

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)
20.000	0.30	FOREST (DA-PRE)
20.000	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=20.000 ac 0.00% Impervious Runoff Depth>1.04"
Tc=5.0 min C=0.30 Runoff=0.87 cfs 1.727 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.16' Max Vel=1.82 fps Inflow=0.87 cfs 1.666 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=0.87 cfs 1.665 af

Pond 2P: (new Pond) Peak Elev=382.62' Storage=0.062 af Inflow=0.87 cfs 1.727 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=0.87 cfs 1.666 af

Total Runoff Area = 20.000 ac Runoff Volume = 1.727 af Average Runoff Depth = 1.04"
100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 0.87 cfs @ 0.09 hrs, Volume= 1.727 af, Depth> 1.04"

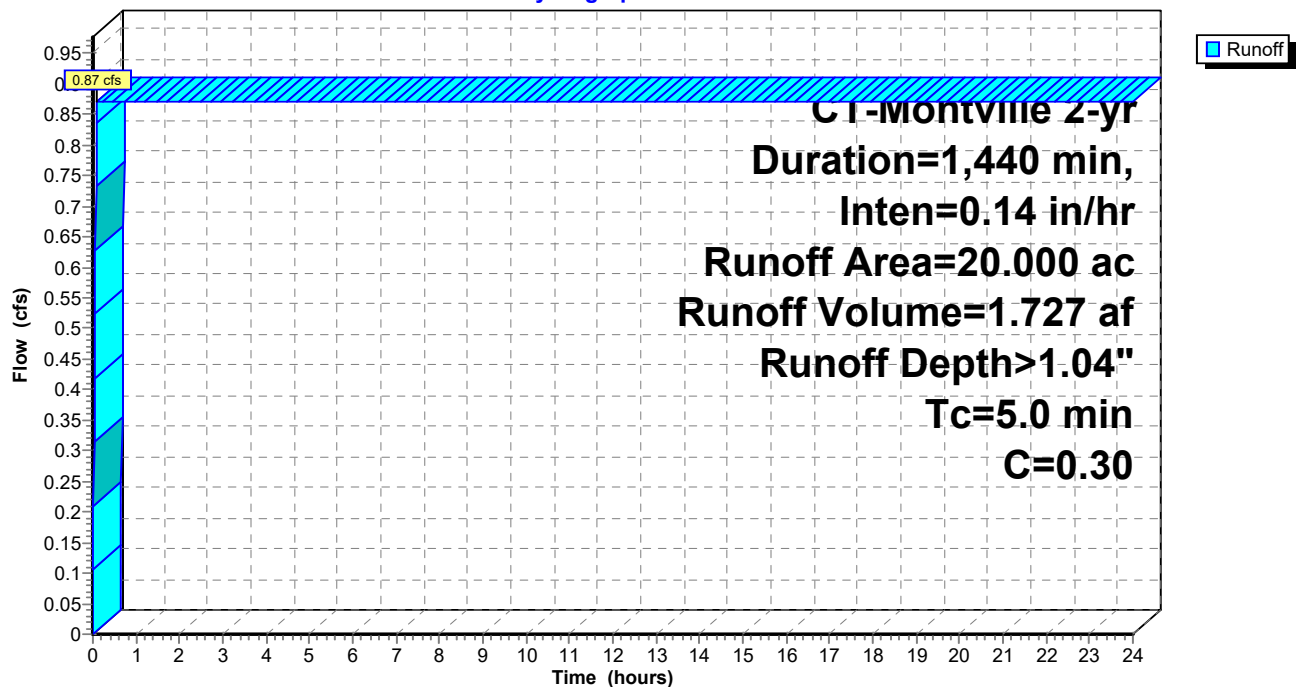
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 2-yr Duration=1,440 min, Inten=0.14 in/hr

Area (ac)	C	Description
20.000	0.30	FOREST
20.000		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



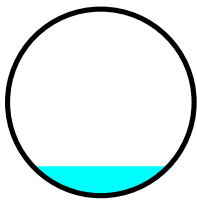
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 1.00" for 2-yr event
 Inflow = 0.87 cfs @ 15.25 hrs, Volume= 1.666 af
 Outflow = 0.87 cfs @ 15.26 hrs, Volume= 1.665 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= 1.82 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 1.79 fps, Avg. Travel Time= 0.1 min

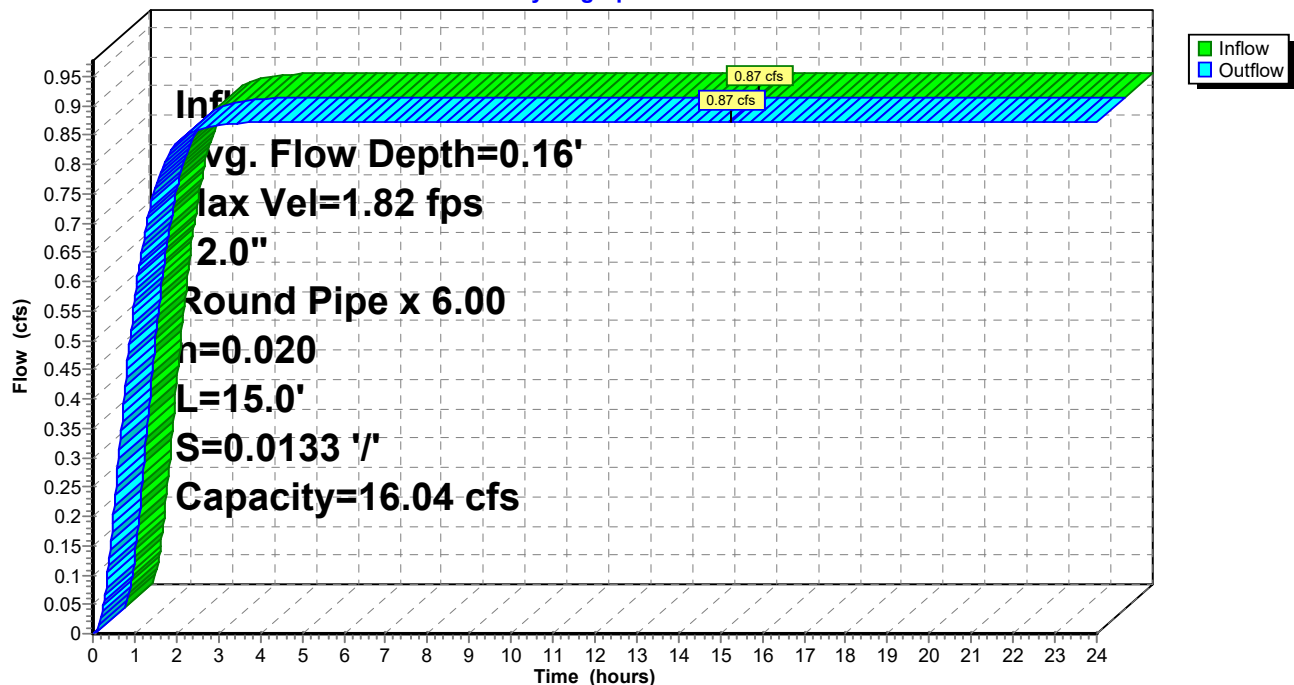
Peak Storage= 7 cf @ 15.26 hrs
 Average Depth at Peak Storage= 0.16' , Surface Width= 4.38'
 Bank-Full Depth= 1.00' Flow Area= 4.7 sf, Capacity= 16.04 cfs

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 = 20.000 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2-yr event
 Inflow = 0.87 cfs @ 0.09 hrs, Volume= 1.727 af
 Outflow = 0.87 cfs @ 15.25 hrs, Volume= 1.666 af, Atten= 0%, Lag= 909.6 min
 Primary = 0.87 cfs @ 15.25 hrs, Volume= 1.666 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.62' @ 13.33 hrs Surf.Area= 0.291 ac Storage= 0.062 af

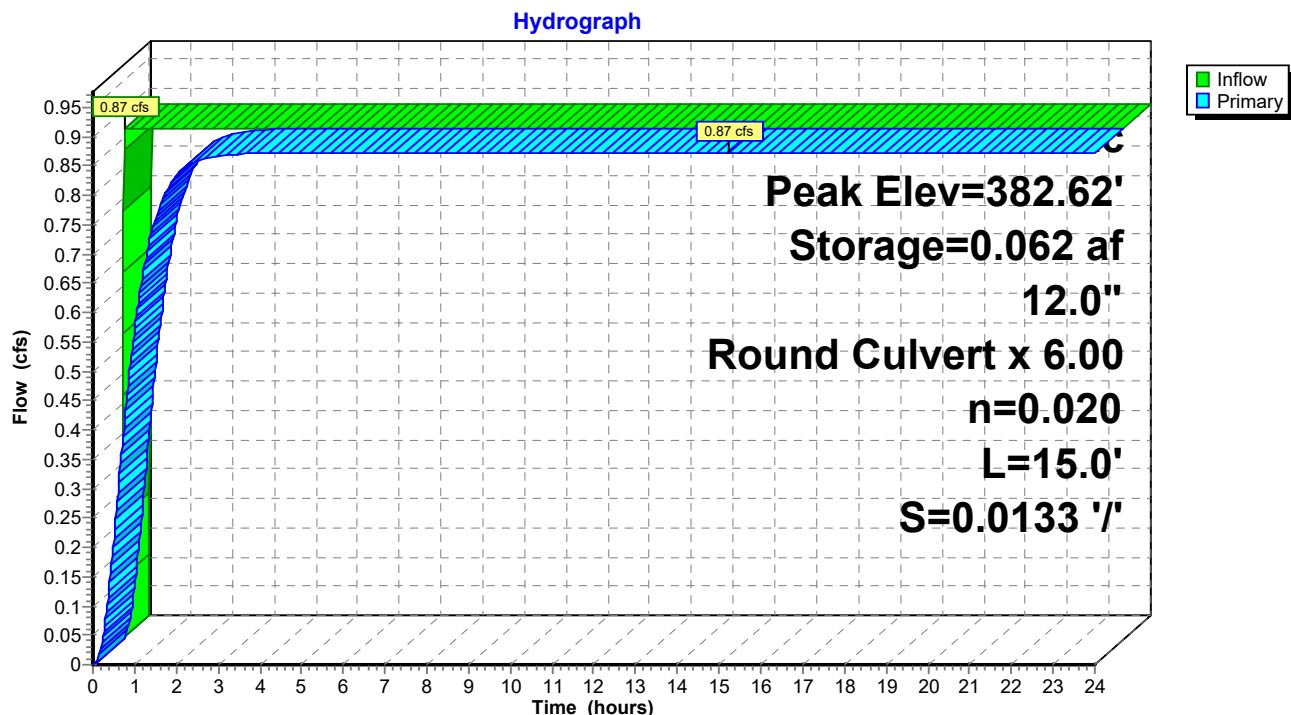
Plug-Flow detention time= 51.0 min calculated for 1.666 af (96% of inflow)
 Center-of-Mass det. time= 25.3 min (746.7 - 721.4)

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=0.87 cfs @ 15.25 hrs HW=382.62' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.87 cfs @ 1.73 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=20.000 ac 0.00% Impervious Runoff Depth>1.53"
Tc=5.0 min C=0.30 Runoff=1.29 cfs 2.556 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.19' Max Vel=2.04 fps Inflow=1.29 cfs 2.480 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=1.29 cfs 2.480 af

Pond 2P: (new Pond) Peak Elev=382.67' Storage=0.076 af Inflow=1.29 cfs 2.556 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=1.29 cfs 2.480 af

Total Runoff Area = 20.000 ac Runoff Volume = 2.556 af Average Runoff Depth = 1.53"
100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 1.29 cfs @ 0.09 hrs, Volume= 2.556 af, Depth> 1.53"

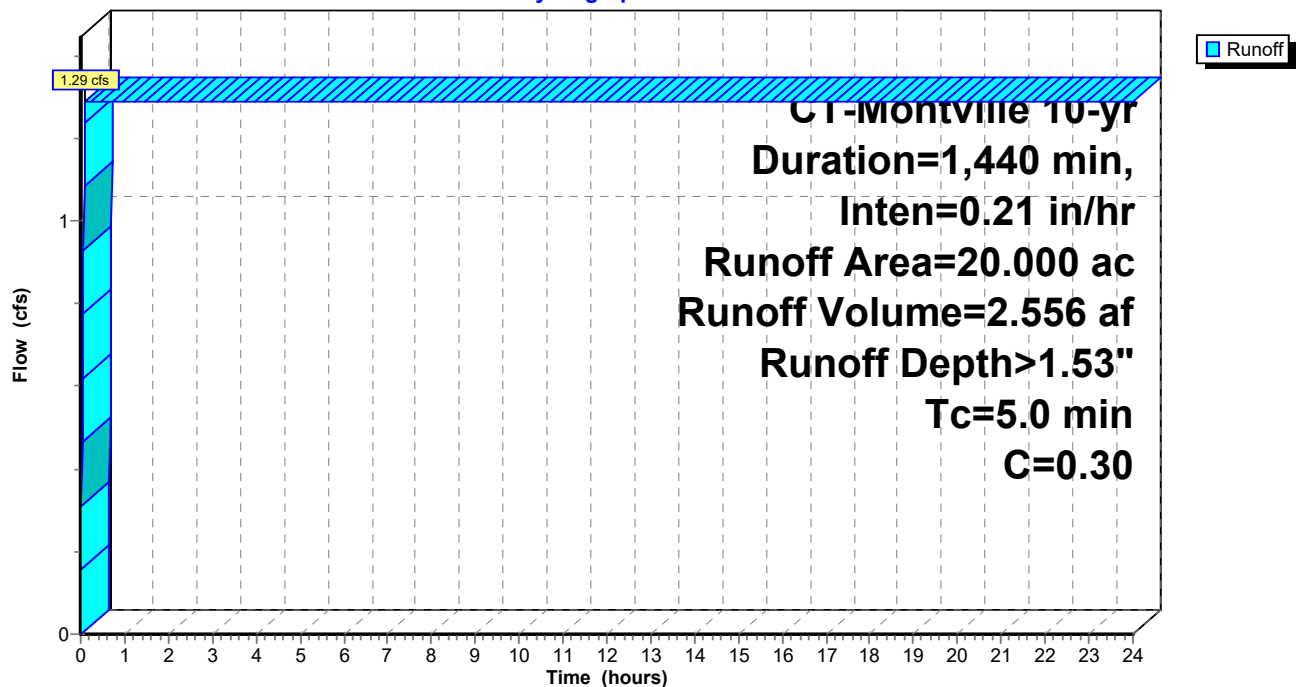
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr

Area (ac)	C	Description
20.000	0.30	FOREST
20.000		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



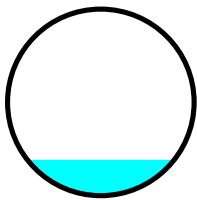
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 1.49" for 10-yr event
 Inflow = 1.29 cfs @ 13.14 hrs, Volume= 2.480 af
 Outflow = 1.29 cfs @ 13.15 hrs, Volume= 2.480 af, Atten= 0%, Lag= 0.6 min

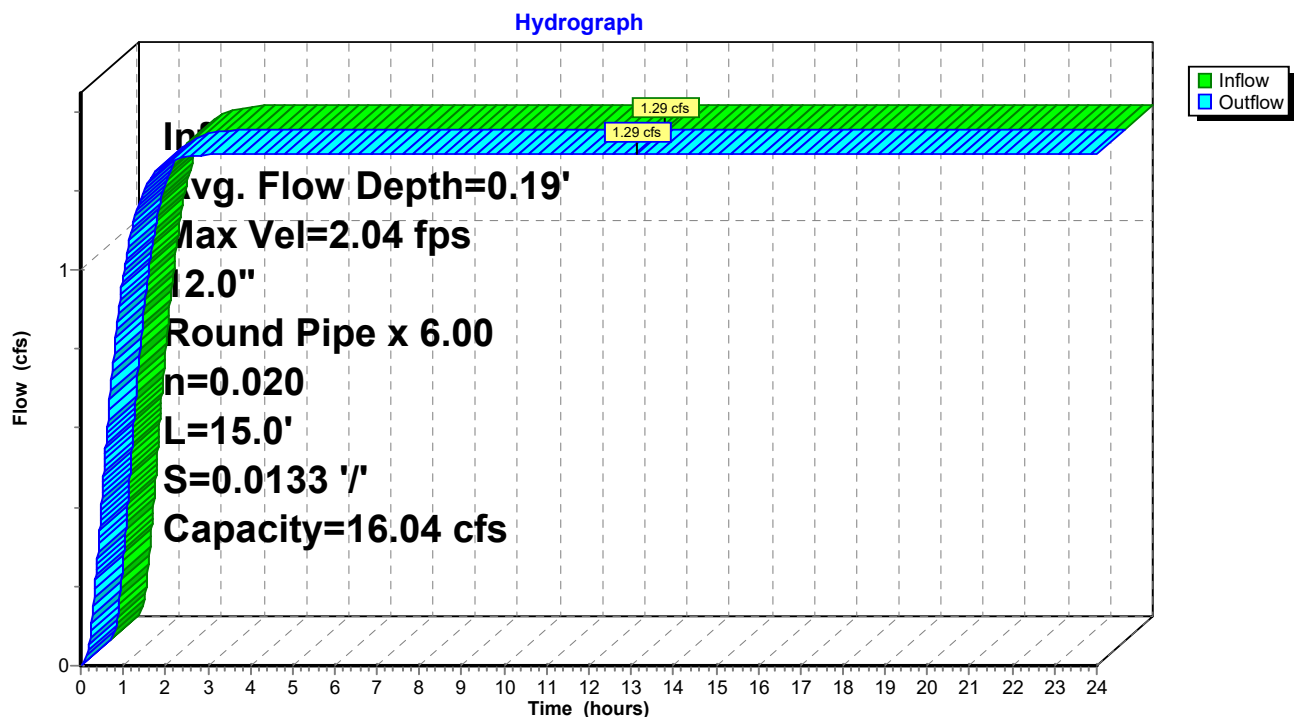
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.04 fps, Min. Travel Time= 0.1 min
 Avg. Velocity= 2.01 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 13.14 hrs
 Average Depth at Peak Storage= 0.19' , Surface Width= 4.72'
 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



Summary for Pond 2P: (new Pond)

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 1.53" for 10-yr event
 Inflow = 1.29 cfs @ 0.09 hrs, Volume= 2.556 af
 Outflow = 1.29 cfs @ 13.14 hrs, Volume= 2.480 af, Atten= 0%, Lag= 783.0 min
 Primary = 1.29 cfs @ 13.14 hrs, Volume= 2.480 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.67' @ 12.76 hrs Surf.Area= 0.295 ac Storage= 0.076 af

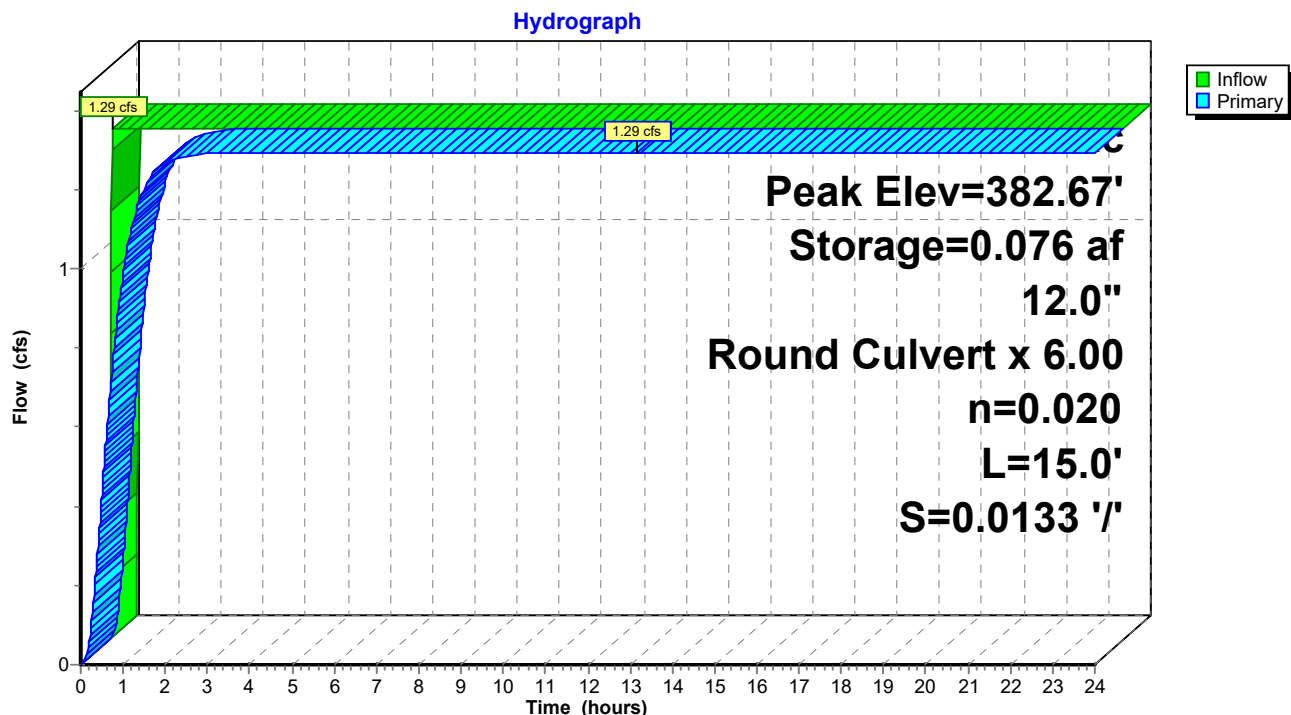
Plug-Flow detention time= 42.5 min calculated for 2.479 af (97% of inflow)
 Center-of-Mass det. time= 21.1 min (742.5 - 721.4)

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=1.29 cfs @ 13.14 hrs HW=382.67' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.29 cfs @ 1.92 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=20.000 ac 0.00% Impervious Runoff Depth>2.32"
Tc=5.0 min C=0.30 Runoff=1.96 cfs 3.874 af

Reach C1: CULVERT CROSSING Avg. Flow Depth=0.24' Max Vel=2.31 fps Inflow=1.96 cfs 3.779 af
12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=1.96 cfs 3.778 af

Pond 2P: (new Pond) Peak Elev=382.73' Storage=0.095 af Inflow=1.96 cfs 3.874 af
12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=1.96 cfs 3.779 af

Total Runoff Area = 20.000 ac Runoff Volume = 3.874 af Average Runoff Depth = 2.32"
100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-PRE: DA

Runoff = 1.96 cfs @ 0.09 hrs, Volume= 3.874 af, Depth> 2.32"

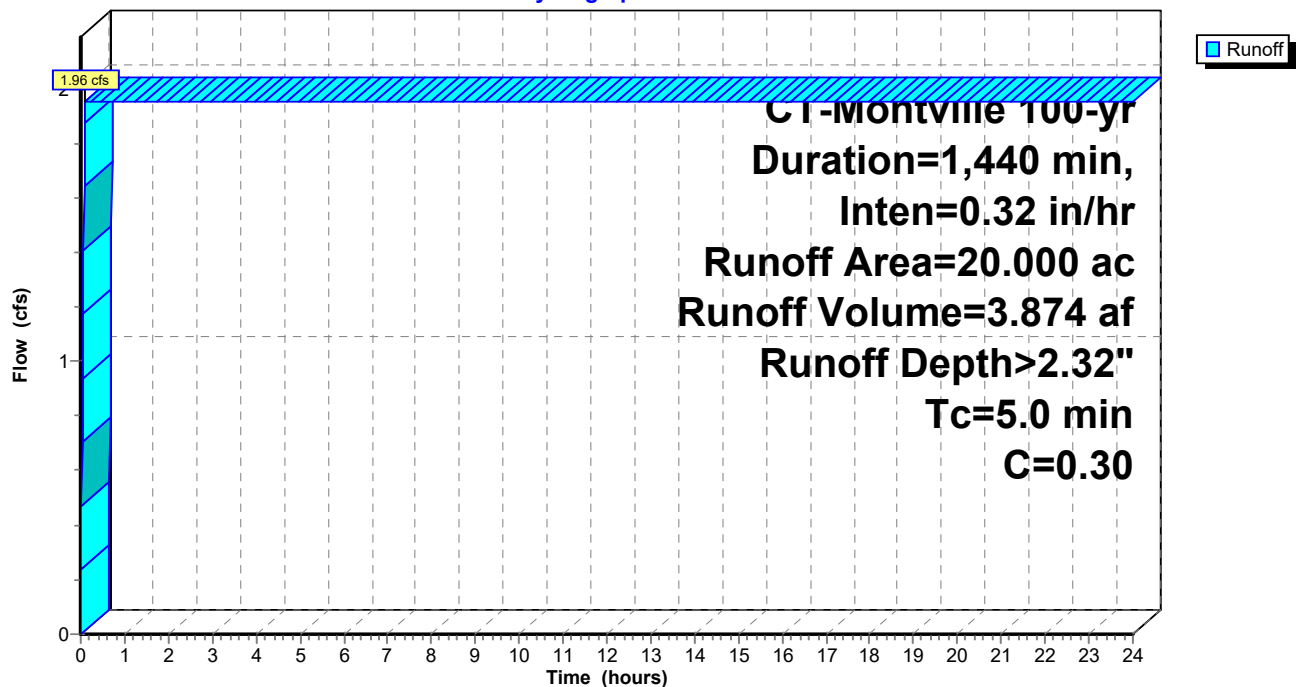
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 CT-Montville 100-yr Duration=1,440 min, Inten=0.32 in/hr

Area (ac)	C	Description
20.000	0.30	FOREST
20.000		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



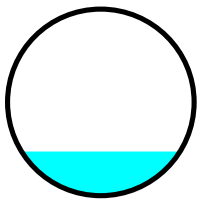
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 2.27" for 100-yr event
 Inflow = 1.96 cfs @ 11.15 hrs, Volume= 3.779 af
 Outflow = 1.96 cfs @ 11.16 hrs, Volume= 3.778 af, Atten= 0%, Lag= 0.6 min

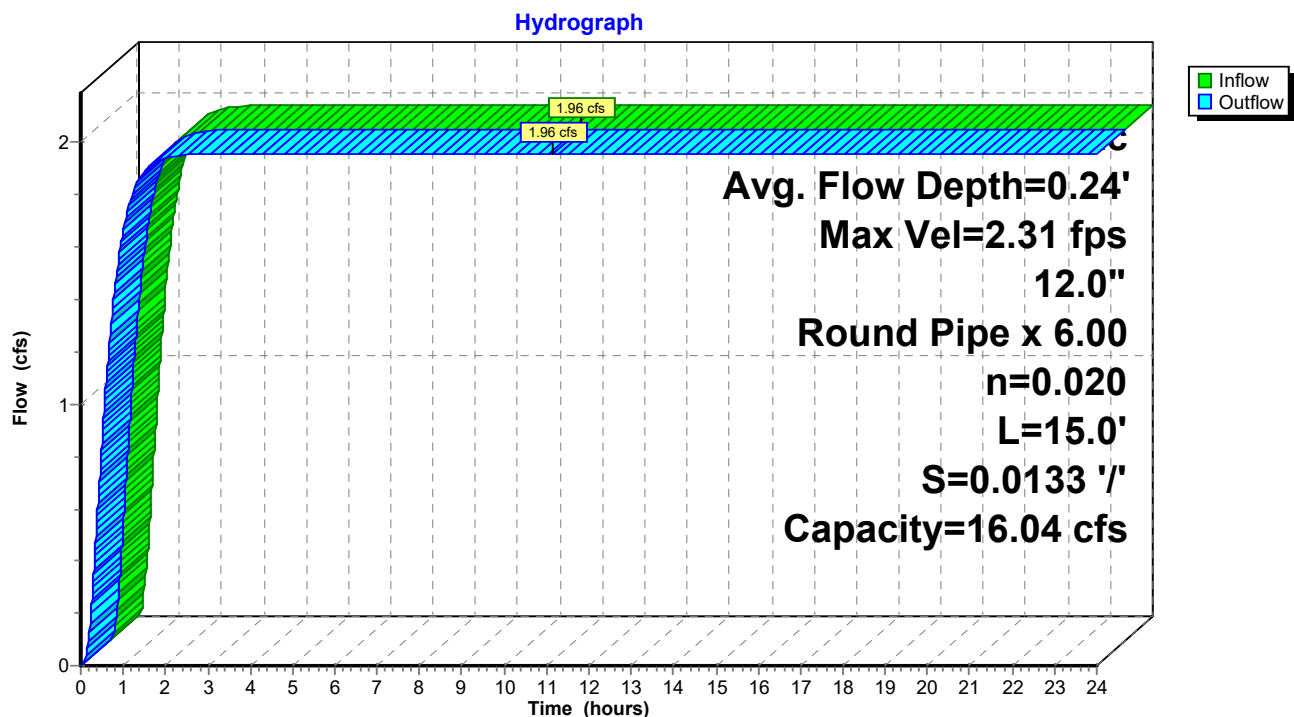
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.31 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.28 fps, Avg. Travel Time= 0.1 min

Peak Storage= 13 cf @ 11.15 hrs
 Average Depth at Peak Storage= 0.24' , Surface Width= 5.09'
 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



Summary for Pond 2P: (new Pond)

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 2.32" for 100-yr event
 Inflow = 1.96 cfs @ 0.09 hrs, Volume= 3.874 af
 Outflow = 1.96 cfs @ 11.15 hrs, Volume= 3.779 af, Atten= 0%, Lag= 663.6 min
 Primary = 1.96 cfs @ 11.15 hrs, Volume= 3.779 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.73' @ 9.90 hrs Surf.Area= 0.300 ac Storage= 0.095 af

Plug-Flow detention time= 35.2 min calculated for 3.777 af (97% of inflow)
 Center-of-Mass det. time= 17.5 min (738.9 - 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=1.96 cfs @ 11.15 hrs HW=382.73' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.96 cfs @ 2.14 fps)

Pond 2P: (new Pond)

