CARMINA WOOD
DESIGN

ENGINEER'S REPORT

for

Proposed Retail

4548-4564 Main Street
Town of Amherst, Erie County, New York

Prepared for

Benderson Development Group, LLC

570 Delaware Avenue
Buffalo, NY 14202

Prepared by

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April 2025

Table of Contents

Attachments

Section 1 - Location & Description

This redevelopment project will consist of the construction of a 2-story commercial use building that will include retail space and multi-level parking. The site is located on the north side of Main Street (NY-5), between Fruehauf Ave and Chateau Terrace in the Town of Amherst. The existing site is currently occupied by a 3-story vacant building located along the Main Street frontage. Existing surface parking is located north behind the existing building. Both the existing building and parking areas will be removed as part of this project. The project area is approximately 0.79 acres, all of which is to be disturbed for construction.

Section 2 - Storm Sewer Service

The existing side streets, Fruehauf Ave and Chateau Terrace, slope from south to north. Existing closed stormwater drainage systems are located along Main Street (NYSDOT) and Chateau Terrace (Town of Amherst). The existing northeast parking lot area sheet drains to the north and northeast to Chateau Terrace. The existing northwest parking lot is generally flat and drains to an existing closed stormwater drainage system with unknown outlet. Existing stormwater runoff collected and conveyed from the site is ultimately tributary to Ellicott Creek and the Niagara River.

The proposed dry detention basin is designed to attenuate proposed runoff to existing conditions prior to discharge via an 8" outlet control pipe connecting to the existing storm sewer system on Chateau Terrace.

Detention Pond Summary (dry):
Top of basin elevation = 674.50
Bottom of basin elevation = 672.90

Design Criteria:
Detention: Comparison of the existing 10-year vs. the proposed 25-year runoff

Runoff Summary:

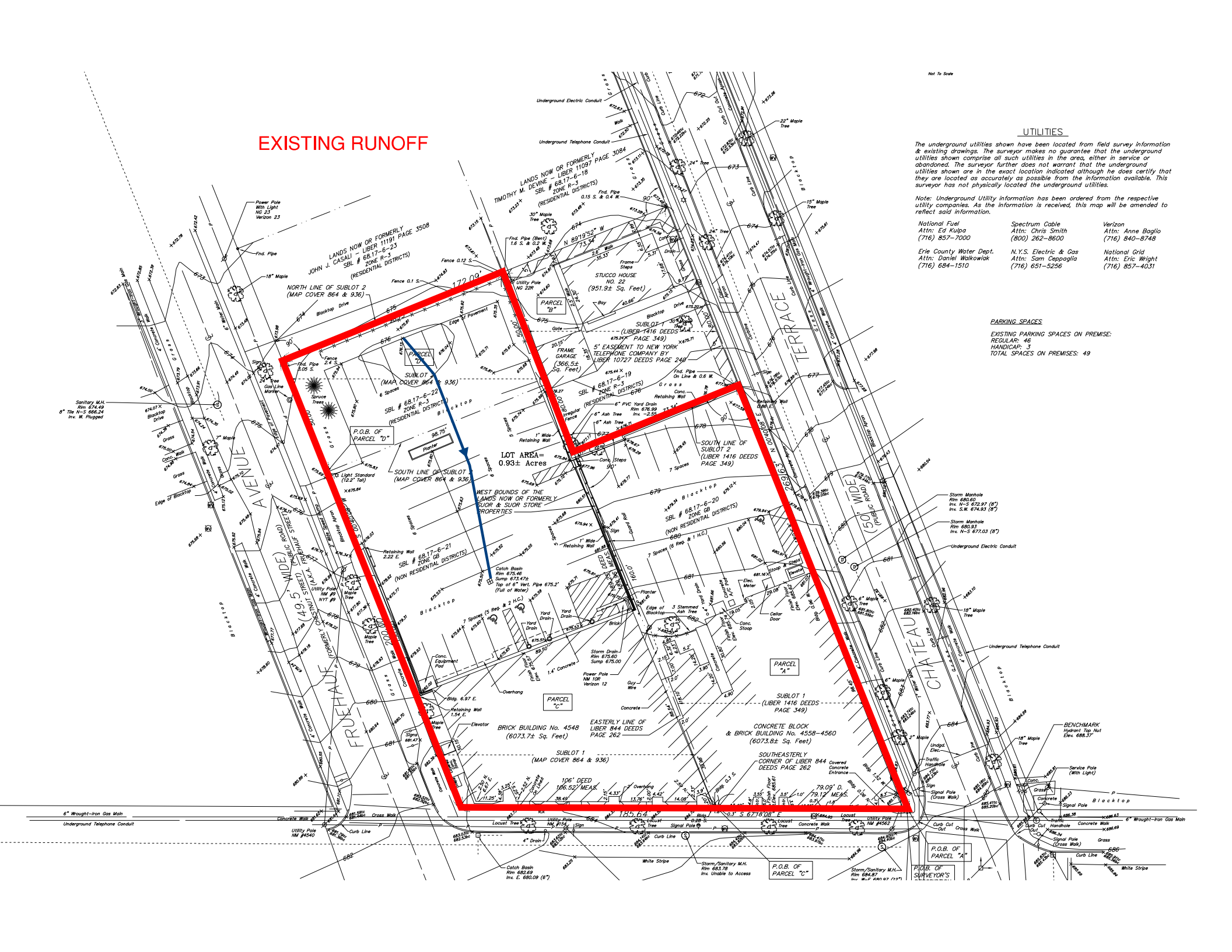
Event	Ex. Runoff (cfs)	Pro. Runoff (cfs)*	Result (cfs)
10-year	3.46	1.13	-2.34
25-year	4.25	1.27	-2.98

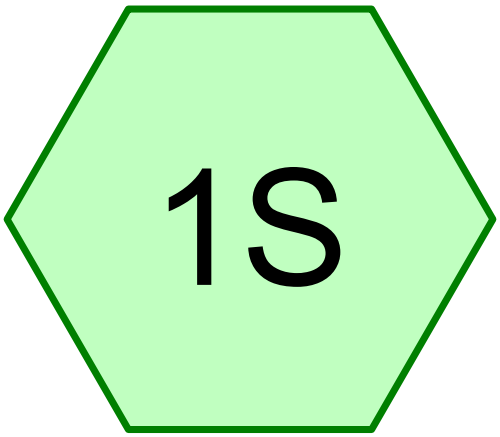
*Proposed runoff flowrate is the total of the multiple subcatchments as shown in Attachment A of this report.

Attachment A

Storm Sewer System Drainage Calculations

Existing Runoff


EXISTING RUNOFF
Not To Scale
UTILITIES
The underground utilities shown have been located from field survey information & existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from the information available. This surveyor has not physically located the underground utilities.
Note: Underground Utility information has been ordered from the respective utility companies. As the information is received, this map will be amended to reflect said information.
National Fuel
Attn: Ed Kulpa
(716) 857-7000
Spectrum Cable
Attn: Chris Smith
(800) 262-8600
Verizon
Attn: Anne Baglio
(716) 840-8748
Erie County Water Dept.
Attn: Daniel Walkowiak
(716) 684-1510
N.Y.S. Electric & Gas
Attn: Sam Ceppaglia
(716) 651-5256
National Grid
Attn: Eric Wright
(716) 857-4031
PARKING SPACES
EXISTING PARKING SPACES ON PREMISE:
REGULAR: 46
HANDICAP: 3
TOTAL SPACES ON PREMISES: 49
LANDS NOW OR FORMERLY JOHN J. CASALI – LIBER 11191 PAGE 3508 SBL # 68.17-6-23 ZONE R-3 (RESIDENTIAL DISTRICTS)
LANDS NOW OR FORMERLY TIMOTHY M. DEVINE – LIBER 11097 PAGE 3084 SBL # 68.17-6-18 ZONE R-3 (RESIDENTIAL DISTRICTS)
NORTH LINE OF SUBLOT 2 (MAP COVER 864 & 936)
SOUTH LINE OF SUBLOT 2 (MAP COVER 864 & 936)
WEST BOUNDS OF THE LANDS NOW OR FORMERLY TUOR & SUOR STORE PROPERTIES
EASTERLY LINE OF LIBER 844 DEEDS PAGE 262
SOUTHEASTERLY CORNER OF LIBER 844 DEEDS PAGE 262
SOUTH LINE OF SUBLOT 2 (LIBER 1416 DEEDS PAGE 349)
SUBLOT 1 (LIBER 1416 DEEDS PAGE 349)
SUBLOT 1 (MAP COVER 864 & 936)
SUBLOT 2 (MAP COVER 864 & 936)
P.O.B. OF PARCEL "D"
P.O.B. OF PARCEL "A"
P.O.B. OF PARCEL "C"
P.O.B. OF SURVEYOR'S
PARCEL "A"
PARCEL "B"
PARCEL "C"
PARCEL "D"
LOT AREA= 0.93± Acres
STUCCO HOUSE NO. 22 (951.9± Sq. Feet)
FRAME GARAGE (366.5± Sq. Feet)
BRICK BUILDING No. 4548 (6073.7± Sq. Feet)
CONCRETE BLOCK & BRICK BUILDING No. 4558-4560 (6073.8± Sq. Feet)
5' EASEMENT TO NEW YORK TELEPHONE COMPANY BY LIBER 10727 DEEDS PAGE 248
SBL # 68.17-6-22 ZONE R-3 (RESIDENTIAL DISTRICTS)
SBL # 68.17-6-21 ZONE GB (NON RESIDENTIAL DISTRICTS)
SBL # 68.17-6-20 ZONE GB (NON RESIDENTIAL DISTRICTS)
SBL # 68.17-6-19 ZONE R-3 (RESIDENTIAL DISTRICTS)
FRUEHAUF AVENUE (49.5' WIDE) (PUBLIC STREET) (FORMERLY CHESTNUT STREET) (A.K.A. CHESTNUT STREET)
CHATEAU TERRACE (50' WIDE) (Public Road)
BENCHMARK Hydrant Top Nut Elev. 688.37'
Power Pole With Light NG 23 Verizon 23
Sanitary M.H. Rim 674.49 8" Tile N-S 666.24 Inv. W. Plugged
Storm Manhole Rim 680.60 Inv. N-S 672.97 (8") Inv. S.W. 674.93 (8")
Storm Manhole Rim 680.93 Inv. N-S 677.03 (8")
Underground Electric Conduit
Underground Telephone Conduit
6" Wrought-Iron Gas Main
Catch Basin Rim 675.46 Sump 673.47± Top of 6" Vert. Pipe 675.2' (Full of Water)
Catch Basin Rim 682.69 Inv. E. 680.09 (6")
Storm/Sanitary M.H. Rim 683.78 Inv. Unable to Access
Storm/Sanitary M.H. Rim 684.87
N 89°19'52" W 73.34'
S 67°18'08" E 185.64'
106' DEED 106.52' MEAS.
79.09' D. 79.12' MEAS.
172.00'
90.00'
98.75'



Existing Site

Subcat Reach Pond Link

Routing Diagram for 21.152 Existing
Prepared by Carmina Wood Morris, PC, Printed 4/17/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-Year	Type II 24-hr		Default	24.00	1	3.11	2
2	25-Year	Type II 24-hr		Default	24.00	1	3.79	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.040	84	50-75% Grass cover, Fair, HSG D (1S)
0.750	98	Impervious (1S)
0.790	**97**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.040	HSG D	1S
0.750	Other	1S
0.790		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.040	0.000	0.040	50-75% Grass cover, Fair	1S
0.000	0.000	0.000	0.000	0.750	0.750	Impervious	1S
0.000	**0.000**	**0.000**	**0.040**	**0.750**	**0.790**	**TOTAL AREA**	

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=0.790 ac 94.94% Impervious Runoff Depth=2.77"
Flow Length=110' Slope=0.0063 '/' Tc=5.0 min CN=97 Runoff=3.46 cfs 0.182 af

Total Runoff Area = 0.790 ac Runoff Volume = 0.182 af Average Runoff Depth = 2.77"
5.06% Pervious = 0.040 ac 94.94% Impervious = 0.750 ac

Summary for Subcatchment 1S: Existing Site

[49] Hint: Tc<2dt may require smaller dt

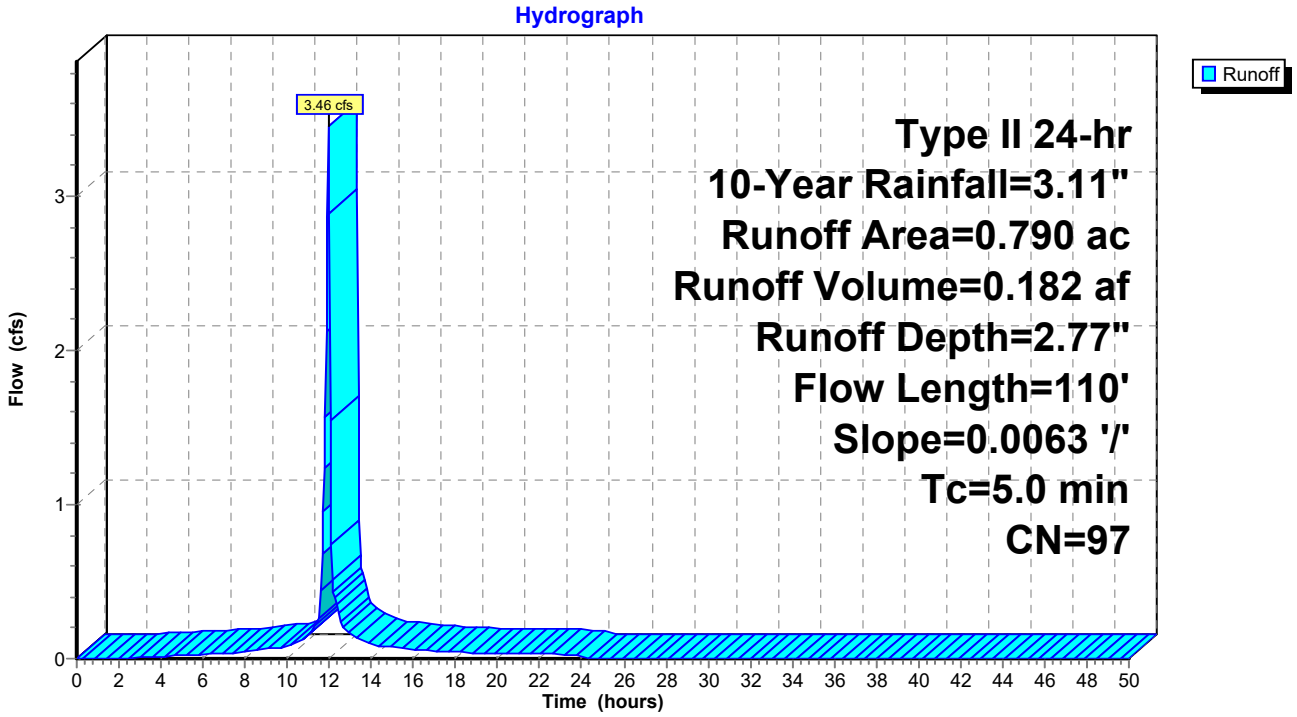
Runoff = 3.46 cfs @ 11.95 hrs, Volume= 0.182 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.11"

	Area (ac)	CN	Description
	0.040	84	50-75% Grass cover, Fair, HSG D
*	0.750	98	Impervious
	0.790	97	Weighted Average
	0.040		5.06% Pervious Area
	0.750		94.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	110	0.0063	0.78		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.3	110	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site



Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Existing Site Runoff Area=0.790 ac 94.94% Impervious Runoff Depth=3.44"
Flow Length=110' Slope=0.0063 '/' Tc=5.0 min CN=97 Runoff=4.25 cfs 0.227 af

Total Runoff Area = 0.790 ac Runoff Volume = 0.227 af Average Runoff Depth = 3.44"
5.06% Pervious = 0.040 ac 94.94% Impervious = 0.750 ac

Summary for Subcatchment 1S: Existing Site

[49] Hint: Tc<2dt may require smaller dt

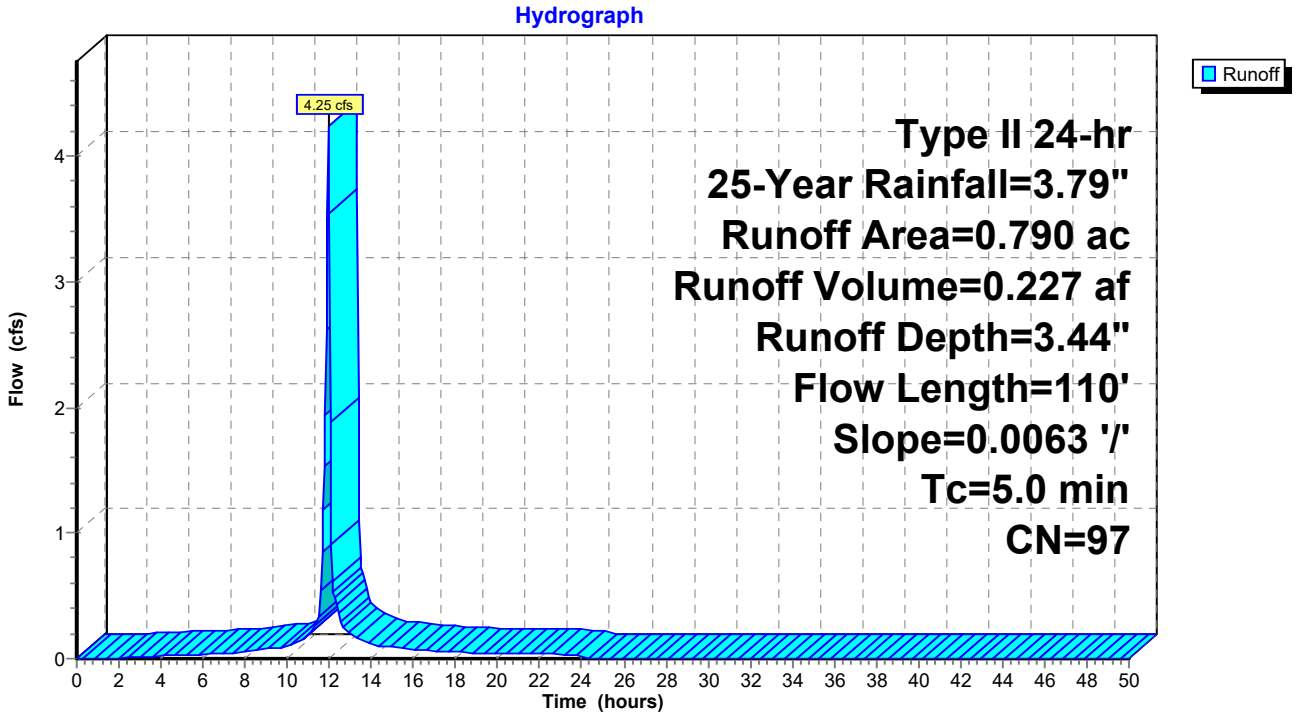
Runoff = 4.25 cfs @ 11.95 hrs, Volume= 0.227 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.79"

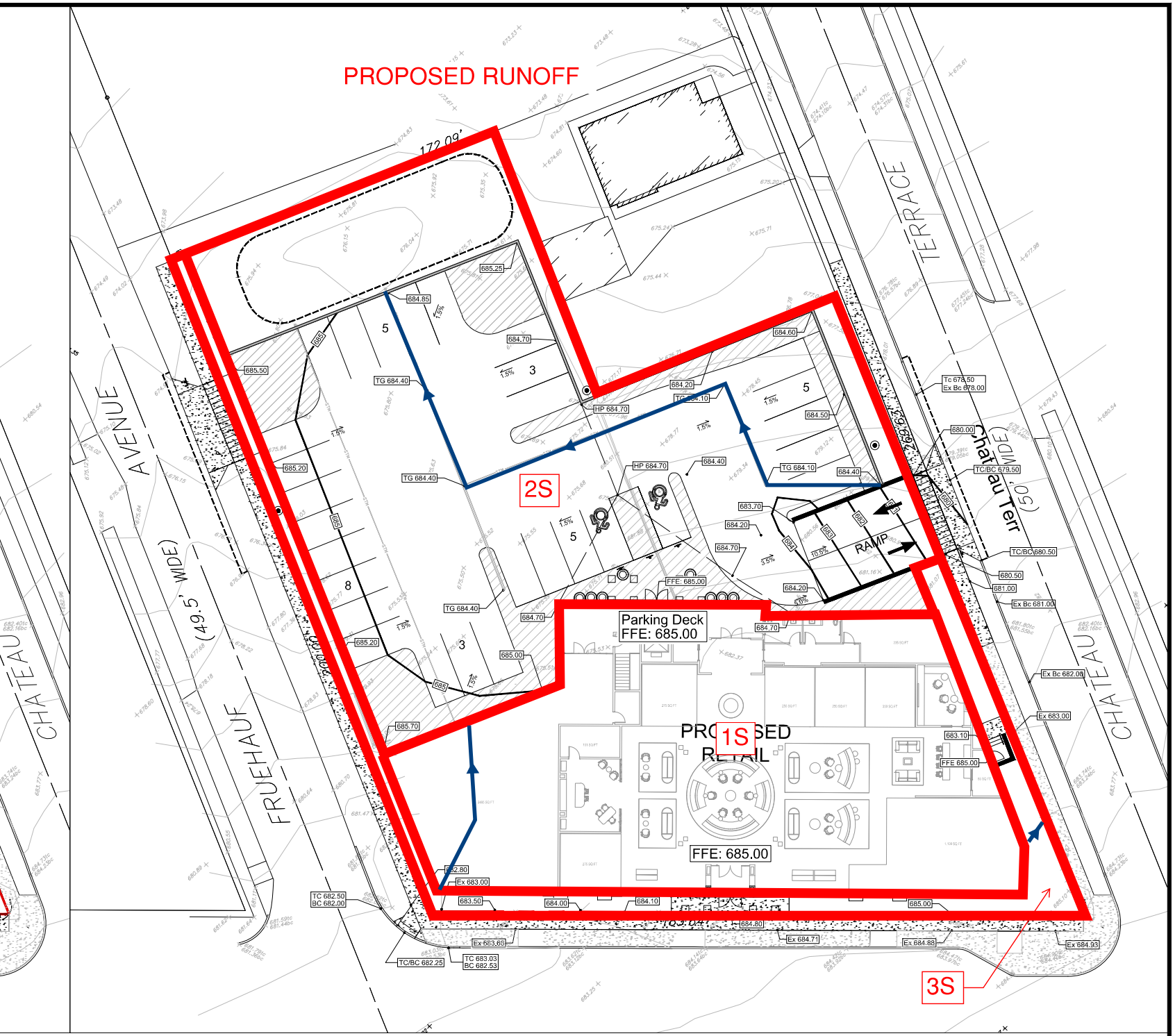
	Area (ac)	CN	Description
	0.040	84	50-75% Grass cover, Fair, HSG D
*	0.750	98	Impervious
	0.790	97	Weighted Average
	0.040		5.06% Pervious Area
	0.750		94.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	110	0.0063	0.78		**Sheet Flow, Overland - Pvmt.** Smooth surfaces n= 0.011 P2= 2.50"
2.3	110	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Existing Site



Proposed Runoff



Ground Level

DRAWING REVISIONS:

No.	DATE	BY	REMARKS

SPECIAL INFORMATION:

ALL CONTRACTORS SHALL GUARANTEE THEIR WORK FOR A PERIOD OF ONE YEAR FROM THE DATE OF OWNERS ACCEPTANCE.

SHOP DRAWING SUBMITTALS ARE REQUIRED FOR ANY AND ALL STRUCTURES.

NOTICE

UNAUTHORIZED ALTERATIONS OF THIS DOCUMENT ARE IN VIOLATION OF SECTION #7209 OF THE STATE EDUCATION LAW.

CONSTRUCTION SET

NORTH

811 Know what's below. Call before you dig.

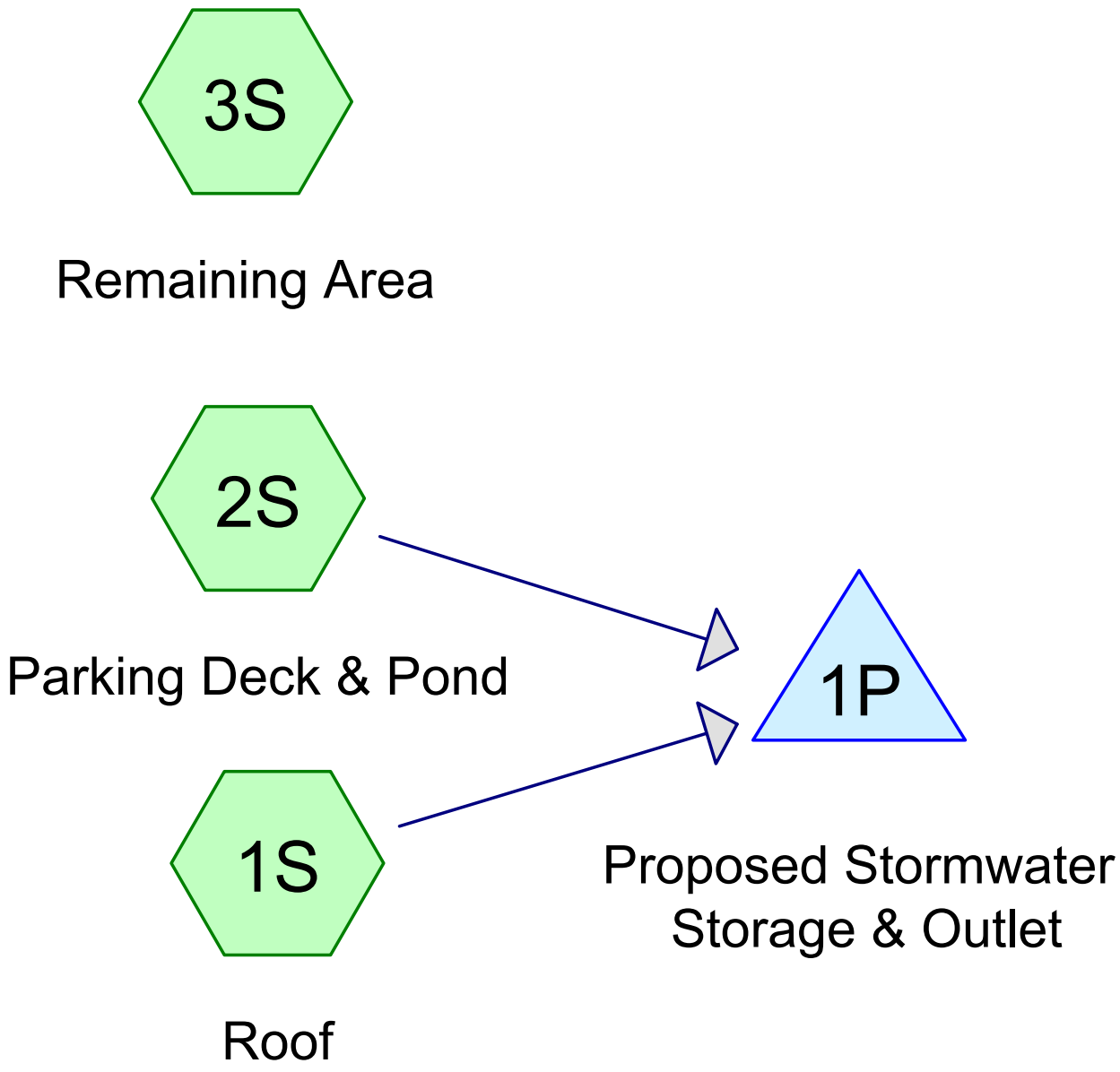
PROPERTY NUMBER: #5202

AREA: -

Main St - Snyder
4548-4564 Main St.
Amherst, NY14226

PROPOSED RETAIL

CONSULTANT



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2	25-Year	Type II 24-hr		Default	24.00	1	3.79	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.140	80	>75% Grass cover, Good, HSG D (2S, 3S)
0.370	98	Impervious, HSG D (2S)
0.280	98	Roofs, HSG D (1S)
0.790	**95**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.790	HSG D	1S, 2S, 3S
0.000	Other	
0.790		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.140	0.000	0.140	>75% Grass cover, Good	2S, 3S
0.000	0.000	0.000	0.370	0.000	0.370	Impervious	2S
0.000	0.000	0.000	0.280	0.000	0.280	Roofs	1S
0.000	**0.000**	**0.000**	**0.790**	**0.000**	**0.790**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1S	0.00	0.00	122.0	0.0020	0.013	0.0	8.0	0.0
2	2S	0.00	0.00	32.0	0.0020	0.013	0.0	6.0	0.0
3	2S	0.00	0.00	80.0	0.0050	0.013	0.0	6.0	0.0
4	2S	0.00	0.00	32.0	0.0020	0.013	0.0	6.0	0.0
5	2S	0.00	0.00	31.0	0.0020	0.013	0.0	6.0	0.0
6	1P	671.15	670.80	166.0	0.0021	0.020	0.0	8.0	0.0

Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Roof Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=2.88"
Flow Length=172' Tc=5.0 min CN=98 Runoff=1.27 cfs 0.067 af

Subcatchment2S: Parking Deck & Pond Runoff Area=0.430 ac 86.05% Impervious Runoff Depth=2.56"
Flow Length=205' Tc=5.0 min CN=95 Runoff=1.85 cfs 0.092 af

Subcatchment3S: Remaining Area Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=1.33"
Flow Length=5' Slope=0.0100 '/' Tc=5.0 min CN=80 Runoff=0.20 cfs 0.009 af

Pond 1P: Proposed Stormwater Storage & Peak Elev=673.95' Storage=1,475 cf Inflow=3.12 cfs 0.159 af
8.0" Round Culvert n=0.020 L=166.0' S=0.0021 '/' Outflow=0.93 cfs 0.159 af

Total Runoff Area = 0.790 ac Runoff Volume = 0.168 af Average Runoff Depth = 2.55"
17.72% Pervious = 0.140 ac 82.28% Impervious = 0.650 ac

Summary for Subcatchment 1S: Roof

[47] Hint: Peak is 235% of capacity of segment #2

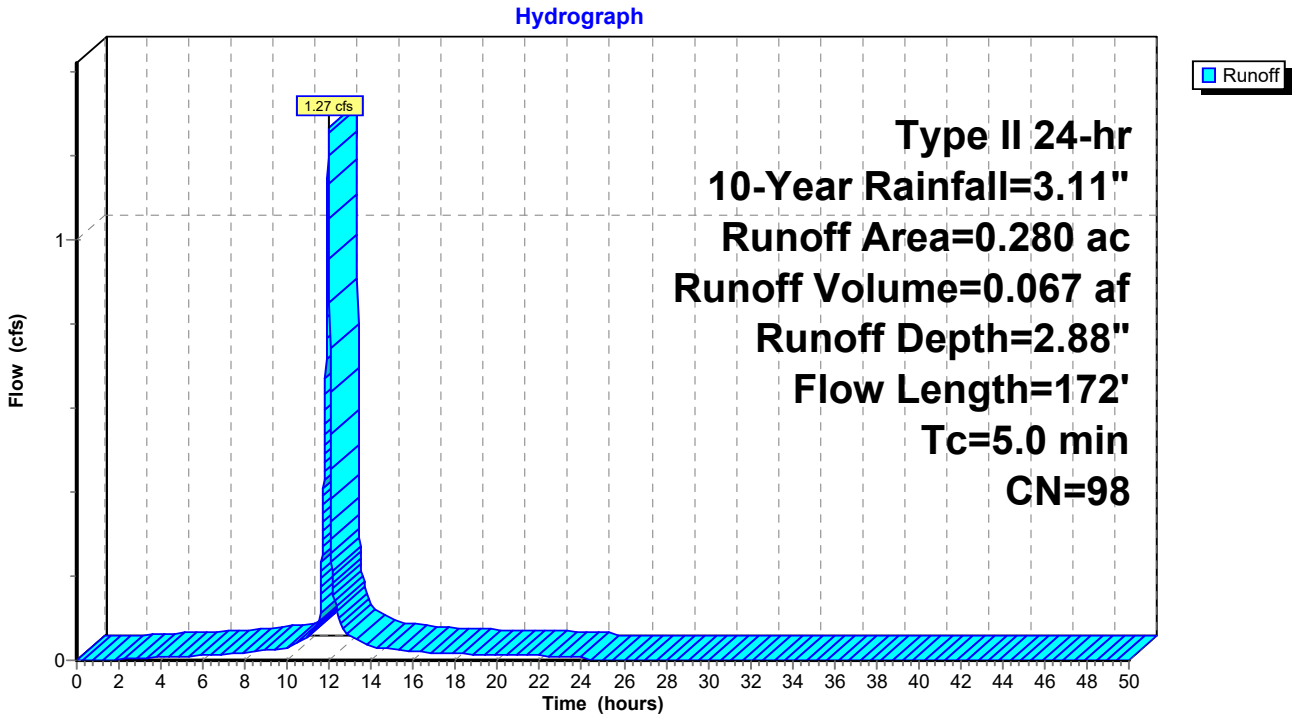
Runoff = 1.27 cfs @ 11.96 hrs, Volume= 0.067 af, Depth= 2.88"
Routed to Pond 1P : Proposed Stormwater Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.11"

Area (ac)	CN	Description
0.280	98	Roofs, HSG D
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.80		**Sheet Flow, roof** Smooth surfaces n= 0.011 P2= 2.50"
1.3	122	0.0020	1.55	0.54	**Pipe Channel, Roof drain** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Corrugated PE, smooth interior
2.3	172	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Roof



Summary for Subcatchment 2S: Parking Deck & Pond

[47] Hint: Peak is 737% of capacity of segment #2
[47] Hint: Peak is 466% of capacity of segment #3
[47] Hint: Peak is 737% of capacity of segment #4
[47] Hint: Peak is 737% of capacity of segment #5

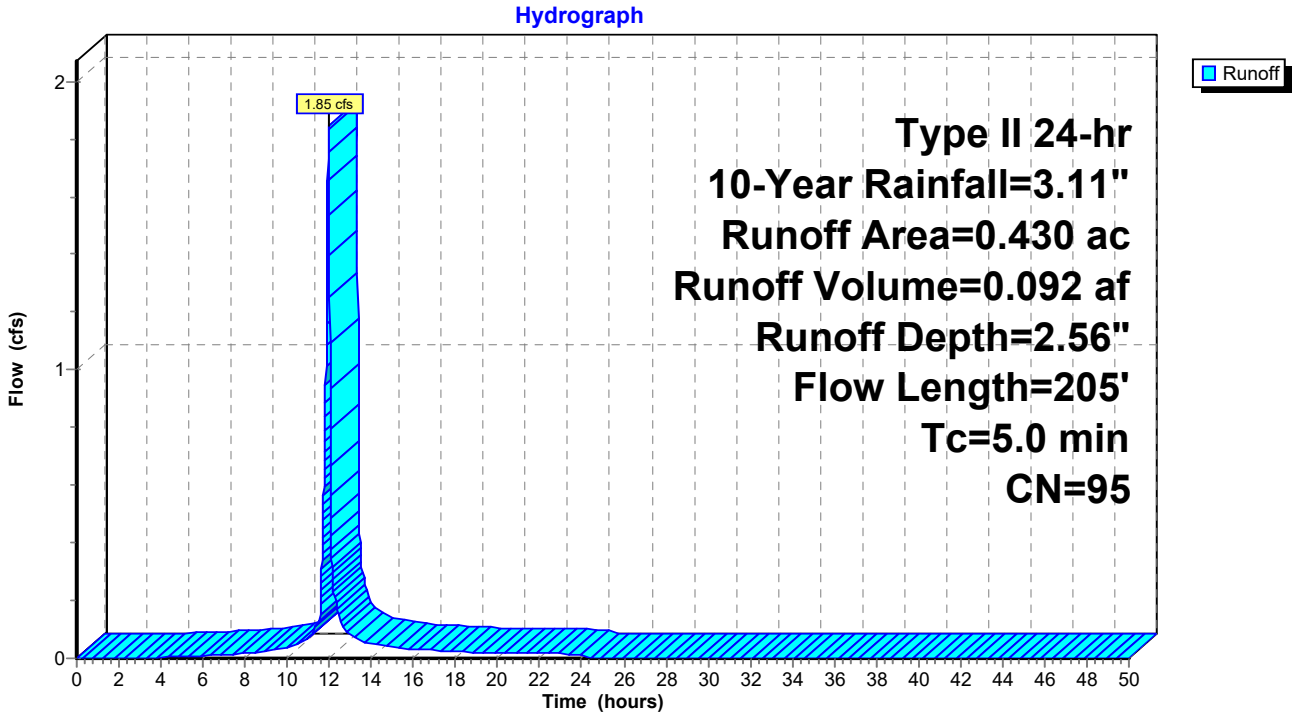
Runoff = 1.85 cfs @ 11.96 hrs, Volume= 0.092 af, Depth= 2.56"
Routed to Pond 1P : Proposed Stormwater Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.11"

	Area (ac)	CN	Description
*	0.370	98	Impervious, HSG D
	0.060	80	>75% Grass cover, Good, HSG D
	0.430	95	Weighted Average
	0.060		13.95% Pervious Area
	0.370		86.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	30	0.0100	0.72		**Sheet Flow, parking deck** Smooth surfaces n= 0.011 P2= 2.50"
0.4	32	0.0020	1.28	0.25	**Pipe Channel, Trench drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.7	80	0.0050	2.02	0.40	**Pipe Channel, 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.4	32	0.0020	1.28	0.25	**Pipe Channel, Trench drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.4	31	0.0020	1.28	0.25	**Pipe Channel, 6+"pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
2.6	205	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Parking Deck & Pond



Summary for Subcatchment 3S: Remaining Area

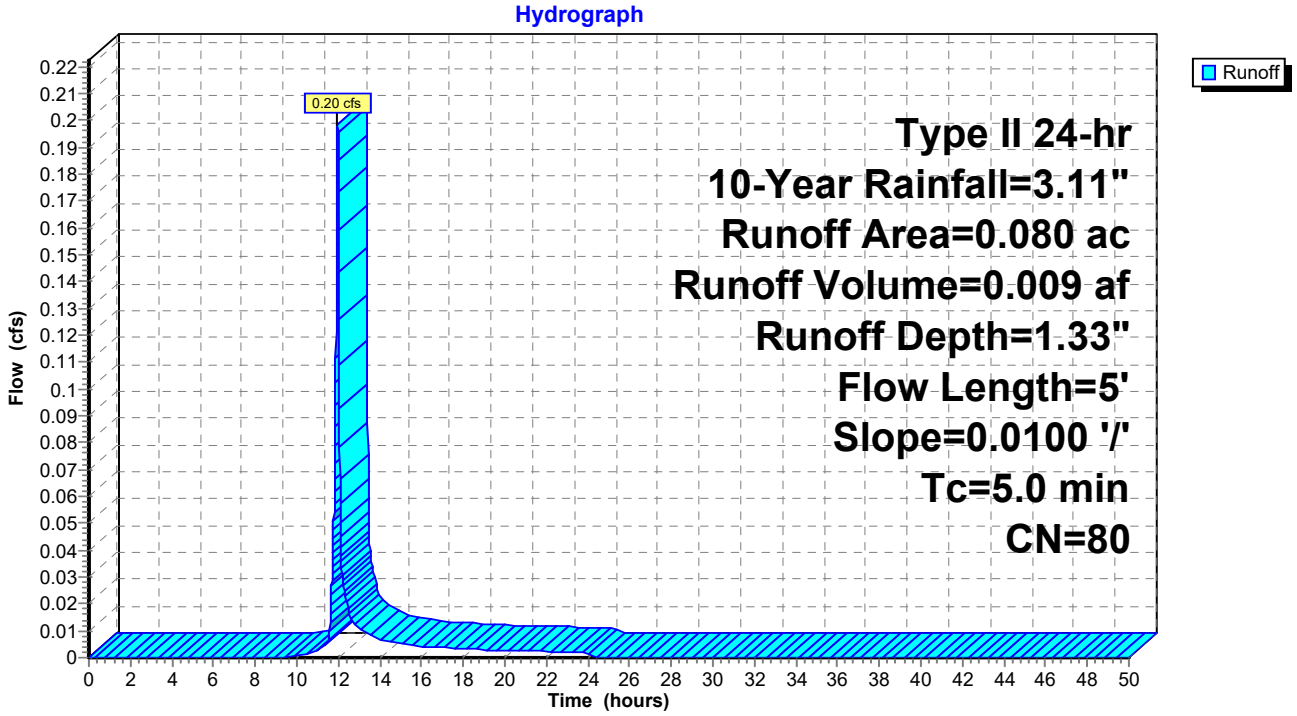
Runoff = 0.20 cfs @ 11.96 hrs, Volume= 0.009 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.11"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	5	0.0100	0.06		**Sheet Flow, grass/landscaping** Grass: Short n= 0.150 P2= 2.50"
1.3	5	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S: Remaining Area



Summary for Pond 1P: Proposed Stormwater Storage & Outlet

[44] Hint: Outlet device #1 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=563)

Inflow Area = 0.710 ac, 91.55% Impervious, Inflow Depth = 2.68" for 10-Year event
Inflow = 3.12 cfs @ 11.96 hrs, Volume= 0.159 af
Outflow = 0.93 cfs @ 12.07 hrs, Volume= 0.159 af, Atten= 70%, Lag= 6.9 min
Primary = 0.93 cfs @ 12.07 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 673.95' @ 12.07 hrs Surf.Area= 1,713 sf Storage= 1,475 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.1 min (774.0 - 766.8)

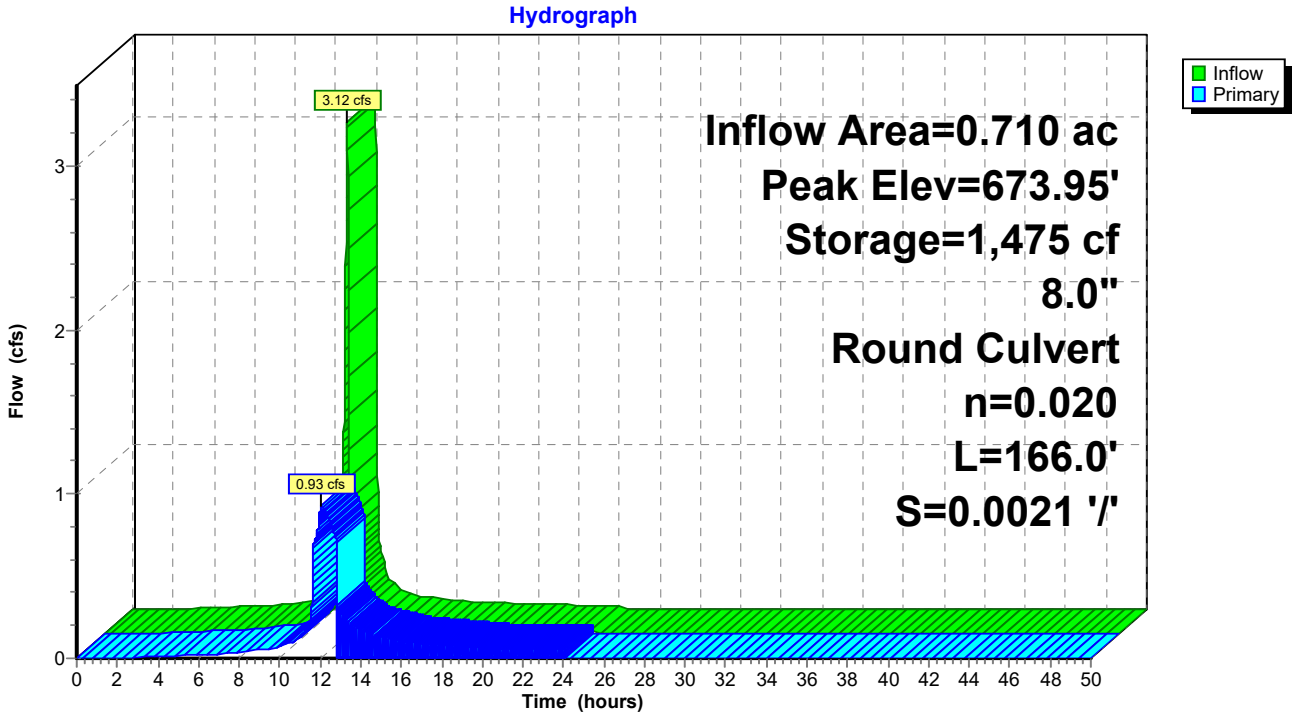
Volume	Invert	Avail.Storage	Storage Description
#1	672.90'	2,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
672.90	425	0	0
673.00	1,210	82	82
674.00	1,738	1,474	1,556
674.50	2,032	943	2,498

Device	Routing	Invert	Outlet Devices
#1	Primary	671.15'	**8.0" Round Outlet Pipe** L= 166.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 671.15' / 670.80' S= 0.0021 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.93 cfs @ 12.07 hrs HW=673.95' (Free Discharge)
1=Outlet Pipe (Barrel Controls 0.93 cfs @ 2.66 fps)

Pond 1P: Proposed Stormwater Storage & Outlet



Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Roof Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=3.56"
Flow Length=172' Tc=5.0 min CN=98 Runoff=1.55 cfs 0.083 af

Subcatchment2S: Parking Deck & Pond Runoff Area=0.430 ac 86.05% Impervious Runoff Depth=3.22"
Flow Length=205' Tc=5.0 min CN=95 Runoff=2.30 cfs 0.116 af

Subcatchment3S: Remaining Area Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=1.87"
Flow Length=5' Slope=0.0100 '/' Tc=5.0 min CN=80 Runoff=0.28 cfs 0.012 af

Pond 1P: Proposed Stormwater Storage & Peak Elev=674.28' Storage=2,064 cf Inflow=3.85 cfs 0.198 af
8.0" Round Culvert n=0.020 L=166.0' S=0.0021 '/' Outflow=0.99 cfs 0.199 af

Total Runoff Area = 0.790 ac Runoff Volume = 0.211 af Average Runoff Depth = 3.20"
17.72% Pervious = 0.140 ac 82.28% Impervious = 0.650 ac

Summary for Subcatchment 1S: Roof

[47] Hint: Peak is 287% of capacity of segment #2

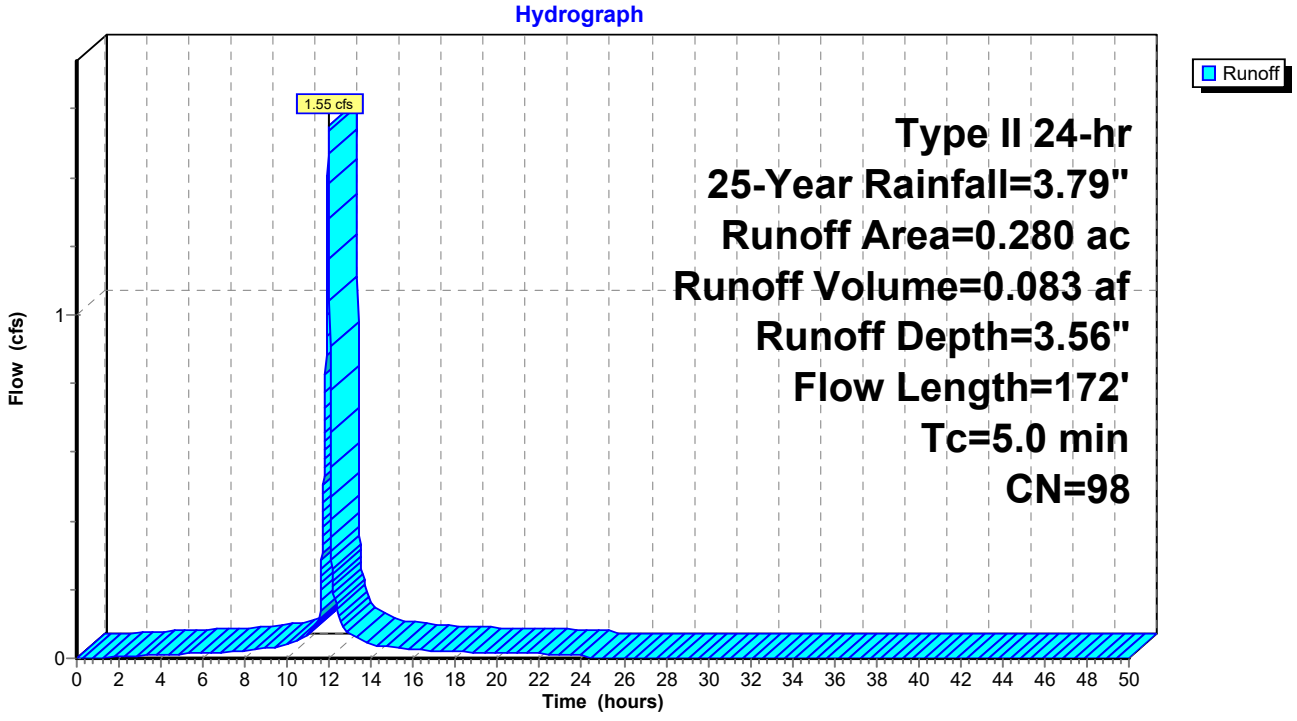
Runoff = 1.55 cfs @ 11.96 hrs, Volume= 0.083 af, Depth= 3.56"
Routed to Pond 1P : Proposed Stormwater Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.79"

Area (ac)	CN	Description
0.280	98	Roofs, HSG D
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.80		**Sheet Flow, roof** Smooth surfaces n= 0.011 P2= 2.50"
1.3	122	0.0020	1.55	0.54	**Pipe Channel, Roof drain** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Corrugated PE, smooth interior
2.3	172	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: Roof



Summary for Subcatchment 2S: Parking Deck & Pond

[47] Hint: Peak is 915% of capacity of segment #2
[47] Hint: Peak is 579% of capacity of segment #3
[47] Hint: Peak is 915% of capacity of segment #4
[47] Hint: Peak is 915% of capacity of segment #5

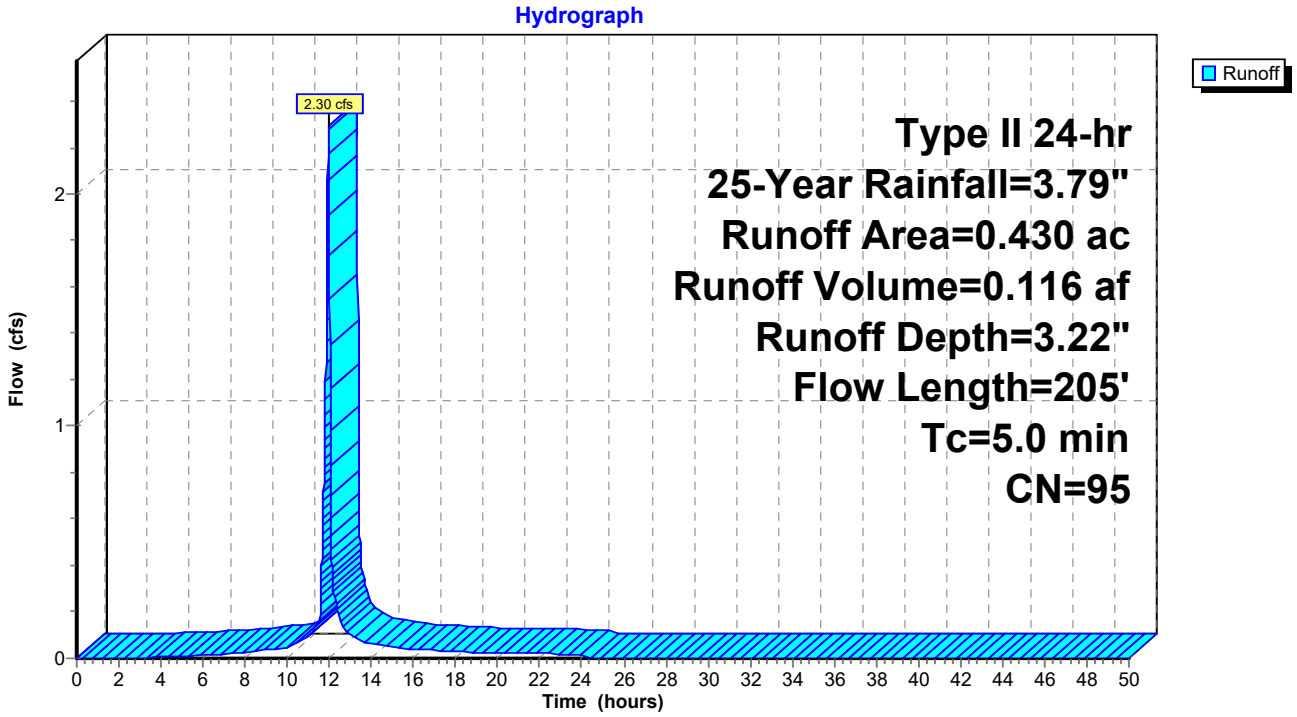
Runoff = 2.30 cfs @ 11.96 hrs, Volume= 0.116 af, Depth= 3.22"
Routed to Pond 1P : Proposed Stormwater Storage & Outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.79"

	Area (ac)	CN	Description
*	0.370	98	Impervious, HSG D
	0.060	80	>75% Grass cover, Good, HSG D
	0.430	95	Weighted Average
	0.060		13.95% Pervious Area
	0.370		86.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	30	0.0100	0.72		**Sheet Flow, parking deck** Smooth surfaces n= 0.011 P2= 2.50"
0.4	32	0.0020	1.28	0.25	**Pipe Channel, Trench drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.7	80	0.0050	2.02	0.40	**Pipe Channel, 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.4	32	0.0020	1.28	0.25	**Pipe Channel, Trench drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.4	31	0.0020	1.28	0.25	**Pipe Channel, 6+"pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
2.6	205	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: Parking Deck & Pond



Summary for Subcatchment 3S: Remaining Area

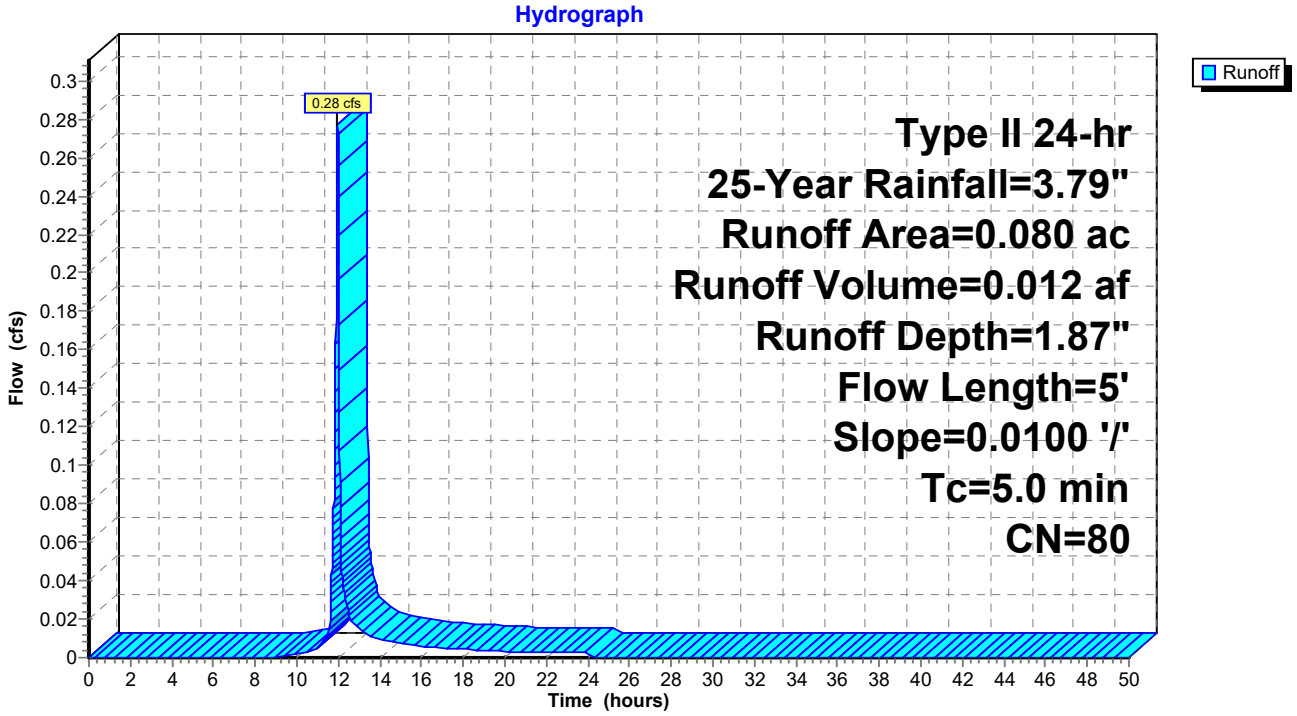
Runoff = 0.28 cfs @ 11.96 hrs, Volume= 0.012 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.79"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	5	0.0100	0.06		**Sheet Flow, grass/landscaping** Grass: Short n= 0.150 P2= 2.50"
1.3	5	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S: Remaining Area



Summary for Pond 1P: Proposed Stormwater Storage & Outlet

[44] Hint: Outlet device #1 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=550)

Inflow Area = 0.710 ac, 91.55% Impervious, Inflow Depth = 3.35" for 25-Year event
Inflow = 3.85 cfs @ 11.96 hrs, Volume= 0.198 af
Outflow = 0.99 cfs @ 12.08 hrs, Volume= 0.199 af, Atten= 74%, Lag= 7.5 min
Primary = 0.99 cfs @ 12.08 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 674.28' @ 12.08 hrs Surf.Area= 1,902 sf Storage= 2,064 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 10.1 min (771.8 - 761.7)

Volume	Invert	Avail.Storage	Storage Description
#1	672.90'	2,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
672.90	425	0	0
673.00	1,210	82	82
674.00	1,738	1,474	1,556
674.50	2,032	943	2,498

Device	Routing	Invert	Outlet Devices
#1	Primary	671.15'	**8.0" Round Outlet Pipe** L= 166.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 671.15' / 670.80' S= 0.0021 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.99 cfs @ 12.08 hrs HW=674.28' (Free Discharge)
1=Outlet Pipe (Barrel Controls 0.99 cfs @ 2.83 fps)

Pond 1P: Proposed Stormwater Storage & Outlet