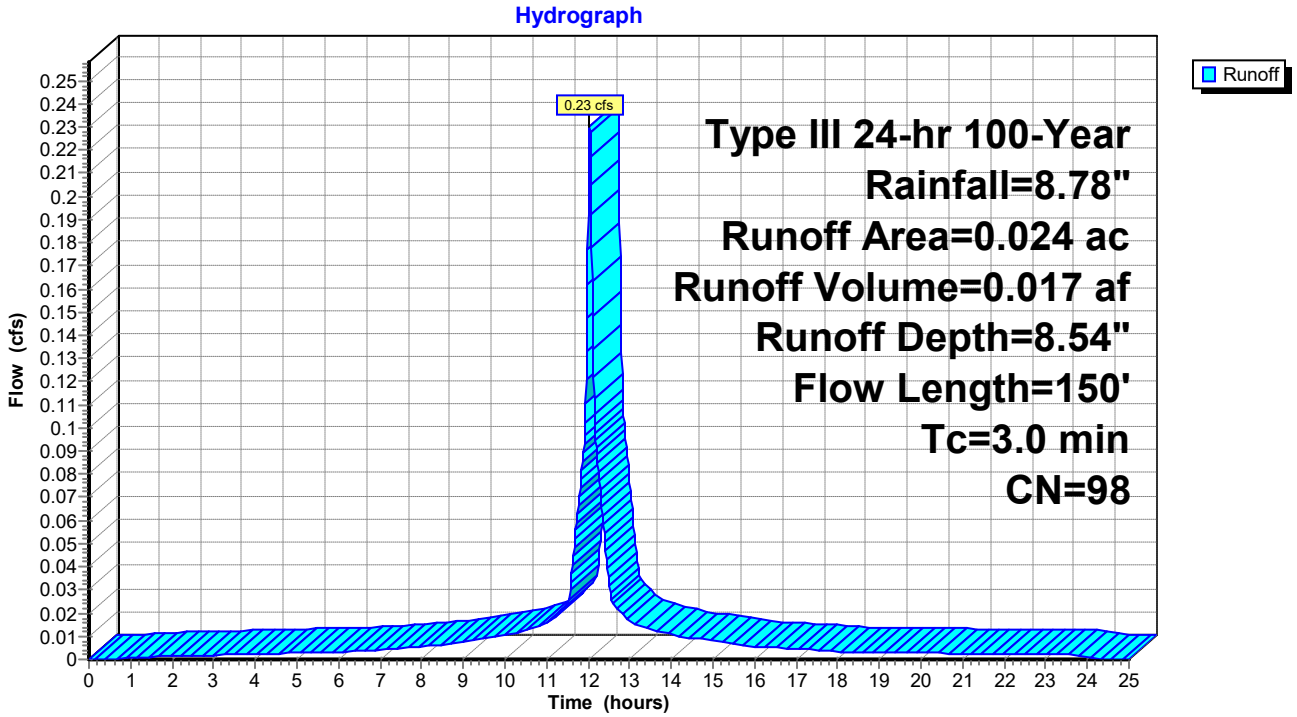
Runoff = 0.23 cfs @ 12.04 hrs, Volume= 0.017 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.024	98	Prop Roof Runoff

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	150	0.2500	3.8		**Lag/CN Method,**
0.7	150	Total, Increased to minimum Tc = 3.0 min			

Subcatchment 8S: Proposed Front Roof Runoff & Part of Rear



Subcatchment 10S: Proposed Catch Basin

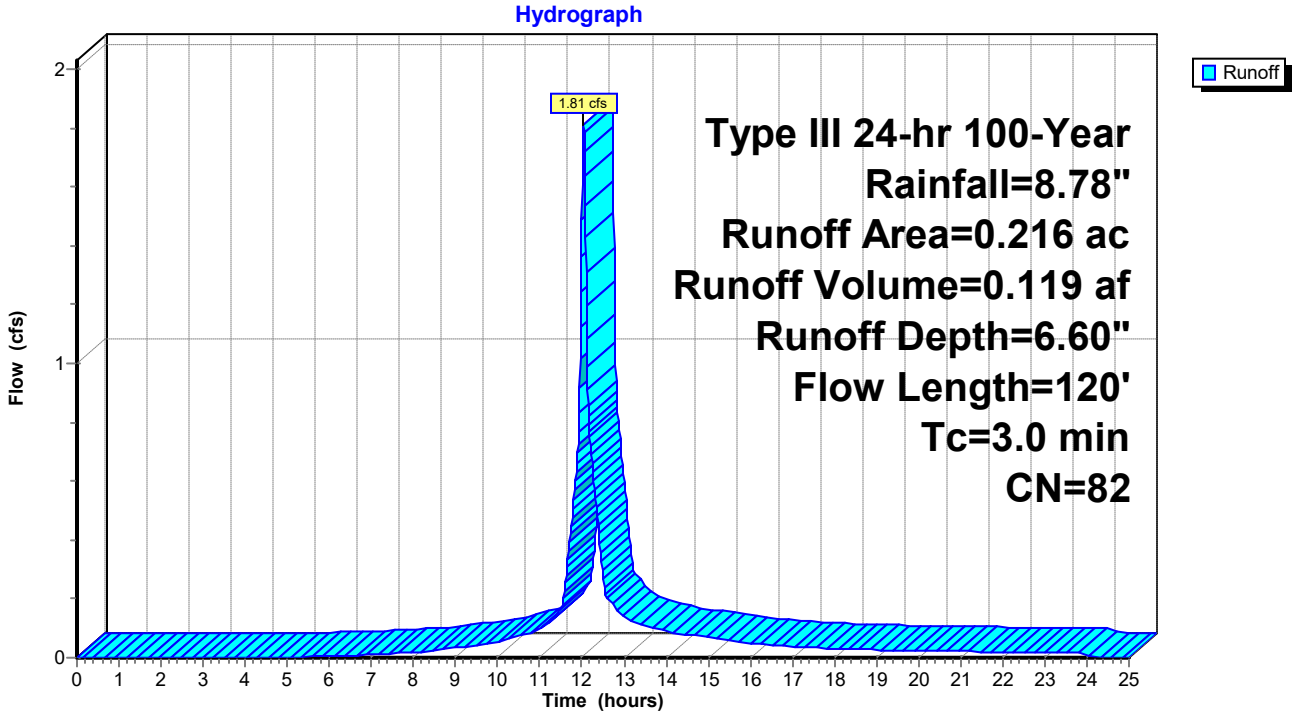
Runoff = 1.81 cfs @ 12.04 hrs, Volume= 0.119 af, Depth= 6.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.78"

Area (ac)	CN	Description
0.074	98	Paved parking & roofs
0.142	74	>75% Grass cover, Good, HSG C
0.216	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	120	0.0540	0.9		**Lag/CN Method,**
2.4	120	Total, Increased to minimum Tc = 3.0 min			

Subcatchment 10S: Proposed Catch Basin



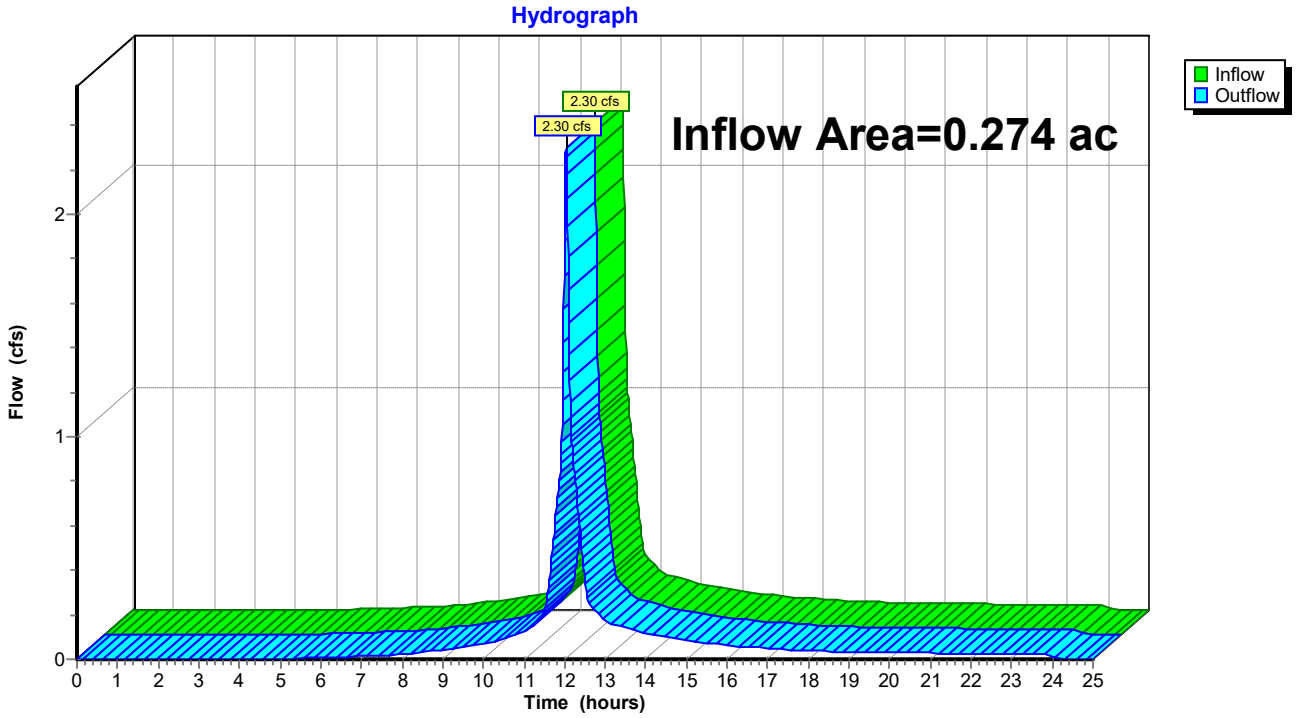
Reach 2R: Existing Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.274 ac, Inflow Depth = 6.60" for 100-Year event
Inflow = 2.30 cfs @ 12.04 hrs, Volume= 0.151 af
Outflow = 2.30 cfs @ 12.04 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 2R: Existing Watershed to Rear



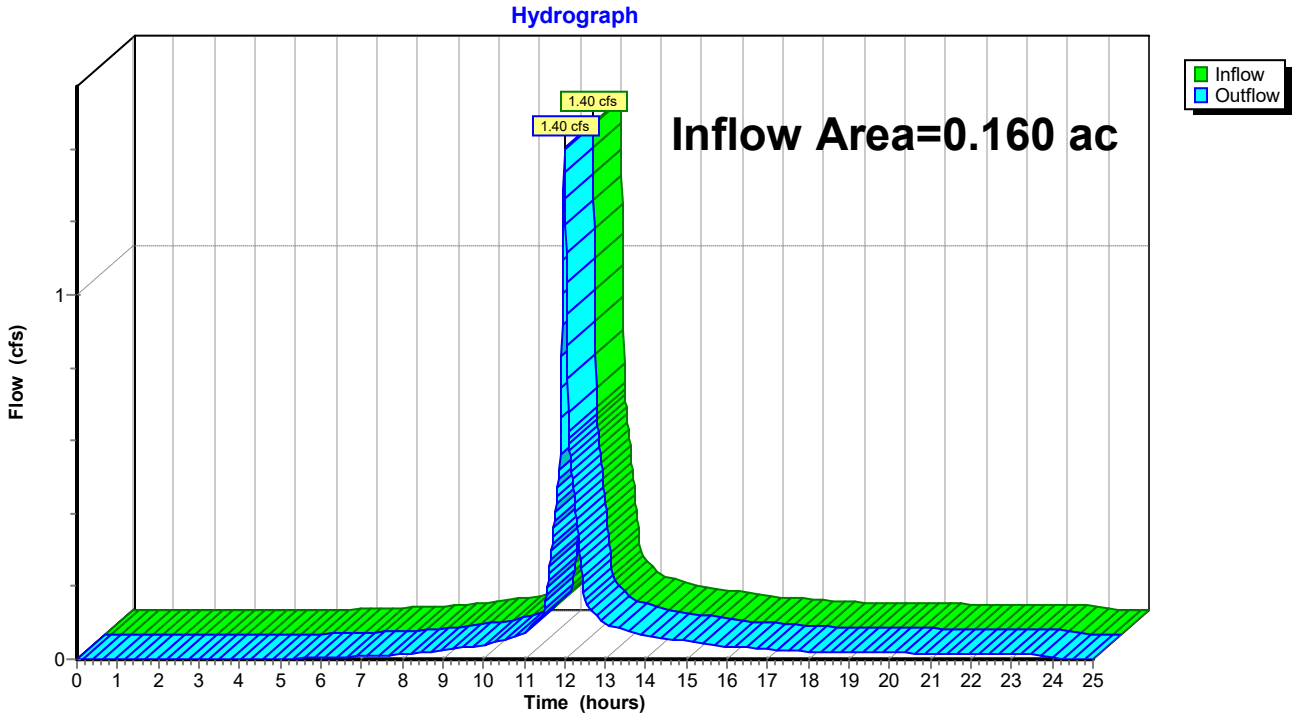
Reach 5R: Proposed Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.160 ac, Inflow Depth = 6.55" for 100-Year event
Inflow = 1.40 cfs @ 12.00 hrs, Volume= 0.087 af
Outflow = 1.40 cfs @ 12.00 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 5R: Proposed Watershed to Rear



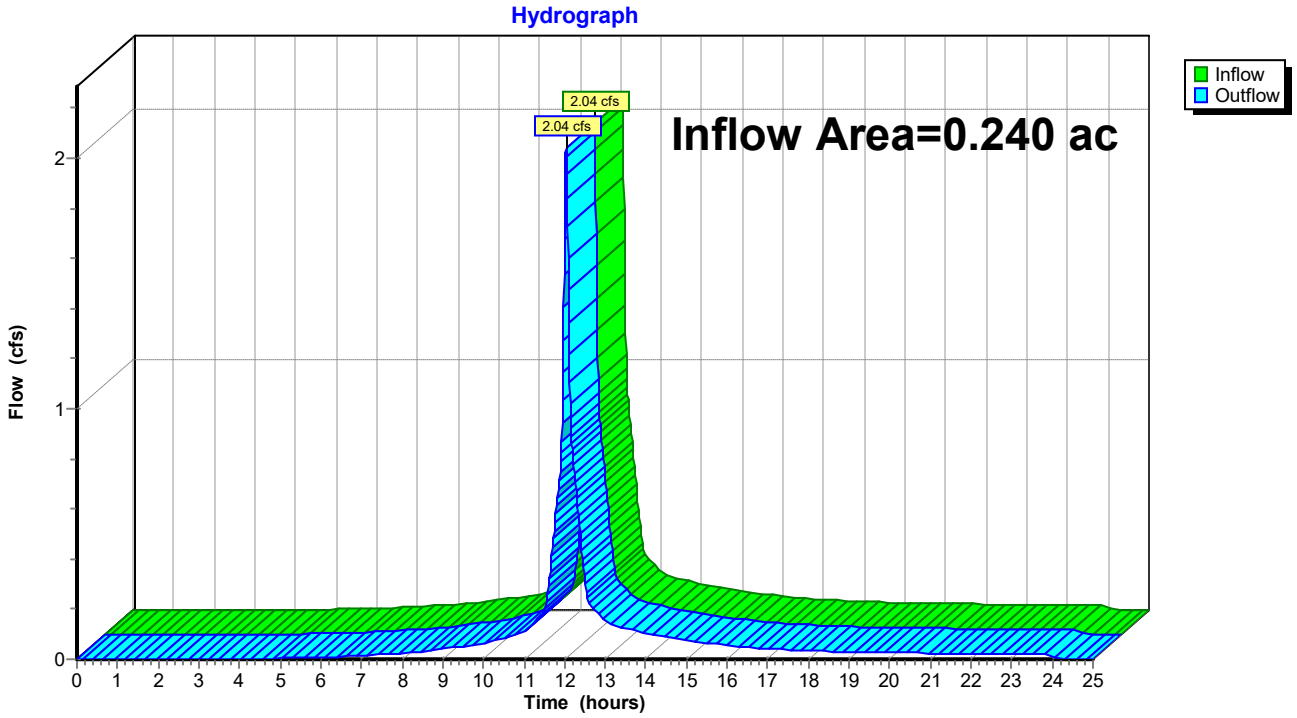
Reach 11R: Overflow to City Drain Main

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.240 ac, Inflow Depth = 6.80" for 100-Year event
Inflow = 2.04 cfs @ 12.04 hrs, Volume= 0.136 af
Outflow = 2.04 cfs @ 12.04 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Reach 11R: Overflow to City Drain Main



Pond 7P: Proposed Drainage System - Standard Concrete Leaching Galleys

Standard Concrete Leaching Galleys (5):
4' X 4' x 3.25' deep with 3' of stone surrounding and 6" of stone under the entire system.

Rawls Rate=1.02 in/hr

Inflow Area = 0.027 ac, Inflow Depth = 8.54" for 100-Year event
Inflow = 0.26 cfs @ 12.04 hrs, Volume= 0.019 af
Outflow = 0.01 cfs @ 8.23 hrs, Volume= 0.010 af, Atten= 98%, Lag= 0.0 min
Discarded = 0.01 cfs @ 8.23 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 111.12' @ 16.10 hrs Surf.Area= 0.006 ac Storage= 0.011 af
Plug-Flow detention time= 271.0 min calculated for 0.010 af (54% of inflow)
Center-of-Mass det. time= 144.6 min (881.7 - 737.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.75'	0.007 af	**10.00'W x 26.00'L x 3.75'H Gravel** 0.022 af Overall - 0.006 af Embedded = 0.016 af x 40.0% Voids
#2	108.25'	0.006 af	**4.00'W x 20.00'L x 3.25'H Galleys** Inside #1
		0.013 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	107.70'	**1.020 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 0.000 ac

Discarded OutFlow Max=0.01 cfs @ 8.23 hrs HW=107.79' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Pond 7P: Proposed Drainage System - Standard Concrete Leaching Galleys