

Stormwater Management Report

Owner:

Rory Synstelien
925 Wayzata Blvd
Long Lake, MN 55391

Project:

Wilds on Wayzata
925 Wayzata Blvd
Long Lake, MN 55391

Engineer's Certification:

All plans and supporting Documentation contained in this report have been reviewed by me and it is hereby certified that to the best of my knowledge the plans comply with the requirements of the ordinance.

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Robert A. Latta P.E.

Registration Number: 59612

Date:

06/26/2024

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2.0 Summary Analysis / Narrative:

2.1 Introduction:

This stormwater management report accompanies the Civil Engineering Plans prepared by Civil Site Group for the subject project and serves as attachment D to the storm water pollution prevention plan (SWPPP). This report includes a summary of the existing and proposed site conditions, the stormwater requirements of relevant regulatory agencies, and proposed design calculations and data to meet the requirements.

2.2 Existing Site Conditions:

Site Description:

The existing site is currently one single family home. The existing site surface coverage areas are shown in the table below:

Existing Conditions						
Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
EX1 TO ROAD	5991	98	33663	74	39654	78
EX2 TO ADJACENT PROPERTY TO WEST	0	98	13009	74	13009	74

Existing Soils:

A geotechnical evaluation is not available at this time. USDA Web Soil Survey shows Lester Loam with an HSG 'C' designation, and Hamel-Glencoe Complex with HSG 'C/D' designation. Soils are poor for infiltration and filtration basins with draintile will be utilized for stormwater treatment.

Groundwater:

Groundwater observations are not available at this time.

2.3 Proposed Site Conditions:

Site Description:

The proposed site is a development of the parcel into four single-family homes with parking, landscaping, and aboveground stormwater management. The proposed site surface coverage areas are shown in the table below:

Proposed Conditions						
Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
2S TO RAIN GARDEN 1	7572	98	11823	74	19395	83
4S TO RAIN GARDEN 2	11156	98	17847	74	29003	83
7S TO ADJACENT PROPERTY TO WEST	0	98	2641	74	2641	74
8S TO ROAD	1032	98	592	74	1624	89

2.4 Stormwater Requirements City (Long Lake):

The City of Long Lake defers to Minnehaha Creek Watershed District requirements.

2.5 Stormwater Requirements Watershed (Minnehaha Creek Watershed District):

Requirement threshold – Redevelopment Projects that are >1 acre, result in an increase in impervious surface and disturb >40% of the site.

Rate Control – Runoff rate may not exceed existing conditions for the 2, 10, 100-yr storm events. Utilize Atlas-14 rainfall data.

Water Quality – Stormwater must be treated prior to discharge to result in no net increase of total phosphorus. If volume control requirements are met, it can be assumed that water quality requirements are satisfied

Volume Control – Stormwater runoff volume must be infiltrated/abstracted onsite in the amount equivalent to one inch (1") of runoff generated from the new or reconstructed impervious surface. If infiltration is infeasible onsite, volume control requirements double to 2.2" of runoff generated from the new or reconstructed impervious surface.

2.6 Stormwater Requirements - Minnesota Pollution Control Agency – NPDES permit (MPCA):

Requirement threshold - A permit is required for projects with a disturbed area over 1 acre in size, Stormwater management is required for a project adding 1-acre or more of NEW impervious surface (reconstructed impervious is not included).

Rate Control – No specific regulation, may not degrade downstream facilities.

Water Quality – Stormwater water quality treatment volume must be provided equal to 1.0" over all new impervious surfaces (includes all newly constructed impervious surfaces only, re-constructed impervious surfaces are not included).

Volume Control – Must consider volume reduction if feasible and not prohibited on site. The required infiltration volume is equal to the water quality volume described above.

3.0 Stormwater Calculations:

3.1 Proposed Stormwater Management Strategy & Facilities Description

Stormwater Management is provided for this site by two aboveground filtration basins. Filtration Rain Garden 1 drains by drain tile and overflow outlet to Filtration Rain Garden 2, which drains by drain tile and overflow to the catch basin structure in the ROW.

3.2 Rate Control

Rate control per the requirement is provided by live storage within the proposed filtration basins. This information was derived using HydroCAD stormwater modeling software. The existing and proposed runoff rates are shown in the summary table below.

Overall Stormwater Rate Summary		
	Existing Conditions Rate (cfs)	Proposed Conditions Rate (cfs)
2-Year Event	2.09	0.24
10-Year Event	4.26	0.63
100-Year Event	9.59	5.47
Stormwater Rate Summary - To Road		
	Existing Conditions Rate (cfs) (EX1)	Proposed Conditions Rate (cfs) (9R)
2-Year Event	1.66	0.19
10-Year Event	3.31	0.61
100-Year Event	7.32	5.06
Stormwater Rate Summary - To Adjacent Property		
	Existing Conditions Rate (cfs) (EX2)	Proposed Conditions Rate (cfs) (7S)
2-Year Event	0.43	0.09
10-Year Event	0.96	0.19
100-Year Event	2.28	0.46

3.3 Water Quality

The proposed stormwater BMP's are designed to capture the prescribed water quality volume meeting the watershed requirements.

3.4 Volume Control

Water quality and volume control requirements are met by providing filtration onsite in the amount equal to 2.2 inches of runoff from the new or reconstructed impervious surfaces. The proposed aboveground filtration basins will be utilized to meet these requirements. Filtration is being provided in lieu of infiltration due to poorly draining soils.

The calculations are shown below:

Stormwater Water Quality and Volume Summary				
Drainage Area	Required Infiltration Vol. Summary		Filtration Volume = 2.2"*Dist. Impv. Area	
	New Impv. Area (sf)	Required Volume (cf)		
2S TO RAIN GARDEN 1	7572	1388		
4S TO RAIN GARDEN 2	11156	2045		
7S TO ADJACENT PROPERTY TO WEST	0	0		
8S TO ROAD	1032	189		
TOTAL	19760	3623		
Proposed BMP Area	Provided Vol (cf)	Drawdown Time Calculations (0.8"/Hour)		
		Inf. Area (sf)	Assoc. Inf. Height (ft)	Drawdown Time (h)
Rain Garden 1	987	822	1.20	9.01
Rain Garden 2	3920	1368	2.87	21.49
Total	4907			

4.0 Conclusions:

To the best of our knowledge, this project meets all State, City, and Watershed stormwater management requirements.

Wilds on Wayzata
Civil Site Group - Stormwater Calculations

Existing Conditions

Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
EX1 TO ROAD	5991	98	33663	74	39654	78
EX2 TO ADJACENT PROPERTY TO WEST	0	98	13009	74	13009	74

Proposed Conditions

Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
2S TO RAIN GARDEN 1	7572	98	11823	74	19395	83
4S TO RAIN GARDEN 2	11156	98	17847	74	29003	83
7S TO ADJACENT PROPERTY TO WEST	0	98	2641	74	2641	74
8S TO ROAD	1032	98	592	74	1624	89

Site Area Summary

	Impervious [SF]	Impervious [AC]	Pervious [SF]	Pervious [AC]	Total [SF]	Total [AC]
Existing Site	5991	0.14	46672	1.07	52663	1.21
Proposed Site	19760	0.45	32903	0.76	52663	1.21

Stormwater Rate Summary

Drainage Area	Existing Rate (cfs)		
	2-YR [2.94"]	10-YR [4.47"]	100-YR [7.81"]
EX1 TO ROAD	1.66	3.31	7.32
EX2 TO ADJACENT PROPERTY TO WEST	0.43	0.96	2.28
TOTAL (REACH)	2.09	4.26	9.59

Drainage Area	Proposed Conditions Rate (cfs)		
	2-YR [2.94"]	10-YR [4.47"]	100-YR [7.81"]
Rain Garden 1	0.24	1.73	3.68
Rain Garden 2	0.07	0.59	4.71
7S TO ADJACENT PROPERTY	0.09	0.19	0.46
8S TO ROAD	0.14	0.22	0.42
TOTAL (REACH)	0.24	0.63	5.47

Overall Stormwater Rate Summary

	Existing Conditions Rate (cfs)	Proposed Conditions Rate (cfs)
2-Year Event	2.09	0.24
10-Year Event	4.26	0.63
100-Year Event	9.59	5.47

Stormwater Rate Summary - To Road

	Existing Conditions Rate (cfs) (EX1)	Proposed Conditions Rate (cfs) (9R)
2-Year Event	1.66	0.19
10-Year Event	3.31	0.61
100-Year Event	7.32	5.06

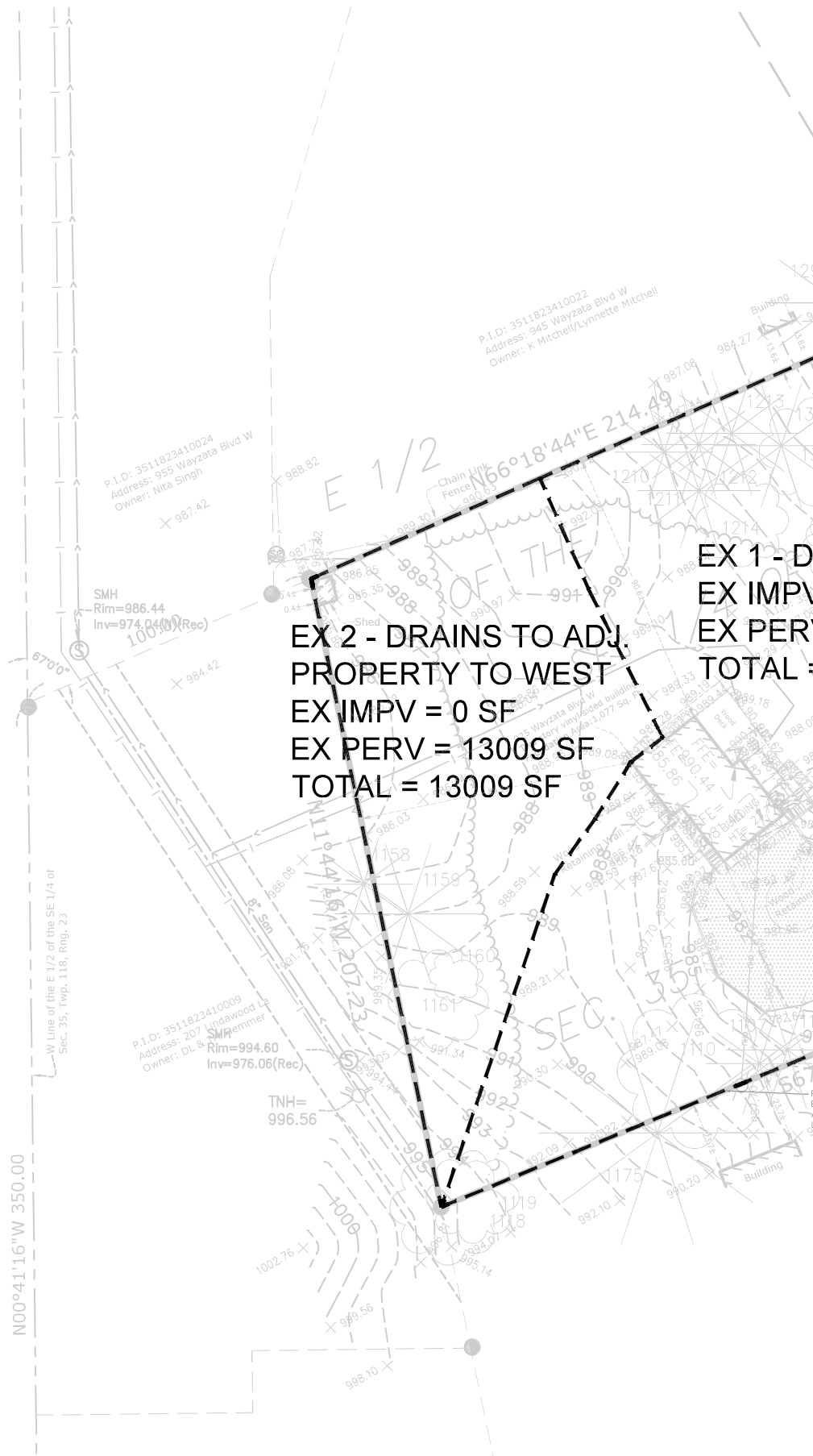
Stormwater Rate Summary - To Adjacent Property

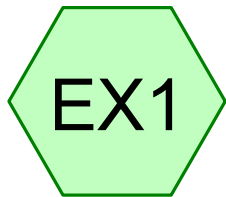
	Existing Conditions Rate (cfs) (EX2)	Proposed Conditions Rate (cfs) (7S)
2-Year Event	0.43	0.09
10-Year Event	0.96	0.19
100-Year Event	2.28	0.46

Stormwater Water Quality and Volume Summary

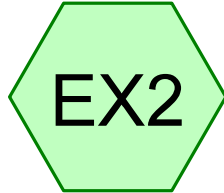
Drainage Area	Required Infiltration Vol. Summary		Filtration Volume = 2.2" * Dist. Impv. Area
	New Impv. Area (sf)	Required Volume (cf)	
2S TO RAIN GARDEN 1	7572	1388	
4S TO RAIN GARDEN 2	11156	2045	
7S TO ADJACENT PROPERTY TO WEST	0	0	
8S TO ROAD	1032	189	
TOTAL	19760	3623	

Proposed BMP Area	Provided Vol (cf)	Drawdown Time Calculations (0.8"/Hour)		
		Inf. Area (sf)	Assoc. Inf. Height (ft)	Drawdown Time (h)
Rain Garden 1	987	822	1.20	9.01
Rain Garden 2	3920	1368	2.87	21.49
Total	4907			

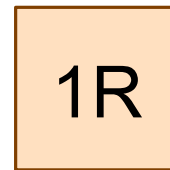




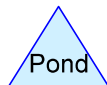
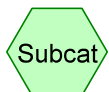
EX1 - TO ROAD



EX2 - TO ADJACENT
PROPERTY TO WEST



TOTAL



Routing Diagram for 20163 EXISTING

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Project Notes

Rainfall events imported from "20163 PROPOSED.hcp"

Rainfall events imported from "20163 PROPOSED.hcp"

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type II 24-hr		Default	24.00	1	2.86	2
2	10-Year	Type II 24-hr		Default	24.00	1	4.26	2
3	100-Year	Type II 24-hr		Default	24.00	1	7.32	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.071	74	>75% Grass cover, Good, HSG C (EX1, EX2)
0.138	98	Paved parking, HSG C (EX1)
1.208	77	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.208	HSG C	EX1, EX2
0.000	HSG D	
0.000	Other	
1.208		TOTAL AREA

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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	1.071	0.000	0.000	1.071	>75% Grass cover, Good	EX1, EX2
0.000	0.000	0.138	0.000	0.000	0.138	Paved parking	EX1
0.000	0.000	1.208	0.000	0.000	1.208	TOTAL AREA	

20163 EXISTING*Type II 24-hr 2-Year Rainfall=2.86"*

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 - TO ROAD Runoff Area=39,624 sf 15.12% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=WQ Runoff=1.66 cfs 0.083 af

Subcatchment EX2: EX2 - TO ADJACENT Runoff Area=13,009 sf 0.00% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=74 Runoff=0.43 cfs 0.020 af

Reach 1R: TOTAL Inflow=2.09 cfs 0.103 af
Outflow=2.09 cfs 0.103 af

Total Runoff Area = 1.208 ac Runoff Volume = 0.103 af Average Runoff Depth = 1.03"
88.62% Pervious = 1.071 ac 11.38% Impervious = 0.138 ac

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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Subcatchment EX1: EX1 - TO ROAD

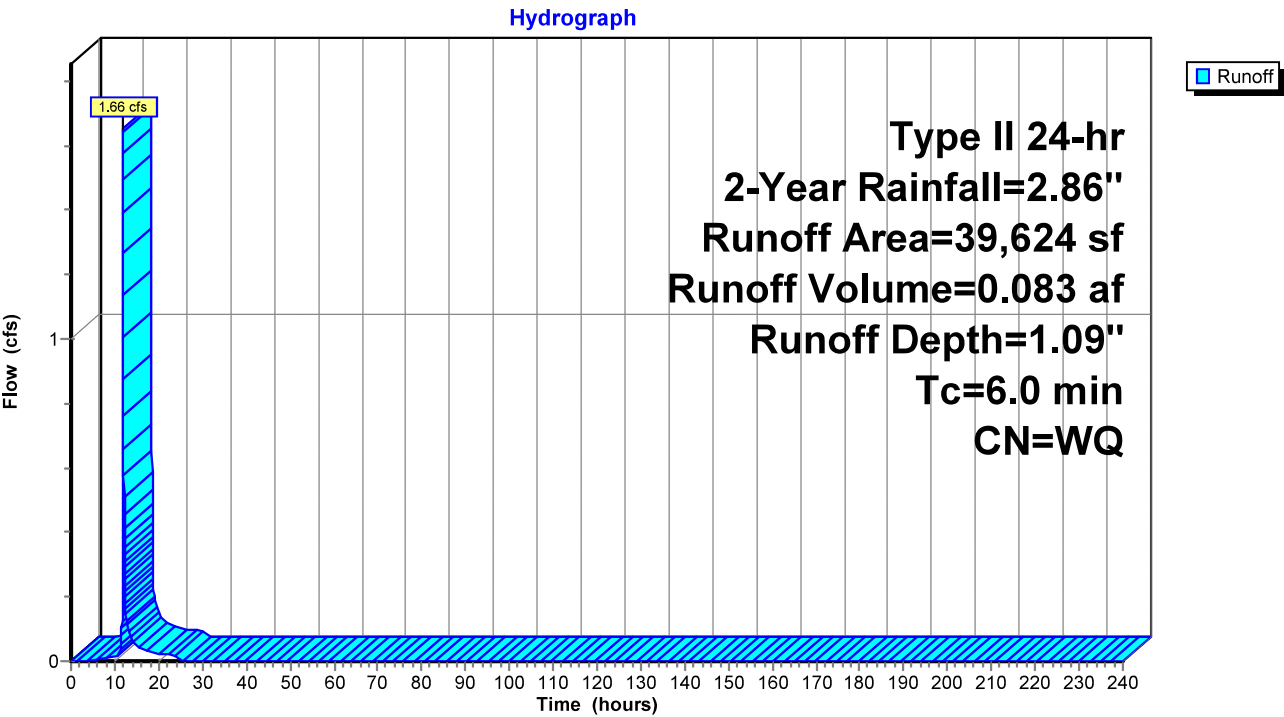
Runoff = 1.66 cfs @ 11.98 hrs, Volume= 0.083 af, Depth= 1.09"
Routed to Reach 1R : TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
5,991	98	Paved parking, HSG C
33,633	74	>75% Grass cover, Good, HSG C
39,624		Weighted Average
33,633		84.88% Pervious Area
5,991		15.12% Impervious Area

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

Subcatchment EX1: EX1 - TO ROAD



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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST

Runoff = 0.43 cfs @ 11.98 hrs, Volume= 0.020 af, Depth= 0.82"
Routed to Reach 1R : TOTAL

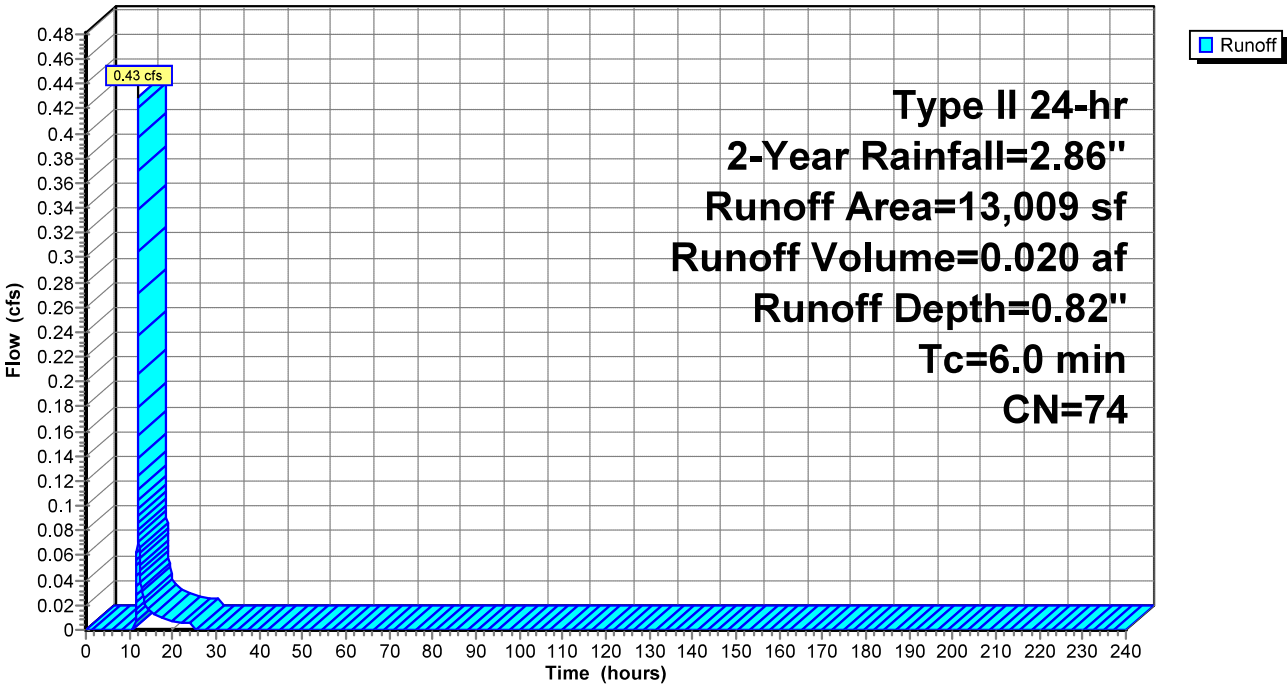
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
13,009	74	>75% Grass cover, Good, HSG C
13,009		100.00% Pervious Area

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

Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Reach 1R: TOTAL

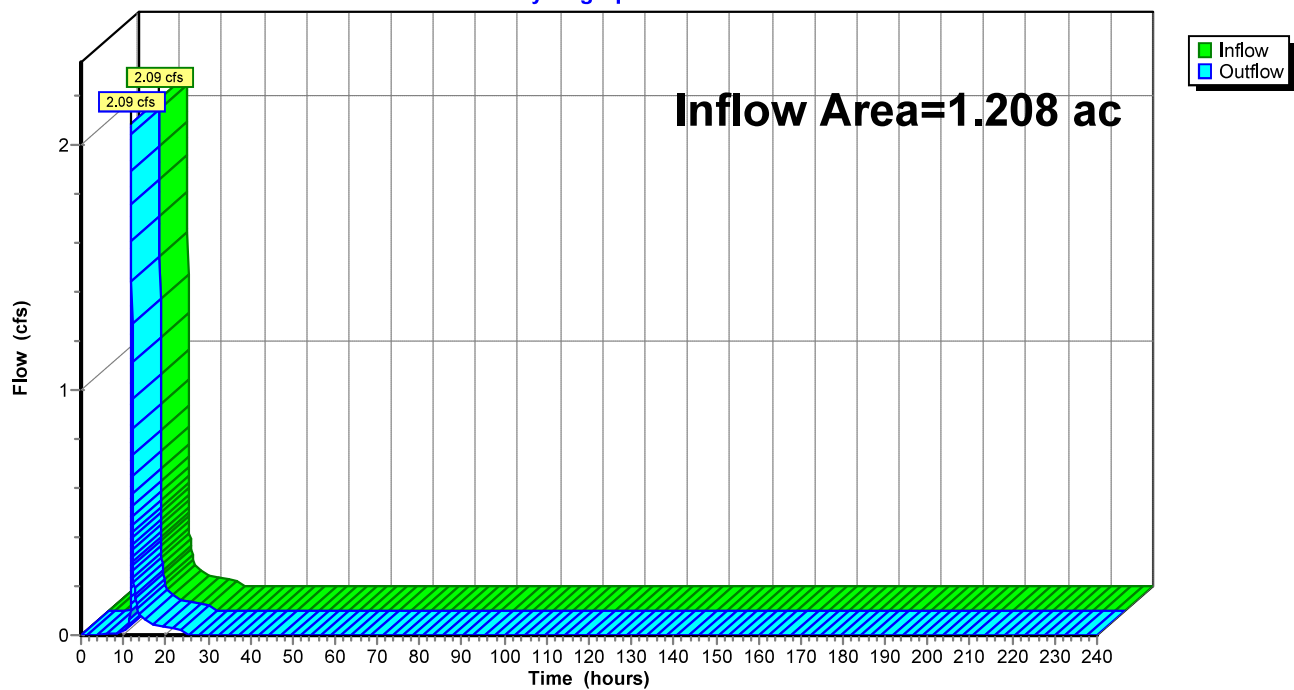
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.208 ac, 11.38% Impervious, Inflow Depth = 1.03" for 2-Year event
Inflow = 2.09 cfs @ 11.98 hrs, Volume= 0.103 af
Outflow = 2.09 cfs @ 11.98 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 1R: TOTAL

Hydrograph



20163 EXISTING*Type II 24-hr 10-Year Rainfall=4.26"*

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 - TO ROAD Runoff Area=39,624 sf 15.12% Impervious Runoff Depth=2.13"
Tc=6.0 min CN=WQ Runoff=3.31 cfs 0.161 af

Subcatchment EX2: EX2 - TO ADJACENT Runoff Area=13,009 sf 0.00% Impervious Runoff Depth=1.79"
Tc=6.0 min CN=74 Runoff=0.96 cfs 0.045 af

Reach 1R: TOTAL Inflow=4.26 cfs 0.206 af
Outflow=4.26 cfs 0.206 af

Total Runoff Area = 1.208 ac Runoff Volume = 0.206 af Average Runoff Depth = 2.04"
88.62% Pervious = 1.071 ac 11.38% Impervious = 0.138 ac

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Type II 24-hr 10-Year Rainfall=4.26"

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Summary for Subcatchment EX1: EX1 - TO ROAD

Runoff = 3.31 cfs @ 11.97 hrs, Volume= 0.161 af, Depth= 2.13"
Routed to Reach 1R : TOTAL

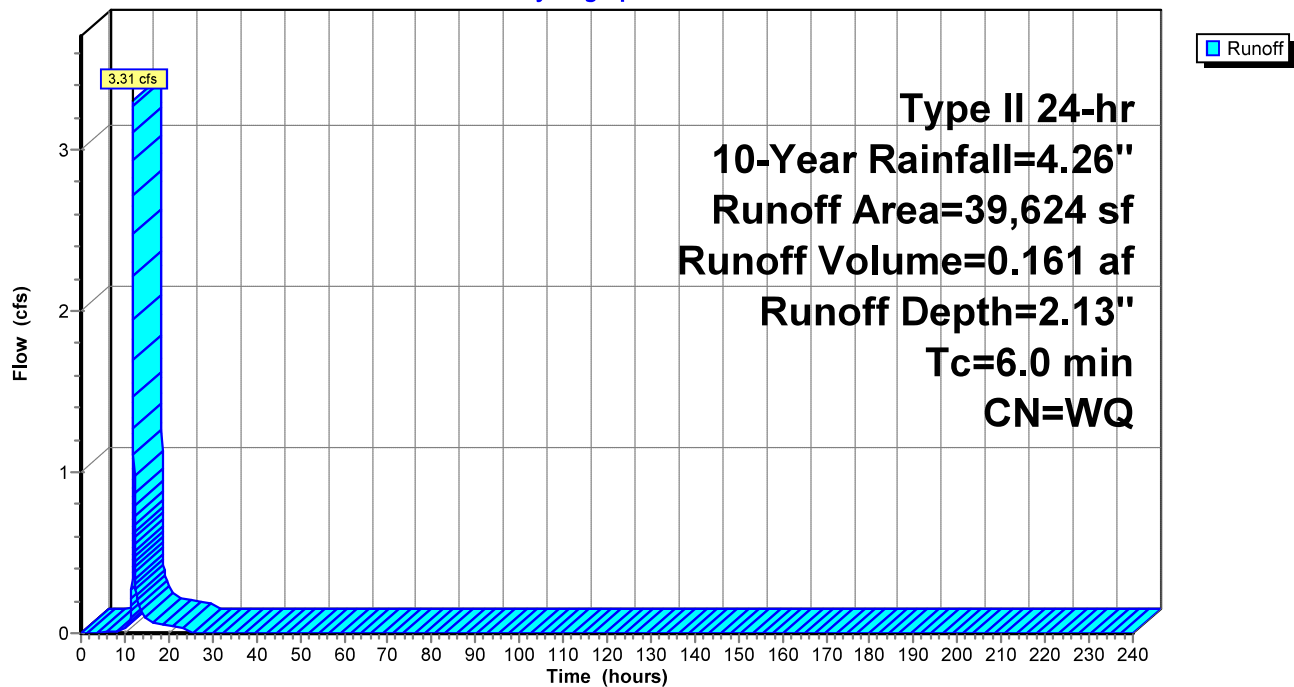
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
5,991	98	Paved parking, HSG C
33,633	74	>75% Grass cover, Good, HSG C
39,624		Weighted Average
33,633		84.88% Pervious Area
5,991		15.12% Impervious Area

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

Subcatchment EX1: EX1 - TO ROAD

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.26"

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Summary for Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST

Runoff = 0.96 cfs @ 11.98 hrs, Volume= 0.045 af, Depth= 1.79"
Routed to Reach 1R : TOTAL

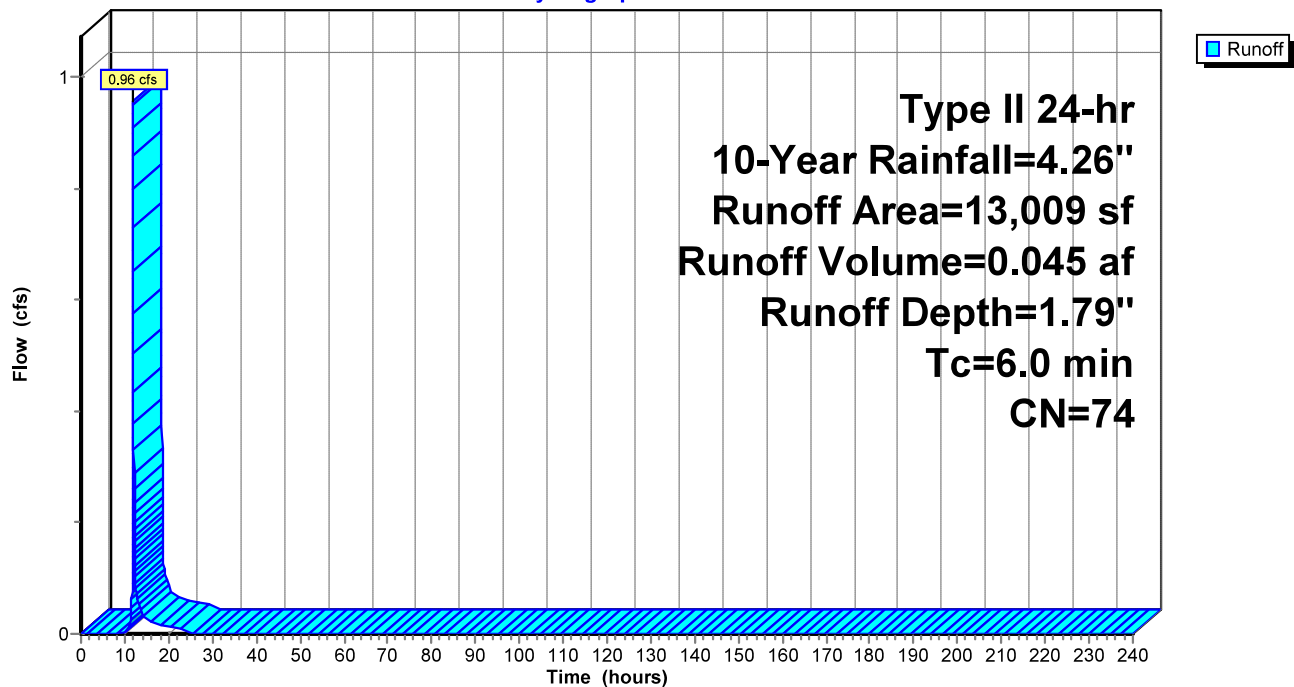
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
13,009	74	>75% Grass cover, Good, HSG C
13,009		100.00% Pervious Area

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

Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.26"

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Summary for Reach 1R: TOTAL

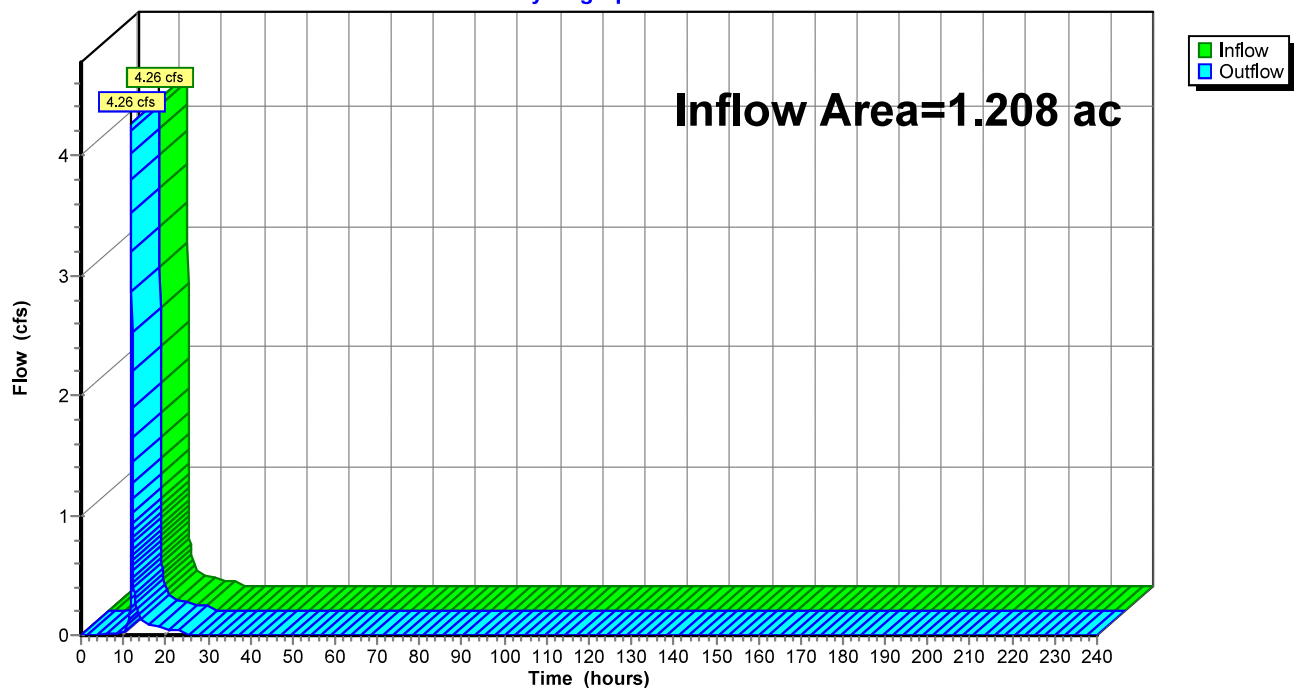
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.208 ac, 11.38% Impervious, Inflow Depth = 2.04" for 10-Year event
Inflow = 4.26 cfs @ 11.97 hrs, Volume= 0.206 af
Outflow = 4.26 cfs @ 11.97 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 1R: TOTAL

Hydrograph



20163 EXISTING*Type II 24-hr 100-Year Rainfall=7.32"*

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 - TO ROAD Runoff Area=39,624 sf 15.12% Impervious Runoff Depth=4.74"
Tc=6.0 min CN=WQ Runoff=7.32 cfs 0.359 af

Subcatchment EX2: EX2 - TO ADJACENT Runoff Area=13,009 sf 0.00% Impervious Runoff Depth=4.32"
Tc=6.0 min CN=74 Runoff=2.28 cfs 0.108 af

Reach 1R: TOTAL Inflow=9.59 cfs 0.467 af
Outflow=9.59 cfs 0.467 af

Total Runoff Area = 1.208 ac Runoff Volume = 0.467 af Average Runoff Depth = 4.64"
88.62% Pervious = 1.071 ac 11.38% Impervious = 0.138 ac

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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Subcatchment EX1: EX1 - TO ROAD

Runoff = 7.32 cfs @ 11.97 hrs, Volume= 0.359 af, Depth= 4.74"
Routed to Reach 1R : TOTAL

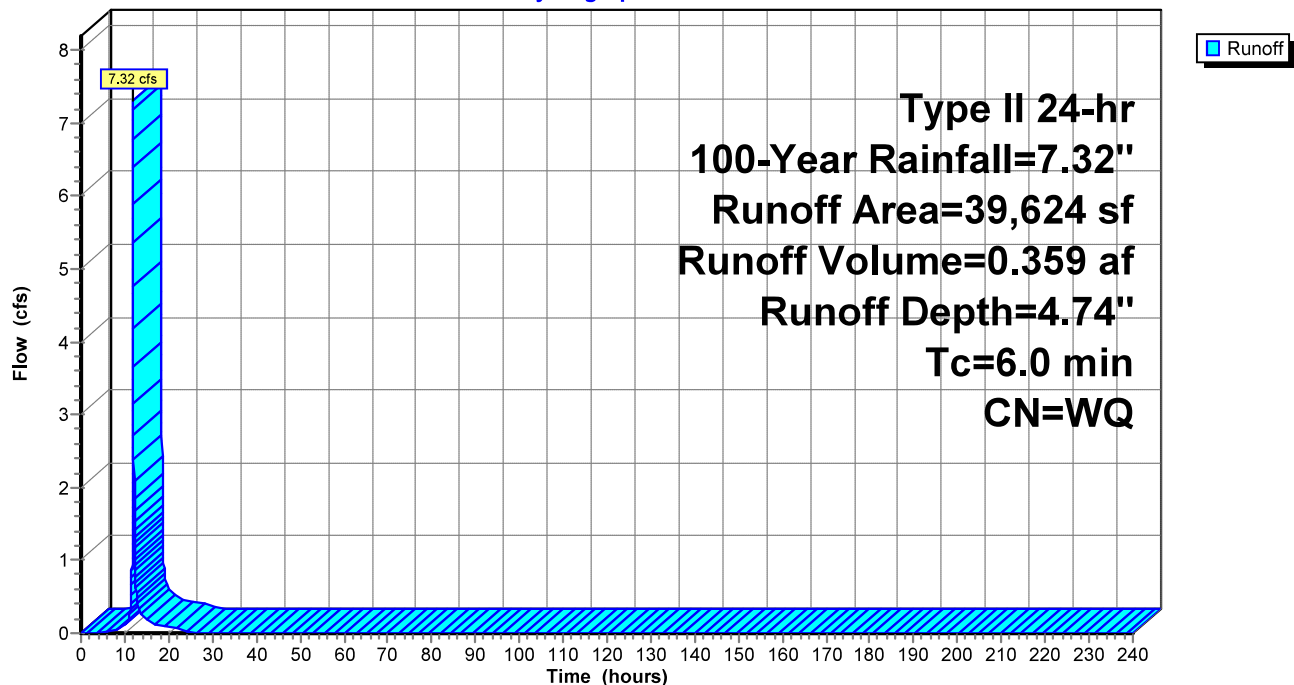
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
5,991	98	Paved parking, HSG C
33,633	74	>75% Grass cover, Good, HSG C
39,624		Weighted Average
33,633		84.88% Pervious Area
5,991		15.12% Impervious Area

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

Subcatchment EX1: EX1 - TO ROAD

Hydrograph



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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST

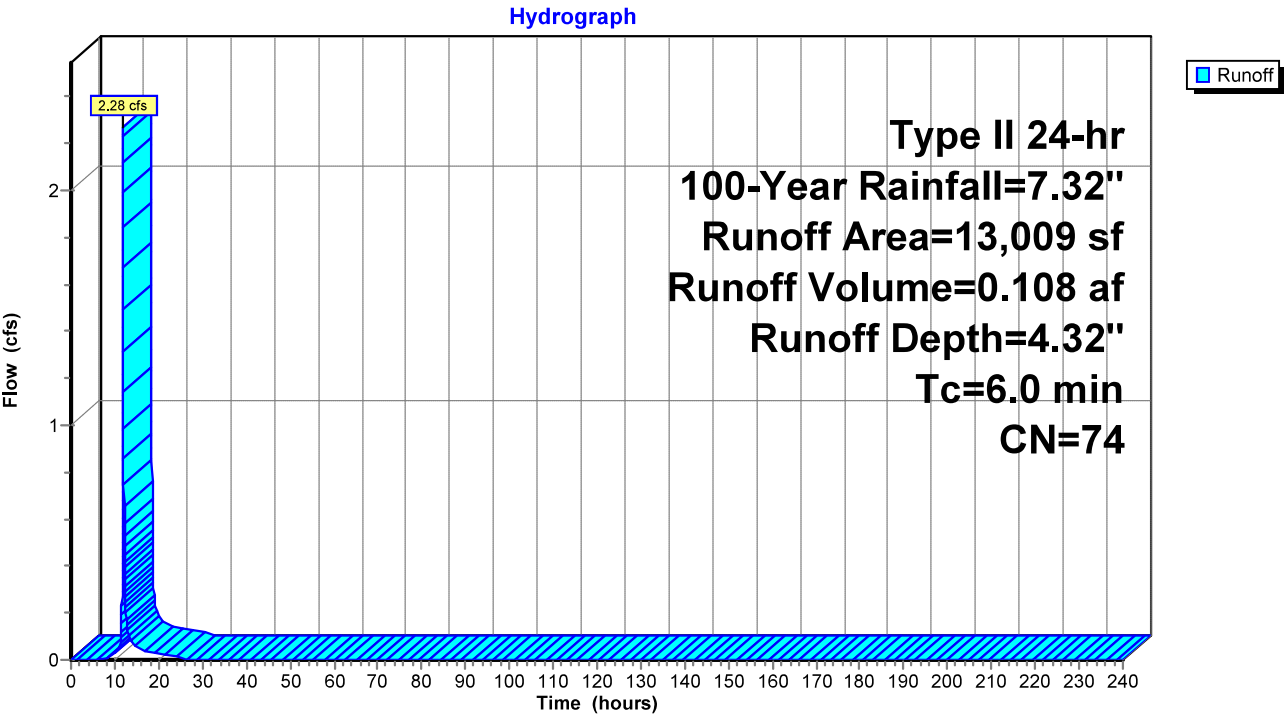
Runoff = 2.28 cfs @ 11.97 hrs, Volume= 0.108 af, Depth= 4.32"
Routed to Reach 1R : TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
13,009	74	>75% Grass cover, Good, HSG C
13,009		100.00% Pervious Area

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

Subcatchment EX2: EX2 - TO ADJACENT PROPERTY TO WEST



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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Reach 1R: TOTAL

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

Inflow Area = 1.208 ac, 11.38% Impervious, Inflow Depth = 4.64" for 100-Year event

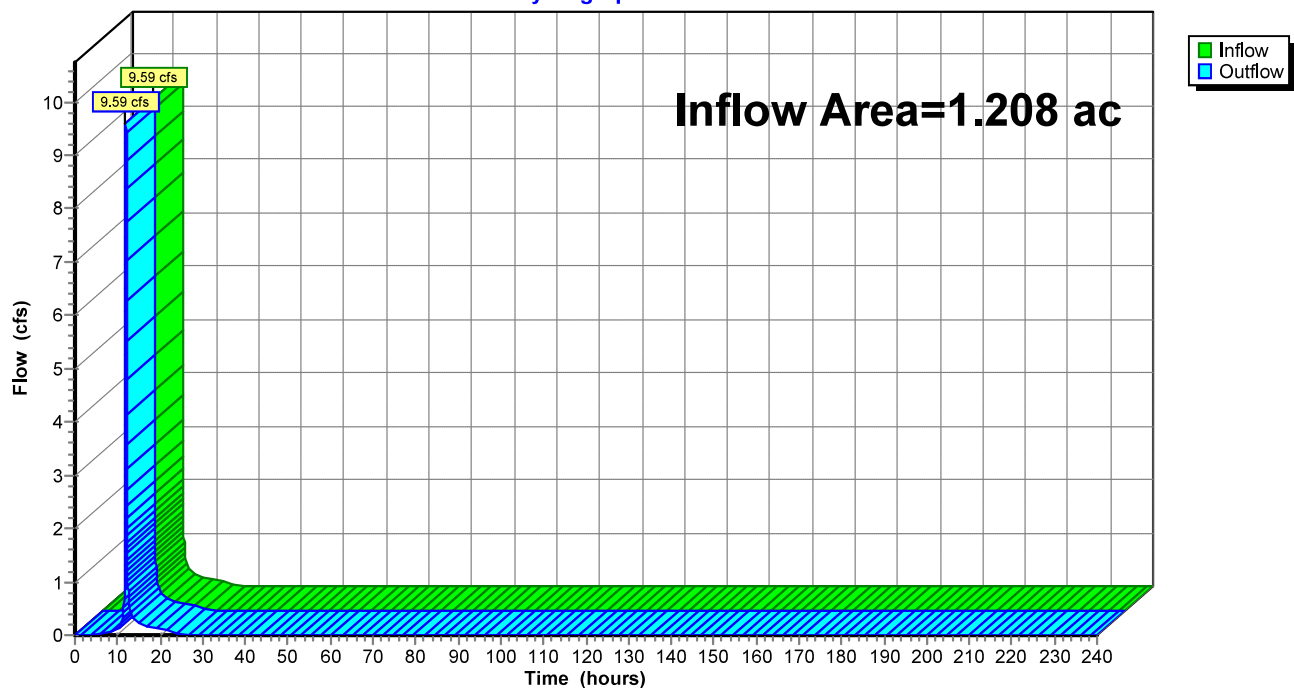
Inflow = 9.59 cfs @ 11.97 hrs, Volume= 0.467 af

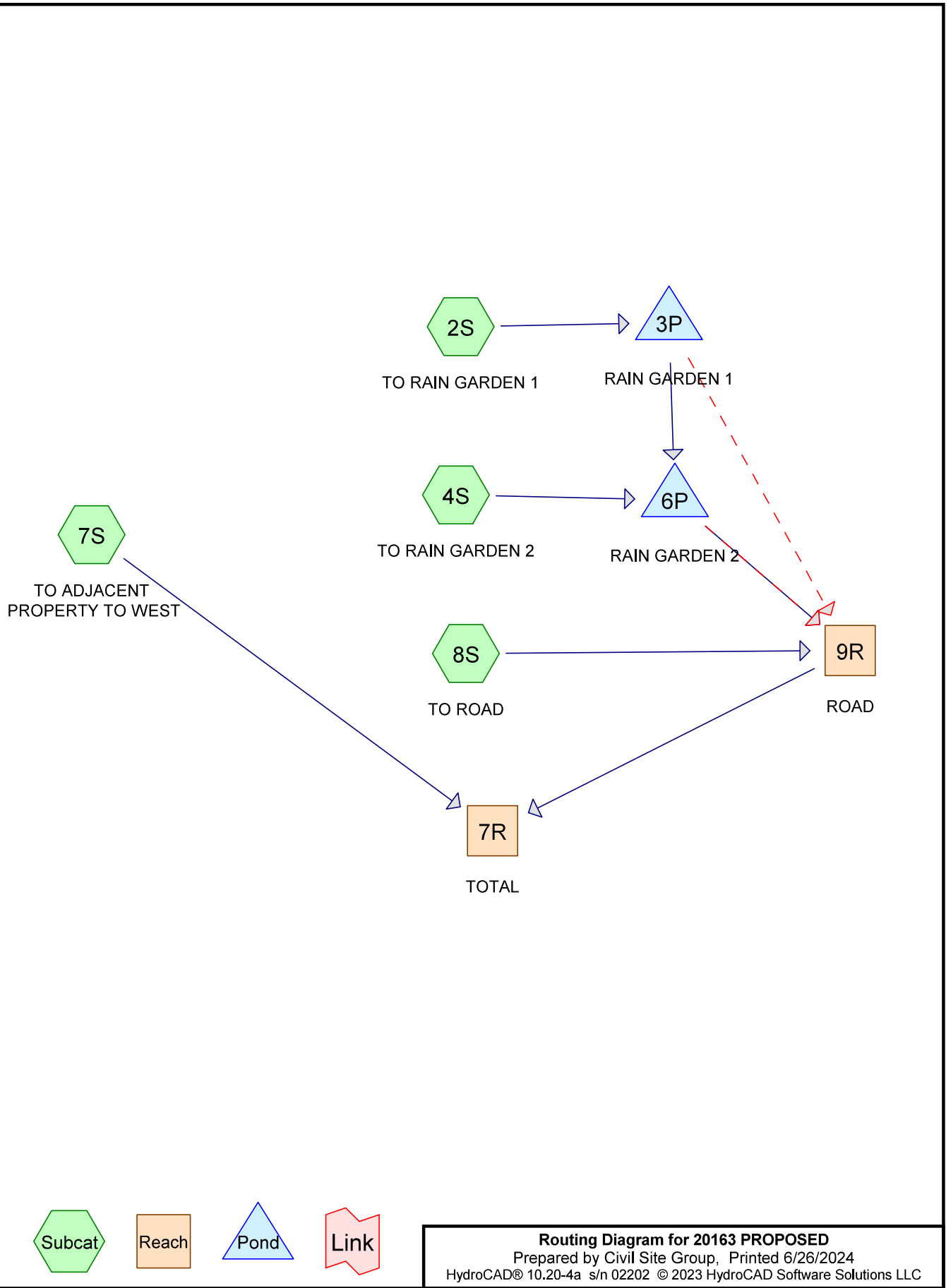
Outflow = 9.59 cfs @ 11.97 hrs, Volume= 0.467 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 1R: TOTAL

Hydrograph





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Project Notes

Rainfall events imported from "Atlas-14-Rain.txt" for 543 MN Hennepin

Rainfall events imported from "Atlas-14-Rain.txt" for 543 MN Hennepin

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type II 24-hr		Default	24.00	1	2.86	2
2	10-Year	Type II 24-hr		Default	24.00	1	4.26	2
3	100-Year	Type II 24-hr		Default	24.00	1	7.32	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.755	74	>75% Grass cover, Good, HSG C (2S, 4S, 7S, 8S)
0.454	98	Paved parking, HSG C (2S, 4S, 8S)
1.209	83	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.209	HSG C	2S, 4S, 7S, 8S
0.000	HSG D	
0.000	Other	
1.209		TOTAL AREA

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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	0.755	0.000	0.000	0.755	>75% Grass cover, Good	2S, 4S, 7S, 8S
0.000	0.000	0.454	0.000	0.000	0.454	Paved parking	2S, 4S, 8S
0.000	0.000	1.209	0.000	0.000	1.209	TOTAL AREA	

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Type II 24-hr 2-Year Rainfall=2.86"

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 2S: TO RAIN GARDEN 1 Runoff Area=19,395 sf 39.04% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=WQ Runoff=1.09 cfs 0.057 af

Subcatchment 4S: TO RAIN GARDEN 2 Runoff Area=29,003 sf 38.46% Impervious Runoff Depth=1.52"
Tc=6.0 min CN=WQ Runoff=1.61 cfs 0.084 af

Subcatchment 7S: TO ADJACENT Runoff Area=2,641 sf 0.00% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=74 Runoff=0.09 cfs 0.004 af

Subcatchment 8S: TO ROAD Runoff Area=1,624 sf 63.55% Impervious Runoff Depth=1.97"
Tc=0.0 min CN=WQ Runoff=0.14 cfs 0.006 af

Reach 7R: TOTAL Inflow=0.24 cfs 0.151 af
Outflow=0.24 cfs 0.151 af

Reach 9R: ROAD Inflow=0.19 cfs 0.147 af
Outflow=0.19 cfs 0.147 af

Pond 3P: RAIN GARDEN 1 Peak Elev=970.07' Storage=1,049 cf Inflow=1.09 cfs 0.057 af
Primary=0.24 cfs 0.057 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.057 af

Pond 6P: RAIN GARDEN 2 Peak Elev=966.72' Storage=2,446 cf Inflow=1.64 cfs 0.141 af
Primary=0.07 cfs 0.141 af Secondary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.141 af

Total Runoff Area = 1.209 ac Runoff Volume = 0.151 af Average Runoff Depth = 1.50"
62.48% Pervious = 0.755 ac 37.52% Impervious = 0.454 ac

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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Subcatchment 2S: TO RAIN GARDEN 1

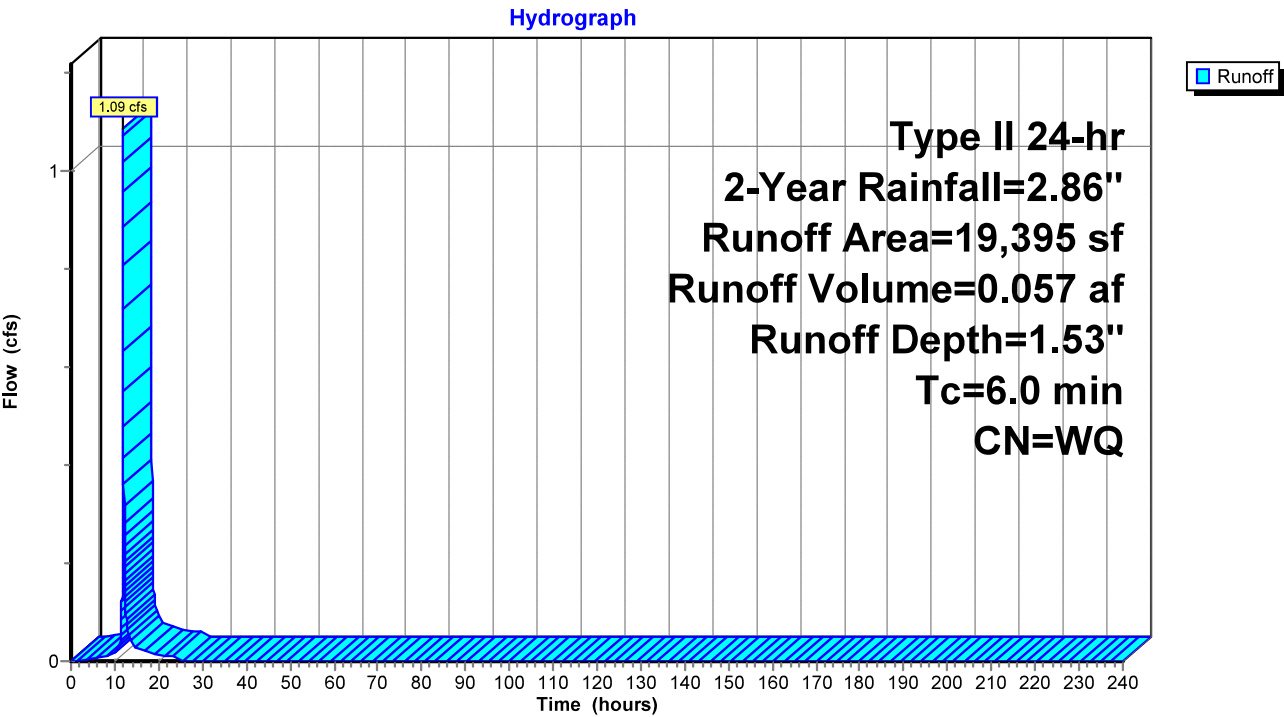
Runoff = 1.09 cfs @ 11.97 hrs, Volume= 0.057 af, Depth= 1.53"
Routed to Pond 3P : RAIN GARDEN 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
7,572	98	Paved parking, HSG C
11,823	74	>75% Grass cover, Good, HSG C
19,395		Weighted Average
11,823		60.96% Pervious Area
7,572		39.04% Impervious Area

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

Subcatchment 2S: TO RAIN GARDEN 1



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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Subcatchment 4S: TO RAIN GARDEN 2

Runoff = 1.61 cfs @ 11.97 hrs, Volume= 0.084 af, Depth= 1.52"
Routed to Pond 6P : RAIN GARDEN 2

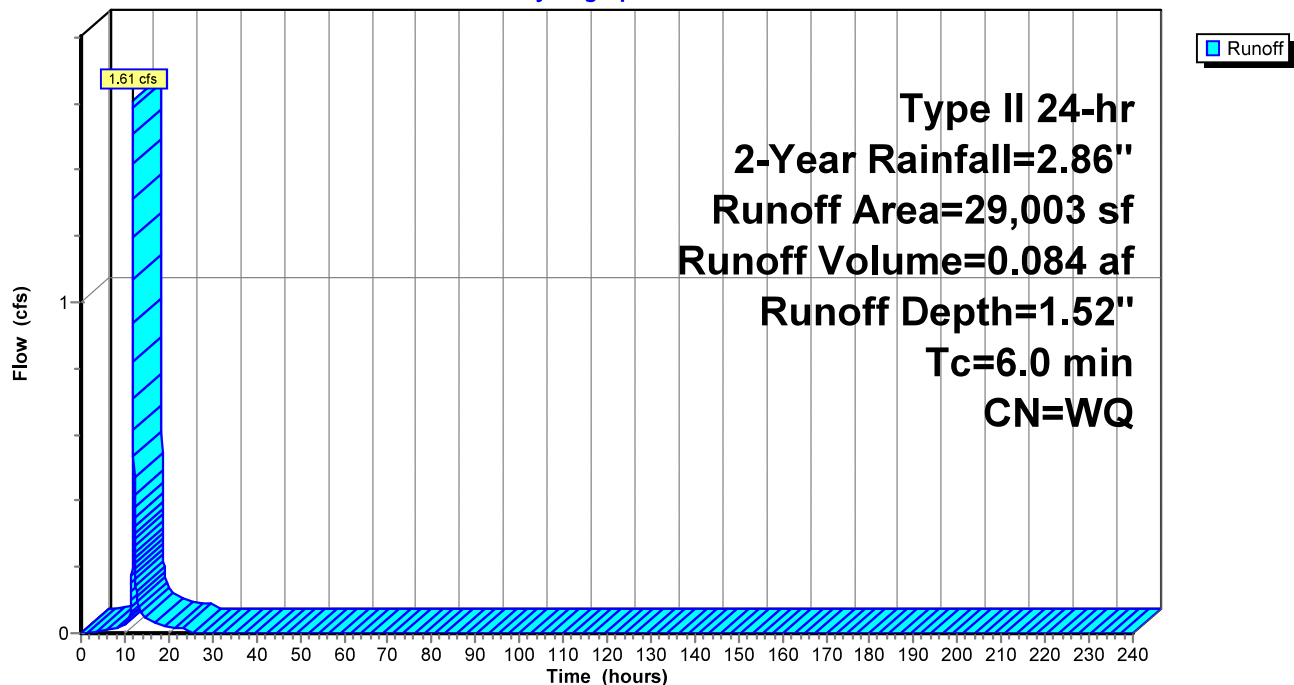
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
11,156	98	Paved parking, HSG C
17,847	74	>75% Grass cover, Good, HSG C
29,003		Weighted Average
17,847		61.54% Pervious Area
11,156		38.46% Impervious Area

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

Subcatchment 4S: TO RAIN GARDEN 2

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Runoff = 0.09 cfs @ 11.98 hrs, Volume= 0.004 af, Depth= 0.82"
Routed to Reach 7R : TOTAL

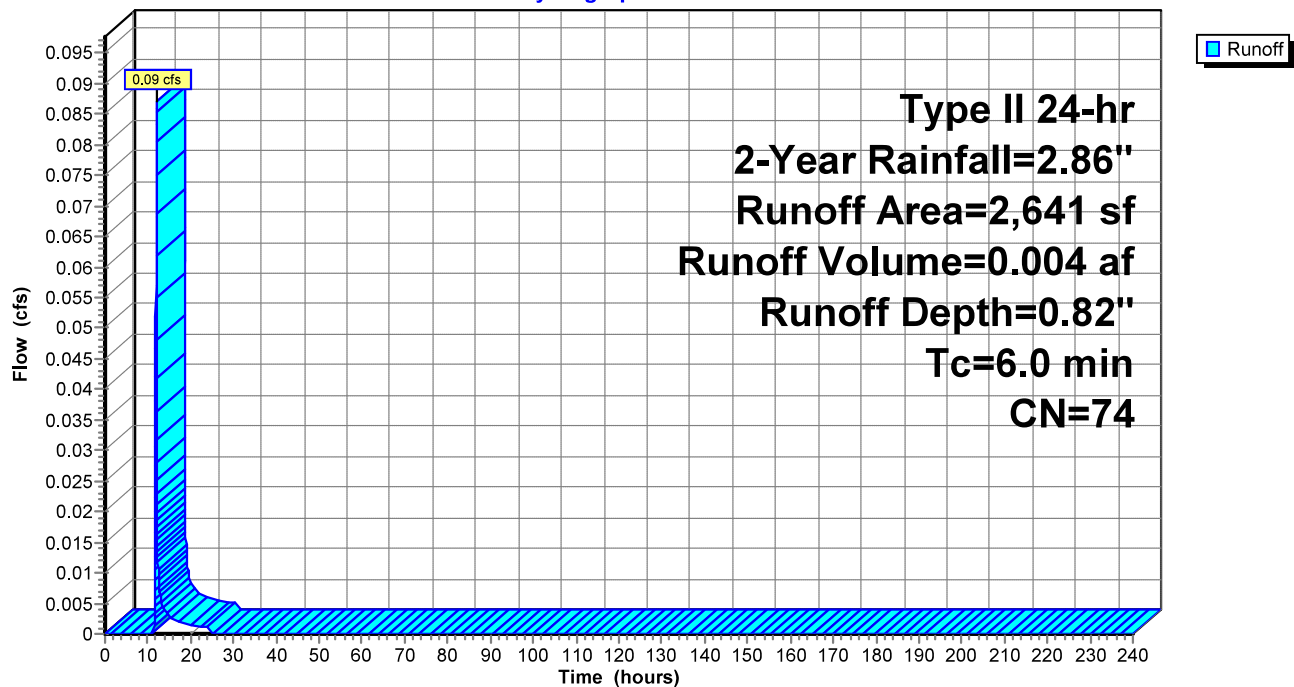
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
2,641	74	>75% Grass cover, Good, HSG C
2,641		100.00% Pervious Area

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

Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Hydrograph



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Summary for Subcatchment 8S: TO ROAD[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

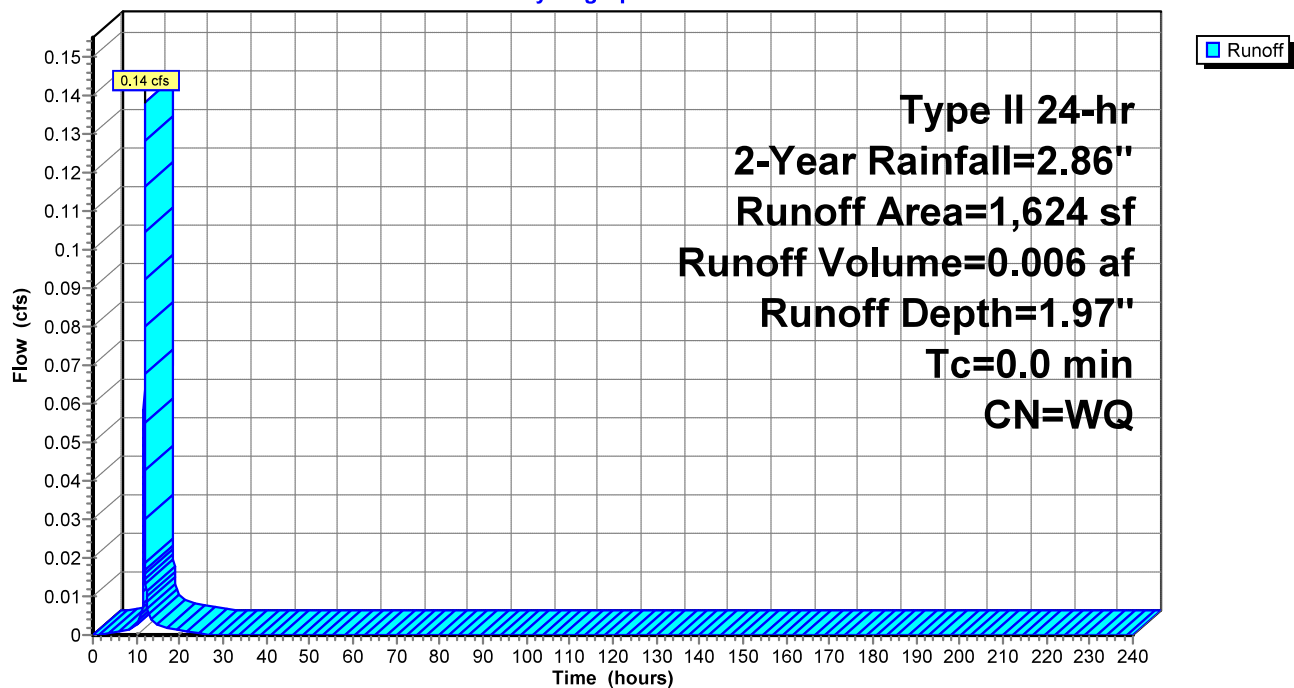
Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 1.97"
Routed to Reach 9R : ROAD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.86"

Area (sf)	CN	Description
1,032	98	Paved parking, HSG C
592	74	>75% Grass cover, Good, HSG C
1,624		Weighted Average
592		36.45% Pervious Area
1,032		63.55% Impervious Area

Subcatchment 8S: TO ROAD

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Reach 7R: TOTAL

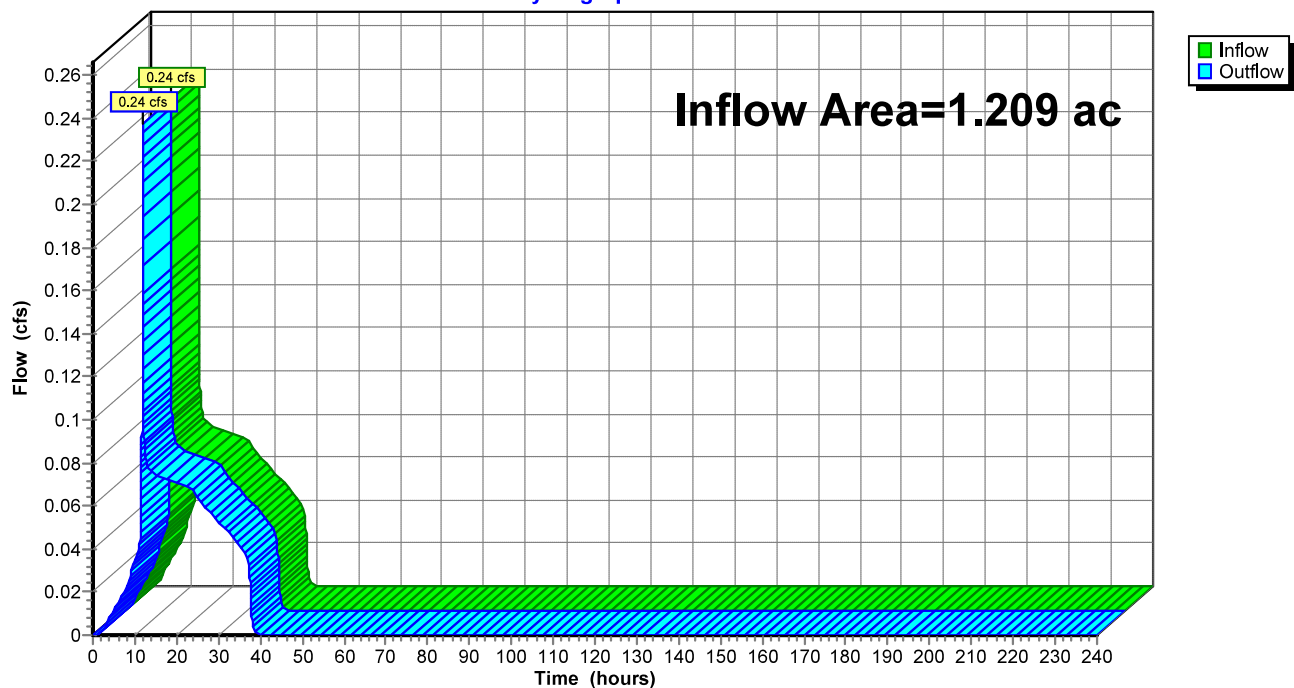
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.209 ac, 37.52% Impervious, Inflow Depth = 1.50" for 2-Year event
Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.151 af
Outflow = 0.24 cfs @ 11.90 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 7R: TOTAL

Hydrograph



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Summary for Reach 9R: ROAD

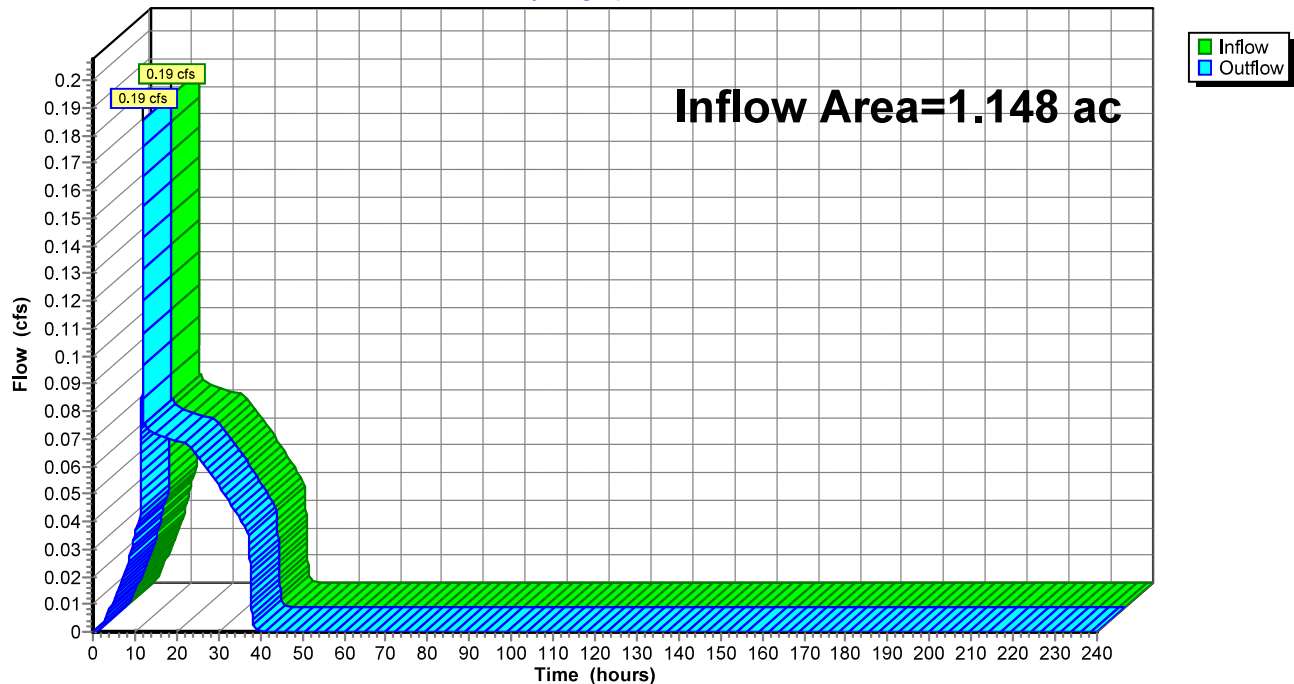
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.148 ac, 39.50% Impervious, Inflow Depth = 1.53" for 2-Year event
Inflow = 0.19 cfs @ 11.90 hrs, Volume= 0.147 af
Outflow = 0.19 cfs @ 11.90 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 7R : TOTAL

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 9R: ROAD

Hydrograph



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Summary for Pond 3P: RAIN GARDEN 1

Inflow Area = 0.445 ac, 39.04% Impervious, Inflow Depth = 1.53" for 2-Year event
 Inflow = 1.09 cfs @ 11.97 hrs, Volume= 0.057 af
 Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.057 af, Atten= 78%, Lag= 9.3 min
 Primary = 0.24 cfs @ 12.13 hrs, Volume= 0.057 af
 Routed to Pond 6P : RAIN GARDEN 2
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 970.07' @ 12.13 hrs Surf.Area= 850 sf Storage= 1,049 cf

Plug-Flow detention time= 329.9 min calculated for 0.057 af (100% of inflow)
 Center-of-Mass det. time= 329.9 min (1,121.3 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1	968.00'	1,998 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
968.00	236	0	0
969.00	458	347	347
970.00	822	640	987
971.00	1,200	1,011	1,998

Device	Routing	Invert	Outlet Devices
#1	Device 2	968.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	966.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	970.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	966.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	970.50'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.24 cfs @ 12.13 hrs HW=970.07' (Free Discharge)

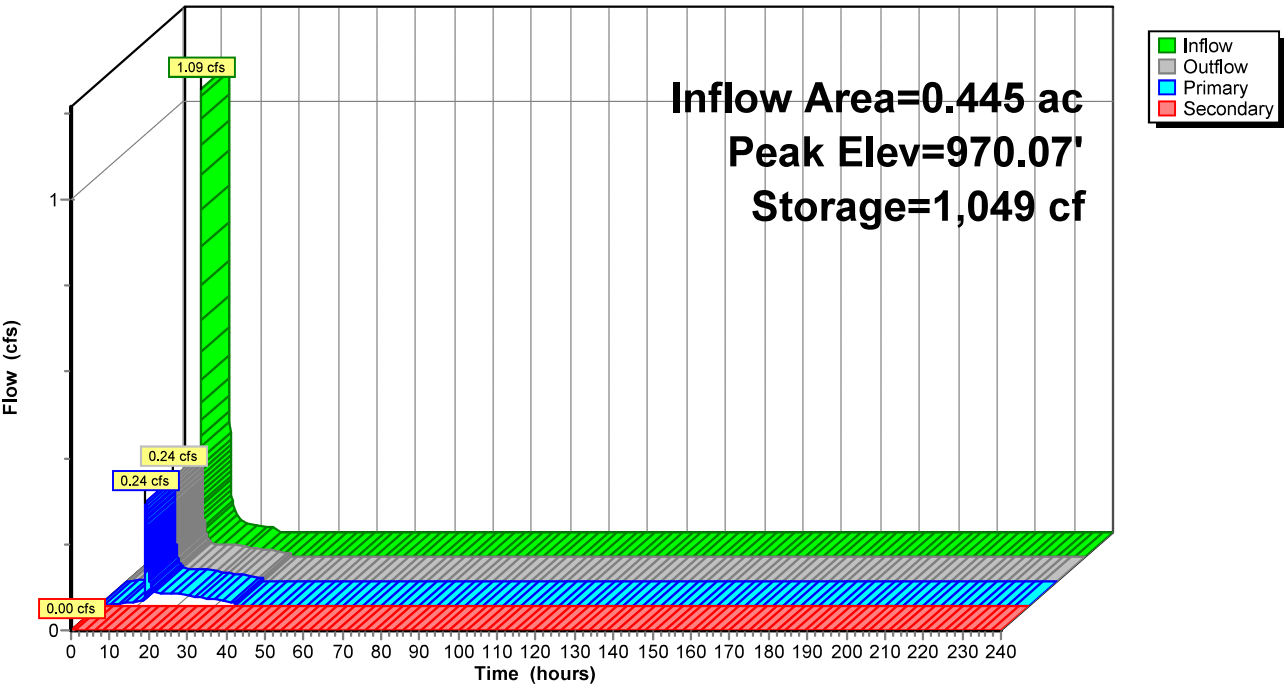
↑ **4=Orifice/Grate** (Passes 0.24 cfs of 7.15 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.03 cfs of 1.85 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 0.21 cfs @ 0.89 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=968.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: RAIN GARDEN 1

Hydrograph



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Stage-Area-Storage for Pond 3P: RAIN GARDEN 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
968.00	236	0	970.60	1,049	1,548
968.05	247	12	970.65	1,068	1,601
968.10	258	25	970.70	1,087	1,655
968.15	269	38	970.75	1,106	1,710
968.20	280	52	970.80	1,124	1,766
968.25	292	66	970.85	1,143	1,822
968.30	303	81	970.90	1,162	1,880
968.35	314	96	970.95	1,181	1,938
968.40	325	112	971.00	1,200	1,998
968.45	336	129			
968.50	347	146			
968.55	358	163			
968.60	369	182			
968.65	380	200			
968.70	391	220			
968.75	403	239			
968.80	414	260			
968.85	425	281			
968.90	436	302			
968.95	447	324			
969.00	458	347			
969.05	476	370			
969.10	494	395			
969.15	513	420			
969.20	531	446			
969.25	549	473			
969.30	567	501			
969.35	585	530			
969.40	604	559			
969.45	622	590			
969.50	640	622			
969.55	658	654			
969.60	676	687			
969.65	695	722			
969.70	713	757			
969.75	731	793			
969.80	749	830			
969.85	767	868			
969.90	786	907			
969.95	804	946			
970.00	822	987			
970.05	841	1,029			
970.10	860	1,071			
970.15	879	1,115			
970.20	898	1,159			
970.25	917	1,204			
970.30	935	1,251			
970.35	954	1,298			
970.40	973	1,346			
970.45	992	1,395			
970.50	1,011	1,445			
970.55	1,030	1,496			

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Type II 24-hr 2-Year Rainfall=2.86"

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Summary for Pond 6P: RAIN GARDEN 2

[79] Warning: Submerged Pond 3P Primary device # 4 by 0.72'

Inflow Area = 1.111 ac, 38.70% Impervious, Inflow Depth = 1.52" for 2-Year event
 Inflow = 1.64 cfs @ 11.97 hrs, Volume= 0.141 af
 Outflow = 0.07 cfs @ 15.46 hrs, Volume= 0.141 af, Atten= 96%, Lag= 209.0 min
 Primary = 0.07 cfs @ 15.46 hrs, Volume= 0.141 af
 Routed to Reach 9R : ROAD
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 966.72' @ 15.46 hrs Surf.Area= 1,852 sf Storage= 2,446 cf

Plug-Flow detention time= 391.9 min calculated for 0.141 af (100% of inflow)
 Center-of-Mass det. time= 391.9 min (1,316.4 - 924.5)

Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	9,067 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	901	0	0
966.50	1,813	2,036	2,036
967.00	1,900	928	2,964
968.00	1,951	1,926	4,889
969.00	1,952	1,952	6,841
970.00	2,500	2,226	9,067

Device	Routing	Invert	Outlet Devices
#1	Device 2	965.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	963.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	967.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	963.50'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	969.00'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

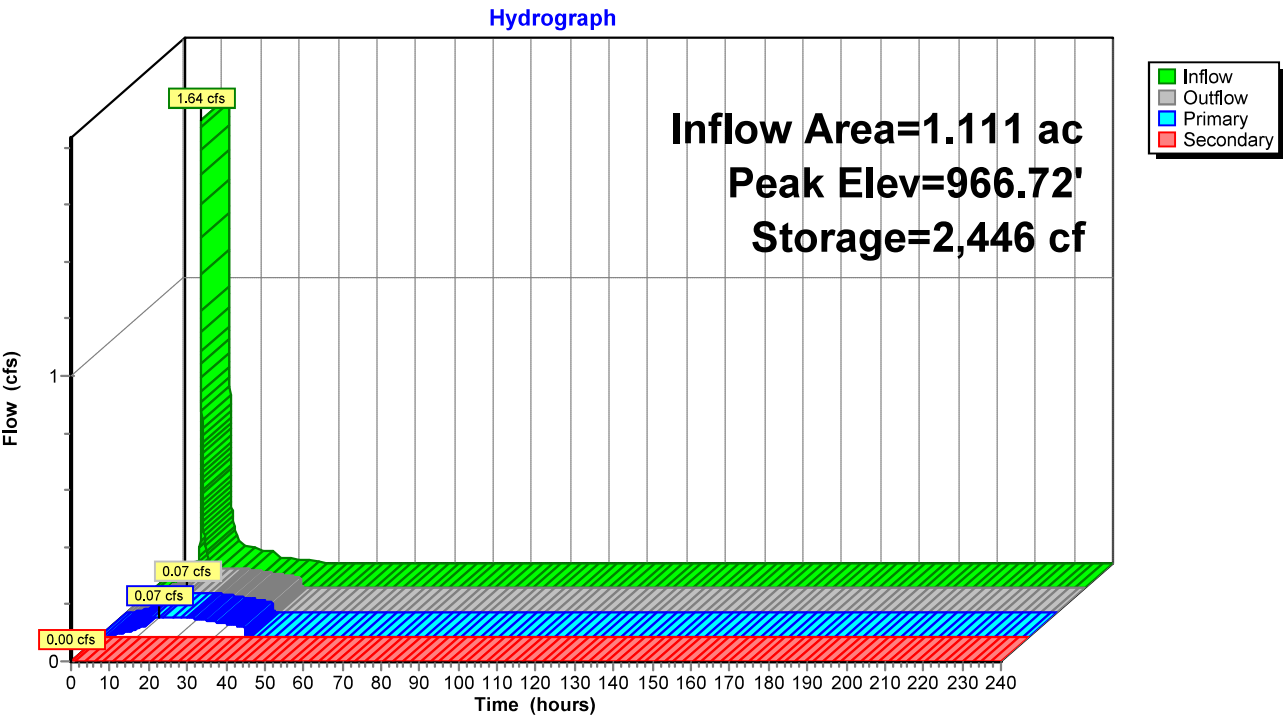
Primary OutFlow Max=0.07 cfs @ 15.46 hrs HW=966.72' (Free Discharge)

↑ **4=Orifice/Grate** (Passes 0.07 cfs of 6.24 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.07 cfs of 1.63 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.07 cfs)
 ↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=965.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: RAIN GARDEN 2



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Type II 24-hr 2-Year Rainfall=2.86"

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Stage-Area-Storage for Pond 6P: RAIN GARDEN 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
965.00	901	0	967.60	1,931	4,113
965.05	931	46	967.65	1,933	4,210
965.10	962	93	967.70	1,936	4,306
965.15	992	142	967.75	1,938	4,403
965.20	1,023	192	967.80	1,941	4,500
965.25	1,053	244	967.85	1,943	4,597
965.30	1,083	298	967.90	1,946	4,694
965.35	1,114	353	967.95	1,948	4,792
965.40	1,144	409	968.00	1,951	4,889
965.45	1,175	467	968.05	1,951	4,987
965.50	1,205	527	968.10	1,951	5,084
965.55	1,235	588	968.15	1,951	5,182
965.60	1,266	650	968.20	1,951	5,279
965.65	1,296	714	968.25	1,951	5,377
965.70	1,327	780	968.30	1,951	5,475
965.75	1,357	847	968.35	1,951	5,572
965.80	1,387	915	968.40	1,951	5,670
965.85	1,418	985	968.45	1,951	5,767
965.90	1,448	1,057	968.50	1,952	5,865
965.95	1,479	1,130	968.55	1,952	5,962
966.00	1,509	1,205	968.60	1,952	6,060
966.05	1,539	1,281	968.65	1,952	6,158
966.10	1,570	1,359	968.70	1,952	6,255
966.15	1,600	1,438	968.75	1,952	6,353
966.20	1,631	1,519	968.80	1,952	6,450
966.25	1,661	1,601	968.85	1,952	6,548
966.30	1,691	1,685	968.90	1,952	6,646
966.35	1,722	1,770	968.95	1,952	6,743
966.40	1,752	1,857	969.00	1,952	6,841
966.45	1,783	1,946	969.05	1,979	6,939
966.50	1,813	2,036	969.10	2,007	7,039
966.55	1,822	2,126	969.15	2,034	7,140
966.60	1,830	2,218	969.20	2,062	7,242
966.65	1,839	2,309	969.25	2,089	7,346
966.70	1,848	2,402	969.30	2,116	7,451
966.75	1,857	2,494	969.35	2,144	7,558
966.80	1,865	2,587	969.40	2,171	7,665
966.85	1,874	2,681	969.45	2,199	7,775
966.90	1,883	2,775	969.50	2,226	7,885
966.95	1,891	2,869	969.55	2,253	7,997
967.00	1,900	2,964	969.60	2,281	8,111
967.05	1,903	3,059	969.65	2,308	8,225
967.10	1,905	3,154	969.70	2,336	8,341
967.15	1,908	3,249	969.75	2,363	8,459
967.20	1,910	3,345	969.80	2,390	8,578
967.25	1,913	3,440	969.85	2,418	8,698
967.30	1,915	3,536	969.90	2,445	8,819
967.35	1,918	3,632	969.95	2,473	8,942
967.40	1,920	3,728	970.00	2,500	9,067
967.45	1,923	3,824			
967.50	1,926	3,920			
967.55	1,928	4,016			

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Type II 24-hr 10-Year Rainfall=4.26"

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 2S: TO RAIN GARDEN 1 Runoff Area=19,395 sf 39.04% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=WQ Runoff=1.92 cfs 0.099 af

Subcatchment 4S: TO RAIN GARDEN 2 Runoff Area=29,003 sf 38.46% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=WQ Runoff=2.86 cfs 0.147 af

Subcatchment 7S: TO ADJACENT Runoff Area=2,641 sf 0.00% Impervious Runoff Depth=1.79"
Tc=6.0 min CN=74 Runoff=0.19 cfs 0.009 af

Subcatchment 8S: TO ROAD Runoff Area=1,624 sf 63.55% Impervious Runoff Depth=3.21"
Tc=0.0 min CN=WQ Runoff=0.22 cfs 0.010 af

Reach 7R: TOTAL Inflow=0.63 cfs 0.265 af
Outflow=0.63 cfs 0.265 af

Reach 9R: ROAD Inflow=0.61 cfs 0.256 af
Outflow=0.61 cfs 0.256 af

Pond 3P: RAIN GARDEN 1 Peak Elev=970.30' Storage=1,252 cf Inflow=1.92 cfs 0.099 af
Primary=1.73 cfs 0.099 af Secondary=0.00 cfs 0.000 af Outflow=1.73 cfs 0.099 af

Pond 6P: RAIN GARDEN 2 Peak Elev=967.64' Storage=4,182 cf Inflow=4.47 cfs 0.246 af
Primary=0.59 cfs 0.246 af Secondary=0.00 cfs 0.000 af Outflow=0.59 cfs 0.246 af

Total Runoff Area = 1.209 ac Runoff Volume = 0.265 af Average Runoff Depth = 2.63"
62.48% Pervious = 0.755 ac 37.52% Impervious = 0.454 ac

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Summary for Subcatchment 2S: TO RAIN GARDEN 1

Runoff = 1.92 cfs @ 11.97 hrs, Volume= 0.099 af, Depth= 2.66"
Routed to Pond 3P : RAIN GARDEN 1

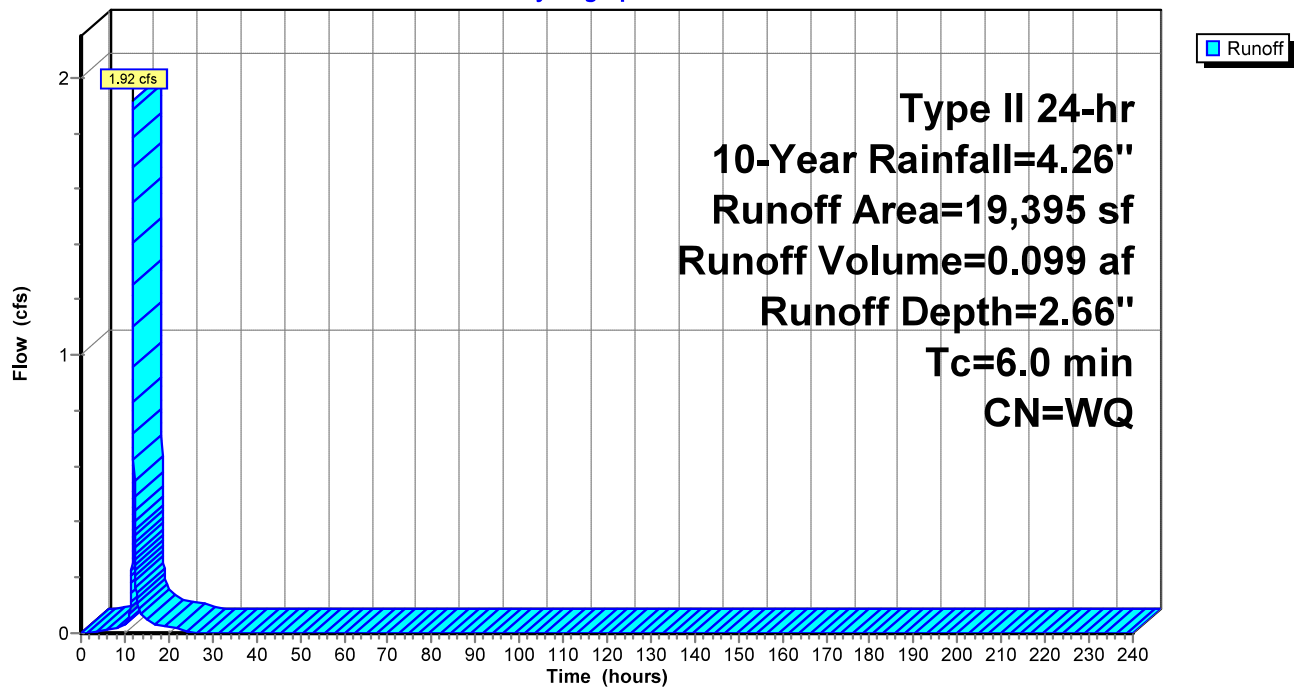
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
7,572	98	Paved parking, HSG C
11,823	74	>75% Grass cover, Good, HSG C
19,395		Weighted Average
11,823		60.96% Pervious Area
7,572		39.04% Impervious Area

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

Subcatchment 2S: TO RAIN GARDEN 1

Hydrograph



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Summary for Subcatchment 4S: TO RAIN GARDEN 2

Runoff = 2.86 cfs @ 11.97 hrs, Volume= 0.147 af, Depth= 2.65"
Routed to Pond 6P : RAIN GARDEN 2

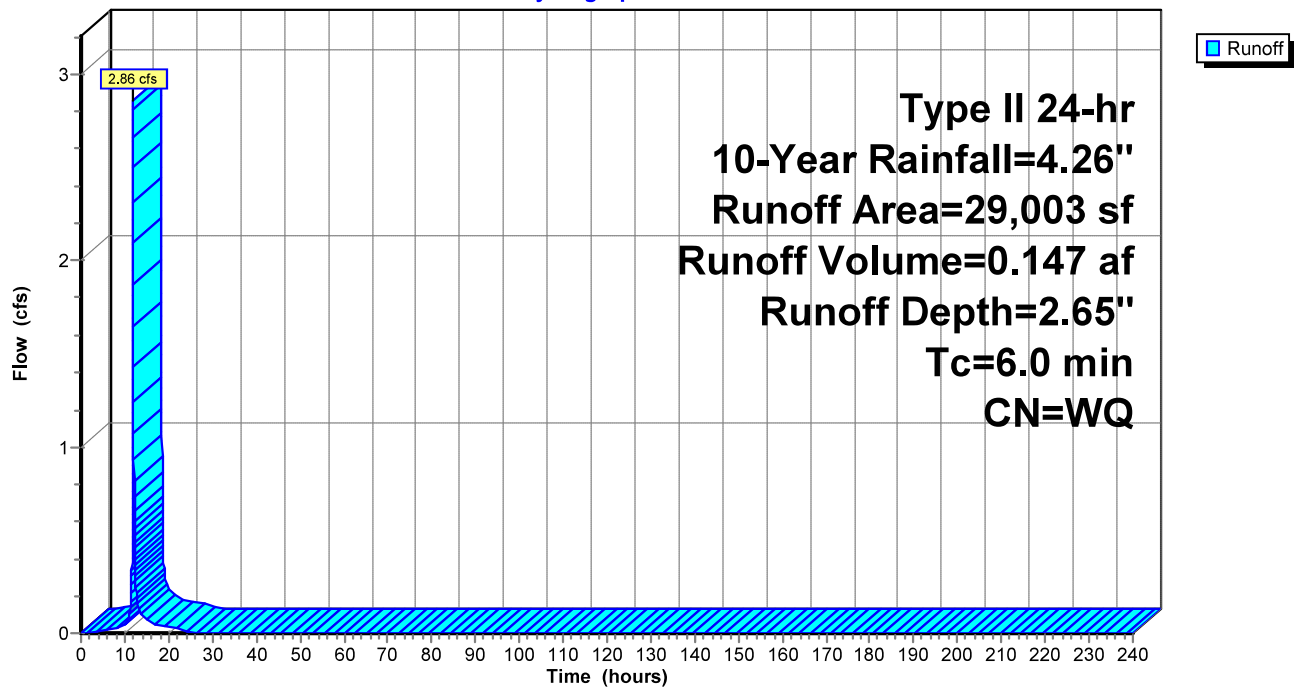
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
11,156	98	Paved parking, HSG C
17,847	74	>75% Grass cover, Good, HSG C
29,003		Weighted Average
17,847		61.54% Pervious Area
11,156		38.46% Impervious Area

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

Subcatchment 4S: TO RAIN GARDEN 2

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.26"

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Summary for Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Runoff = 0.19 cfs @ 11.98 hrs, Volume= 0.009 af, Depth= 1.79"
Routed to Reach 7R : TOTAL

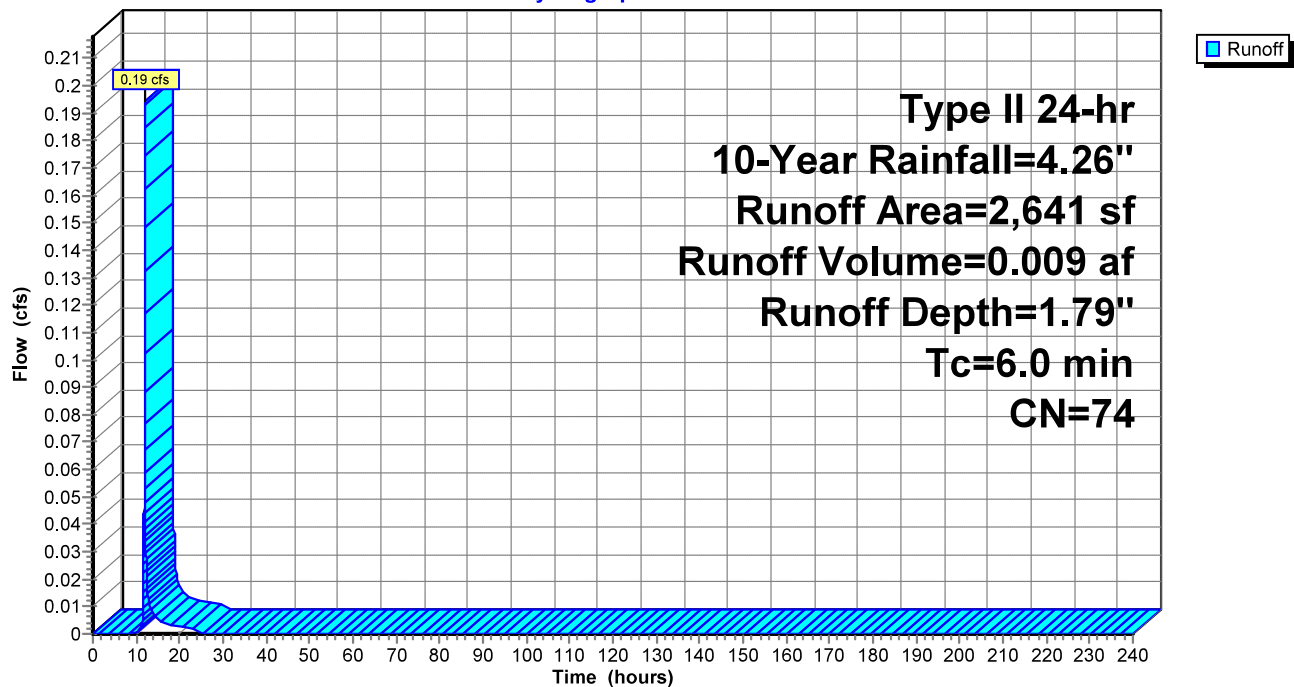
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
2,641	74	>75% Grass cover, Good, HSG C
2,641		100.00% Pervious Area

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

Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Hydrograph



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Summary for Subcatchment 8S: TO ROAD

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

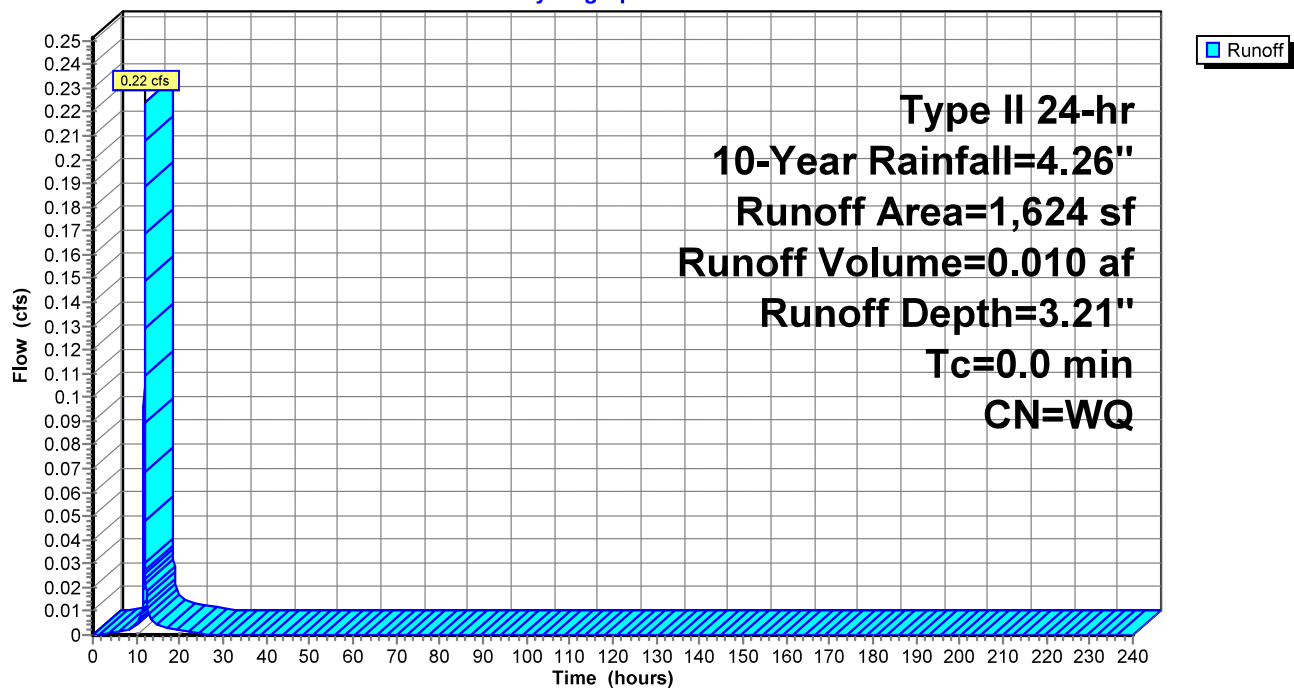
Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 3.21"
Routed to Reach 9R : ROAD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, $dt=0.01$ hrs
Type II 24-hr 10-Year Rainfall=4.26"

Area (sf)	CN	Description
1,032	98	Paved parking, HSG C
592	74	>75% Grass cover, Good, HSG C
1,624		Weighted Average
592		36.45% Pervious Area
1,032		63.55% Impervious Area

Subcatchment 8S: TO ROAD

Hydrograph



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Summary for Reach 7R: TOTAL

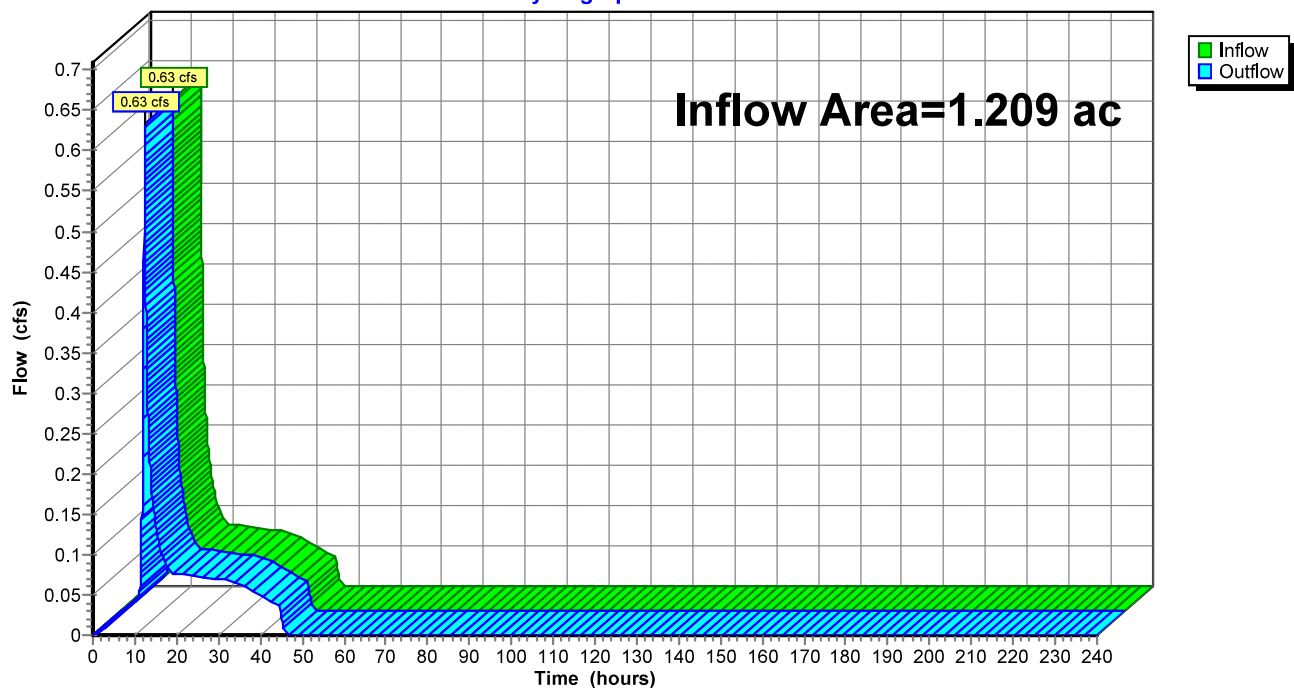
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.209 ac, 37.52% Impervious, Inflow Depth = 2.63" for 10-Year event
Inflow = 0.63 cfs @ 12.31 hrs, Volume= 0.265 af
Outflow = 0.63 cfs @ 12.31 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 7R: TOTAL

Hydrograph

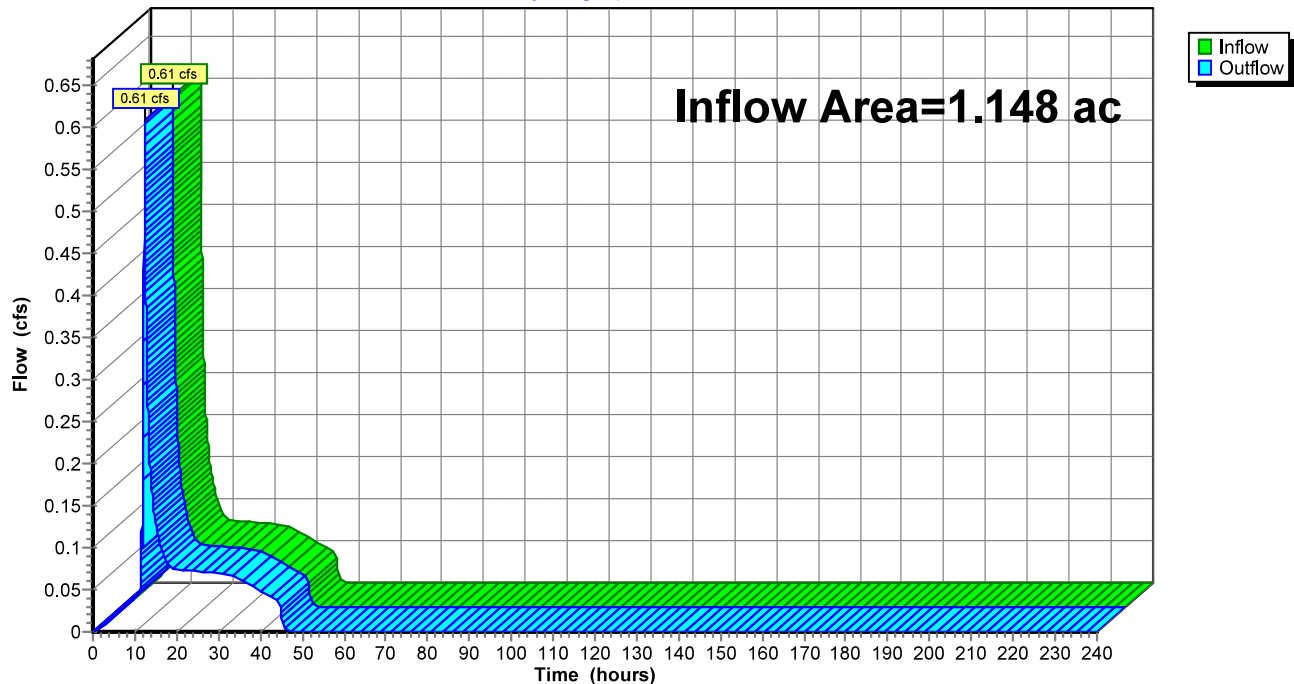


Summary for Reach 9R: ROAD

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

Inflow Area = 1.148 ac, 39.50% Impervious, Inflow Depth = 2.67" for 10-Year event
Inflow = 0.61 cfs @ 12.31 hrs, Volume= 0.256 af
Outflow = 0.61 cfs @ 12.31 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 7R : TOTAL

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 9R: ROAD**Hydrograph**

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Summary for Pond 3P: RAIN GARDEN 1

Inflow Area = 0.445 ac, 39.04% Impervious, Inflow Depth = 2.66" for 10-Year event
 Inflow = 1.92 cfs @ 11.97 hrs, Volume= 0.099 af
 Outflow = 1.73 cfs @ 12.01 hrs, Volume= 0.099 af, Atten= 10%, Lag= 2.0 min
 Primary = 1.73 cfs @ 12.01 hrs, Volume= 0.099 af
 Routed to Pond 6P : RAIN GARDEN 2
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 970.30' @ 12.01 hrs Surf.Area= 936 sf Storage= 1,252 cf

Plug-Flow detention time= 235.0 min calculated for 0.099 af (100% of inflow)
 Center-of-Mass det. time= 235.0 min (1,020.9 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	968.00'	1,998 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
968.00	236	0	0
969.00	458	347	347
970.00	822	640	987
971.00	1,200	1,011	1,998

Device	Routing	Invert	Outlet Devices
#1	Device 2	968.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	966.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	970.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	966.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	970.50'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

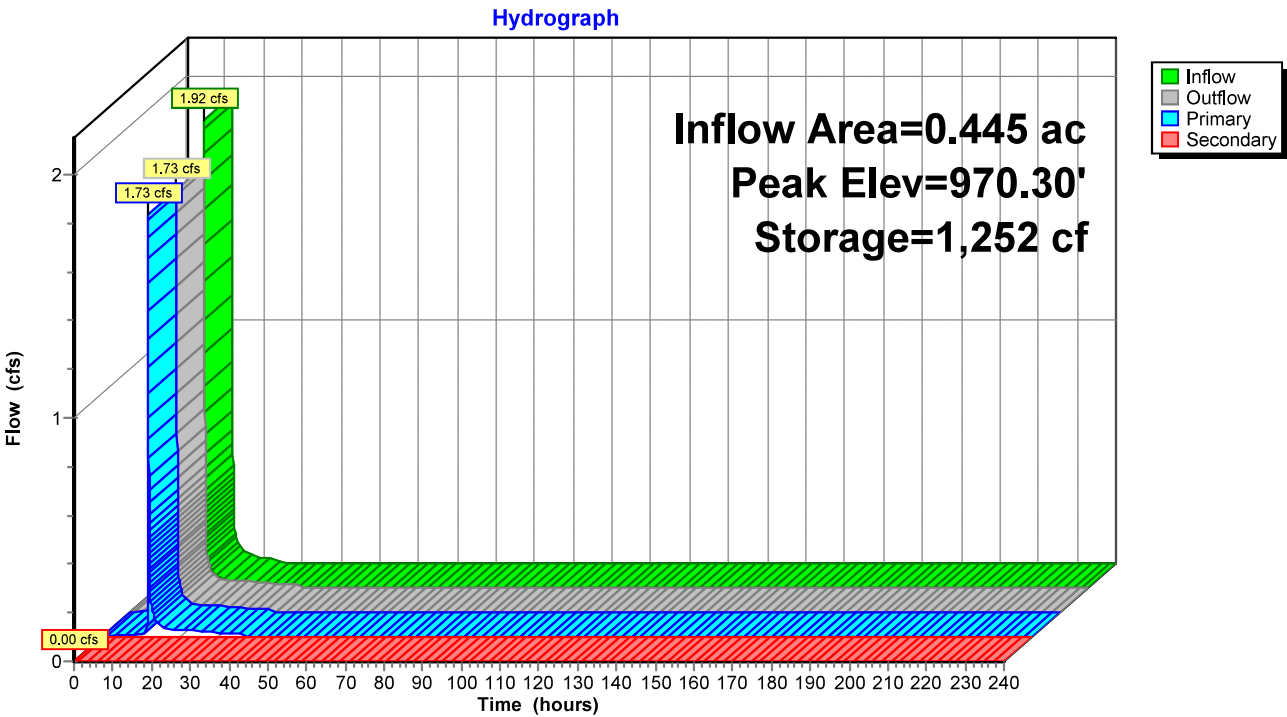
Primary OutFlow Max=1.73 cfs @ 12.01 hrs HW=970.30' (Free Discharge)

↑ **4=Orifice/Grate** (Passes 1.73 cfs of 7.37 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.03 cfs of 1.90 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 1.69 cfs @ 1.79 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=968.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: RAIN GARDEN 1



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Type II 24-hr 10-Year Rainfall=4.26"

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Stage-Area-Storage for Pond 3P: RAIN GARDEN 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
968.00	236	0	970.60	1,049	1,548
968.05	247	12	970.65	1,068	1,601
968.10	258	25	970.70	1,087	1,655
968.15	269	38	970.75	1,106	1,710
968.20	280	52	970.80	1,124	1,766
968.25	292	66	970.85	1,143	1,822
968.30	303	81	970.90	1,162	1,880
968.35	314	96	970.95	1,181	1,938
968.40	325	112	971.00	1,200	1,998
968.45	336	129			
968.50	347	146			
968.55	358	163			
968.60	369	182			
968.65	380	200			
968.70	391	220			
968.75	403	239			
968.80	414	260			
968.85	425	281			
968.90	436	302			
968.95	447	324			
969.00	458	347			
969.05	476	370			
969.10	494	395			
969.15	513	420			
969.20	531	446			
969.25	549	473			
969.30	567	501			
969.35	585	530			
969.40	604	559			
969.45	622	590			
969.50	640	622			
969.55	658	654			
969.60	676	687			
969.65	695	722			
969.70	713	757			
969.75	731	793			
969.80	749	830			
969.85	767	868			
969.90	786	907			
969.95	804	946			
970.00	822	987			
970.05	841	1,029			
970.10	860	1,071			
970.15	879	1,115			
970.20	898	1,159			
970.25	917	1,204			
970.30	935	1,251			
970.35	954	1,298			
970.40	973	1,346			
970.45	992	1,395			
970.50	1,011	1,445			
970.55	1,030	1,496			

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Summary for Pond 6P: RAIN GARDEN 2

[79] Warning: Submerged Pond 3P Primary device # 4 by 1.64'

Inflow Area = 1.111 ac, 38.70% Impervious, Inflow Depth = 2.65" for 10-Year event
 Inflow = 4.47 cfs @ 11.99 hrs, Volume= 0.246 af
 Outflow = 0.59 cfs @ 12.31 hrs, Volume= 0.246 af, Atten= 87%, Lag= 19.6 min
 Primary = 0.59 cfs @ 12.31 hrs, Volume= 0.246 af
 Routed to Reach 9R : ROAD
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 967.64' @ 12.31 hrs Surf.Area= 1,932 sf Storage= 4,182 cf

Plug-Flow detention time= 483.7 min calculated for 0.246 af (100% of inflow)
 Center-of-Mass det. time= 483.7 min (1,364.4 - 880.7)

Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	9,067 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	901	0	0
966.50	1,813	2,036	2,036
967.00	1,900	928	2,964
968.00	1,951	1,926	4,889
969.00	1,952	1,952	6,841
970.00	2,500	2,226	9,067

Device	Routing	Invert	Outlet Devices
#1	Device 2	965.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	963.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	967.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	963.50'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	969.00'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

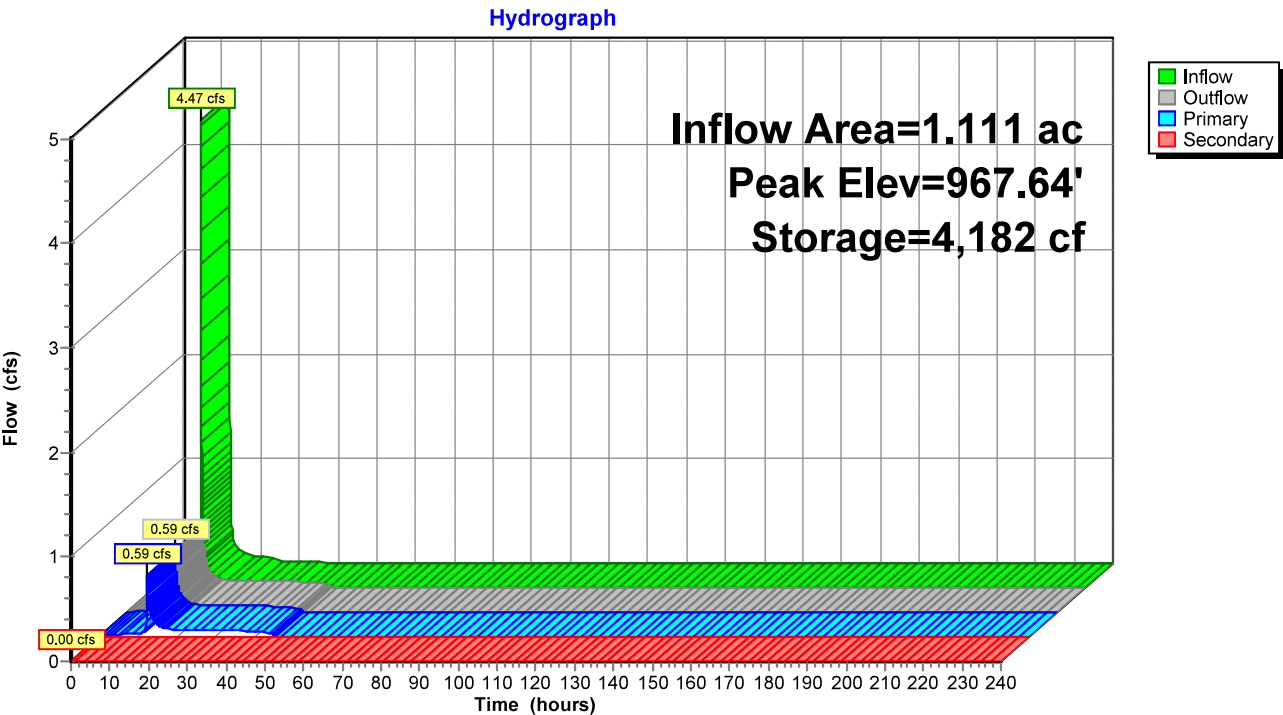
Primary OutFlow Max=0.58 cfs @ 12.31 hrs HW=967.64' (Free Discharge)

↑ **4=Orifice/Grate** (Passes 0.58 cfs of 7.21 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.07 cfs of 1.86 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.07 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 0.51 cfs @ 1.20 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=965.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: RAIN GARDEN 2



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Stage-Area-Storage for Pond 6P: RAIN GARDEN 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
965.00	901	0	967.60	1,931	4,113
965.05	931	46	967.65	1,933	4,210
965.10	962	93	967.70	1,936	4,306
965.15	992	142	967.75	1,938	4,403
965.20	1,023	192	967.80	1,941	4,500
965.25	1,053	244	967.85	1,943	4,597
965.30	1,083	298	967.90	1,946	4,694
965.35	1,114	353	967.95	1,948	4,792
965.40	1,144	409	968.00	1,951	4,889
965.45	1,175	467	968.05	1,951	4,987
965.50	1,205	527	968.10	1,951	5,084
965.55	1,235	588	968.15	1,951	5,182
965.60	1,266	650	968.20	1,951	5,279
965.65	1,296	714	968.25	1,951	5,377
965.70	1,327	780	968.30	1,951	5,475
965.75	1,357	847	968.35	1,951	5,572
965.80	1,387	915	968.40	1,951	5,670
965.85	1,418	985	968.45	1,951	5,767
965.90	1,448	1,057	968.50	1,952	5,865
965.95	1,479	1,130	968.55	1,952	5,962
966.00	1,509	1,205	968.60	1,952	6,060
966.05	1,539	1,281	968.65	1,952	6,158
966.10	1,570	1,359	968.70	1,952	6,255
966.15	1,600	1,438	968.75	1,952	6,353
966.20	1,631	1,519	968.80	1,952	6,450
966.25	1,661	1,601	968.85	1,952	6,548
966.30	1,691	1,685	968.90	1,952	6,646
966.35	1,722	1,770	968.95	1,952	6,743
966.40	1,752	1,857	969.00	1,952	6,841
966.45	1,783	1,946	969.05	1,979	6,939
966.50	1,813	2,036	969.10	2,007	7,039
966.55	1,822	2,126	969.15	2,034	7,140
966.60	1,830	2,218	969.20	2,062	7,242
966.65	1,839	2,309	969.25	2,089	7,346
966.70	1,848	2,402	969.30	2,116	7,451
966.75	1,857	2,494	969.35	2,144	7,558
966.80	1,865	2,587	969.40	2,171	7,665
966.85	1,874	2,681	969.45	2,199	7,775
966.90	1,883	2,775	969.50	2,226	7,885
966.95	1,891	2,869	969.55	2,253	7,997
967.00	1,900	2,964	969.60	2,281	8,111
967.05	1,903	3,059	969.65	2,308	8,225
967.10	1,905	3,154	969.70	2,336	8,341
967.15	1,908	3,249	969.75	2,363	8,459
967.20	1,910	3,345	969.80	2,390	8,578
967.25	1,913	3,440	969.85	2,418	8,698
967.30	1,915	3,536	969.90	2,445	8,819
967.35	1,918	3,632	969.95	2,473	8,942
967.40	1,920	3,728	970.00	2,500	9,067
967.45	1,923	3,824			
967.50	1,926	3,920			
967.55	1,928	4,016			

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Type II 24-hr 100-Year Rainfall=7.32"

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 2S: TO RAIN GARDEN 1 Runoff Area=19,395 sf 39.04% Impervious Runoff Depth=5.40"
Tc=6.0 min CN=WQ Runoff=3.88 cfs 0.200 af

Subcatchment 4S: TO RAIN GARDEN 2 Runoff Area=29,003 sf 38.46% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=WQ Runoff=5.79 cfs 0.299 af

Subcatchment 7S: TO ADJACENT Runoff Area=2,641 sf 0.00% Impervious Runoff Depth=4.32"
Tc=6.0 min CN=74 Runoff=0.46 cfs 0.022 af

Subcatchment 8S: TO ROAD Runoff Area=1,624 sf 63.55% Impervious Runoff Depth=6.08"
Tc=0.0 min CN=WQ Runoff=0.42 cfs 0.019 af

Reach 7R: TOTAL Inflow=5.47 cfs 0.540 af
Outflow=5.47 cfs 0.540 af

Reach 9R: ROAD Inflow=5.06 cfs 0.518 af
Outflow=5.06 cfs 0.518 af

Pond 3P: RAIN GARDEN 1 Peak Elev=970.59' Storage=1,538 cf Inflow=3.88 cfs 0.200 af
Primary=2.94 cfs 0.196 af Secondary=0.73 cfs 0.004 af Outflow=3.68 cfs 0.200 af

Pond 6P: RAIN GARDEN 2 Peak Elev=969.00' Storage=6,843 cf Inflow=8.69 cfs 0.495 af
Primary=4.71 cfs 0.495 af Secondary=0.01 cfs 0.000 af Outflow=4.71 cfs 0.495 af

Total Runoff Area = 1.209 ac Runoff Volume = 0.540 af Average Runoff Depth = 5.36"
62.48% Pervious = 0.755 ac 37.52% Impervious = 0.454 ac

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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Subcatchment 2S: TO RAIN GARDEN 1

Runoff = 3.88 cfs @ 11.97 hrs, Volume= 0.200 af, Depth= 5.40"
Routed to Pond 3P : RAIN GARDEN 1

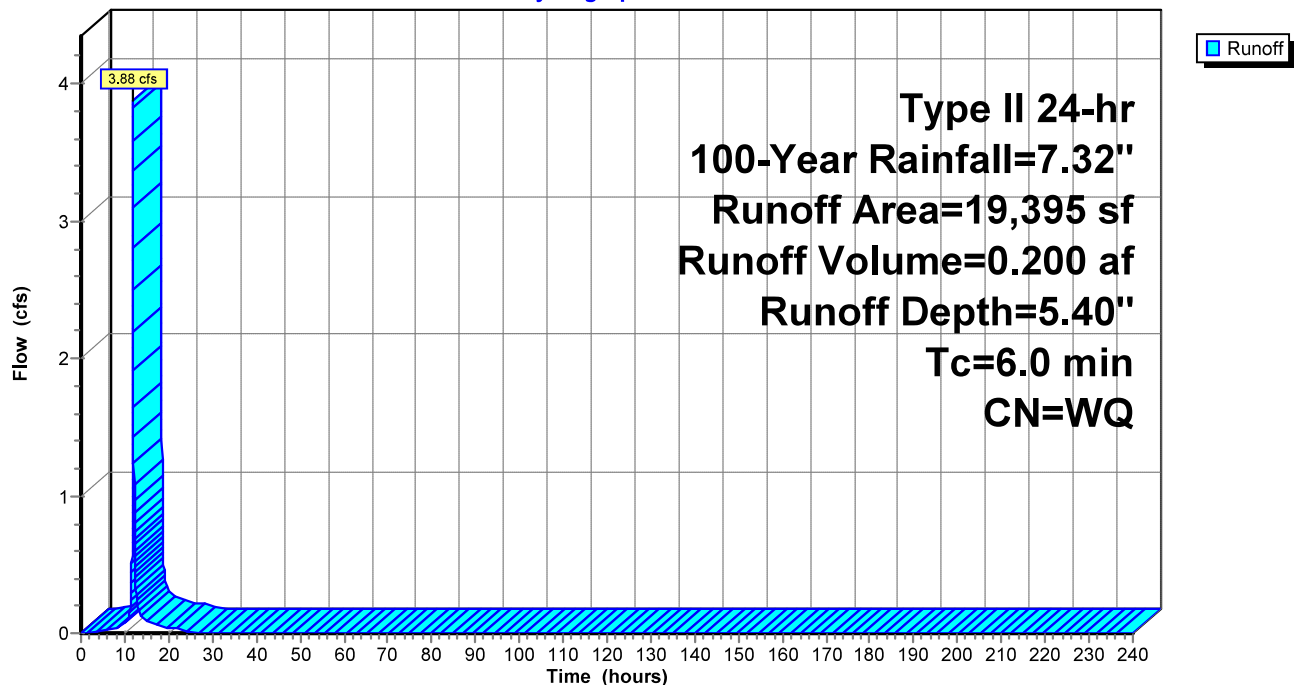
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
7,572	98	Paved parking, HSG C
11,823	74	>75% Grass cover, Good, HSG C
19,395		Weighted Average
11,823		60.96% Pervious Area
7,572		39.04% Impervious Area

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

Subcatchment 2S: TO RAIN GARDEN 1

Hydrograph



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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Subcatchment 4S: TO RAIN GARDEN 2

Runoff = 5.79 cfs @ 11.97 hrs, Volume= 0.299 af, Depth= 5.38"
Routed to Pond 6P : RAIN GARDEN 2

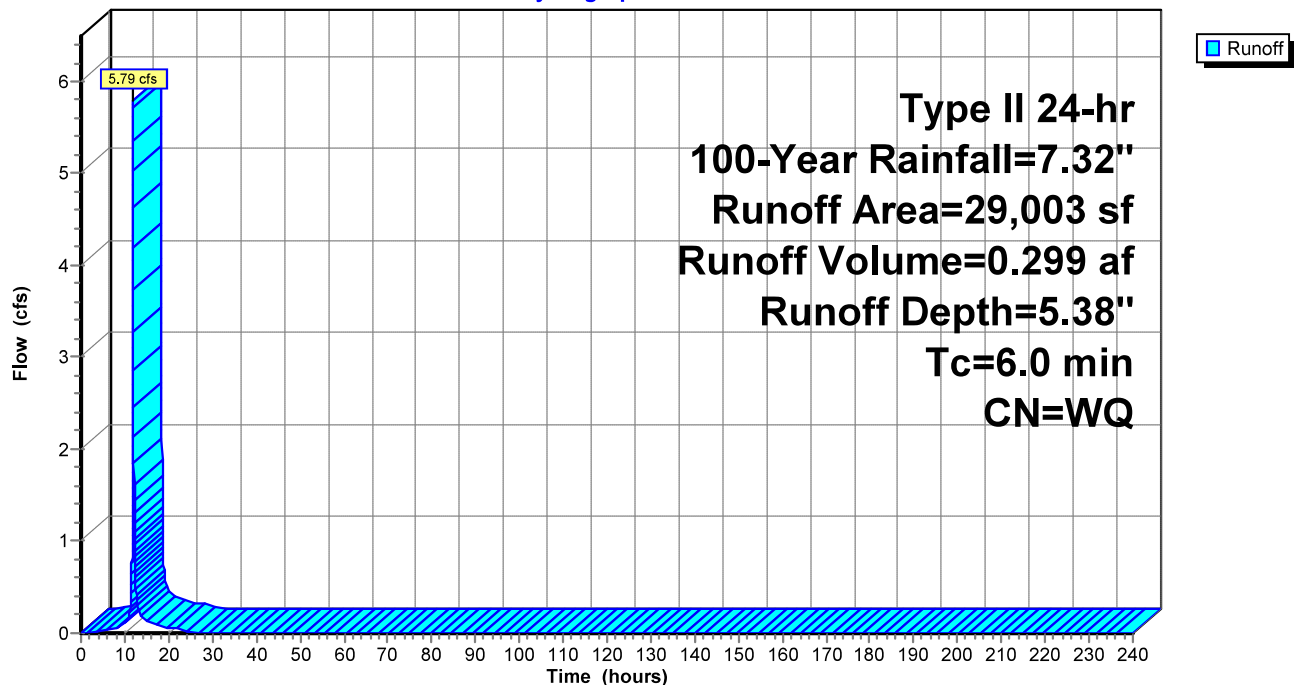
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
11,156	98	Paved parking, HSG C
17,847	74	>75% Grass cover, Good, HSG C
29,003		Weighted Average
17,847		61.54% Pervious Area
11,156		38.46% Impervious Area

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

Subcatchment 4S: TO RAIN GARDEN 2

Hydrograph



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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Runoff = 0.46 cfs @ 11.97 hrs, Volume= 0.022 af, Depth= 4.32"
Routed to Reach 7R : TOTAL

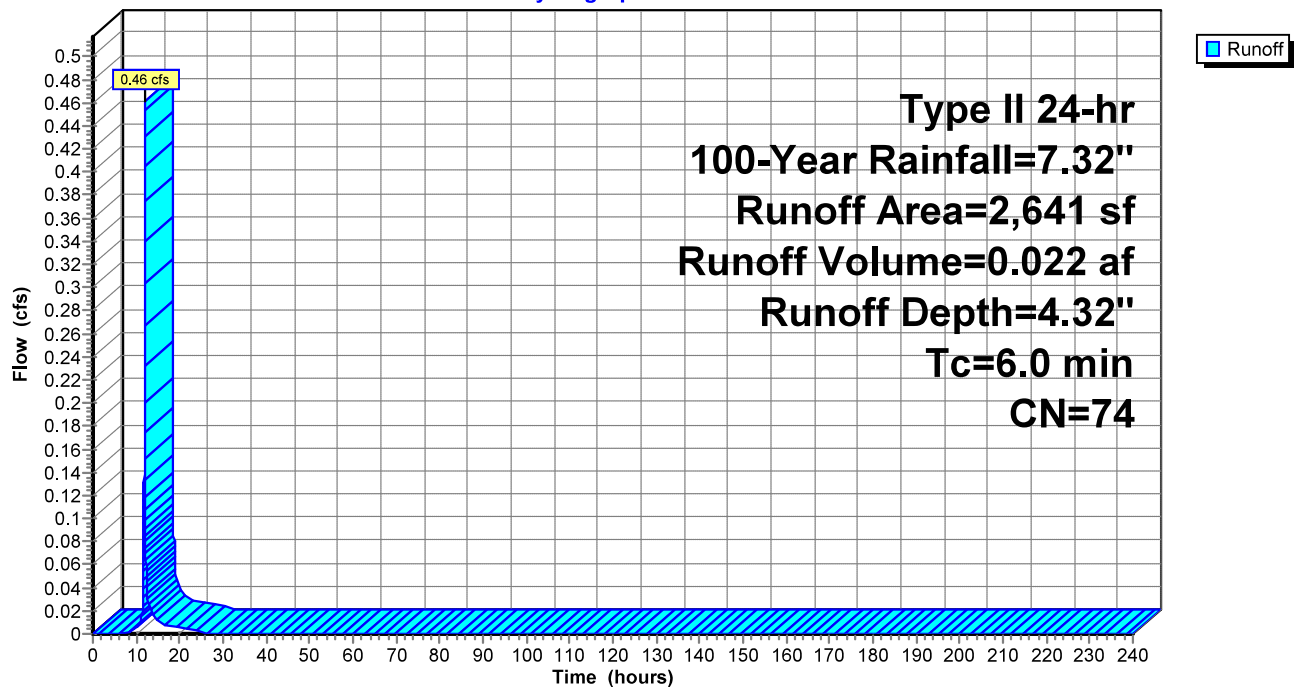
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
2,641	74	>75% Grass cover, Good, HSG C
2,641		100.00% Pervious Area

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

Subcatchment 7S: TO ADJACENT PROPERTY TO WEST

Hydrograph



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Summary for Subcatchment 8S: TO ROAD[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

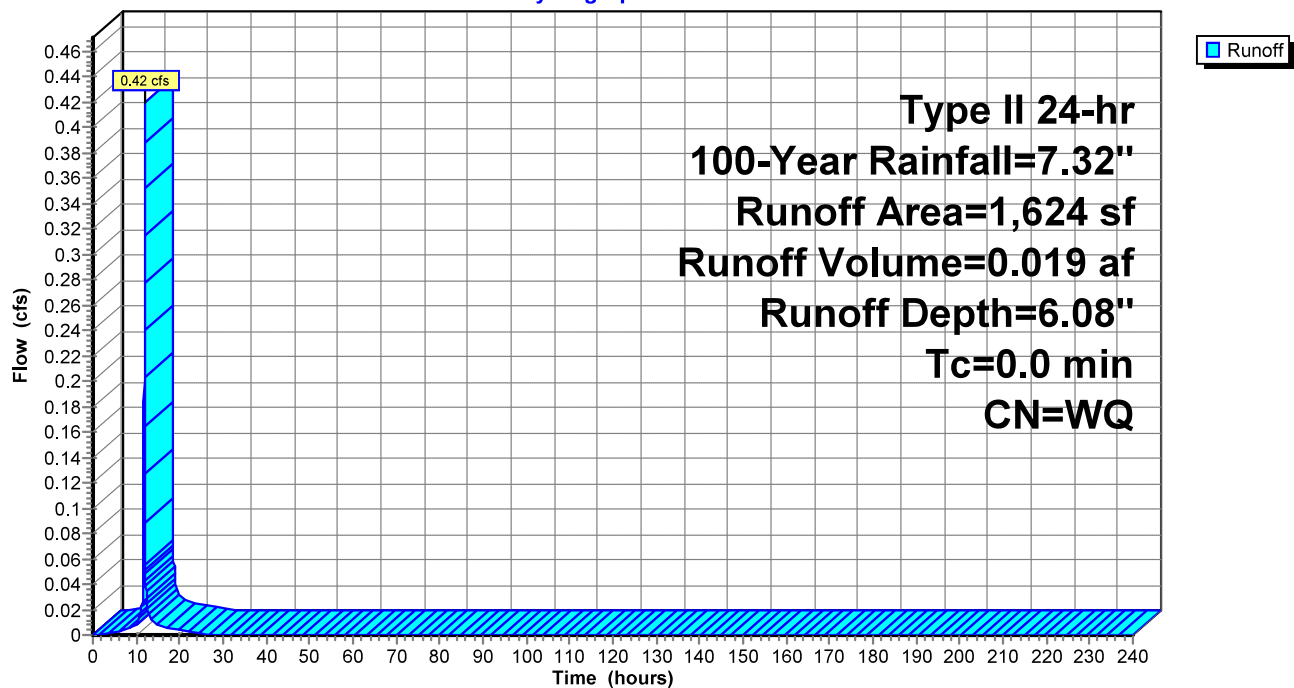
Runoff = 0.42 cfs @ 11.90 hrs, Volume= 0.019 af, Depth= 6.08"
Routed to Reach 9R : ROAD

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=7.32"

Area (sf)	CN	Description
1,032	98	Paved parking, HSG C
592	74	>75% Grass cover, Good, HSG C
1,624		Weighted Average
592		36.45% Pervious Area
1,032		63.55% Impervious Area

Subcatchment 8S: TO ROAD

Hydrograph



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Summary for Reach 7R: TOTAL

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

Inflow Area = 1.209 ac, 37.52% Impervious, Inflow Depth = 5.36" for 100-Year event

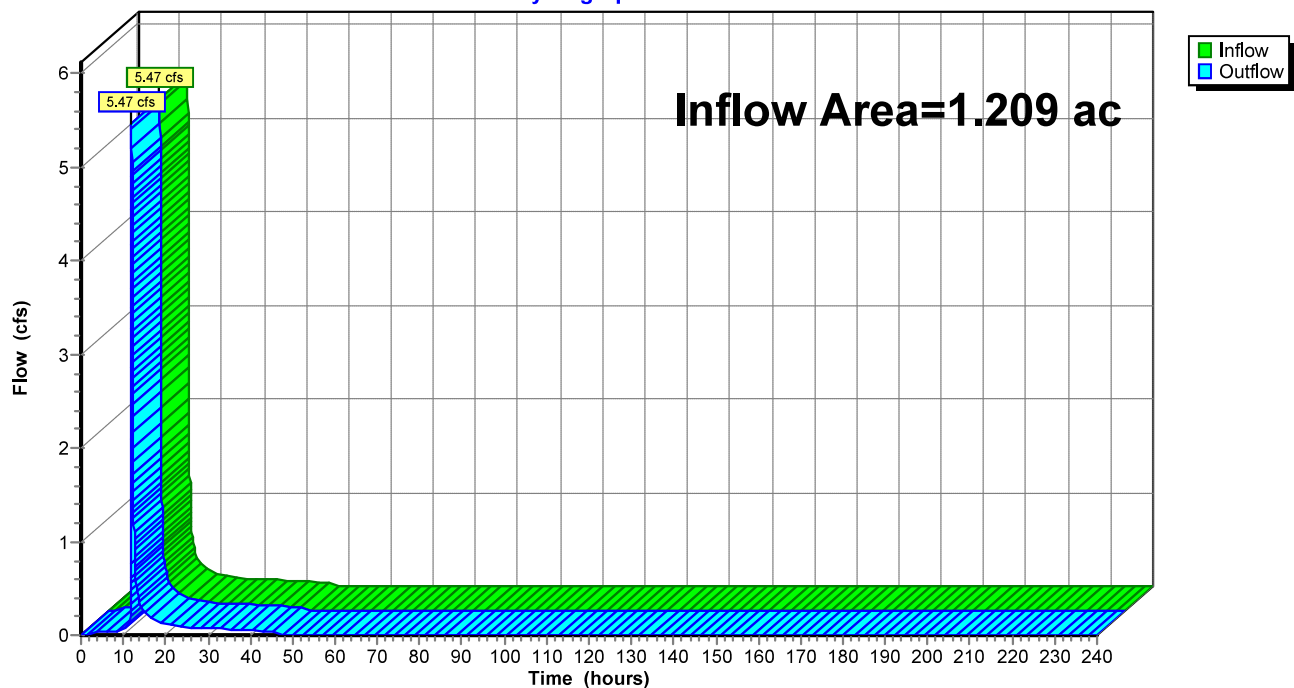
Inflow = 5.47 cfs @ 12.01 hrs, Volume= 0.540 af

Outflow = 5.47 cfs @ 12.01 hrs, Volume= 0.540 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 7R: TOTAL

Hydrograph



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Type II 24-hr 100-Year Rainfall=7.32"

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Summary for Reach 9R: ROAD

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

Inflow Area = 1.148 ac, 39.50% Impervious, Inflow Depth = 5.41" for 100-Year event

Inflow = 5.06 cfs @ 12.01 hrs, Volume= 0.518 af

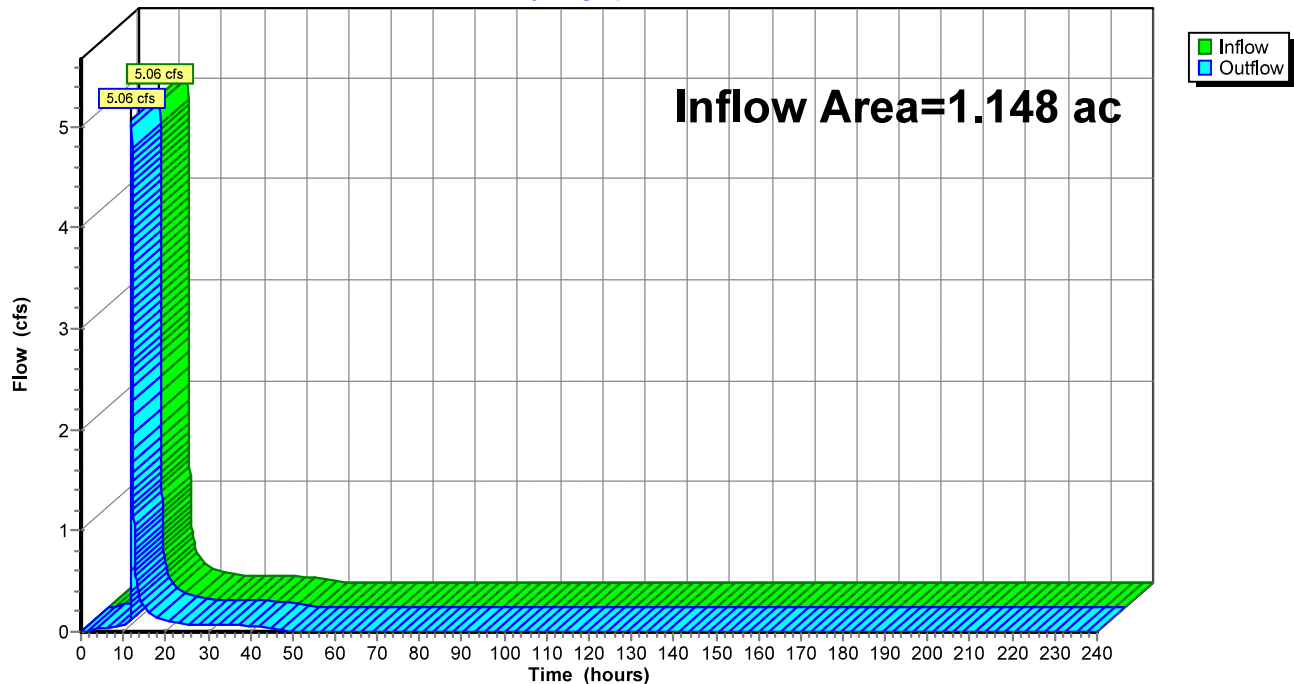
Outflow = 5.06 cfs @ 12.01 hrs, Volume= 0.518 af, Atten= 0%, Lag= 0.0 min

Routed to Reach 7R : TOTAL

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs

Reach 9R: ROAD

Hydrograph



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Summary for Pond 3P: RAIN GARDEN 1

Inflow Area = 0.445 ac, 39.04% Impervious, Inflow Depth = 5.40" for 100-Year event
 Inflow = 3.88 cfs @ 11.97 hrs, Volume= 0.200 af
 Outflow = 3.68 cfs @ 11.99 hrs, Volume= 0.200 af, Atten= 5%, Lag= 1.5 min
 Primary = 2.94 cfs @ 11.99 hrs, Volume= 0.196 af
 Routed to Pond 6P : RAIN GARDEN 2
 Secondary = 0.73 cfs @ 11.99 hrs, Volume= 0.004 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 970.59' @ 11.99 hrs Surf.Area= 1,045 sf Storage= 1,538 cf

Plug-Flow detention time= 142.0 min calculated for 0.200 af (100% of inflow)
 Center-of-Mass det. time= 142.0 min (918.6 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	968.00'	1,998 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
968.00	236	0	0
969.00	458	347	347
970.00	822	640	987
971.00	1,200	1,011	1,998

Device	Routing	Invert	Outlet Devices
#1	Device 2	968.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	966.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	970.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	966.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	970.50'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

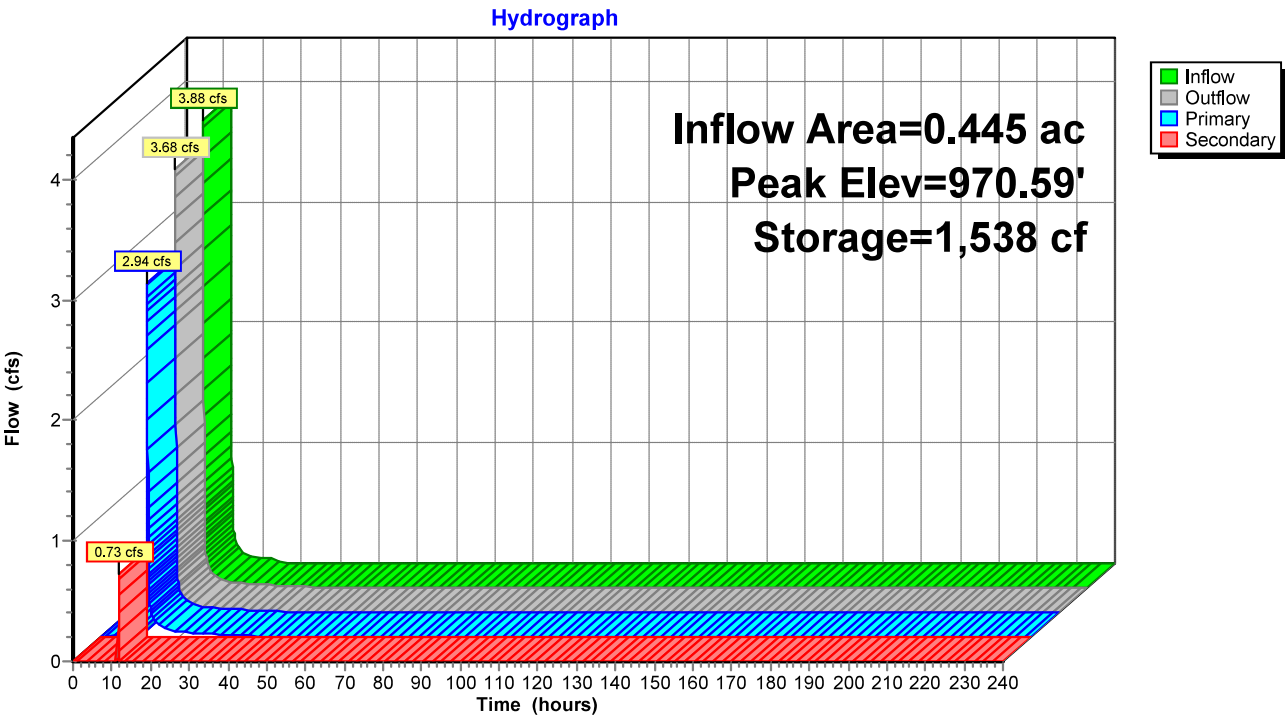
Primary OutFlow Max=2.94 cfs @ 11.99 hrs HW=970.59' (Free Discharge)

↑ **4=Orifice/Grate** (Passes 2.94 cfs of 7.65 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.04 cfs of 1.97 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 2.90 cfs @ 3.70 fps)

Secondary OutFlow Max=0.72 cfs @ 11.99 hrs HW=970.59' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 0.72 cfs @ 0.80 fps)

Pond 3P: RAIN GARDEN 1



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Type II 24-hr 100-Year Rainfall=7.32"

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Stage-Area-Storage for Pond 3P: RAIN GARDEN 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
968.00	236	0	970.60	1,049	1,548
968.05	247	12	970.65	1,068	1,601
968.10	258	25	970.70	1,087	1,655
968.15	269	38	970.75	1,106	1,710
968.20	280	52	970.80	1,124	1,766
968.25	292	66	970.85	1,143	1,822
968.30	303	81	970.90	1,162	1,880
968.35	314	96	970.95	1,181	1,938
968.40	325	112	971.00	1,200	1,998
968.45	336	129			
968.50	347	146			
968.55	358	163			
968.60	369	182			
968.65	380	200			
968.70	391	220			
968.75	403	239			
968.80	414	260			
968.85	425	281			
968.90	436	302			
968.95	447	324			
969.00	458	347			
969.05	476	370			
969.10	494	395			
969.15	513	420			
969.20	531	446			
969.25	549	473			
969.30	567	501			
969.35	585	530			
969.40	604	559			
969.45	622	590			
969.50	640	622			
969.55	658	654			
969.60	676	687			
969.65	695	722			
969.70	713	757			
969.75	731	793			
969.80	749	830			
969.85	767	868			
969.90	786	907			
969.95	804	946			
970.00	822	987			
970.05	841	1,029			
970.10	860	1,071			
970.15	879	1,115			
970.20	898	1,159			
970.25	917	1,204			
970.30	935	1,251			
970.35	954	1,298			
970.40	973	1,346			
970.45	992	1,395			
970.50	1,011	1,445			
970.55	1,030	1,496			

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Summary for Pond 6P: RAIN GARDEN 2

[79] Warning: Submerged Pond 3P Primary device # 4 by 3.00'

Inflow Area = 1.111 ac, 38.70% Impervious, Inflow Depth = 5.35" for 100-Year event
 Inflow = 8.69 cfs @ 11.97 hrs, Volume= 0.495 af
 Outflow = 4.71 cfs @ 12.08 hrs, Volume= 0.495 af, Atten= 46%, Lag= 6.3 min
 Primary = 4.71 cfs @ 12.08 hrs, Volume= 0.495 af
 Routed to Reach 9R : ROAD
 Secondary = 0.01 cfs @ 12.08 hrs, Volume= 0.000 af
 Routed to Reach 9R : ROAD

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 969.00' @ 12.08 hrs Surf.Area= 1,953 sf Storage= 6,843 cf

Plug-Flow detention time= 269.8 min calculated for 0.495 af (100% of inflow)
 Center-of-Mass det. time= 269.8 min (1,104.6 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	9,067 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	901	0	0
966.50	1,813	2,036	2,036
967.00	1,900	928	2,964
968.00	1,951	1,926	4,889
969.00	1,952	1,952	6,841
970.00	2,500	2,226	9,067

Device	Routing	Invert	Outlet Devices
#1	Device 2	965.00'	1.600 in/hr Exfiltration over Surface area
#2	Device 4	963.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 4	967.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	963.50'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	969.00'	10.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

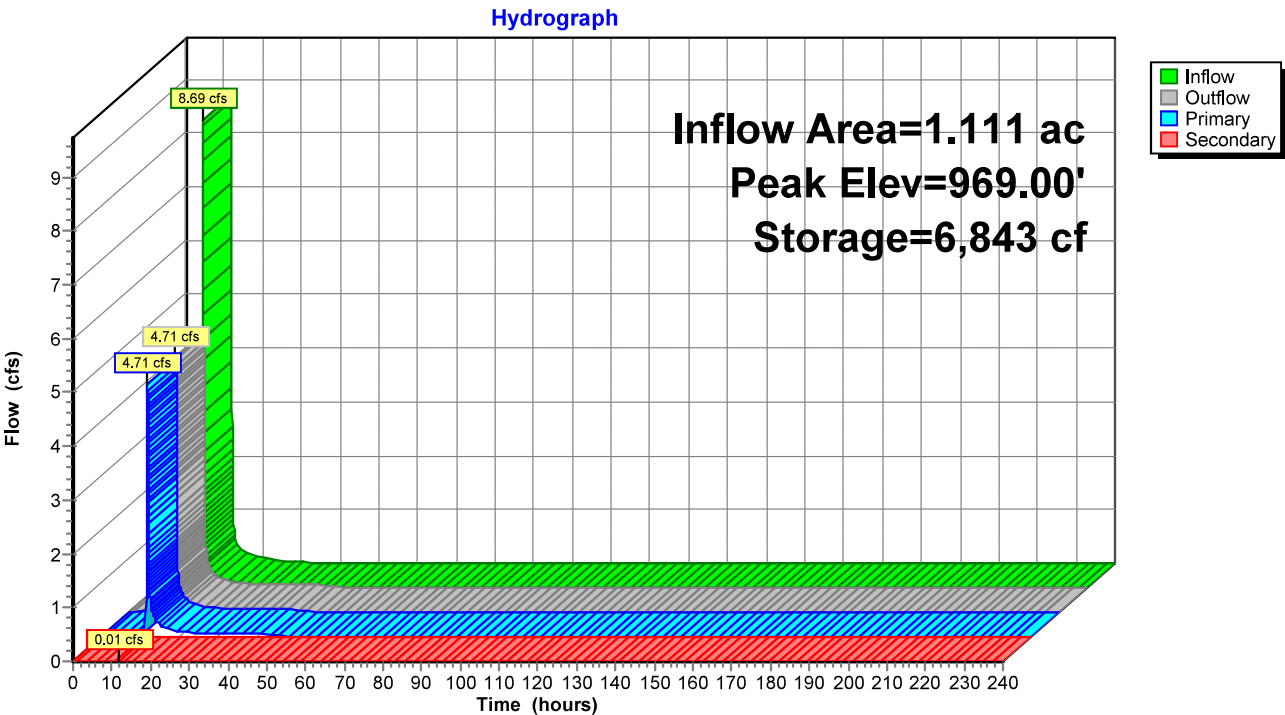
Primary OutFlow Max=4.70 cfs @ 12.08 hrs HW=969.00' (Free Discharge)

↑ **4=Orifice/Grate** (Passes 4.70 cfs of 8.46 cfs potential flow)
 ↑ **2=Orifice/Grate** (Passes 0.07 cfs of 2.17 cfs potential flow)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.07 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 4.63 cfs @ 5.90 fps)

Secondary OutFlow Max=0.00 cfs @ 12.08 hrs HW=969.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.08 fps)

Pond 6P: RAIN GARDEN 2



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Stage-Area-Storage for Pond 6P: RAIN GARDEN 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
965.00	901	0	967.60	1,931	4,113
965.05	931	46	967.65	1,933	4,210
965.10	962	93	967.70	1,936	4,306
965.15	992	142	967.75	1,938	4,403
965.20	1,023	192	967.80	1,941	4,500
965.25	1,053	244	967.85	1,943	4,597
965.30	1,083	298	967.90	1,946	4,694
965.35	1,114	353	967.95	1,948	4,792
965.40	1,144	409	968.00	1,951	4,889
965.45	1,175	467	968.05	1,951	4,987
965.50	1,205	527	968.10	1,951	5,084
965.55	1,235	588	968.15	1,951	5,182
965.60	1,266	650	968.20	1,951	5,279
965.65	1,296	714	968.25	1,951	5,377
965.70	1,327	780	968.30	1,951	5,475
965.75	1,357	847	968.35	1,951	5,572
965.80	1,387	915	968.40	1,951	5,670
965.85	1,418	985	968.45	1,951	5,767
965.90	1,448	1,057	968.50	1,952	5,865
965.95	1,479	1,130	968.55	1,952	5,962
966.00	1,509	1,205	968.60	1,952	6,060
966.05	1,539	1,281	968.65	1,952	6,158
966.10	1,570	1,359	968.70	1,952	6,255
966.15	1,600	1,438	968.75	1,952	6,353
966.20	1,631	1,519	968.80	1,952	6,450
966.25	1,661	1,601	968.85	1,952	6,548
966.30	1,691	1,685	968.90	1,952	6,646
966.35	1,722	1,770	968.95	1,952	6,743
966.40	1,752	1,857	969.00	1,952	6,841
966.45	1,783	1,946	969.05	1,979	6,939
966.50	1,813	2,036	969.10	2,007	7,039
966.55	1,822	2,126	969.15	2,034	7,140
966.60	1,830	2,218	969.20	2,062	7,242
966.65	1,839	2,309	969.25	2,089	7,346
966.70	1,848	2,402	969.30	2,116	7,451
966.75	1,857	2,494	969.35	2,144	7,558
966.80	1,865	2,587	969.40	2,171	7,665
966.85	1,874	2,681	969.45	2,199	7,775
966.90	1,883	2,775	969.50	2,226	7,885
966.95	1,891	2,869	969.55	2,253	7,997
967.00	1,900	2,964	969.60	2,281	8,111
967.05	1,903	3,059	969.65	2,308	8,225
967.10	1,905	3,154	969.70	2,336	8,341
967.15	1,908	3,249	969.75	2,363	8,459
967.20	1,910	3,345	969.80	2,390	8,578
967.25	1,913	3,440	969.85	2,418	8,698
967.30	1,915	3,536	969.90	2,445	8,819
967.35	1,918	3,632	969.95	2,473	8,942
967.40	1,920	3,728	970.00	2,500	9,067
967.45	1,923	3,824			
967.50	1,926	3,920			
967.55	1,928	4,016			