CARMINA WOOD
DESIGN

ENGINEER'S REPORT

for

Proposed Medical Building

1692 Maple Road
Town of Amherst, Erie County, New York

Prepared for

1692 Maple Road LLC

1692 Maple Road
Buffalo, NY 14221

Prepared by

Carmina Wood Design

80 Silo City Row, Suite 100
Buffalo, NY 14203

Telephone: (716) 842-3165
Fax: (716) 842-0263

June 2025

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Section 1 - Location & Description

This project is a development of an existing vacant 0.9 acre site located 1692 Maple Road in the Town of Amherst. Construction will consist of a 9,000 sf surgical center with associated site, utility and landscaping improvements. Currently the site is vacant. The proposed site development area to be disturbed for this project is approximately 0.8 acres when construction is completed.

Section 2 - Water Service

Water service for the site will be tapped off the existing 8" Erie County Water Authority water main on the south side of Maple Road. The proposed service will be a 2" type k copper domestic water service. This service will continue into an interior mechanical room housing the meter and RPZ. Proper heat and lighting will be provided in the enclosure, drainage due to testing or failure of the RPZ will be to the exterior grade. The owner will be responsible for keeping the drainage ports clear of snow and debris. Water inside the building will be used for typical domestic uses.

Domestic Summary:	
Peak Operating Demand:	0.41 gpm
Water Main:	8" on Maple Road
Static Pressure:	94 psi (per ECWA)
Friction Loss:	0.0 psi
Loss through meter/RPZ:	13.0 psi
Elevation Loss:	0.0 psi
Pressure after RPZ:	69 psi

Section 3 - Sanitary Sewer Service

Proposed is a 6" SDR-35 PVC private sanitary sewer lateral, connected to the existing public sanitary sewer main along the west side of Youngs Road.

Design Parameters

Doctors:	250 gal/day/doctor x 4 doctors = 1,000 gpd
Employees:	15 gal/day/employee x 10 employees = 150 gpd

1,150 gpd * 4.41 = 5,070 gpd *use peaking factor of 4.41

The hydraulic loading rate is per "Design Standards for Intermediate Sized Wastewater Treatment Systems" 2014, NYSDEC, number of students is based on maximum capacity of the proposed building.

Section 4 - Storm Sewer Service

The existing site currently sheet drains in multiple directions either to neighboring properties or public storm sewer systems on either Maple Road or Youngs Road.

Stormwater runoff collected onsite as a result of the proposed development will be routed to an onsite dry detention basin. An 8" outlet control pipe will be provided downstream of the dry detention basin. Discharge from the outlet pipe will connect to the existing storm sewer system on Youngs Road.

Town of Amherst Requirement:
The Town of Amherst requires that the 25-year proposed storm event be attenuated with detention and that the outlet be restricted to the 10-year existing storm event. This volume of 2,738 cf is accommodated in the detention basin at elevation 603.89. At this elevation, the outlet discharge

will be restricted to 1.32 cfs, which is less than the existing 10-year peak runoff outflow of 2.25 cfs.

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	2.25	1.17	-1.08
25-year	3.16	1.32	-1.84

Appendix A

Sanitary Sewer and Water Demand Calculations

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 24-4153 Date: 6/23/2025
Project Name: Proposed Medical Building
Project Address: 1692 Maple Road Amherst, NY
Subject: Sanitary Sewer & Water Demand Calcs
Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

250 gal/d/doc	x	4 doc	=	1,000	gpd	*use 250 gallons per doctor per day	
15 gal/d/emp	x	10 emp	=	150	gpd	*use 15 gallons per employee per day	

Total Site Sanitary Demand: = 1,150 gpd

Find Peak Sanitary Demand:

Peaking Factor based on Population:

Total demand: 1,150 gpd / 100 gpcd = 12 per capita

Population (P) = 12 people

Peaking Factor : (18 +√P) / (4 + √P) where P is in thousands

Peaking Factor = 4.41

Peak Sanitary Demand = 1,150 x 4.41 = 5,070 gpd
= 0.005 MGD
= 0.008 cfs

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Sheet: 2 of 2

Water Demand Calculations (domestic):

Medical Building

1,150 gpd x 1.1 = 1,265 gpd *use 110% of sewage demand

*use 1.8 peaking factor and assume a 12 hour day

1,265 gpm x 1day/12hr x 1hr/60min = 1.76 gpm

1.76 gpm x 1.8 = 3.16 gpm Q_{peak}

Headlosses:

Q_{peak} = 3.16 gpm
Pipe = 2 inch Type 'K' Copper C = 140
Length = 135 LF (approx. distance from tap to RPZ)

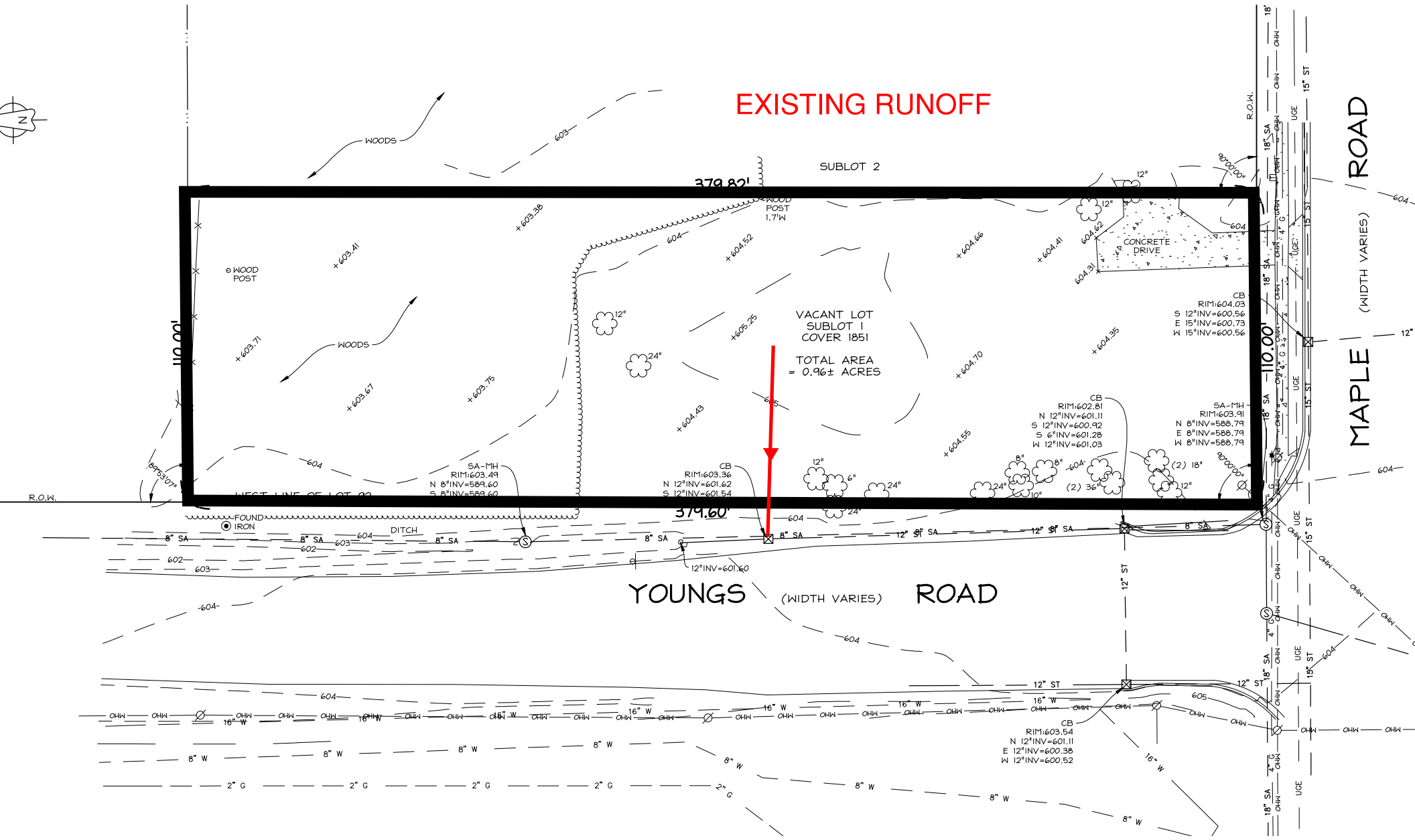
$$H_L = \frac{10.44\ L\ Q^{1.85}}{C^{1.85}\ D^{4.866}} = \frac{10.44(135)(3.16)^{1.85}}{(140)^{1.85}\ (2)^{4.866}} = 0.04 \text{ ft} = 0.02 \text{ psi}$$

Δ elev = 0 ft = 0.00 psi
Loss through meter = 1 psi
Loss through RPZ = 12 psi
Total Losses = 13.0 psi
Static Pressure = 82 psi (per ECWA)
Residual Pressure Following RPZ = 82 - 13.0 = 69.0 psi (available after rpz & meter)

Appendix B

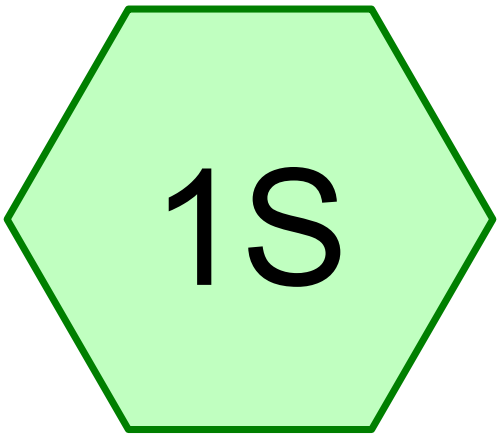
Storm Sewer System Drainage Calculations

Existing Runoff


EXISTING RUNOFF
SUBLOT 2
379.82'
WOODS
WOOD POST 1.7'W
VACANT LOT
SUBLOT 1
COVER 1851
TOTAL AREA
= 0.96± ACRES
110.00'
379.60'
CONCRETE DRIVE
CB
RIM:604.03
S 12"INV=600.56
E 15"INV=600.73
W 15"INV=600.56
CB
RIM:602.81
N 12"INV=601.11
S 12"INV=600.92
S 6"INV=601.28
W 12"INV=601.03
SA-MH
RIM:603.91
N 8"INV=588.79
E 8"INV=588.79
W 8"INV=588.79
SA-MH
RIM:603.49
N 8"INV=589.60
S 8"INV=589.60
CB
RIM:603.36
N 12"INV=601.62
S 12"INV=601.54
12"INV=601.60
CB
RIM:603.54
N 12"INV=601.11
E 12"INV=600.38
W 12"INV=600.52
FOUND IRON
DITCH
WEST LINE OF LOT 82
R.O.W.
MAPLE ROAD (WIDTH VARIES)
YOUNGS ROAD (WIDTH VARIES)
N

Events for Subcatchment 1S: Existing

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
1-Year	1.87	0.77	1,690	0.48
2-Year	2.20	1.12	2,398	0.69
5-Year	2.69	1.69	3,564	1.02
10-Year	3.14	2.25	4,725	1.36
25-Year	3.84	3.16	6,657	1.91
50-Year	4.48	4.02	8,519	2.44
100-Year	**5.23**	**5.05**	**10,784**	**3.09**



Existing

Subcat Reach Pond Link

Routing Diagram for 24-4153 existing
Prepared by Carmina Wood Morris, PC, Printed 6/23/2025

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	3.14	2
2	25-Year	Type II 24-hr		Default	24.00	1	3.84	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
41,818	80	>75% Grass cover, Good, HSG D (1S)
41,818	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
41,818	HSG D	1S
0	Other	
41,818		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	0	41,818	0	41,818	>75% Grass cover, Good	
0	**0**	**0**	**41,818**	**0**	**41,818**	**TOTAL AREA**	

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Existing Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=1.36"
Flow Length=67' Slope=0.0280 '/' Tc=7.0 min CN=80 Runoff=2.25 cfs 4,725 cf

Total Runoff Area = 41,818 sf Runoff Volume = 4,725 cf Average Runoff Depth = 1.36"
100.00% Pervious = 41,818 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: Existing

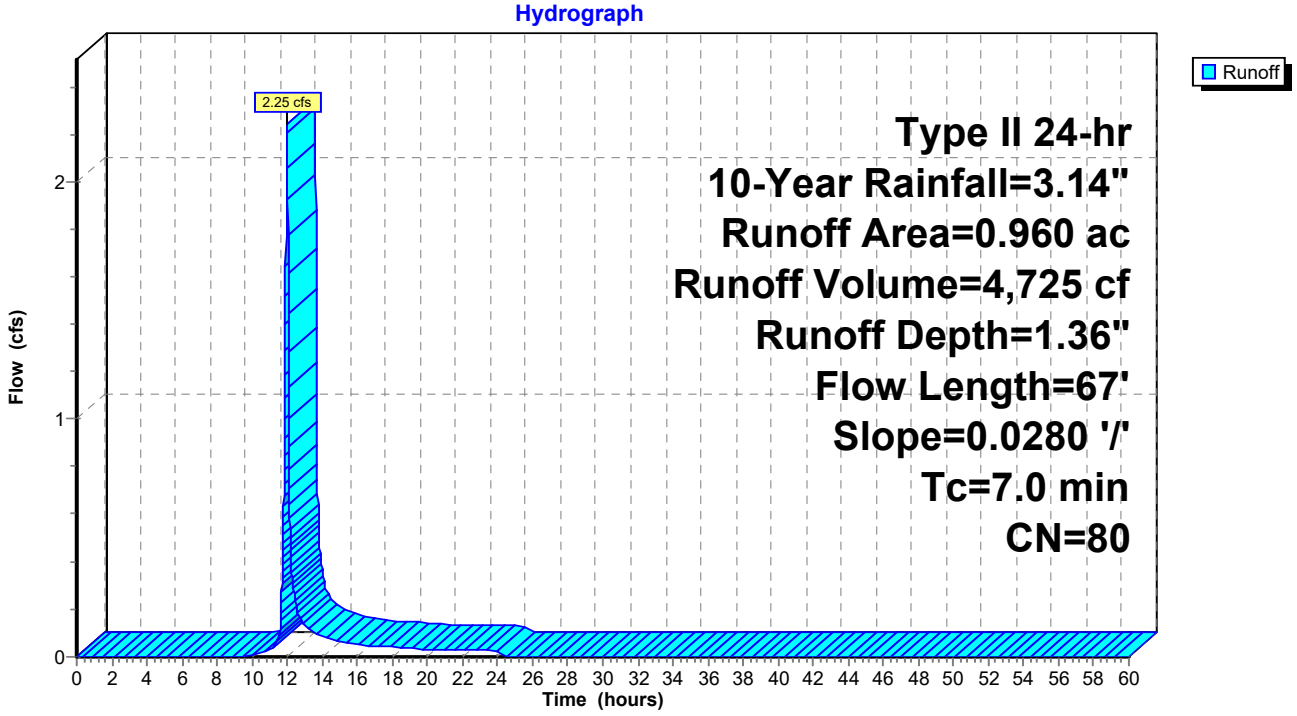
Runoff = 2.25 cfs @ 11.99 hrs, Volume= 4,725 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.14"

Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	67	0.0280	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1S: Existing



Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Existing Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=1.91"
Flow Length=67' Slope=0.0280 '/' Tc=7.0 min CN=80 Runoff=3.16 cfs 6,657 cf

Total Runoff Area = 41,818 sf Runoff Volume = 6,657 cf Average Runoff Depth = 1.91"
100.00% Pervious = 41,818 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: Existing

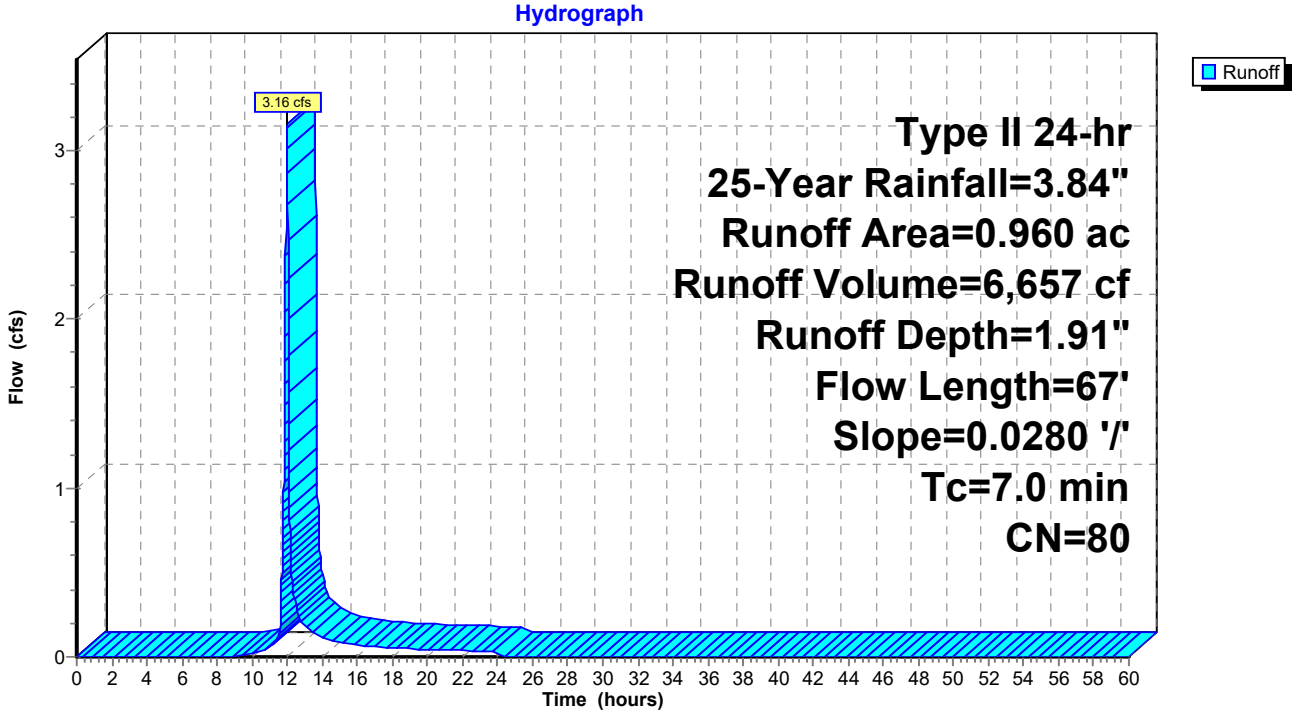
Runoff = 3.16 cfs @ 11.99 hrs, Volume= 6,657 cf, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.84"

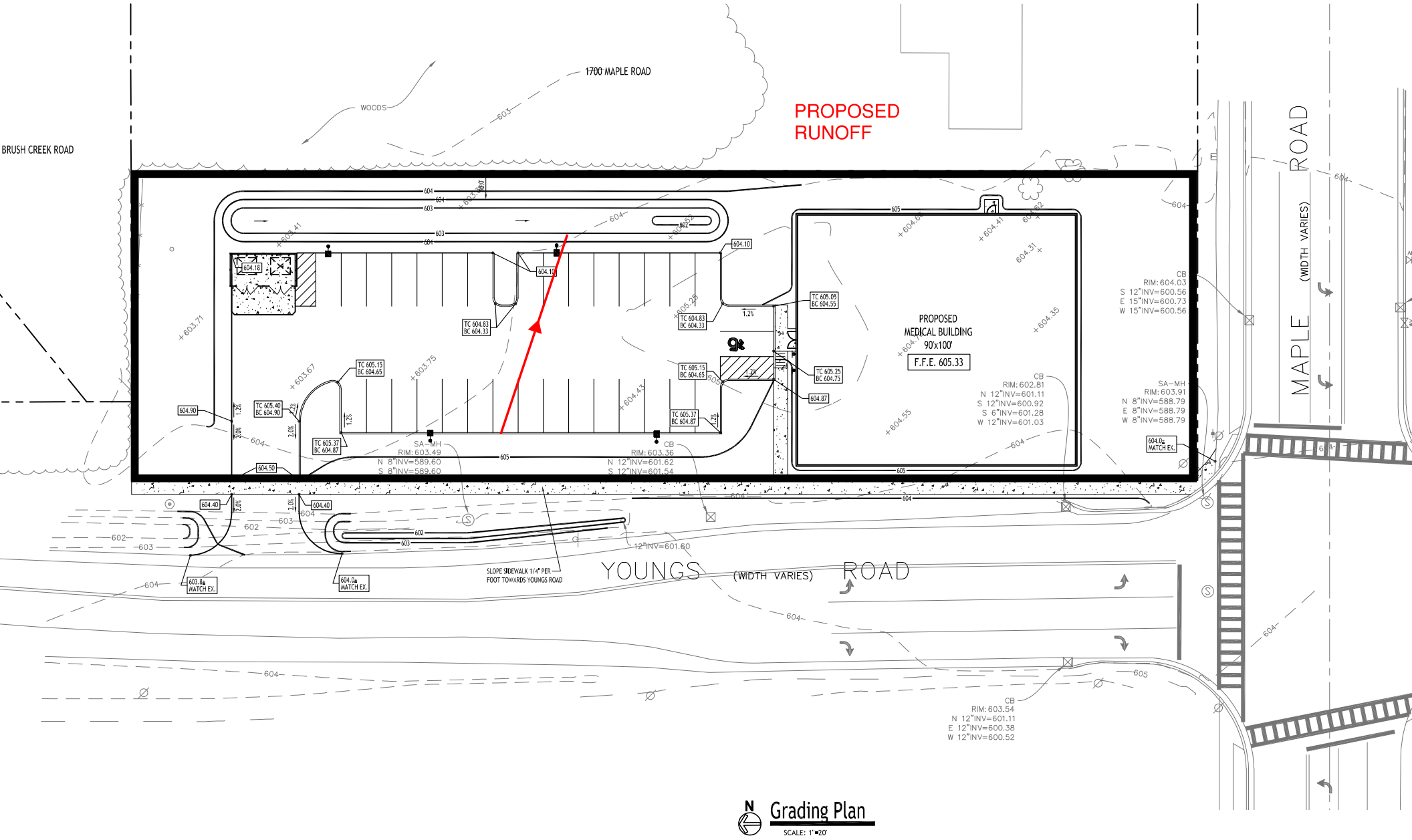
Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	67	0.0280	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1S: Existing



Proposed Runoff

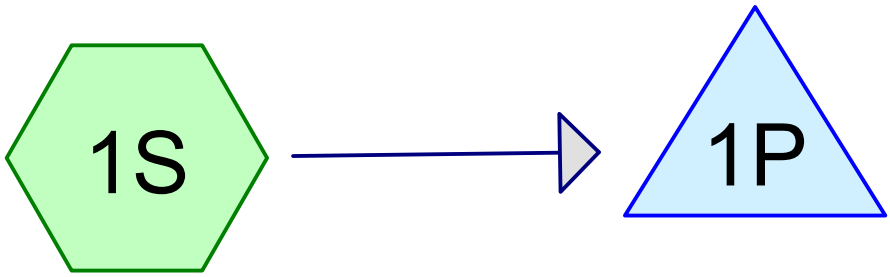


Grading Plan

SCALE: 1"=20'

Events for Pond 1P: (new Pond)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	1.77	0.80	602.89	735
2-Year	2.27	0.90	603.07	1,023
5-Year	3.04	1.05	603.33	1,490
10-Year	3.75	1.17	603.56	1,958
25-Year	4.87	1.32	603.89	2,738
50-Year	5.89	6.23	636.34	**3,035**
100-Year	**7.08**	**9.62**	**683.66**	3,035



Proposed (new Pond)

Subcat Reach Pond Link

Routing Diagram for 24-4153 proposed
Prepared by Carmina Wood Morris, PC, Printed 6/23/2025

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	3.14	2
2	25-Year	Type II 24-hr		Default	24.00	1	3.84	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
20,909	80	>75% Grass cover, Good, HSG D (1S)
20,909	98	Paved parking, HSG D (1S)
41,818	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
41,818	HSG D	1S
0	Other	
41,818		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	0	20,909	0	20,909	>75% Grass cover, Good	
0	0	0	20,909	0	20,909	Paved parking	
0	**0**	**0**	**41,818**	**0**	**41,818**	**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	1P	602.00	601.70	100.0	0.0030	0.013	0.0	8.0	0.0

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Proposed Runoff Area=0.960 ac 50.00% Impervious Runoff Depth=2.03"
Flow Length=72' Tc=3.0 min CN=89 Runoff=3.75 cfs 7,063 cf

Pond 1P: (new Pond) Peak Elev=603.56' Storage=1,958 cf Inflow=3.75 cfs 7,063 cf
8.0" Round Culvert n=0.013 L=100.0' S=0.0030 '/' Outflow=1.17 cfs 7,063 cf

Total Runoff Area = 41,818 sf Runoff Volume = 7,063 cf Average Runoff Depth = 2.03"
50.00% Pervious = 20,909 sf 50.00% Impervious = 20,909 sf

Summary for Subcatchment 1S: Proposed

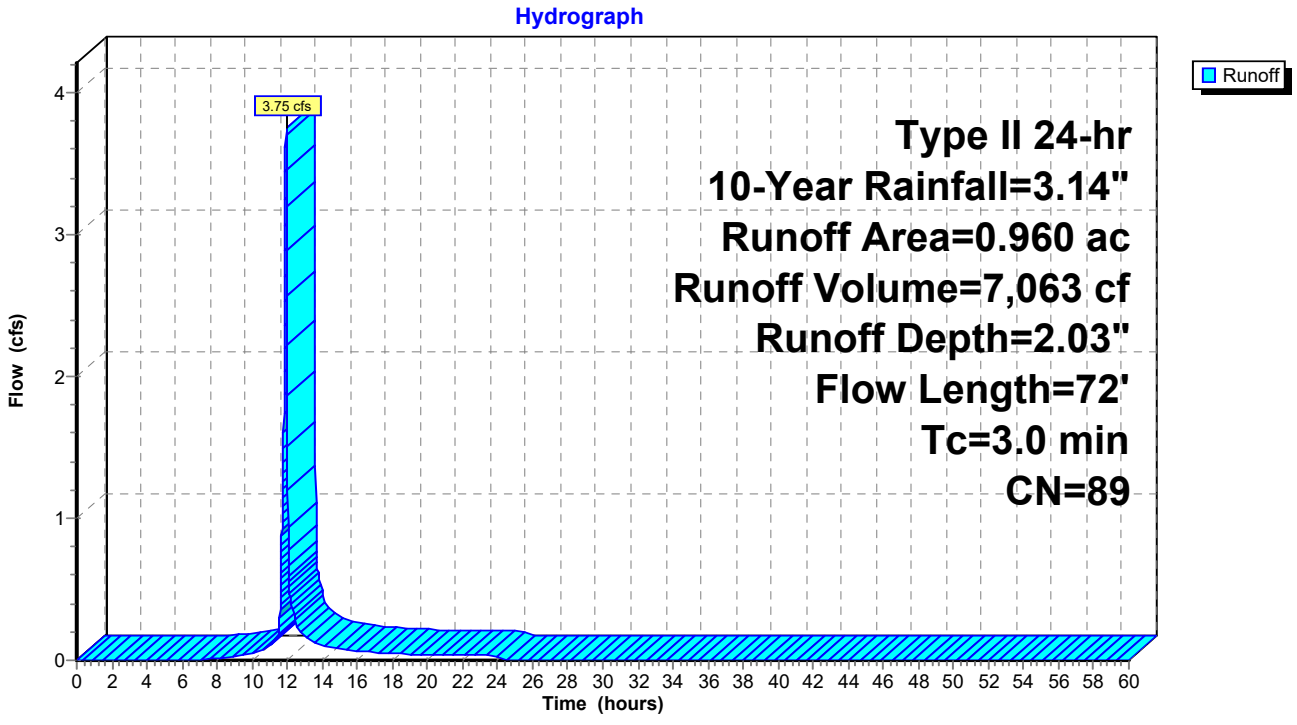
Runoff = 3.75 cfs @ 11.94 hrs, Volume= 7,063 cf, Depth= 2.03"
Routed to Pond 1P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.14"

Area (ac)	CN	Description
0.480	98	Paved parking, HSG D
0.480	80	>75% Grass cover, Good, HSG D
0.960	89	Weighted Average
0.480		50.00% Pervious Area
0.480		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0120	0.91		**Sheet Flow, pavement** Smooth surfaces n= 0.011 P2= 2.50"
1.8	5	0.0050	0.05		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.50"
3.0	72	Total			

Subcatchment 1S: Proposed



Summary for Pond 1P: (new Pond)

Inflow Area = 41,818 sf, 50.00% Impervious, Inflow Depth = 2.03" for 10-Year event
Inflow = 3.75 cfs @ 11.94 hrs, Volume= 7,063 cf
Outflow = 1.17 cfs @ 12.03 hrs, Volume= 7,063 cf, Atten= 69%, Lag= 5.7 min
Primary = 1.17 cfs @ 12.03 hrs, Volume= 7,063 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 603.56' @ 12.03 hrs Surf.Area= 2,199 sf Storage= 1,958 cf

Plug-Flow detention time= 19.1 min calculated for 7,062 cf (100% of inflow)
Center-of-Mass det. time= 19.2 min (825.1 - 806.0)

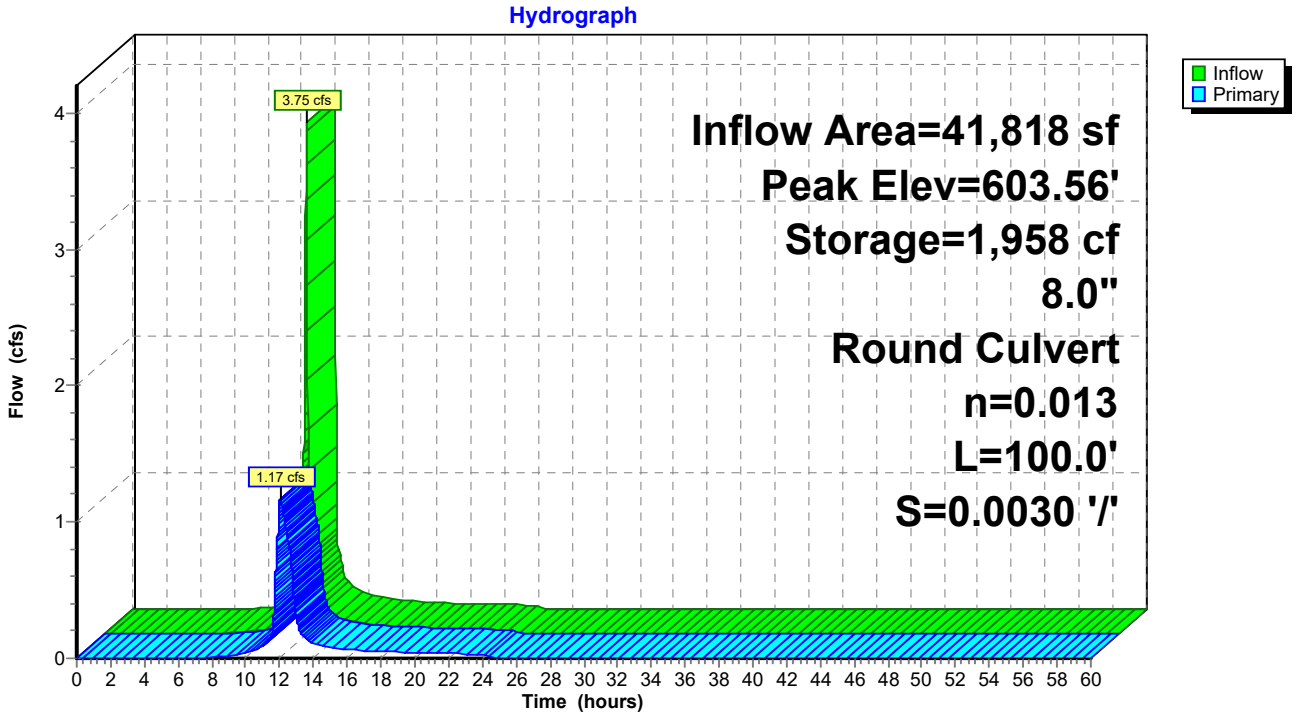
Volume	Invert	Avail.Storage	Storage Description
#1	602.00'	3,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
602.00	250	0	0
603.00	1,560	905	905
604.00	2,700	2,130	3,035

Device	Routing	Invert	Outlet Devices
#1	Primary	602.00'	**8.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 602.00' / 601.70' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.17 cfs @ 12.03 hrs HW=603.56' (Free Discharge)
1=Culvert (Barrel Controls 1.17 cfs @ 3.34 fps)

Pond 1P: (new Pond)



Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Proposed Runoff Area=0.960 ac 50.00% Impervious Runoff Depth=2.67"
Flow Length=72' Tc=3.0 min CN=89 Runoff=4.87 cfs 9,316 cf

Pond 1P: (new Pond) Peak Elev=603.89' Storage=2,738 cf Inflow=4.87 cfs 9,316 cf
8.0" Round Culvert n=0.013 L=100.0' S=0.0030 '/' Outflow=1.32 cfs 9,316 cf

Total Runoff Area = 41,818 sf Runoff Volume = 9,316 cf Average Runoff Depth = 2.67"
50.00% Pervious = 20,909 sf 50.00% Impervious = 20,909 sf

Summary for Subcatchment 1S: Proposed

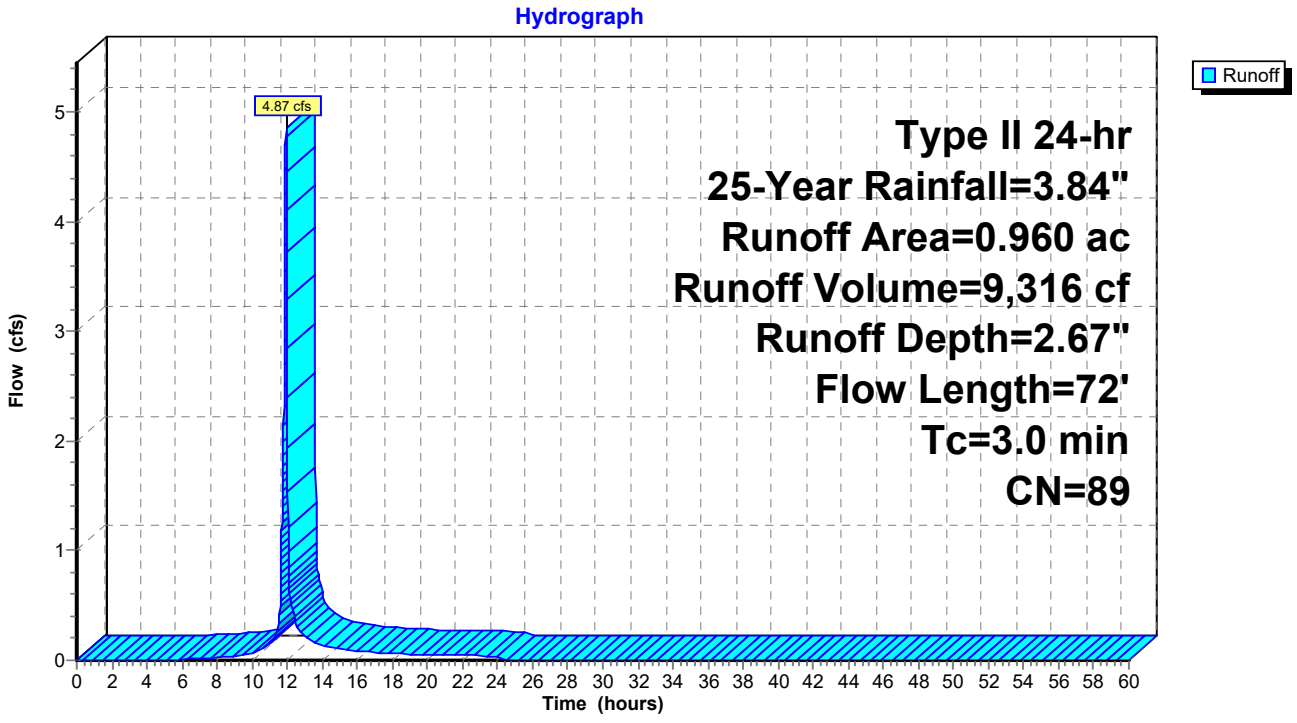
Runoff = 4.87 cfs @ 11.94 hrs, Volume= 9,316 cf, Depth= 2.67"
Routed to Pond 1P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.84"

Area (ac)	CN	Description
0.480	98	Paved parking, HSG D
0.480	80	>75% Grass cover, Good, HSG D
0.960	89	Weighted Average
0.480		50.00% Pervious Area
0.480		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0120	0.91		**Sheet Flow, pavement** Smooth surfaces n= 0.011 P2= 2.50"
1.8	5	0.0050	0.05		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.50"
3.0	72	Total			

Subcatchment 1S: Proposed



Summary for Pond 1P: (new Pond)

Inflow Area = 41,818 sf, 50.00% Impervious, Inflow Depth = 2.67" for 25-Year event
Inflow = 4.87 cfs @ 11.94 hrs, Volume= 9,316 cf
Outflow = 1.32 cfs @ 12.04 hrs, Volume= 9,316 cf, Atten= 73%, Lag= 6.1 min
Primary = 1.32 cfs @ 12.04 hrs, Volume= 9,316 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 603.89' @ 12.04 hrs Surf.Area= 2,572 sf Storage= 2,738 cf

Plug-Flow detention time= 21.1 min calculated for 9,316 cf (100% of inflow)
Center-of-Mass det. time= 20.9 min (819.1 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	602.00'	3,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
602.00	250	0	0
603.00	1,560	905	905
604.00	2,700	2,130	3,035

Device	Routing	Invert	Outlet Devices
#1	Primary	602.00'	**8.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 602.00' / 601.70' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.32 cfs @ 12.04 hrs HW=603.89' (Free Discharge)
1=Culvert (Barrel Controls 1.32 cfs @ 3.77 fps)

Pond 1P: (new Pond)