

339 CHESTERFIELD RD CULVERT SIZING

Prepared by RCL Thompson LLC

Printed 8/15/2024

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
9.084	0.30	FOREST (DA-PRE)
9.084	0.30	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	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	C1	382.40	382.20	15.0	0.0133	0.020	0.0	12.0	0.0
2	2P	382.40	382.20	15.0	0.0133	0.020	0.0	12.0	0.0

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA-PRE: DA Runoff Area=395,694 sf 0.00% Impervious Runoff Depth>1.04"
Tc=5.0 min C=0.30 Runoff=0.40 cfs 0.785 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.11' Max Vel=1.44 fps Inflow=0.40 cfs 0.743 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=0.40 cfs 0.743 af

Pond 2P: (new Pond) Peak Elev=382.55' Storage=0.041 af Inflow=0.40 cfs 0.785 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=0.40 cfs 0.743 af

Total Runoff Area = 9.084 ac Runoff Volume = 0.785 af Average Runoff Depth = 1.04"
100.00% Pervious = 9.084 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 0.40 cfs @ 0.09 hrs, Volume= 0.785 af, Depth> 1.04"

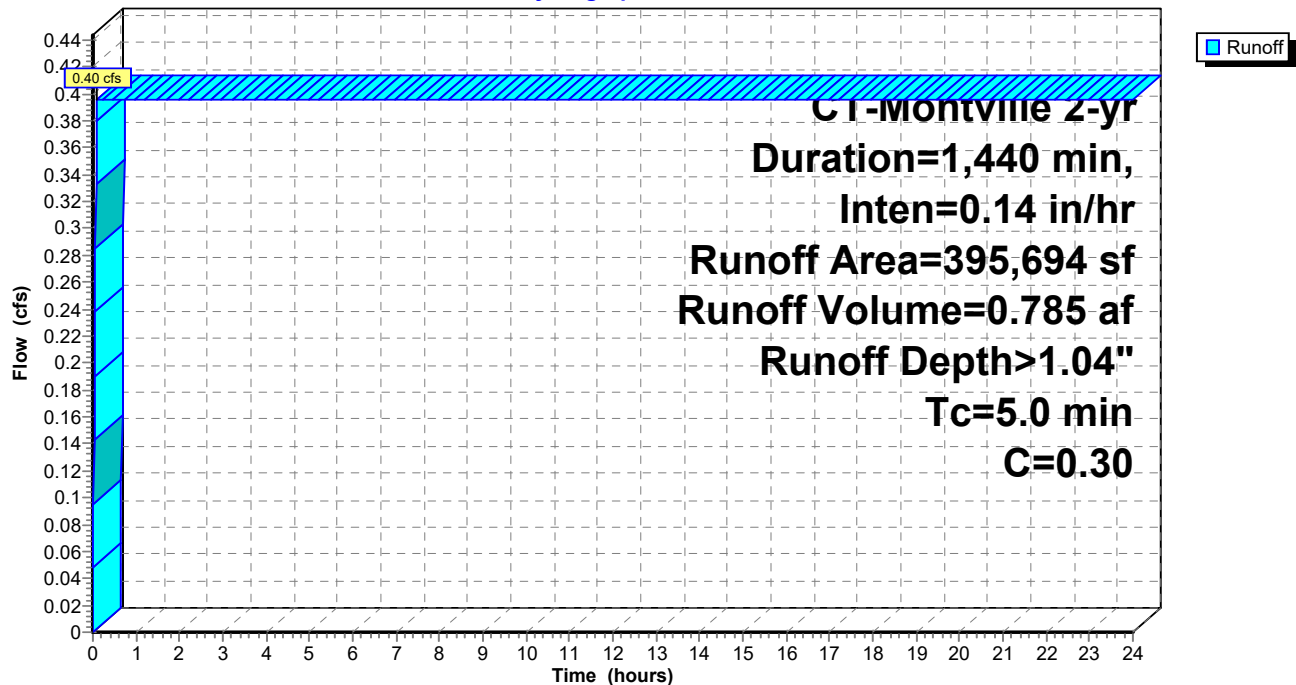
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 2-yr Duration=1,440 min, Inten=0.14 in/hr

Area (sf)	C	Description
395,694	0.30	FOREST
395,694		100.00% Pervious Area

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

Subcatchment DA-PRE: DA

Hydrograph



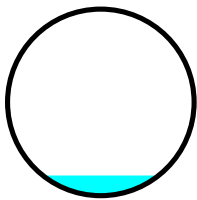
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 0.98" for 2-yr event
 Inflow = 0.40 cfs @ 20.42 hrs, Volume= 0.743 af
 Outflow = 0.40 cfs @ 20.43 hrs, Volume= 0.743 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.44 fps, Min. Travel Time= 0.2 min
 Avg. Velocity= 1.40 fps, Avg. Travel Time= 0.2 min

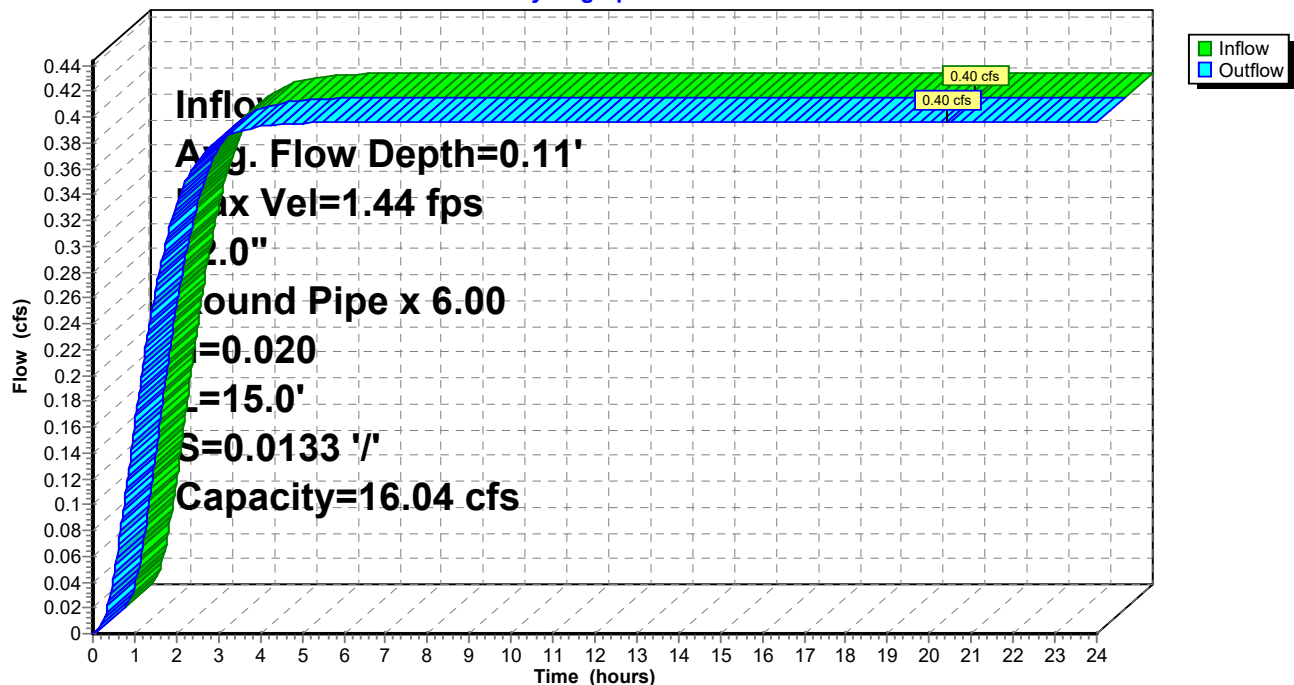
Peak Storage= 4 cf @ 20.43 hrs
 Average Depth at Peak Storage= 0.11', Surface Width= 3.73'
 Bank-Full Depth= 1.00' Flow Area= 4.7 sf, Capacity= 16.04 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
 12.0" Round Pipe
 n= 0.020 Corrugated PE, corrugated interior
 Length= 15.0' Slope= 0.0133 '/
 Inlet Invert= 382.40', Outlet Invert= 382.20'



Reach C1: CULVERT CROSSING

Hydrograph



Summary for Pond 2P: (new Pond)

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2-yr event
 Inflow = 0.40 cfs @ 0.09 hrs, Volume= 0.785 af
 Outflow = 0.40 cfs @ 20.42 hrs, Volume= 0.743 af, Atten= 0%, Lag= 1,219.8 min
 Primary = 0.40 cfs @ 20.42 hrs, Volume= 0.743 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.55' @ 17.85 hrs Surf.Area= 0.286 ac Storage= 0.041 af

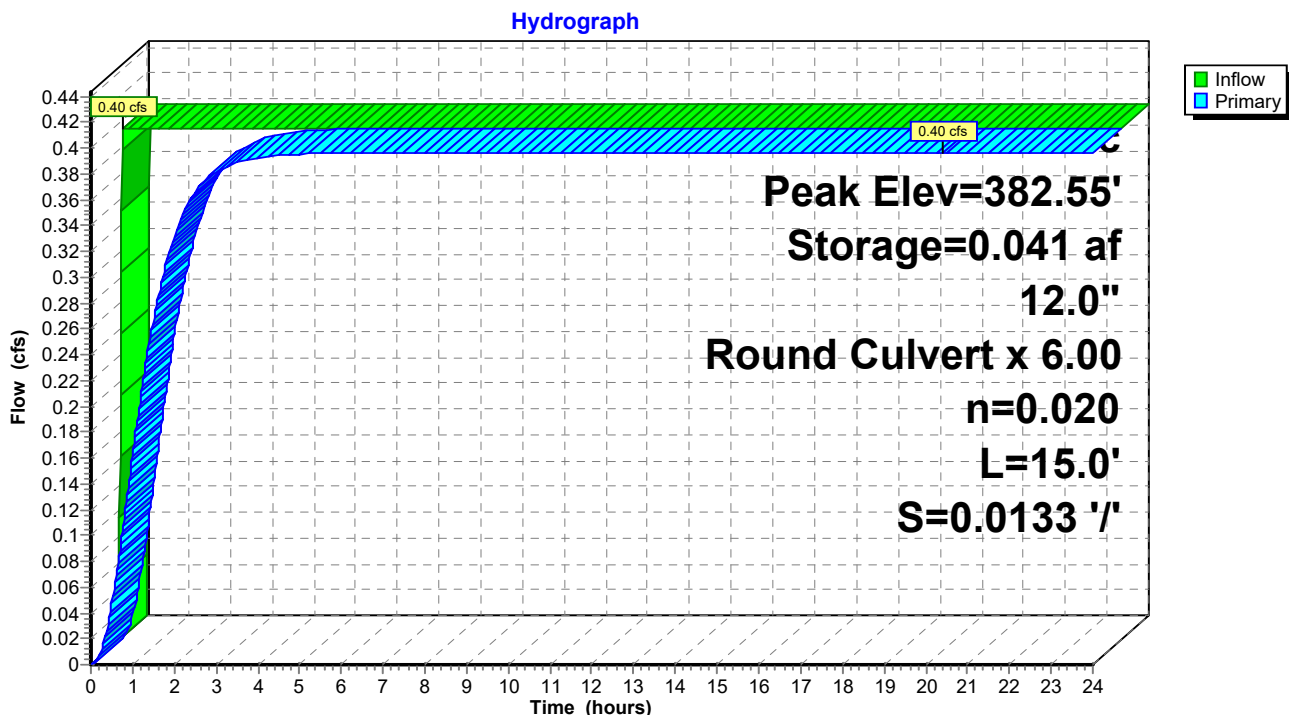
Plug-Flow detention time= 74.9 min calculated for 0.743 af (95% of inflow)
 Center-of-Mass det. time= 37.1 min (758.5 - 721.4)

Volume	Invert	Avail.Storage	Storage Description
#1	382.40'	0.747 af	60.00'W x 200.00'L x 2.10'H Prismaoid Z=6.0

Device	Routing	Invert	Outlet Devices
#1	Primary	382.40'	12.0" Round Culvert X 6.00 L= 15.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 382.40' / 382.20' S= 0.0133 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 20.42 hrs HW=382.55' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.40 cfs @ 1.40 fps)

Pond 2P: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA-PRE: DA Runoff Area=395,694 sf 0.00% Impervious Runoff Depth>1.53"
Tc=5.0 min C=0.30 Runoff=0.59 cfs 1.161 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.13' Max Vel=1.62 fps Inflow=0.59 cfs 1.111 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=0.59 cfs 1.110 af

Pond 2P: (new Pond) Peak Elev=382.58' Storage=0.050 af Inflow=0.59 cfs 1.161 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=0.59 cfs 1.111 af

Total Runoff Area = 9.084 ac Runoff Volume = 1.161 af Average Runoff Depth = 1.53"
100.00% Pervious = 9.084 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 0.59 cfs @ 0.09 hrs, Volume= 1.161 af, Depth> 1.53"

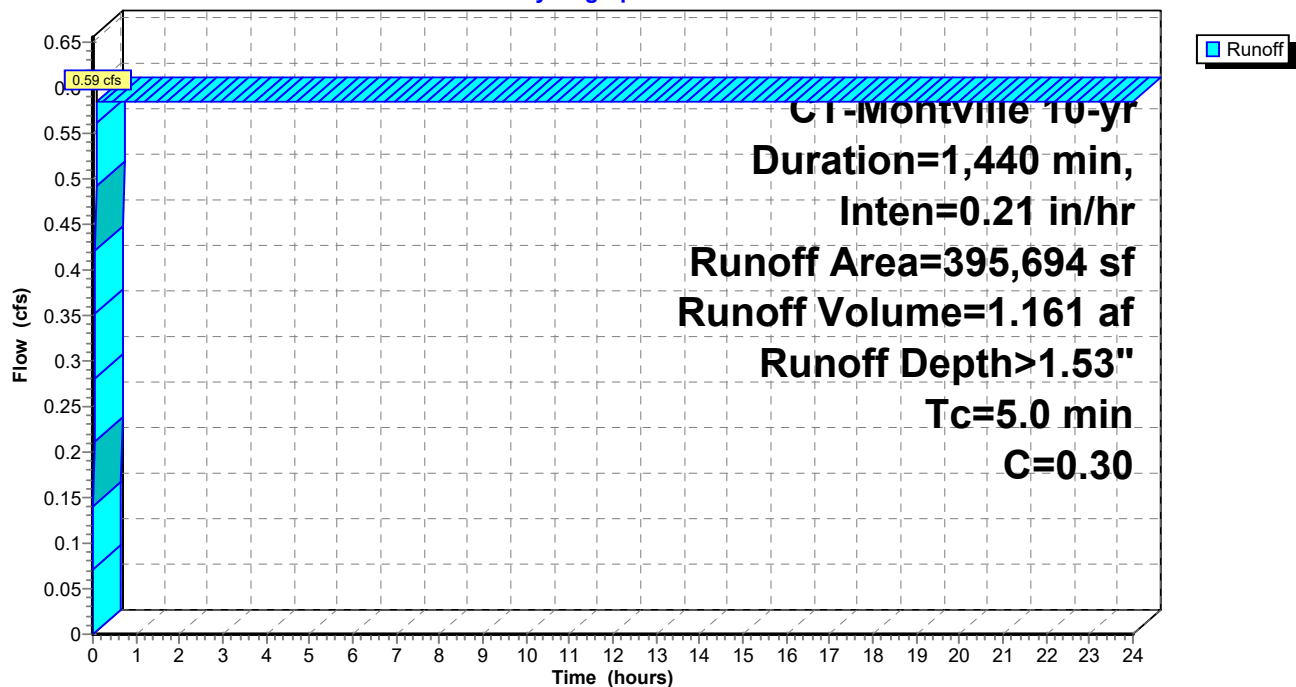
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr

Area (sf)	C	Description
395,694	0.30	FOREST
395,694		100.00% Pervious Area

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

Subcatchment DA-PRE: DA

Hydrograph



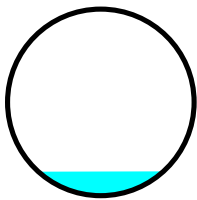
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 1.47" for 10-yr event
 Inflow = 0.59 cfs @ 17.41 hrs, Volume= 1.111 af
 Outflow = 0.59 cfs @ 17.42 hrs, Volume= 1.110 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.62 fps, Min. Travel Time= 0.2 min
 Avg. Velocity= 1.58 fps, Avg. Travel Time= 0.2 min

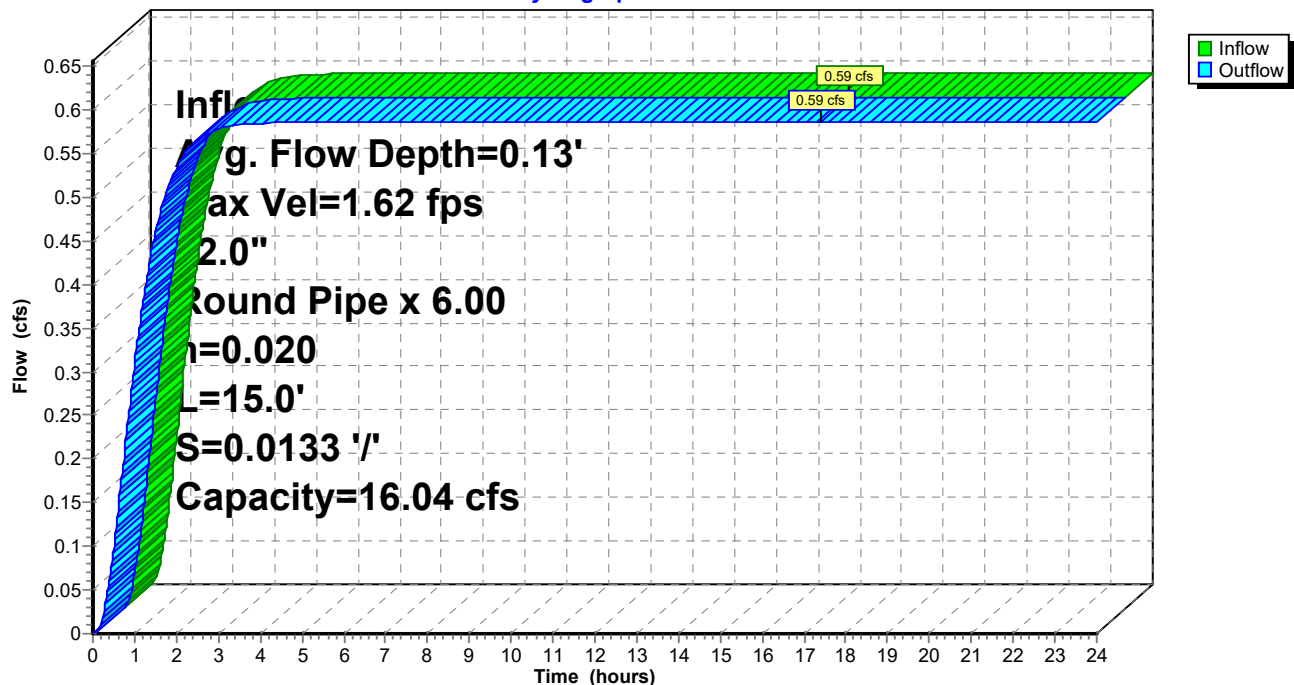
Peak Storage= 5 cf @ 17.41 hrs
 Average Depth at Peak Storage= 0.13', Surface Width= 4.04'
 Bank-Full Depth= 1.00' Flow Area= 4.7 sf, Capacity= 16.04 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
 12.0" Round Pipe
 n= 0.020 Corrugated PE, corrugated interior
 Length= 15.0' Slope= 0.0133 '/
 Inlet Invert= 382.40', Outlet Invert= 382.20'



Reach C1: CULVERT CROSSING

Hydrograph



Summary for Pond 2P: (new Pond)

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 1.53" for 10-yr event
 Inflow = 0.59 cfs @ 0.09 hrs, Volume= 1.161 af
 Outflow = 0.59 cfs @ 17.41 hrs, Volume= 1.111 af, Atten= 0%, Lag= 1,039.2 min
 Primary = 0.59 cfs @ 17.41 hrs, Volume= 1.111 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.58' @ 15.93 hrs Surf.Area= 0.288 ac Storage= 0.050 af

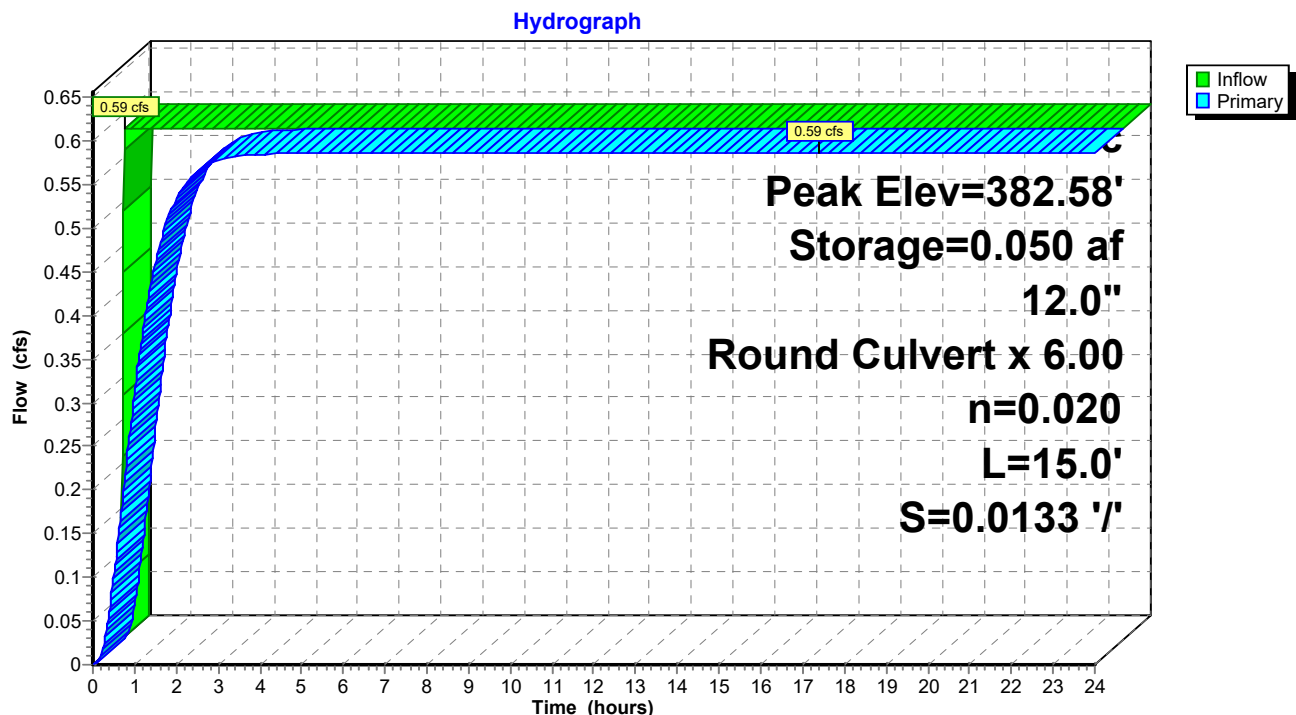
Plug-Flow detention time= 61.7 min calculated for 1.111 af (96% of inflow)
 Center-of-Mass det. time= 30.6 min (752.0 - 721.4)

Volume	Invert	Avail.Storage	Storage Description
#1	382.40'	0.747 af	60.00'W x 200.00'L x 2.10'H Prismatic Z=6.0

Device	Routing	Invert	Outlet Devices
#1	Primary	382.40'	12.0" Round Culvert X 6.00 L= 15.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 382.40' / 382.20' S= 0.0133 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 17.41 hrs HW=382.58' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.58 cfs @ 1.56 fps)

Pond 2P: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA-PRE: DA Runoff Area=395,694 sf 0.00% Impervious Runoff Depth>2.32"
Tc=5.0 min C=0.30 Runoff=0.89 cfs 1.760 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.16' Max Vel=1.83 fps Inflow=0.89 cfs 1.697 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=0.89 cfs 1.697 af

Pond 2P: (new Pond) Peak Elev=382.62' Storage=0.062 af Inflow=0.89 cfs 1.760 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=0.89 cfs 1.697 af

Total Runoff Area = 9.084 ac Runoff Volume = 1.760 af Average Runoff Depth = 2.32"
100.00% Pervious = 9.084 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 0.89 cfs @ 0.09 hrs, Volume= 1.760 af, Depth> 2.32"

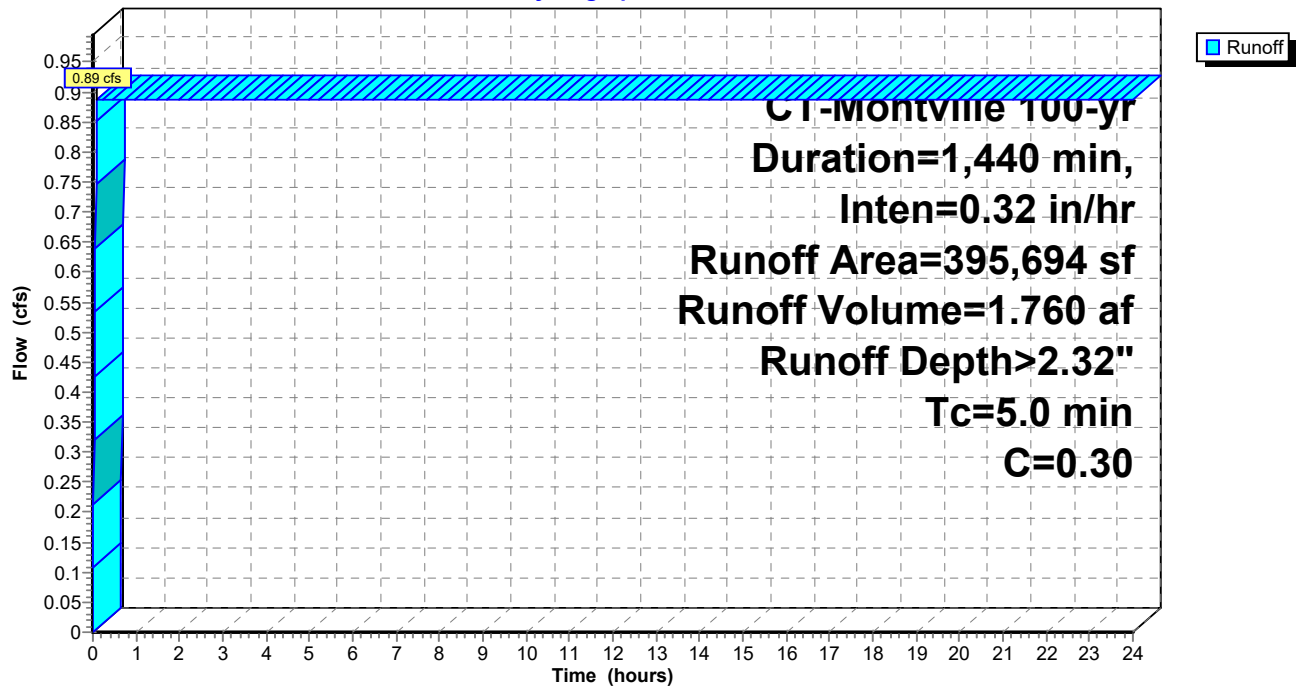
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 100-yr Duration=1,440 min, Inten=0.32 in/hr

Area (sf)	C	Description
395,694	0.30	FOREST
395,694		100.00% Pervious Area

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

Subcatchment DA-PRE: DA

Hydrograph



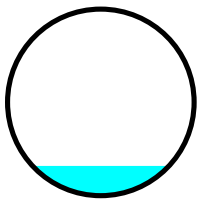
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 2.24" for 100-yr event
 Inflow = 0.89 cfs @ 14.93 hrs, Volume= 1.697 af
 Outflow = 0.89 cfs @ 14.94 hrs, Volume= 1.697 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.83 fps, Min. Travel Time= 0.1 min
 Avg. Velocity= 1.80 fps, Avg. Travel Time= 0.1 min

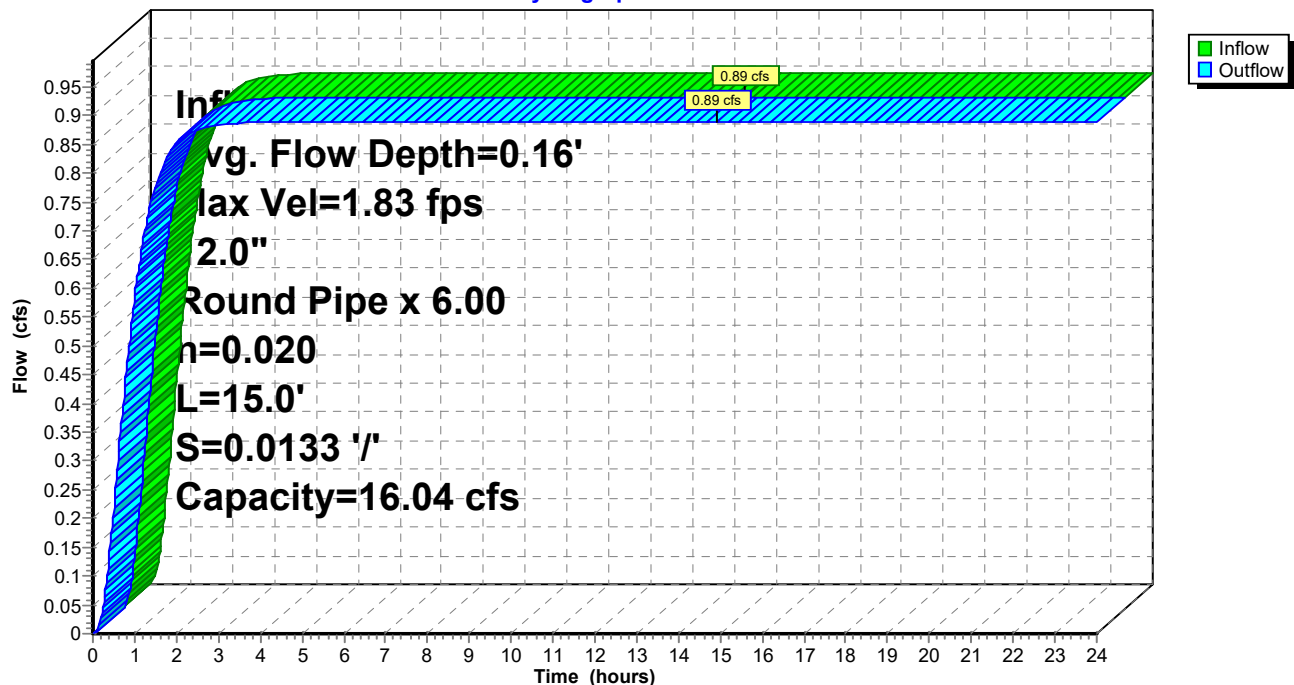
Peak Storage= 7 cf @ 14.94 hrs
 Average Depth at Peak Storage= 0.16', Surface Width= 4.40'
 Bank-Full Depth= 1.00' Flow Area= 4.7 sf, Capacity= 16.04 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
 12.0" Round Pipe
 n= 0.020 Corrugated PE, corrugated interior
 Length= 15.0' Slope= 0.0133 '/
 Inlet Invert= 382.40', Outlet Invert= 382.20'



Reach C1: CULVERT CROSSING

Hydrograph



Summary for Pond 2P: (new Pond)

Inflow Area = 9.084 ac, 0.00% Impervious, Inflow Depth > 2.32" for 100-yr event
 Inflow = 0.89 cfs @ 0.09 hrs, Volume= 1.760 af
 Outflow = 0.89 cfs @ 14.93 hrs, Volume= 1.697 af, Atten= 0%, Lag= 890.4 min
 Primary = 0.89 cfs @ 14.93 hrs, Volume= 1.697 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.62' @ 13.17 hrs Surf.Area= 0.291 ac Storage= 0.062 af

Plug-Flow detention time= 50.6 min calculated for 1.697 af (96% of inflow)
 Center-of-Mass det. time= 25.1 min (746.5 - 721.4)

Volume	Invert	Avail.Storage	Storage Description
#1	382.40'	0.747 af	60.00'W x 200.00'L x 2.10'H Prismatic Z=6.0

Device	Routing	Invert	Outlet Devices
#1	Primary	382.40'	12.0" Round Culvert X 6.00 L= 15.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 382.40' / 382.20' S= 0.0133 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 14.93 hrs HW=382.62' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.89 cfs @ 1.74 fps)

Pond 2P: (new Pond)

