

Data file name: U:\Makepeace Engineering\2 Clients\Uploaded\Wieser\Performance Elite Gymnastics\SLAMM\PEG SLAMM model 20230510.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppd
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 05-11-2023 Time: 10:42:50
Site information:

LU# 1 - Commercial: 1S Total area (ac): 0.271
1 - Roofs 1: 0.158 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.024 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.089 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: 2S Total area (ac): 0.318
13 - Paved Parking 1: 0.251 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.030 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
71 - Other Pervious Areas 1: 0.037 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: 3S Total area (ac): 0.093
13 - Paved Parking 1: 0.039 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.042 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
71 - Other Pervious Areas 1: 0.012 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Biofilter CP# 1 (DS) - BF1

1. Top area (square feet) = 752
2. Bottom area (square feet) = 70
3. Depth (ft): 7.25
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 3.6
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 5.5
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 3.6
12. Engineered soil depth (ft) = 0.5
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil
User-Defined Soil Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 25
2. Weir crest width (ft): 3
3. Height of datum to bottom of weir opening: 7.24

Control Practice 2: Biofilter CP# 2 (DS) - BF2

1. Top area (square feet) = 537
2. Bottom area (square feet) = 100
3. Depth (ft): 7
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 3.6
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 4
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 3.6
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Soil Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

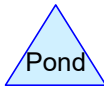
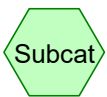
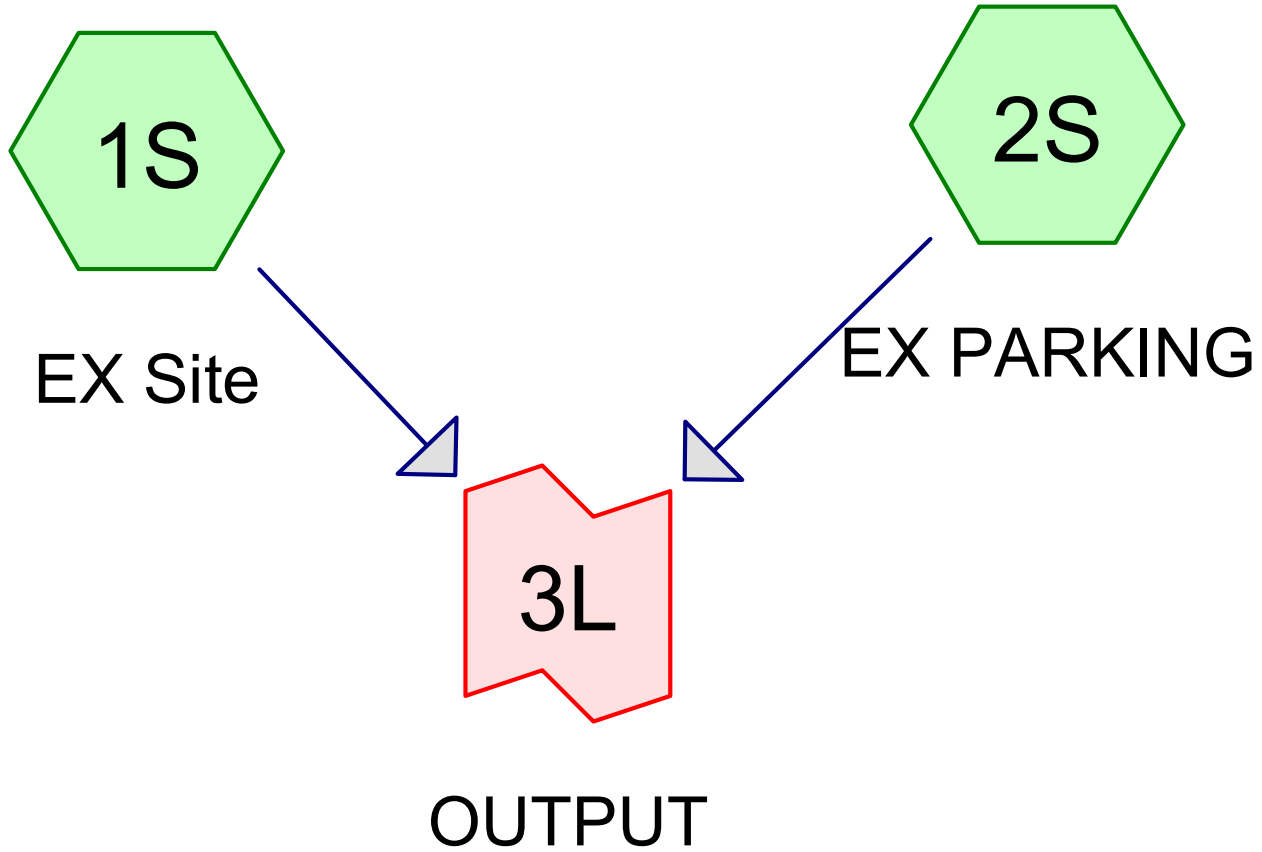
1. Weir crest length (ft): 5
2. Weir crest width (ft): 3
3. Height of datum to bottom of weir opening: 6.98

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 0.5
2. Stand pipe height above datum (ft): 6.75

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Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
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Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
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Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 05-10-2023 Time of run: 16:50:14
Total Area Modeled (acres): 0.682
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	44590	-	88.38	246.0	-
Outfall Total with Controls:	16574	62.83%	101.8	105.3	57.20%
Annualized Total After Outfall Controls:	16619			105.6	



Routing Diagram for EX Site PEG 2023

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Project Notes

Rainfall events imported from "Prelim Pro Site PEG2022.hcp"

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.344	61	>75% Grass cover, Good, HSG B (1S, 2S)
0.015	98	Concrete, HSG B (1S)
0.309	98	Paved parking, HSG B (2S)
0.006	98	Paved roads w/curbs & sewers, HSG B (2S)
0.008	98	Roofs, HSG B (1S)
0.682	79	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.682	HSG B	1S, 2S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.682		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	0.344	0.000	0.000	0.000	0.344	>75% Grass cover, Good	1S, 2S
0.000	0.015	0.000	0.000	0.000	0.015	Concrete	1S
0.000	0.309	0.000	0.000	0.000	0.309	Paved parking	2S
0.000	0.006	0.000	0.000	0.000	0.006	Paved roads w/curbs & sewers	2S
0.000	0.008	0.000	0.000	0.000	0.008	Roofs	1S
0.000	0.682	0.000	0.000	0.000	0.682	TOTAL AREA	

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Type II 24-hr 1-Year Rainfall=2.57"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX Site

Runoff Area=11,988 sf 8.38% Impervious Runoff Depth>0.25"
Flow Length=134' Tc=10.5 min CN=64 Runoff=0.08 cfs 0.006 af

Subcatchment 2S: EX PARKING

Runoff Area=17,708 sf 77.41% Impervious Runoff Depth>1.48"
Flow Length=178' Tc=4.1 min CN=90 Runoff=1.19 cfs 0.050 af

Link 3L: OUTPUT

Inflow=1.21 cfs 0.056 af
Primary=1.21 cfs 0.056 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.056 af Average Runoff Depth = 0.98"
50.45% Pervious = 0.344 ac 49.55% Impervious = 0.338 ac

EX Site PEG 2023

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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Subcatchment 1S: EX Site

Runoff = 0.08 cfs @ 12.06 hrs, Volume= 0.006 af, Depth> 0.25"

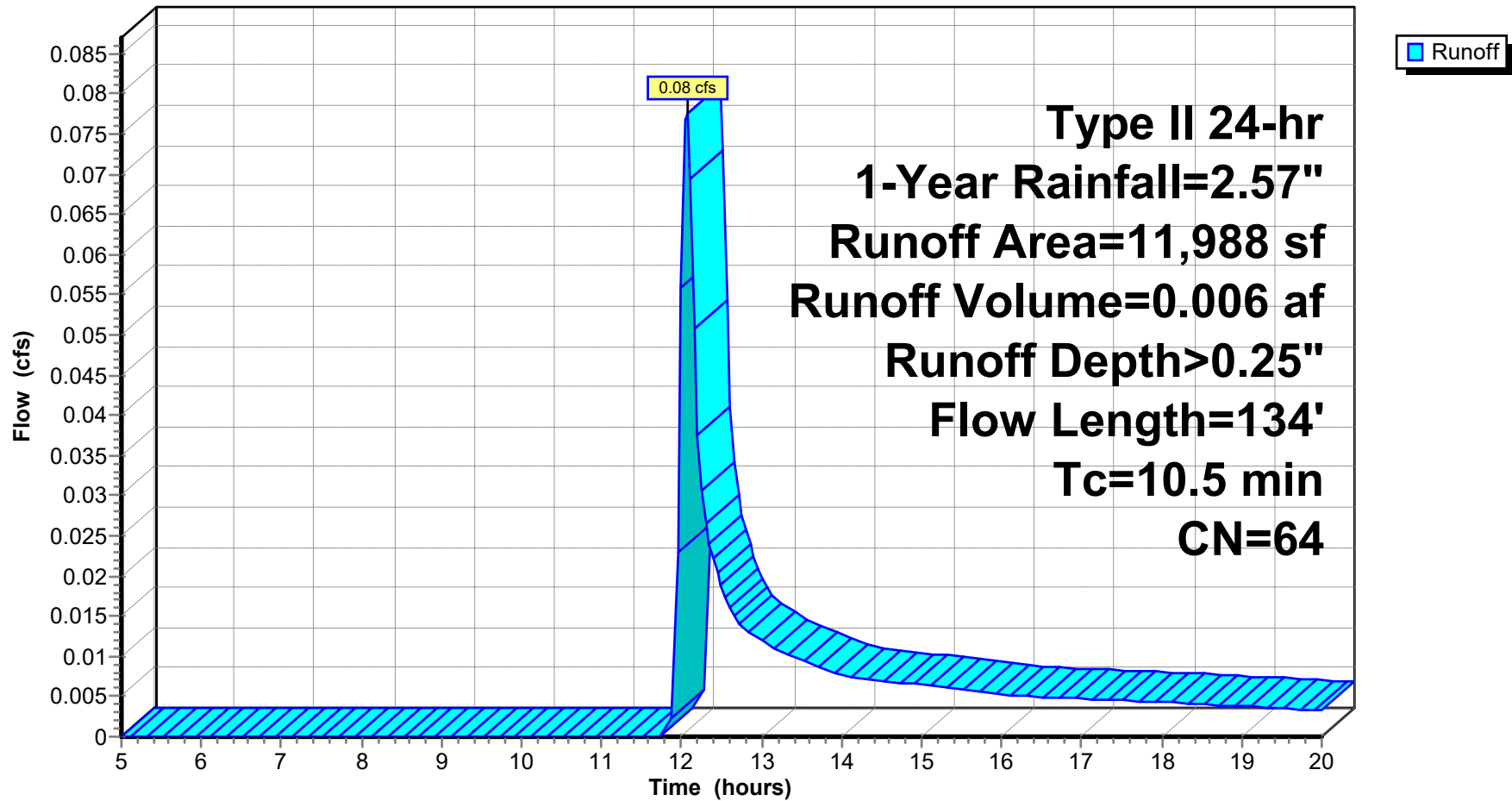
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.57"

Area (sf)	CN	Description
330	98	Roofs, HSG B
* 675	98	Concrete, HSG B
10,983	61	>75% Grass cover, Good, HSG B
11,988	64	Weighted Average
10,983		91.62% Pervious Area
1,005		8.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0280	1.09		Sheet Flow, Concrete Smooth surfaces n= 0.011 P2= 2.94"
10.2	114	0.0260	0.19		Sheet Flow, Yard Grass: Short n= 0.150 P2= 2.94"
10.5	134	Total			

Subcatchment 1S: EX Site

Hydrograph



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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Subcatchment 2S: EX PARKING

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

Runoff = 1.19 cfs @ 11.95 hrs, Volume= 0.050 af, Depth> 1.48"

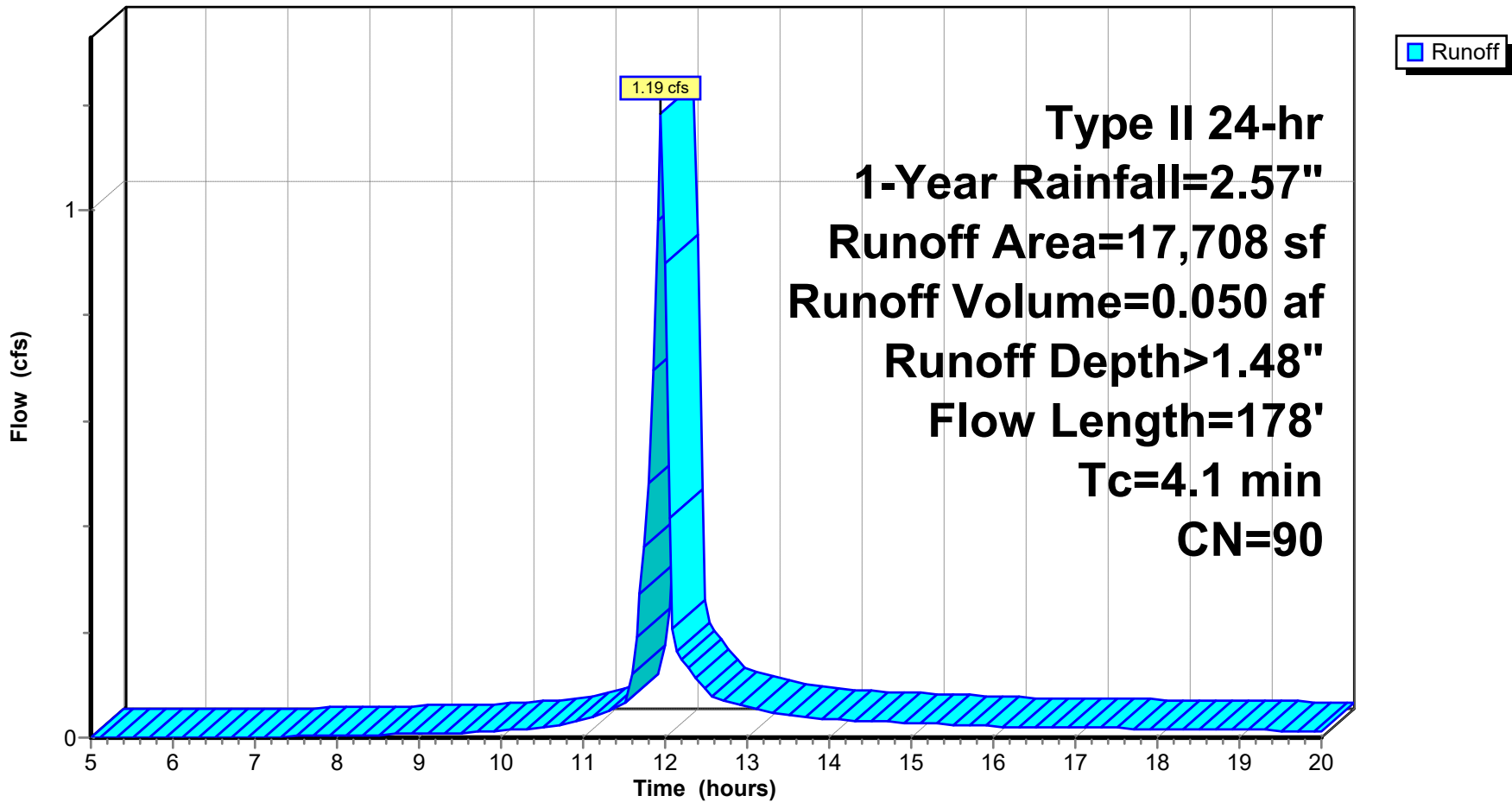
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.57"

Area (sf)	CN	Description
13,446	98	Paved parking, HSG B
262	98	Paved roads w/curbs & sewers, HSG B
4,000	61	>75% Grass cover, Good, HSG B
17,708	90	Weighted Average
4,000		22.59% Pervious Area
13,708		77.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0110	0.96		Sheet Flow, BUILDING TO FL Smooth surfaces n= 0.011 P2= 2.94"
2.9	111	0.0032	0.65		Sheet Flow, FLOW LINE Smooth surfaces n= 0.011 P2= 2.94"
4.1	178	Total			

Subcatchment 2S: EX PARKING

Hydrograph



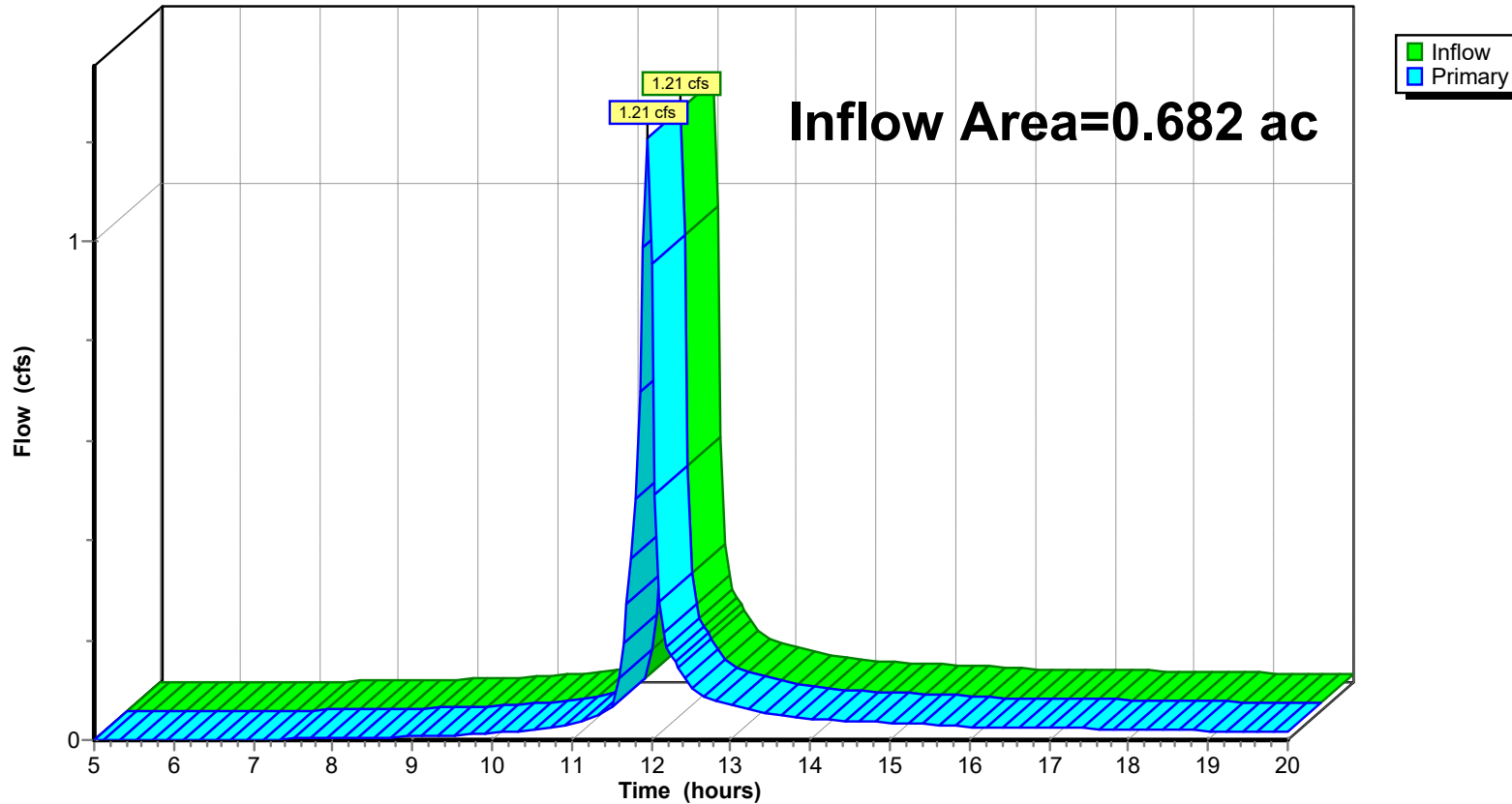
Summary for Link 3L: OUTPUT

Inflow Area = 0.682 ac, 49.55% Impervious, Inflow Depth > 0.98" for 1-Year event
Inflow = 1.21 cfs @ 11.95 hrs, Volume= 0.056 af
Primary = 1.21 cfs @ 11.95 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 3L: OUTPUT

Hydrograph



EX Site PEG 2023

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Type II 24-hr 2-Year Rainfall=2.94"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX Site

Runoff Area=11,988 sf 8.38% Impervious Runoff Depth>0.38"
Flow Length=134' Tc=10.5 min CN=64 Runoff=0.14 cfs 0.009 af

Subcatchment 2S: EX PARKING

Runoff Area=17,708 sf 77.41% Impervious Runoff Depth>1.80"
Flow Length=178' Tc=4.1 min CN=90 Runoff=1.42 cfs 0.061 af

Link 3L: OUTPUT

Inflow=1.48 cfs 0.070 af
Primary=1.48 cfs 0.070 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.070 af Average Runoff Depth = 1.23"
50.45% Pervious = 0.344 ac 49.55% Impervious = 0.338 ac

EX Site PEG 2023

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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Subcatchment 1S: EX Site

Runoff = 0.14 cfs @ 12.05 hrs, Volume= 0.009 af, Depth> 0.38"

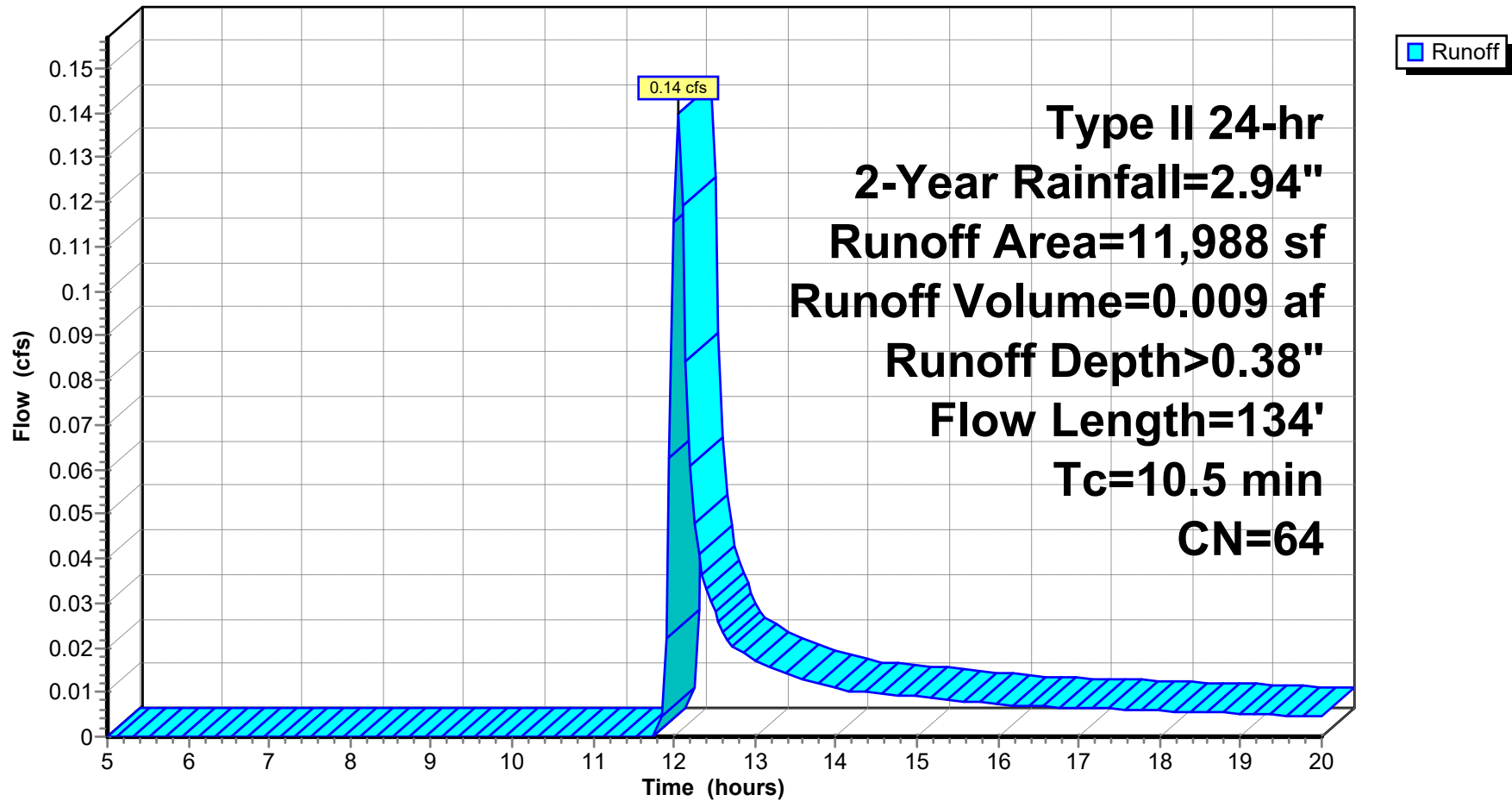
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.94"

Area (sf)	CN	Description
330	98	Roofs, HSG B
* 675	98	Concrete, HSG B
10,983	61	>75% Grass cover, Good, HSG B
11,988	64	Weighted Average
10,983		91.62% Pervious Area
1,005		8.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0280	1.09		Sheet Flow, Concrete Smooth surfaces n= 0.011 P2= 2.94"
10.2	114	0.0260	0.19		Sheet Flow, Yard Grass: Short n= 0.150 P2= 2.94"
10.5	134	Total			

Subcatchment 1S: EX Site

Hydrograph



EX Site PEG 2023

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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Subcatchment 2S: EX PARKING

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

Runoff = 1.42 cfs @ 11.95 hrs, Volume= 0.061 af, Depth> 1.80"

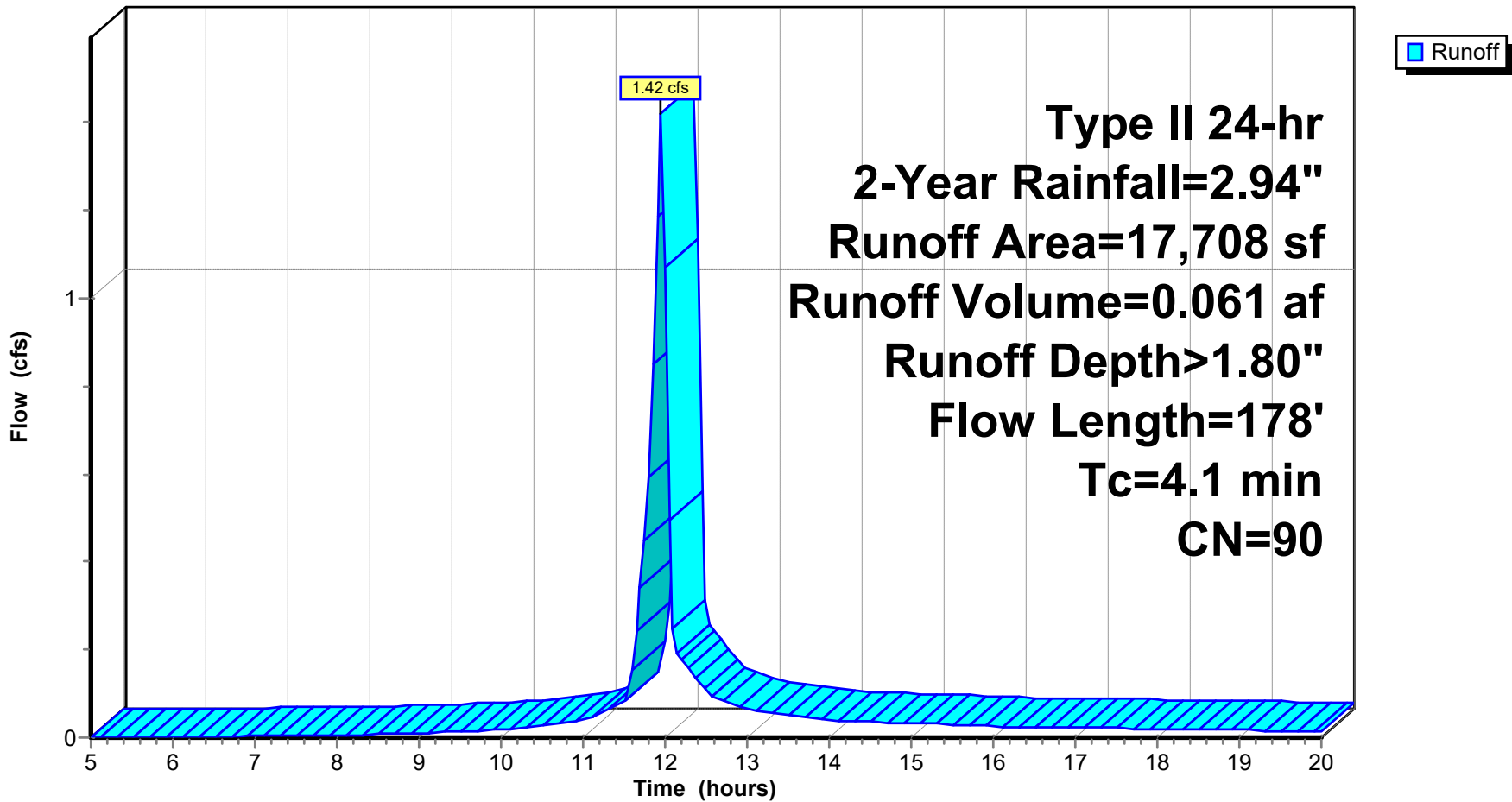
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.94"

Area (sf)	CN	Description
13,446	98	Paved parking, HSG B
262	98	Paved roads w/curbs & sewers, HSG B
4,000	61	>75% Grass cover, Good, HSG B
17,708	90	Weighted Average
4,000		22.59% Pervious Area
13,708		77.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0110	0.96		Sheet Flow, BUILDING TO FL Smooth surfaces n= 0.011 P2= 2.94"
2.9	111	0.0032	0.65		Sheet Flow, FLOW LINE Smooth surfaces n= 0.011 P2= 2.94"
4.1	178	Total			

Subcatchment 2S: EX PARKING

Hydrograph



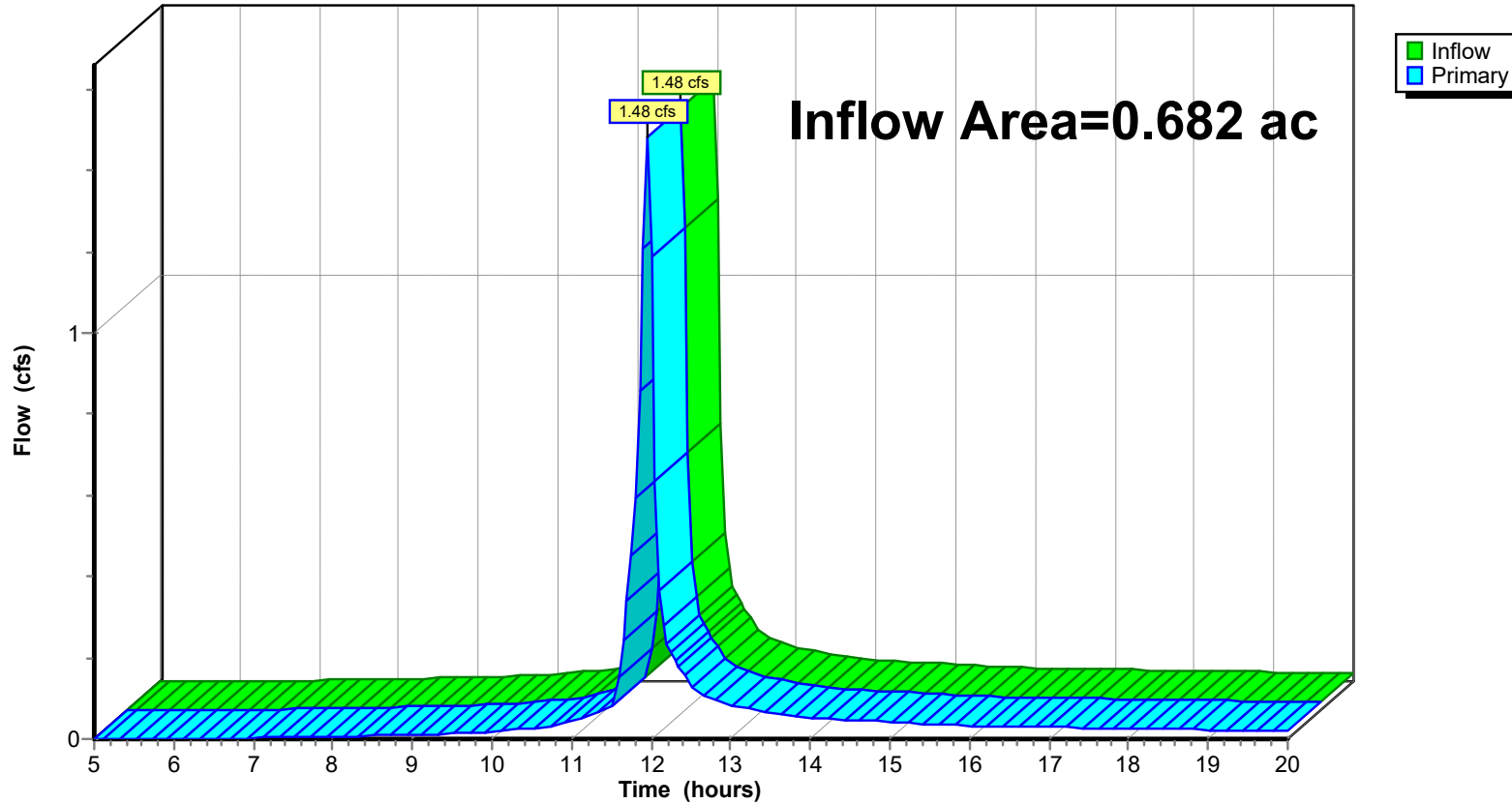
Summary for Link 3L: OUTPUT

Inflow Area = 0.682 ac, 49.55% Impervious, Inflow Depth > 1.23" for 2-Year event
Inflow = 1.48 cfs @ 11.95 hrs, Volume= 0.070 af
Primary = 1.48 cfs @ 11.95 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 3L: OUTPUT

Hydrograph



EX Site PEG 2023

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Type II 24-hr 10-Year Rainfall=4.32"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX Site

Runoff Area=11,988 sf 8.38% Impervious Runoff Depth>1.03"
Flow Length=134' Tc=10.5 min CN=64 Runoff=0.45 cfs 0.024 af

Subcatchment 2S: EX PARKING

Runoff Area=17,708 sf 77.41% Impervious Runoff Depth>3.02"
Flow Length=178' Tc=4.1 min CN=90 Runoff=2.30 cfs 0.102 af

Link 3L: OUTPUT

Inflow=2.59 cfs 0.126 af
Primary=2.59 cfs 0.126 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.126 af Average Runoff Depth = 2.22"
50.45% Pervious = 0.344 ac 49.55% Impervious = 0.338 ac

EX Site PEG 2023

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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Subcatchment 1S: EX Site

Runoff = 0.45 cfs @ 12.04 hrs, Volume= 0.024 af, Depth> 1.03"

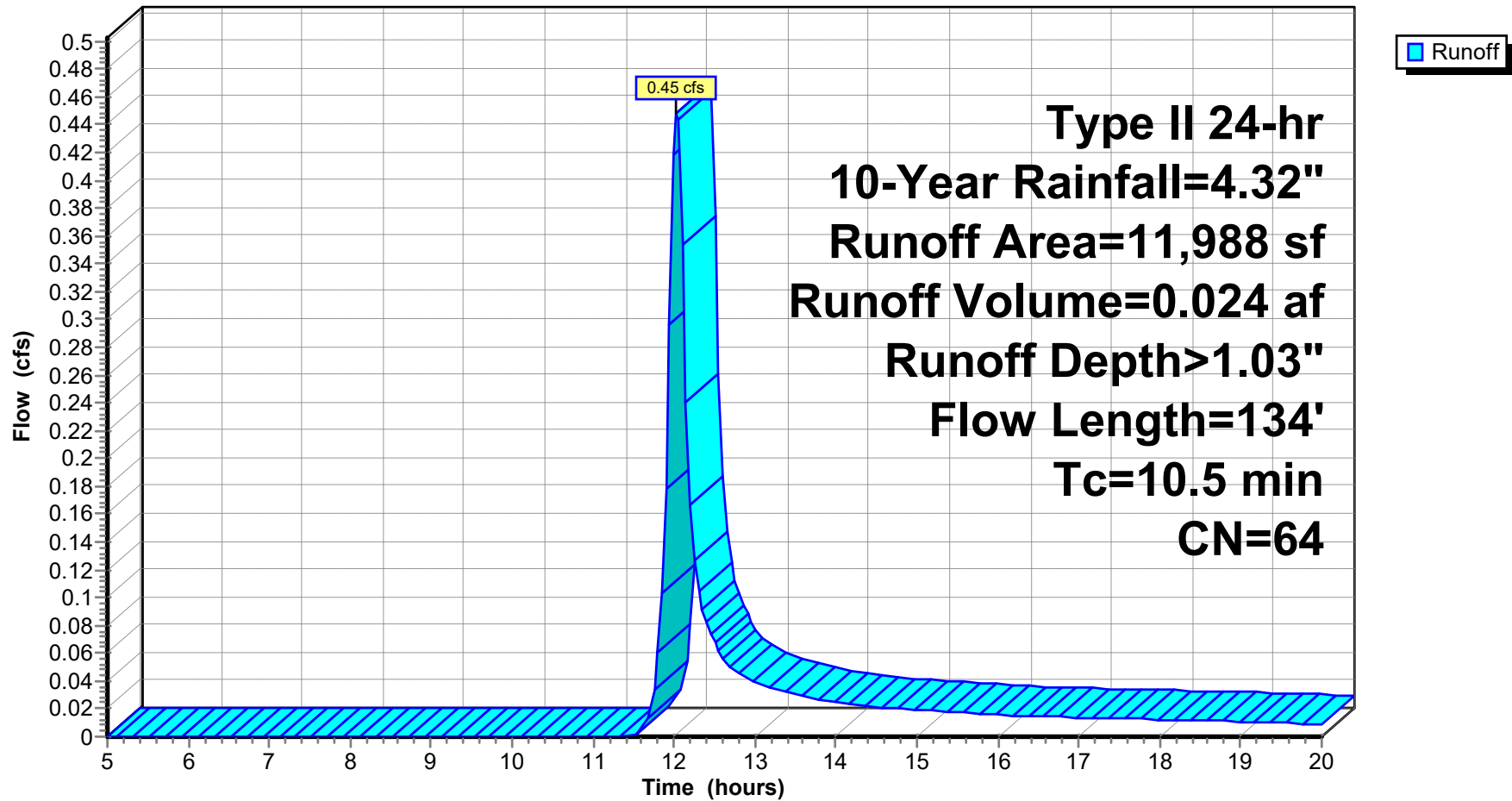
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Type II 24-hr 10-Year Rainfall=4.32"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
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10.2	114	0.0260	0.19		Sheet Flow, Yard Grass: Short n= 0.150 P2= 2.94"
10.5	134	Total			

Subcatchment 1S: EX Site

Hydrograph



EX Site PEG 2023

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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Subcatchment 2S: EX PARKING

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

Runoff = 2.30 cfs @ 11.94 hrs, Volume= 0.102 af, Depth> 3.02"

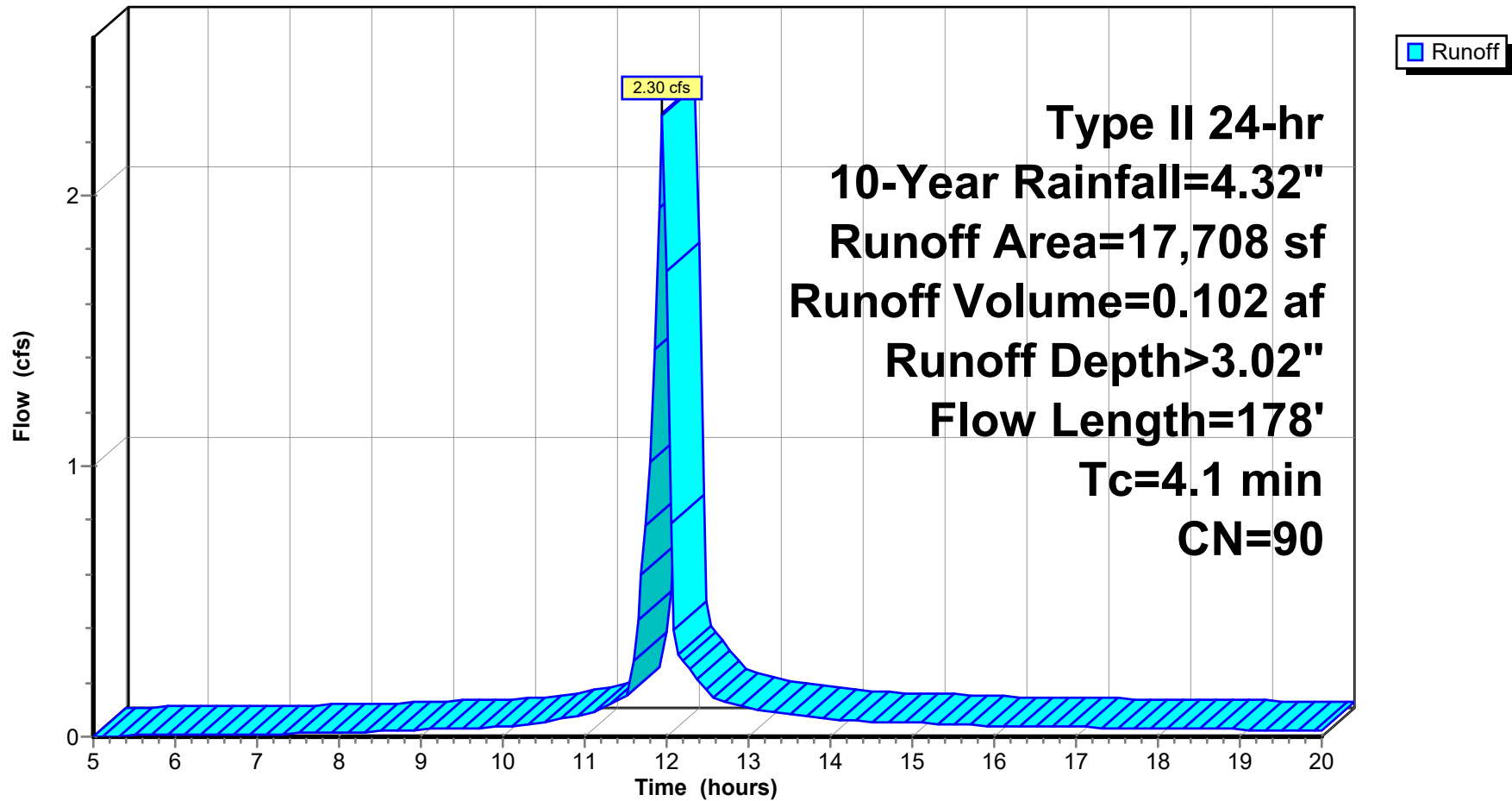
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.32"

Area (sf)	CN	Description
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4.1	178	Total			

Subcatchment 2S: EX PARKING

Hydrograph



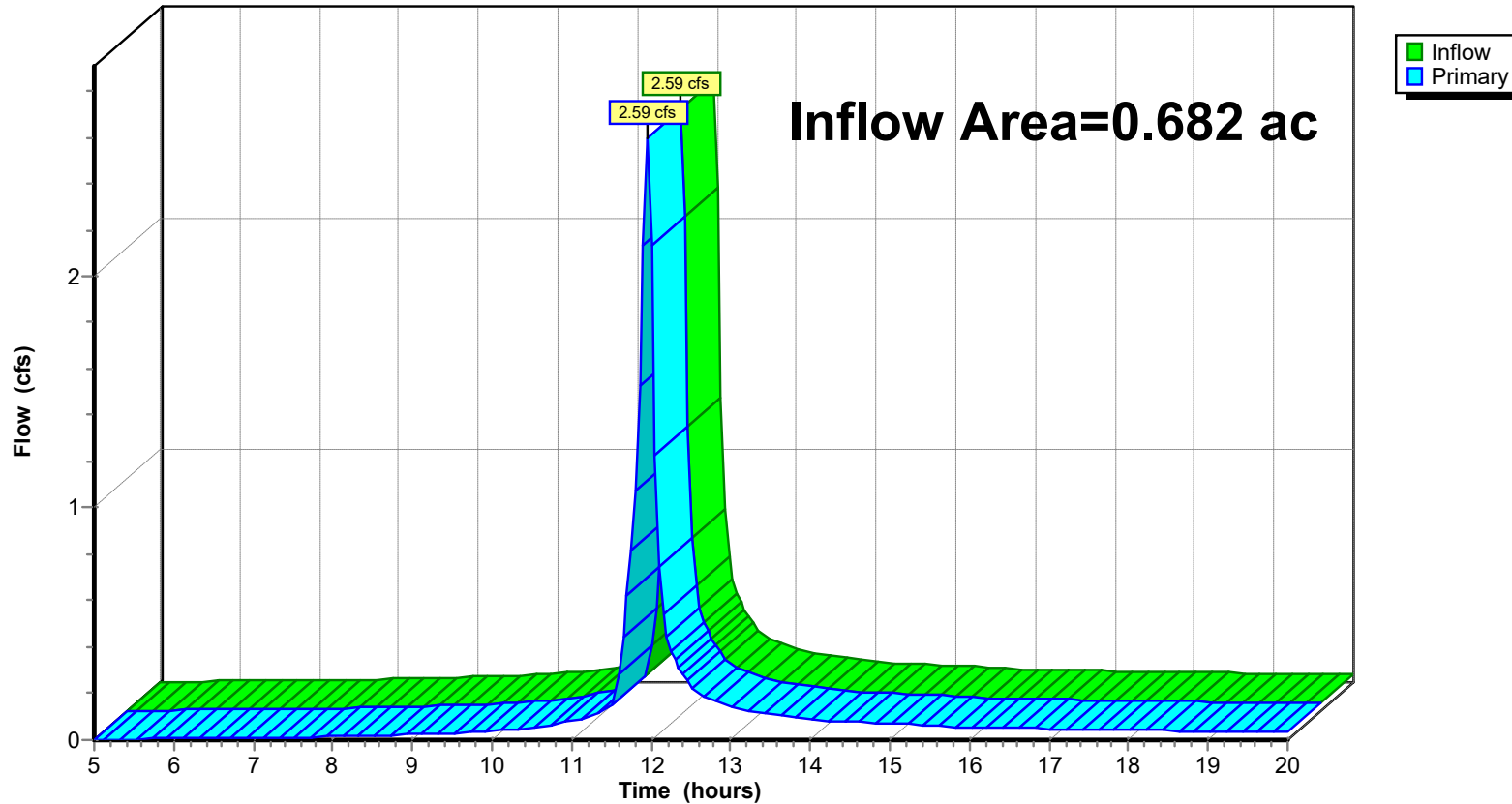
Summary for Link 3L: OUTPUT

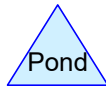
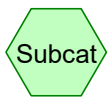
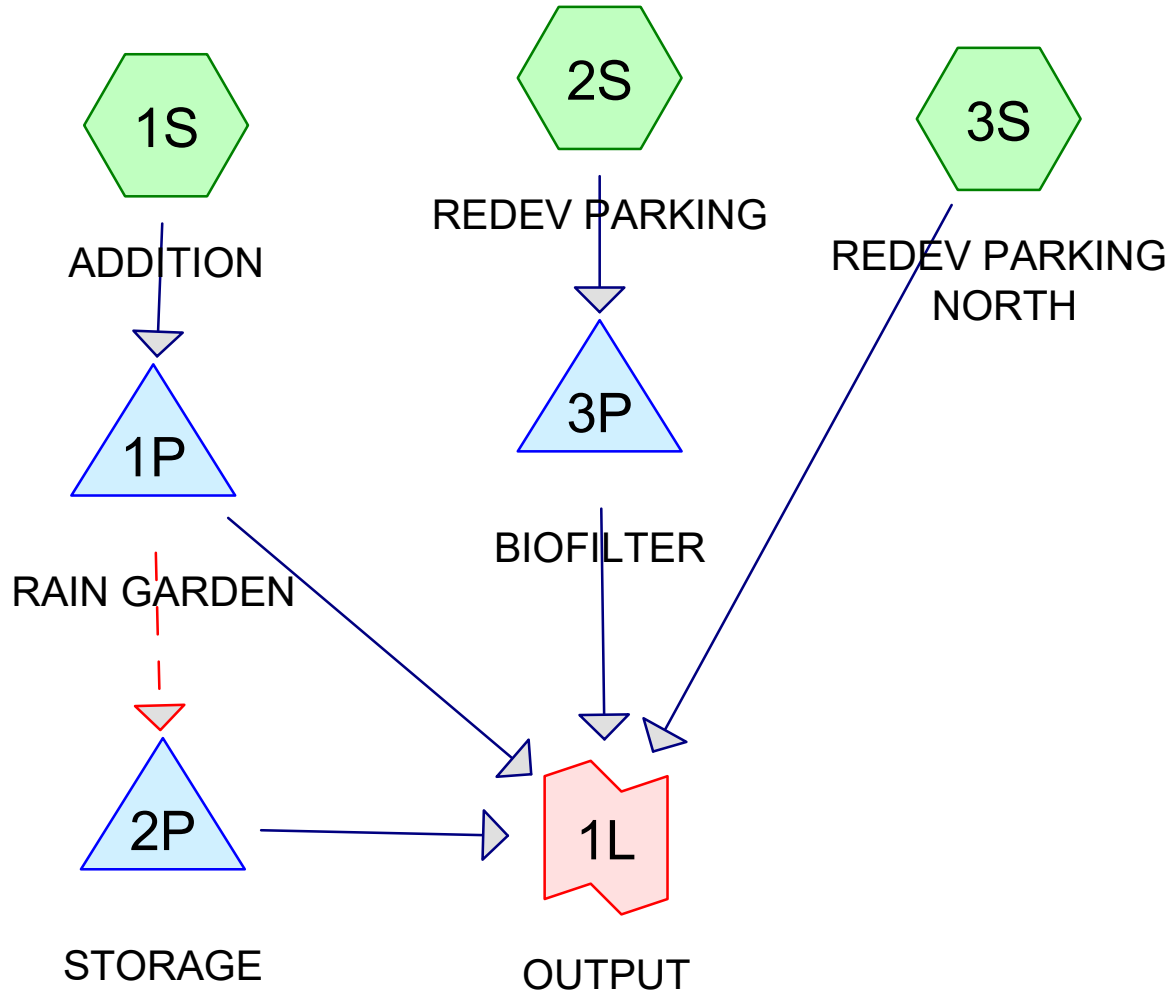
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Inflow = 2.59 cfs @ 11.95 hrs, Volume= 0.126 af
Primary = 2.59 cfs @ 11.95 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 3L: OUTPUT

Hydrograph





Routing Diagram for PRO SITE PEG 2023

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Project Notes

Rainfall events imported from "Prelim Pro Site PEG2022.hcp"

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.137	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S)
0.024	98	Concrete, HSG B (1S)
0.291	98	Paved parking, HSG B (2S, 3S)
0.072	98	Paved roads w/curbs & sewers, HSG B (2S, 3S)
0.158	98	Roofs, HSG B (1S)
0.682	91	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.682	HSG B	1S, 2S, 3S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.682		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	0.137	0.000	0.000	0.000	0.137	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.024	0.000	0.000	0.000	0.024	Concrete	1S
0.000	0.291	0.000	0.000	0.000	0.291	Paved parking	2S, 3S
0.000	0.072	0.000	0.000	0.000	0.072	Paved roads w/curbs & sewers	2S, 3S
0.000	0.158	0.000	0.000	0.000	0.158	Roofs	1S
0.000	0.682	0.000	0.000	0.000	0.682	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	660.46	660.00	90.0	0.0051	0.010	12.0	0.0	0.0
2	3P	658.20	657.88	60.0	0.0053	0.010	8.0	0.0	0.0

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Type II 24-hr 1-Year Rainfall=2.57"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment 1S: ADDITION

Runoff Area=11,770 sf 67.21% Impervious Runoff Depth>1.20"
Tc=0.0 min CN=86 Runoff=0.72 cfs 0.027 af

Subcatchment 2S: REDEV PARKING

Runoff Area=13,845 sf 88.49% Impervious Runoff Depth>1.82"
Flow Length=178' Tc=3.1 min CN=94 Runoff=1.10 cfs 0.048 af

Subcatchment 3S: REDEV PARKING NORTH

Runoff Area=4,101 sf 87.22% Impervious Runoff Depth>1.73"
Flow Length=42' Slope=0.0100 '/' Tc=0.8 min CN=93 Runoff=0.33 cfs 0.014 af

Pond 1P: RAIN GARDEN

Peak Elev=660.90' Storage=259 cf Inflow=0.72 cfs 0.027 af
Discarded=0.05 cfs 0.018 af Primary=0.00 cfs 0.000 af Secondary=0.60 cfs 0.009 af Outflow=0.65 cfs 0.027 af

Pond 2P: STORAGE

Peak Elev=659.43' Storage=304 cf Inflow=0.60 cfs 0.009 af
Discarded=0.04 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.009 af

Pond 3P: BIOFILTER

Peak Elev=661.27' Storage=622 cf Inflow=1.10 cfs 0.048 af
Discarded=0.03 cfs 0.019 af Primary=1.03 cfs 0.022 af Outflow=1.06 cfs 0.041 af

Link 1L: OUTPUT

Inflow=1.25 cfs 0.036 af
Primary=1.25 cfs 0.036 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.089 af Average Runoff Depth = 1.56"
20.11% Pervious = 0.137 ac 79.89% Impervious = 0.545 ac

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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Subcatchment 1S: ADDITION

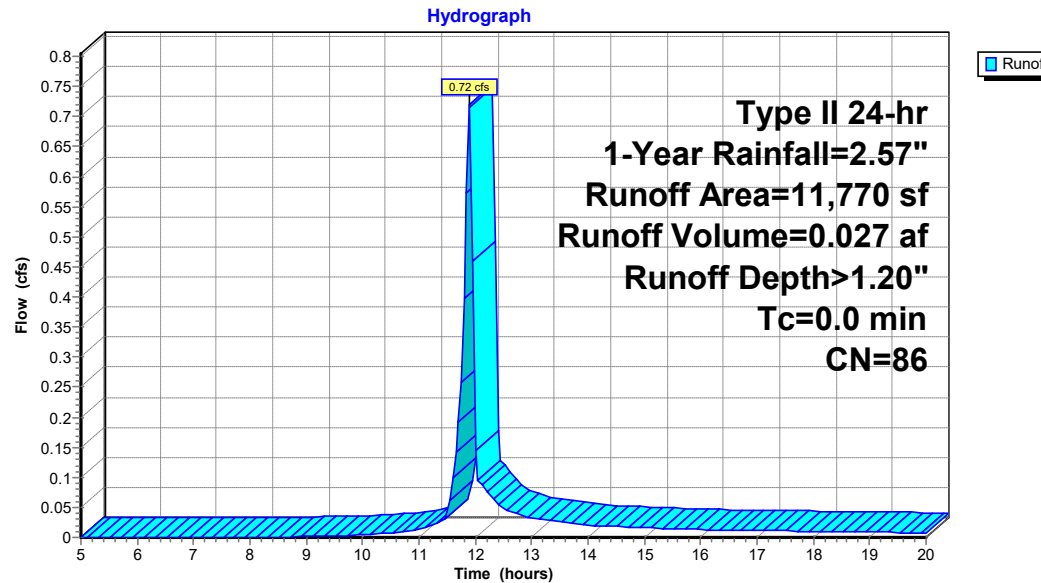
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.72 cfs @ 11.89 hrs, Volume= 0.027 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.57"

	Area (sf)	CN	Description
	6,863	98	Roofs, HSG B
*	1,048	98	Concrete, HSG B
	3,859	61	>75% Grass cover, Good, HSG B
	11,770	86	Weighted Average
	3,859		32.79% Pervious Area
	7,911		67.21% Impervious Area

Subcatchment 1S: ADDITION



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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Subcatchment 2S: REDEV PARKING

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

Runoff = 1.10 cfs @ 11.93 hrs, Volume= 0.048 af, Depth> 1.82"

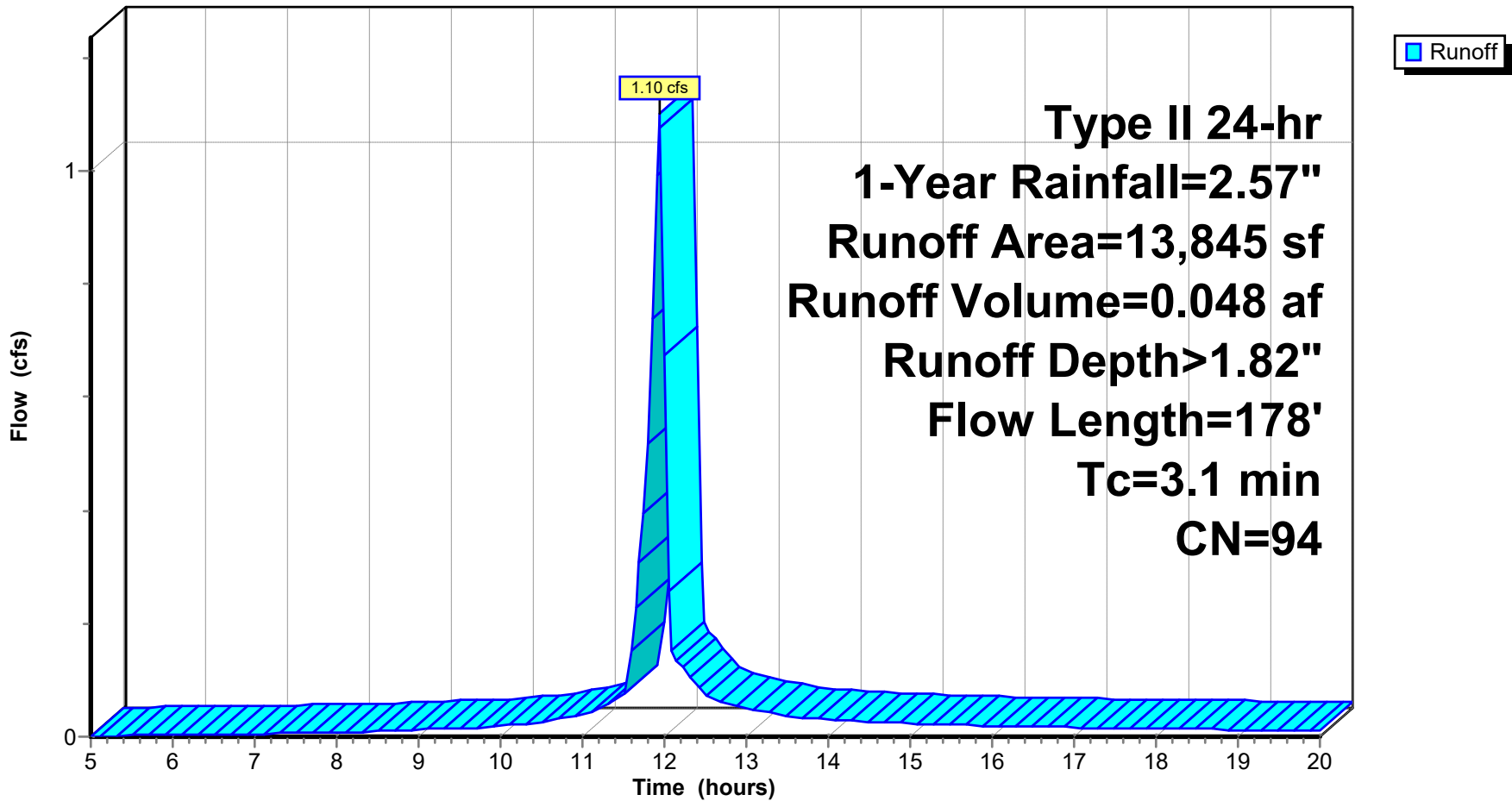
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.57"

Area (sf)	CN	Description
10,959	98	Paved parking, HSG B
1,293	98	Paved roads w/curbs & sewers, HSG B
1,593	61	>75% Grass cover, Good, HSG B
13,845	94	Weighted Average
1,593		11.51% Pervious Area
12,252		88.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0097	0.91		Sheet Flow, BUILDING TO FL Smooth surfaces n= 0.011 P2= 2.94"
1.9	111	0.0092	0.99		Sheet Flow, FLOWLINE Smooth surfaces n= 0.011 P2= 2.94"
3.1	178	Total			

Subcatchment 2S: REDEV PARKING

Hydrograph



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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Subcatchment 3S: REDEV PARKING NORTH

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

Runoff = 0.33 cfs @ 11.90 hrs, Volume= 0.014 af, Depth> 1.73"

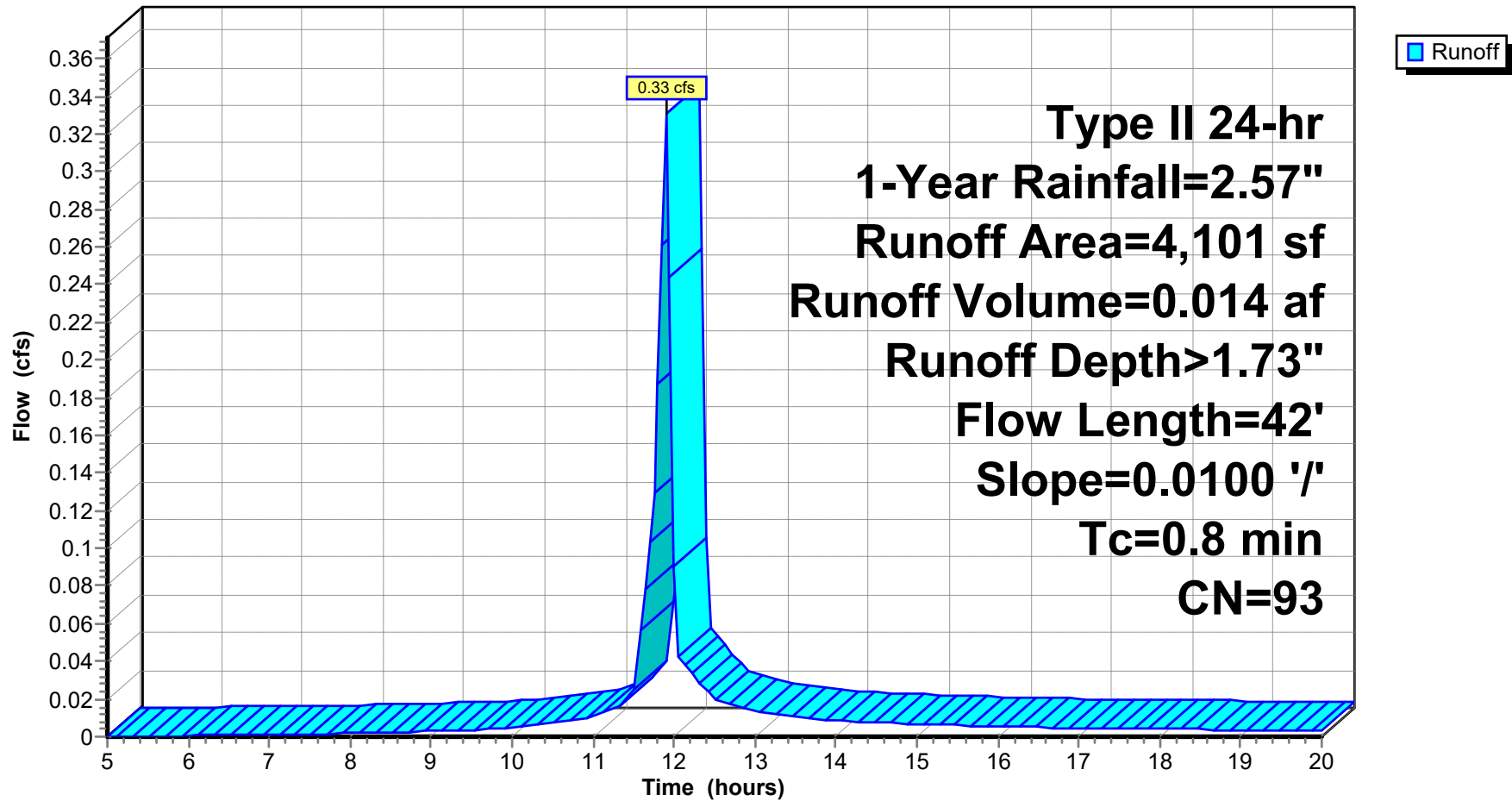
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.57"

Area (sf)	CN	Description
1,720	98	Paved parking, HSG B
1,857	98	Paved roads w/curbs & sewers, HSG B
524	61	>75% Grass cover, Good, HSG B
4,101	93	Weighted Average
524		12.78% Pervious Area
3,577		87.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	42	0.0100	0.84		Sheet Flow, BUILDING TO PL Smooth surfaces n= 0.011 P2= 2.94"

Subcatchment 3S: REDEV PARKING NORTH

Hydrograph



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Type II 24-hr 1-Year Rainfall=2.57"

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Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.270 ac, 67.21% Impervious, Inflow Depth > 1.20" for 1-Year event
 Inflow = 0.72 cfs @ 11.89 hrs, Volume= 0.027 af
 Outflow = 0.65 cfs @ 11.92 hrs, Volume= 0.027 af, Atten= 10%, Lag= 1.7 min
 Discarded = 0.05 cfs @ 11.92 hrs, Volume= 0.018 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Secondary = 0.60 cfs @ 11.92 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 660.90' @ 11.92 hrs Surf.Area= 244 sf Storage= 259 cf

Plug-Flow detention time= 33.8 min calculated for 0.027 af (100% of inflow)
 Center-of-Mass det. time= 33.6 min (816.1 - 782.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.96'	357 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.96	152	0.0	0	0	152	
659.35	10	33.0	97	97	338	
660.46	152	100.0	74	171	483	
661.25	330	100.0	186	357	667	

Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.96'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	660.96'	5.0' long x 3.0' 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 3.50 4.00 4.50															
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32															
#3	Secondary	660.46'	12.0" Round CMP_Round 12" L= 90.0' CMP, projecting, no headwall, Ke= 0.900															
			Inlet / Outlet Invert= 660.46' / 660.00' S= 0.0051 '/' Cc= 0.900															
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf															

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Type II 24-hr 1-Year Rainfall=2.57"

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Discarded OutFlow Max=0.05 cfs @ 11.92 hrs HW=660.88' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=654.96' TW=0.00' (Dynamic Tailwater)

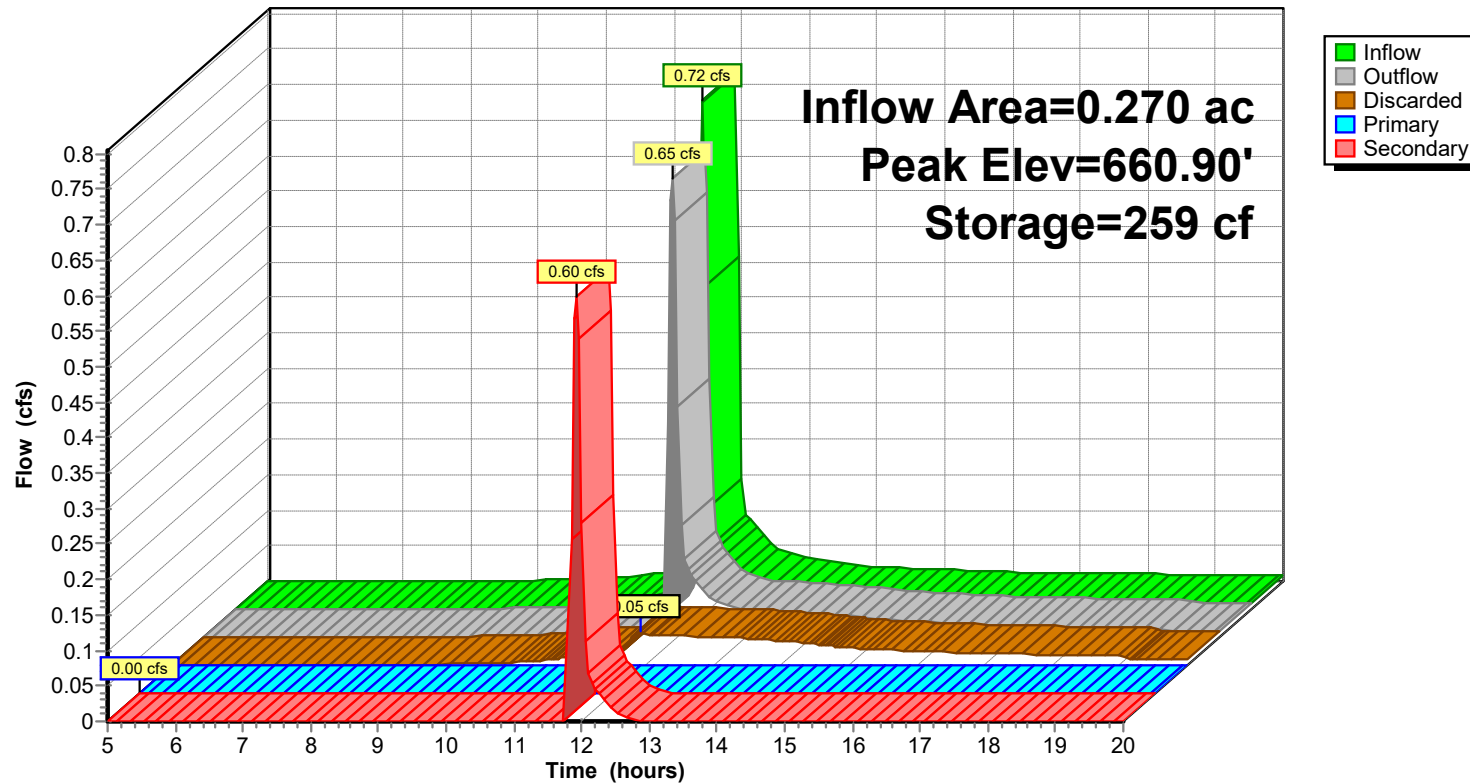
↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.56 cfs @ 11.92 hrs HW=660.88' TW=656.64' (Dynamic Tailwater)

↳ **3=CMP_Round 12"** (Inlet Controls 0.56 cfs @ 1.75 fps)

Pond 1P: RAIN GARDEN

Hydrograph



Summary for Pond 2P: STORAGE

[92] Warning: Device #2 is above defined storage

Inflow = 0.60 cfs @ 11.92 hrs, Volume= 0.009 af
 Outflow = 0.04 cfs @ 12.28 hrs, Volume= 0.009 af, Atten= 94%, Lag= 21.6 min
 Discarded = 0.04 cfs @ 12.28 hrs, Volume= 0.009 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 659.43' @ 12.28 hrs Surf.Area= 187 sf Storage= 304 cf

Plug-Flow detention time= 98.3 min calculated for 0.009 af (100% of inflow)
 Center-of-Mass det. time= 98.7 min (818.1 - 719.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.50'	710 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.50	187	0.0	0	0	187	
660.00	187	33.0	339	339	454	
661.25	422	100.0	371	710	701	

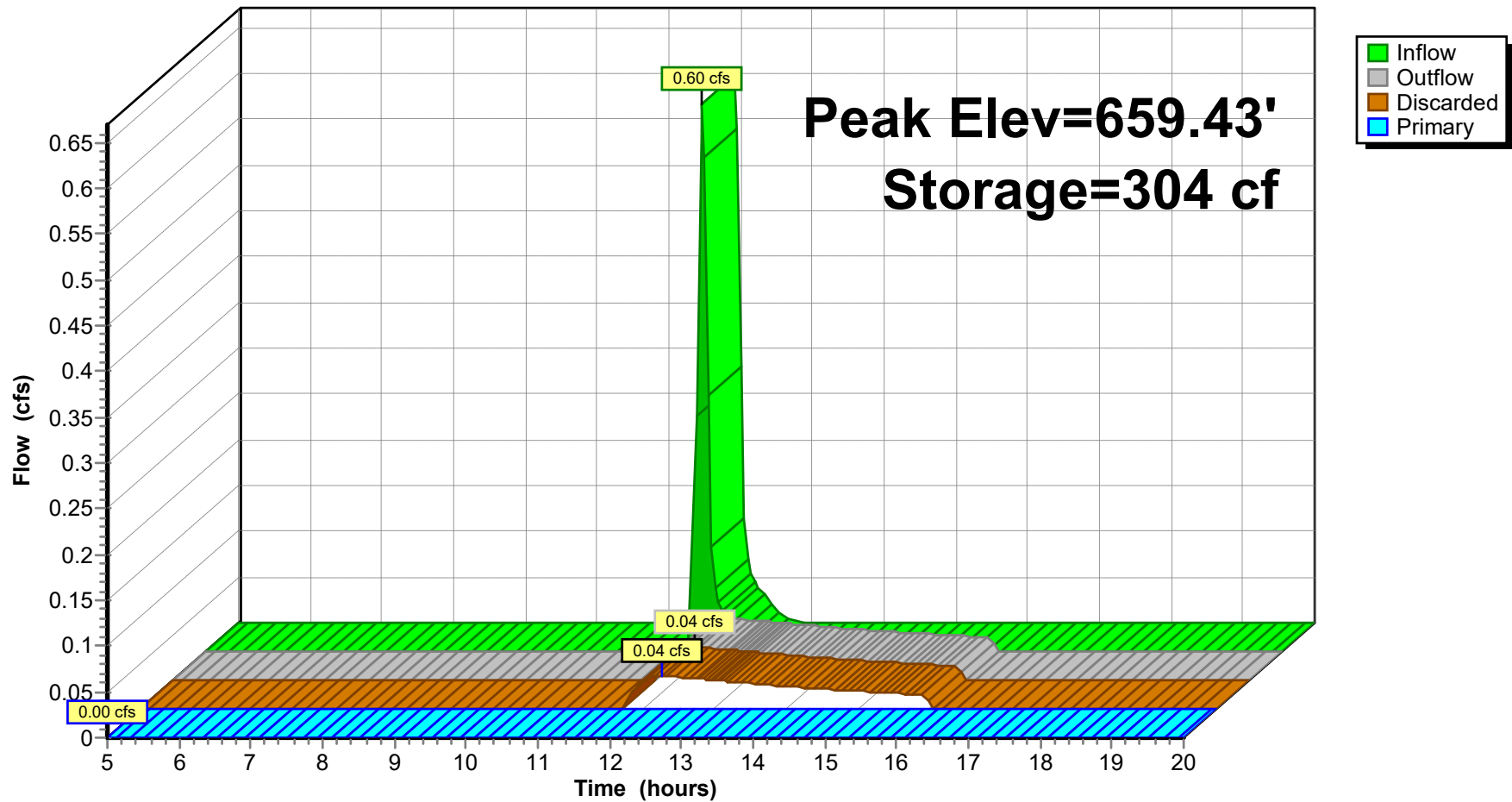
Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.50'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	661.25'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir															
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50															
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32															

Discarded OutFlow Max=0.04 cfs @ 12.28 hrs HW=659.43' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=654.50' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: STORAGE

Hydrograph



Summary for Pond 3P: BIOFILTER

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.318 ac, 88.49% Impervious, Inflow Depth > 1.82" for 1-Year event
 Inflow = 1.10 cfs @ 11.93 hrs, Volume= 0.048 af
 Outflow = 1.06 cfs @ 11.97 hrs, Volume= 0.041 af, Atten= 4%, Lag= 2.0 min
 Discarded = 0.03 cfs @ 11.96 hrs, Volume= 0.019 af
 Primary = 1.03 cfs @ 11.97 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 661.27' @ 11.96 hrs Surf.Area= 367 sf Storage= 622 cf

Plug-Flow detention time= 81.6 min calculated for 0.041 af (84% of inflow)
 Center-of-Mass det. time= 34.0 min (788.5 - 754.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	654.23'	1,051 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
654.23	181	0.0	0	0
658.23	181	33.0	239	239
660.23	181	27.0	98	337
662.22	537	100.0	714	1,051

Device	Routing	Invert	Outlet Devices
#1	Discarded	654.23'	3.600 in/hr NATIVE SOIL over Surface area Phase-In= 0.01'
#2	Primary	658.20'	8.0" Round Culvert L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 658.20' / 657.88' S= 0.0053 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 2	658.23'	3.600 in/hr UNDERDRAIN over Surface area above 658.23' Excluded Surface area = 181 sf Phase-In= 0.01'
#4	Device 2	660.56'	2.0" Vert. STANDPIPE 2" HOLE C= 0.600
#5	Device 2	660.98'	8.0" Horiz. STANDPIPE C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 11.96 hrs HW=661.25' (Free Discharge)

1=NATIVE SOIL (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.97 cfs @ 11.97 hrs HW=661.25' TW=0.00' (Dynamic Tailwater)

2=Culvert (Passes 0.97 cfs of 2.19 cfs potential flow)

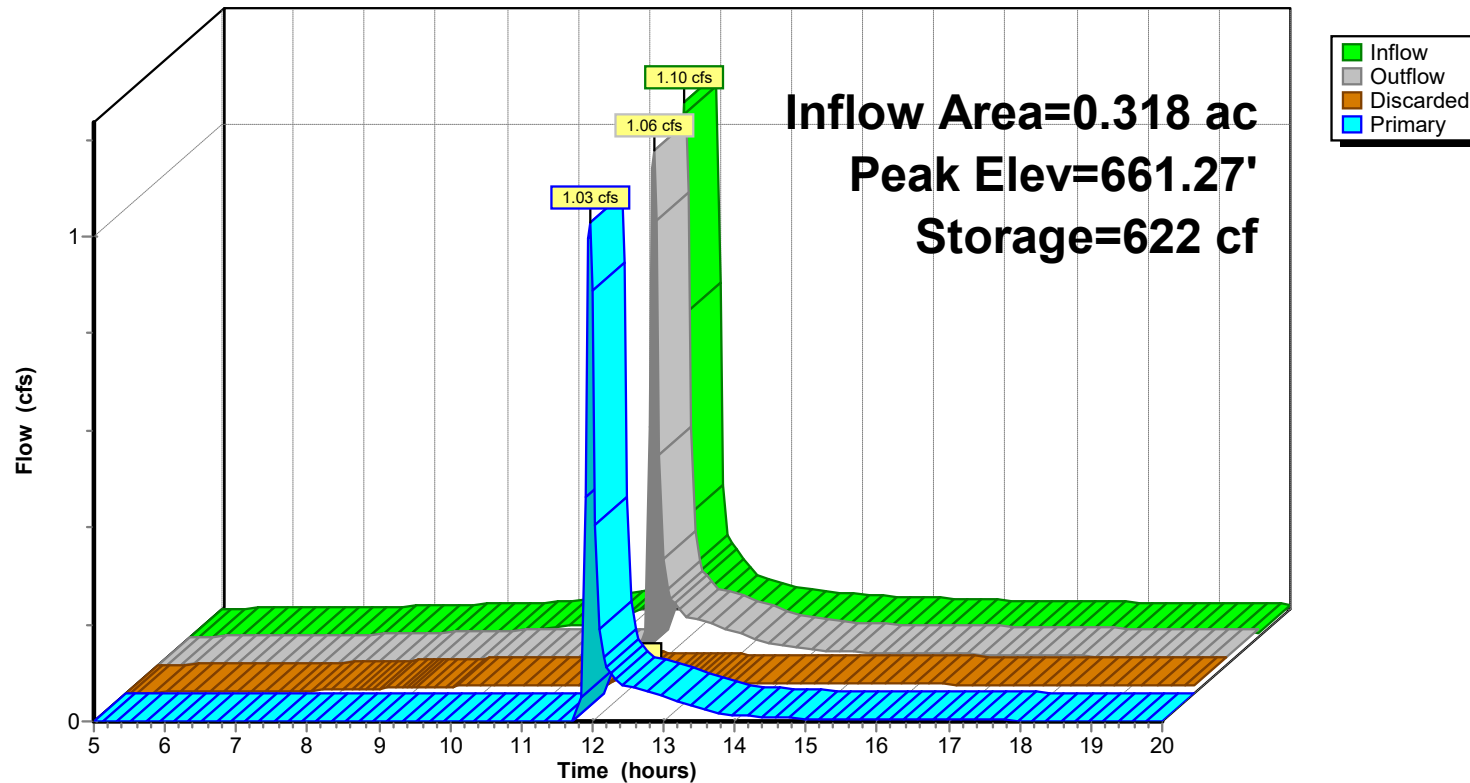
3=UNDERDRAIN (Exfiltration Controls 0.02 cfs)

4=STANDPIPE 2" HOLE (Orifice Controls 0.08 cfs @ 3.75 fps)

5=STANDPIPE (Orifice Controls 0.87 cfs @ 2.50 fps)

Pond 3P: BIOFILTER

Hydrograph



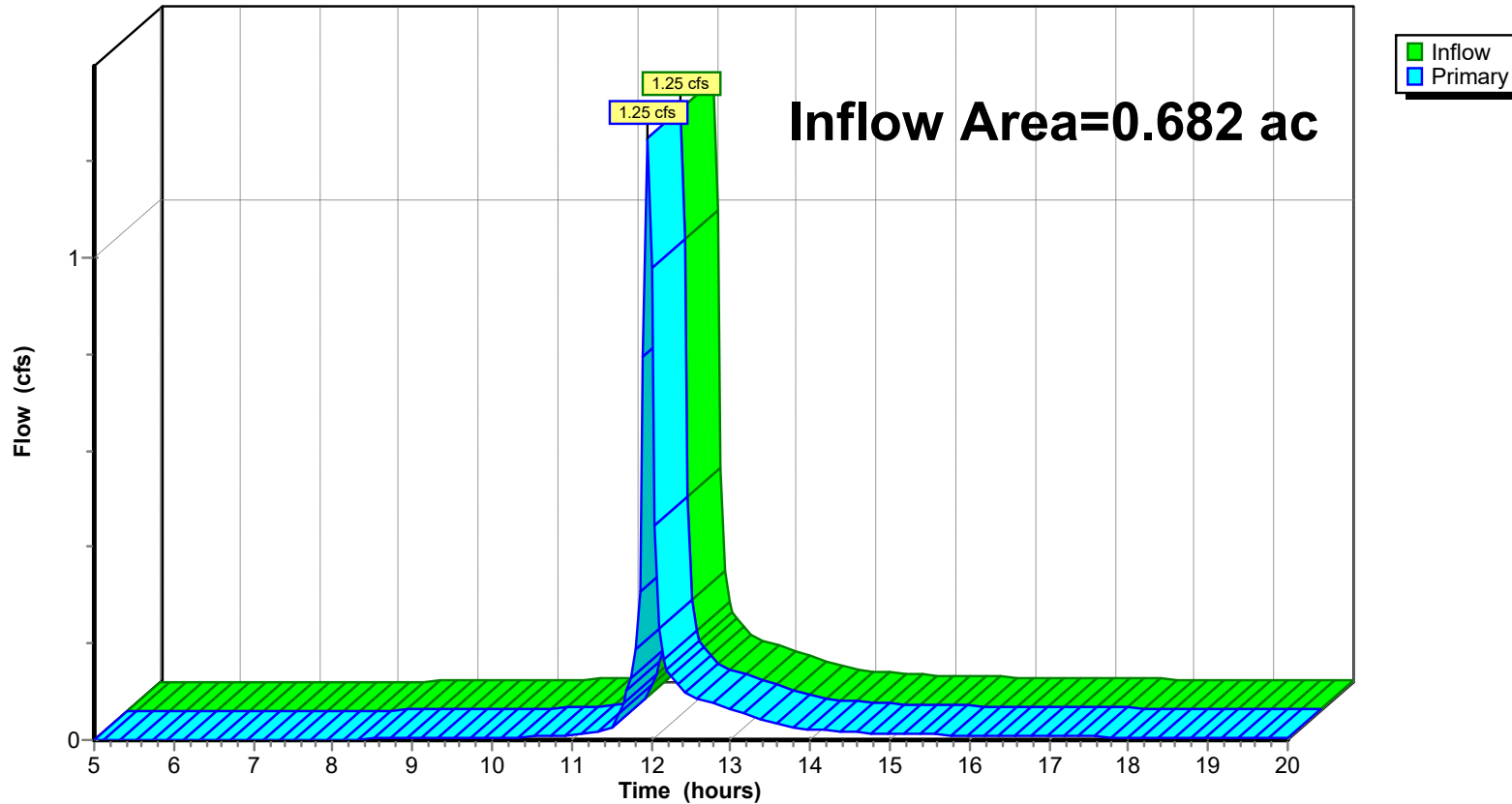
Summary for Link 1L: OUTPUT

Inflow Area = 0.682 ac, 79.89% Impervious, Inflow Depth > 0.63" for 1-Year event
Inflow = 1.25 cfs @ 11.96 hrs, Volume= 0.036 af
Primary = 1.25 cfs @ 11.96 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: OUTPUT

Hydrograph



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment 1S: ADDITION

Runoff Area=11,770 sf 67.21% Impervious Runoff Depth>1.49"
Tc=0.0 min CN=86 Runoff=0.88 cfs 0.034 af

Subcatchment 2S: REDEV PARKING

Runoff Area=13,845 sf 88.49% Impervious Runoff Depth>2.15"
Flow Length=178' Tc=3.1 min CN=94 Runoff=1.29 cfs 0.057 af

Subcatchment 3S: REDEV PARKING NORTH

Runoff Area=4,101 sf 87.22% Impervious Runoff Depth>2.06"
Flow Length=42' Slope=0.0100 '/' Tc=0.8 min CN=93 Runoff=0.39 cfs 0.016 af

Pond 1P: RAIN GARDEN

Peak Elev=660.96' Storage=273 cf Inflow=0.88 cfs 0.034 af
Discarded=0.05 cfs 0.021 af Primary=0.00 cfs 0.000 af Secondary=0.75 cfs 0.013 af Outflow=0.80 cfs 0.034 af

Pond 2P: STORAGE

Peak Elev=660.46' Storage=442 cf Inflow=0.75 cfs 0.013 af
Discarded=0.04 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.013 af

Pond 3P: BIOFILTER

Peak Elev=661.33' Storage=644 cf Inflow=1.29 cfs 0.057 af
Discarded=0.03 cfs 0.020 af Primary=1.10 cfs 0.029 af Outflow=1.13 cfs 0.049 af

Link 1L: OUTPUT

Inflow=1.41 cfs 0.045 af
Primary=1.41 cfs 0.045 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.107 af Average Runoff Depth = 1.88"
20.11% Pervious = 0.137 ac 79.89% Impervious = 0.545 ac

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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Subcatchment 1S: ADDITION

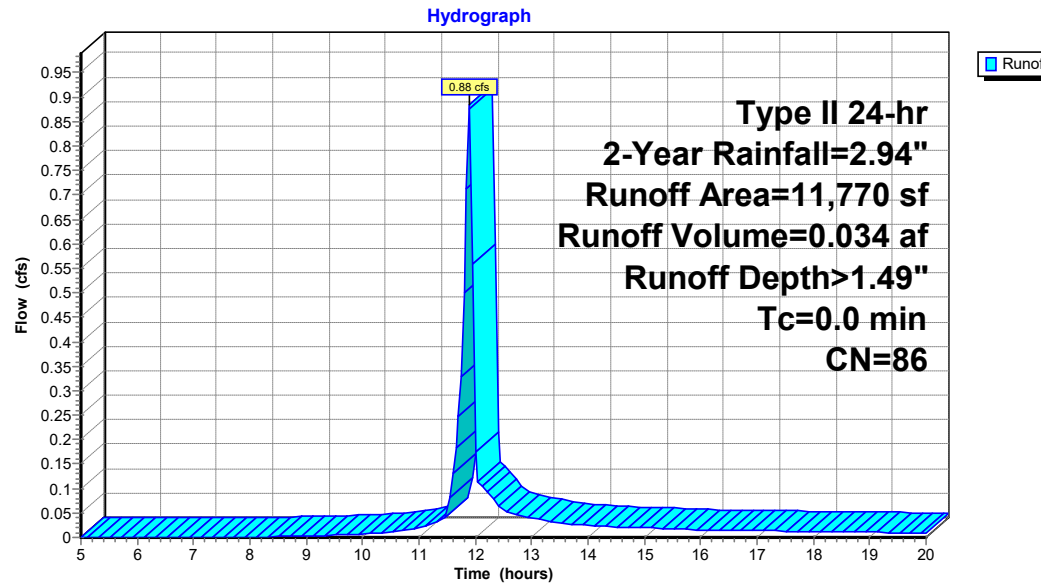
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.88 cfs @ 11.89 hrs, Volume= 0.034 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
	6,863	98	Roofs, HSG B
*	1,048	98	Concrete, HSG B
	3,859	61	>75% Grass cover, Good, HSG B
	11,770	86	Weighted Average
	3,859		32.79% Pervious Area
	7,911		67.21% Impervious Area

Subcatchment 1S: ADDITION



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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Subcatchment 2S: REDEV PARKING

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

Runoff = 1.29 cfs @ 11.93 hrs, Volume= 0.057 af, Depth> 2.15"

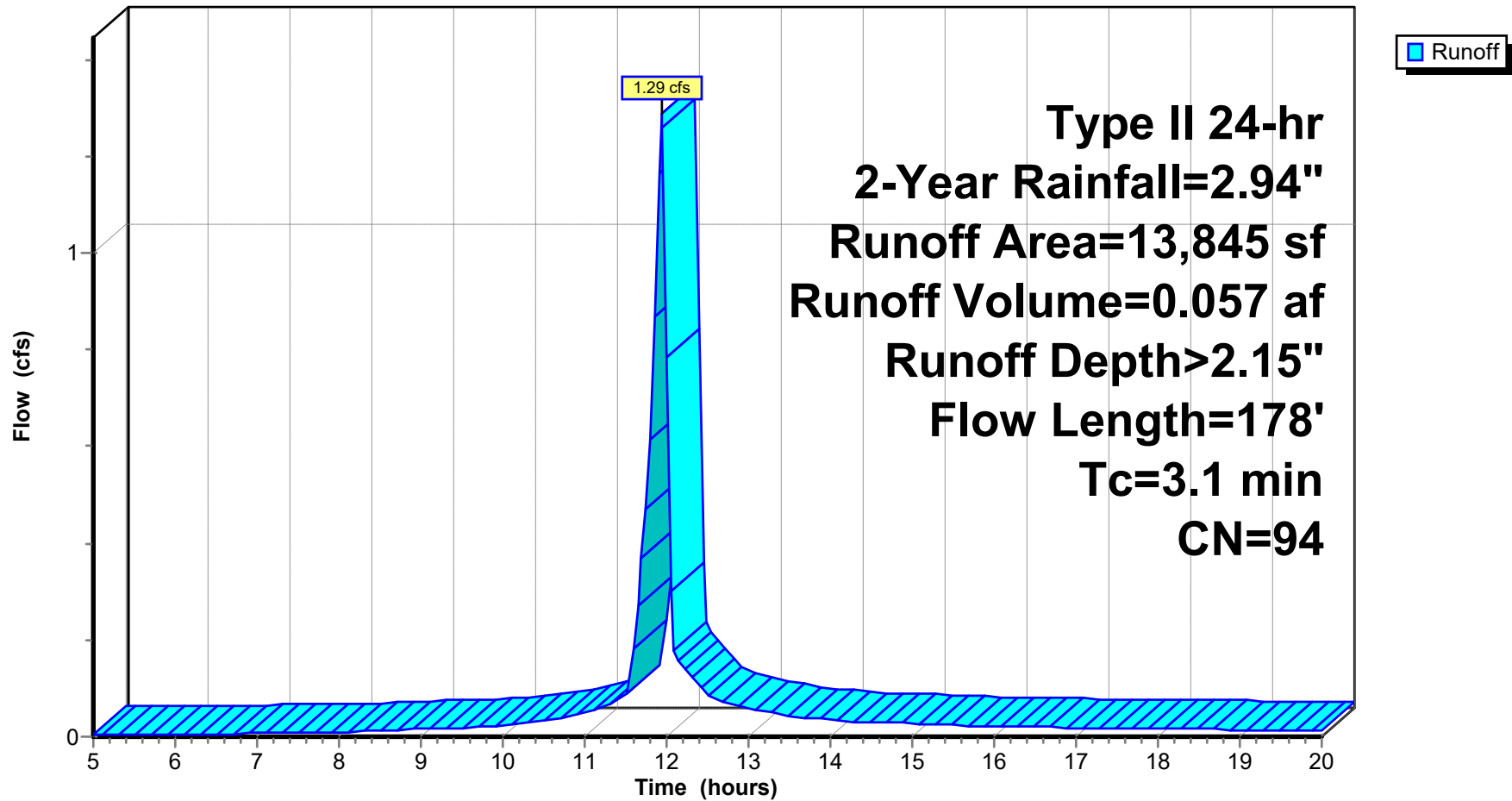
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.94"

Area (sf)	CN	Description
10,959	98	Paved parking, HSG B
1,293	98	Paved roads w/curbs & sewers, HSG B
1,593	61	>75% Grass cover, Good, HSG B
13,845	94	Weighted Average
1,593		11.51% Pervious Area
12,252		88.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0097	0.91		Sheet Flow, BUILDING TO FL Smooth surfaces n= 0.011 P2= 2.94"
1.9	111	0.0092	0.99		Sheet Flow, FLOWLINE Smooth surfaces n= 0.011 P2= 2.94"
3.1	178	Total			

Subcatchment 2S: REDEV PARKING

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Subcatchment 3S: REDEV PARKING NORTH

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

Runoff = 0.39 cfs @ 11.90 hrs, Volume= 0.016 af, Depth> 2.06"

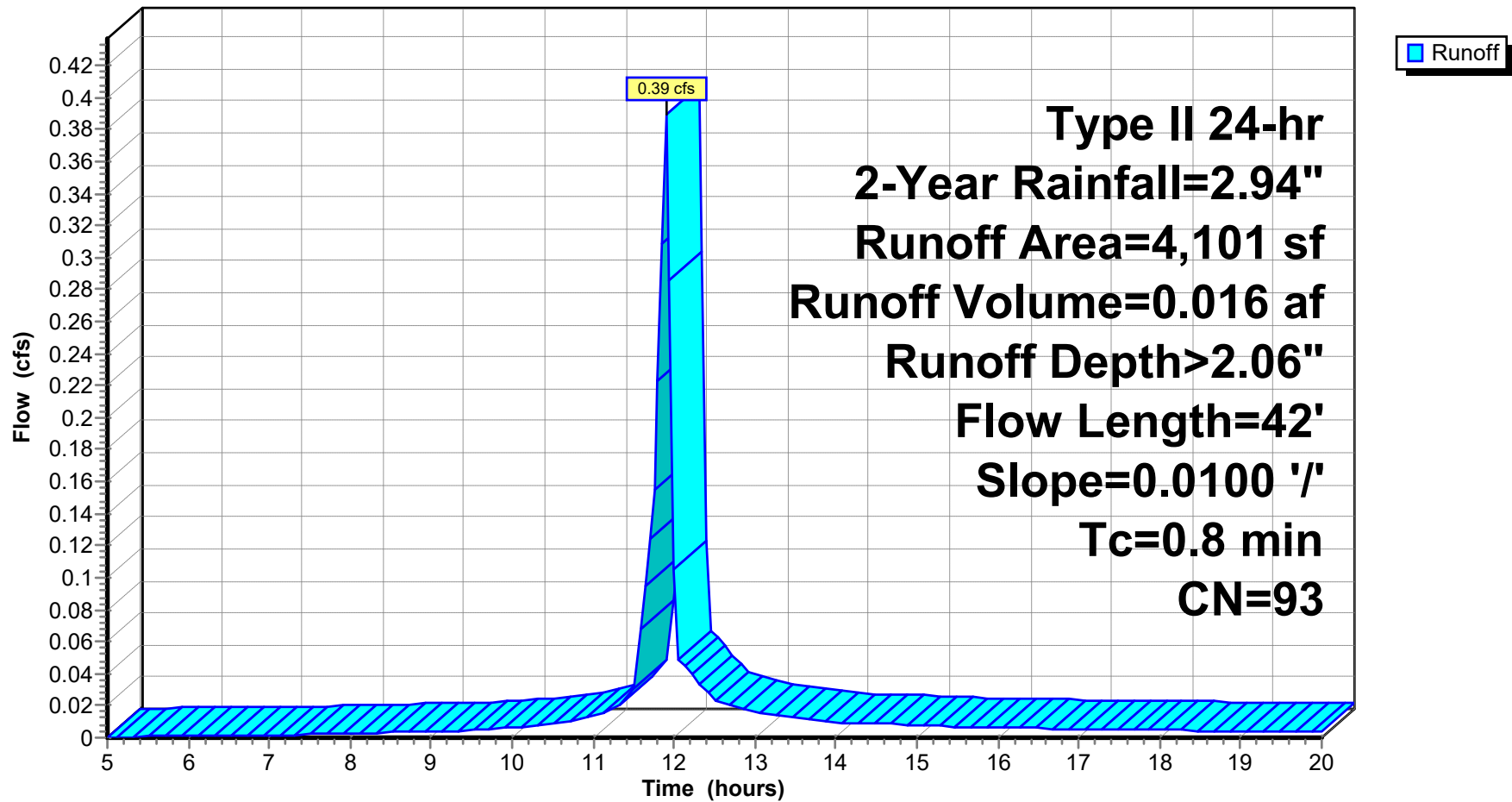
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.94"

Area (sf)	CN	Description
1,720	98	Paved parking, HSG B
1,857	98	Paved roads w/curbs & sewers, HSG B
524	61	>75% Grass cover, Good, HSG B
4,101	93	Weighted Average
524		12.78% Pervious Area
3,577		87.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	42	0.0100	0.84		Sheet Flow, BUILDING TO PL Smooth surfaces n= 0.011 P2= 2.94"

Subcatchment 3S: REDEV PARKING NORTH

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.270 ac, 67.21% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 0.88 cfs @ 11.89 hrs, Volume= 0.034 af
 Outflow = 0.80 cfs @ 11.91 hrs, Volume= 0.034 af, Atten= 10%, Lag= 1.3 min
 Discarded = 0.05 cfs @ 11.91 hrs, Volume= 0.021 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Secondary = 0.75 cfs @ 11.91 hrs, Volume= 0.013 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 660.96' @ 11.91 hrs Surf.Area= 257 sf Storage= 273 cf

Plug-Flow detention time= 32.5 min calculated for 0.033 af (100% of inflow)
 Center-of-Mass det. time= 31.9 min (809.7 - 777.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.96'	357 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.96	152	0.0	0	0	152	
659.35	10	33.0	97	97	338	
660.46	152	100.0	74	171	483	
661.25	330	100.0	186	357	667	

Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.96'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	660.96'	5.0' long x 3.0' 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	3.50	4.00	4.50
			Coef. (English)	2.44	2.58	2.68	2.67	2.65	2.64	2.64	2.68	2.68	2.72	2.81	2.92	2.97	3.07	3.32
#3	Secondary	660.46'	12.0" Round CMP_Round 12" L= 90.0' CMP, projecting, no headwall, Ke= 0.900															
			Inlet / Outlet Invert= 660.46' / 660.00' S= 0.0051 '/' Cc= 0.900															
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf															

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Type II 24-hr 2-Year Rainfall=2.94"

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Discarded OutFlow Max=0.05 cfs @ 11.91 hrs HW=660.95' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=654.96' TW=0.00' (Dynamic Tailwater)

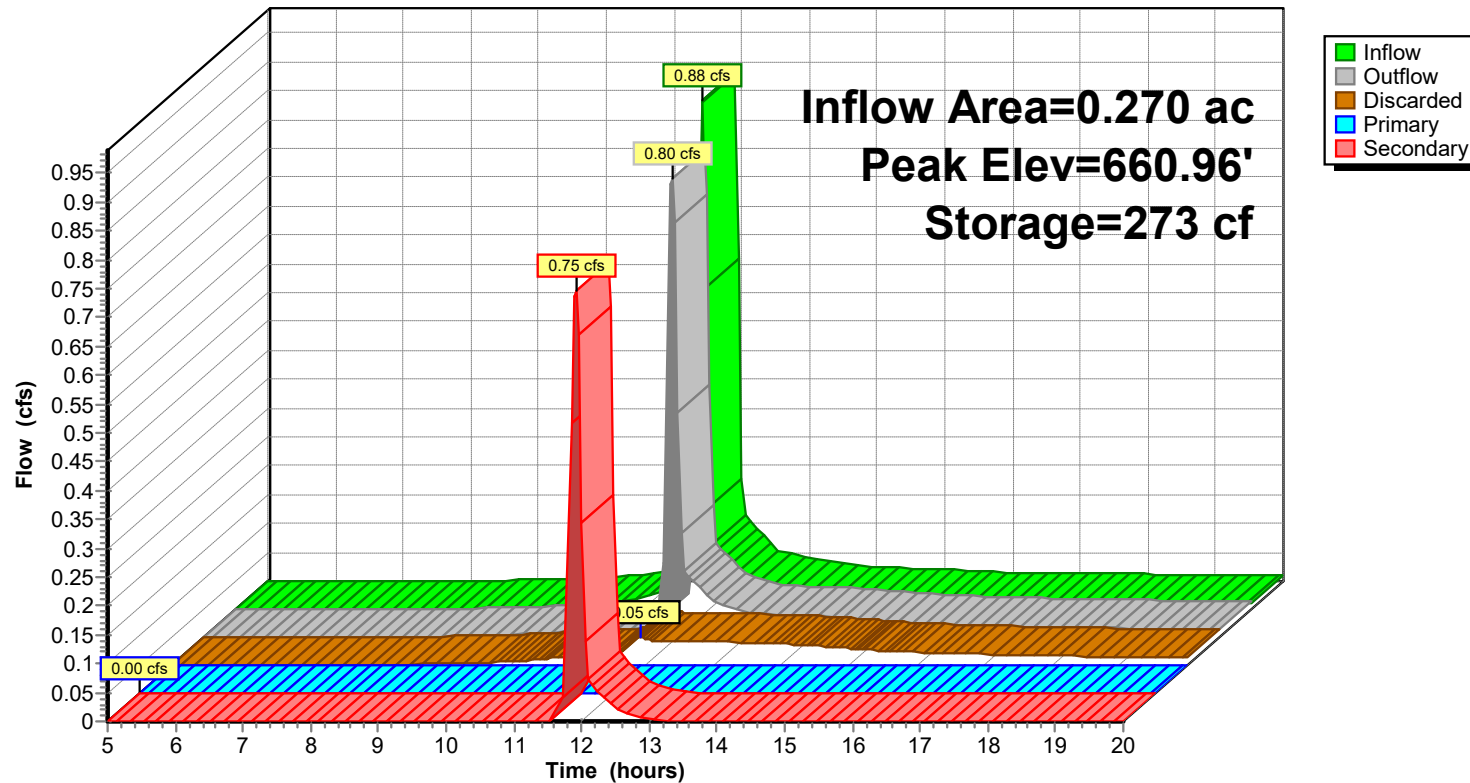
↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.72 cfs @ 11.91 hrs HW=660.95' TW=657.97' (Dynamic Tailwater)

↳ **3=CMP_Round 12"** (Inlet Controls 0.72 cfs @ 1.88 fps)

Pond 1P: RAIN GARDEN

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Pond 2P: STORAGE

[92] Warning: Device #2 is above defined storage

Inflow = 0.75 cfs @ 11.91 hrs, Volume= 0.013 af
 Outflow = 0.04 cfs @ 12.31 hrs, Volume= 0.013 af, Atten= 94%, Lag= 23.8 min
 Discarded = 0.04 cfs @ 12.31 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 660.46' @ 12.31 hrs Surf.Area= 263 sf Storage= 442 cf

Plug-Flow detention time= 119.3 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 119.8 min (839.4 - 719.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.50'	710 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.50	187	0.0	0	0	187	
660.00	187	33.0	339	339	454	
661.25	422	100.0	371	710	701	

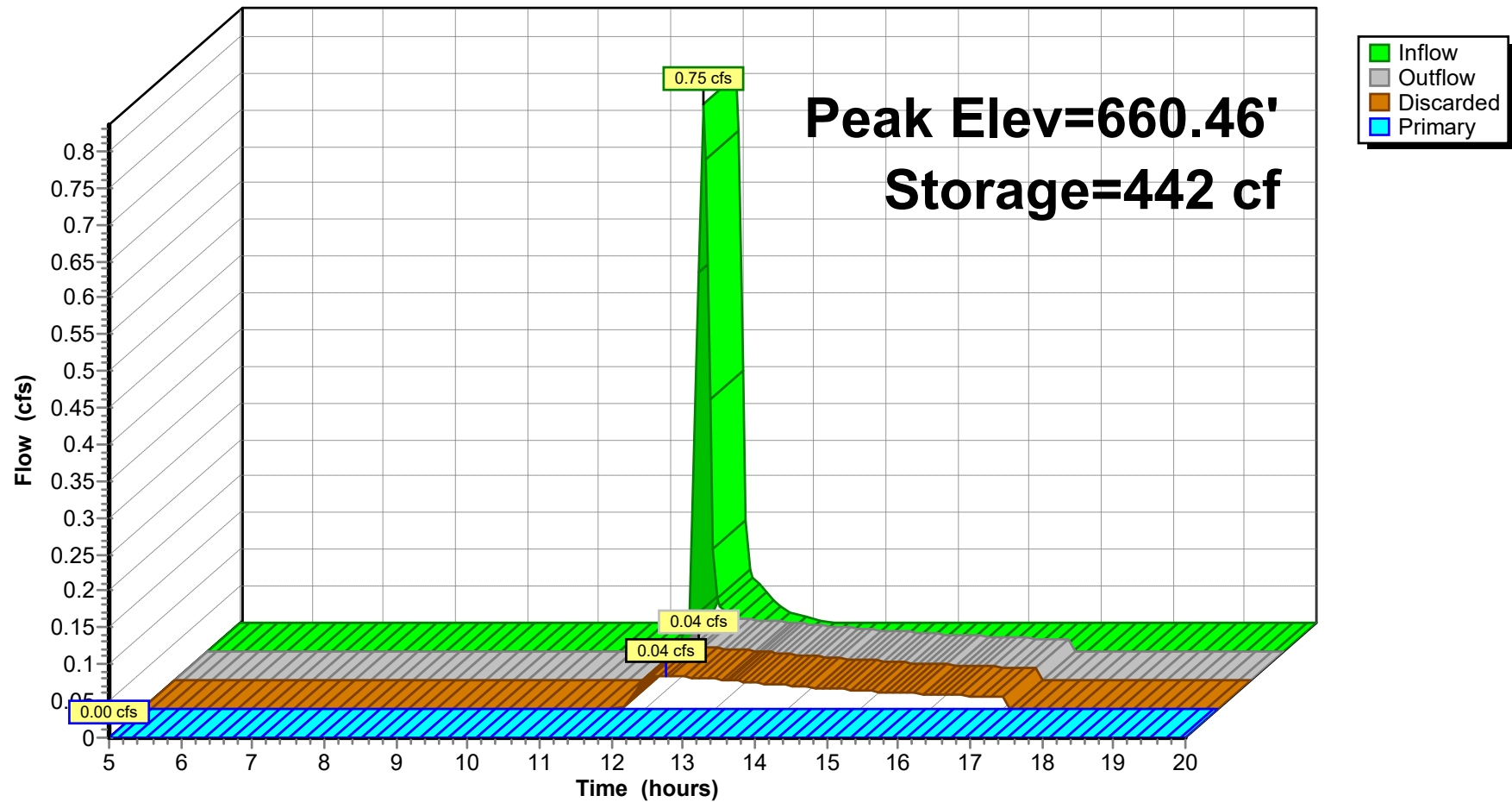
Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.50'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	661.25'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir															
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50															
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32															

Discarded OutFlow Max=0.04 cfs @ 12.31 hrs HW=660.46' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=654.50' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: STORAGE

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.94"

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Summary for Pond 3P: BIOFILTER

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.318 ac, 88.49% Impervious, Inflow Depth > 2.15" for 2-Year event
 Inflow = 1.29 cfs @ 11.93 hrs, Volume= 0.057 af
 Outflow = 1.13 cfs @ 11.96 hrs, Volume= 0.049 af, Atten= 13%, Lag= 1.5 min
 Discarded = 0.03 cfs @ 11.96 hrs, Volume= 0.020 af
 Primary = 1.10 cfs @ 11.96 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 661.33' @ 11.96 hrs Surf.Area= 378 sf Storage= 644 cf

Plug-Flow detention time= 72.3 min calculated for 0.049 af (86% of inflow)
 Center-of-Mass det. time= 29.2 min (780.2 - 751.0)

Volume	Invert	Avail.Storage	Storage Description
#1	654.23'	1,051 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
654.23	181	0.0	0	0
658.23	181	33.0	239	239
660.23	181	27.0	98	337
662.22	537	100.0	714	1,051

Device	Routing	Invert	Outlet Devices
#1	Discarded	654.23'	3.600 in/hr NATIVE SOIL over Surface area Phase-In= 0.01'
#2	Primary	658.20'	8.0" Round Culvert L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 658.20' / 657.88' S= 0.0053 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 2	658.23'	3.600 in/hr UNDERDRAIN over Surface area above 658.23' Excluded Surface area = 181 sf Phase-In= 0.01'
#4	Device 2	660.56'	2.0" Vert. STANDPIPE 2" HOLE C= 0.600
#5	Device 2	660.98'	8.0" Horiz. STANDPIPE C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 11.96 hrs HW=661.32' (Free Discharge)

1=NATIVE SOIL (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.09 cfs @ 11.96 hrs HW=661.32' TW=0.00' (Dynamic Tailwater)

2=Culvert (Passes 1.09 cfs of 2.22 cfs potential flow)

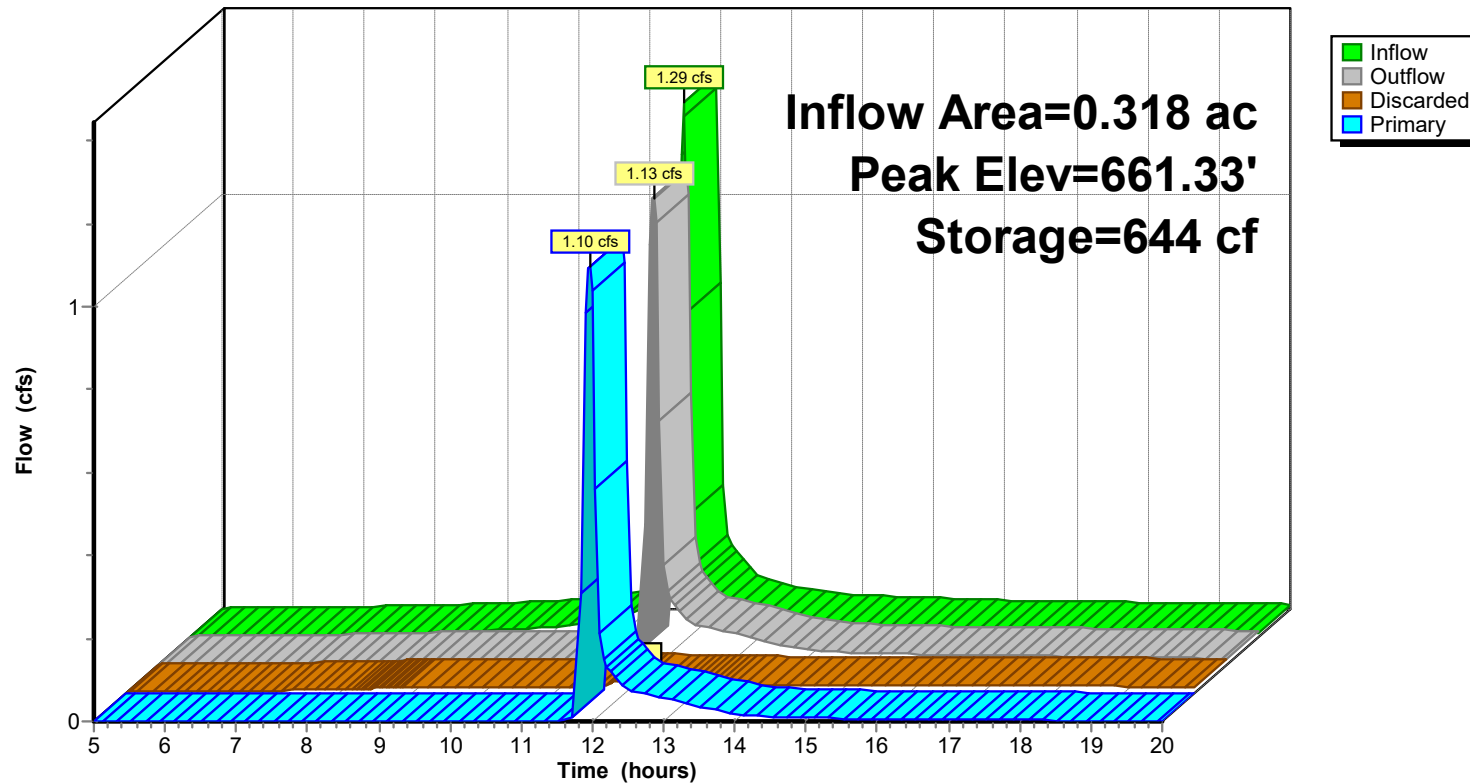
3=UNDERDRAIN (Exfiltration Controls 0.02 cfs)

4=STANDPIPE 2" HOLE (Orifice Controls 0.09 cfs @ 3.97 fps)

5=STANDPIPE (Orifice Controls 0.98 cfs @ 2.82 fps)

Pond 3P: BIOFILTER

Hydrograph



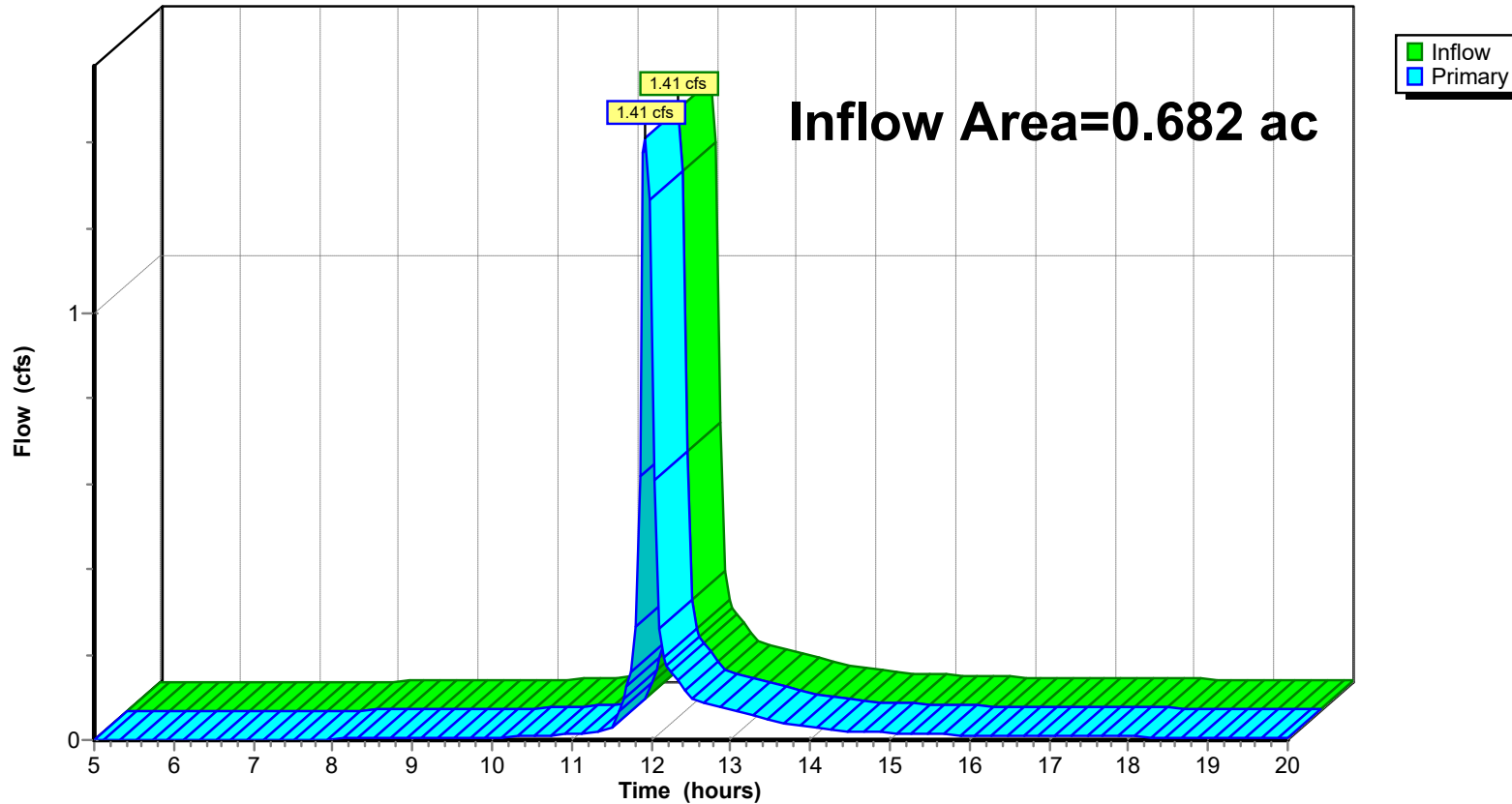
Summary for Link 1L: OUTPUT

Inflow Area = 0.682 ac, 79.89% Impervious, Inflow Depth > 0.80" for 2-Year event
Inflow = 1.41 cfs @ 11.93 hrs, Volume= 0.045 af
Primary = 1.41 cfs @ 11.93 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: OUTPUT

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.32"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment 1S: ADDITION

Runoff Area=11,770 sf 67.21% Impervious Runoff Depth>2.65"
Tc=0.0 min CN=86 Runoff=1.51 cfs 0.060 af

Subcatchment 2S: REDEV PARKING

Runoff Area=13,845 sf 88.49% Impervious Runoff Depth>3.41"
Flow Length=178' Tc=3.1 min CN=94 Runoff=1.98 cfs 0.090 af

Subcatchment 3S: REDEV PARKING NORTH

Runoff Area=4,101 sf 87.22% Impervious Runoff Depth>3.31"
Flow Length=42' Slope=0.0100 '/' Tc=0.8 min CN=93 Runoff=0.61 cfs 0.026 af

Pond 1P: RAIN GARDEN

Peak Elev=661.06' Storage=300 cf Inflow=1.51 cfs 0.060 af
Discarded=0.05 cfs 0.029 af Primary=0.39 cfs 0.008 af Secondary=1.04 cfs 0.021 af Outflow=1.47 cfs 0.059 af

Pond 2P: STORAGE

Peak Elev=661.27' Storage=710 cf Inflow=1.04 cfs 0.021 af
Discarded=0.06 cfs 0.021 af Primary=0.20 cfs 0.001 af Outflow=0.25 cfs 0.021 af

Pond 3P: BIOFILTER

Peak Elev=661.69' Storage=793 cf Inflow=1.98 cfs 0.090 af
Discarded=0.04 cfs 0.023 af Primary=1.55 cfs 0.058 af Outflow=1.59 cfs 0.081 af

Link 1L: OUTPUT

Inflow=2.34 cfs 0.093 af
Primary=2.34 cfs 0.093 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.176 af Average Runoff Depth = 3.09"
20.11% Pervious = 0.137 ac 79.89% Impervious = 0.545 ac

Summary for Subcatchment 1S: ADDITION

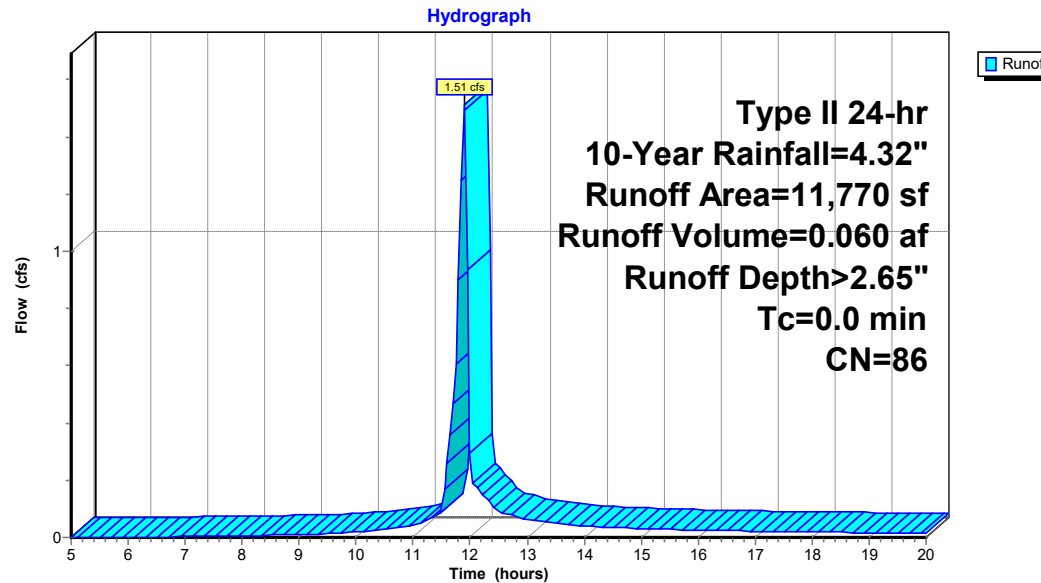
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.51 cfs @ 11.89 hrs, Volume= 0.060 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-Year Rainfall=4.32"

Area (sf)	CN	Description
6,863	98	Roofs, HSG B
* 1,048	98	Concrete, HSG B
3,859	61	>75% Grass cover, Good, HSG B
11,770	86	Weighted Average
3,859		32.79% Pervious Area
7,911		67.21% Impervious Area

Subcatchment 1S: ADDITION



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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Subcatchment 2S: REDEV PARKING

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

Runoff = 1.98 cfs @ 11.93 hrs, Volume= 0.090 af, Depth> 3.41"

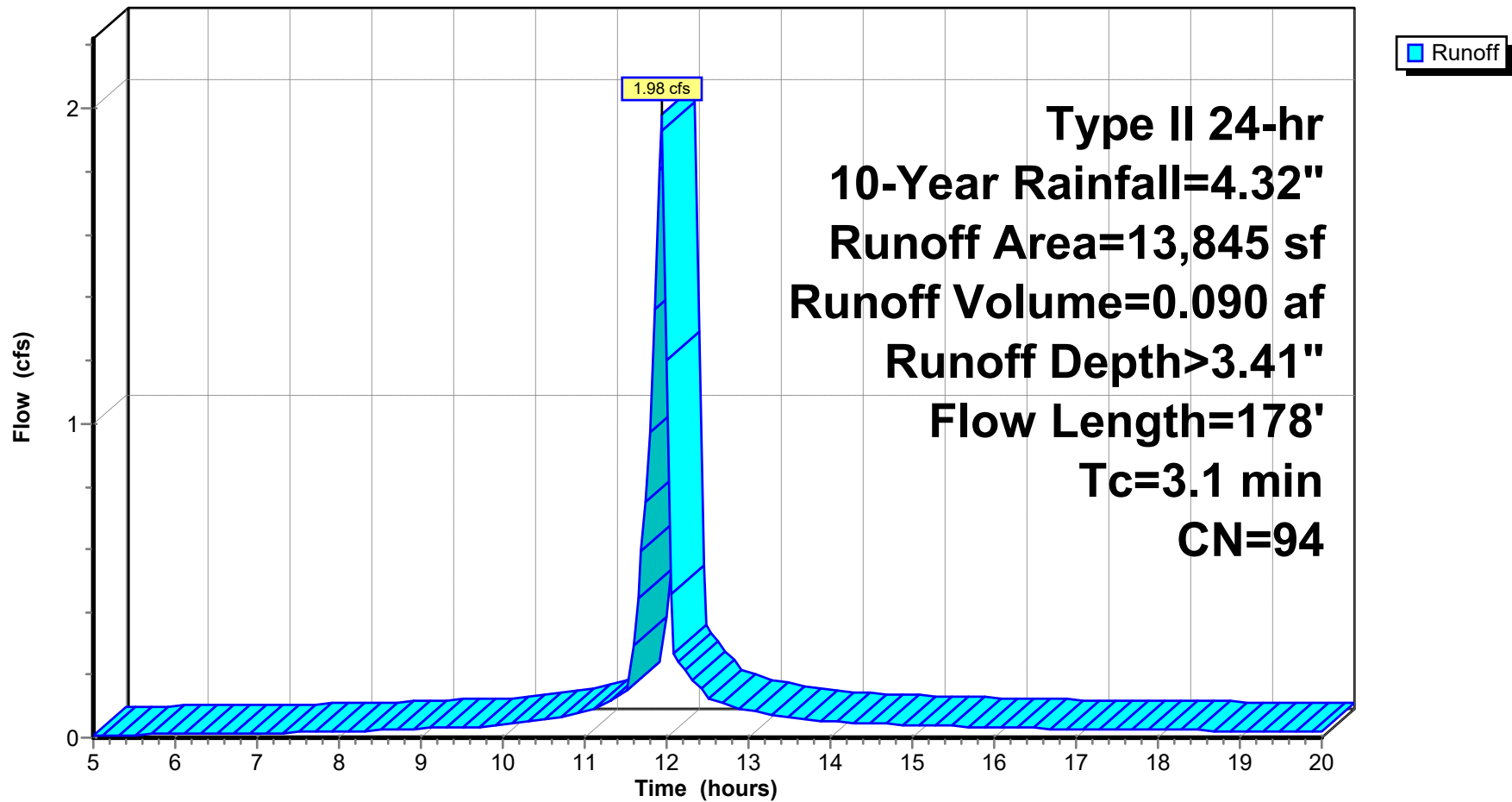
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.32"

Area (sf)	CN	Description
10,959	98	Paved parking, HSG B
1,293	98	Paved roads w/curbs & sewers, HSG B
1,593	61	>75% Grass cover, Good, HSG B
13,845	94	Weighted Average
1,593		11.51% Pervious Area
12,252		88.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	67	0.0097	0.91		Sheet Flow, BUILDING TO FL
					Smooth surfaces n= 0.011 P2= 2.94"
1.9	111	0.0092	0.99		Sheet Flow, FLOWLINE
					Smooth surfaces n= 0.011 P2= 2.94"
3.1	178	Total			

Subcatchment 2S: REDEV PARKING

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Subcatchment 3S: REDEV PARKING NORTH

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

Runoff = 0.61 cfs @ 11.90 hrs, Volume= 0.026 af, Depth> 3.31"

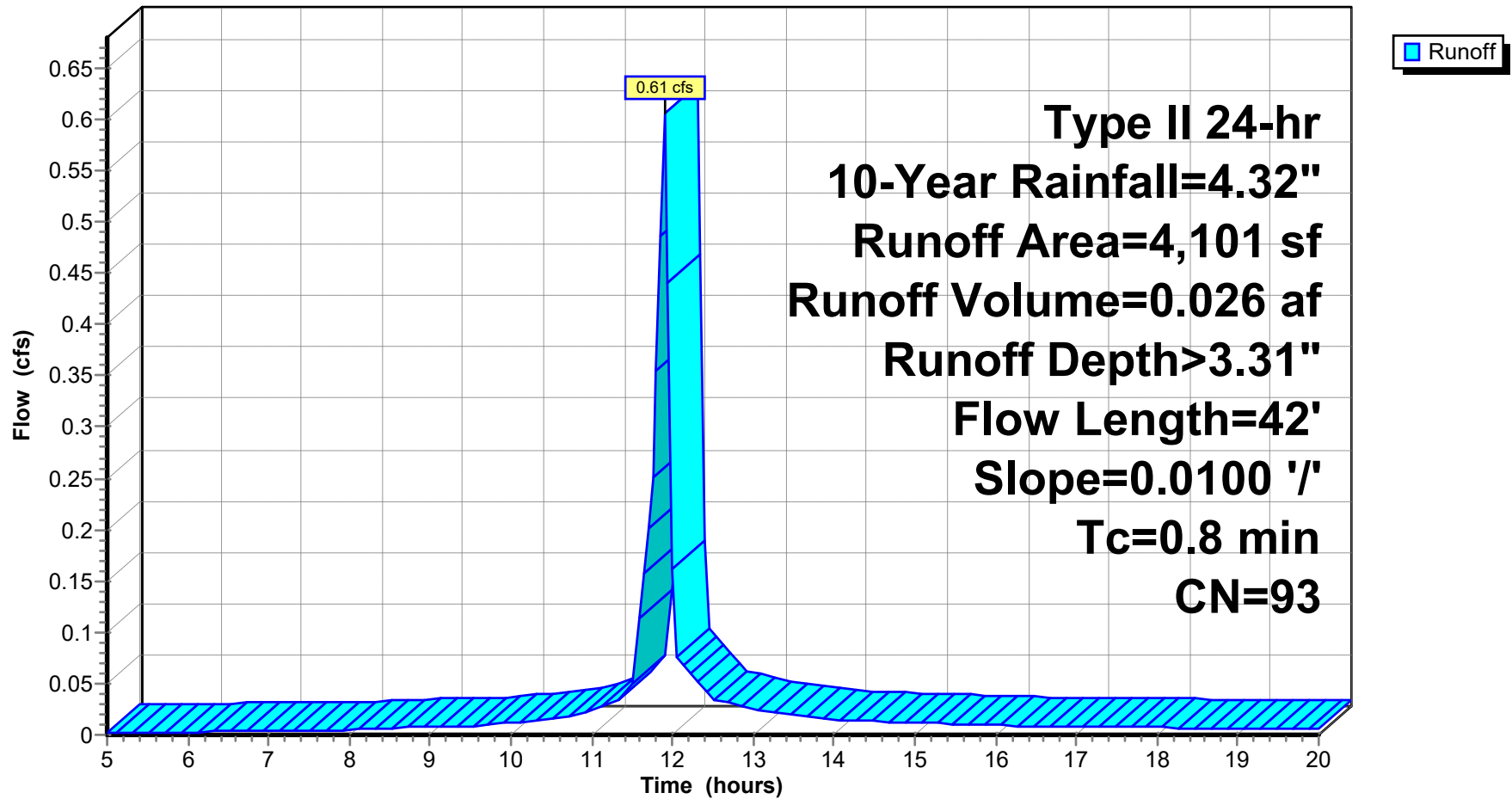
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.32"

Area (sf)	CN	Description
1,720	98	Paved parking, HSG B
1,857	98	Paved roads w/curbs & sewers, HSG B
524	61	>75% Grass cover, Good, HSG B
4,101	93	Weighted Average
524		12.78% Pervious Area
3,577		87.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	42	0.0100	0.84		Sheet Flow, BUILDING TO PL Smooth surfaces n= 0.011 P2= 2.94"

Subcatchment 3S: REDEV PARKING NORTH

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.270 ac, 67.21% Impervious, Inflow Depth > 2.65" for 10-Year event
 Inflow = 1.51 cfs @ 11.89 hrs, Volume= 0.060 af
 Outflow = 1.47 cfs @ 11.90 hrs, Volume= 0.059 af, Atten= 3%, Lag= 0.3 min
 Discarded = 0.05 cfs @ 11.91 hrs, Volume= 0.029 af
 Primary = 0.39 cfs @ 11.91 hrs, Volume= 0.008 af
 Secondary = 1.04 cfs @ 11.89 hrs, Volume= 0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 661.06' @ 11.91 hrs Surf.Area= 281 sf Storage= 300 cf

Plug-Flow detention time= 30.8 min calculated for 0.058 af (98% of inflow)
 Center-of-Mass det. time= 23.4 min (788.2 - 764.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.96'	357 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.96	152	0.0	0	0	152	
659.35	10	33.0	97	97	338	
660.46	152	100.0	74	171	483	
661.25	330	100.0	186	357	667	

Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.96'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	660.96'	5.0' long x 3.0' 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 3.50 4.00 4.50															
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32															
#3	Secondary	660.46'	12.0" Round CMP_Round 12" L= 90.0' CMP, projecting, no headwall, Ke= 0.900															
			Inlet / Outlet Invert= 660.46' / 660.00' S= 0.0051 '/' Cc= 0.900															
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf															

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Type II 24-hr 10-Year Rainfall=4.32"

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Discarded OutFlow Max=0.05 cfs @ 11.91 hrs HW=661.06' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.37 cfs @ 11.91 hrs HW=661.06' TW=0.00' (Dynamic Tailwater)

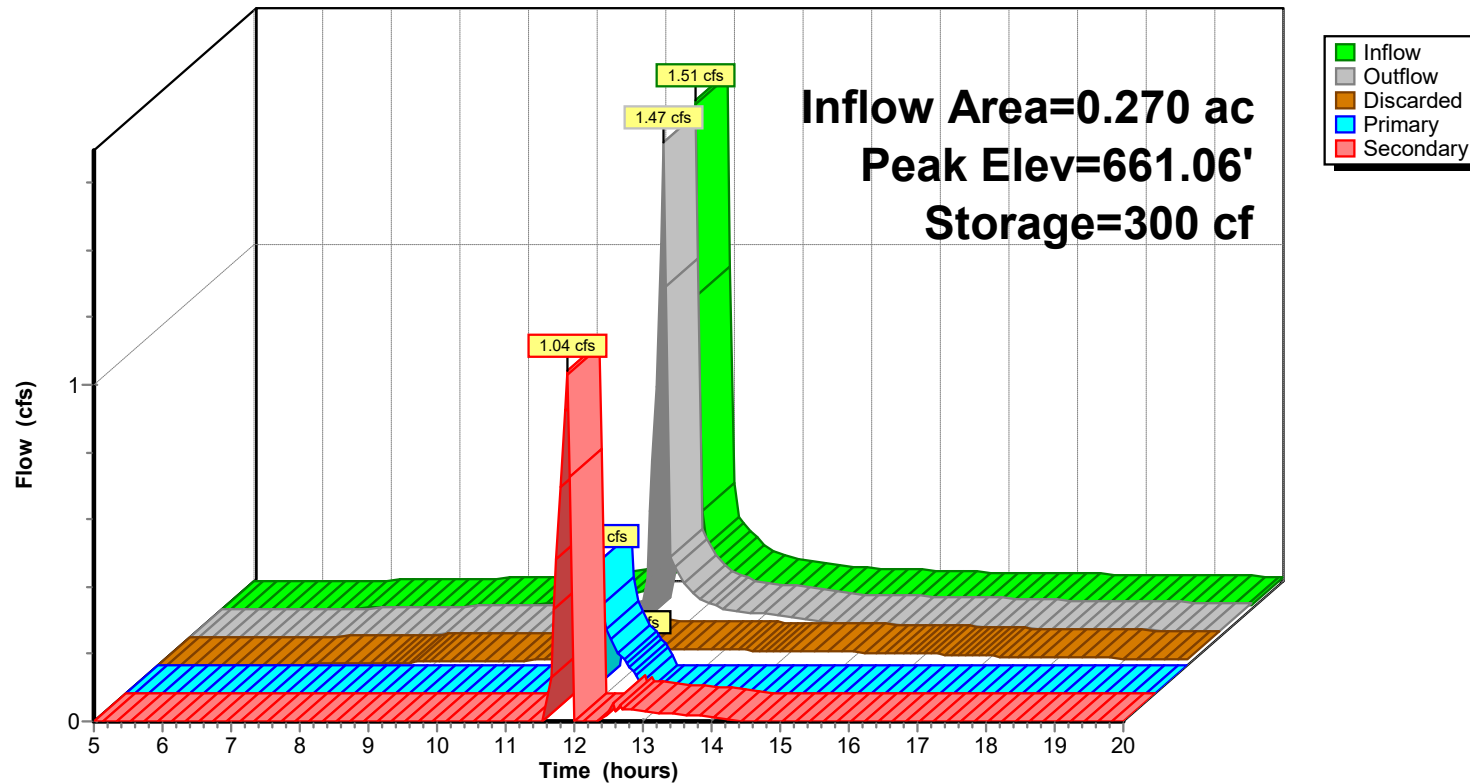
↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 0.76 fps)

Secondary OutFlow Max=0.95 cfs @ 11.89 hrs HW=661.05' TW=660.59' (Dynamic Tailwater)

↳ **3=CMP_Round 12"** (Outlet Controls 0.95 cfs @ 2.81 fps)

Pond 1P: RAIN GARDEN

Hydrograph



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Type II 24-hr 10-Year Rainfall=4.32"

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Summary for Pond 2P: STORAGE

[92] Warning: Device #2 is above defined storage

[93] Warning: Storage range exceeded by 0.02'

[80] Warning: Exceeded Pond 1P by 0.25' @ 12.00 hrs (1.10 cfs 0.022 af)

Inflow = 1.04 cfs @ 11.89 hrs, Volume= 0.021 af
 Outflow = 0.25 cfs @ 12.00 hrs, Volume= 0.021 af, Atten= 76%, Lag= 6.7 min
 Discarded = 0.06 cfs @ 12.00 hrs, Volume= 0.021 af
 Primary = 0.20 cfs @ 12.00 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 661.27' @ 12.00 hrs Surf.Area= 422 sf Storage= 710 cf

Plug-Flow detention time= 139.7 min calculated for 0.021 af (100% of inflow)
 Center-of-Mass det. time= 140.2 min (864.4 - 724.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	654.50'	710 cf	Custom Stage Data (Conic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
654.50	187	0.0	0	0	187	
660.00	187	33.0	339	339	454	
661.25	422	100.0	371	710	701	

Device	Routing	Invert	Outlet Devices															
#1	Discarded	654.50'	3.600 in/hr Exfiltration over Wetted area Phase-In= 0.01'															
#2	Primary	661.25'	25.0' long x 3.0' 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 3.50 4.00 4.50															
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32															

Discarded OutFlow Max=0.06 cfs @ 12.00 hrs HW=661.27' (Free Discharge)

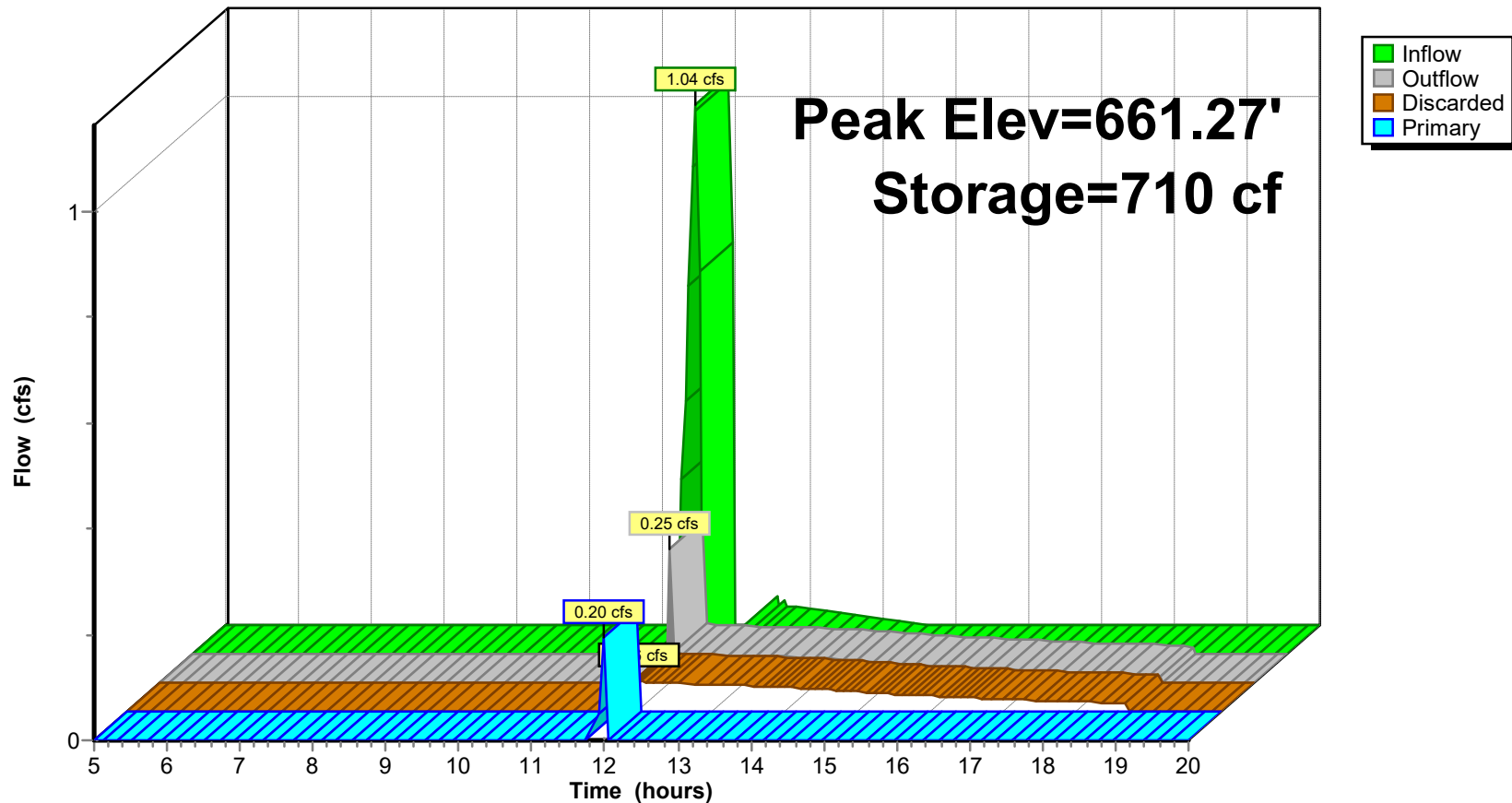
↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.20 cfs @ 12.00 hrs HW=661.27' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.20 cfs @ 0.36 fps)

Pond 2P: STORAGE

Hydrograph



Summary for Pond 3P: BIOFILTER

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.318 ac, 88.49% Impervious, Inflow Depth > 3.41" for 10-Year event
 Inflow = 1.98 cfs @ 11.93 hrs, Volume= 0.090 af
 Outflow = 1.59 cfs @ 11.98 hrs, Volume= 0.081 af, Atten= 20%, Lag= 2.6 min
 Discarded = 0.04 cfs @ 11.98 hrs, Volume= 0.023 af
 Primary = 1.55 cfs @ 11.98 hrs, Volume= 0.058 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 661.69' @ 11.98 hrs Surf.Area= 443 sf Storage= 793 cf

Plug-Flow detention time= 56.8 min calculated for 0.081 af (90% of inflow)
 Center-of-Mass det. time= 22.1 min (764.6 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	654.23'	1,051 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
654.23	181	0.0	0	0
658.23	181	33.0	239	239
660.23	181	27.0	98	337
662.22	537	100.0	714	1,051

Device	Routing	Invert	Outlet Devices
#1	Discarded	654.23'	3.600 in/hr NATIVE SOIL over Surface area Phase-In= 0.01'
#2	Primary	658.20'	8.0" Round Culvert L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 658.20' / 657.88' S= 0.0053 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 2	658.23'	3.600 in/hr UNDERDRAIN over Surface area above 658.23' Excluded Surface area = 181 sf Phase-In= 0.01'
#4	Device 2	660.56'	2.0" Vert. STANDPIPE 2" HOLE C= 0.600
#5	Device 2	660.98'	8.0" Horiz. STANDPIPE C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.98 hrs HW=661.66' (Free Discharge)

1=NATIVE SOIL (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.52 cfs @ 11.98 hrs HW=661.66' TW=0.00' (Dynamic Tailwater)

2=Culvert (Passes 1.52 cfs of 2.35 cfs potential flow)

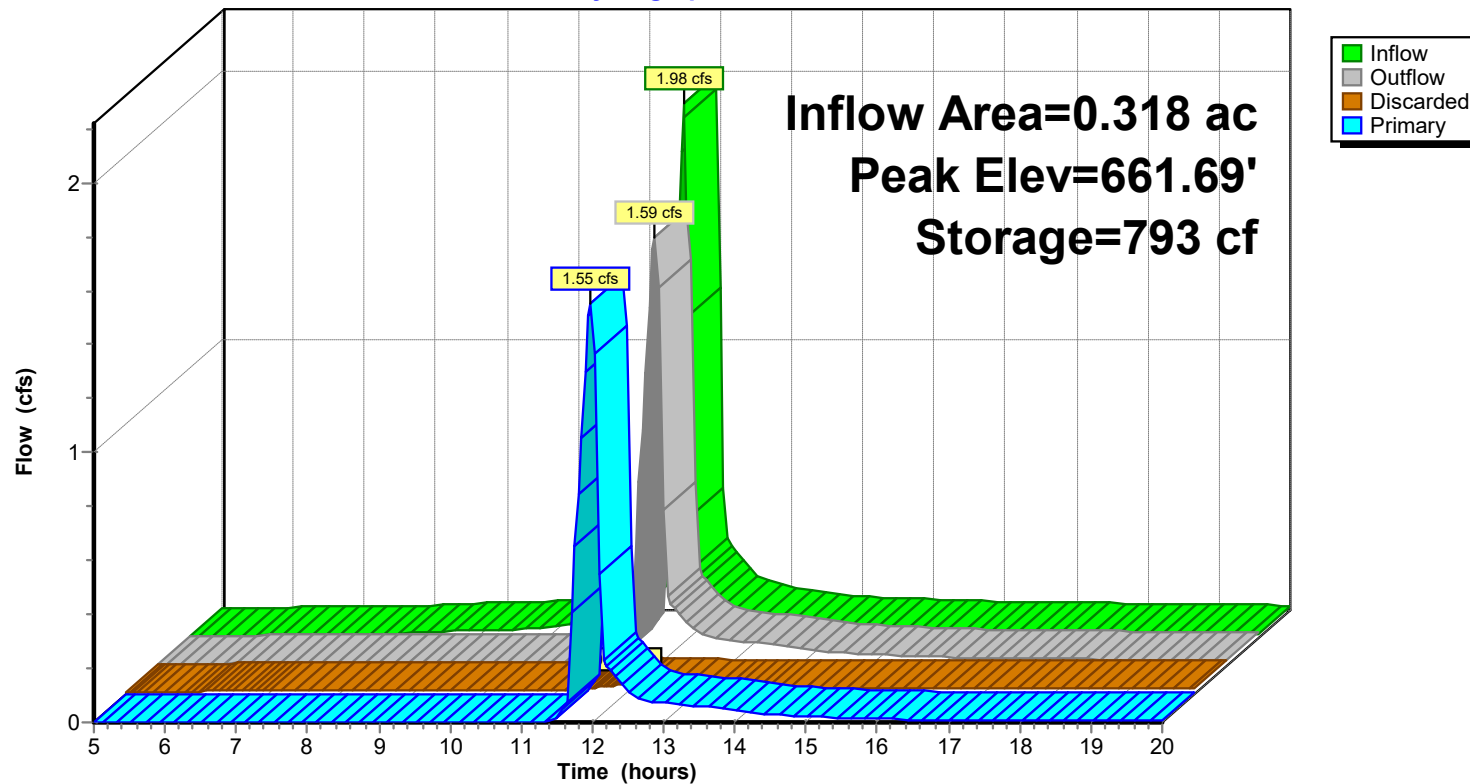
3=UNDERDRAIN (Exfiltration Controls 0.02 cfs)

4=STANDPIPE 2" HOLE (Orifice Controls 0.11 cfs @ 4.86 fps)

5=STANDPIPE (Orifice Controls 1.39 cfs @ 3.98 fps)

Pond 3P: BIOFILTER

Hydrograph



Summary for Link 1L: OUTPUT

Inflow Area = 0.682 ac, 79.89% Impervious, Inflow Depth > 1.64" for 10-Year event
Inflow = 2.34 cfs @ 11.92 hrs, Volume= 0.093 af
Primary = 2.34 cfs @ 11.92 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: OUTPUT

Hydrograph

