STORMWATER MANAGEMENT
SUMMARY REPORT

THE CARAVELA
278 UNION STREET
NEW BEDFORD, MASSACHUSETTS

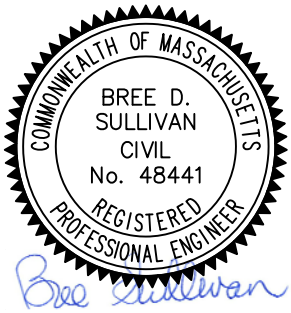
July 14, 2021

Prepared for:

Alinea Capital Partners, LLC
278 Union Street
New Bedford, Massachusetts

Prepared by:

Gale Associates, Inc.
163 Libbey Parkway
Weymouth, MA 02189
Gale JN 718460



PROJECT DESCRIPTION

Alinea Capital Partners, LLC is proposing to redevelop the property located at 278 Union Street in New Bedford. The site will be redeveloped to include a five-story multi-use building. This report has been prepared to describe the existing and proposed stormwater management on the site.

Existing Conditions

The existing site has a single-story masonry building with a footprint that occupies about one-quarter of the property (approximately 4,000 square feet) and is located on the northern portion of the site. The area to the south of the existing building is impervious parking (approximately 11,320 square feet). The existing building frontage is on Union Street to the north and abuts existing buildings, 282 Union Street to the west and 276 Union Street building to the east. The site is currently 95% impervious, with no stormwater treatment in the parking lot.

According to the USDA Natural Resources Conservation Service (NRCS) Soil Resource Report, the site soils are “Urban Land”. The Foundation Engineering Report, dated August 22, 2017 by McPhail

Associates indicates measured groundwater elevations of 75.7 to 80.3 (NGVD) with an average elevation of approximately 77.0.

According to MassGIS, the site is not within a Flood Hazard Zone, not within jurisdictional wetland or river resource areas, not within an Interim Wellhead Protection Area (IPWA) or Zone II well protection zone; and not within mapped National Heritage Endangered Species Habitat.

Proposed Conditions

The proposed development will consist of a 5-story mixed-use (residential and commercial) structure which will include a full below-grade garage and basement and occupy an approximate 15,750 square-foot plan area. The proposed building footprint will occupy the entire site. It is understood that the proposed garage floor slab is planned to be constructed at elevation 82.5, and the basement floor elevation is planned to be constructed at elevation 74.0.

STORMWATER MANAGEMENT

Pre-Development

The site drains from two areas to the municipal system; the parking lot, approximately 12,071 square feet (75%), discharges untreated runoff to a catch basin. The remaining 4,000 square feet (25%) is roof runoff that discharges directly to the municipal system from connected roof leaders.

Area	EWS-1
Total Contributary Area (s.f.)	16,071
Curve Number (CN)	97
Time of Concentration (min)	6.0
Hydrologic Soil Group	A

Post-Development

After construction, the building lot coverage will be 100%, so site stormwater will be collected entirely from the roof and directed to the municipal stormwater system via directly-connected roof leaders.

Area	EWS-1
Total Contributary Area (s.f.)	16,071
Curve Number (CN)	98
Time of Concentration (min)	6.0
Hydrologic Soil Group	A

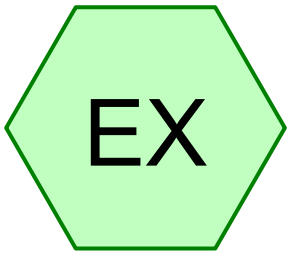
Peak Rate Comparison

Peak rate of runoff for the existing site as well as for the developed site were calculated at 2, 10 and 100-year design storms. The result shows no increase in stormwater runoff:

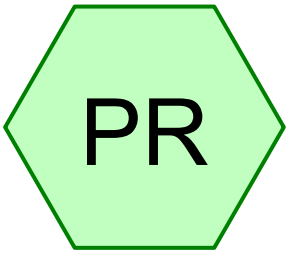
Recurrence Interval	Pre (cfs)	Post (cfs)
2-year	1.2	1.2
10-year	1.7	1.7
100-year	2.5	2.5

SUMMARY

The proposed project will result in the redevelopment of an existing disused site in an urbanized area that is predominately impervious. Under current conditions, 75% of the existing site discharges untreated roadway/parking lot runoff to the municipal system. Under the developed conditions 100% of the stormwater runoff from the roof will be directly discharged to the municipal system. Roof runoff does not contain vehicular pollutants and sediment from the roadway, and therefore is considered to not contain Total Suspended Solids (TSS), in accordance with the Massachusetts Stormwater Management Standards. Based on this, the project conforms with the City of New Bedford Stormwater Management Rules and Regulations Section 3.2.14.C (June 2021 Revision).



Site



Site

Subcat Reach Pond Link

Drainage Diagram for Post

Prepared by Gale Associates, Inc., Printed 7/13/2021

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.017	86	Newly graded area, HSG B (EX)
0.721	98	Roofs, HSG A (EX, PR)
0.738	98	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.721	HSG A	EX, PR
0.017	HSG B	EX
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.738		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX: Site Runoff Area=16,071 sf 95.33% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=97 Runoff=1.17 cfs 0.094 af

Subcatchment PR: Site Runoff Area=16,071 sf 100.00% Impervious Runoff Depth>3.16"
Tc=6.0 min CN=98 Runoff=1.19 cfs 0.097 af

Total Runoff Area = 0.738 ac Runoff Volume = 0.191 af Average Runoff Depth = 3.11"
2.33% Pervious = 0.017 ac 97.67% Impervious = 0.721 ac

Summary for Subcatchment EX: Site

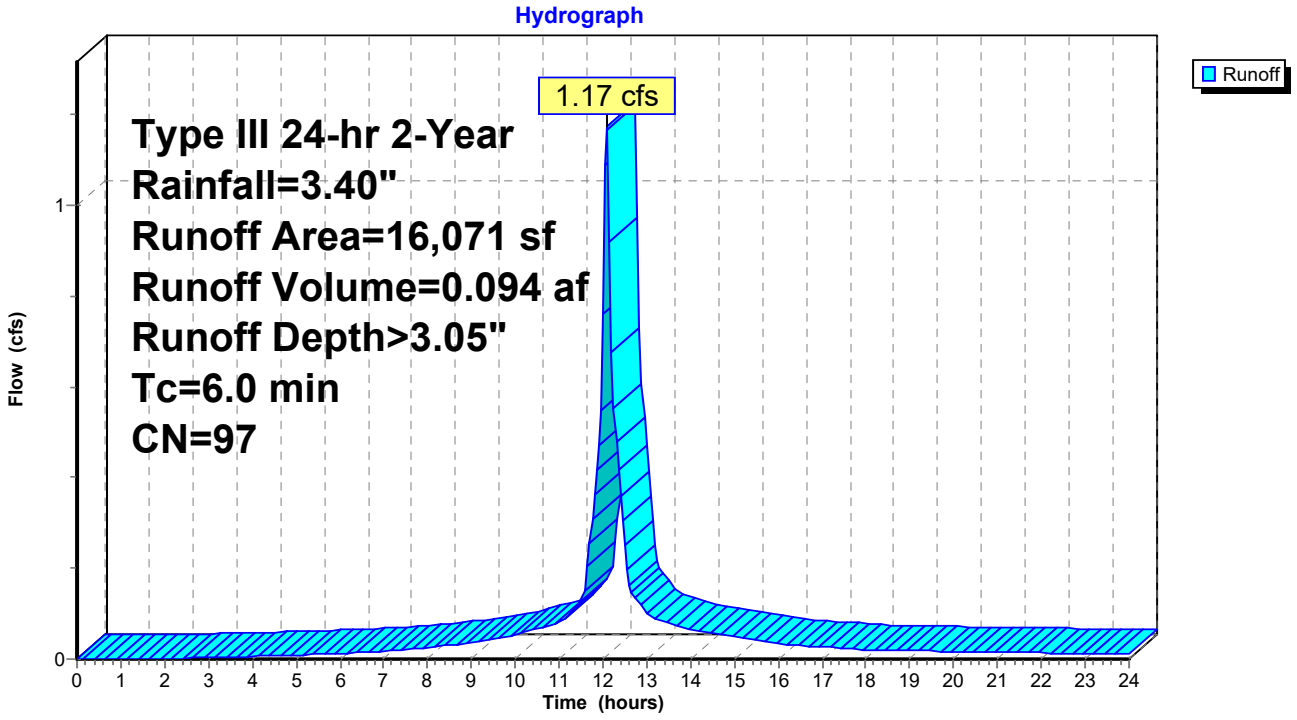
Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.094 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
15,321	98	Roofs, HSG A
750	86	Newly graded area, HSG B
16,071	97	Weighted Average
750		4.67% Pervious Area
15,321		95.33% Impervious Area

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

Subcatchment EX: Site



Summary for Subcatchment PR: Site

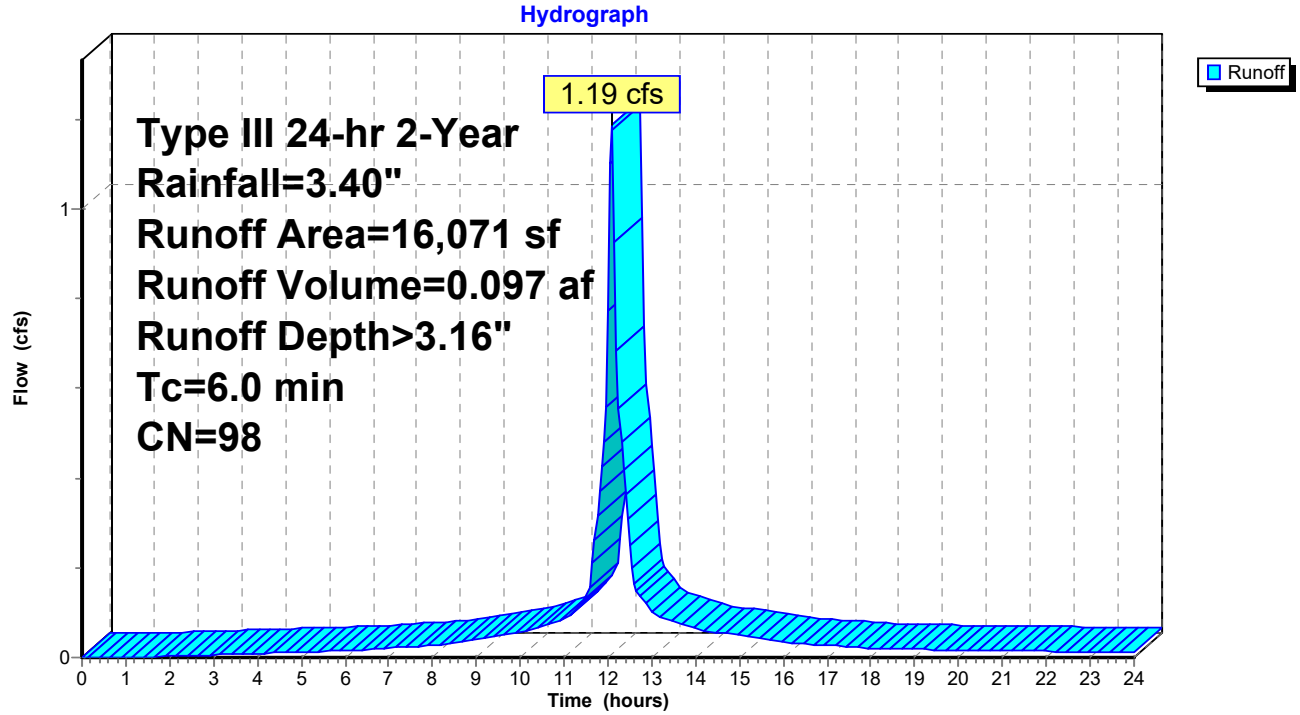
Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.097 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
16,071	98	Roofs, HSG A
16,071		100.00% Impervious Area

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

Subcatchment PR: Site



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX: Site Runoff Area=16,071 sf 95.33% Impervious Runoff Depth>4.45"
Tc=6.0 min CN=97 Runoff=1.68 cfs 0.137 af

Subcatchment PR: Site Runoff Area=16,071 sf 100.00% Impervious Runoff Depth>4.56"
Tc=6.0 min CN=98 Runoff=1.69 cfs 0.140 af

Total Runoff Area = 0.738 ac Runoff Volume = 0.277 af Average Runoff Depth = 4.50"
2.33% Pervious = 0.017 ac 97.67% Impervious = 0.721 ac

Summary for Subcatchment EX: Site

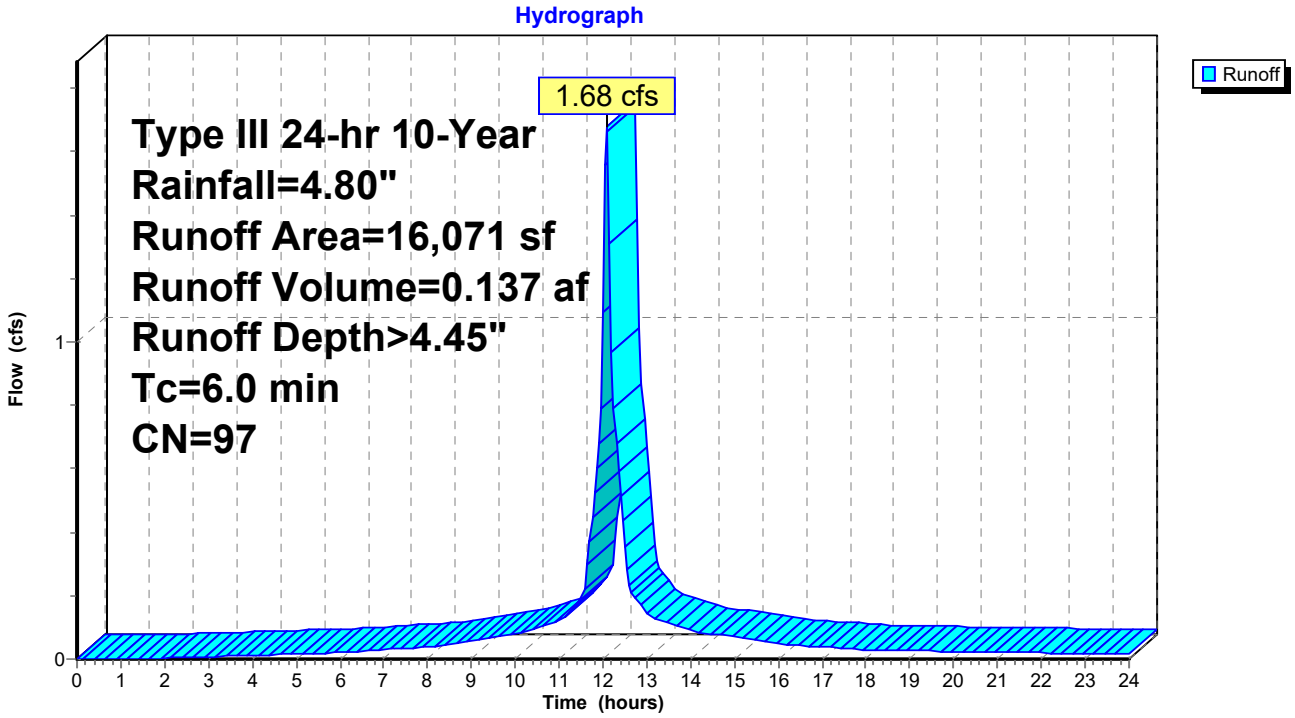
Runoff = 1.68 cfs @ 12.09 hrs, Volume= 0.137 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
15,321	98	Roofs, HSG A
750	86	Newly graded area, HSG B
16,071	97	Weighted Average
750		4.67% Pervious Area
15,321		95.33% Impervious Area

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

Subcatchment EX: Site



Summary for Subcatchment PR: Site

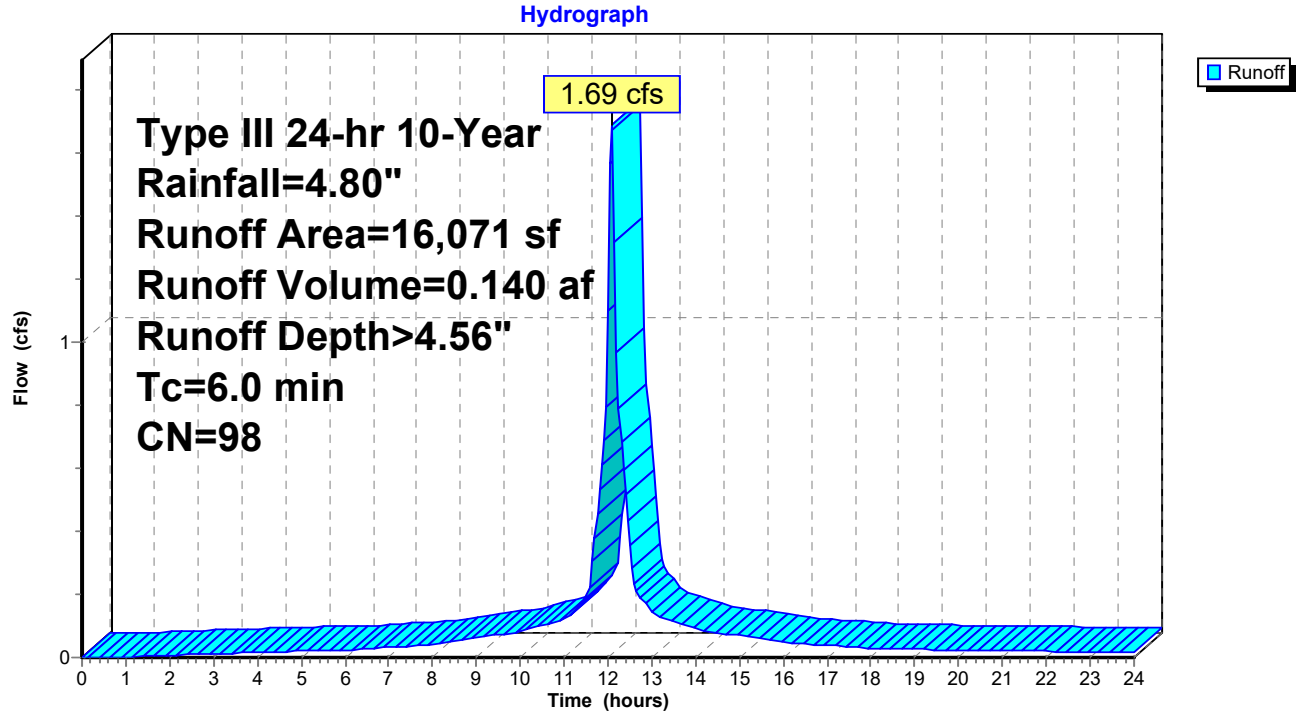
Runoff = 1.69 cfs @ 12.09 hrs, Volume= 0.140 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
16,071	98	Roofs, HSG A
16,071		100.00% Impervious Area

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

Subcatchment PR: Site



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX: Site Runoff Area=16,071 sf 95.33% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=97 Runoff=2.46 cfs 0.204 af

Subcatchment PR: Site Runoff Area=16,071 sf 100.00% Impervious Runoff Depth>6.76"
Tc=6.0 min CN=98 Runoff=2.47 cfs 0.208 af

Total Runoff Area = 0.738 ac Runoff Volume = 0.412 af Average Runoff Depth = 6.70"
2.33% Pervious = 0.017 ac 97.67% Impervious = 0.721 ac

Summary for Subcatchment EX: Site

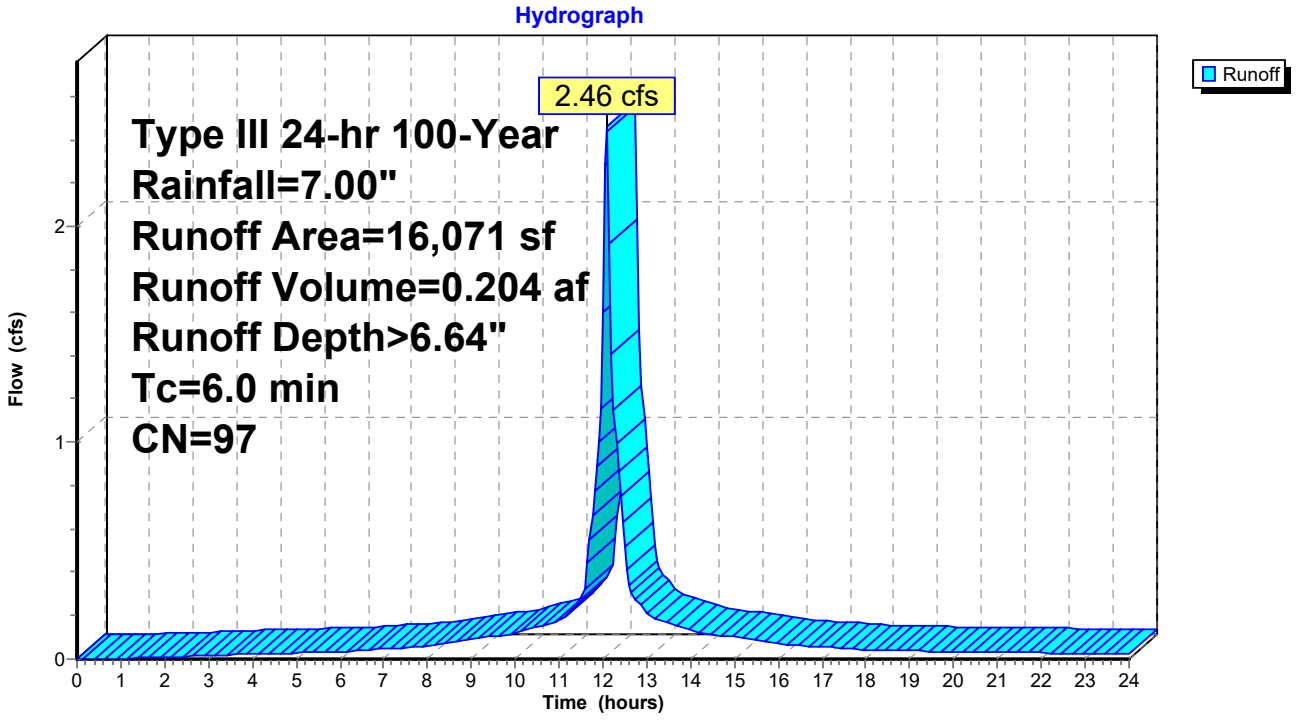
Runoff = 2.46 cfs @ 12.09 hrs, Volume= 0.204 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
15,321	98	Roofs, HSG A
750	86	Newly graded area, HSG B
16,071	97	Weighted Average
750		4.67% Pervious Area
15,321		95.33% Impervious Area

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

Subcatchment EX: Site



Summary for Subcatchment PR: Site

Runoff = 2.47 cfs @ 12.09 hrs, Volume= 0.208 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (sf)	CN	Description
16,071	98	Roofs, HSG A
16,071		100.00% Impervious Area

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

Subcatchment PR: Site