

Masiello - Grafton - 88 Westboro Road

Type III 24-hr 1 Inch Storm Rainfall=1.00"

Prepared by {enter your company name here}

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=0.36"

Flow Length=690' Tc=8.7 min CN=91 Runoff=1.04 cfs 0.086 af

Reach 1R: New Drain

Peak Depth=0.28' Max Vel=4.9 fps Inflow=1.04 cfs 0.086 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=1.04 cfs 0.086 af

Reach 2R: New Drain

Peak Depth=0.28' Max Vel=4.9 fps Inflow=1.04 cfs 0.086 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=1.03 cfs 0.086 af

Reach 3R: Existing 8" Drain

Peak Depth=0.20' Max Vel=11.4 fps Inflow=1.03 cfs 0.086 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=1.03 cfs 0.086 af

Reach DP: DP1

Inflow=1.03 cfs 0.086 af

Outflow=1.03 cfs 0.086 af

Pond 1P: New DCB

Peak Elev=92.35' Storage=0 cf Inflow=1.04 cfs 0.086 af

15.0" x 35.0' Culvert Outflow=1.04 cfs 0.086 af

Total Runoff Area = 2.866 ac Runoff Volume = 0.086 af Average Runoff Depth = 0.36"

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 1.04 cfs @ 12.13 hrs, Volume= 0.086 af, Depth= 0.36"

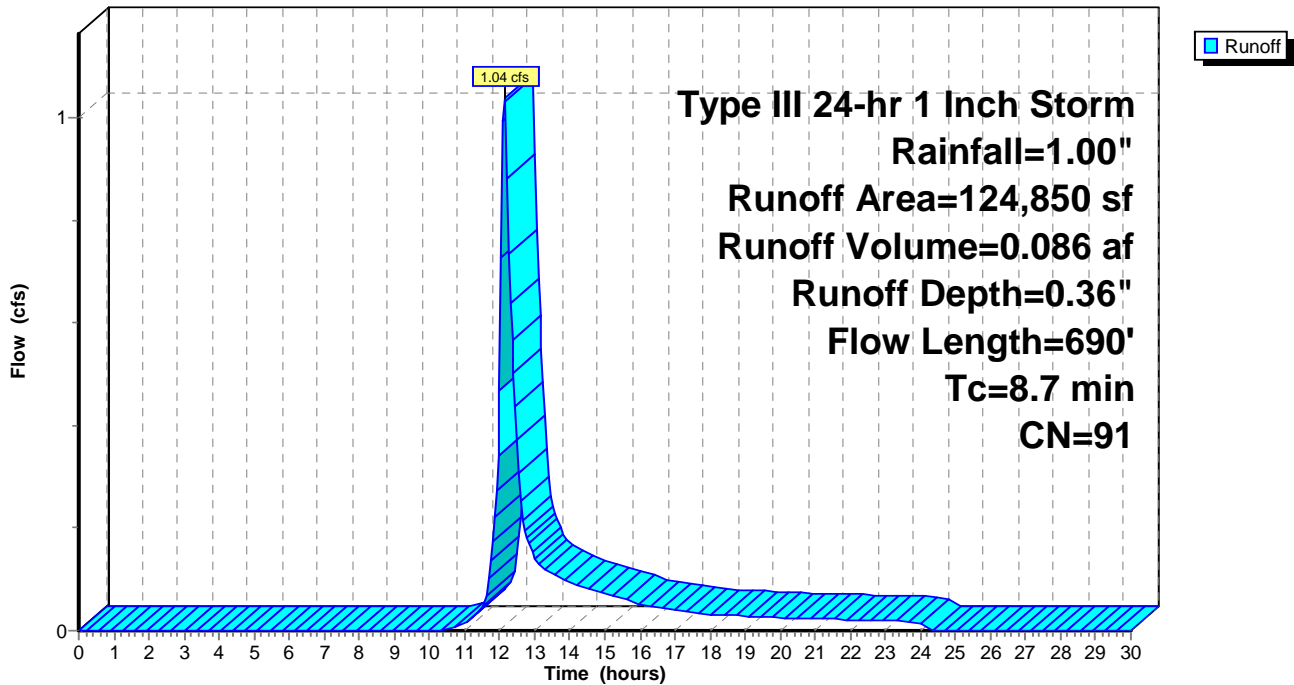
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Inch Storm Rainfall=1.00"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.18'

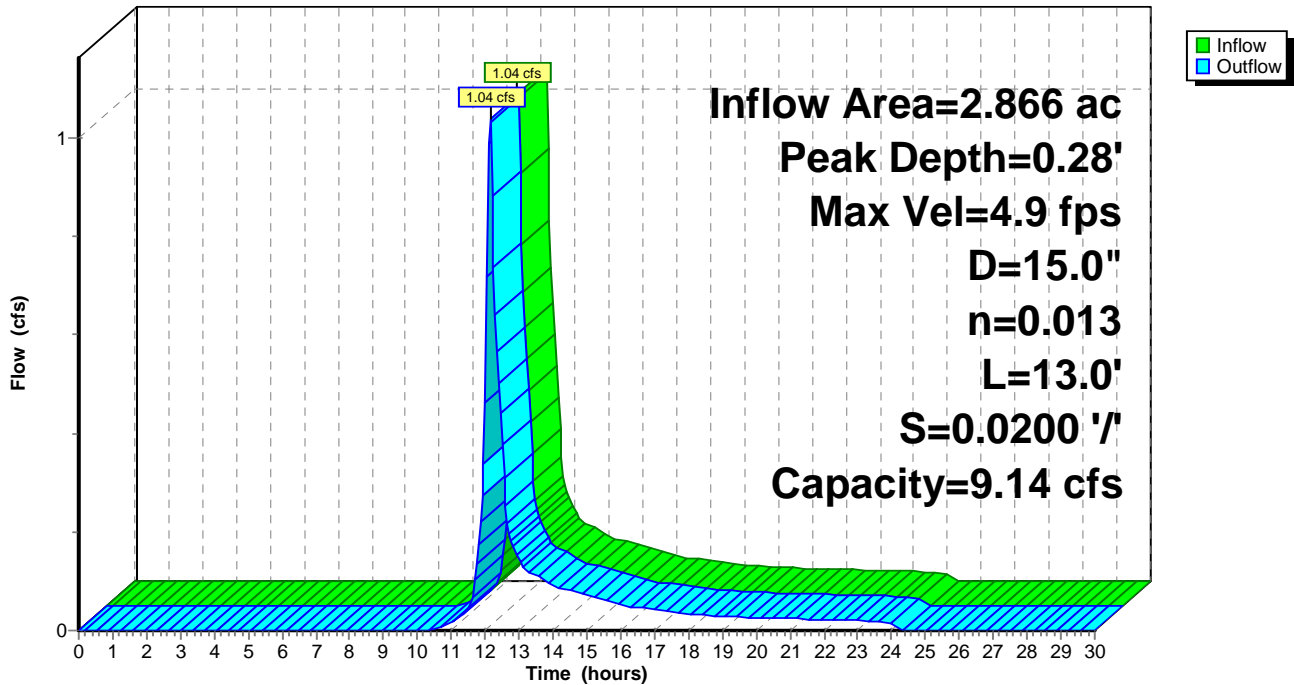
Inflow Area = 2.866 ac, Inflow Depth = 0.36" for 1 Inch Storm event
 Inflow = 1.04 cfs @ 12.13 hrs, Volume= 0.086 af
 Outflow = 1.04 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.9 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 1.9 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.28' @ 12.14 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 91.15', Outlet Invert= 90.89'
 15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
 Length= 13.0' Slope= 0.0200 '/'

Reach 1R: New Drain

Hydrograph



Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[61] Hint: Submerged 71% of Reach 1R bottom

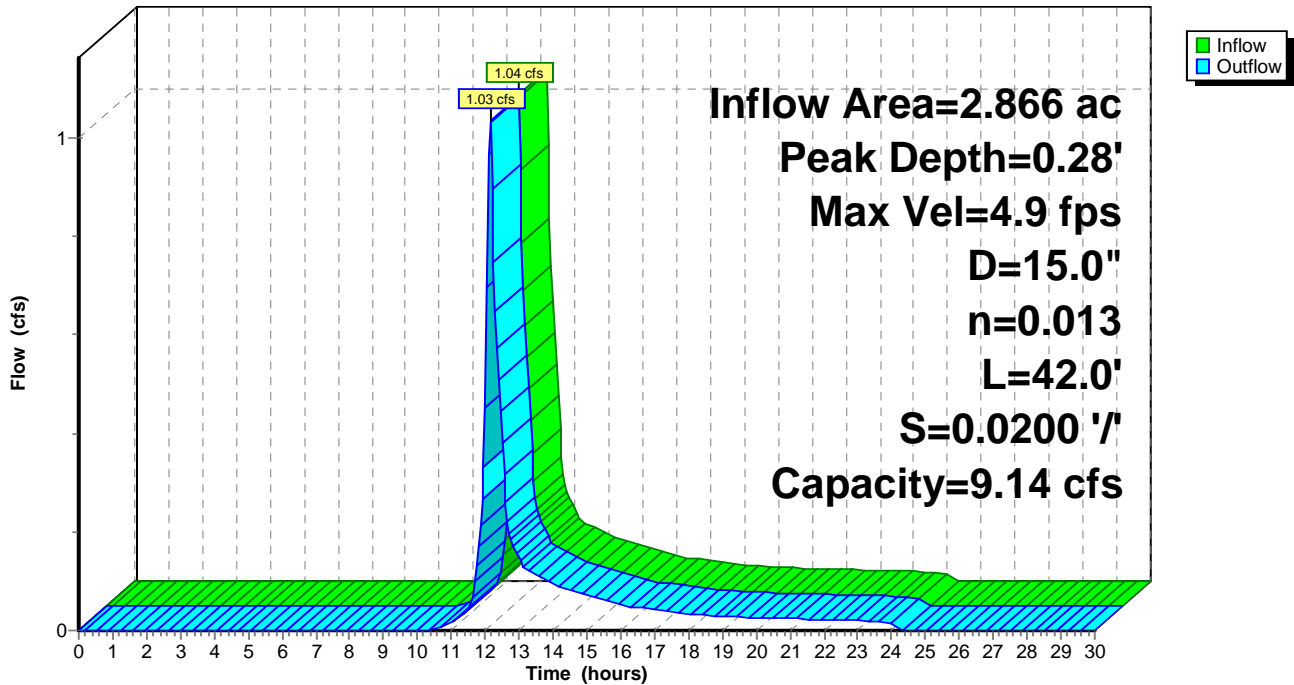
Inflow Area = 2.866 ac, Inflow Depth = 0.36" for 1 Inch Storm event
 Inflow = 1.04 cfs @ 12.14 hrs, Volume= 0.086 af
 Outflow = 1.03 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.9 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 1.9 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.28' @ 12.14 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 90.79', Outlet Invert= 89.95'
 15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 42.0' Slope= 0.0200 '/'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

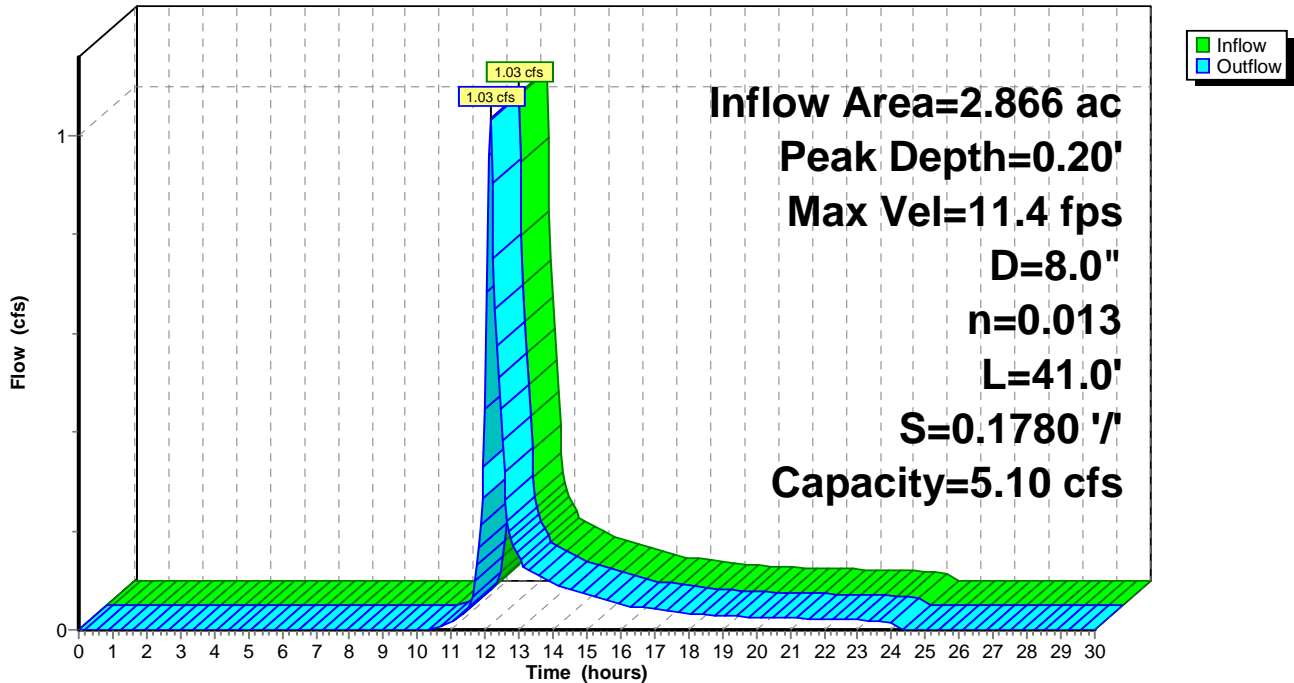
Inflow Area = 2.866 ac, Inflow Depth = 0.36" for 1 Inch Storm event
Inflow = 1.03 cfs @ 12.14 hrs, Volume= 0.086 af
Outflow = 1.03 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.4 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.5 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.20' @ 12.14 hrs
Capacity at bank full= 5.10 cfs
Inlet Invert= 88.70', Outlet Invert= 81.40'
8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 41.0' Slope= 0.1780 '/'

Reach 3R: Existing 8" Drain

Hydrograph

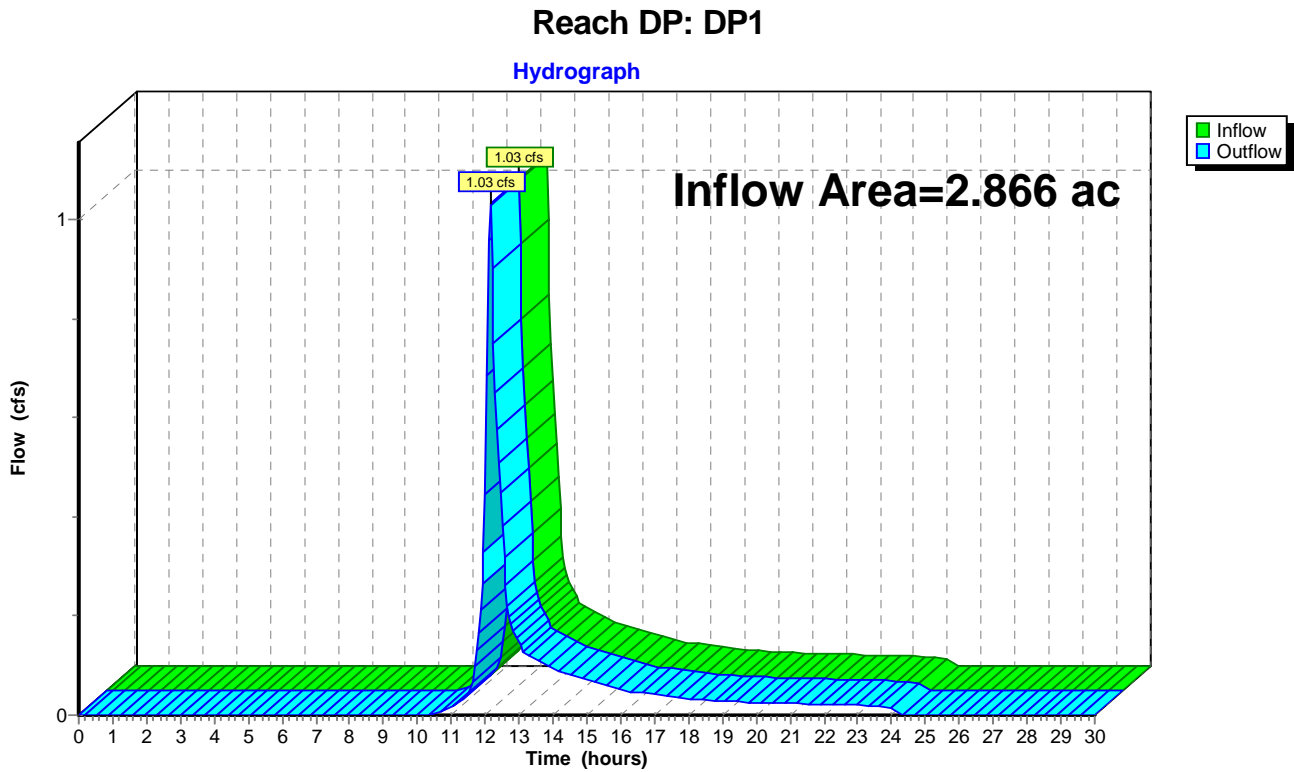


Reach DP: DP1

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

Inflow Area = 2.866 ac, Inflow Depth = 0.36" for 1 Inch Storm event
Inflow = 1.03 cfs @ 12.14 hrs, Volume= 0.086 af
Outflow = 1.03 cfs @ 12.14 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



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Type III 24-hr 1 Inch Storm Rainfall=1.00"

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Pond 1P: New DCB

Inflow Area = 2.866 ac, Inflow Depth = 0.36" for 1 Inch Storm event
 Inflow = 1.04 cfs @ 12.13 hrs, Volume= 0.086 af
 Outflow = 1.04 cfs @ 12.13 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.13 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.35' @ 12.13 hrs Surf.Area= 1 sf Storage= 0 cf
 Plug-Flow detention time= 0.0 min calculated for 0.086 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (858.2 - 858.2)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

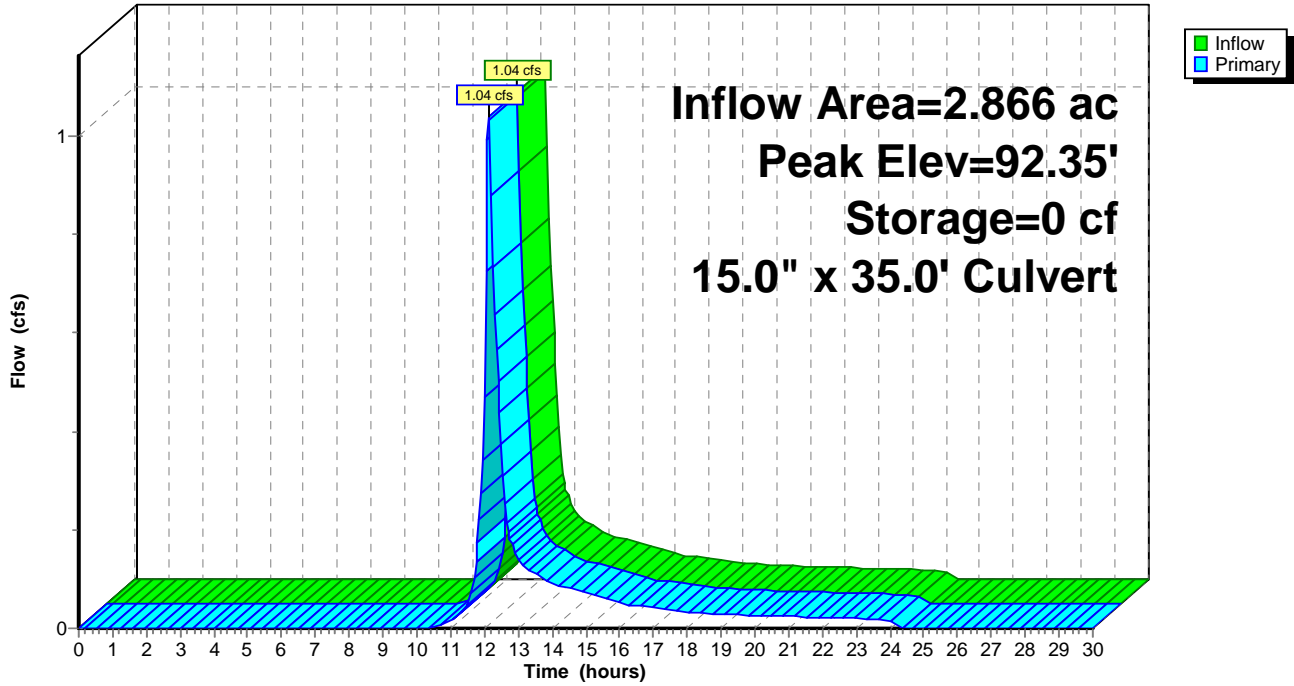
Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=92.34' (Free Discharge)

↑**1=Culvert** (Inlet Controls 1.02 cfs @ 2.0 fps)

Pond 1P: New DCB

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 2 Inch Storm Rainfall=2.00"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=1.16"

Flow Length=690' Tc=8.7 min CN=91 Runoff=3.51 cfs 0.278 af

Reach 1R: New Drain

Peak Depth=0.54' Max Vel=6.9 fps Inflow=3.51 cfs 0.278 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=3.48 cfs 0.278 af

Reach 2R: New Drain

Peak Depth=0.54' Max Vel=6.9 fps Inflow=3.48 cfs 0.278 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=3.47 cfs 0.278 af

Reach 3R: Existing 8" Drain

Peak Depth=0.40' Max Vel=15.7 fps Inflow=3.47 cfs 0.278 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=3.47 cfs 0.278 af

Reach DP: DP1

Inflow=3.47 cfs 0.278 af

Outflow=3.47 cfs 0.278 af

Pond 1P: New DCB

Peak Elev=92.98' Storage=1 cf Inflow=3.51 cfs 0.278 af

15.0" x 35.0' Culvert Outflow=3.51 cfs 0.278 af

Total Runoff Area = 2.866 ac Runoff Volume = 0.278 af Average Runoff Depth = 1.16"

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 3.51 cfs @ 12.12 hrs, Volume= 0.278 af, Depth= 1.16"

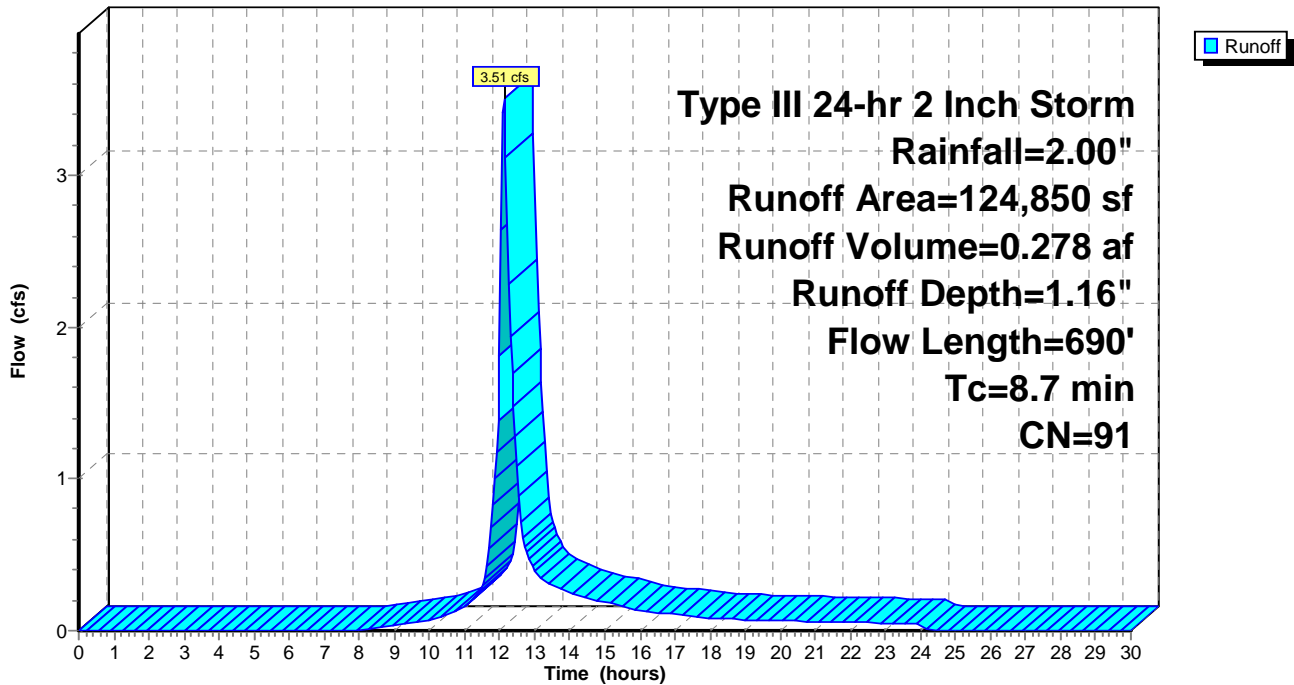
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Inch Storm Rainfall=2.00"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.43'

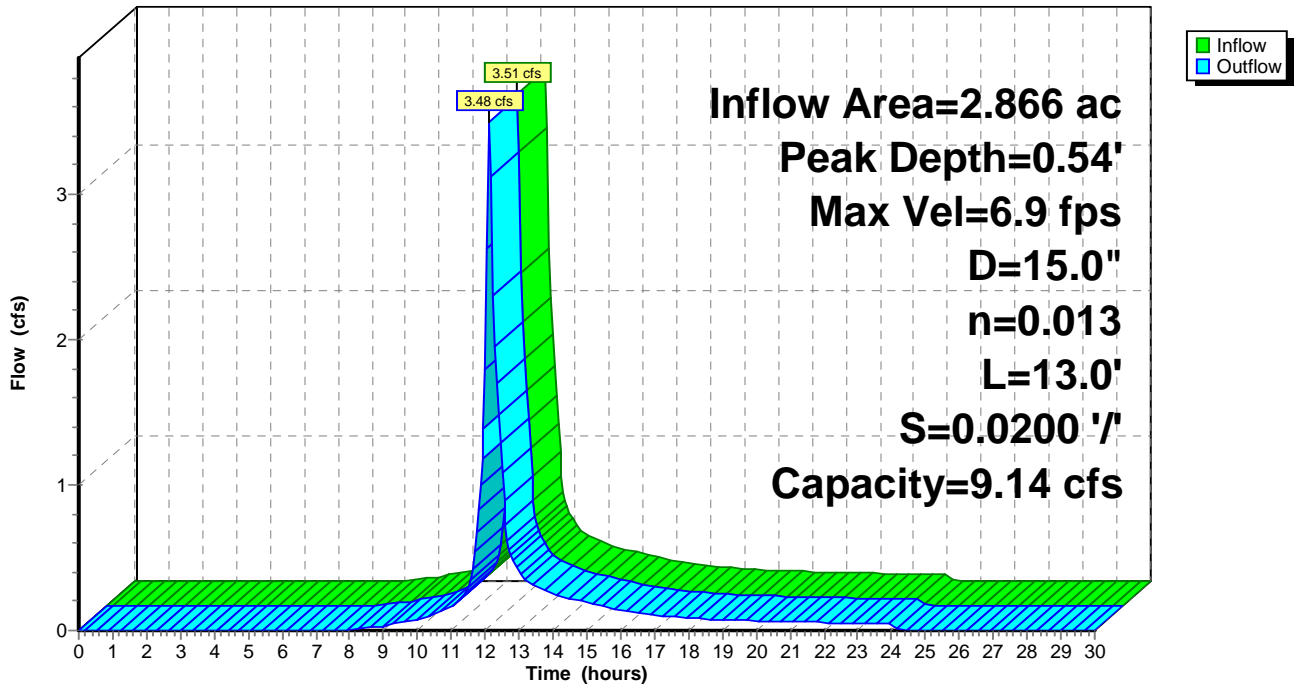
Inflow Area = 2.866 ac, Inflow Depth = 1.16" for 2 Inch Storm event
 Inflow = 3.51 cfs @ 12.12 hrs, Volume= 0.278 af
 Outflow = 3.48 cfs @ 12.13 hrs, Volume= 0.278 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.9 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 2.5 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.54' @ 12.12 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 91.15', Outlet Invert= 90.89'
 15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
 Length= 13.0' Slope= 0.0200 '/'

Reach 1R: New Drain

Hydrograph



Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[62] Warning: Submerged 14% of Reach 1R inlet

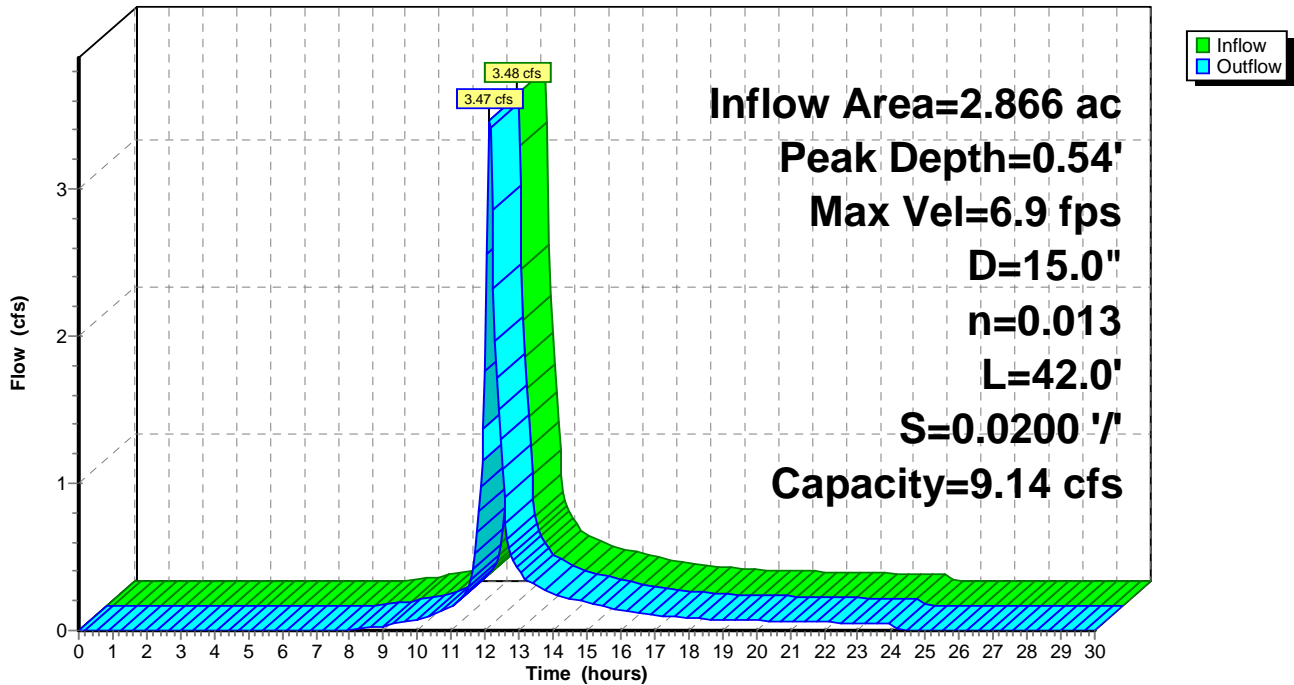
Inflow Area = 2.866 ac, Inflow Depth = 1.16" for 2 Inch Storm event
 Inflow = 3.48 cfs @ 12.13 hrs, Volume= 0.278 af
 Outflow = 3.47 cfs @ 12.13 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.9 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.5 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.54' @ 12.13 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 90.79', Outlet Invert= 89.95'
 15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 42.0' Slope= 0.0200 '/'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

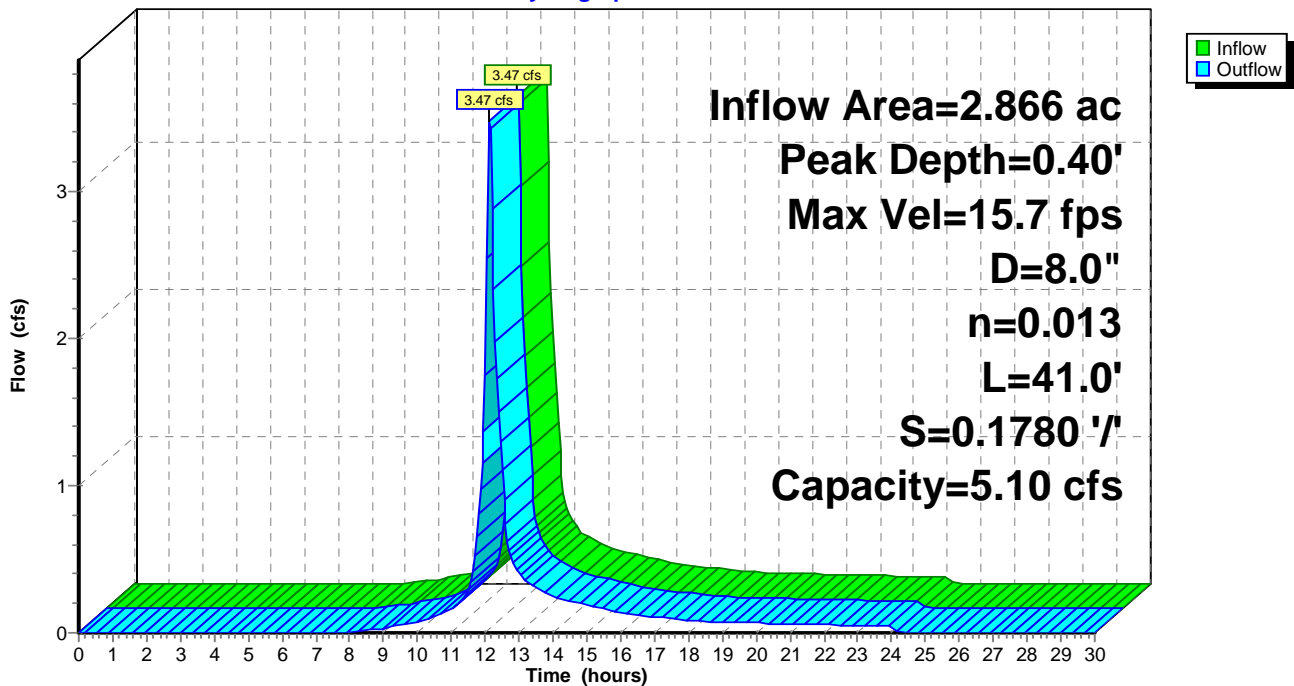
Inflow Area = 2.866 ac, Inflow Depth = 1.16" for 2 Inch Storm event
Inflow = 3.47 cfs @ 12.13 hrs, Volume= 0.278 af
Outflow = 3.47 cfs @ 12.13 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 15.7 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.9 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.40' @ 12.13 hrs
Capacity at bank full= 5.10 cfs
Inlet Invert= 88.70', Outlet Invert= 81.40'
8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 41.0' Slope= 0.1780 '/'

Reach 3R: Existing 8" Drain

Hydrograph



Reach DP: DP1

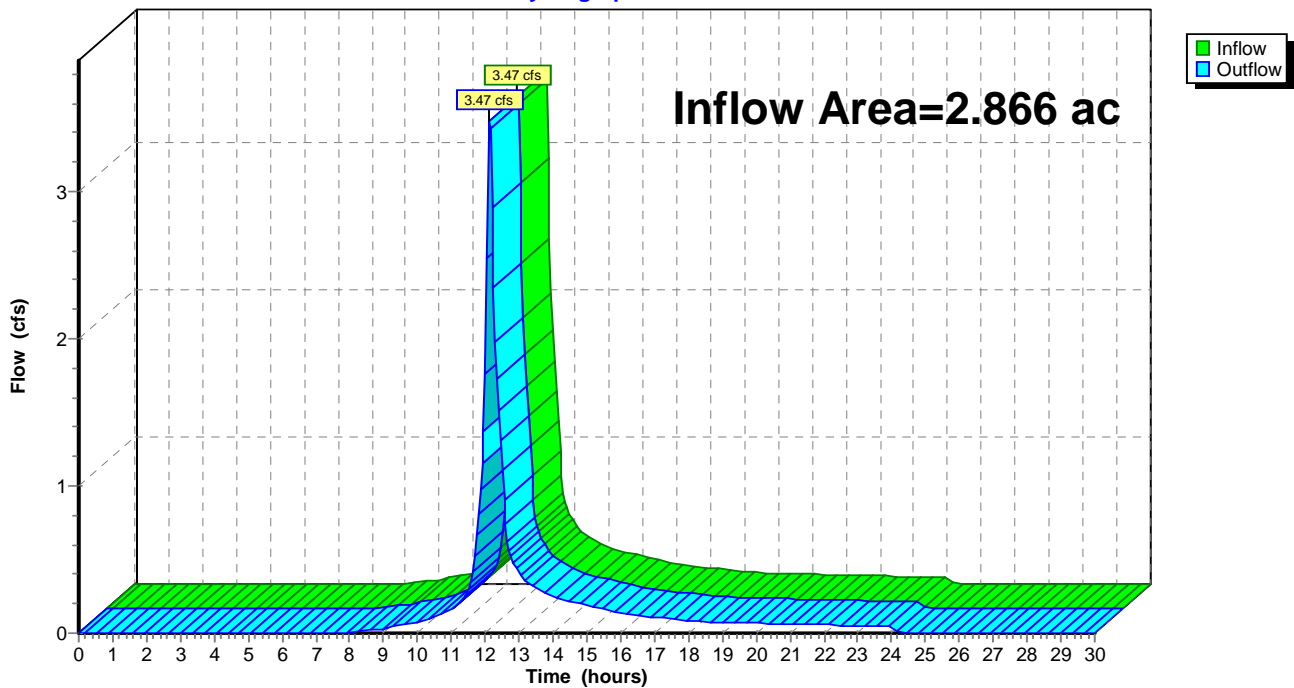
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.866 ac, Inflow Depth = 1.16" for 2 Inch Storm event
Inflow = 3.47 cfs @ 12.13 hrs, Volume= 0.278 af
Outflow = 3.47 cfs @ 12.13 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP: DP1

Hydrograph



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Type III 24-hr 2 Inch Storm Rainfall=2.00"

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Pond 1P: New DCB

Inflow Area = 2.866 ac, Inflow Depth = 1.16" for 2 Inch Storm event
 Inflow = 3.51 cfs @ 12.12 hrs, Volume= 0.278 af
 Outflow = 3.51 cfs @ 12.12 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.51 cfs @ 12.12 hrs, Volume= 0.278 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.98' @ 12.12 hrs Surf.Area= 2 sf Storage= 1 cf
 Plug-Flow detention time= 0.0 min calculated for 0.277 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (823.8 - 823.8)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

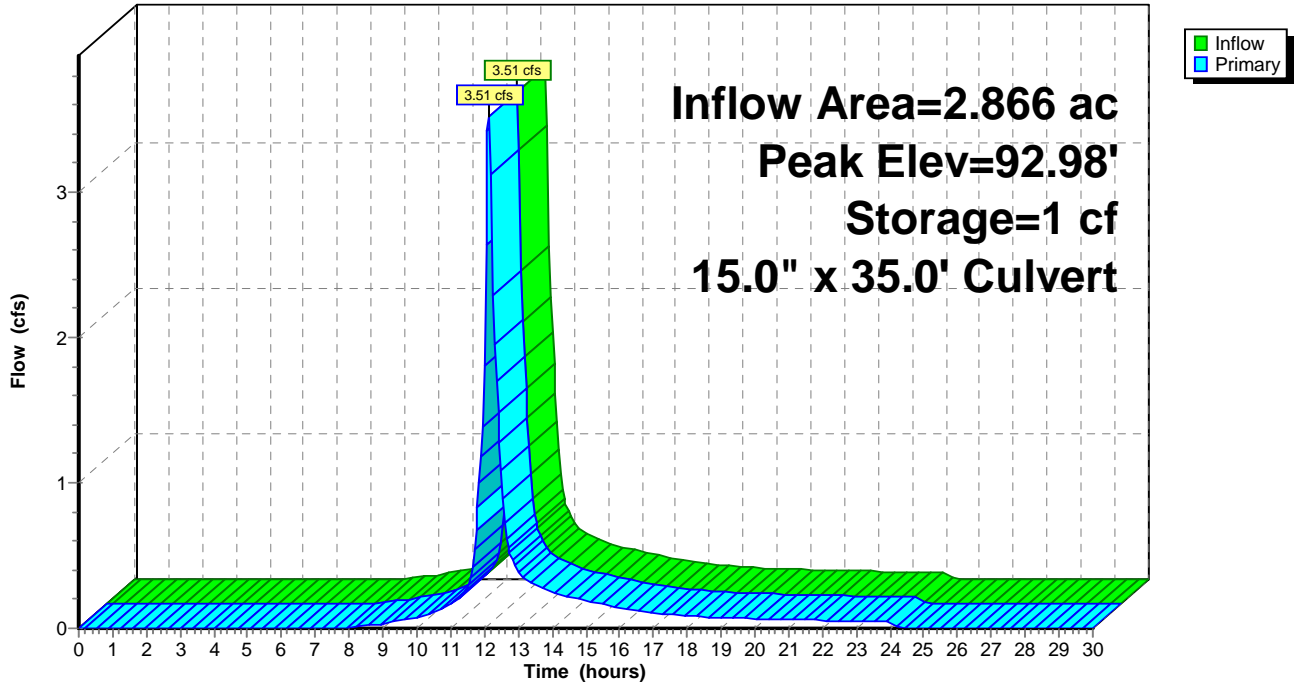
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.42 cfs @ 12.12 hrs HW=92.95' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 3.42 cfs @ 2.9 fps)

Pond 1P: New DCB

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 2-year storm Rainfall=3.20"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=2.26"

Flow Length=690' Tc=8.7 min CN=91 Runoff=6.72 cfs 0.539 af

Reach 1R: New Drain

Peak Depth=0.80' Max Vel=8.1 fps Inflow=6.71 cfs 0.539 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=6.70 cfs 0.539 af

Reach 2R: New Drain

Peak Depth=0.79' Max Vel=8.1 fps Inflow=6.70 cfs 0.539 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=6.64 cfs 0.539 af

Reach 3R: Existing 8" Drain

Peak Depth=0.67' Max Vel=16.7 fps Inflow=6.64 cfs 0.539 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=5.10 cfs 0.539 af

Reach DP: DP1

Inflow=5.10 cfs 0.539 af

Outflow=5.10 cfs 0.539 af

Pond 1P: New DCB

Peak Elev=94.48' Storage=7 cf Inflow=6.72 cfs 0.539 af

15.0" x 35.0' Culvert Outflow=6.71 cfs 0.539 af

Total Runoff Area = 2.866 ac Runoff Volume = 0.539 af Average Runoff Depth = 2.26"

Masiello - Grafton - 88 Westboro Road

Type III 24-hr 2-year storm Rainfall=3.20"

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Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 6.72 cfs @ 12.12 hrs, Volume= 0.539 af, Depth= 2.26"

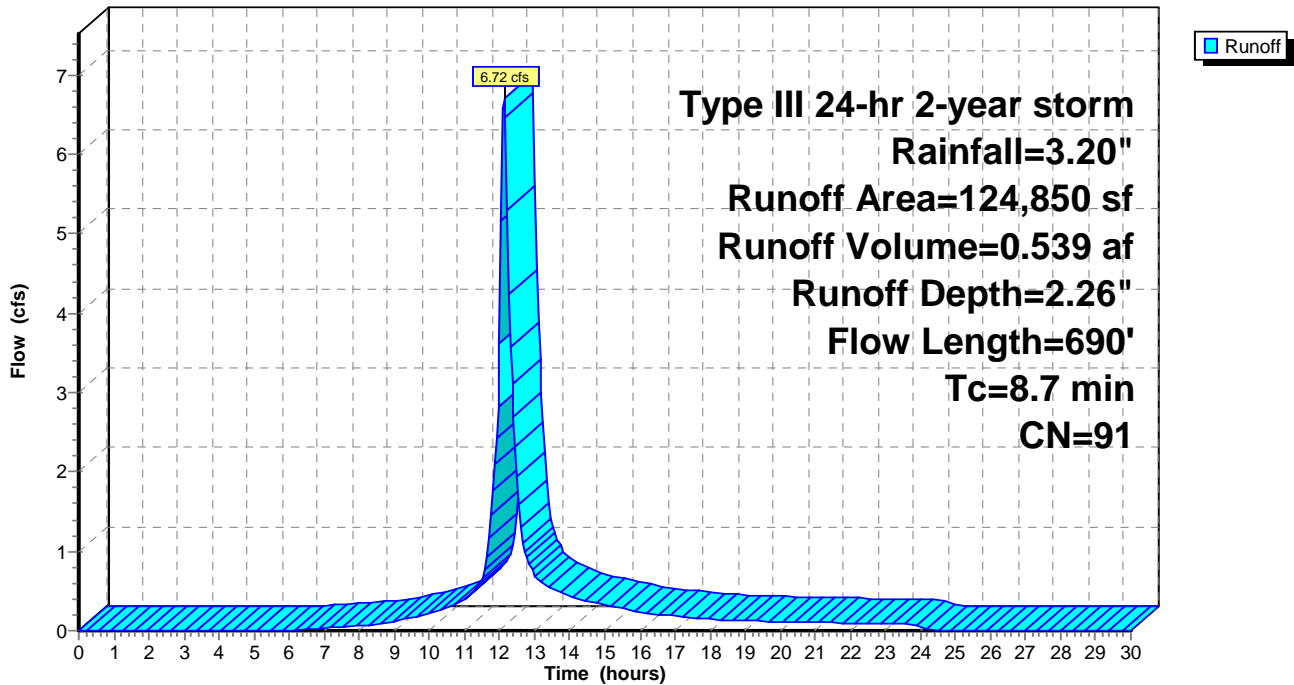
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.20"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.13'

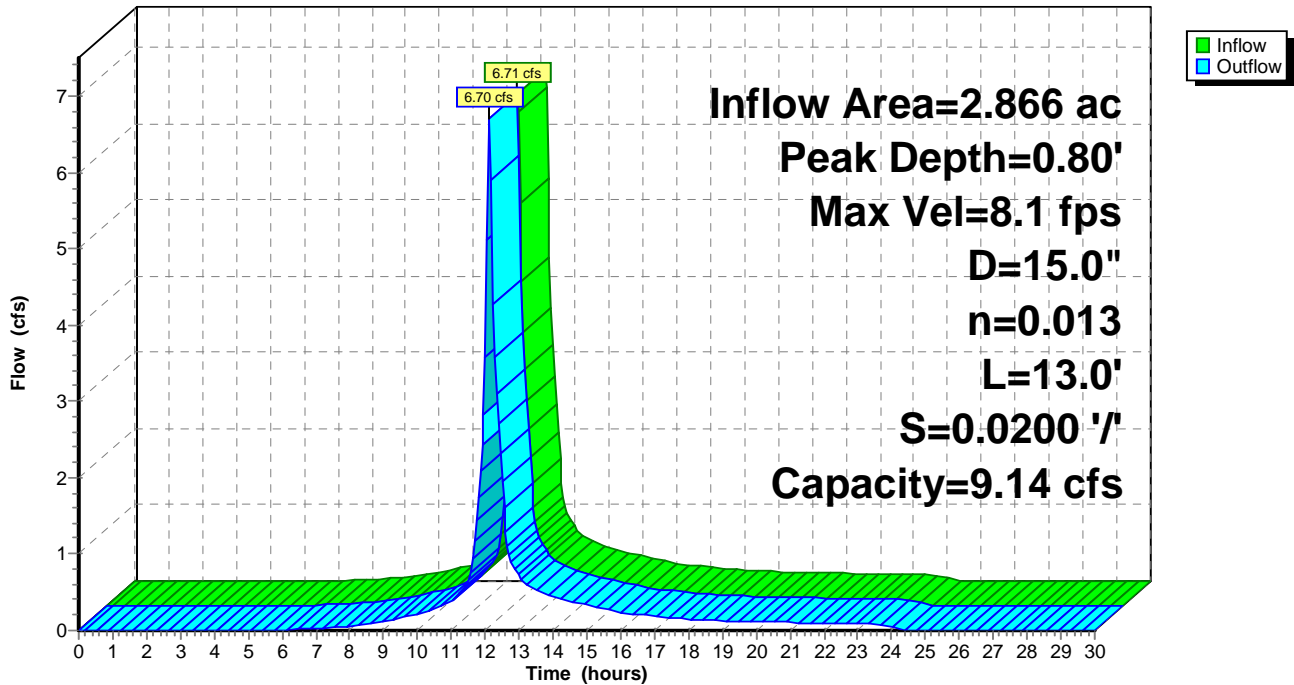
Inflow Area = 2.866 ac, Inflow Depth = 2.26" for 2-year storm event
Inflow = 6.71 cfs @ 12.12 hrs, Volume= 0.539 af
Outflow = 6.70 cfs @ 12.12 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.1 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.9 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.80' @ 12.12 hrs
Capacity at bank full= 9.14 cfs
Inlet Invert= 91.15', Outlet Invert= 90.89'
15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
Length= 13.0' Slope= 0.0200 '/'

Reach 1R: New Drain

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 2-year storm Rainfall=3.20"

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Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[62] Warning: Submerged 34% of Reach 1R inlet

Inflow Area = 2.866 ac, Inflow Depth = 2.26" for 2-year storm event
Inflow = 6.70 cfs @ 12.12 hrs, Volume= 0.539 af
Outflow = 6.64 cfs @ 12.13 hrs, Volume= 0.539 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 8.1 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.9 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.79' @ 12.12 hrs

Capacity at bank full= 9.14 cfs

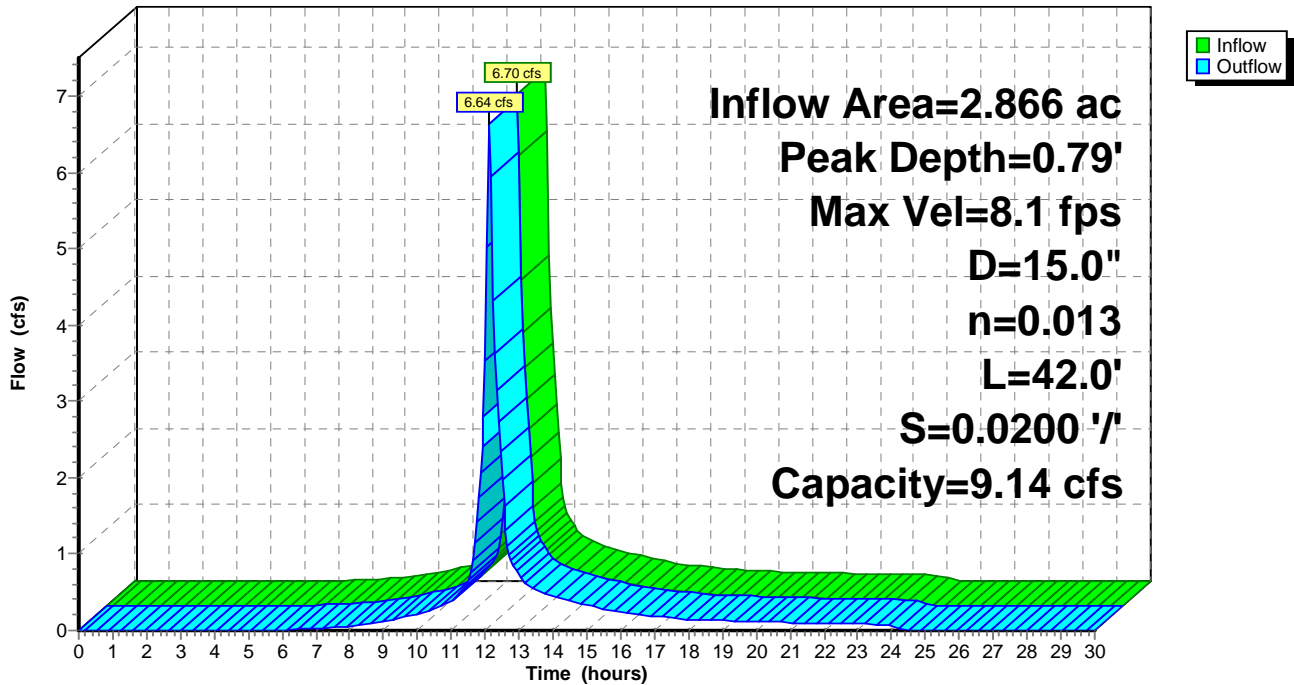
Inlet Invert= 90.79', Outlet Invert= 89.95'

15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior

Length= 42.0' Slope= 0.0200 '/'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 130% of Manning's capacity

[76] Warning: Detained 0.013 af (Pond w/culvert advised)

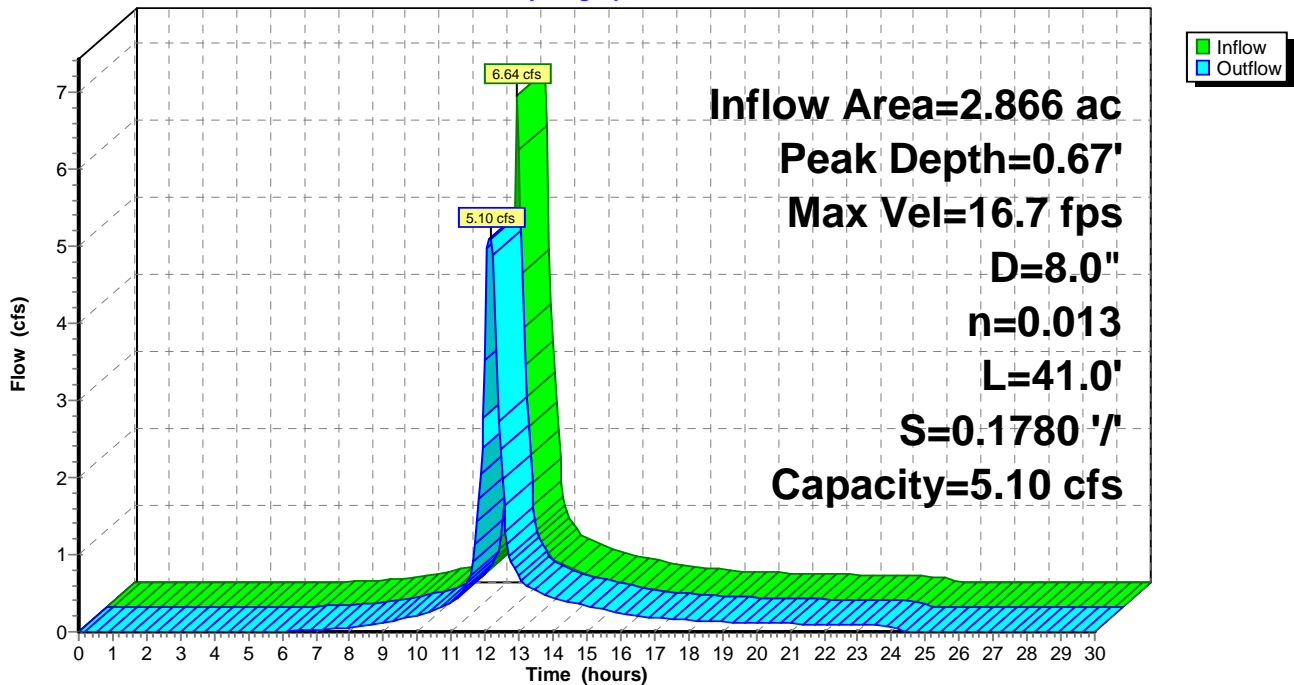
Inflow Area =	2.866 ac,	Inflow Depth =	2.26"	for 2-year storm event
Inflow =	6.64 cfs @	12.13 hrs,	Volume=	0.539 af
Outflow =	5.10 cfs @	12.15 hrs,	Volume=	0.539 af, Atten= 23%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.7 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 6.8 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.67' @ 12.10 hrs
 Capacity at bank full= 5.10 cfs
 Inlet Invert= 88.70', Outlet Invert= 81.40'
 8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 41.0' Slope= 0.1780 1/1

Reach 3R: Existing 8" Drain

Hydrograph



Reach DP: DP1

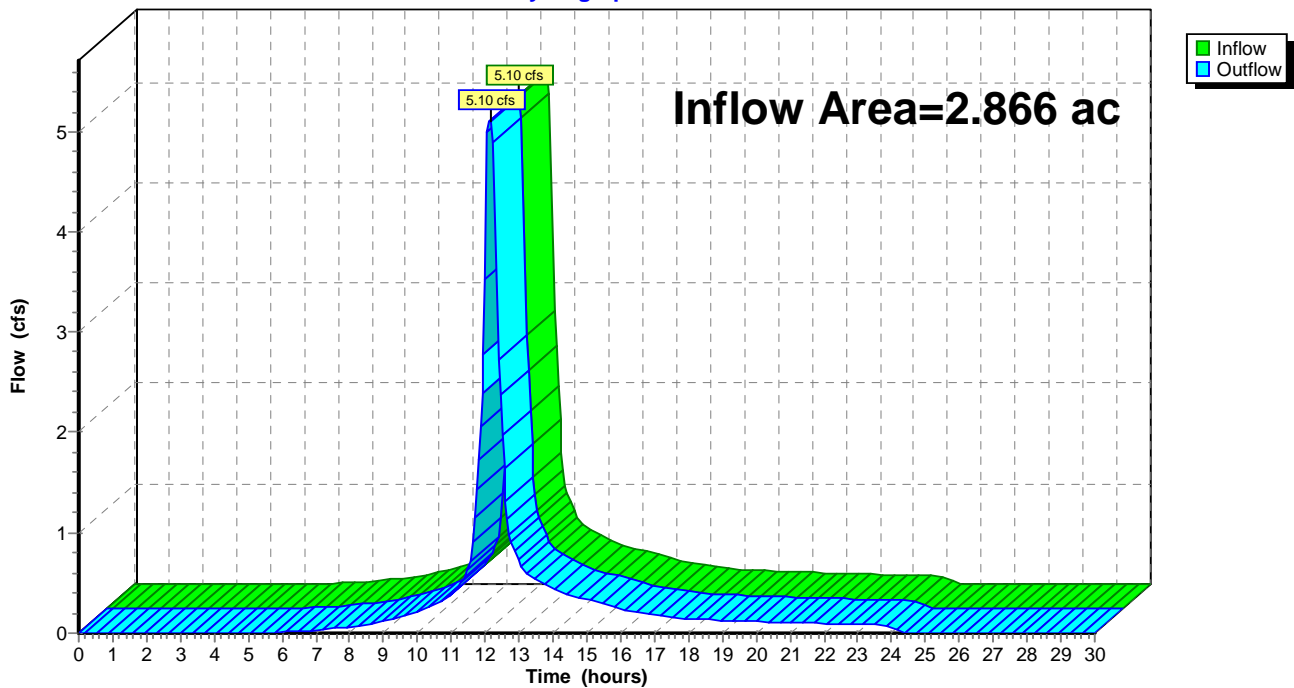
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.866 ac, Inflow Depth = 2.26" for 2-year storm event
Inflow = 5.10 cfs @ 12.15 hrs, Volume= 0.539 af
Outflow = 5.10 cfs @ 12.15 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP: DP1

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 2-year storm Rainfall=3.20"

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Pond 1P: New DCB

Inflow Area = 2.866 ac, Inflow Depth = 2.26" for 2-year storm event
 Inflow = 6.72 cfs @ 12.12 hrs, Volume= 0.539 af
 Outflow = 6.71 cfs @ 12.12 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.1 min
 Primary = 6.71 cfs @ 12.12 hrs, Volume= 0.539 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.48' @ 12.12 hrs Surf.Area= 5 sf Storage= 7 cf
 Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (805.0 - 805.0)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

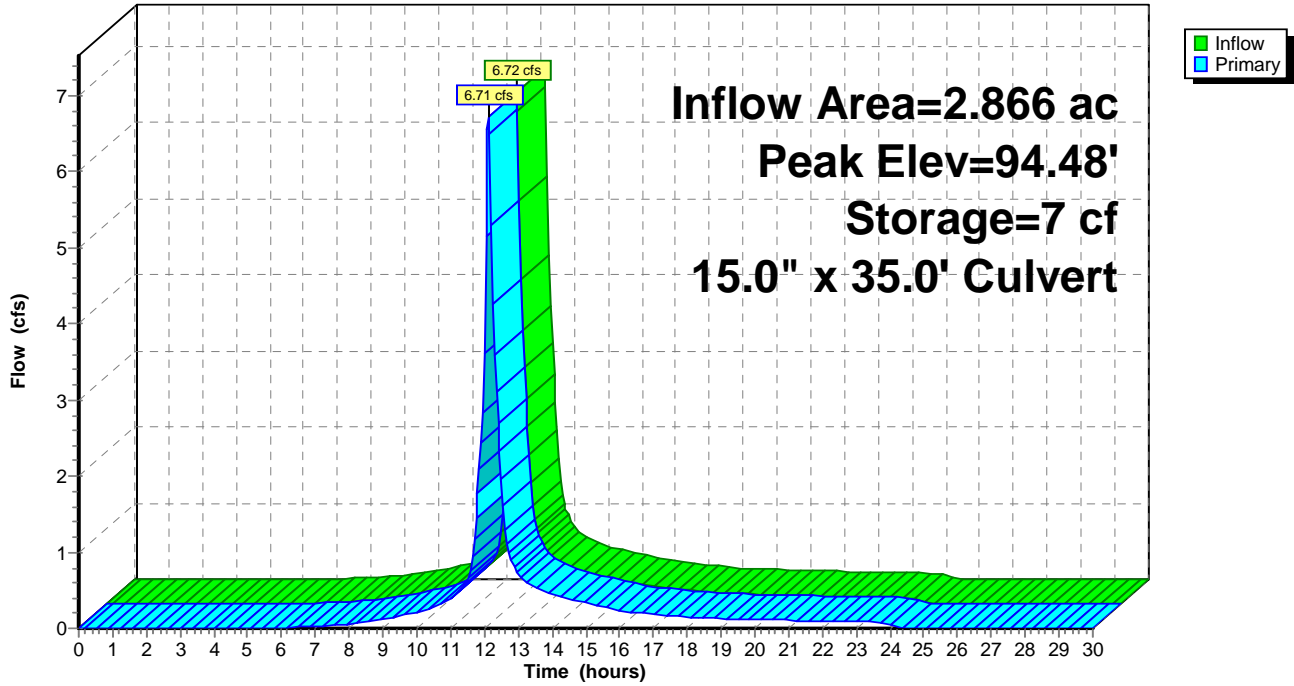
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=6.53 cfs @ 12.12 hrs HW=94.38' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 6.53 cfs @ 5.3 fps)

Pond 1P: New DCB

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 10-year storm Rainfall=4.80"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=3.79"

Flow Length=690' Tc=8.7 min CN=91 Runoff=11.01 cfs 0.905 af

Reach 1R: New Drain

Peak Depth=1.02' Max Vel=8.5 fps Inflow=9.08 cfs 0.907 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.10 cfs 0.907 af

Reach 2R: New Drain

Peak Depth=1.02' Max Vel=8.5 fps Inflow=9.10 cfs 0.907 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.13 cfs 0.907 af

Reach 3R: Existing 8" Drain

Peak Depth=0.67' Max Vel=16.6 fps Inflow=9.13 cfs 0.907 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=5.10 cfs 0.907 af

Reach DP: DP1

Inflow=5.10 cfs 0.907 af

Outflow=5.10 cfs 0.907 af

Pond 1P: New DCB

Peak Elev=96.22' Storage=609 cf Inflow=11.01 cfs 0.905 af

15.0" x 35.0' Culvert Outflow=9.08 cfs 0.907 af

Total Runoff Area = 2.866 ac Runoff Volume = 0.905 af Average Runoff Depth = 3.79"

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 11.01 cfs @ 12.12 hrs, Volume= 0.905 af, Depth= 3.79"

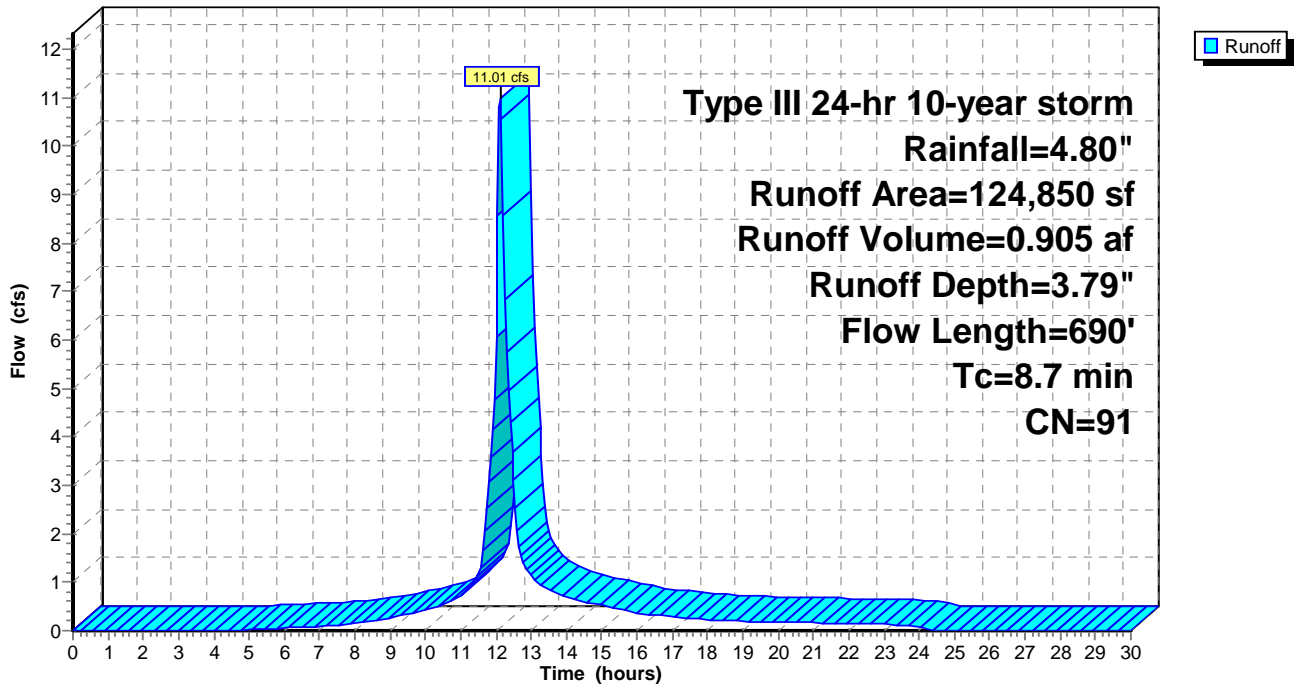
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.80"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[88] Warning: Qout>Qin may require Finer Routing>1

[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.37'

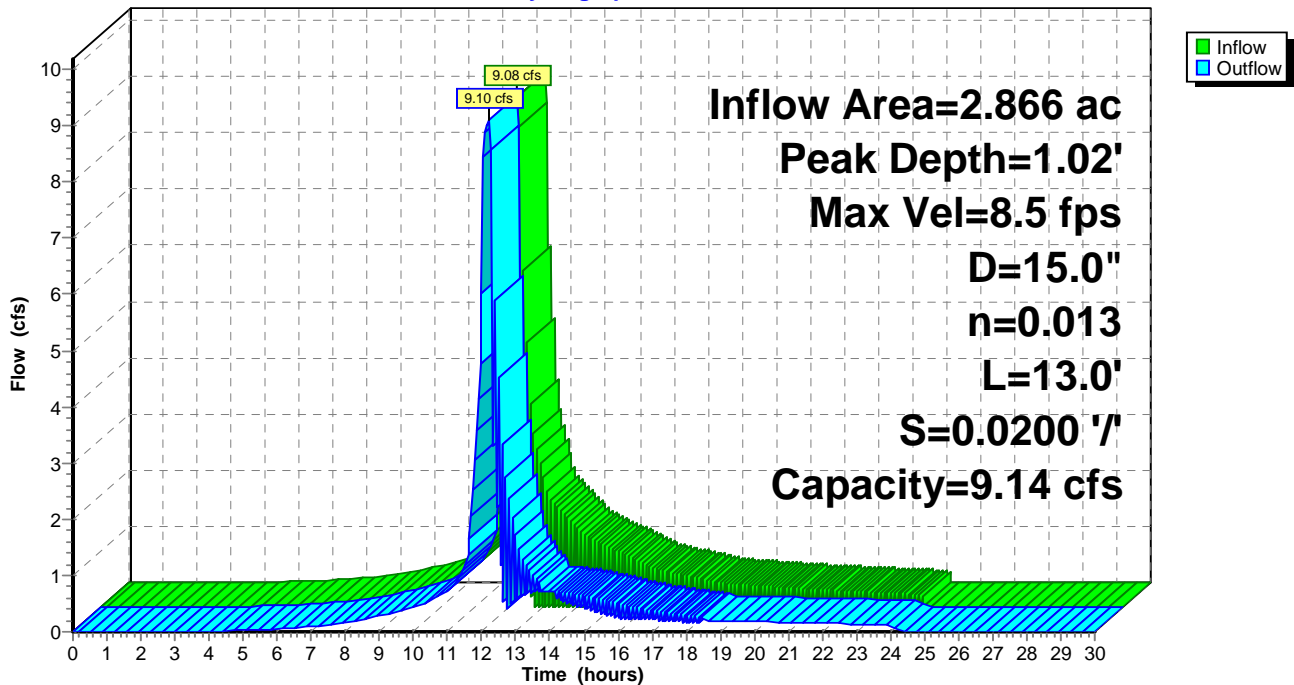
Inflow Area = 2.866 ac, Inflow Depth = 3.80" for 10-year storm event
 Inflow = 9.08 cfs @ 12.19 hrs, Volume= 0.907 af
 Outflow = 9.10 cfs @ 12.19 hrs, Volume= 0.907 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.5 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 3.3 fps, Avg. Travel Time= 0.1 min

Peak Depth= 1.02' @ 12.19 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 91.15', Outlet Invert= 90.89'
 15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
 Length= 13.0' Slope= 0.0200 1/1

Reach 1R: New Drain

Hydrograph



Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[88] Warning: Qout>Qin may require Finer Routing>1

[62] Warning: Submerged 53% of Reach 1R inlet

Inflow Area =	2.866 ac,	Inflow Depth =	3.80"	for 10-year storm event
Inflow =	9.10 cfs @	12.19 hrs,	Volume=	0.907 af
Outflow =	9.13 cfs @	12.20 hrs,	Volume=	0.907 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 8.5 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 3.3 fps, Avg. Travel Time= 0.2 min

Peak Depth= 1.02' @ 12.20 hrs

Capacity at bank full= 9.14 cfs

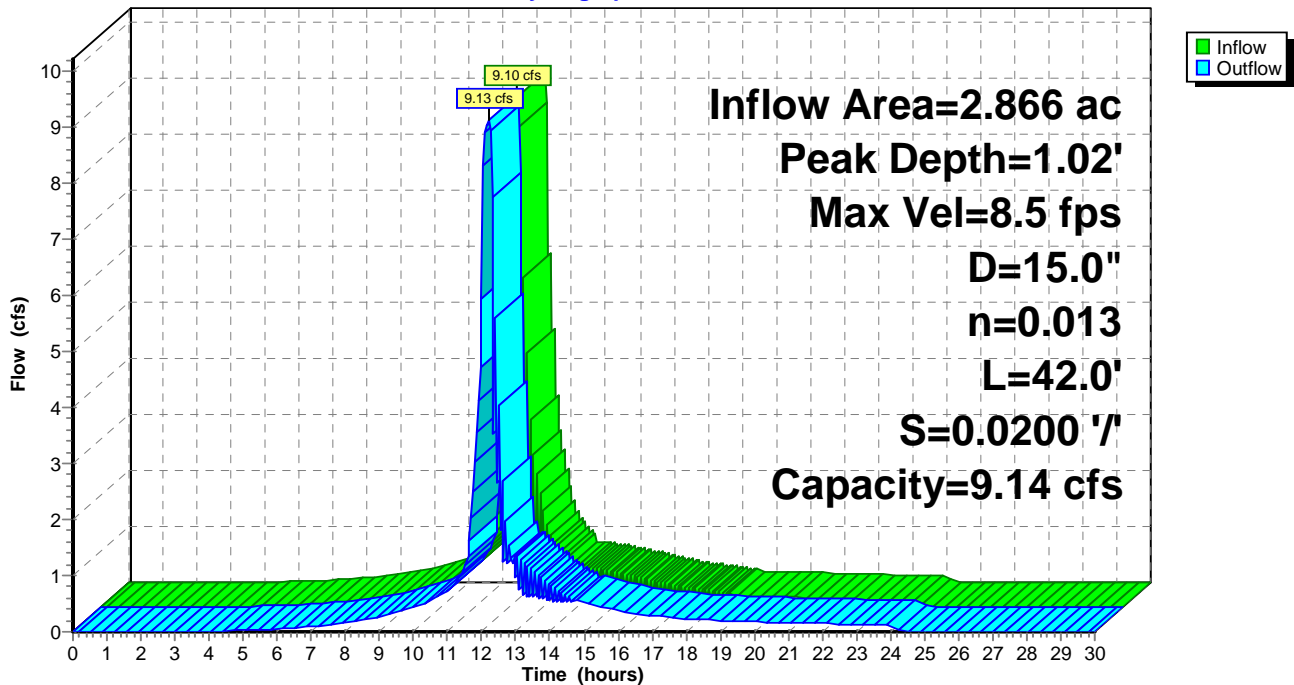
Inlet Invert= 90.79', Outlet Invert= 89.95'

15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior

Length= 42.0' Slope= 0.0200 1'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 179% of Manning's capacity

[76] Warning: Detained 0.092 af (Pond w/culvert advised)

Inflow Area =	2.866 ac,	Inflow Depth =	3.80"	for	10-year storm event
Inflow =	9.13 cfs @	12.20 hrs,	Volume=	0.907 af	
Outflow =	5.10 cfs @	12.05 hrs,	Volume=	0.907 af,	Atten= 44%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 16.6 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 7.7 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.67' @ 12.00 hrs

Capacity at bank full= 5.10 cfs

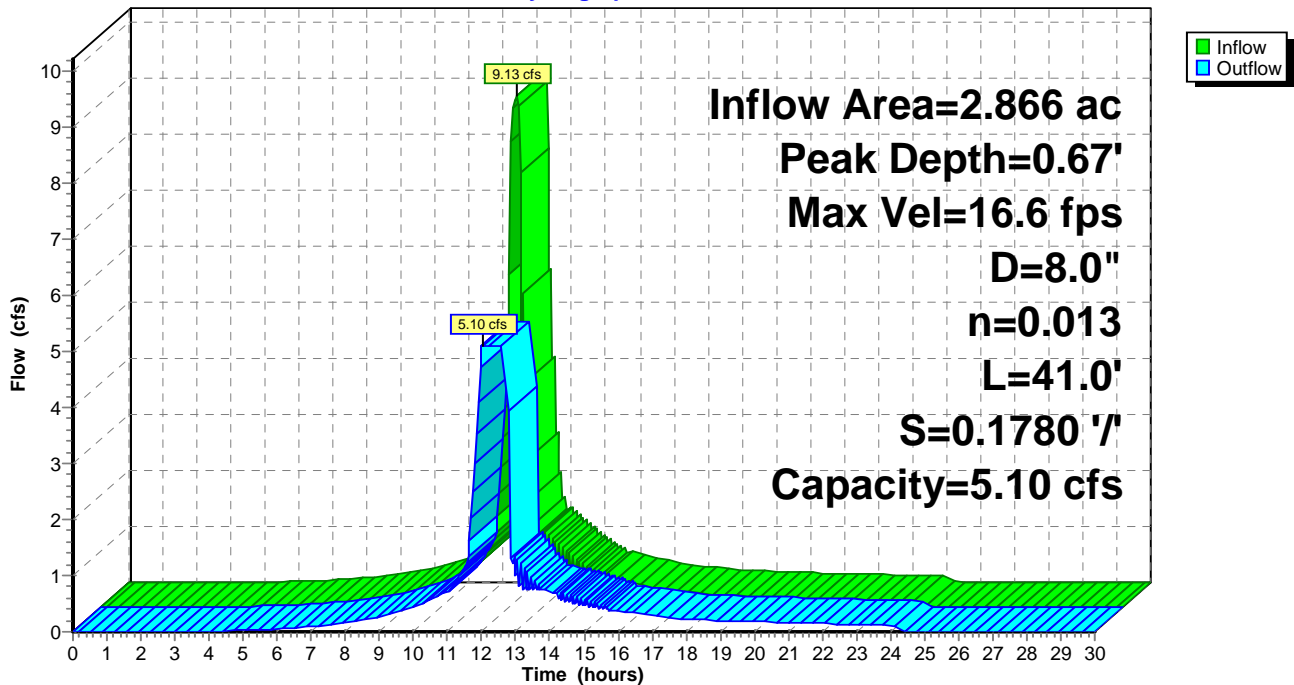
Inlet Invert= 88.70', Outlet Invert= 81.40'

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior

Length= 41.0' Slope= 0.1780 1/100

Reach 3R: Existing 8" Drain

Hydrograph



Reach DP: DP1

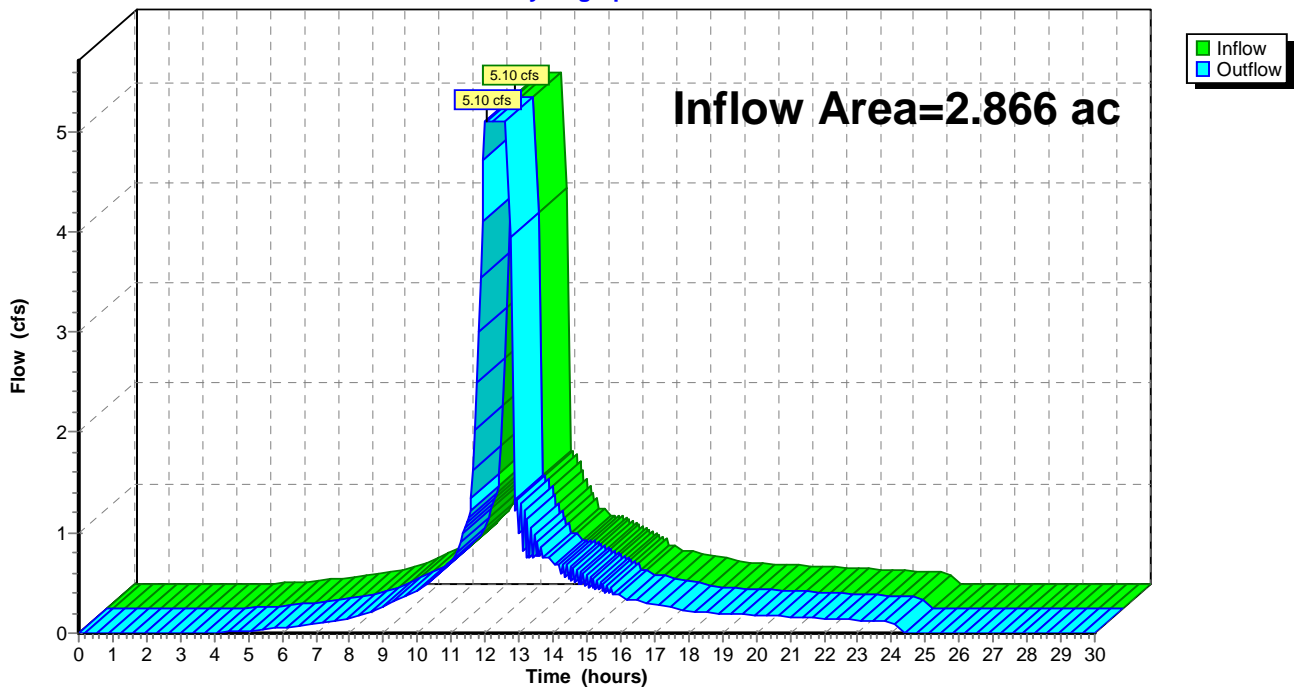
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.866 ac, Inflow Depth = 3.80" for 10-year storm event
Inflow = 5.10 cfs @ 12.05 hrs, Volume= 0.907 af
Outflow = 5.10 cfs @ 12.05 hrs, Volume= 0.907 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP: DP1

Hydrograph



Pond 1P: New DCB

[85] Warning: Oscillations may require Finer Routing>1

Inflow Area = 2.866 ac, Inflow Depth = 3.79" for 10-year storm event
 Inflow = 11.01 cfs @ 12.12 hrs, Volume= 0.905 af
 Outflow = 9.08 cfs @ 12.19 hrs, Volume= 0.907 af, Atten= 17%, Lag= 4.1 min
 Primary = 9.08 cfs @ 12.19 hrs, Volume= 0.907 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 96.22' @ 12.19 hrs Surf.Area= 2,836 sf Storage= 609 cf
 Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.4 min (791.1 - 790.7)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

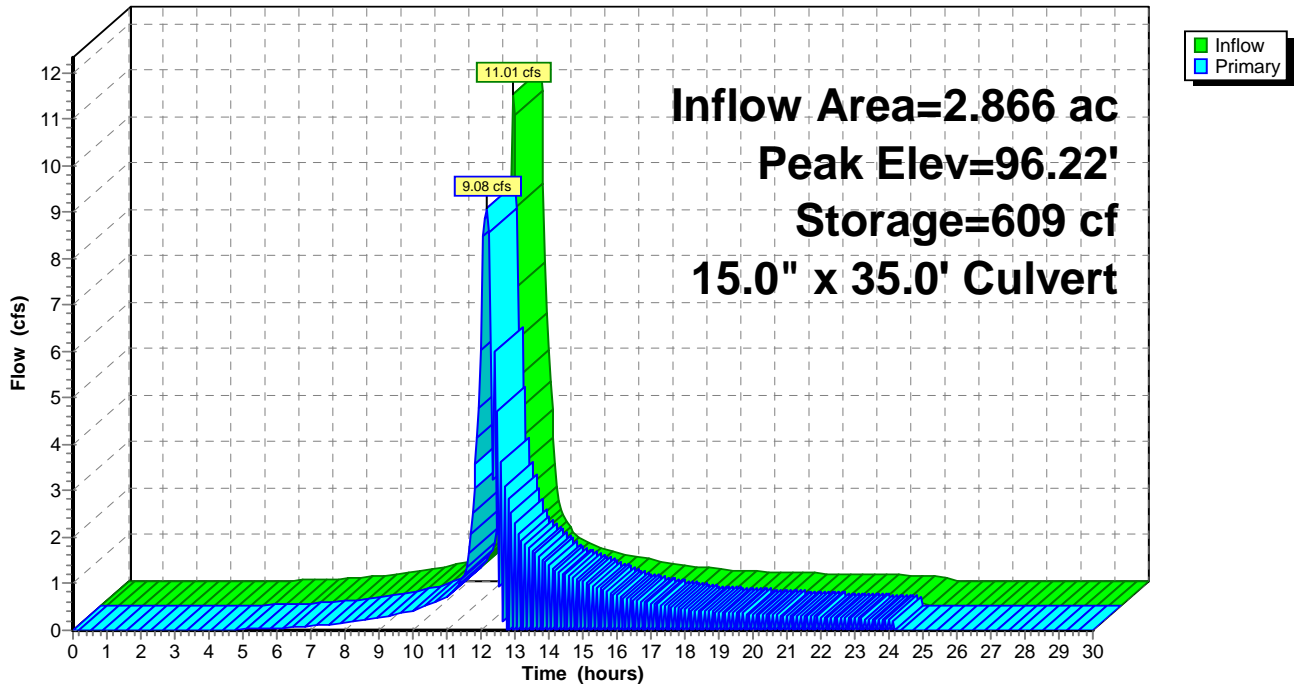
Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=9.07 cfs @ 12.19 hrs HW=96.21' (Free Discharge)

↑**1=Culvert** (Inlet Controls 9.07 cfs @ 7.4 fps)

Pond 1P: New DCB

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 25-year storm Rainfall=5.50"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=4.47"

Flow Length=690' Tc=8.7 min CN=91 Runoff=12.87 cfs 1.067 af

Reach 1R: New Drain

Peak Depth=1.06' Max Vel=8.5 fps Inflow=9.37 cfs 1.071 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.38 cfs 1.071 af

Reach 2R: New Drain

Peak Depth=1.06' Max Vel=8.5 fps Inflow=9.38 cfs 1.071 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.39 cfs 1.071 af

Reach 3R: Existing 8" Drain

Peak Depth=0.67' Max Vel=16.6 fps Inflow=9.39 cfs 1.071 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=5.10 cfs 1.071 af

Reach DP: DP1

Inflow=5.10 cfs 1.071 af

Outflow=5.10 cfs 1.071 af

Pond 1P: New DCB

Peak Elev=96.46' Storage=1,513 cf Inflow=12.87 cfs 1.067 af

15.0" x 35.0' Culvert Outflow=9.37 cfs 1.071 af

Total Runoff Area = 2.866 ac Runoff Volume = 1.067 af Average Runoff Depth = 4.47"

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 12.87 cfs @ 12.12 hrs, Volume= 1.067 af, Depth= 4.47"

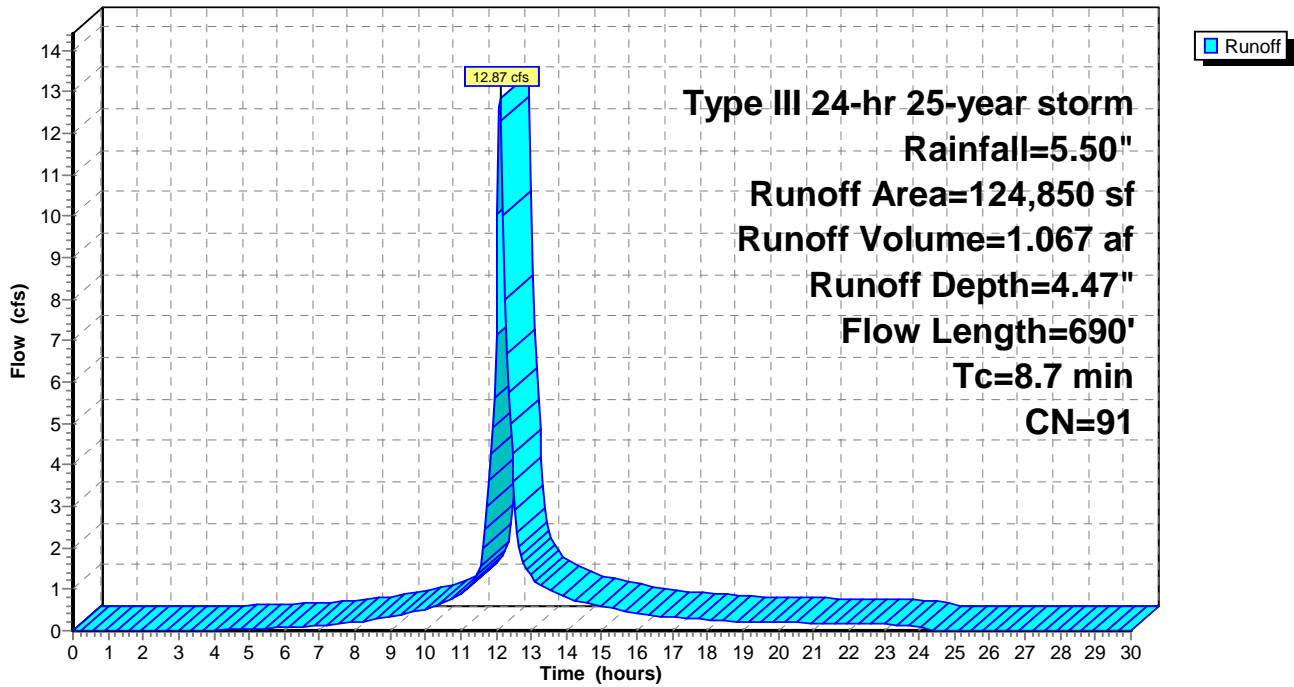
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year storm Rainfall=5.50"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 103% of Manning's capacity

[88] Warning: Qout>Qin may require Finer Routing>1

[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.41'

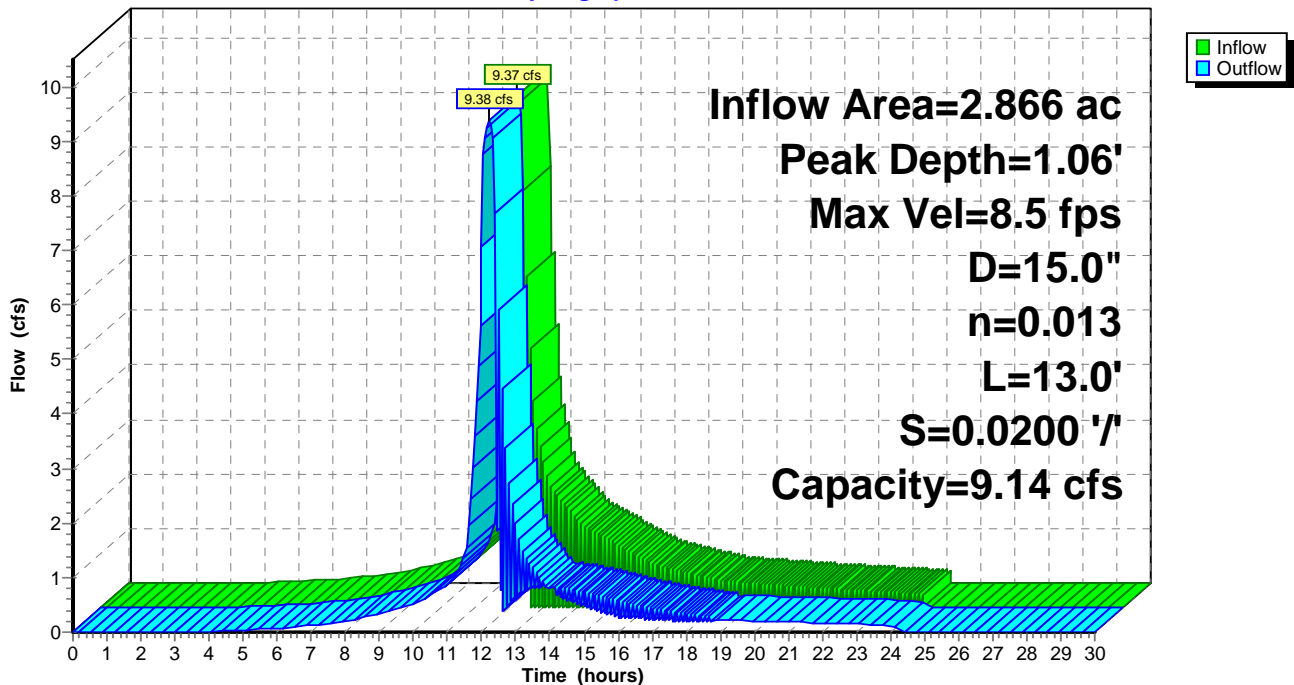
Inflow Area = 2.866 ac, Inflow Depth = 4.48" for 25-year storm event
 Inflow = 9.37 cfs @ 12.22 hrs, Volume= 1.071 af
 Outflow = 9.38 cfs @ 12.21 hrs, Volume= 1.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.5 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 3.5 fps, Avg. Travel Time= 0.1 min

Peak Depth= 1.06' @ 12.21 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 91.15', Outlet Invert= 90.89'
 15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
 Length= 13.0' Slope= 0.0200 '/'

Reach 1R: New Drain

Hydrograph



Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 103% of Manning's capacity

[88] Warning: Qout>Qin may require Finer Routing>1

[62] Warning: Submerged 56% of Reach 1R inlet

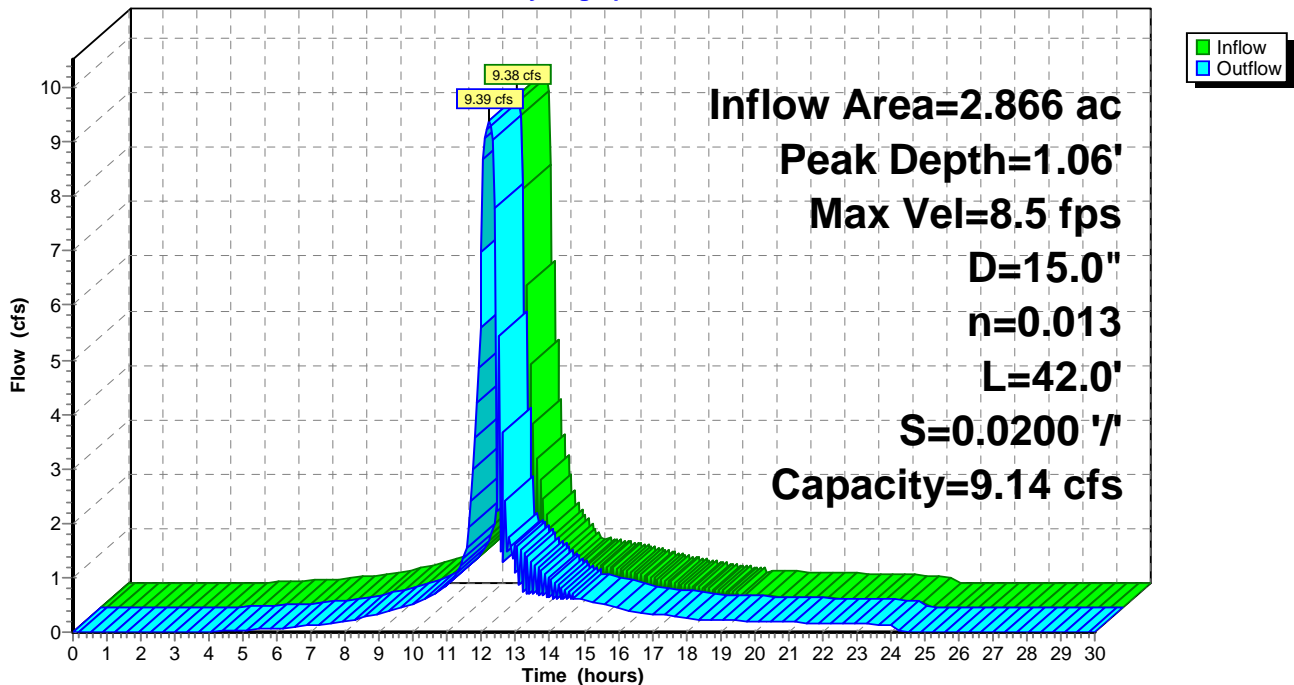
Inflow Area = 2.866 ac, Inflow Depth = 4.48" for 25-year storm event
 Inflow = 9.38 cfs @ 12.21 hrs, Volume= 1.071 af
 Outflow = 9.39 cfs @ 12.21 hrs, Volume= 1.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.5 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 3.5 fps, Avg. Travel Time= 0.2 min

Peak Depth= 1.06' @ 12.21 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 90.79', Outlet Invert= 89.95'
 15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 42.0' Slope= 0.0200 '/'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 184% of Manning's capacity

[76] Warning: Detained 0.138 af (Pond w/culvert advised)

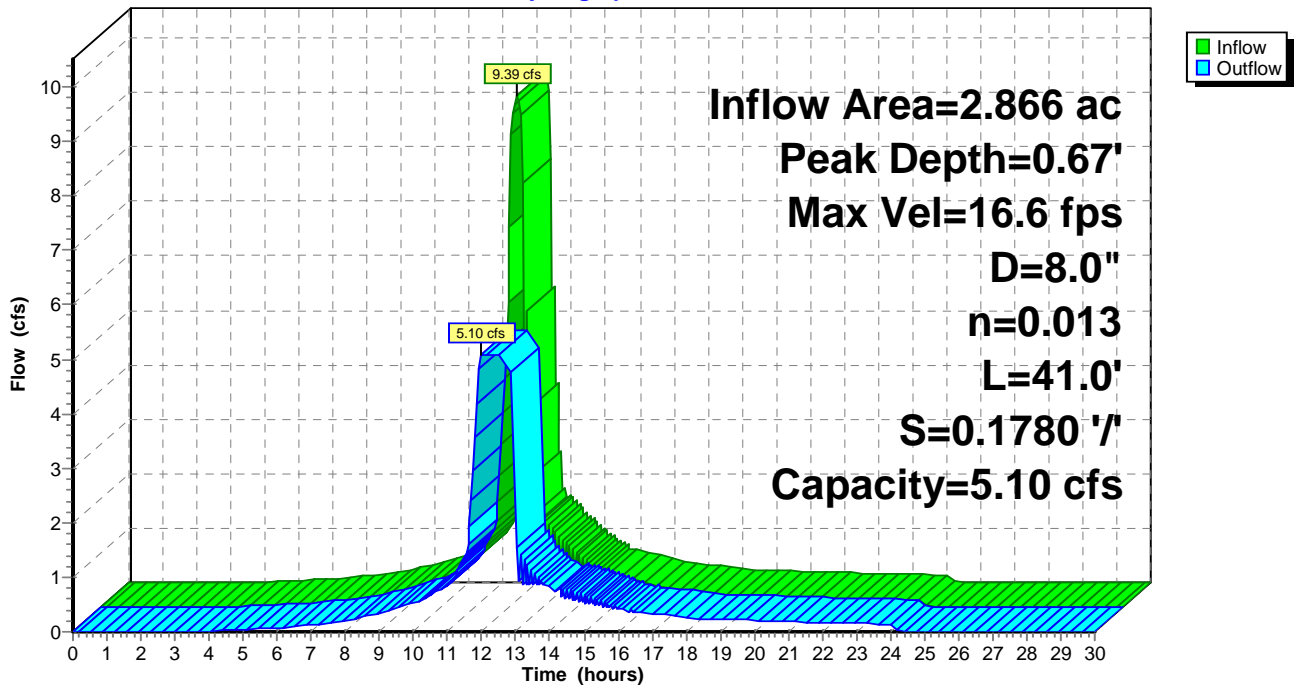
Inflow Area =	2.866 ac,	Inflow Depth =	4.48"	for	25-year storm event
Inflow =	9.39 cfs @	12.21 hrs,	Volume=	1.071 af	
Outflow =	5.10 cfs @	12.00 hrs,	Volume=	1.071 af,	Atten= 46%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.6 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 8.0 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.67' @ 11.95 hrs
 Capacity at bank full= 5.10 cfs
 Inlet Invert= 88.70', Outlet Invert= 81.40'
 8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 41.0' Slope= 0.1780 1/1

Reach 3R: Existing 8" Drain

Hydrograph



Reach DP: DP1

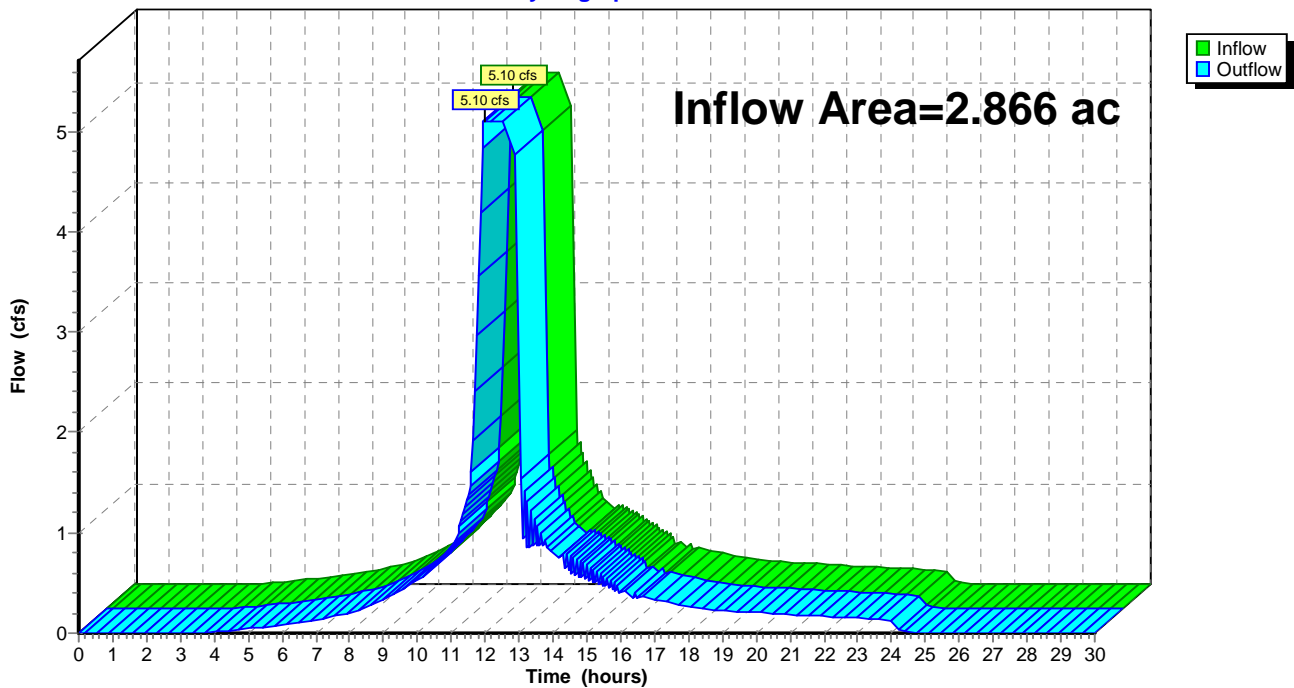
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.866 ac, Inflow Depth = 4.48" for 25-year storm event
Inflow = 5.10 cfs @ 12.00 hrs, Volume= 1.071 af
Outflow = 5.10 cfs @ 12.00 hrs, Volume= 1.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP: DP1

Hydrograph



Pond 1P: New DCB

[85] Warning: Oscillations may require Finer Routing>1

Inflow Area = 2.866 ac, Inflow Depth = 4.47" for 25-year storm event
 Inflow = 12.87 cfs @ 12.12 hrs, Volume= 1.067 af
 Outflow = 9.37 cfs @ 12.22 hrs, Volume= 1.071 af, Atten= 27%, Lag= 5.9 min
 Primary = 9.37 cfs @ 12.22 hrs, Volume= 1.071 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 96.46' @ 12.22 hrs Surf.Area= 4,506 sf Storage= 1,513 cf
 Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.6 min (786.9 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

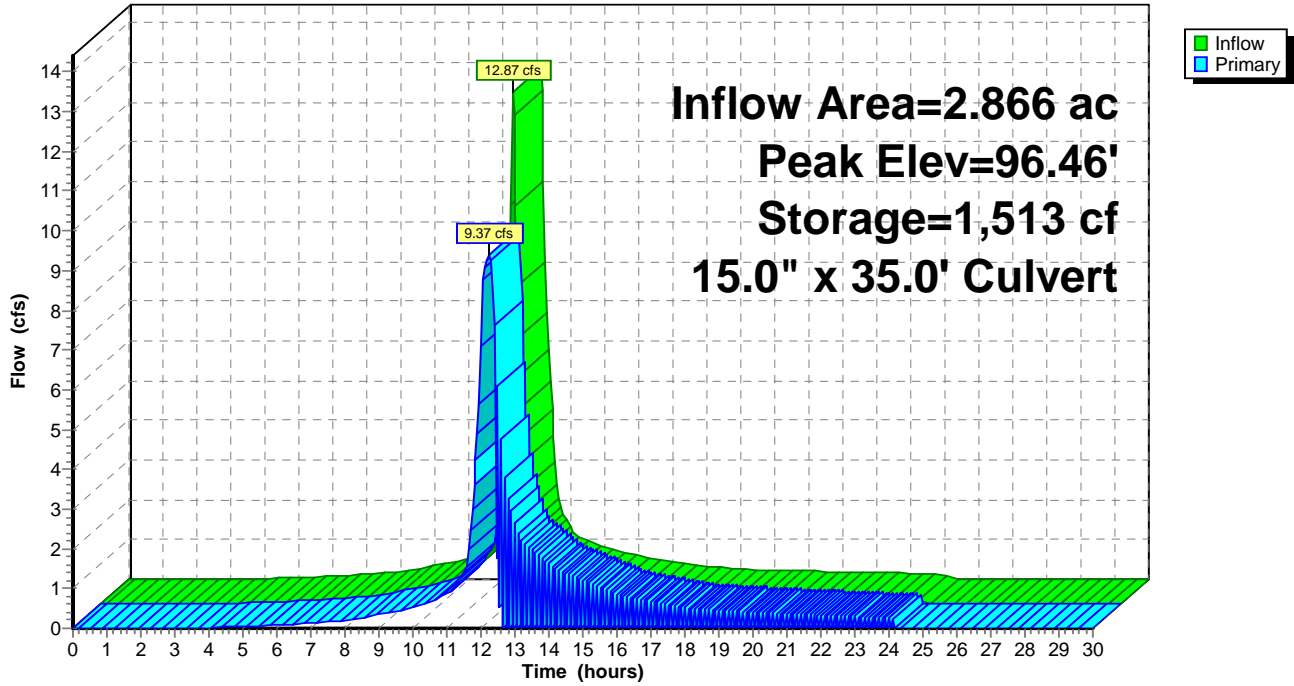
Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=9.36 cfs @ 12.22 hrs HW=96.45' (Free Discharge)

↑**1=Culvert** (Inlet Controls 9.36 cfs @ 7.6 fps)

Pond 1P: New DCB

Hydrograph



Masiello - Grafton - 88 Westboro Road

Type III 24-hr 100-year storm Rainfall=6.90"

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff Area=124,850 sf Runoff Depth=5.84"

Flow Length=690' Tc=8.7 min CN=91 Runoff=16.57 cfs 1.395 af

Reach 1R: New Drain

Peak Depth=1.17' Max Vel=8.5 fps Inflow=9.82 cfs 1.395 af

D=15.0" n=0.013 L=13.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.83 cfs 1.395 af

Reach 2R: New Drain

Peak Depth=1.25' Max Vel=8.5 fps Inflow=9.83 cfs 1.395 af

D=15.0" n=0.013 L=42.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.77 cfs 1.395 af

Reach 3R: Existing 8" Drain

Peak Depth=0.67' Max Vel=16.6 fps Inflow=9.77 cfs 1.395 af

D=8.0" n=0.013 L=41.0' S=0.1780 '/' Capacity=5.10 cfs Outflow=5.10 cfs 1.395 af

Reach DP: DP1

Inflow=5.10 cfs 1.395 af

Outflow=5.10 cfs 1.395 af

Pond 1P: New DCB

Peak Elev=96.86' Storage=3,802 cf Inflow=16.57 cfs 1.395 af

15.0" x 35.0' Culvert Outflow=9.82 cfs 1.395 af

Total Runoff Area = 2.866 ac Runoff Volume = 1.395 af Average Runoff Depth = 5.84"

Subcatchment 1S: Tributary Area to DCB/WQU

Runoff = 16.57 cfs @ 12.12 hrs, Volume= 1.395 af, Depth= 5.84"

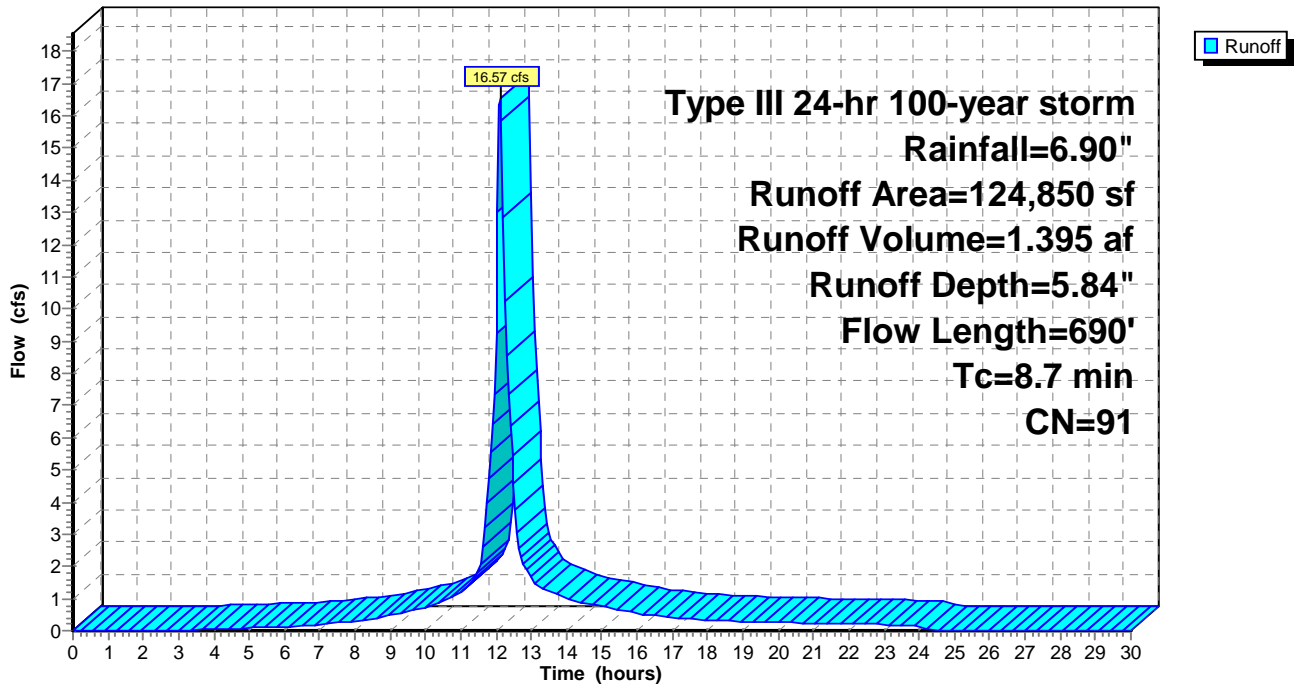
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year storm Rainfall=6.90"

Area (sf)	CN	Description
92,050	98	Paved parking & roofs
32,800	70	Woods, Good, HSG C
124,850	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	80	0.2500	8.1		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.4	375	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	185	0.0160	2.6		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.7	690	Total			

Subcatchment 1S: Tributary Area to DCB/WQU

Hydrograph



Reach 1R: New Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 107% of Manning's capacity

[88] Warning: Qout>Qin may require Finer Routing>1

[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.52'

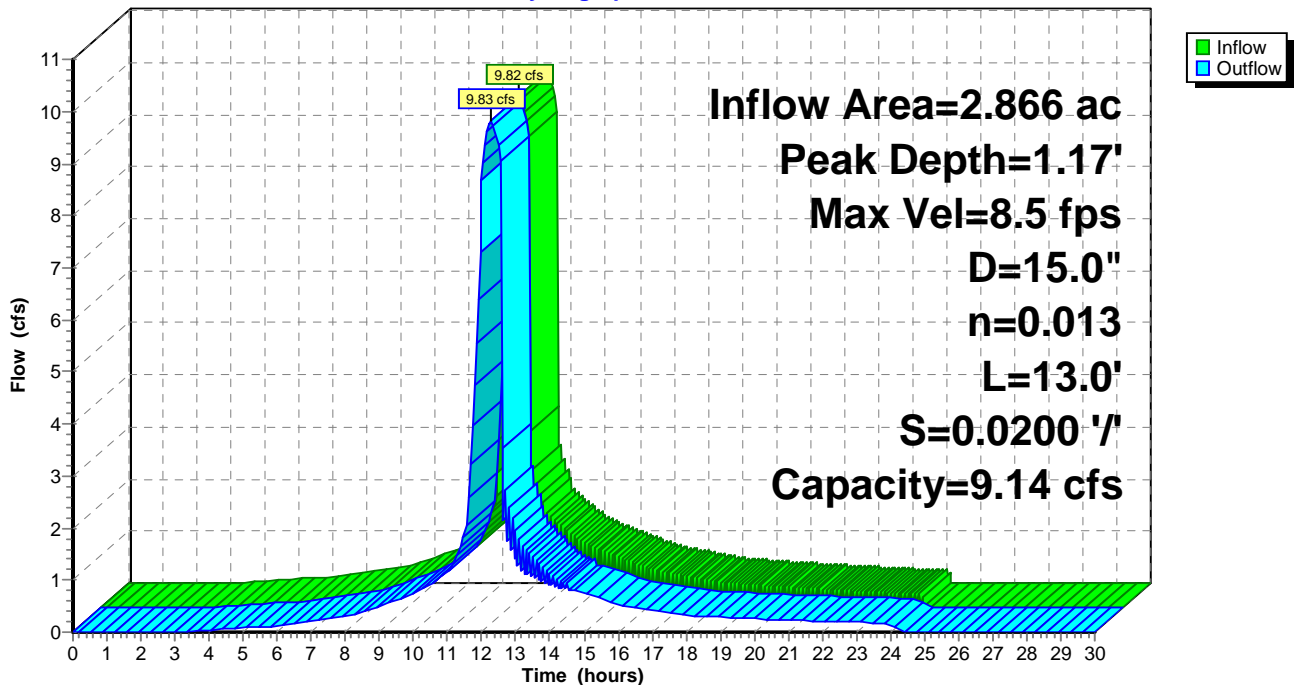
Inflow Area = 2.866 ac, Inflow Depth = 5.84" for 100-year storm event
 Inflow = 9.82 cfs @ 12.27 hrs, Volume= 1.395 af
 Outflow = 9.83 cfs @ 12.26 hrs, Volume= 1.395 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.5 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 3.7 fps, Avg. Travel Time= 0.1 min

Peak Depth= 1.17' @ 12.26 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 91.15', Outlet Invert= 90.89'
 15.0" Diameter Pipe, n= 0.013 Concrete pipe, bends & connections
 Length= 13.0' Slope= 0.0200 1/1

Reach 1R: New Drain

Hydrograph



Reach 2R: New Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 108% of Manning's capacity

[76] Warning: Detained 0.013 af (Pond w/culvert advised)

[62] Warning: Submerged 71% of Reach 1R inlet

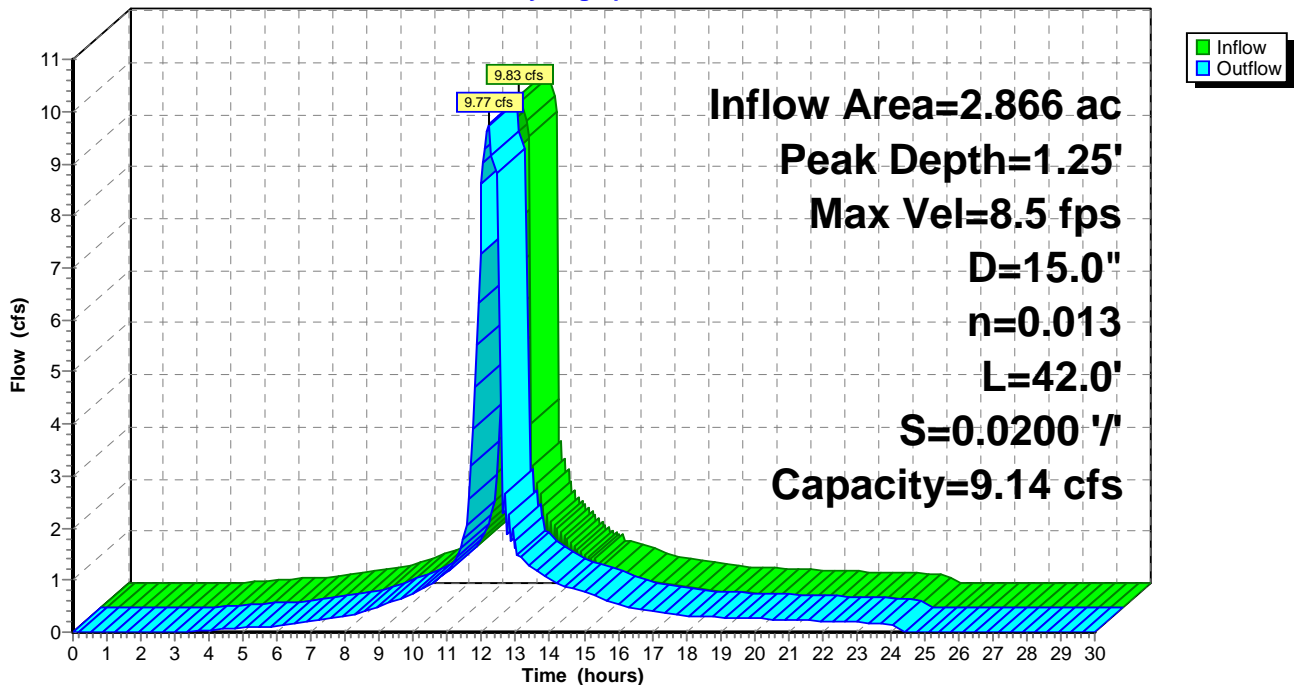
Inflow Area = 2.866 ac, Inflow Depth = 5.84" for 100-year storm event
 Inflow = 9.83 cfs @ 12.26 hrs, Volume= 1.395 af
 Outflow = 9.77 cfs @ 12.18 hrs, Volume= 1.395 af, Atten= 1%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.5 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 3.7 fps, Avg. Travel Time= 0.2 min

Peak Depth= 1.25' @ 12.25 hrs
 Capacity at bank full= 9.14 cfs
 Inlet Invert= 90.79', Outlet Invert= 89.95'
 15.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
 Length= 42.0' Slope= 0.0200 1/1'

Reach 2R: New Drain

Hydrograph



Reach 3R: Existing 8" Drain

[52] Hint: Inlet conditions not evaluated

[55] Hint: Peak inflow is 192% of Manning's capacity

[76] Warning: Detained 0.226 af (Pond w/culvert advised)

Inflow Area =	2.866 ac,	Inflow Depth =	5.84"	for	100-year storm event
Inflow =	9.77 cfs @	12.18 hrs,	Volume=	1.395 af	
Outflow =	5.10 cfs @	11.90 hrs,	Volume=	1.395 af,	Atten= 48%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 16.6 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 8.6 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.67' @ 11.85 hrs

Capacity at bank full= 5.10 cfs

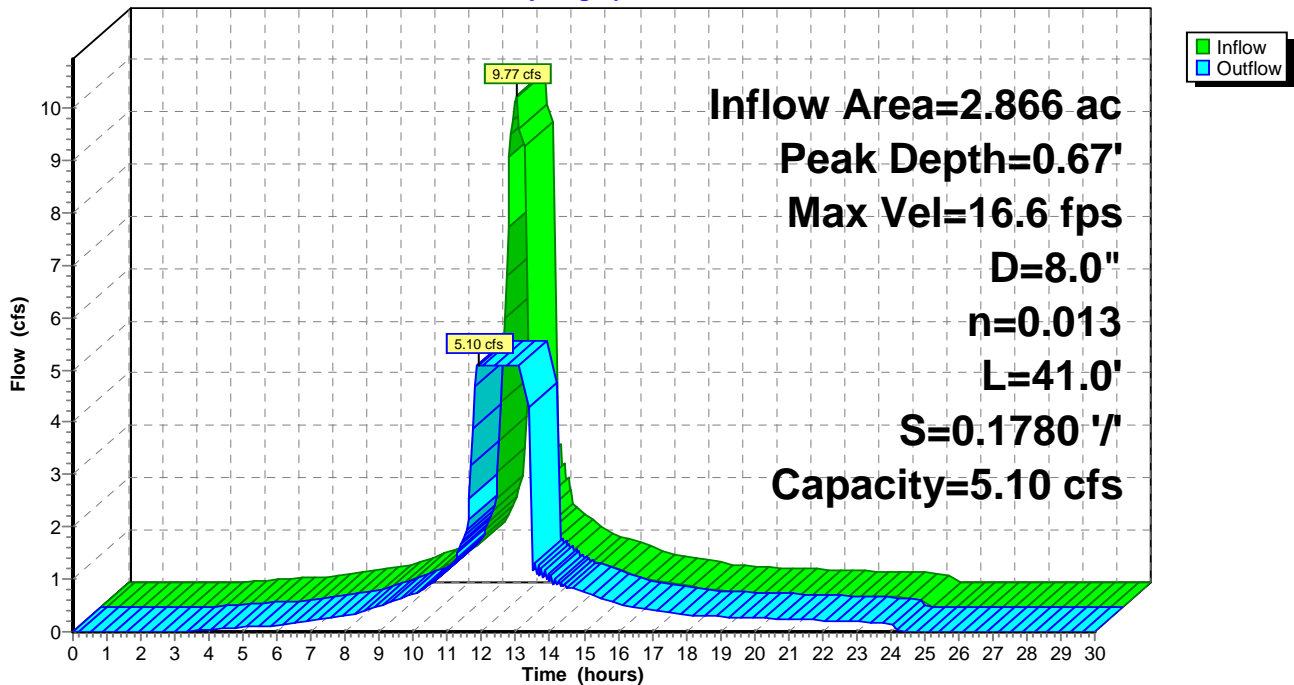
Inlet Invert= 88.70', Outlet Invert= 81.40'

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior

Length= 41.0' Slope= 0.1780 1/100

Reach 3R: Existing 8" Drain

Hydrograph



Reach DP: DP1

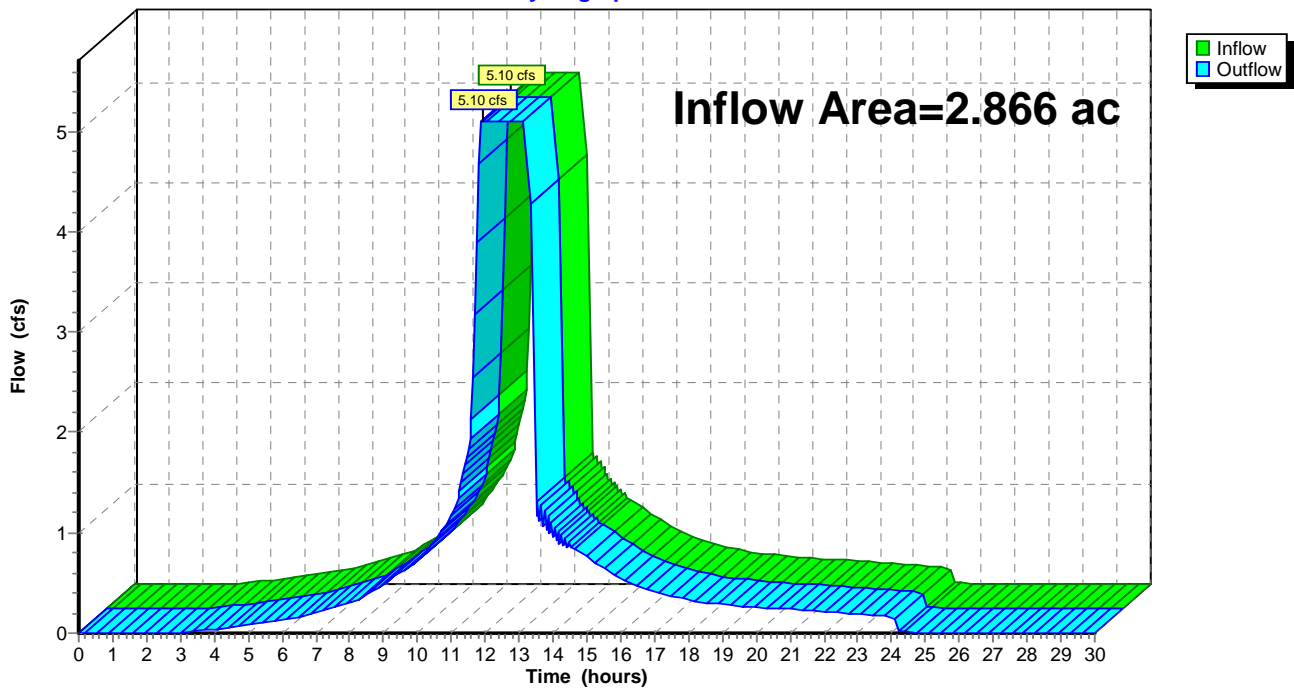
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.866 ac, Inflow Depth = 5.84" for 100-year storm event
Inflow = 5.10 cfs @ 11.90 hrs, Volume= 1.395 af
Outflow = 5.10 cfs @ 11.90 hrs, Volume= 1.395 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP: DP1

Hydrograph



Pond 1P: New DCB

[85] Warning: Oscillations may require Finer Routing>1

Inflow Area = 2.866 ac, Inflow Depth = 5.84" for 100-year storm event
 Inflow = 16.57 cfs @ 12.12 hrs, Volume= 1.395 af
 Outflow = 9.82 cfs @ 12.27 hrs, Volume= 1.395 af, Atten= 41%, Lag= 8.8 min
 Primary = 9.82 cfs @ 12.27 hrs, Volume= 1.395 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 96.86' @ 12.27 hrs Surf.Area= 7,165 sf Storage= 3,802 cf
 Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.4 min (780.7 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1	91.80'	9,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.80	0	0	0
95.80	8	16	16
97.50	11,535	9,812	9,828

Device	Routing	Invert	Outlet Devices
#1	Primary	91.80'	15.0" x 35.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 91.25' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=9.81 cfs @ 12.27 hrs HW=96.85' (Free Discharge)

↑**1=Culvert** (Inlet Controls 9.81 cfs @ 8.0 fps)

Pond 1P: New DCB

Hydrograph

