

**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.145	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S)
0.013	98	Concrete, HSG A (4S)
0.026	98	Concrete, HSG B (1S, 2S, 3S)
0.175	98	Paved parking, HSG B (1S)
0.158	98	Roofs, HSG B (2S, 4S)
<b>0.517</b>	<b>88</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.013	HSG A	4S
0.504	HSG B	1S, 2S, 3S, 4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
<b>0.517</b>		<b>TOTAL AREA</b>

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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	0.145	0.000	0.000	0.000	0.145	>75% Grass cover, Good	1S, 2S, 3S, 4S
0.013	0.026	0.000	0.000	0.000	0.039	Concrete	1S, 2S, 3S, 4S
0.000	0.175	0.000	0.000	0.000	0.175	Paved parking	1S
0.000	0.158	0.000	0.000	0.000	0.158	Roofs	2S, 4S
<b>0.013</b>	<b>0.504</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.517</b>	<b>TOTAL AREA</b>	

**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	2S	0.00	0.00	175.0	0.0050	0.010	6.0	0.0	0.0
2	3P	667.80	667.47	66.0	0.0050	0.010	8.0	0.0	0.0
3	4P	667.47	667.34	26.0	0.0050	0.010	8.0	0.0	0.0
4	5P	669.00	667.47	147.0	0.0104	0.010	6.0	0.0	0.0

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MSE 24-hr 4 2-Year Rainfall=3.01"

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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-Q  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: S1** Runoff Area=9,696 sf 86.76% Impervious Runoff Depth>2.34"  
Flow Length=130' Tc=1.6 min CN=WQ Runoff=0.84 cfs 0.043 af

**Subcatchment 2S: S2** Runoff Area=8,347 sf 71.91% Impervious Runoff Depth>2.00"  
Flow Length=200' Tc=1.2 min CN=WQ Runoff=0.62 cfs 0.032 af

**Subcatchment 3S: SE BLDG** Runoff Area=1,813 sf 5.41% Impervious Runoff Depth>0.46"  
Flow Length=10' Slope=0.0100 '/' Tc=2.1 min CN=WQ Runoff=0.03 cfs 0.002 af

**Subcatchment 4S: West Parking** Runoff Area=2,648 sf 63.48% Impervious Runoff Depth>1.80"  
Flow Length=37' Tc=2.9 min CN=WQ Runoff=0.17 cfs 0.009 af

**Pond 1P: North Pond** Peak Elev=671.22' Storage=202 cf Inflow=0.84 cfs 0.043 af  
Discarded=0.05 cfs 0.021 af Primary=0.70 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.76 cfs 0.043 af

**Pond 3P: CB 2** Peak Elev=668.22' Inflow=0.17 cfs 0.009 af  
8.0" Round Culvert n=0.010 L=66.0' S=0.0050 '/' Outflow=0.17 cfs 0.009 af

**Pond 4P: CB 1** Peak Elev=668.19' Inflow=1.00 cfs 0.062 af  
8.0" Round Culvert n=0.010 L=26.0' S=0.0050 '/' Outflow=1.00 cfs 0.062 af

**Pond 5P: East Pond** Peak Elev=670.71' Storage=415 cf Inflow=0.62 cfs 0.032 af  
Discarded=0.00 cfs 0.000 af Primary=0.13 cfs 0.031 af Outflow=0.14 cfs 0.032 af

**Link 1L: Output** Inflow=1.03 cfs 0.064 af  
Primary=1.03 cfs 0.064 af

**Total Runoff Area = 0.517 ac Runoff Volume = 0.086 af Average Runoff Depth = 2.00"**  
**28.04% Pervious = 0.145 ac 71.96% Impervious = 0.372 ac**

**Summary for Subcatchment 1S: S1**

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

Runoff = 0.84 cfs @ 12.07 hrs, Volume= 0.043 af, Depth> 2.34"

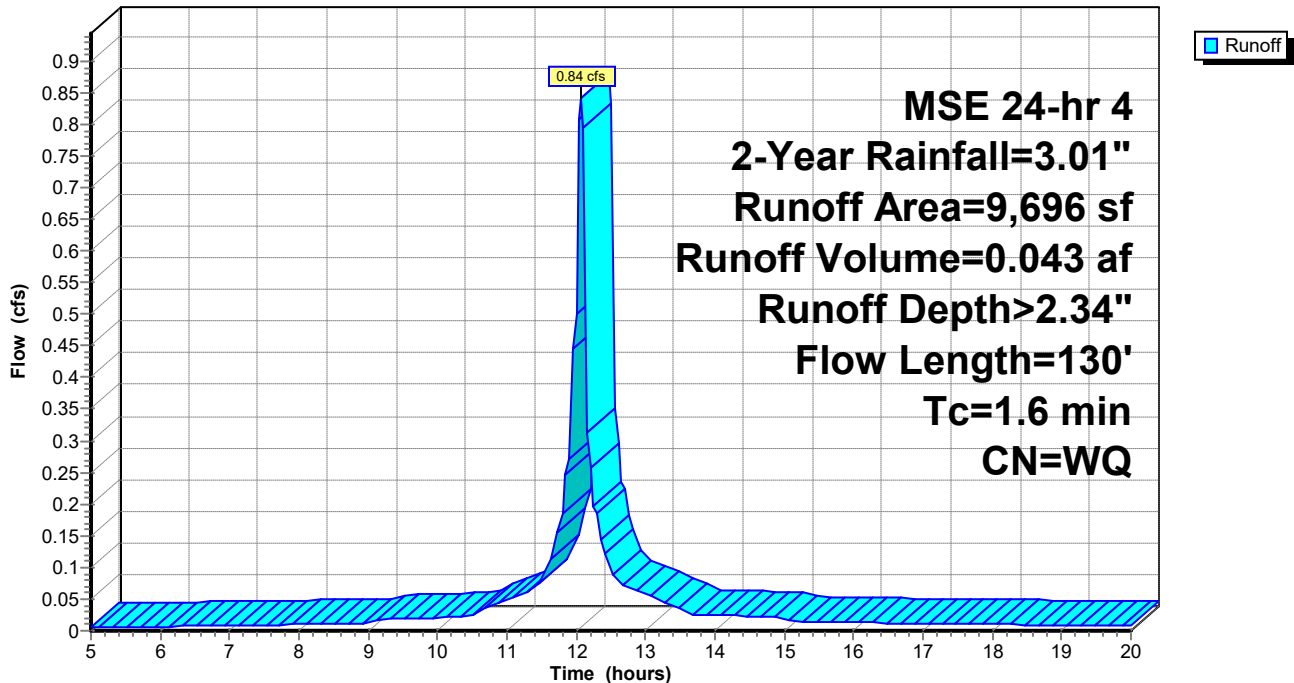
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 2-Year Rainfall=3.01"

Area (sf)	CN	Description
0	98	Roofs, HSG B
* 793	98	Concrete, HSG B
7,619	98	Paved parking, HSG B
1,284	61	>75% Grass cover, Good, HSG B
9,696		Weighted Average
1,284		13.24% Pervious Area
8,412		86.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	60	0.0200	1.19		<b>Sheet Flow, Pavement</b> Smooth surfaces n= 0.011 P2= 2.94"
0.8	70	0.0100	1.50		<b>Shallow Concentrated Flow, Swale</b> Grassed Waterway Kv= 15.0 fps
1.6	130	Total			

**Subcatchment 1S: S1**

Hydrograph



### Summary for Subcatchment 2S: S2

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

Runoff = 0.62 cfs @ 12.07 hrs, Volume= 0.032 af, Depth> 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 2-Year Rainfall=3.01"

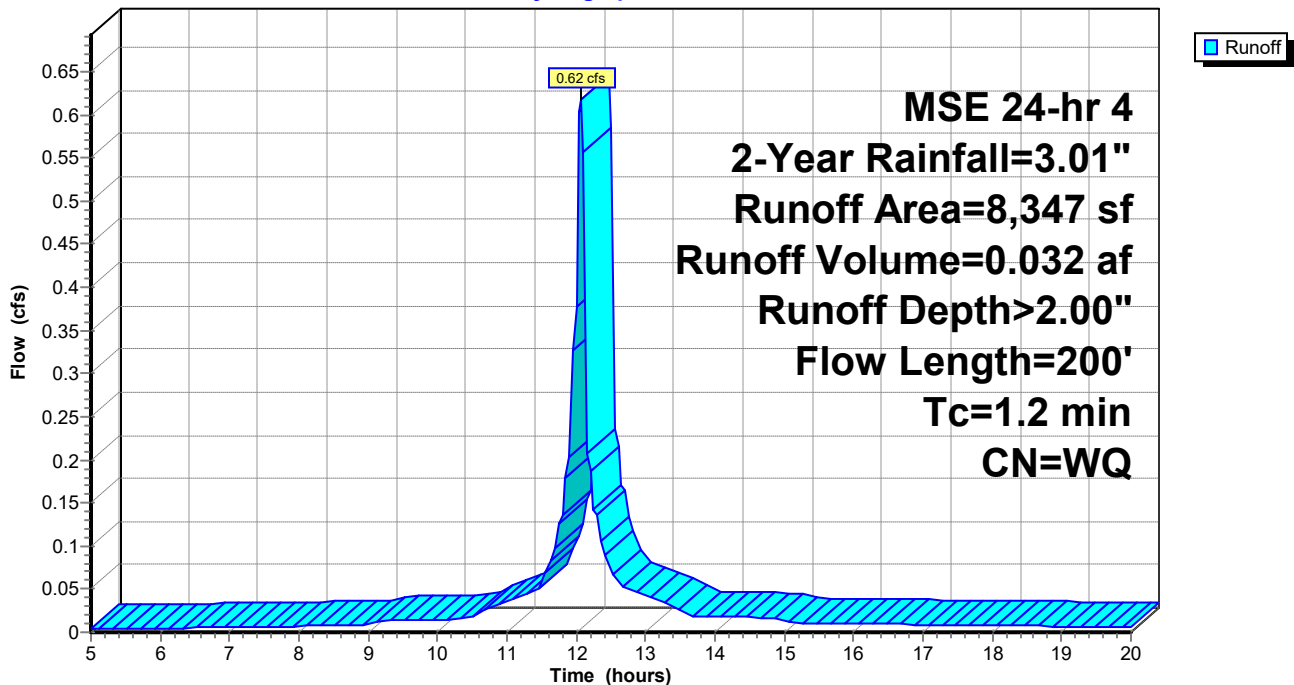
Area (sf)	CN	Description
5,765	98	Roofs, HSG B
0	98	Paved parking, HSG B
* 237	98	Concrete, HSG B
2,345	61	>75% Grass cover, Good, HSG B
<hr/>		
8,347		Weighted Average
2,345		28.09% Pervious Area
6,002		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.5000	3.62		<b>Sheet Flow, Roof</b> Smooth surfaces n= 0.011 P2= 2.94"
1.1	175	0.0050	2.63	0.52	<b>Pipe Channel,</b> 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
<hr/>					
1.2	200	Total			

### Subcatchment 2S: S2

Hydrograph





### Summary for Subcatchment 3S: SE BLDG

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Depth> 0.46"

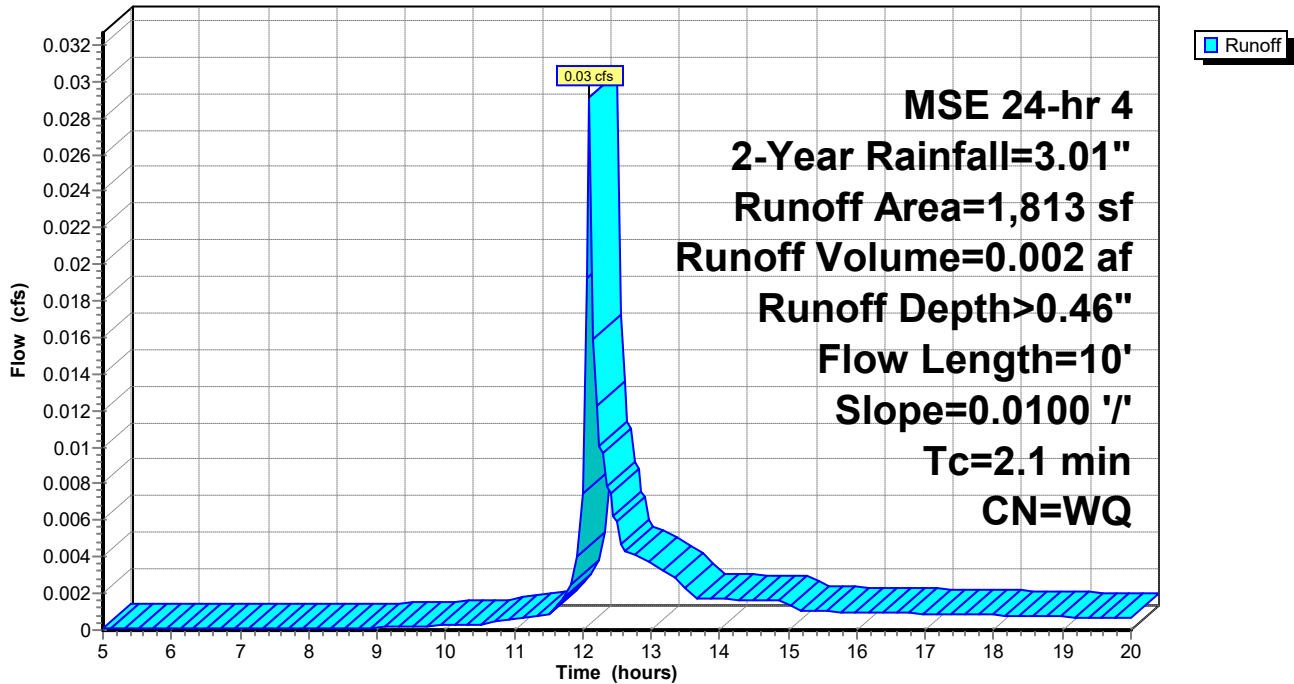
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs,  $dt= 0.05$  hrs  
 MSE 24-hr 4 2-Year Rainfall=3.01"

Area (sf)	CN	Description
* 98	98	Concrete, HSG B
1,715	61	>75% Grass cover, Good, HSG B
1,813		Weighted Average
1,715		94.59% Pervious Area
98		5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	10	0.0100	0.08		Sheet Flow, Grass Grass: Short n= 0.150 P2= 2.94"

### Subcatchment 3S: SE BLDG

Hydrograph



### Summary for Subcatchment 4S: West Parking

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 1.80"

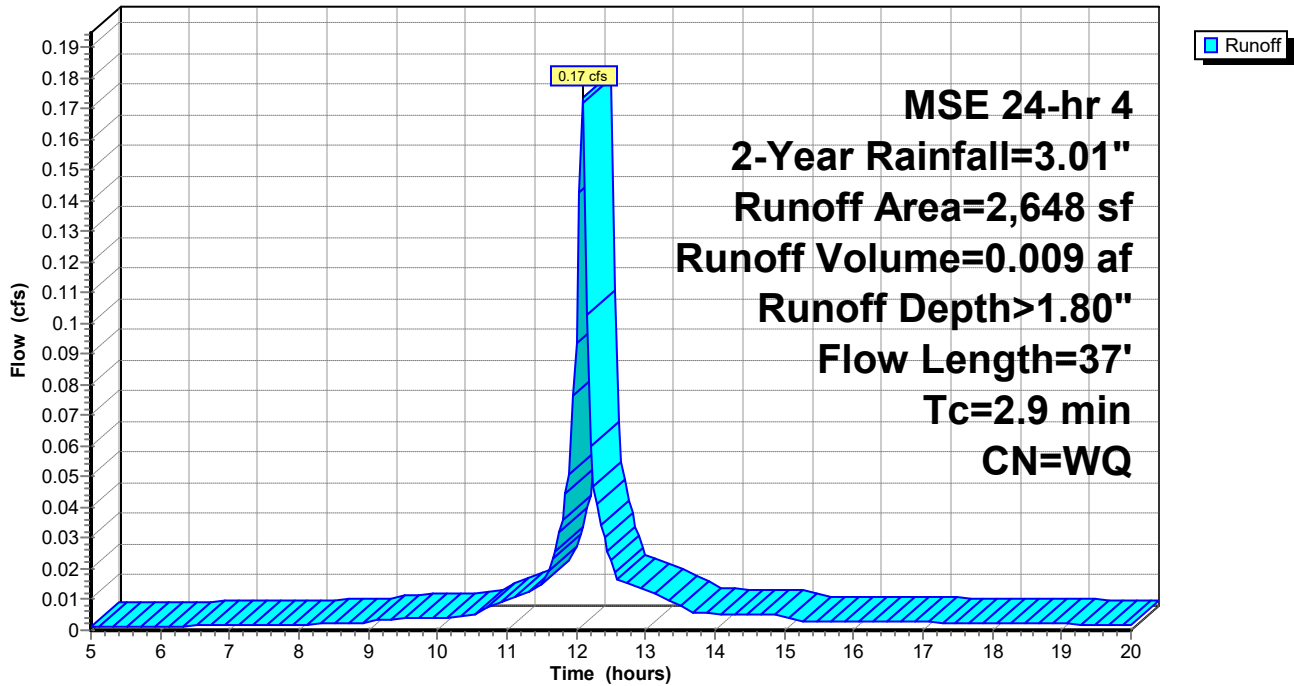
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs,  $dt= 0.05$  hrs  
 MSE 24-hr 4 2-Year Rainfall=3.01"

Area (sf)	CN	Description
1,126	98	Roofs, HSG B
* 555	98	Concrete, HSG A
967	61	>75% Grass cover, Good, HSG B
2,648		Weighted Average
967		36.52% Pervious Area
1,681		63.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	11	0.0100	0.08		<b>Sheet Flow, Grass</b> Grass: Short n= 0.150 P2= 2.94"
0.1	4	0.0200	0.69		<b>Sheet Flow, Sidewalk</b> Smooth surfaces n= 0.011 P2= 2.94"
0.5	22	0.0100	0.74		<b>Sheet Flow, Parking Lot</b> Smooth surfaces n= 0.011 P2= 2.94"
2.9	37	Total			

### Subcatchment 4S: West Parking

Hydrograph



**Summary for Pond 1P: North Pond**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.223 ac, 86.76% Impervious, Inflow Depth > 2.34" for 2-Year event  
 Inflow = 0.84 cfs @ 12.07 hrs, Volume= 0.043 af  
 Outflow = 0.76 cfs @ 12.10 hrs, Volume= 0.043 af, Atten= 10%, Lag= 1.6 min  
 Discarded = 0.05 cfs @ 12.10 hrs, Volume= 0.021 af  
 Primary = 0.70 cfs @ 12.10 hrs, Volume= 0.022 af  
 Secondary = 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= 671.22' @ 12.10 hrs Surf.Area= 702 sf Storage= 202 cf

Plug-Flow detention time= 20.1 min calculated for 0.043 af (99% of inflow)  
 Center-of-Mass det. time= 17.0 min ( 755.7 - 738.7 )

Volume	Invert	Avail.Storage	Storage Description	
#1	670.65'	1,575 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
670.65	65	0.0	0	0
671.00	400	100.0	81	81
671.29	800	100.0	174	255
672.00	2,918	100.0	1,320	1,575

Device	Routing	Invert	Outlet Devices
#1	Discarded	670.65'	<b>3.600 in/hr Exfiltration over Horizontal area above 670.65'</b> Excluded Horizontal area = 65 sf Phase-In= 0.01'
#2	Primary	671.00'	<b>8.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	671.29'	<b>5.0' long x 3.0' breadth Broad-Crested Rectangular Weir</b> 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

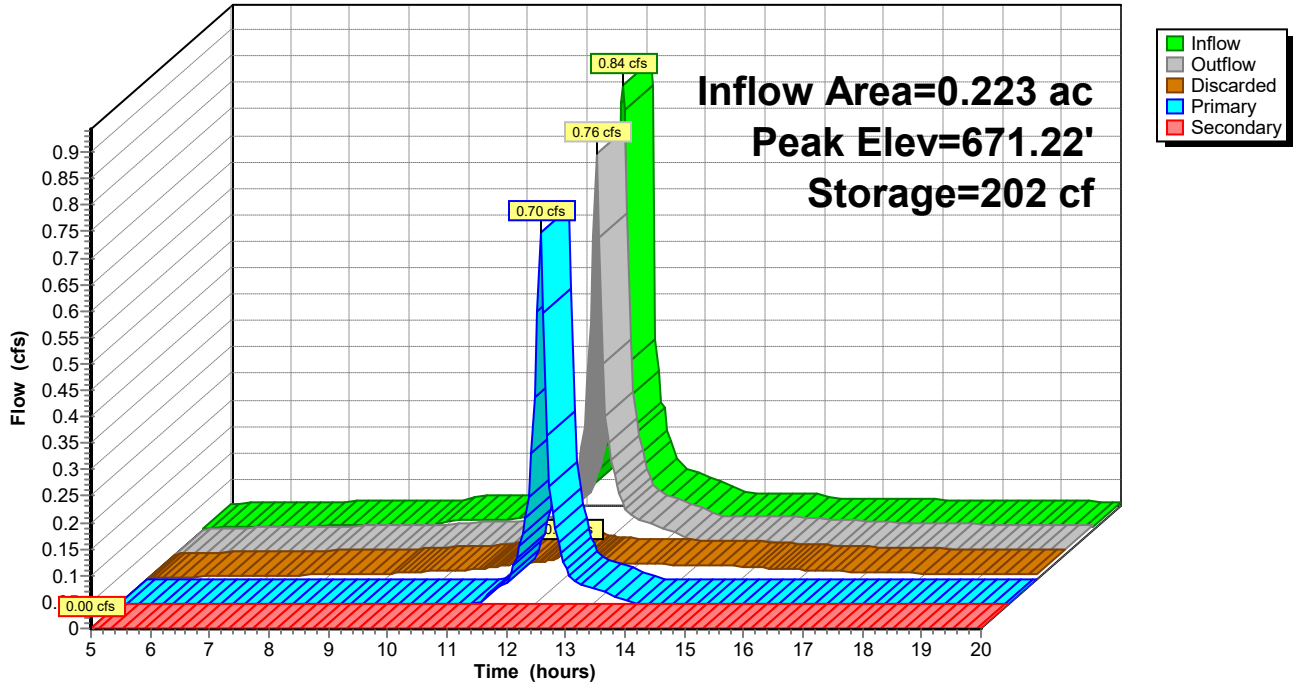
**Discarded OutFlow** Max=0.05 cfs @ 12.10 hrs HW=671.22' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

**Primary OutFlow** Max=0.70 cfs @ 12.10 hrs HW=671.22' TW=668.19' (Dynamic Tailwater)  
 ↑2=Orifice/Grate (Weir Controls 0.70 cfs @ 1.53 fps)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=670.66' TW=0.00' (Dynamic Tailwater)  
 ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 1P: North Pond

Hydrograph



### Summary for Pond 3P: CB 2

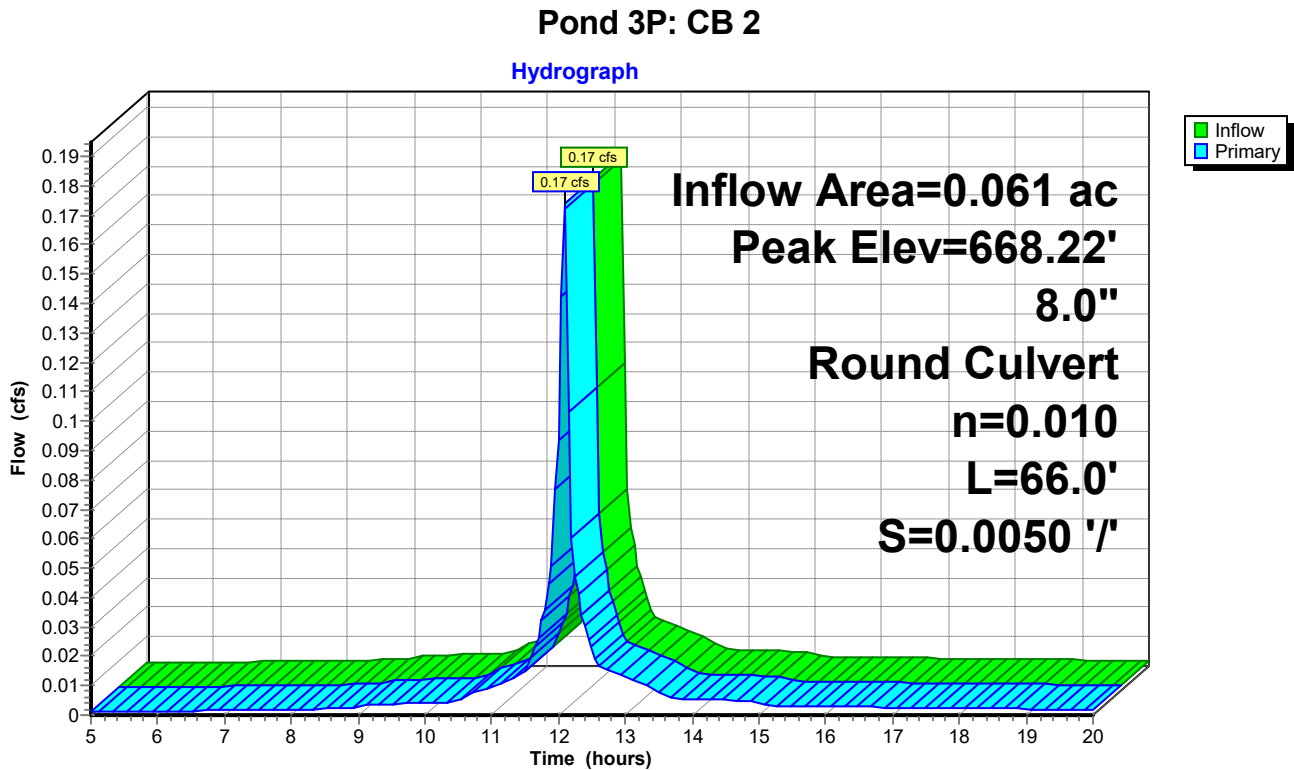
[82] Warning: Early inflow requires earlier time span  
 [57] Hint: Peaked at 668.22' (Flood elevation advised)

Inflow Area = 0.061 ac, 63.48% Impervious, Inflow Depth > 1.80" for 2-Year event  
 Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.009 af  
 Outflow = 0.17 cfs @ 12.09 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.17 cfs @ 12.09 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 668.22' @ 12.14 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	667.80'	<b>8.0" Round Culvert</b> L= 66.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 667.80' / 667.47' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

**Primary OutFlow** Max=0.00 cfs @ 12.09 hrs HW=668.16' TW=668.17' (Dynamic Tailwater)  
 ↑1=Culvert ( Controls 0.00 cfs)



### Summary for Pond 4P: CB 1

[57] Hint: Peaked at 668.19' (Flood elevation advised)

[80] Warning: Exceeded Pond 3P by 0.02' @ 12.10 hrs (0.09 cfs 0.000 af)

Inflow Area = 0.475 ac, 77.79% Impervious, Inflow Depth > 1.58" for 2-Year event  
 Inflow = 1.00 cfs @ 12.10 hrs, Volume= 0.062 af  
 Outflow = 1.00 cfs @ 12.10 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.00 cfs @ 12.10 hrs, Volume= 0.062 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 668.19' @ 12.10 hrs

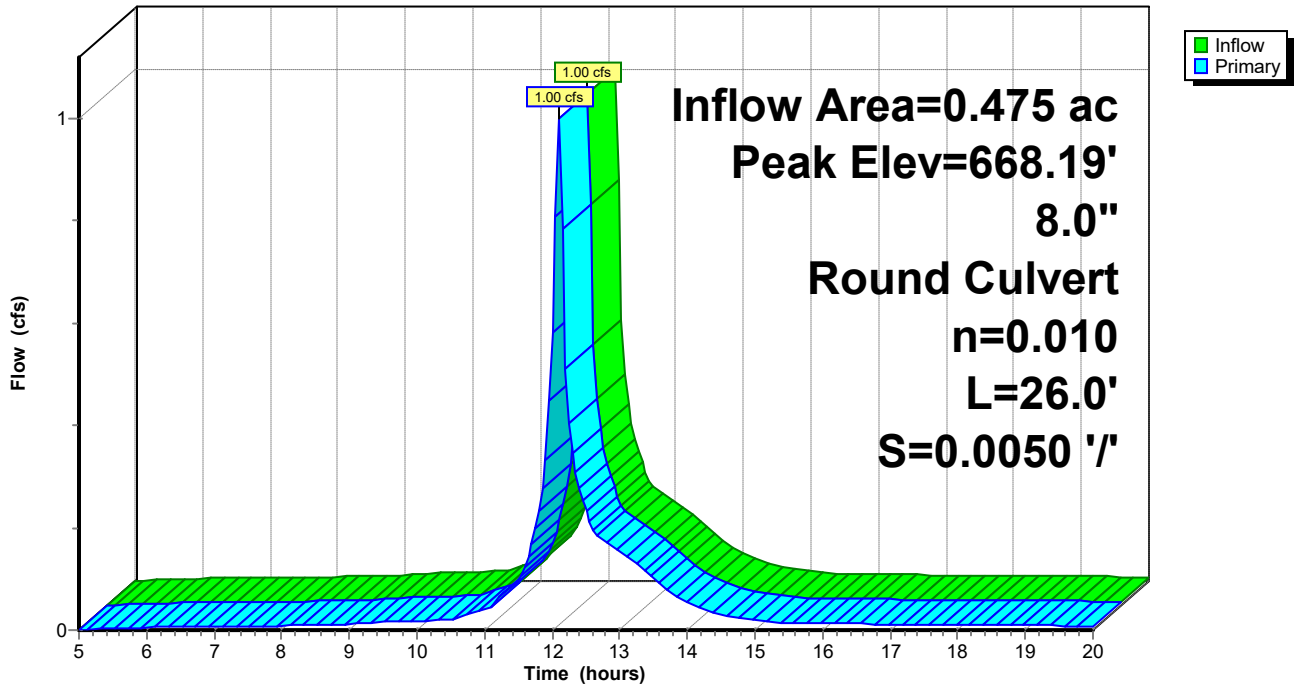
Device #	Routing	Invert	Outlet Devices
#1	Primary	667.47'	<b>8.0" Round Culvert</b> L= 26.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 667.47' / 667.34' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

**Primary OutFlow** Max=1.00 cfs @ 12.10 hrs HW=668.19' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 1.00 cfs @ 3.29 fps)

### Pond 4P: CB 1

Hydrograph



**Summary for Pond 5P: East Pond**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.192 ac, 71.91% Impervious, Inflow Depth > 2.00" for 2-Year event  
 Inflow = 0.62 cfs @ 12.07 hrs, Volume= 0.032 af  
 Outflow = 0.14 cfs @ 12.28 hrs, Volume= 0.032 af, Atten= 78%, Lag= 13.0 min  
 Discarded = 0.00 cfs @ 12.28 hrs, Volume= 0.000 af  
 Primary = 0.13 cfs @ 12.28 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 670.71' @ 12.28 hrs Surf.Area= 334 sf Storage= 415 cf

Plug-Flow detention time= 31.3 min calculated for 0.032 af (99% of inflow)  
 Center-of-Mass det. time= 27.8 min ( 769.3 - 741.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	954 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
669.00	163	0	0
670.00	251	207	207
671.00	367	309	516
672.00	509	438	954

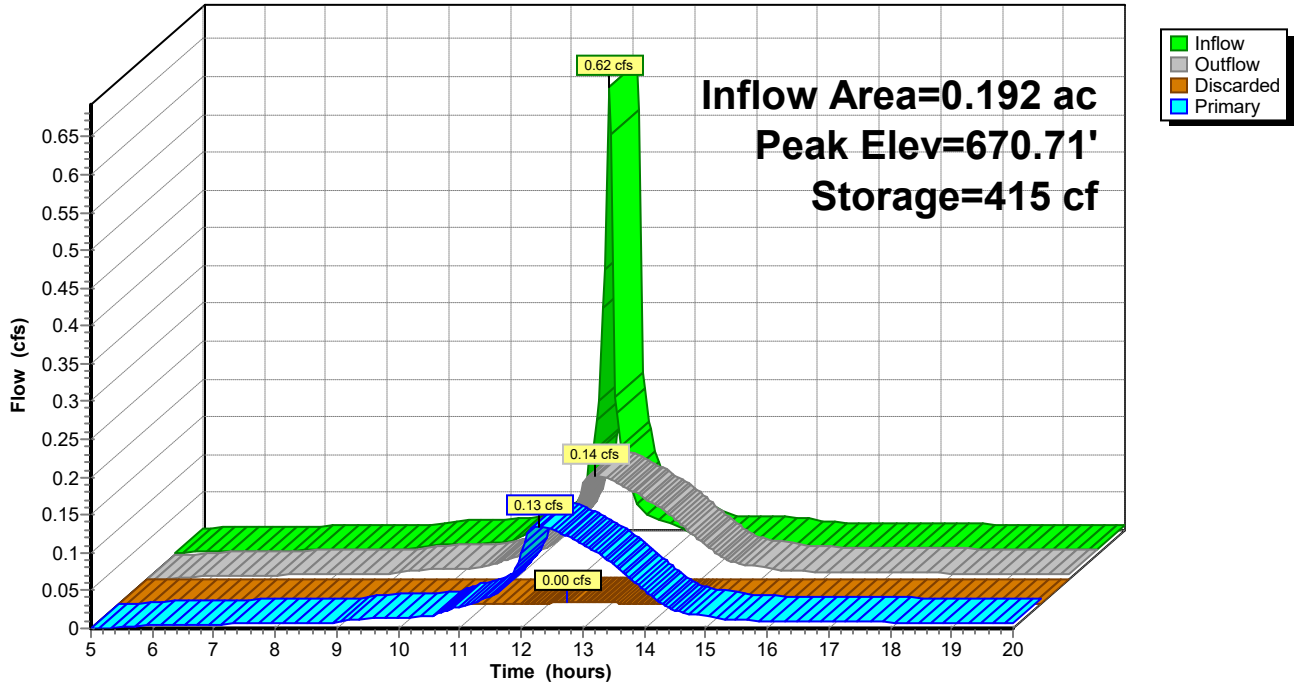
Device	Routing	Invert	Outlet Devices
#1	Discarded	669.00'	<b>0.510 in/hr Exfiltration over Surface area above 669.00'</b> Excluded Surface area = 163 sf
#2	Primary	669.00'	<b>6.0" Round Culvert</b> L= 147.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 669.00' / 667.47' S= 0.0104 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	669.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 12.28 hrs HW=670.71' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.13 cfs @ 12.28 hrs HW=670.71' TW=667.85' (Dynamic Tailwater)  
 ↑2=Culvert (Passes 0.13 cfs of 0.92 cfs potential flow)  
 ↑3=Orifice/Grate (Orifice Controls 0.13 cfs @ 6.14 fps)

### Pond 5P: East Pond

#### Hydrograph





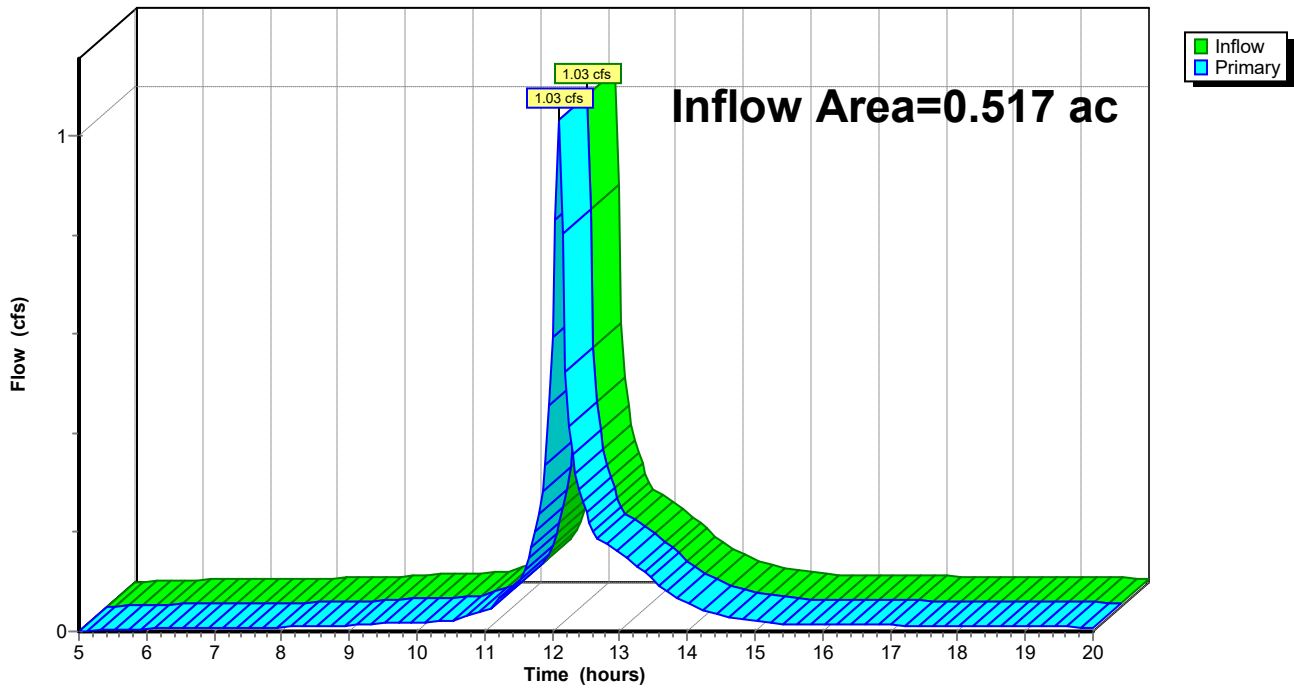
### Summary for Link 1L: Output

Inflow Area = 0.517 ac, 71.96% Impervious, Inflow Depth > 1.49" for 2-Year event  
Inflow = 1.03 cfs @ 12.10 hrs, Volume= 0.064 af  
Primary = 1.03 cfs @ 12.10 hrs, Volume= 0.064 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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MSE 24-hr 4 10-Year Rainfall=4.46"

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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-Q  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: S1** Runoff Area=9,696 sf 86.76% Impervious Runoff Depth>3.61"  
Flow Length=130' Tc=1.6 min CN=WQ Runoff=1.29 cfs 0.067 af

**Subcatchment 2S: S2** Runoff Area=8,347 sf 71.91% Impervious Runoff Depth>3.16"  
Flow Length=200' Tc=1.2 min CN=WQ Runoff=0.98 cfs 0.050 af

**Subcatchment 3S: SE BLDG** Runoff Area=1,813 sf 5.41% Impervious Runoff Depth>1.14"  
Flow Length=10' Slope=0.0100 '/' Tc=2.1 min CN=WQ Runoff=0.09 cfs 0.004 af

**Subcatchment 4S: West Parking** Runoff Area=2,648 sf 63.48% Impervious Runoff Depth>2.90"  
Flow Length=37' Tc=2.9 min CN=WQ Runoff=0.28 cfs 0.015 af

**Pond 1P: North Pond** Peak Elev=671.31' Storage=275 cf Inflow=1.29 cfs 0.067 af  
Discarded=0.07 cfs 0.027 af Primary=0.94 cfs 0.039 af Secondary=0.04 cfs 0.000 af Outflow=1.05 cfs 0.066 af

**Pond 3P: CB 2** Peak Elev=668.51' Inflow=0.28 cfs 0.015 af  
8.0" Round Culvert n=0.010 L=66.0' S=0.0050 '/' Outflow=0.28 cfs 0.015 af

**Pond 4P: CB 1** Peak Elev=668.50' Inflow=1.37 cfs 0.103 af  
8.0" Round Culvert n=0.010 L=26.0' S=0.0050 '/' Outflow=1.37 cfs 0.103 af

**Pond 5P: East Pond** Peak Elev=671.55' Storage=740 cf Inflow=0.98 cfs 0.050 af  
Discarded=0.00 cfs 0.001 af Primary=0.17 cfs 0.050 af Outflow=0.17 cfs 0.050 af

**Link 1L: Output** Inflow=1.50 cfs 0.107 af  
Primary=1.50 cfs 0.107 af

**Total Runoff Area = 0.517 ac Runoff Volume = 0.136 af Average Runoff Depth = 3.16"**  
**28.04% Pervious = 0.145 ac 71.96% Impervious = 0.372 ac**

### Summary for Subcatchment 1S: S1

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

Runoff = 1.29 cfs @ 12.07 hrs, Volume= 0.067 af, Depth> 3.61"

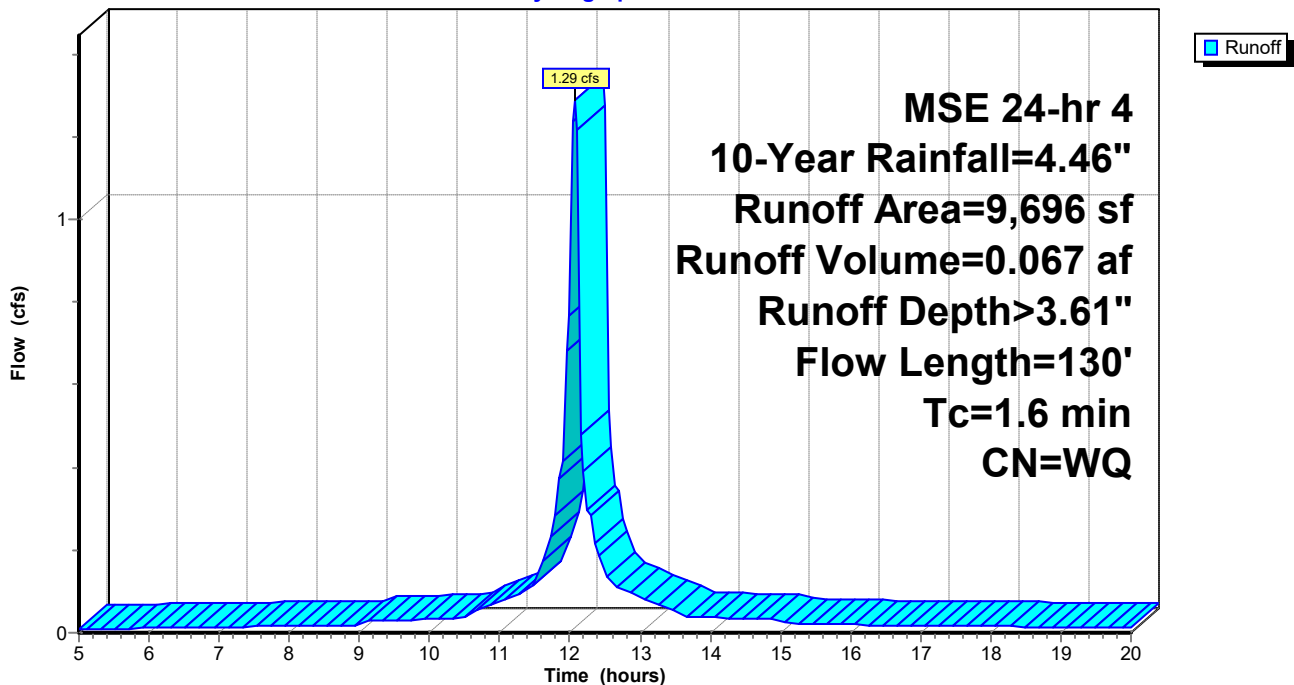
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 10-Year Rainfall=4.46"

Area (sf)	CN	Description
0	98	Roofs, HSG B
* 793	98	Concrete, HSG B
7,619	98	Paved parking, HSG B
1,284	61	>75% Grass cover, Good, HSG B
9,696		Weighted Average
1,284		13.24% Pervious Area
8,412		86.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	60	0.0200	1.19		<b>Sheet Flow, Pavement</b> Smooth surfaces n= 0.011 P2= 2.94"
0.8	70	0.0100	1.50		<b>Shallow Concentrated Flow, Swale</b> Grassed Waterway Kv= 15.0 fps
1.6	130	Total			

### Subcatchment 1S: S1

Hydrograph



### Summary for Subcatchment 2S: S2

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.050 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 10-Year Rainfall=4.46"

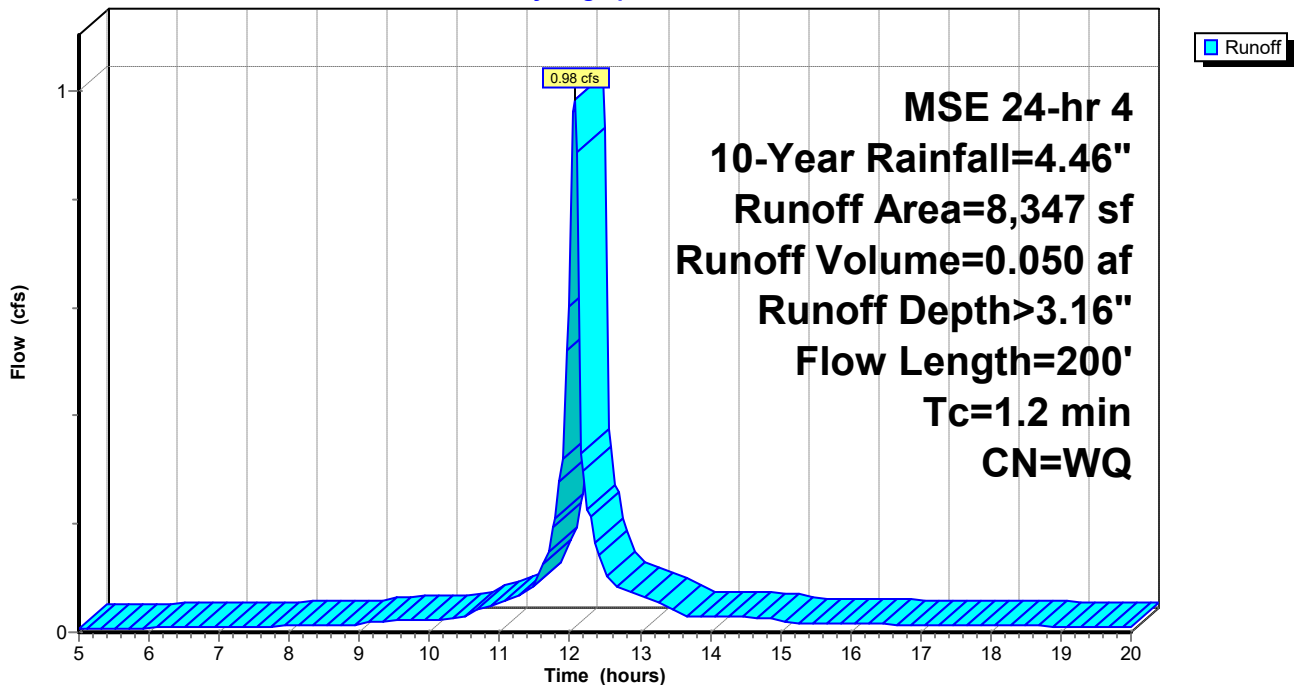
Area (sf)	CN	Description
5,765	98	Roofs, HSG B
0	98	Paved parking, HSG B
* 237	98	Concrete, HSG B
2,345	61	>75% Grass cover, Good, HSG B
8,347		Weighted Average
2,345		28.09% Pervious Area
6,002		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.5000	3.62		<b>Sheet Flow, Roof</b> Smooth surfaces n= 0.011 P2= 2.94"
1.1	175	0.0050	2.63	0.52	<b>Pipe Channel,</b> 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.2	200	Total			

### Subcatchment 2S: S2

Hydrograph



### Summary for Subcatchment 3S: SE BLDG

[49] Hint:  $T_c < 2dt$  may require smaller dt

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 1.14"

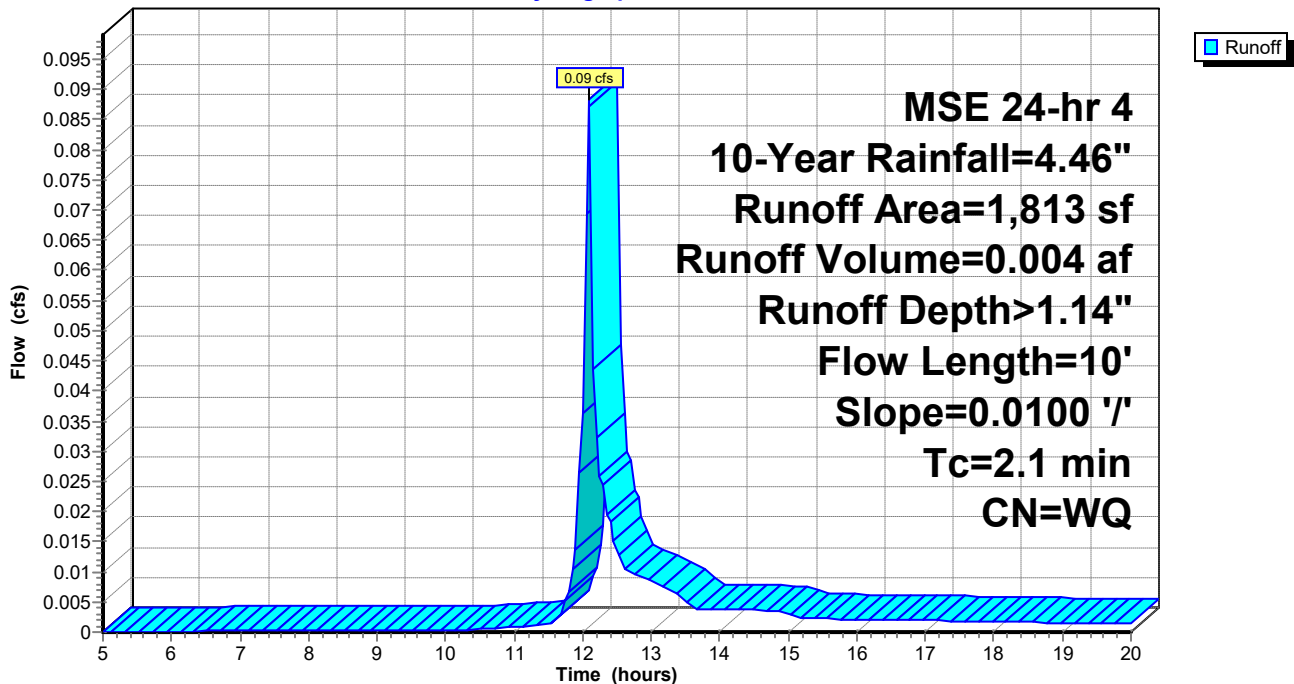
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 10-Year Rainfall=4.46"

Area (sf)	CN	Description
* 98	98	Concrete, HSG B
1,715	61	>75% Grass cover, Good, HSG B
1,813		Weighted Average
1,715		94.59% Pervious Area
98		5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	10	0.0100	0.08		Sheet Flow, Grass Grass: Short n= 0.150 P2= 2.94"

### Subcatchment 3S: SE BLDG

Hydrograph



**Summary for Subcatchment 4S: West Parking**

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

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.015 af, Depth> 2.90"

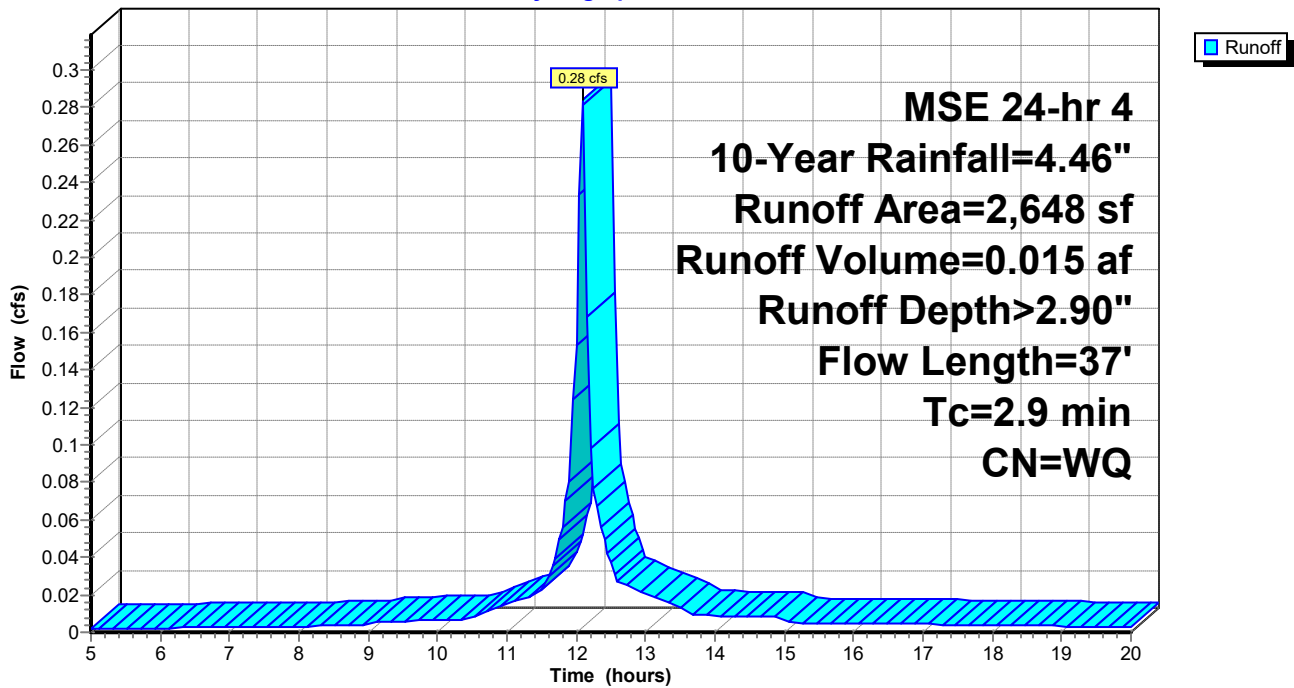
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 4 10-Year Rainfall=4.46"

Area (sf)	CN	Description
1,126	98	Roofs, HSG B
* 555	98	Concrete, HSG A
967	61	>75% Grass cover, Good, HSG B
2,648		Weighted Average
967		36.52% Pervious Area
1,681		63.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	11	0.0100	0.08		<b>Sheet Flow, Grass</b> Grass: Short n= 0.150 P2= 2.94"
0.1	4	0.0200	0.69		<b>Sheet Flow, Sidewalk</b> Smooth surfaces n= 0.011 P2= 2.94"
0.5	22	0.0100	0.74		<b>Sheet Flow, Parking Lot</b> Smooth surfaces n= 0.011 P2= 2.94"
2.9	37	Total			

**Subcatchment 4S: West Parking**

Hydrograph



### Summary for Pond 1P: North Pond

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.223 ac, 86.76% Impervious, Inflow Depth > 3.61" for 10-Year event  
 Inflow = 1.29 cfs @ 12.07 hrs, Volume= 0.067 af  
 Outflow = 1.05 cfs @ 12.10 hrs, Volume= 0.066 af, Atten= 19%, Lag= 1.9 min  
 Discarded = 0.07 cfs @ 12.10 hrs, Volume= 0.027 af  
 Primary = 0.94 cfs @ 12.11 hrs, Volume= 0.039 af  
 Secondary = 0.04 cfs @ 12.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 671.31' @ 12.11 hrs Surf.Area= 869 sf Storage= 275 cf

Plug-Flow detention time= 18.3 min calculated for 0.066 af (99% of inflow)  
 Center-of-Mass det. time= 14.3 min ( 750.5 - 736.2 )

Volume	Invert	Avail.Storage	Storage Description	
#1	670.65'	1,575 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
670.65	65	0.0	0	0
671.00	400	100.0	81	81
671.29	800	100.0	174	255
672.00	2,918	100.0	1,320	1,575

Device	Routing	Invert	Outlet Devices
#1	Discarded	670.65'	<b>3.600 in/hr Exfiltration over Horizontal area above 670.65'</b> Excluded Horizontal area = 65 sf Phase-In= 0.01'
#2	Primary	671.00'	<b>8.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	671.29'	<b>5.0' long x 3.0' breadth Broad-Crested Rectangular Weir</b> 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

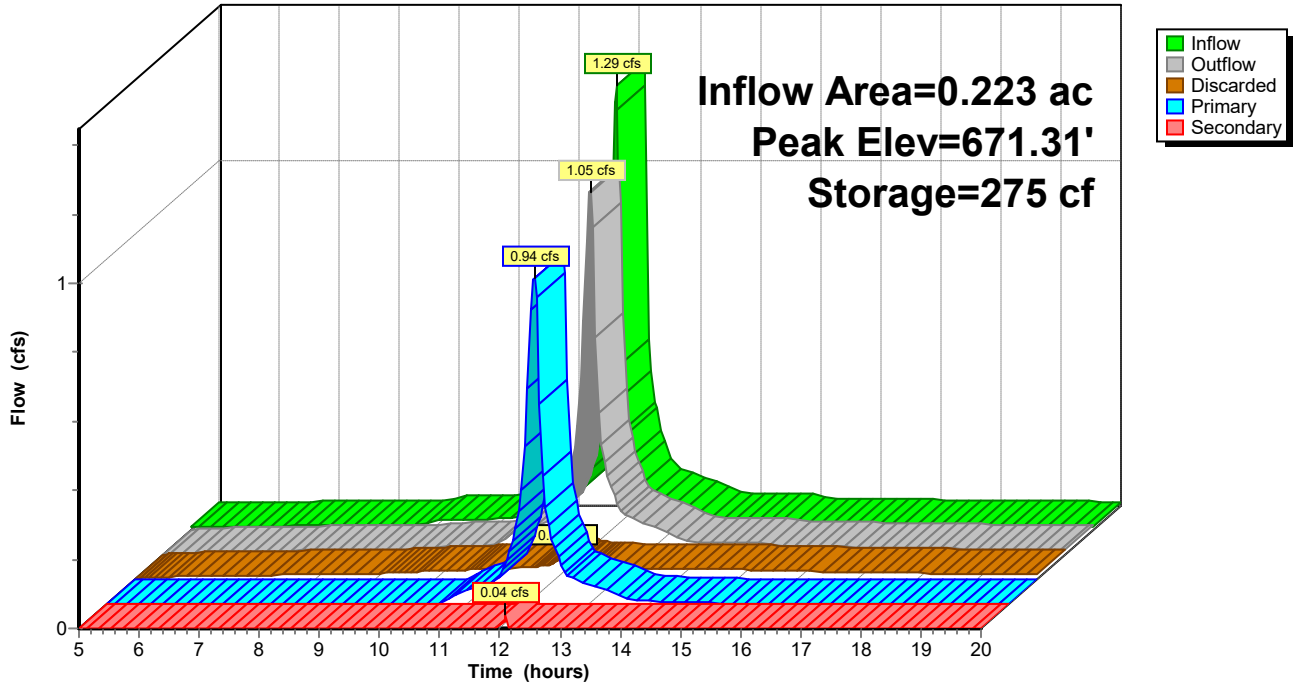
**Discarded OutFlow** Max=0.07 cfs @ 12.10 hrs HW=671.31' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.07 cfs)

**Primary OutFlow** Max=0.93 cfs @ 12.11 hrs HW=671.31' TW=668.48' (Dynamic Tailwater)  
 ↑2=Orifice/Grate (Orifice Controls 0.93 cfs @ 2.67 fps)

**Secondary OutFlow** Max=0.04 cfs @ 12.10 hrs HW=671.31' TW=0.00' (Dynamic Tailwater)  
 ↑3=Broad-Crested Rectangular Weir (Weir Controls 0.04 cfs @ 0.37 fps)

### Pond 1P: North Pond

Hydrograph





### Summary for Pond 3P: CB 2

[82] Warning: Early inflow requires earlier time span

[57] Hint: Peaked at 668.51' (Flood elevation advised)

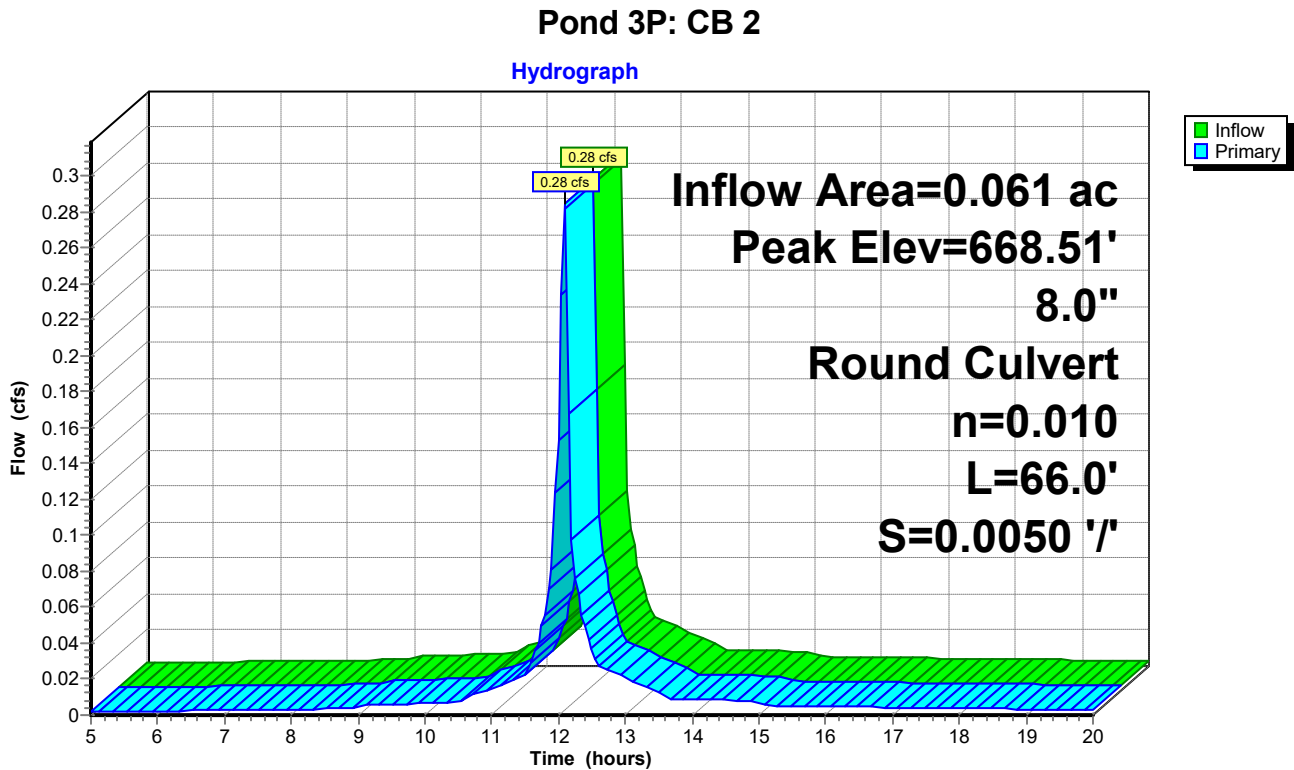
Inflow Area = 0.061 ac, 63.48% Impervious, Inflow Depth > 2.90" for 10-Year event  
 Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.015 af  
 Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 668.51' @ 12.14 hrs

Device #	Routing	Invert	Outlet Devices
#1	Primary	667.80'	<b>8.0" Round Culvert</b> L= 66.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 667.80' / 667.47' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

**Primary OutFlow** Max=0.00 cfs @ 12.09 hrs HW=668.40' TW=668.47' (Dynamic Tailwater)  
 ↑1=Culvert ( Controls 0.00 cfs)



### Summary for Pond 4P: CB 1

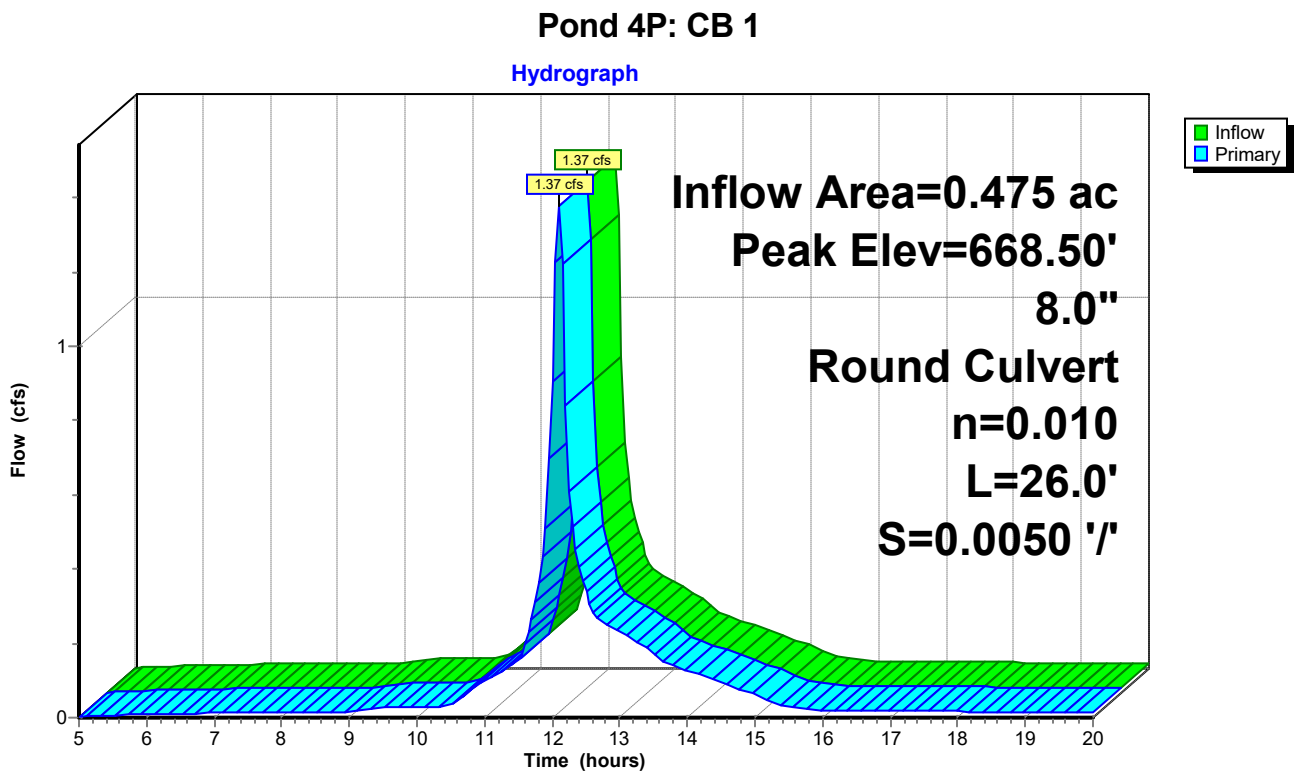
[82] Warning: Early inflow requires earlier time span  
 [57] Hint: Peaked at 668.50' (Flood elevation advised)  
 [80] Warning: Exceeded Pond 3P by 0.16' @ 12.05 hrs (0.47 cfs 0.003 af)

Inflow Area = 0.475 ac, 77.79% Impervious, Inflow Depth > 2.60" for 10-Year event  
 Inflow = 1.37 cfs @ 12.10 hrs, Volume= 0.103 af  
 Outflow = 1.37 cfs @ 12.10 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.37 cfs @ 12.10 hrs, Volume= 0.103 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 668.50' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	667.47'	<b>8.0" Round Culvert</b> L= 26.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 667.47' / 667.34' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

**Primary OutFlow** Max=1.37 cfs @ 12.10 hrs HW=668.49' TW=0.00' (Dynamic Tailwater)  
 ←1=Culvert (Barrel Controls 1.37 cfs @ 3.93 fps)



### Summary for Pond 5P: East Pond

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.192 ac, 71.91% Impervious, Inflow Depth > 3.16" for 10-Year event  
 Inflow = 0.98 cfs @ 12.07 hrs, Volume= 0.050 af  
 Outflow = 0.17 cfs @ 12.36 hrs, Volume= 0.050 af, Atten= 83%, Lag= 17.9 min  
 Discarded = 0.00 cfs @ 12.36 hrs, Volume= 0.001 af  
 Primary = 0.17 cfs @ 12.36 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 671.55' @ 12.36 hrs Surf.Area= 445 sf Storage= 740 cf

Plug-Flow detention time= 41.5 min calculated for 0.050 af (99% of inflow)  
 Center-of-Mass det. time= 38.6 min ( 778.9 - 740.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	954 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
669.00	163	0	0
670.00	251	207	207
671.00	367	309	516
672.00	509	438	954

Device	Routing	Invert	Outlet Devices
#1	Discarded	669.00'	<b>0.510 in/hr Exfiltration over Surface area above 669.00'</b> Excluded Surface area = 163 sf
#2	Primary	669.00'	<b>6.0" Round Culvert</b> L= 147.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 669.00' / 667.47' S= 0.0104 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	669.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Discarded OutFlow** Max=0.00 cfs @ 12.36 hrs HW=671.55' (Free Discharge)

↑1=**Exfiltration** (Exfiltration Controls 0.00 cfs)

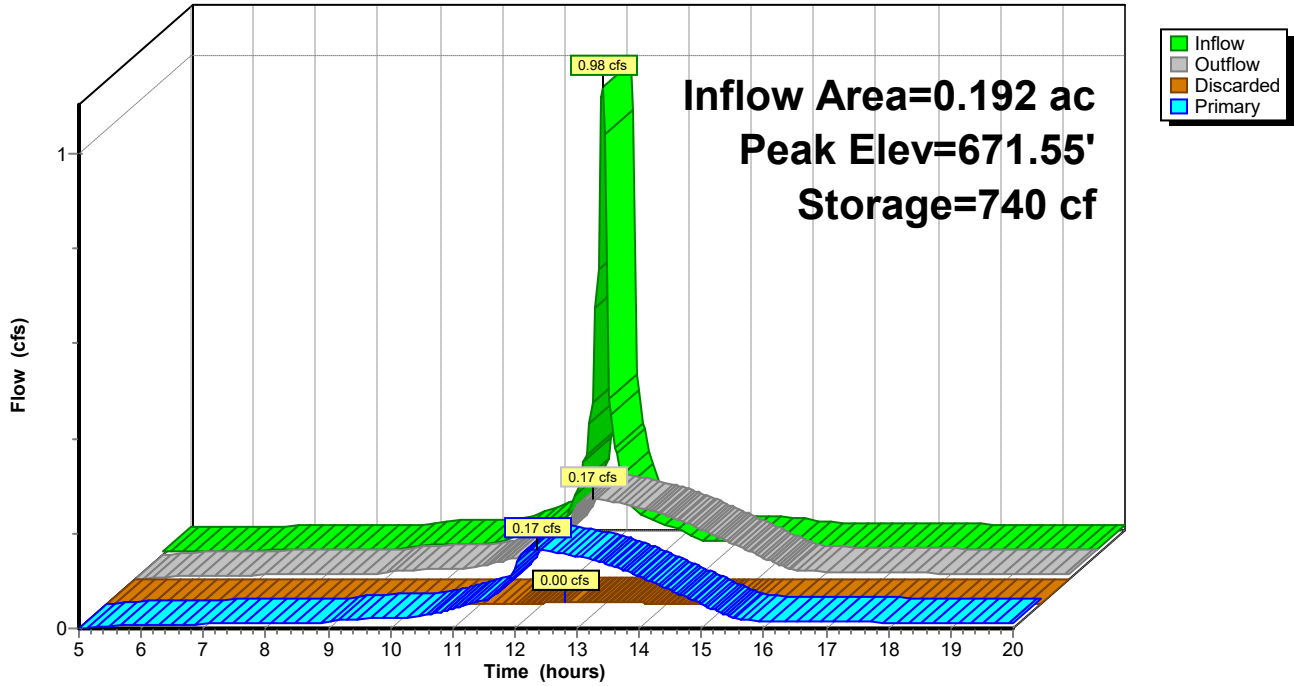
**Primary OutFlow** Max=0.16 cfs @ 12.36 hrs HW=671.55' TW=667.89' (Dynamic Tailwater)

↑2=**Culvert** (Passes 0.16 cfs of 1.05 cfs potential flow)

↑3=**Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.56 fps)

### Pond 5P: East Pond

#### Hydrograph



### Summary for Link 1L: Output

Inflow Area = 0.517 ac, 71.96% Impervious, Inflow Depth > 2.49" for 10-Year event  
Inflow = 1.50 cfs @ 12.10 hrs, Volume= 0.107 af  
Primary = 1.50 cfs @ 12.10 hrs, Volume= 0.107 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

