

339 CHESTERFIELD RD CULVERT SIZING

Prepared by RCL Thompson LLC

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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

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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

SubcatchmentDA-PRE: DA

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=0.12"

Tc=5.0 min C=0.30 Runoff=28.44 cfs 0.203 af

Reach C1: CULVERT CROSSING

Avg. Flow Depth=0.40' Max Vel=3.07 fps Inflow=5.39 cfs 0.201 af

12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=5.38 cfs 0.201 af

Pond 2P: (new Pond)

Peak Elev=382.98' Storage=0.172 af Inflow=28.44 cfs 0.203 af

12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=5.39 cfs 0.201 af

Total Runoff Area = 20.000 ac Runoff Volume = 0.203 af Average Runoff Depth = 0.12"

100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment DA-PRE: DA

Runoff = 28.44 cfs @ 0.08 hrs, Volume= 0.203 af, Depth= 0.12"

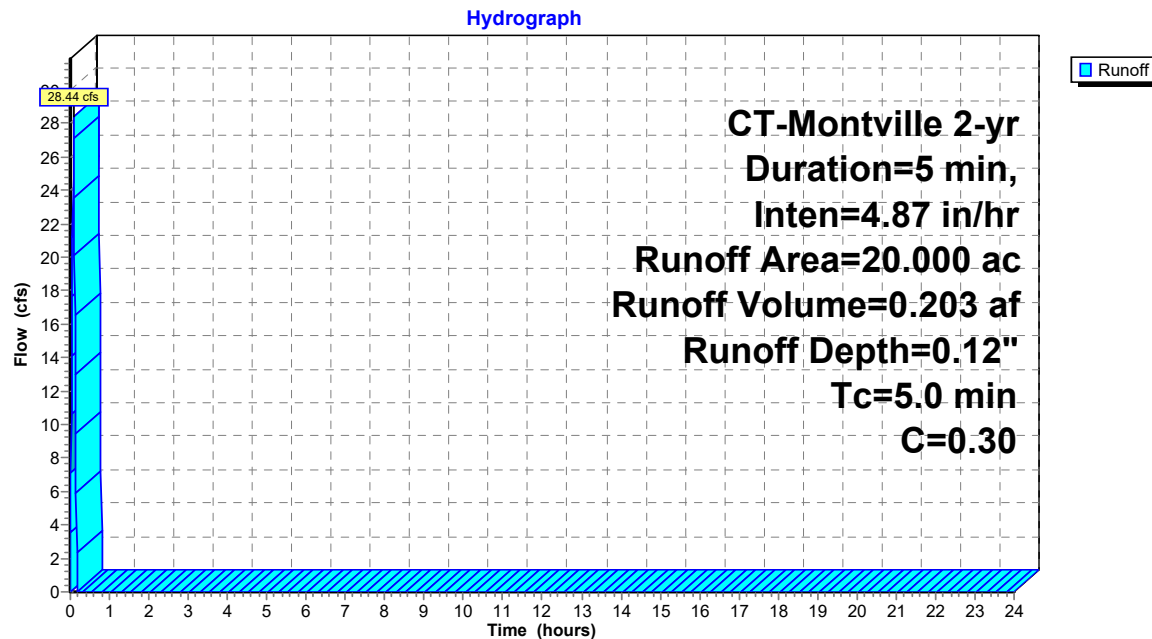
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

CT-Montville 2-yr Duration=5 min, Inten=4.87 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



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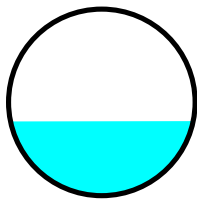
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 0.12" for 2-yr event
Inflow = 5.39 cfs @ 0.15 hrs, Volume= 0.201 af
Outflow = 5.38 cfs @ 0.15 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 0.5 min

Peak Storage= 26 cf @ 0.15 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 5.88'
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'



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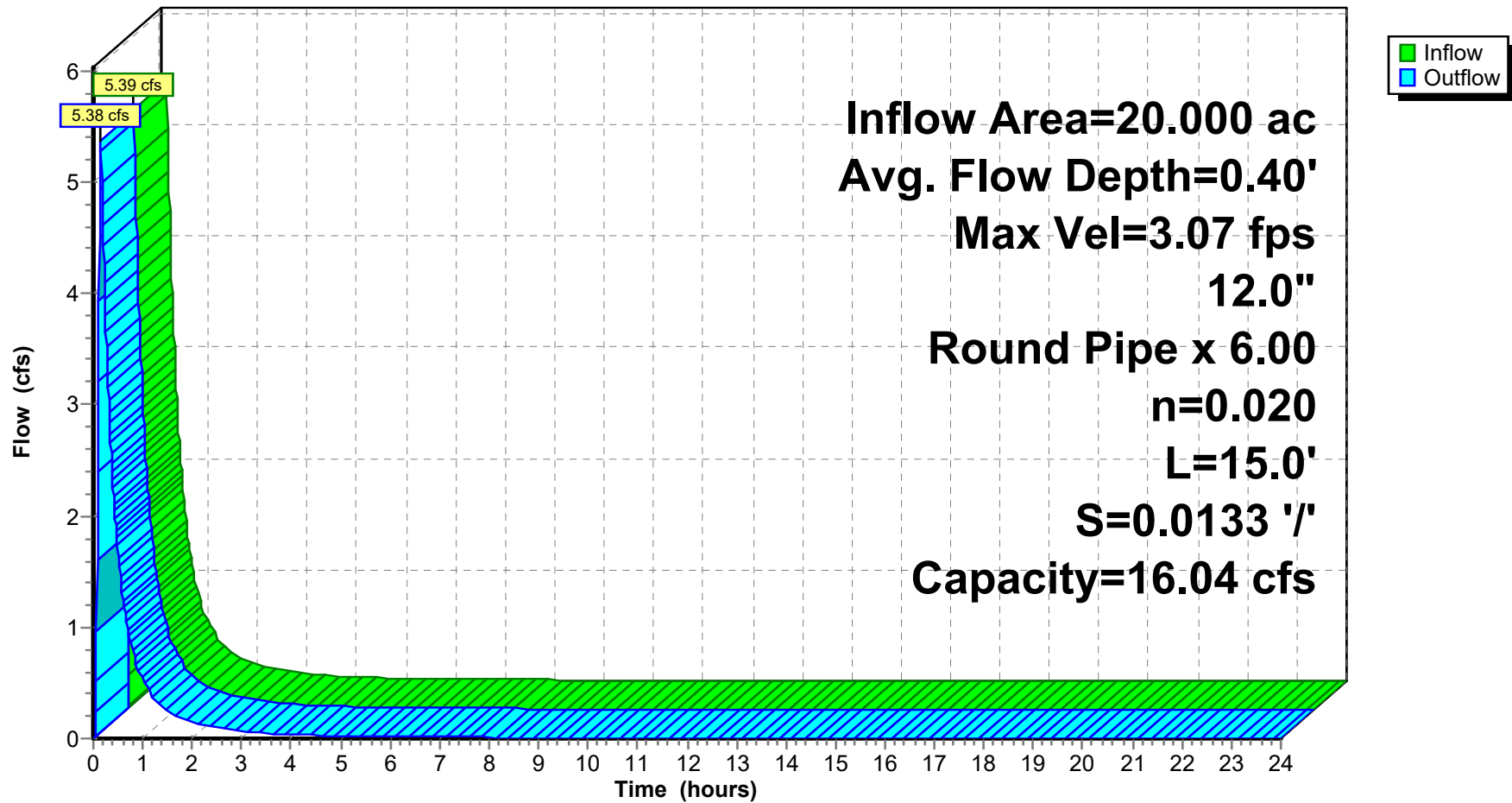
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Reach C1: CULVERT CROSSING

Hydrograph



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CT-Montville 2-yr Duration=5 min, Inten=4.87 in/hr

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Summary for Pond 2P: (new Pond)

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth = 0.12" for 2-yr event
Inflow = 28.44 cfs @ 0.08 hrs, Volume= 0.203 af
Outflow = 5.39 cfs @ 0.15 hrs, Volume= 0.201 af, Atten= 81%, Lag= 4.1 min
Primary = 5.39 cfs @ 0.15 hrs, Volume= 0.201 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 382.98' @ 0.15 hrs Surf.Area= 0.318 ac Storage= 0.172 af

Plug-Flow detention time=63.1 min calculated for 0.201 af (99% of inflow)
Center-of-Mass det. time= 63.0 min (68.0 - 5.0)

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=5.38 cfs @ 0.15 hrs HW=382.98' (Free Discharge)

↑**1=Culvert** (Barrel Controls 5.38 cfs @ 2.74 fps)

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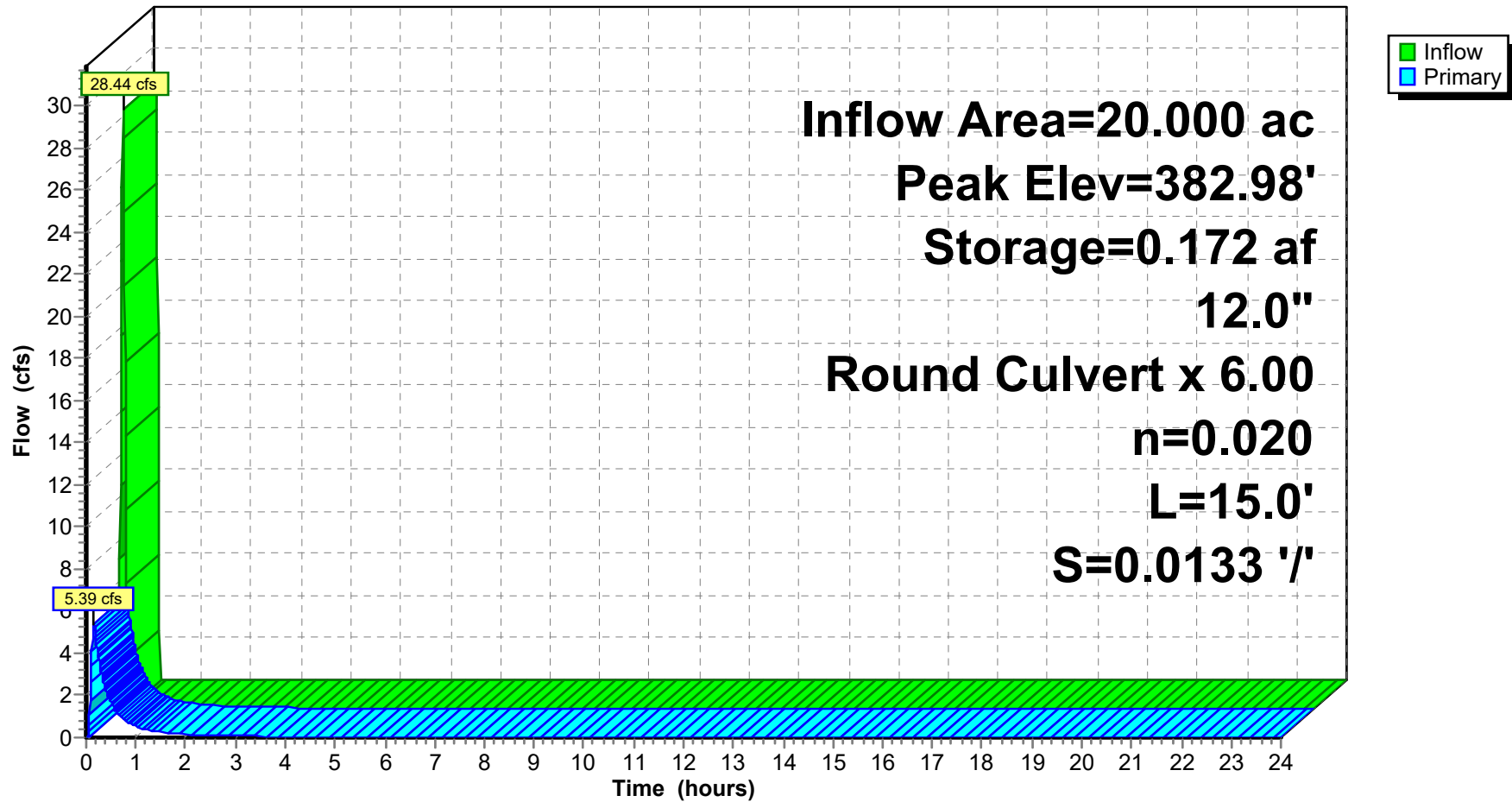
CT-Montville 2-yr Duration=5 min, Inten=4.87 in/hr

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Pond 2P: (new Pond)

Hydrograph



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CT-Montville 10-yr Duration=5 min, Inten=7.25 in/hr

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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

SubcatchmentDA-PRE: DA

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=0.18"

Tc=5.0 min C=0.30 Runoff=42.32 cfs 0.302 af

Reach C1: CULVERT CROSSING

Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=9.34 cfs 0.300 af

12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 '/' Capacity=16.04 cfs Outflow=9.32 cfs 0.300 af

Pond 2P: (new Pond)

Peak Elev=383.21' Storage=0.247 af Inflow=42.32 cfs 0.302 af

12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 '/' Outflow=9.34 cfs 0.300 af

Total Runoff Area = 20.000 ac Runoff Volume = 0.302 af Average Runoff Depth = 0.18"

100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

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CT-Montville 10-yr Duration=5 min, Inten=7.25 in/hr

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Summary for Subcatchment DA-PRE: DA

Runoff = 42.32 cfs @ 0.08 hrs, Volume= 0.302 af, Depth= 0.18"

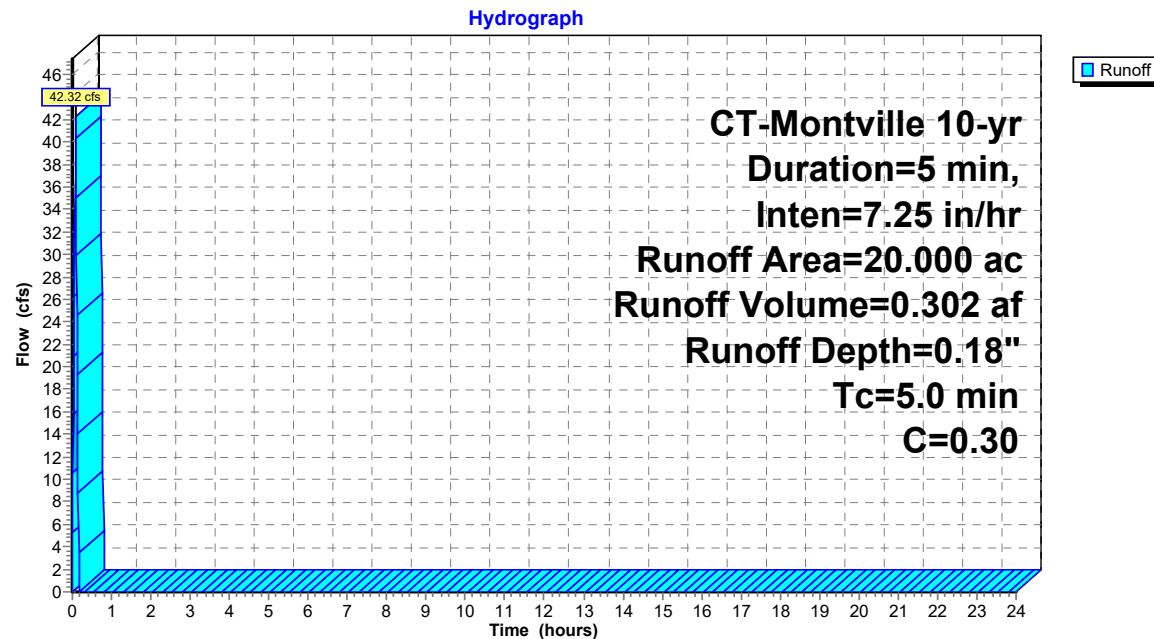
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

CT-Montville 10-yr Duration=5 min, Inten=7.25 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



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CT-Montville 10-yr Duration=5 min, Inten=7.25 in/hr

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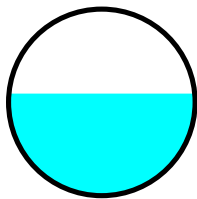
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 0.18" for 10-yr event
Inflow = 9.34 cfs @ 0.15 hrs, Volume= 0.300 af
Outflow = 9.32 cfs @ 0.15 hrs, Volume= 0.300 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 0.4 min

Peak Storage= 40 cf @ 0.15 hrs
Average Depth at Peak Storage= 0.55', Surface Width= 5.97'
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'



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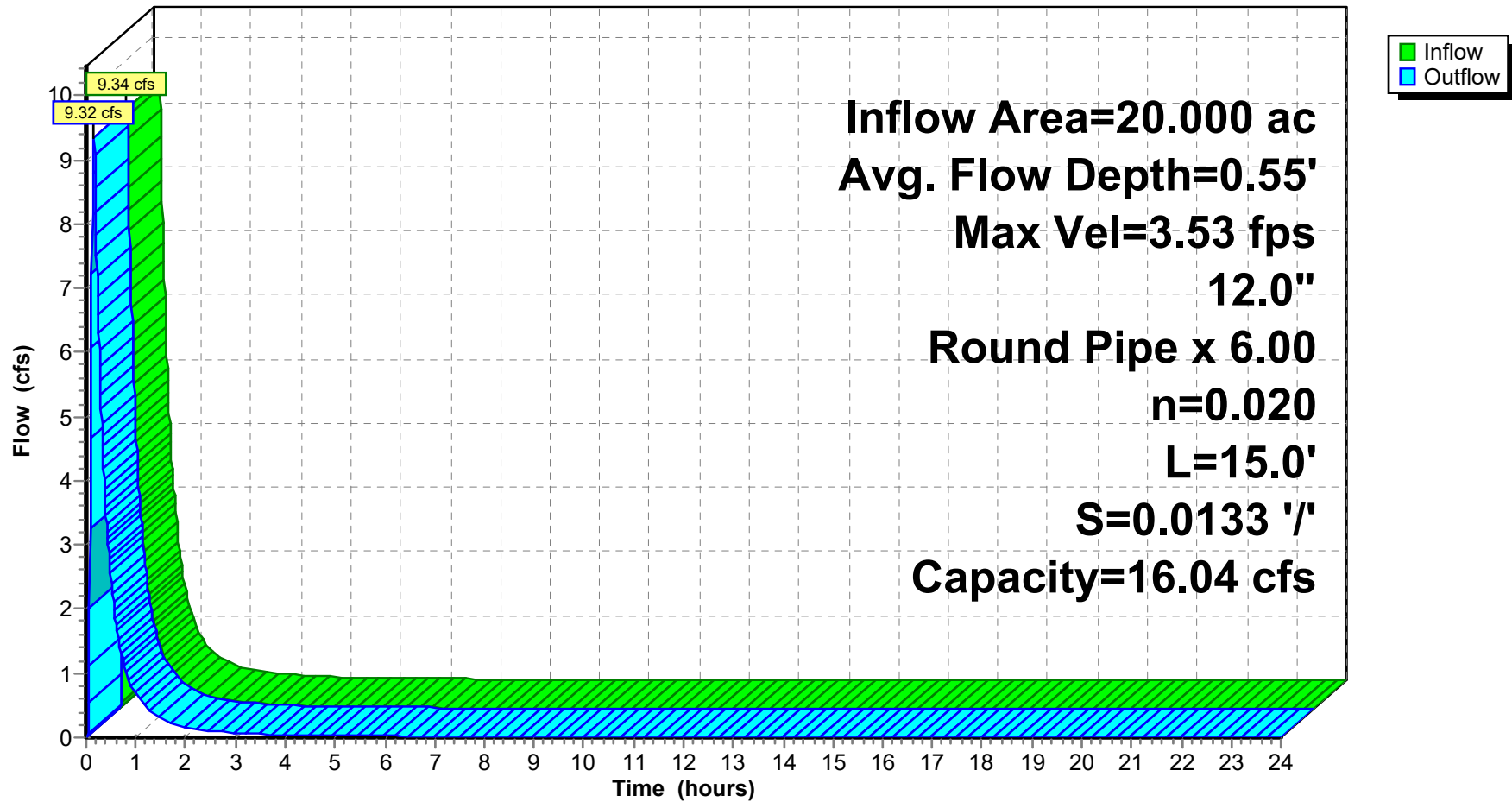
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Reach C1: CULVERT CROSSING

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CT-Montville 10-yr Duration=5 min, Inten=7.25 in/hr

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Summary for Pond 2P: (new Pond)

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth = 0.18" for 10-yr event
Inflow = 42.32 cfs @ 0.08 hrs, Volume= 0.302 af
Outflow = 9.34 cfs @ 0.15 hrs, Volume= 0.300 af, Atten= 78%, Lag= 4.0 min
Primary = 9.34 cfs @ 0.15 hrs, Volume= 0.300 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.21' @ 0.15 hrs Surf.Area= 0.336 ac Storage= 0.247 af

Plug-Flow detention time= 48.6 min calculated for 0.300 af (99% of inflow)
Center-of-Mass det. time= 48.6 min (53.6 - 5.0)

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=9.33 cfs @ 0.15 hrs HW=383.21' (Free Discharge)

↑**1=Culvert** (Barrel Controls 9.33 cfs @ 3.12 fps)

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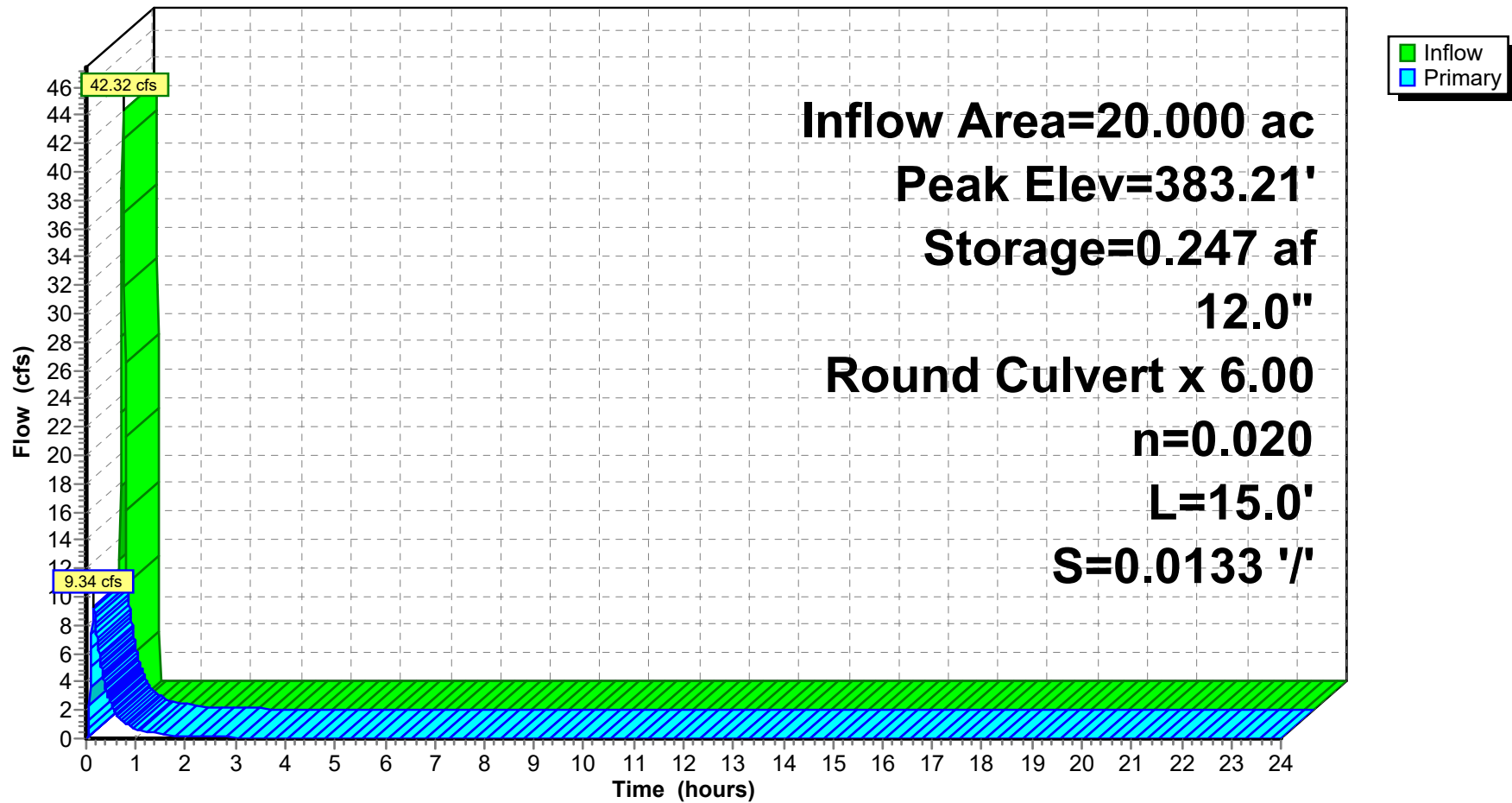
CT-Montville 10-yr Duration=5 min, Inten=7.25 in/hr

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Pond 2P: (new Pond)

Hydrograph



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CT-Montville 100-yr Duration=5 min, Inten=11.02 in/hr

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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

SubcatchmentDA-PRE: DA

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=0.27"

Tc=5.0 min C=0.30 Runoff=64.31 cfs 0.458 af

Reach C1: CULVERT CROSSING

Avg. Flow Depth=0.77' Max Vel=3.87 fps Inflow=15.08 cfs 0.457 af

12.0" Round Pipe x 6.00 n=0.020 L=15.0' S=0.0133 ' ' Capacity=16.04 cfs Outflow=15.07 cfs 0.457 af

Pond 2P: (new Pond)

Peak Elev=383.55' Storage=0.365 af Inflow=64.31 cfs 0.458 af

12.0" Round Culvert x 6.00 n=0.020 L=15.0' S=0.0133 ' ' Outflow=15.08 cfs 0.457 af

Total Runoff Area = 20.000 ac Runoff Volume = 0.458 af Average Runoff Depth = 0.27"

100.00% Pervious = 20.000 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment DA-PRE: DA

Runoff = 64.31 cfs @ 0.08 hrs, Volume= 0.458 af, Depth= 0.27"

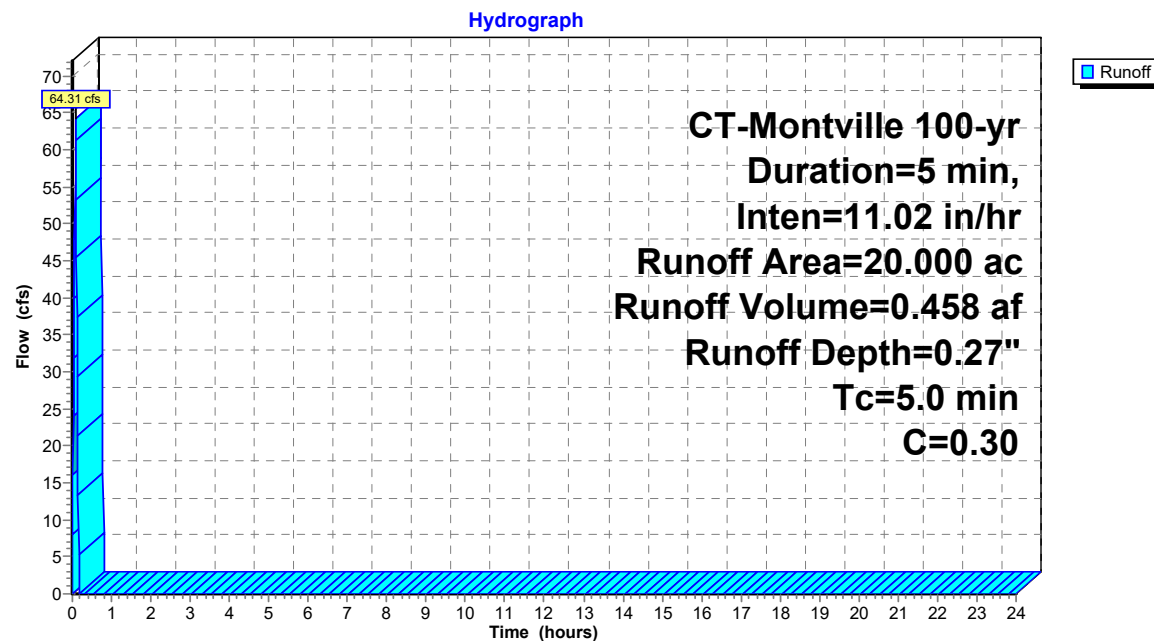
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

CT-Montville 100-yr Duration=5 min, Inten=11.02 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



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CT-Montville 100-yr Duration=5 min, Inten=11.02 in/hr

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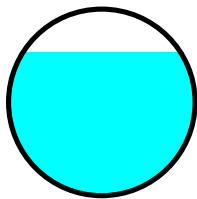
Summary for Reach C1: CULVERT CROSSING

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth > 0.27" for 100-yr event
Inflow = 15.08 cfs @ 0.15 hrs, Volume= 0.457 af
Outflow = 15.07 cfs @ 0.15 hrs, Volume= 0.457 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.58 fps, Avg. Travel Time= 0.4 min

Peak Storage= 58 cf @ 0.15 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 5.05'
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'



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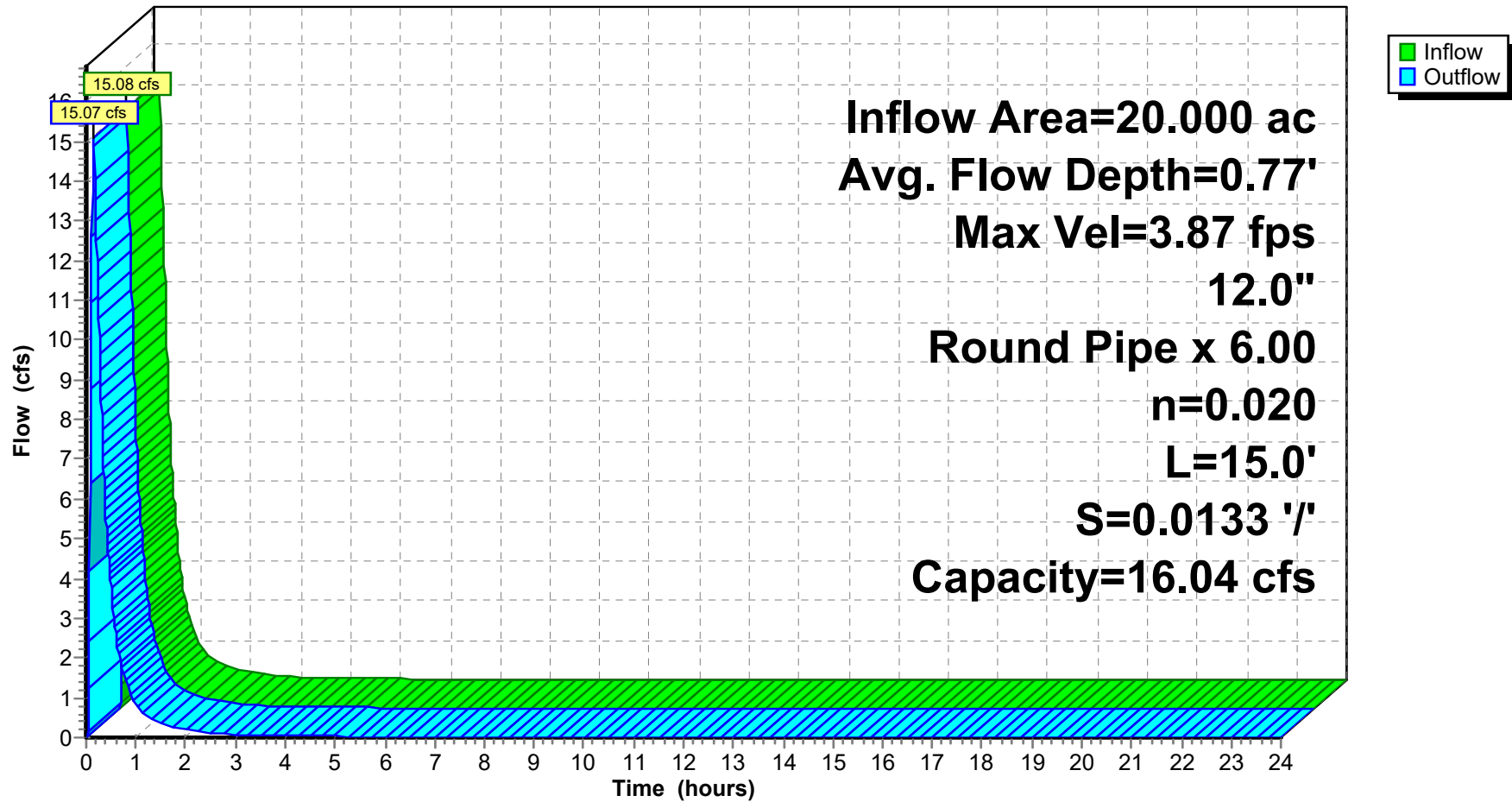
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Reach C1: CULVERT CROSSING

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Summary for Pond 2P: (new Pond)

Inflow Area = 20.000 ac, 0.00% Impervious, Inflow Depth = 0.27" for 100-yr event
Inflow = 64.31 cfs @ 0.08 hrs, Volume= 0.458 af
Outflow = 15.08 cfs @ 0.15 hrs, Volume= 0.457 af, Atten= 77%, Lag= 3.9 min
Primary = 15.08 cfs @ 0.15 hrs, Volume= 0.457 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 383.55' @ 0.15 hrs Surf.Area= 0.362 ac Storage= 0.365 af

Plug-Flow detention time= 37.8 min calculated for 0.457 af (100% of inflow)
Center-of-Mass det. time= 37.8 min (42.8 - 5.0)

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=15.06 cfs @ 0.15 hrs HW=383.55' (Free Discharge)

↑**1=Culvert** (Barrel Controls 15.06 cfs @ 3.50 fps)

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CT-Montville 100-yr Duration=5 min, Inten=11.02 in/hr

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Pond 2P: (new Pond)

Hydrograph

