Summary for Pond C3: 48" RCP

[57] Hint: Peaked at 373.20' (Flood elevation advised)
[61] Hint: Exceeded Reach R5 outlet invert by 1.20' @ 12.21 hrs

Inflow Area =	10.354 ac,	0.00% Impervious,	Inflow Depth > 12.28"	for 25-yr event	
Inflow =	72.68 cfs @	12.21 hrs,	Volume=	10.594 af	
Outflow =	72.68 cfs @	12.21 hrs,	Volume=	10.594 af,	Atten= 0%, Lag= 0.0 min
Primary =	67.73 cfs @	12.21 hrs,	Volume=	10.534 af	
Secondary =	4.95 cfs @	12.21 hrs,	Volume=	0.059 af	

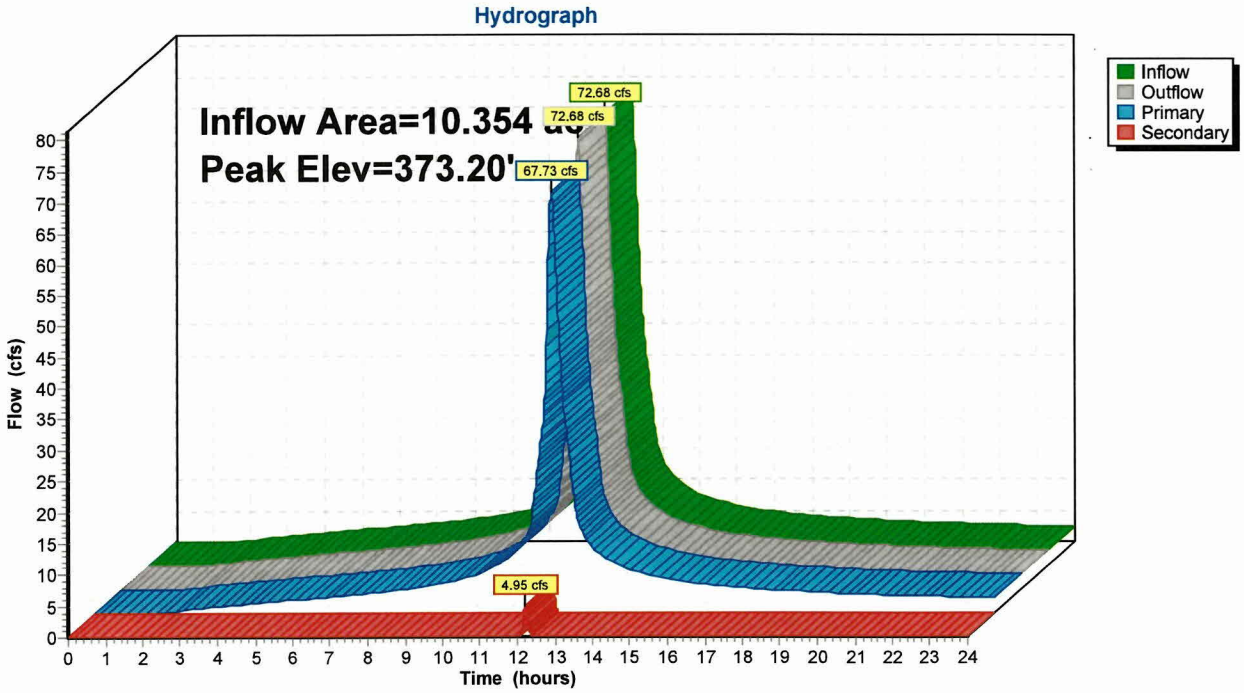
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 373.20' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	362.00'	**48.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 362.00' / 361.10' S= 0.0090 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	372.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	373.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=67.66 cfs @ 12.21 hrs HW=373.20' (Free Discharge)
└─**1=Culvert** (Passes 67.66 cfs of 183.54 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 67.66 cfs @ 3.58 fps)

Secondary OutFlow Max=4.86 cfs @ 12.21 hrs HW=373.20' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.86 cfs @ 1.20 fps)

Pond C3: 48" RCP



Summary for Pond C4: (2) 48" RCP

[57] Hint: Peaked at 339.64' (Flood elevation advised)
[62] Hint: Exceeded Reach R7 OUTLET depth by 6.80' @ 12.24 hrs

Inflow Area =	78.983 ac,	2.18% Impervious,	Inflow Depth > 11.03"	for 25-yr event	
Inflow =	445.04 cfs @	12.24 hrs,	Volume=	72.579 af	
Outflow =	445.04 cfs @	12.24 hrs,	Volume=	72.579 af,	Atten= 0%, Lag= 0.0 min
Primary =	334.42 cfs @	12.24 hrs,	Volume=	70.535 af	
Secondary =	110.62 cfs @	12.24 hrs,	Volume=	2.044 af	

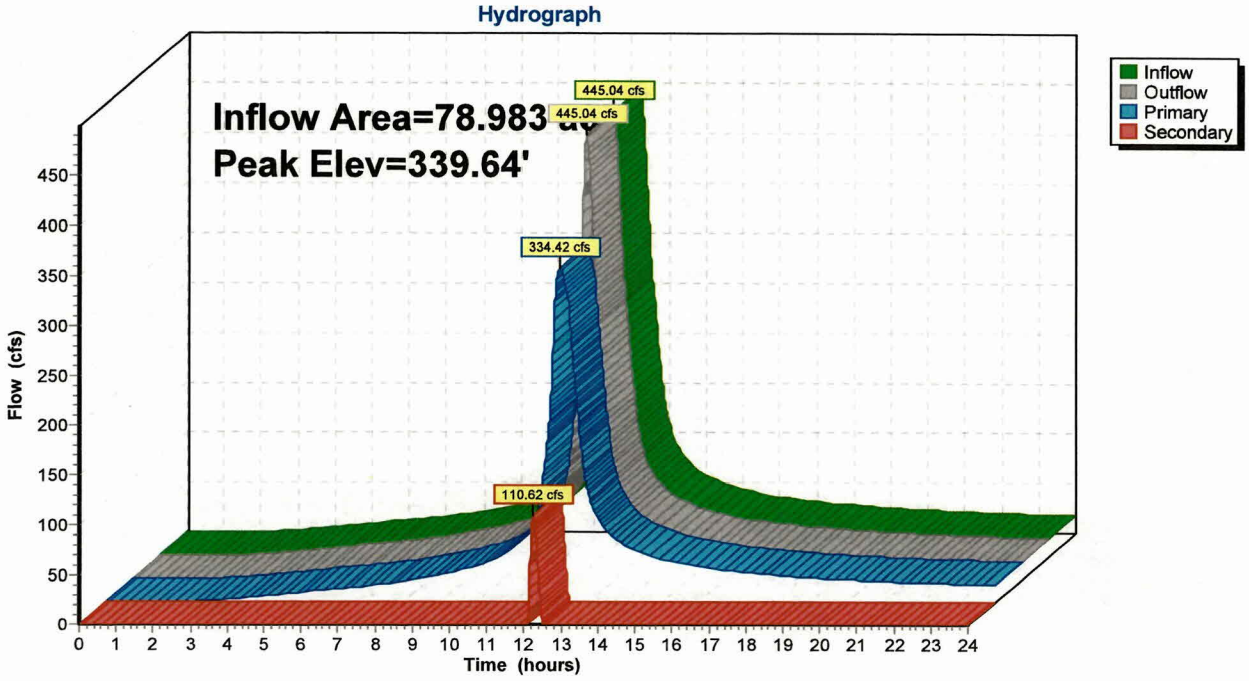
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 339.64' @ 12.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	330.00'	**48.0" Round Culvert X 2.00** L= 150.0' Ke= 0.500 Inlet / Outlet Invert= 330.00' / 327.00' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	338.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=334.40 cfs @ 12.24 hrs HW=339.64' (Free Discharge)
└**1=Culvert** (Inlet Controls 334.40 cfs @ 13.31 fps)

Secondary OutFlow Max=110.48 cfs @ 12.24 hrs HW=339.64' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 110.48 cfs @ 3.38 fps)

Pond C4: (2) 48" RCP



Summary for Pond C5: 30" HDPE

[57] Hint: Peaked at 350.99' (Flood elevation advised)

Inflow Area =	0.857 ac,	0.00% Impervious,	Inflow Depth > 11.35"	for 25-yr event	
Inflow =	6.15 cfs @	12.11 hrs,	Volume=	0.811 af	
Outflow =	6.15 cfs @	12.11 hrs,	Volume=	0.811 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.15 cfs @	12.11 hrs,	Volume=	0.811 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

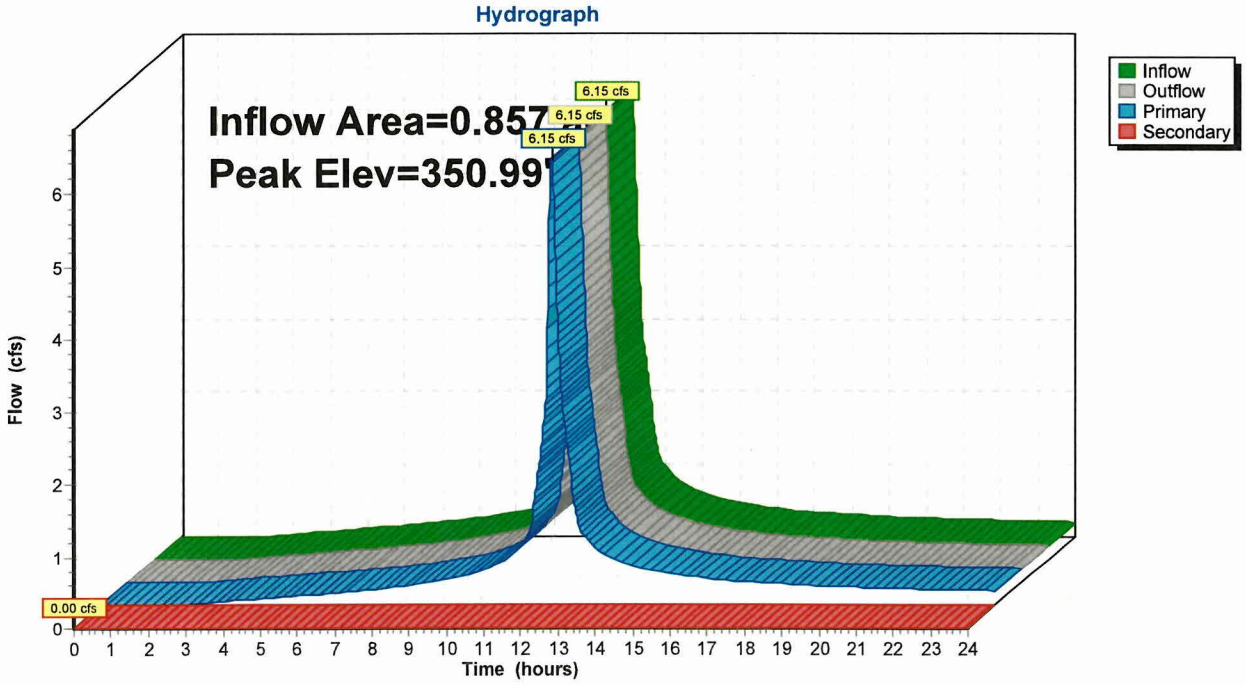
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 350.99' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	350.00'	**30.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 350.00' / 346.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Secondary	353.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.14 cfs @ 12.11 hrs HW=350.99' (Free Discharge)
└─**1=Culvert** (Inlet Controls 6.14 cfs @ 3.39 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond C5: 30" HDPE



Summary for Pond C6: 36" CMP

[57] Hint: Peaked at 272.52' (Flood elevation advised)
[62] Hint: Exceeded Reach R12 OUTLET depth by 3.20' @ 12.34 hrs

Inflow Area =	20.557 ac,	17.50% Impervious,	Inflow Depth >	9.23"	for 25-yr event
Inflow =	118.28 cfs @	12.15 hrs,	Volume=	15.815 af	
Outflow =	118.28 cfs @	12.15 hrs,	Volume=	15.815 af,	Atten= 0%, Lag= 0.0 min
Primary =	57.88 cfs @	12.15 hrs,	Volume=	14.592 af	
Secondary =	60.40 cfs @	12.15 hrs,	Volume=	1.222 af	

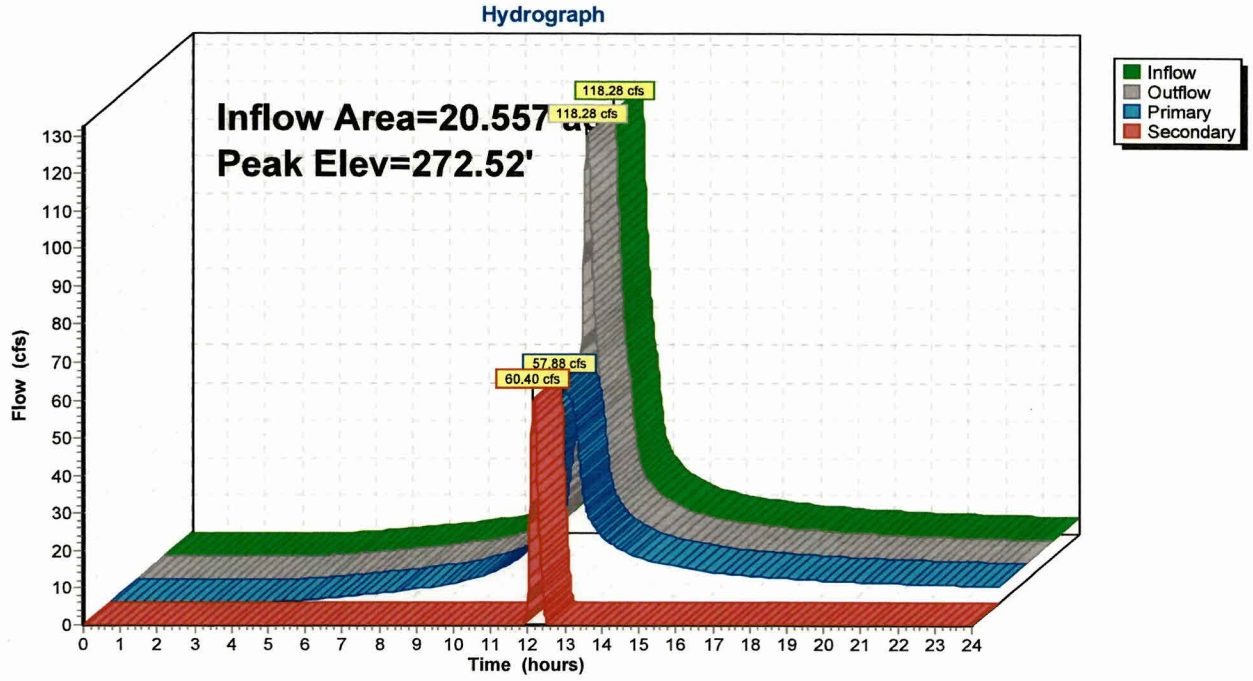
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 272.52' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	268.00'	**36.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 268.00' / 266.00' S= 0.0286 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf
#2	Secondary	272.00'	**60.0' long x 40.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=57.88 cfs @ 12.15 hrs HW=272.52' (Free Discharge)
└**1=Culvert** (Barrel Controls 57.88 cfs @ 8.19 fps)

Secondary OutFlow Max=60.38 cfs @ 12.15 hrs HW=272.52' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 60.38 cfs @ 1.94 fps)

Pond C6: 36" CMP



Summary for Pond C7: 24"x32" CMP

[57] Hint: Peaked at 280.91' (Flood elevation advised)
[62] Hint: Exceeded Reach R11 OUTLET depth by 4.38' @ 12.71 hrs

Inflow Area =	185.310 ac,	0.00% Impervious,	Inflow Depth >	8.29"	for 25-yr event
Inflow =	567.86 cfs @	12.67 hrs,	Volume=	128.092 af	
Outflow =	567.86 cfs @	12.67 hrs,	Volume=	128.092 af,	Atten= 0%, Lag= 0.0 min
Primary =	46.86 cfs @	12.67 hrs,	Volume=	49.588 af	
Secondary =	521.00 cfs @	12.67 hrs,	Volume=	78.503 af	

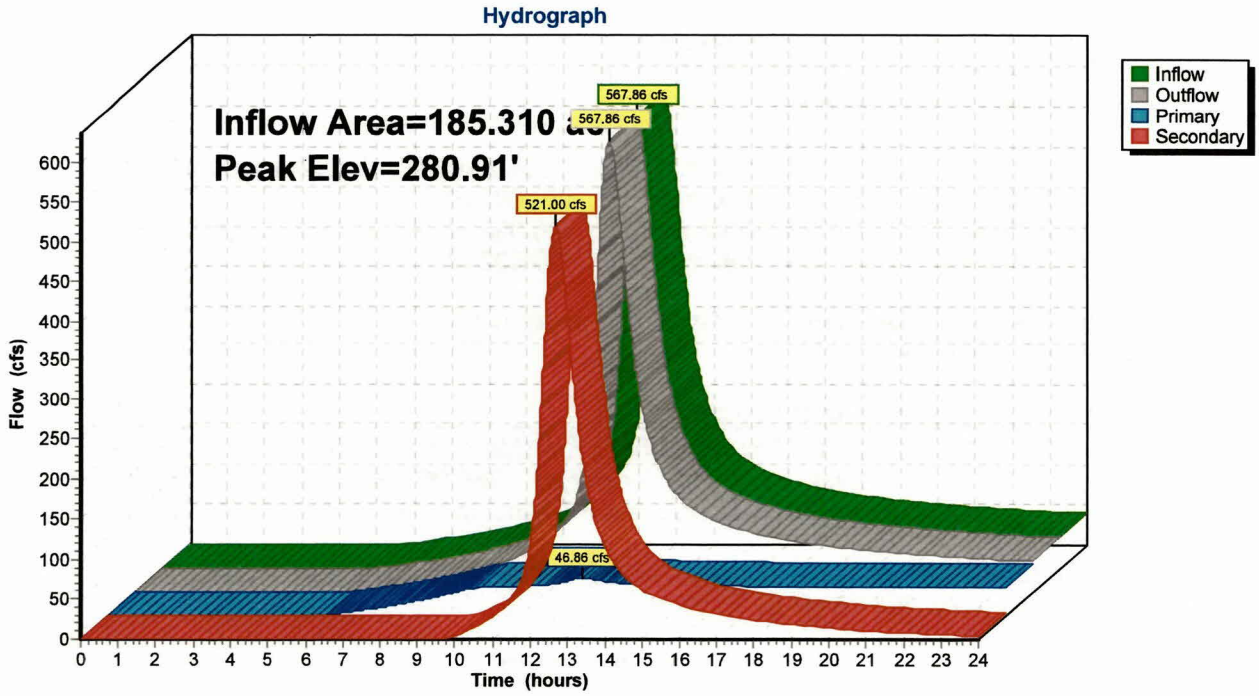
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 280.91' @ 12.67 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	274.00'	**34.0" W x 22.0" H, R=24.9" Elliptical RCP_Elliptical 34x22** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 274.00' / 272.00' S= 0.0400 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.12 sf
#2	Secondary	278.00'	**40.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=46.86 cfs @ 12.67 hrs HW=280.91' (Free Discharge)
└**1=RCP_Elliptical 34x22** (Barrel Controls 46.86 cfs @ 11.37 fps)

Secondary OutFlow Max=520.92 cfs @ 12.67 hrs HW=280.91' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 520.92 cfs @ 4.48 fps)

Pond C7: 24"x32" CMP



Summary for Pond C9: 36" CMP

[57] Hint: Peaked at 487.36' (Flood elevation advised)
[81] Warning: Exceeded Pond C7 by 206.42' @ 12.67 hrs
[81] Warning: Exceeded Pond C7 by 206.42' @ 12.67 hrs

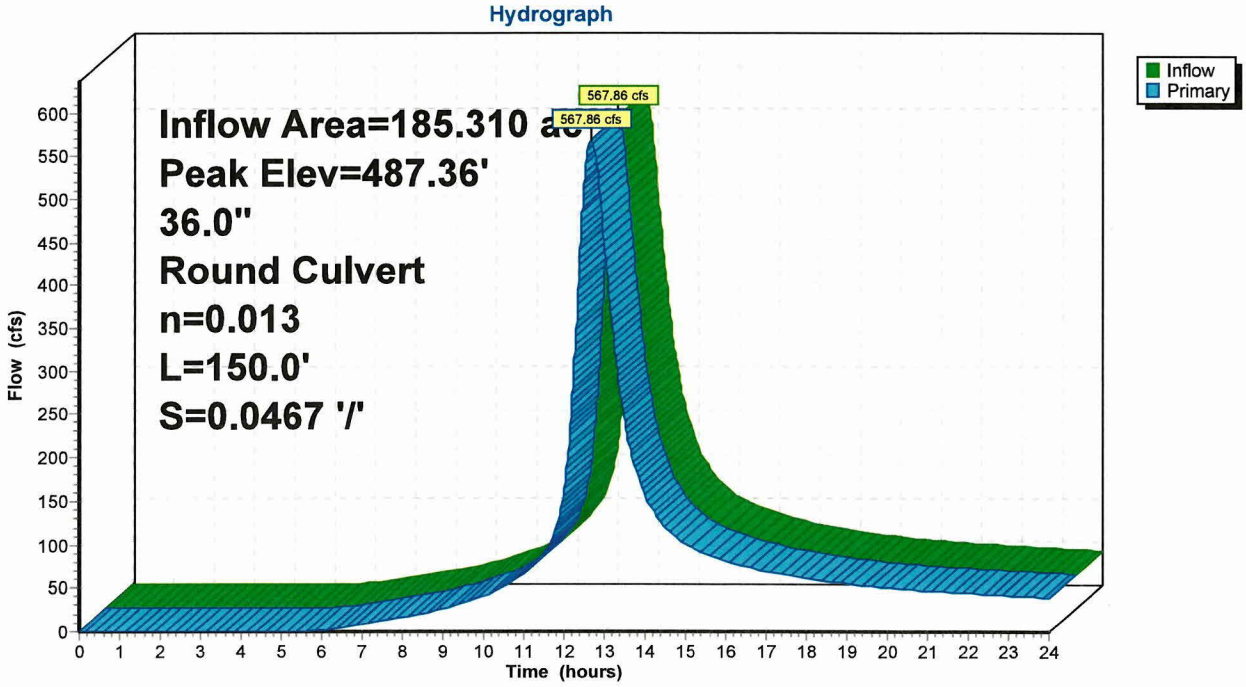
Inflow Area =	185.310 ac,	0.00% Impervious,	Inflow Depth >	8.29"	for 25-yr event
Inflow =	567.86 cfs @	12.67 hrs,	Volume=	128.092 af	
Outflow =	567.86 cfs @	12.67 hrs,	Volume=	128.092 af,	Atten= 0%, Lag= 0.0 min
Primary =	567.86 cfs @	12.67 hrs,	Volume=	128.092 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 487.36' @ 12.67 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	272.00'	**36.0" Round Culvert** L= 150.0' Ke= 0.100 Inlet / Outlet Invert= 272.00' / 265.00' S= 0.0467 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=567.78 cfs @ 12.67 hrs HW=487.30' (Free Discharge)
└**1=Culvert** (Barrel Controls 567.78 cfs @ 80.32 fps)

Pond C9: 36" CMP



Summary for Pond F1: Sediment Forebay

[61] Hint: Exceeded Reach R10 outlet invert by 2.64' @ 12.30 hrs

Inflow Area =	101.328 ac,	2.22% Impervious,	Inflow Depth > 11.12"	for 25-yr event	
Inflow =	571.48 cfs @	12.29 hrs,	Volume=	93.933 af	
Outflow =	570.95 cfs @	12.30 hrs,	Volume=	93.328 af,	Atten= 0%, Lag= 0.5 min
Primary =	570.95 cfs @	12.30 hrs,	Volume=	93.328 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 262.64' @ 12.30 hrs Surf.Area= 0.000 ac Storage= 1.033 af

Plug-Flow detention time= 8.3 min calculated for 93.328 af (99% of inflow)
Center-of-Mass det. time= 4.3 min (818.5 - 814.2)

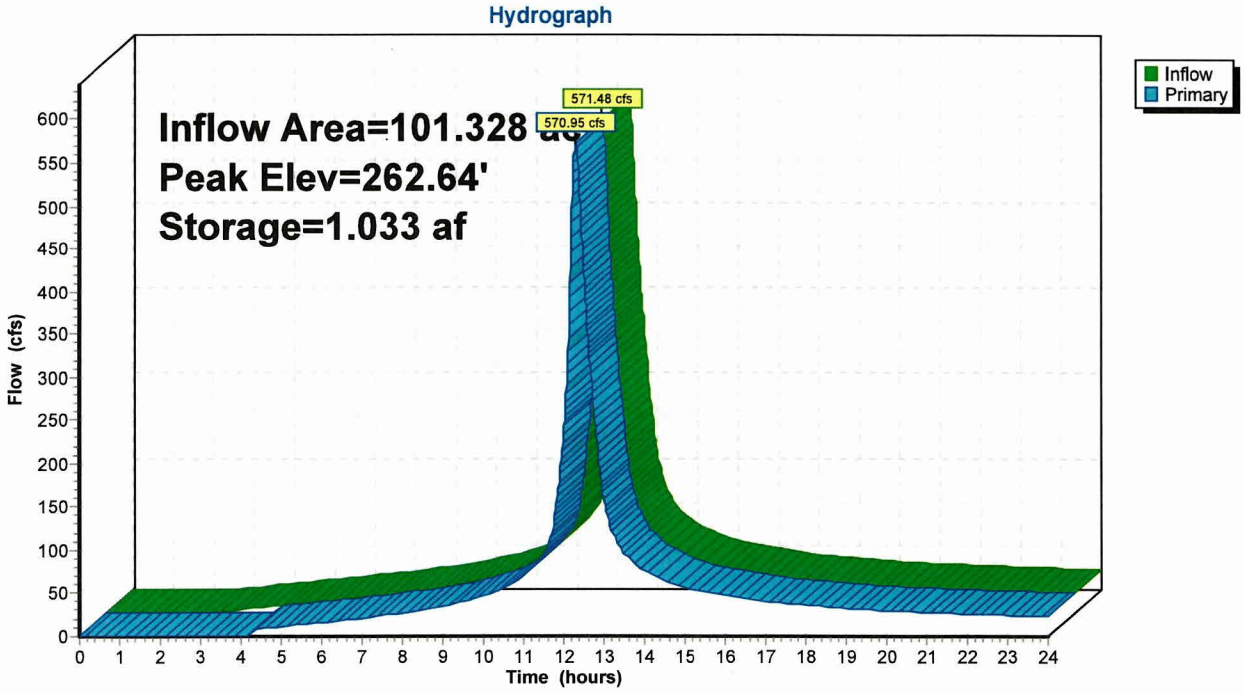
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	1.307 af	**Custom Stage Data**Listed below

Elevation (feet)	Cum.Store (acre-feet)
254.00	0.000
256.00	0.066
258.00	0.255
260.00	0.546
262.00	0.905
264.00	1.307

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=570.70 cfs @ 12.30 hrs HW=262.64' (Free Discharge)
└**1=Broad-Crested Rectangular Weir**(Weir Controls 570.70 cfs @ 4.33 fps)

Pond F1: Sediment Forebay



Summary for Pond P1: Outfall Pond

[81] Warning: Exceeded Pond P2 by 1.25' @ 16.65 hrs

Inflow Area =	132.800 ac,	4.97% Impervious,	Inflow Depth >	6.72"	for 25-yr event
Inflow =	295.42 cfs @	12.30 hrs,	Volume=	74.327 af	
Outflow =	240.06 cfs @	12.82 hrs,	Volume=	70.116 af,	Atten= 19%, Lag= 31.2 min
Primary =	56.95 cfs @	12.82 hrs,	Volume=	52.748 af	
Secondary =	183.11 cfs @	12.82 hrs,	Volume=	17.368 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 254.78' @ 12.82 hrs Surf.Area= 0.000 ac Storage= 12.502 af

Plug-Flow detention time= 95.5 min calculated for 70.116 af (94% of inflow)
Center-of-Mass det. time= 68.6 min (1,011.4 - 942.9)

Volume	Invert	Avail.Storage	Storage Description
#1	236.00'	16.166 af	**Custom Stage Data**Listed below

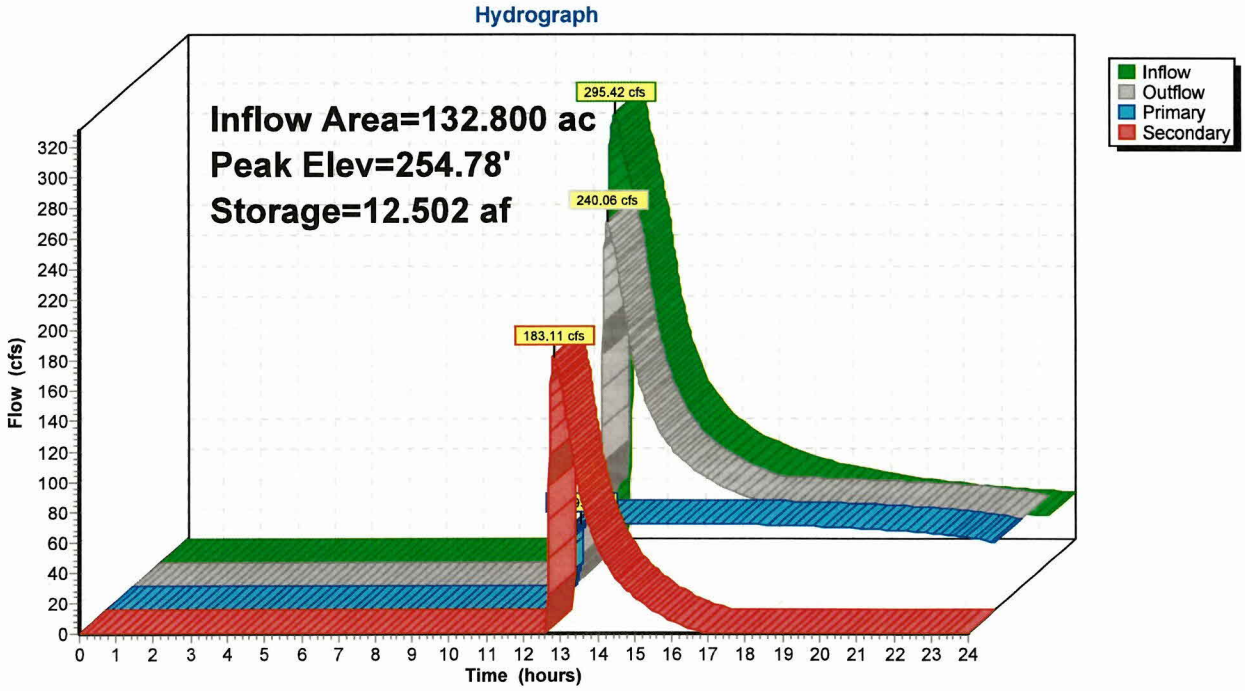
Elevation (feet)	Cum.Store (acre-feet)
236.00	0.000
238.00	0.754
240.00	1.601
242.00	2.547
244.00	3.641
246.00	4.912
248.00	6.340
250.00	7.937
252.00	9.713
254.00	11.665
256.00	13.800
258.00	16.166

Device	Routing	Invert	Outlet Devices
#1	Primary	233.35'	**16.0" Round Culvert X 2.00** L= 150.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 233.35' / 223.04' S= 0.0687 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.40 sf
#2	Device 1	241.00'	**60.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	254.00'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#4	Device 1	236.00'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600
#5	Device 1	236.50'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600
#6	Device 1	237.00'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600

Primary OutFlow Max=56.95 cfs @ 12.82 hrs HW=254.78' (Free Discharge)
└─**1=Culvert** (Barrel Controls 56.95 cfs @ 20.39 fps)
  ├─**2=Orifice/Grate** (Passes < 702.01 cfs potential flow)
  ├─**4=Orifice/Grate** (Passes < 10.88 cfs potential flow)
  ├─**5=Orifice/Grate** (Passes < 10.73 cfs potential flow)
  └─**6=Orifice/Grate** (Passes < 10.58 cfs potential flow)

Secondary OutFlow Max=180.52 cfs @ 12.82 hrs HW=254.78' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 180.52 cfs @ 2.30 fps)

Pond P1: Outfall Pond



Summary for Pond P2: Sedimentation Pond

Inflow Area = 132.800 ac, 4.97% Impervious, Inflow Depth > 10.81" for 25-yr event
Inflow = 705.67 cfs @ 12.27 hrs, Volume= 119.596 af
Outflow = 700.12 cfs @ 12.30 hrs, Volume= 88.251 af, Atten= 1%, Lag= 1.5 min
Primary = 295.42 cfs @ 12.30 hrs, Volume= 74.327 af
Secondary = 404.69 cfs @ 12.30 hrs, Volume= 13.924 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 254.41' @ 12.30 hrs Surf.Area= 0.000 ac Storage= 36.637 af

Plug-Flow detention time= 205.1 min calculated for 88.214 af (74% of inflow)
Center-of-Mass det. time= 92.1 min (911.7 - 819.5)

Volume	Invert	Avail.Storage	Storage Description
#1	234.00'	48.552 af	**Custom Stage Data**Listed below

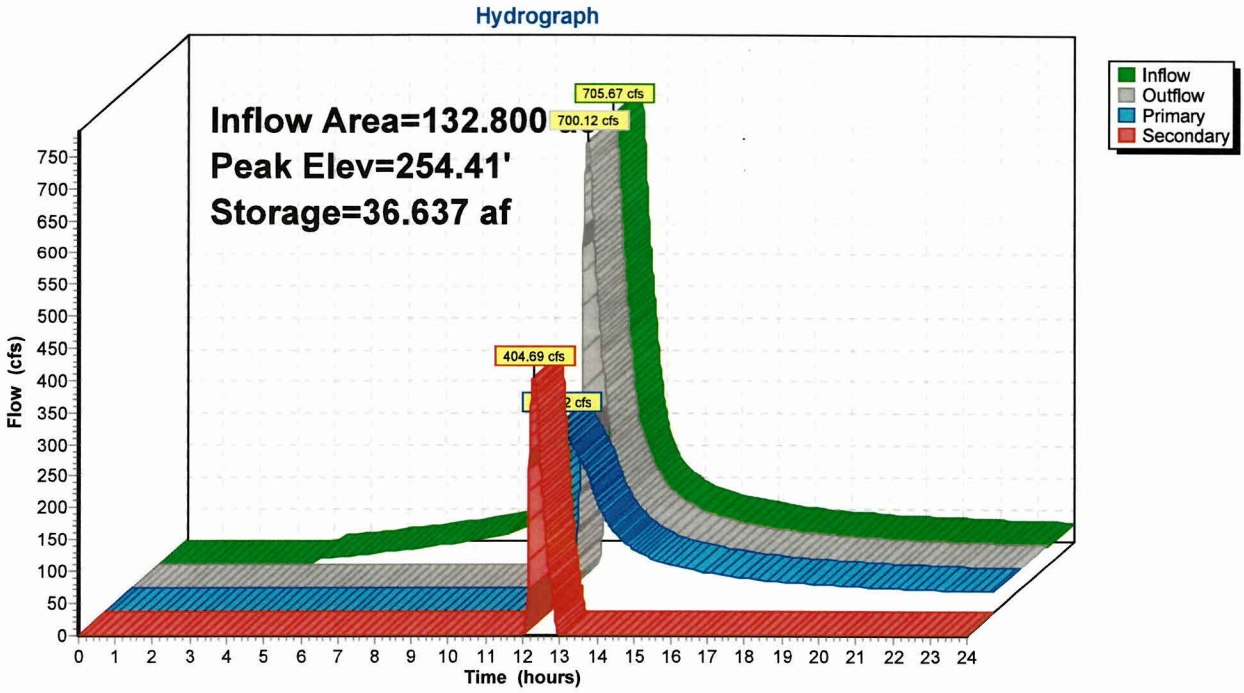
Elevation (feet)	Cum.Store (acre-feet)
234.00	0.000
236.00	1.859
238.00	4.009
240.00	6.484
242.00	9.330
244.00	12.581
246.00	16.250
248.00	20.352
250.00	24.898
252.00	29.905
254.00	35.381
256.00	41.581
258.00	48.552

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Secondary	254.00'	**600.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=295.40 cfs @ 12.30 hrs HW=254.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 295.40 cfs @ 4.09 fps)

Secondary OutFlow Max=403.69 cfs @ 12.30 hrs HW=254.41' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 403.69 cfs @ 1.66 fps)

Pond P2: Sedimentation Pond

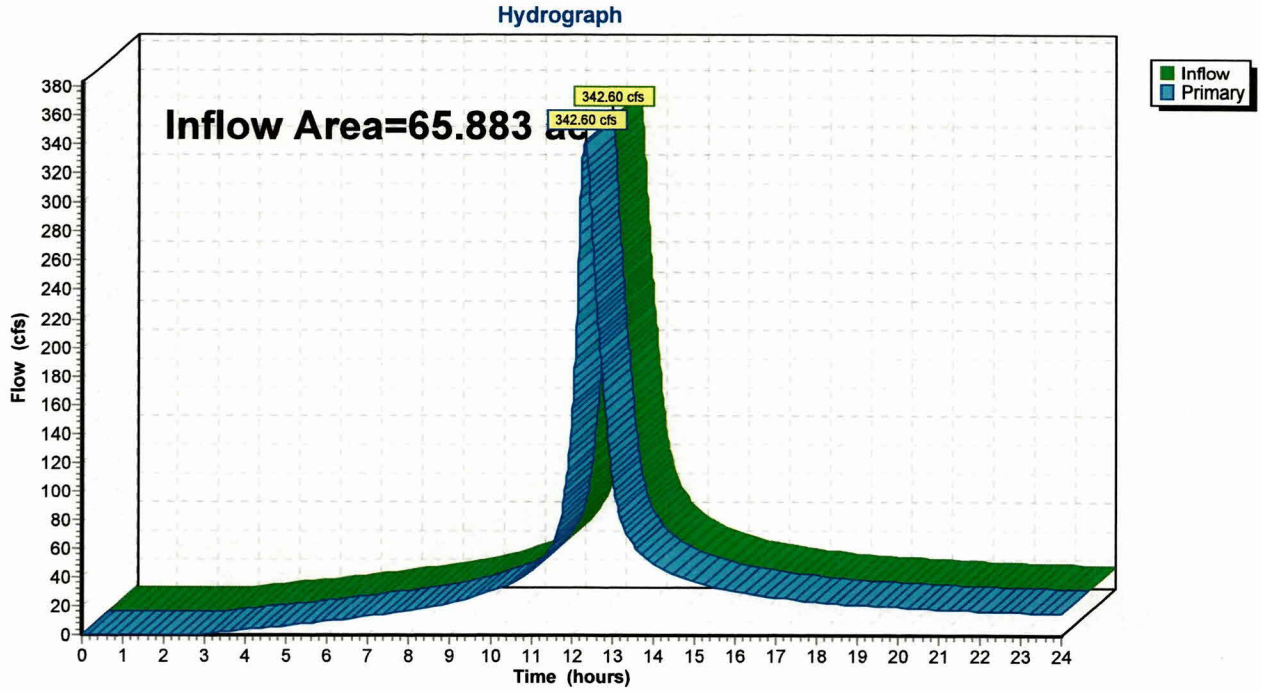


Summary for Link 1: Offsite Discharge

Inflow Area = 65.883 ac, 0.00% Impervious, Inflow Depth > 11.01" for 25-yr event
Inflow = 342.60 cfs @ 12.32 hrs, Volume= 60.421 af
Primary = 342.60 cfs @ 12.32 hrs, Volume= 60.421 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1: Offsite Discharge

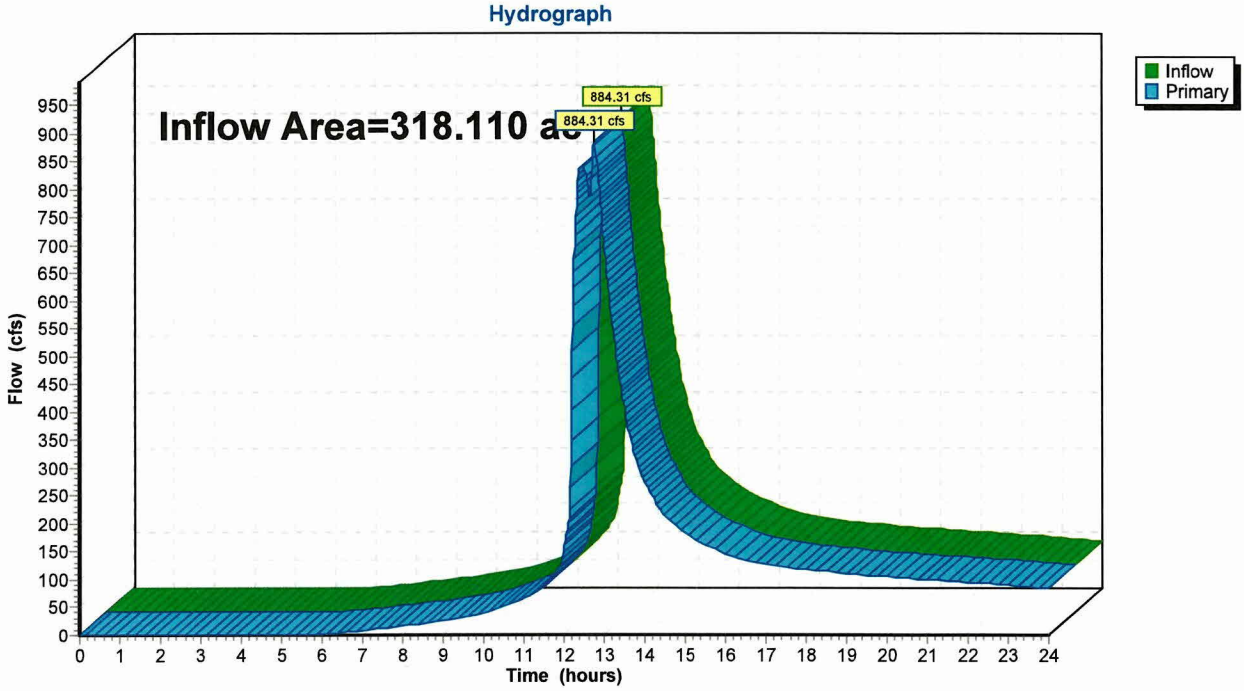


Summary for Link 2: Offsite Discharge

Inflow Area = 318.110 ac, 2.07% Impervious, Inflow Depth > 7.99" for 25-yr event
Inflow = 884.31 cfs @ 12.77 hrs, Volume= 211.921 af
Primary = 884.31 cfs @ 12.77 hrs, Volume= 211.921 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 2: Offsite Discharge



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=65.883 ac 0.00% Impervious Runoff Depth>17.61"
Flow Length=3,924' Tc=25.1 min CN=78 Runoff=432.94 cfs 96.678 af

Subcatchment2A: 2A Runoff Area=10.915 ac 6.83% Impervious Runoff Depth>18.16"
Flow Length=1,341' Tc=11.6 min CN=81 Runoff=97.81 cfs 16.517 af

Subcatchment2B: 2B Runoff Area=20.557 ac 17.50% Impervious Runoff Depth>15.61"
Flow Length=1,340' Tc=13.3 min CN=66 Runoff=158.91 cfs 26.735 af

Subcatchment2C: 2C Runoff Area=20.311 ac 3.06% Impervious Runoff Depth>17.65"
Flow Length=1,818' Tc=18.6 min CN=78 Runoff=150.49 cfs 29.872 af

Subcatchment2D: 2G Runoff Area=21.488 ac 2.45% Impervious Runoff Depth>18.29"
Flow Length=2,515' Tc=15.4 min CN=82 Runoff=174.25 cfs 32.746 af

Subcatchment2E: 2E Runoff Area=0.857 ac 0.00% Impervious Runoff Depth>18.01"
Flow Length=386' Tc=11.5 min CN=80 Runoff=7.68 cfs 1.286 af

Subcatchment2F: 2F Runoff Area=185.310 ac 0.00% Impervious Runoff Depth>14.42"
Flow Length=4,928' Tc=48.4 min CN=61 Runoff=794.96 cfs 222.716 af

Subcatchment2G: 2G Runoff Area=11.557 ac 2.80% Impervious Runoff Depth>17.53"
Flow Length=1,614' Tc=11.2 min CN=77 Runoff=103.19 cfs 16.887 af

Subcatchment2H: 2H Runoff Area=2.478 ac 4.64% Impervious Runoff Depth>14.90"
Flow Length=1,345' Tc=35.1 min CN=63 Runoff=12.55 cfs 3.077 af

Subcatchment2I: 2I Runoff Area=10.354 ac 0.00% Impervious Runoff Depth>19.04"
Flow Length=2,796' Tc=11.9 min CN=87 Runoff=94.32 cfs 16.426 af

Subcatchment2J: 2J Runoff Area=10.062 ac 4.32% Impervious Runoff Depth>18.78"
Flow Length=1,496' Tc=6.9 min CN=85 Runoff=108.96 cfs 15.749 af

Subcatchment2K: 2K Runoff Area=24.221 ac 0.95% Impervious Runoff Depth>16.98"
Flow Length=1,628' Tc=20.5 min CN=74 Runoff=168.77 cfs 34.282 af

Reach O1: Emergency Spillway Avg. Flow Depth=4.56' Max Vel=18.91 fps Inflow=1,383.60 cfs 306.953 af
n=0.022 L=230.0' S=0.0217 '/' Capacity=708.10 cfs Outflow=1,383.47 cfs 306.885 af

Reach O2: Pond Bypass Avg. Flow Depth=5.83' Max Vel=16.91 fps Inflow=1,133.56 cfs 249.174 af
n=0.022 L=950.0' S=0.0200 '/' Capacity=528.63 cfs Outflow=1,132.93 cfs 248.904 af

Reach R1: Earthen Channel Avg. Flow Depth=0.94' Max Vel=11.60 fps Inflow=108.96 cfs 15.749 af
n=0.030 L=583.0' S=0.0787 '/' Capacity=914.58 cfs Outflow=107.86 cfs 15.729 af

Reach R10: Earth channel Avg. Flow Depth=3.84' Max Vel=14.79 fps Inflow=728.54 cfs 149.884 af
n=0.030 L=1,730.0' S=0.0312 '/' Capacity=1,285.55 cfs Outflow=720.48 cfs 149.534 af

Reach R11: Earth channel Avg. Flow Depth=3.03' Max Vel=16.35 fps Inflow=794.96 cfs 222.716 af
n=0.030 L=1,350.0' S=0.0415 '/' Capacity=781.41 cfs Outflow=794.35 cfs 222.293 af

Reach R12: Earthen Channel Avg. Flow Depth=1.62' Max Vel=7.40 fps Inflow=158.91 cfs 26.735 af
n=0.030 L=240.0' S=0.0167 '/' Capacity=495.31 cfs Outflow=158.58 cfs 26.713 af

Reach R13: Earth Bypass Channel Avg. Flow Depth=3.25' Max Vel=13.84 fps Inflow=432.94 cfs 96.678 af
n=0.022 L=740.0' S=0.0162 '/' Capacity=381.01 cfs Outflow=432.13 cfs 96.564 af

Reach R2: Geomembrane Channel Avg. Flow Depth=1.16' Max Vel=8.91 fps Inflow=107.86 cfs 15.729 af
n=0.013 L=392.0' S=0.0069 '/' Capacity=169.00 cfs Outflow=107.02 cfs 15.712 af

Reach R3: Rip-Rap Channel Avg. Flow Depth=4.68' Max Vel=3.56 fps Inflow=241.33 cfs 49.994 af
n=0.040 L=443.0' S=0.0026 '/' Capacity=276.84 cfs Outflow=238.80 cfs 49.871 af

Reach R4: Concrete Channel Avg. Flow Depth=2.68' Max Vel=22.78 fps Inflow=389.25 cfs 79.743 af
n=0.017 L=890.0' S=0.0472 '/' Capacity=1,050.84 cfs Outflow=388.87 cfs 79.683 af

Reach R5: Concrete Channel Avg. Flow Depth=2.22' Max Vel=12.91 fps Inflow=94.32 cfs 16.426 af
n=0.017 L=2,290.0' S=0.0419 '/' Capacity=20.93 cfs Outflow=88.65 cfs 16.378 af

Reach R6: Concrete Channel Avg. Flow Depth=2.59' Max Vel=30.44 fps Inflow=486.43 cfs 99.138 af
n=0.017 L=335.0' S=0.0881 '/' Capacity=1,435.48 cfs Outflow=486.26 cfs 99.117 af

Reach R7: Earth Channel Avg. Flow Depth=3.17' Max Vel=15.57 fps Inflow=561.73 cfs 116.004 af
n=0.030 L=656.0' S=0.0427 '/' Capacity=919.64 cfs Outflow=560.94 cfs 115.904 af

Reach R8: Rip-Rap Downchute Avg. Flow Depth=0.13' Max Vel=5.70 fps Inflow=7.68 cfs 1.286 af
n=0.040 L=60.0' S=0.3667 '/' Capacity=486.26 cfs Outflow=7.67 cfs 1.286 af

Reach R9: Earth Channel Avg. Flow Depth=2.78' Max Vel=16.84 fps Inflow=728.97 cfs 149.936 af
n=0.030 L=270.0' S=0.0481 '/' Capacity=3,359.86 cfs Outflow=728.54 cfs 149.884 af

Pond C1: (2) 48" RCP Peak Elev=434.68' Inflow=107.02 cfs 15.712 af
Primary=107.02 cfs 15.712 af Secondary=0.00 cfs 0.000 af Outflow=107.02 cfs 15.712 af

Pond C2: 48" RCP Peak Elev=394.86' Inflow=388.87 cfs 79.683 af
Primary=133.40 cfs 68.072 af Secondary=255.47 cfs 11.612 af Outflow=388.87 cfs 79.683 af

Pond C3: 48" RCP Peak Elev=373.33' Inflow=88.65 cfs 16.378 af
Primary=78.55 cfs 16.224 af Secondary=10.10 cfs 0.154 af Outflow=88.65 cfs 16.378 af

Pond C4: (2) 48" RCP Peak Elev=340.50' Inflow=560.94 cfs 115.904 af
Primary=352.73 cfs 110.857 af Secondary=208.22 cfs 5.048 af Outflow=560.94 cfs 115.904 af

Pond C5: 30" HDPE Peak Elev=351.12' Inflow=7.68 cfs 1.286 af
Primary=7.68 cfs 1.286 af Secondary=0.00 cfs 0.000 af Outflow=7.68 cfs 1.286 af

Pond C6: 36" CMP Peak Elev=272.73' Inflow=158.58 cfs 26.713 af
Primary=59.57 cfs 24.157 af Secondary=99.01 cfs 2.555 af Outflow=158.58 cfs 26.713 af

Pond C7: 24"x32" CMP Peak Elev=281.69' Inflow=794.35 cfs 222.293 af
Primary=49.38 cfs 60.644 af Secondary=744.97 cfs 161.649 af Outflow=794.35 cfs 222.293 af

Pond C9: 36" CMP Peak Elev=697.24' Inflow=794.35 cfs 222.293 af
36.0" Round Culvert n=0.013 L=150.0' S=0.0467 '/' Outflow=794.35 cfs 222.293 af

Pond F1: Sediment Forebay Peak Elev=263.08' Storage=1.122 af Inflow=720.48 cfs 149.534 af
Outflow=719.95 cfs 148.905 af

Pond P1: Outfall Pond Peak Elev=254.98' Storage=12.707 af Inflow=314.99 cfs 133.265 af
Primary=57.13 cfs 63.626 af Secondary=256.86 cfs 58.049 af Outflow=313.98 cfs 121.676 af

Pond P2: Sedimentation Pond Peak Elev=254.51' Storage=36.958 af Inflow=899.73 cfs 192.134 af
Primary=314.99 cfs 133.265 af Secondary=579.81 cfs 26.880 af Outflow=894.80 cfs 160.145 af

Link 1: Offsite Discharge Inflow=432.13 cfs 96.564 af
Primary=432.13 cfs 96.564 af

Link 2: Offsite Discharge Inflow=1,440.58 cfs 370.511 af
Primary=1,440.58 cfs 370.511 af

Total Runoff Area = 383.993 ac Runoff Volume = 512.971 af Average Runoff Depth = 16.03"
98.28% Pervious = 377.397 ac 1.72% Impervious = 6.596 ac

Summary for Subcatchment 1A: 1A

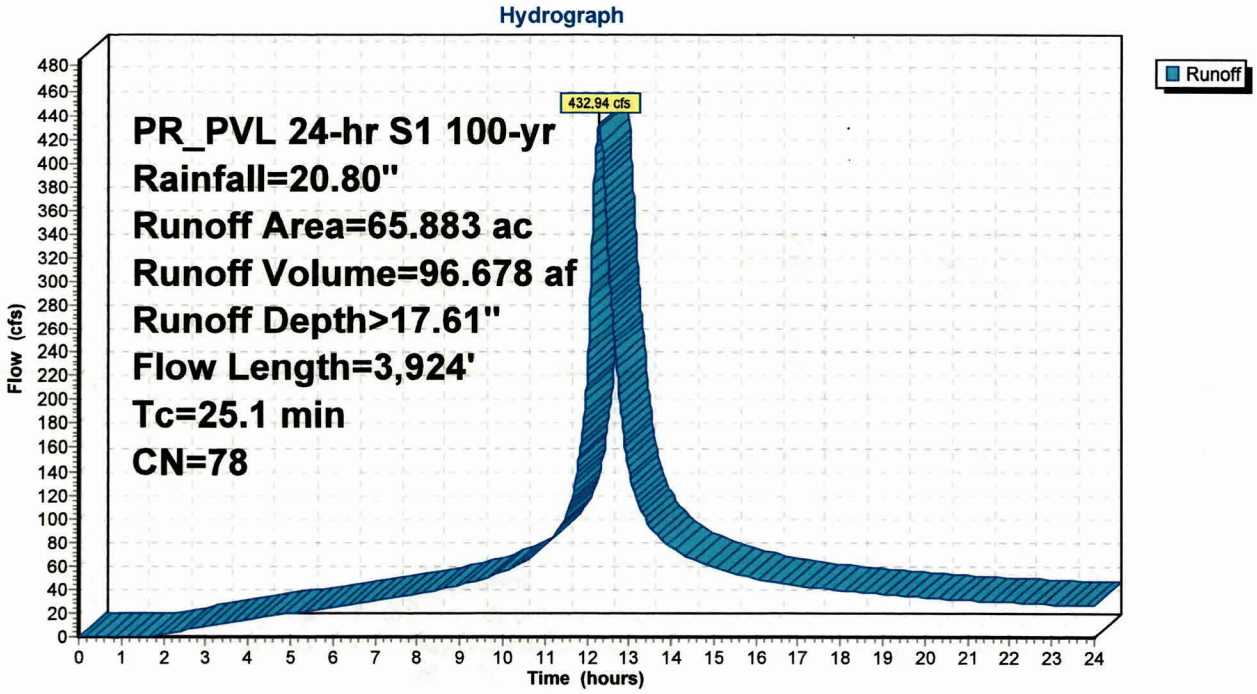
Runoff = 432.94 cfs @ 12.30 hrs, Volume= 96.678 af, Depth>17.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.000	98	Paved parking, HSG B
3.107	96	Gravel surface, HSG B
6.322	55	Woods, Good, HSG B
15.602	66	Woods, Poor, HSG B
34.942	86	Fallow, bare soil, HSG B
5.910	77	Woods, Good, HSG D
65.883	78	Weighted Average
65.883	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	100	0.2000	0.64		**Sheet Flow, Initial Sheet Flow** Range n= 0.130 P2= 5.68"
7.4	1,757	0.1560	3.95		**Shallow Concentrated Flow, Overland shallow concentrated flov** Nearly Bare & Untilled Kv= 10.0 fps
14.1	1,572	0.0700	1.85		**Shallow Concentrated Flow, Overland shallow concentrate ov** Kv= 7.0 fps
1.0	495	0.0182	8.55	188.11	**Channel Flow, Earthen by-pass channel** Area= 22.0 sf Perim= 15.2' r= 1.45' n= 0.030 Earth, grassed & winding
25.1	3,924	Total			

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

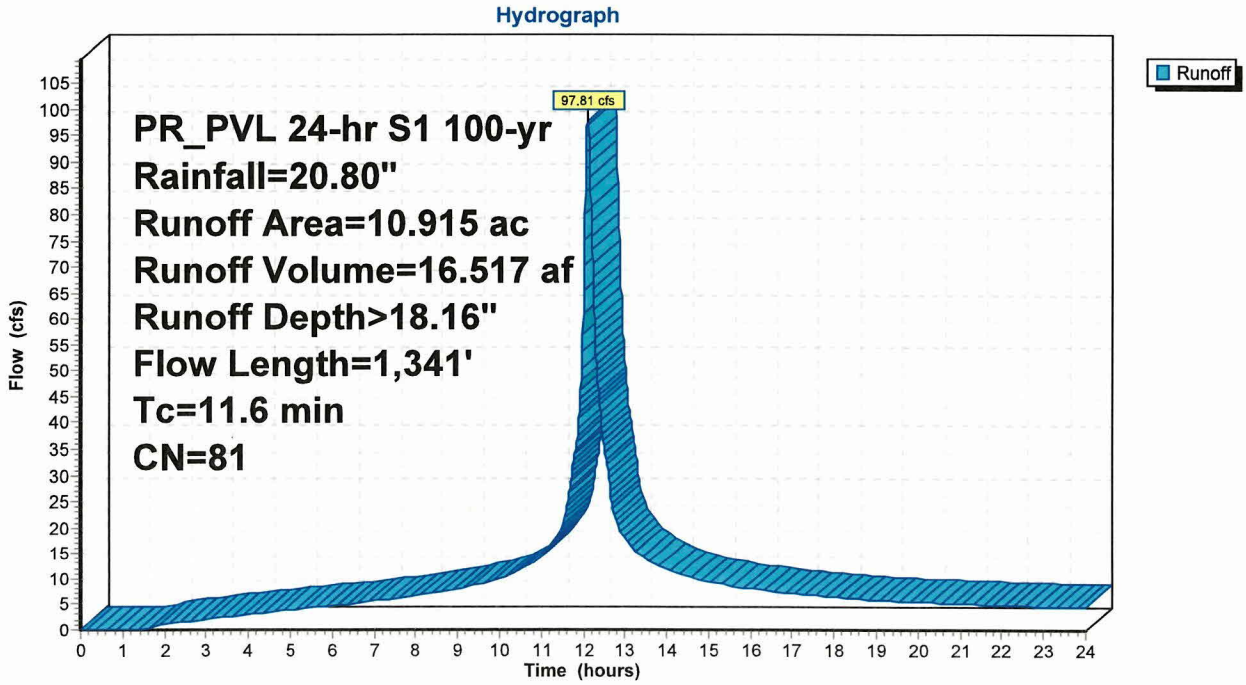
Runoff = 97.81 cfs @ 12.11 hrs, Volume= 16.517 af, Depth>18.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.746	98	Paved parking, HSG B
1.564	96	Gravel surface, HSG B
0.000	55	Woods, Good, HSG B
3.873	66	Woods, Poor, HSG B
4.732	86	Fallow, bare soil, HSG B
10.915	81	Weighted Average
10.169	80	93.17% Pervious Area
0.746	98	6.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0600	2.84		**Sheet Flow, Initial sheet** Smooth surfaces n= 0.011 P2= 5.68"
6.1	1,006	0.0290	2.74		**Shallow Concentrated Flow, Overland** Unpaved Kv= 16.1 fps
4.9	235	0.0260	0.81		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
11.6	1,341	Total			

Subcatchment 2A: 2A



Summary for Subcatchment 2B: 2B

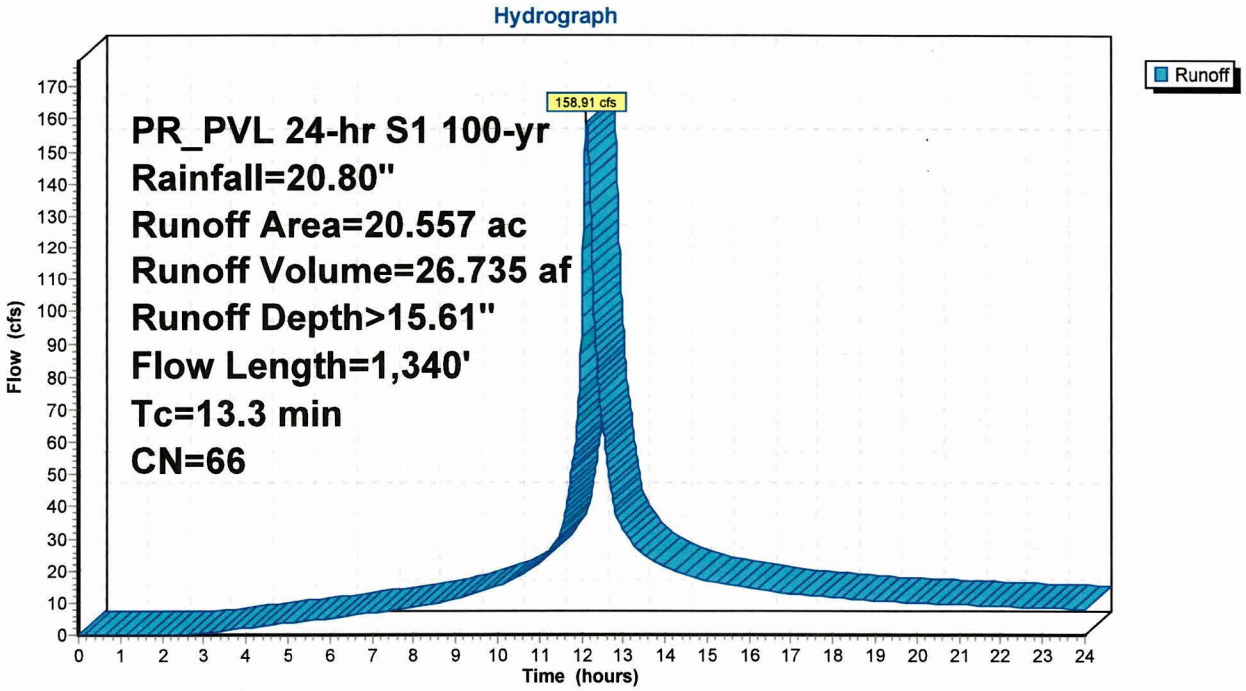
Runoff = 158.91 cfs @ 12.13 hrs, Volume= 26.735 af, Depth>15.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
3.598	98	Paved parking, HSG B
0.000	96	Gravel surface, HSG B
14.799	55	Woods, Good, HSG B
0.000	66	Woods, Poor, HSG B
2.160	86	Fallow, bare soil, HSG B
20.557	66	Weighted Average
16.959	59	82.50% Pervious Area
3.598	98	17.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.2500	0.16		**Sheet Flow, Initial sheet** Woods: Dense underbrush n= 0.800 P2= 5.68"
1.0	211	0.5000	3.54		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
2.1	1,029	0.0870	8.04	192.97	**Channel Flow, Earth channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.080 Earth, long dense weeds
13.3	1,340	Total			

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

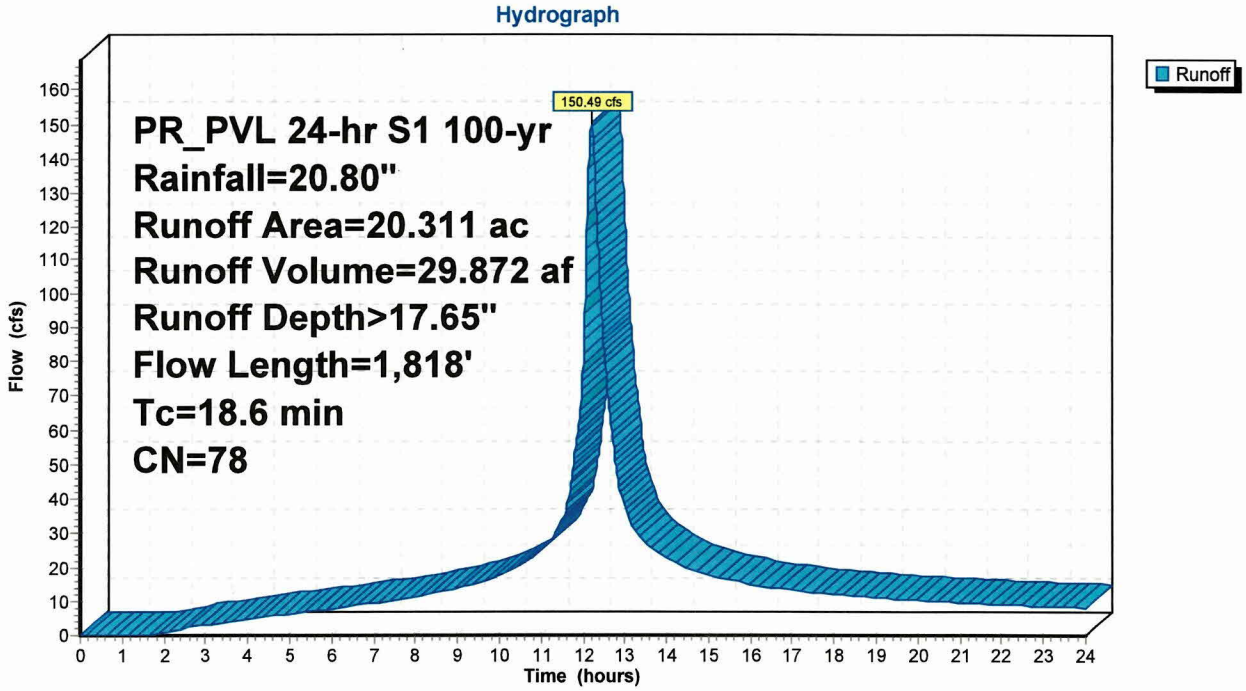
Runoff = 150.49 cfs @ 12.21 hrs, Volume= 29.872 af, Depth>17.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.621	98	Paved parking, HSG D
0.000	96	Gravel surface, HSG D
18.887	77	Woods, Good, HSG D
0.000	83	Woods, Poor, HSG D
0.803	94	Fallow, bare soil, HSG D
20.311	78	Weighted Average
19.690	78	96.94% Pervious Area
0.621	98	3.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.2800	0.17		**Sheet Flow, Initial Sheet** Woods: Dense underbrush n= 0.800 P2= 5.68"
8.7	1,546	0.3500	2.96		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
0.1	172	0.1300	48.43	1,743.43	**Channel Flow, Concrete Channel** Area= 36.0 sf Perim= 18.9' r= 1.90' n= 0.017 Concrete, unfinished
18.6	1,818	Total			

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2G

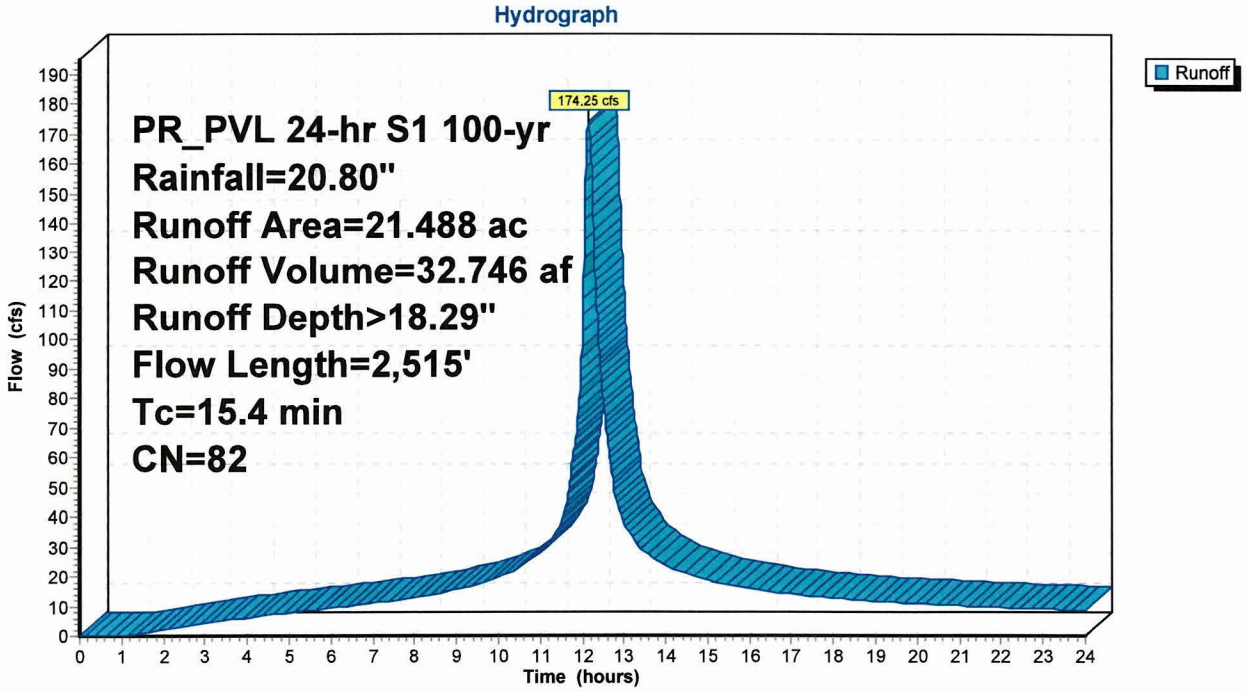
Runoff = 174.25 cfs @ 12.16 hrs, Volume= 32.746 af, Depth>18.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.527	98	Paved parking, HSG B
2.696	96	Gravel surface, HSG B
0.000	55	Woods, Good, HSG B
6.297	66	Woods, Poor, HSG B
11.968	86	Fallow, bare soil, HSG B
21.488	82	Weighted Average
20.961	81	97.55% Pervious Area
0.527	98	2.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0500	0.79		**Sheet Flow, Initial sheet** Fallow n= 0.050 P2= 5.68"
12.2	1,619	0.1000	2.21		**Shallow Concentrated Flow, Overland** Kv= 7.0 fps
1.1	796	0.0380	12.15	291.50	**Channel Flow, Earth channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.035 Earth, dense weeds
15.4	2,515	Total			

Subcatchment 2D: 2G



Summary for Subcatchment 2E: 2E

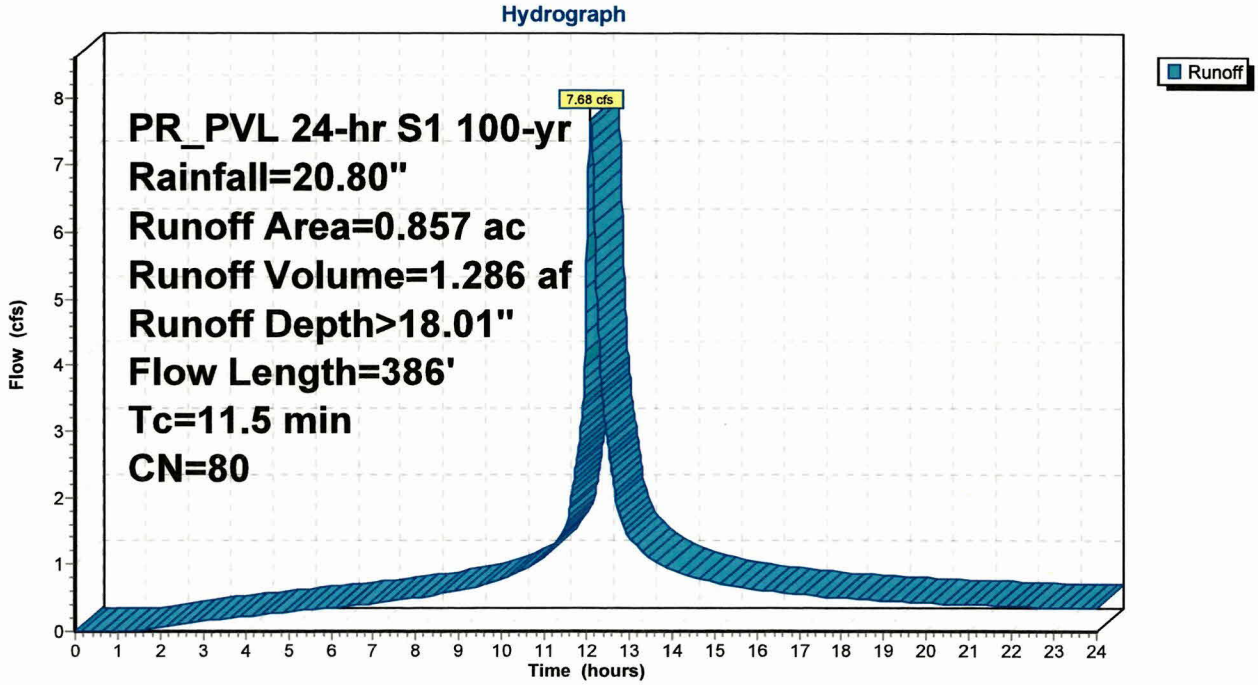
Runoff = 7.68 cfs @ 12.10 hrs, Volume= 1.286 af, Depth>18.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.000	98	Paved parking, HSG B
0.069	96	Gravel surface, HSG B
0.000	55	Woods, Good, HSG B
0.293	66	Woods, Poor, HSG B
0.495	86	Fallow, bare soil, HSG B
0.857	80	Weighted Average
0.857	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0700	0.17		**Sheet Flow, Initial sheet** Woods: Light underbrush n= 0.400 P2= 5.68"
1.7	236	0.2200	2.35		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
0.0	50	0.1200	18.81	92.36	**Pipe Channel, 30" HDPE** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.020 Corrugated PE, corrugated interior
11.5	386	Total			

Subcatchment 2E: 2E



Summary for Subcatchment 2F: 2F

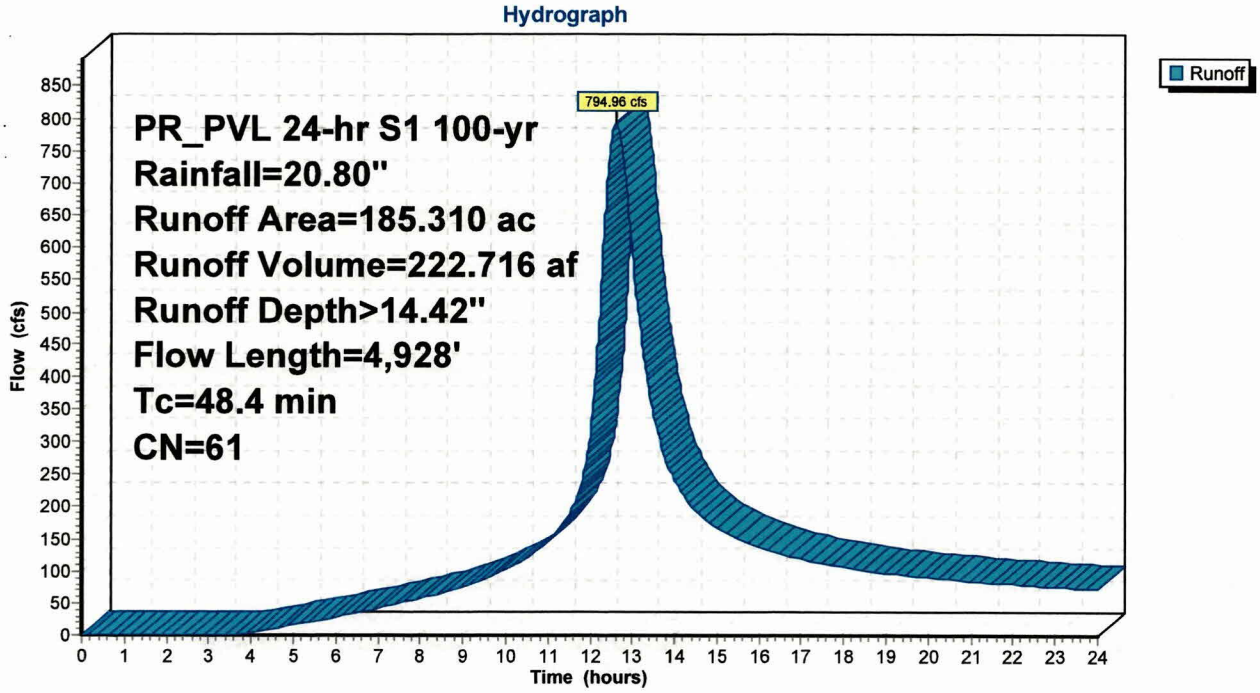
Runoff = 794.96 cfs @ 12.63 hrs, Volume= 222.716 af, Depth>14.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.000	98	Paved parking, HSG B
0.000	96	Gravel surface, HSG B
132.102	55	Woods, Good, HSG B
0.000	66	Woods, Poor, HSG B
0.000	86	Fallow, bare soil, HSG B
53.208	77	Woods, Good, HSG D
185.310	61	Weighted Average
185.310	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.1500	0.13		**Sheet Flow, Initial sheet** Woods: Dense underbrush n= 0.800 P2= 5.68"
22.9	2,664	0.1500	1.94		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
11.0	723	0.0480	1.10		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
2.0	1,441	0.0380	12.15	291.50	**Channel Flow, Earth channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.035 Earth, dense weeds
48.4	4,928	Total			

Subcatchment 2F: 2F



Summary for Subcatchment 2G: 2G

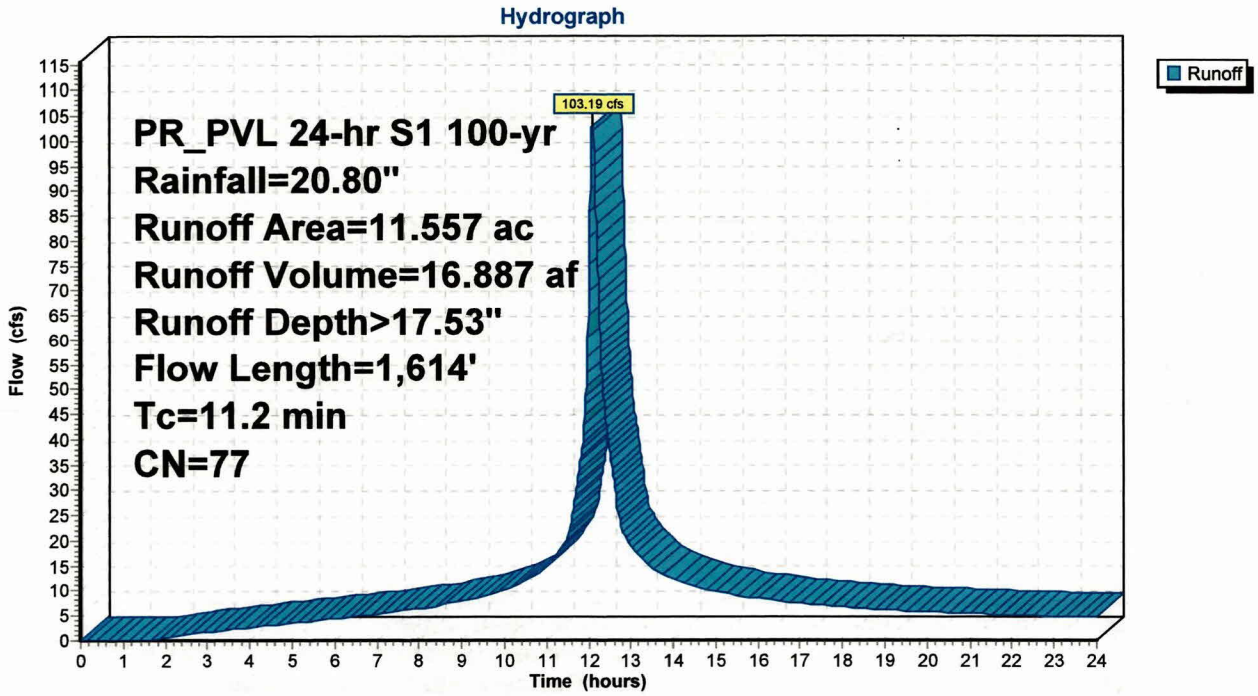
Runoff = 103.19 cfs @ 12.10 hrs, Volume= 16.887 af, Depth>17.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.324	98	Paved parking, HSG B
0.000	96	Gravel surface, HSG B
2.349	55	Woods, Good, HSG B
1.767	66	Woods, Poor, HSG B
7.117	86	Fallow, bare soil, HSG B
11.557	77	Weighted Average
11.233	76	97.20% Pervious Area
0.324	98	2.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	100	0.0200	0.55		**Sheet Flow, Initial sheet** Fallow n= 0.050 P2= 5.68"
7.3	1,021	0.1100	2.32		**Shallow Concentrated Flow, Overland** Kv= 7.0 fps
0.8	493	0.0280	10.43	250.22	**Channel Flow, Earth channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.035 Earth, dense weeds
11.2	1,614	Total			

Subcatchment 2G: 2G



Summary for Subcatchment 2H: 2H

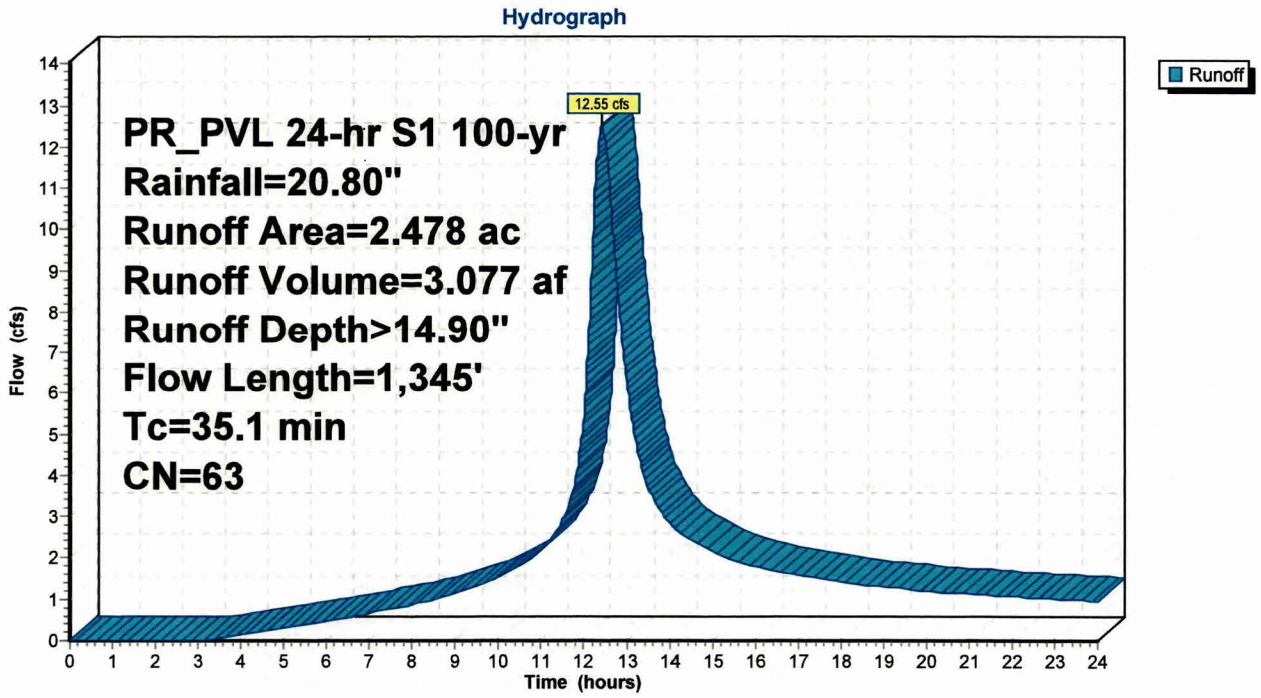
Runoff = 12.55 cfs @ 12.44 hrs, Volume= 3.077 af, Depth>14.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.115	98	Paved parking, HSG D
0.000	96	Gravel surface, HSG B
1.879	55	Woods, Good, HSG B
0.000	66	Woods, Poor, HSG B
0.241	94	Fallow, bare soil, HSG D
0.243	77	Woods, Good, HSG D
2.478	63	Weighted Average
2.363	61	95.36% Pervious Area
0.115	98	4.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	100	0.0450	0.08		**Sheet Flow, Initial sheet** Woods: Dense underbrush n= 0.800 P2= 5.68"
13.3	815	0.0420	1.02		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
1.4	129	0.0900	1.50		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
0.1	301	0.0730	34.66	831.82	**Channel Flow, Concrete Channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.017 Concrete, unfinished
35.1	1,345	Total			

Subcatchment 2H: 2H



Summary for Subcatchment 2l: 2l

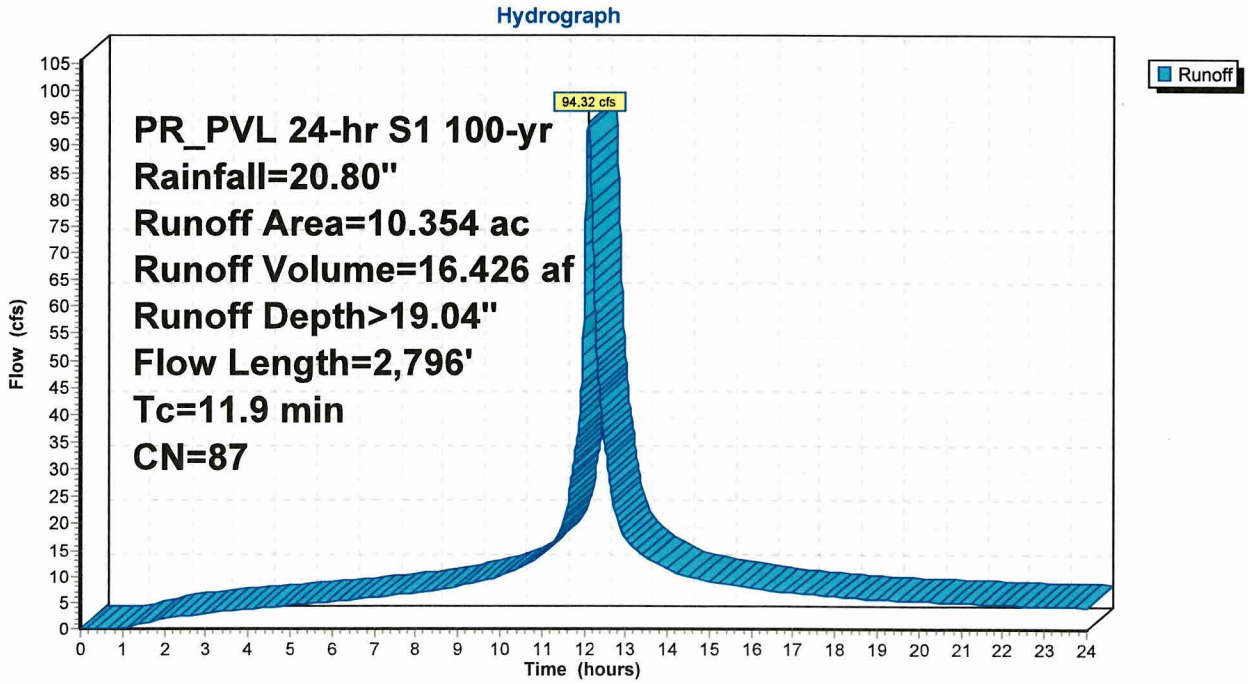
Runoff = 94.32 cfs @ 12.11 hrs, Volume= 16.426 af, Depth>19.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.000	98	Paved parking, HSG B
0.700	96	Gravel surface, HSG B
0.000	55	Woods, Good, HSG B
0.000	66	Woods, Poor, HSG B
9.654	86	Fallow, bare soil, HSG B
10.354	87	Weighted Average
10.354	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.0100	0.41		**Sheet Flow, Initial sheet** Fallow n= 0.050 P2= 5.68"
6.5	550	0.0200	1.41		**Shallow Concentrated Flow, Overland** Nearly Bare & Untilled Kv= 10.0 fps
1.4	2,146	0.0400	25.66	615.74	**Channel Flow, Concrete Channel** Area= 24.0 sf Perim= 13.5' r= 1.78' n= 0.017 Concrete, unfinished
11.9	2,796	Total			

Subcatchment 2l: 2l



Summary for Subcatchment 2J: 2J

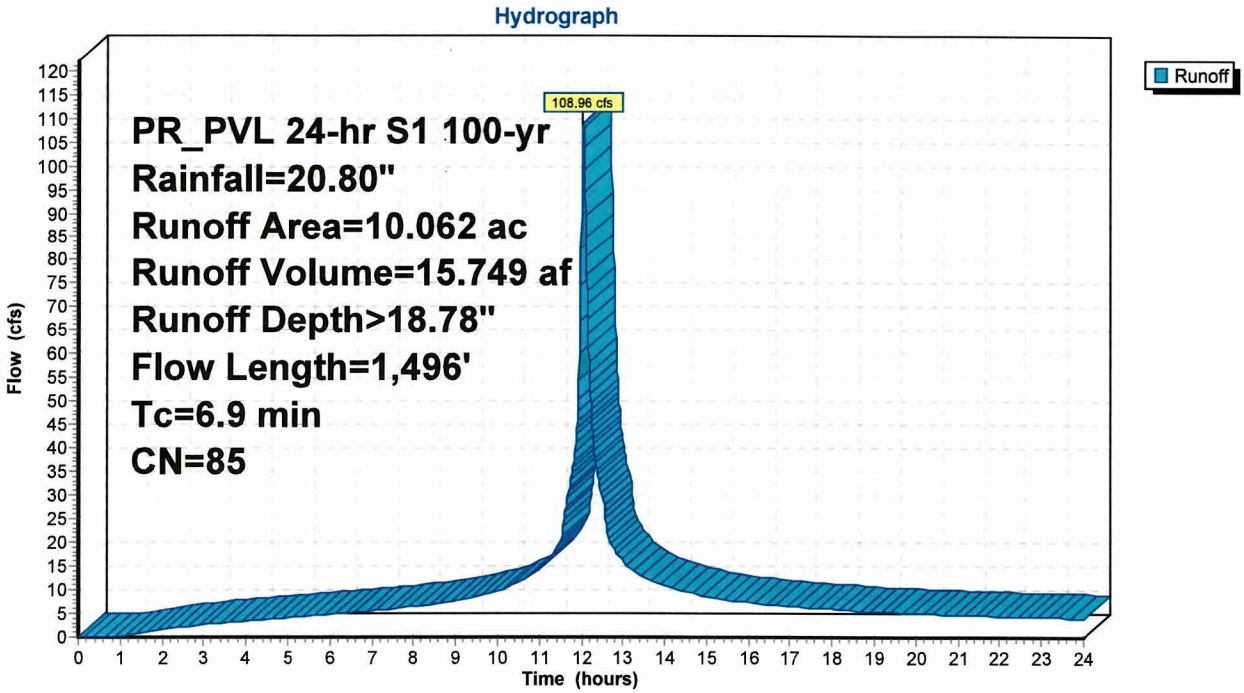
Runoff = 108.96 cfs @ 12.05 hrs, Volume= 15.749 af, Depth>18.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.435	98	Paved parking, HSG B
0.786	96	Gravel surface, HSG B
0.000	55	Woods, Good, HSG B
1.340	66	Woods, Poor, HSG B
7.501	86	Fallow, bare soil, HSG B
10.062	85	Weighted Average
9.627	84	95.68% Pervious Area
0.435	98	4.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.1400	1.19		**Sheet Flow, Initial Sheet Flow** Fallow n= 0.050 P2= 5.68"
5.0	1,126	0.2180	3.74		**Shallow Concentrated Flow, Overland** Kv= 8.0 fps
0.5	270	0.0037	8.74	340.93	**Channel Flow, Geomembrane Line Channel** Area= 39.0 sf Perim= 18.5' r= 2.11' n= 0.017 Concrete, unfinished
6.9	1,496	Total			

Subcatchment 2J: 2J



Summary for Subcatchment 2K: 2K

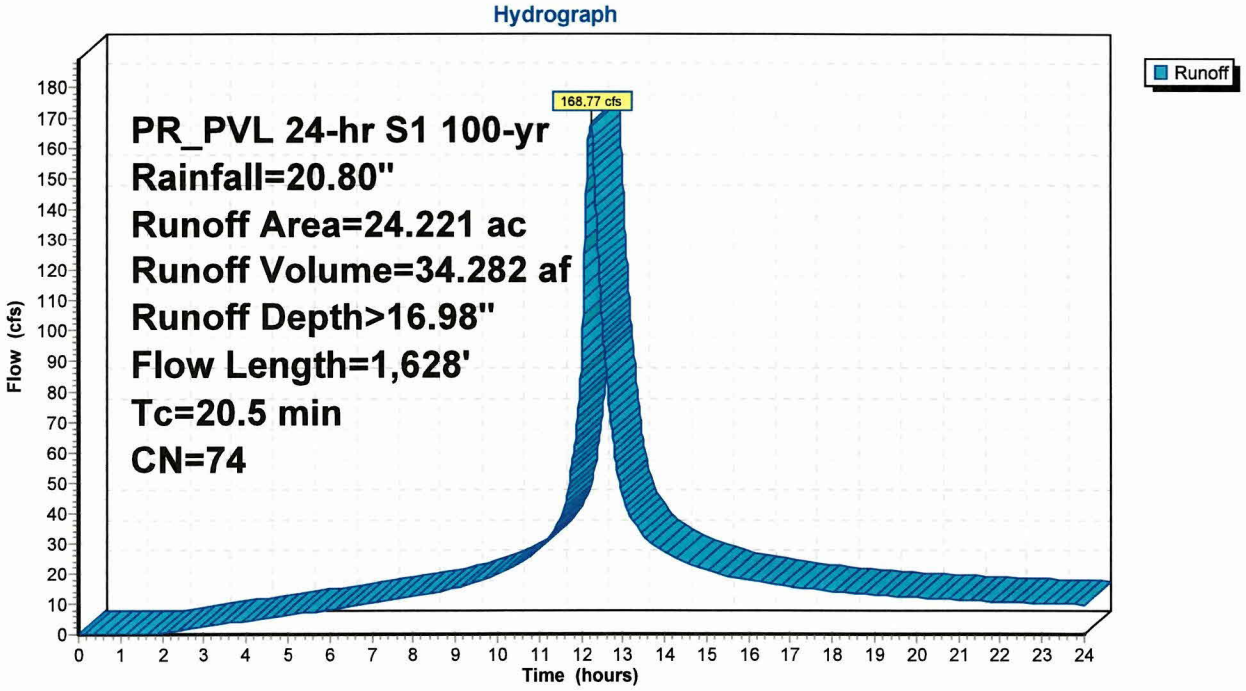
Runoff = 168.77 cfs @ 12.23 hrs, Volume= 34.282 af, Depth>16.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
PR_PVL 24-hr S1 100-yr Rainfall=20.80"

Area (ac)	CN	Description
0.230	98	Paved parking, HSG B
0.193	96	Gravel surface, HSG B
4.913	55	Woods, Good, HSG B
0.000	66	Woods, Poor, HSG B
2.800	86	Fallow, bare soil, HSG B
0.689	94	Fallow, bare soil, HSG D
15.396	77	Woods, Good, HSG D
24.221	74	Weighted Average
23.991	74	99.05% Pervious Area
0.230	98	0.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1900	0.15		**Sheet Flow, Initial Sheet** Woods: Dense underbrush n= 0.800 P2= 5.68"
4.7	878	0.3860	3.11		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
2.7	264	0.1100	1.66		**Shallow Concentrated Flow, Overland** Woodland Kv= 5.0 fps
1.7	386	0.0026	3.71	278.00	**Channel Flow, Rip-Rap Channel** Area= 75.0 sf Perim= 27.4' r= 2.74' n= 0.040 Earth, cobble bottom, clean sides
20.5	1,628	Total			

Subcatchment 2K: 2K



Summary for Reach O1: Emergency Spillway

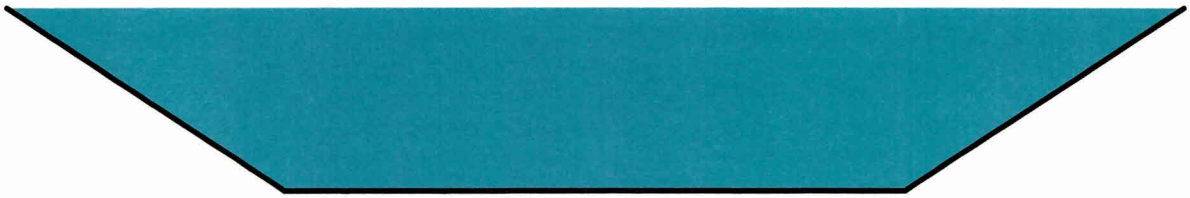
[91] Warning: Storage range exceeded by 1.56'
[55] Hint: Peak inflow is 195% of Manning's capacity
[61] Hint: Exceeded Reach O2 outlet invert by 4.56' @ 12.39 hrs

Inflow Area = 185.310 ac, 0.00% Impervious, Inflow Depth > 19.88" for 100-yr event
Inflow = 1,383.60 cfs @ 12.39 hrs, Volume= 306.953 af
Outflow = 1,383.47 cfs @ 12.40 hrs, Volume= 306.885 af, Atten= 0%, Lag= 0.4 min

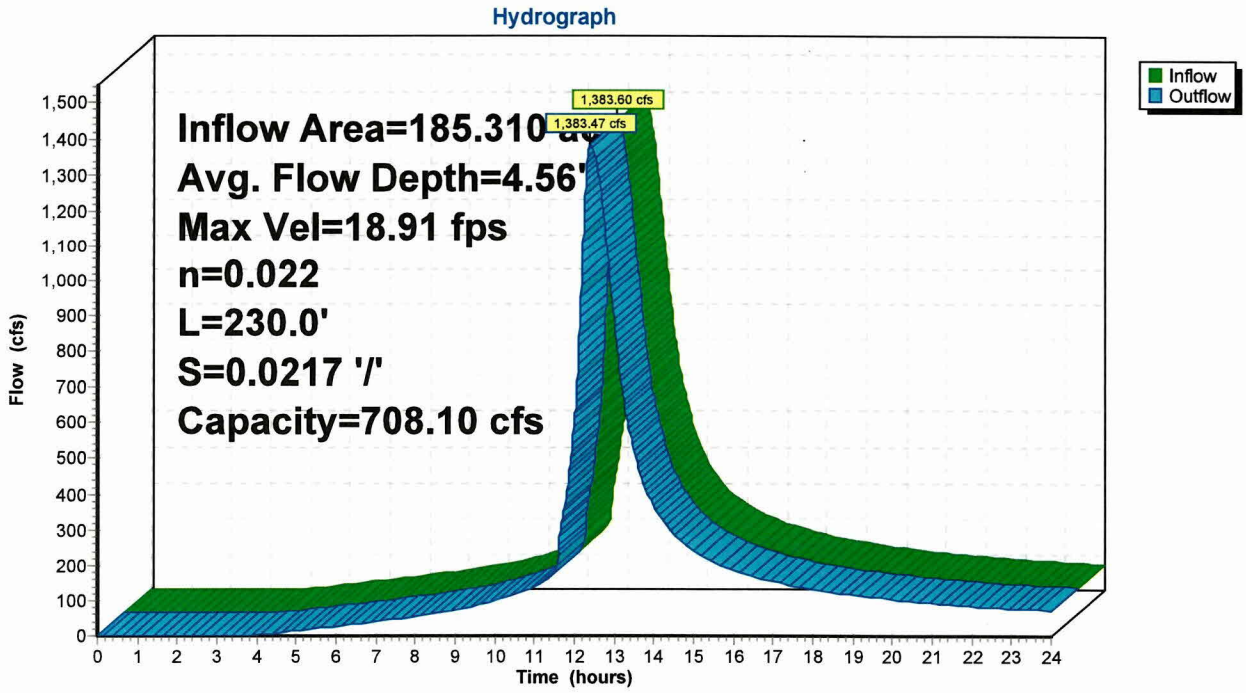
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 18.91 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 9.09 fps, Avg. Travel Time= 0.4 min

Peak Storage= 16,827 cf @ 12.39 hrs
Average Depth at Peak Storage= 4.56'
Bank-Full Depth= 3.00' Flow Area= 43.5 sf, Capacity= 708.10 cfs

10.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 1.5 '/' Top Width= 19.00'
Length= 230.0' Slope= 0.0217 '/'
Inlet Invert= 247.00', Outlet Invert= 242.00'



Reach O1: Emergency Spillway



Summary for Reach O2: Pond Bypass

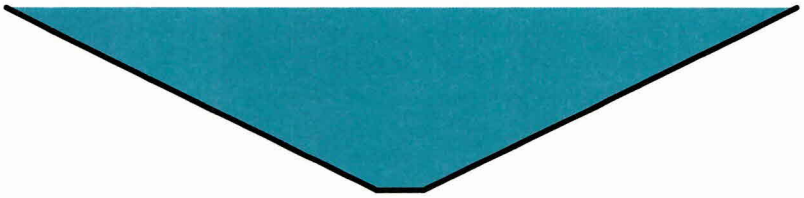
[91] Warning: Storage range exceeded by 1.83'
[55] Hint: Peak inflow is 214% of Manning's capacity
[79] Warning: Submerged Pond C9 Primary device # 1 OUTLET by 6.83'
[81] Warning: Exceeded Pond P2 by 32.00' @ 0.00 hrs

Inflow Area = 185.310 ac, 0.00% Impervious, Inflow Depth > 16.14" for 100-yr event
Inflow = 1,133.56 cfs @ 12.38 hrs, Volume= 249.174 af
Outflow = 1,132.93 cfs @ 12.41 hrs, Volume= 248.904 af, Atten= 0%, Lag= 1.8 min

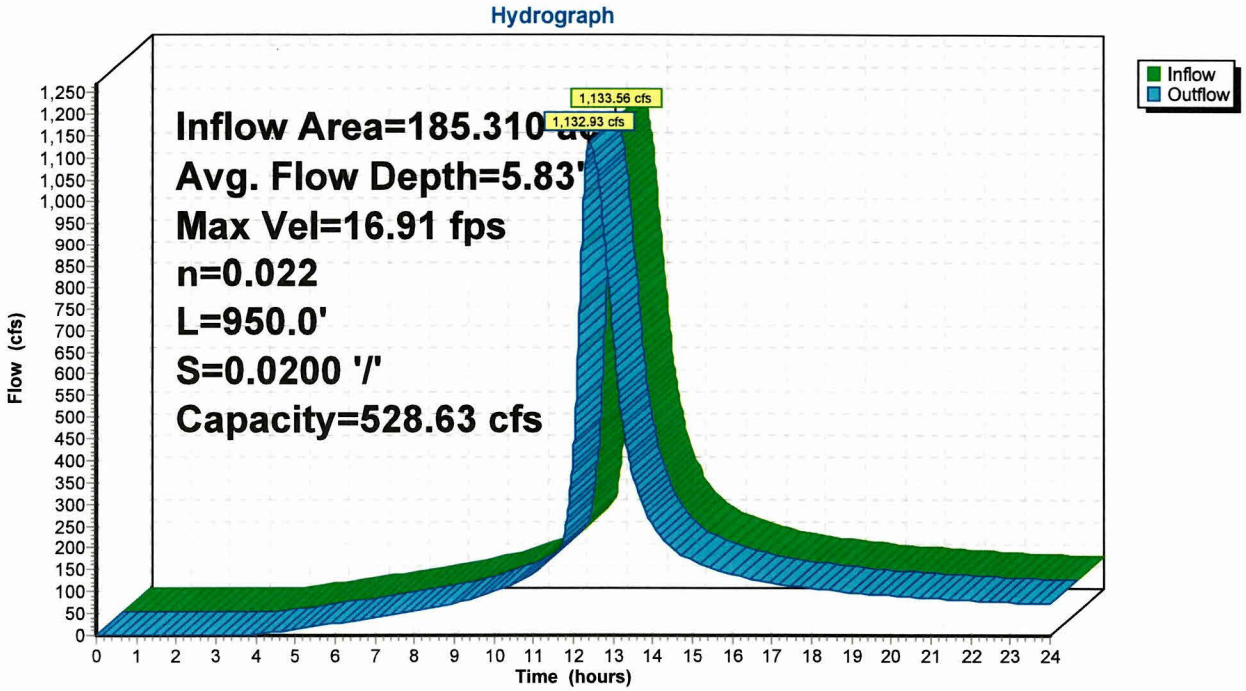
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.91 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 9.45 fps, Avg. Travel Time= 1.7 min

Peak Storage= 63,638 cf @ 12.39 hrs
Average Depth at Peak Storage= 5.83'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 528.63 cfs

1.00' x 4.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 17.00'
Length= 950.0' Slope= 0.0200 '/'
Inlet Invert= 266.00', Outlet Invert= 247.00'



Reach O2: Pond Bypass



Summary for Reach R1: Earthen Channel

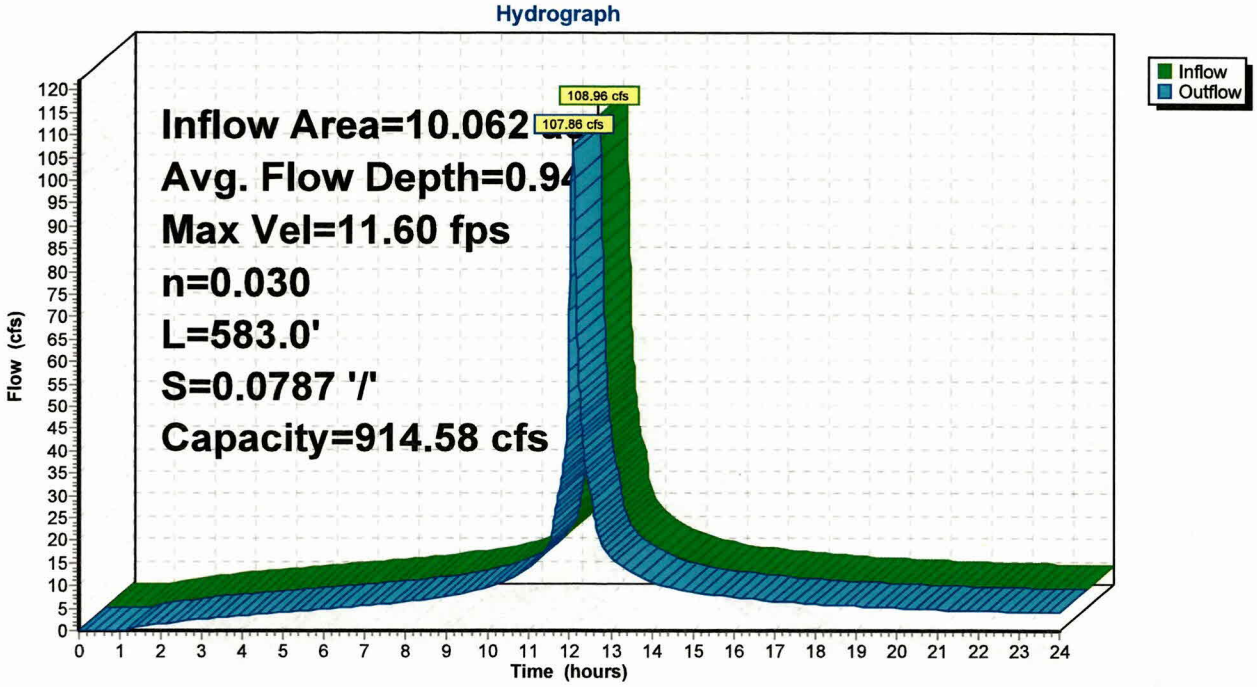
Inflow Area = 10.062 ac, 4.32% Impervious, Inflow Depth > 18.78" for 100-yr event
Inflow = 108.96 cfs @ 12.05 hrs, Volume= 15.749 af
Outflow = 107.86 cfs @ 12.07 hrs, Volume= 15.729 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.60 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 4.31 fps, Avg. Travel Time= 2.3 min

Peak Storage= 5,431 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 914.58 cfs

8.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 583.0' Slope= 0.0787 '/'
Inlet Invert= 480.00', Outlet Invert= 434.10'

Reach R1: Earthen Channel



Summary for Reach R10: Earth channel

[62] Hint: Exceeded Reach R9 OUTLET depth by 1.12' @ 12.32 hrs

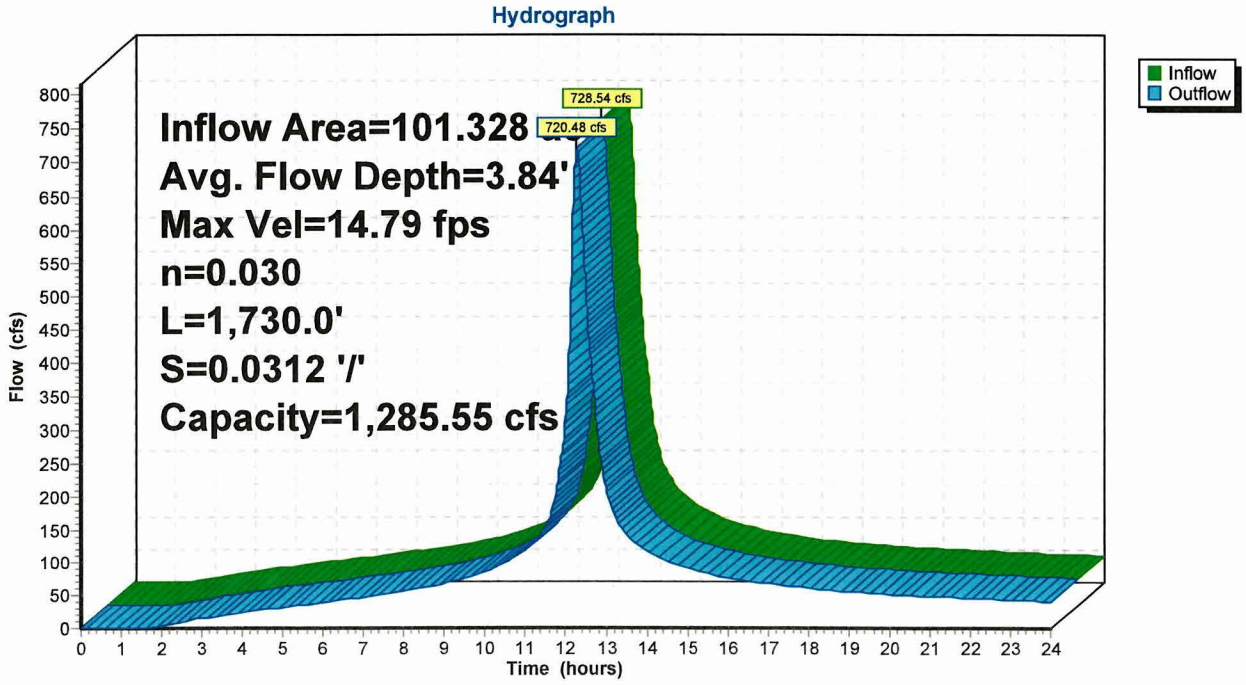
Inflow Area = 101.328 ac, 2.22% Impervious, Inflow Depth > 17.75" for 100-yr event
Inflow = 728.54 cfs @ 12.22 hrs, Volume= 149.884 af
Outflow = 720.48 cfs @ 12.28 hrs, Volume= 149.534 af, Atten= 1%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 14.79 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 7.41 fps, Avg. Travel Time= 3.9 min

Peak Storage= 84,303 cf @ 12.25 hrs
Average Depth at Peak Storage= 3.84'
Bank-Full Depth= 5.00' Flow Area= 75.0 sf, Capacity= 1,285.55 cfs

5.00' x 5.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 25.00'
Length= 1,730.0' Slope= 0.0312 '/'
Inlet Invert= 314.00', Outlet Invert= 260.00'

Reach R10: Earth channel



Summary for Reach R11: Earth channel

[91] Warning: Storage range exceeded by 0.03'
[55] Hint: Peak inflow is 102% of Manning's capacity

Inflow Area = 185.310 ac, 0.00% Impervious, Inflow Depth > 14.42" for 100-yr event
Inflow = 794.96 cfs @ 12.63 hrs, Volume= 222.716 af
Outflow = 794.35 cfs @ 12.66 hrs, Volume= 222.293 af, Atten= 0%, Lag= 1.8 min

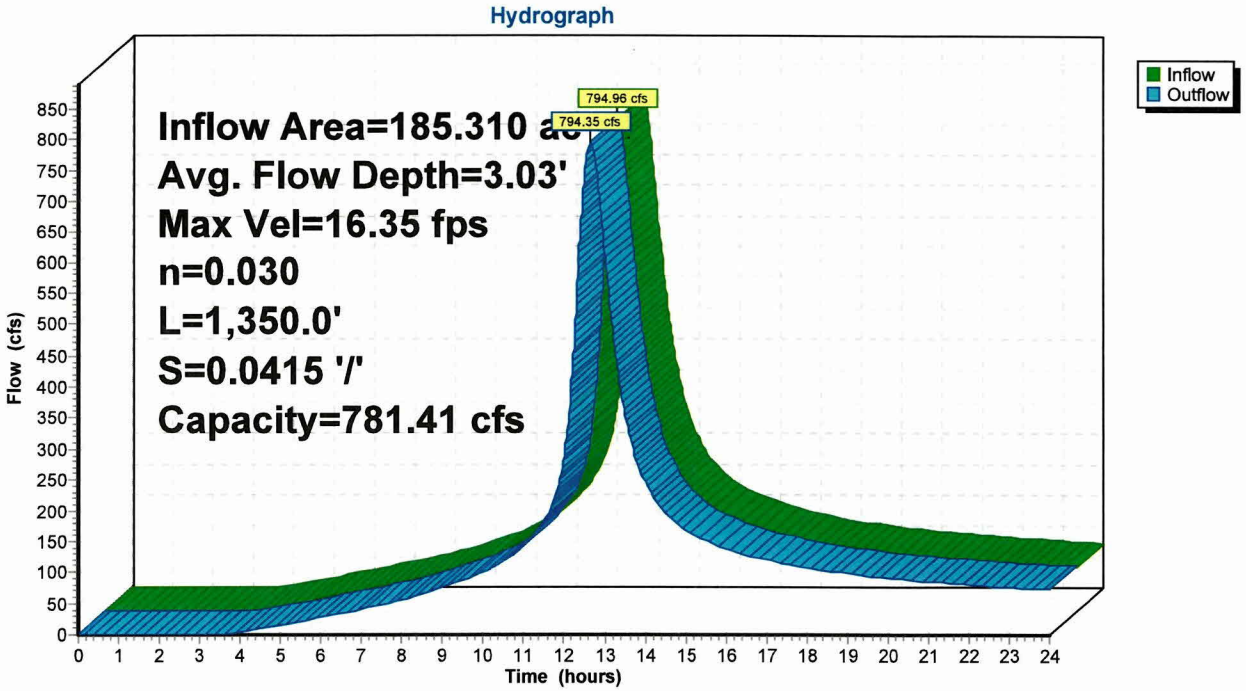
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.35 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 8.42 fps, Avg. Travel Time= 2.7 min

Peak Storage= 65,580 cf @ 12.64 hrs
Average Depth at Peak Storage= 3.03'
Bank-Full Depth= 3.00' Flow Area= 48.0 sf, Capacity= 781.41 cfs

10.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 1,350.0' Slope= 0.0415 '/'
Inlet Invert= 330.00', Outlet Invert= 274.00'

‡

Reach R11: Earth channel



Summary for Reach R12: Earthen Channel

Inflow Area = 20.557 ac, 17.50% Impervious, Inflow Depth > 15.61" for 100-yr event
Inflow = 158.91 cfs @ 12.13 hrs, Volume= 26.735 af
Outflow = 158.58 cfs @ 12.15 hrs, Volume= 26.713 af, Atten= 0%, Lag= 0.9 min

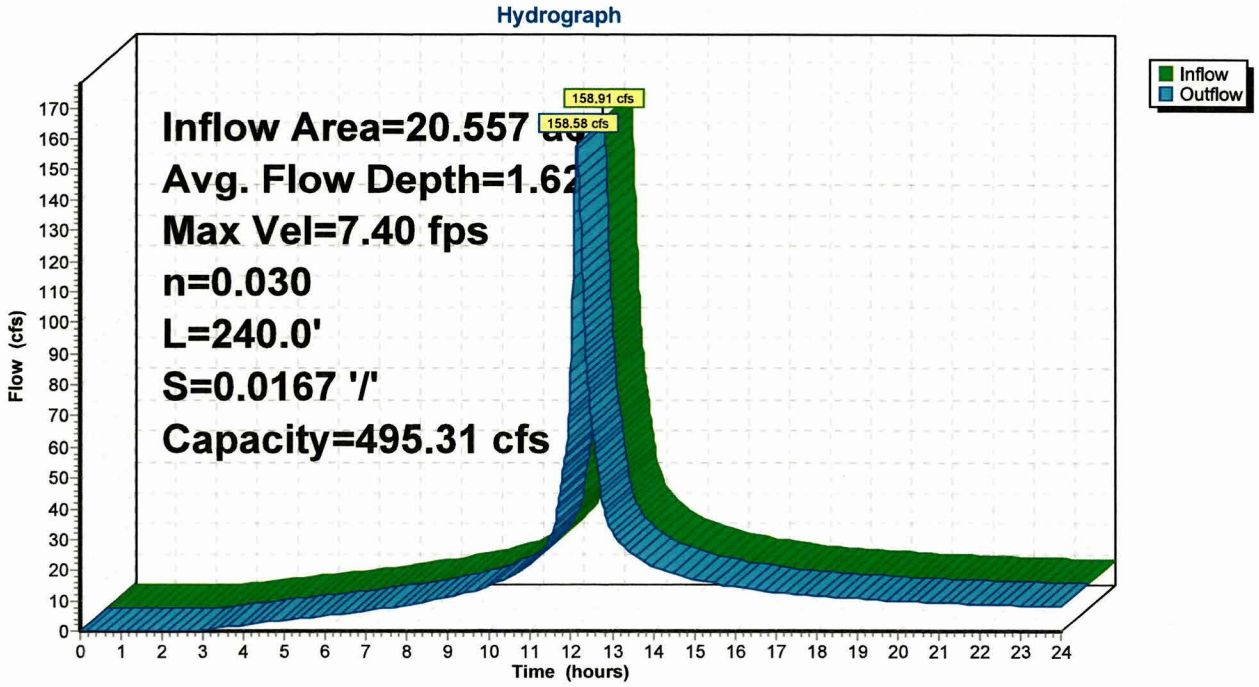
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.40 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 1.3 min

Peak Storage= 5,148 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.62'
Bank-Full Depth= 3.00' Flow Area= 48.0 sf, Capacity= 495.31 cfs

10.00' x 3.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 240.0' Slope= 0.0167 '/'
Inlet Invert= 272.00', Outlet Invert= 268.00'

‡

Reach R12: Earthen Channel



Summary for Reach R13: Earth Bypass Channel

[91] Warning: Storage range exceeded by 0.25'
[55] Hint: Peak inflow is 114% of Manning's capacity

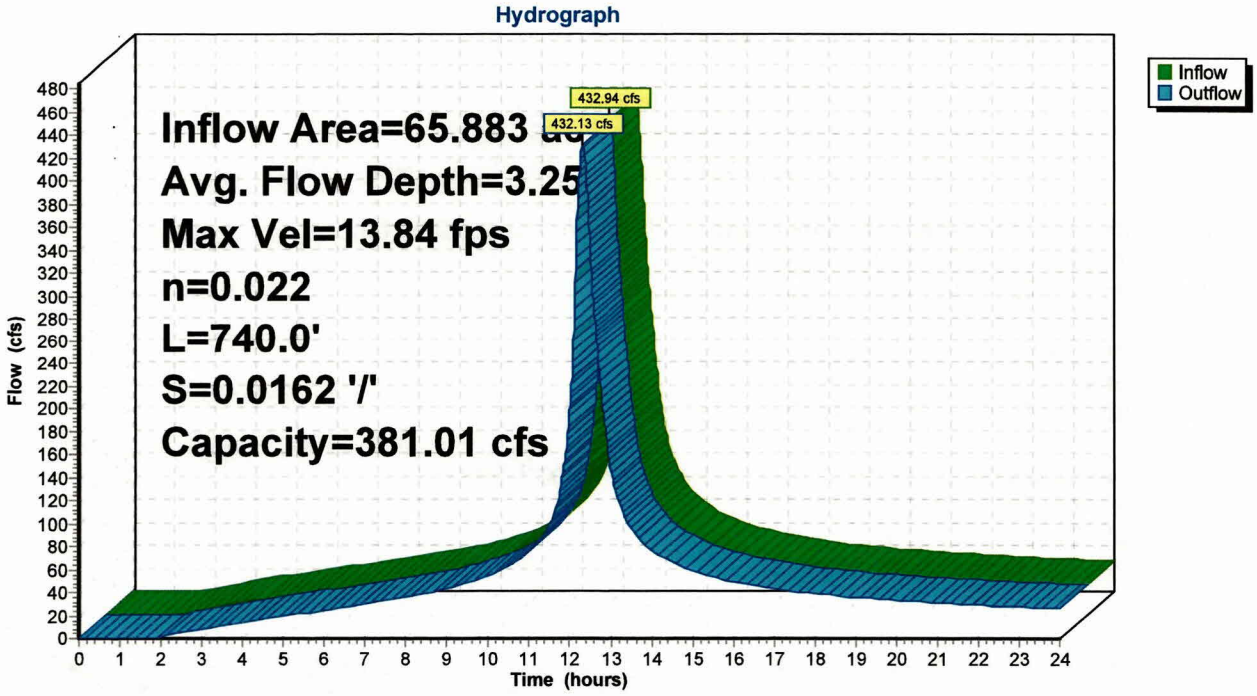
Inflow Area = 65.883 ac, 0.00% Impervious, Inflow Depth > 17.61" for 100-yr event
Inflow = 432.94 cfs @ 12.30 hrs, Volume= 96.678 af
Outflow = 432.13 cfs @ 12.32 hrs, Volume= 96.564 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 13.84 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 6.36 fps, Avg. Travel Time= 1.9 min

Peak Storage= 23,114 cf @ 12.30 hrs
Average Depth at Peak Storage= 3.25'
Bank-Full Depth= 3.00' Flow Area= 28.5 sf, Capacity= 381.01 cfs

8.00' x 3.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 0.5 '/' Top Width= 11.00'
Length= 740.0' Slope= 0.0162 '/'
Inlet Invert= 270.00', Outlet Invert= 258.00'

Reach R13: Earth Bypass Channel



Summary for Reach R2: Geomembrane Channel

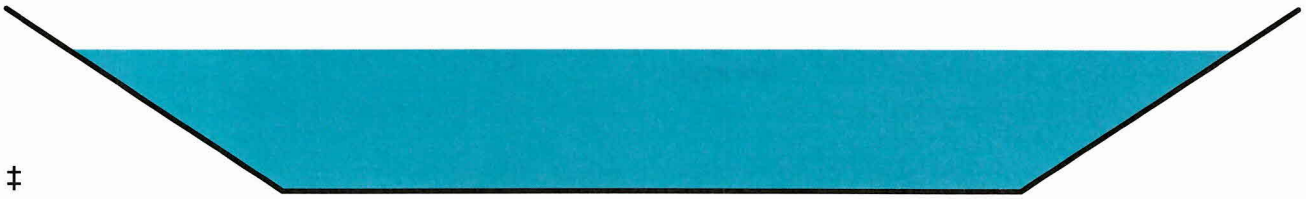
[62] Hint: Exceeded Reach R1 OUTLET depth by 0.27' @ 12.11 hrs

Inflow Area = 10.062 ac, 4.32% Impervious, Inflow Depth > 18.76" for 100-yr event
Inflow = 107.86 cfs @ 12.07 hrs, Volume= 15.729 af
Outflow = 107.02 cfs @ 12.09 hrs, Volume= 15.712 af, Atten= 1%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.91 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.38 fps, Avg. Travel Time= 1.9 min

Peak Storage= 4,714 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.16'
Bank-Full Depth= 1.50' Flow Area= 16.5 sf, Capacity= 169.00 cfs

8.00' x 1.50' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 392.0' Slope= 0.0069 '/'
Inlet Invert= 434.10', Outlet Invert= 431.40'



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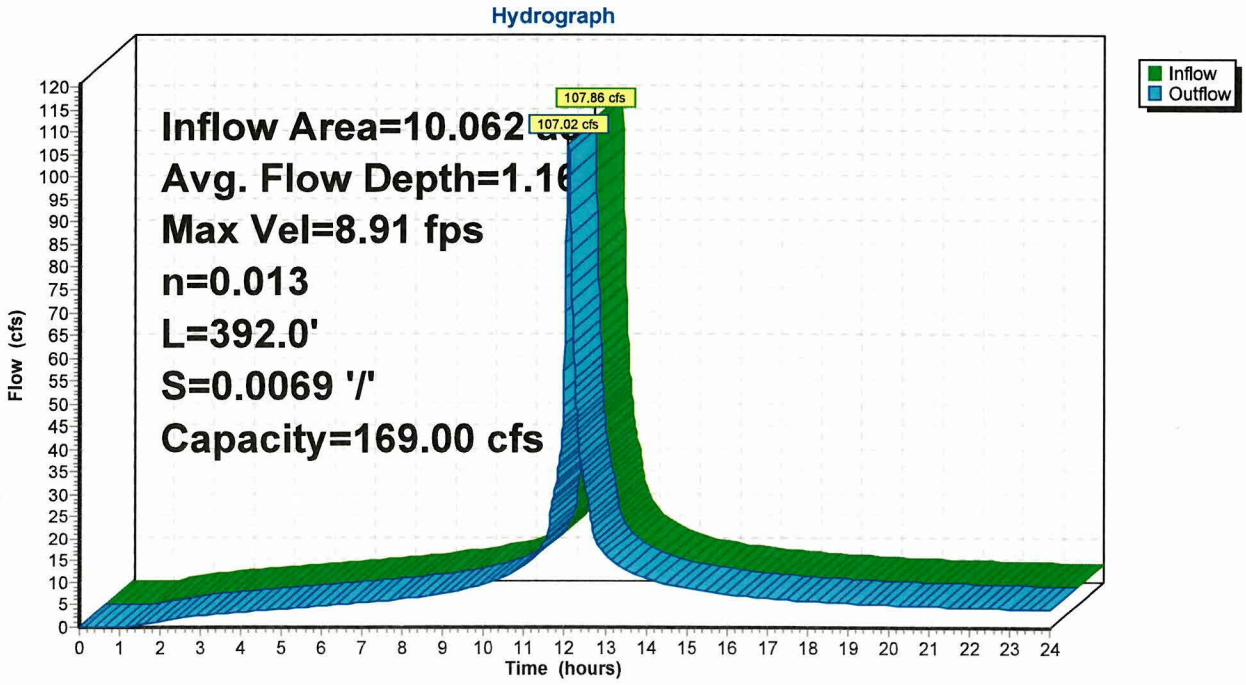
Reach R2: Geomembrane Channel



Summary for Reach R3: Rip-Rap Channel

[81] Warning: Exceeded Pond C1 by 2.20' @ 12.30 hrs

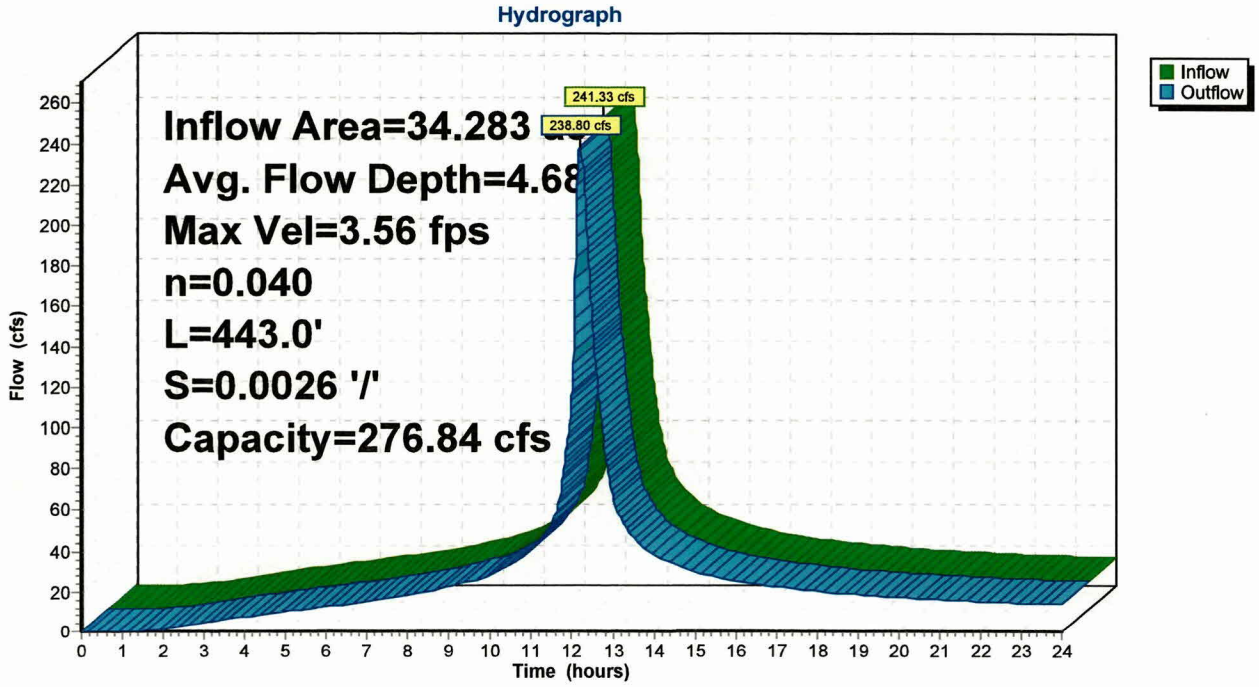
Inflow Area = 34.283 ac, 1.94% Impervious, Inflow Depth > 17.50" for 100-yr event
Inflow = 241.33 cfs @ 12.14 hrs, Volume= 49.994 af
Outflow = 238.80 cfs @ 12.21 hrs, Volume= 49.871 af, Atten= 1%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 4.1 min

Peak Storage= 29,758 cf @ 12.18 hrs
Average Depth at Peak Storage= 4.68'
Bank-Full Depth= 5.00' Flow Area= 75.0 sf, Capacity= 276.84 cfs

5.00' x 5.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 25.00'
Length= 443.0' Slope= 0.0026 '/'
Inlet Invert= 431.14', Outlet Invert= 430.00'

Reach R3: Rip-Rap Channel



Summary for Reach R4: Concrete Channel

[61] Hint: Exceeded Reach R3 outlet invert by 2.68' @ 12.22 hrs

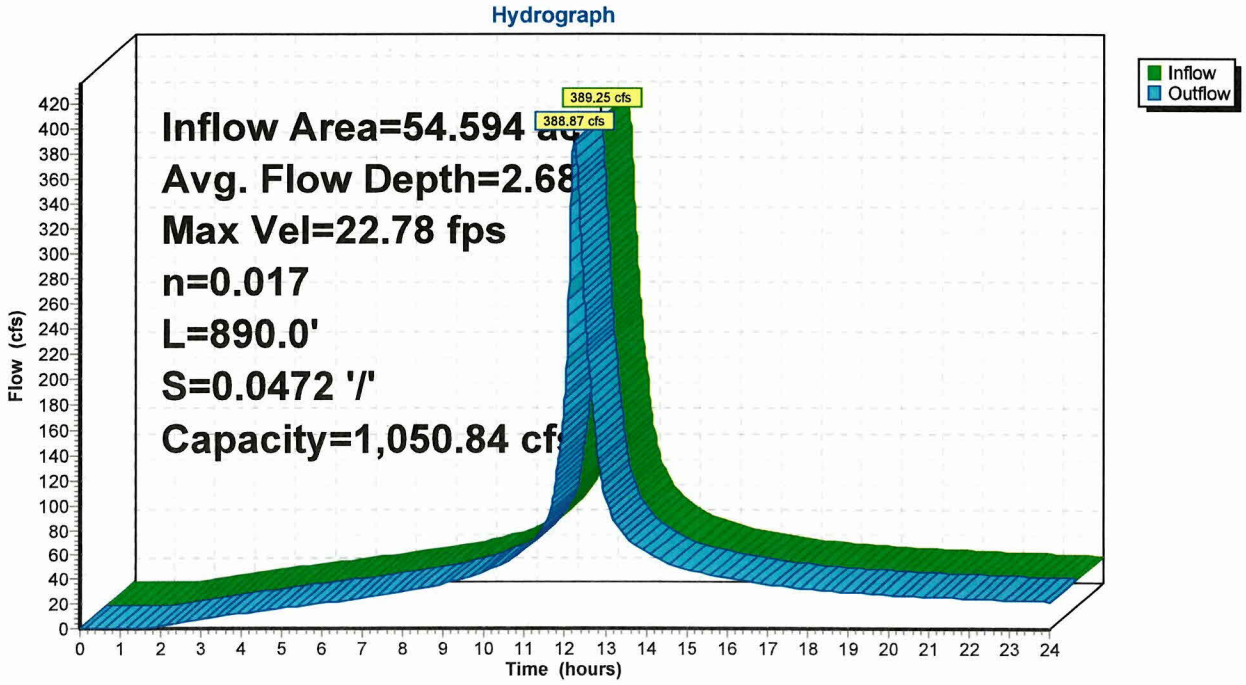
Inflow Area = 54.594 ac, 2.36% Impervious, Inflow Depth > 17.53" for 100-yr event
Inflow = 389.25 cfs @ 12.21 hrs, Volume= 79.743 af
Outflow = 388.87 cfs @ 12.23 hrs, Volume= 79.683 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 22.78 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 11.97 fps, Avg. Travel Time= 1.2 min

Peak Storage= 15,196 cf @ 12.22 hrs
Average Depth at Peak Storage= 2.68'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 1,050.84 cfs

1.00' x 4.00' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.0 '/' Top Width= 17.00'
Length= 890.0' Slope= 0.0472 '/'
Inlet Invert= 430.00', Outlet Invert= 388.00'

Reach R4: Concrete Channel



Summary for Reach R5: Concrete Channel

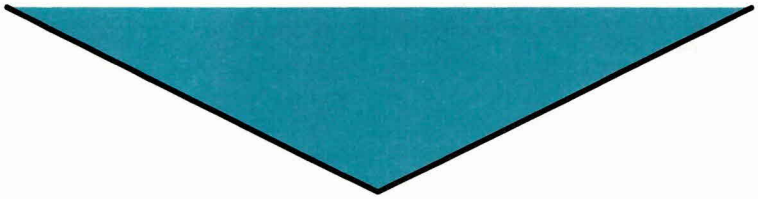
[91] Warning: Storage range exceeded by 1.22'
[55] Hint: Peak inflow is 451% of Manning's capacity

Inflow Area =	10.354 ac,	0.00% Impervious,	Inflow Depth > 19.04"	for 100-yr event	
Inflow =	94.32 cfs @	12.11 hrs,	Volume=	16.426 af	
Outflow =	88.65 cfs @	12.20 hrs,	Volume=	16.378 af,	Atten= 6%, Lag= 5.6 min

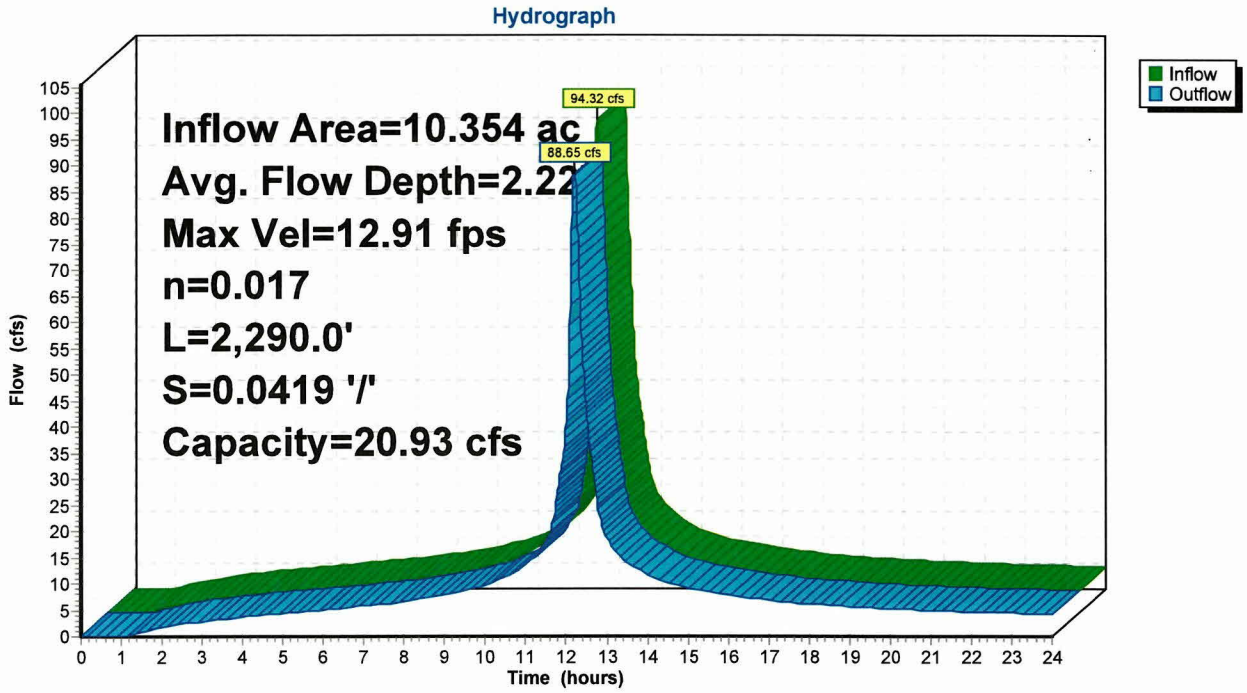
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.91 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 7.79 fps, Avg. Travel Time= 4.9 min

Peak Storage= 15,731 cf @ 12.15 hrs
Average Depth at Peak Storage= 2.22'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 20.93 cfs

0.00' x 1.00' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.0 '/' Top Width= 4.00'
Length= 2,290.0' Slope= 0.0419 '/'
Inlet Invert= 468.00', Outlet Invert= 372.00'



Reach R5: Concrete Channel



Summary for Reach R6: Concrete Channel

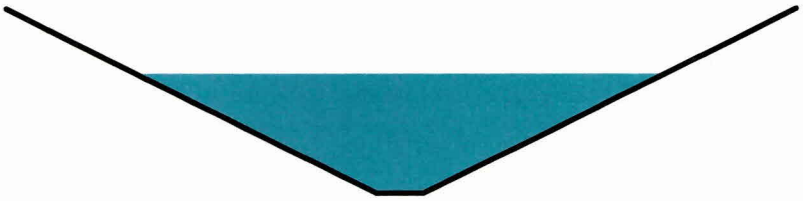
[79] Warning: Submerged Pond C2 Primary device # 1 INLET by 2.09'
[81] Warning: Exceeded Pond C3 by 25.50' @ 0.00 hrs
[81] Warning: Exceeded Pond C3 by 25.50' @ 0.00 hrs

Inflow Area = 67.426 ac, 2.08% Impervious, Inflow Depth > 17.64" for 100-yr event
Inflow = 486.43 cfs @ 12.22 hrs, Volume= 99.138 af
Outflow = 486.26 cfs @ 12.23 hrs, Volume= 99.117 af, Atten= 0%, Lag= 0.3 min

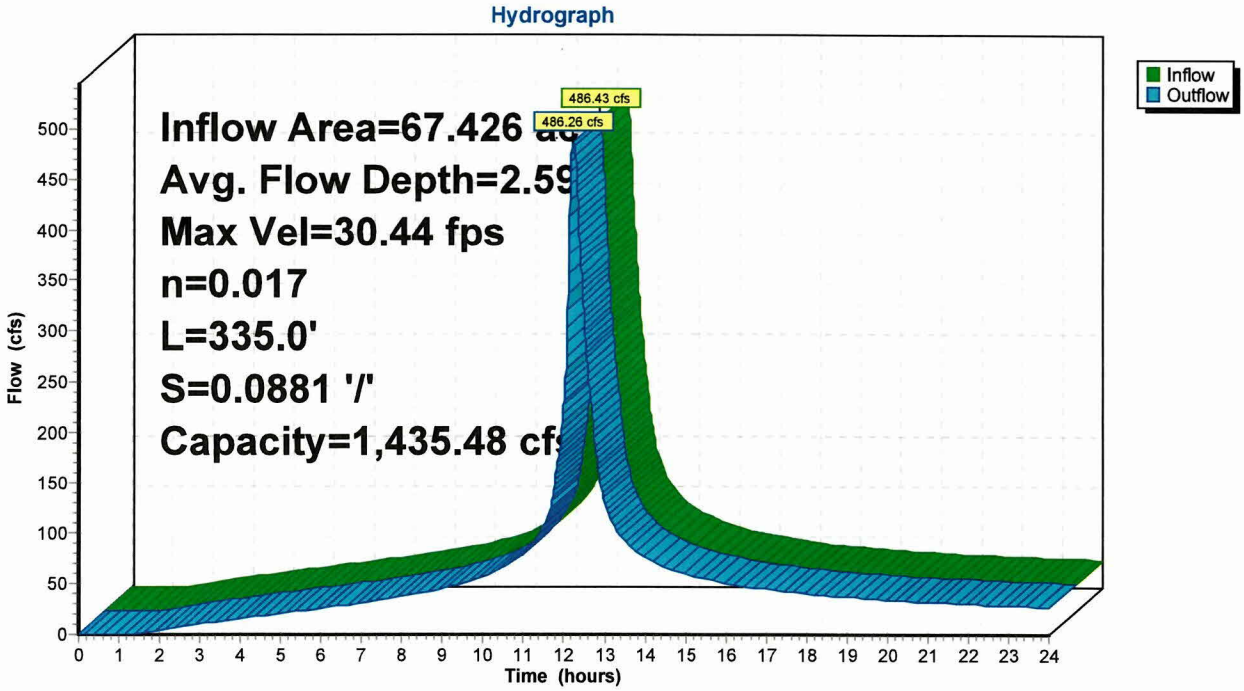
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 30.44 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 15.93 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5,353 cf @ 12.22 hrs
Average Depth at Peak Storage= 2.59'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 1,435.48 cfs

1.00' x 4.00' deep channel, n= 0.017 Concrete, unfinished
Side Slope Z-value= 2.0 '/' Top Width= 17.00'
Length= 335.0' Slope= 0.0881 '/'
Inlet Invert= 387.50', Outlet Invert= 358.00'



Reach R6: Concrete Channel



Summary for Reach R7: Earth Channel

[62] Hint: Exceeded Reach R6 OUTLET depth by 0.59' @ 12.21 hrs

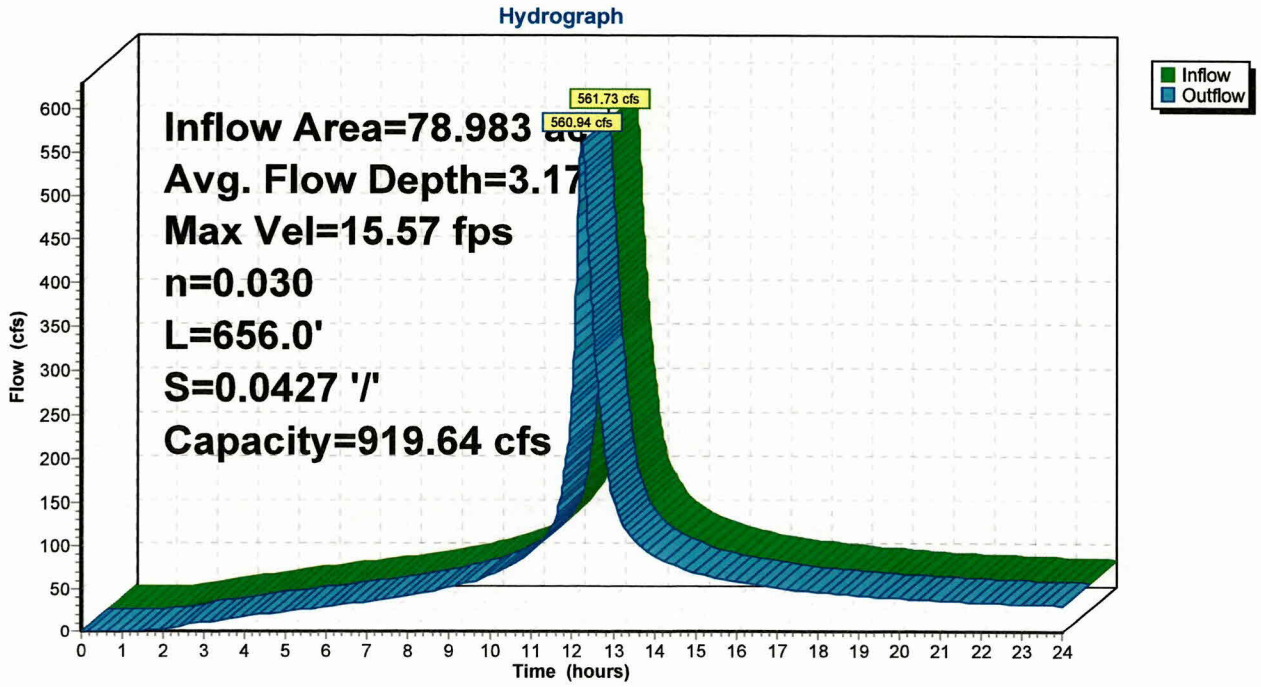
Inflow Area = 78.983 ac, 2.18% Impervious, Inflow Depth > 17.62" for 100-yr event
Inflow = 561.73 cfs @ 12.21 hrs, Volume= 116.004 af
Outflow = 560.94 cfs @ 12.23 hrs, Volume= 115.904 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.57 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 7.65 fps, Avg. Travel Time= 1.4 min

Peak Storage= 23,637 cf @ 12.22 hrs
Average Depth at Peak Storage= 3.17'
Bank-Full Depth= 4.00' Flow Area= 52.0 sf, Capacity= 919.64 cfs

5.00' x 4.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 21.00'
Length= 656.0' Slope= 0.0427 '/'
Inlet Invert= 358.00', Outlet Invert= 330.00'

Reach R7: Earth Channel



Summary for Reach R8: Rip-Rap Downchute

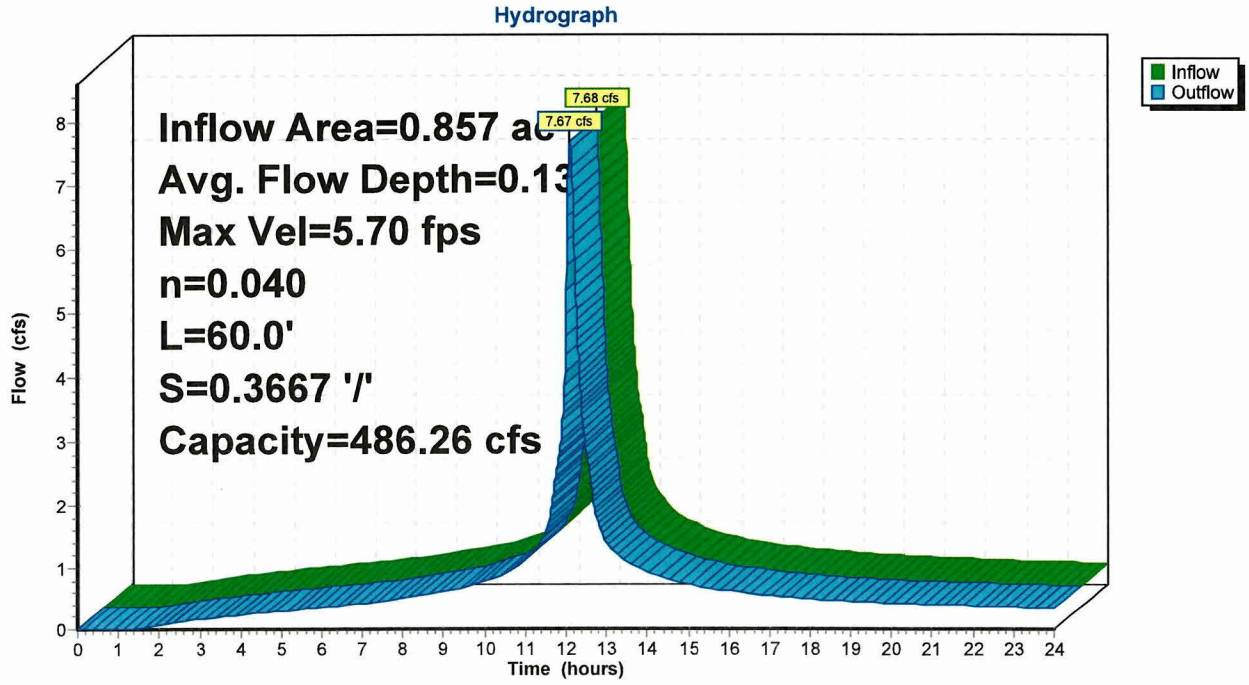
Inflow Area = 0.857 ac, 0.00% Impervious, Inflow Depth > 18.01" for 100-yr event
Inflow = 7.68 cfs @ 12.10 hrs, Volume= 1.286 af
Outflow = 7.67 cfs @ 12.11 hrs, Volume= 1.286 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.09 fps, Avg. Travel Time= 0.5 min

Peak Storage= 81 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.50' Flow Area= 19.5 sf, Capacity= 486.26 cfs

10.00' x 1.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 60.0' Slope= 0.3667 '/'
Inlet Invert= 340.00', Outlet Invert= 318.00'

Reach R8: Rip-Rap Downchute



Summary for Reach R9: Earth Channel

[62] Hint: Exceeded Reach R8 OUTLET depth by 11.67' @ 12.22 hrs
[79] Warning: Submerged Pond C4 Primary device # 1 OUTLET by 2.78'

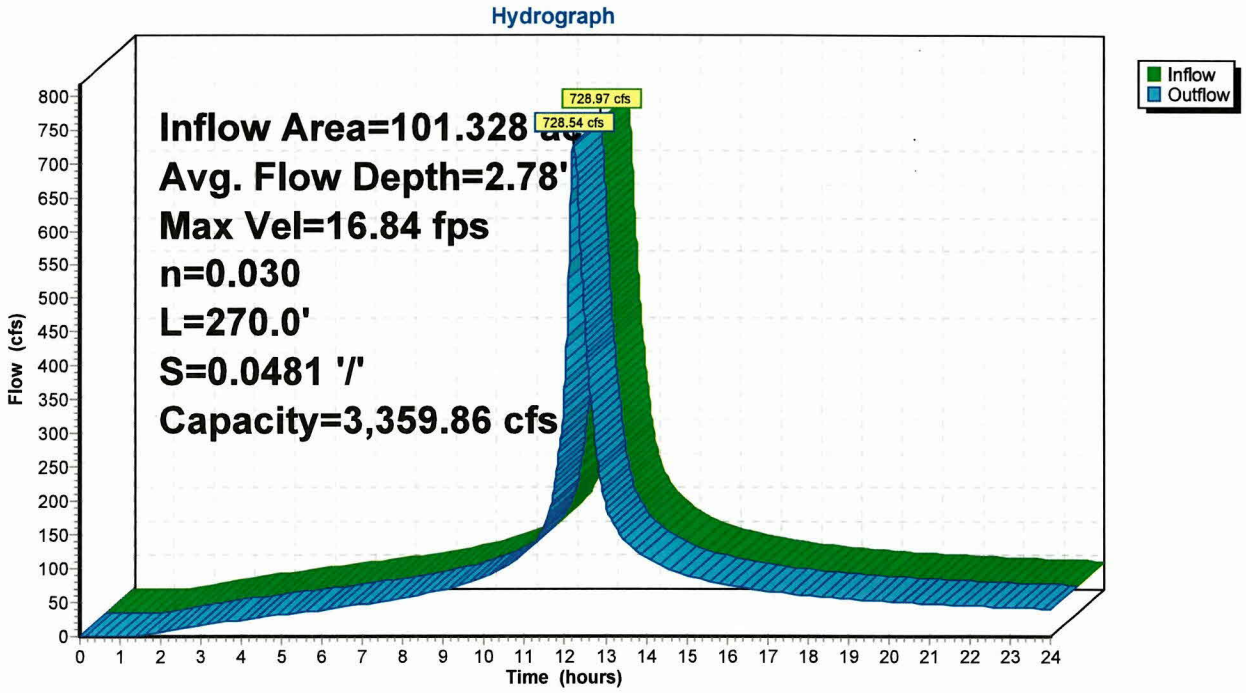
Inflow Area = 101.328 ac, 2.22% Impervious, Inflow Depth > 17.76" for 100-yr event
Inflow = 728.97 cfs @ 12.21 hrs, Volume= 149.936 af
Outflow = 728.54 cfs @ 12.22 hrs, Volume= 149.884 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.84 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 7.64 fps, Avg. Travel Time= 0.6 min

Peak Storage= 11,685 cf @ 12.21 hrs
Average Depth at Peak Storage= 2.78'
Bank-Full Depth= 6.00' Flow Area= 132.0 sf, Capacity= 3,359.86 cfs

10.00' x 6.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 34.00'
Length= 270.0' Slope= 0.0481 '/'
Inlet Invert= 327.00', Outlet Invert= 314.00'

Reach R9: Earth Channel



Summary for Pond C1: (2) 48" RCP

[57] Hint: Peaked at 434.68' (Flood elevation advised)
[62] Hint: Exceeded Reach R2 OUTLET depth by 2.12' @ 12.10 hrs

Inflow Area =	10.062 ac,	4.32% Impervious,	Inflow Depth > 18.74"	for 100-yr event	
Inflow =	107.02 cfs @	12.09 hrs,	Volume=	15.712 af	
Outflow =	107.02 cfs @	12.09 hrs,	Volume=	15.712 af,	Atten= 0%, Lag= 0.0 min
Primary =	107.02 cfs @	12.09 hrs,	Volume=	15.712 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

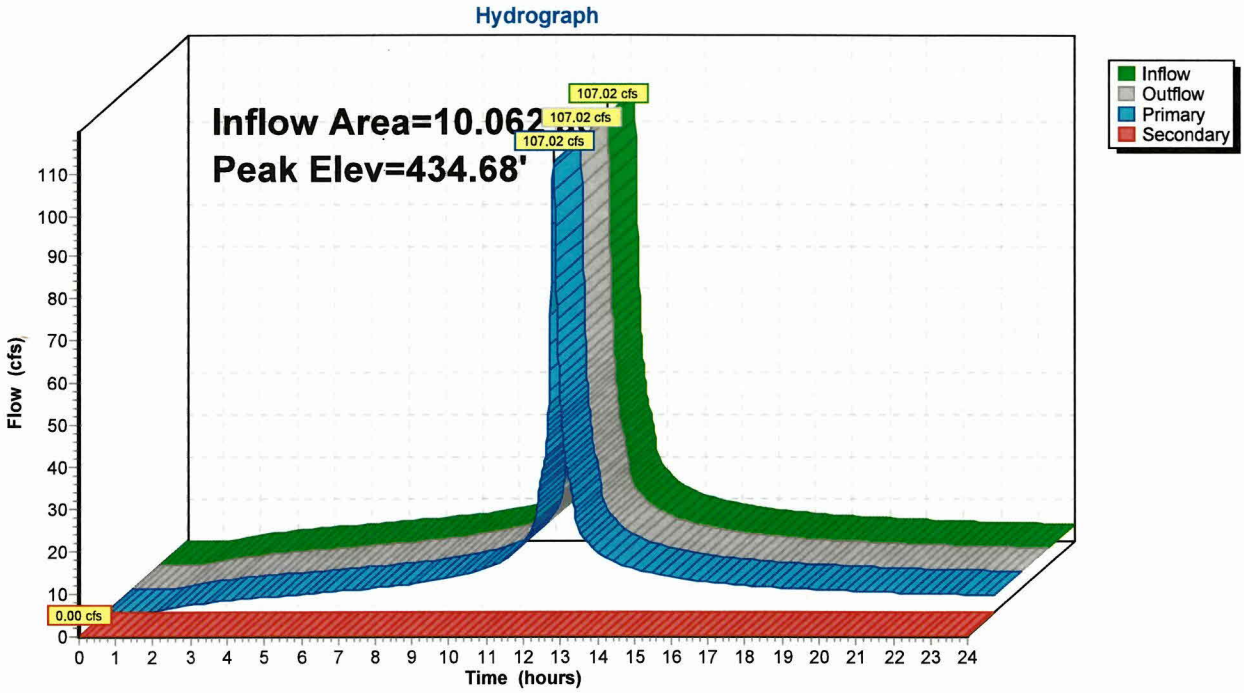
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 434.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	431.40'	**48.0" Round Culvert X 2.00** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 431.40' / 431.14' S= 0.0104 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	436.00'	**25.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=106.97 cfs @ 12.09 hrs HW=434.67' (Free Discharge)
└**1=Culvert** (Barrel Controls 106.97 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=431.40' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond C1: (2) 48" RCP



Summary for Pond C2: 48" RCP

[57] Hint: Peaked at 394.86' (Flood elevation advised)
[62] Hint: Exceeded Reach R4 OUTLET depth by 4.18' @ 12.23 hrs

Inflow Area =	54.594 ac,	2.36% Impervious,	Inflow Depth > 17.51"	for 100-yr event	
Inflow =	388.87 cfs @	12.23 hrs,	Volume=	79.683 af	
Outflow =	388.87 cfs @	12.23 hrs,	Volume=	79.683 af,	Atten= 0%, Lag= 0.0 min
Primary =	133.40 cfs @	12.23 hrs,	Volume=	68.072 af	
Secondary =	255.47 cfs @	12.23 hrs,	Volume=	11.612 af	

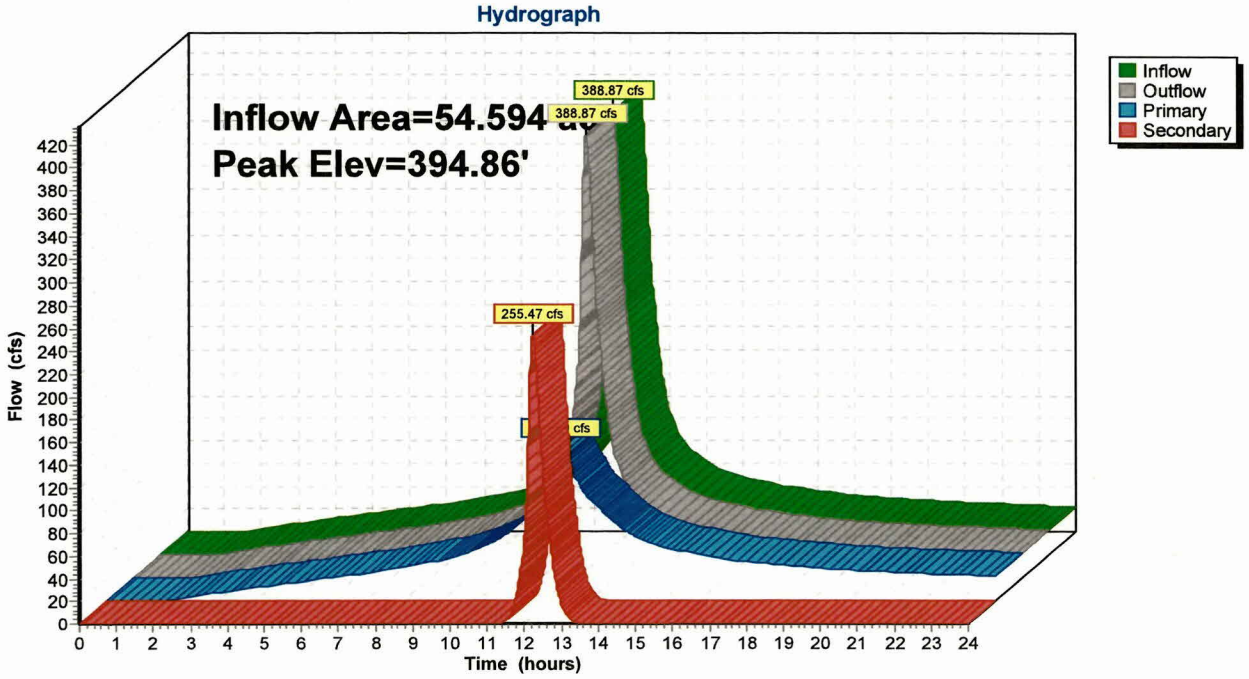
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 394.86' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	**48.0" Round Culvert** L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 388.00' / 387.50' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	392.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=133.39 cfs @ 12.23 hrs HW=394.86' (Free Discharge)
└**1=Culvert** (Inlet Controls 133.39 cfs @ 10.61 fps)

Secondary OutFlow Max=255.39 cfs @ 12.23 hrs HW=394.86' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 255.39 cfs @ 4.46 fps)

Pond C2: 48" RCP



Summary for Pond C3: 48" RCP

[57] Hint: Peaked at 373.33' (Flood elevation advised)
[61] Hint: Exceeded Reach R5 outlet invert by 1.33' @ 12.20 hrs

Inflow Area =	10.354 ac,	0.00% Impervious,	Inflow Depth > 18.98"	for 100-yr event	
Inflow =	88.65 cfs @	12.20 hrs,	Volume=	16.378 af	
Outflow =	88.65 cfs @	12.20 hrs,	Volume=	16.378 af,	Atten= 0%, Lag= 0.0 min
Primary =	78.55 cfs @	12.20 hrs,	Volume=	16.224 af	
Secondary =	10.10 cfs @	12.20 hrs,	Volume=	0.154 af	

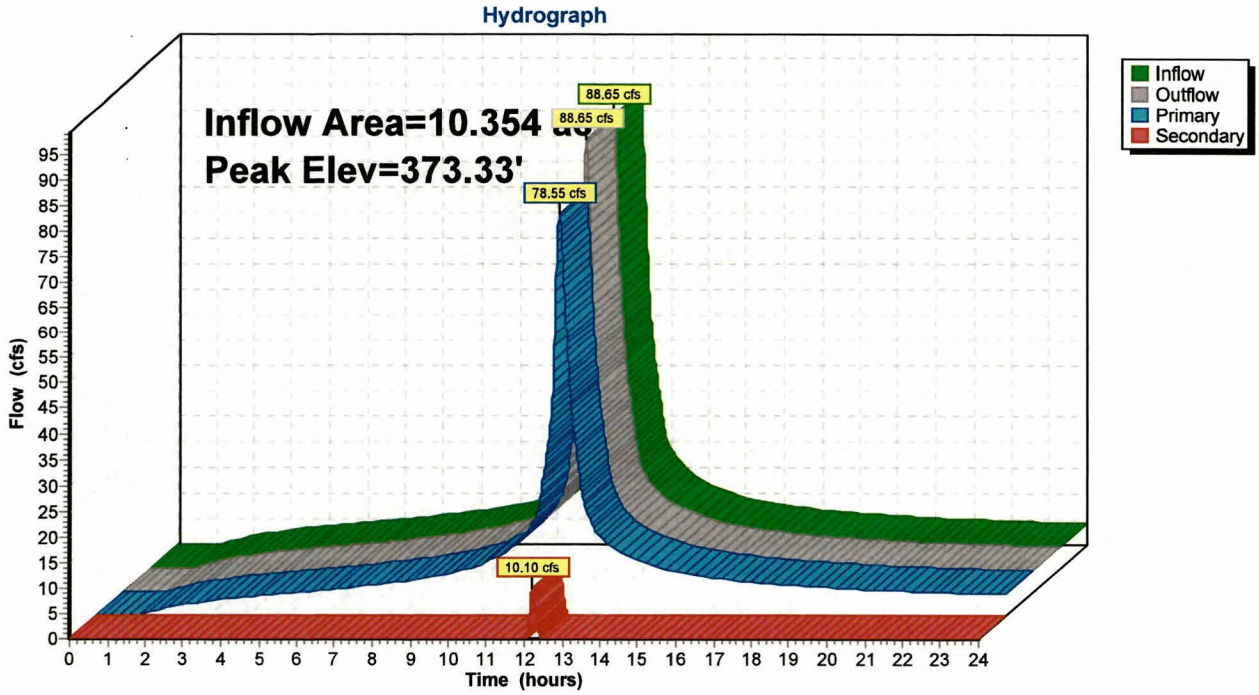
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 373.33' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	362.00'	**48.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 362.00' / 361.10' S= 0.0090 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	372.00'	**60.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	373.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=78.50 cfs @ 12.20 hrs HW=373.33' (Free Discharge)
└─**1=Culvert** (Passes 78.50 cfs of 184.79 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 78.50 cfs @ 3.77 fps)

Secondary OutFlow Max=10.06 cfs @ 12.20 hrs HW=373.33' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 10.06 cfs @ 1.54 fps)

Pond C3: 48" RCP



Summary for Pond C4: (2) 48" RCP

[57] Hint: Peaked at 340.50' (Flood elevation advised)
[62] Hint: Exceeded Reach R7 OUTLET depth by 7.32' @ 12.24 hrs

Inflow Area =	78.983 ac,	2.18% Impervious,	Inflow Depth > 17.61"	for 100-yr event	
Inflow =	560.94 cfs @	12.23 hrs,	Volume=	115.904 af	
Outflow =	560.94 cfs @	12.23 hrs,	Volume=	115.904 af,	Atten= 0%, Lag= 0.0 min
Primary =	352.73 cfs @	12.23 hrs,	Volume=	110.857 af	
Secondary =	208.22 cfs @	12.23 hrs,	Volume=	5.048 af	

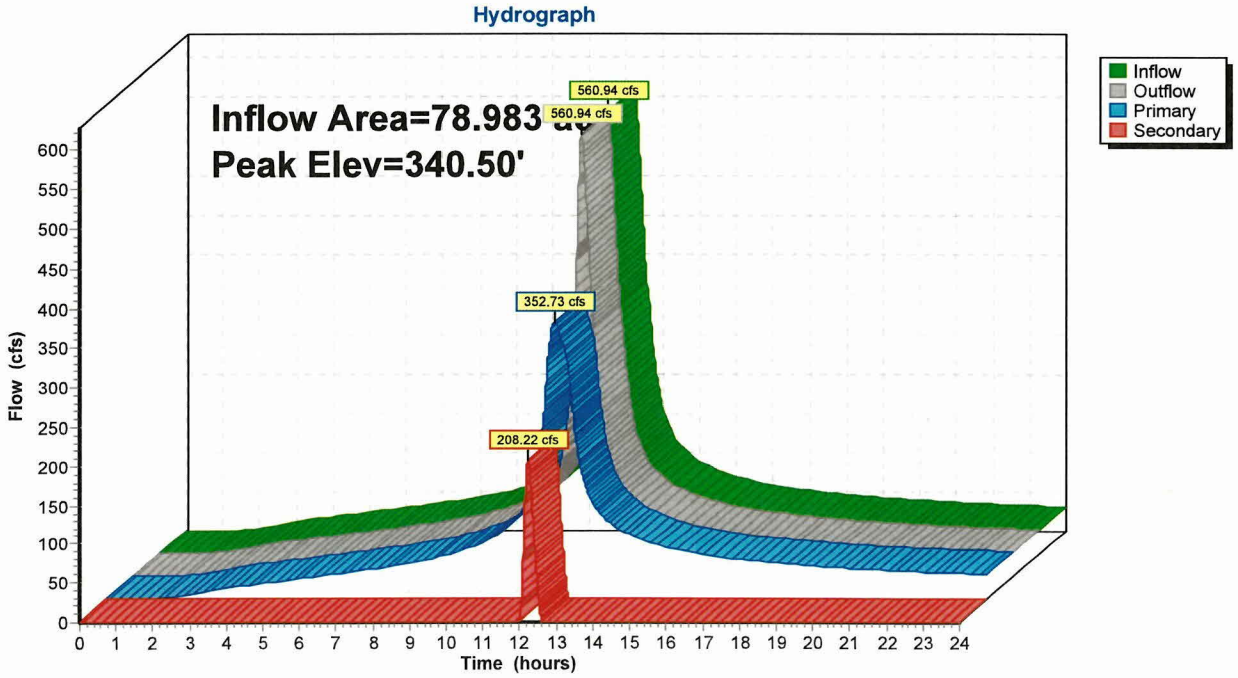
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 340.50' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	330.00'	**48.0" Round Culvert X 2.00** L= 150.0' Ke= 0.500 Inlet / Outlet Invert= 330.00' / 327.00' S= 0.0200 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	338.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=352.72 cfs @ 12.23 hrs HW=340.50' (Free Discharge)
└**1=Culvert** (Inlet Controls 352.72 cfs @ 14.03 fps)

Secondary OutFlow Max=208.17 cfs @ 12.23 hrs HW=340.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 208.17 cfs @ 4.17 fps)

Pond C4: (2) 48" RCP



Summary for Pond C5: 30" HDPE

[57] Hint: Peaked at 351.12' (Flood elevation advised)

Inflow Area =	0.857 ac,	0.00% Impervious,	Inflow Depth > 18.01"	for 100-yr event	
Inflow =	7.68 cfs @	12.10 hrs,	Volume=	1.286 af	
Outflow =	7.68 cfs @	12.10 hrs,	Volume=	1.286 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.68 cfs @	12.10 hrs,	Volume=	1.286 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

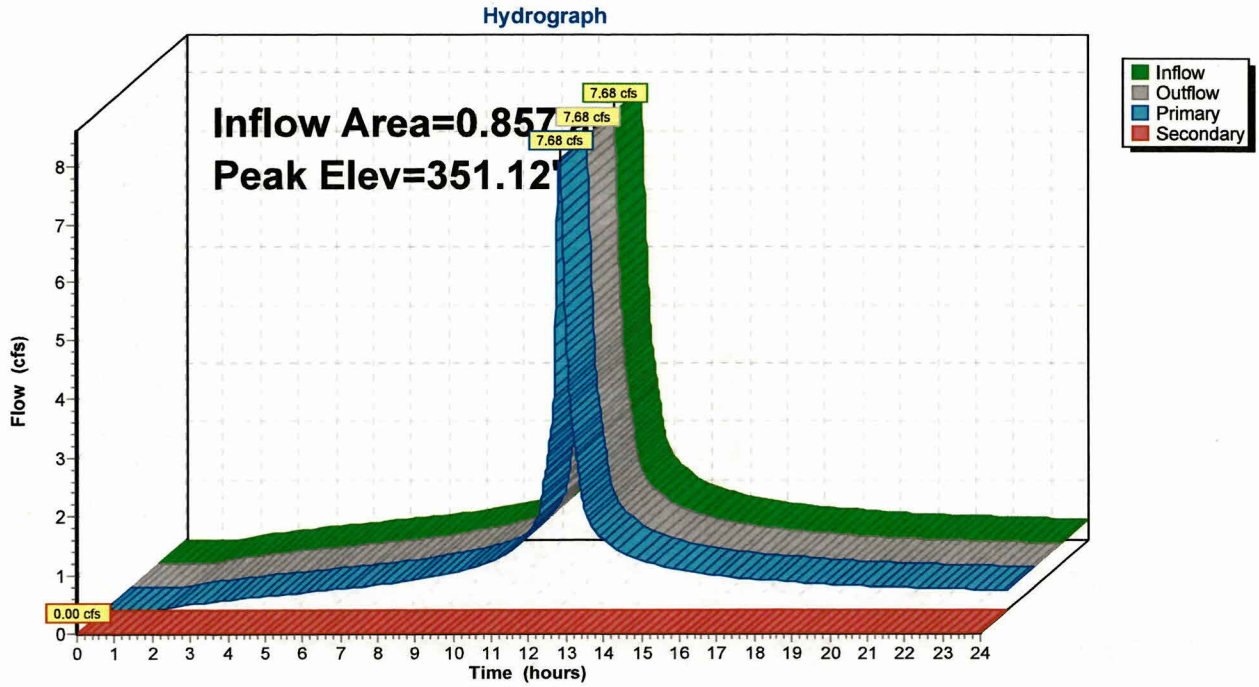
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 351.12' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	350.00'	**30.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 350.00' / 346.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Secondary	353.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.67 cfs @ 12.10 hrs HW=351.12' (Free Discharge)
└**1=Culvert** (Inlet Controls 7.67 cfs @ 3.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond C5: 30" HDPE



Summary for Pond C6: 36" CMP

[57] Hint: Peaked at 272.73' (Flood elevation advised)
[62] Hint: Exceeded Reach R12 OUTLET depth by 3.19' @ 12.45 hrs

Inflow Area =	20.557 ac,	17.50% Impervious,	Inflow Depth > 15.59"	for 100-yr event	
Inflow =	158.58 cfs @	12.15 hrs,	Volume=	26.713 af	
Outflow =	158.58 cfs @	12.15 hrs,	Volume=	26.713 af,	Atten= 0%, Lag= 0.0 min
Primary =	59.57 cfs @	12.15 hrs,	Volume=	24.157 af	
Secondary =	99.01 cfs @	12.15 hrs,	Volume=	2.555 af	

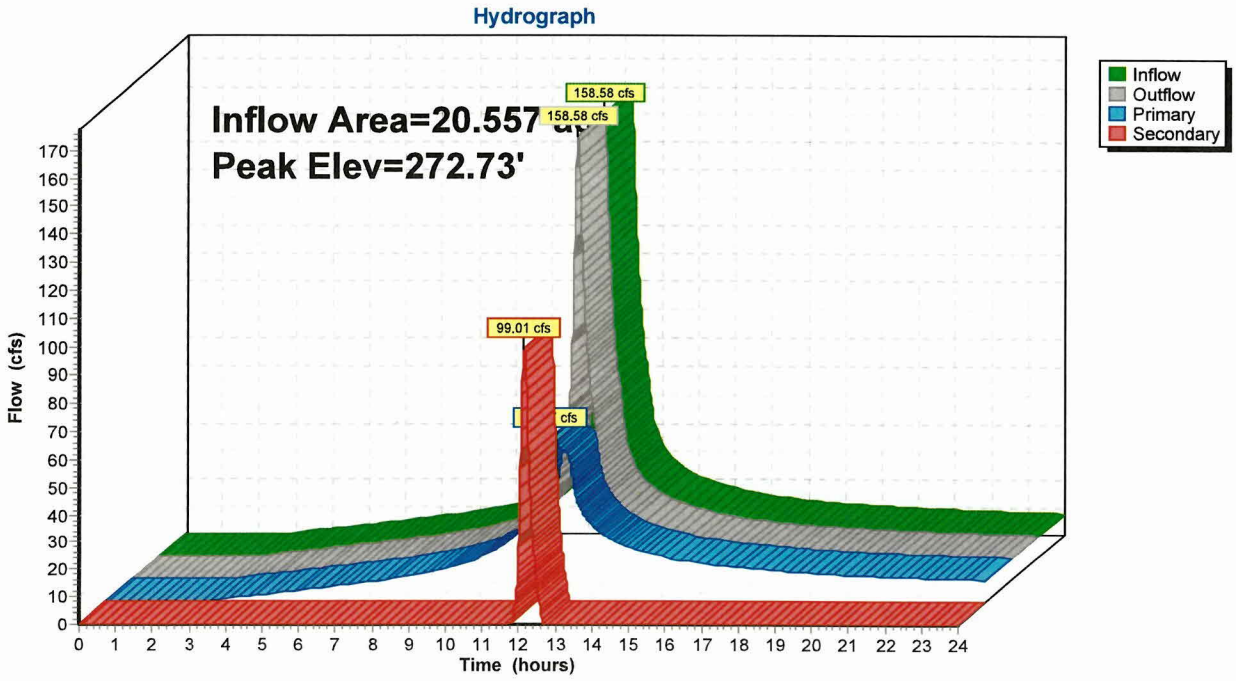
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 272.73' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	268.00'	**36.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 268.00' / 266.00' S= 0.0286 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf
#2	Secondary	272.00'	**60.0' long x 40.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.57 cfs @ 12.15 hrs HW=272.73' (Free Discharge)
└**1=Culvert** (Barrel Controls 59.57 cfs @ 8.43 fps)

Secondary OutFlow Max=98.89 cfs @ 12.15 hrs HW=272.73' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 98.89 cfs @ 2.27 fps)

Pond C6: 36" CMP



Summary for Pond C7: 24"x32" CMP

[57] Hint: Peaked at 281.69' (Flood elevation advised)
[62] Hint: Exceeded Reach R11 OUTLET depth by 4.67' @ 12.68 hrs

Inflow Area =	185.310 ac,	0.00% Impervious,	Inflow Depth > 14.39"	for 100-yr event	
Inflow =	794.35 cfs @	12.66 hrs,	Volume=	222.293 af	
Outflow =	794.35 cfs @	12.66 hrs,	Volume=	222.293 af,	Atten= 0%, Lag= 0.0 min
Primary =	49.38 cfs @	12.66 hrs,	Volume=	60.644 af	
Secondary =	744.97 cfs @	12.66 hrs,	Volume=	161.649 af	

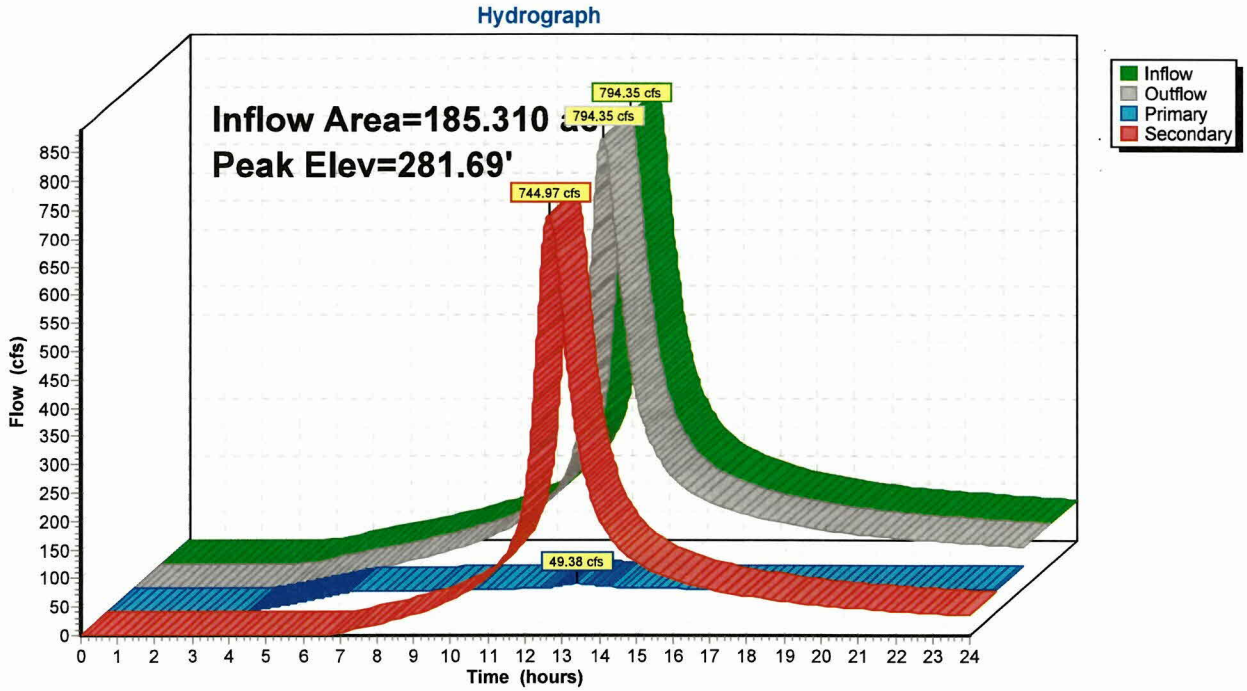
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 281.69' @ 12.66 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	274.00'	**34.0" W x 22.0" H, R=24.9" Elliptical RCP_Elliptical 34x22** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 274.00' / 272.00' S= 0.0400 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.12 sf
#2	Secondary	278.00'	**40.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=49.38 cfs @ 12.66 hrs HW=281.69' (Free Discharge)
└**1=RCP_Elliptical 34x22** (Barrel Controls 49.38 cfs @ 11.99 fps)

Secondary OutFlow Max=744.94 cfs @ 12.66 hrs HW=281.69' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 744.94 cfs @ 5.05 fps)

Pond C7: 24"x32" CMP



Summary for Pond C9: 36" CMP

[57] Hint: Peaked at 697.24' (Flood elevation advised)
[81] Warning: Exceeded Pond C7 by 415.55' @ 12.66 hrs
[81] Warning: Exceeded Pond C7 by 415.55' @ 12.66 hrs

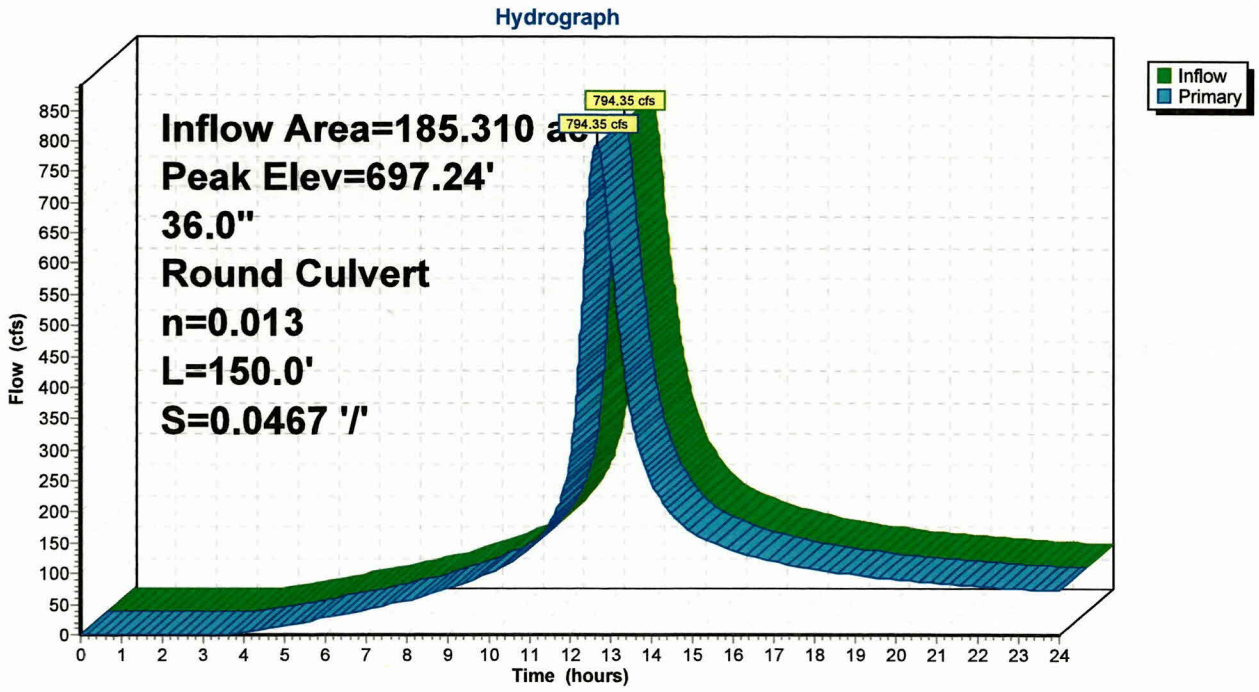
Inflow Area =	185.310 ac,	0.00% Impervious,	Inflow Depth > 14.39"	for 100-yr event	
Inflow =	794.35 cfs @	12.66 hrs,	Volume=	222.293 af	
Outflow =	794.35 cfs @	12.66 hrs,	Volume=	222.293 af,	Atten= 0%, Lag= 0.0 min
Primary =	794.35 cfs @	12.66 hrs,	Volume=	222.293 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 697.24' @ 12.66 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	272.00'	**36.0" Round Culvert** L= 150.0' Ke= 0.100 Inlet / Outlet Invert= 272.00' / 265.00' S= 0.0467 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=794.33 cfs @ 12.66 hrs HW=697.22' (Free Discharge)
└**1=Culvert** (Barrel Controls 794.33 cfs @ 112.37 fps)

Pond C9: 36" CMP



Summary for Pond F1: Sediment Forebay

[61] Hint: Exceeded Reach R10 outlet invert by 3.08' @ 12.29 hrs

Inflow Area =	101.328 ac,	2.22% Impervious,	Inflow Depth > 17.71"	for 100-yr event	
Inflow =	720.48 cfs @	12.28 hrs,	Volume=	149.534 af	
Outflow =	719.95 cfs @	12.29 hrs,	Volume=	148.905 af,	Atten= 0%, Lag= 0.4 min
Primary =	719.95 cfs @	12.29 hrs,	Volume=	148.905 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 263.08' @ 12.29 hrs Surf.Area= 0.000 ac Storage= 1.122 af

Plug-Flow detention time= 5.8 min calculated for 148.905 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (803.2 - 800.0)

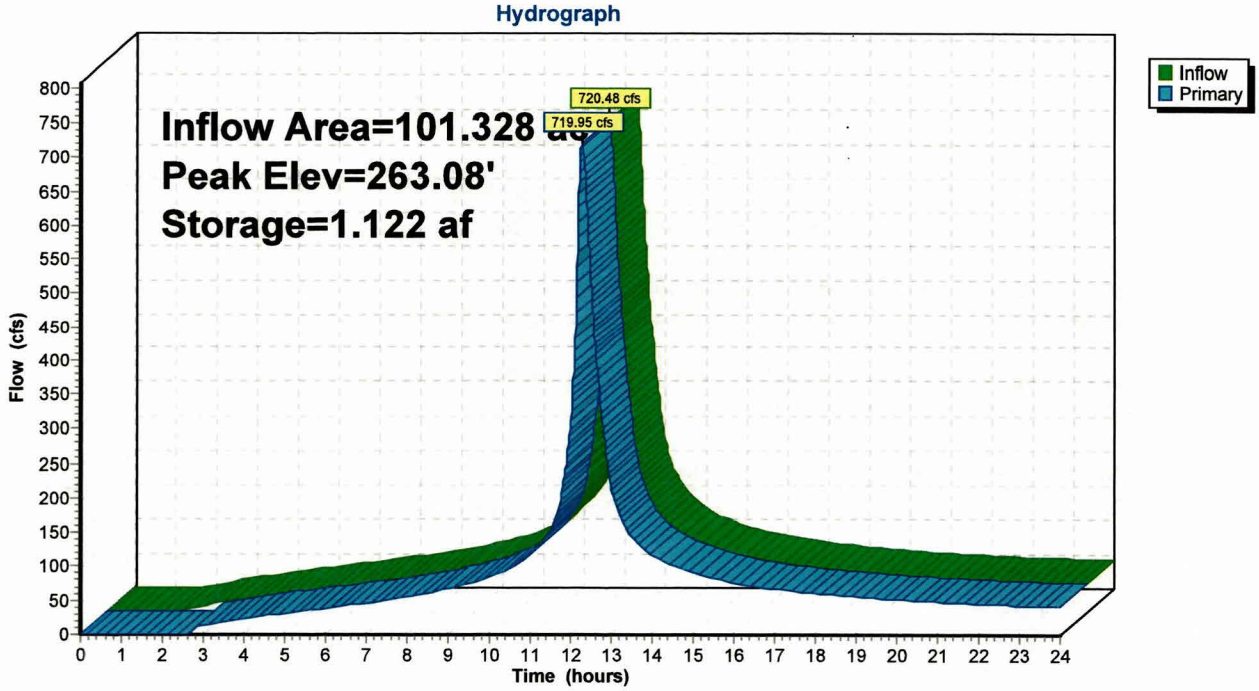
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	1.307 af	**Custom Stage Data**Listed below

Elevation (feet)	Cum.Store (acre-feet)
254.00	0.000
256.00	0.066
258.00	0.255
260.00	0.546
262.00	0.905
264.00	1.307

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=719.63 cfs @ 12.29 hrs HW=263.08' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 719.63 cfs @ 4.67 fps)

Pond F1: Sediment Forebay



Summary for Pond P1: Outfall Pond

[81] Warning: Exceeded Pond P2 by 1.24' @ 22.59 hrs

Inflow Area =	132.800 ac,	4.97% Impervious,	Inflow Depth > 12.04"	for 100-yr event	
Inflow =	314.99 cfs @	12.28 hrs,	Volume=	133.265 af	
Outflow =	313.98 cfs @	12.31 hrs,	Volume=	121.676 af,	Atten= 0%, Lag= 1.8 min
Primary =	57.13 cfs @	12.31 hrs,	Volume=	63.626 af	
Secondary =	256.86 cfs @	12.31 hrs,	Volume=	58.049 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 254.98' @ 12.31 hrs Surf.Area= 0.000 ac Storage= 12.707 af

Plug-Flow detention time= 70.7 min calculated for 121.676 af (91% of inflow)
Center-of-Mass det. time= 27.7 min (942.1 - 914.4)

Volume	Invert	Avail.Storage	Storage Description
#1	236.00'	16.166 af	**Custom Stage Data**Listed below

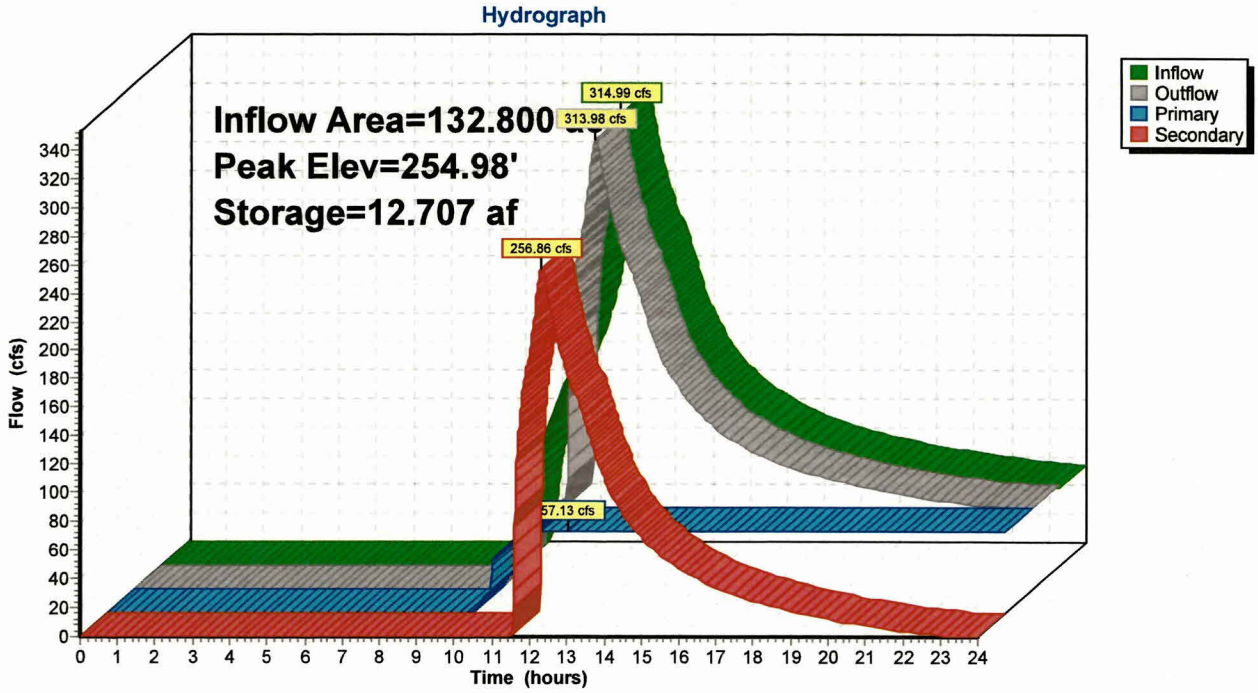
Elevation (feet)	Cum.Store (acre-feet)
236.00	0.000
238.00	0.754
240.00	1.601
242.00	2.547
244.00	3.641
246.00	4.912
248.00	6.340
250.00	7.937
252.00	9.713
254.00	11.665
256.00	13.800
258.00	16.166

Device	Routing	Invert	Outlet Devices
#1	Primary	233.35'	**16.0" Round Culvert X 2.00** L= 150.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 233.35' / 223.04' S= 0.0687 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.40 sf
#2	Device 1	241.00'	**60.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	254.00'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#4	Device 1	236.00'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600
#5	Device 1	236.50'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600
#6	Device 1	237.00'	**4.0" Vert. Orifice/Grate X 6.00** C= 0.600

Primary OutFlow Max=57.13 cfs @ 12.31 hrs HW=254.98' (Free Discharge)
└─**1=Culvert** (Barrel Controls 57.13 cfs @ 20.46 fps)
  ├─**2=Orifice/Grate** (Passes < 706.89 cfs potential flow)
  ├─**4=Orifice/Grate** (Passes < 10.93 cfs potential flow)
  ├─**5=Orifice/Grate** (Passes < 10.79 cfs potential flow)
  └─**6=Orifice/Grate** (Passes < 10.64 cfs potential flow)

Secondary OutFlow Max=255.94 cfs @ 12.31 hrs HW=254.98' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 255.94 cfs @ 2.62 fps)

Pond P1: Outfall Pond



Summary for Pond P2: Sedimentation Pond

Inflow Area = 132.800 ac, 4.97% Impervious, Inflow Depth > 17.36" for 100-yr event
Inflow = 899.73 cfs @ 12.26 hrs, Volume= 192.134 af
Outflow = 894.80 cfs @ 12.28 hrs, Volume= 160.145 af, Atten= 1%, Lag= 1.2 min
Primary = 314.99 cfs @ 12.28 hrs, Volume= 133.265 af
Secondary = 579.81 cfs @ 12.28 hrs, Volume= 26.880 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 254.51' @ 12.28 hrs Surf.Area= 0.000 ac Storage= 36.958 af

Plug-Flow detention time= 169.0 min calculated for 160.145 af (83% of inflow)
Center-of-Mass det. time= 81.0 min (885.5 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	234.00'	48.552 af	**Custom Stage Data**Listed below

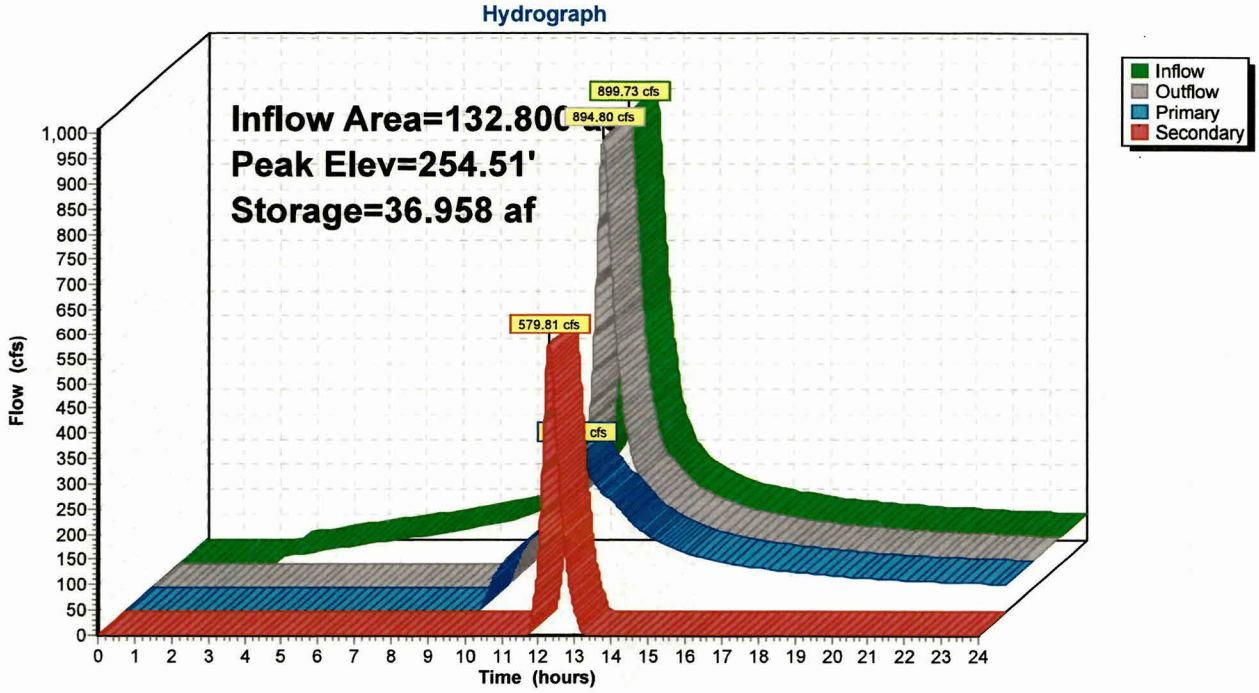
Elevation (feet)	Cum.Store (acre-feet)
234.00	0.000
236.00	1.859
238.00	4.009
240.00	6.484
242.00	9.330
244.00	12.581
246.00	16.250
248.00	20.352
250.00	24.898
252.00	29.905
254.00	35.381
256.00	41.581
258.00	48.552

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Secondary	254.00'	**600.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=314.70 cfs @ 12.28 hrs HW=254.51' (Free Discharge)
└**1=Broad-Crested Rectangular Weir**(Weir Controls 314.70 cfs @ 4.18 fps)

Secondary OutFlow Max=568.19 cfs @ 12.28 hrs HW=254.51' (Free Discharge)
└**2=Broad-Crested Rectangular Weir**(Weir Controls 568.19 cfs @ 1.86 fps)

Pond P2: Sedimentation Pond

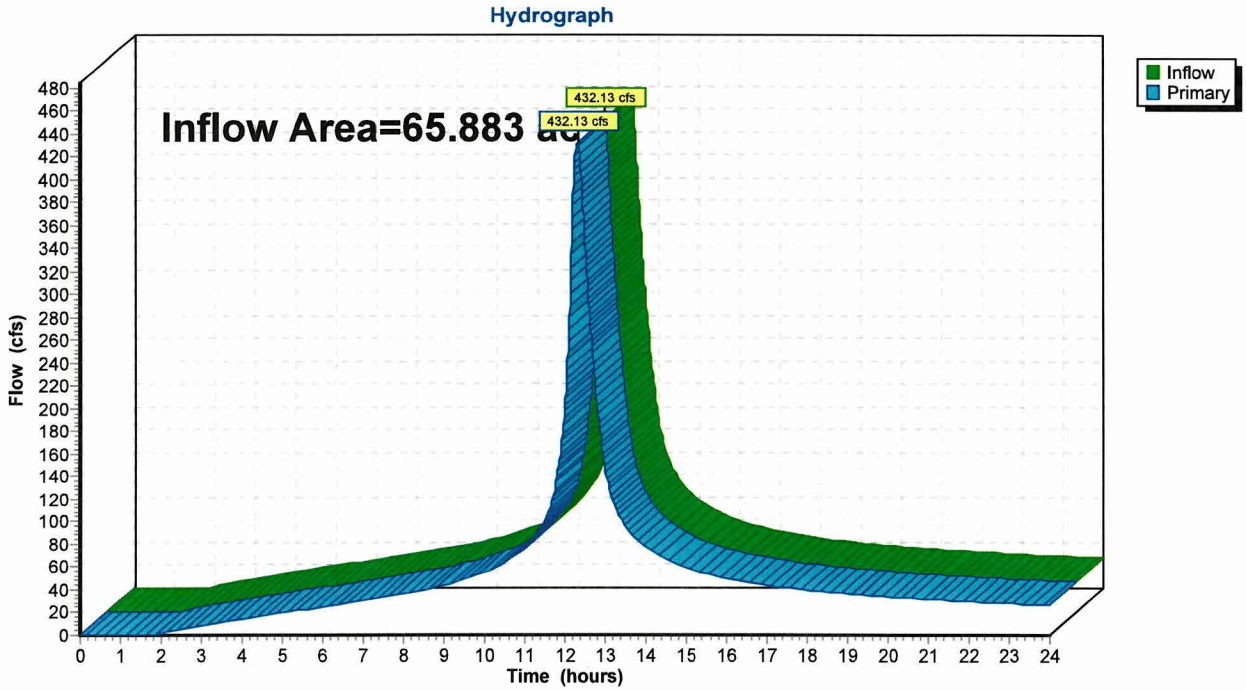


Summary for Link 1: Offsite Discharge

Inflow Area = 65.883 ac, 0.00% Impervious, Inflow Depth > 17.59" for 100-yr event
Inflow = 432.13 cfs @ 12.32 hrs, Volume= 96.564 af
Primary = 432.13 cfs @ 12.32 hrs, Volume= 96.564 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1: Offsite Discharge

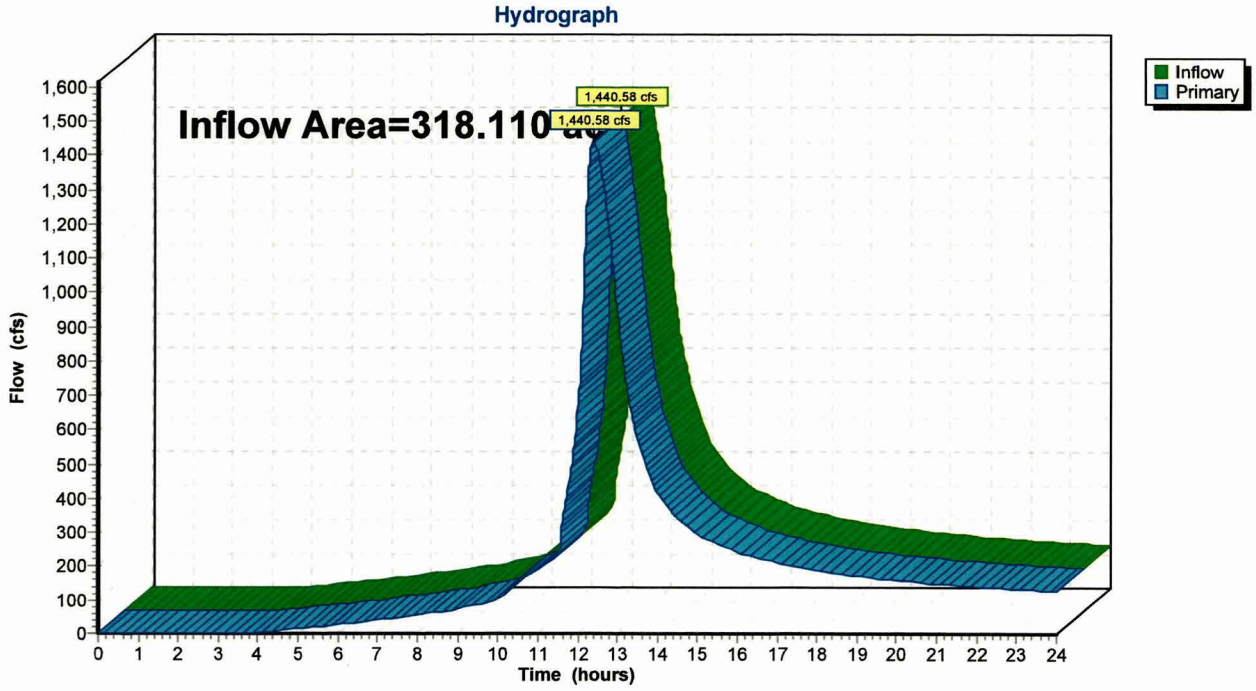


Summary for Link 2: Offsite Discharge

Inflow Area = 318.110 ac, 2.07% Impervious, Inflow Depth > 13.98" for 100-yr event
Inflow = 1,440.58 cfs @ 12.40 hrs, Volume= 370.511 af
Primary = 1,440.58 cfs @ 12.40 hrs, Volume= 370.511 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 2: Offsite Discharge



Hydraflow Express Pipe Capacity Calculations

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C1 - (2) 48 in. RCP

Circular

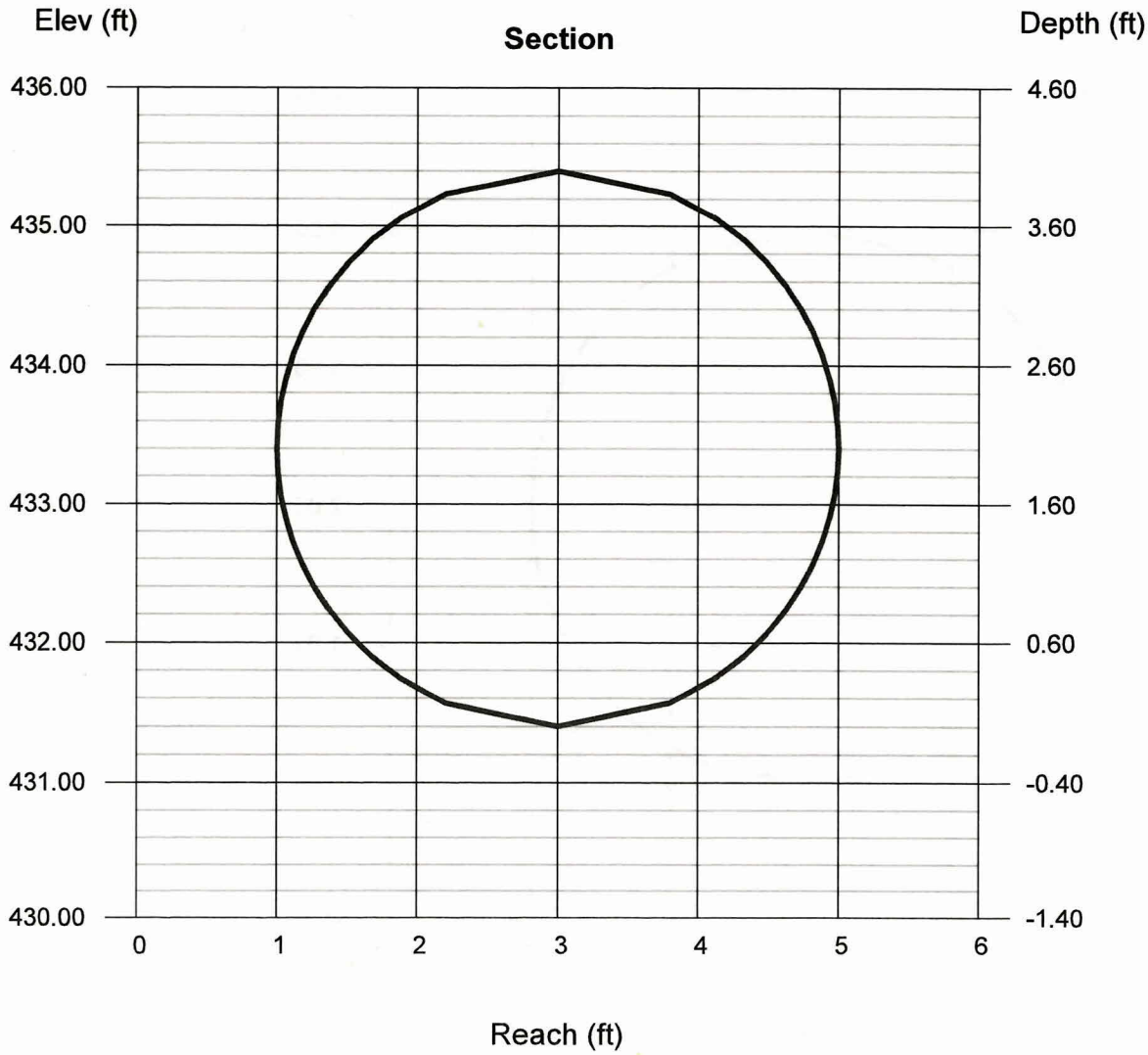
Diameter (ft)	= 4.00
Invert Elev (ft)	= 431.40
Slope (%)	= 1.04
N-Value	= 0.012

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 4.00

Highlighted

Depth (ft)	= 4.00
Q (cfs)	= 158.70
Area (sqft)	= 12.57
Velocity (ft/s)	= 12.63
Wetted Perim (ft)	= 12.57
Crit Depth, Yc (ft)	= 3.66
Top Width (ft)	= 0.00
EGL (ft)	= 6.48
(2)Q (cfs)	= 317.40



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C2 - 48 in. RCP

Circular

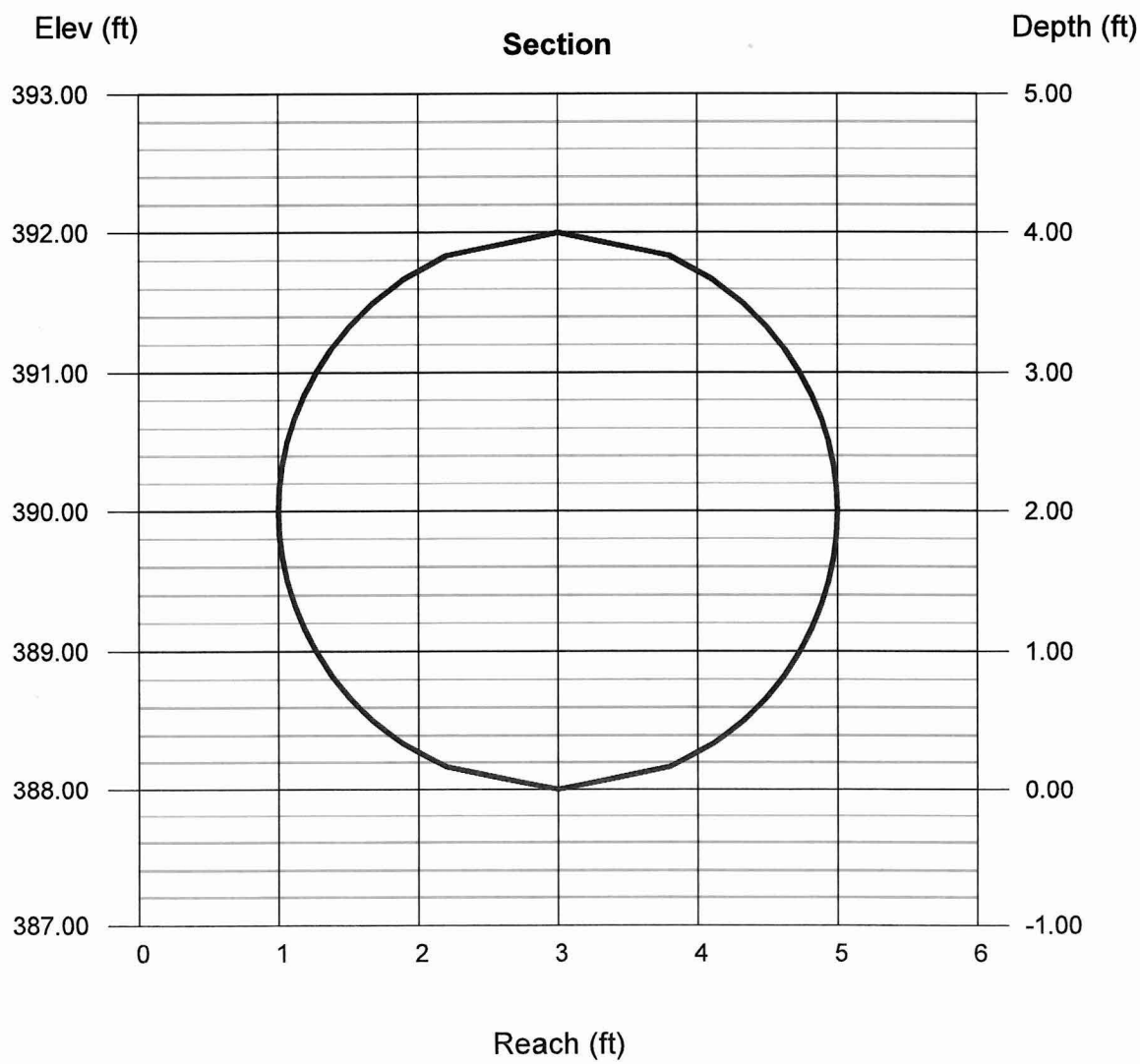
Diameter (ft)	= 4.00
Invert Elev (ft)	= 388.00
Slope (%)	= 2.00
N-Value	= 0.012

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 4.00

Highlighted

Depth (ft)	= 4.00
Q (cfs)	= 220.07
Area (sqft)	= 12.57
Velocity (ft/s)	= 17.51
Wetted Perim (ft)	= 12.57
Crit Depth, Yc (ft)	= 3.90
Top Width (ft)	= 0.00
EGL (ft)	= 8.77



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C3 - 48 in. RCP

Circular

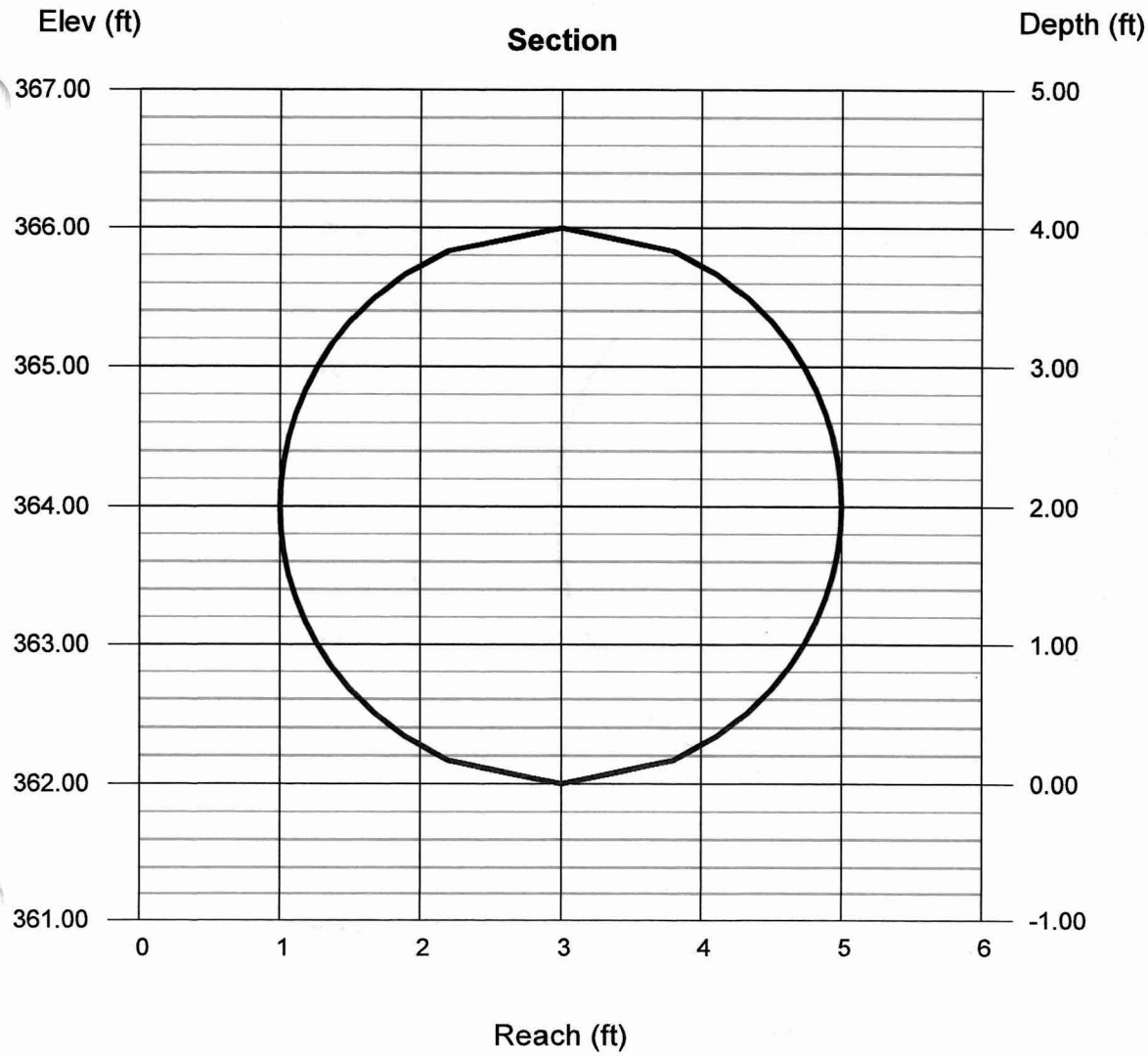
Diameter (ft)	= 4.00
Invert Elev (ft)	= 362.00
Slope (%)	= 0.90
N-Value	= 0.012

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 4.00

Highlighted

Depth (ft)	= 4.00
Q (cfs)	= 147.63
Area (sqft)	= 12.57
Velocity (ft/s)	= 11.75
Wetted Perim (ft)	= 12.57
Crit Depth, Yc (ft)	= 3.58
Top Width (ft)	= 0.00
EGL (ft)	= 6.15



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C4 - (2) 48 in. RCP

Circular

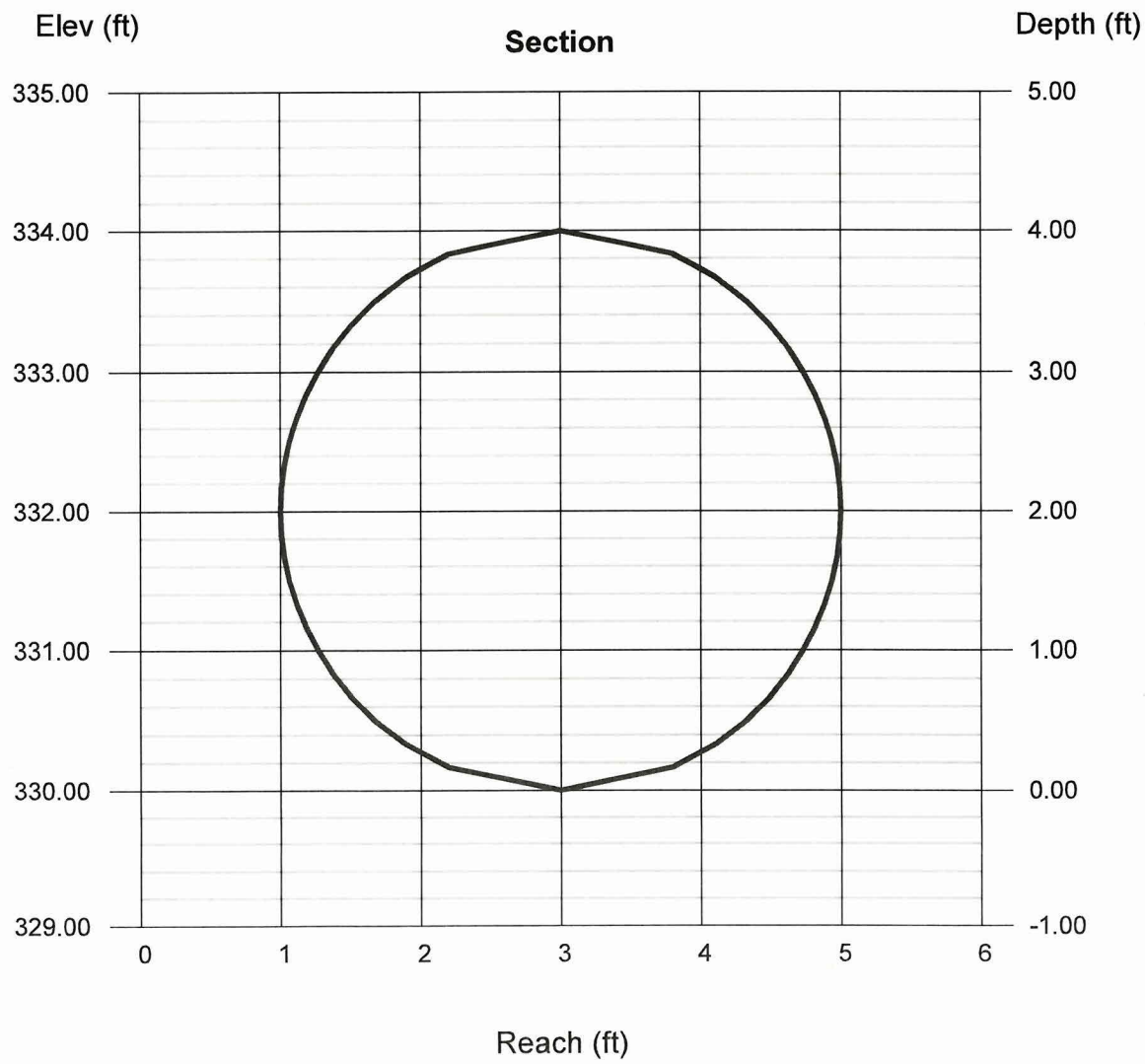
Diameter (ft)	= 4.00
Invert Elev (ft)	= 330.00
Slope (%)	= 2.00
N-Value	= 0.012

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 4.00

Highlighted

Depth (ft)	= 4.00
Q (cfs)	= 220.07
Area (sqft)	= 12.57
Velocity (ft/s)	= 17.51
Wetted Perim (ft)	= 12.57
Crit Depth, Yc (ft)	= 3.90
Top Width (ft)	= 0.00
EGL (ft)	= 8.77
(2)Q (cfs)	= 440.14



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C5 - 30 in. HDPE

Circular

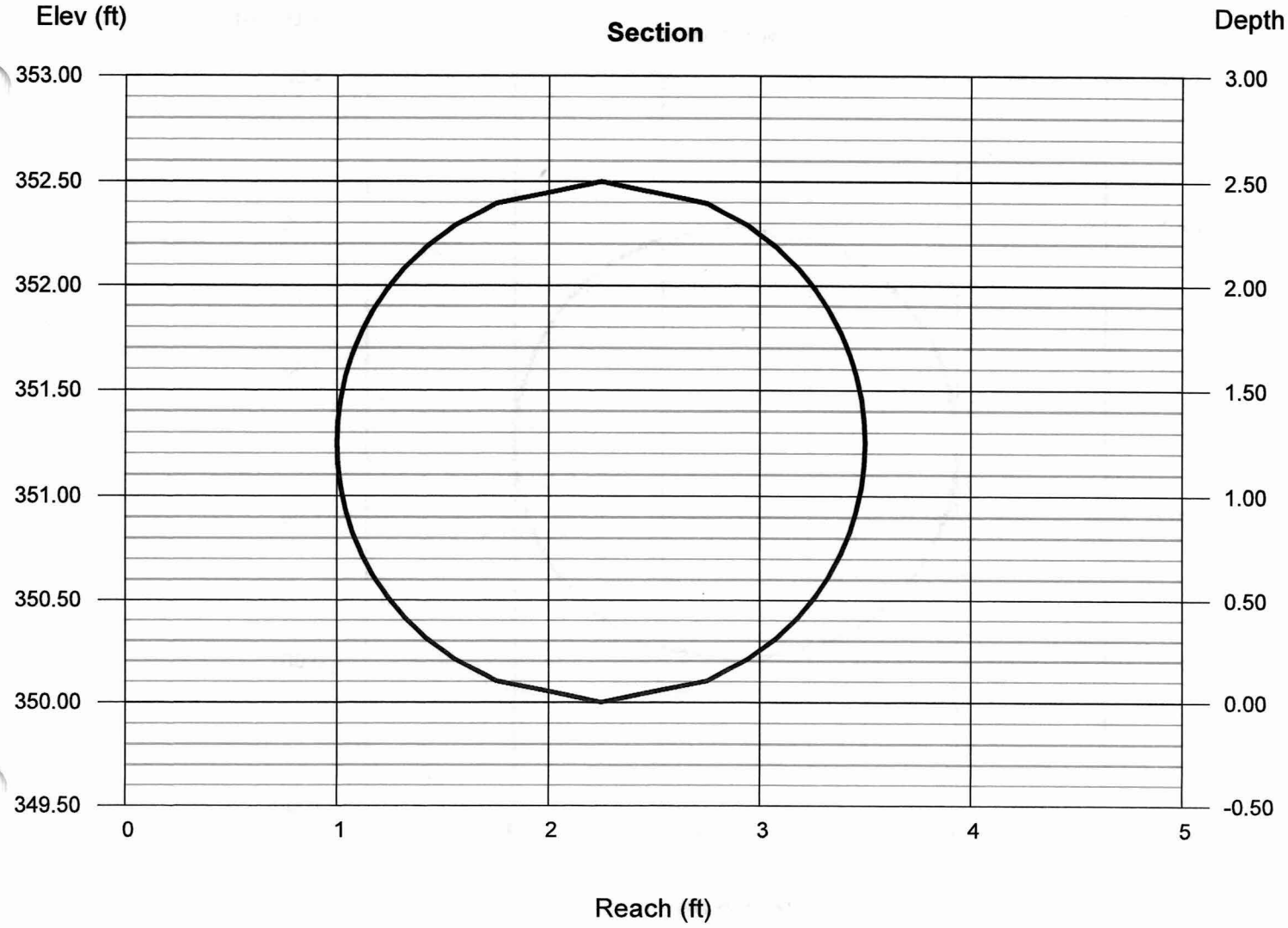
Diameter (ft)	= 2.50
Invert Elev (ft)	= 350.00
Slope (%)	= 8.00
N-Value	= 0.013

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 2.50

Highlighted

Depth (ft)	= 2.50
Q (cfs)	= 116.00
Area (sqft)	= 4.91
Velocity (ft/s)	= 23.63
Wetted Perim (ft)	= 7.85
Crit Depth, Yc (ft)	= 2.50
Top Width (ft)	= 0.00
EGL (ft)	= 11.18



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C6 - 36 in. CMP

Circular

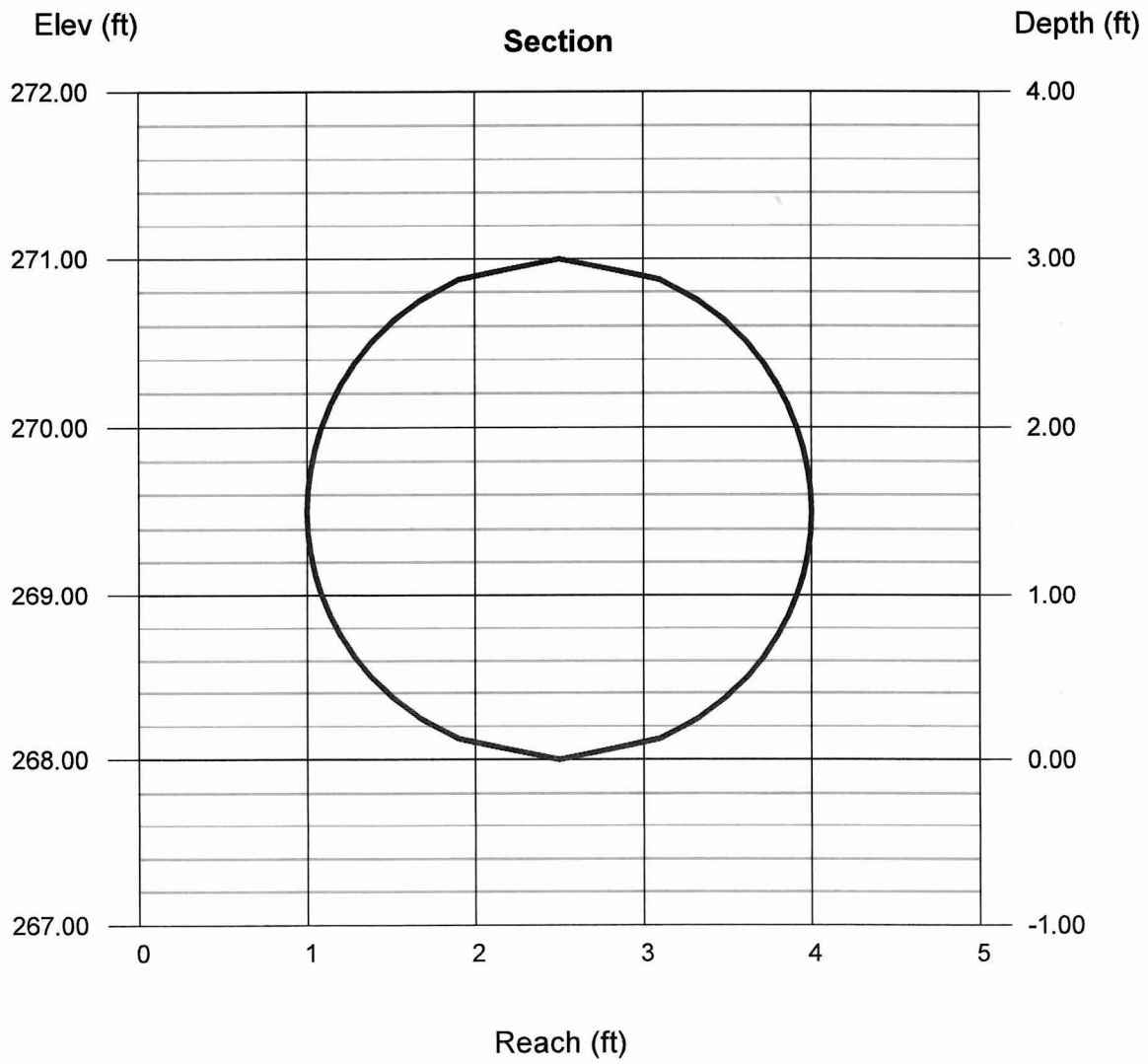
Diameter (ft)	= 3.00
Invert Elev (ft)	= 268.00
Slope (%)	= 2.86
N-Value	= 0.025

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 3.00

Highlighted

Depth (ft)	= 3.00
Q (cfs)	= 58.65
Area (sqft)	= 7.07
Velocity (ft/s)	= 8.30
Wetted Perim (ft)	= 9.42
Crit Depth, Yc (ft)	= 2.48
Top Width (ft)	= 0.00
EGL (ft)	= 4.07



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

C7 - 24x32 in. CMP

Circular

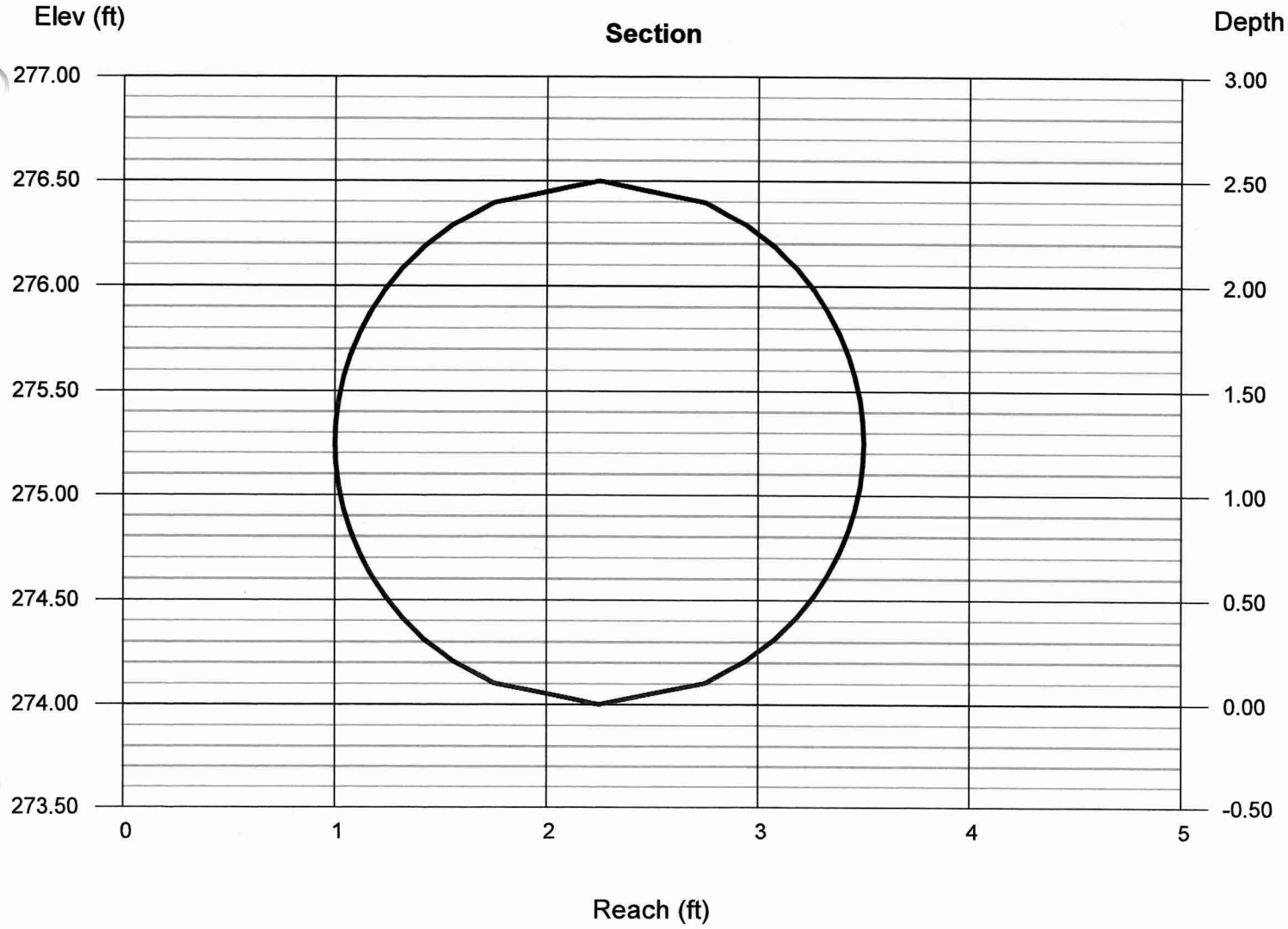
Diameter (ft)	= 2.50
Invert Elev (ft)	= 274.00
Slope (%)	= 4.00
N-Value	= 0.025

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 2.50

Highlighted

Depth (ft)	= 2.50
Q (cfs)	= 42.65
Area (sqft)	= 4.91
Velocity (ft/s)	= 8.69
Wetted Perim (ft)	= 7.85
Crit Depth, Yc (ft)	= 2.19
Top Width (ft)	= 0.00
EGL (ft)	= 3.67



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Mar 18 2019

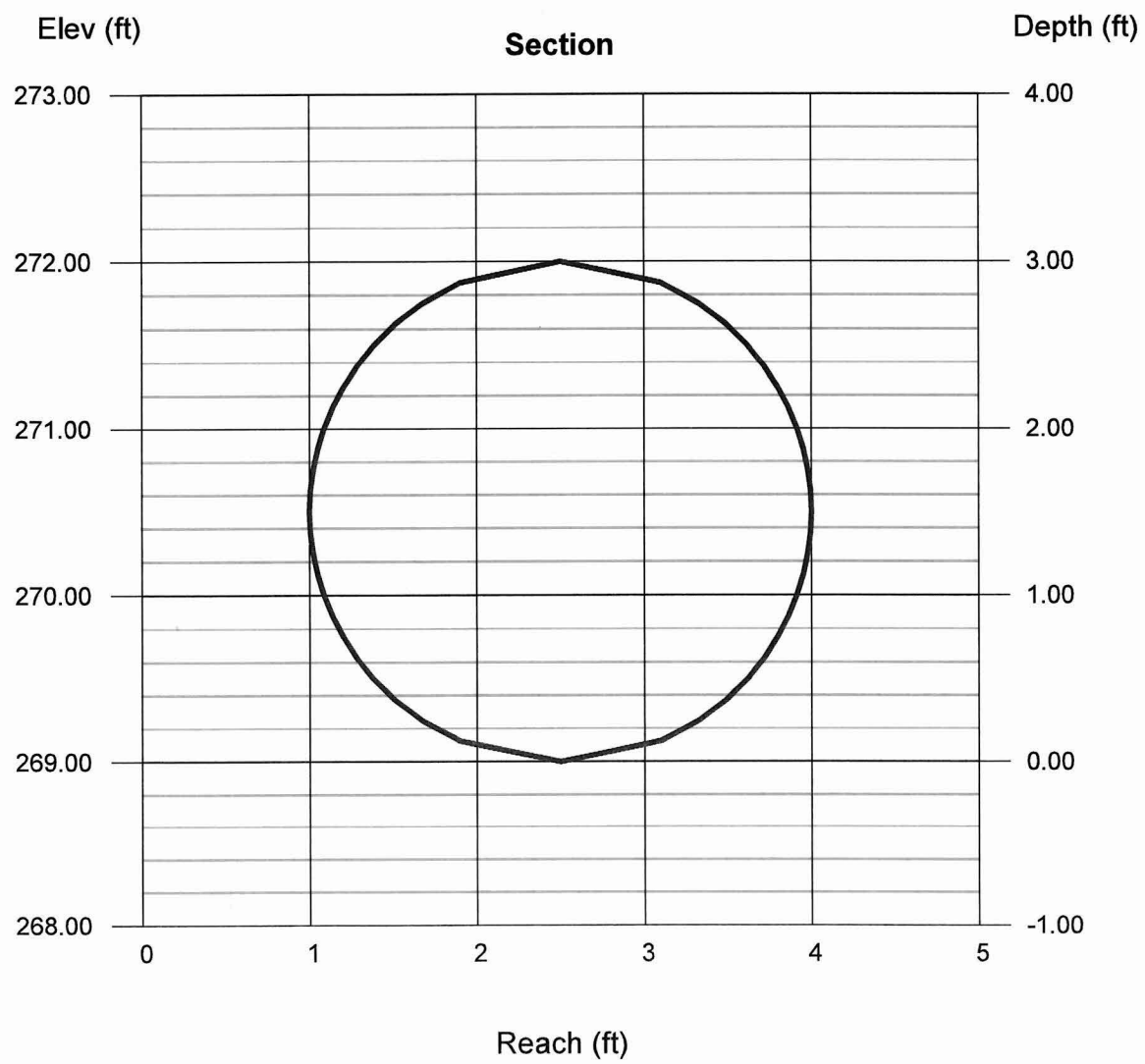
C8 - 36 in. CMP

Circular

Diameter (ft)	= 3.00
Invert Elev (ft)	= 269.00
Slope (%)	= 4.67
N-Value	= 0.025

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 3.00

Highlighted

Depth (ft)	= 3.00
Q (cfs)	= 74.94
Area (sqft)	= 7.07
Velocity (ft/s)	= 10.60
Wetted Perim (ft)	= 9.42
Crit Depth, Yc (ft)	= 2.72
Top Width (ft)	= 0.00
EGL (ft)	= 4.75