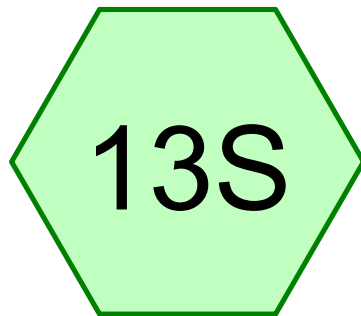
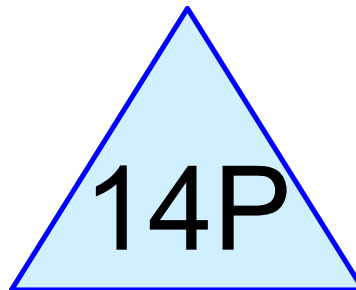
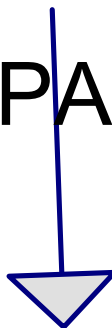
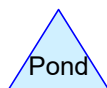
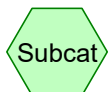




EX PARK



PR OUTLET



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	1.86	2
2	2-yr	Type II 24-hr		Default	24.00	1	2.17	2
3	5-yr	Type II 24-hr		Default	24.00	1	2.66	2
4	10-yr	Type II 24-hr		Default	24.00	1	3.12	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.010	39	>75% Grass cover, Good, HSG A (13S)
6.130	98	Paved parking, HSG A (13S)

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Type II 24-hr 1-yr Rainfall=1.86"

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Summary for Subcatchment 13S: EX PARK

Runoff = 1.30 cfs @ 12.12 hrs, Volume= 0.170 af, Depth> 0.17"
 Routed to Pond 14P : PR OUTLET

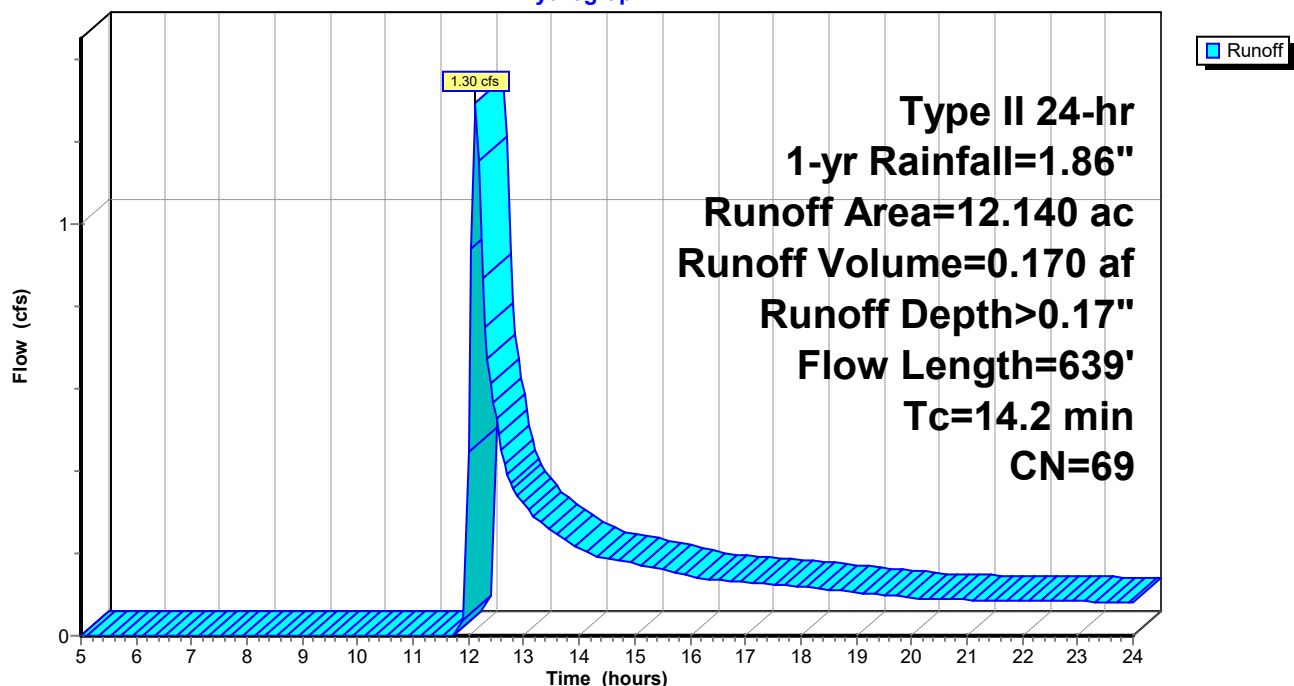
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1-yr Rainfall=1.86"

Area (ac)	CN	Description
6.010	39	>75% Grass cover, Good, HSG A
6.130	98	Paved parking, HSG A
12.140	69	Weighted Average
6.010		49.51% Pervious Area
6.130		50.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.17"
1.5	88	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	451	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
14.2	639	Total			

Subcatchment 13S: EX PARK

Hydrograph



1780-26 HydroCAD - MT Model

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Type II 24-hr 1-yr Rainfall=1.86"

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Summary for Pond 14P: PR OUTLET

Inflow Area = 12.140 ac, 50.49% Impervious, Inflow Depth > 0.17" for 1-yr event
 Inflow = 1.30 cfs @ 12.12 hrs, Volume= 0.170 af
 Outflow = 1.01 cfs @ 12.22 hrs, Volume= 0.170 af, Atten= 22%, Lag= 5.6 min
 Discarded = 0.04 cfs @ 12.22 hrs, Volume= 0.012 af
 Primary = 0.97 cfs @ 12.22 hrs, Volume= 0.158 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 610.99' @ 12.22 hrs Surf.Area= 615 sf Storage= 306 cf

Plug-Flow detention time= 3.1 min calculated for 0.170 af (100% of inflow)

Center-of-Mass det. time= 2.4 min (950.7 - 948.3)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	13,016 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	3	0	0
611.00	621	312	312
612.00	2,132	1,377	1,689
613.00	5,917	4,025	5,713
614.00	8,689	7,303	13,016

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	12.0" Round Culvert L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 610.00' / 609.00' S= 0.0154 ' S= 0.0154 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	610.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.00 2.30 Width (feet) 0.30 0.30 0.80 0.80
#3	Device 1	612.30'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.30'	8.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#5	Discarded	610.00'	3.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.04 cfs @ 12.22 hrs HW=610.98' (Free Discharge)↑ **5=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=0.96 cfs @ 12.22 hrs HW=610.98' (Free Discharge)↑ **1=Culvert** (Passes 0.96 cfs of 2.64 cfs potential flow)↑ **2=Custom Weir/Orifice** (Weir Controls 0.96 cfs @ 3.25 fps)↑ **3=Orifice/Grate** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=610.00' (Free Discharge)↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

1780-26 HydroCAD - MT Model

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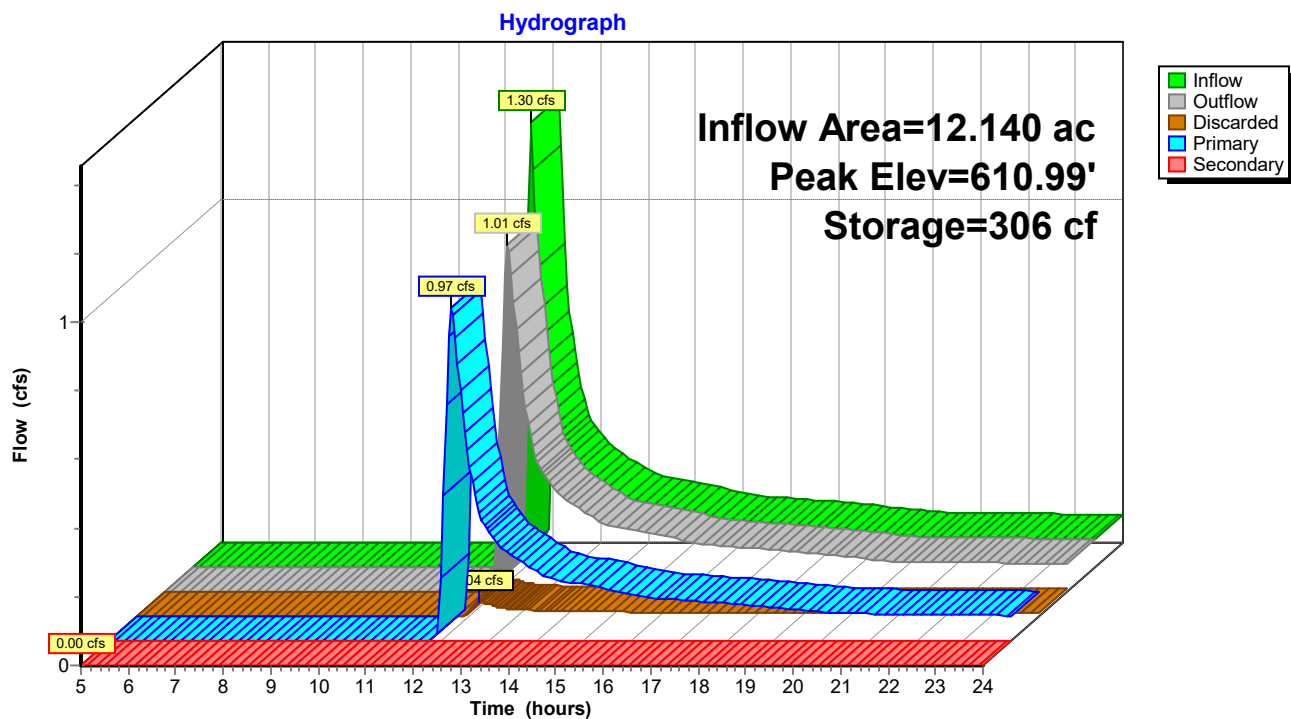
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Type II 24-hr 1-yr Rainfall=1.86"

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Pond 14P: PR OUTLET



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Type II 24-hr 2-yr Rainfall=2.17"

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Summary for Subcatchment 13S: EX PARK

Runoff = 2.97 cfs @ 12.11 hrs, Volume= 0.282 af, Depth> 0.28"
 Routed to Pond 14P : PR OUTLET

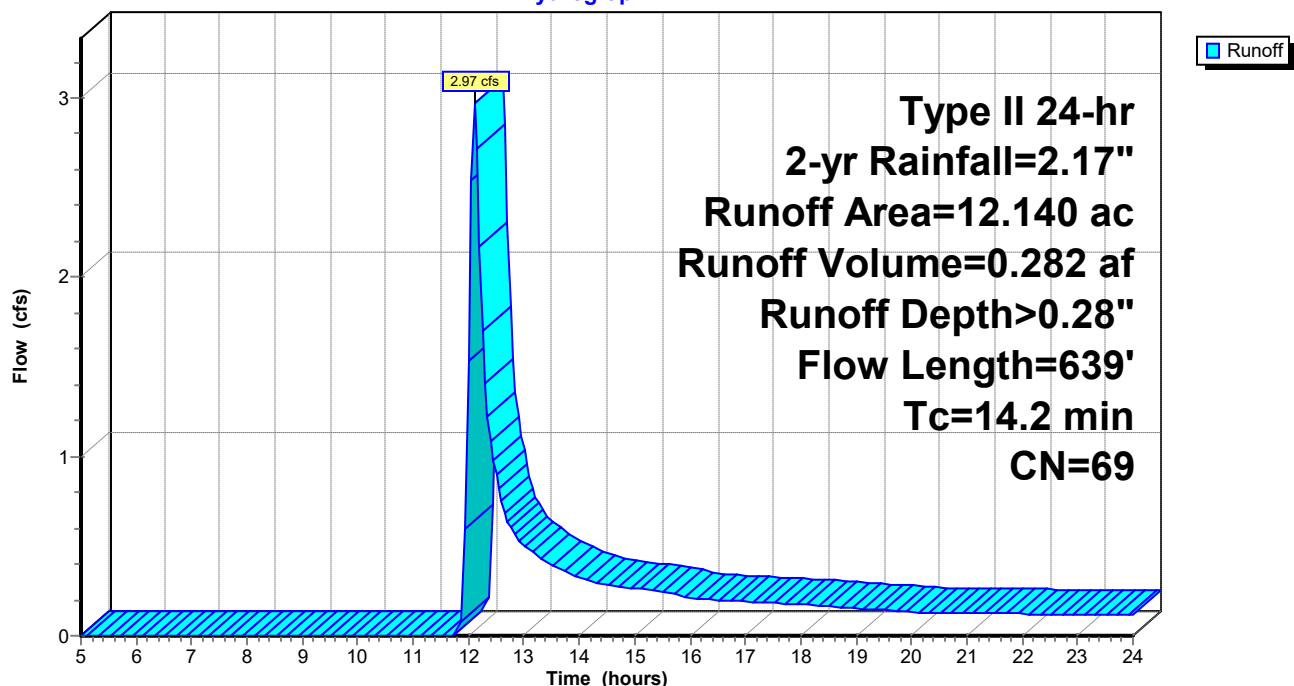
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.17"

Area (ac)	CN	Description
6.010	39	>75% Grass cover, Good, HSG A
6.130	98	Paved parking, HSG A
12.140	69	Weighted Average
6.010		49.51% Pervious Area
6.130		50.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.17"
1.5	88	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	451	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
14.2	639	Total			

Subcatchment 13S: EX PARK

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.17"

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Summary for Pond 14P: PR OUTLET

Inflow Area = 12.140 ac, 50.49% Impervious, Inflow Depth > 0.28" for 2-yr event
 Inflow = 2.97 cfs @ 12.11 hrs, Volume= 0.282 af
 Outflow = 2.32 cfs @ 12.19 hrs, Volume= 0.281 af, Atten= 22%, Lag= 5.1 min
 Discarded = 0.09 cfs @ 12.19 hrs, Volume= 0.017 af
 Primary = 2.23 cfs @ 12.19 hrs, Volume= 0.264 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 611.45' @ 12.19 hrs Surf.Area= 1,308 sf Storage= 751 cf

Plug-Flow detention time= 3.8 min calculated for 0.281 af (100% of inflow)

Center-of-Mass det. time= 3.0 min (925.6 - 922.5)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	13,016 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	3	0	0
611.00	621	312	312
612.00	2,132	1,377	1,689
613.00	5,917	4,025	5,713
614.00	8,689	7,303	13,016

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	12.0" Round Culvert L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 610.00' / 609.00' S= 0.0154 ' S= 0.0154 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	610.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.00 2.30 Width (feet) 0.30 0.30 0.80 0.80
#3	Device 1	612.30'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.30'	8.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#5	Discarded	610.00'	3.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.09 cfs @ 12.19 hrs HW=611.45' (Free Discharge)↑ **5=Exfiltration** (Exfiltration Controls 0.09 cfs)**Primary OutFlow** Max=2.21 cfs @ 12.19 hrs HW=611.45' (Free Discharge)↑ **1=Culvert** (Passes 2.21 cfs of 3.69 cfs potential flow)↑ **2=Custom Weir/Orifice** (Weir Controls 2.21 cfs @ 3.35 fps)↑ **3=Orifice/Grate** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=610.00' (Free Discharge)↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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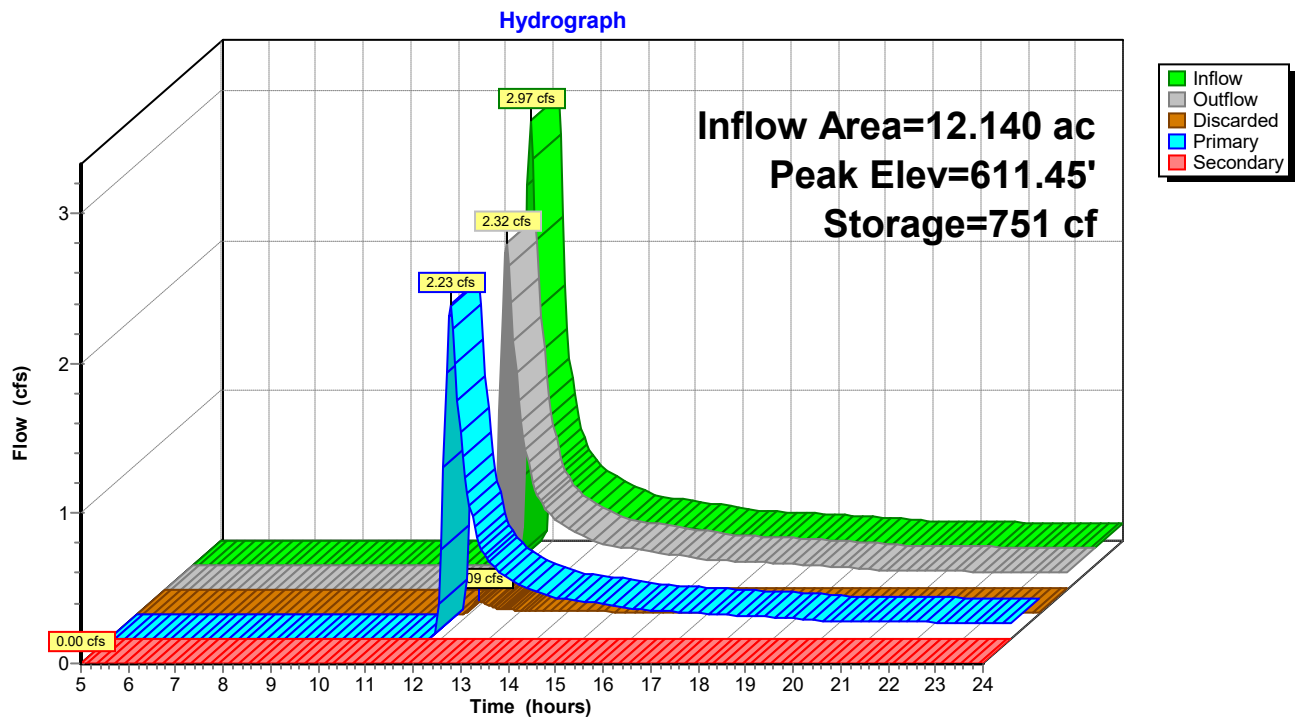
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Type II 24-hr 2-yr Rainfall=2.17"

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Pond 14P: PR OUTLET



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Type II 24-hr 5-yr Rainfall=2.66"

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Summary for Subcatchment 13S: EX PARK

Runoff = 6.50 cfs @ 12.09 hrs, Volume= 0.499 af, Depth> 0.49"
 Routed to Pond 14P : PR OUTLET

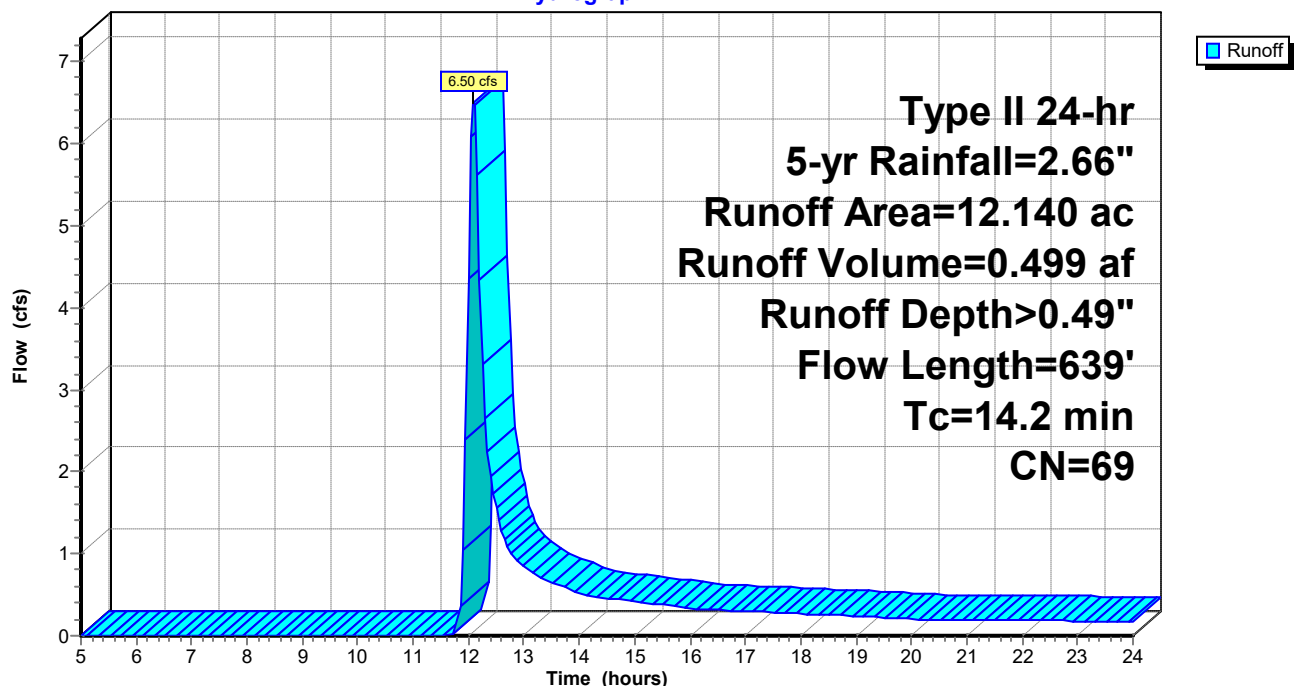
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 5-yr Rainfall=2.66"

Area (ac)	CN	Description
6.010	39	>75% Grass cover, Good, HSG A
6.130	98	Paved parking, HSG A
12.140	69	Weighted Average
6.010		49.51% Pervious Area
6.130		50.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.17"
1.5	88	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	451	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
14.2	639	Total			

Subcatchment 13S: EX PARK

Hydrograph



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Type II 24-hr 5-yr Rainfall=2.66"

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Summary for Pond 14P: PR OUTLET

Inflow Area = 12.140 ac, 50.49% Impervious, Inflow Depth > 0.49" for 5-yr event
 Inflow = 6.50 cfs @ 12.09 hrs, Volume= 0.499 af
 Outflow = 4.89 cfs @ 12.18 hrs, Volume= 0.498 af, Atten= 25%, Lag= 5.3 min
 Discarded = 0.17 cfs @ 12.18 hrs, Volume= 0.025 af
 Primary = 4.73 cfs @ 12.18 hrs, Volume= 0.473 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 612.07' @ 12.18 hrs Surf.Area= 2,404 sf Storage= 1,852 cf

Plug-Flow detention time= 4.5 min calculated for 0.497 af (100% of inflow)
 Center-of-Mass det. time= 3.8 min (901.6 - 897.9)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	13,016 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	3	0	0
611.00	621	312	312
612.00	2,132	1,377	1,689
613.00	5,917	4,025	5,713
614.00	8,689	7,303	13,016

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	12.0" Round Culvert L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 610.00' / 609.00' S= 0.0154 ' S= 0.0154 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	610.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.00 2.30 Width (feet) 0.30 0.30 0.80 0.80
#3	Device 1	612.30'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.30'	8.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#5	Discarded	610.00'	3.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.16 cfs @ 12.18 hrs HW=612.06' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=4.70 cfs @ 12.18 hrs HW=612.06' (Free Discharge)

↑ **1=Culvert** (Passes 4.70 cfs of 4.73 cfs potential flow)

↑ **2=Custom Weir/Orifice** (Weir Controls 4.70 cfs @ 4.09 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=610.00' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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Prepared by Marathon Engineering

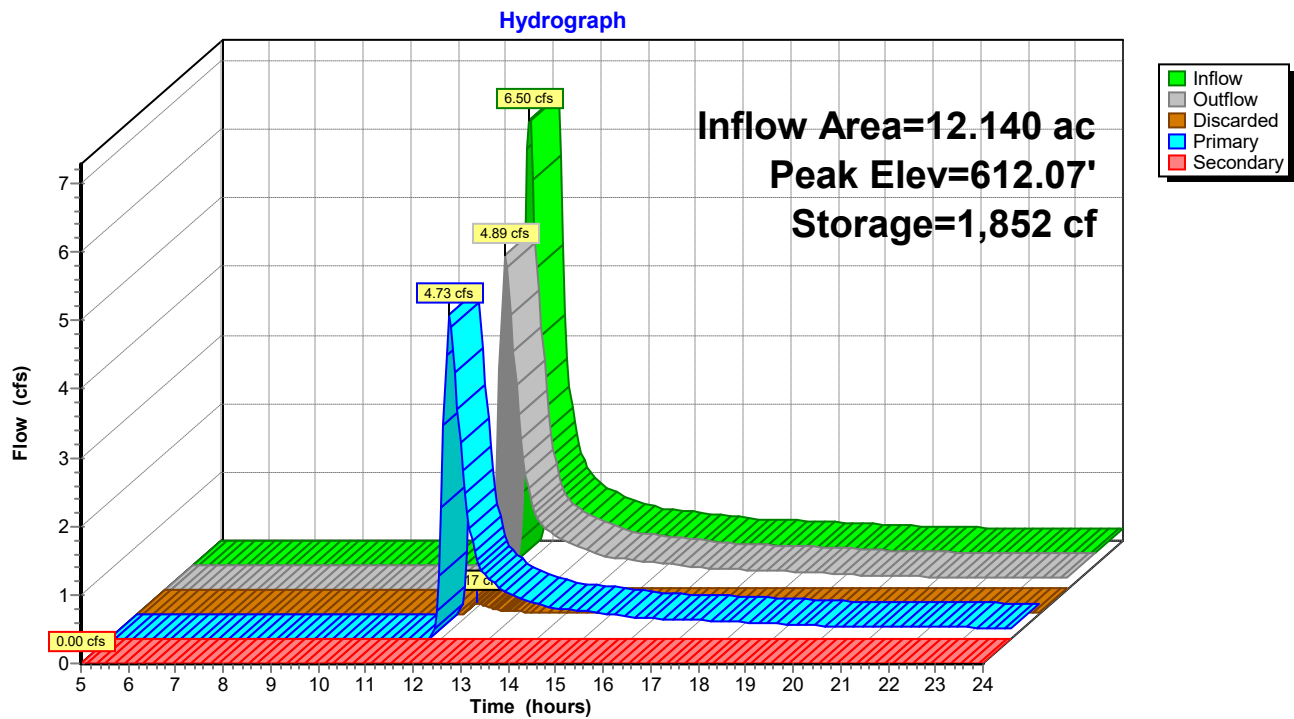
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Type II 24-hr 5-yr Rainfall=2.66"

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Pond 14P: PR OUTLET



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Type II 24-hr 10-yr Rainfall=3.12"

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Summary for Subcatchment 13S: EX PARK

Runoff = 10.50 cfs @ 12.08 hrs, Volume= 0.740 af, Depth> 0.73"
 Routed to Pond 14P : PR OUTLET

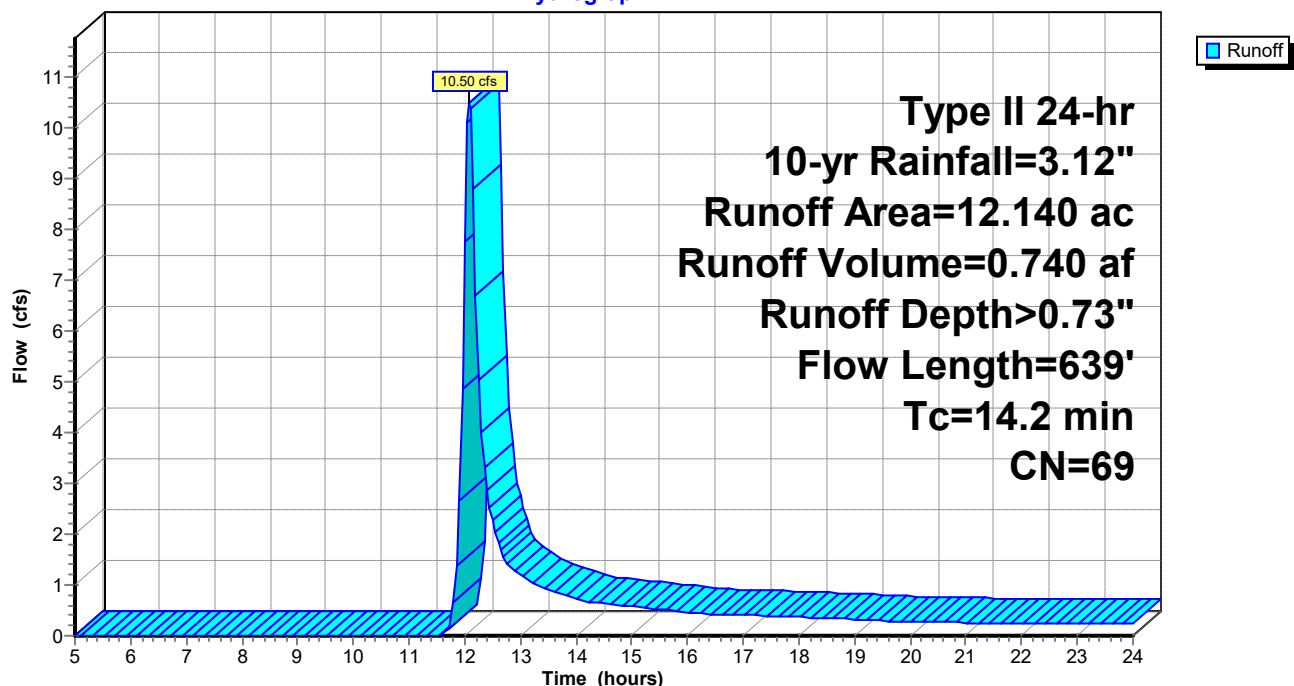
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.12"

Area (ac)	CN	Description
6.010	39	>75% Grass cover, Good, HSG A
6.130	98	Paved parking, HSG A
12.140	69	Weighted Average
6.010		49.51% Pervious Area
6.130		50.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.17"
1.5	88	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	451	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
14.2	639	Total			

Subcatchment 13S: EX PARK

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.12"

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Summary for Pond 14P: PR OUTLET

Inflow Area = 12.140 ac, 50.49% Impervious, Inflow Depth > 0.73" for 10-yr event
 Inflow = 10.50 cfs @ 12.08 hrs, Volume= 0.740 af
 Outflow = 8.40 cfs @ 12.16 hrs, Volume= 0.739 af, Atten= 20%, Lag= 5.0 min
 Discarded = 0.29 cfs @ 12.17 hrs, Volume= 0.035 af
 Primary = 5.32 cfs @ 12.17 hrs, Volume= 0.672 af
 Secondary = 2.79 cfs @ 12.16 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 612.52' @ 12.17 hrs Surf.Area= 4,110 sf Storage= 3,320 cf

Plug-Flow detention time= 4.8 min calculated for 0.737 af (100% of inflow)
 Center-of-Mass det. time= 4.3 min (887.5 - 883.2)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	13,016 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	3	0	0
611.00	621	312	312
612.00	2,132	1,377	1,689
613.00	5,917	4,025	5,713
614.00	8,689	7,303	13,016

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	12.0" Round Culvert L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 610.00' / 609.00' S= 0.0154 ' S= 0.0154 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	610.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.00 2.30 Width (feet) 0.30 0.30 0.80 0.80
#3	Device 1	612.30'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.30'	8.0' long x 0.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#5	Discarded	610.00'	3.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 12.17 hrs HW=612.51' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=5.31 cfs @ 12.17 hrs HW=612.51' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 5.31 cfs @ 6.76 fps)

↑ **2=Custom Weir/Orifice** (Passes < 6.70 cfs potential flow)

↑ **3=Orifice/Grate** (Passes < 2.54 cfs potential flow)

Secondary OutFlow Max=2.59 cfs @ 12.16 hrs HW=612.51' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 2.59 cfs @ 1.54 fps)

Pond 14P: PR OUTLET

