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Mt. Pleasant, Tennessee

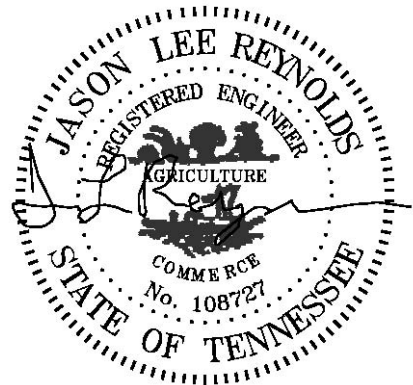
DRAINAGE CALCULATIONS WITH SITE PLAN SUBMITTAL

October 30, 2025

Prepared By:



CSR Project #: 24-040



Abstract

This report presents a detailed summary of stormwater quality and quantity treatment for an industrial 62-acre site in Mt. Pleasant, TN. In compliance with City regulations, the site will require additional quantity controls for stormwater due to the proposed site conditions having an increased rate of runoff vs. the existing conditions. The primary factor for increased runoff is the existing undeveloped property will be converted to industrial work areas and impervious areas (building and asphalt parking). Stormwater quality treatment is not provided on this development.

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Section I Site Information

The subject property consists of 62 acres, described as parcel 63.11, located Main Street, south of Town. (see Figure 1). The property is shown on Maury County Property Map 150, Parcel 11.01 (presented in Figure 2), and is currently owned by Bonafide Holdings TN, LLC. The site is currently vacant, undeveloped, predominately grass/vegetation with a gravel entrance driveway. The proposed development will consist of aligning the entrance drive with Main St. and then extending the asphalt entrance east to a proposed asphalt parking area adjacent to a proposed equipment servicing building. The servicing building will include rail cars into the structure from eastern rail spur tie ins. None of this site is within a flood hazard area according to FEMA's National Flood Hazard Map, Panel 47119C0265E with an effective date of April 16, 2007 (see Figure 3). Currently, the site drains via sheet flow generally to the northeast. There are two offsite drainage basins moving in the same direction but are relatively unaffected by the developed and remain flowing in a similar fashion after development. The site increased stormwater due to impervious and related development surfaces is routed to a detention pond to detain flows less than existing for the site. After detention the water is routed to the northeast along the existing drainage paths at amounts less than existing for the 2 through 100 year events.



Figure 1: Vicinity Map



Figure 2: Maury County Property Map 150, Parcel 63.11

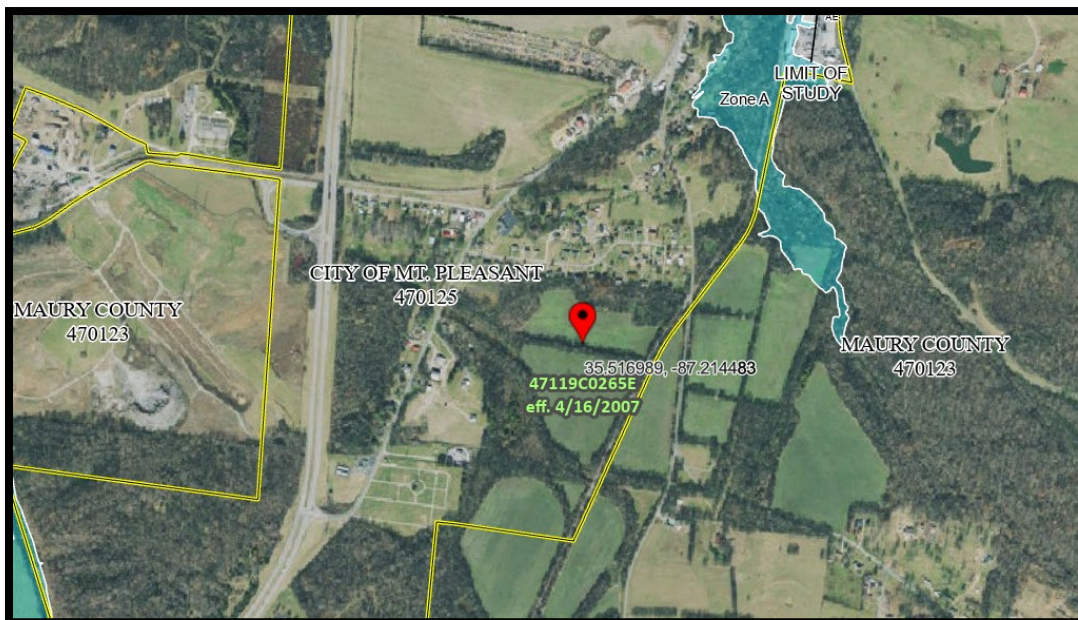


Figure 3: FEMA Map 47119C0265E

Section II Drainage Calculations

Using the existing data detailed below, analysis transpired using the SCS (TR-20) method to determine the pre-developed discharge rates for this site. A curve number varied on the grass or wooded areas and was used for all pervious areas given the site cover and condition observations coupled with the existing soil types detailed shown hereinafter.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ae	Armour silt loam, eroded gently sloping phase	17.5	27.1%
Bg	Braxton cherty silty clay loam, severely eroded sloping phase	0.9	1.4%
Bm	Burgin silt loam, phosphatic phase (Eagleville)	20.9	32.4%
Df	Donerail silt loam, gently sloping phase	6.3	9.8%
Hr	Huntington silt loam, local alluvium phosphatic phase	1.1	1.7%
Ld	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	13.4	20.8%
Mb	Maury silt loam, eroded gently sloping phase	0.1	0.2%
Mp	Mines, Pits, and Dumps	4.2	6.5%
W	Water	0.1	0.2%
Totals for Area of Interest		64.7	100.0%

Figure 4: NRCS Soil Data



Figure 5: NRCS Soil Data Map



Figure 6: Existing Drainage Basin Map

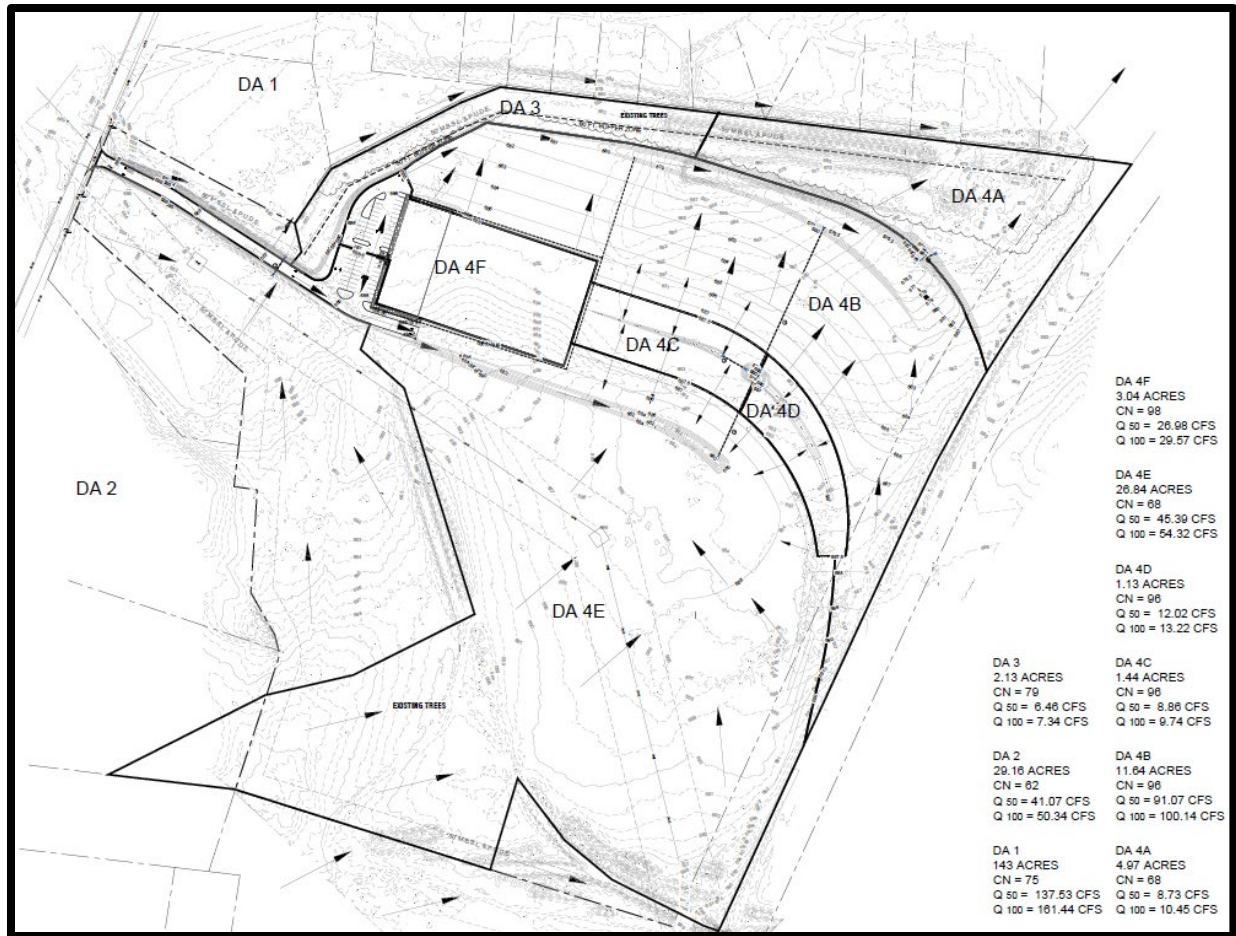


Figure 7: Proposed Drainage Basin Map

The 2, 5, 10, 25, 50 and 100-year storms were each analyzed using a 24-hour period in accordance with the original development of the SCS model. Design rainfall data from NOAA Atlas 14 for Mt Pleasant, TN was used for the intensity of all rainfall events. The resulting runoff rates for each storm can be found in Figure 9 below and as attached in detail in Appendix A.

2.1 General Plan

The site's topography and natural drainage patterns allow the site under development consideration to be analyzed as four subbasins as shown in Figure 6 above the cut into smaller, developed subbasin in the proposed site in Figure 7. The site development will meet the City regulation requirements for quantity pre vs. post measures. The detained flows from the site are then returned to existing drainage features, and the associated runoff follows natural pathways

A general schematic plan of this design is presented in Figure 8 which shows runoff being collected via sheet and shallow concentrated flow and some ditches into the detention pond. No water quality measures are provided.



Section IV Proposed Stormwater Quantity Controls

The stormwater flow control occurs with the application of an individual detention management facility. The SCS (TR-20) method utilizing HydroCAD was used to analyze all flows through the existing and proposed drainage system. The curve number for the proposed site was developed from the weighted site curve numbers in pervious areas (varies) and 98 for improved asphalt, concrete and building areas. Stone covered access and storage areas have a varied CN based upon the underlying soils composition and drainage classification. The resultant flows for the proposed site are based on the proposed development as shown on the plans and further detailed in the Appendix A report.

4.1 Storm Water Quantity Conditions

Pre vs. Post stormwater runoff results in a slight increase to site quantities as tabled below. The images below reveal the drainage areas prior to and after construction.

Storm Event	Predeveloped Flows (CFS) Areas 3&4	Proposed Flows after Detention (CFS) Areas 3/4/Pond
2-year	36.8	36.8
5-year	55.64	48.72
10-year	71.91	56.36
25-year	95.72	65.84
50-year	115.81	72.2
100-year	137.13	78.47

Figure 10: Site Pre vs. Post Runoff Summary

With the quantity increased due to the change in cover and added impervious areas, storm water storage is provided for by a standard detention with controlled release rates. An emergency overflow designed to pass storm events greater than the 100 year event is also included as part of this design. All peak volume calculations are based on the SCS TR-20 method.

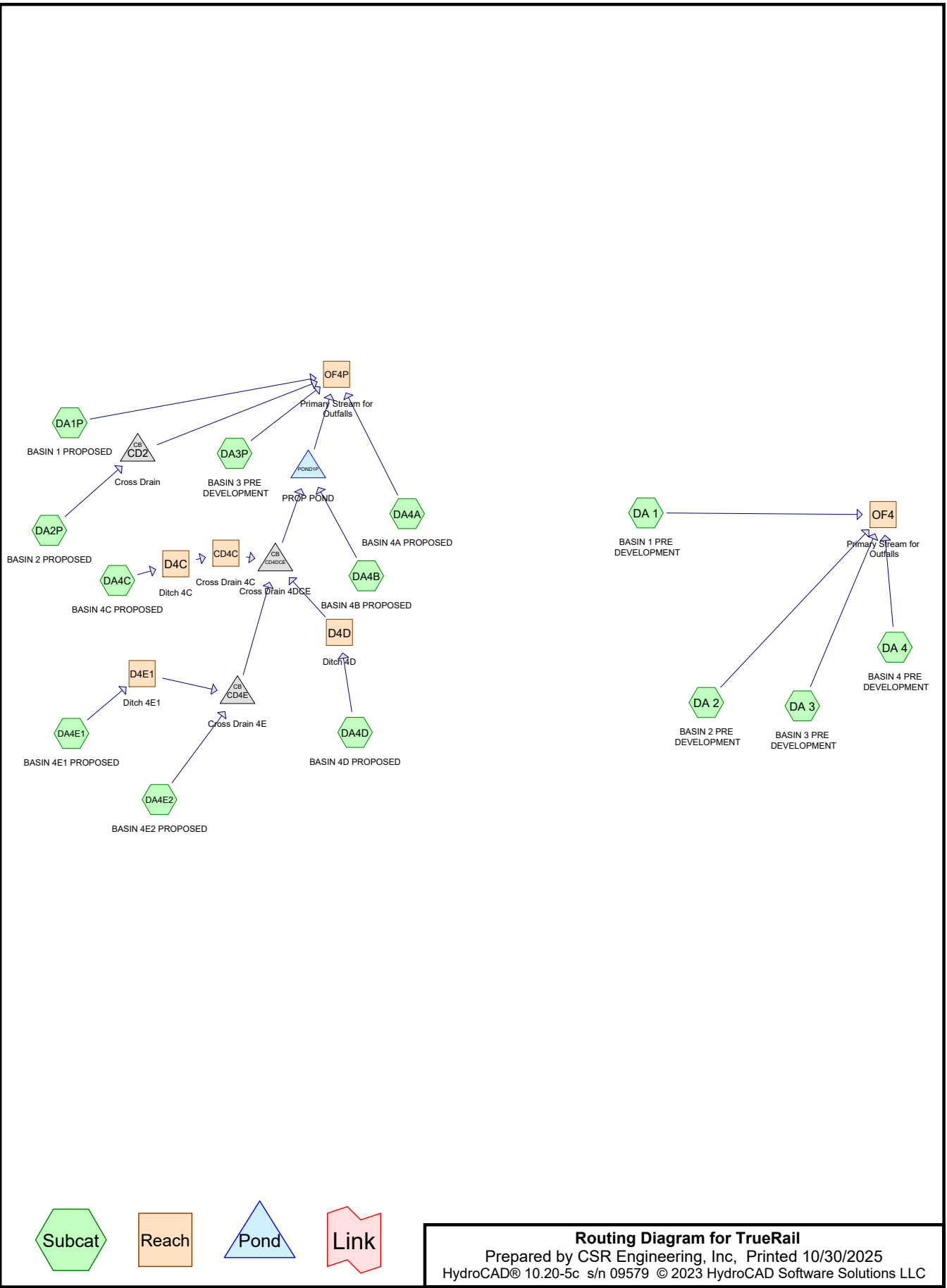
Section V Conclusion

The proposed storm sewer system has been designed to meet the requirements of the City of Mt. Pleasant Regulations and prior recommendations of the Department Staff. The system will

reduce the post-developed site discharge rate from the 2, 5, 10, 25, 50 and 100-year rainfall events to be less than the pre-developed discharge rates from the same storms.

APPENDIX A

Drainage Model Reports



Project Notes

Copied 6 events from Springfield 24-hr S1 storm

Copied 7 events from dickson 24-hr S1 storm

Copied 7 events from stockbridge 24-hr S1 storm

Copied 6 events from Tiptonville 24-hr S1 storm

Copied 7 events from Mt Pleasant 24-hr S1 storm

Copied 6 events from Tiptonville 24-hr S1 storm

Copied 7 events from Mt Pleasant 24-hr S1 storm

Copied 6 events from Tiptonville 24-hr S1 storm

Copied 7 events from Mt Pleasant 24-hr S1 storm

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Mt Pleasant 24-hr S1	2-yr	Default	24.00	1	3.90	2
2	5-yr	Mt Pleasant 24-hr S1	5-yr	Default	24.00	1	4.75	2
3	10-yr	Mt Pleasant 24-hr S1	10-yr	Default	24.00	1	5.42	2
4	25-yr	Mt Pleasant 24-hr S1	25-yr	Default	24.00	1	6.34	2
5	50-yr	Mt Pleasant 24-hr S1	50-yr	Default	24.00	1	7.08	2
6	100-yr	Mt Pleasant 24-hr S1	100-yr	Default	24.00	1	7.83	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,054,840	74	>75% Grass cover, Good, HSG C (DA 1, DA1P)
774,497	96	Gravel surface, HSG C (DA 2, DA2P, DA4B, DA4C, DA4D)
2,302,582	58	Meadow, non-grazed, HSG B (DA 2, DA 3, DA 4, DA2P, DA4E1, DA4E2)
650,351	71	Meadow, non-grazed, HSG C (DA 4)
463,478	78	Meadow, non-grazed, HSG D (DA 3, DA 4)
217,800	98	Paved parking, HSG C (DA 1, DA1P)
43,560	98	Paved parking, HSG D (DA4B)
43,560	98	Paved roads w/curbs & sewers, HSG B (DA4E1)
87,120	98	Roofs, HSG D (DA4B)
1,799,899	60	Woods, Fair, HSG B (DA 2, DA 3, DA 4, DA2P, DA4A, DA4E1, DA4E2)
476,982	73	Woods, Fair, HSG C (DA 4, DA4A)
696,960	79	Woods, Fair, HSG D (DA 3, DA 4, DA3P, DA4E2)
6,185,520	76	Woods/grass comb., Fair, HSG C (DA 1, DA1P)
19,797,149	73	TOTAL AREA

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
4,146,041	HSG B	DA 2, DA 3, DA 4, DA2P, DA4A, DA4E1, DA4E2
14,359,990	HSG C	DA 1, DA 2, DA 4, DA1P, DA2P, DA4A, DA4B, DA4C, DA4D
1,291,118	HSG D	DA 3, DA 4, DA3P, DA4B, DA4E2
0	Other	
19,797,149		TOTAL AREA

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	6,054,840	0	0	6,054,840	>75% Grass cover, Good
0	0	774,497	0	0	774,497	Gravel surface
0	2,302,582	650,351	463,478	0	3,416,411	Meadow, non-grazed
0	0	217,800	43,560	0	261,360	Paved parking
0	43,560	0	0	0	43,560	Paved roads w/curbs & sewers
0	0	0	87,120	0	87,120	Roofs
0	1,799,899	476,982	696,960	0	2,973,841	Woods, Fair
0	0	6,185,520	0	0	6,185,520	Woods/grass comb., Fair
0	4,146,041	14,359,990	1,291,118	0	19,797,149	TOTAL AREA

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	CD4C	683.75	679.00	60.0	0.0792	0.011	0.0	18.0	0.0	
2	CD2	680.25	680.00	50.0	0.0050	0.011	0.0	36.0	0.0	
3	CD4DCE	678.39	676.50	360.0	0.0052	0.011	0.0	48.0	0.0	
4	CD4E	679.50	678.46	200.0	0.0052	0.011	0.0	48.0	0.0	
5	POND1P	676.25	676.00	50.0	0.0050	0.011	0.0	30.0	0.0	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=1.59"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=58.46 cfs 826,416 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=0.81"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=11.06 cfs 102,914 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=1.39"
 Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=10.66 cfs 48,150 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=1.26"
 Flow Length=1,500' Tc=50.3 min CN=70 Runoff=26.14 cfs 190,326 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=1.59"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=58.46 cfs 826,416 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=0.81"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=11.06 cfs 102,914 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=1.88"
 Tc=5.0 min CN=79 Runoff=5.87 cfs 14,556 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=1.14"
 Flow Length=300' Tc=28.4 min CN=68 Runoff=3.69 cfs 20,607 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=3.44"
 Flow Length=1,000' Tc=33.8 min CN=96 Runoff=25.93 cfs 152,513 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=3.44"
 Tc=5.0 min CN=96 Runoff=5.14 cfs 13,615 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=3.44"
 Tc=5.0 min CN=96 Runoff=6.99 cfs 18,486 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=0.92"
 Flow Length=500' Tc=28.1 min CN=64 Runoff=4.66 cfs 27,820 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=1.20"
 Flow Length=1,000' Tc=41.1 min CN=69 Runoff=11.49 cfs 75,926 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.38' Max Vel=13.87 fps Inflow=4.82 cfs 13,615 cf
 18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=4.82 cfs 13,615 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.66' Max Vel=2.57 fps Inflow=5.14 cfs 13,615 cf
 n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=4.82 cfs 13,615 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.71' Max Vel=3.19 fps Inflow=6.99 cfs 18,486 cf
 n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=6.63 cfs 18,486 cf

TrueRail

Prepared by CSR Engineering, Inc

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Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

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Reach D4E1: Ditch 4E1Avg. Flow Depth=0.73' Max Vel=2.07 fps Inflow=4.66 cfs 27,820 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=4.45 cfs 27,820 cf**Reach OF4: Primary Stream for**Avg. Flow Depth=1.80' Max Vel=3.33 fps Inflow=72.15 cfs 1,167,806 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=72.08 cfs 1,167,806 cf**Reach OF4P: Primary Stream for**Avg. Flow Depth=1.89' Max Vel=3.44 fps Inflow=79.87 cfs 1,252,289 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=79.63 cfs 1,252,286 cf**Pond CD2: Cross Drain**Peak Elev=681.73' Inflow=11.06 cfs 102,914 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=11.06 cfs 102,914 cf**Pond CD4DCE: Cross Drain 4DCE**Peak Elev=679.89' Inflow=18.01 cfs 135,848 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=18.01 cfs 135,848 cf**Pond CD4E: Cross Drain 4E**Peak Elev=680.96' Inflow=15.82 cfs 103,746 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=15.82 cfs 103,746 cf**Pond POND1P: PROP POND**Peak Elev=679.29' Storage=57,560 cf Inflow=43.04 cfs 288,362 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=27.73 cfs 287,796 cf**Total Runoff Area = 19,797,149 sf Runoff Volume = 2,420,661 cf Average Runoff Depth = 1.47"**
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 58.46 cfs @ 13.83 hrs, Volume= 826,416 cf, Depth= 1.59"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

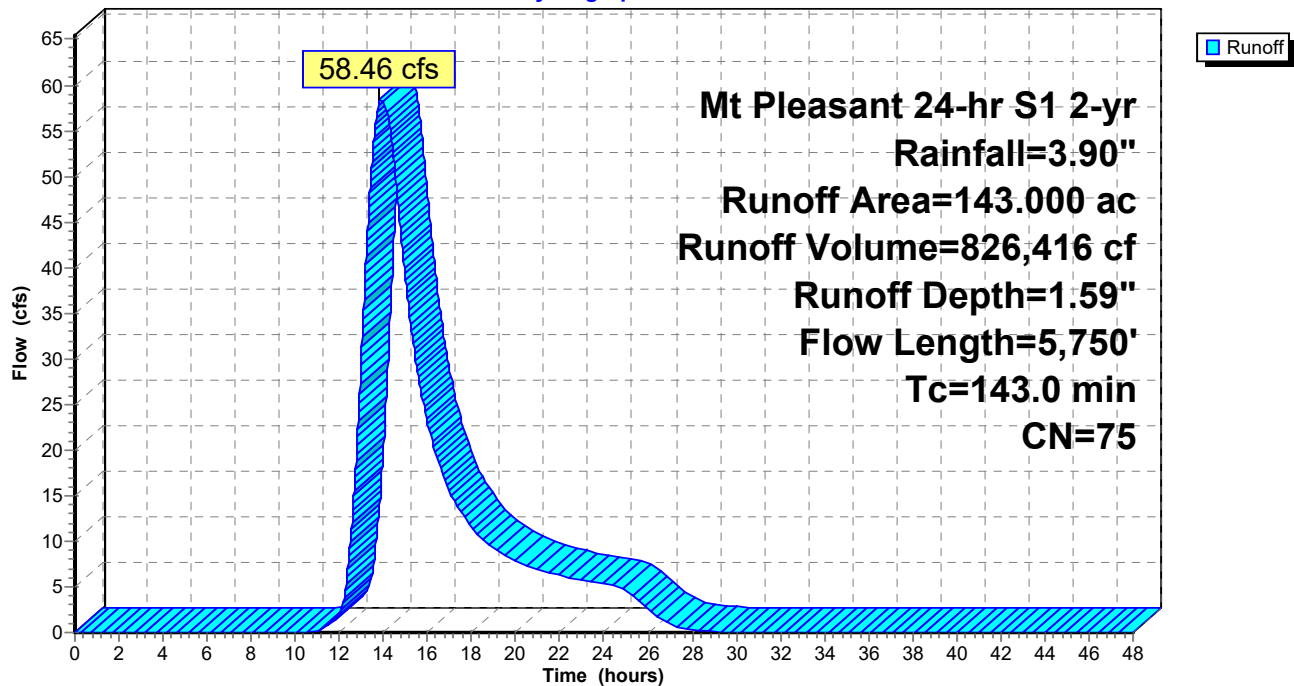
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Runoff = 11.06 cfs @ 12.95 hrs, Volume= 102,914 cf, Depth= 0.81"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

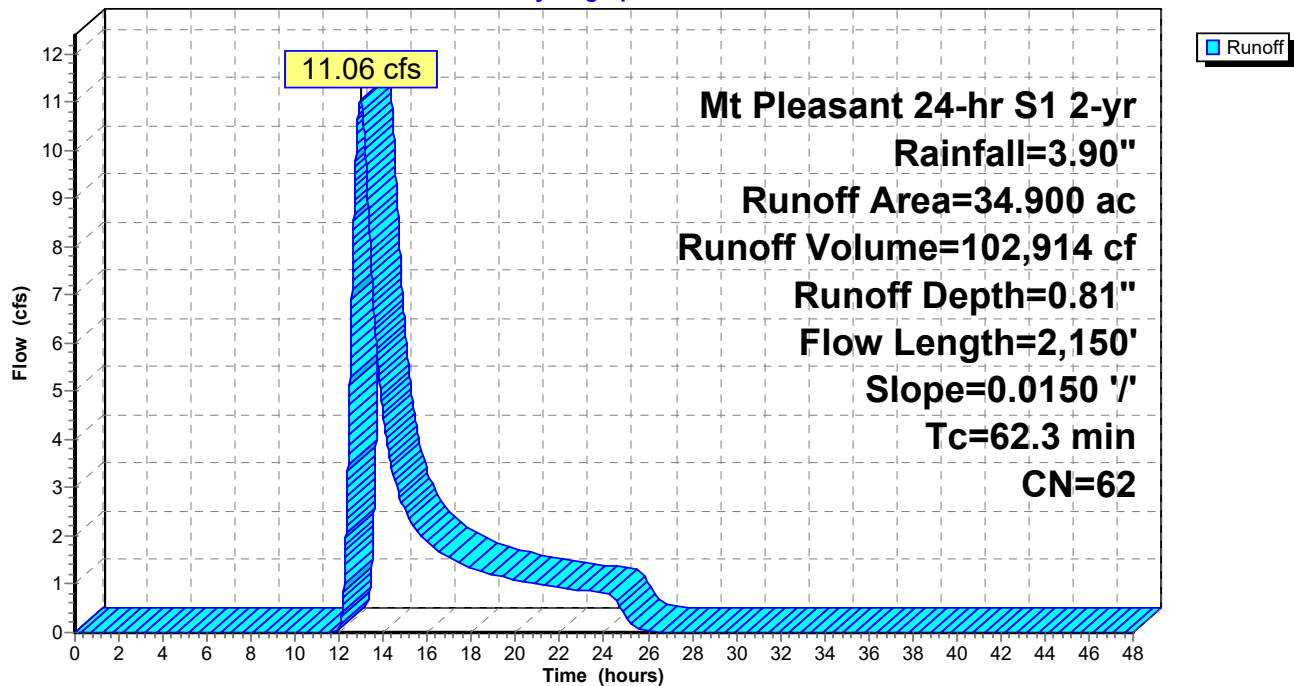
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Hydrograph



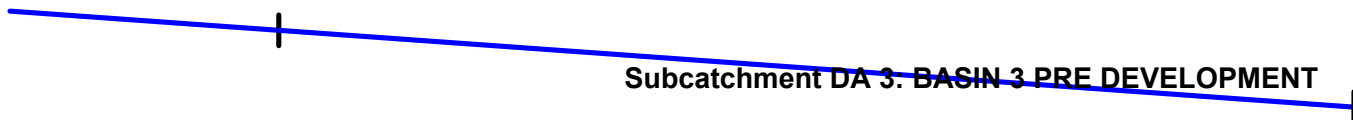
Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Runoff = 10.66 cfs @ 12.25 hrs, Volume= 48,150 cf, Depth= 1.39"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

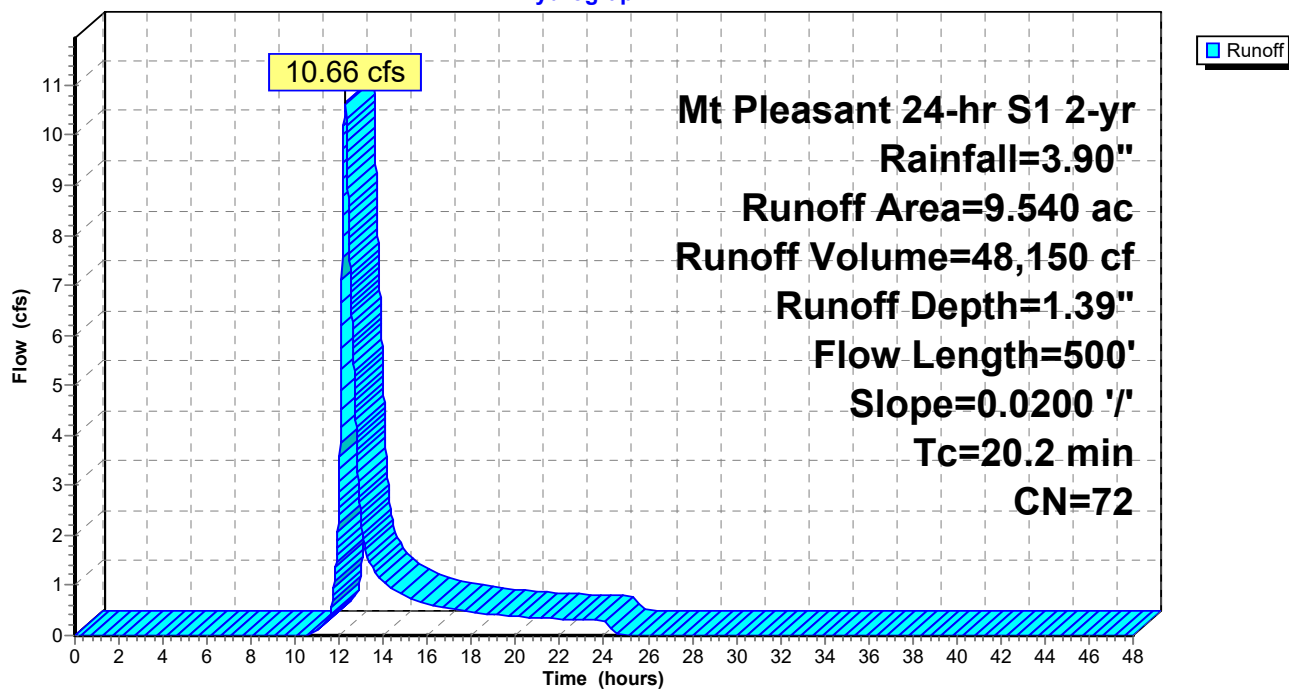
Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 26.14 cfs @ 12.69 hrs, Volume= 190,326 cf, Depth= 1.26"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

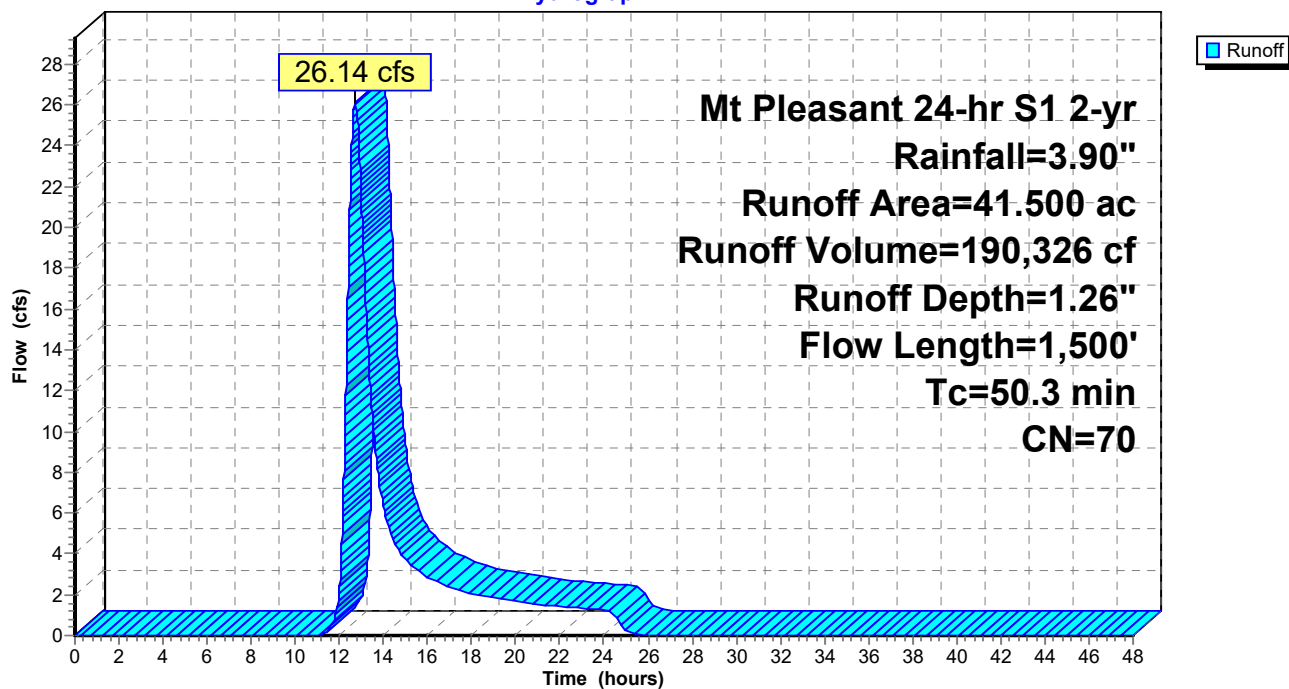
Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA1P: BASIN 1 PROPOSED

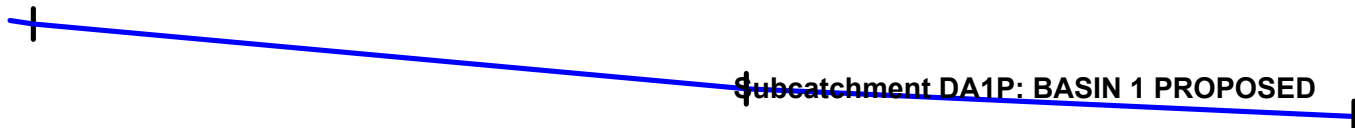
Runoff = 58.46 cfs @ 13.83 hrs, Volume= 826,416 cf, Depth= 1.59"

Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

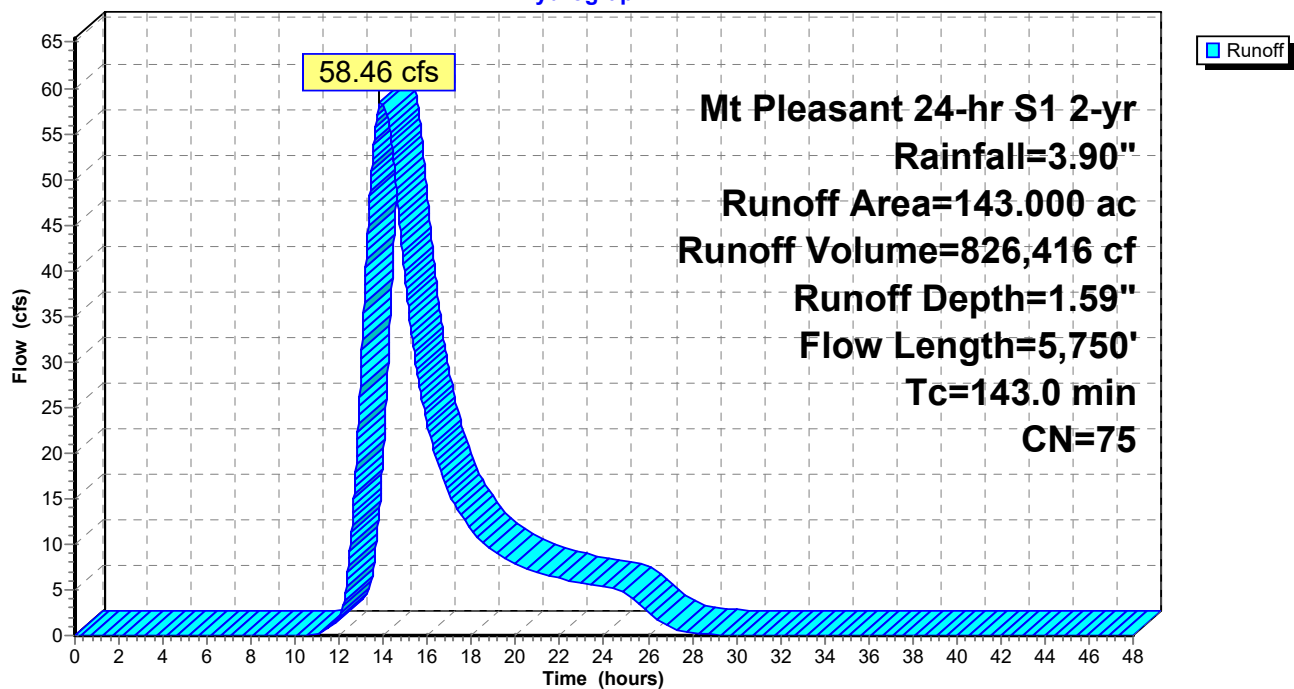
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

Hydrograph



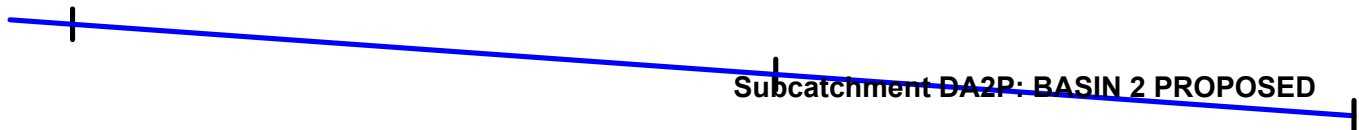
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 11.06 cfs @ 12.95 hrs, Volume= 102,914 cf, Depth= 0.81"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

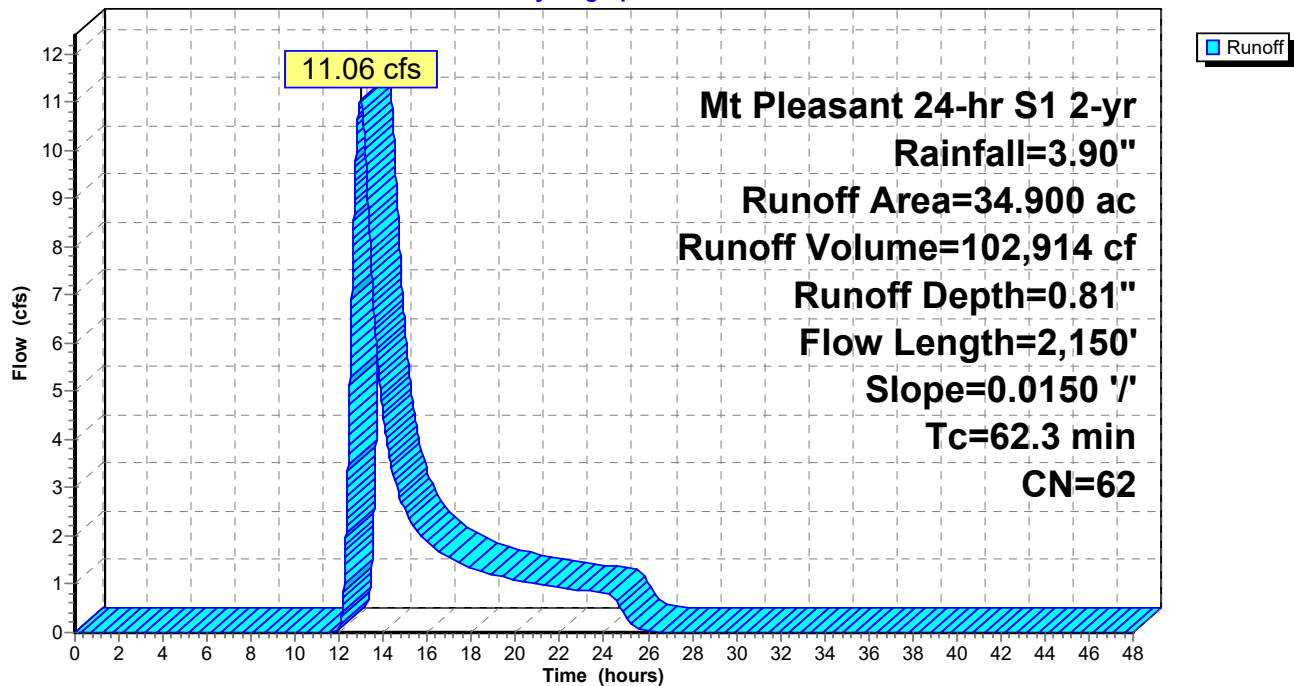
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 5.87 cfs @ 12.03 hrs, Volume= 14,556 cf, Depth= 1.88"

Routed to Reach OF4P : Primary Stream for Outfalls

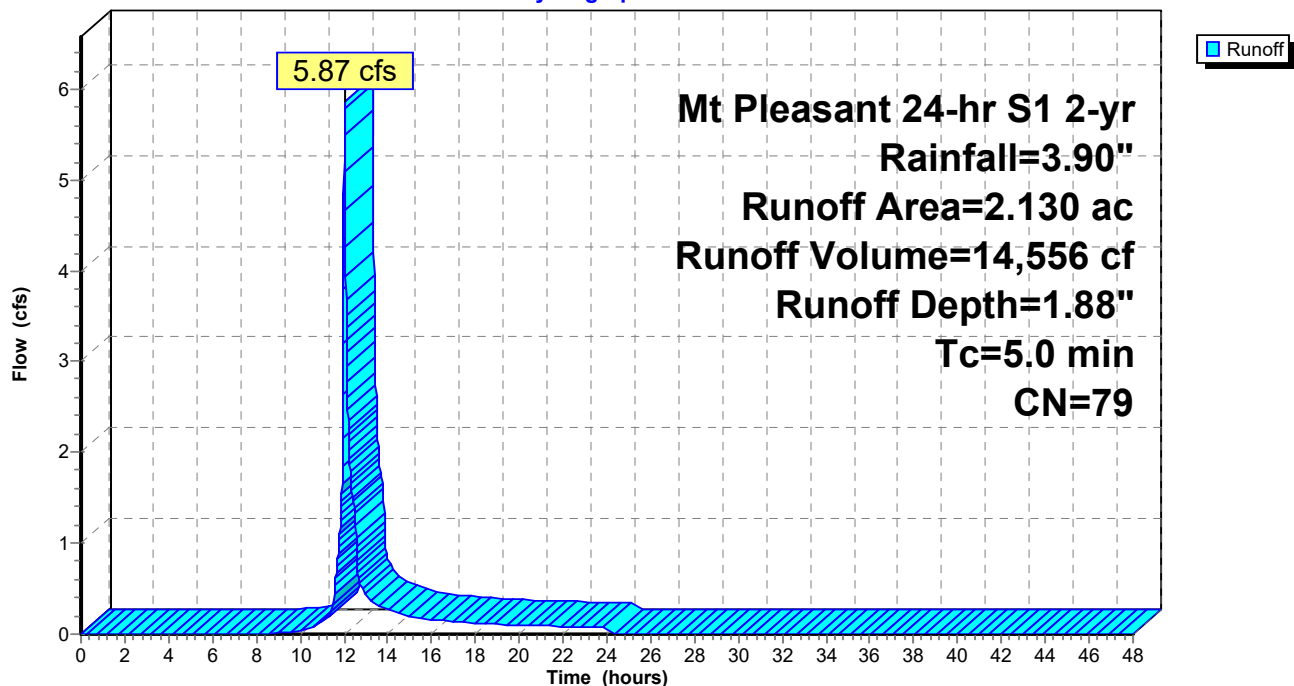
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

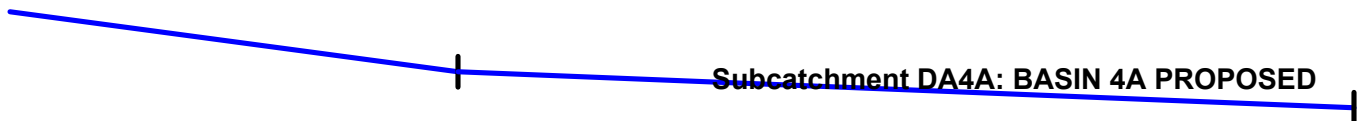
Runoff = 3.69 cfs @ 12.40 hrs, Volume= 20,607 cf, Depth= 1.14"

Routed to Reach OF4P : Primary Stream for Outfalls

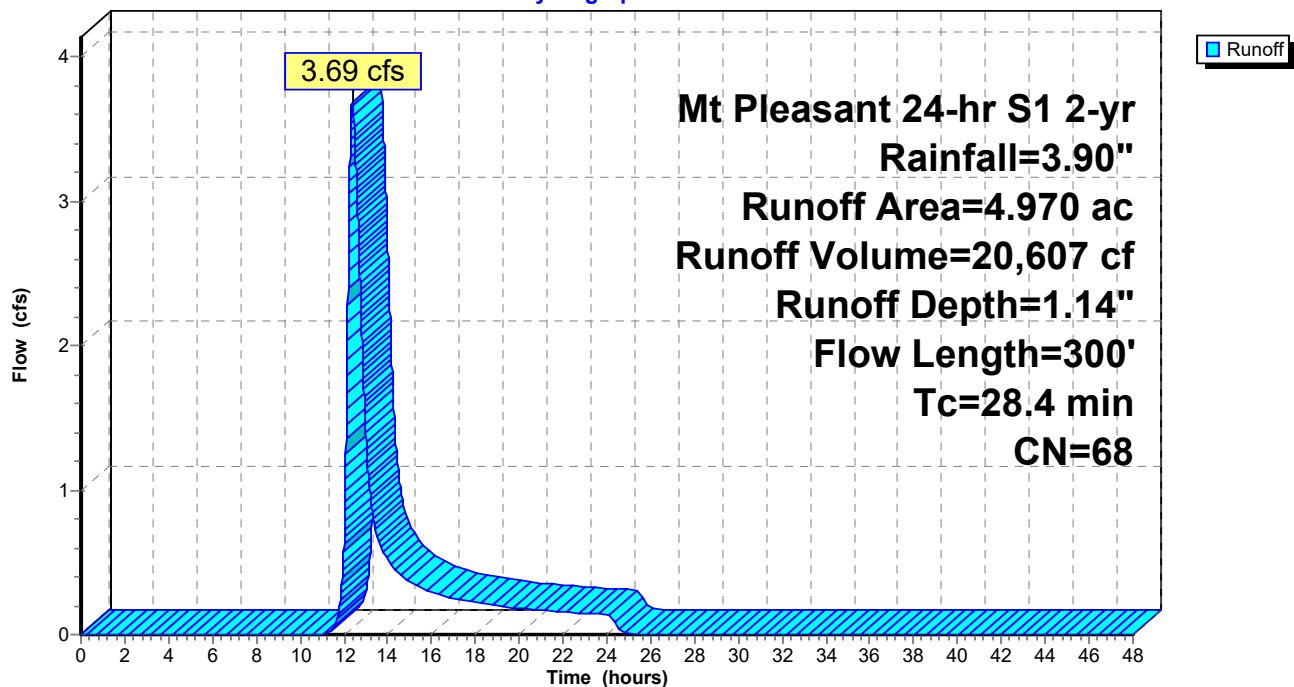
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



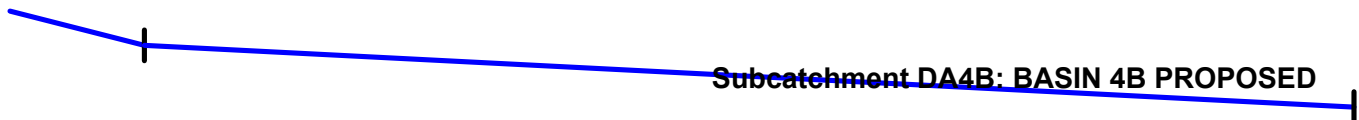
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 25.93 cfs @ 12.40 hrs, Volume= 152,513 cf, Depth= 3.44"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

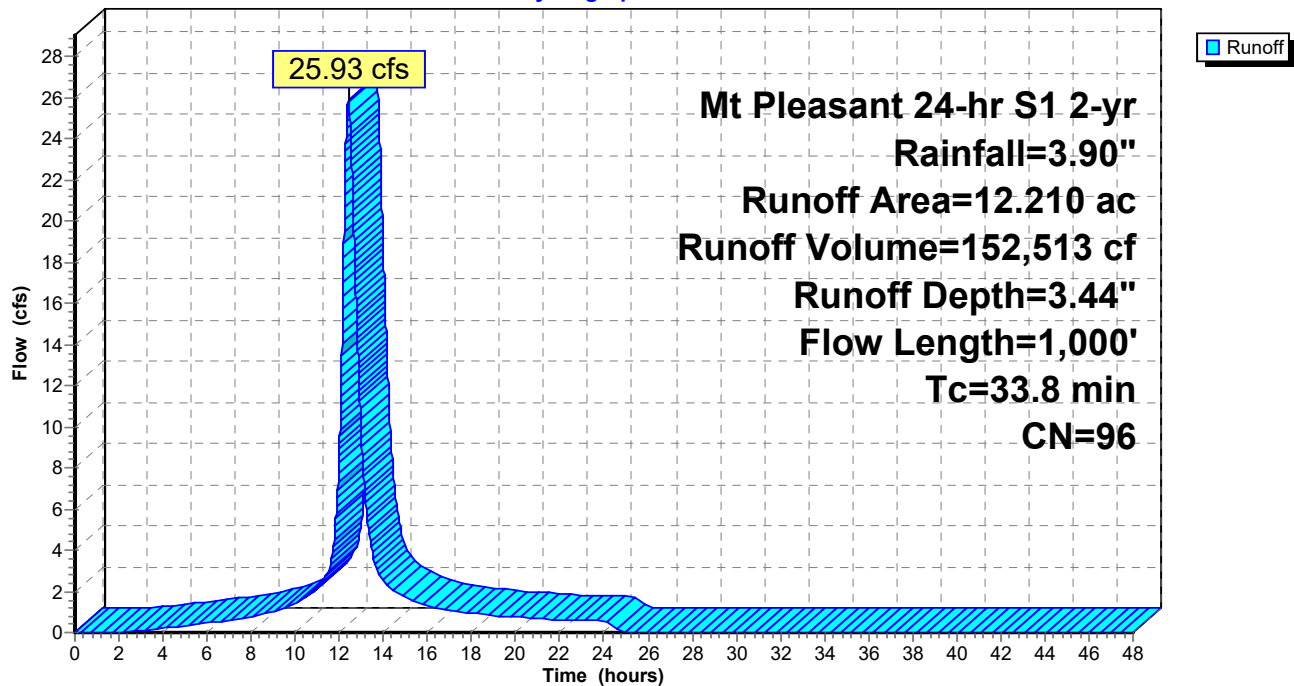
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 5.14 cfs @ 12.03 hrs, Volume= 13,615 cf, Depth= 3.44"
 Routed to Reach D4C : Ditch 4C

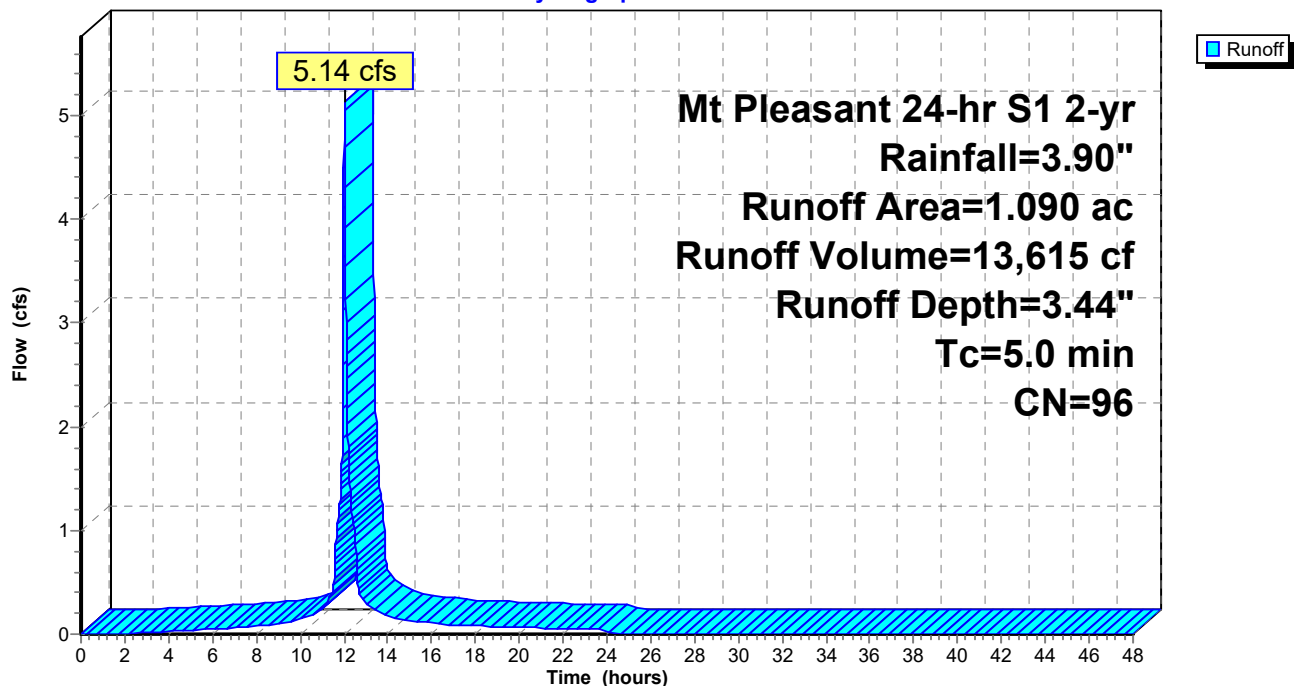
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 6.99 cfs @ 12.03 hrs, Volume= 18,486 cf, Depth= 3.44"
 Routed to Reach D4D : Ditch 4D

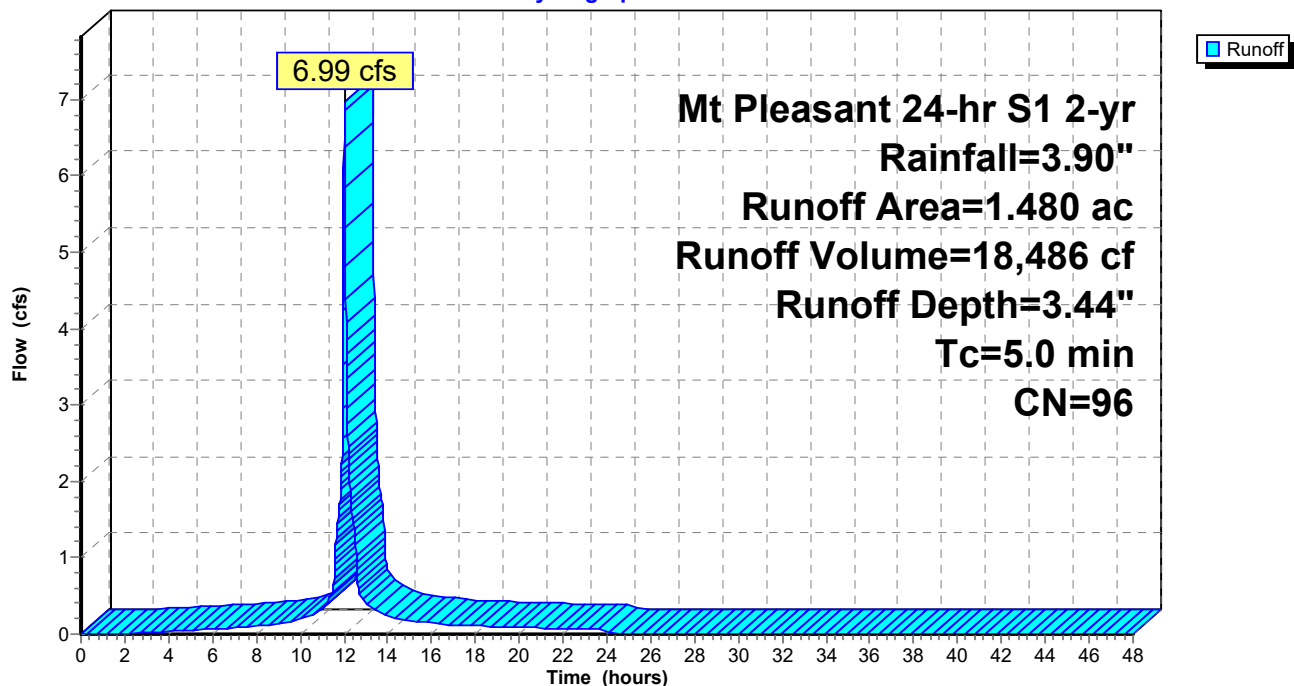
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



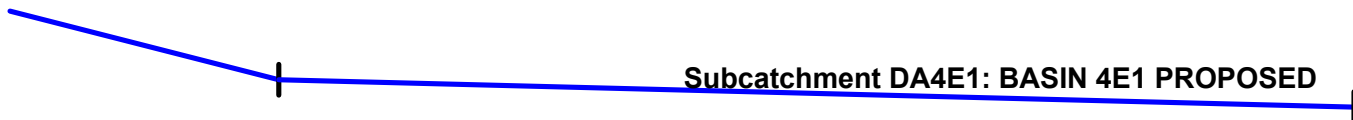
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

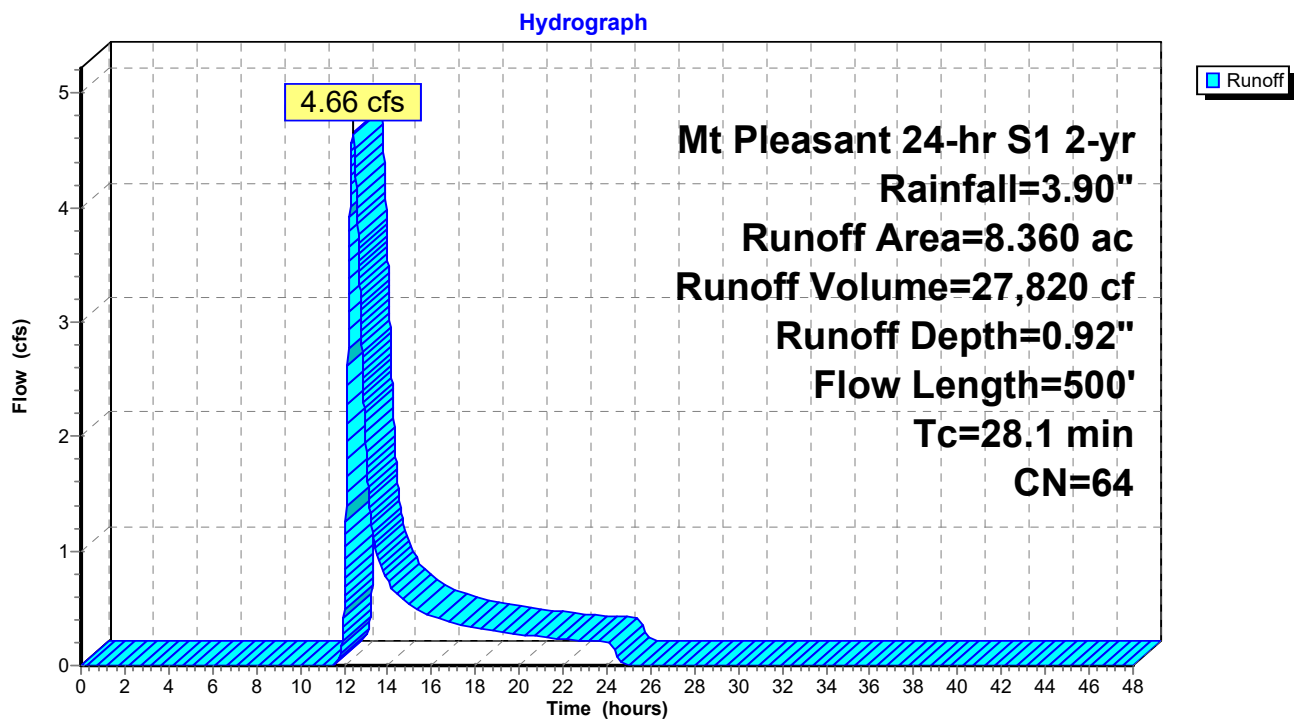
Runoff = 4.66 cfs @ 12.40 hrs, Volume= 27,820 cf, Depth= 0.92"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

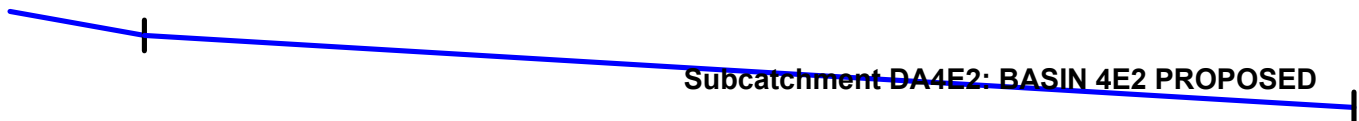
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 11.49 cfs @ 12.60 hrs, Volume= 75,926 cf, Depth= 1.20"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 2-yr Rainfall=3.90"

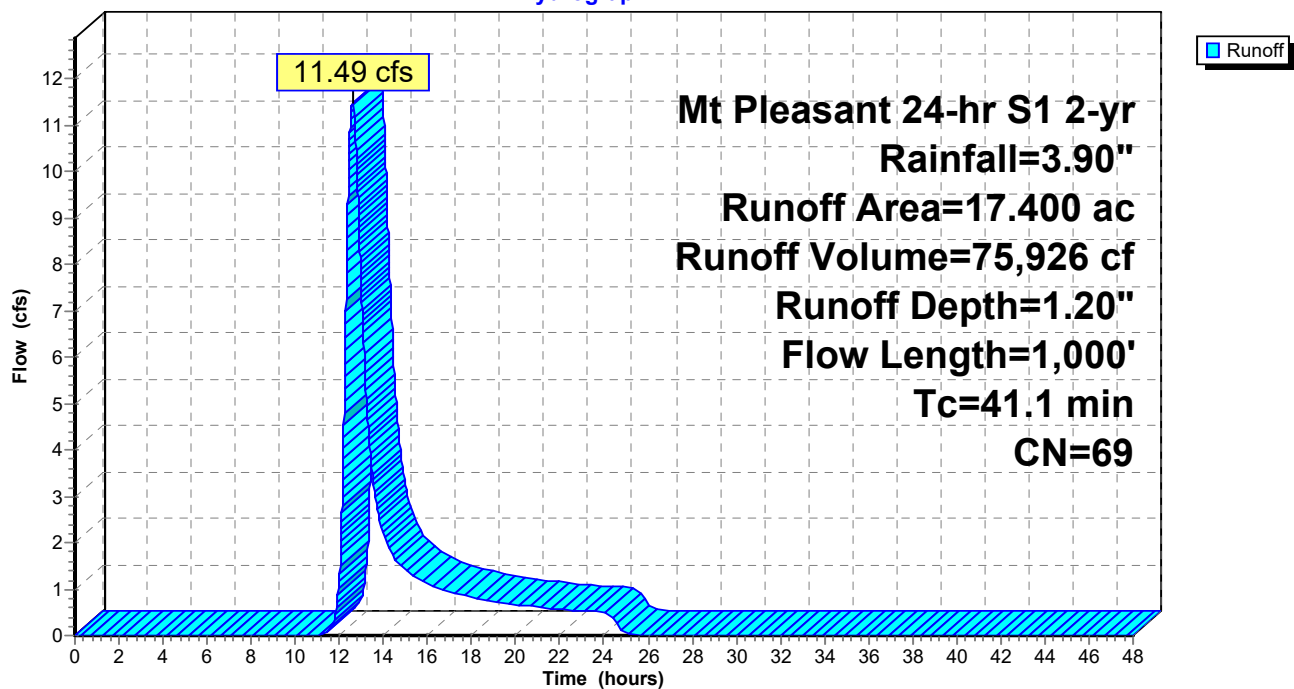
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



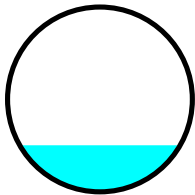
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 3.44" for 2-yr event
Inflow = 4.82 cfs @ 12.05 hrs, Volume= 13,615 cf
Outflow = 4.82 cfs @ 12.05 hrs, Volume= 13,615 cf, Atten= 0%, Lag= 0.1 min
Routed to Pond CD4DCE : Cross Drain 4DCE

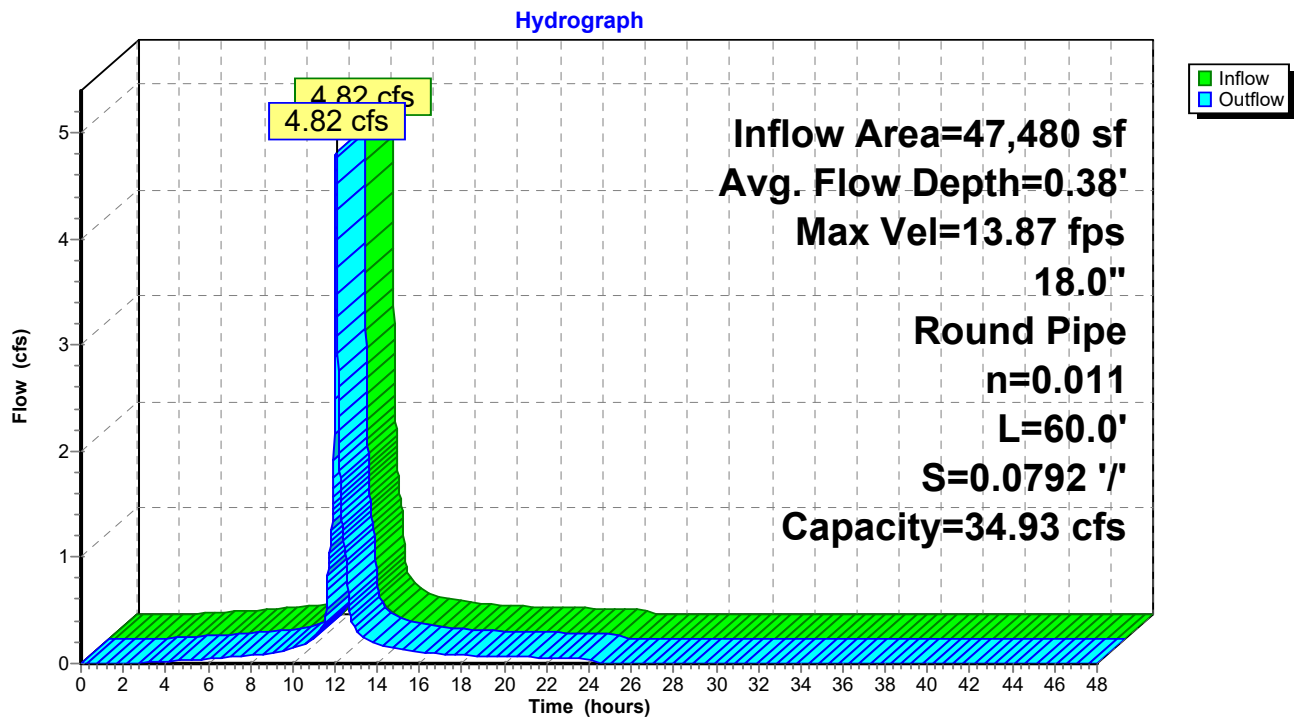
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 13.87 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.16 fps, Avg. Travel Time= 0.2 min

Peak Storage= 21 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 1.30'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

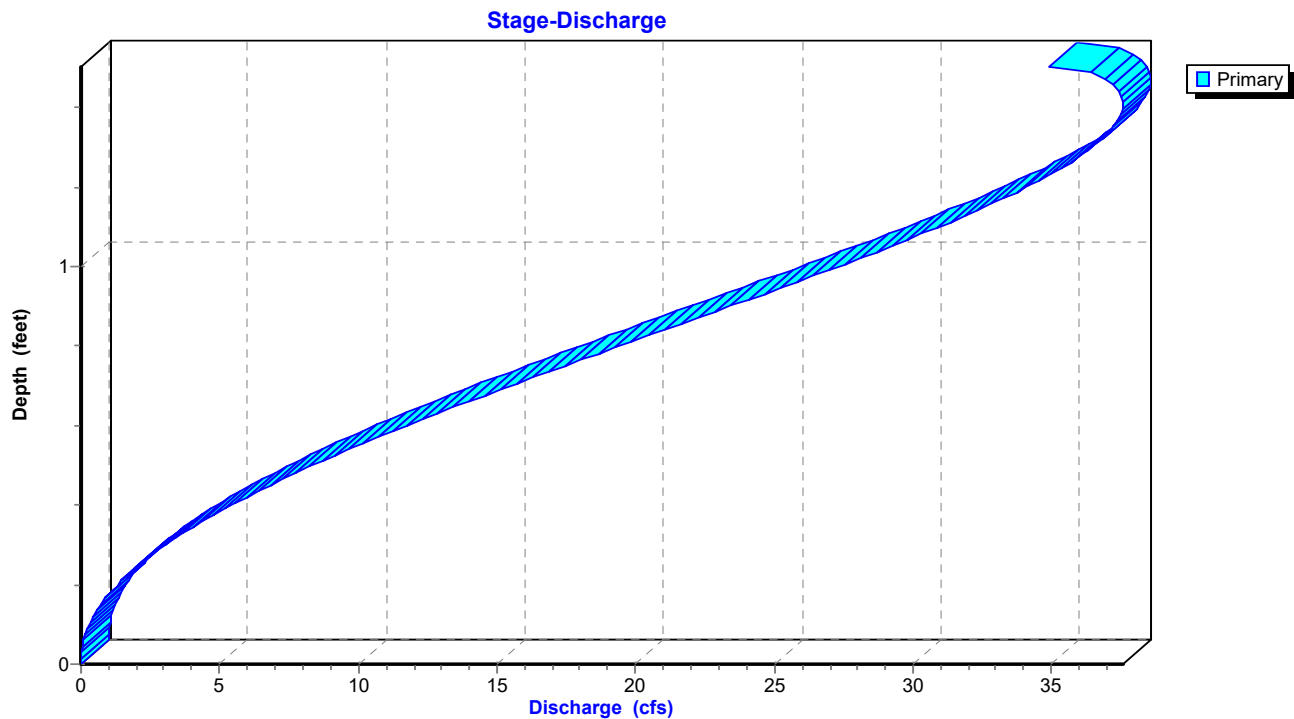
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

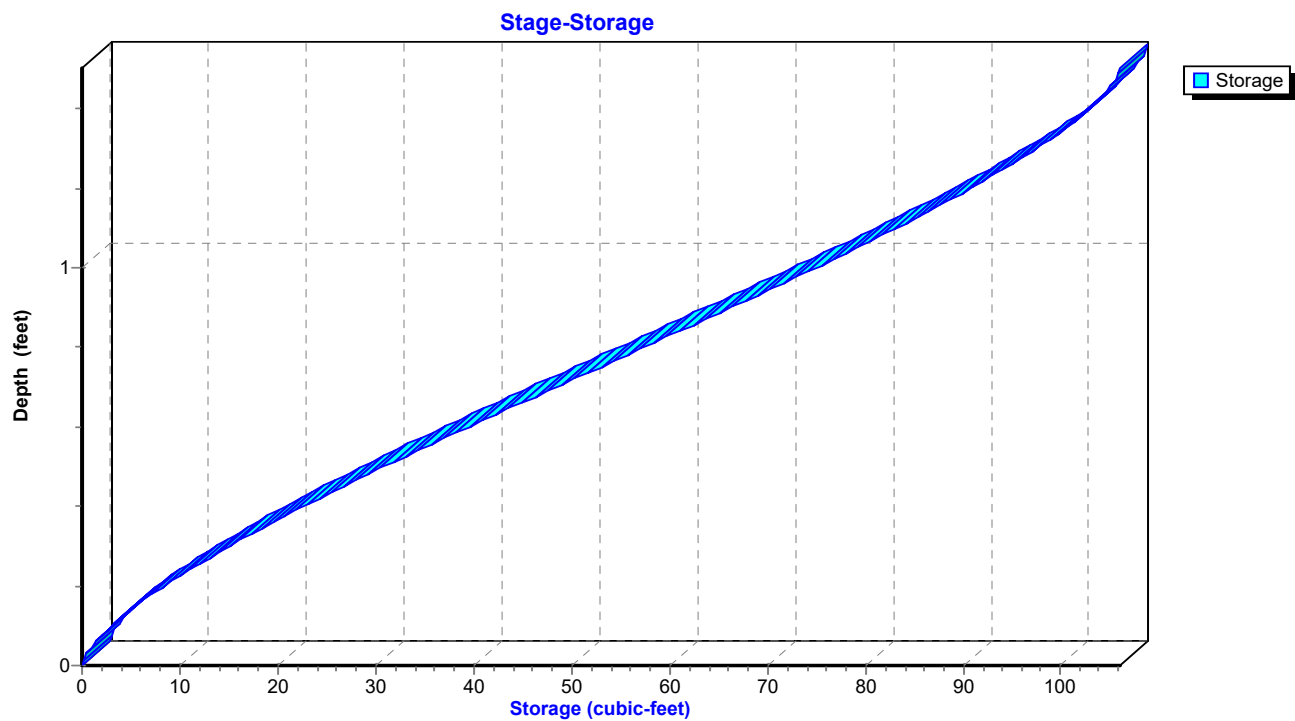


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

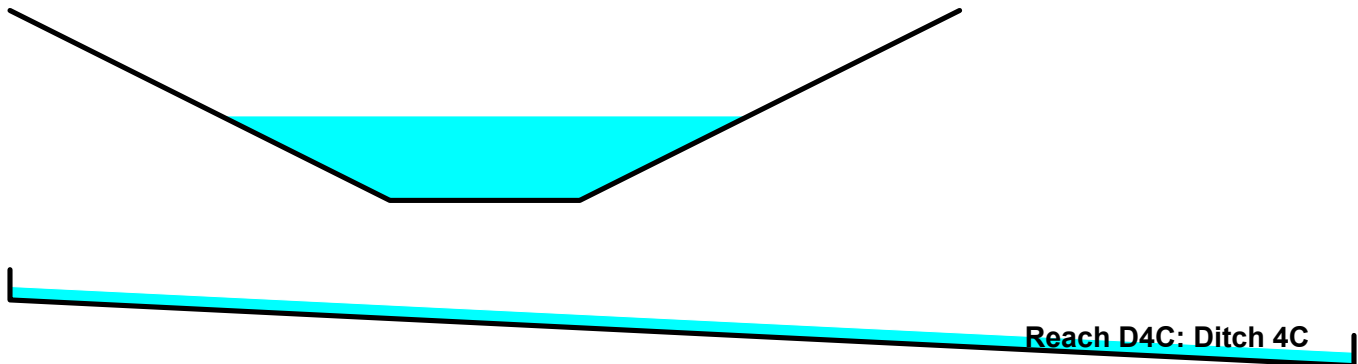
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 3.44" for 2-yr event
Inflow = 5.14 cfs @ 12.03 hrs, Volume= 13,615 cf
Outflow = 4.82 cfs @ 12.05 hrs, Volume= 13,615 cf, Atten= 6%, Lag= 1.2 min
Routed to Reach CD4C : Cross Drain 4C

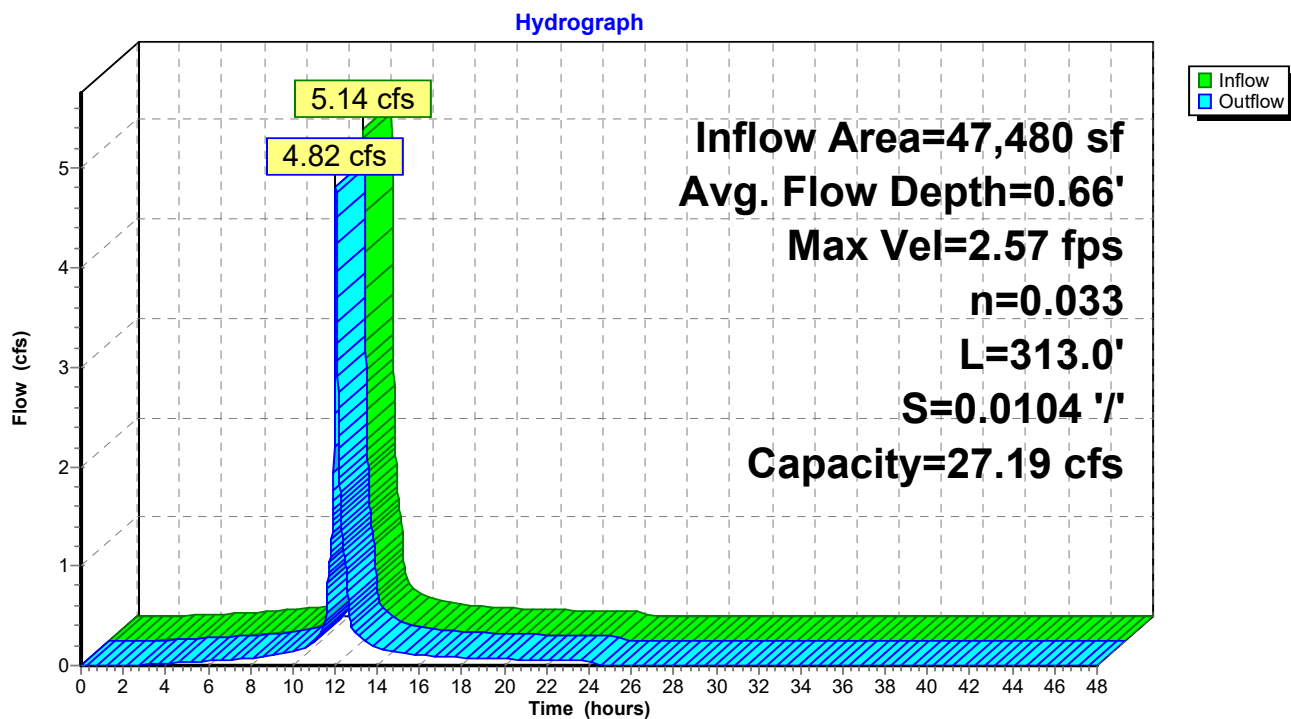
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.57 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 7.2 min

Peak Storage= 586 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 4.15'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

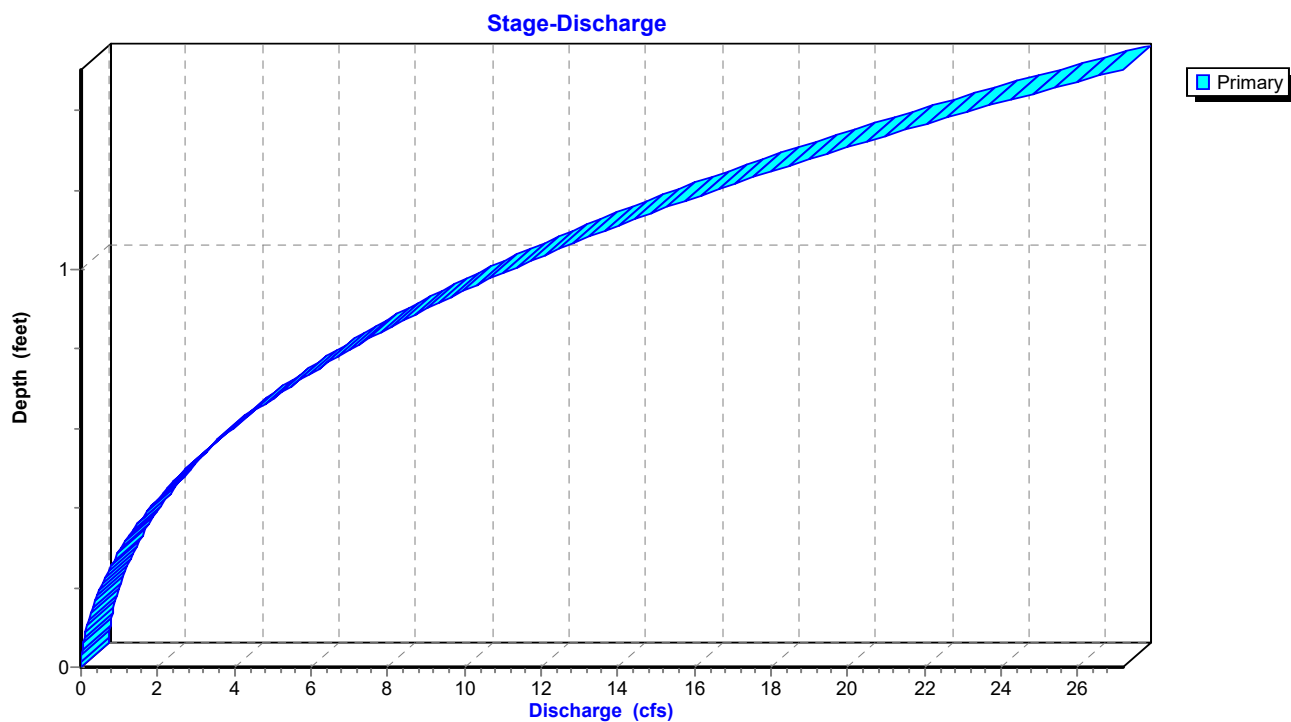
1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 '/'
Inlet Invert= 687.00', Outlet Invert= 683.75'



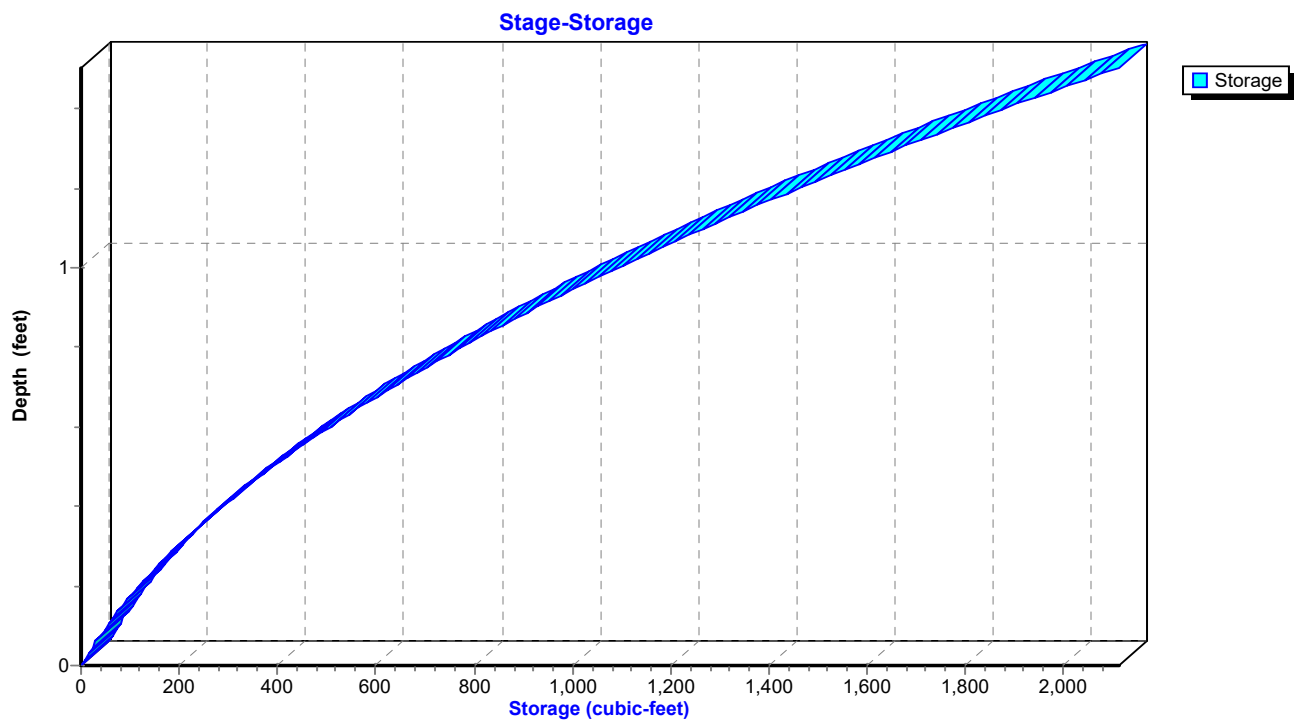
Reach D4C: Ditch 4C



Reach D4C: Ditch 4C



Reach D4C: Ditch 4C



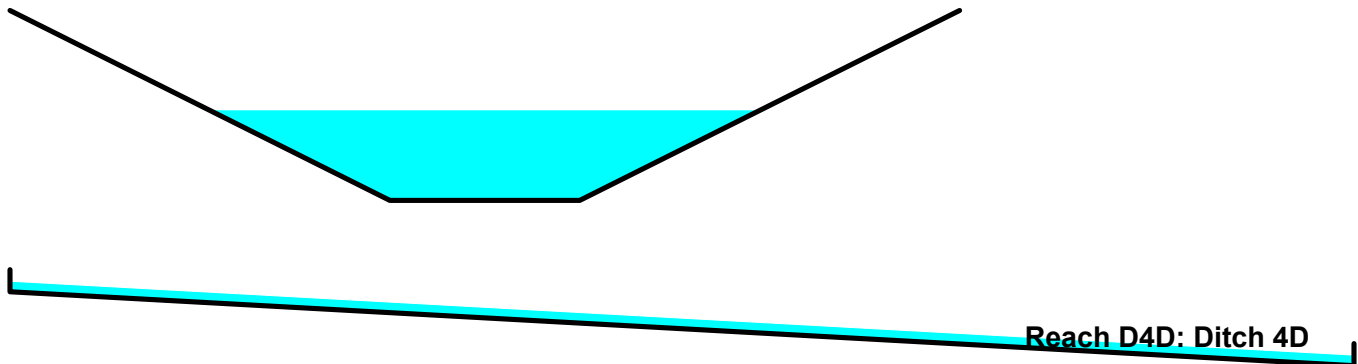
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 3.44" for 2-yr event
Inflow = 6.99 cfs @ 12.03 hrs, Volume= 18,486 cf
Outflow = 6.63 cfs @ 12.04 hrs, Volume= 18,486 cf, Atten= 5%, Lag= 1.1 min
Routed to Pond CD4DCE : Cross Drain 4DCE

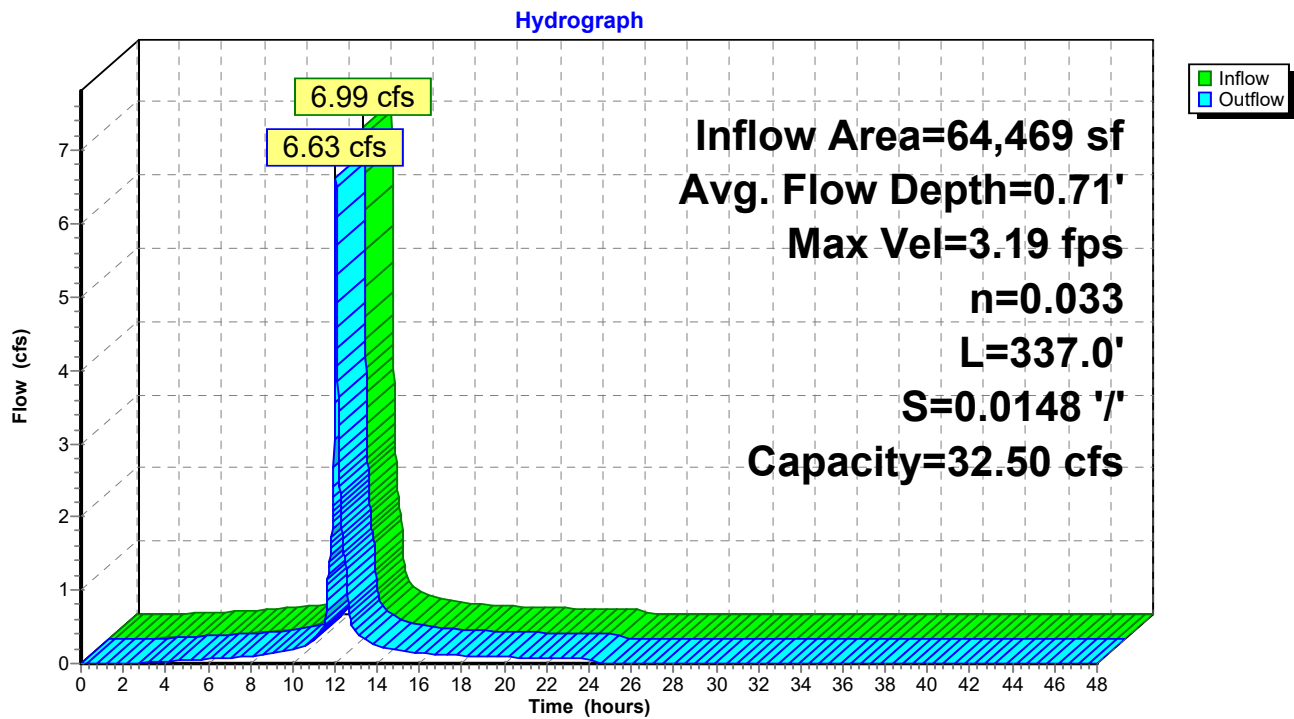
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 6.2 min

Peak Storage= 700 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 4.34'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

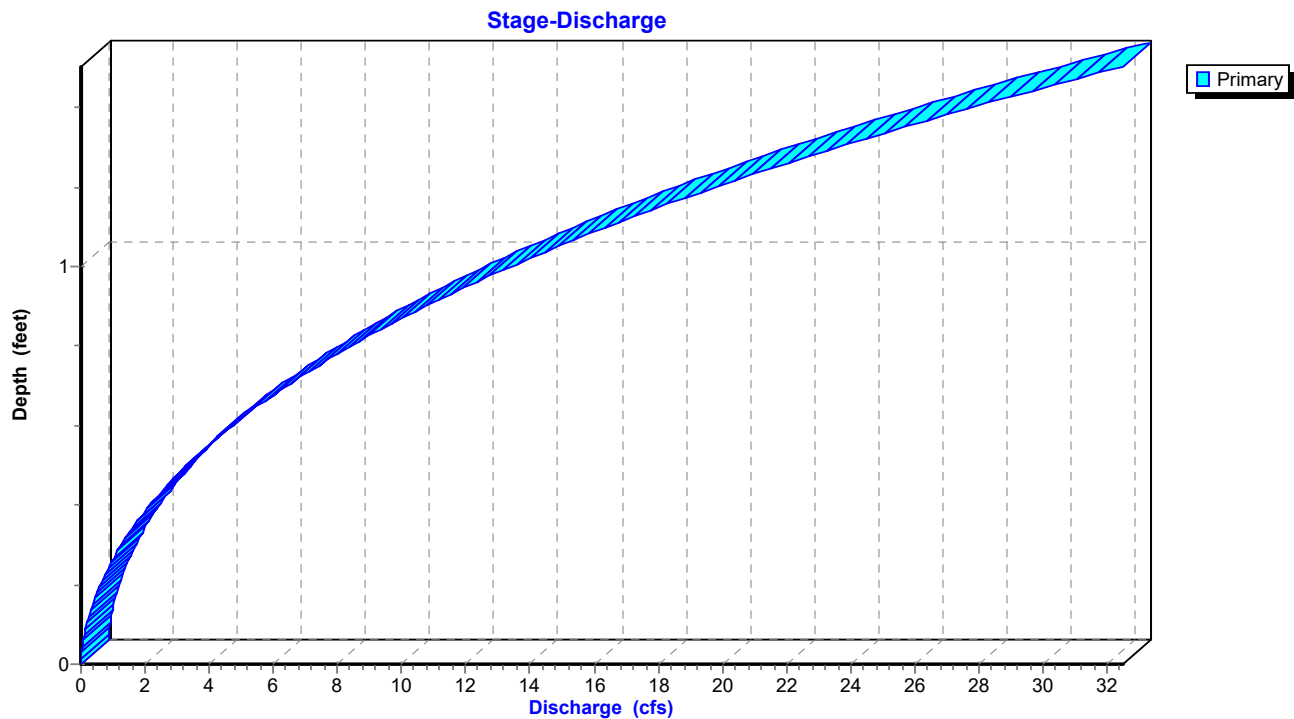
1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



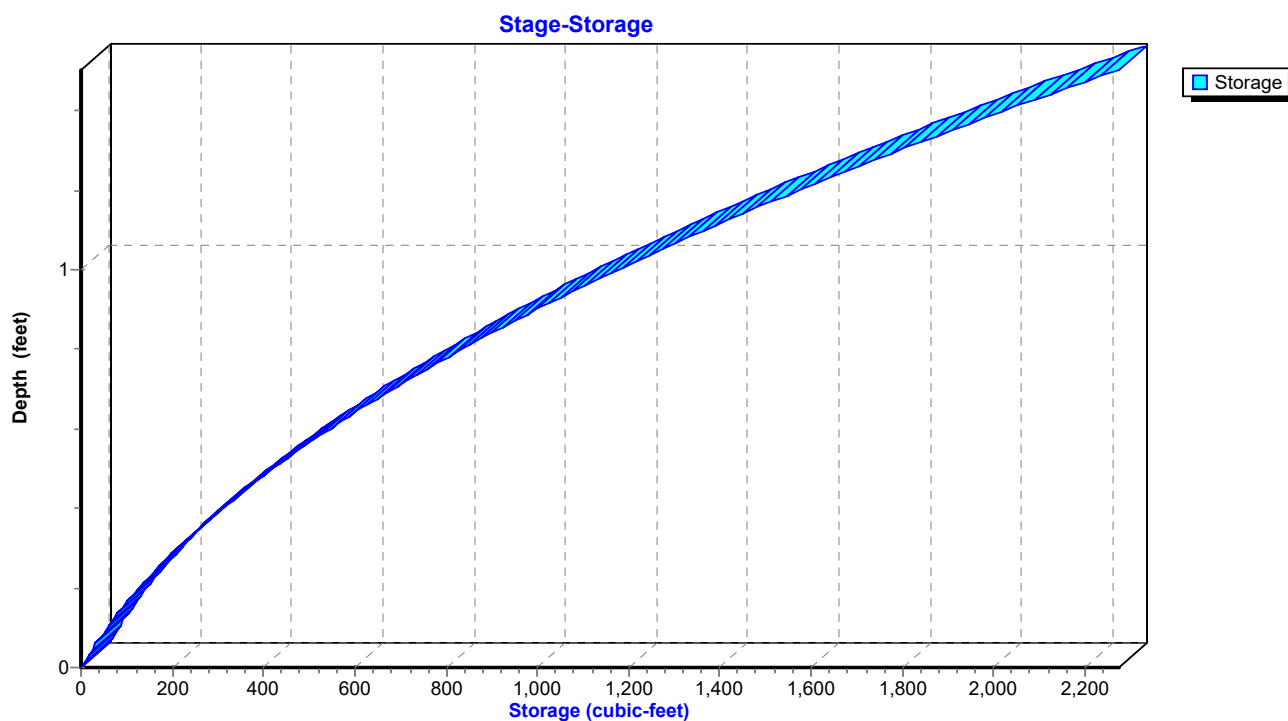
Reach D4D: Ditch 4D



Reach D4D: Ditch 4D



Reach D4D: Ditch 4D



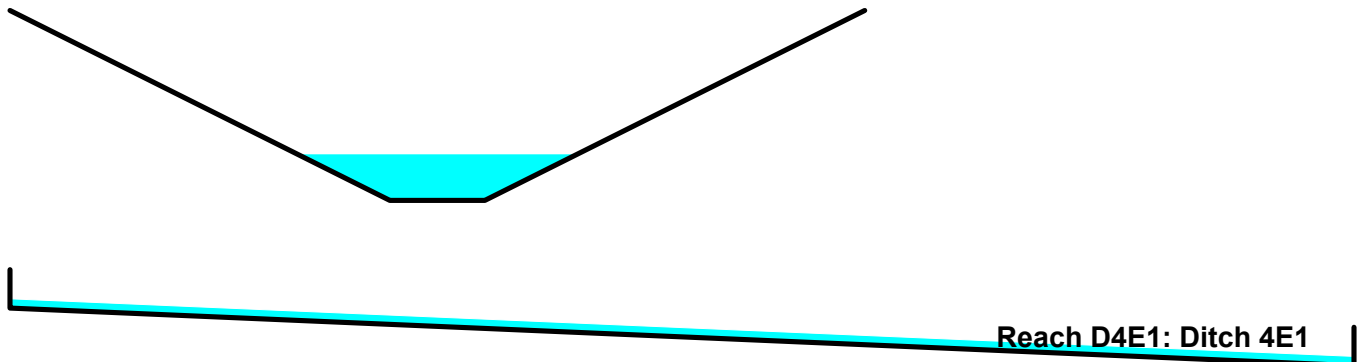
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 0.92" for 2-yr event
Inflow = 4.66 cfs @ 12.40 hrs, Volume= 27,820 cf
Outflow = 4.45 cfs @ 12.49 hrs, Volume= 27,820 cf, Atten= 5%, Lag= 5.4 min
Routed to Pond CD4E : Cross Drain 4E

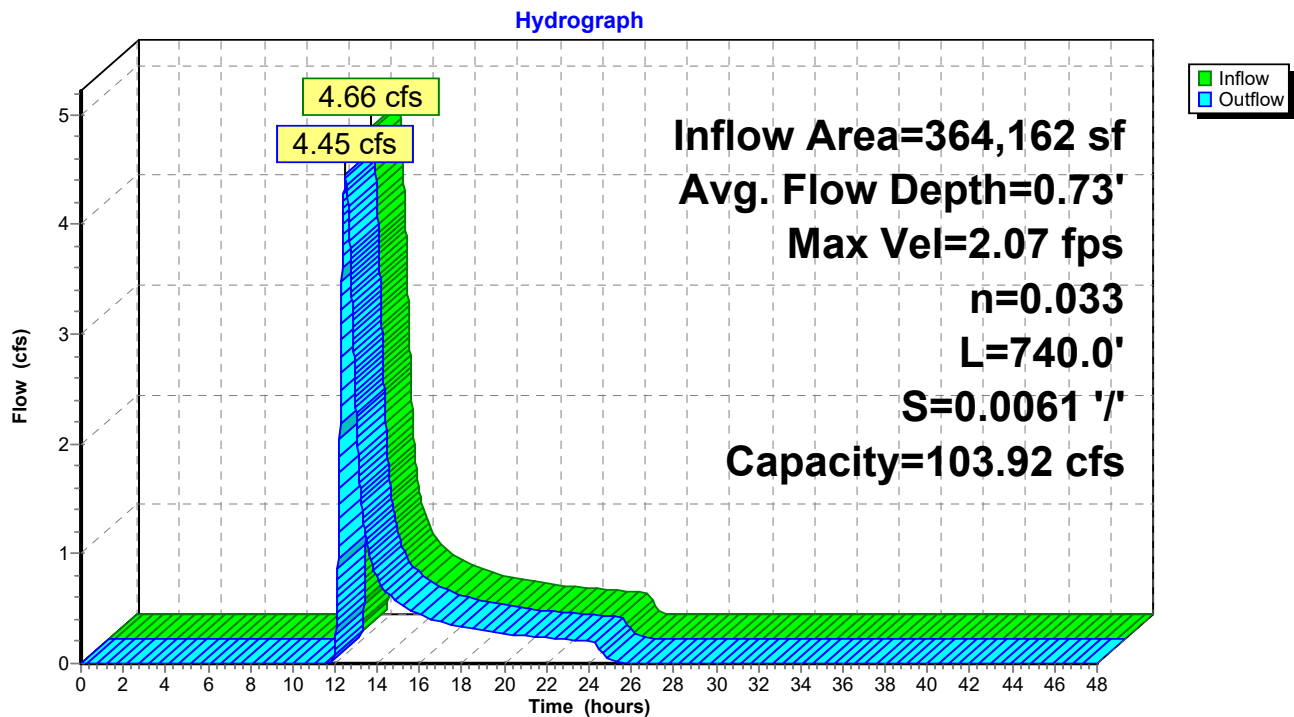
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.07 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 14.2 min

Peak Storage= 1,591 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.73' , Surface Width= 4.41'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

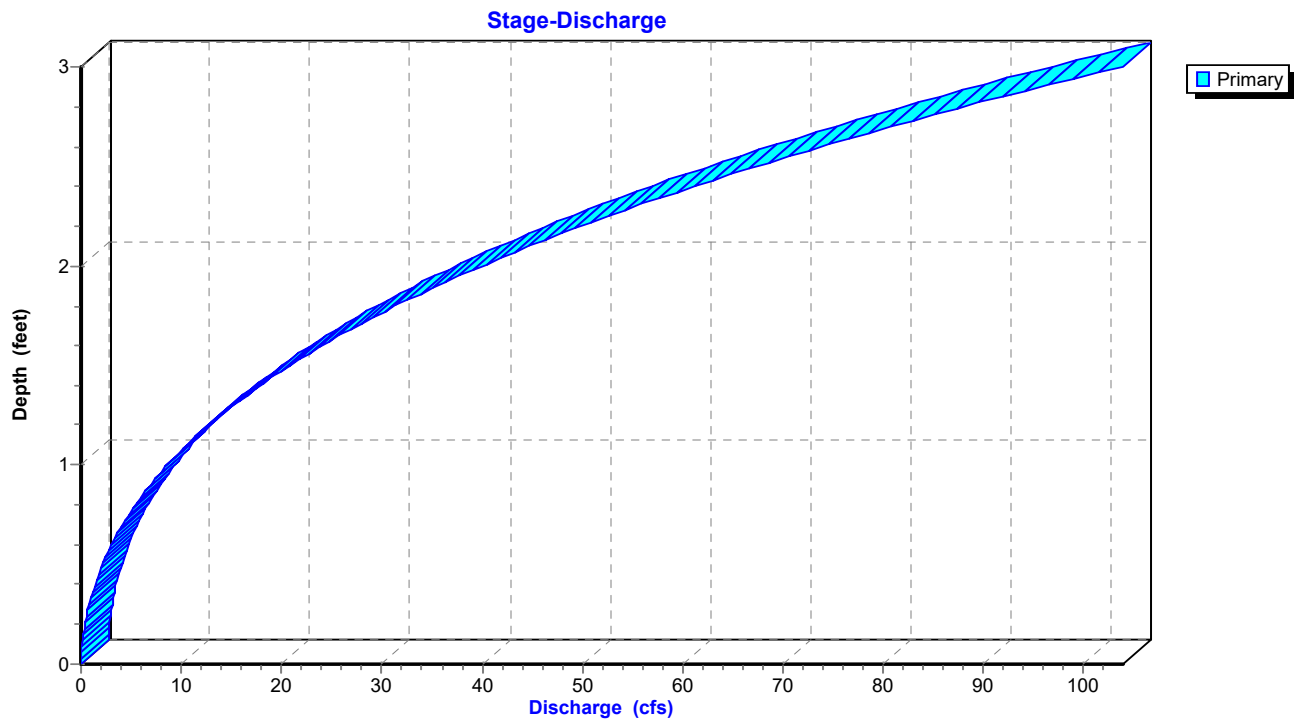
1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 '/'
Inlet Invert= 684.00', Outlet Invert= 679.50'

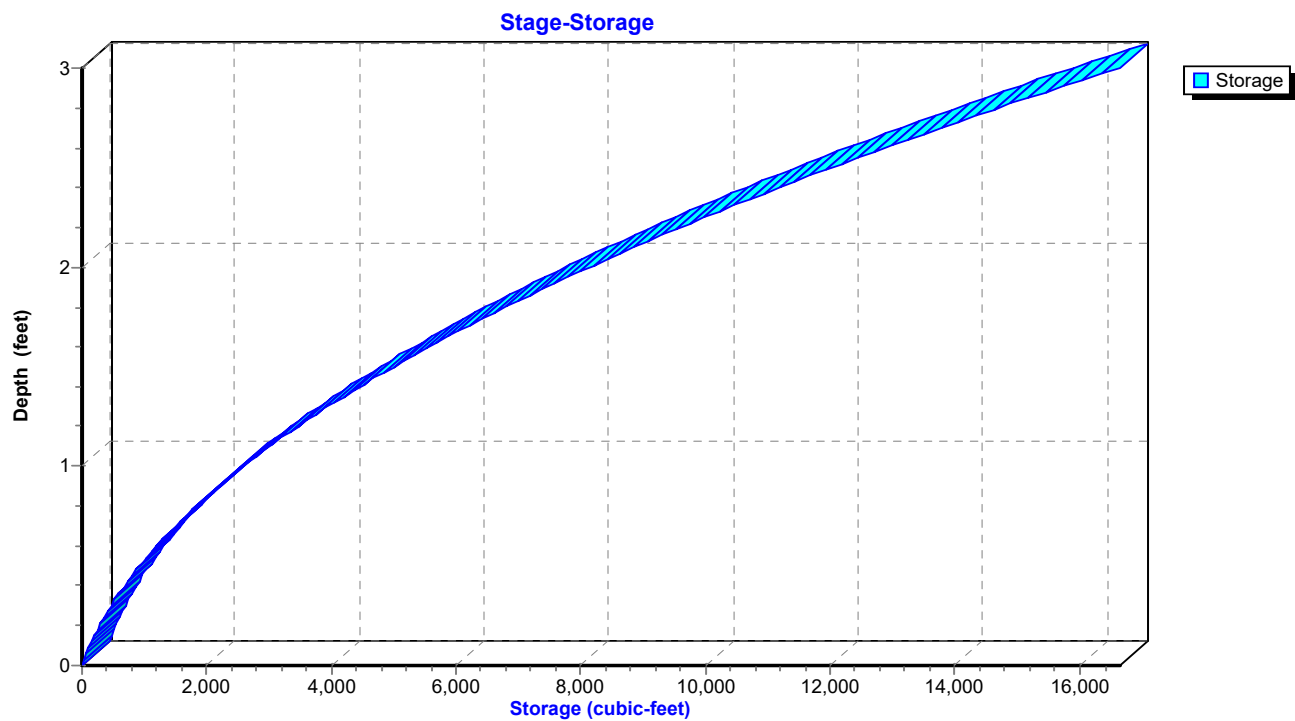


Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1

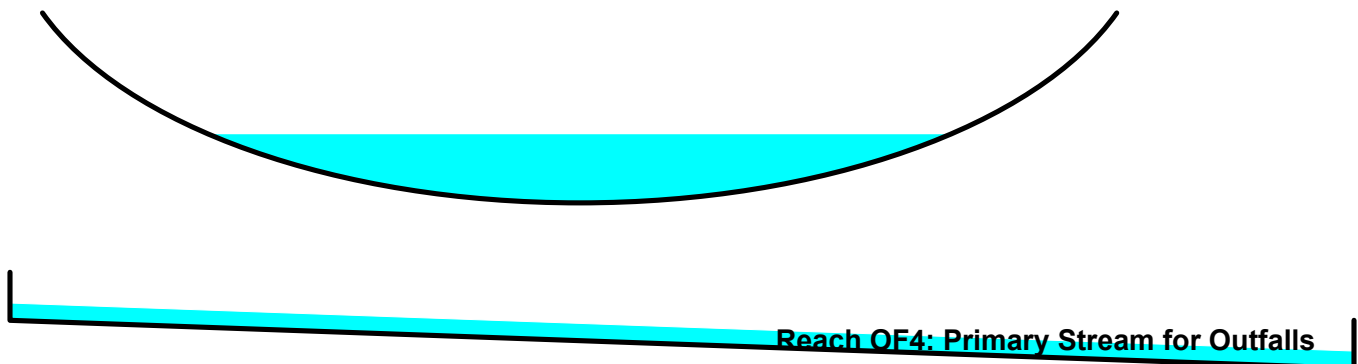
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 1.41" for 2-yr event
Inflow = 72.15 cfs @ 13.67 hrs, Volume= 1,167,806 cf
Outflow = 72.08 cfs @ 13.83 hrs, Volume= 1,167,806 cf, Atten= 0%, Lag= 9.4 min

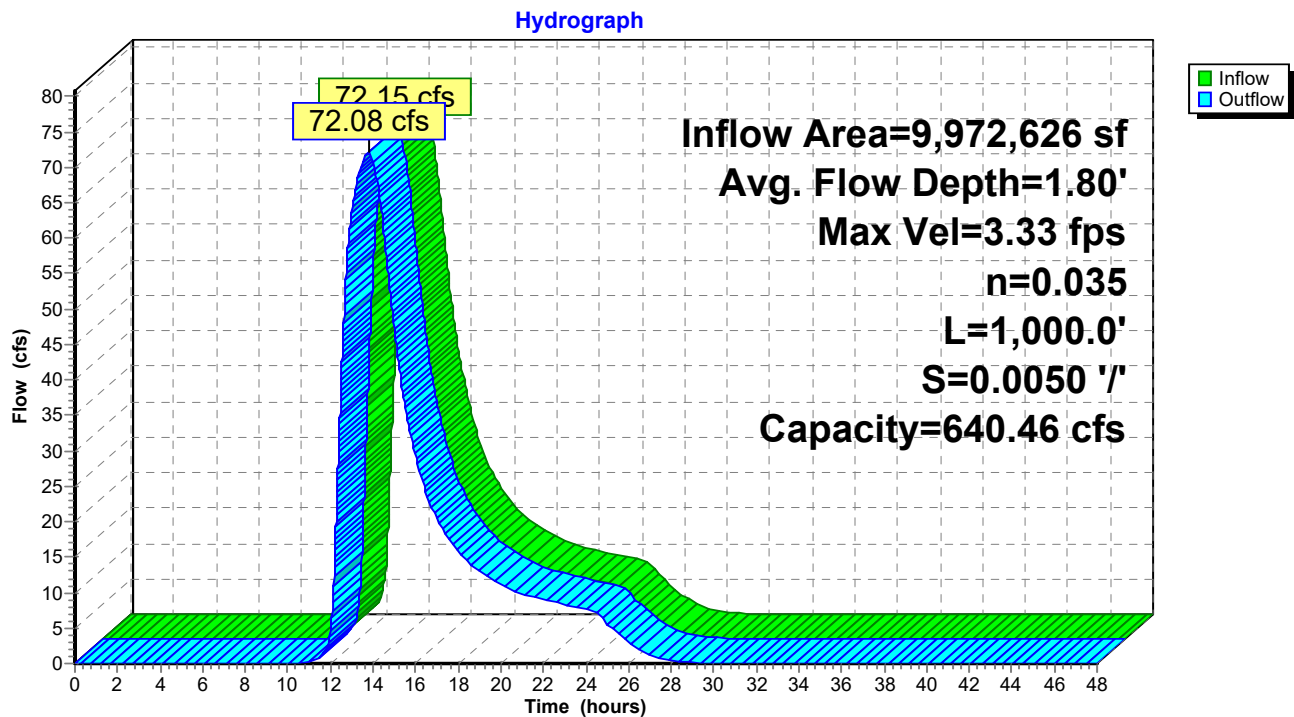
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 12.3 min

Peak Storage= 21,620 cf @ 13.83 hrs
Average Depth at Peak Storage= 1.80' , Surface Width= 18.01'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

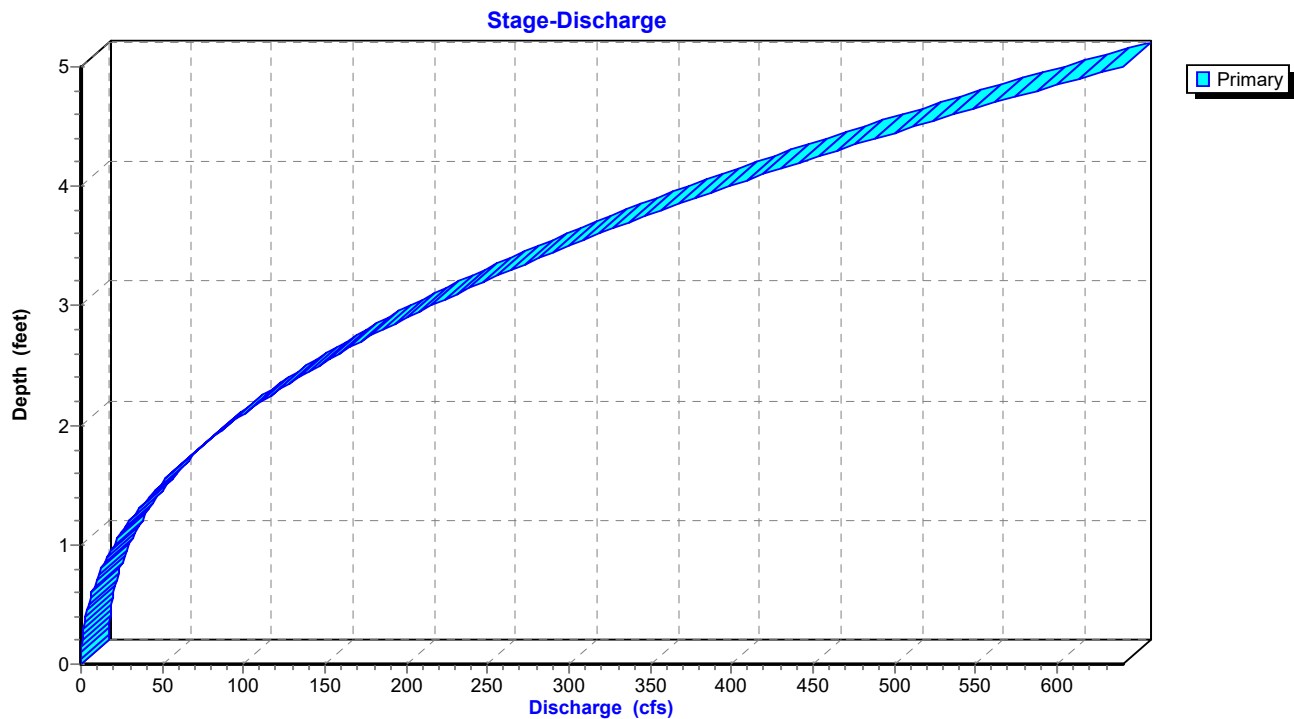
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

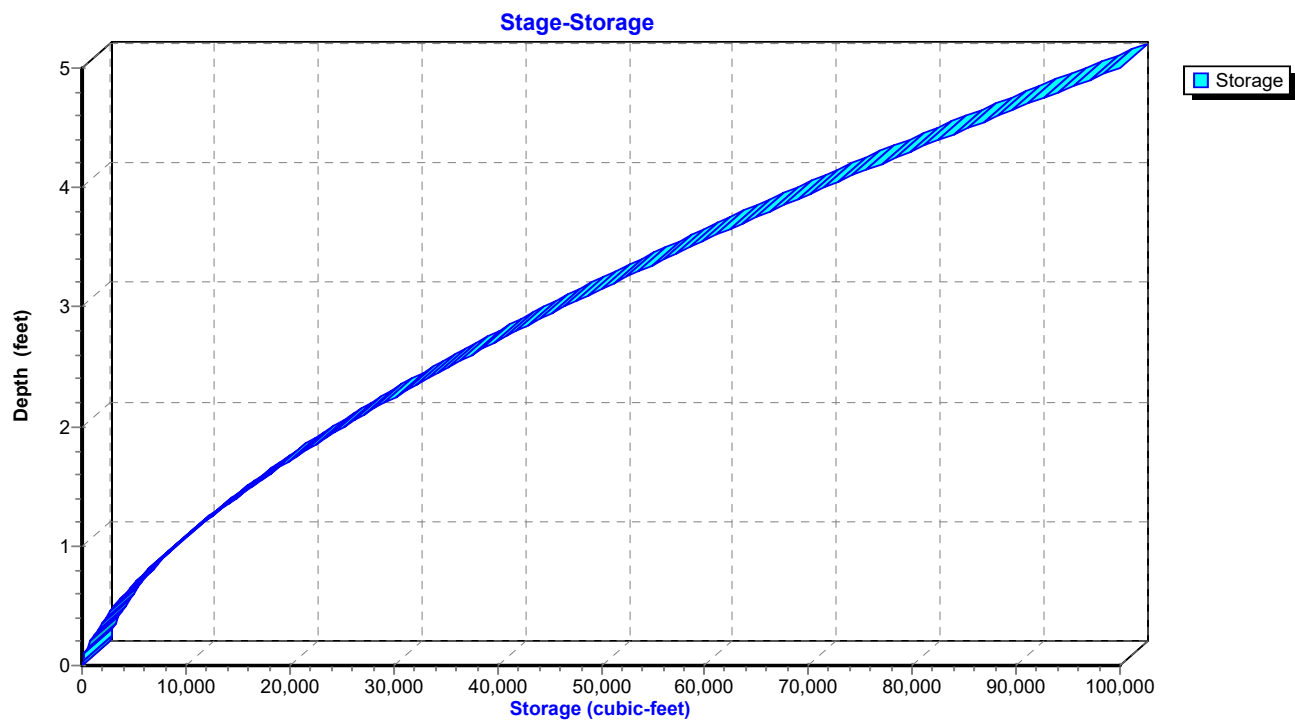


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

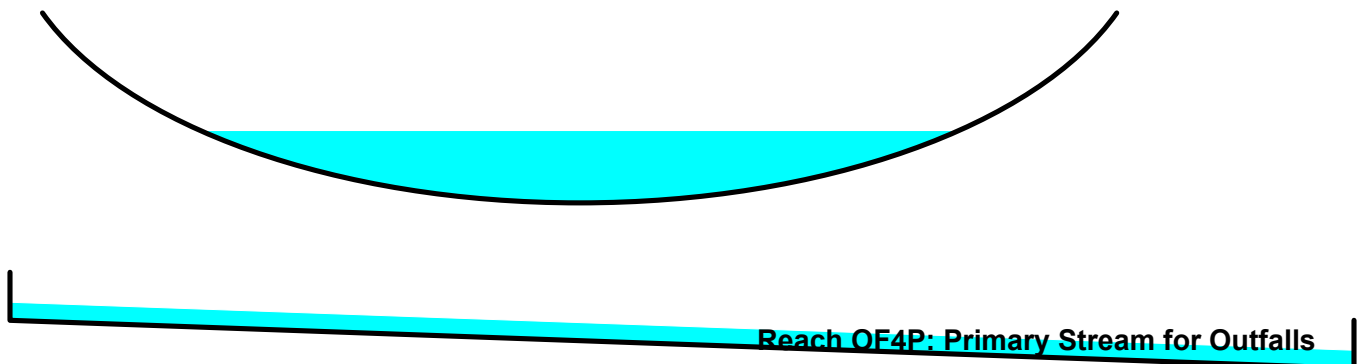
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 1.53" for 2-yr event
Inflow = 79.87 cfs @ 13.51 hrs, Volume= 1,252,289 cf
Outflow = 79.63 cfs @ 13.57 hrs, Volume= 1,252,286 cf, Atten= 0%, Lag= 3.6 min

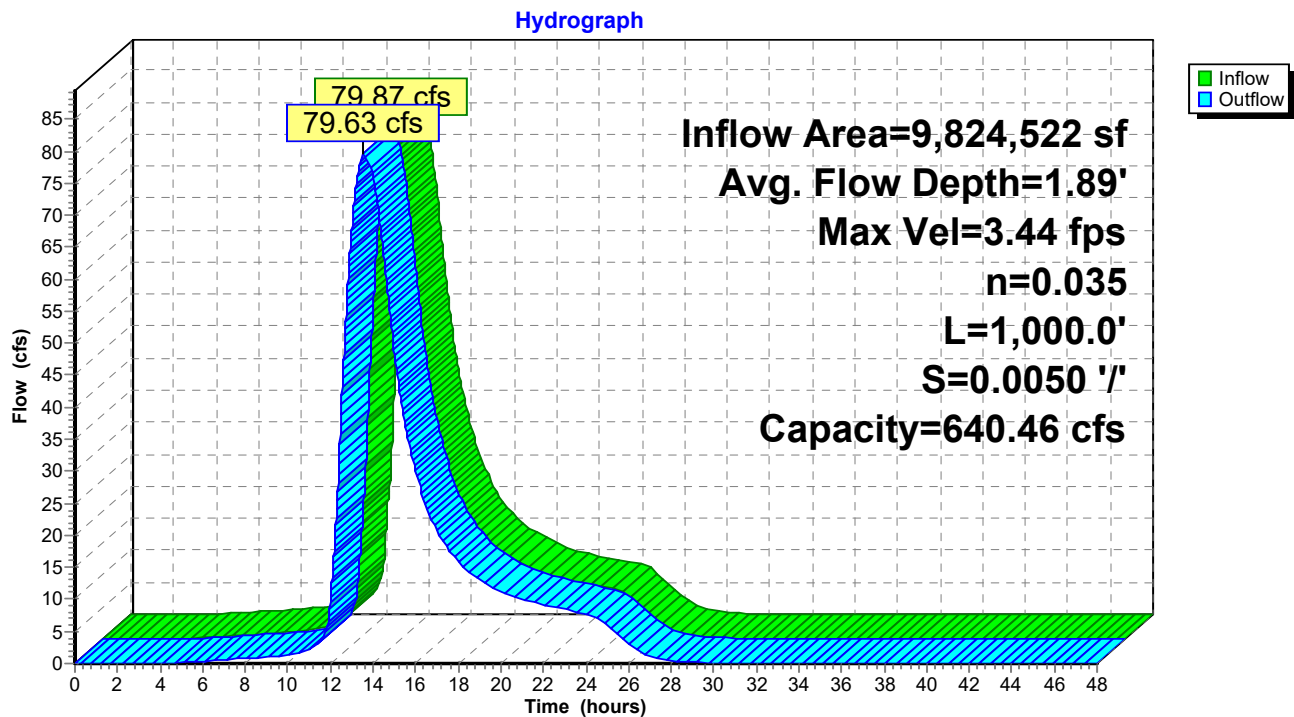
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.44 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 15.9 min

Peak Storage= 23,174 cf @ 13.57 hrs
Average Depth at Peak Storage= 1.89' , Surface Width= 18.43'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

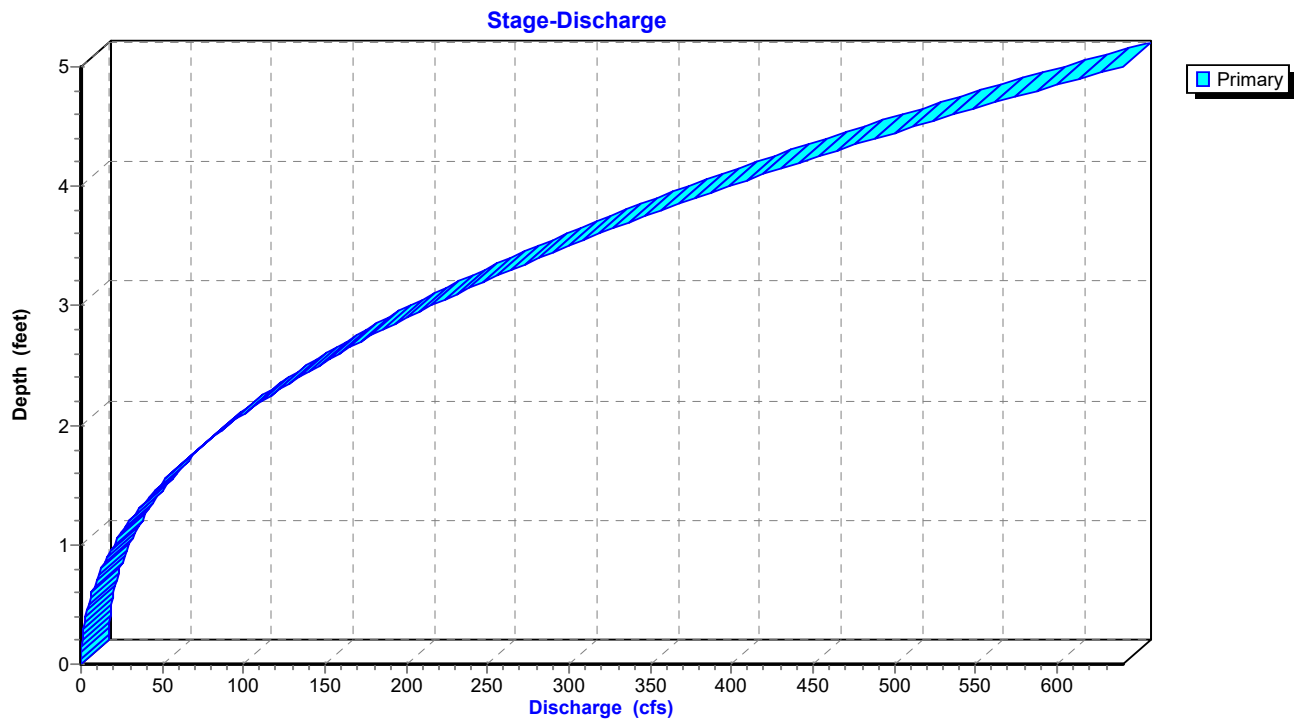
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

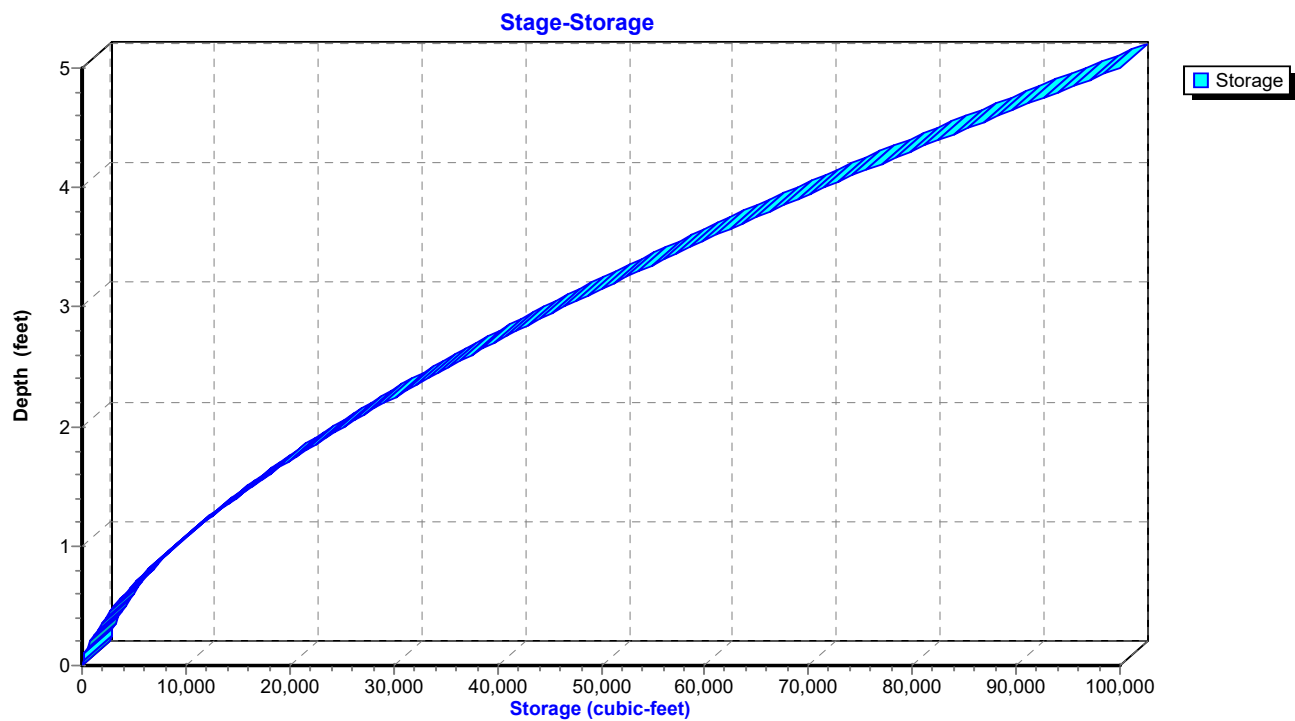


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 0.81" for 2-yr event
 Inflow = 11.06 cfs @ 12.95 hrs, Volume= 102,914 cf
 Outflow = 11.06 cfs @ 12.95 hrs, Volume= 102,914 cf, Atten= 0%, Lag= 0.0 min
 Primary = 11.06 cfs @ 12.95 hrs, Volume= 102,914 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.73' @ 12.95 hrs

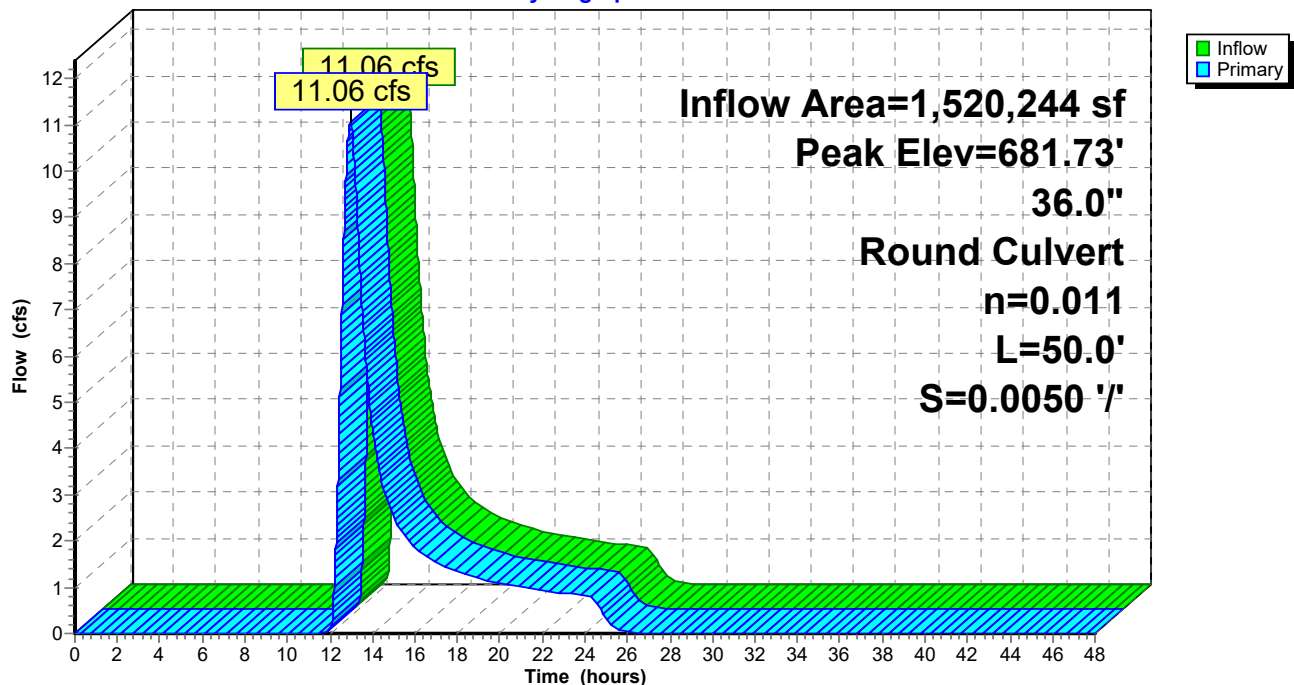
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

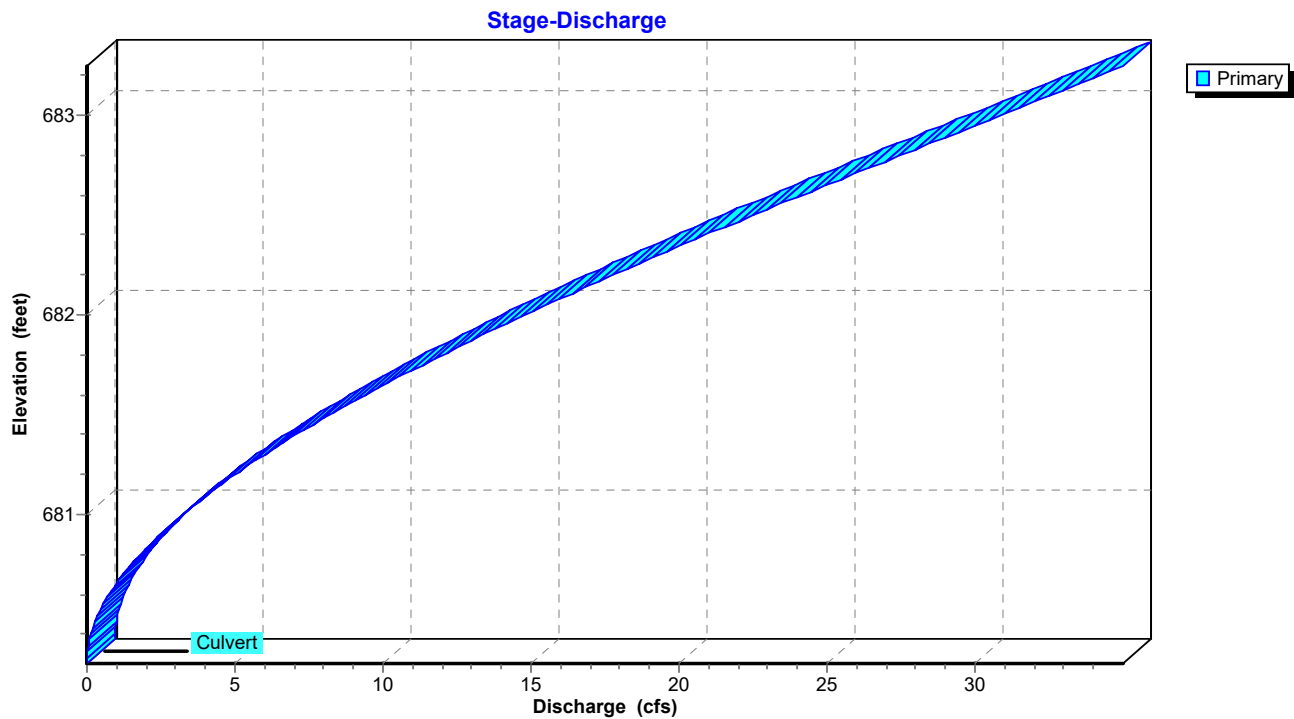
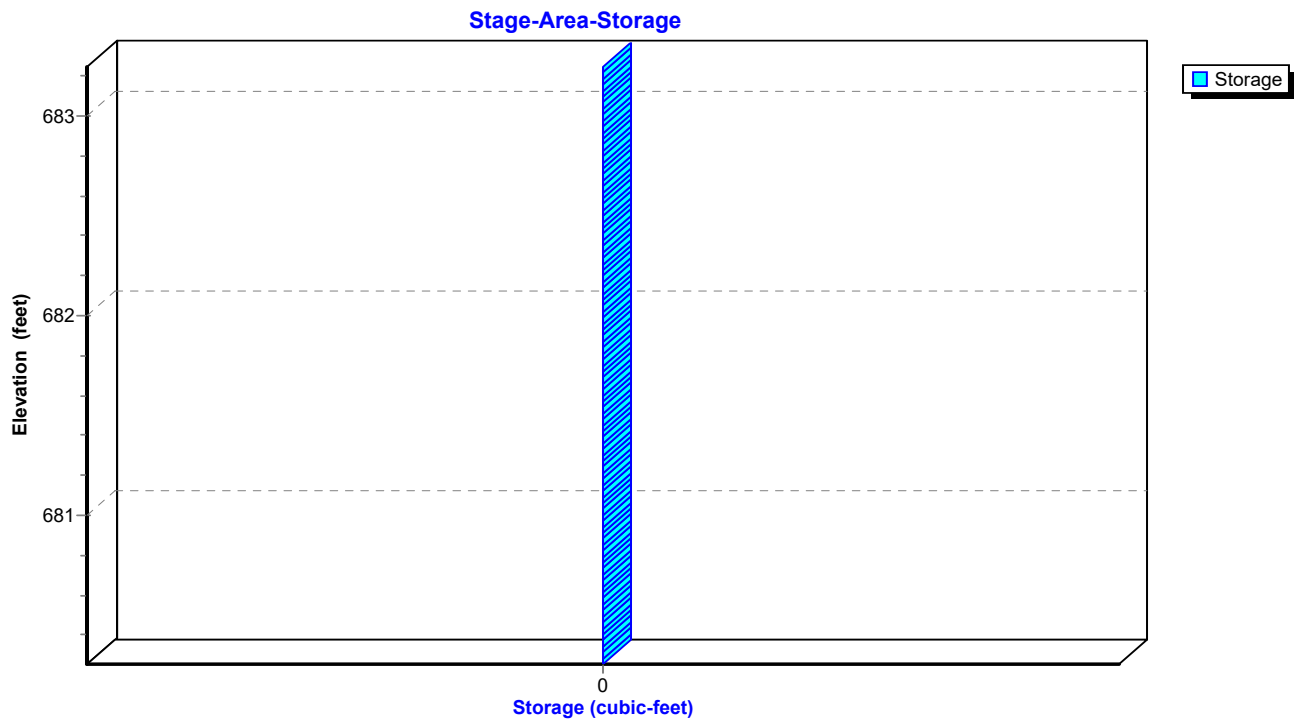
Primary OutFlow Max=11.06 cfs @ 12.95 hrs HW=681.73' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 11.06 cfs @ 4.65 fps)

~~Culvert CD2: Cross Drain~~

Pond CD2: Cross Drain

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

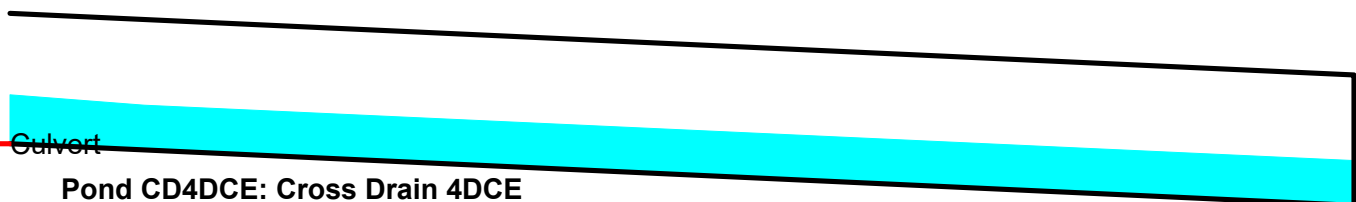
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 1.32" for 2-yr event
 Inflow = 18.01 cfs @ 12.54 hrs, Volume= 135,848 cf
 Outflow = 18.01 cfs @ 12.54 hrs, Volume= 135,848 cf, Atten= 0%, Lag= 0.0 min
 Primary = 18.01 cfs @ 12.54 hrs, Volume= 135,848 cf
 Routed to Pond POND1P : PROP POND

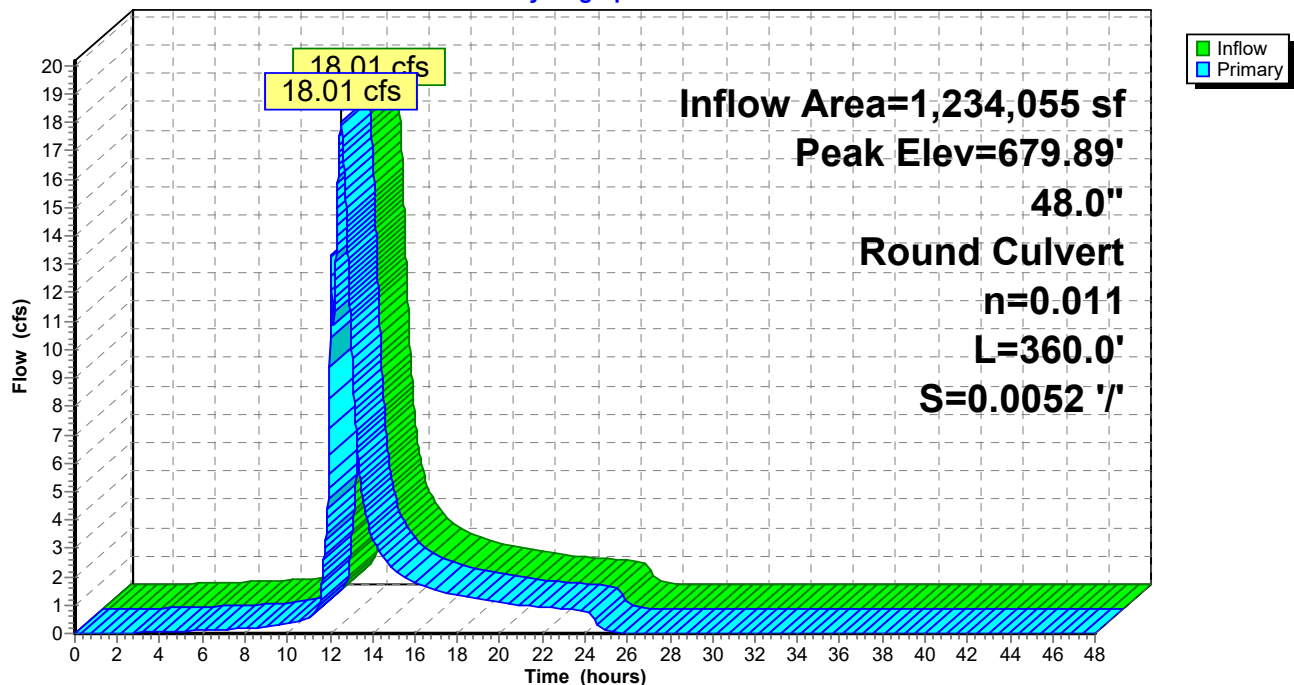
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 679.89' @ 12.54 hrs

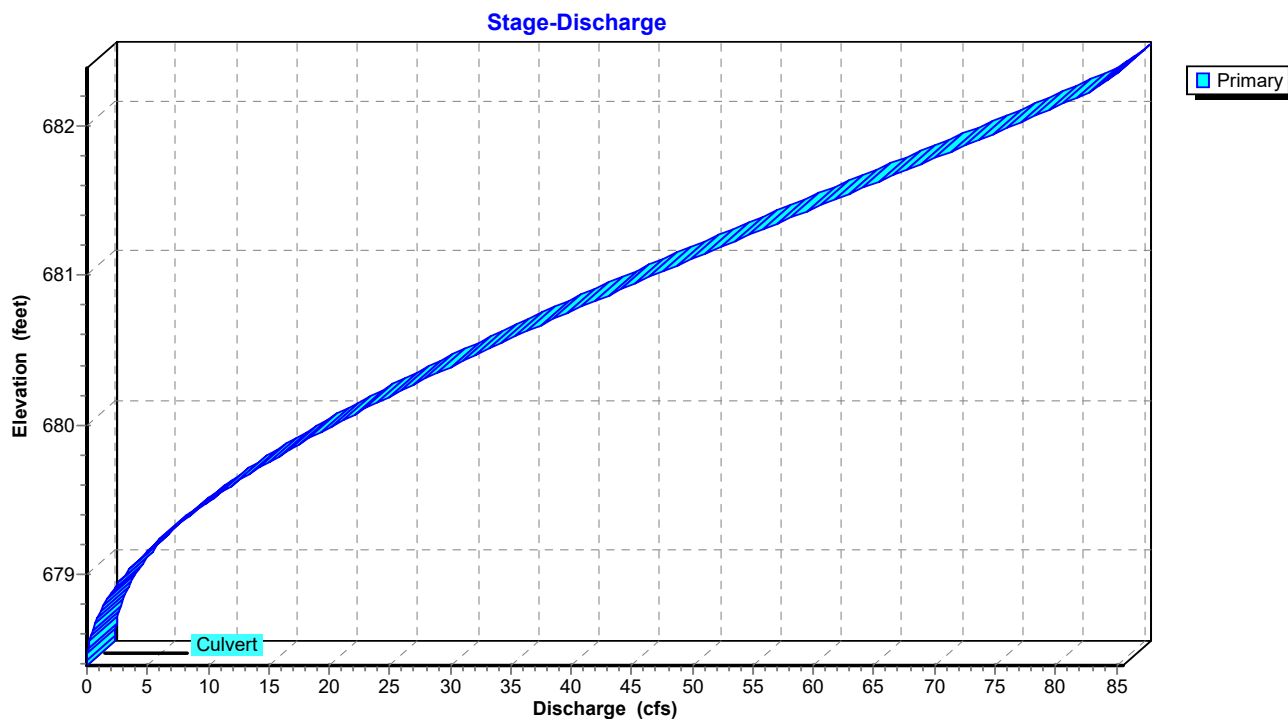
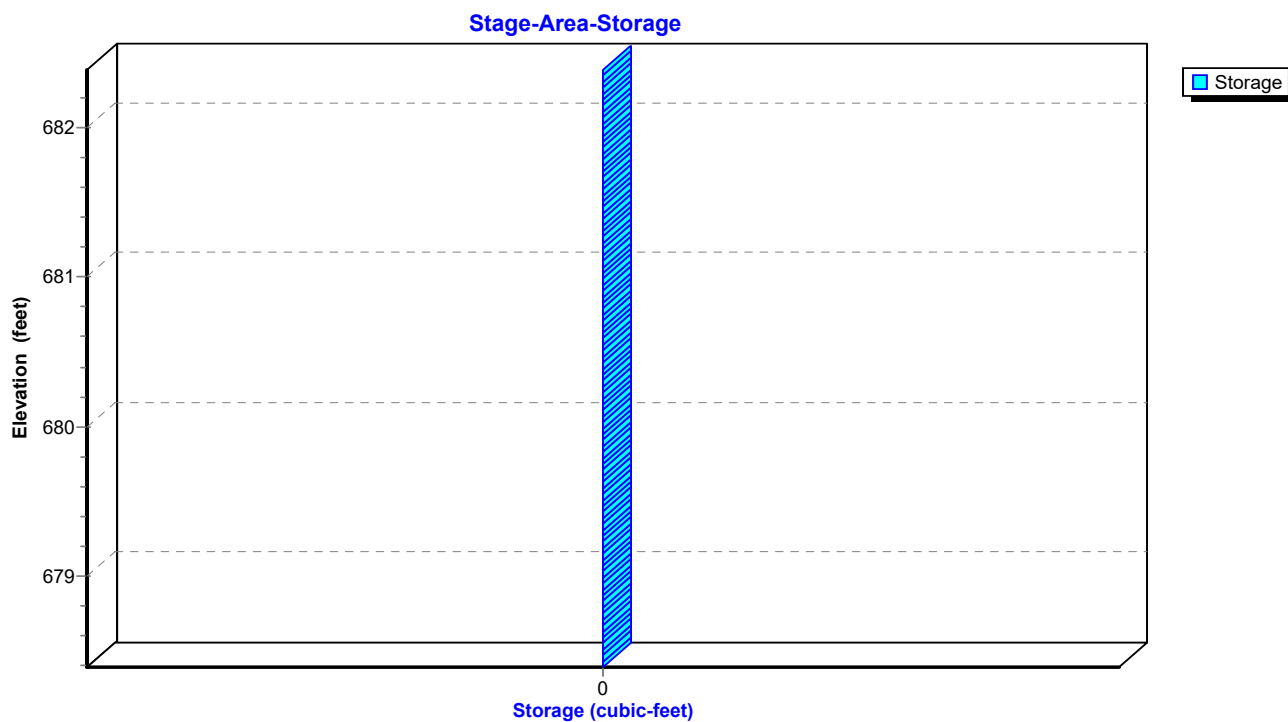
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=18.00 cfs @ 12.54 hrs HW=679.89' (Free Discharge)
 ↑ **1=Culvert** (Inlet Controls 18.00 cfs @ 4.17 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

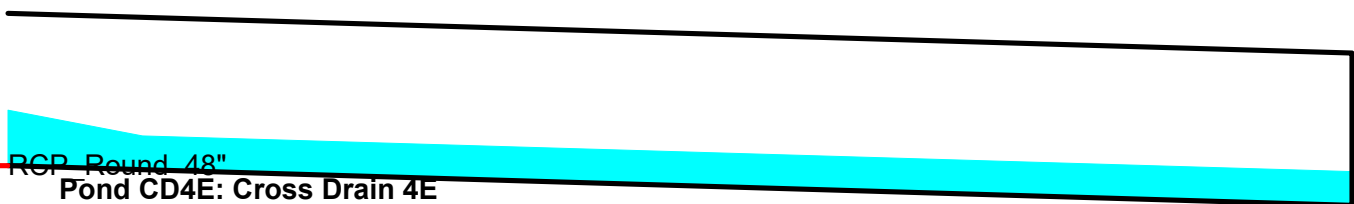
Summary for Pond CD4E: Cross Drain 4E

Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 1.11" for 2-yr event
 Inflow = 15.82 cfs @ 12.56 hrs, Volume= 103,746 cf
 Outflow = 15.82 cfs @ 12.56 hrs, Volume= 103,746 cf, Atten= 0%, Lag= 0.0 min
 Primary = 15.82 cfs @ 12.56 hrs, Volume= 103,746 cf
 Routed to Pond CD4DCE : Cross Drain 4DCE

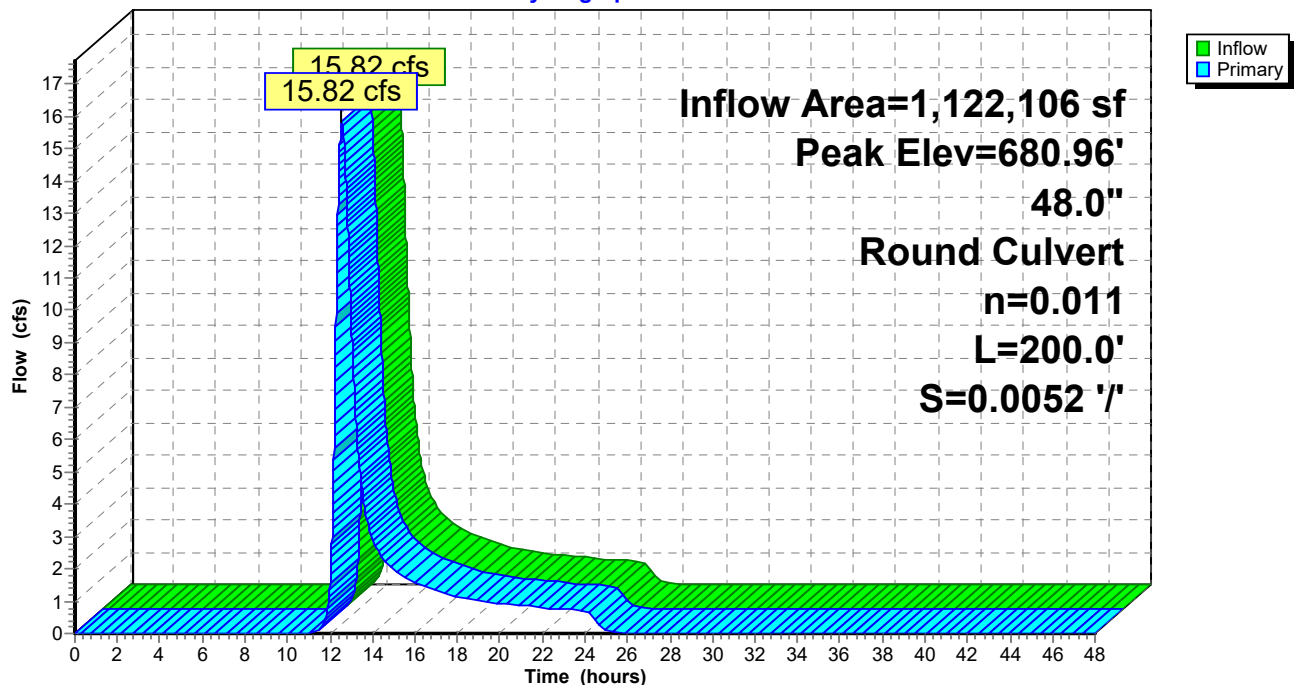
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 680.96' @ 12.56 hrs

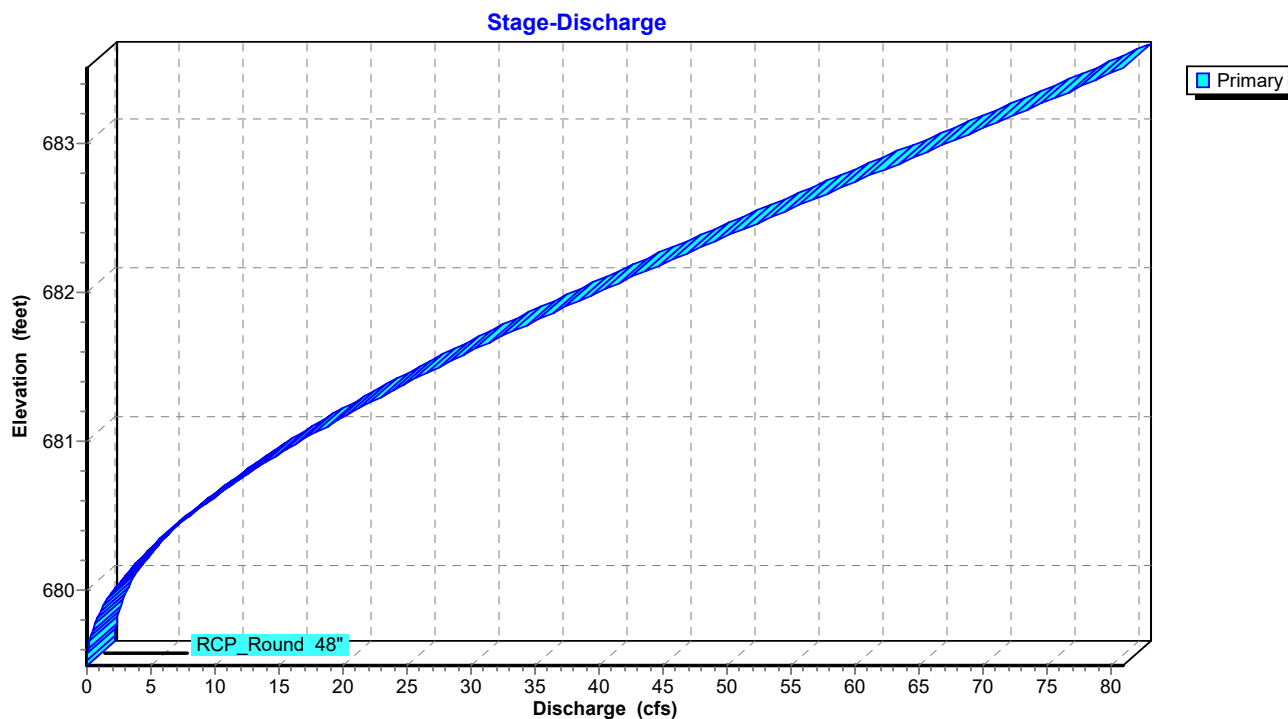
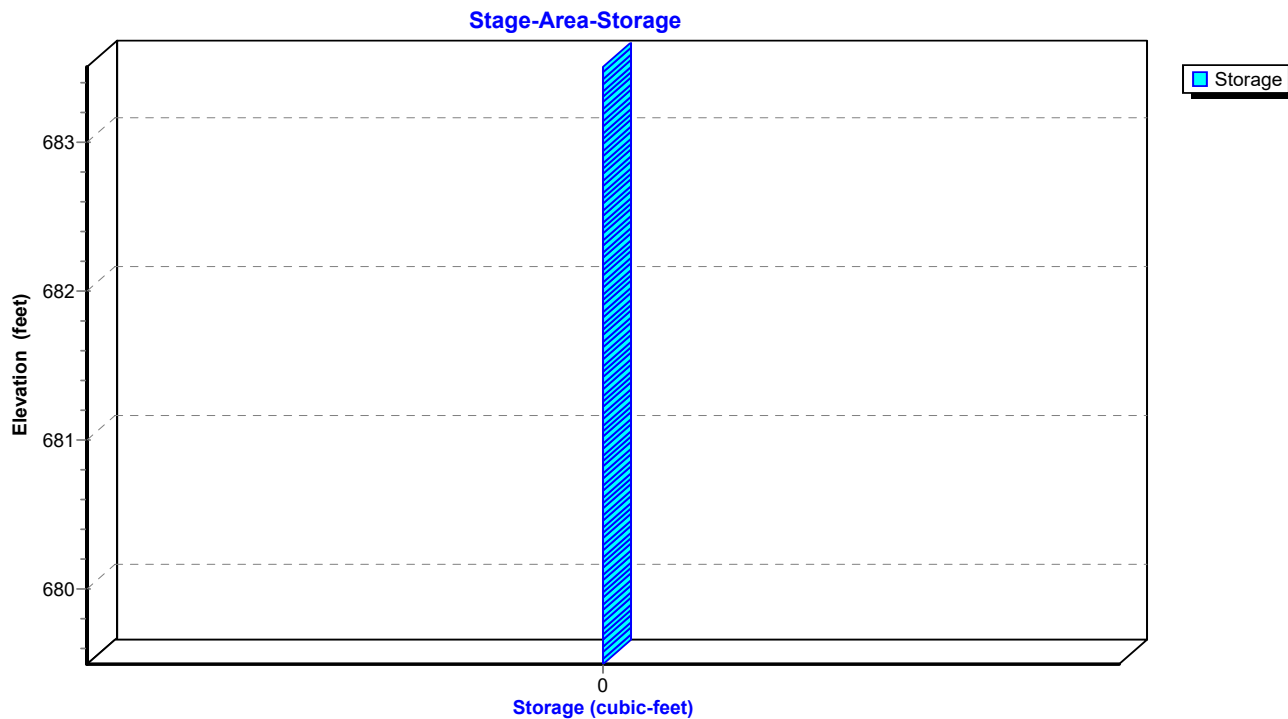
Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=15.82 cfs @ 12.56 hrs HW=680.96' (Free Discharge)
 ↳ **1=RCP_Round 48"** (Barrel Controls 15.82 cfs @ 5.68 fps)

**Pond CD4E: Cross Drain 4E**

Hydrograph



Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 1.96" for 2-yr event
 Inflow = 43.04 cfs @ 12.44 hrs, Volume= 288,362 cf
 Outflow = 27.73 cfs @ 12.82 hrs, Volume= 287,796 cf, Atten= 36%, Lag= 22.8 min
 Primary = 27.73 cfs @ 12.82 hrs, Volume= 287,796 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 679.29' @ 12.82 hrs Surf.Area= 31,893 sf Storage= 57,560 cf

Plug-Flow detention time= 39.1 min calculated for 287,736 cf (100% of inflow)
 Center-of-Mass det. time= 38.0 min (871.7 - 833.8)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

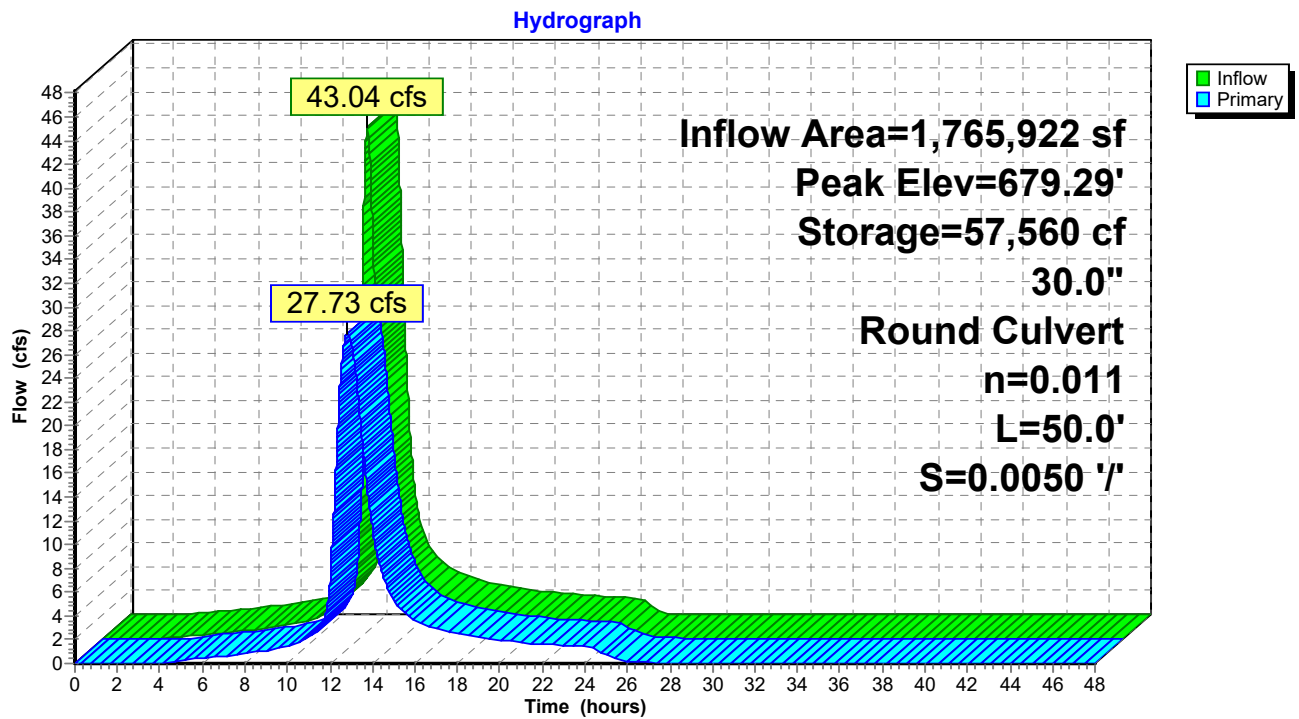
Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

Primary OutFlow Max=27.73 cfs @ 12.82 hrs HW=679.29' (Free Discharge)
 ↑1=Culvert (Barrel Controls 27.73 cfs @ 5.91 fps)

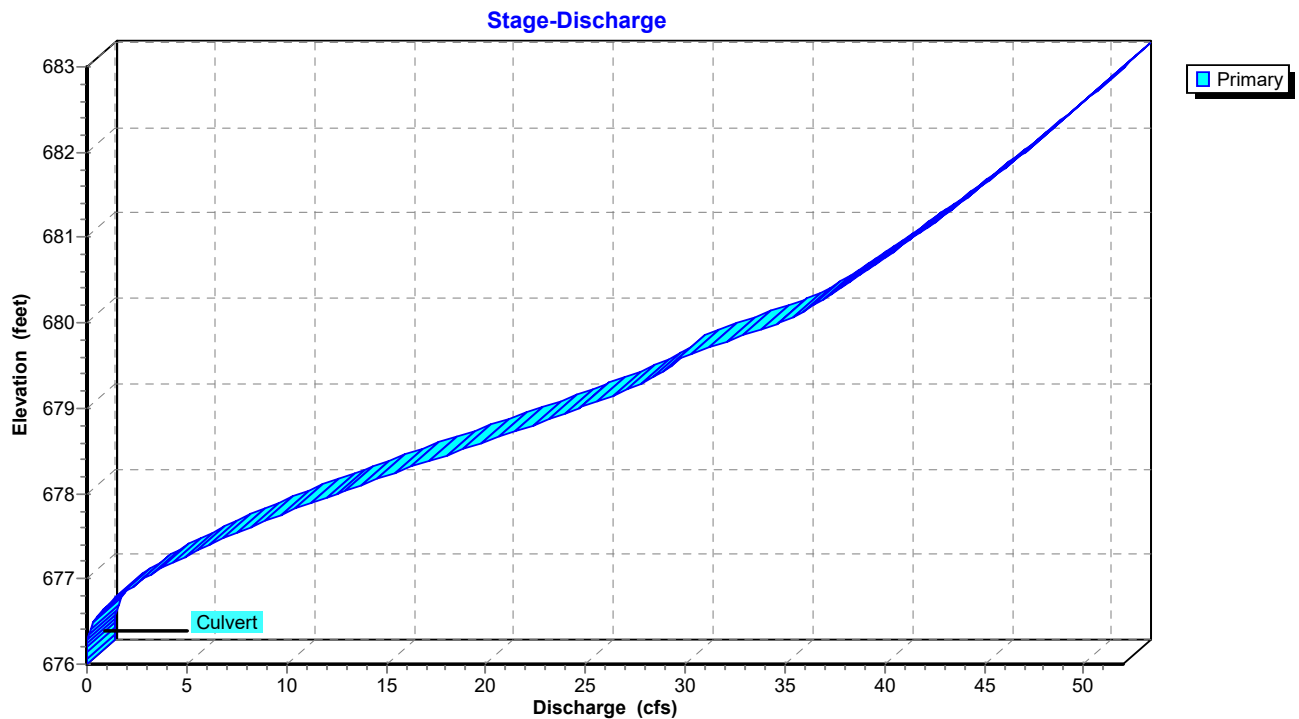
Pond POND1P: PROP POND

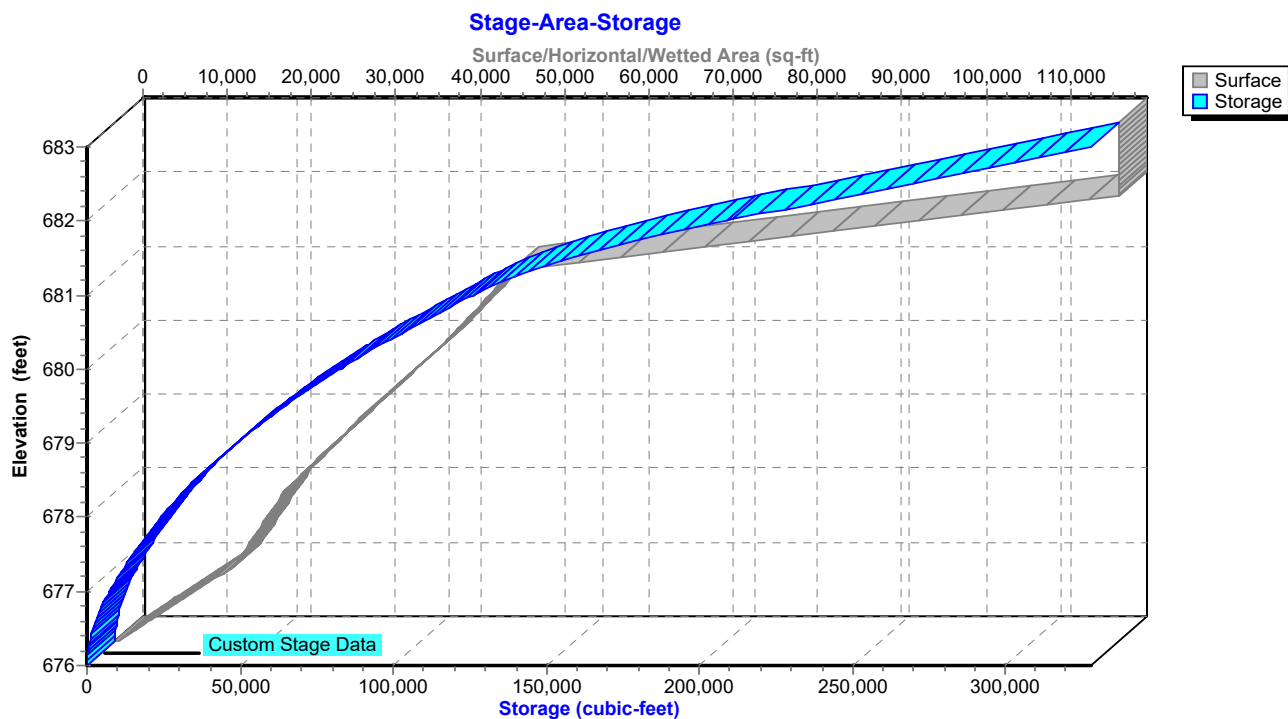
Culvert

Pond POND1P: PROP POND



Pond POND1P: PROP POND



Pond POND1P: PROP POND

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=2.25"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=85.33 cfs 1,166,980 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=1.29"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=19.26 cfs 162,997 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=2.01"
 Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=15.67 cfs 69,509 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=1.85"
 Flow Length=1,500' Tc=50.3 min CN=70 Runoff=39.97 cfs 279,135 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=2.25"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=85.33 cfs 1,166,980 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=1.29"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=19.26 cfs 162,997 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=2.59"
 Tc=5.0 min CN=79 Runoff=7.85 cfs 20,008 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=1.70"
 Flow Length=300' Tc=28.4 min CN=68 Runoff=5.74 cfs 30,738 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=4.28"
 Flow Length=1,000' Tc=33.8 min CN=96 Runoff=31.91 cfs 189,884 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=4.28"
 Tc=5.0 min CN=96 Runoff=6.12 cfs 16,951 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=4.28"
 Tc=5.0 min CN=96 Runoff=8.30 cfs 23,016 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=1.42"
 Flow Length=500' Tc=28.1 min CN=64 Runoff=7.79 cfs 43,111 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=1.78"
 Flow Length=1,000' Tc=41.1 min CN=69 Runoff=17.74 cfs 112,284 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.41' Max Vel=14.61 fps Inflow=5.77 cfs 16,951 cf
 18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=5.77 cfs 16,951 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.72' Max Vel=2.70 fps Inflow=6.12 cfs 16,951 cf
 n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=5.77 cfs 16,951 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.78' Max Vel=3.35 fps Inflow=8.30 cfs 23,016 cf
 n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=7.93 cfs 23,016 cf

TrueRail*Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"*

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Reach D4E1: Ditch 4E1 Avg. Flow Depth=0.94' Max Vel=2.37 fps Inflow=7.79 cfs 43,111 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=7.52 cfs 43,111 cf

Reach OF4: Primary Stream for Avg. Flow Depth=2.16' Max Vel=3.75 fps Inflow=106.39 cfs 1,678,621 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=106.20 cfs 1,678,621 cf

Reach OF4P: Primary Stream for Avg. Flow Depth=2.27' Max Vel=3.87 fps Inflow=118.61 cfs 1,765,403 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=118.35 cfs 1,765,401 cf

Pond CD2: Cross Drain Peak Elev=682.30' Inflow=19.26 cfs 162,997 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=19.26 cfs 162,997 cf

Pond CD4DCE: Cross Drain 4DCE Peak Elev=680.31' Inflow=27.84 cfs 195,363 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=27.84 cfs 195,363 cf

Pond CD4E: Cross Drain 4E Peak Elev=681.39' Inflow=24.90 cfs 155,395 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=24.90 cfs 155,395 cf

Pond POND1P: PROP POND Peak Elev=680.04' Storage=84,175 cf Inflow=58.83 cfs 385,246 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=35.13 cfs 384,680 cf

Total Runoff Area = 19,797,149 sf Runoff Volume = 3,444,590 cf Average Runoff Depth = 2.09"
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 85.33 cfs @ 13.83 hrs, Volume= 1,166,980 cf, Depth= 2.25"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

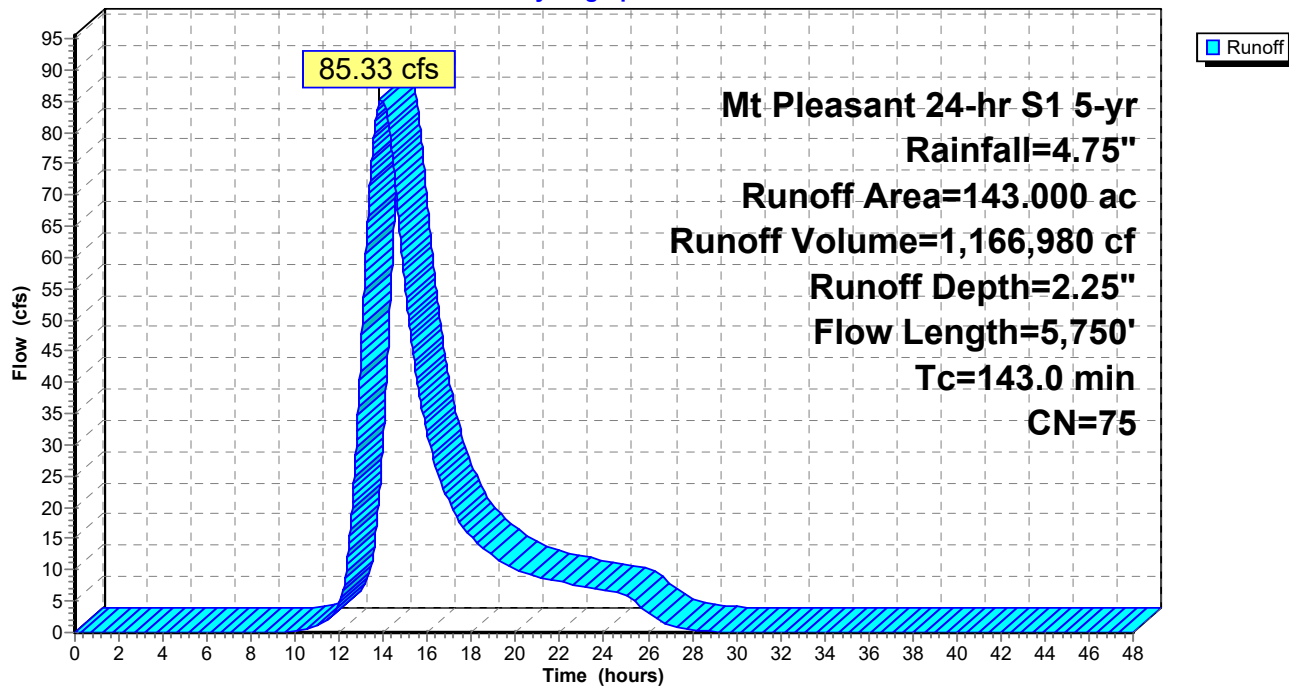
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Hydrograph



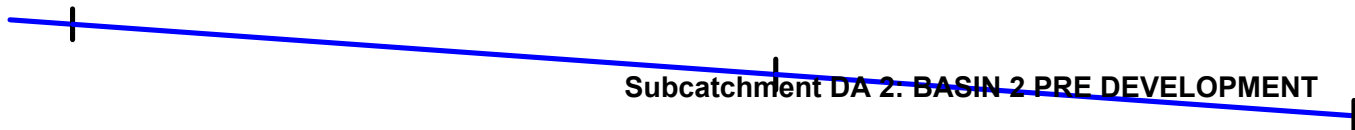
Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Runoff = 19.26 cfs @ 12.94 hrs, Volume= 162,997 cf, Depth= 1.29"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

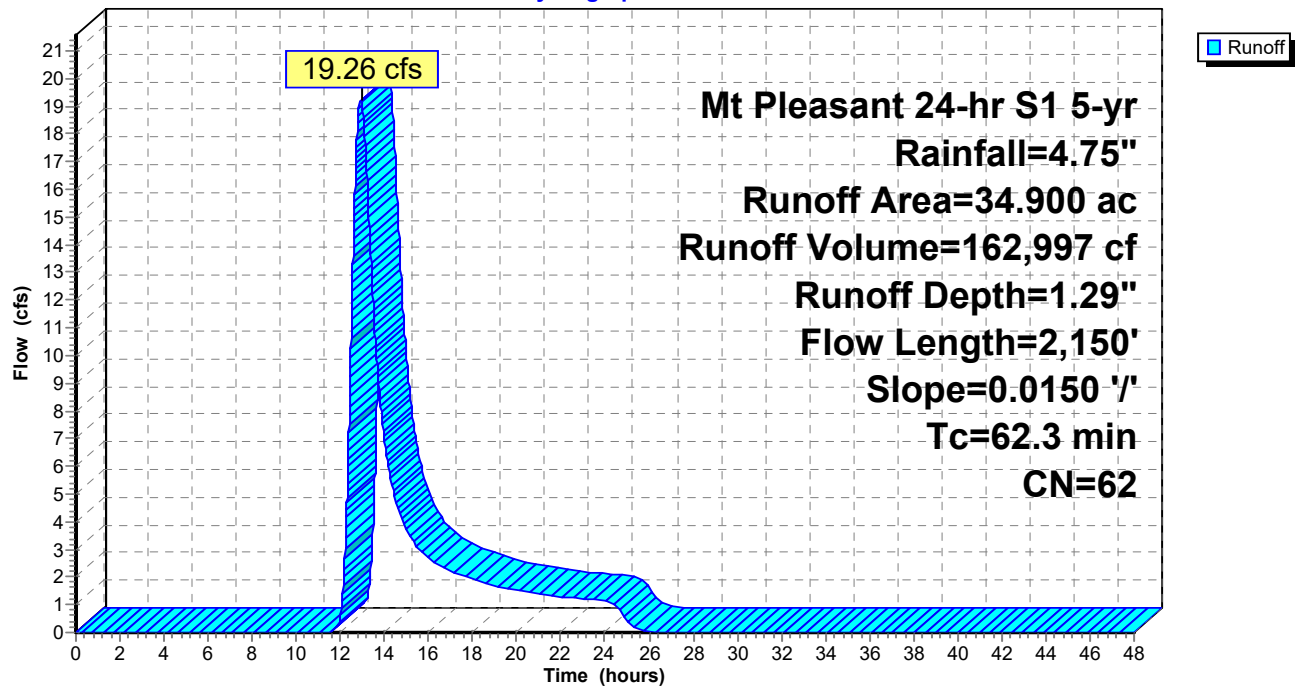
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Hydrograph



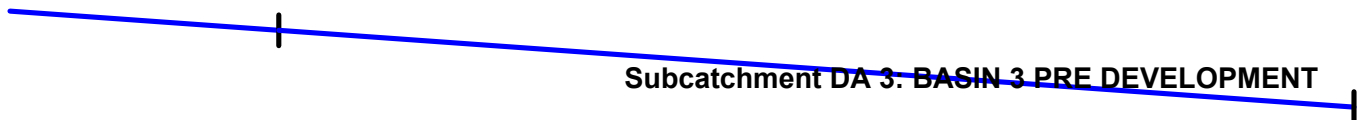
Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Runoff = 15.67 cfs @ 12.25 hrs, Volume= 69,509 cf, Depth= 2.01"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

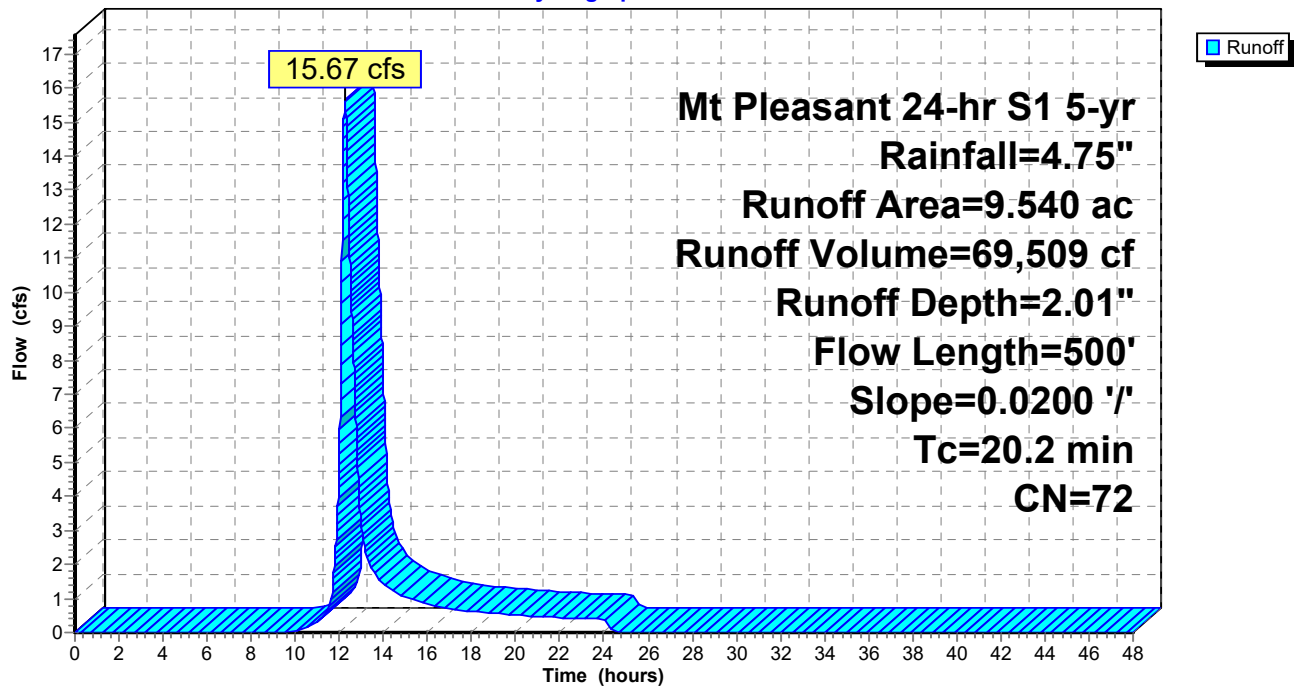
Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 39.97 cfs @ 12.69 hrs, Volume= 279,135 cf, Depth= 1.85"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

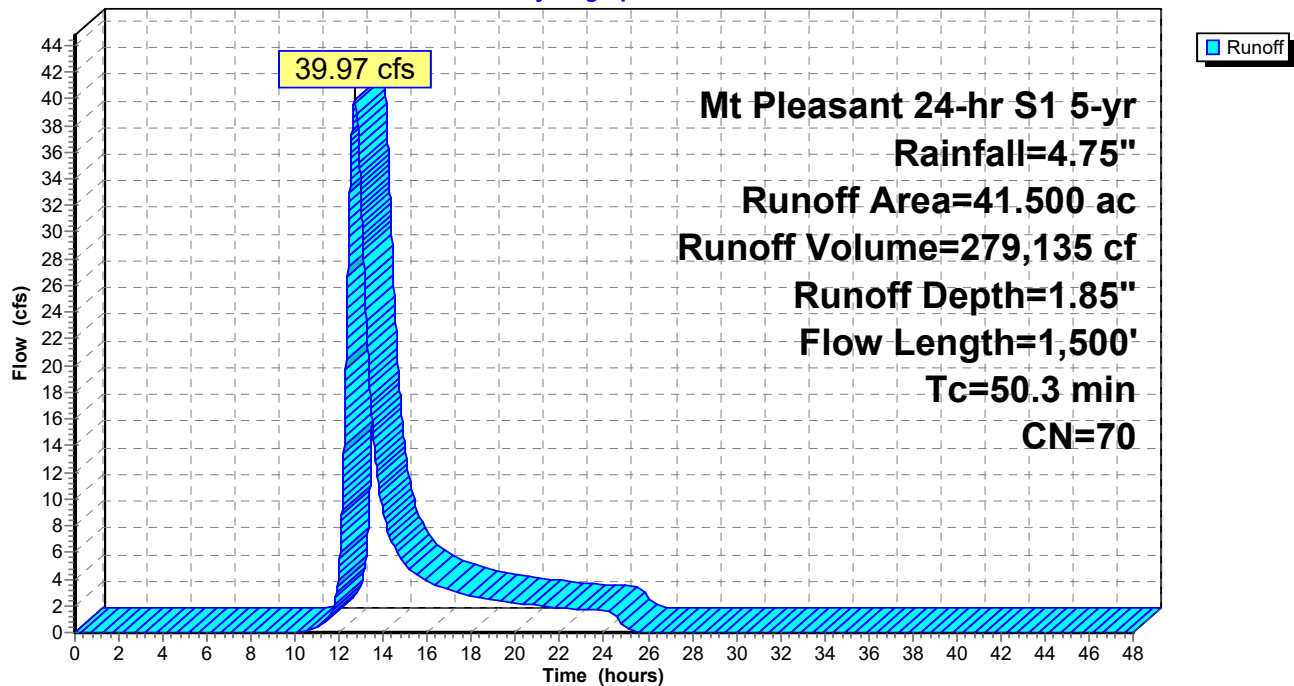
Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA1P: BASIN 1 PROPOSED

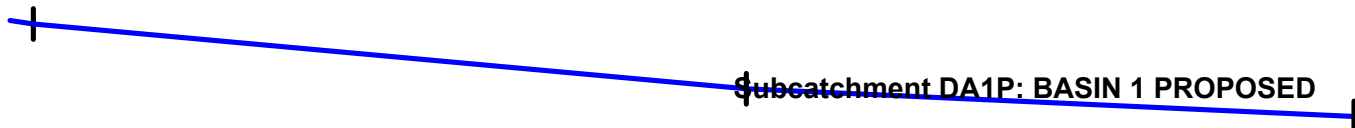
Runoff = 85.33 cfs @ 13.83 hrs, Volume= 1,166,980 cf, Depth= 2.25"

Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

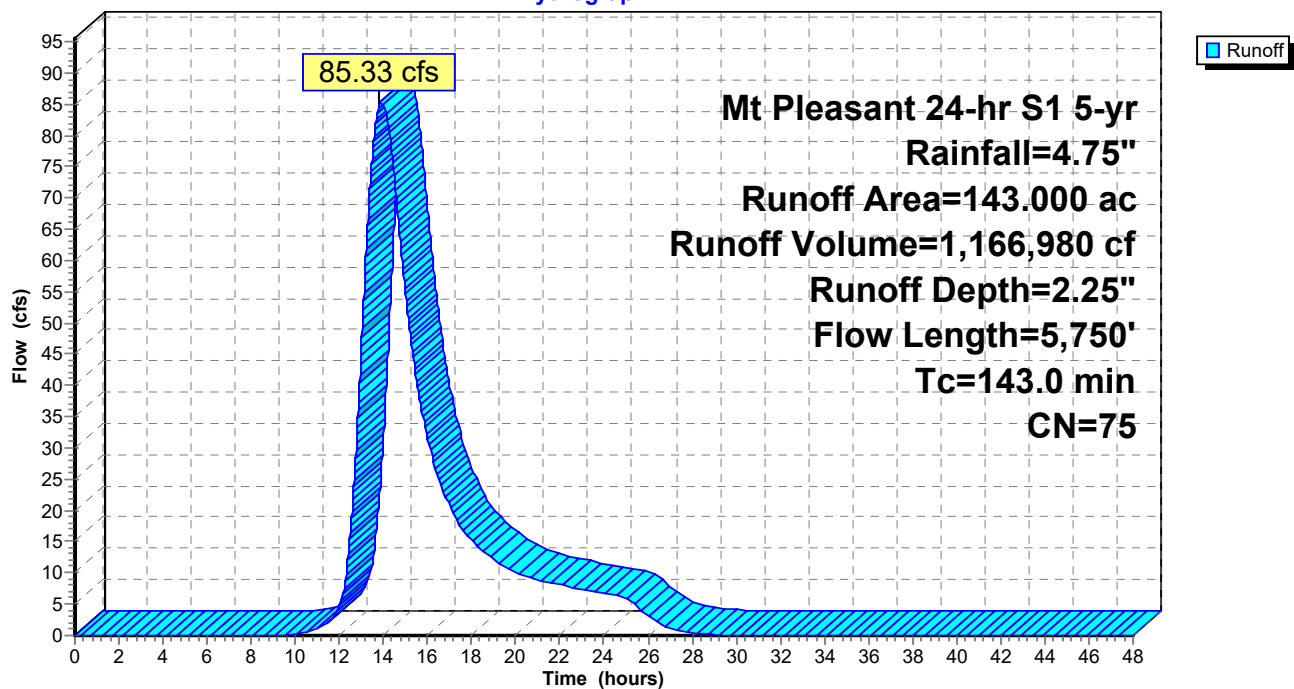
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

Hydrograph



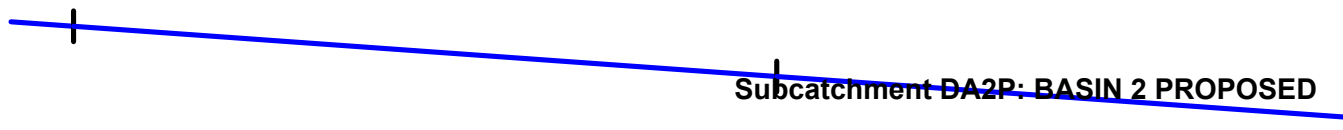
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 19.26 cfs @ 12.94 hrs, Volume= 162,997 cf, Depth= 1.29"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

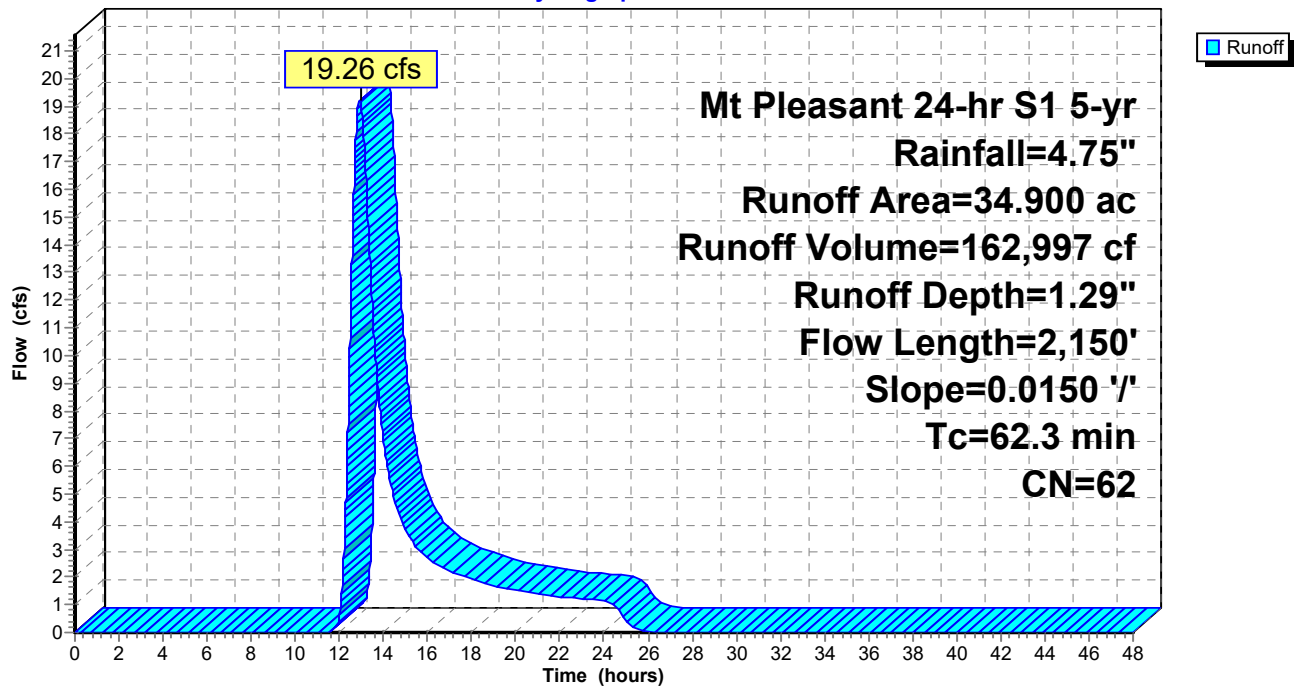
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 7.85 cfs @ 12.03 hrs, Volume= 20,008 cf, Depth= 2.59"

Routed to Reach OF4P : Primary Stream for Outfalls

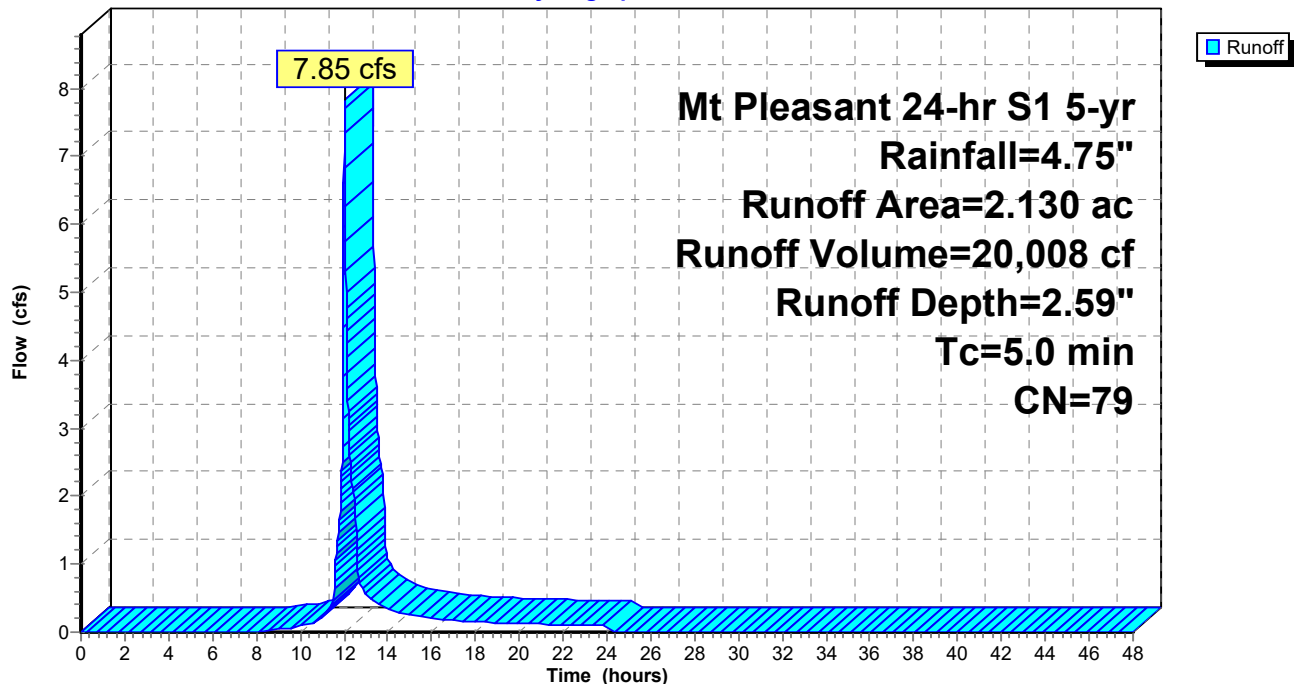
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

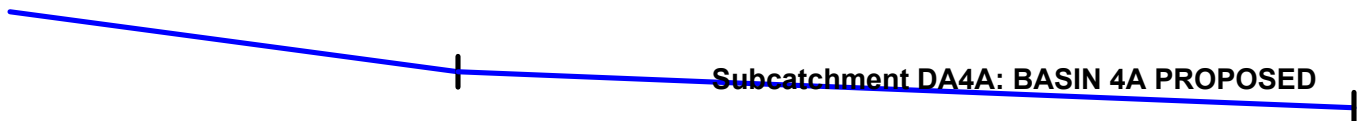
Runoff = 5.74 cfs @ 12.38 hrs, Volume= 30,738 cf, Depth= 1.70"

Routed to Reach OF4P : Primary Stream for Outfalls

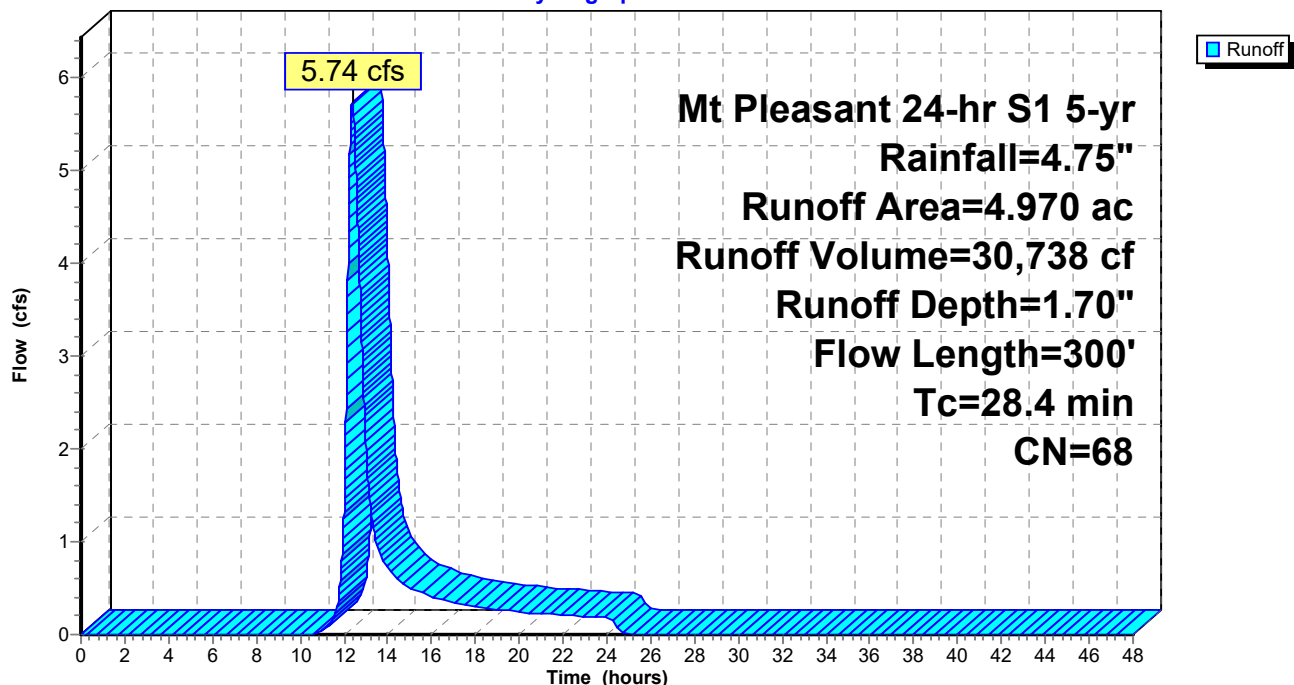
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



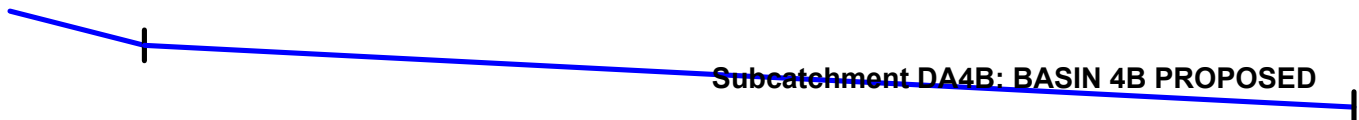
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 31.91 cfs @ 12.40 hrs, Volume= 189,884 cf, Depth= 4.28"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

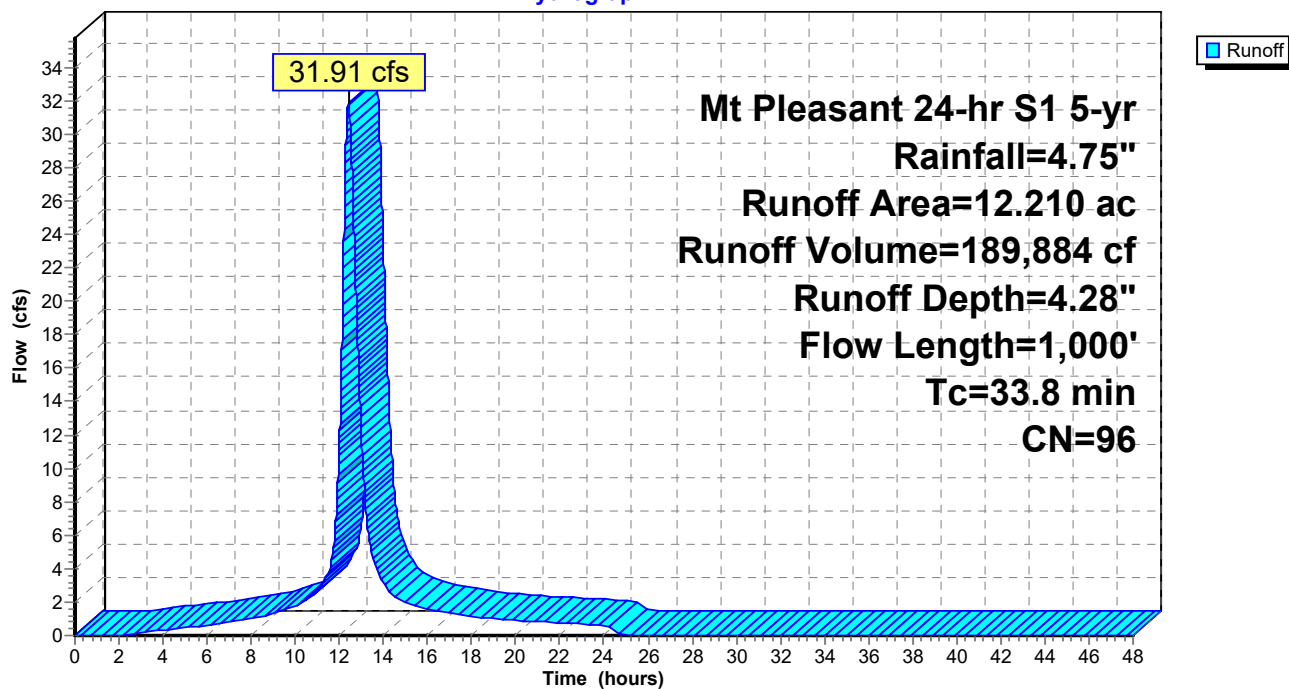
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 6.12 cfs @ 12.03 hrs, Volume= 16,951 cf, Depth= 4.28"
 Routed to Reach D4C : Ditch 4C

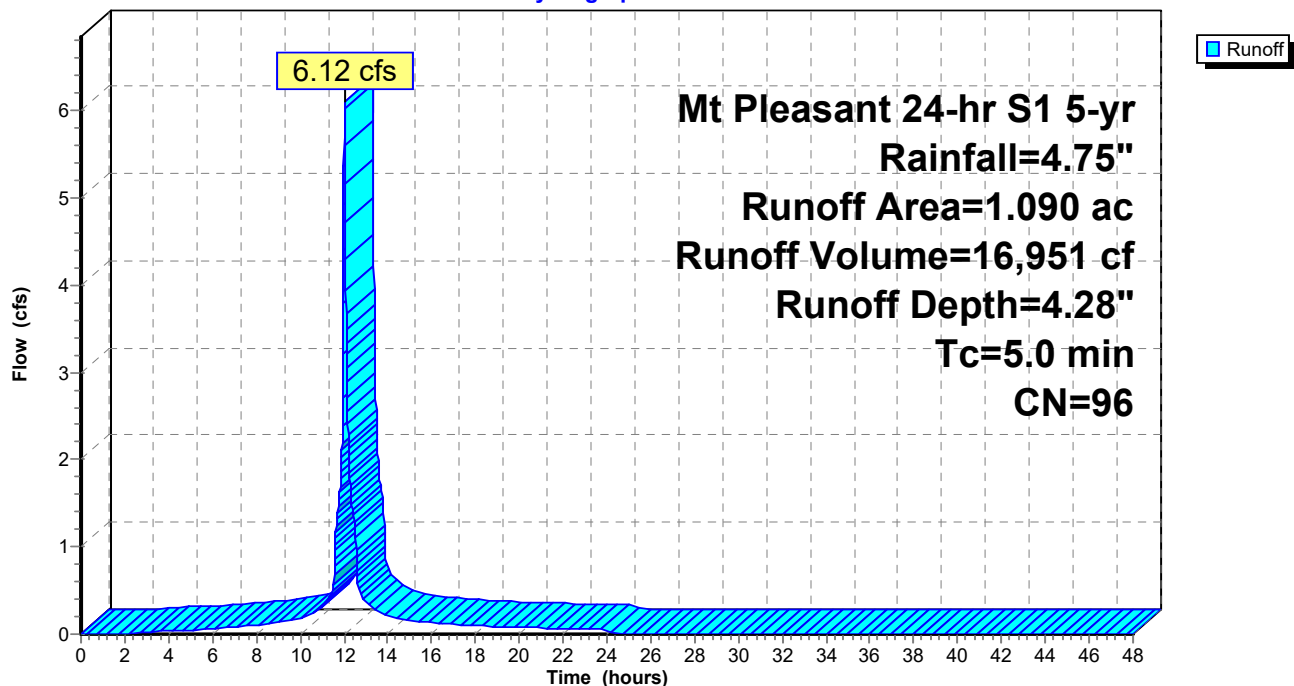
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 8.30 cfs @ 12.03 hrs, Volume= 23,016 cf, Depth= 4.28"
 Routed to Reach D4D : Ditch 4D

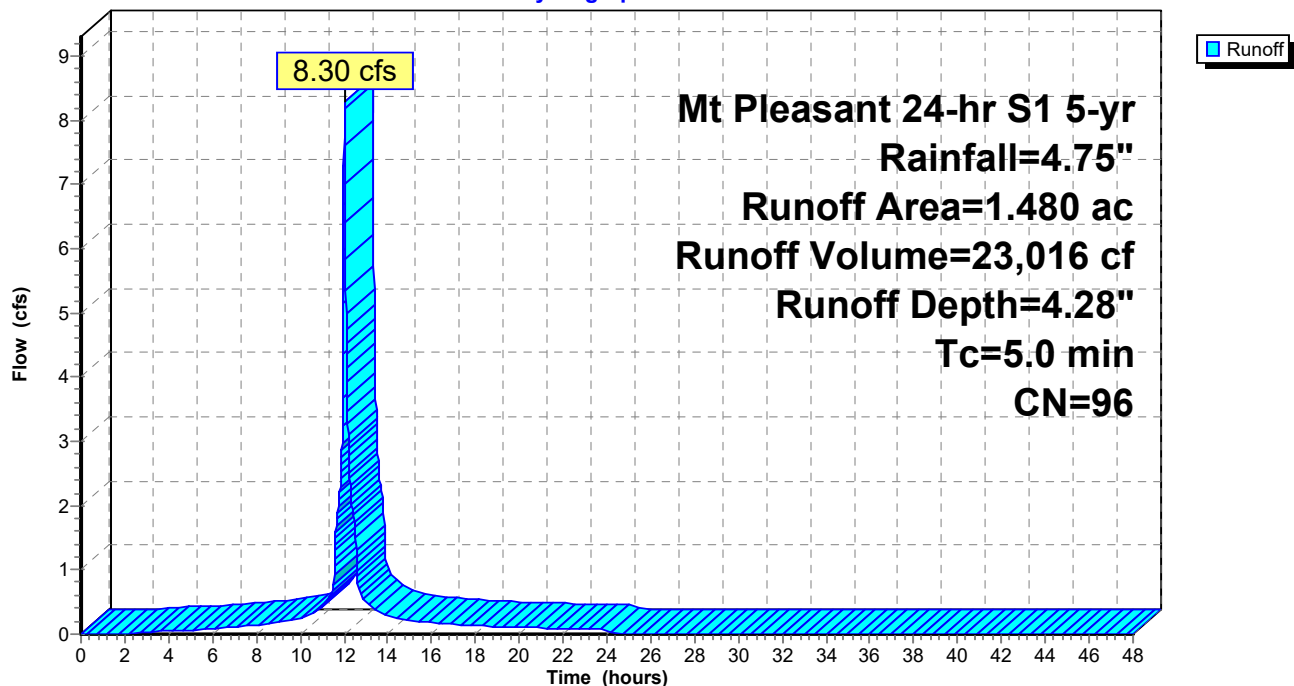
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



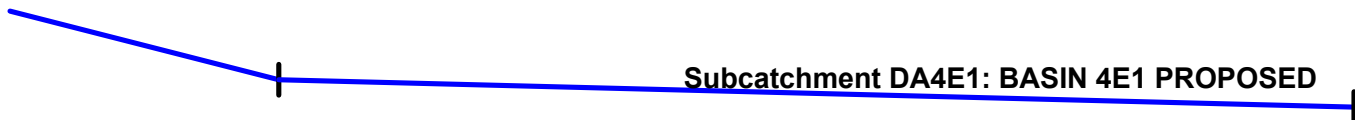
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

Runoff = 7.79 cfs @ 12.39 hrs, Volume= 43,111 cf, Depth= 1.42"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

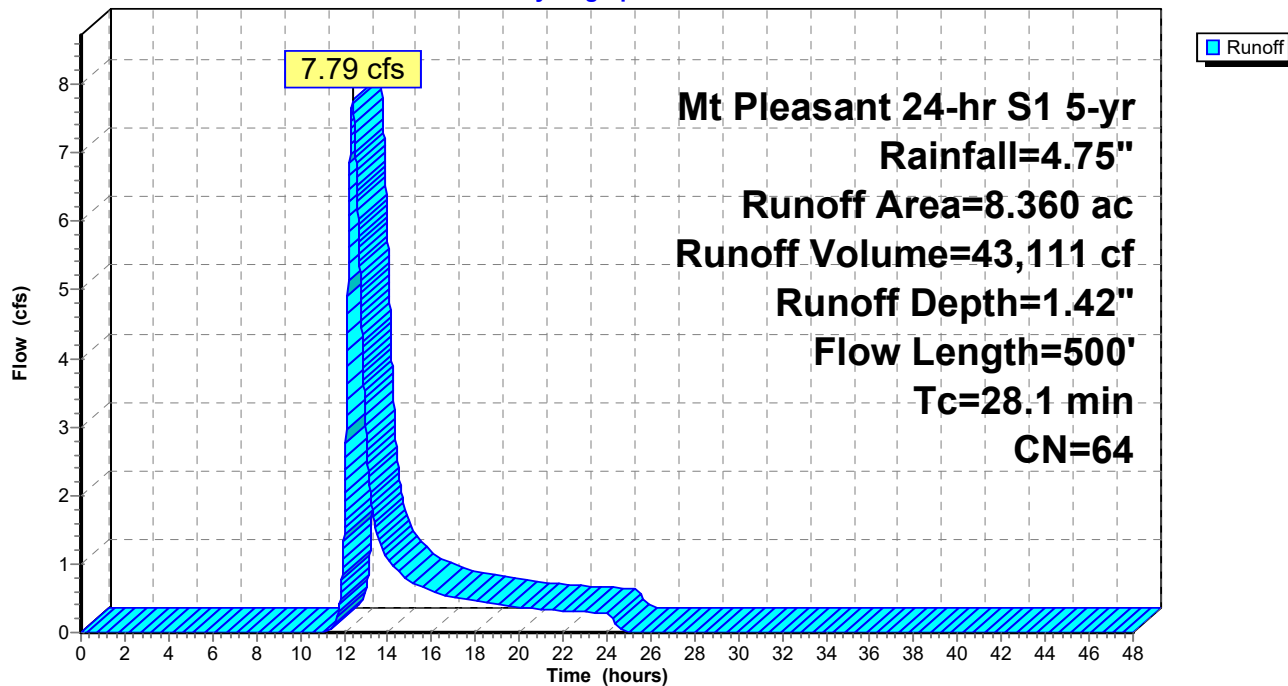
Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

Hydrograph



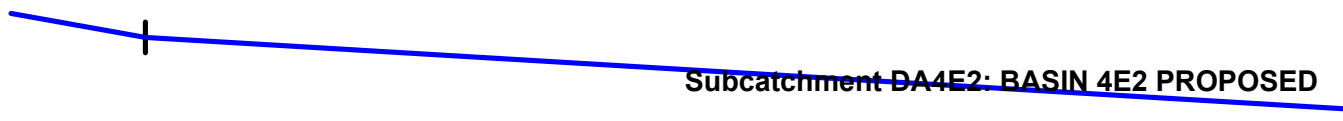
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 17.74 cfs @ 12.56 hrs, Volume= 112,284 cf, Depth= 1.78"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 5-yr Rainfall=4.75"

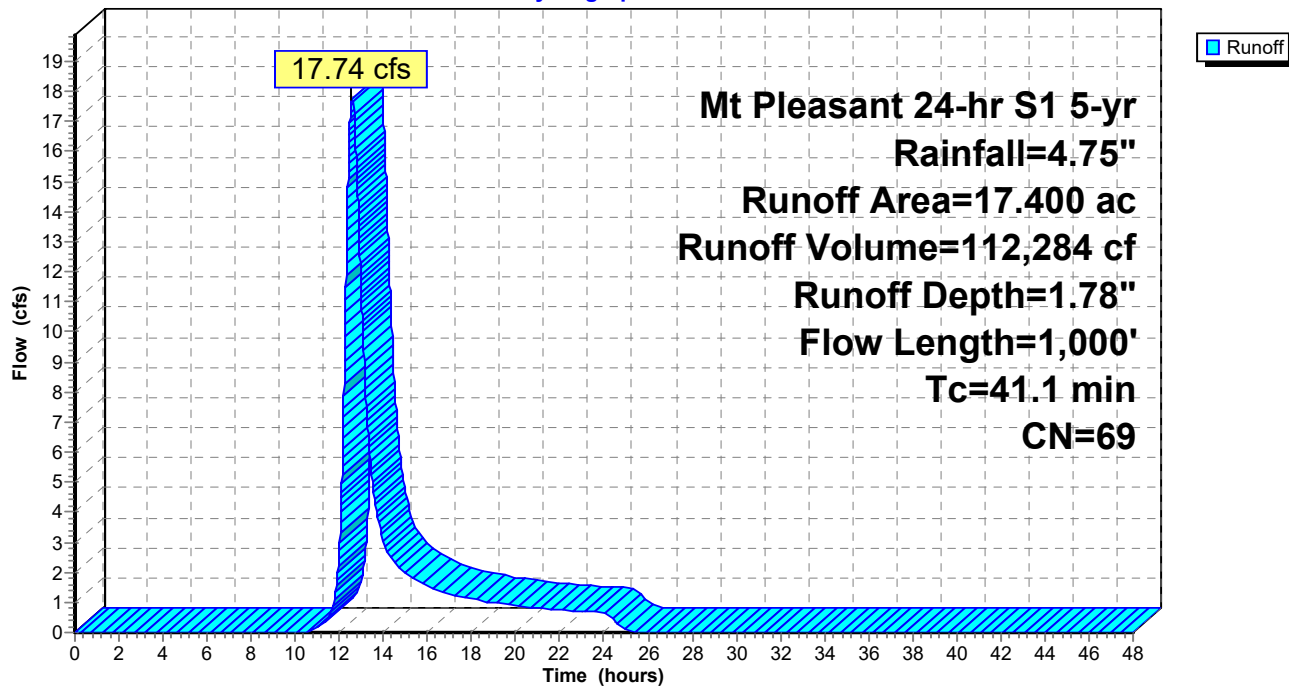
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



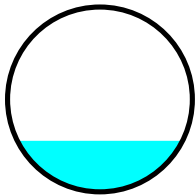
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 4.28" for 5-yr event
Inflow = 5.77 cfs @ 12.05 hrs, Volume= 16,951 cf
Outflow = 5.77 cfs @ 12.05 hrs, Volume= 16,951 cf, Atten= 0%, Lag= 0.1 min
Routed to Pond CD4DCE : Cross Drain 4DCE

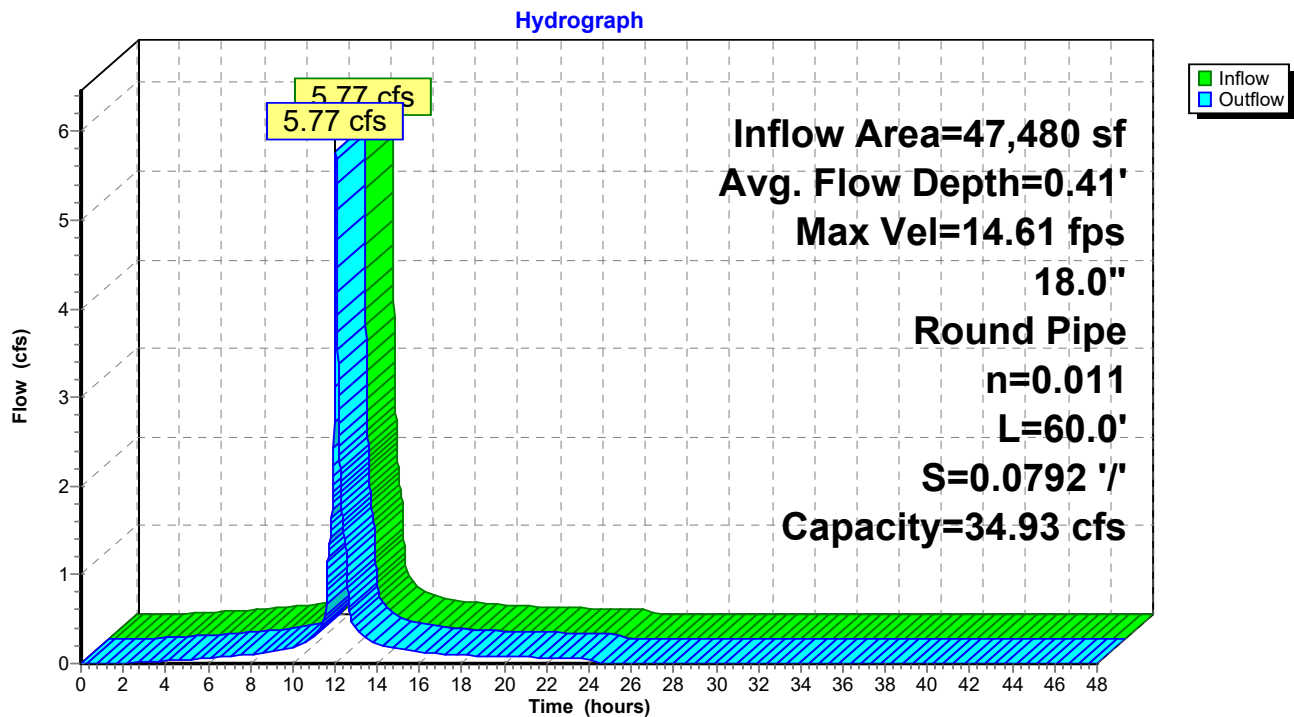
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 14.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.41 fps, Avg. Travel Time= 0.2 min

Peak Storage= 24 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 1.34'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

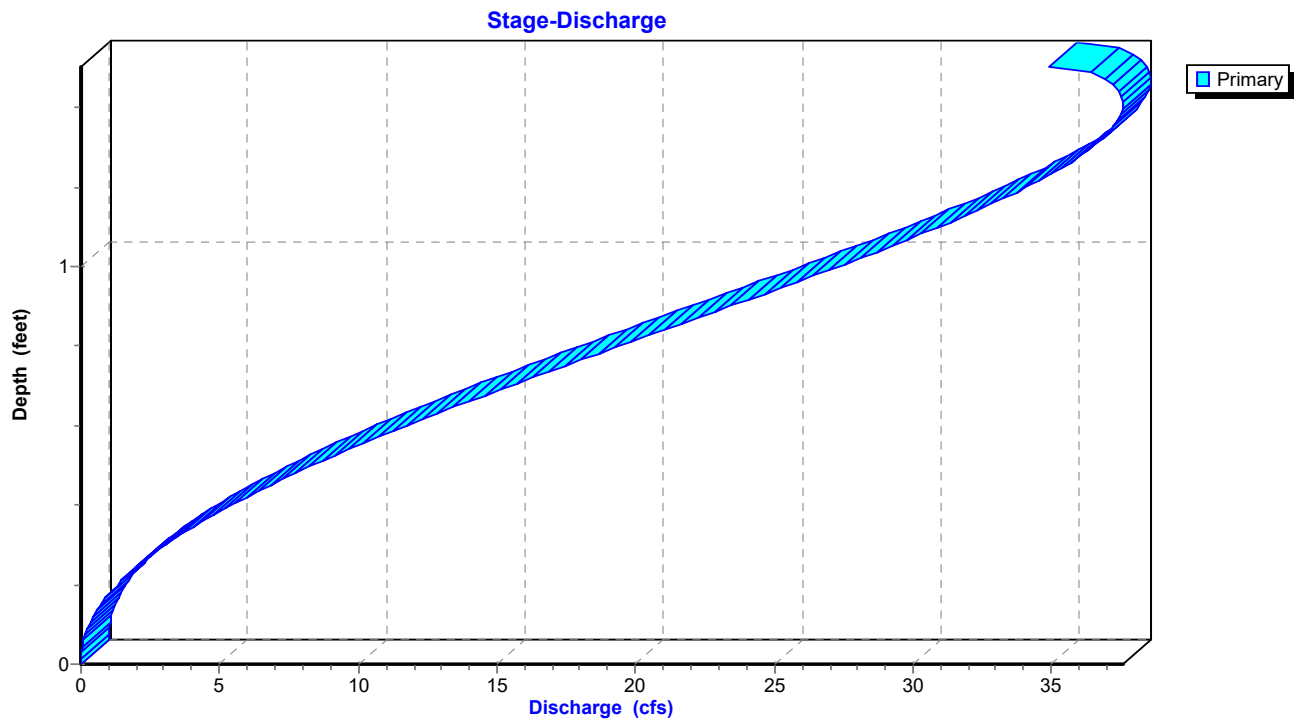
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

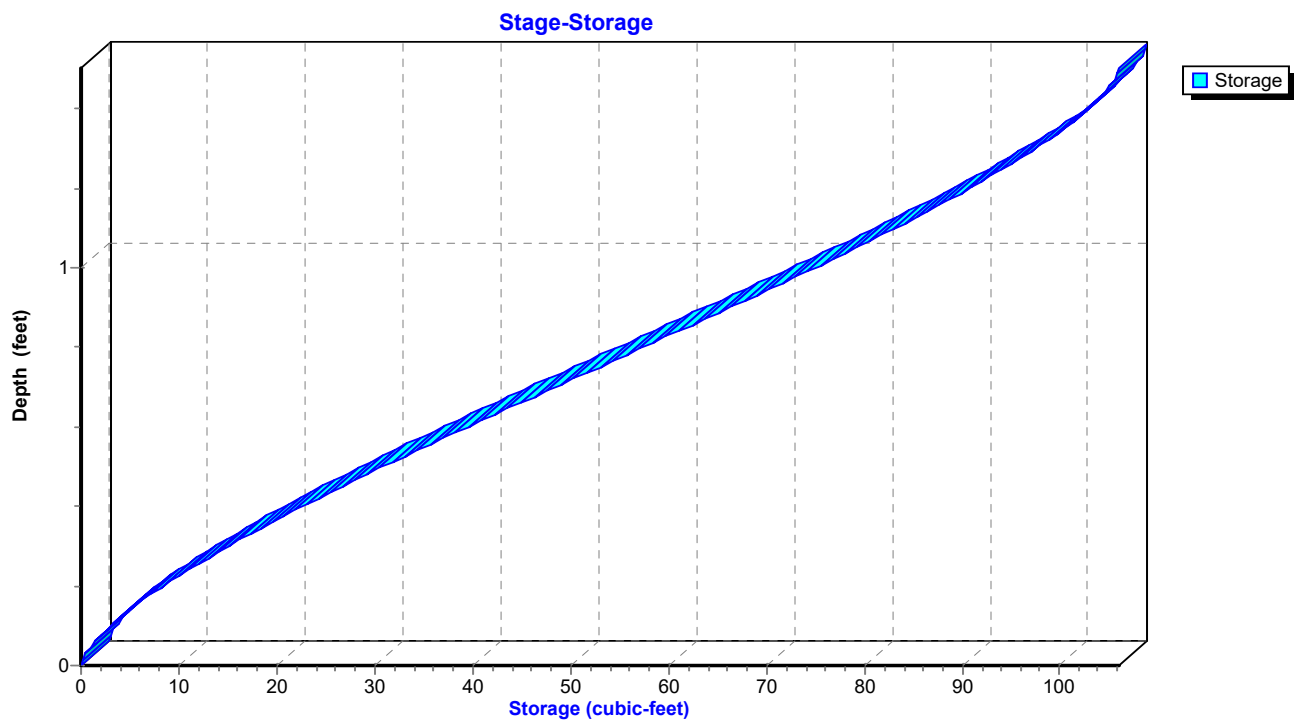


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

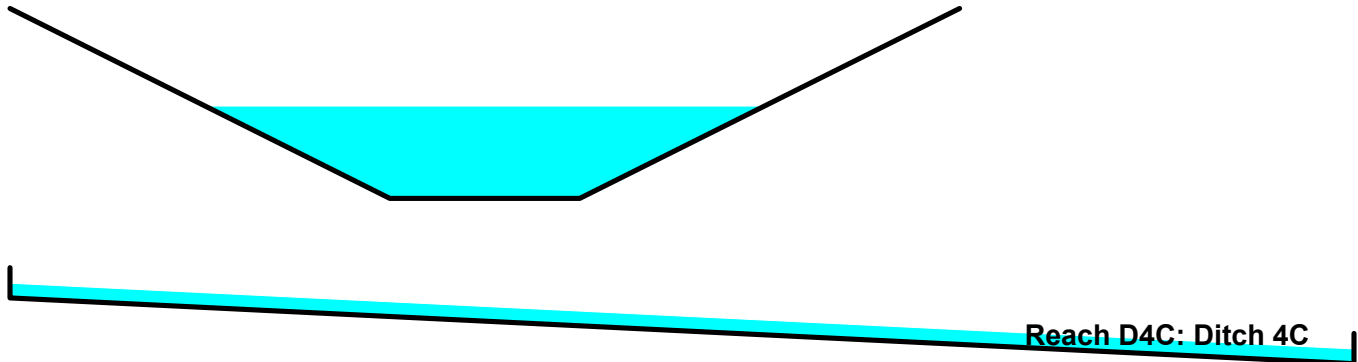
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 4.28" for 5-yr event
Inflow = 6.12 cfs @ 12.03 hrs, Volume= 16,951 cf
Outflow = 5.77 cfs @ 12.05 hrs, Volume= 16,951 cf, Atten= 6%, Lag= 1.2 min
Routed to Reach CD4C : Cross Drain 4C

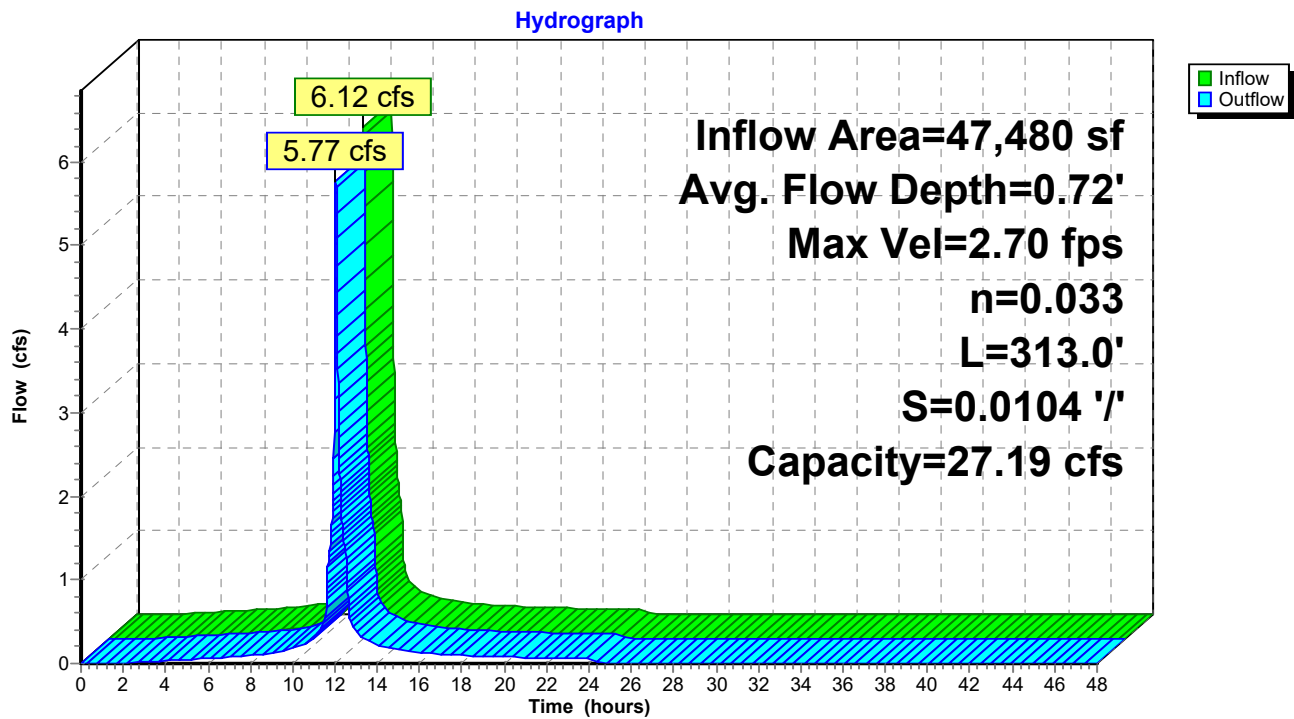
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 6.7 min

Peak Storage= 669 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.72' , Surface Width= 4.40'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

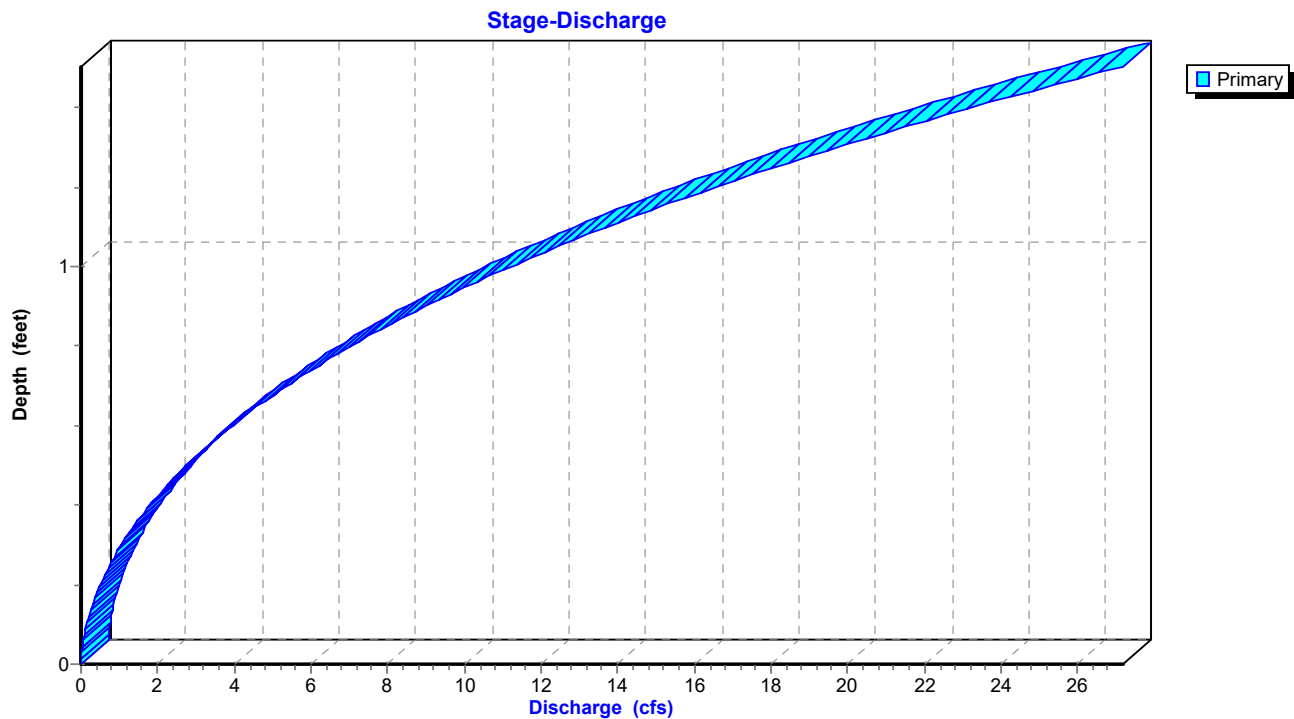
1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 '/'
Inlet Invert= 687.00', Outlet Invert= 683.75'

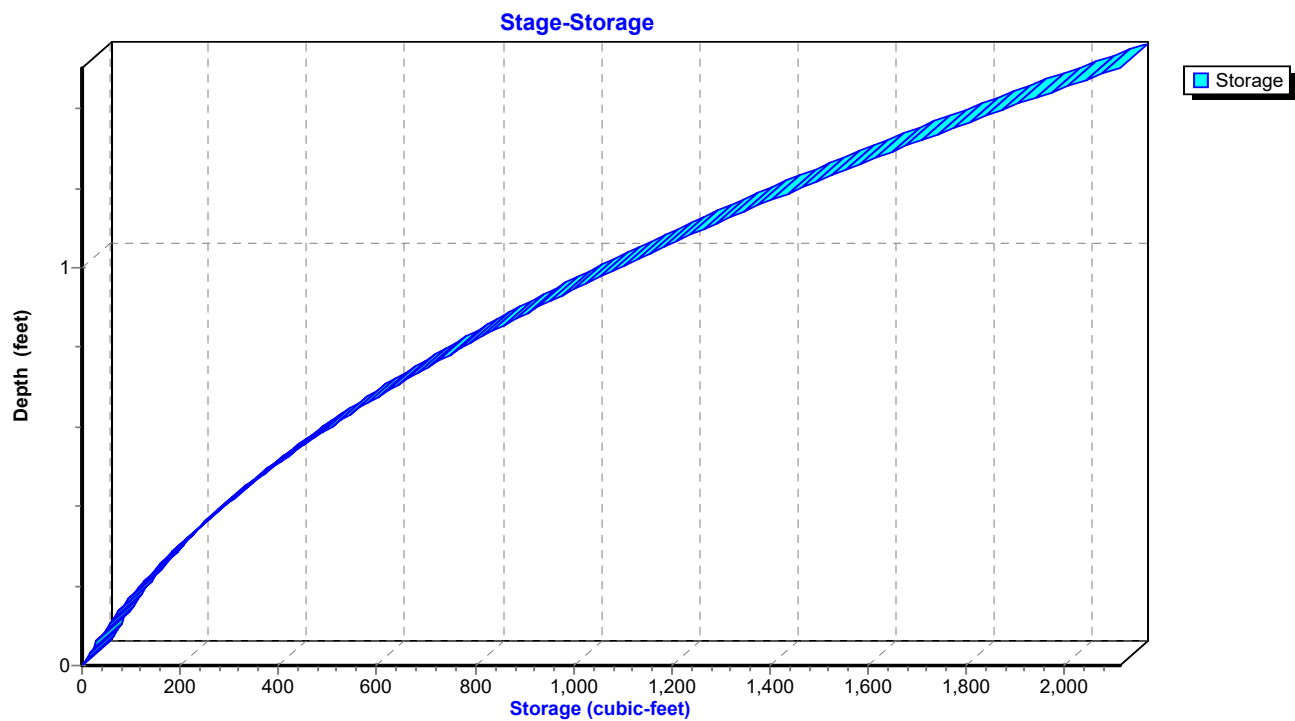


Reach D4C: Ditch 4C



Reach D4C: Ditch 4C



Reach D4C: Ditch 4C

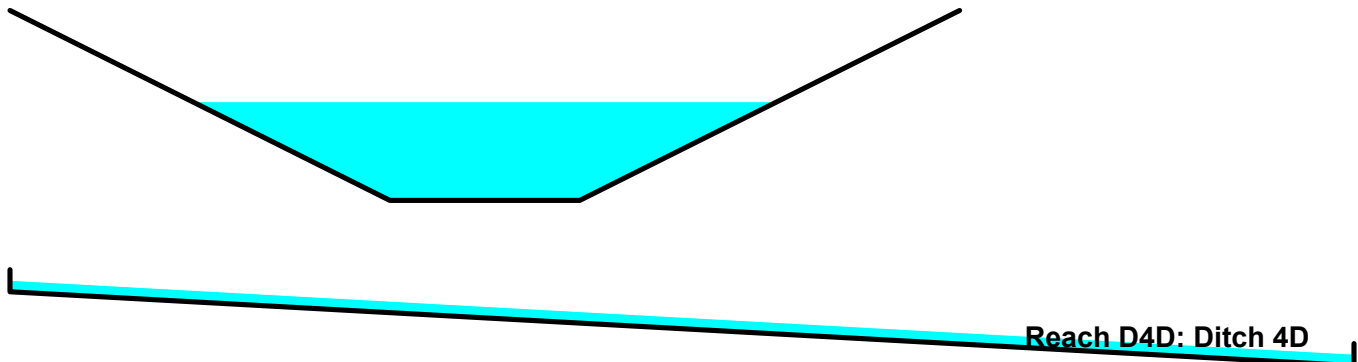
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 4.28" for 5-yr event
Inflow = 8.30 cfs @ 12.03 hrs, Volume= 23,016 cf
Outflow = 7.93 cfs @ 12.04 hrs, Volume= 23,016 cf, Atten= 4%, Lag= 1.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

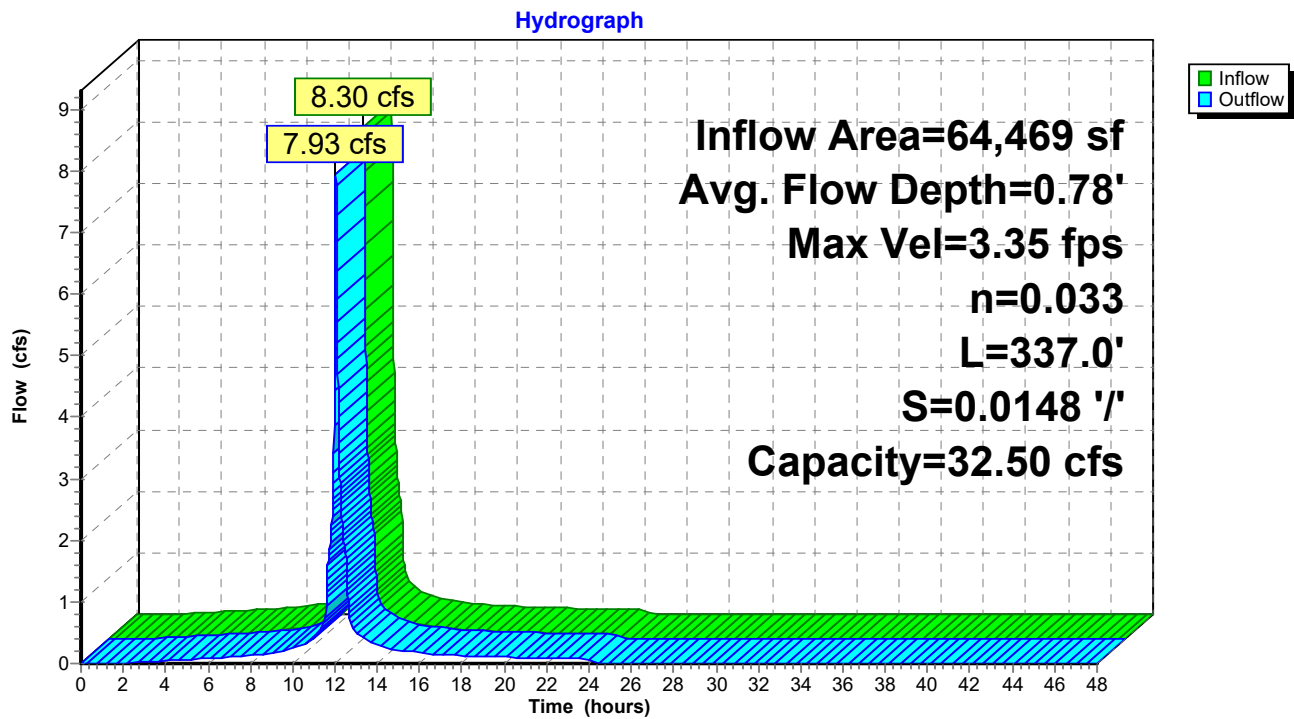
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.35 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 5.8 min

Peak Storage= 799 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.78' , Surface Width= 4.61'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

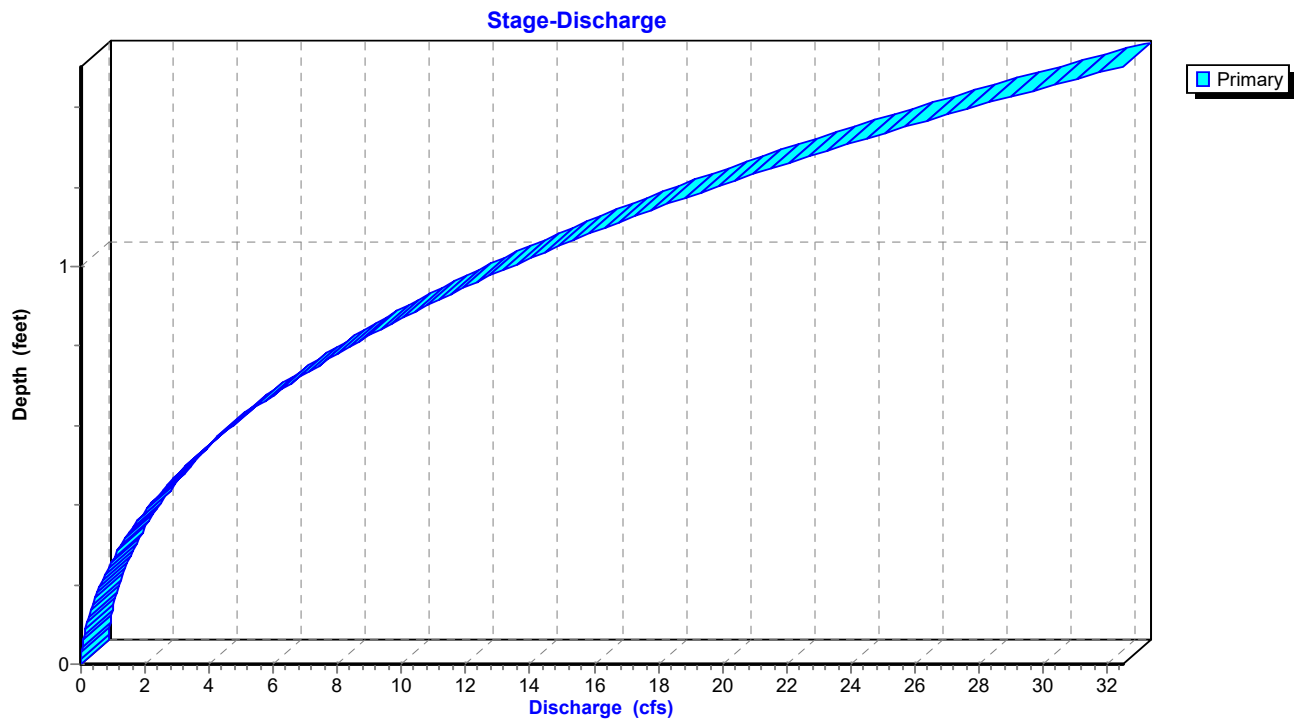
1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



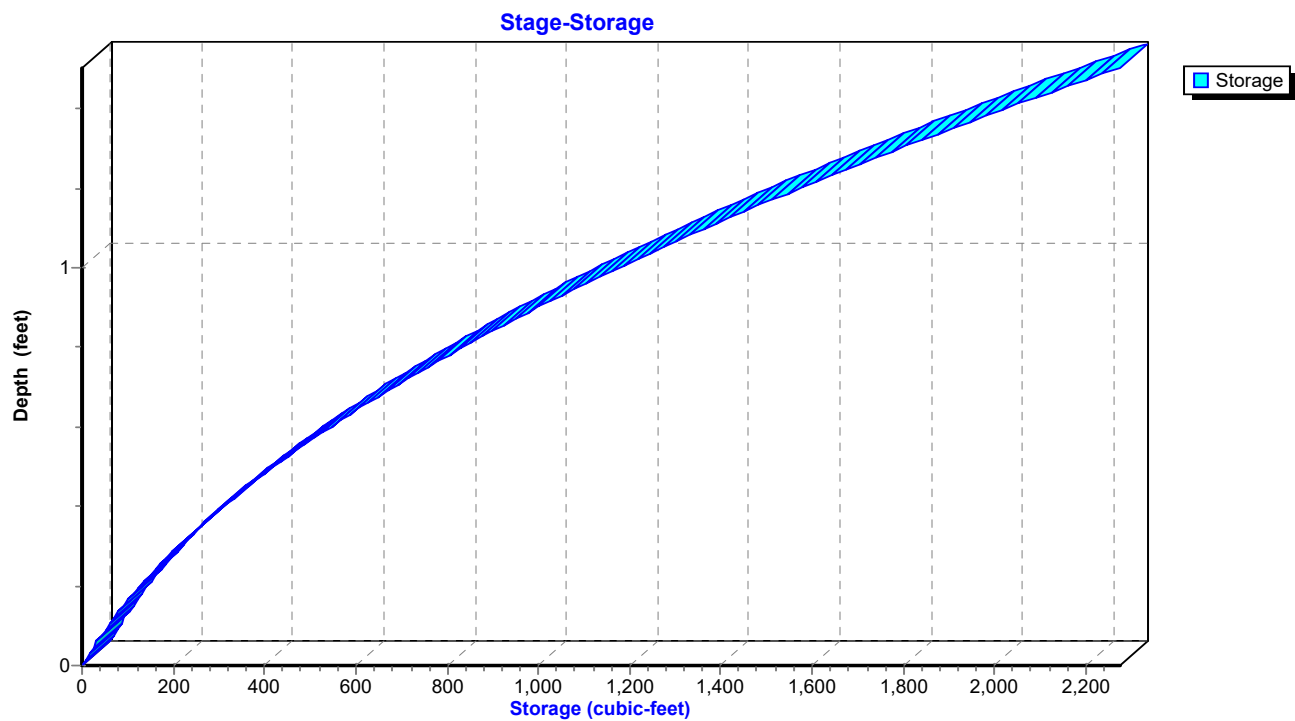
Reach D4D: Ditch 4D



Reach D4D: Ditch 4D



Reach D4D: Ditch 4D



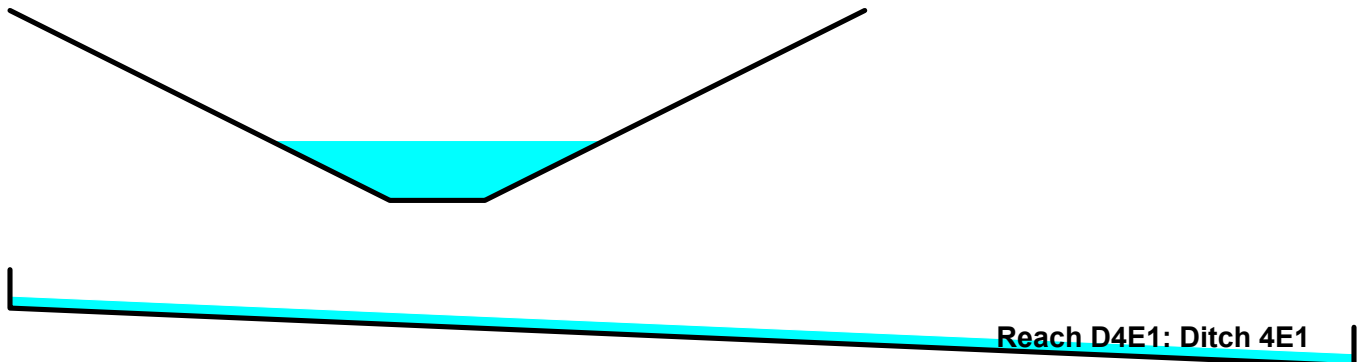
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 1.42" for 5-yr event
Inflow = 7.79 cfs @ 12.39 hrs, Volume= 43,111 cf
Outflow = 7.52 cfs @ 12.46 hrs, Volume= 43,111 cf, Atten= 3%, Lag= 4.2 min
Routed to Pond CD4E : Cross Drain 4E

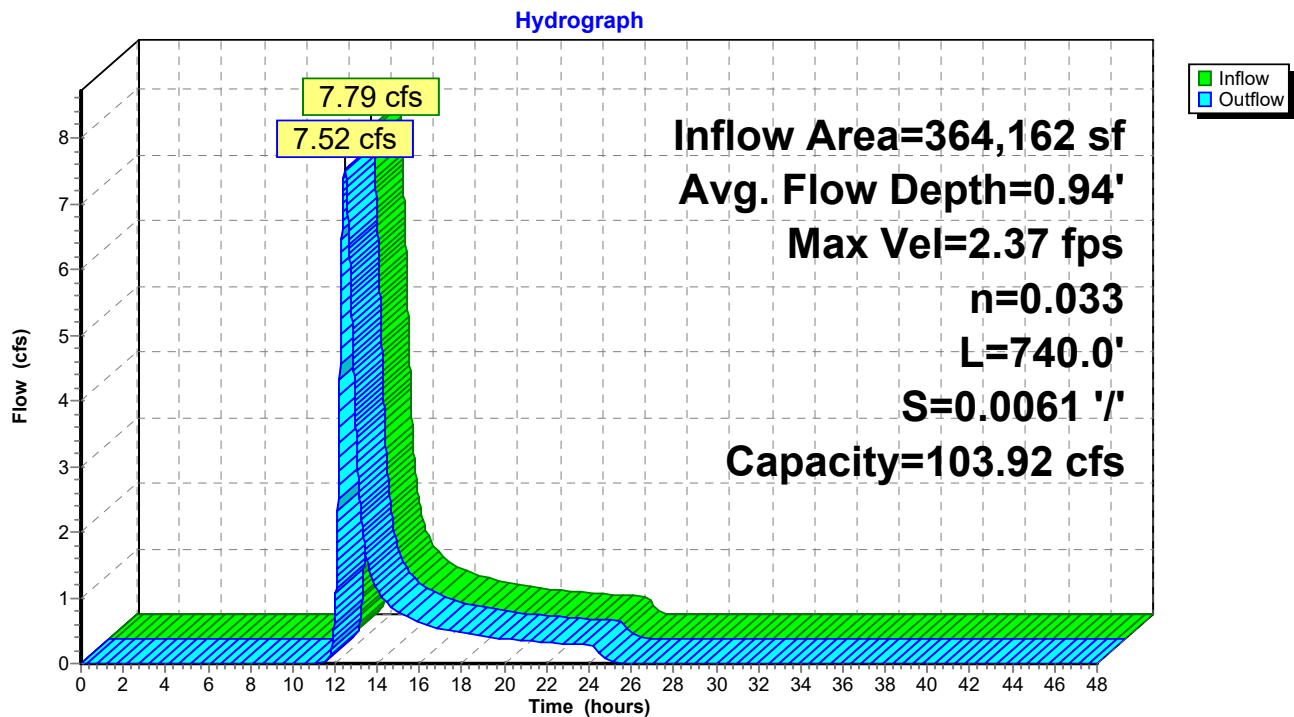
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.37 fps, Min. Travel Time= 5.2 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 13.0 min

Peak Storage= 2,343 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.94' , Surface Width= 5.25'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

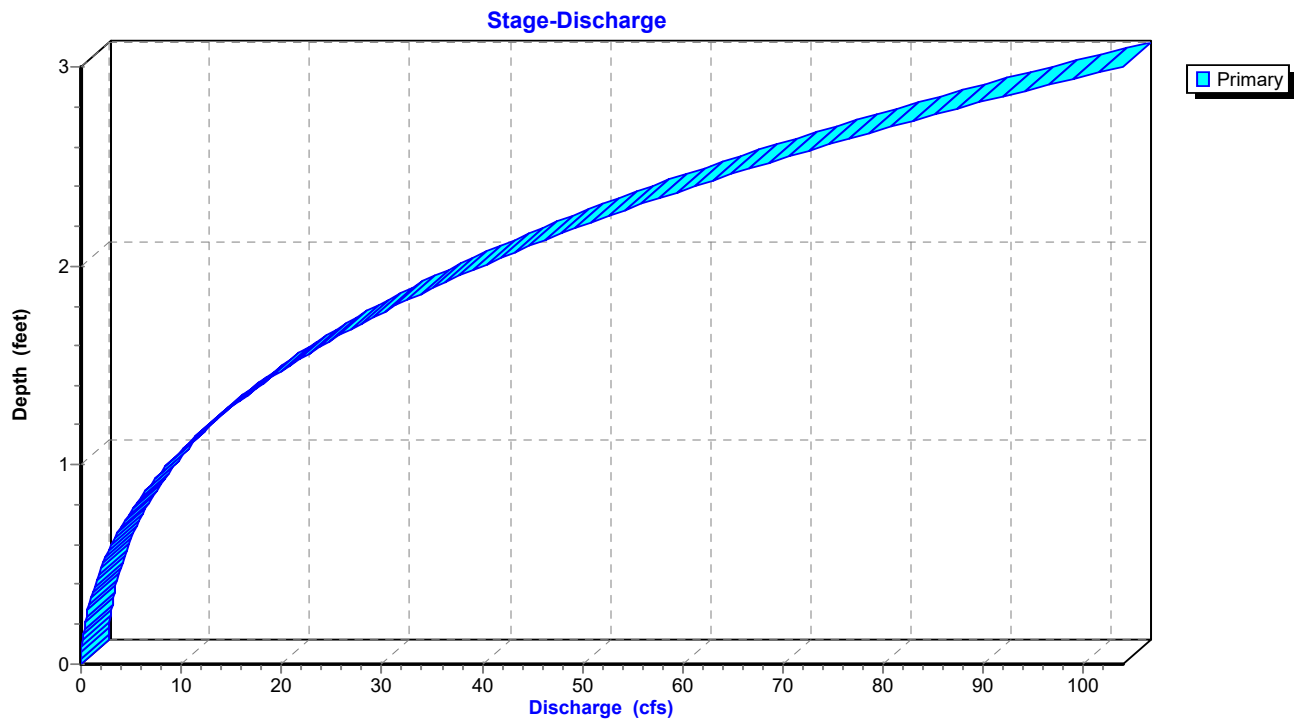
1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 '/'
Inlet Invert= 684.00', Outlet Invert= 679.50'

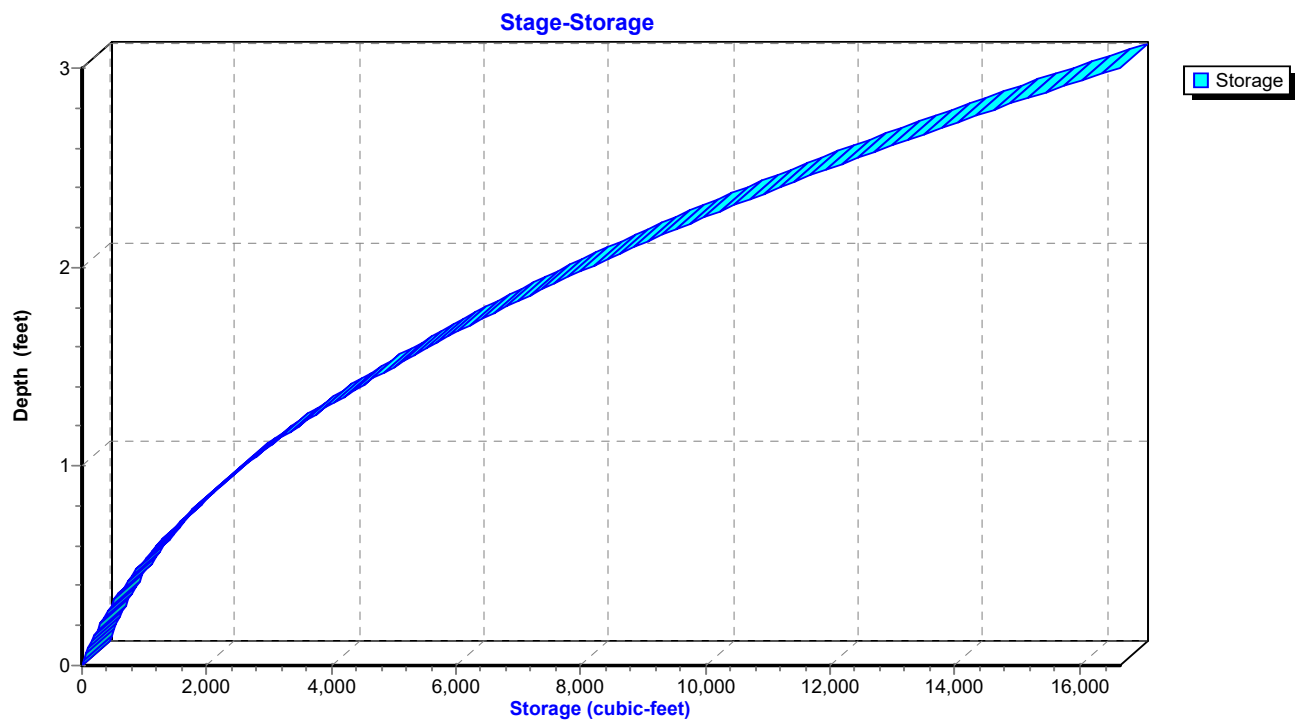


Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1

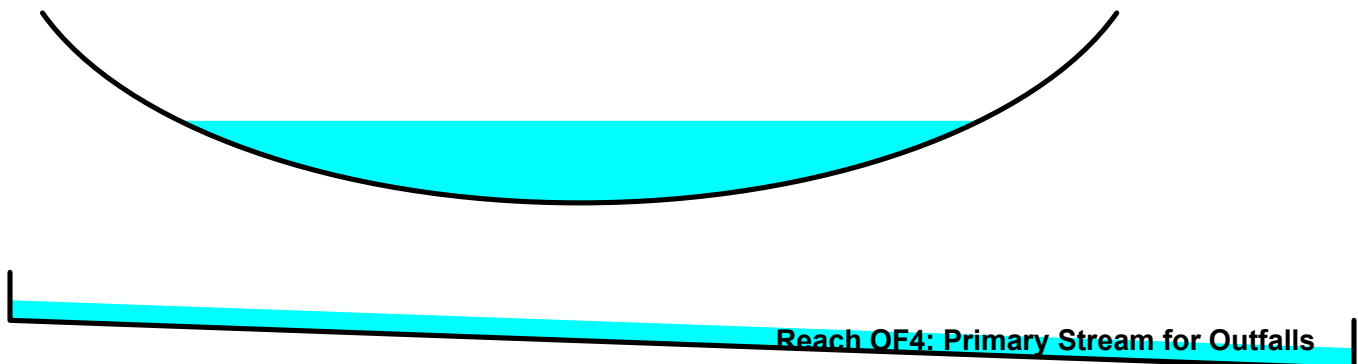
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 2.02" for 5-yr event
Inflow = 106.39 cfs @ 13.51 hrs, Volume= 1,678,621 cf
Outflow = 106.20 cfs @ 13.68 hrs, Volume= 1,678,621 cf, Atten= 0%, Lag= 10.0 min

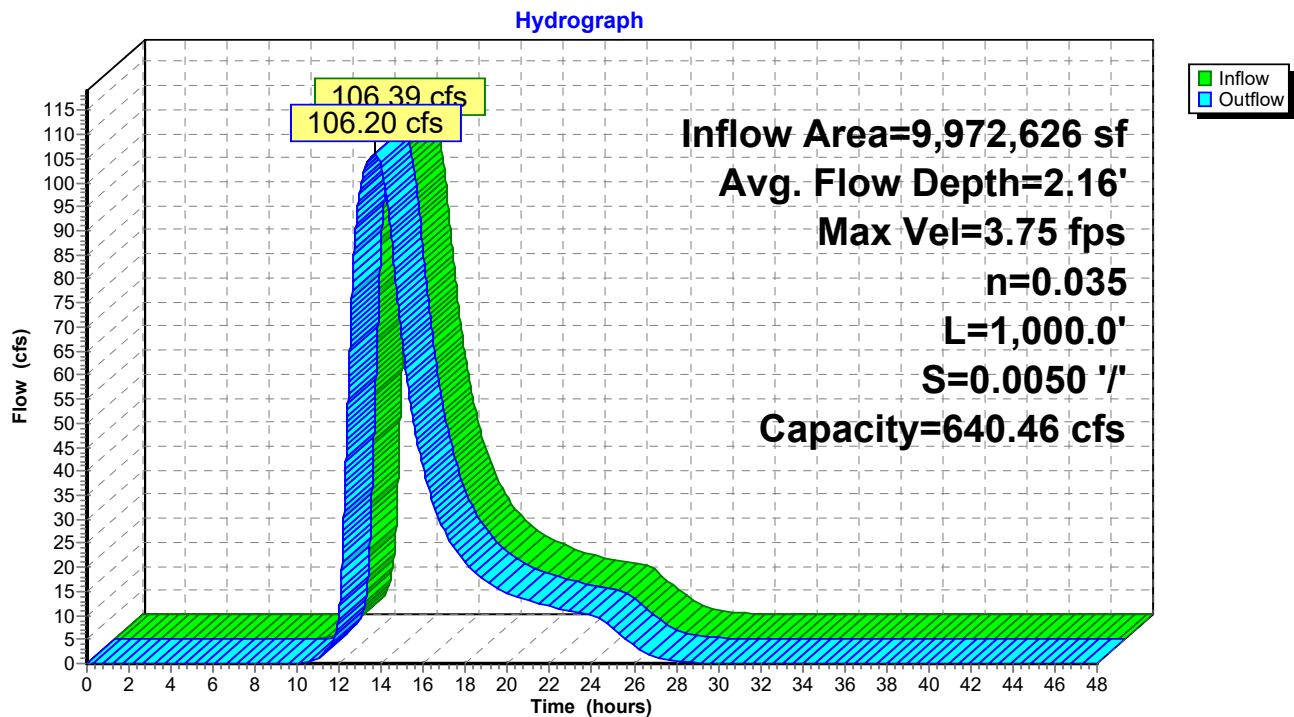
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 11.4 min

Peak Storage= 28,337 cf @ 13.68 hrs
Average Depth at Peak Storage= 2.16' , Surface Width= 19.70'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

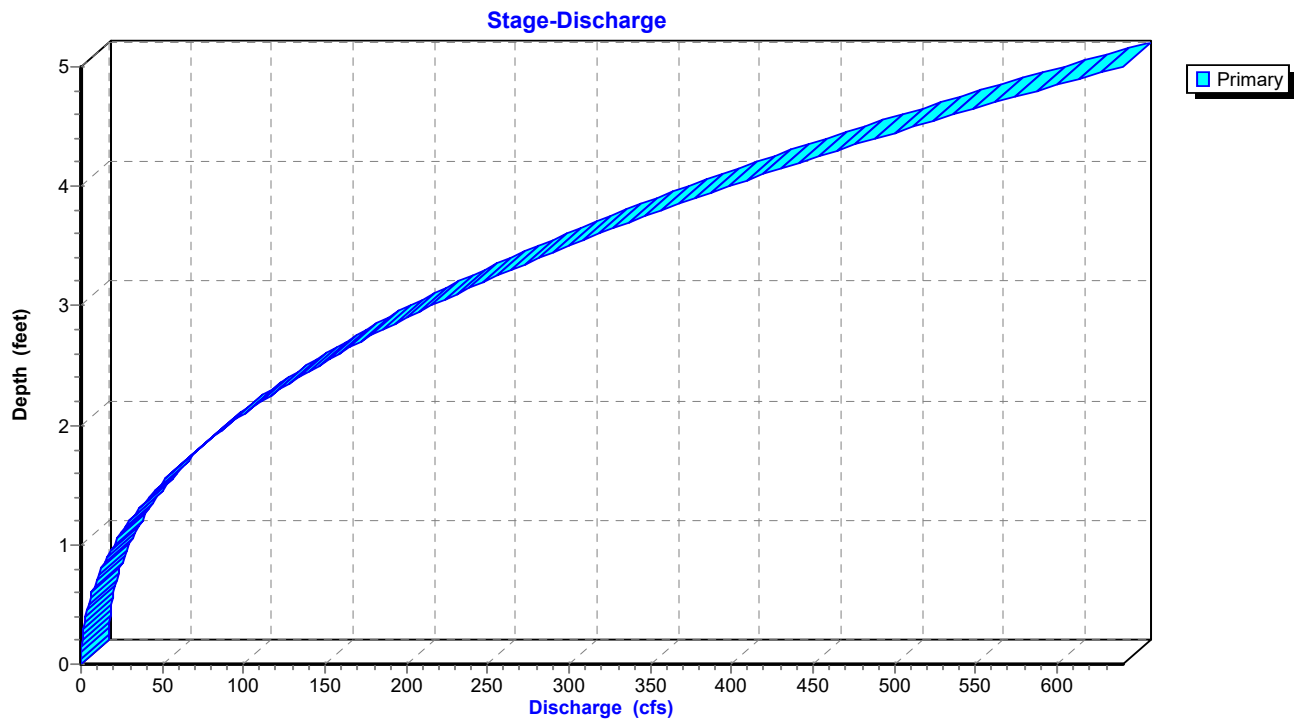
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

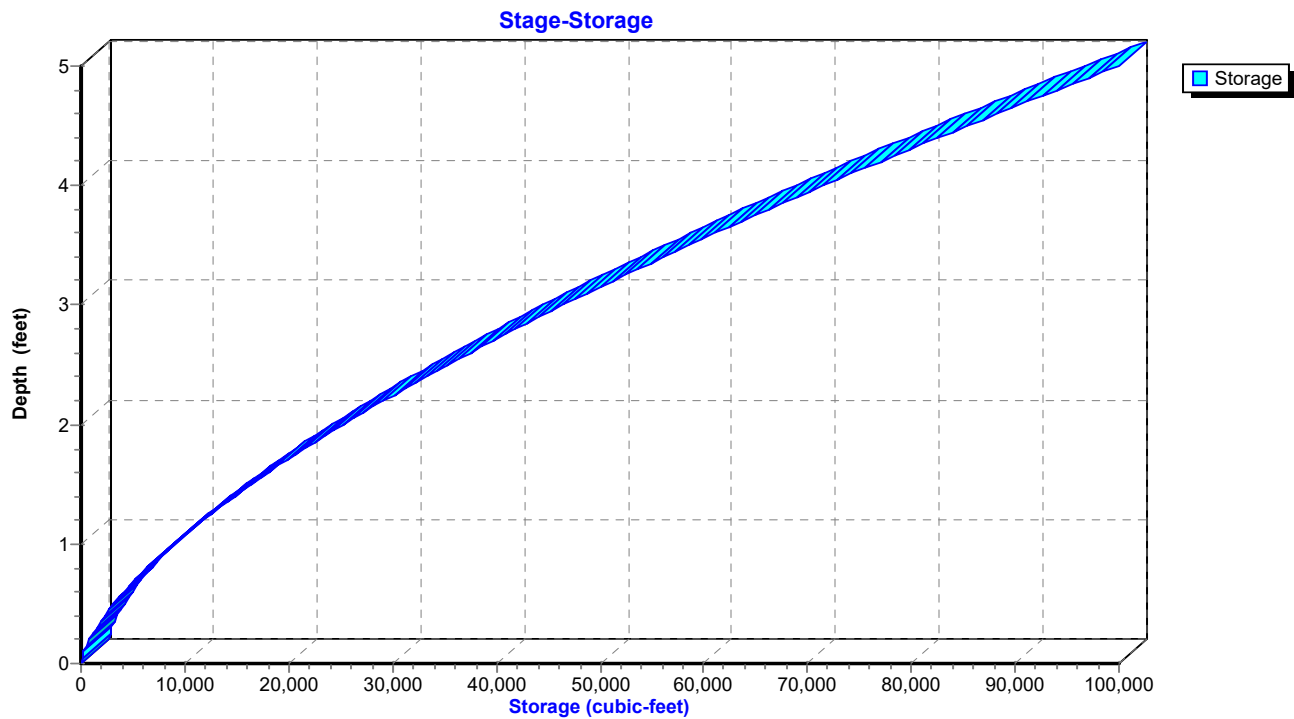


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

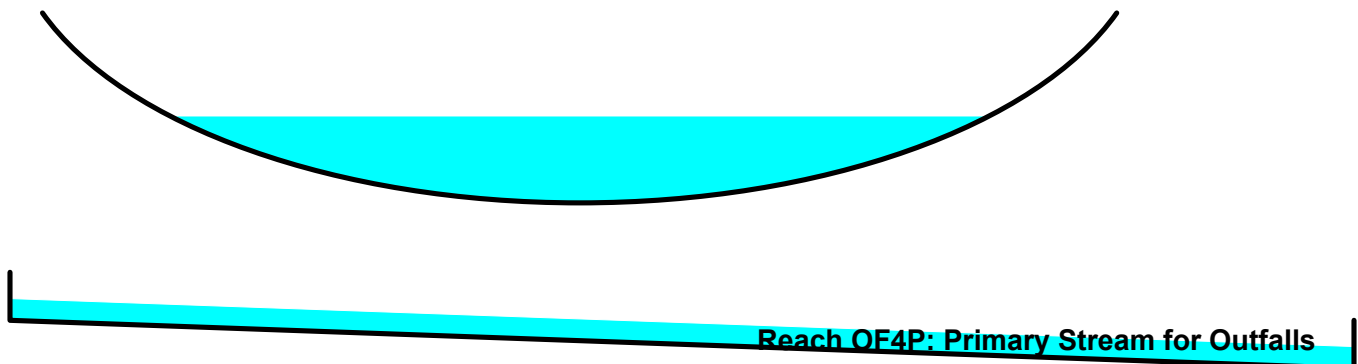
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 2.16" for 5-yr event
Inflow = 118.61 cfs @ 13.51 hrs, Volume= 1,765,403 cf
Outflow = 118.35 cfs @ 13.62 hrs, Volume= 1,765,401 cf, Atten= 0%, Lag= 6.1 min

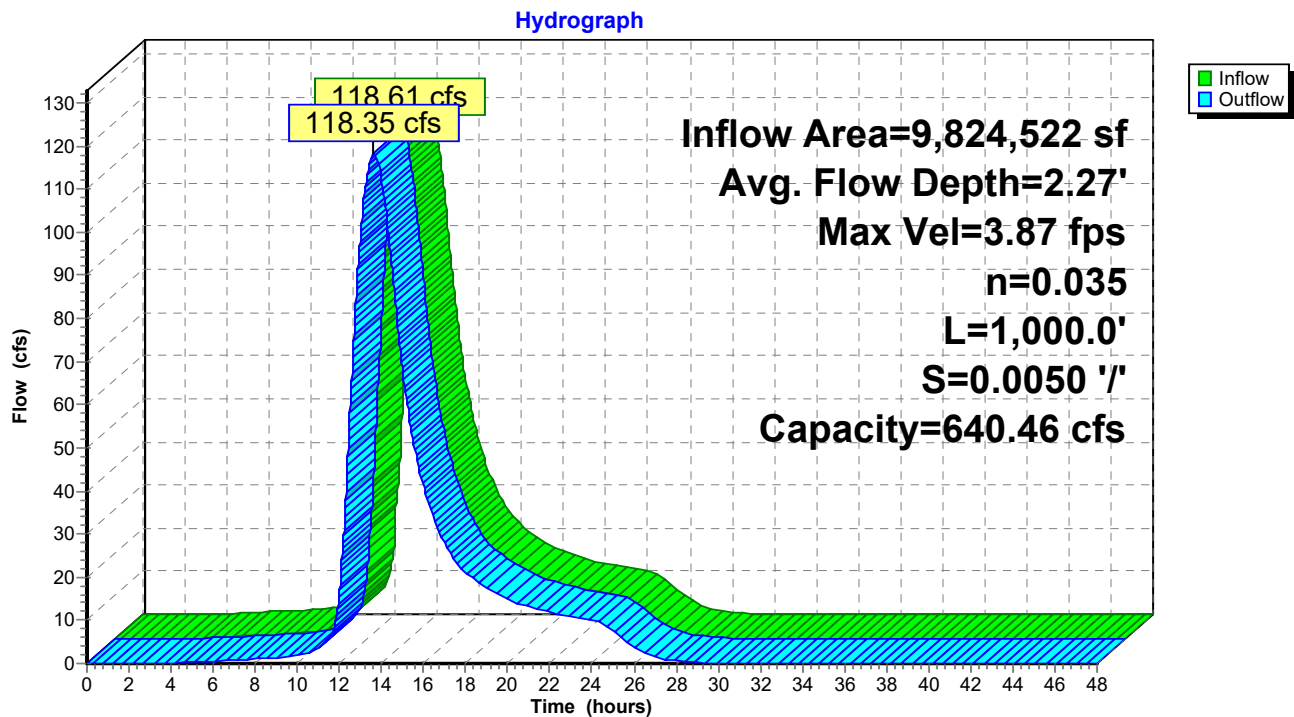
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 14.7 min

Peak Storage= 30,564 cf @ 13.62 hrs
Average Depth at Peak Storage= 2.27' , Surface Width= 20.21'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

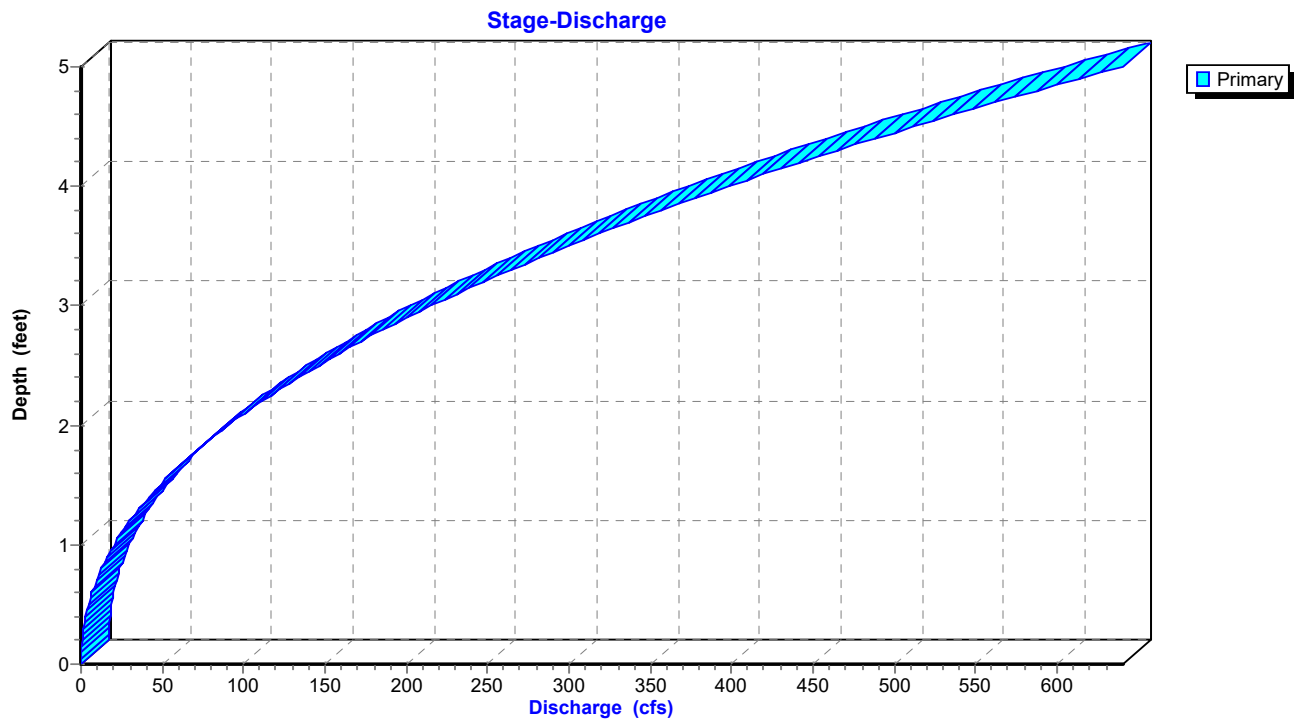
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

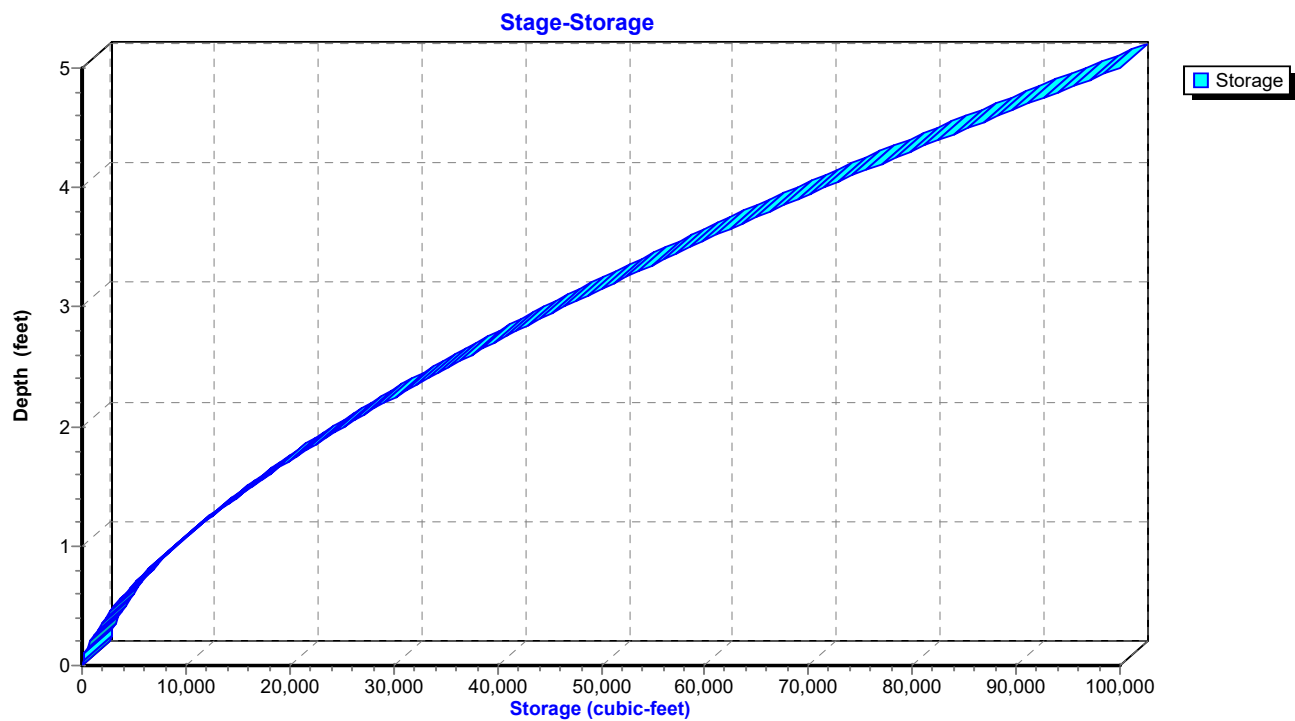


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 1.29" for 5-yr event
 Inflow = 19.26 cfs @ 12.94 hrs, Volume= 162,997 cf
 Outflow = 19.26 cfs @ 12.94 hrs, Volume= 162,997 cf, Atten= 0%, Lag= 0.0 min
 Primary = 19.26 cfs @ 12.94 hrs, Volume= 162,997 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 682.30' @ 12.94 hrs

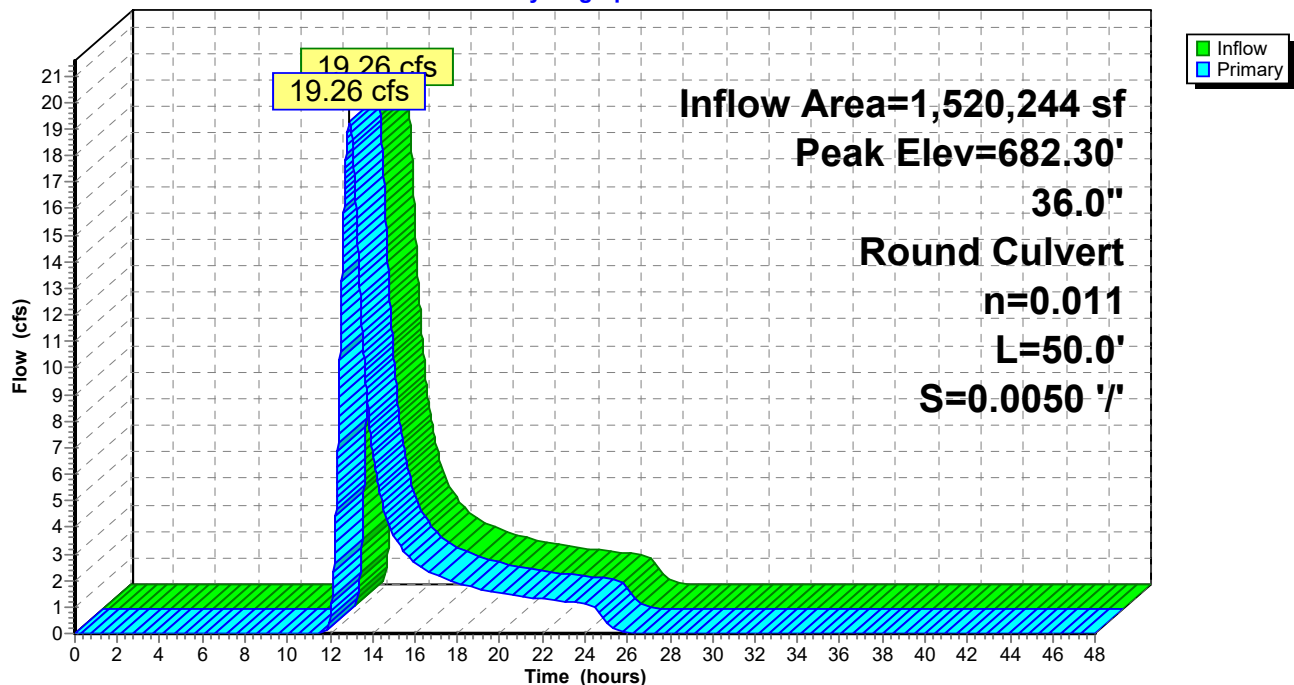
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

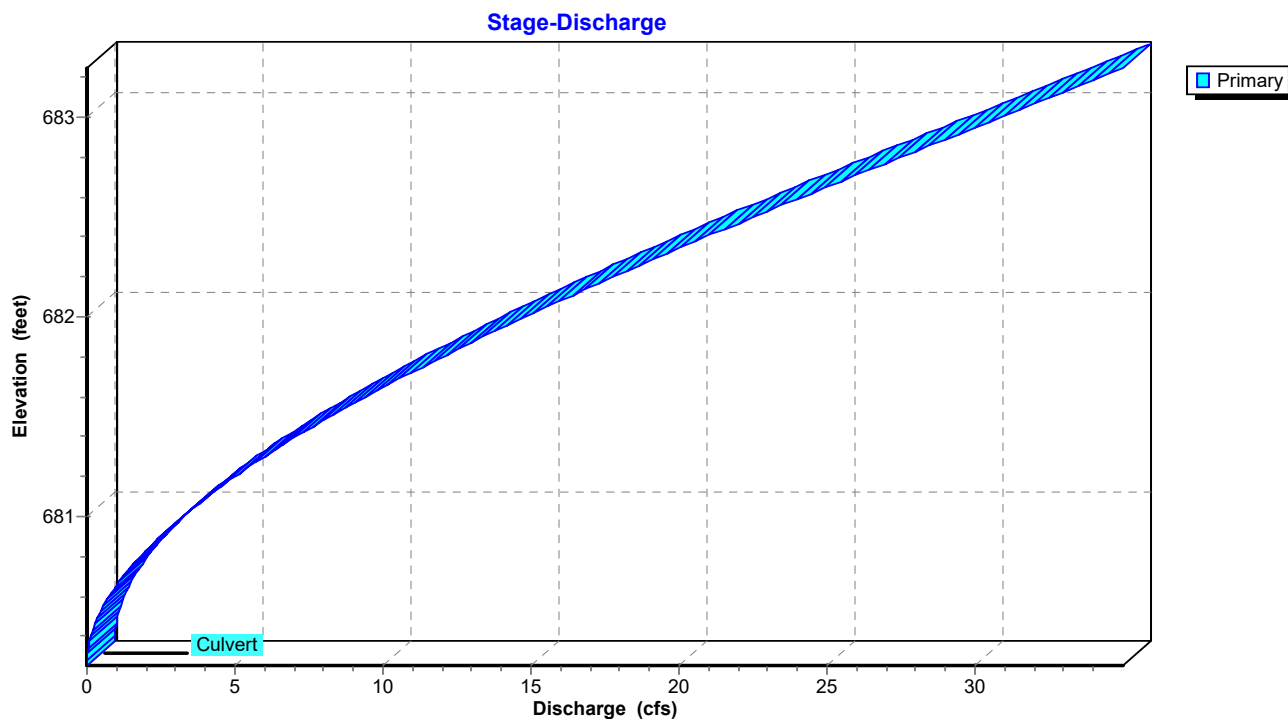
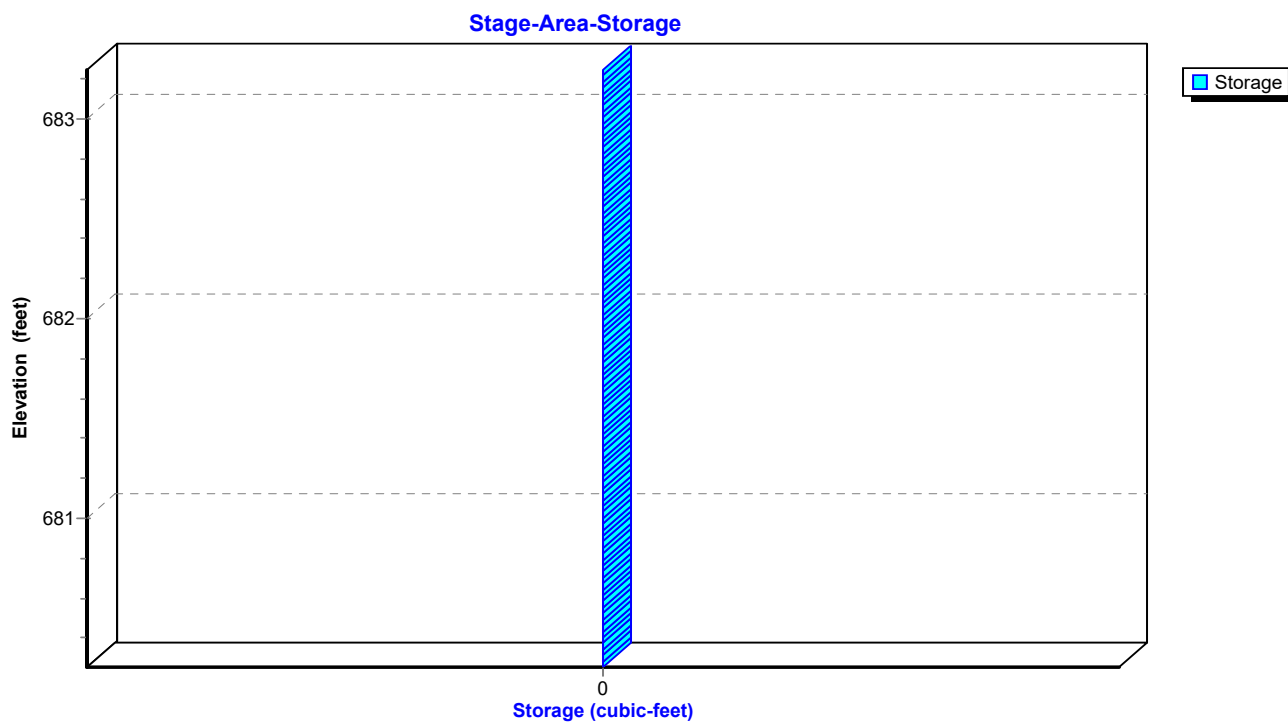
Primary OutFlow Max=19.26 cfs @ 12.94 hrs HW=682.30' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 19.26 cfs @ 5.29 fps)

~~Culvert~~ **Pond CD2: Cross Drain**

Pond CD2: Cross Drain

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

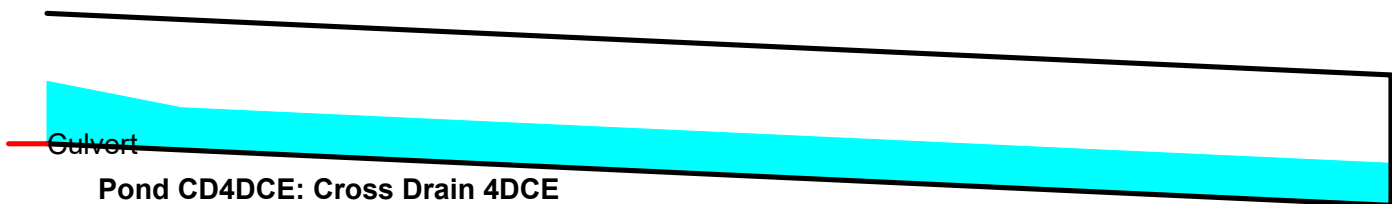
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 1.90" for 5-yr event
 Inflow = 27.84 cfs @ 12.52 hrs, Volume= 195,363 cf
 Outflow = 27.84 cfs @ 12.52 hrs, Volume= 195,363 cf, Atten= 0%, Lag= 0.0 min
 Primary = 27.84 cfs @ 12.52 hrs, Volume= 195,363 cf
 Routed to Pond POND1P : PROP POND

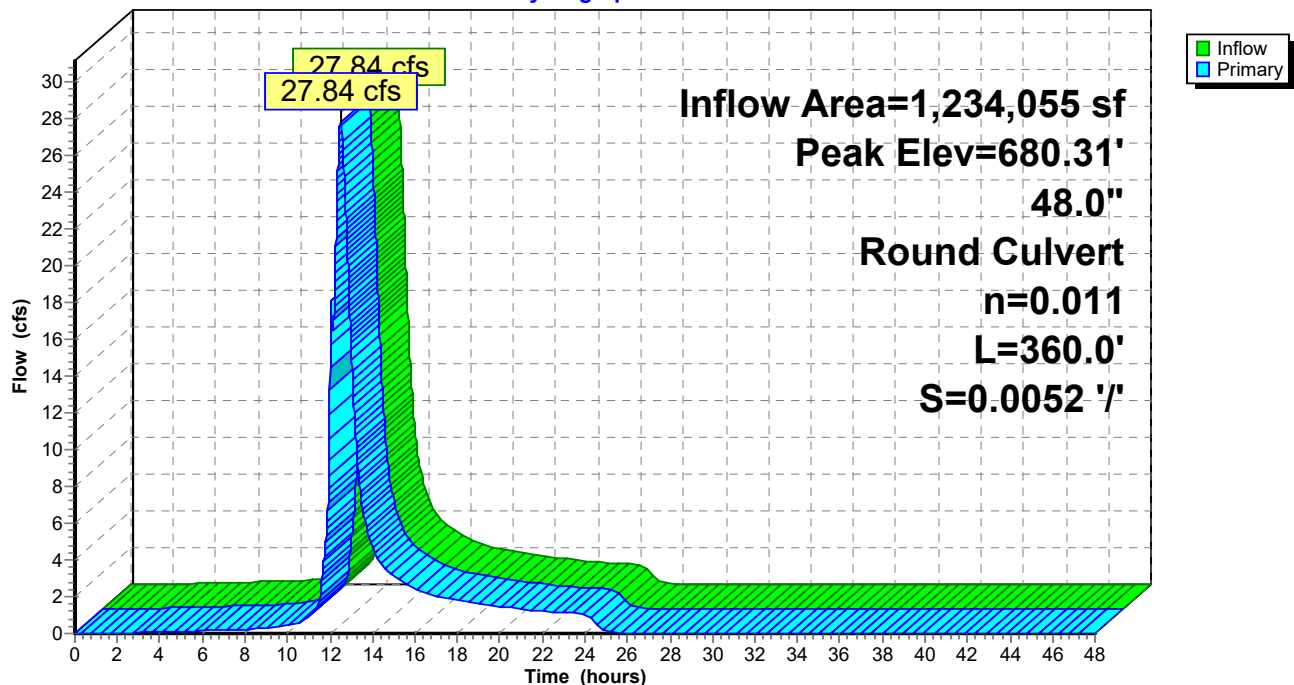
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 680.31' @ 12.52 hrs

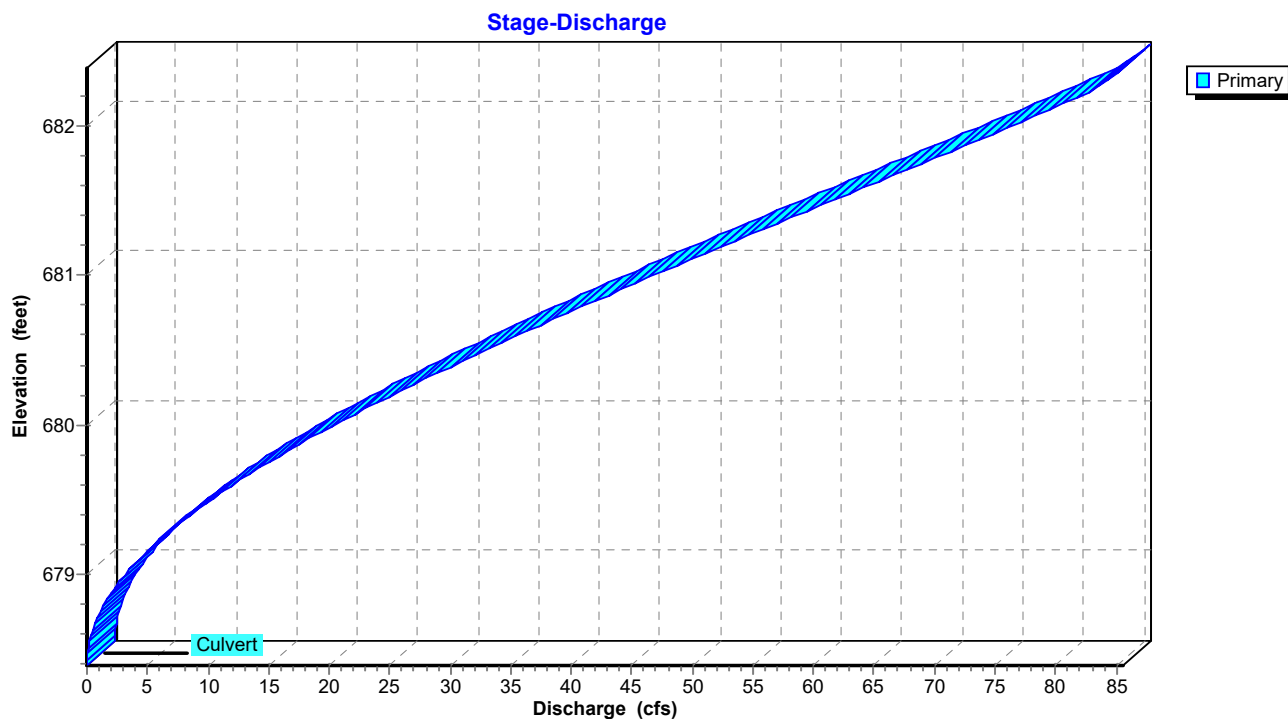
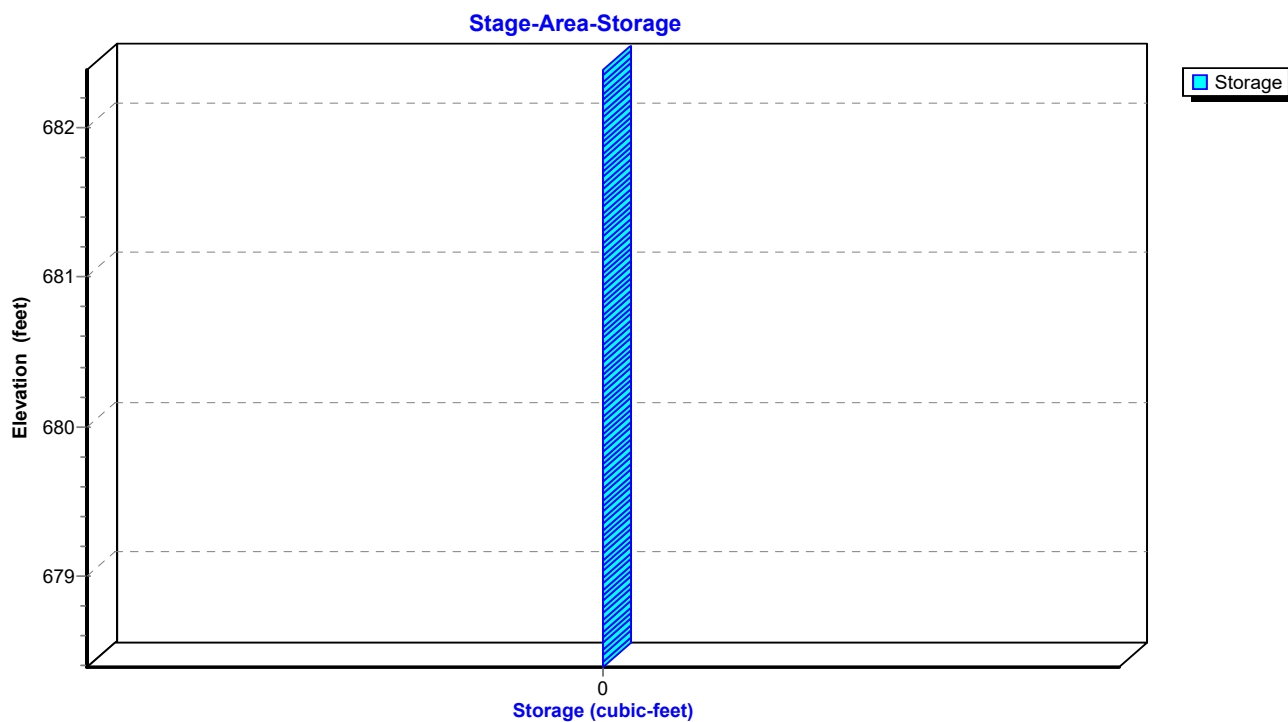
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=27.84 cfs @ 12.52 hrs HW=680.31' (Free Discharge)
 1=Culvert (Barrel Controls 27.84 cfs @ 6.86 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

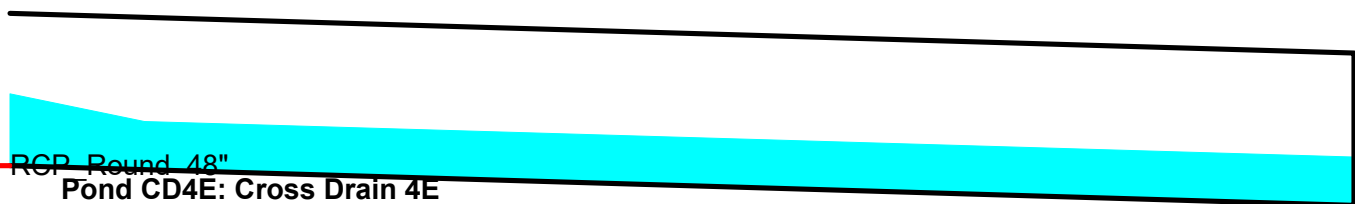
Summary for Pond CD4E: Cross Drain 4E

Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 1.66" for 5-yr event
 Inflow = 24.90 cfs @ 12.55 hrs, Volume= 155,395 cf
 Outflow = 24.90 cfs @ 12.55 hrs, Volume= 155,395 cf, Atten= 0%, Lag= 0.0 min
 Primary = 24.90 cfs @ 12.55 hrs, Volume= 155,395 cf
 Routed to Pond CD4DCE : Cross Drain 4DCE

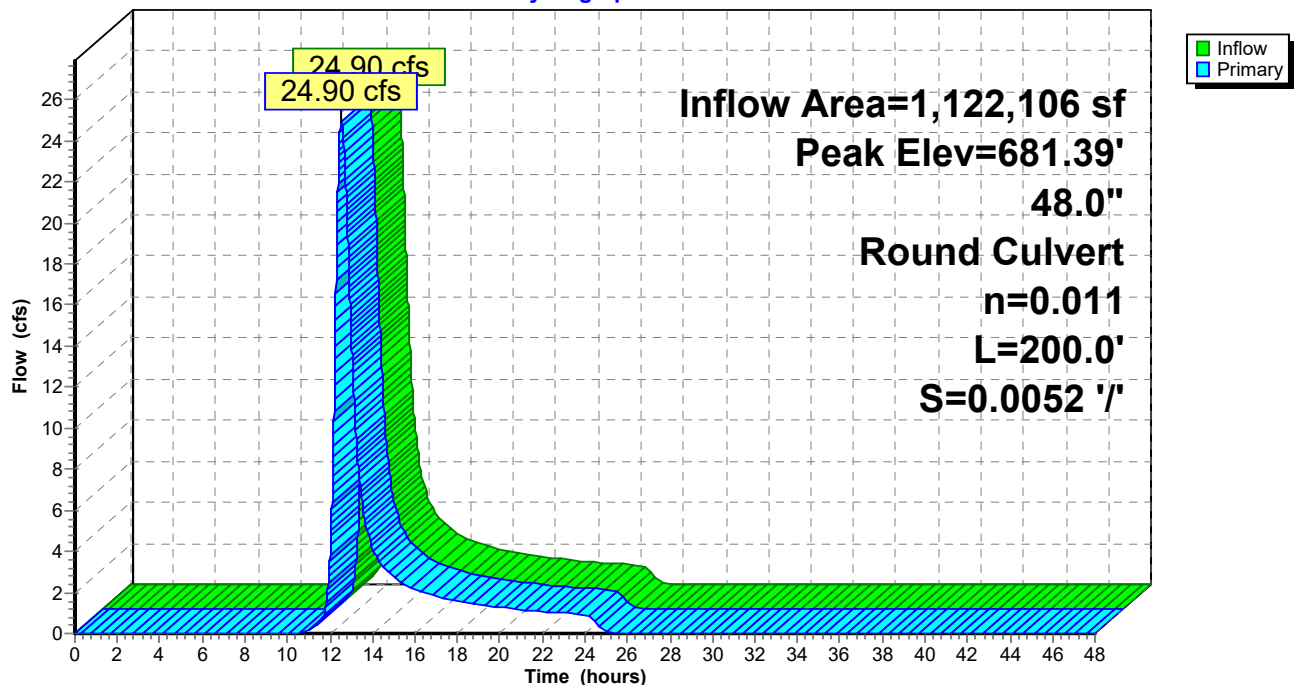
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.39' @ 12.55 hrs

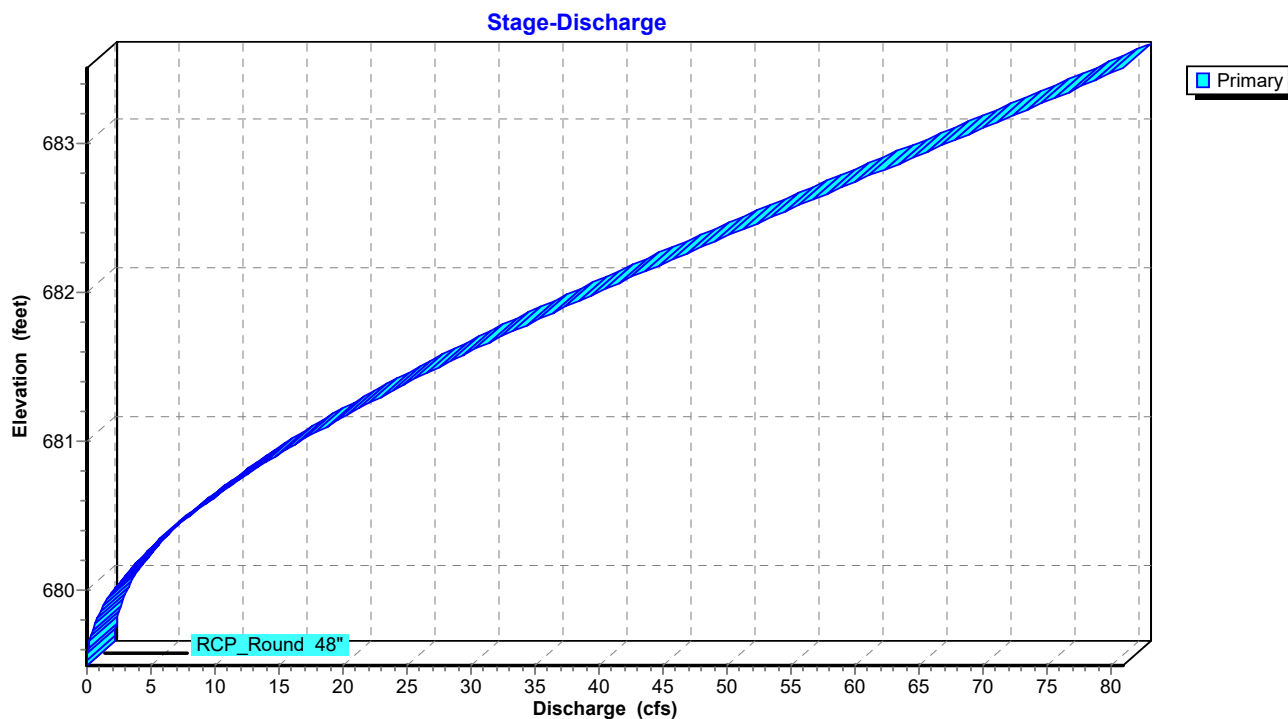
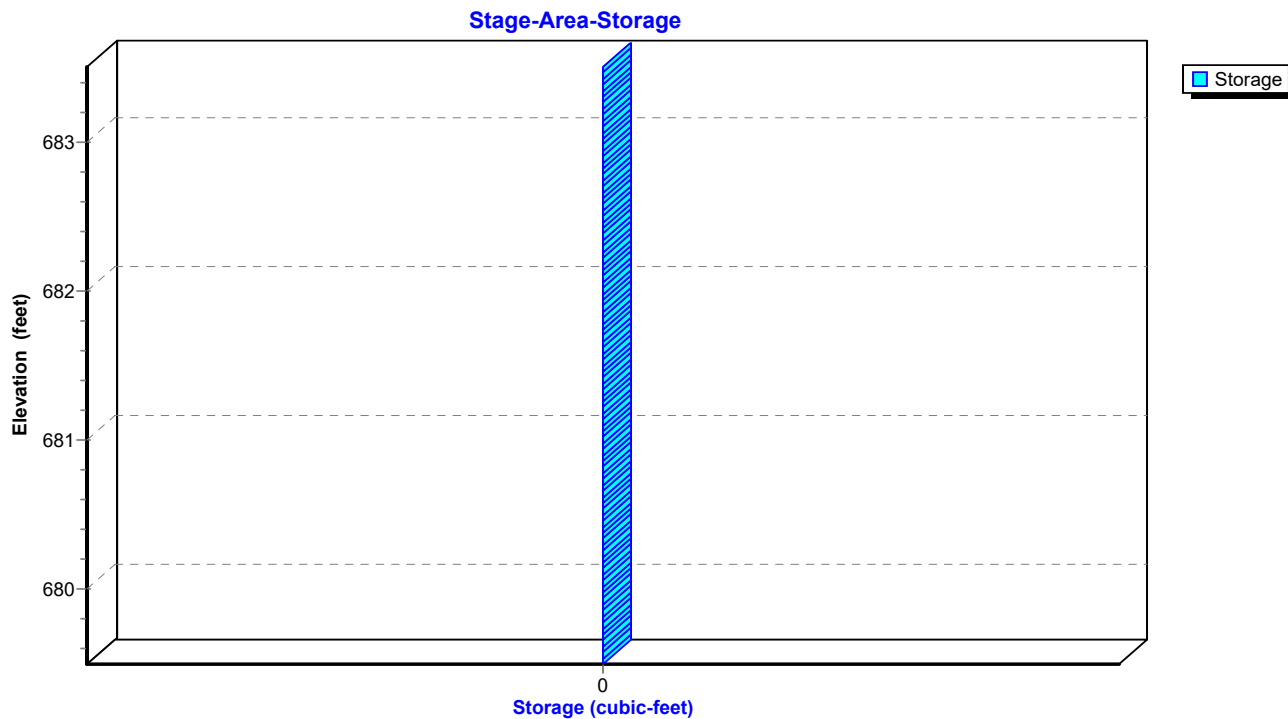
Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=24.90 cfs @ 12.55 hrs HW=681.39' (Free Discharge)
 ↳ **1=RCP_Round 48"** (Barrel Controls 24.90 cfs @ 6.26 fps)

**Pond CD4E: Cross Drain 4E**

Hydrograph



Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 2.62" for 5-yr event
 Inflow = 58.83 cfs @ 12.45 hrs, Volume= 385,246 cf
 Outflow = 35.13 cfs @ 12.87 hrs, Volume= 384,680 cf, Atten= 40%, Lag= 25.4 min
 Primary = 35.13 cfs @ 12.87 hrs, Volume= 384,680 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 680.04' @ 12.87 hrs Surf.Area= 39,291 sf Storage= 84,175 cf

Plug-Flow detention time= 39.4 min calculated for 384,680 cf (100% of inflow)
 Center-of-Mass det. time= 38.4 min (867.7 - 829.3)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

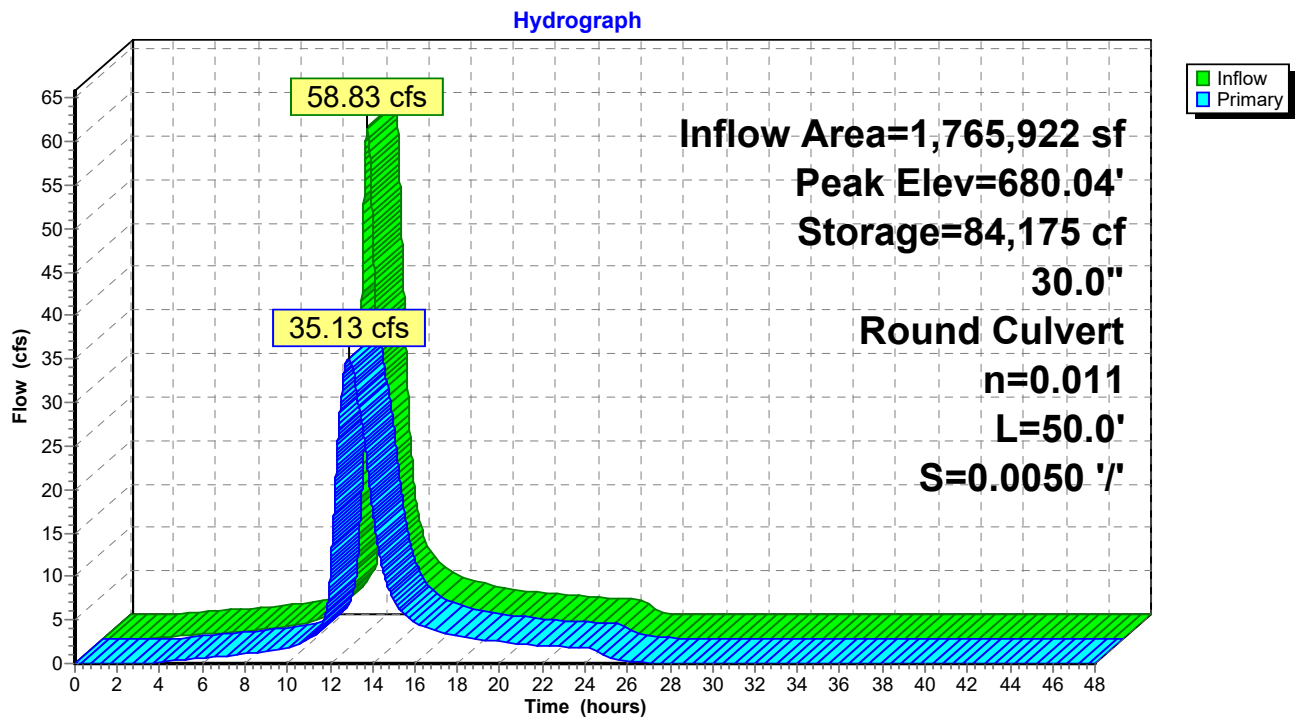
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 ' ' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

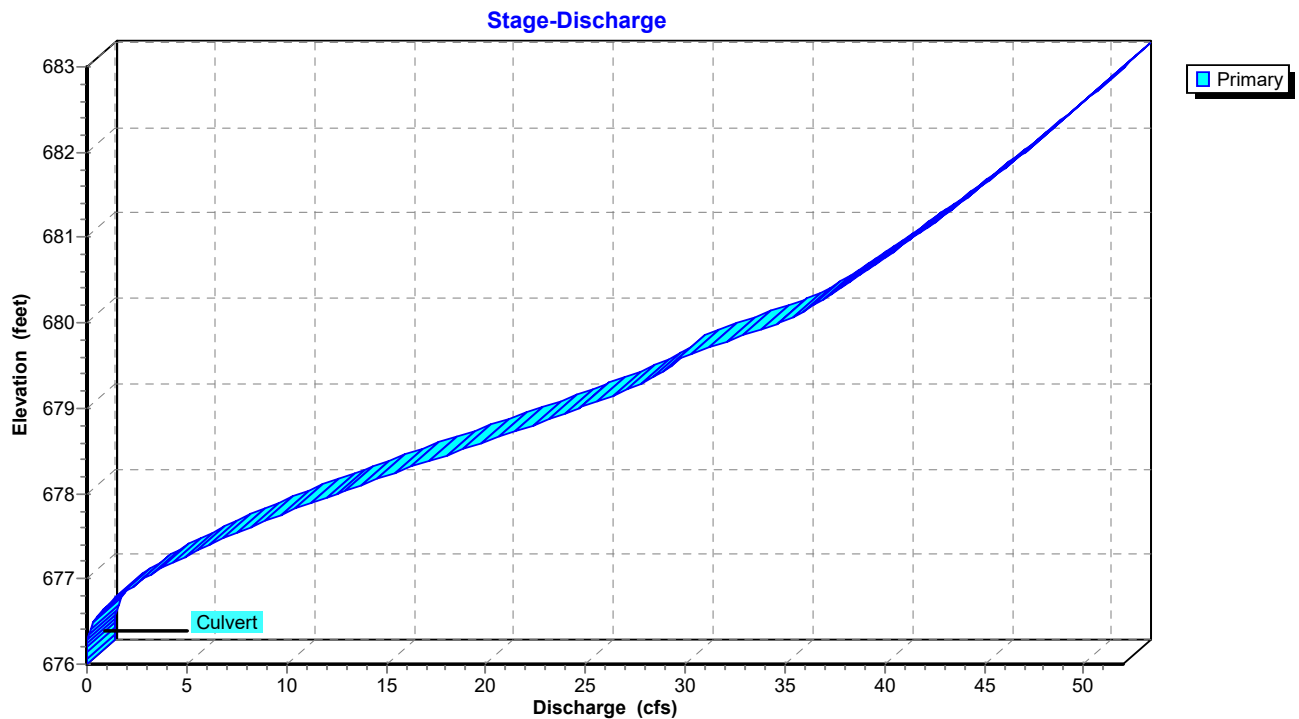
Primary OutFlow Max=35.13 cfs @ 12.87 hrs HW=680.04' (Free Discharge)
 ↑1=Culvert (Barrel Controls 35.13 cfs @ 7.16 fps)

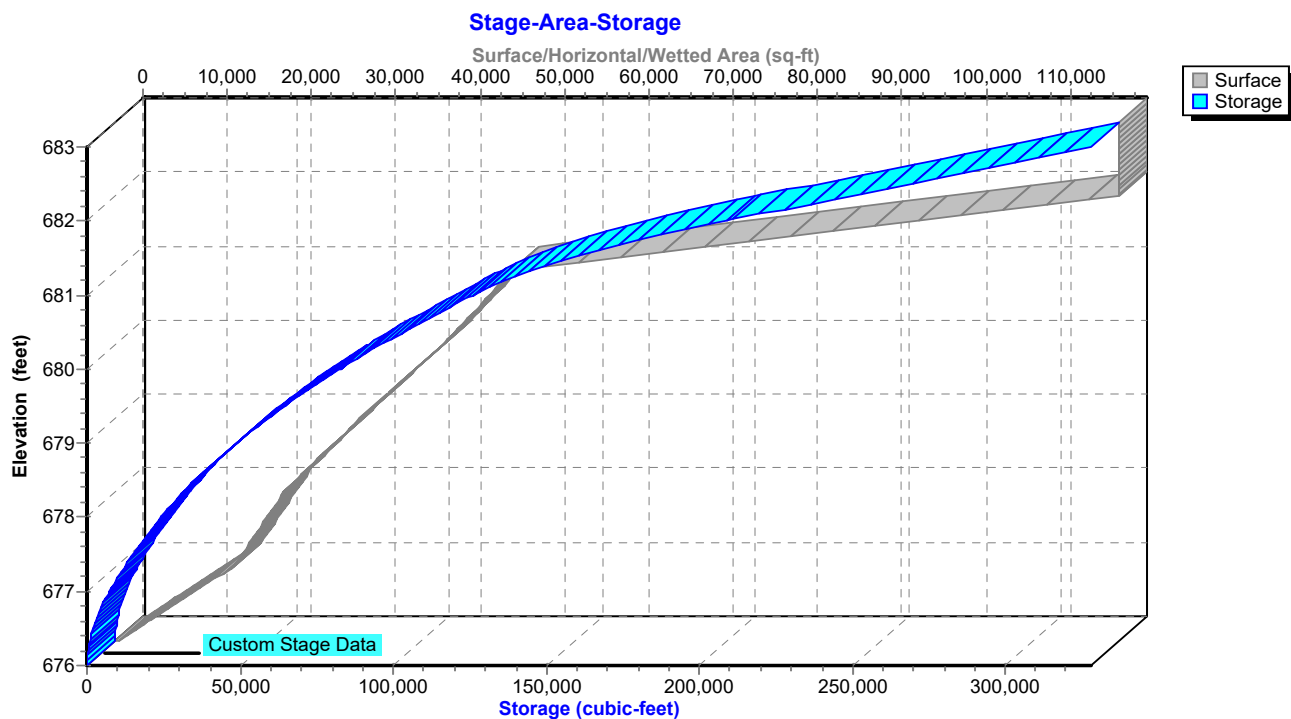


Pond POND1P: PROP POND



Pond POND1P: PROP POND



Pond POND1P: PROP POND

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=2.79"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=108.16 cfs 1,450,339 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=1.70"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=26.69 cfs 215,881 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=2.53"
 Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=19.95 cfs 87,478 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=2.35"
 Flow Length=1,500' Tc=50.3 min CN=70 Runoff=51.96 cfs 354,450 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=2.79"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=108.16 cfs 1,450,339 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=1.70"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=26.69 cfs 215,881 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=3.17"
 Tc=5.0 min CN=79 Runoff=9.48 cfs 24,483 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=2.18"
 Flow Length=300' Tc=28.4 min CN=68 Runoff=7.54 cfs 39,403 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=4.95"
 Flow Length=1,000' Tc=33.8 min CN=96 Runoff=36.82 cfs 219,403 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=4.95"
 Tc=5.0 min CN=96 Runoff=6.92 cfs 19,586 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=4.95"
 Tc=5.0 min CN=96 Runoff=9.39 cfs 26,594 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=1.86"
 Flow Length=500' Tc=28.1 min CN=64 Runoff=10.56 cfs 56,432 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=2.27"
 Flow Length=1,000' Tc=41.1 min CN=69 Runoff=23.18 cfs 143,246 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.44' Max Vel=15.15 fps Inflow=6.56 cfs 19,586 cf
 18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=6.56 cfs 19,586 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.77' Max Vel=2.79 fps Inflow=6.92 cfs 19,586 cf
 n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=6.56 cfs 19,586 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.83' Max Vel=3.46 fps Inflow=9.39 cfs 26,594 cf
 n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=9.01 cfs 26,594 cf

TrueRail*Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"*

Prepared by CSR Engineering, Inc

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Reach D4E1: Ditch 4E1 Avg. Flow Depth=1.09' Max Vel=2.57 fps Inflow=10.56 cfs 56,432 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=10.25 cfs 56,432 cf

Reach OF4: Primary Stream for Avg. Flow Depth=2.42' Max Vel=4.04 fps Inflow=136.08 cfs 2,108,149 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=135.81 cfs 2,108,149 cf

Reach OF4P: Primary Stream for Avg. Flow Depth=2.53' Max Vel=4.16 fps Inflow=150.50 cfs 2,194,802 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=150.10 cfs 2,194,799 cf

Pond CD2: Cross Drain Peak Elev=682.76' Inflow=26.69 cfs 215,881 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=26.69 cfs 215,881 cf

Pond CD4DCE: Cross Drain 4DCE Peak Elev=680.63' Inflow=36.42 cfs 245,859 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=36.42 cfs 245,859 cf

Pond CD4E: Cross Drain 4E Peak Elev=681.72' Inflow=32.85 cfs 199,679 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=32.85 cfs 199,679 cf

Pond POND1P: PROP POND Peak Elev=680.65' Storage=109,872 cf Inflow=72.29 cfs 465,263 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=39.34 cfs 464,696 cf

Total Runoff Area = 19,797,149 sf Runoff Volume = 4,303,517 cf Average Runoff Depth = 2.61"
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 108.16 cfs @ 13.83 hrs, Volume= 1,450,339 cf, Depth= 2.79"

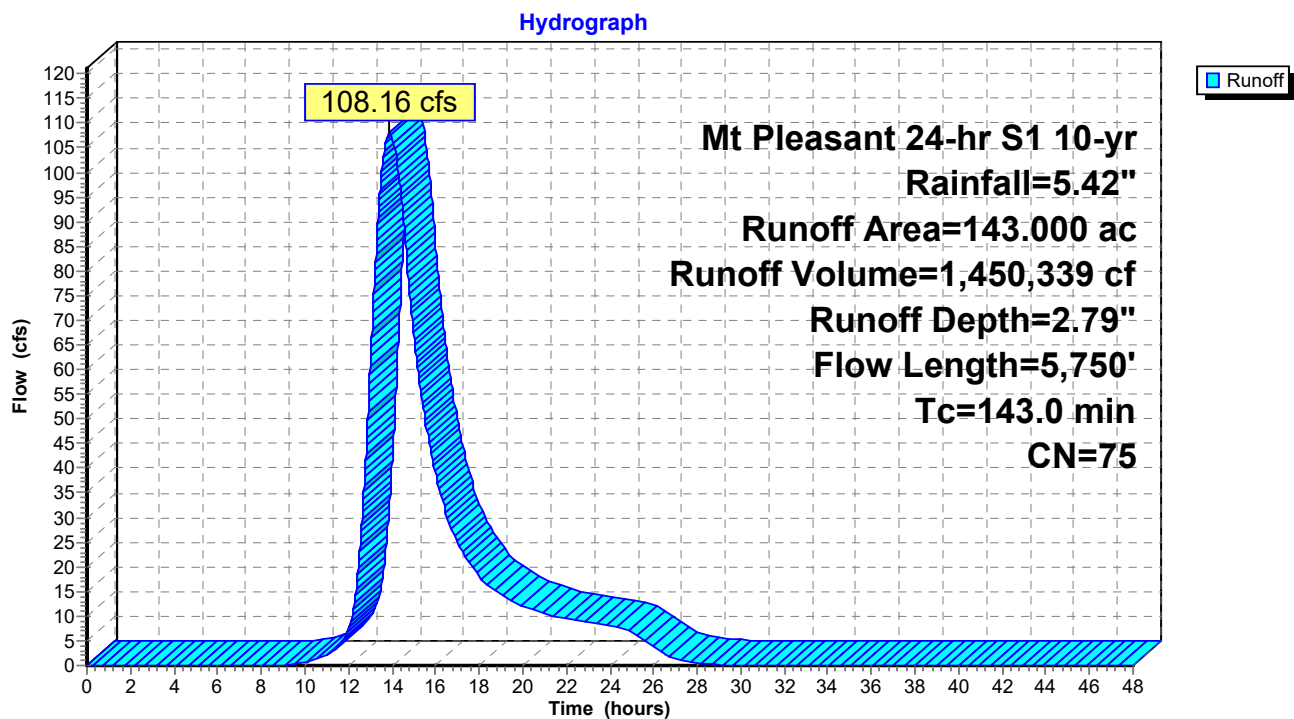
Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Runoff = 26.69 cfs @ 12.94 hrs, Volume= 215,881 cf, Depth= 1.70"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

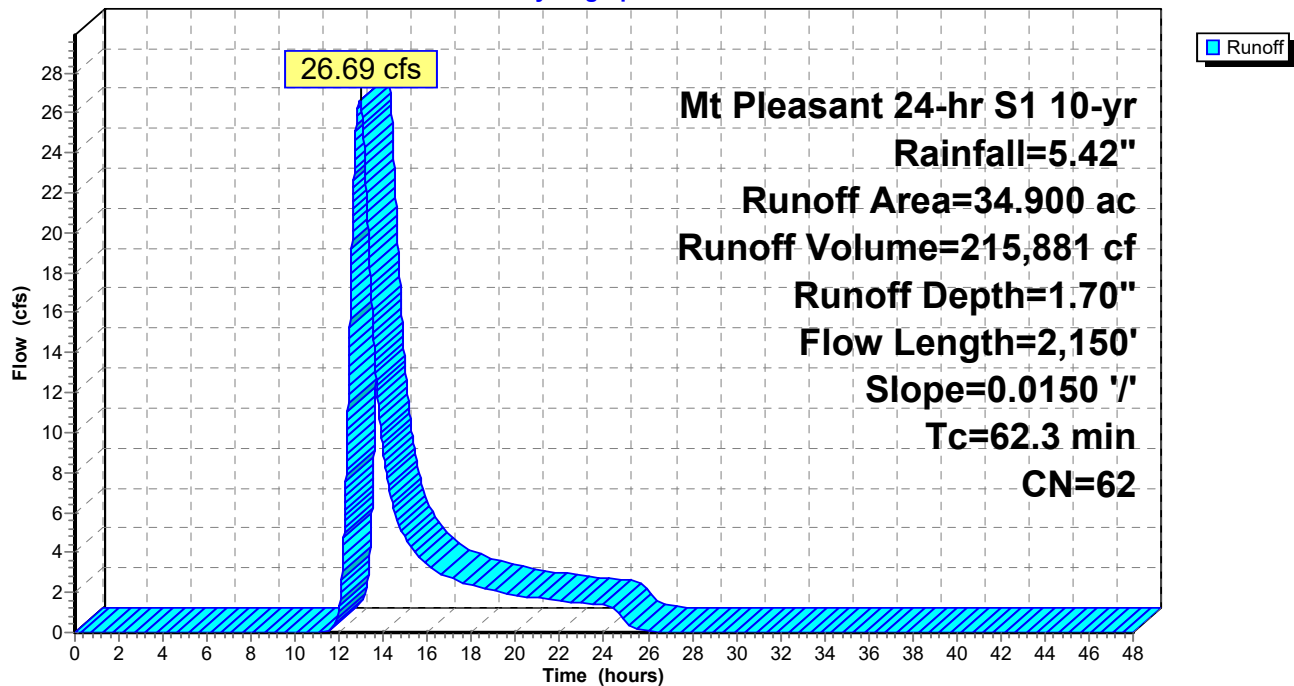
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Hydrograph



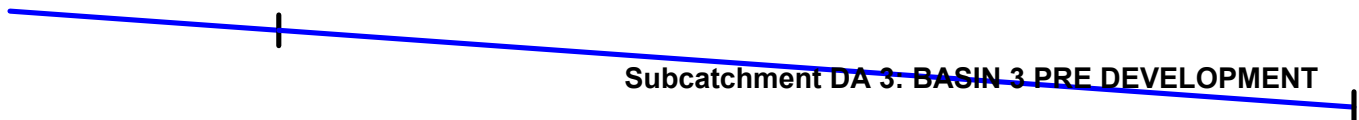
Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Runoff = 19.95 cfs @ 12.24 hrs, Volume= 87,478 cf, Depth= 2.53"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

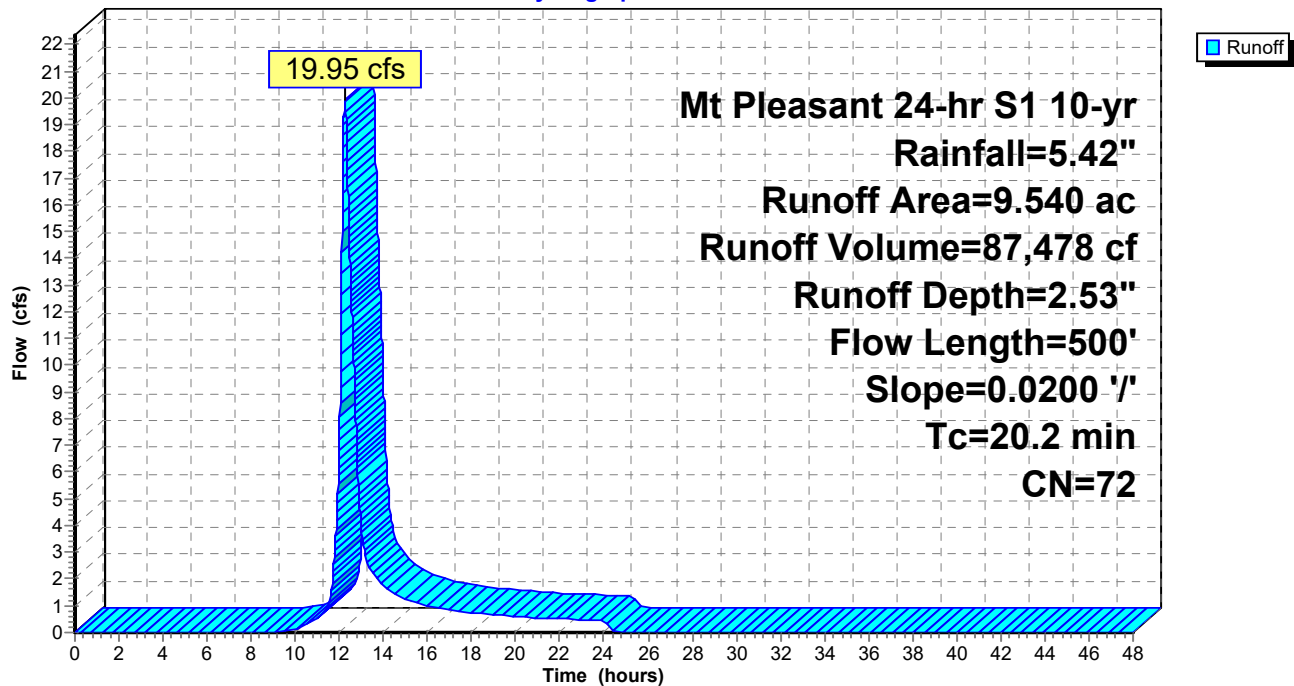
Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 51.96 cfs @ 12.69 hrs, Volume= 354,450 cf, Depth= 2.35"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

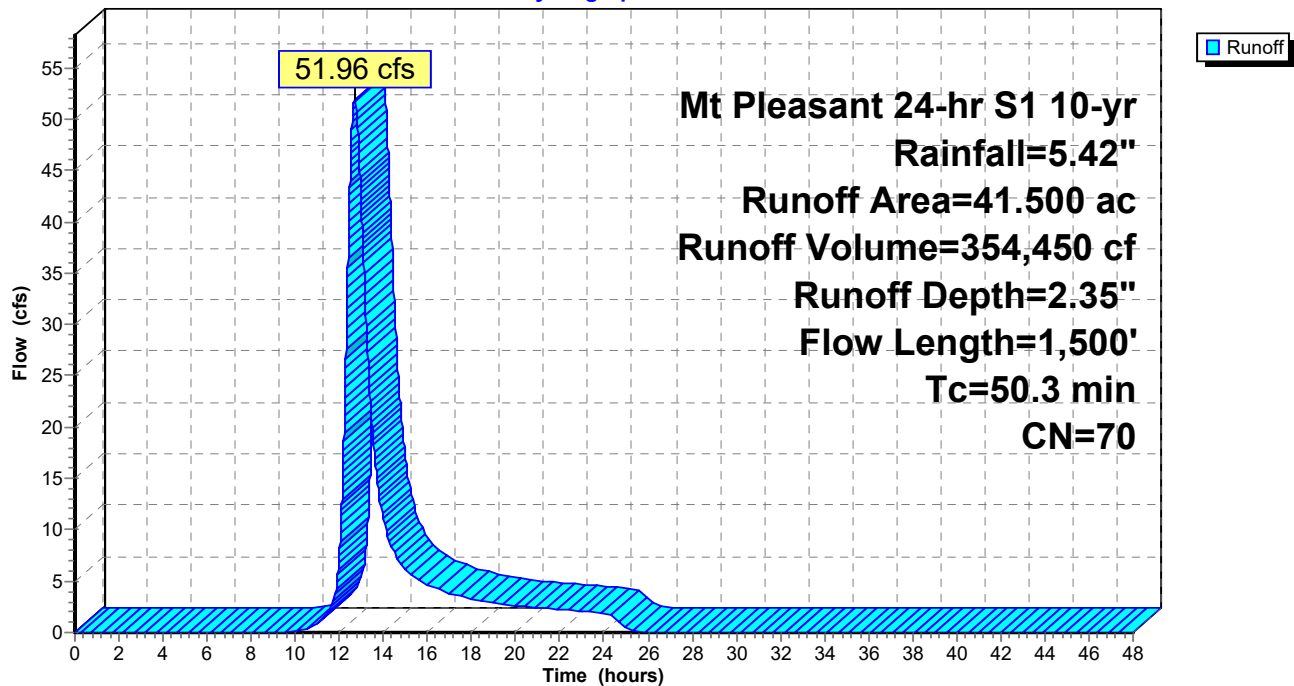
Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA1P: BASIN 1 PROPOSED

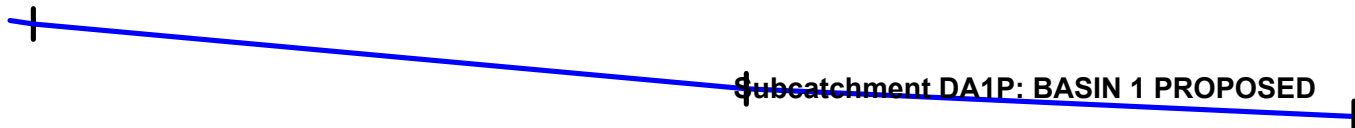
Runoff = 108.16 cfs @ 13.83 hrs, Volume= 1,450,339 cf, Depth= 2.79"

Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

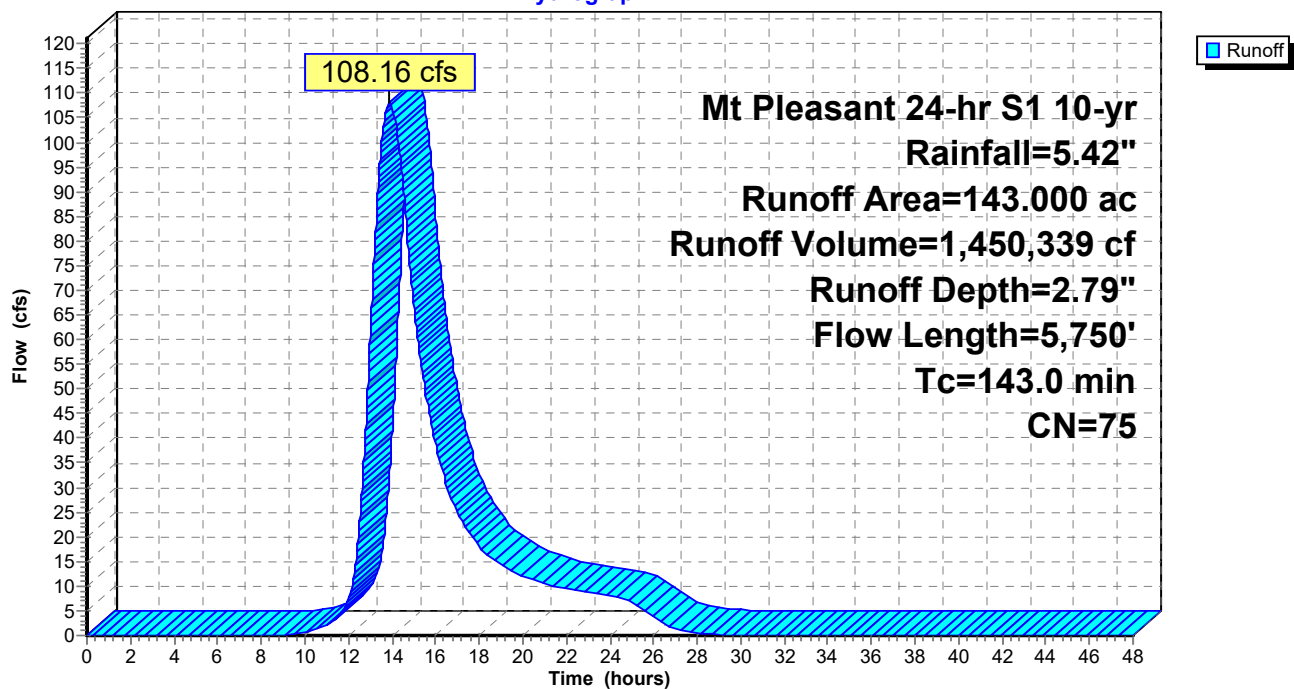
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

Hydrograph



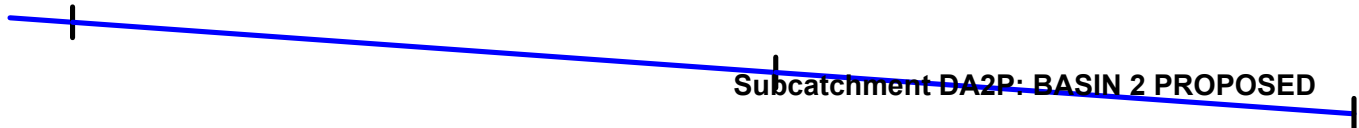
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 26.69 cfs @ 12.94 hrs, Volume= 215,881 cf, Depth= 1.70"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

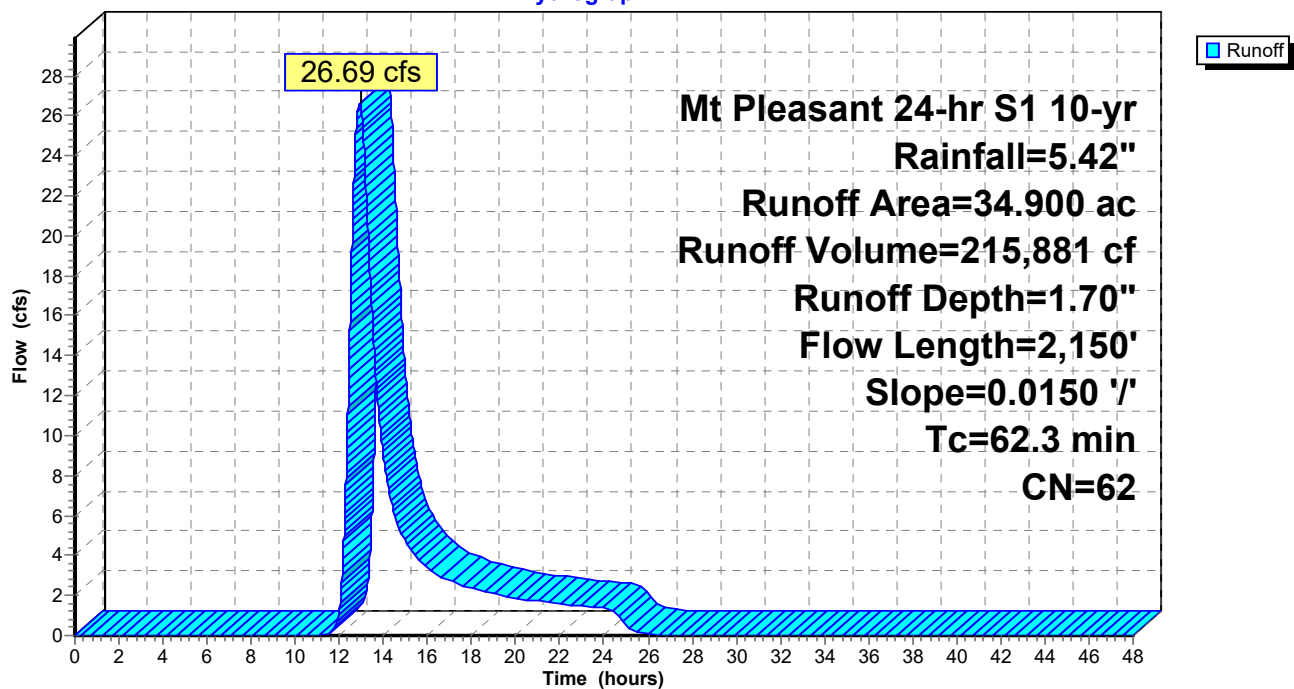
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 9.48 cfs @ 12.03 hrs, Volume= 24,483 cf, Depth= 3.17"

Routed to Reach OF4P : Primary Stream for Outfalls

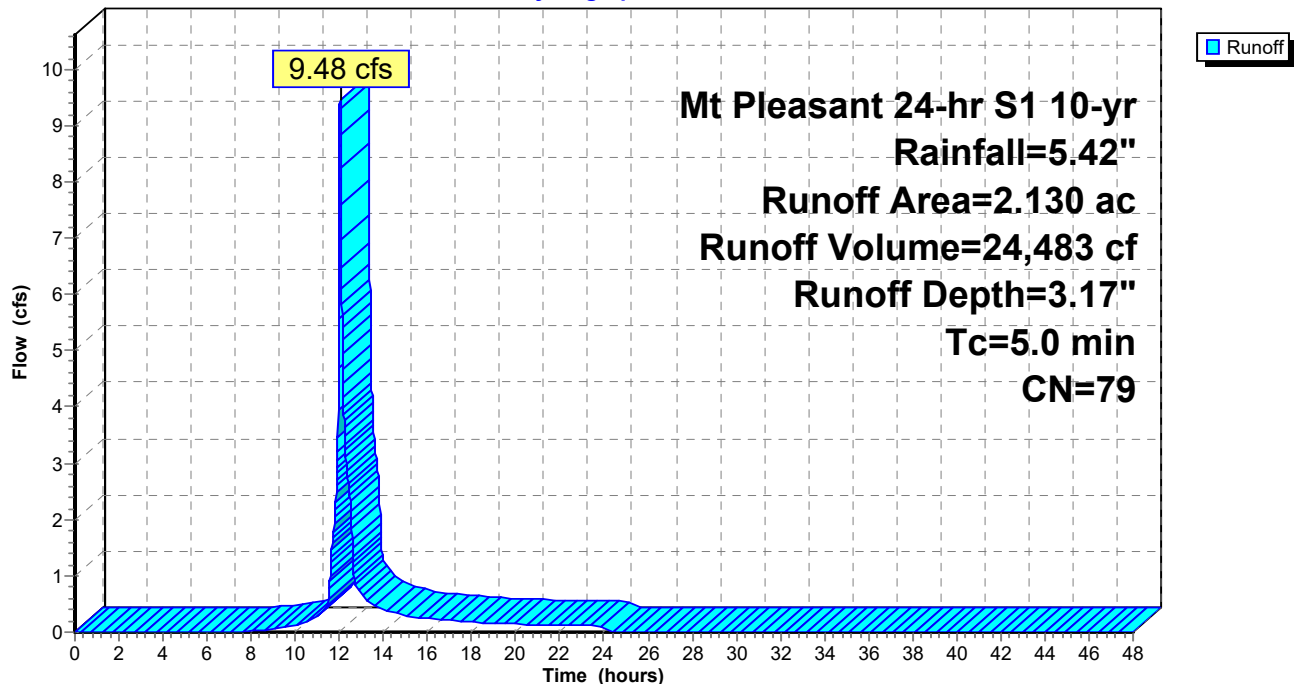
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

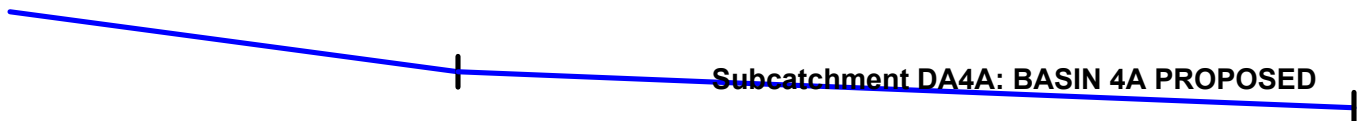
Runoff = 7.54 cfs @ 12.37 hrs, Volume= 39,403 cf, Depth= 2.18"

Routed to Reach OF4P : Primary Stream for Outfalls

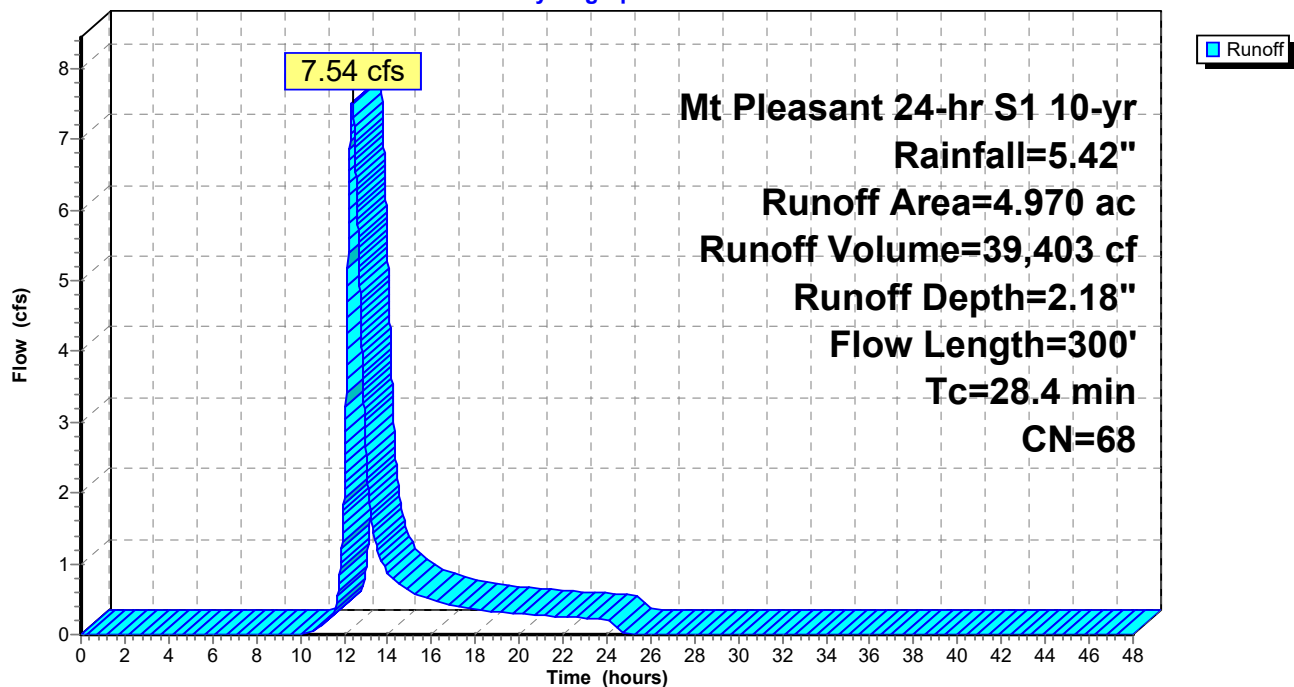
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



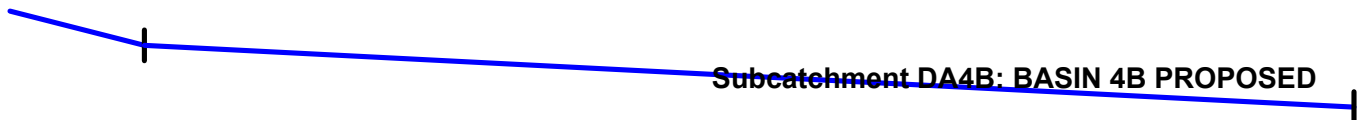
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 36.82 cfs @ 12.40 hrs, Volume= 219,403 cf, Depth= 4.95"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

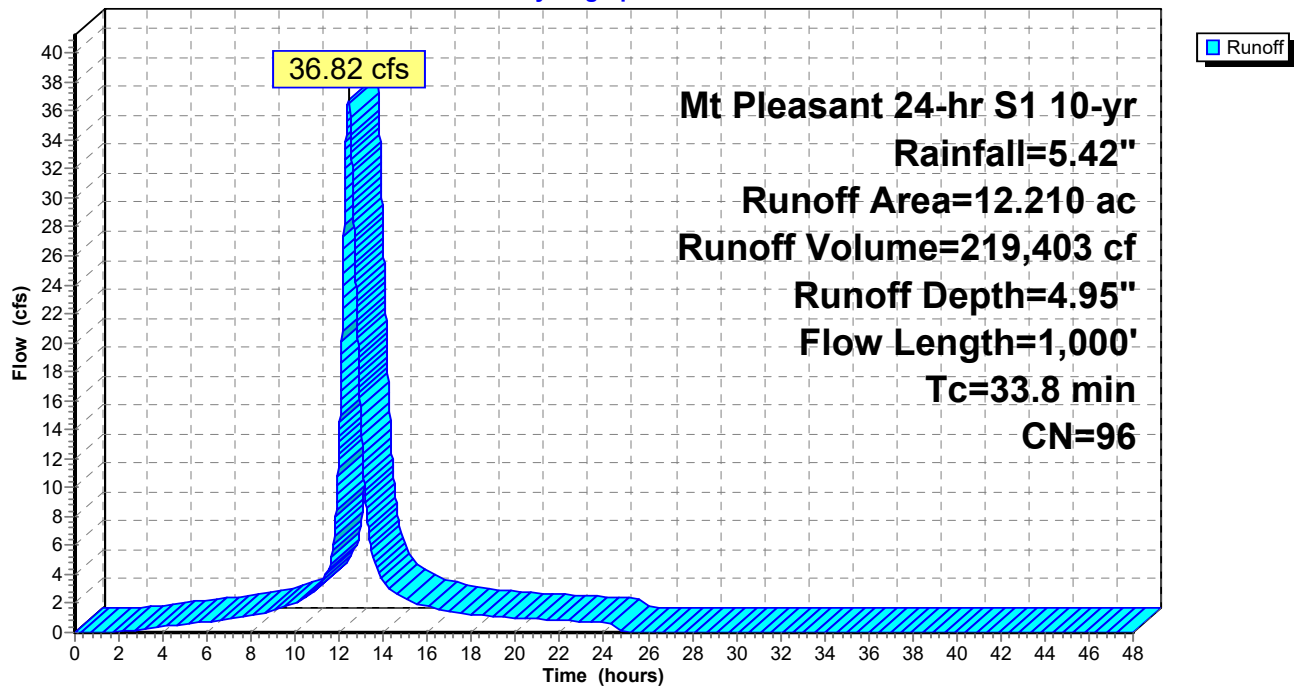
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 6.92 cfs @ 12.03 hrs, Volume= 19,586 cf, Depth= 4.95"
 Routed to Reach D4C : Ditch 4C

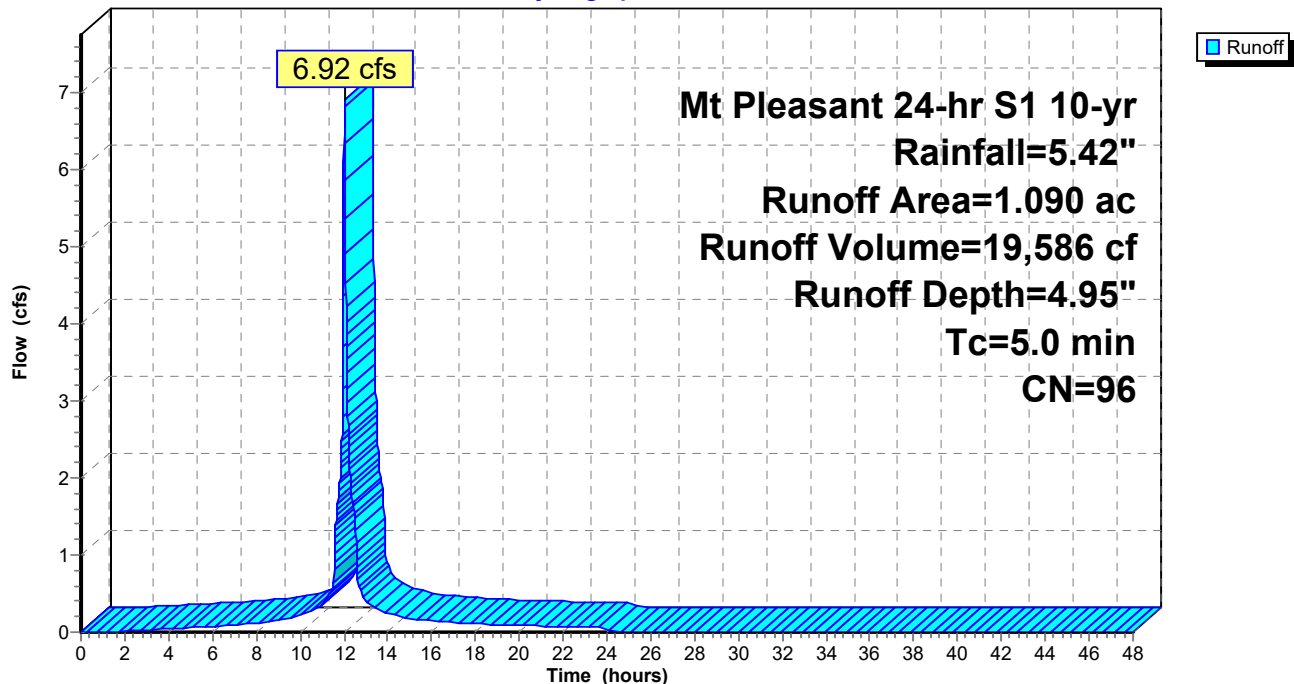
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 9.39 cfs @ 12.03 hrs, Volume= 26,594 cf, Depth= 4.95"
 Routed to Reach D4D : Ditch 4D

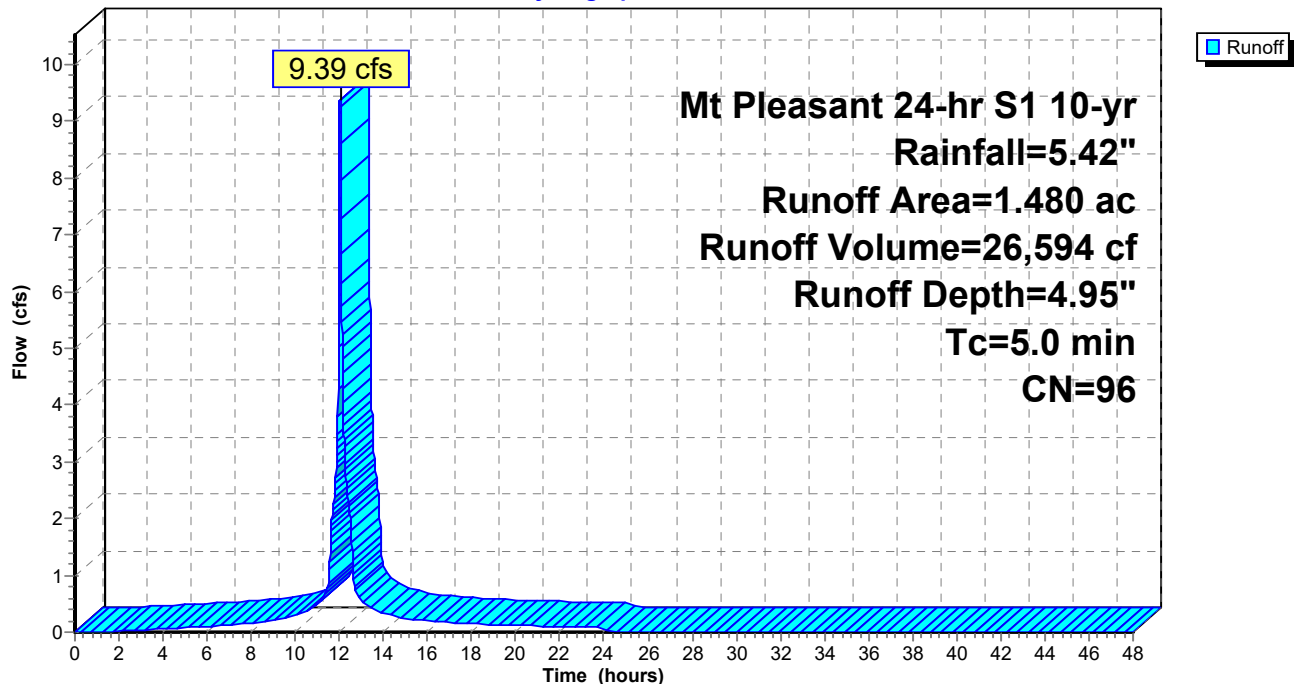
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



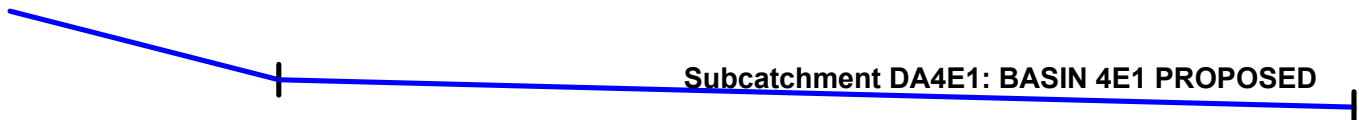
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

Runoff = 10.56 cfs @ 12.39 hrs, Volume= 56,432 cf, Depth= 1.86"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

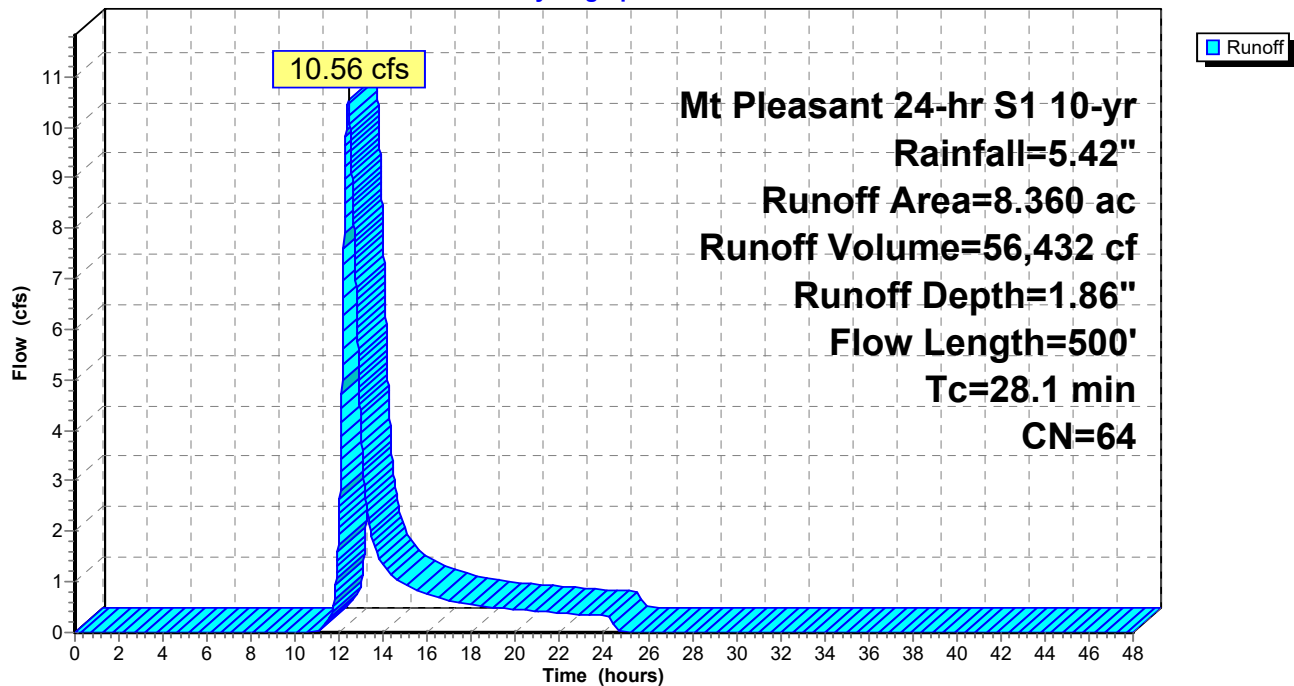
Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

Hydrograph



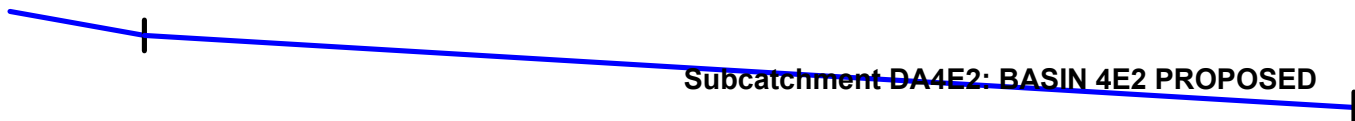
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 23.18 cfs @ 12.56 hrs, Volume= 143,246 cf, Depth= 2.27"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 10-yr Rainfall=5.42"

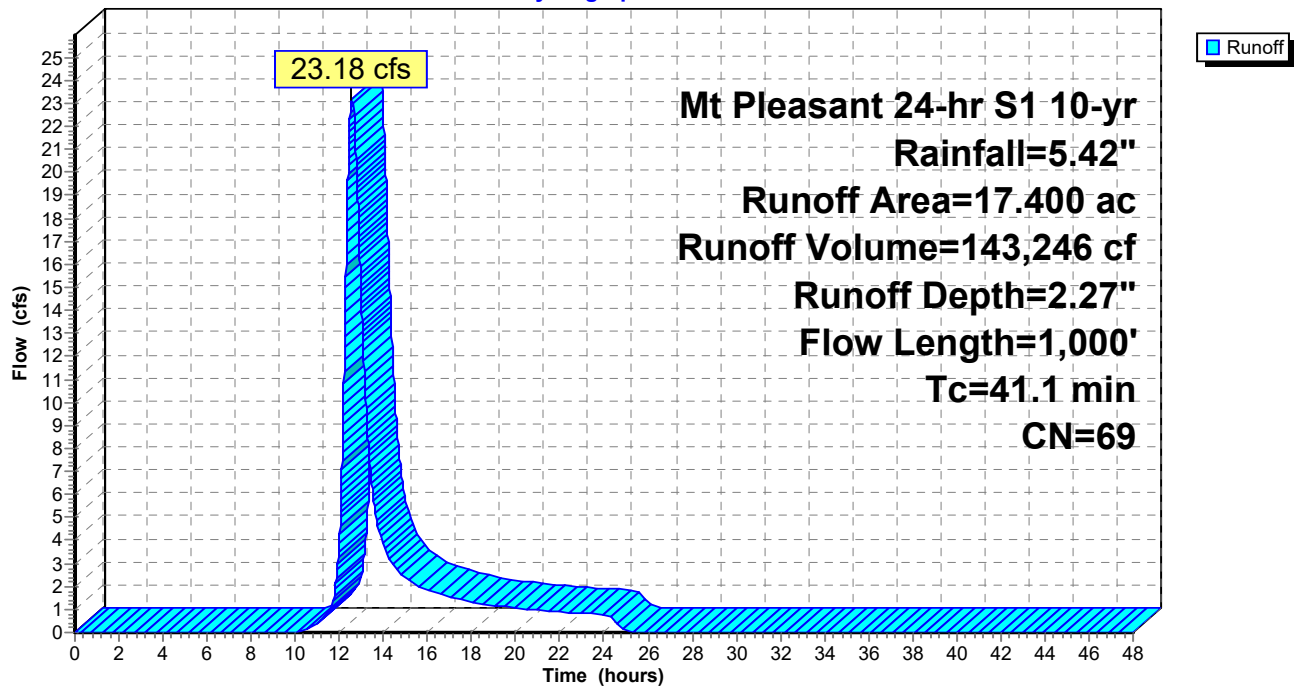
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



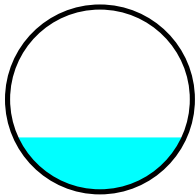
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 4.95" for 10-yr event
Inflow = 6.56 cfs @ 12.04 hrs, Volume= 19,586 cf
Outflow = 6.56 cfs @ 12.05 hrs, Volume= 19,586 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

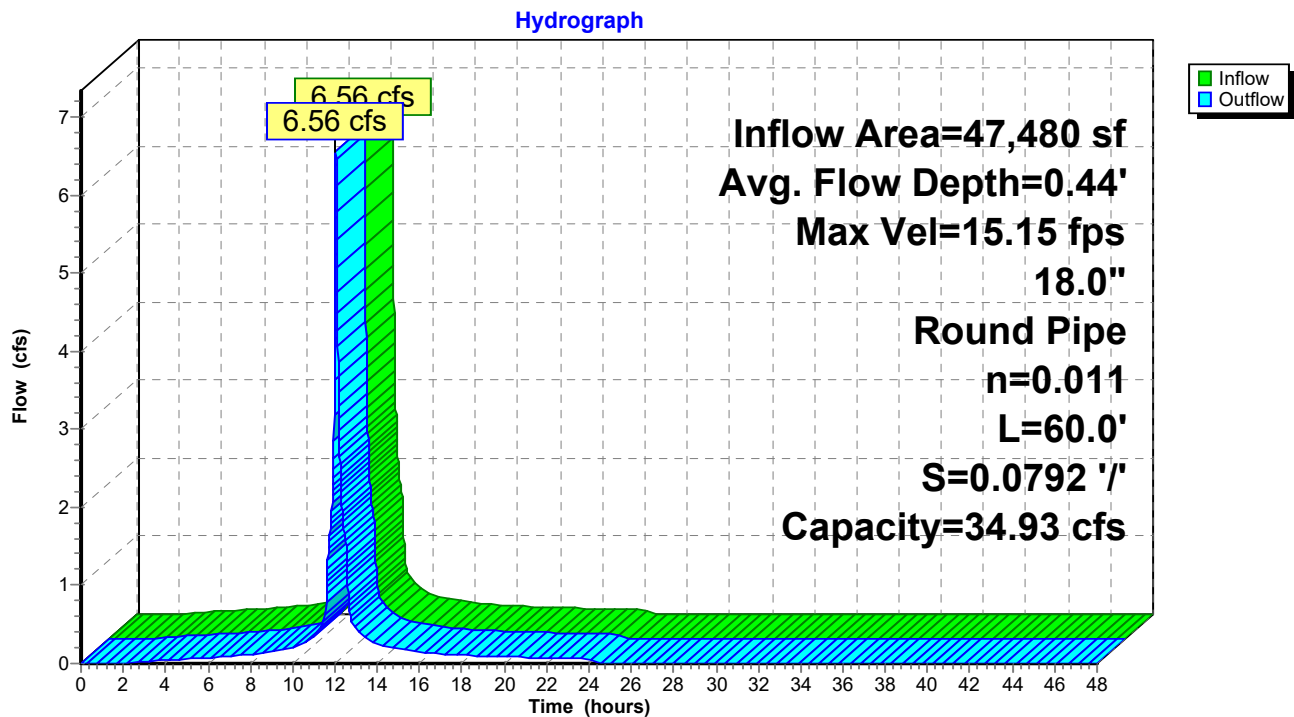
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.15 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.59 fps, Avg. Travel Time= 0.2 min

Peak Storage= 26 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 1.37'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

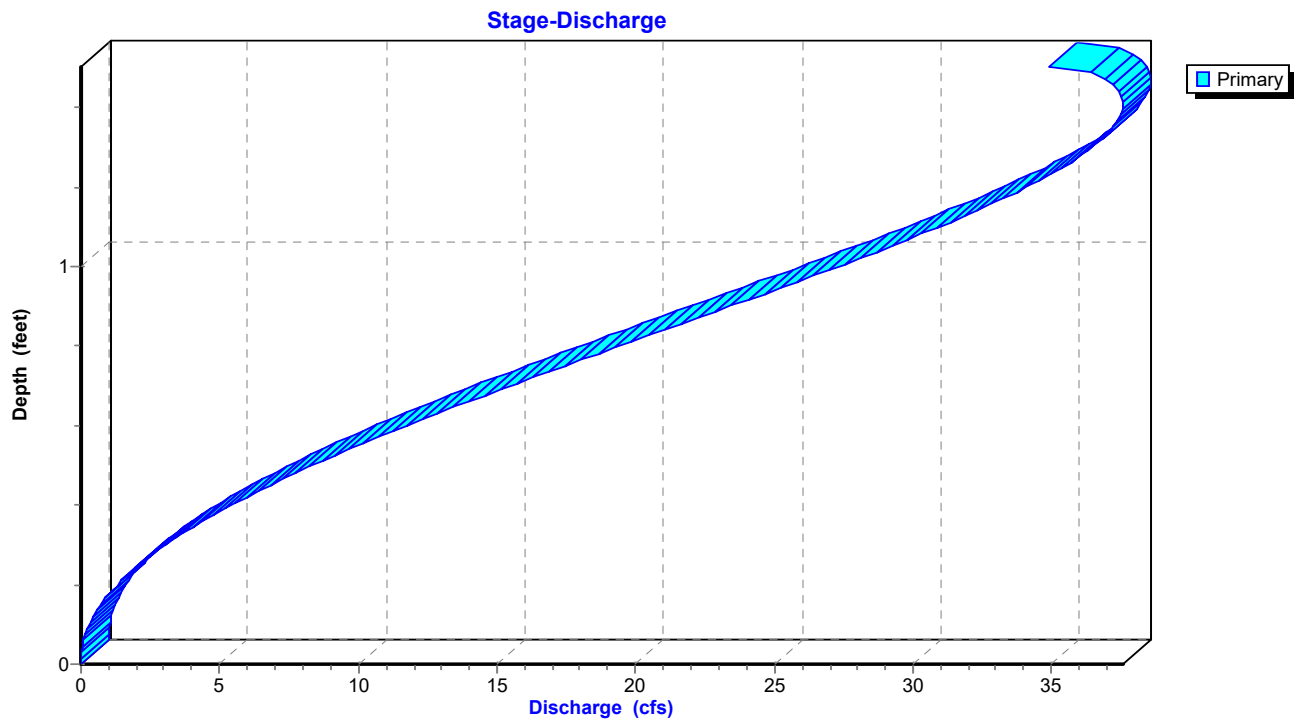
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

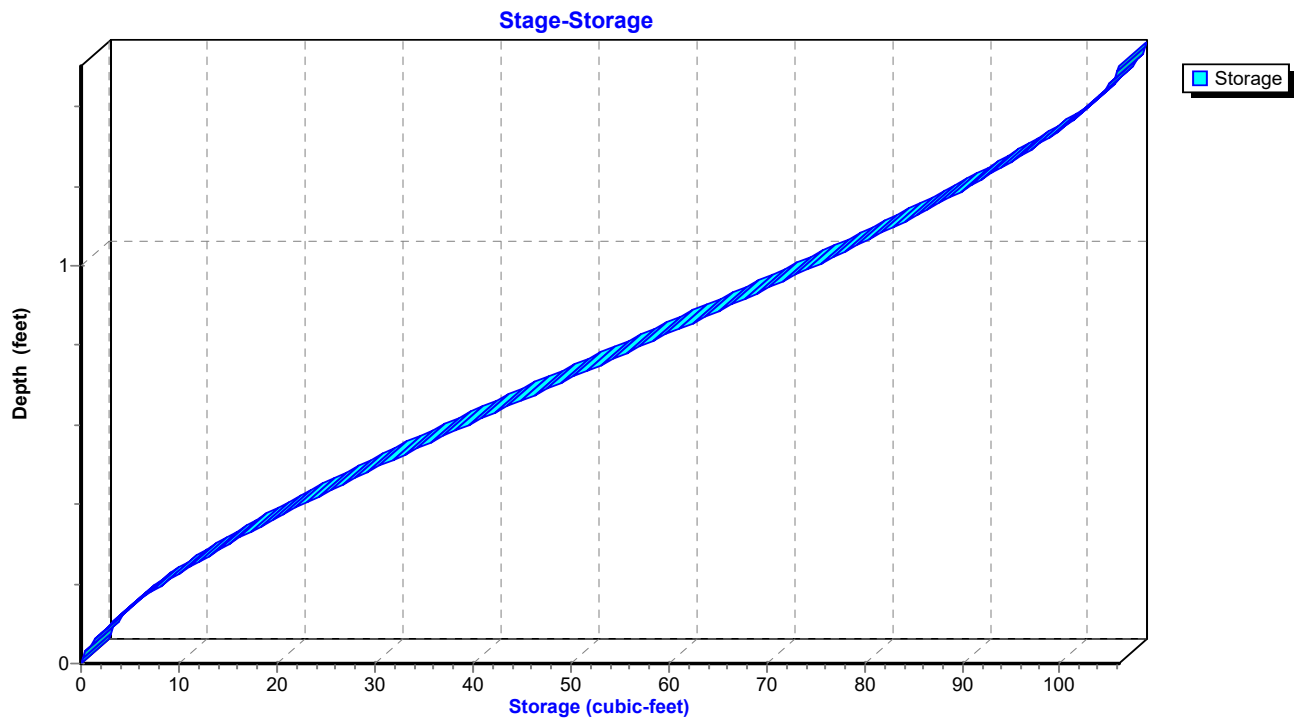


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

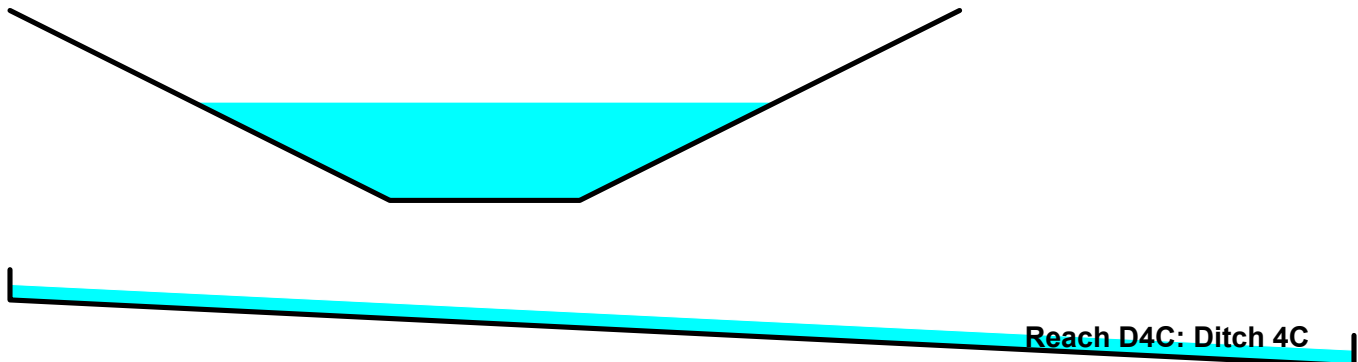
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 4.95" for 10-yr event
Inflow = 6.92 cfs @ 12.03 hrs, Volume= 19,586 cf
Outflow = 6.56 cfs @ 12.04 hrs, Volume= 19,586 cf, Atten= 5%, Lag= 1.2 min
Routed to Reach CD4C : Cross Drain 4C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 6.5 min

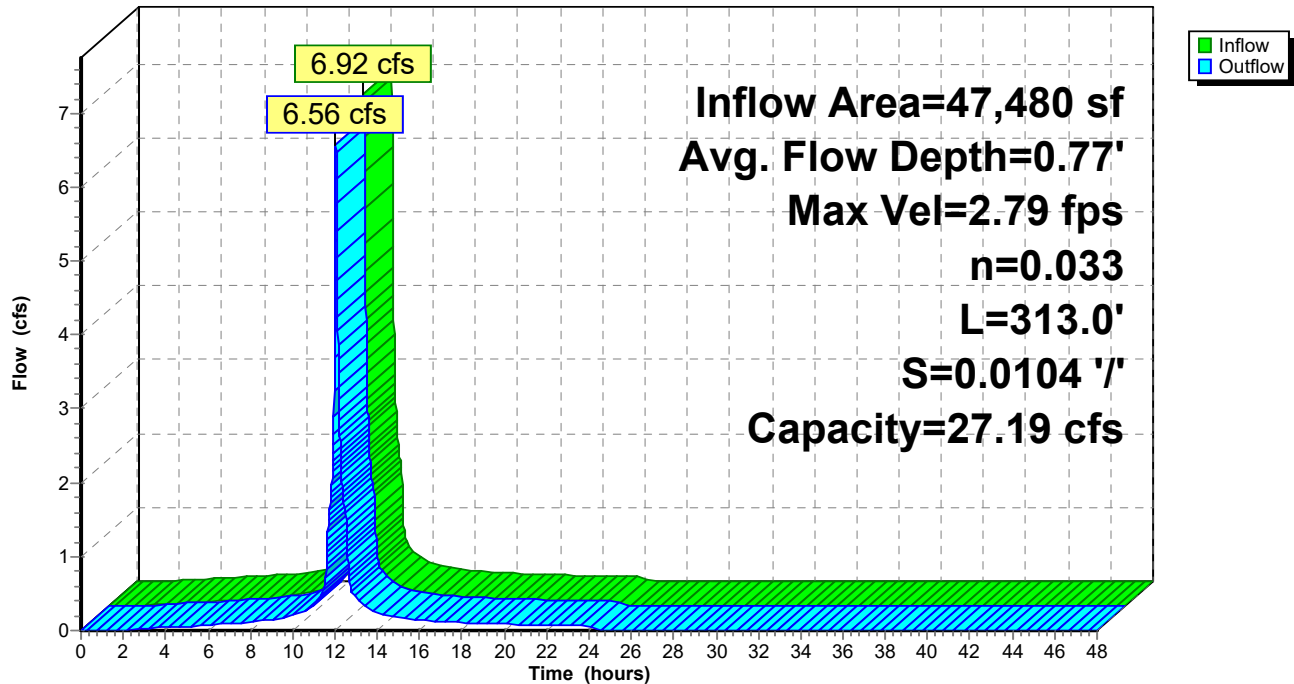
Peak Storage= 735 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 4.59'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 '/'
Inlet Invert= 687.00', Outlet Invert= 683.75'



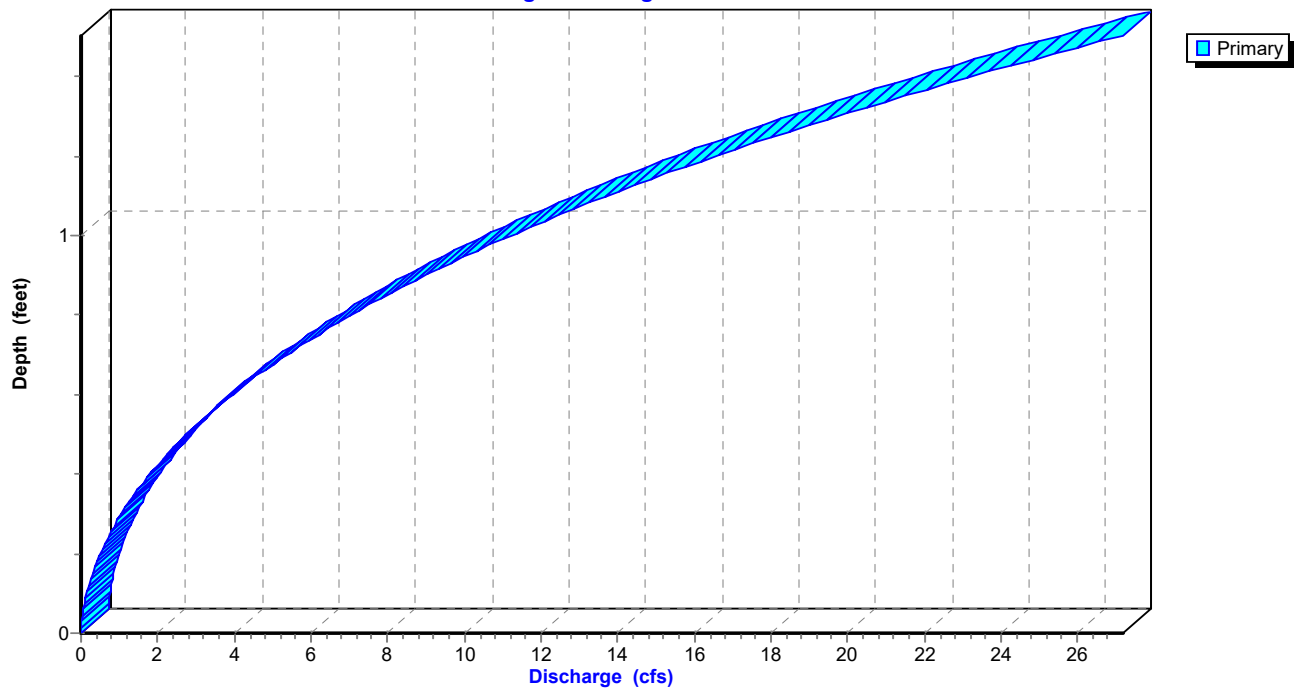
Reach D4C: Ditch 4C

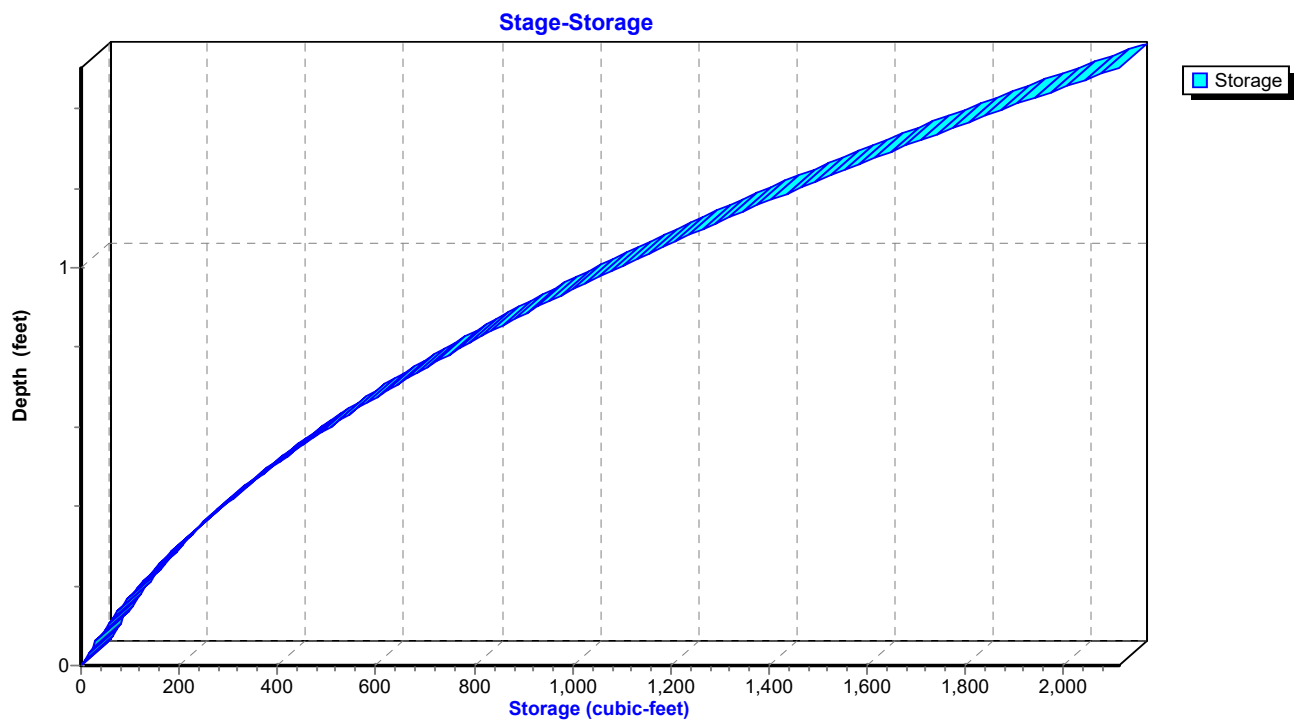
Hydrograph



Reach D4C: Ditch 4C

Stage-Discharge



Reach D4C: Ditch 4C

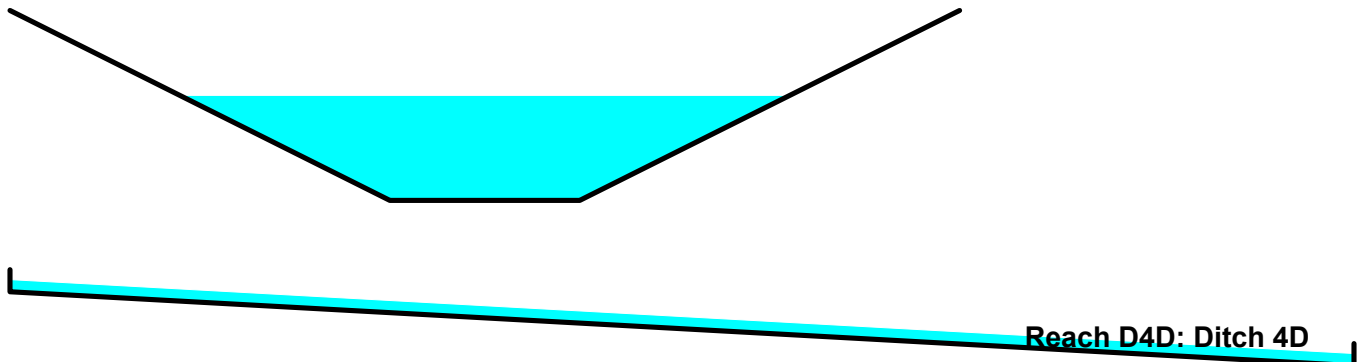
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 4.95" for 10-yr event
Inflow = 9.39 cfs @ 12.03 hrs, Volume= 26,594 cf
Outflow = 9.01 cfs @ 12.04 hrs, Volume= 26,594 cf, Atten= 4%, Lag= 1.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 5.5 min

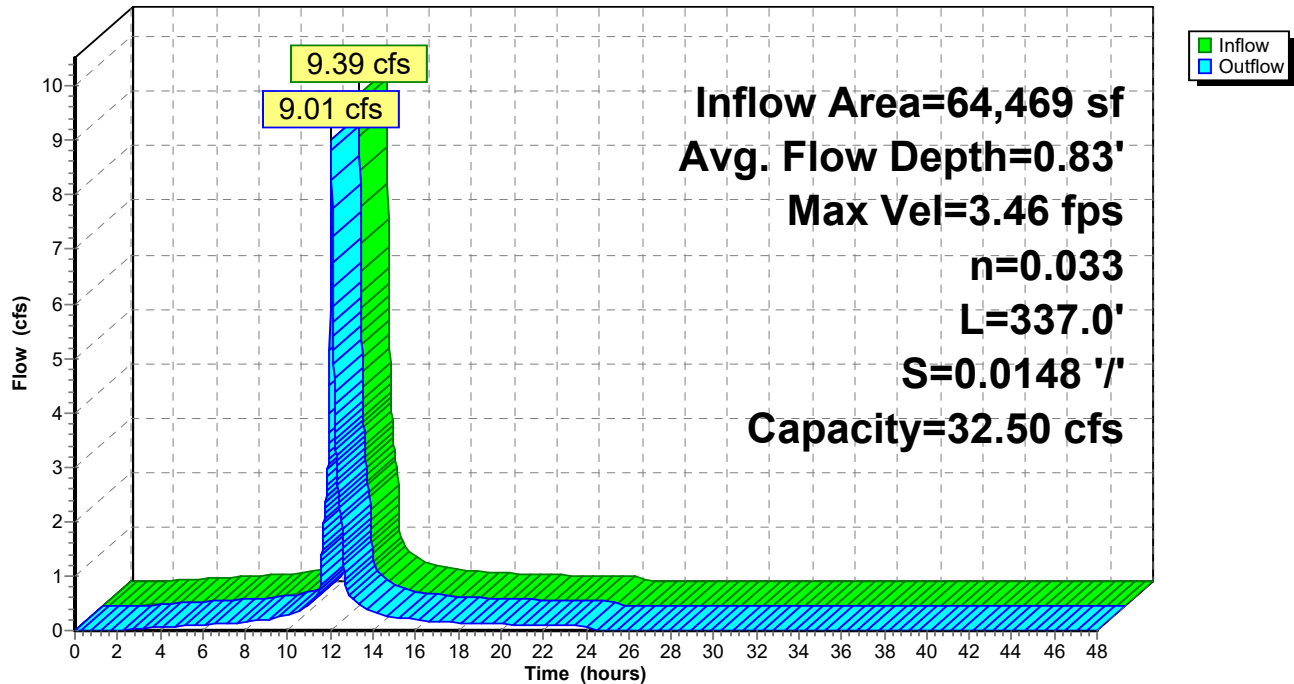
Peak Storage= 877 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 4.80'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



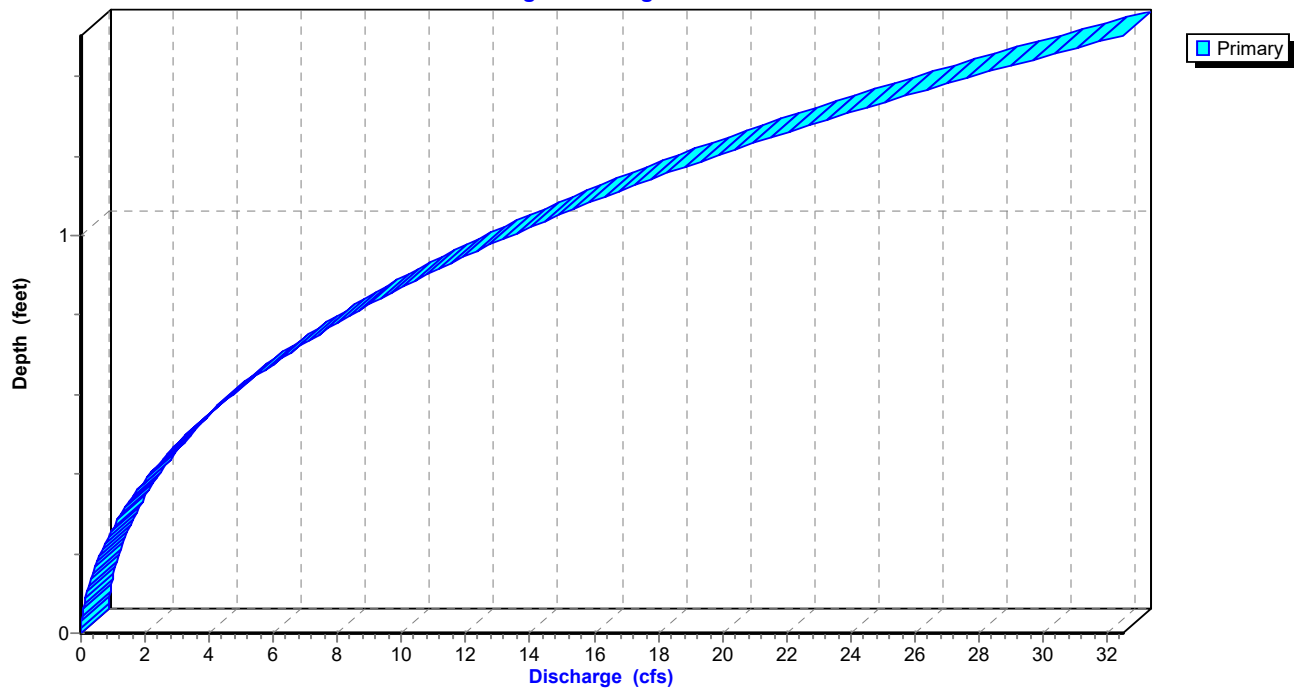
Reach D4D: Ditch 4D

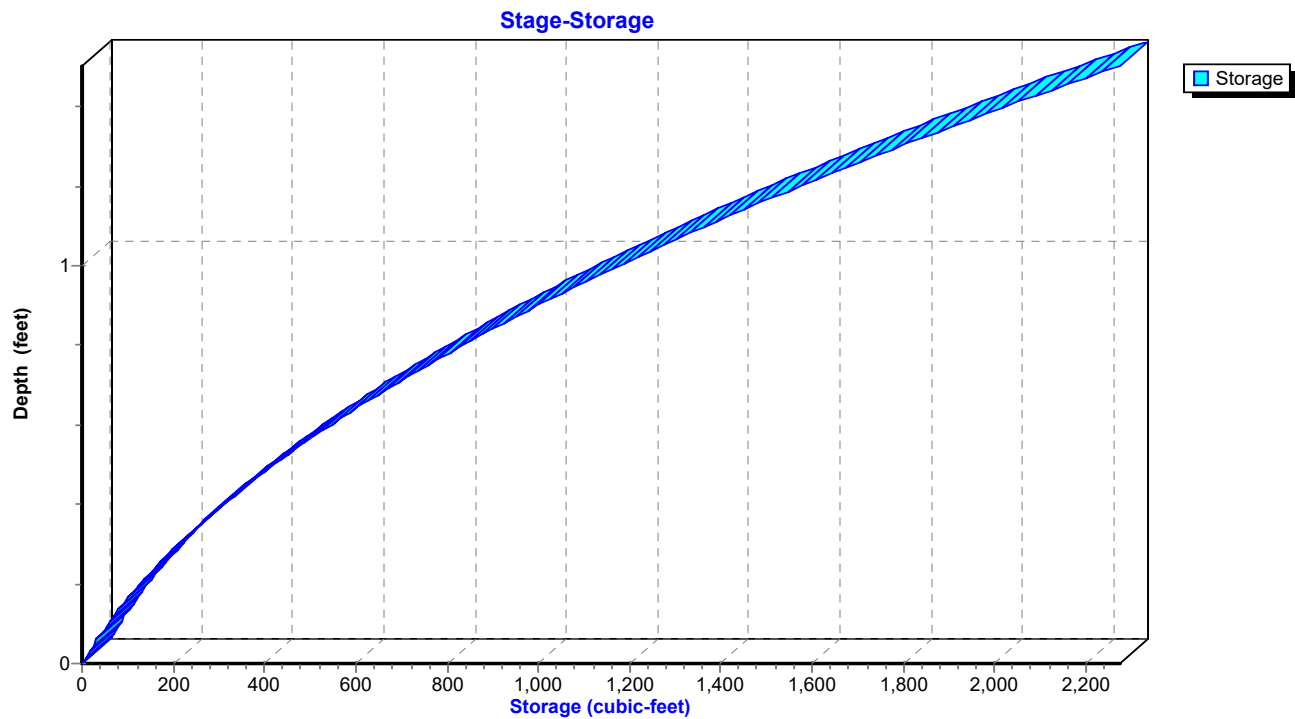
Hydrograph



Reach D4D: Ditch 4D

Stage-Discharge



Reach D4D: Ditch 4D

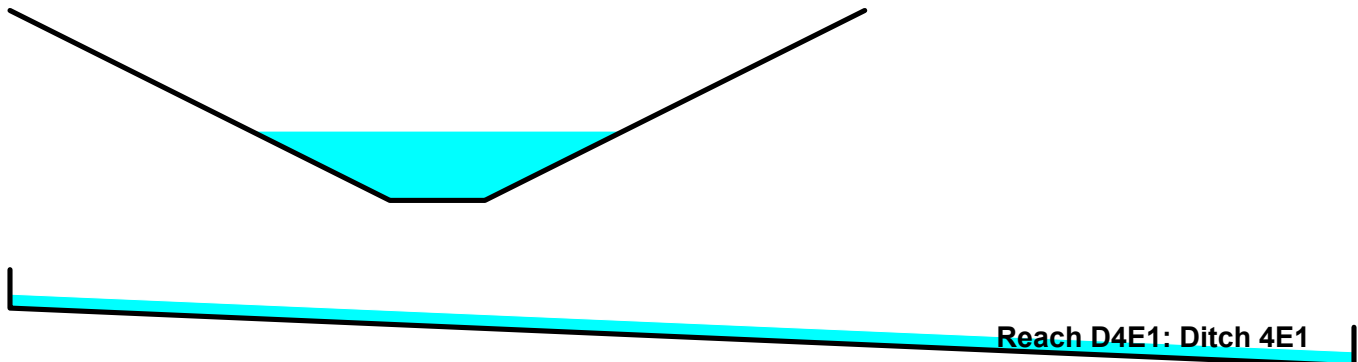
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 1.86" for 10-yr event
Inflow = 10.56 cfs @ 12.39 hrs, Volume= 56,432 cf
Outflow = 10.25 cfs @ 12.45 hrs, Volume= 56,432 cf, Atten= 3%, Lag= 3.7 min
Routed to Pond CD4E : Cross Drain 4E

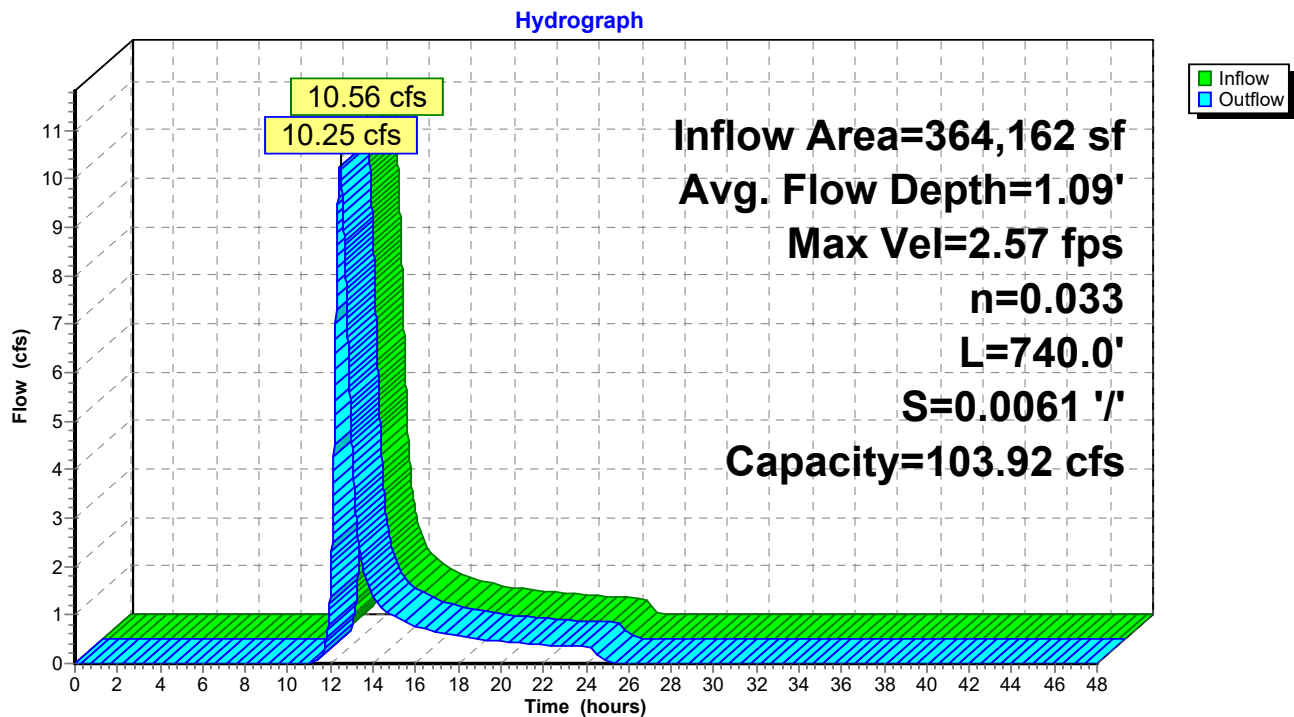
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.57 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 12.3 min

Peak Storage= 2,949 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.09' , Surface Width= 5.84'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

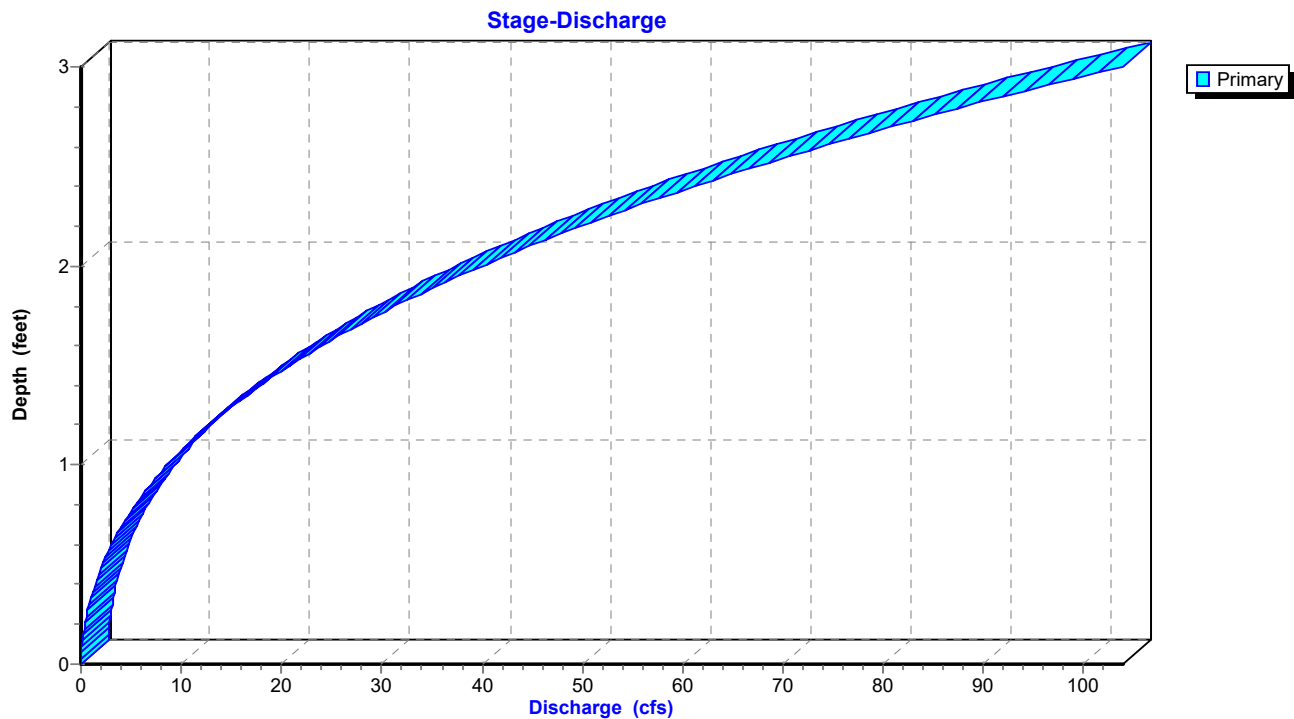
1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 '/'
Inlet Invert= 684.00', Outlet Invert= 679.50'



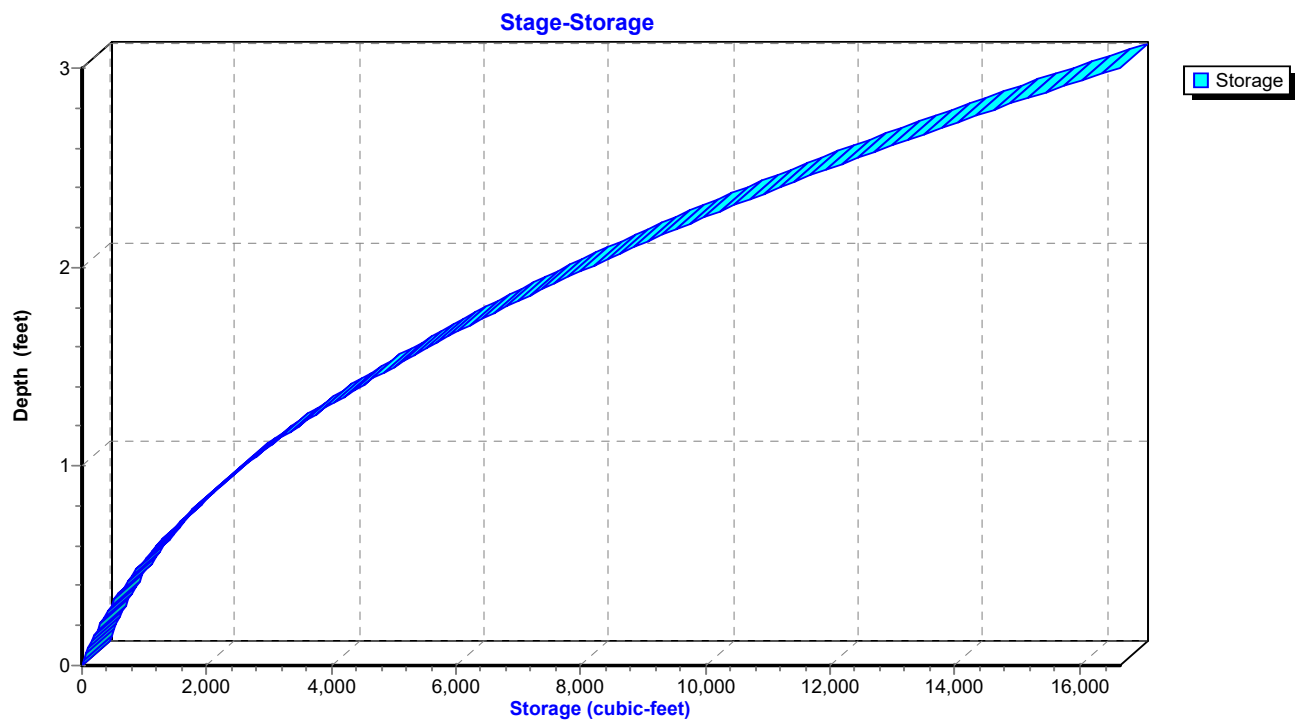
Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



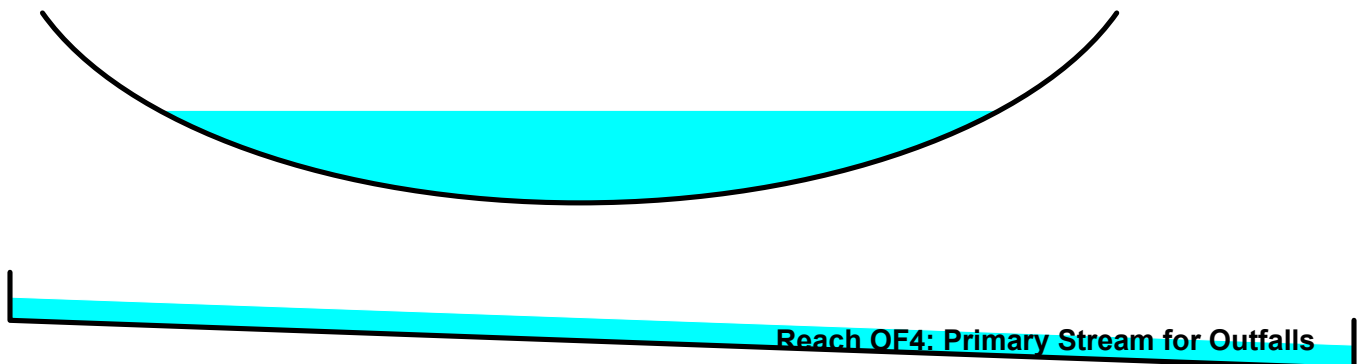
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 2.54" for 10-yr event
Inflow = 136.08 cfs @ 13.51 hrs, Volume= 2,108,149 cf
Outflow = 135.81 cfs @ 13.54 hrs, Volume= 2,108,149 cf, Atten= 0%, Lag= 1.8 min

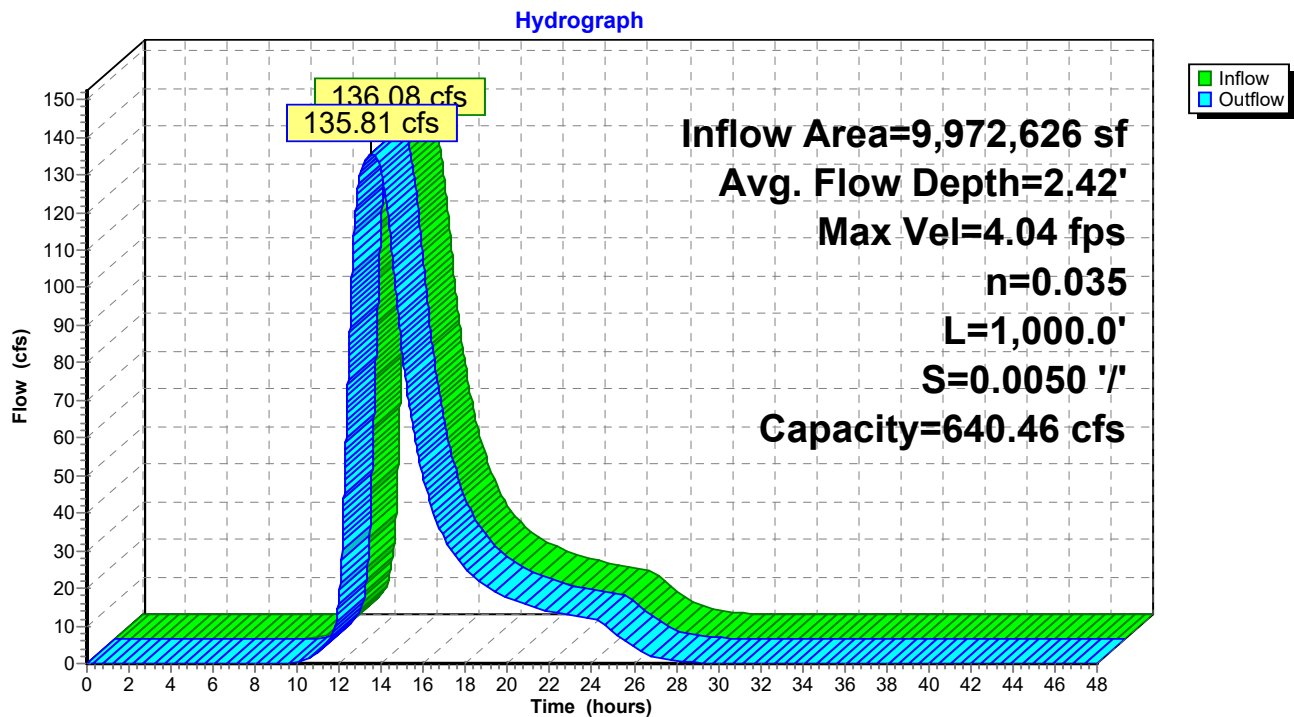
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 10.8 min

Peak Storage= 33,651 cf @ 13.54 hrs
Average Depth at Peak Storage= 2.42' , Surface Width= 20.87'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

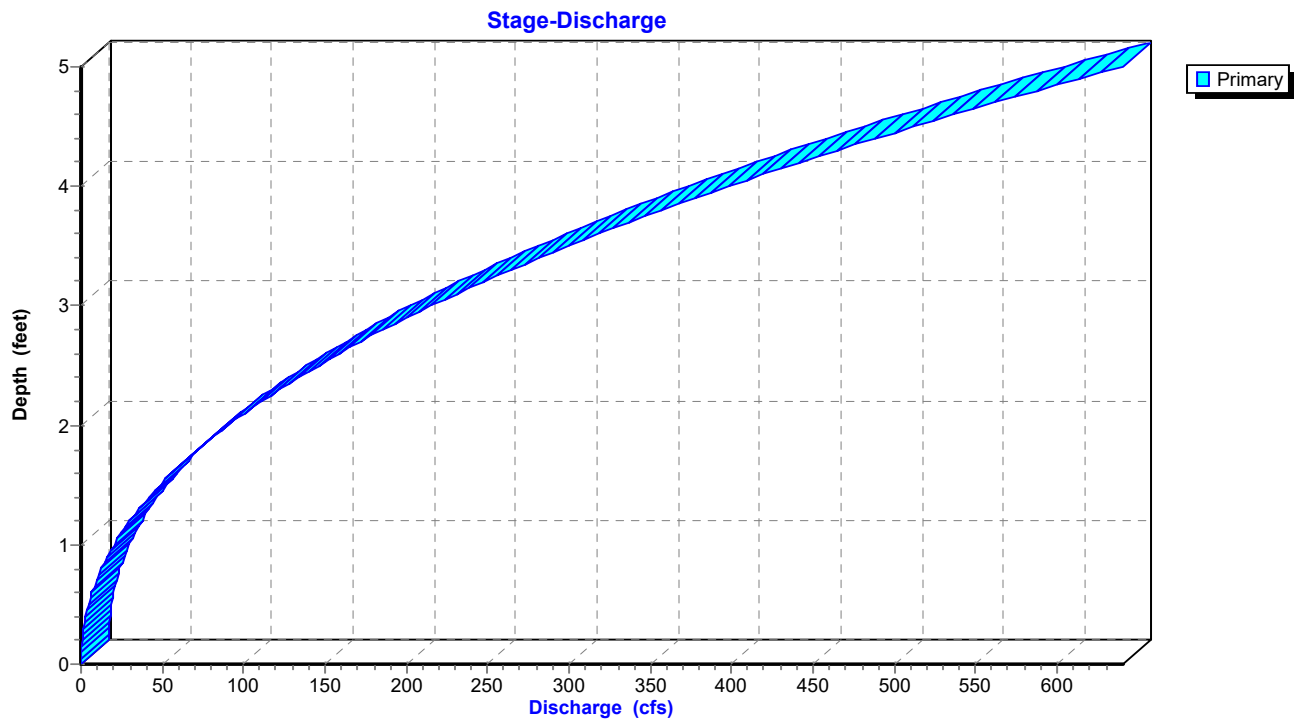
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

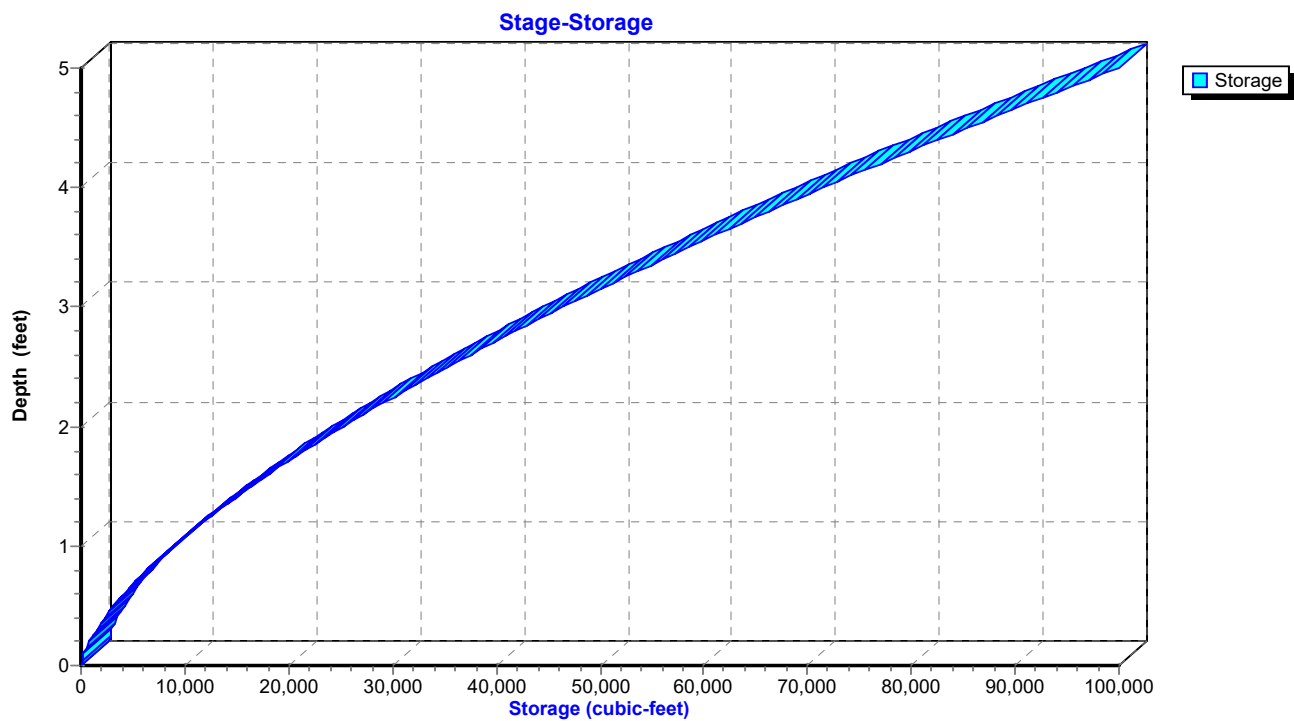


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

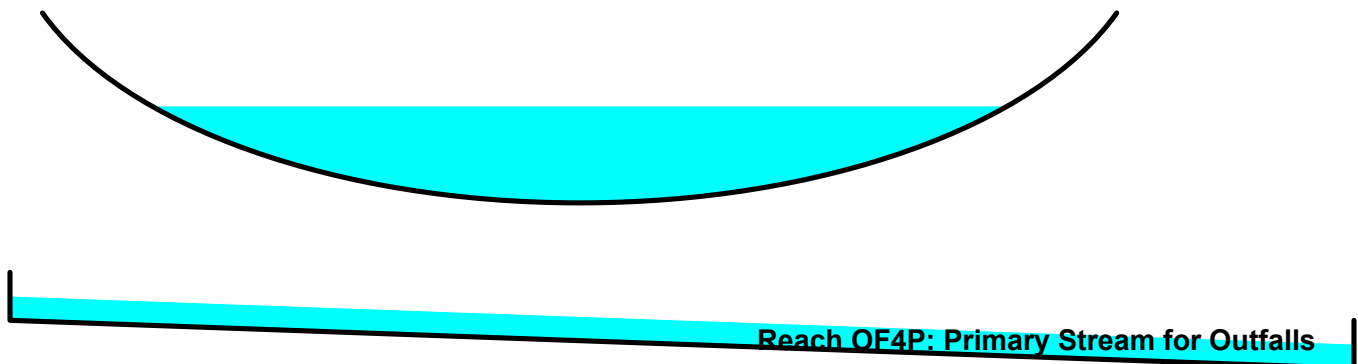
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 2.68" for 10-yr event
Inflow = 150.50 cfs @ 13.51 hrs, Volume= 2,194,802 cf
Outflow = 150.10 cfs @ 13.57 hrs, Volume= 2,194,799 cf, Atten= 0%, Lag= 3.6 min

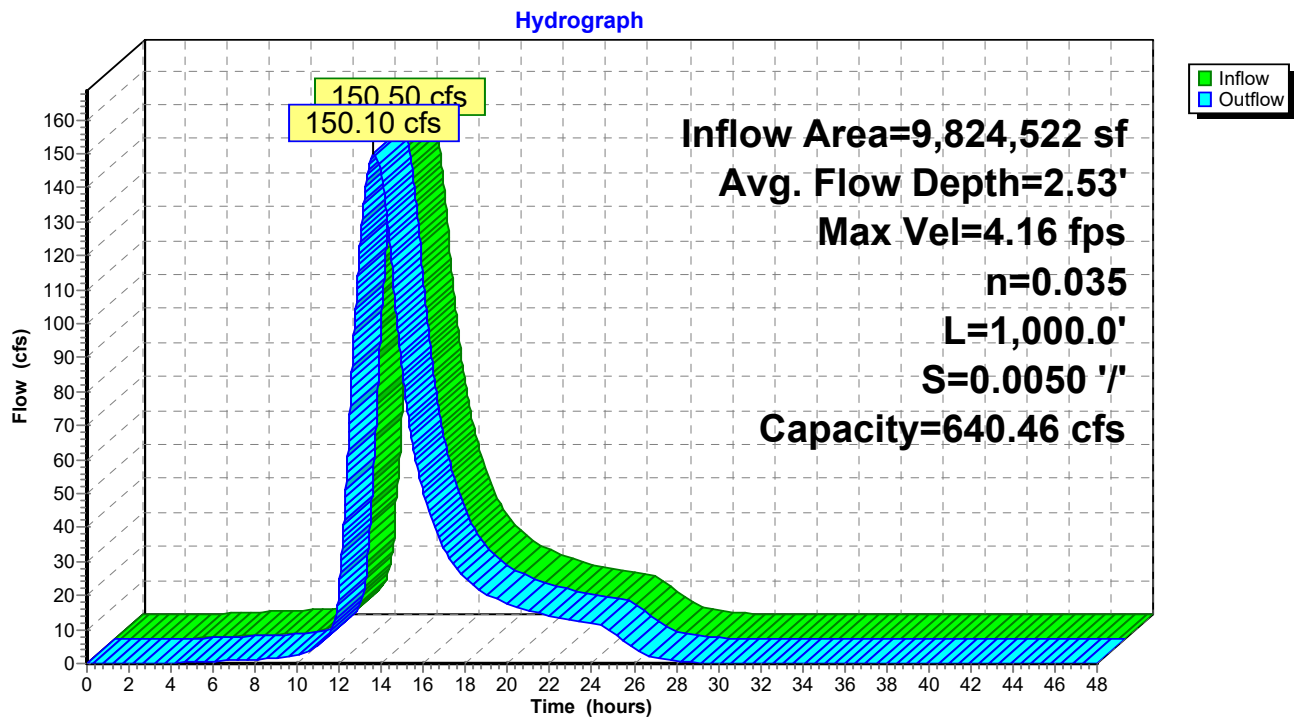
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 13.9 min

Peak Storage= 36,091 cf @ 13.57 hrs
Average Depth at Peak Storage= 2.53' , Surface Width= 21.36'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

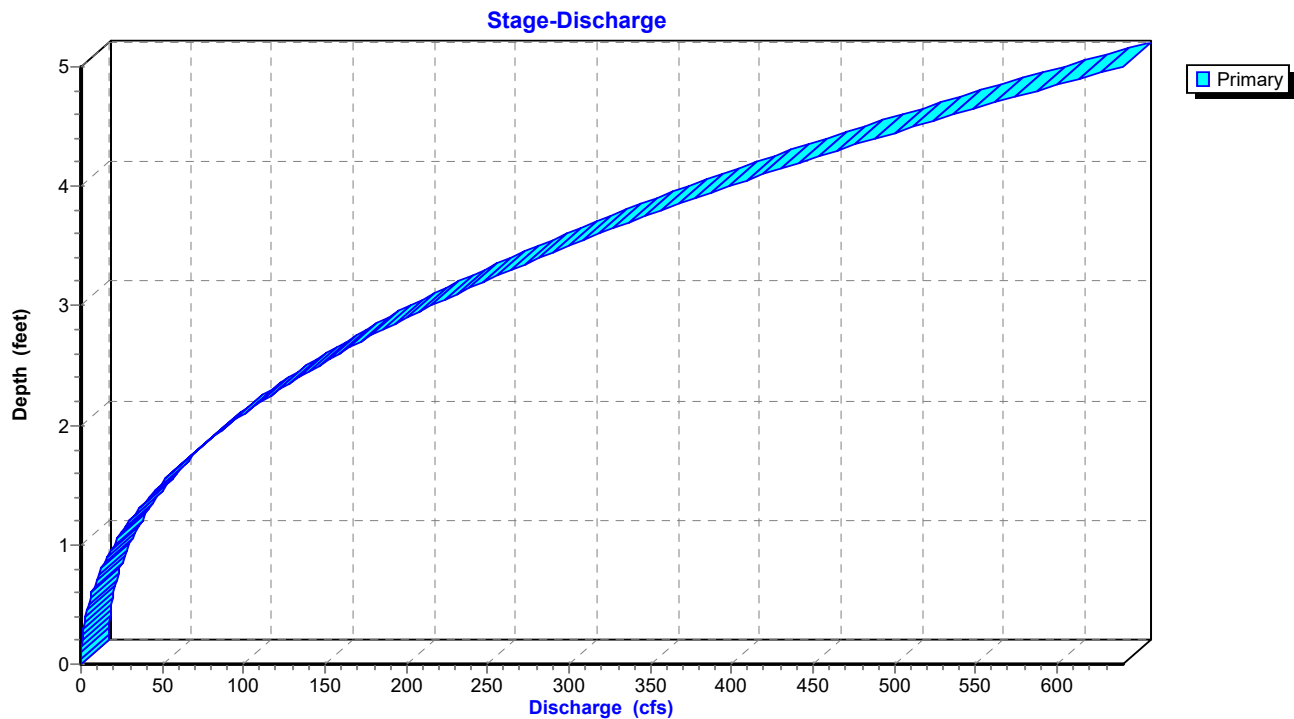
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

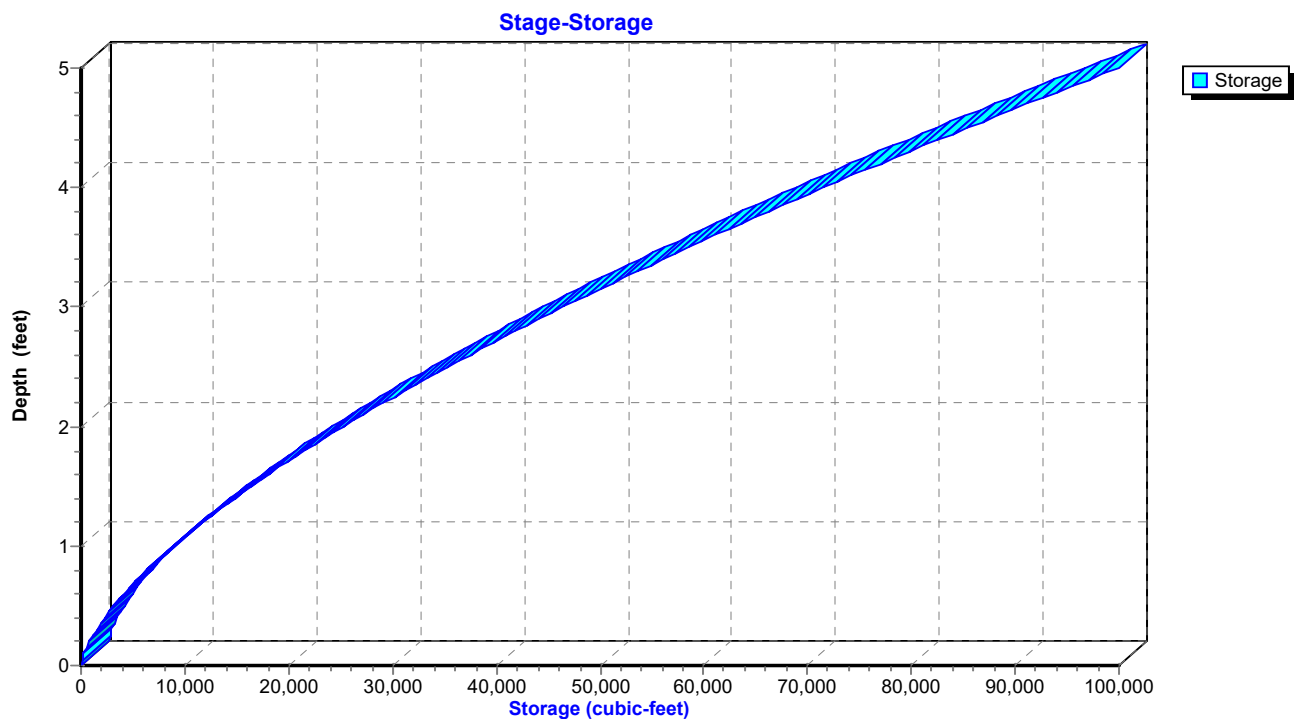


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 1.70" for 10-yr event
 Inflow = 26.69 cfs @ 12.94 hrs, Volume= 215,881 cf
 Outflow = 26.69 cfs @ 12.94 hrs, Volume= 215,881 cf, Atten= 0%, Lag= 0.0 min
 Primary = 26.69 cfs @ 12.94 hrs, Volume= 215,881 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 682.76' @ 12.94 hrs

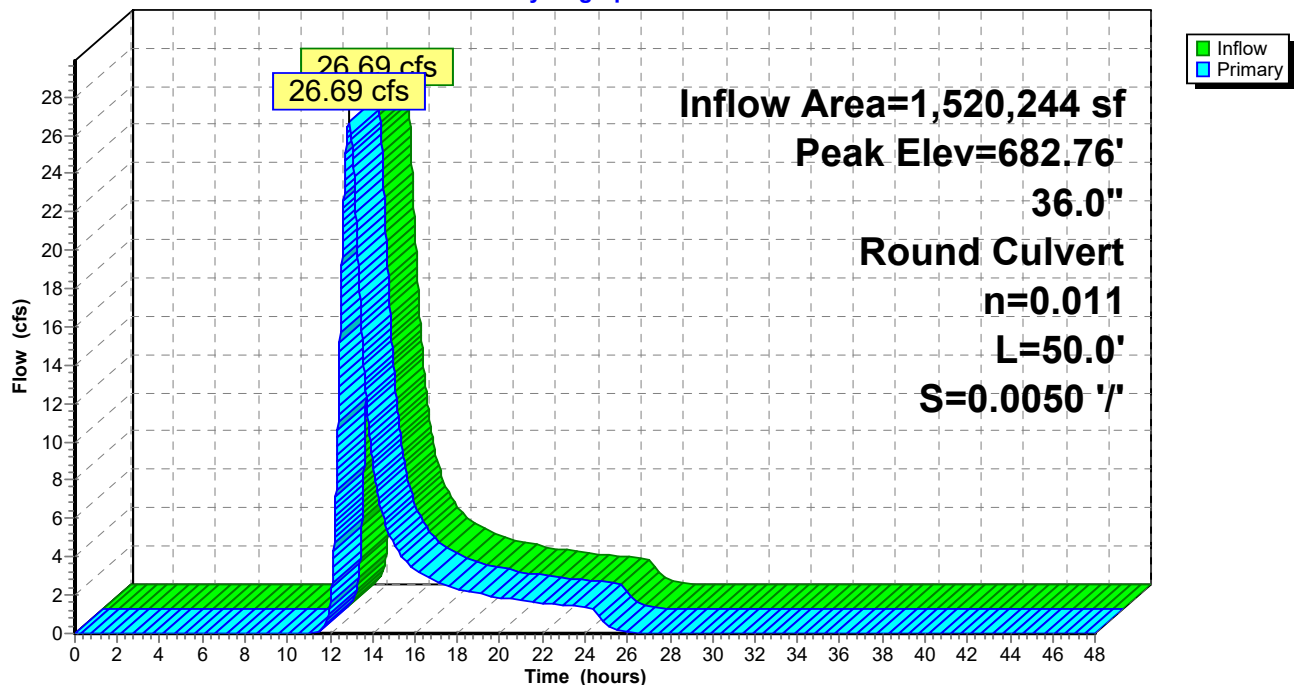
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

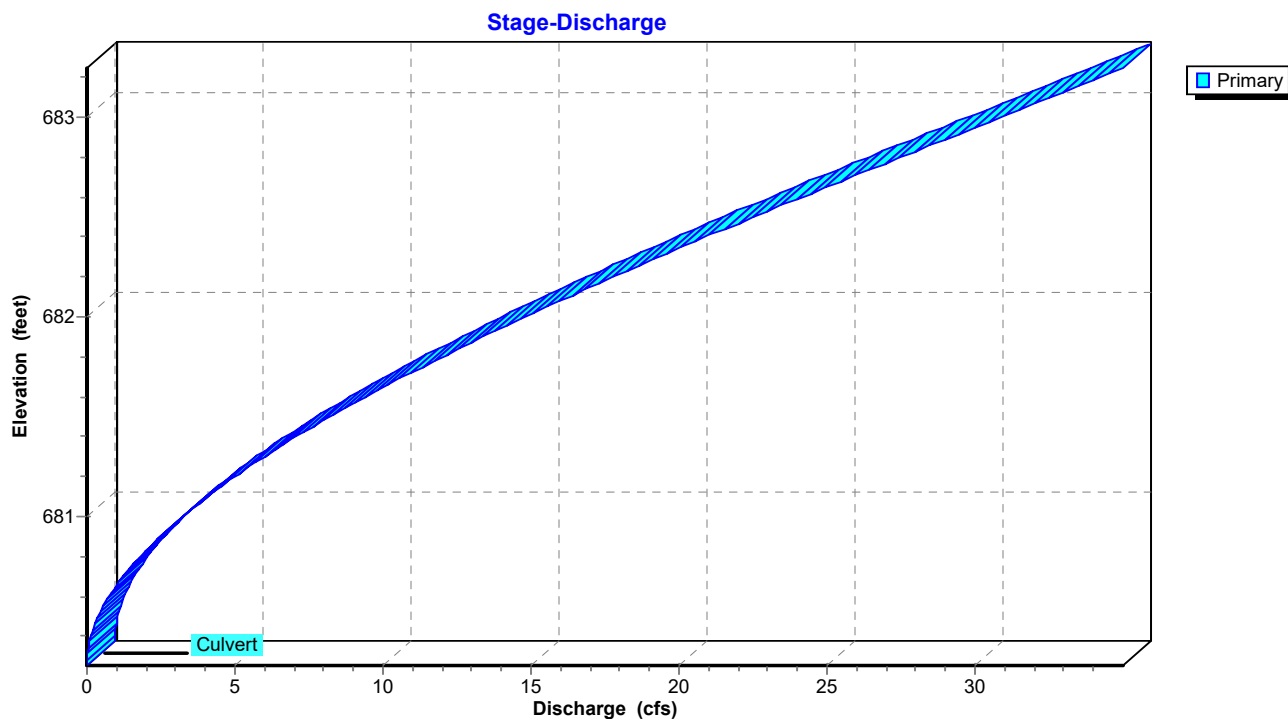
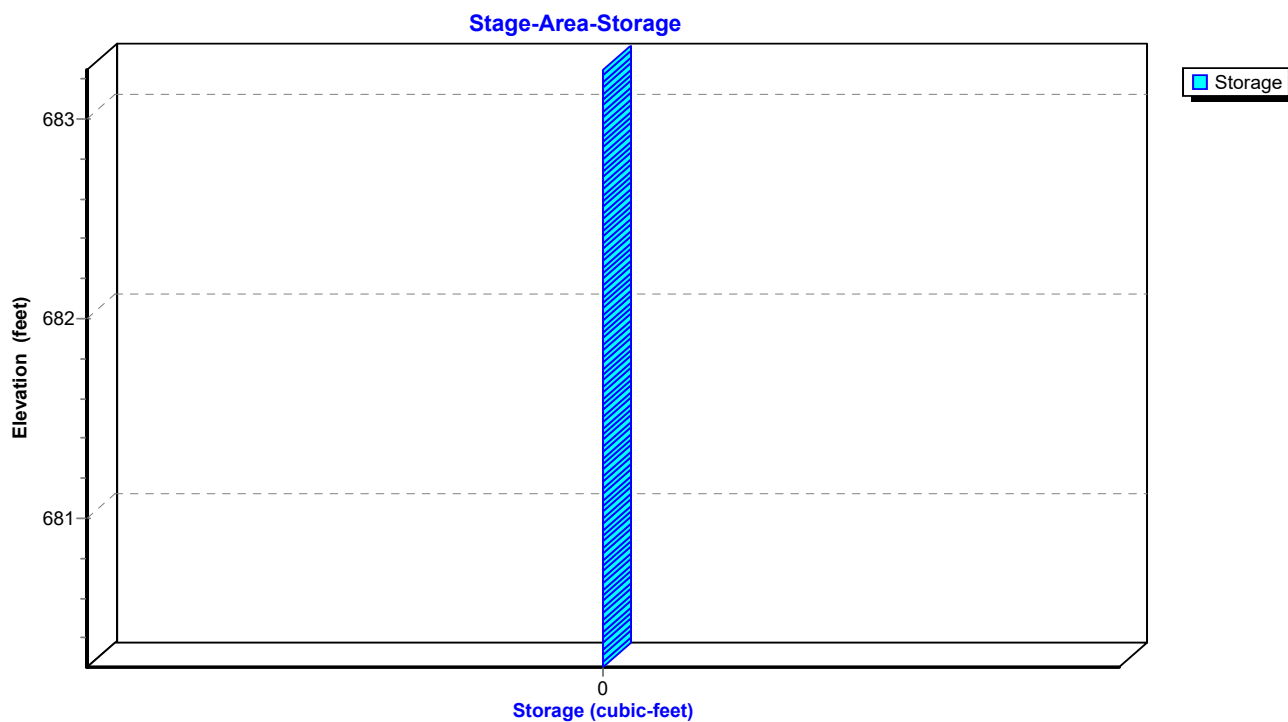
Primary OutFlow Max=26.69 cfs @ 12.94 hrs HW=682.76' (Free Discharge)
 1=Culvert (Barrel Controls 26.69 cfs @ 5.73 fps)

~~Culvert~~ Pond CD2: Cross Drain

Pond CD2: Cross Drain

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

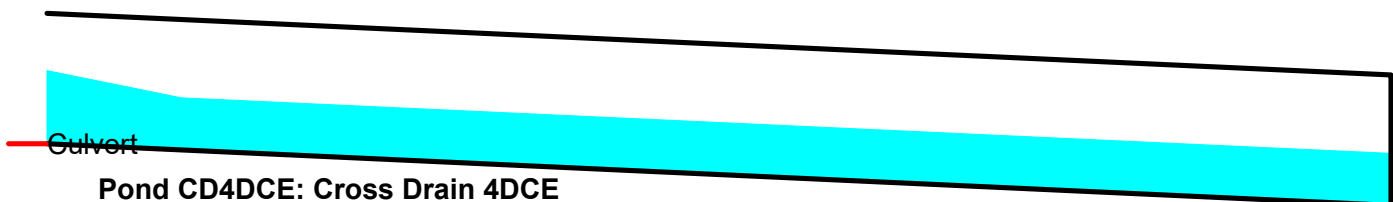
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 2.39" for 10-yr event
 Inflow = 36.42 cfs @ 12.51 hrs, Volume= 245,859 cf
 Outflow = 36.42 cfs @ 12.51 hrs, Volume= 245,859 cf, Atten= 0%, Lag= 0.0 min
 Primary = 36.42 cfs @ 12.51 hrs, Volume= 245,859 cf
 Routed to Pond POND1P : PROP POND

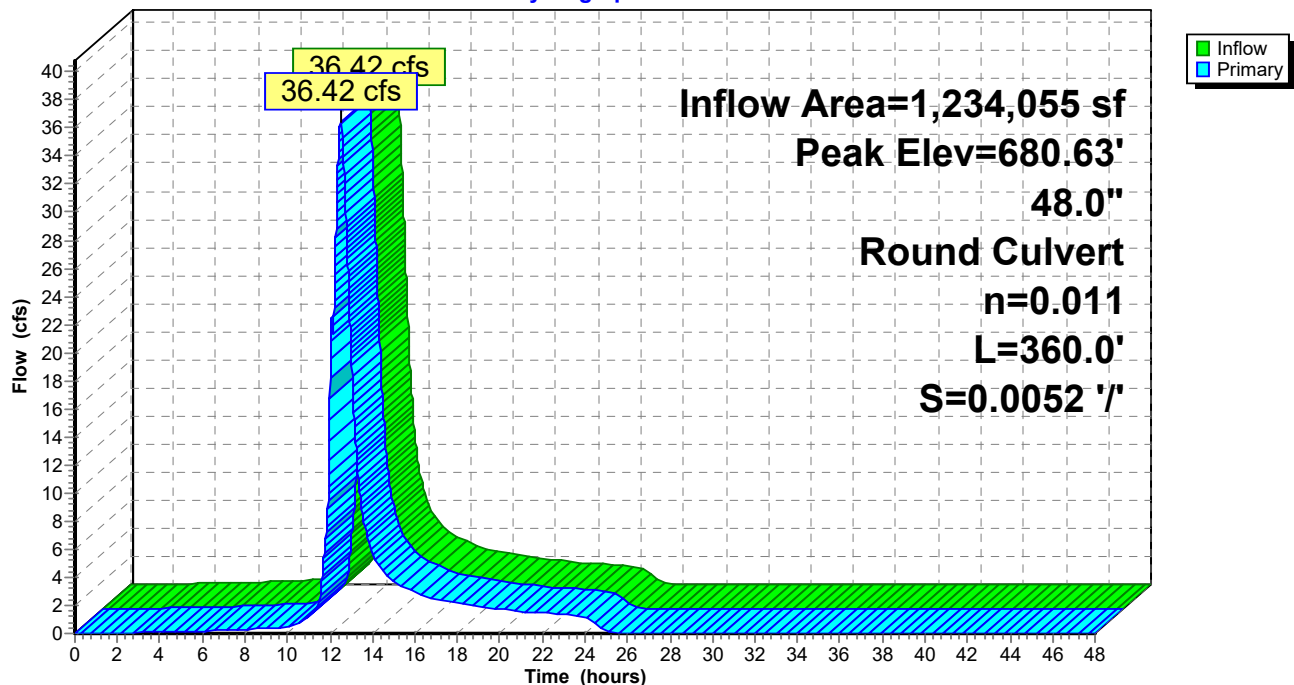
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 680.63' @ 12.51 hrs

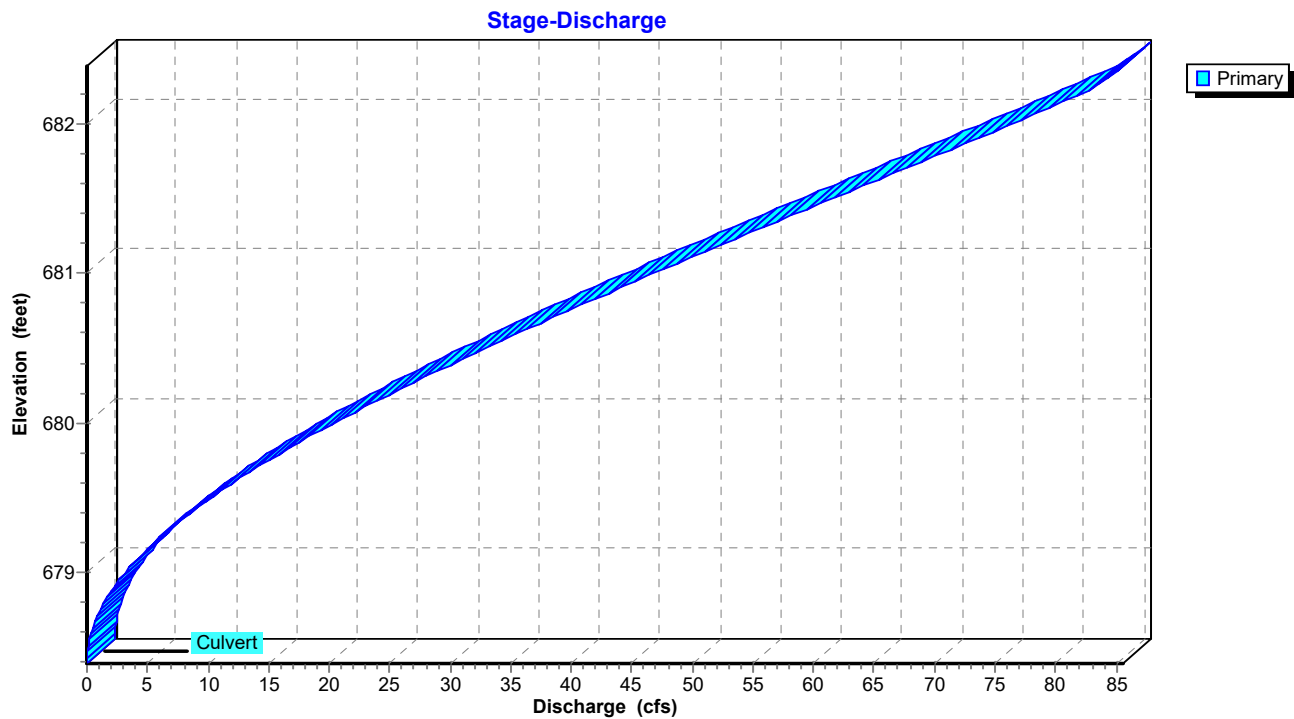
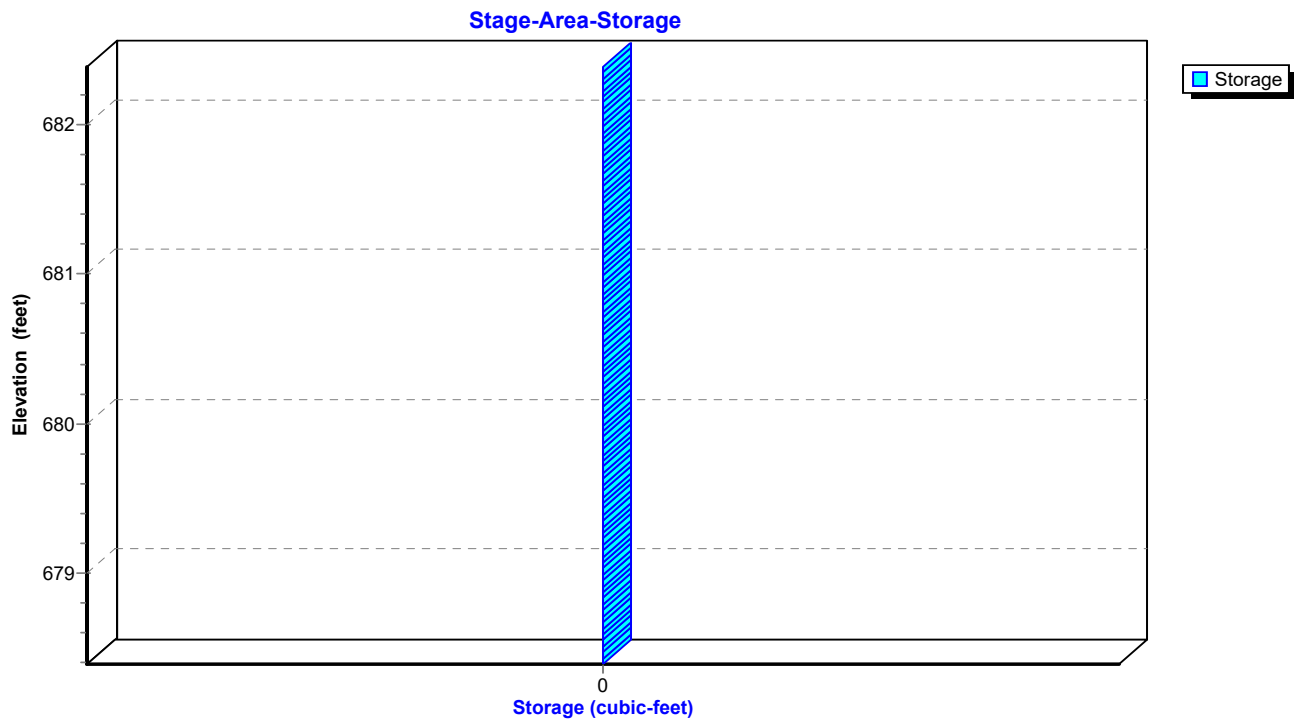
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=36.41 cfs @ 12.51 hrs HW=680.63' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 36.41 cfs @ 7.26 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

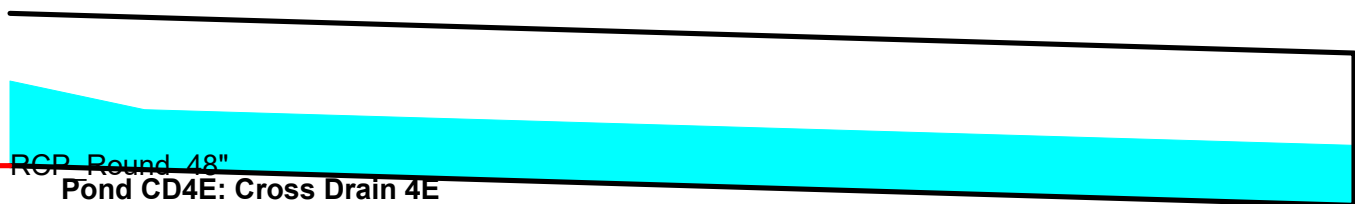
Summary for Pond CD4E: Cross Drain 4E

Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 2.14" for 10-yr event
 Inflow = 32.85 cfs @ 12.53 hrs, Volume= 199,679 cf
 Outflow = 32.85 cfs @ 12.53 hrs, Volume= 199,679 cf, Atten= 0%, Lag= 0.0 min
 Primary = 32.85 cfs @ 12.53 hrs, Volume= 199,679 cf
 Routed to Pond CD4DCE : Cross Drain 4DCE

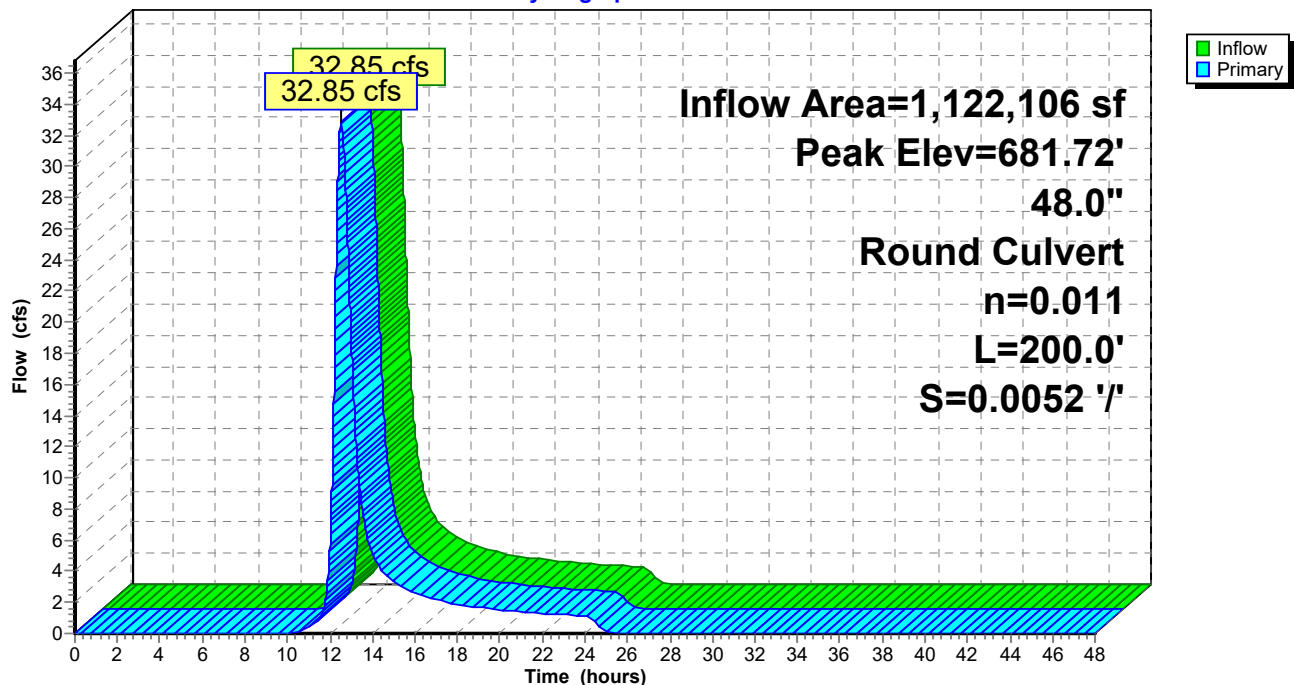
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.72' @ 12.53 hrs

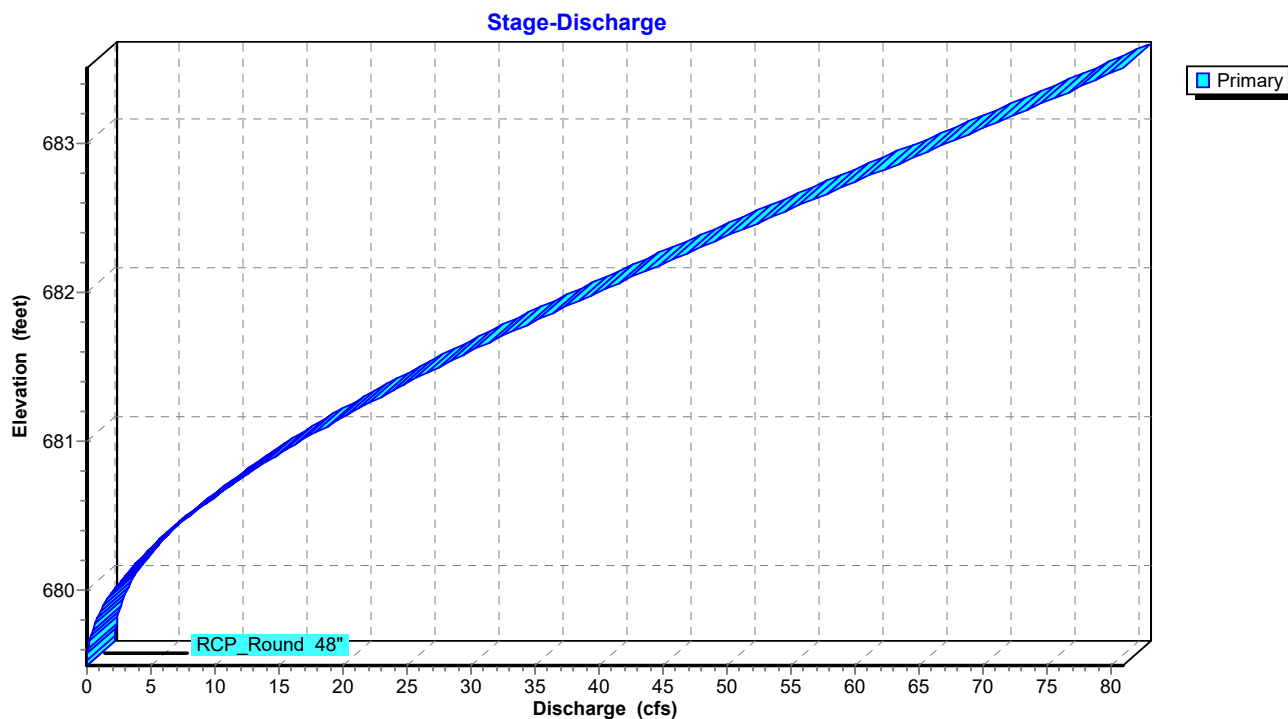
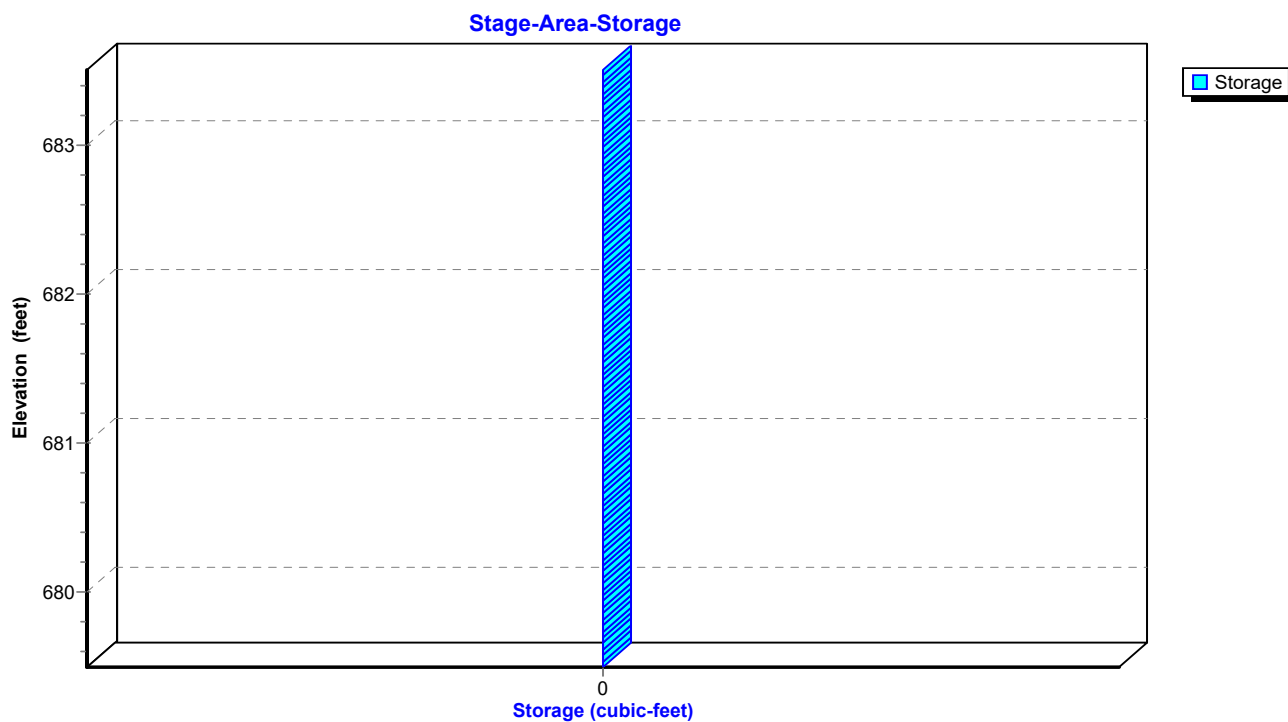
Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=32.85 cfs @ 12.53 hrs HW=681.72' (Free Discharge)
 ↳ **1=RCP_Round 48"** (Barrel Controls 32.85 cfs @ 6.63 fps)

**Pond CD4E: Cross Drain 4E**

Hydrograph



Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 3.16" for 10-yr event
 Inflow = 72.29 cfs @ 12.45 hrs, Volume= 465,263 cf
 Outflow = 39.34 cfs @ 12.92 hrs, Volume= 464,696 cf, Atten= 46%, Lag= 28.2 min
 Primary = 39.34 cfs @ 12.92 hrs, Volume= 464,696 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 680.65' @ 12.92 hrs Surf.Area= 44,214 sf Storage= 109,872 cf

Plug-Flow detention time= 40.4 min calculated for 464,599 cf (100% of inflow)
 Center-of-Mass det. time= 39.8 min (865.7 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

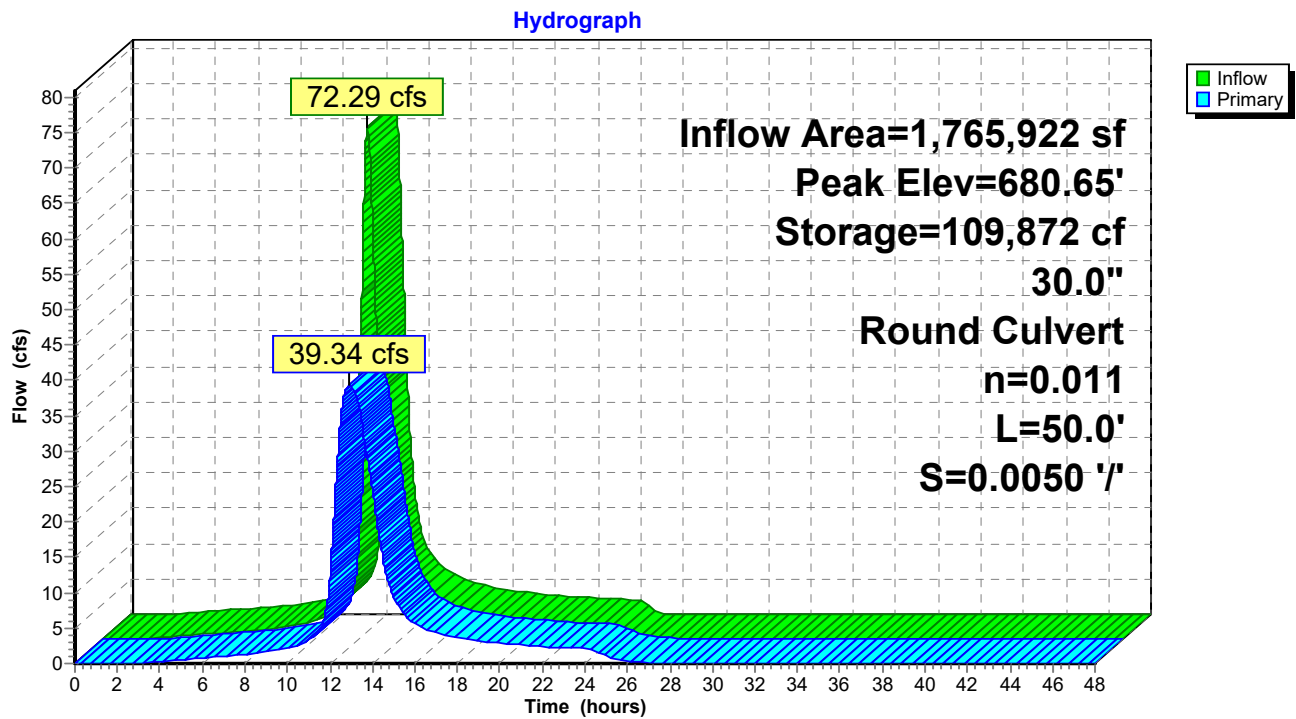
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

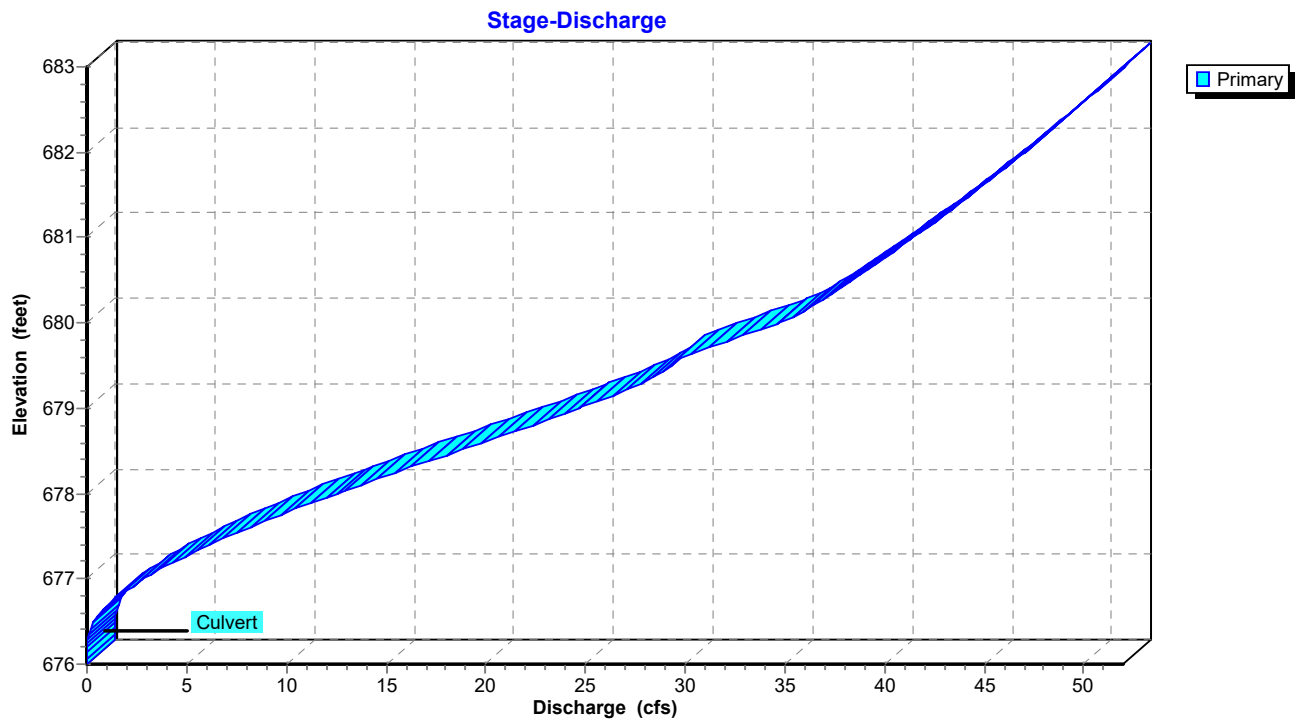
Primary OutFlow Max=39.34 cfs @ 12.92 hrs HW=680.65' (Free Discharge)
 ↑1=Culvert (Inlet Controls 39.34 cfs @ 8.01 fps)

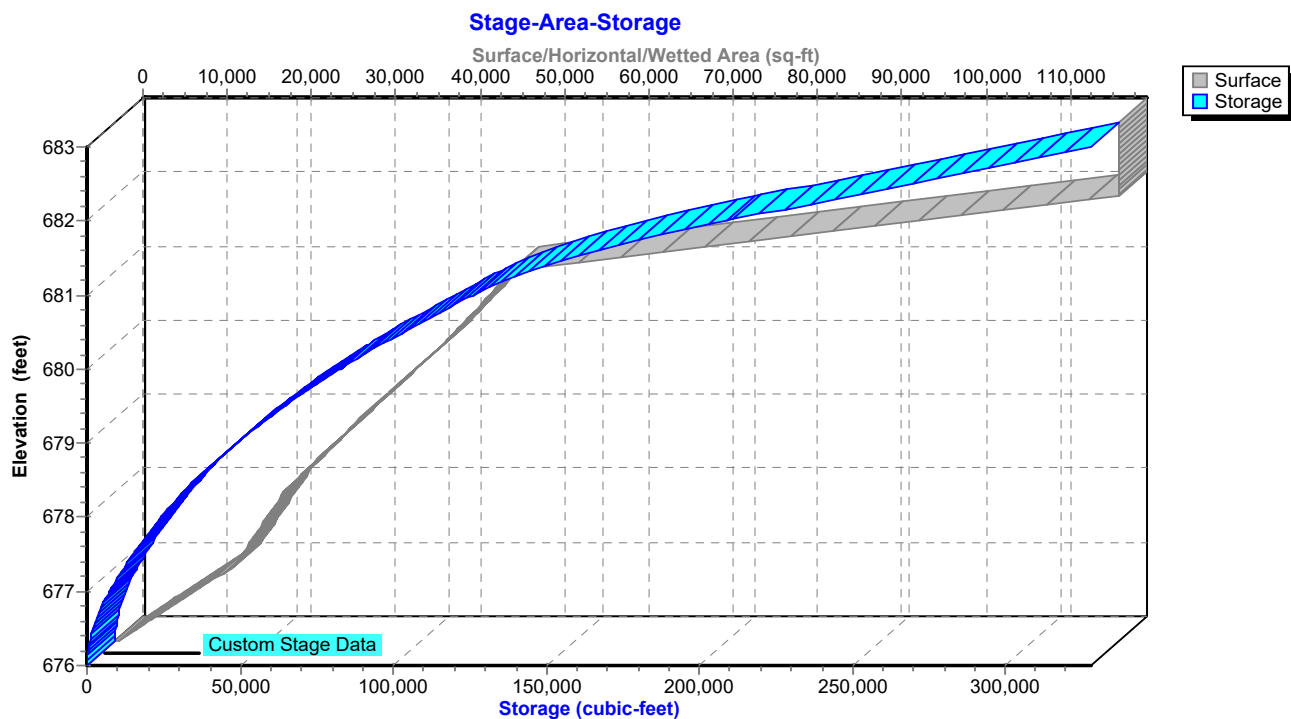


Pond POND1P: PROP POND



Pond POND1P: PROP POND



Pond POND1P: PROP POND

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=3.57"
Flow Length=5,750' Tc=143.0 min CN=75 Runoff=141.35 cfs 1,855,048 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=2.33"
Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=38.11 cfs 294,710 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=3.27"
Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=26.12 cfs 113,362 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=3.08"
Flow Length=1,500' Tc=50.3 min CN=70 Runoff=69.60 cfs 463,594 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=3.57"
Flow Length=5,750' Tc=143.0 min CN=75 Runoff=141.35 cfs 1,855,048 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=2.33"
Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=38.11 cfs 294,710 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=3.98"
Tc=5.0 min CN=79 Runoff=11.72 cfs 30,809 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=300' Tc=28.4 min CN=68 Runoff=10.18 cfs 52,040 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=5.87"
Flow Length=1,000' Tc=33.8 min CN=96 Runoff=43.69 cfs 259,995 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=5.87"
Tc=5.0 min CN=96 Runoff=8.01 cfs 23,210 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=5.87"
Tc=5.0 min CN=96 Runoff=10.87 cfs 31,515 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=2.51"
Flow Length=500' Tc=28.1 min CN=64 Runoff=14.70 cfs 76,136 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=2.98"
Flow Length=1,000' Tc=41.1 min CN=69 Runoff=31.20 cfs 188,257 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.48' Max Vel=15.81 fps Inflow=7.63 cfs 23,210 cf
18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=7.63 cfs 23,210 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.83' Max Vel=2.90 fps Inflow=8.01 cfs 23,210 cf
n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=7.63 cfs 23,210 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.89' Max Vel=3.60 fps Inflow=10.87 cfs 31,515 cf
n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=10.47 cfs 31,515 cf

TrueRail*Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"*

Prepared by CSR Engineering, Inc

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Reach D4E1: Ditch 4E1 Avg. Flow Depth=1.27' Max Vel=2.80 fps Inflow=14.70 cfs 76,136 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=14.36 cfs 76,136 cf

Reach OF4: Primary Stream for Avg. Flow Depth=2.75' Max Vel=4.39 fps Inflow=179.49 cfs 2,726,715 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=179.28 cfs 2,726,715 cf

Reach OF4P: Primary Stream for Avg. Flow Depth=2.87' Max Vel=4.51 fps Inflow=196.26 cfs 2,811,155 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=196.02 cfs 2,811,153 cf

Pond CD2: Cross Drain Peak Elev=683.44' Inflow=38.11 cfs 294,710 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=38.11 cfs 294,710 cf

Pond CD4DCE: Cross Drain 4DCE Peak Elev=681.08' Inflow=49.09 cfs 319,118 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=49.09 cfs 319,118 cf

Pond CD4E: Cross Drain 4E Peak Elev=682.18' Inflow=44.67 cfs 264,394 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=44.67 cfs 264,394 cf

Pond POND1P: PROP POND Peak Elev=681.43' Storage=152,782 cf Inflow=91.82 cfs 579,114 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=43.94 cfs 578,547 cf

Total Runoff Area = 19,797,149 sf Runoff Volume = 5,538,436 cf Average Runoff Depth = 3.36"
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 141.35 cfs @ 13.83 hrs, Volume= 1,855,048 cf, Depth= 3.57"

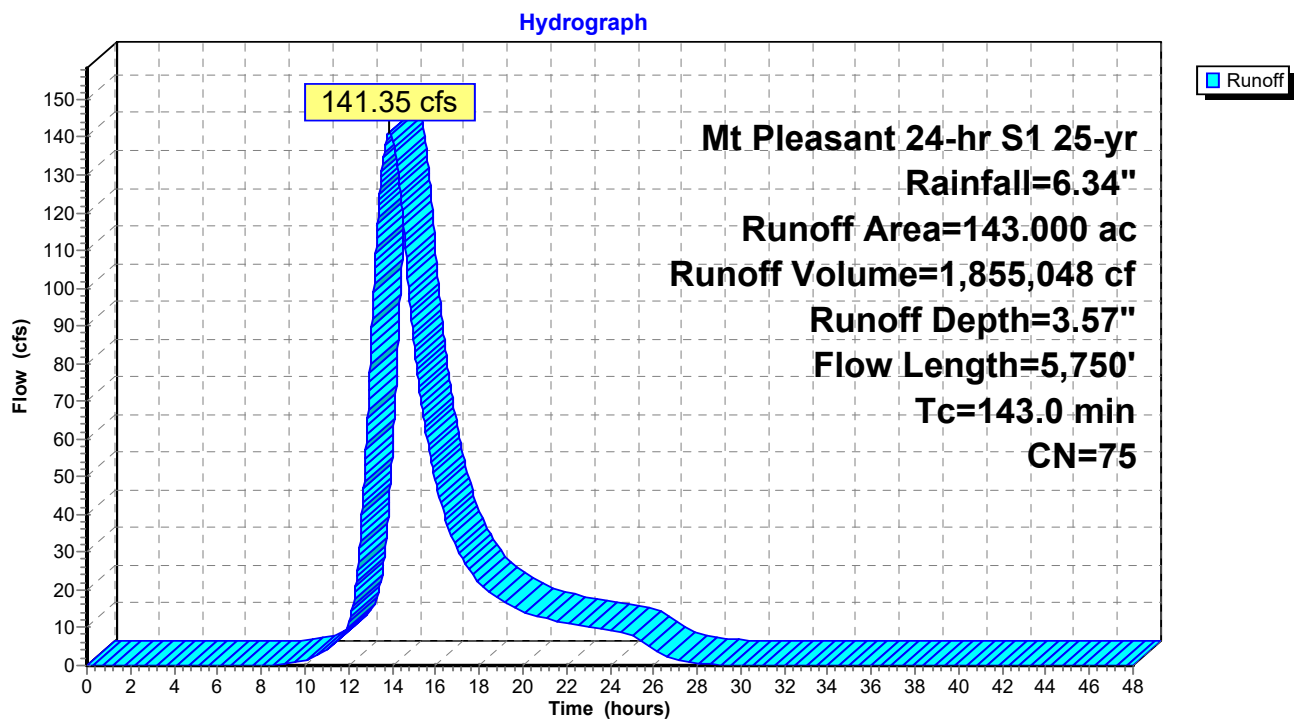
Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Runoff = 38.11 cfs @ 12.88 hrs, Volume= 294,710 cf, Depth= 2.33"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

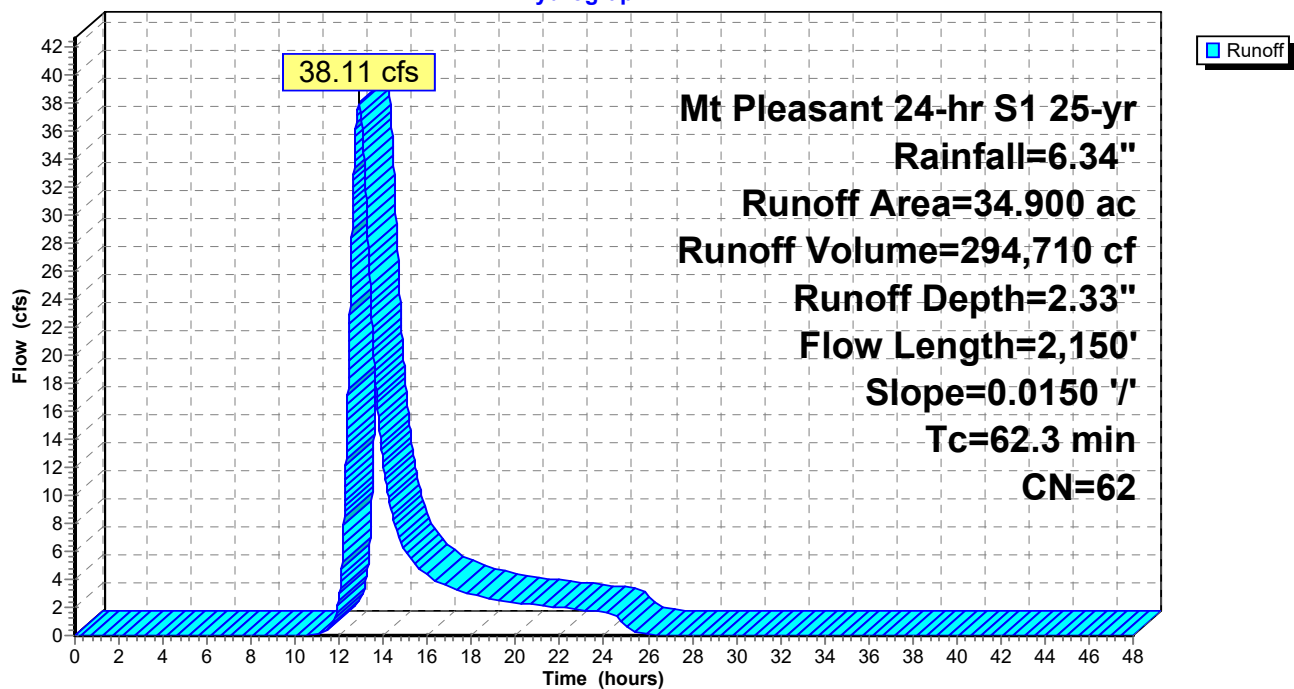
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

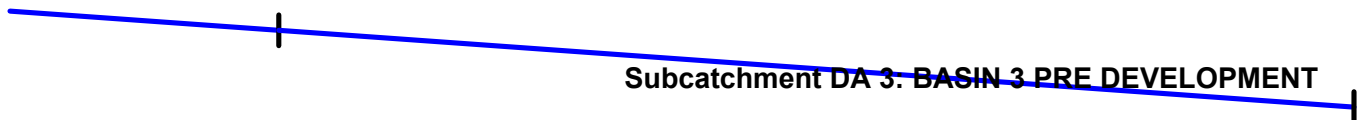
Runoff = 26.12 cfs @ 12.24 hrs, Volume= 113,362 cf, Depth= 3.27"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

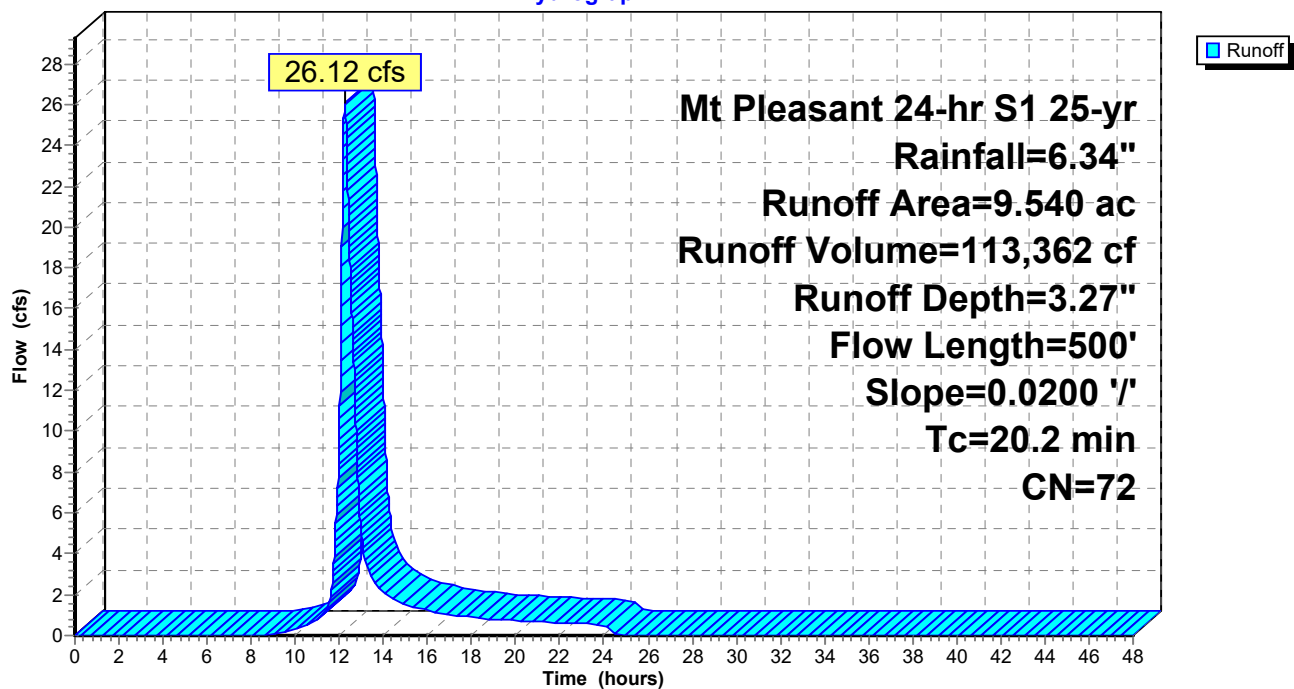
Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 69.60 cfs @ 12.69 hrs, Volume= 463,594 cf, Depth= 3.08"

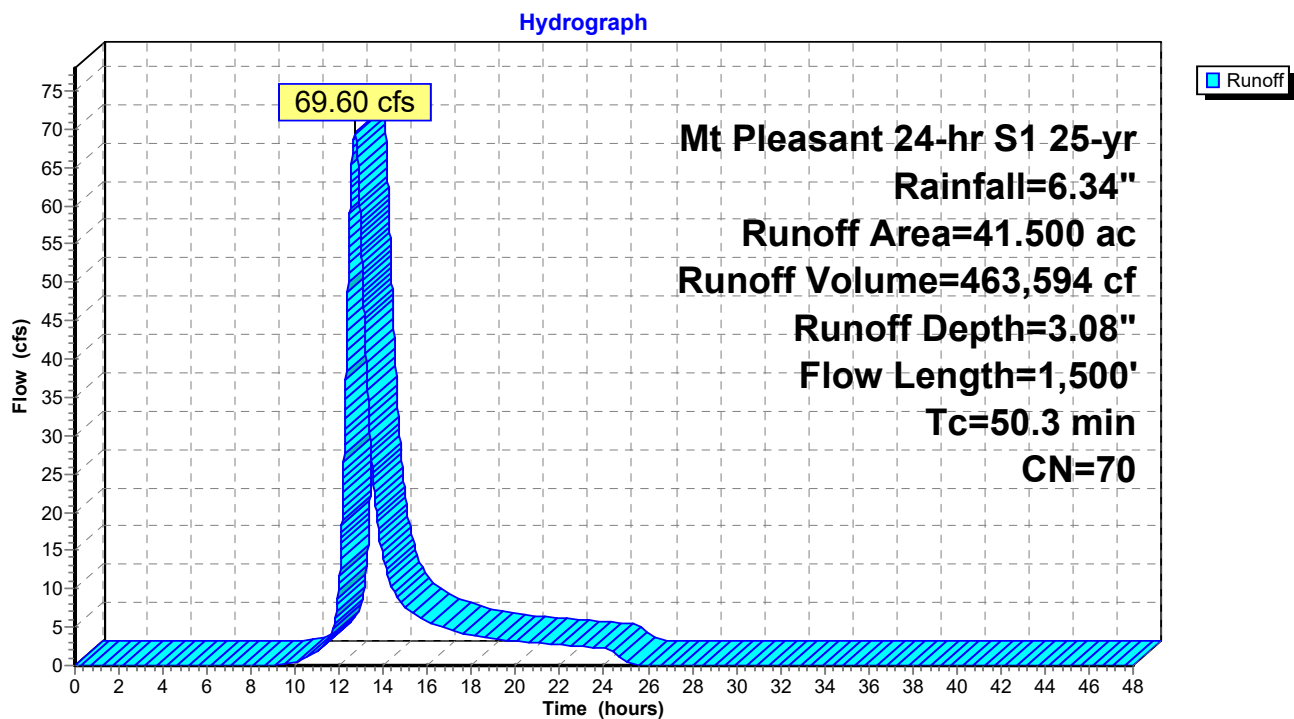
Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Summary for Subcatchment DA1P: BASIN 1 PROPOSED

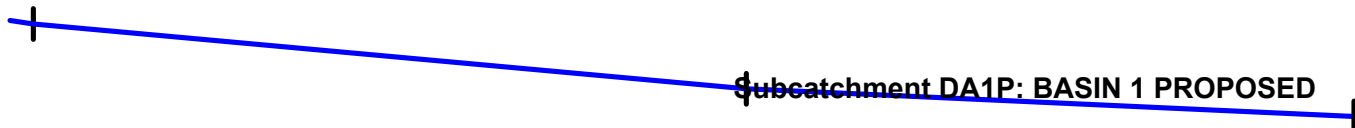
Runoff = 141.35 cfs @ 13.83 hrs, Volume= 1,855,048 cf, Depth= 3.57"

Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

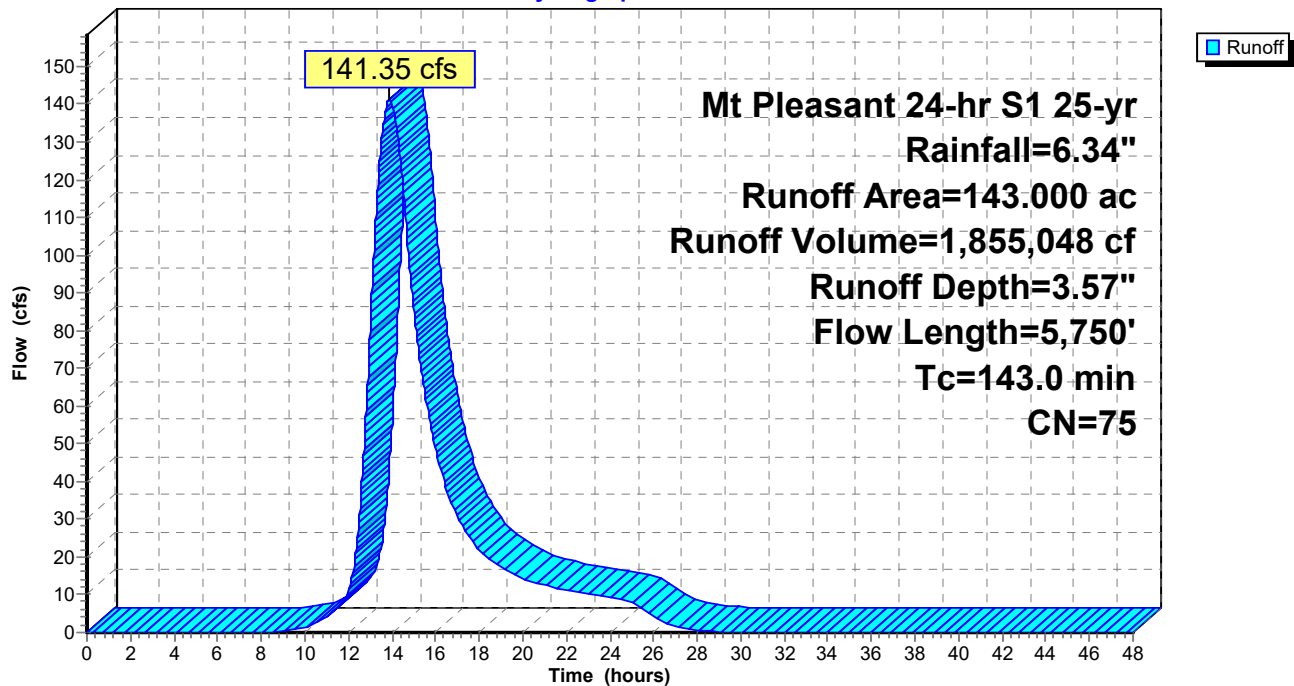
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

Hydrograph



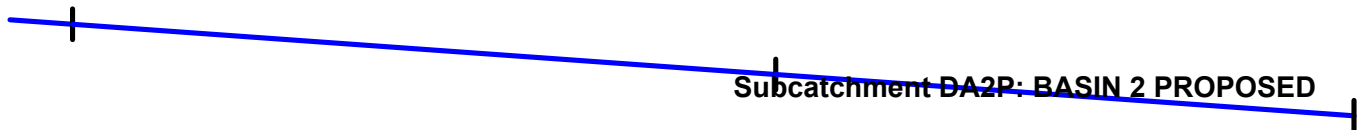
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 38.11 cfs @ 12.88 hrs, Volume= 294,710 cf, Depth= 2.33"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

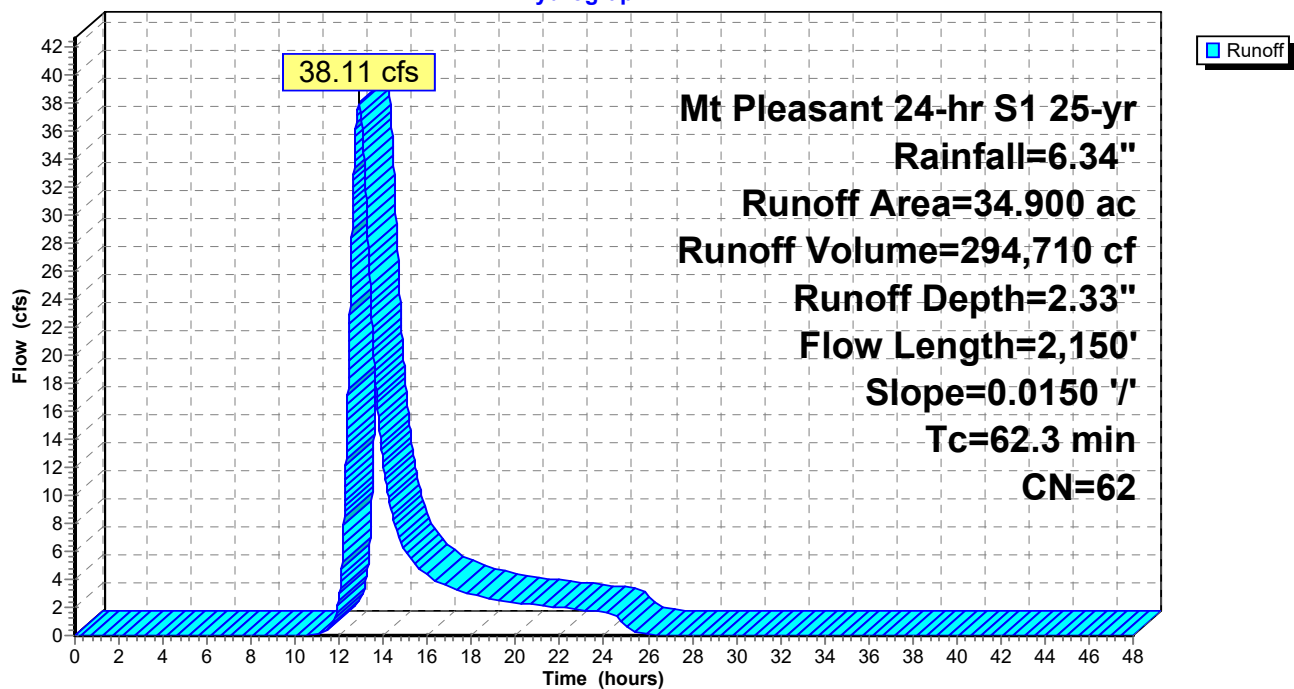
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 11.72 cfs @ 12.03 hrs, Volume= 30,809 cf, Depth= 3.98"

Routed to Reach OF4P : Primary Stream for Outfalls

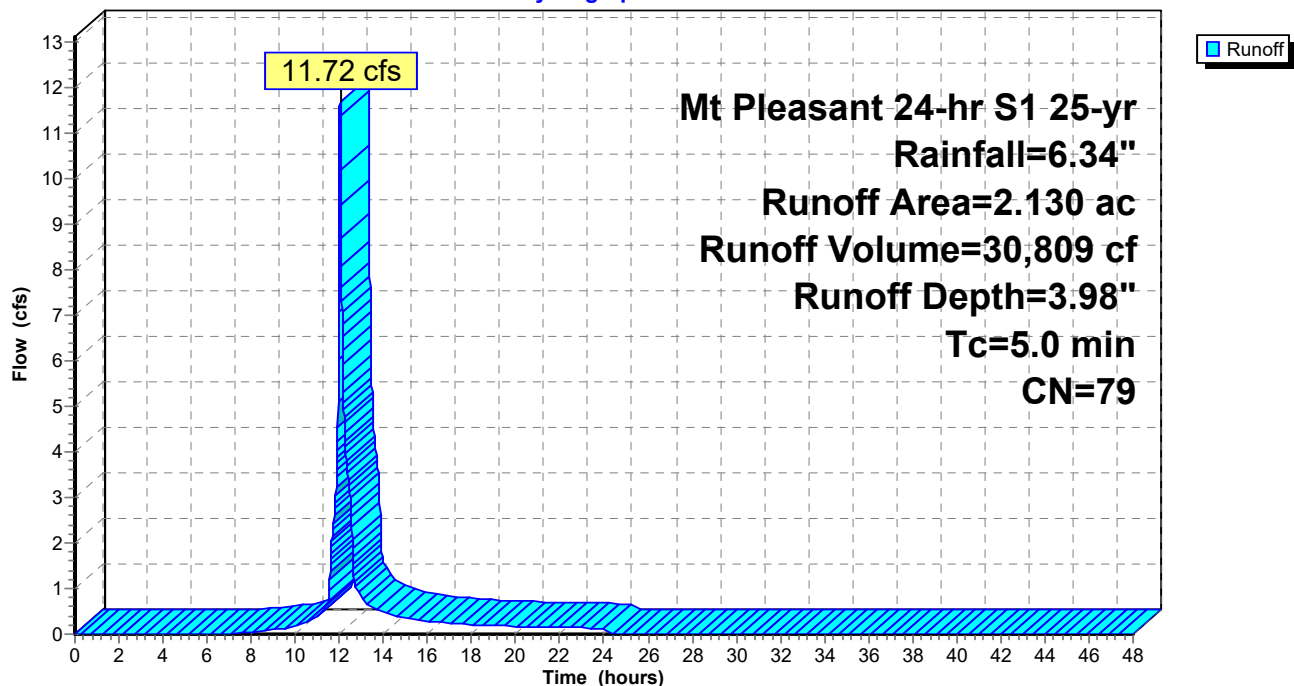
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

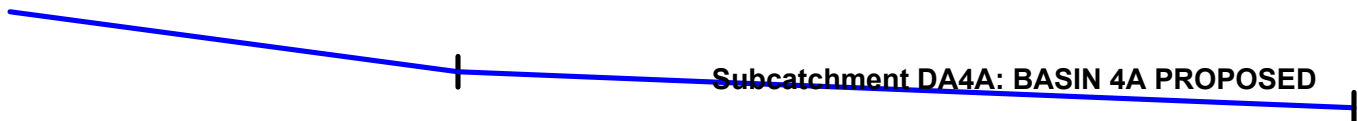
Runoff = 10.18 cfs @ 12.37 hrs, Volume= 52,040 cf, Depth= 2.88"

Routed to Reach OF4P : Primary Stream for Outfalls

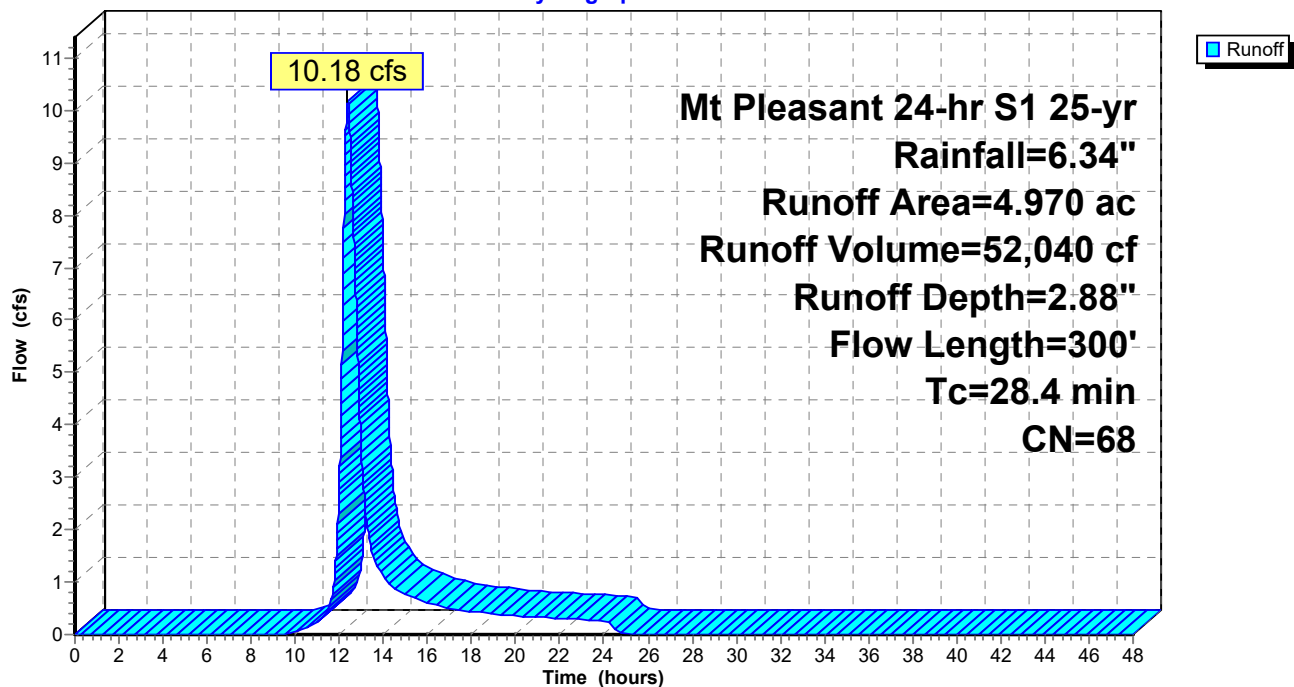
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



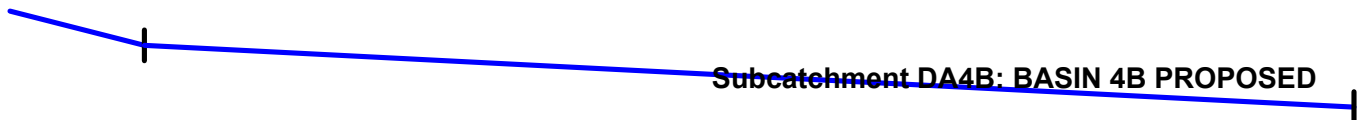
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 43.69 cfs @ 12.40 hrs, Volume= 259,995 cf, Depth= 5.87"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

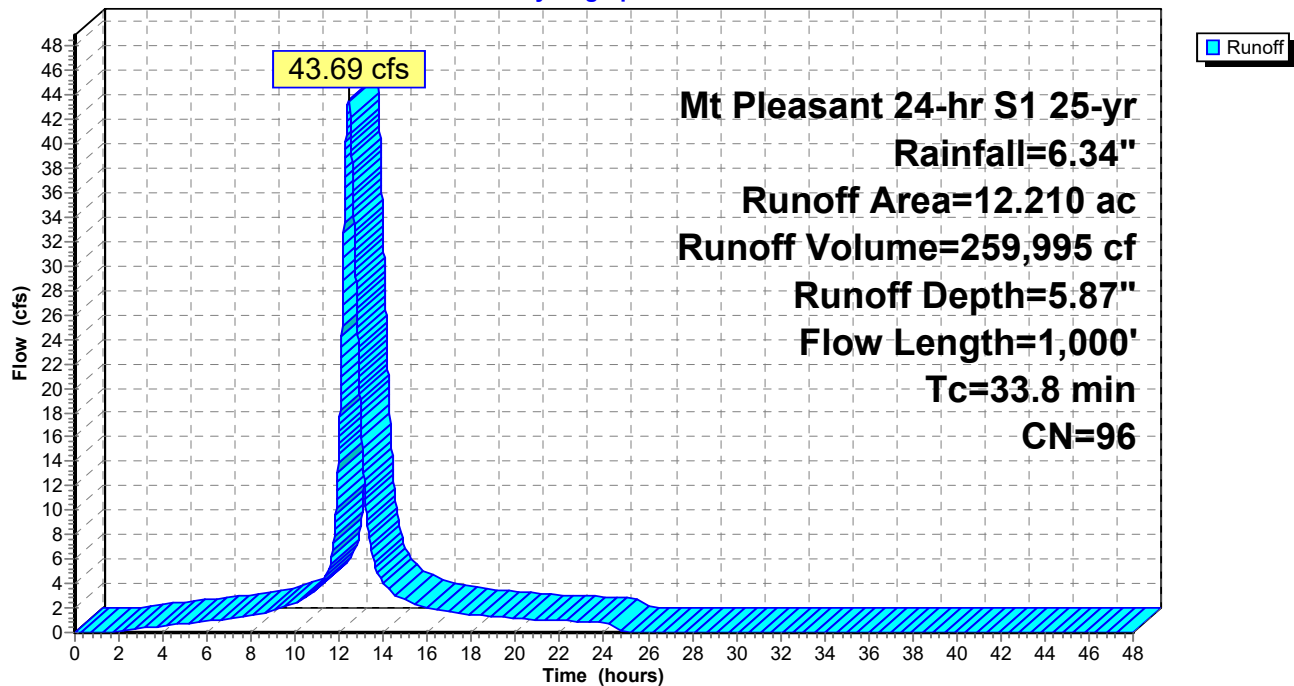
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 8.01 cfs @ 12.03 hrs, Volume= 23,210 cf, Depth= 5.87"
 Routed to Reach D4C : Ditch 4C

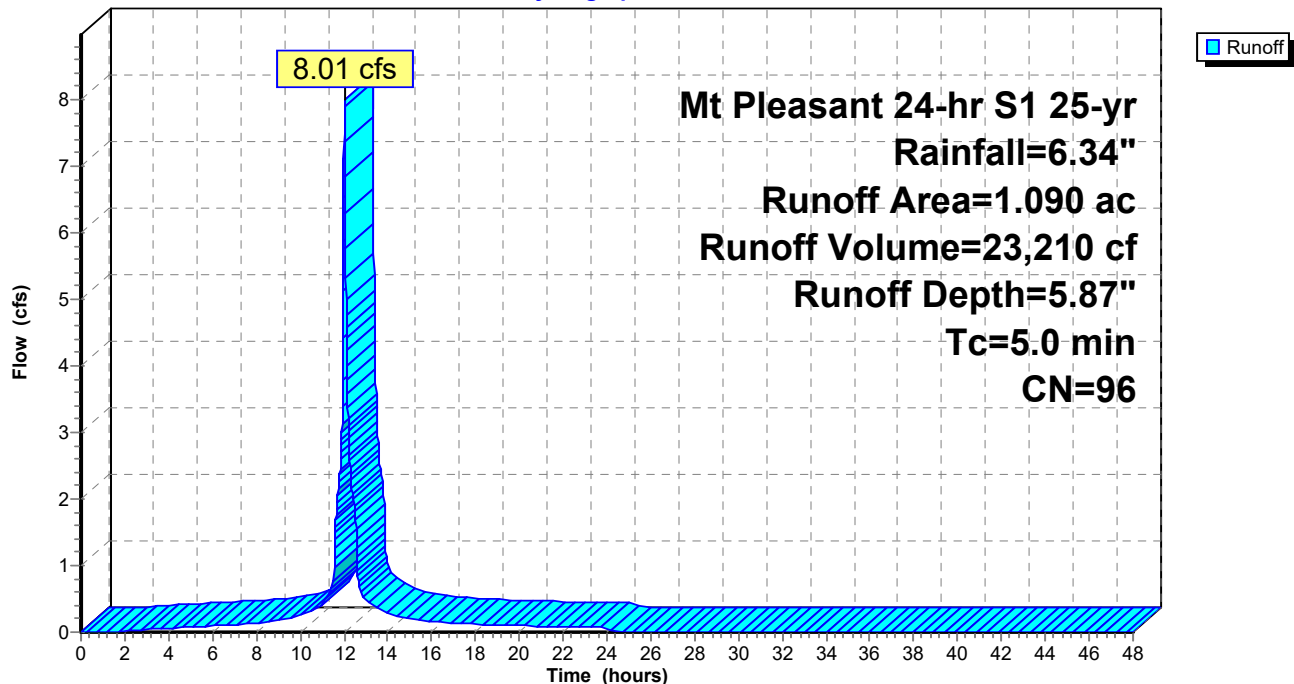
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 10.87 cfs @ 12.03 hrs, Volume= 31,515 cf, Depth= 5.87"
 Routed to Reach D4D : Ditch 4D

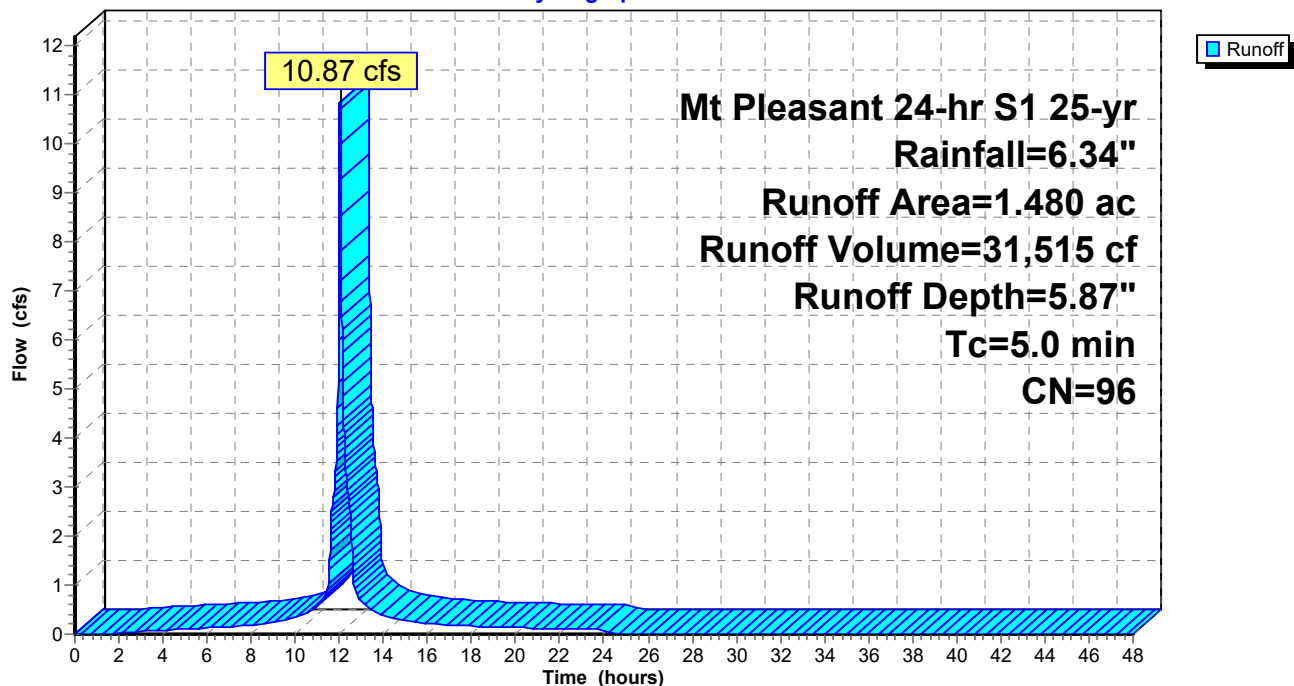
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



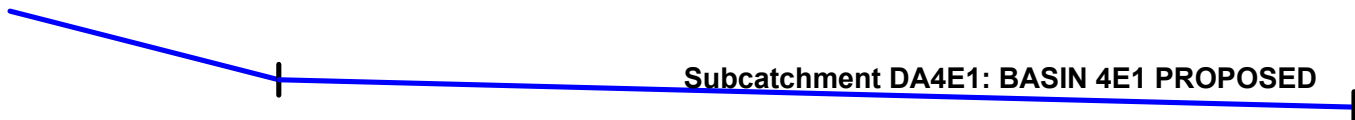
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

Runoff = 14.70 cfs @ 12.39 hrs, Volume= 76,136 cf, Depth= 2.51"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

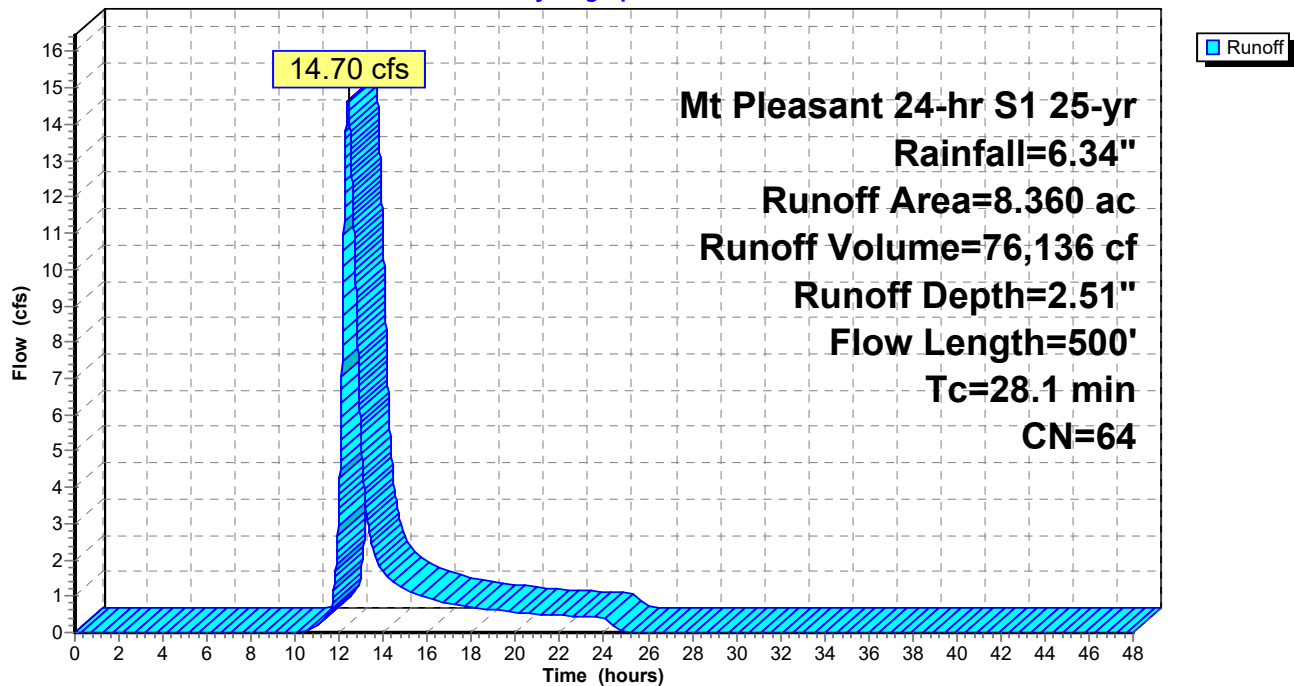
Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

Hydrograph



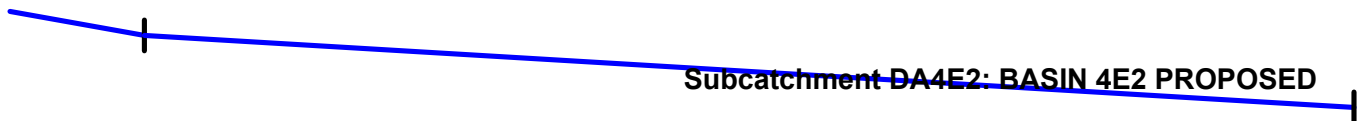
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 31.20 cfs @ 12.56 hrs, Volume= 188,257 cf, Depth= 2.98"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 25-yr Rainfall=6.34"

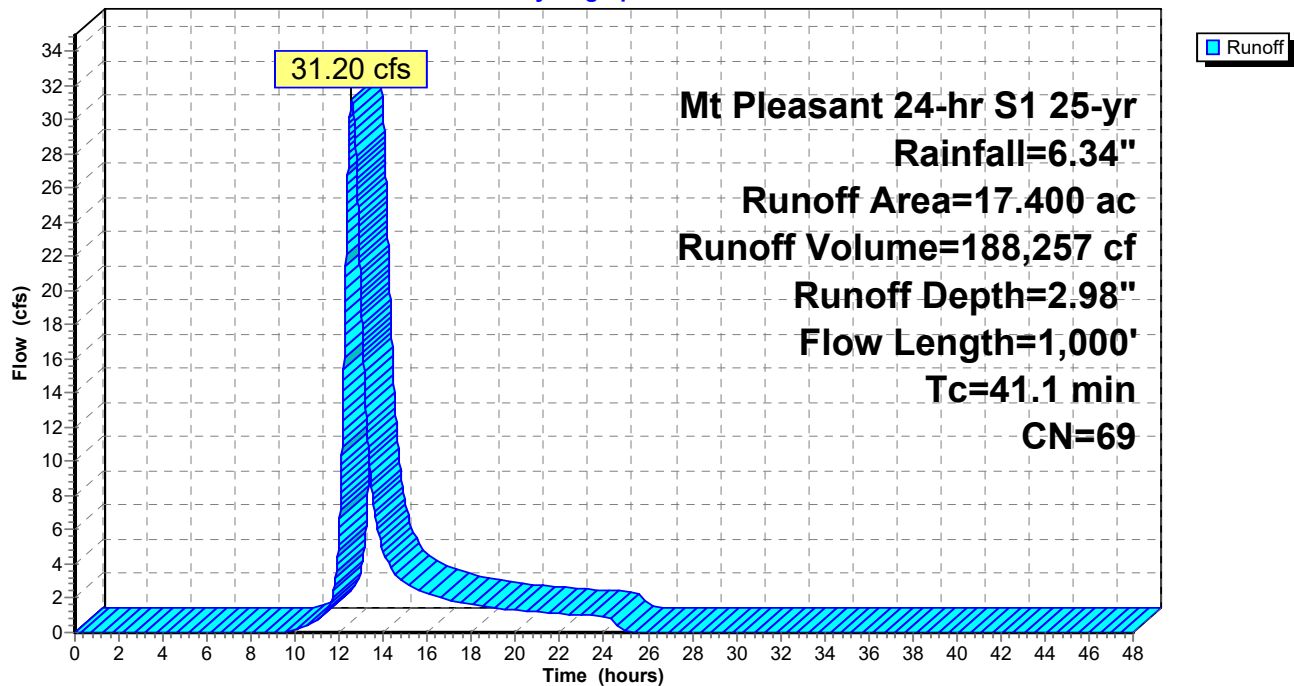
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



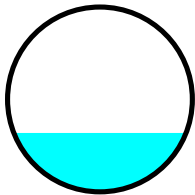
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 5.87" for 25-yr event
Inflow = 7.63 cfs @ 12.04 hrs, Volume= 23,210 cf
Outflow = 7.63 cfs @ 12.05 hrs, Volume= 23,210 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

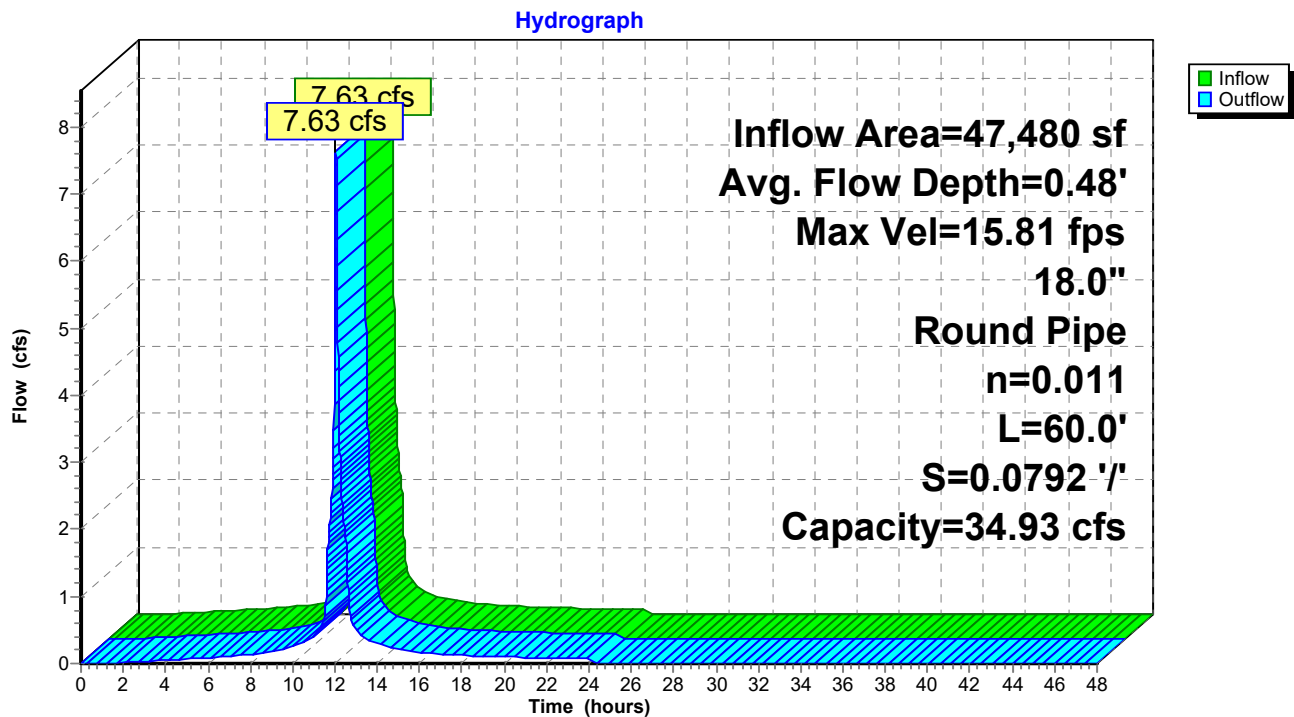
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.81 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.80 fps, Avg. Travel Time= 0.2 min

Peak Storage= 29 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 1.40'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

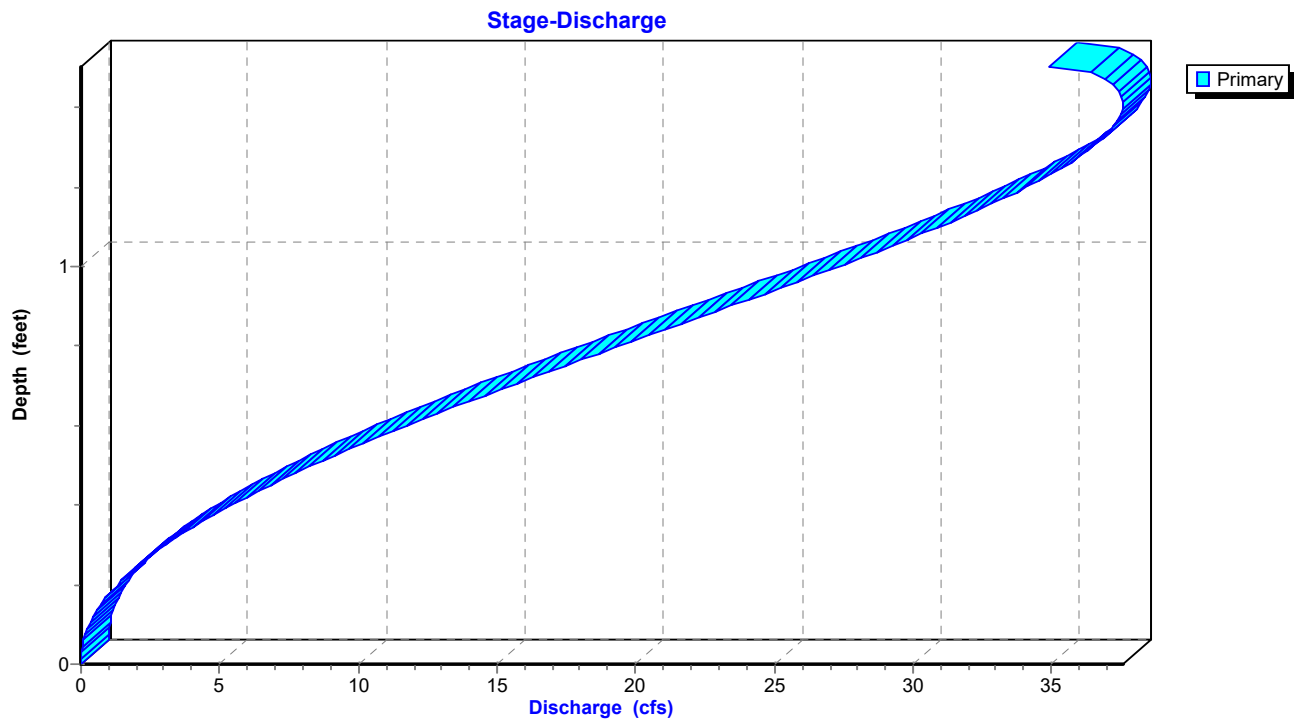
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

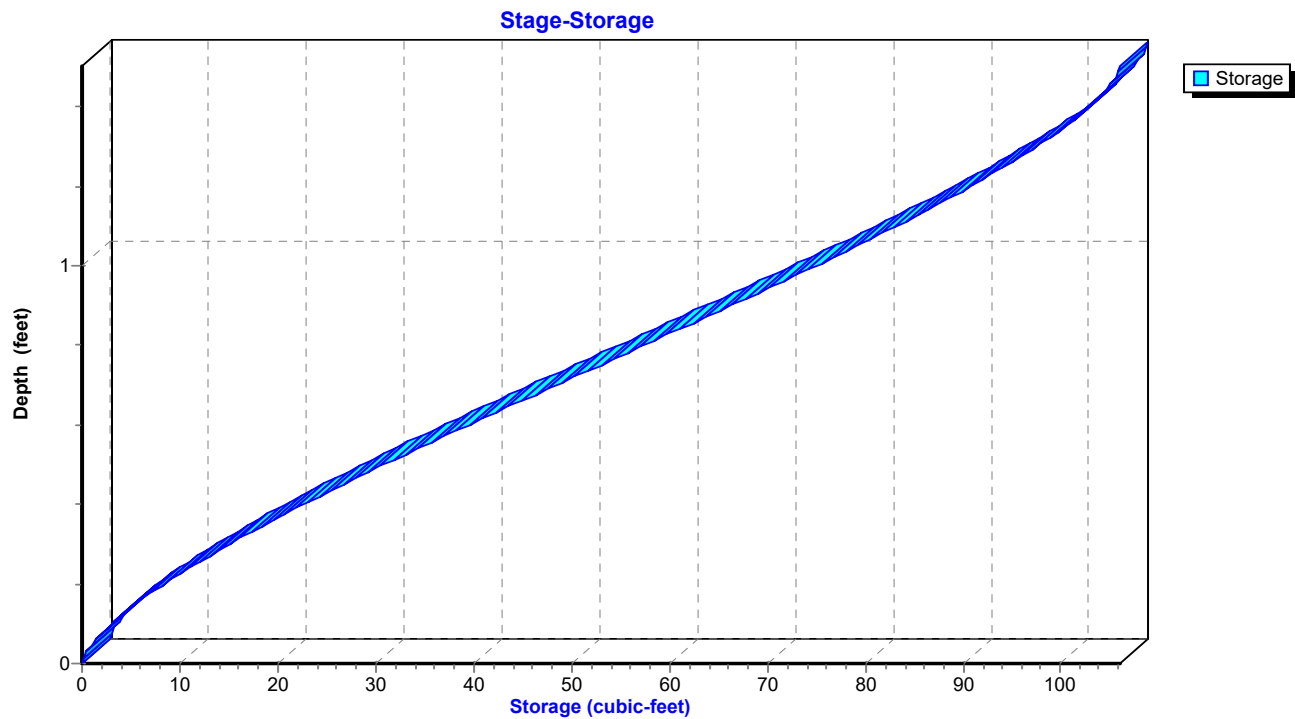


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

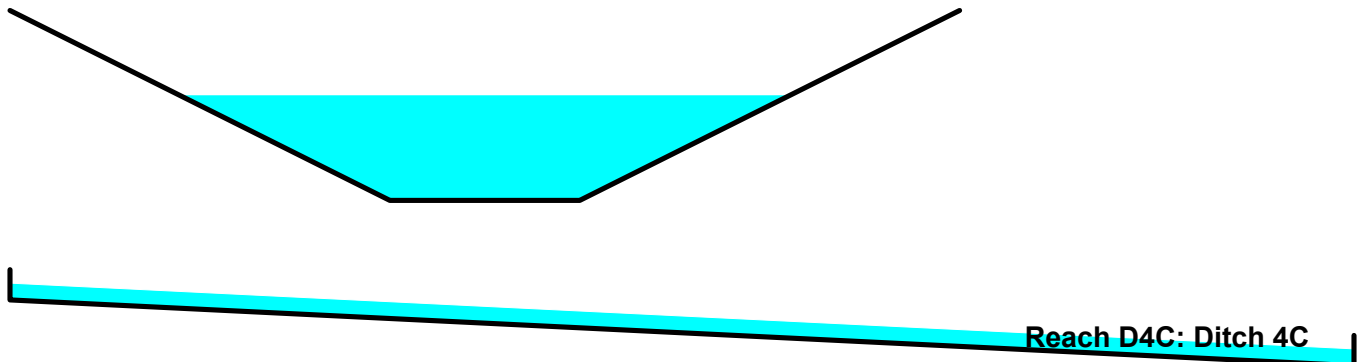
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 5.87" for 25-yr event
Inflow = 8.01 cfs @ 12.03 hrs, Volume= 23,210 cf
Outflow = 7.63 cfs @ 12.04 hrs, Volume= 23,210 cf, Atten= 5%, Lag= 1.1 min
Routed to Reach CD4C : Cross Drain 4C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.90 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 6.1 min

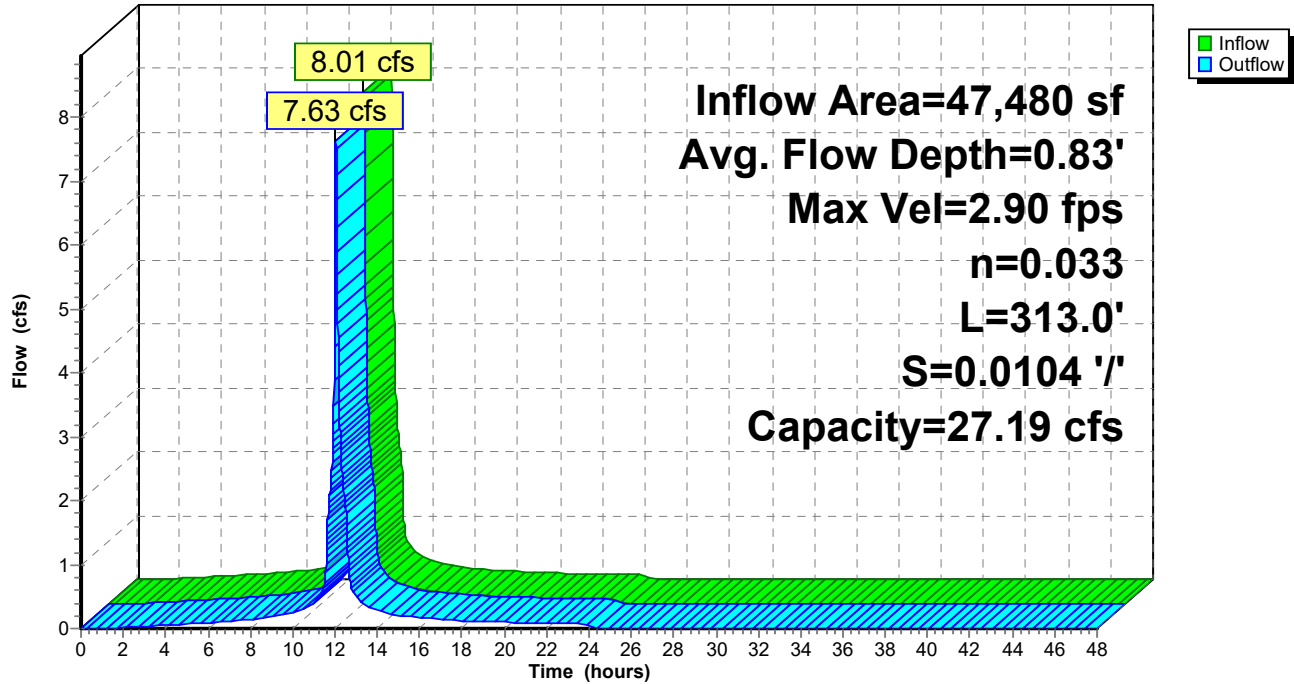
Peak Storage= 822 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 4.82'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 '/'
Inlet Invert= 687.00', Outlet Invert= 683.75'



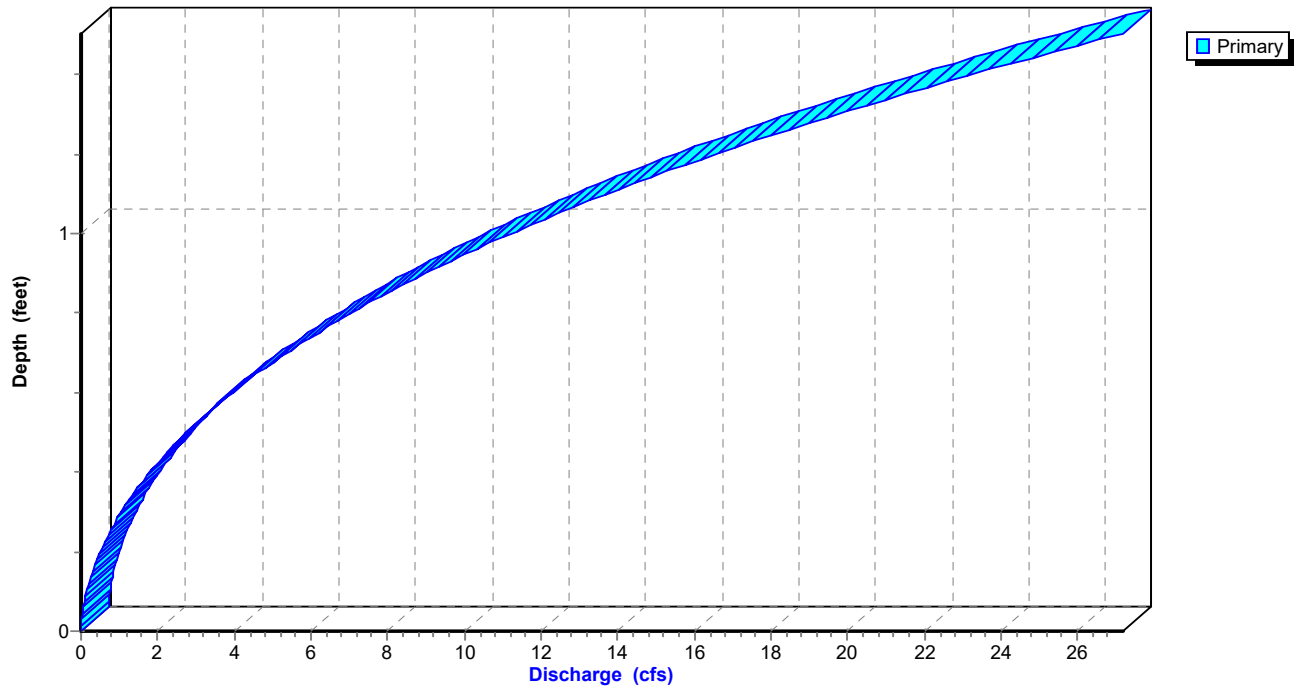
Reach D4C: Ditch 4C

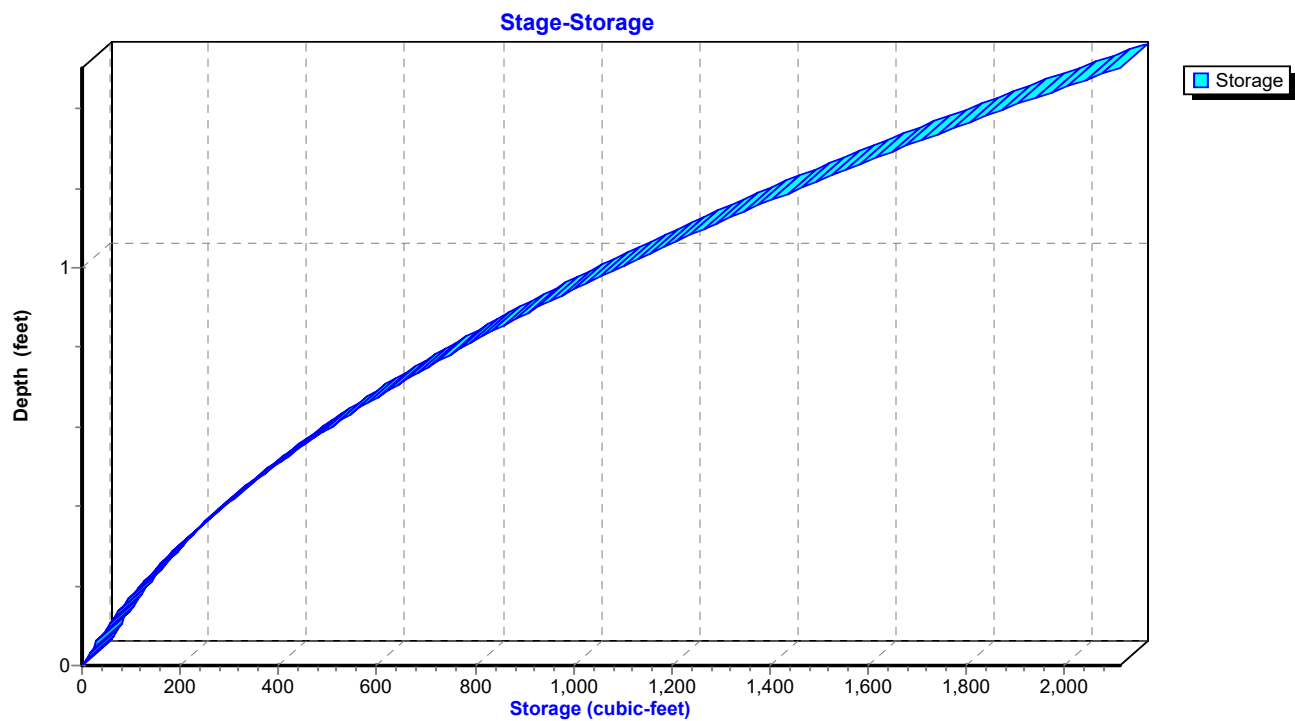
Hydrograph



Reach D4C: Ditch 4C

Stage-Discharge



Reach D4C: Ditch 4C

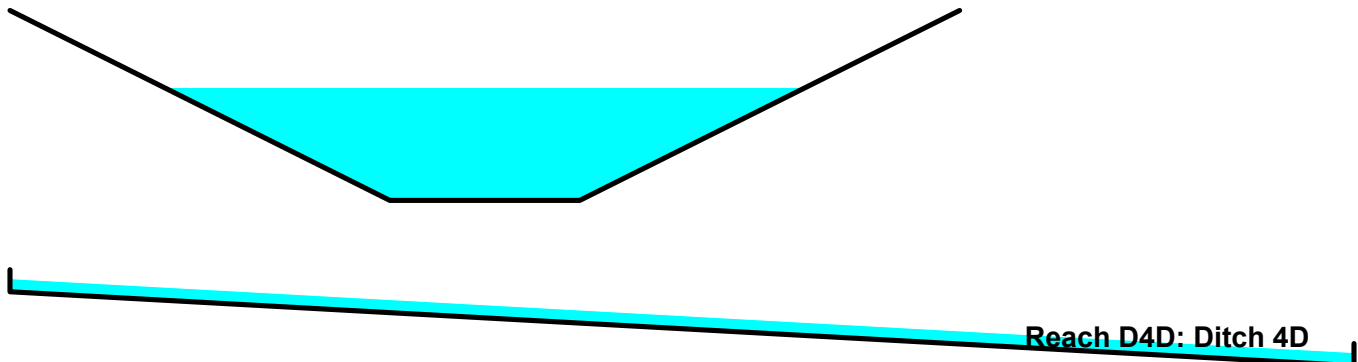
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 5.87" for 25-yr event
Inflow = 10.87 cfs @ 12.03 hrs, Volume= 31,515 cf
Outflow = 10.47 cfs @ 12.04 hrs, Volume= 31,515 cf, Atten= 4%, Lag= 1.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 5.3 min

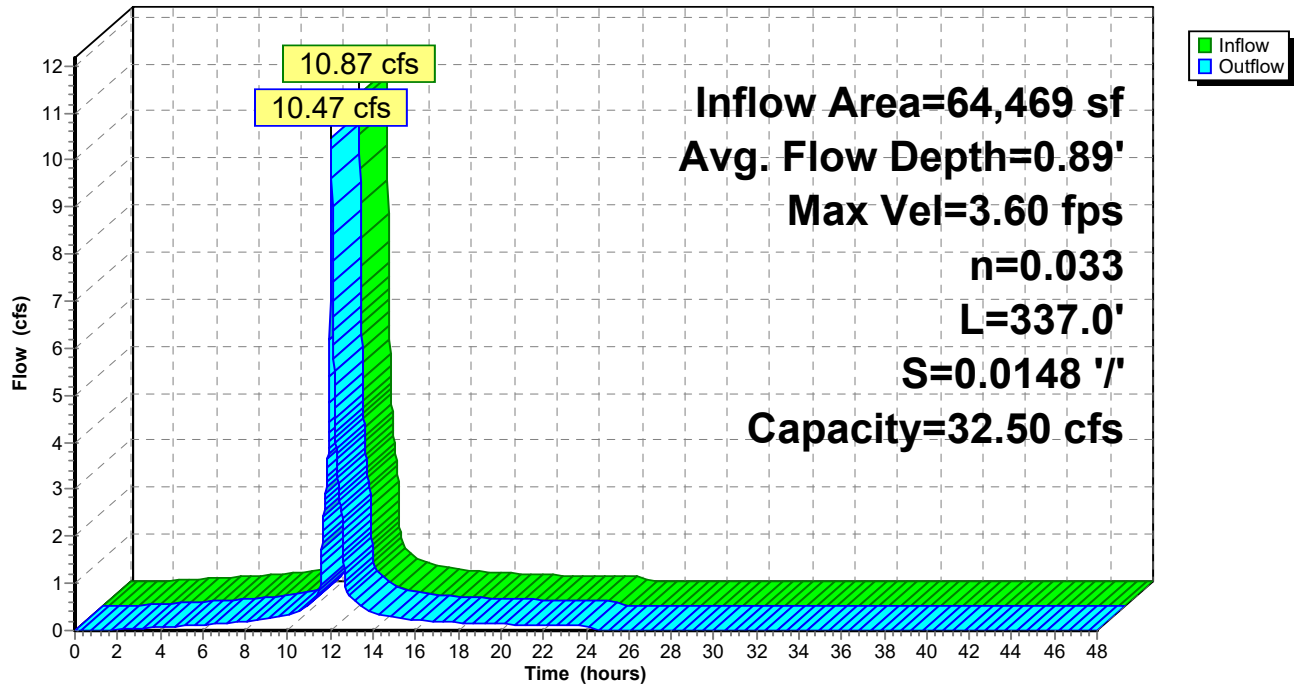
Peak Storage= 980 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.89' , Surface Width= 5.05'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



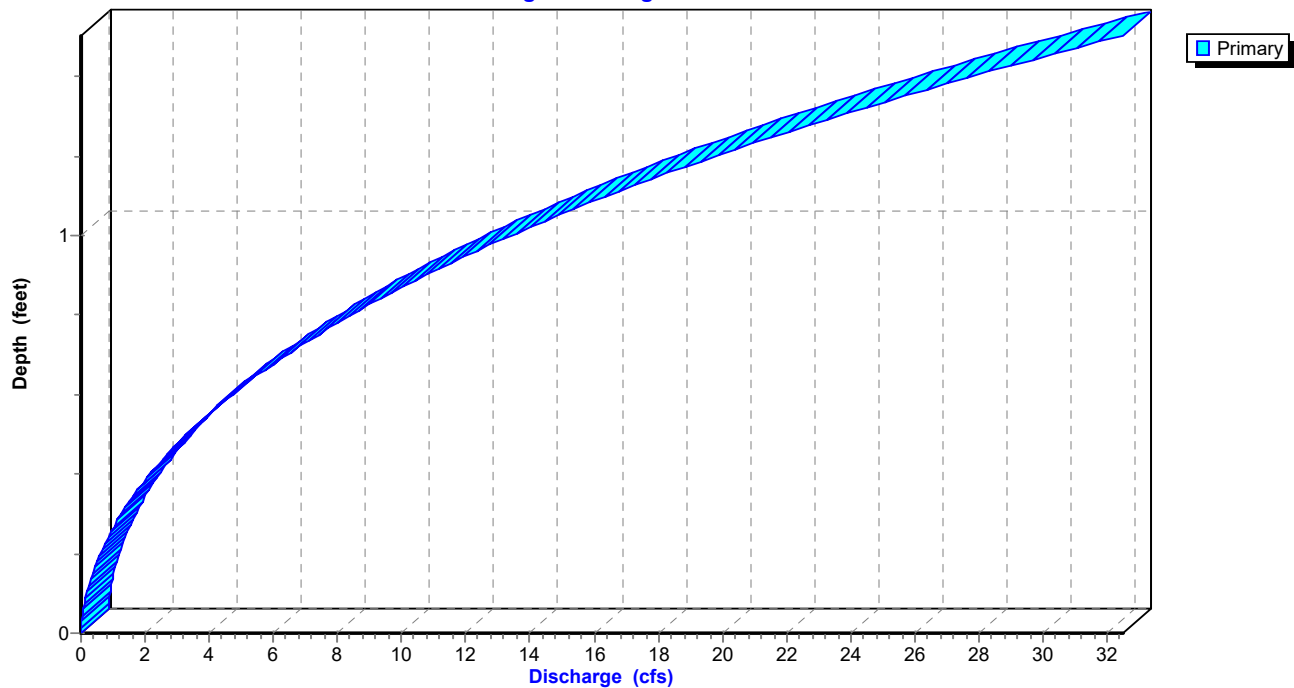
Reach D4D: Ditch 4D

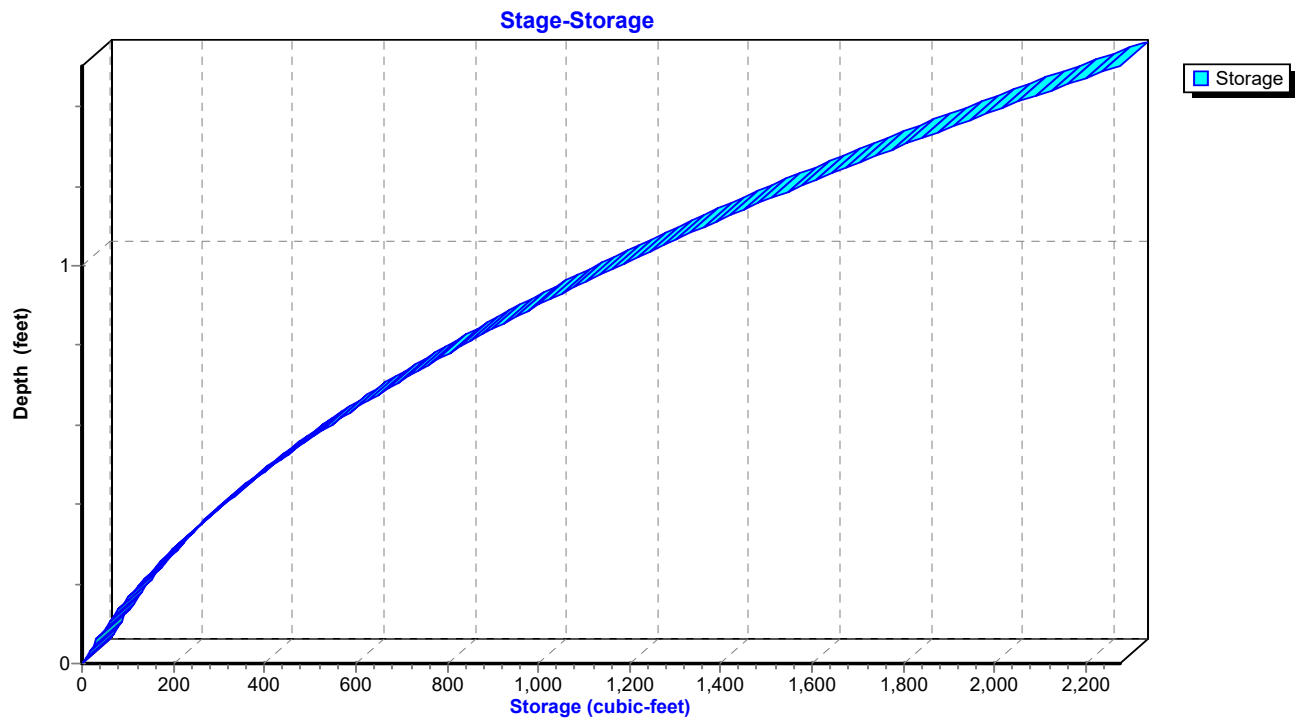
Hydrograph



Reach D4D: Ditch 4D

Stage-Discharge



Reach D4D: Ditch 4D

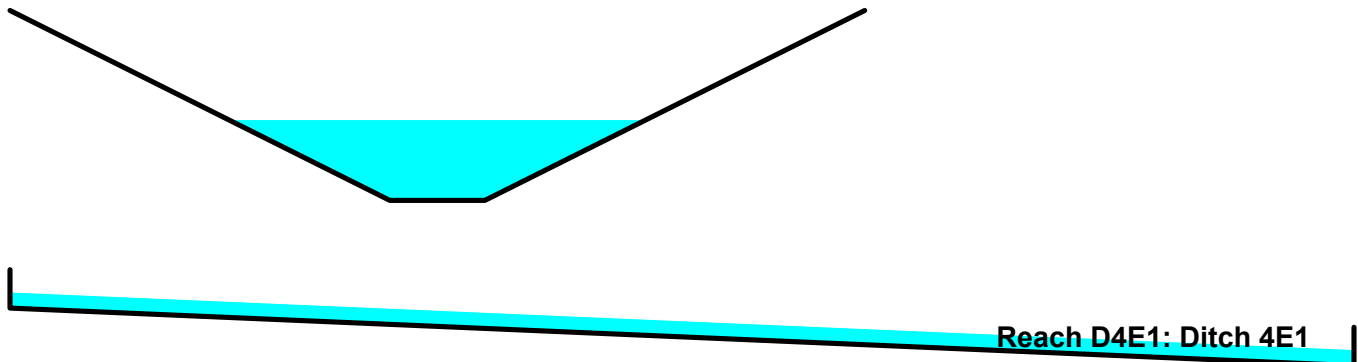
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 2.51" for 25-yr event
Inflow = 14.70 cfs @ 12.39 hrs, Volume= 76,136 cf
Outflow = 14.36 cfs @ 12.44 hrs, Volume= 76,136 cf, Atten= 2%, Lag= 3.1 min
Routed to Pond CD4E : Cross Drain 4E

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.80 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 11.6 min

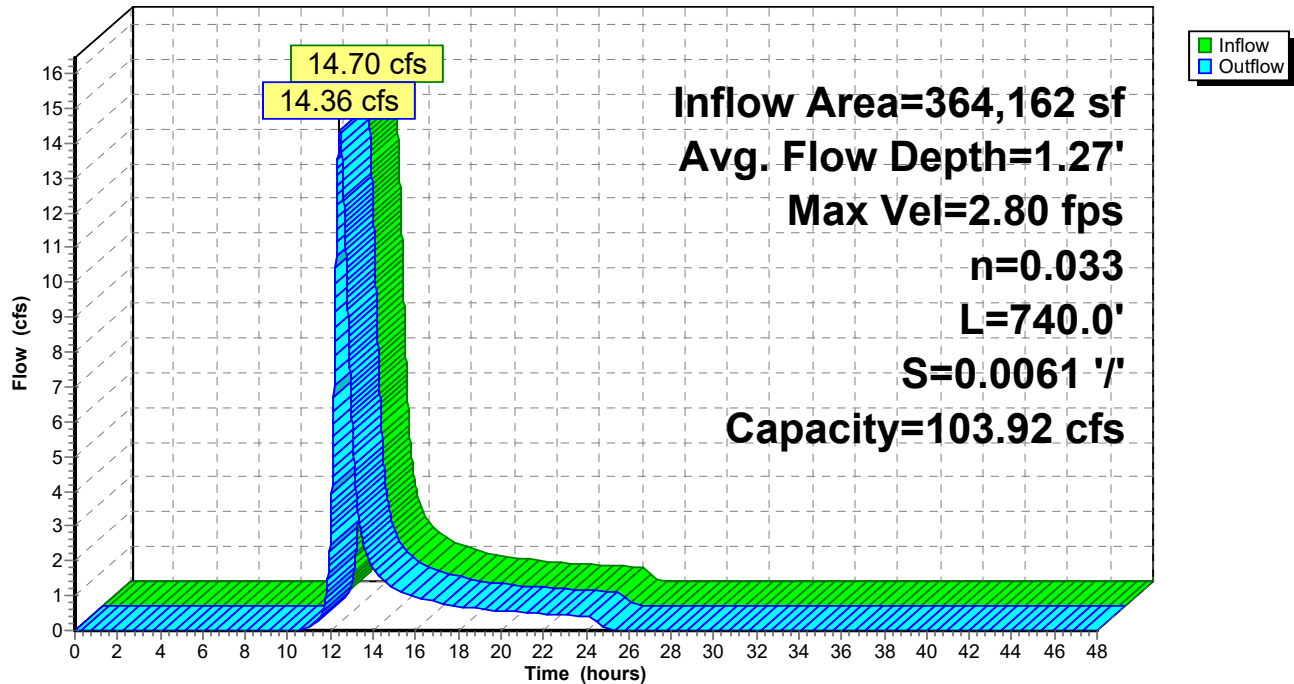
Peak Storage= 3,788 cf @ 12.44 hrs
Average Depth at Peak Storage= 1.27' , Surface Width= 6.57'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 ' / ' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 ' / '
Inlet Invert= 684.00', Outlet Invert= 679.50'



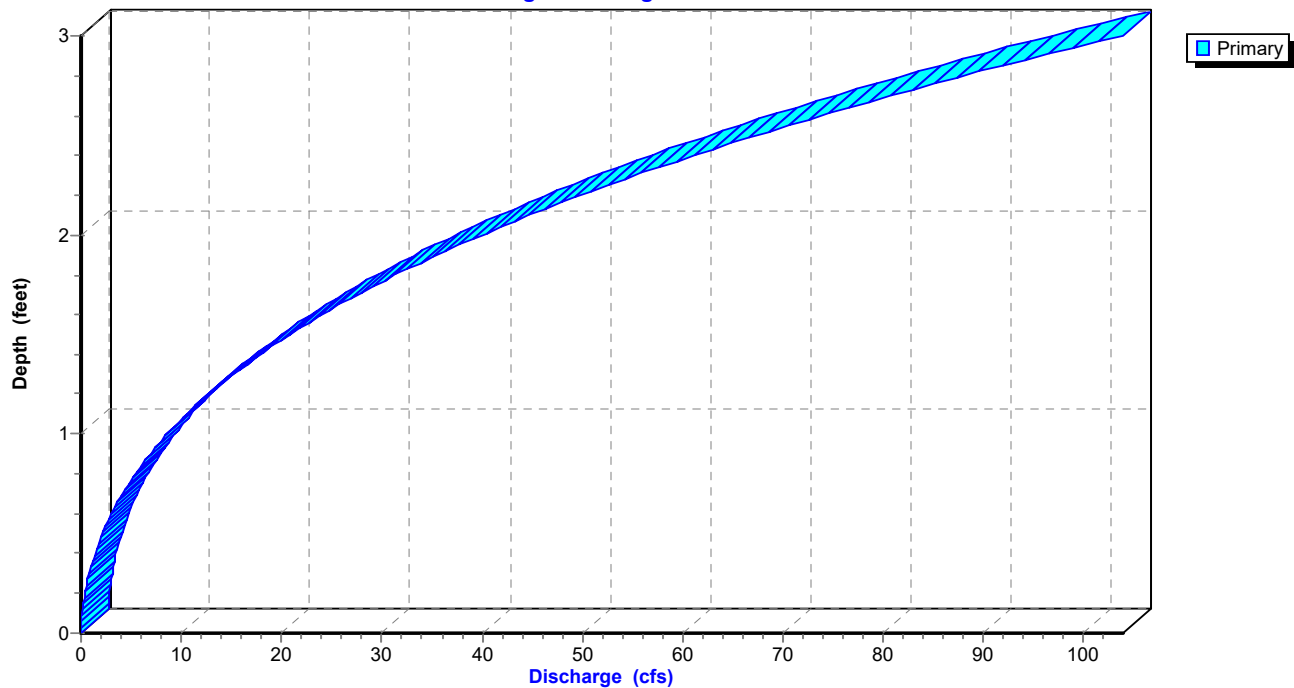
Reach D4E1: Ditch 4E1

Hydrograph

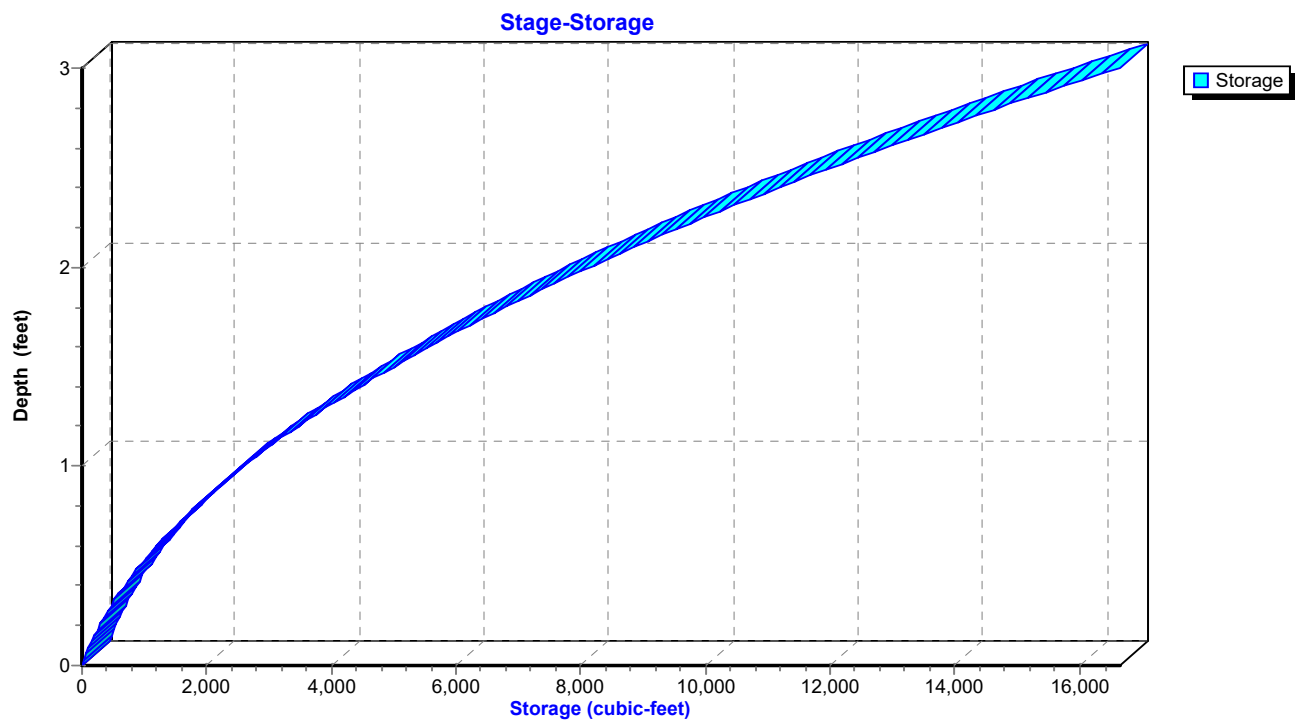


Reach D4E1: Ditch 4E1

Stage-Discharge



Reach D4E1: Ditch 4E1



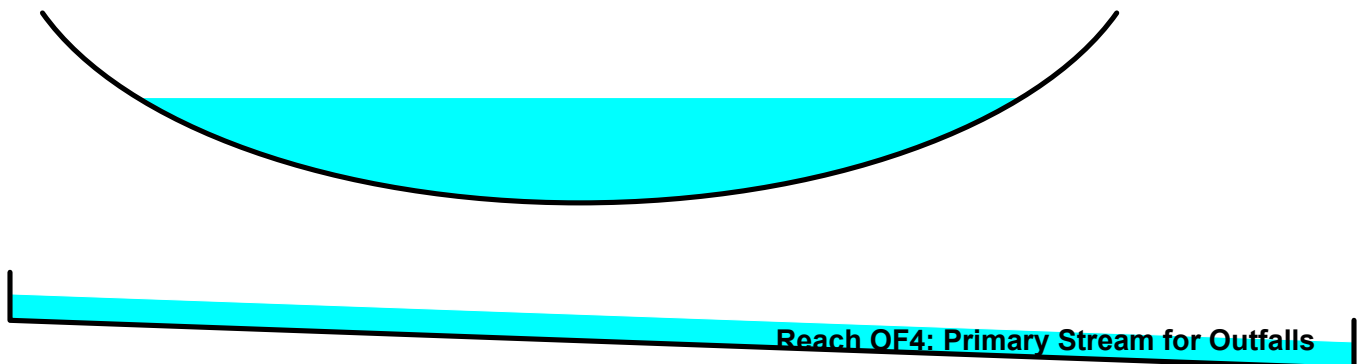
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 3.28" for 25-yr event
Inflow = 179.49 cfs @ 13.35 hrs, Volume= 2,726,715 cf
Outflow = 179.28 cfs @ 13.37 hrs, Volume= 2,726,715 cf, Atten= 0%, Lag= 1.6 min

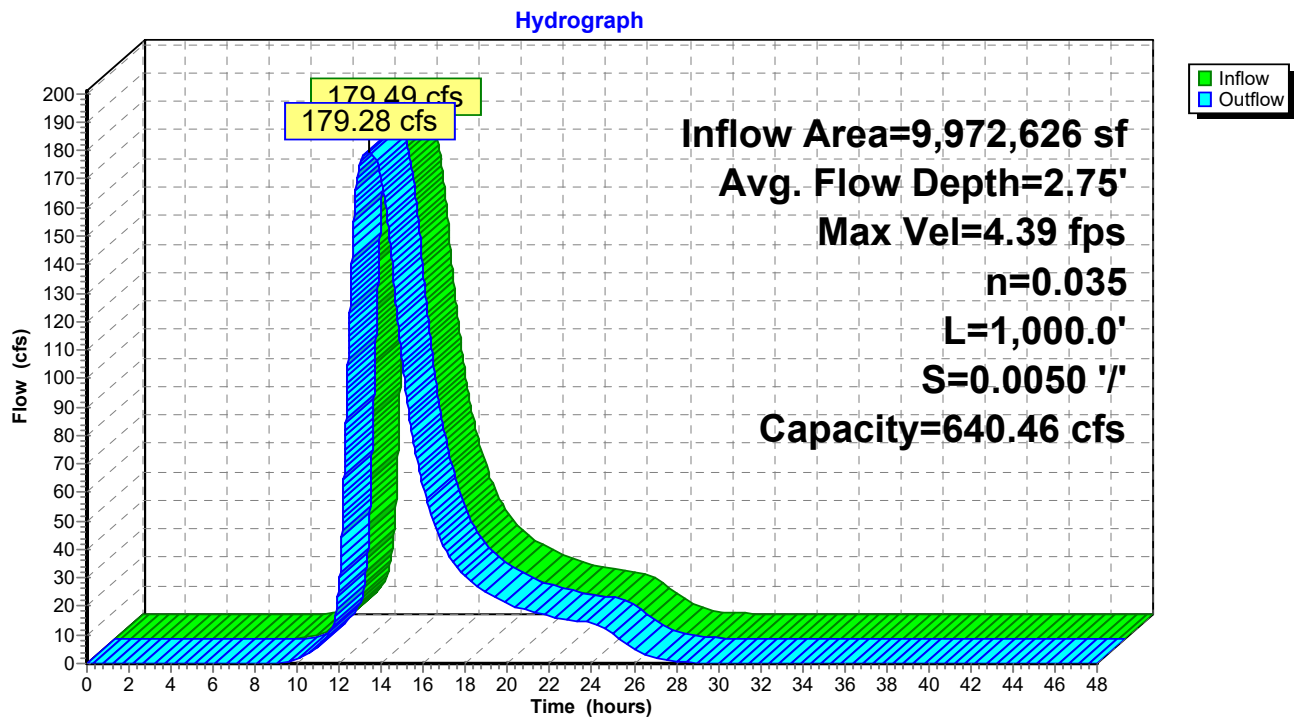
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 1.64 fps, Avg. Travel Time= 10.2 min

Peak Storage= 40,870 cf @ 13.37 hrs
Average Depth at Peak Storage= 2.75' , Surface Width= 22.26'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

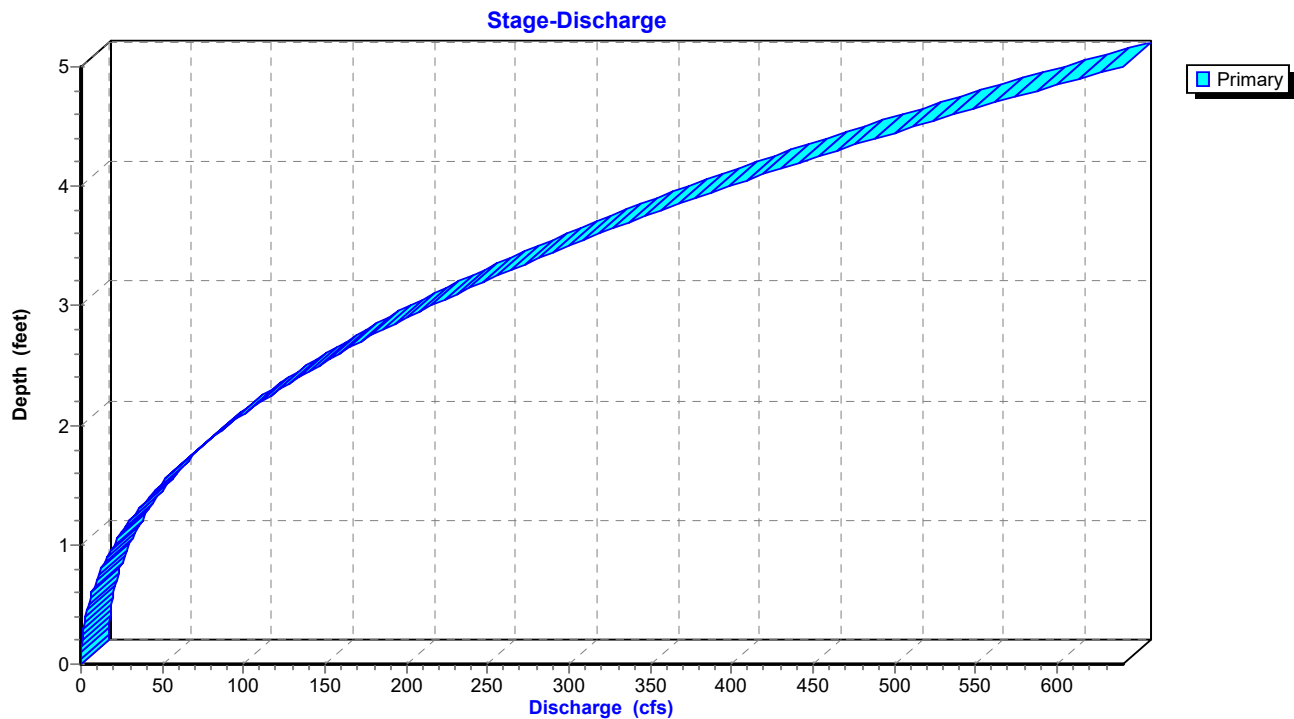
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

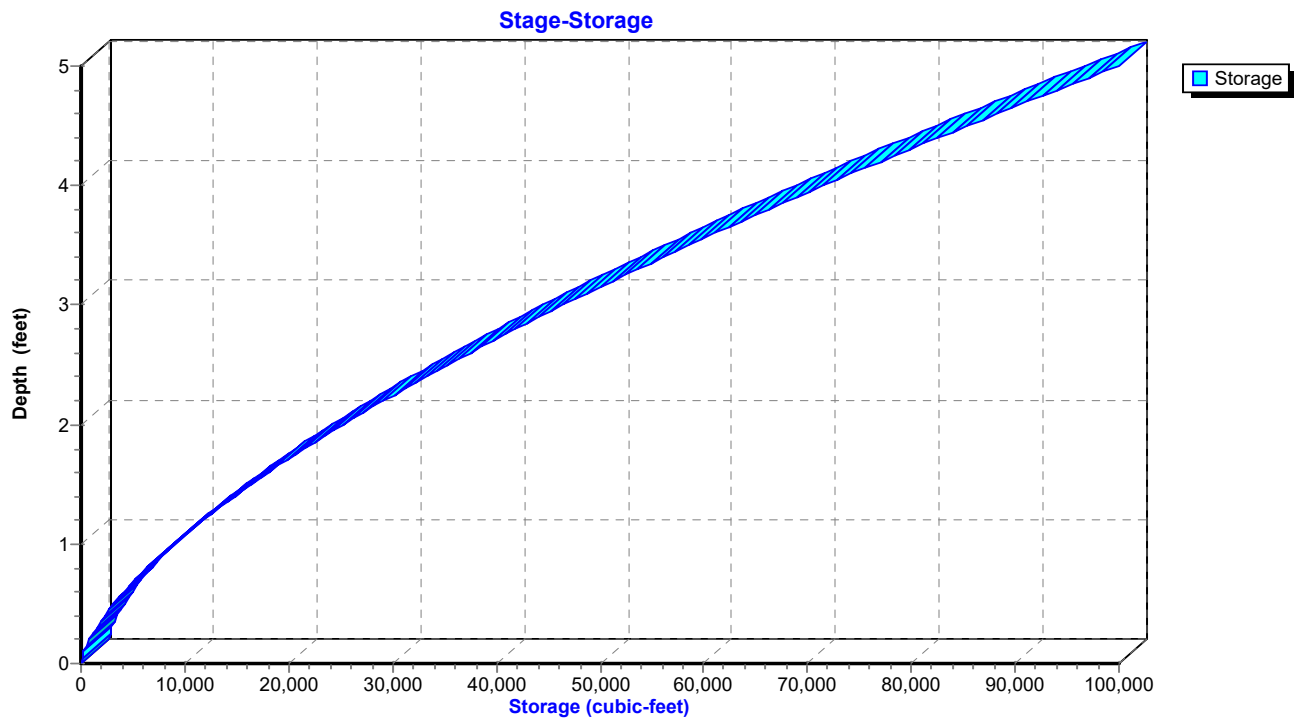


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

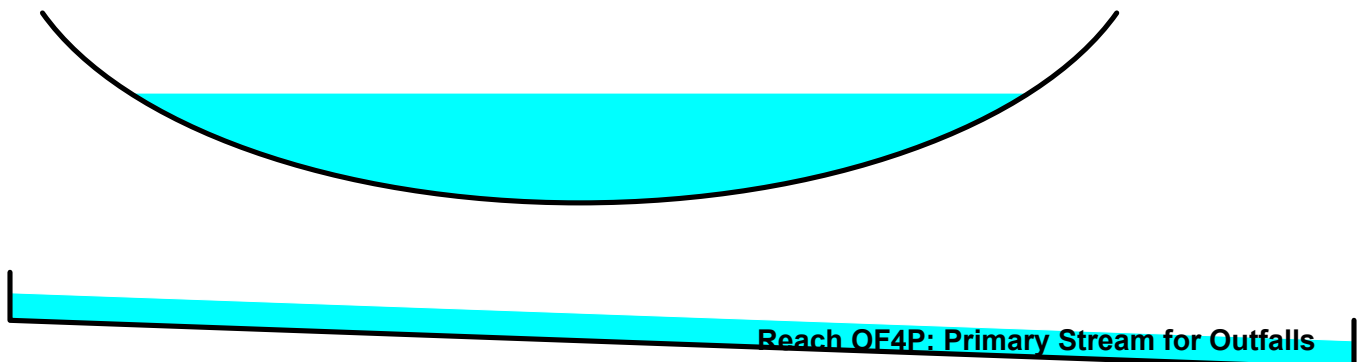
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 3.43" for 25-yr event
Inflow = 196.26 cfs @ 13.66 hrs, Volume= 2,811,155 cf
Outflow = 196.02 cfs @ 13.69 hrs, Volume= 2,811,153 cf, Atten= 0%, Lag= 1.6 min

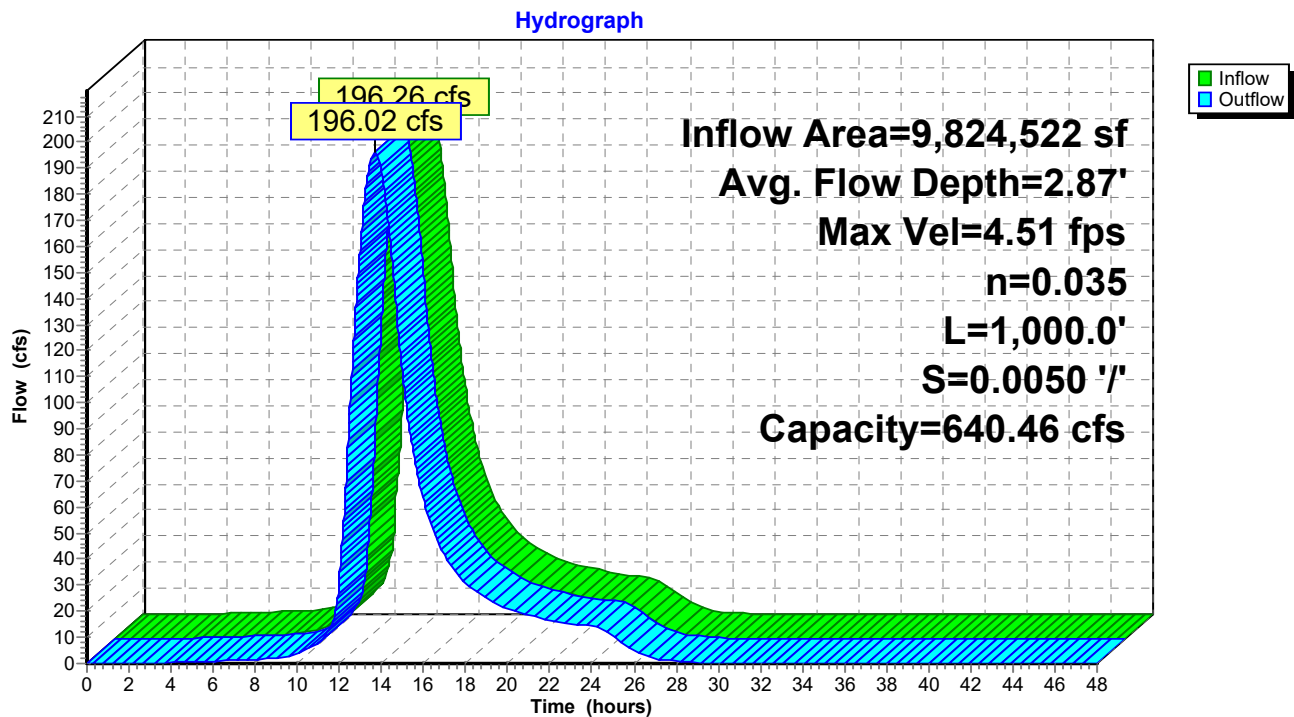
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.51 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 13.1 min

Peak Storage= 43,506 cf @ 13.69 hrs
Average Depth at Peak Storage= 2.87' , Surface Width= 22.73'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

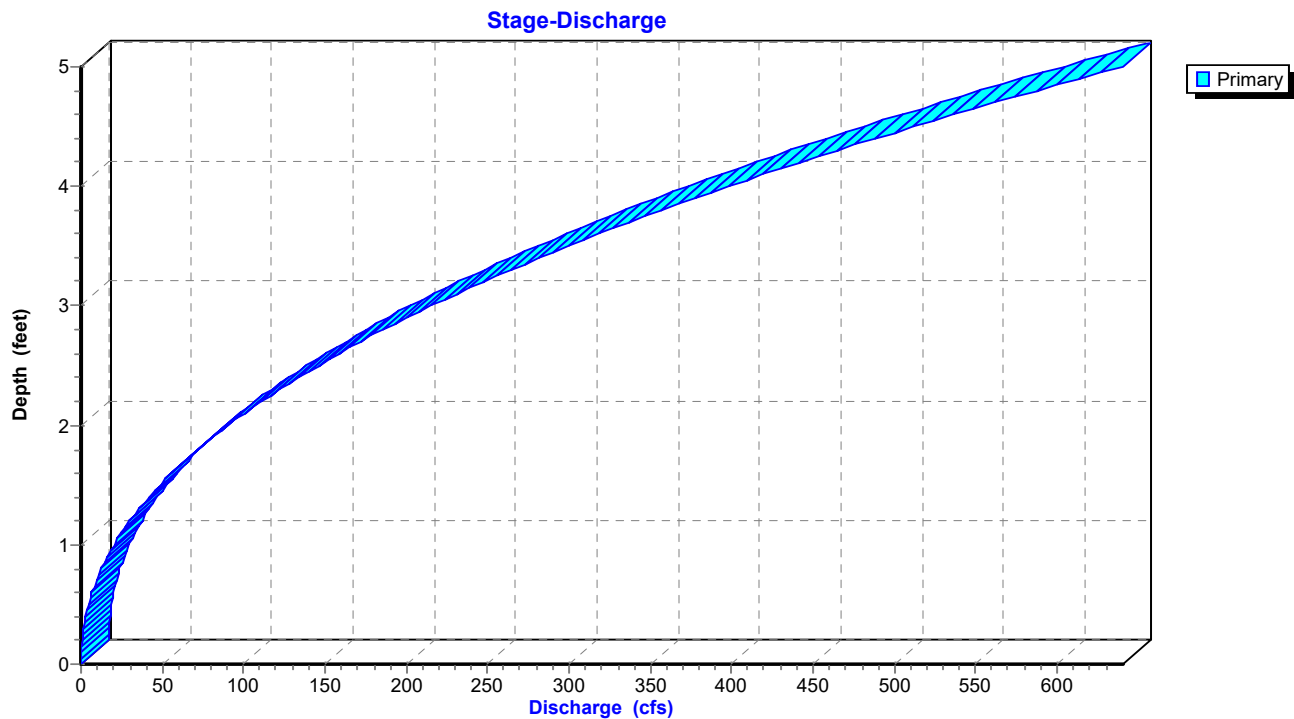
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

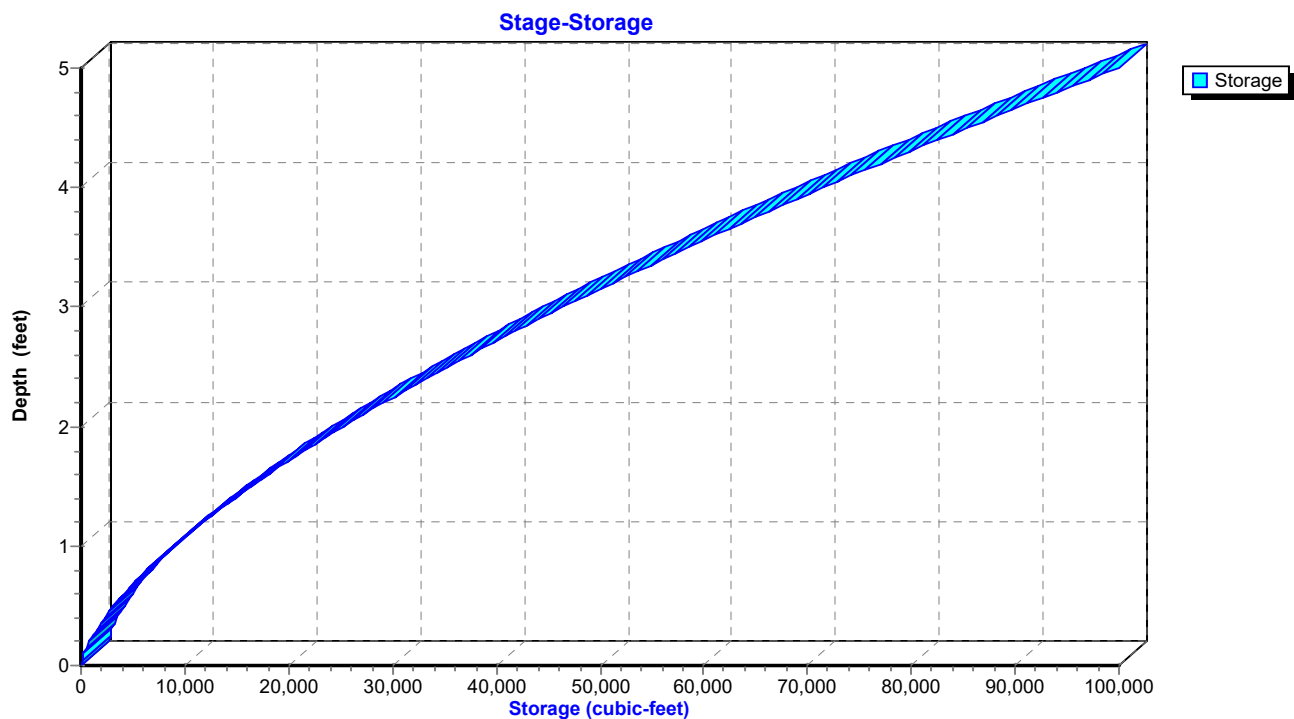


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

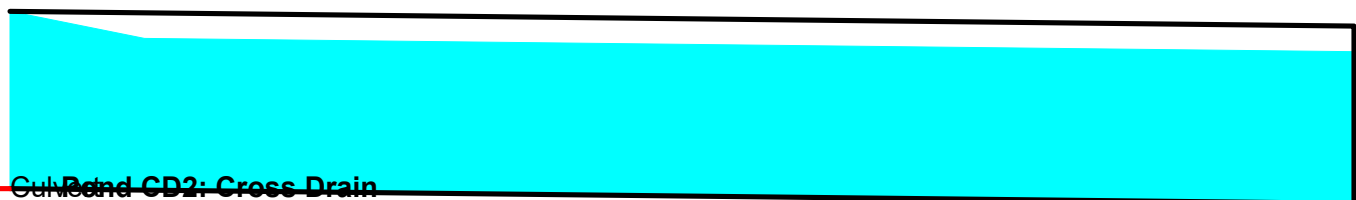
Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 2.33" for 25-yr event
 Inflow = 38.11 cfs @ 12.88 hrs, Volume= 294,710 cf
 Outflow = 38.11 cfs @ 12.88 hrs, Volume= 294,710 cf, Atten= 0%, Lag= 0.0 min
 Primary = 38.11 cfs @ 12.88 hrs, Volume= 294,710 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

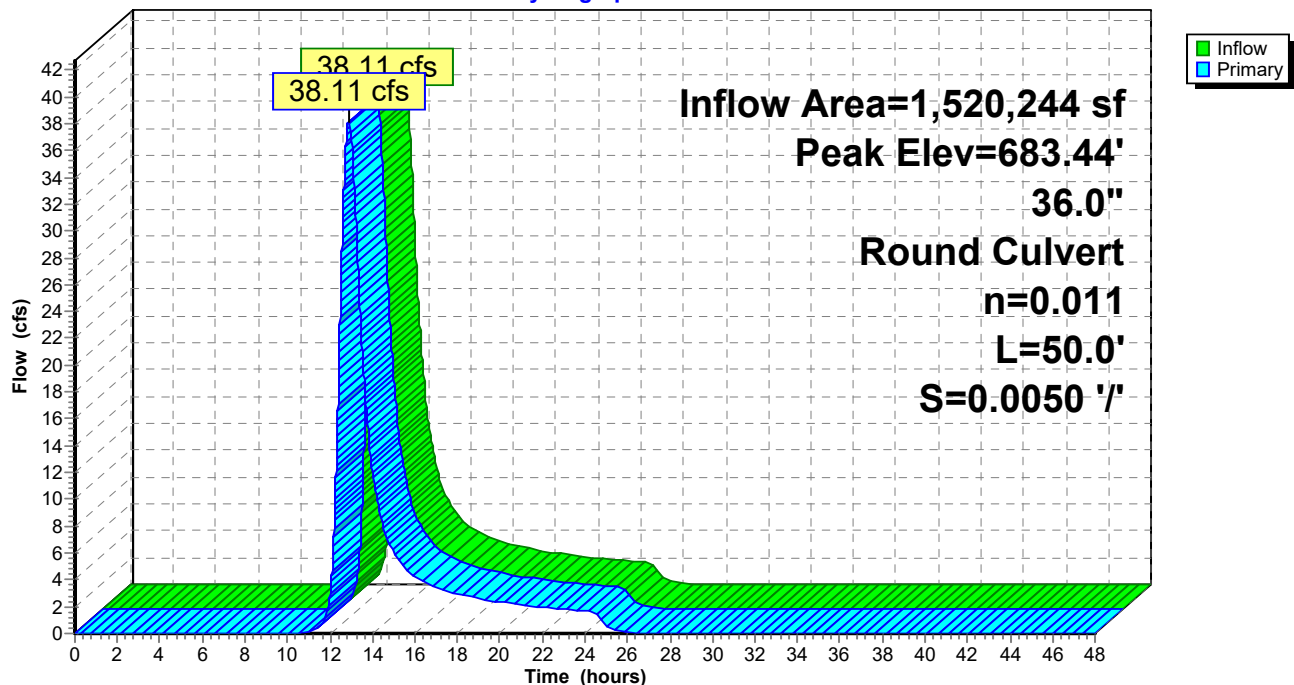
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 683.44' @ 12.88 hrs

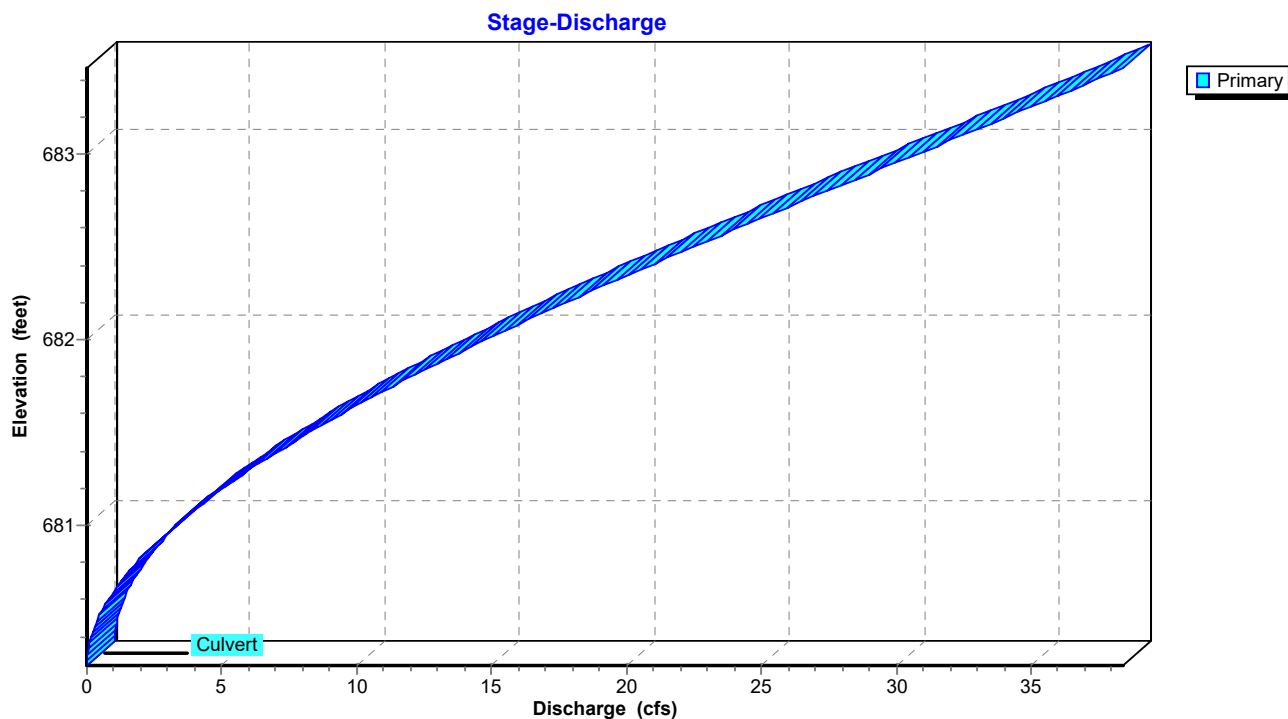
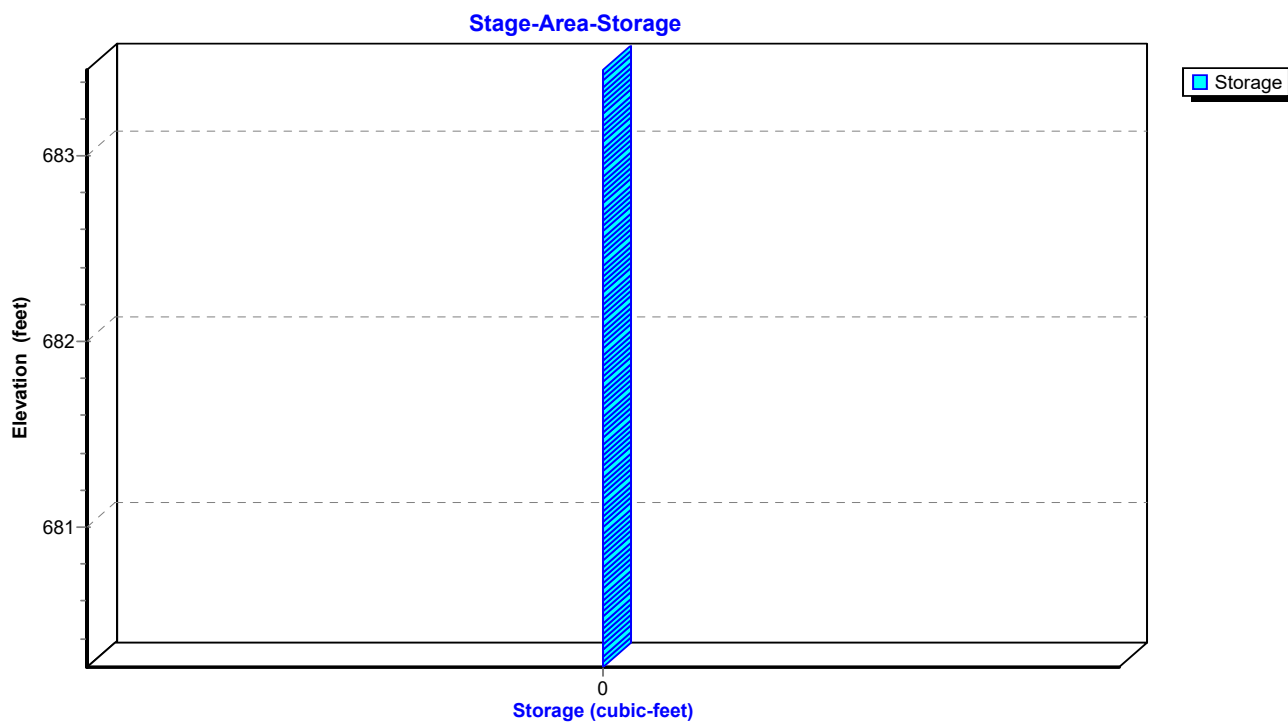
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=38.11 cfs @ 12.88 hrs HW=683.44' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 38.11 cfs @ 6.30 fps)

**Pond CD2: Cross Drain**

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

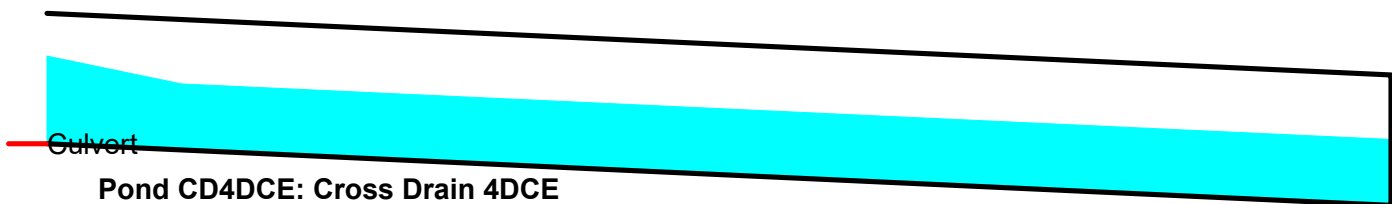
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 3.10" for 25-yr event
 Inflow = 49.09 cfs @ 12.51 hrs, Volume= 319,118 cf
 Outflow = 49.09 cfs @ 12.51 hrs, Volume= 319,118 cf, Atten= 0%, Lag= 0.0 min
 Primary = 49.09 cfs @ 12.51 hrs, Volume= 319,118 cf
 Routed to Pond POND1P : PROP POND

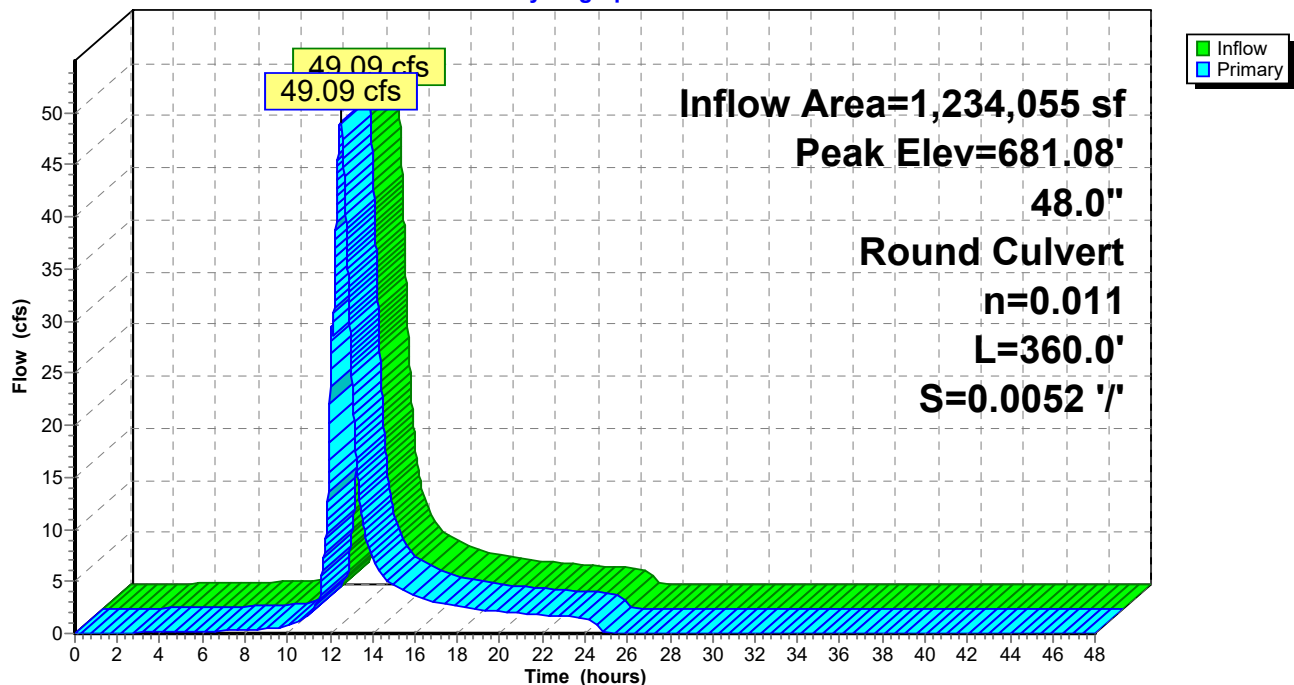
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.08' @ 12.51 hrs

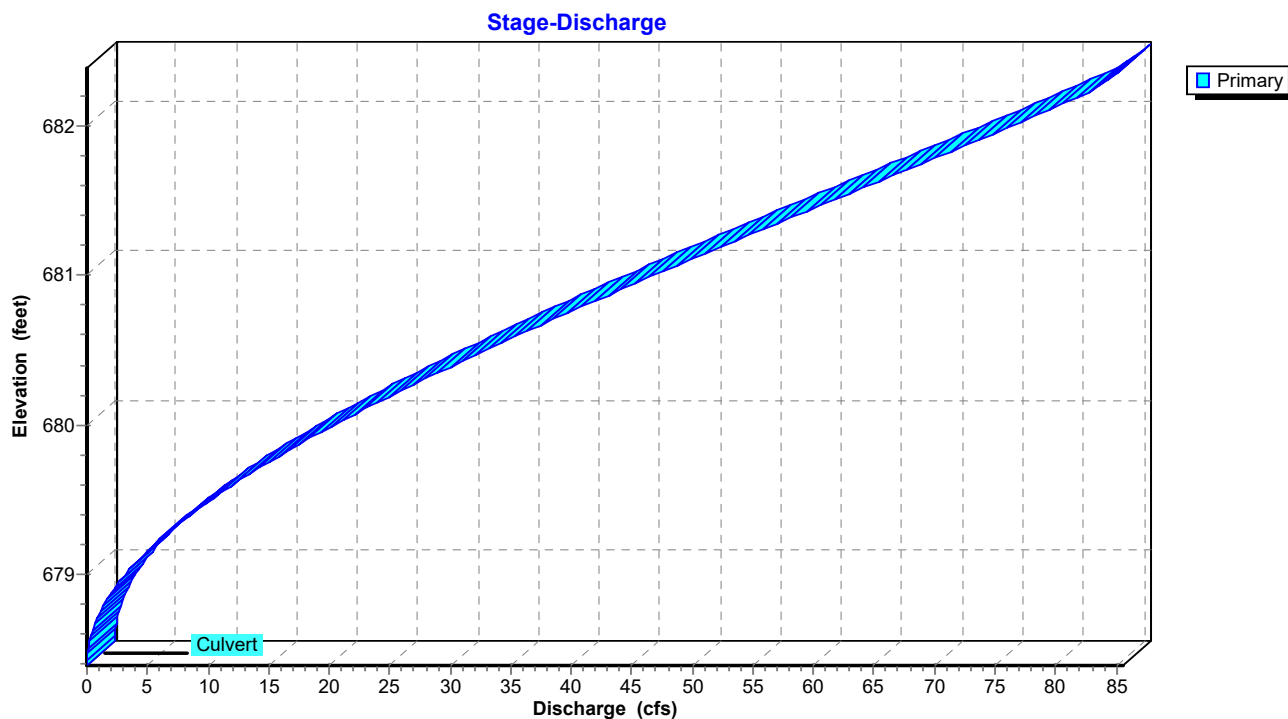
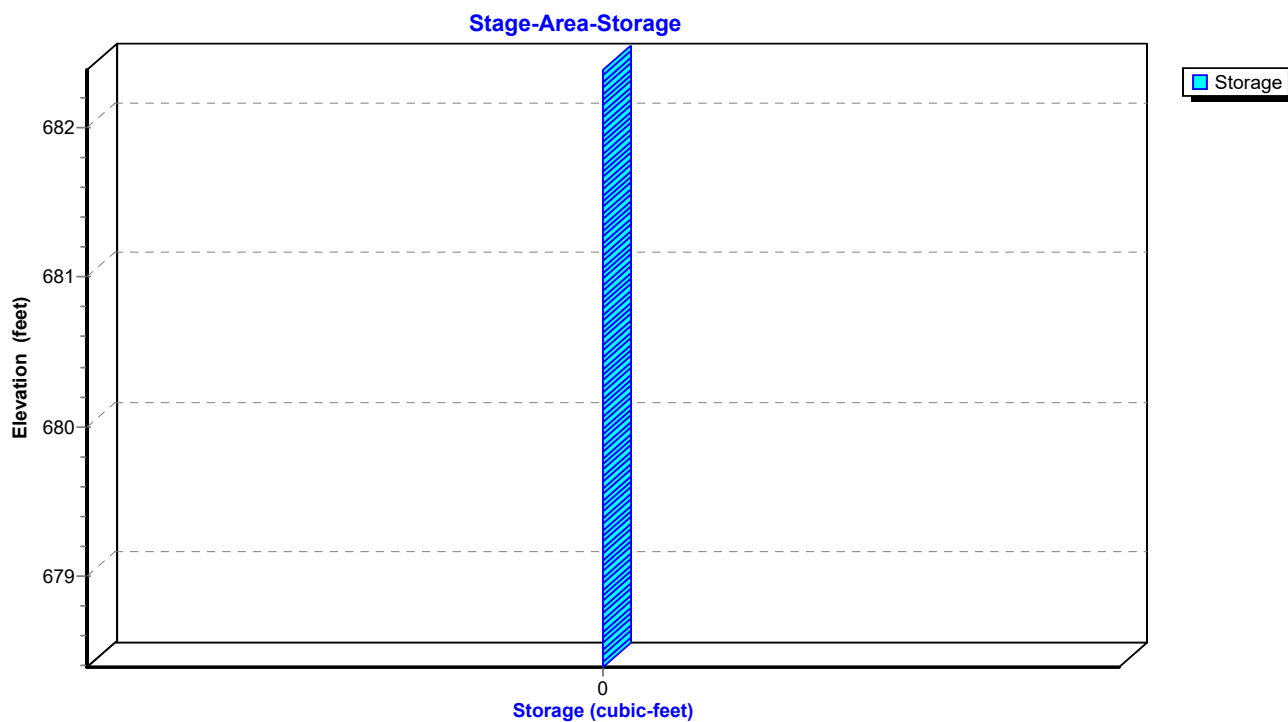
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=49.09 cfs @ 12.51 hrs HW=681.08' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 49.09 cfs @ 7.72 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

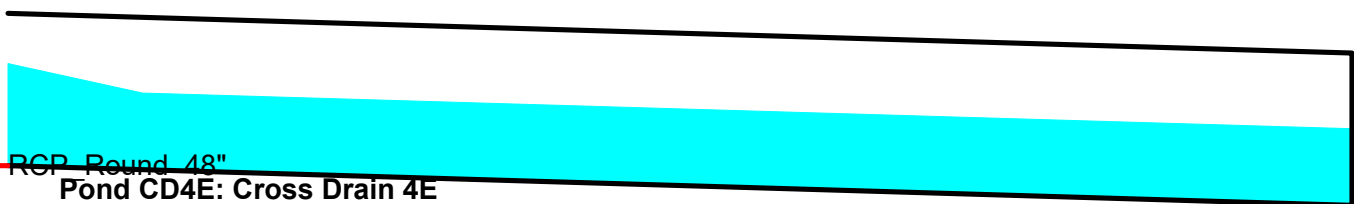
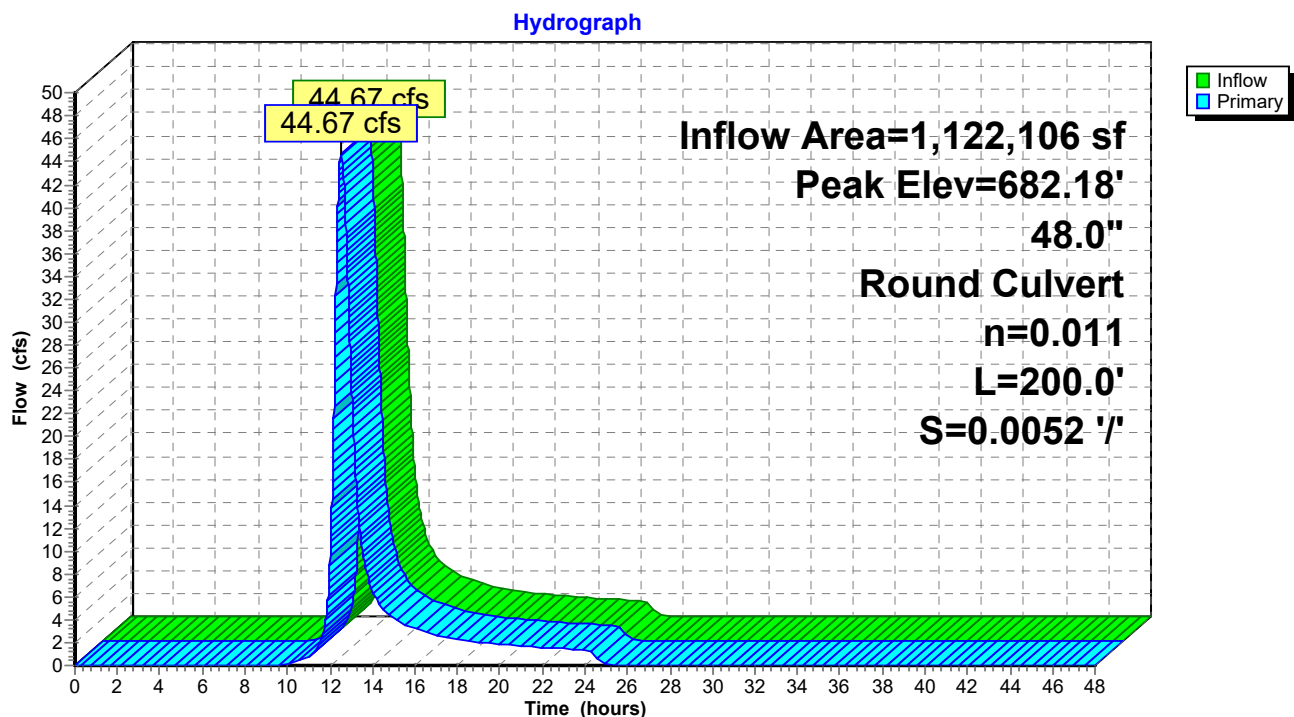
Summary for Pond CD4E: Cross Drain 4E

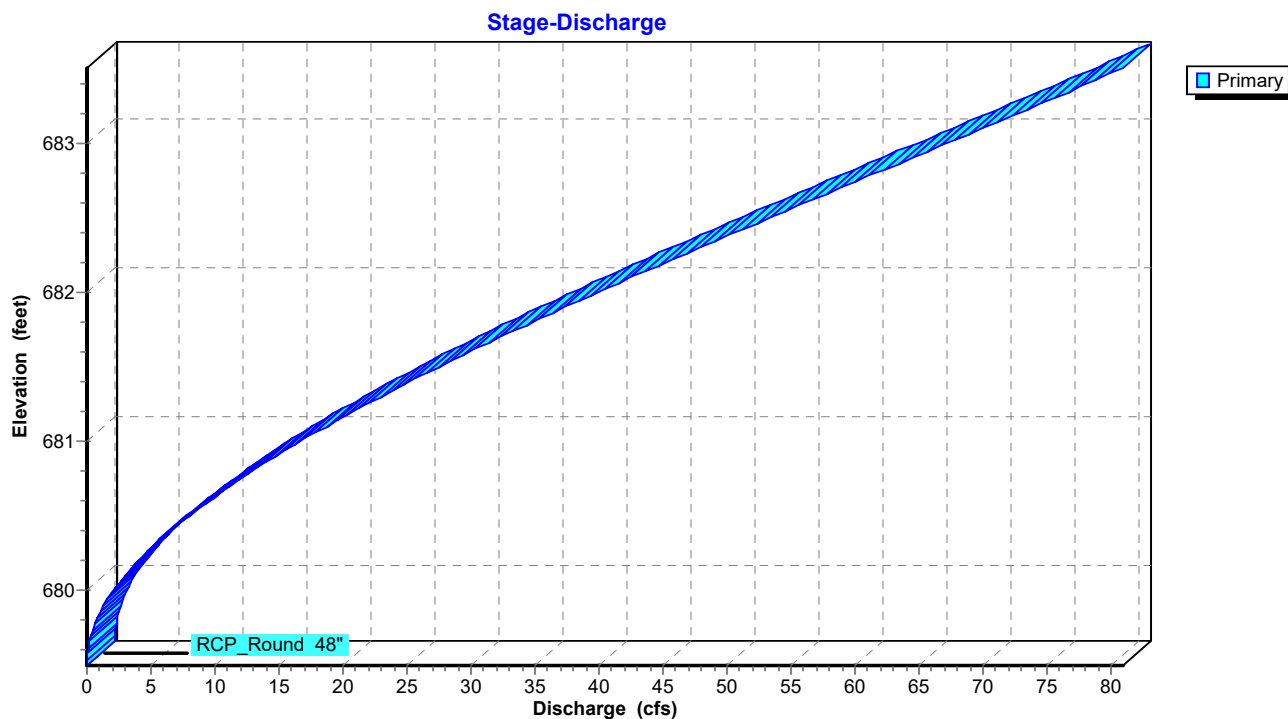
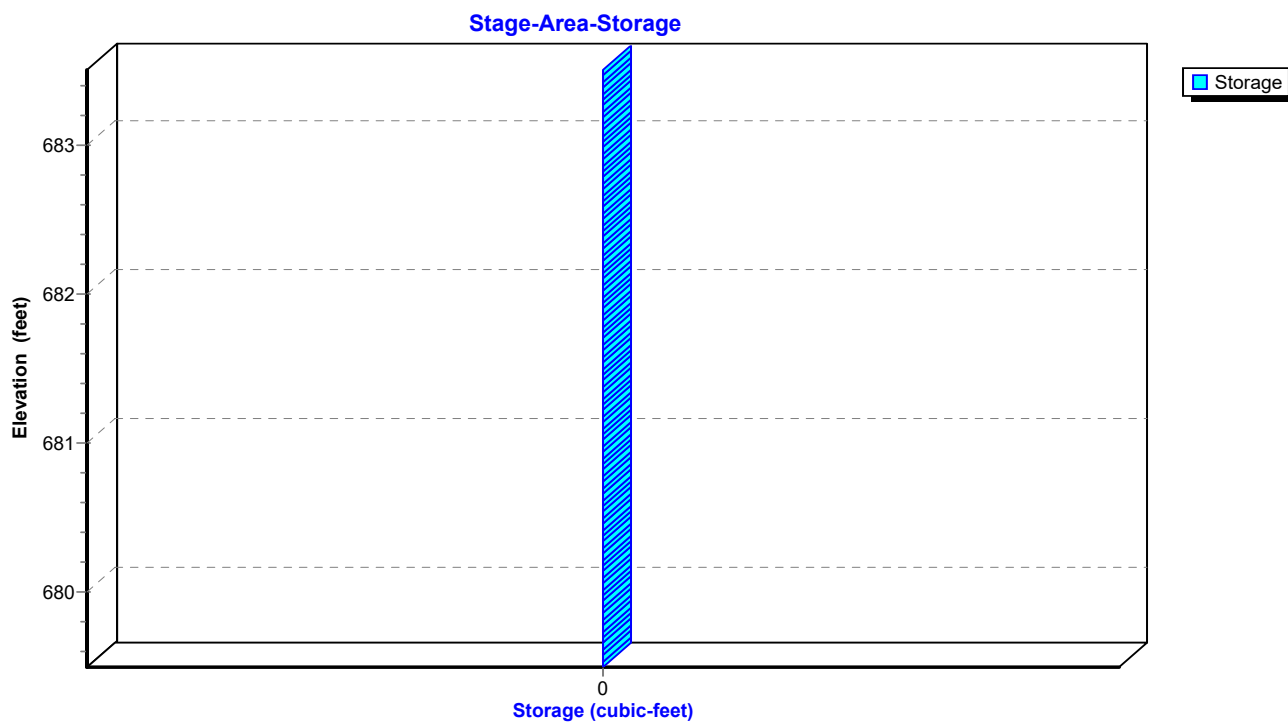
Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 2.83" for 25-yr event
Inflow = 44.67 cfs @ 12.52 hrs, Volume= 264,394 cf
Outflow = 44.67 cfs @ 12.52 hrs, Volume= 264,394 cf, Atten= 0%, Lag= 0.0 min
Primary = 44.67 cfs @ 12.52 hrs, Volume= 264,394 cf
Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 682.18' @ 12.52 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=44.67 cfs @ 12.52 hrs HW=682.18' (Free Discharge)
↑1=RCP_Round 48" (Barrel Controls 44.67 cfs @ 7.07 fps)

**Pond CD4E: Cross Drain 4E**

Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 3.94" for 25-yr event
 Inflow = 91.82 cfs @ 12.46 hrs, Volume= 579,114 cf
 Outflow = 43.94 cfs @ 12.99 hrs, Volume= 578,547 cf, Atten= 52%, Lag= 31.9 min
 Primary = 43.94 cfs @ 12.99 hrs, Volume= 578,547 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.43' @ 12.99 hrs Surf.Area= 78,131 sf Storage= 152,782 cf

Plug-Flow detention time= 43.7 min calculated for 578,427 cf (100% of inflow)
 Center-of-Mass det. time= 43.2 min (864.8 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

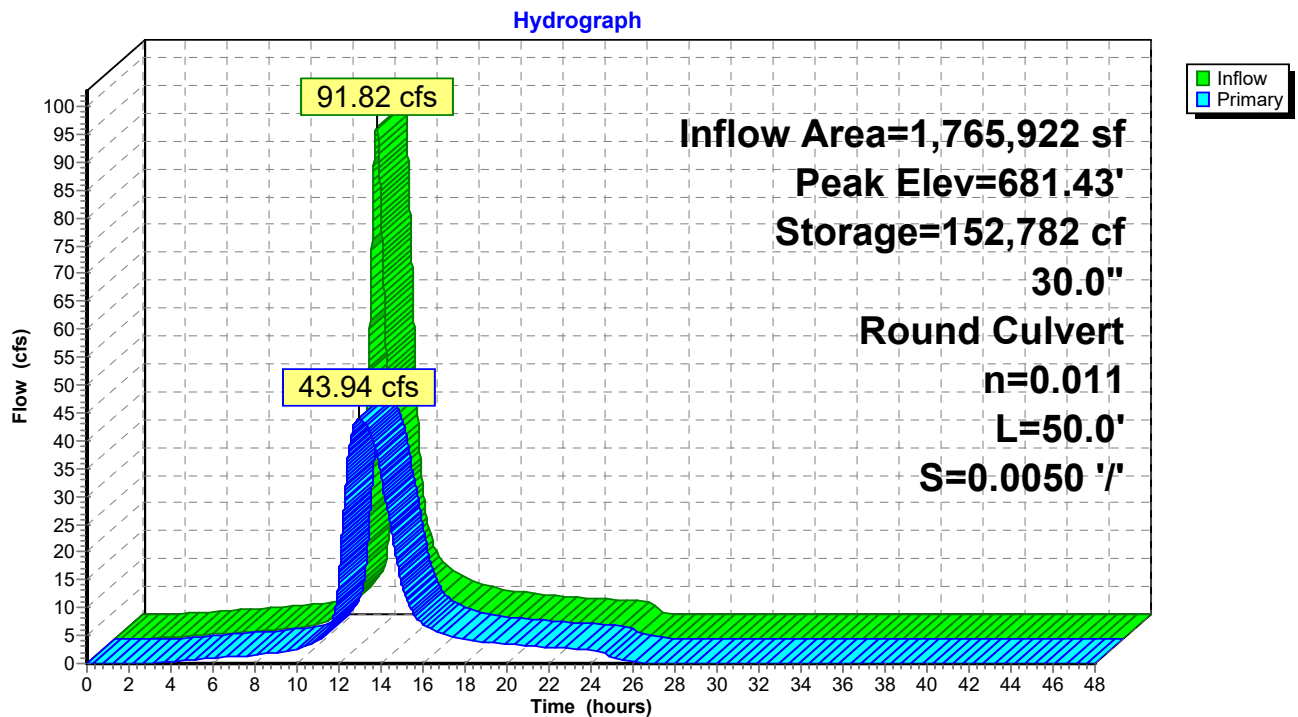
Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 ' ' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

Primary OutFlow Max=43.94 cfs @ 12.99 hrs HW=681.43' (Free Discharge)

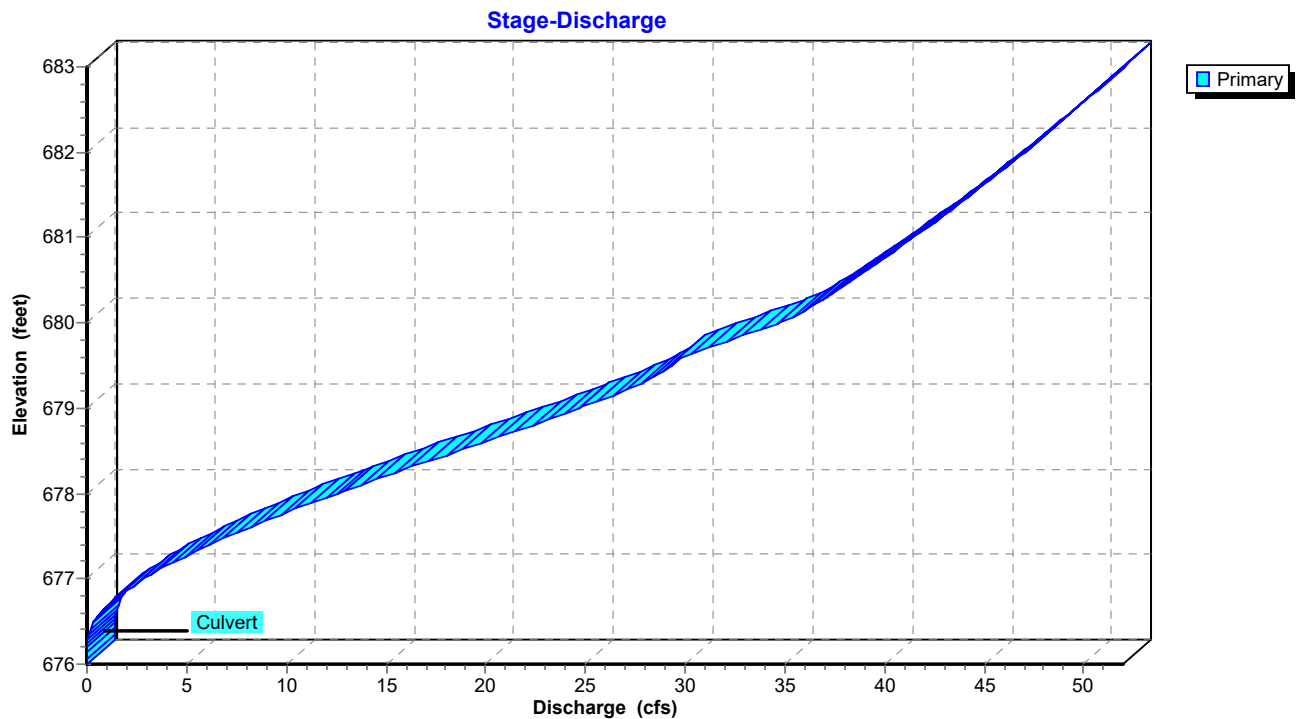
↑1=Culvert (Inlet Controls 43.94 cfs @ 8.95 fps)

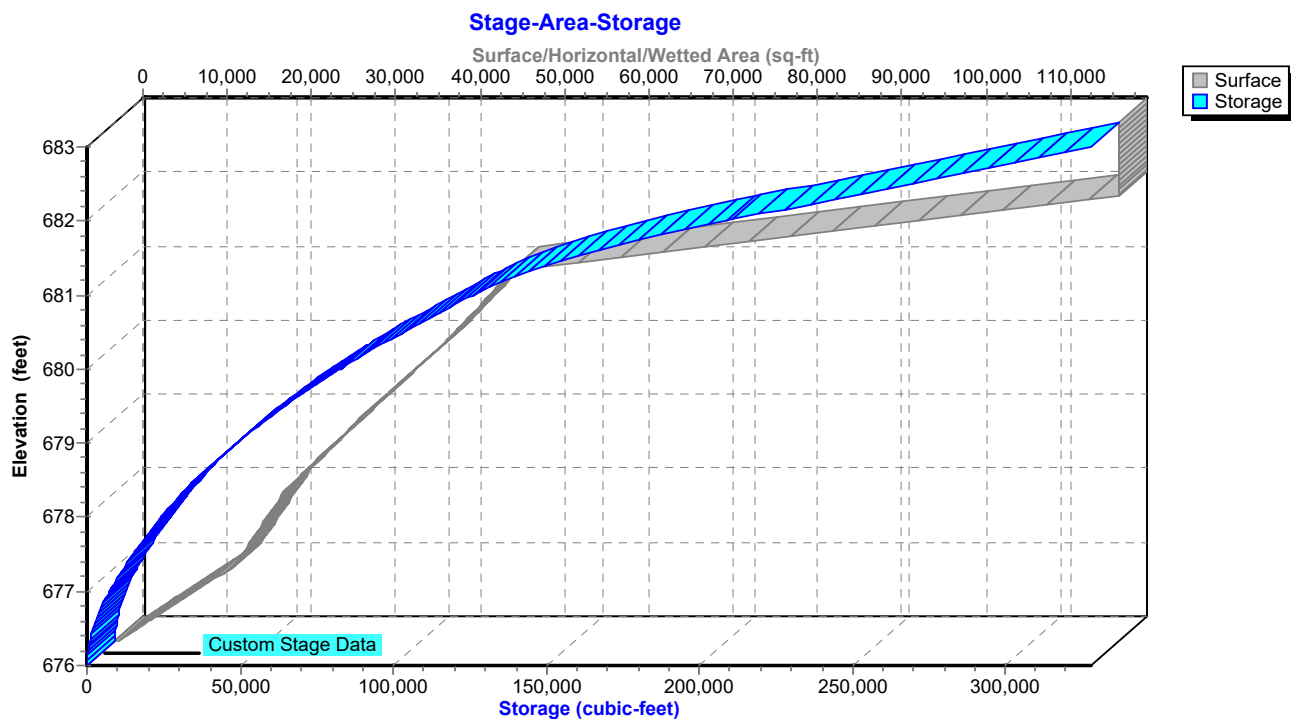


Pond POND1P: PROP POND



Pond POND1P: PROP POND



Pond POND1P: PROP POND

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=4.22"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=169.27 cfs 2,190,555 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=2.86"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=48.09 cfs 362,320 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=3.90"
 Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=31.23 cfs 134,965 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=3.68"
 Flow Length=1,500' Tc=50.3 min CN=70 Runoff=84.58 cfs 555,125 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=4.22"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=169.27 cfs 2,190,555 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=2.86"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=48.09 cfs 362,320 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=4.66"
 Tc=5.0 min CN=79 Runoff=13.49 cfs 36,012 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=3.47"
 Flow Length=300' Tc=28.4 min CN=68 Runoff=12.40 cfs 62,692 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=6.60"
 Flow Length=1,000' Tc=33.8 min CN=96 Runoff=49.26 cfs 292,679 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=6.60"
 Tc=5.0 min CN=96 Runoff=8.86 cfs 26,128 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=6.60"
 Tc=5.0 min CN=96 Runoff=12.02 cfs 35,476 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=3.06"
 Flow Length=500' Tc=28.1 min CN=64 Runoff=18.24 cfs 92,933 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=3.58"
 Flow Length=1,000' Tc=41.1 min CN=69 Runoff=38.00 cfs 226,100 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.50' Max Vel=16.28 fps Inflow=8.46 cfs 26,128 cf
 18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=8.46 cfs 26,128 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.87' Max Vel=2.98 fps Inflow=8.86 cfs 26,128 cf
 n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=8.46 cfs 26,128 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.93' Max Vel=3.70 fps Inflow=12.02 cfs 35,476 cf
 n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=11.61 cfs 35,476 cf

TrueRail*Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"*

Prepared by CSR Engineering, Inc

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Reach D4E1: Ditch 4E1 Avg. Flow Depth=1.40' Max Vel=2.97 fps Inflow=18.24 cfs 92,933 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=17.87 cfs 92,933 cf

Reach OF4: Primary Stream for Avg. Flow Depth=3.01' Max Vel=4.65 fps Inflow=217.29 cfs 3,242,965 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=217.22 cfs 3,242,965 cf

Reach OF4P: Primary Stream for Avg. Flow Depth=3.11' Max Vel=4.74 fps Inflow=232.59 cfs 3,324,329 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=232.28 cfs 3,324,326 cf

Pond CD2: Cross Drain Peak Elev=684.26' Inflow=48.09 cfs 362,320 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=48.09 cfs 362,320 cf

Pond CD4DCE: Cross Drain 4DCE Peak Elev=681.45' Inflow=59.89 cfs 380,637 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=59.89 cfs 380,637 cf

Pond CD4E: Cross Drain 4E Peak Elev=682.55' Inflow=54.75 cfs 319,033 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=54.75 cfs 319,033 cf

Pond POND1P: PROP POND Peak Elev=681.87' Storage=193,726 cf Inflow=108.19 cfs 673,315 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=46.31 cfs 672,749 cf

Total Runoff Area = 19,797,149 sf Runoff Volume = 6,567,861 cf Average Runoff Depth = 3.98"
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 169.27 cfs @ 13.83 hrs, Volume= 2,190,555 cf, Depth= 4.22"

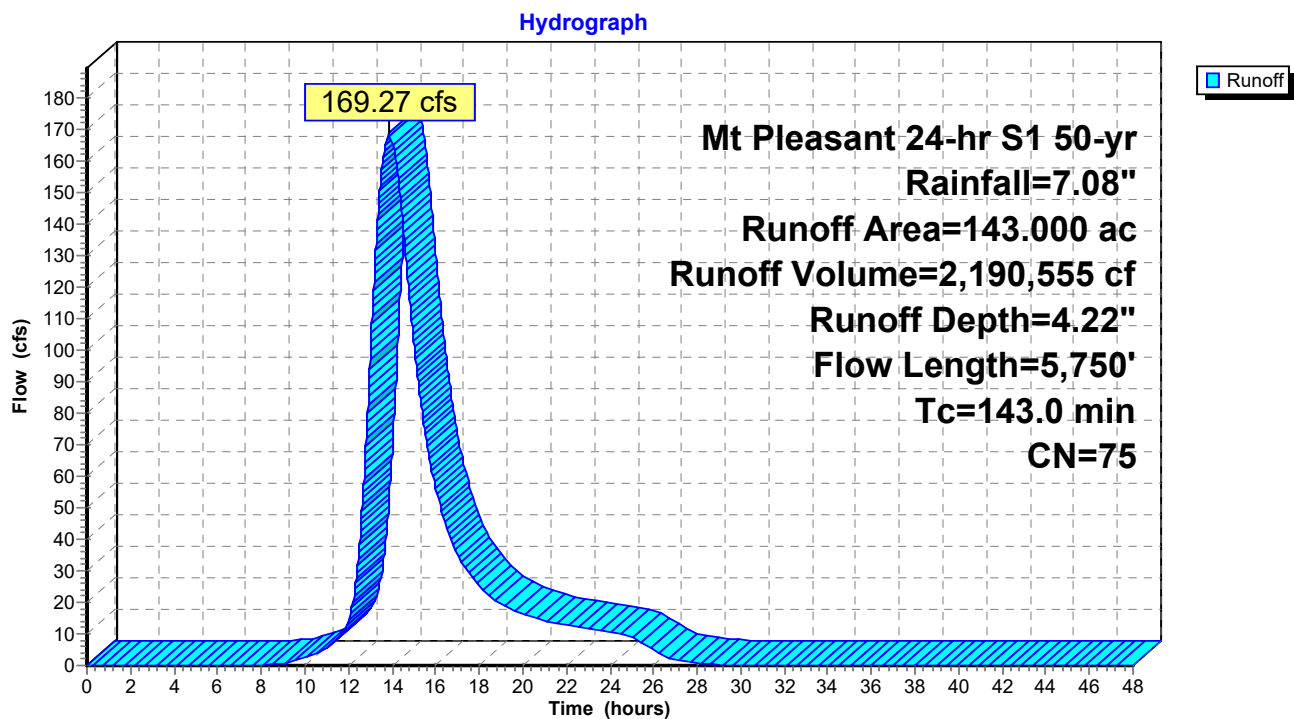
Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

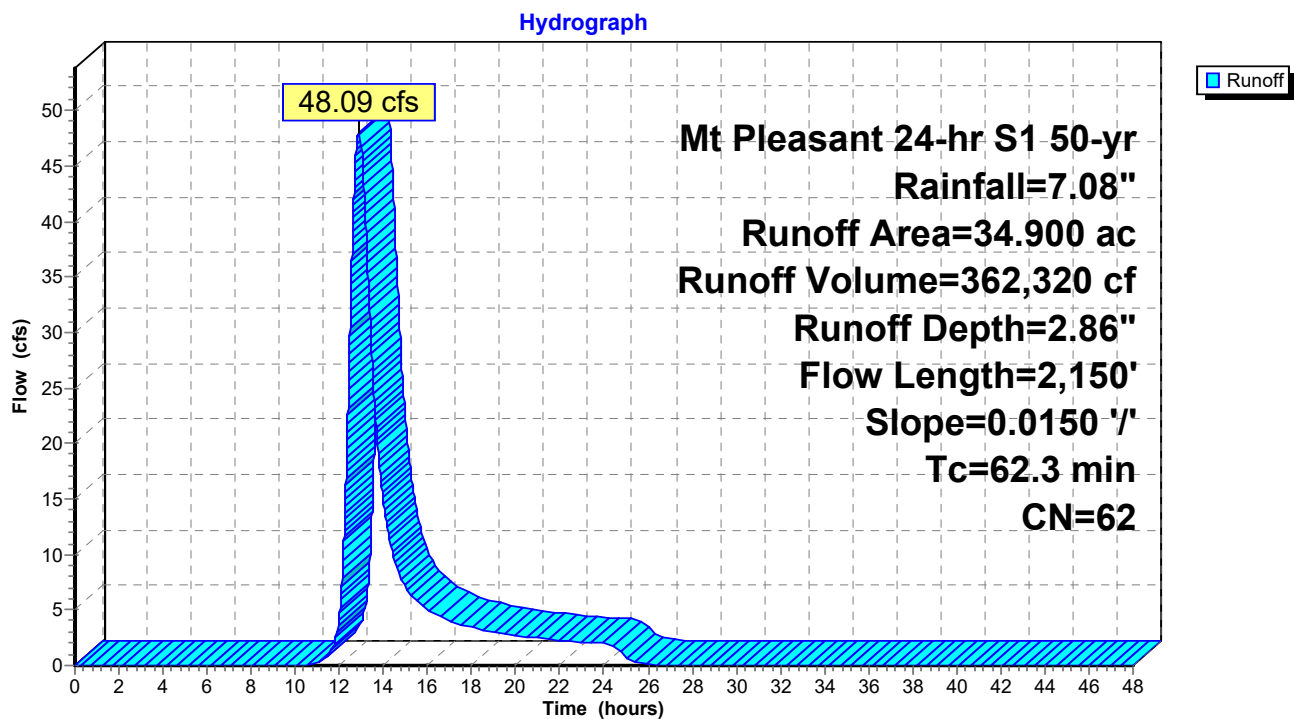
Runoff = 48.09 cfs @ 12.88 hrs, Volume= 362,320 cf, Depth= 2.86"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

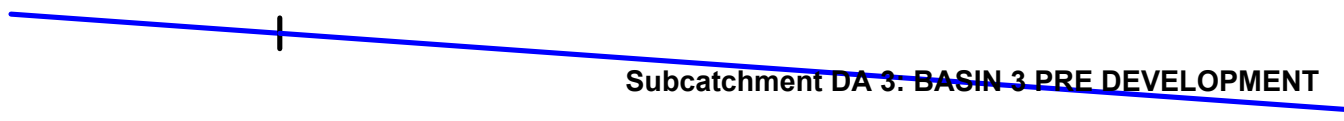
Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

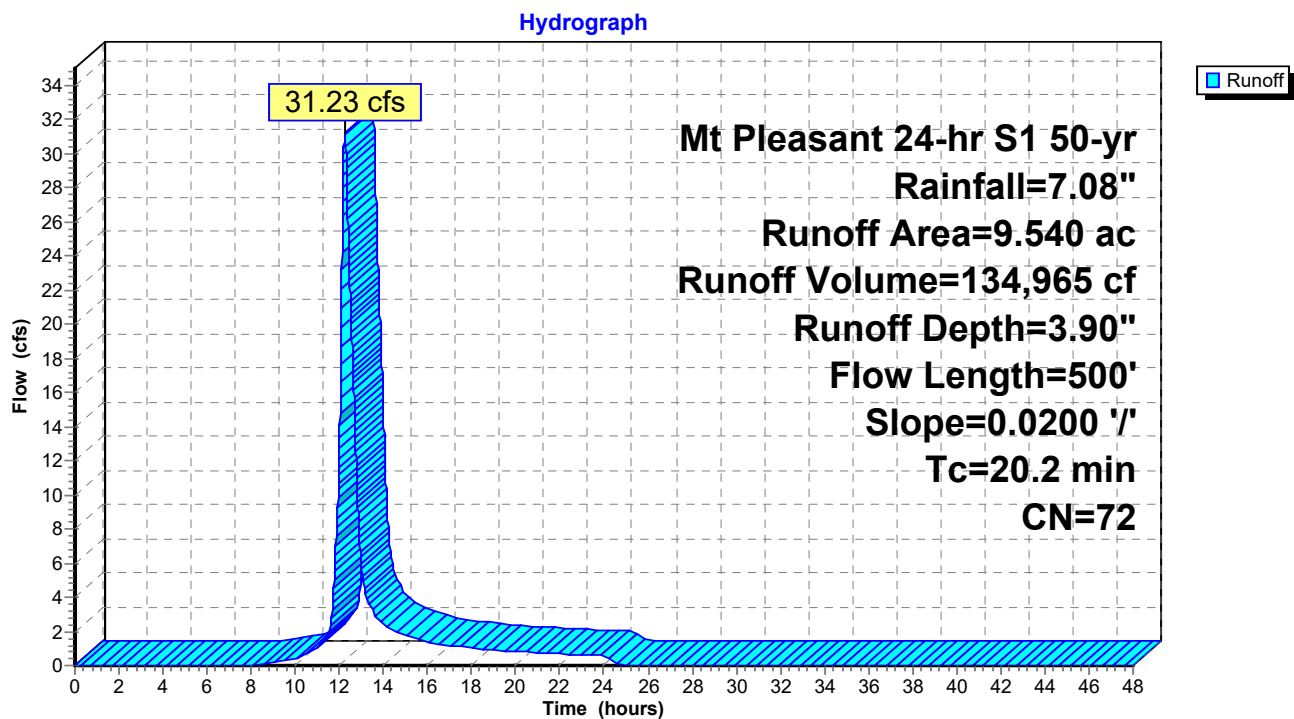
Runoff = 31.23 cfs @ 12.24 hrs, Volume= 134,965 cf, Depth= 3.90"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 84.58 cfs @ 12.69 hrs, Volume= 555,125 cf, Depth= 3.68"

Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

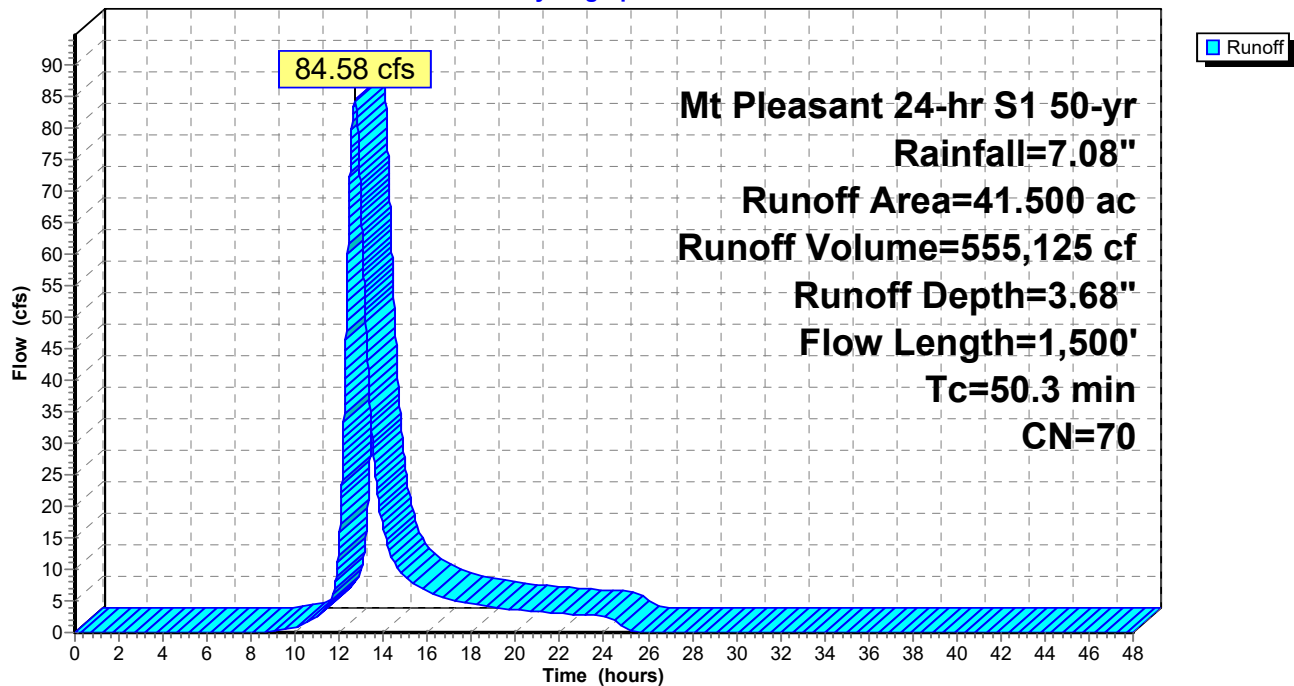
Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA1P: BASIN 1 PROPOSED

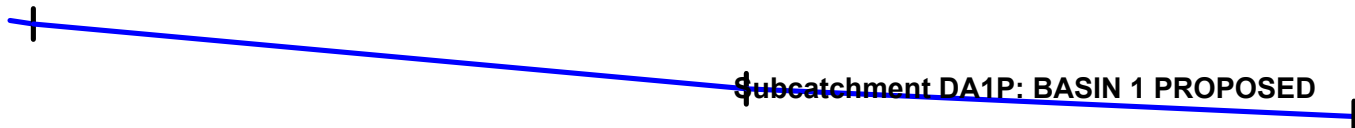
Runoff = 169.27 cfs @ 13.83 hrs, Volume= 2,190,555 cf, Depth= 4.22"

Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

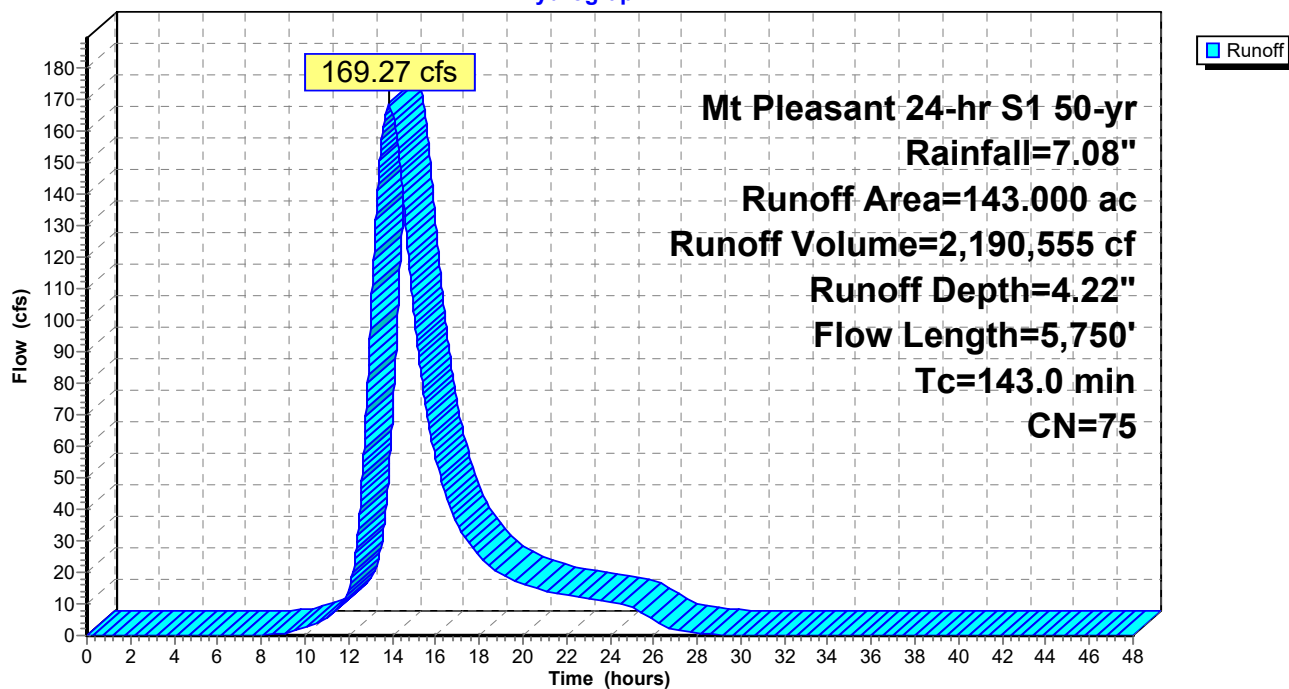
Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

Hydrograph



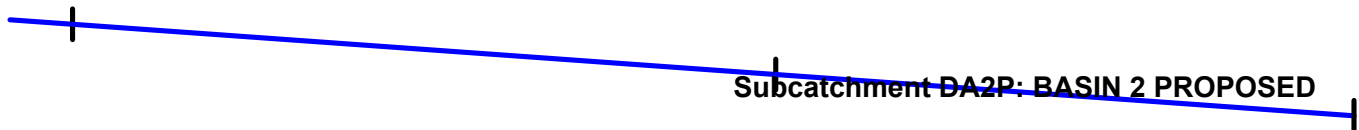
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 48.09 cfs @ 12.88 hrs, Volume= 362,320 cf, Depth= 2.86"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

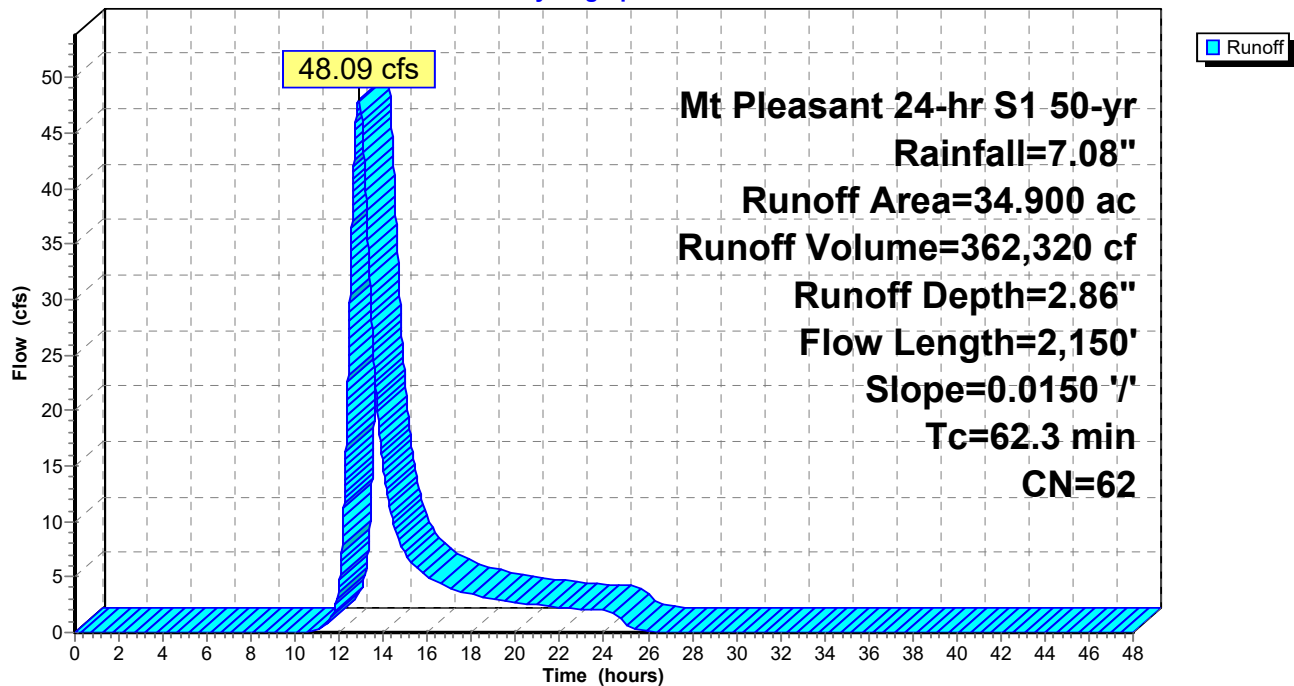
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 13.49 cfs @ 12.03 hrs, Volume= 36,012 cf, Depth= 4.66"

Routed to Reach OF4P : Primary Stream for Outfalls

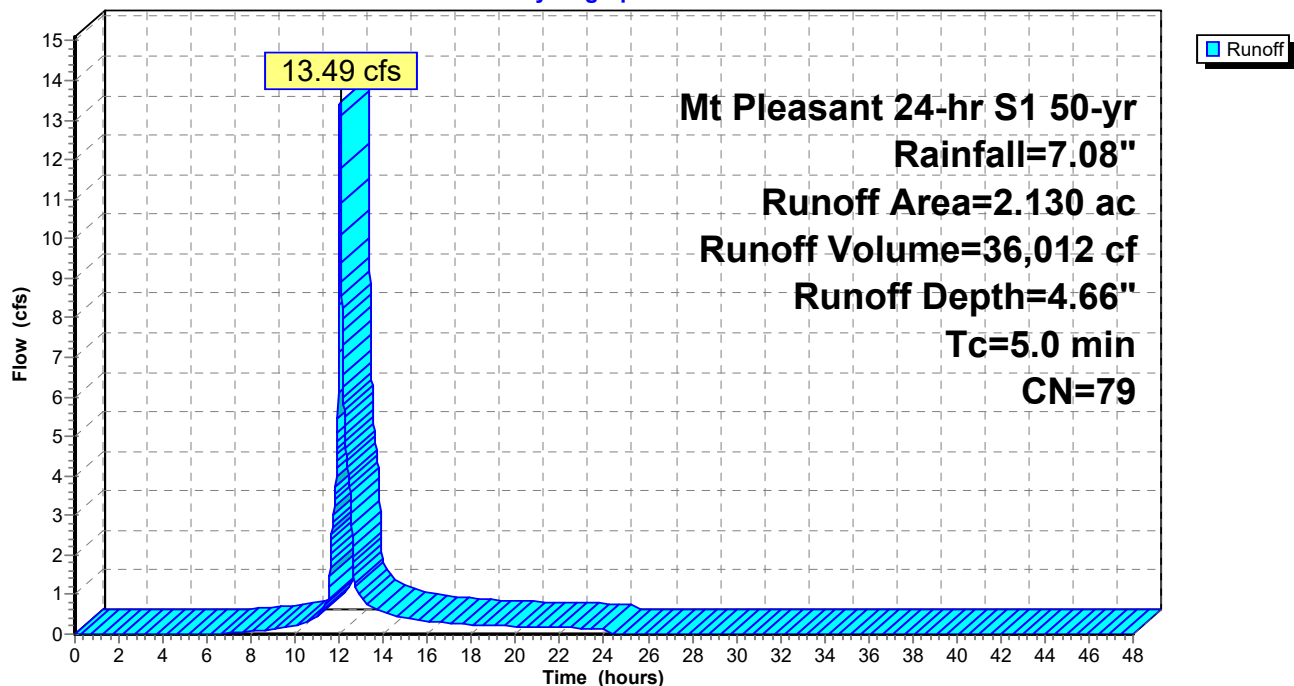
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

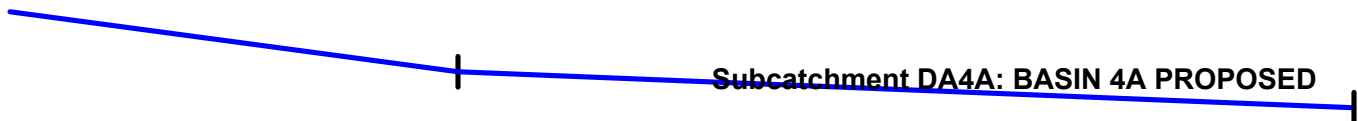
Runoff = 12.40 cfs @ 12.37 hrs, Volume= 62,692 cf, Depth= 3.47"

Routed to Reach OF4P : Primary Stream for Outfalls

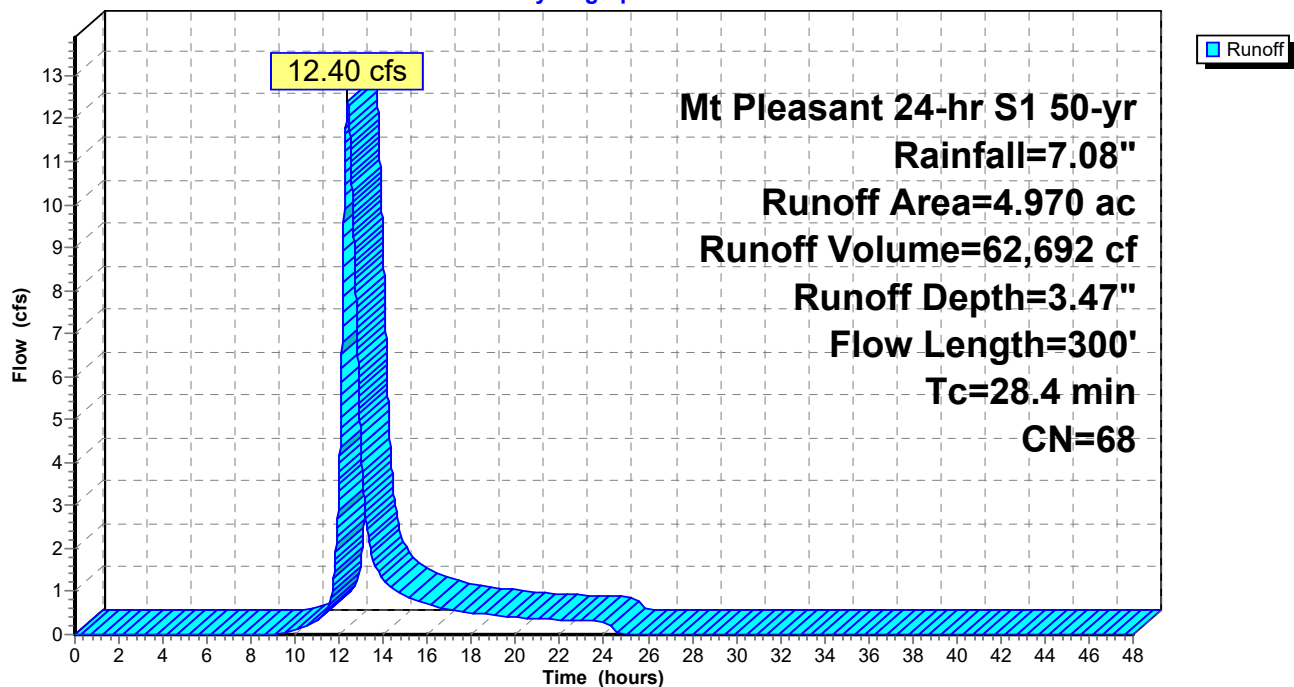
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



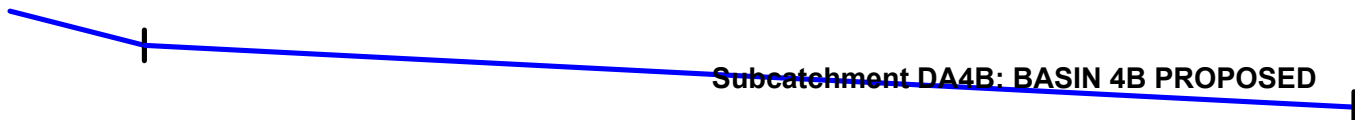
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 49.26 cfs @ 12.40 hrs, Volume= 292,679 cf, Depth= 6.60"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

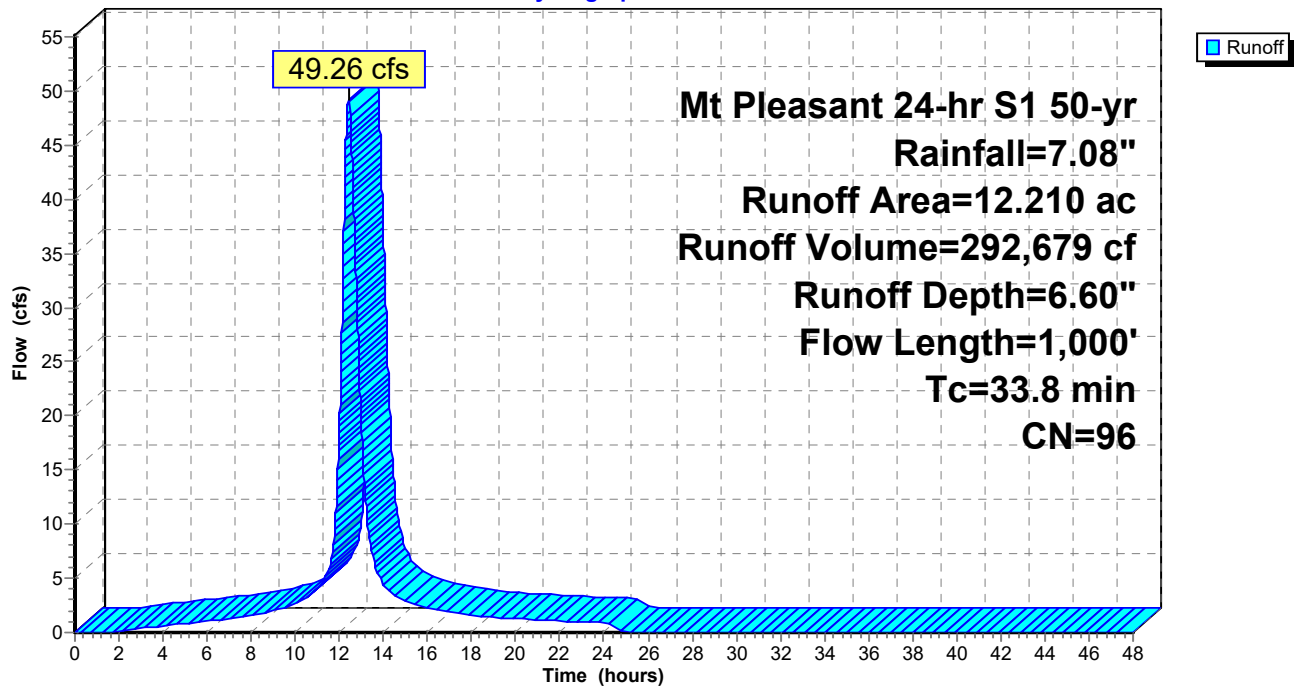
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 8.86 cfs @ 12.03 hrs, Volume= 26,128 cf, Depth= 6.60"
 Routed to Reach D4C : Ditch 4C

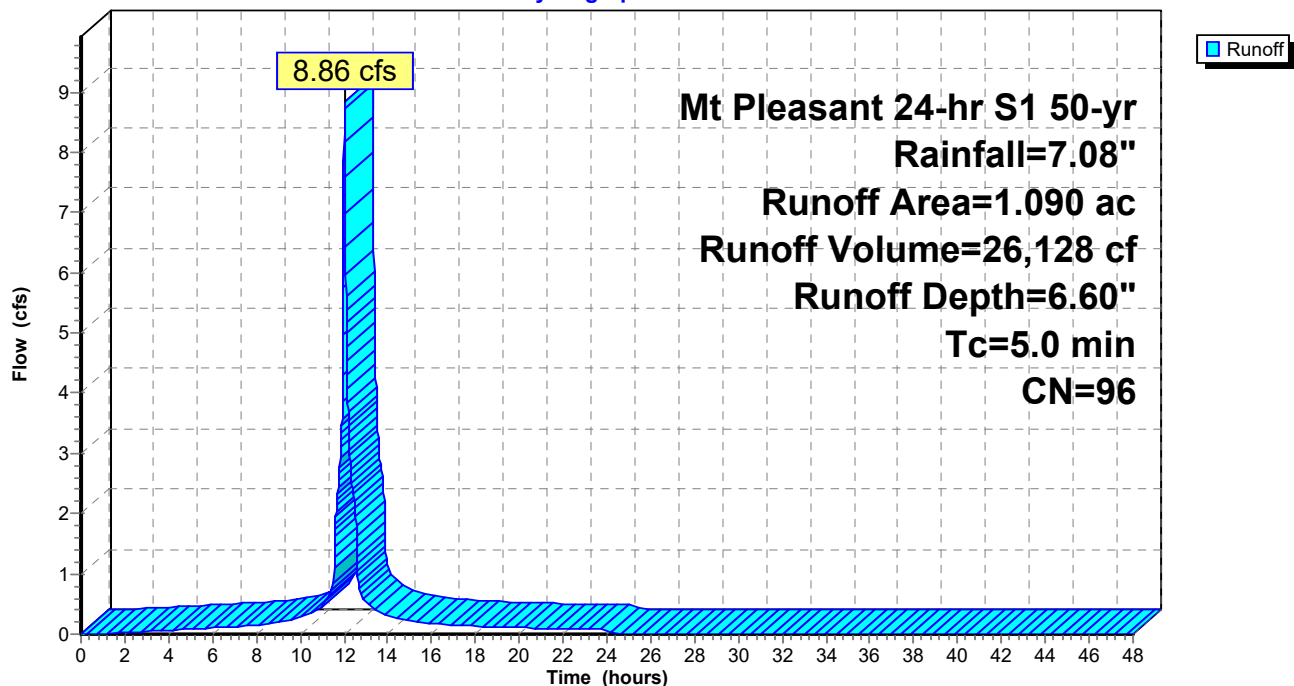
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 12.02 cfs @ 12.03 hrs, Volume= 35,476 cf, Depth= 6.60"
 Routed to Reach D4D : Ditch 4D

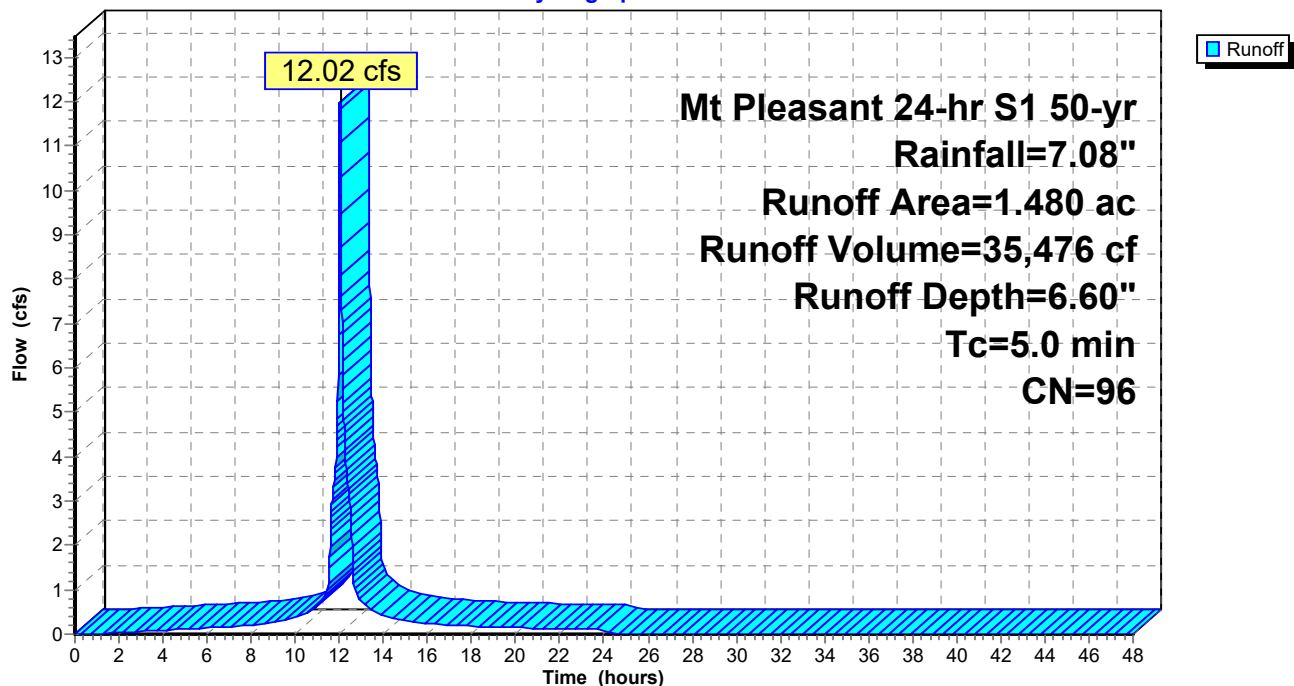
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



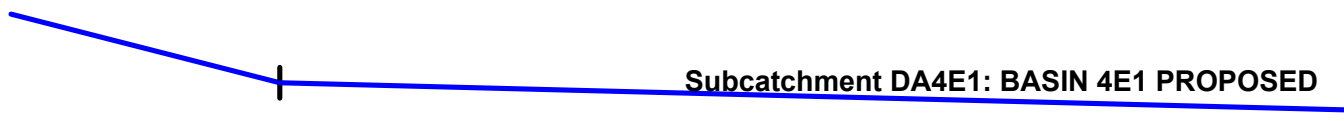
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

Runoff = 18.24 cfs @ 12.37 hrs, Volume= 92,933 cf, Depth= 3.06"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

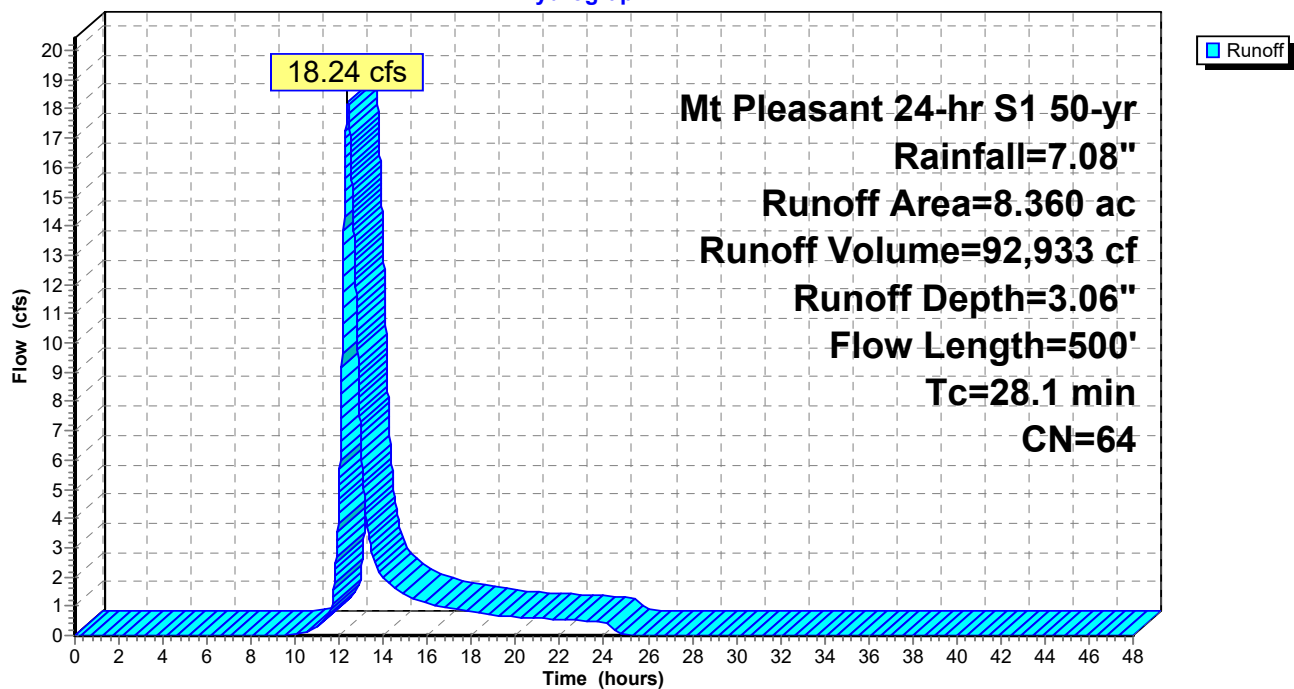
Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

Hydrograph



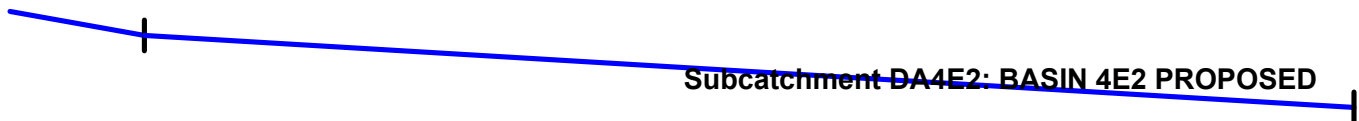
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 38.00 cfs @ 12.56 hrs, Volume= 226,100 cf, Depth= 3.58"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 50-yr Rainfall=7.08"

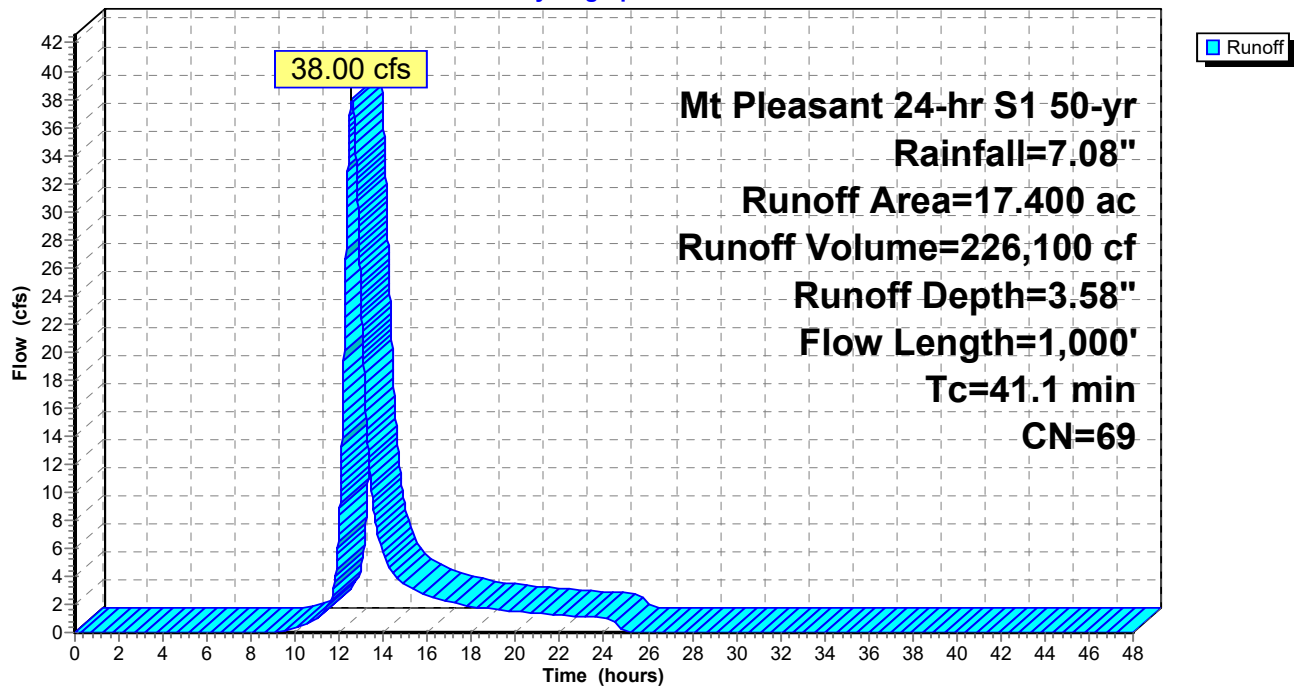
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



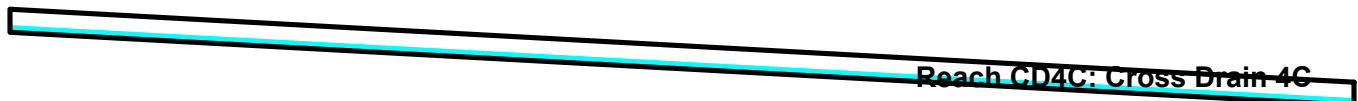
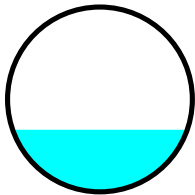
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 6.60" for 50-yr event
Inflow = 8.46 cfs @ 12.04 hrs, Volume= 26,128 cf
Outflow = 8.46 cfs @ 12.04 hrs, Volume= 26,128 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

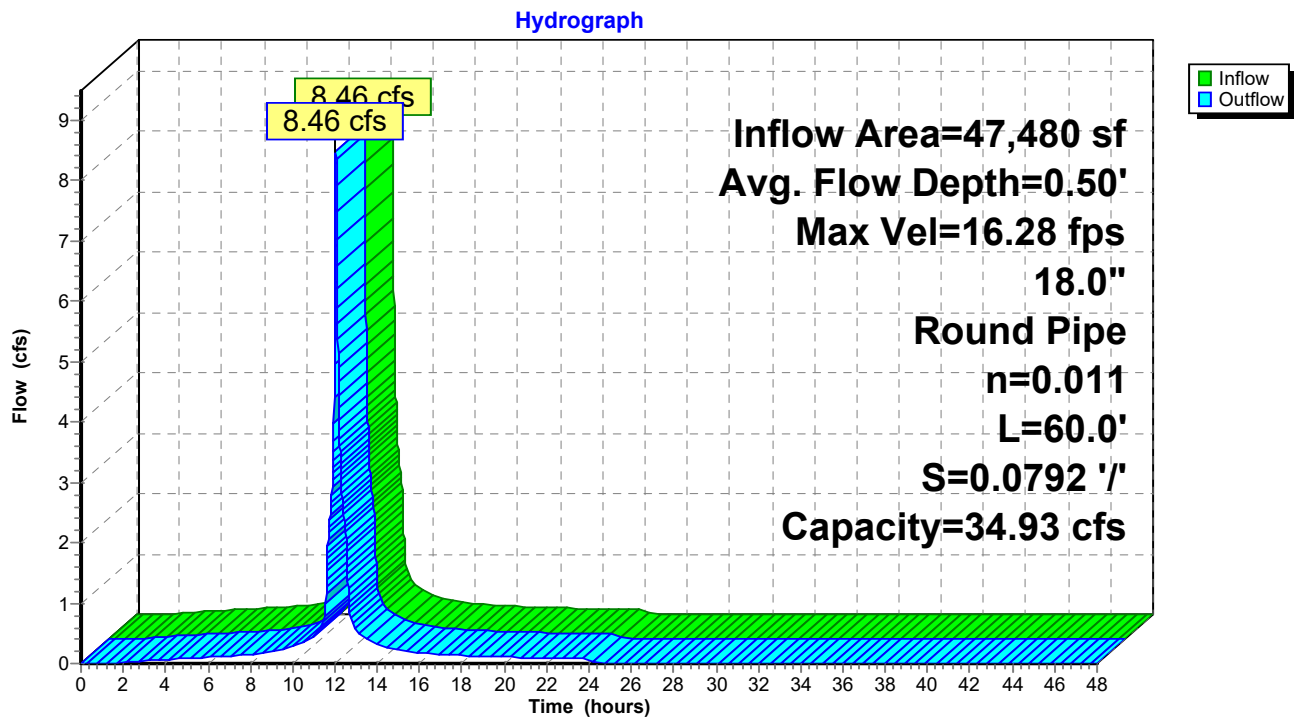
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.95 fps, Avg. Travel Time= 0.2 min

Peak Storage= 31 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.50' , Surface Width= 1.42'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

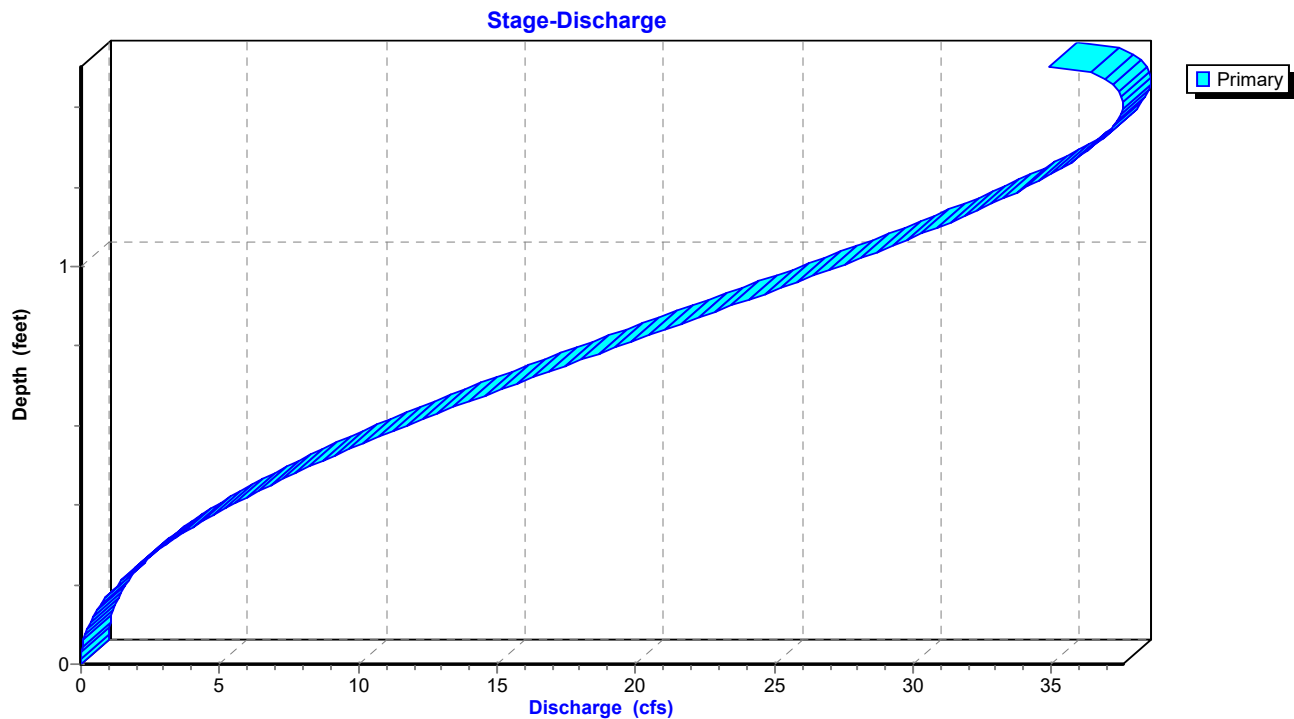
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

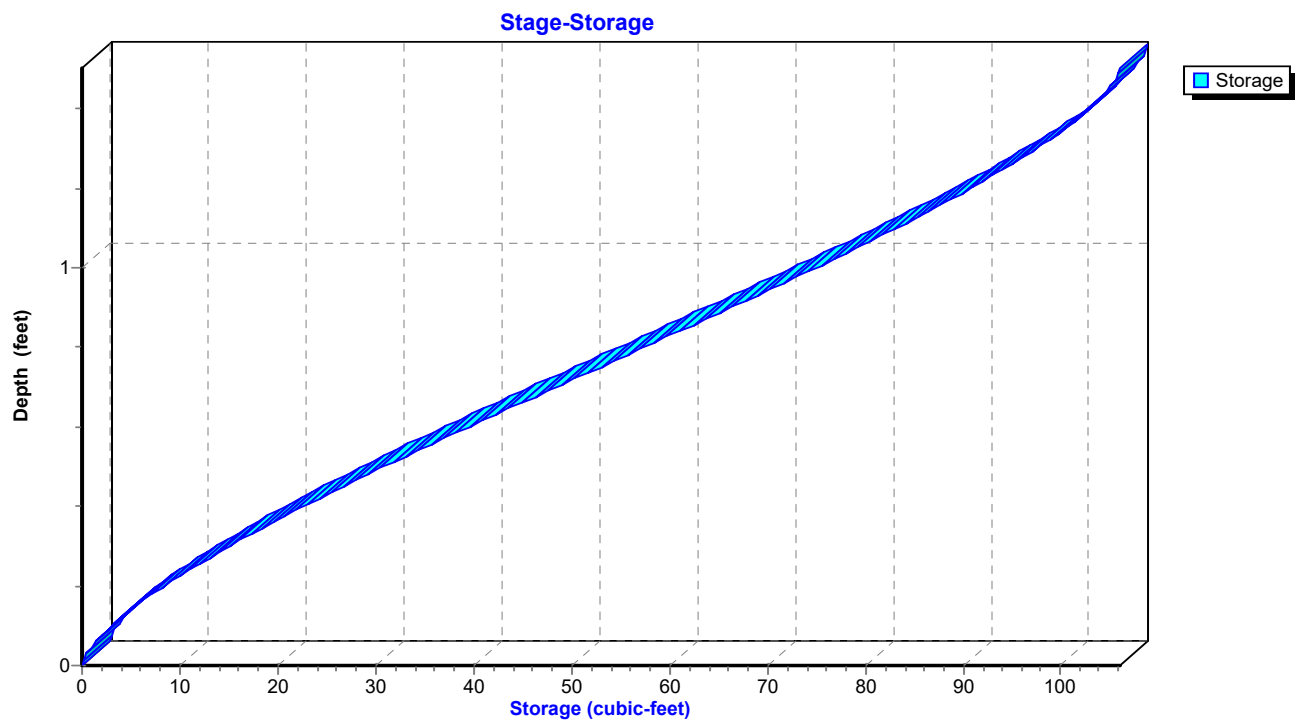


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

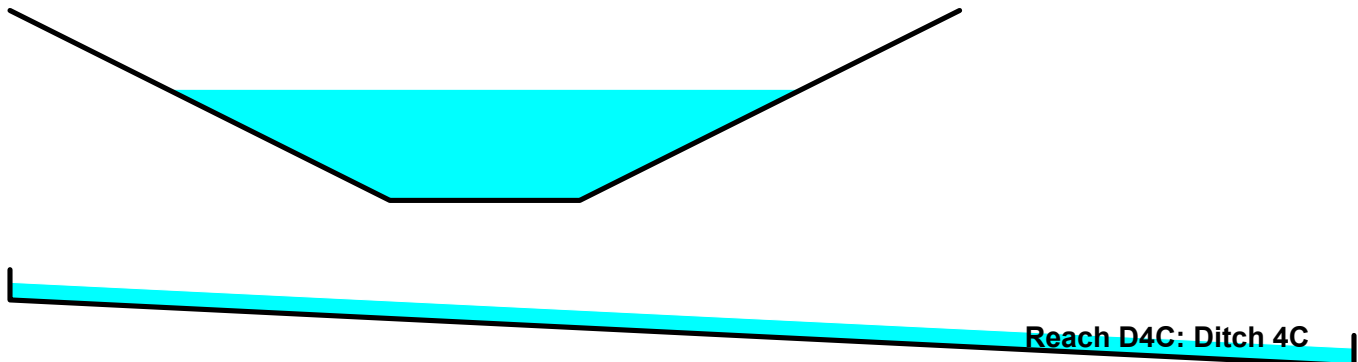
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 6.60" for 50-yr event
Inflow = 8.86 cfs @ 12.03 hrs, Volume= 26,128 cf
Outflow = 8.46 cfs @ 12.04 hrs, Volume= 26,128 cf, Atten= 4%, Lag= 1.1 min
Routed to Reach CD4C : Cross Drain 4C

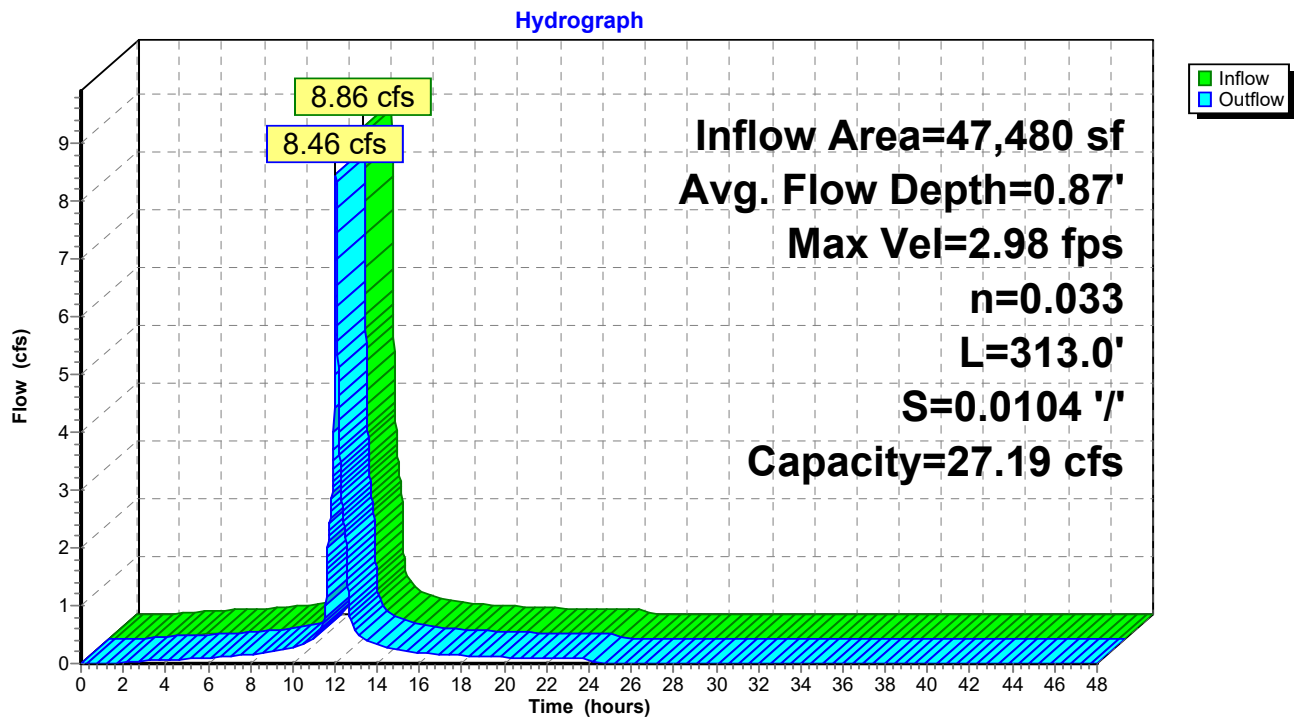
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.98 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 5.9 min

Peak Storage= 888 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.87' , Surface Width= 4.99'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

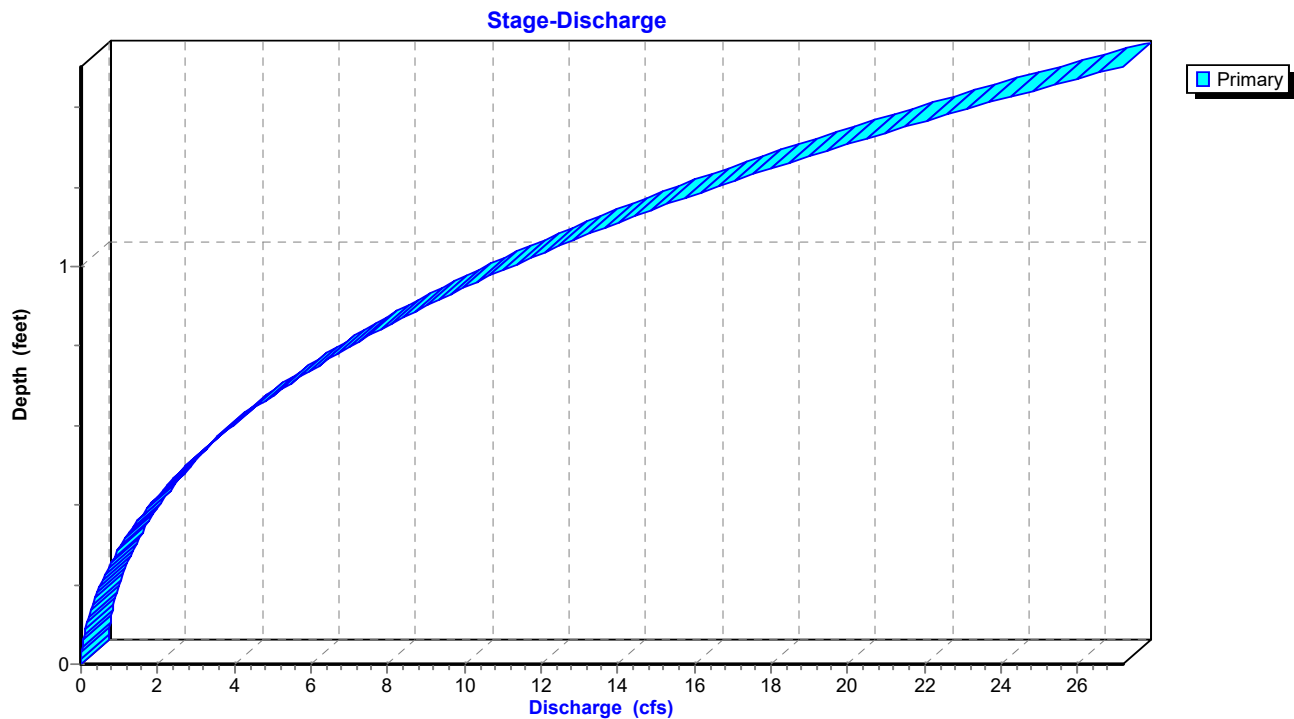
1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 '/'
Inlet Invert= 687.00', Outlet Invert= 683.75'



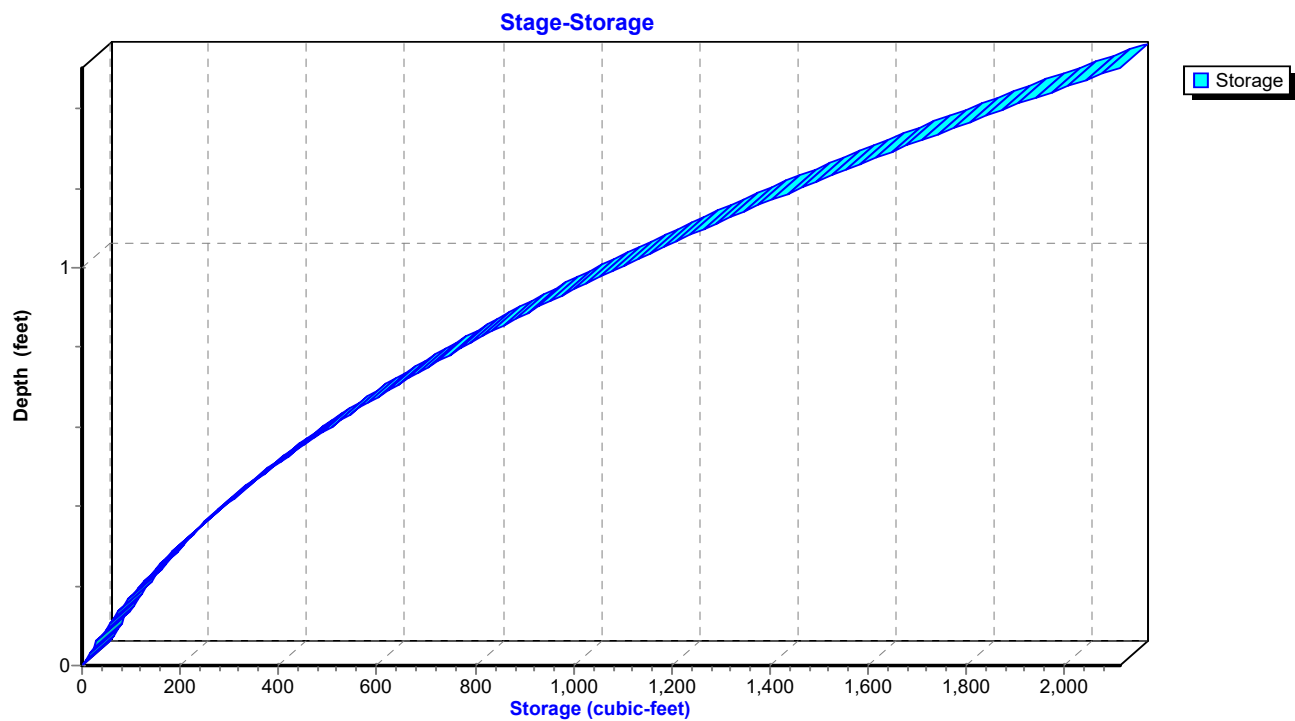
Reach D4C: Ditch 4C



Reach D4C: Ditch 4C



Reach D4C: Ditch 4C



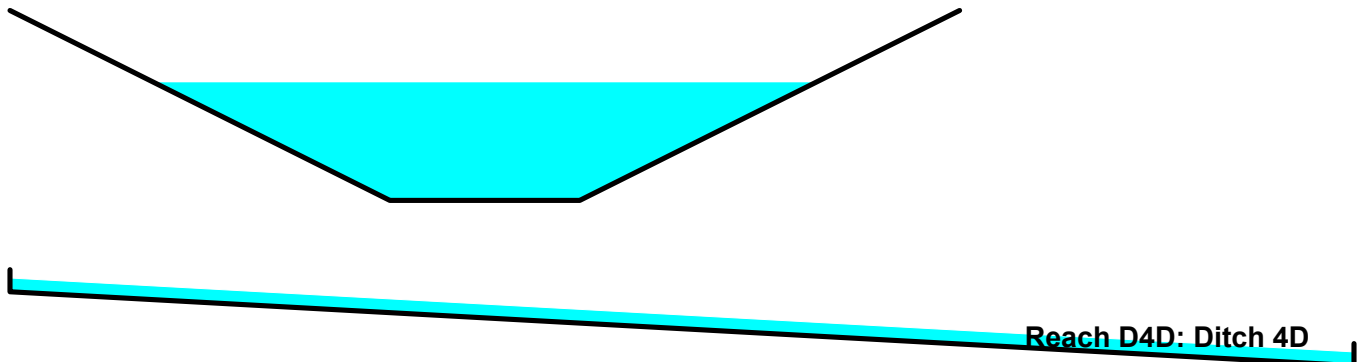
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 6.60" for 50-yr event
Inflow = 12.02 cfs @ 12.03 hrs, Volume= 35,476 cf
Outflow = 11.61 cfs @ 12.04 hrs, Volume= 35,476 cf, Atten= 3%, Lag= 1.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 5.1 min

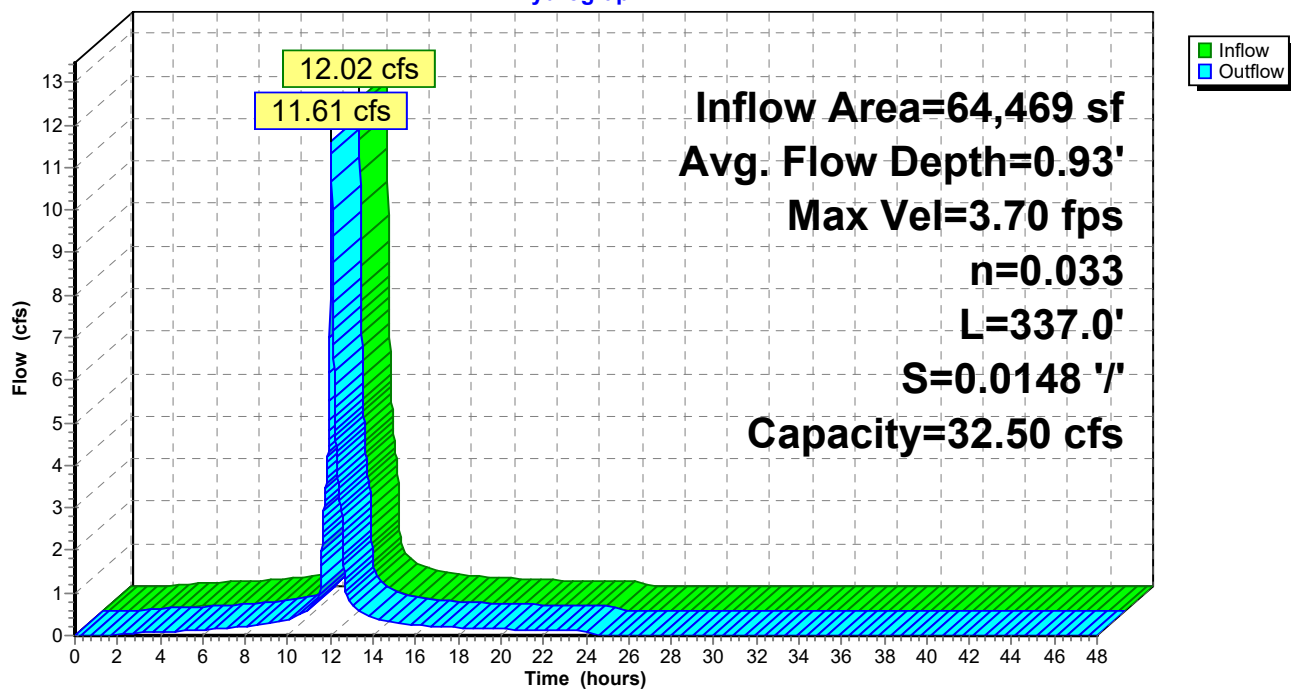
Peak Storage= 1,058 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.93' , Surface Width= 5.23'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



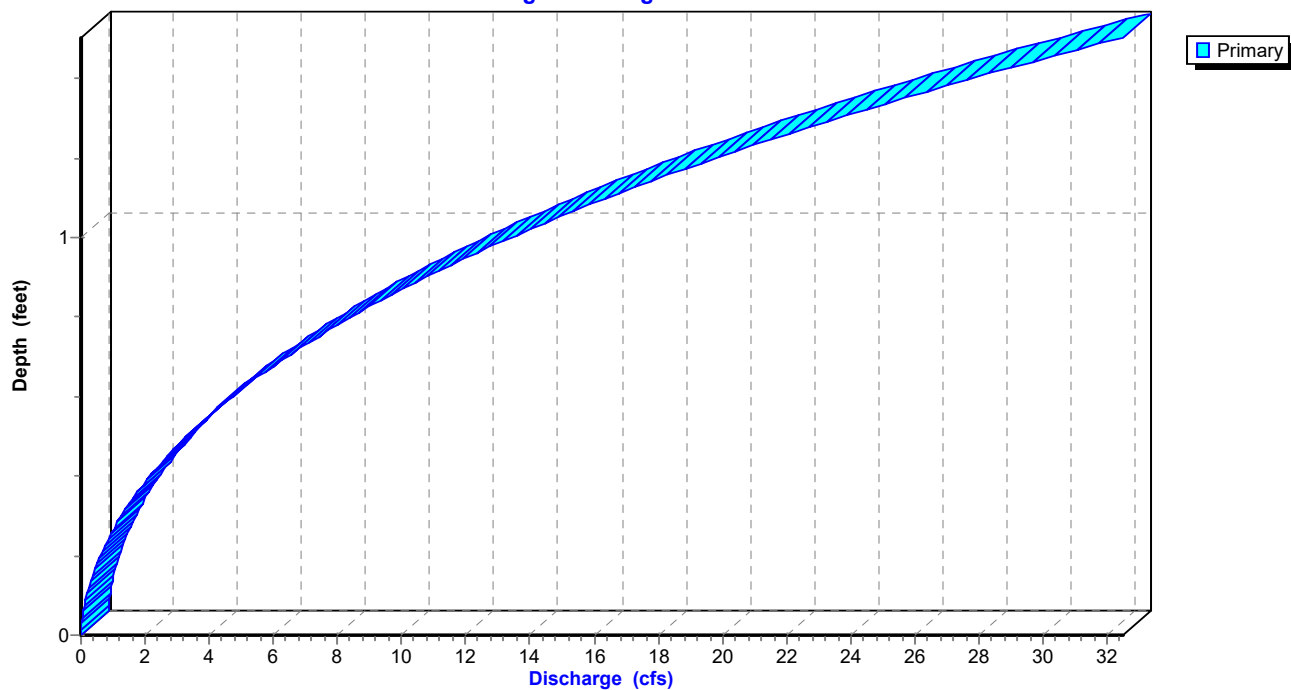
Reach D4D: Ditch 4D

Hydrograph

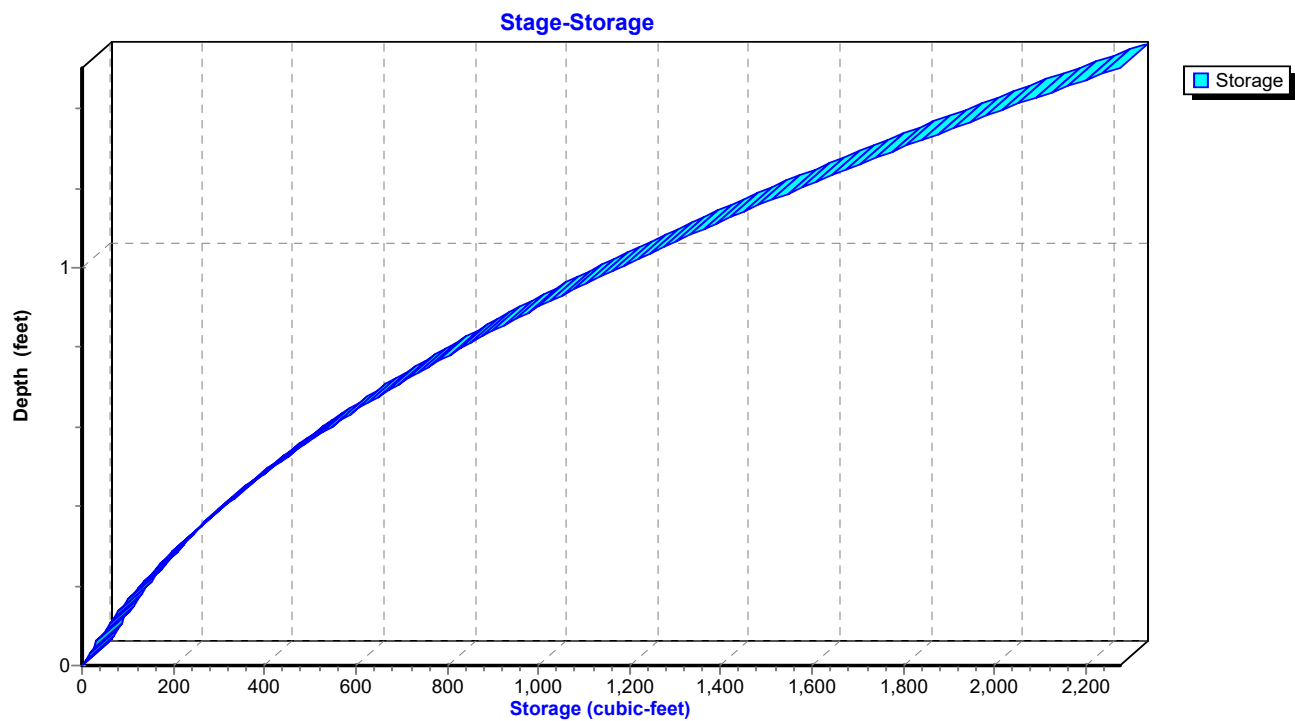


Reach D4D: Ditch 4D

Stage-Discharge



Reach D4D: Ditch 4D



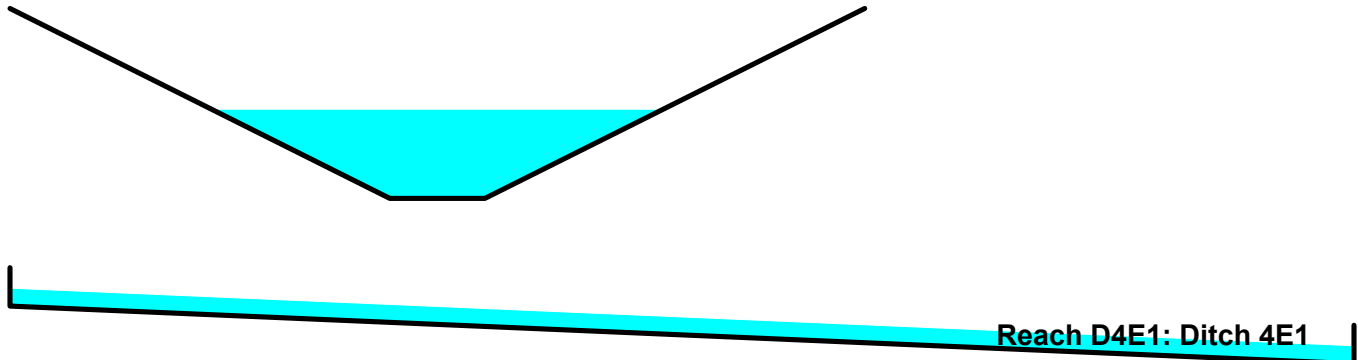
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 3.06" for 50-yr event
Inflow = 18.24 cfs @ 12.37 hrs, Volume= 92,933 cf
Outflow = 17.87 cfs @ 12.43 hrs, Volume= 92,933 cf, Atten= 2%, Lag= 3.4 min
Routed to Pond CD4E : Cross Drain 4E

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 11.2 min

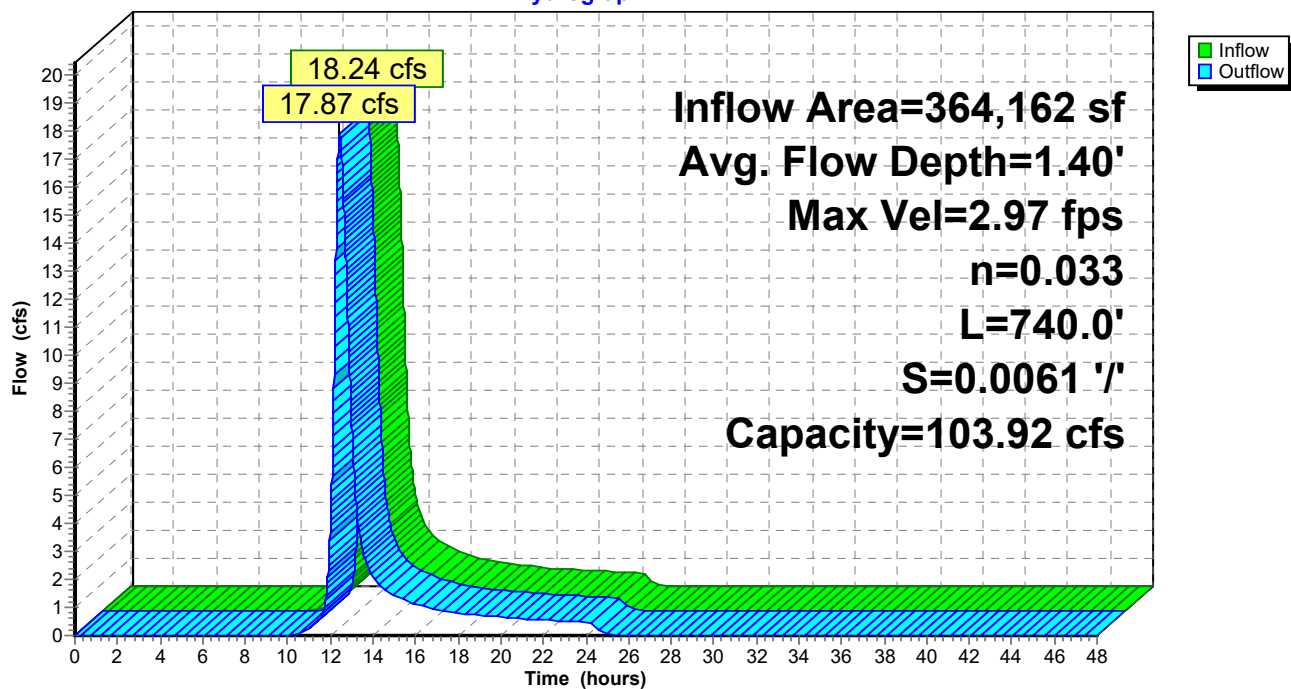
Peak Storage= 4,460 cf @ 12.43 hrs
Average Depth at Peak Storage= 1.40' , Surface Width= 7.10'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 '/'
Inlet Invert= 684.00', Outlet Invert= 679.50'



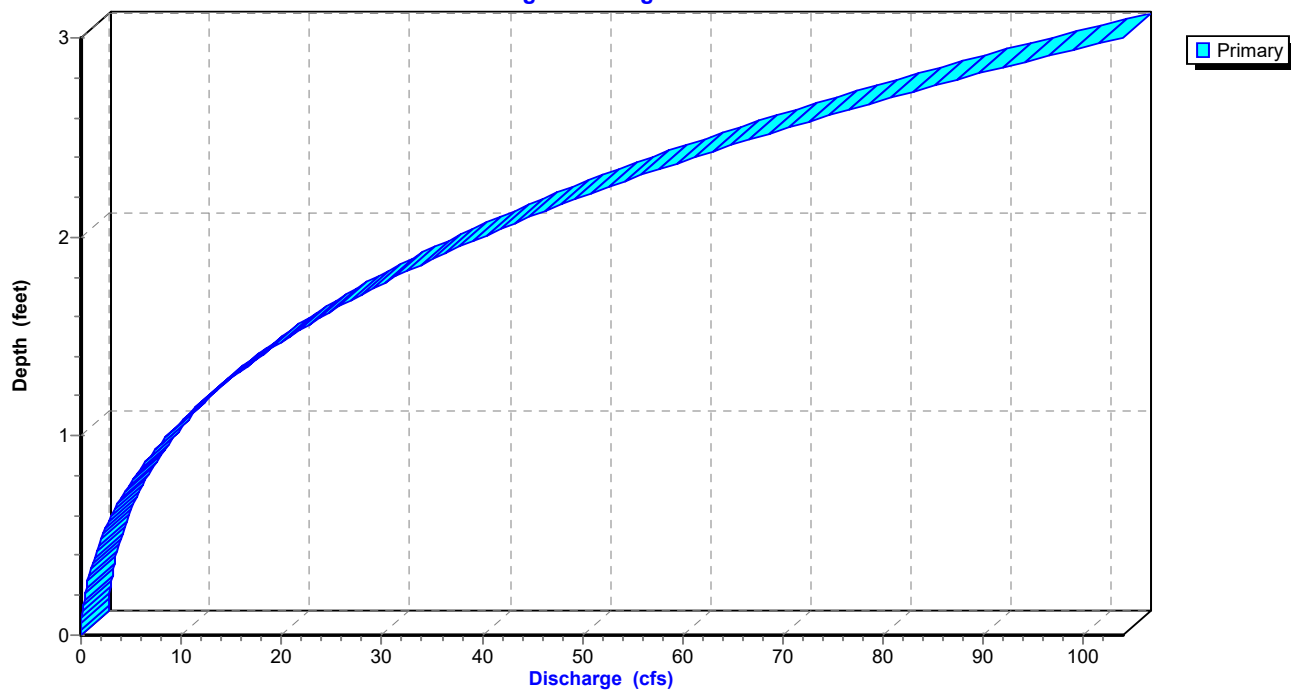
Reach D4E1: Ditch 4E1

Hydrograph

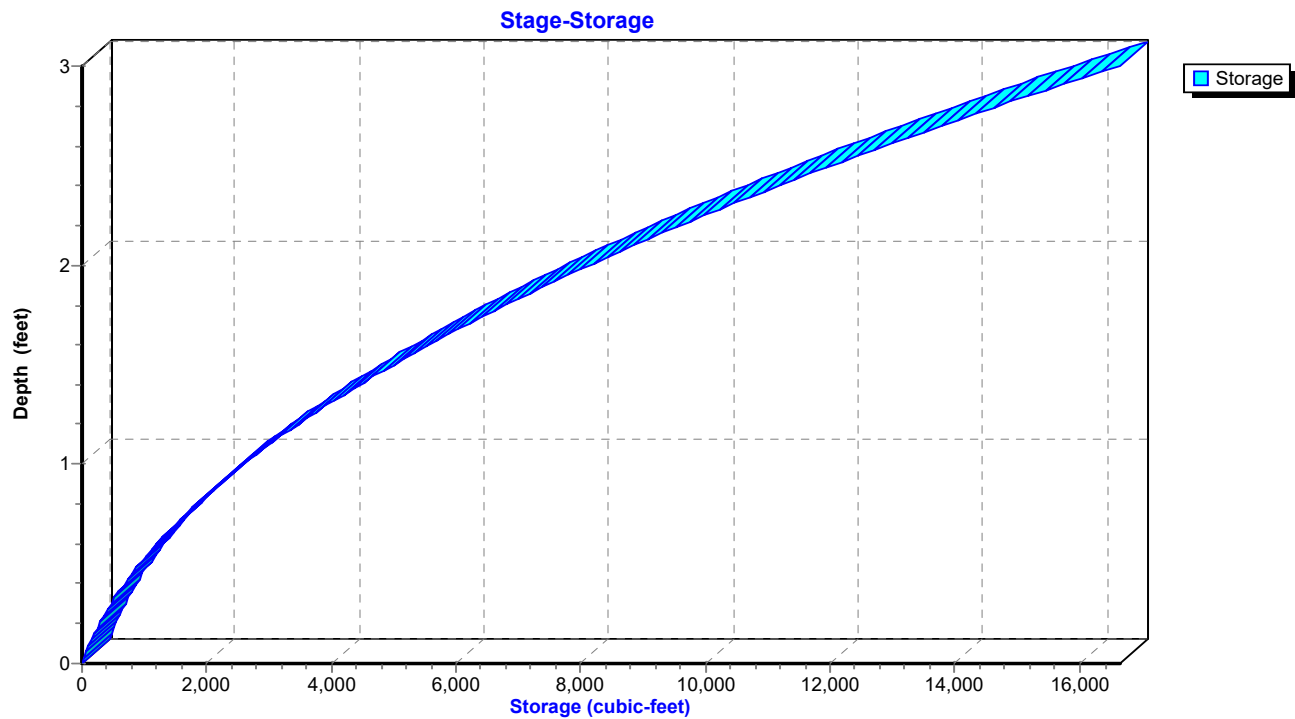


Reach D4E1: Ditch 4E1

Stage-Discharge



Reach D4E1: Ditch 4E1



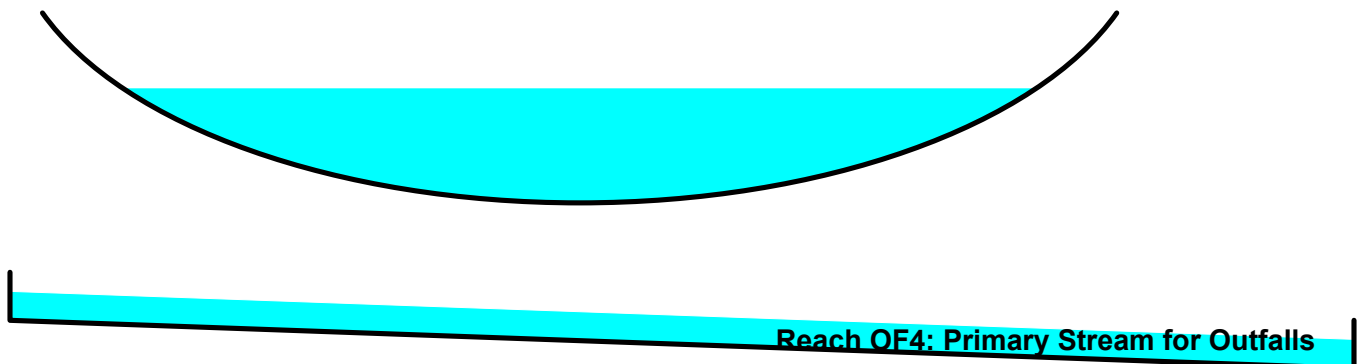
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 3.90" for 50-yr event
Inflow = 217.29 cfs @ 13.18 hrs, Volume= 3,242,965 cf
Outflow = 217.22 cfs @ 13.20 hrs, Volume= 3,242,965 cf, Atten= 0%, Lag= 1.0 min

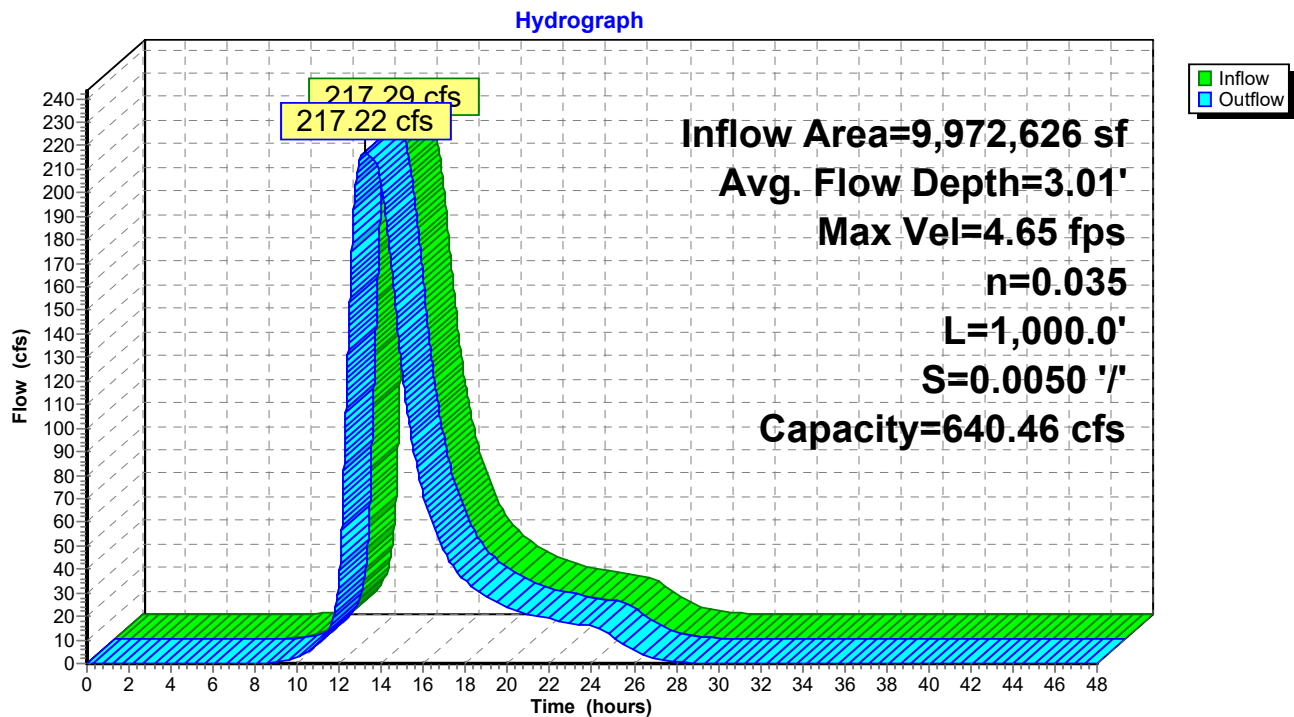
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 9.8 min

Peak Storage= 46,752 cf @ 13.20 hrs
Average Depth at Peak Storage= 3.01' , Surface Width= 23.28'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

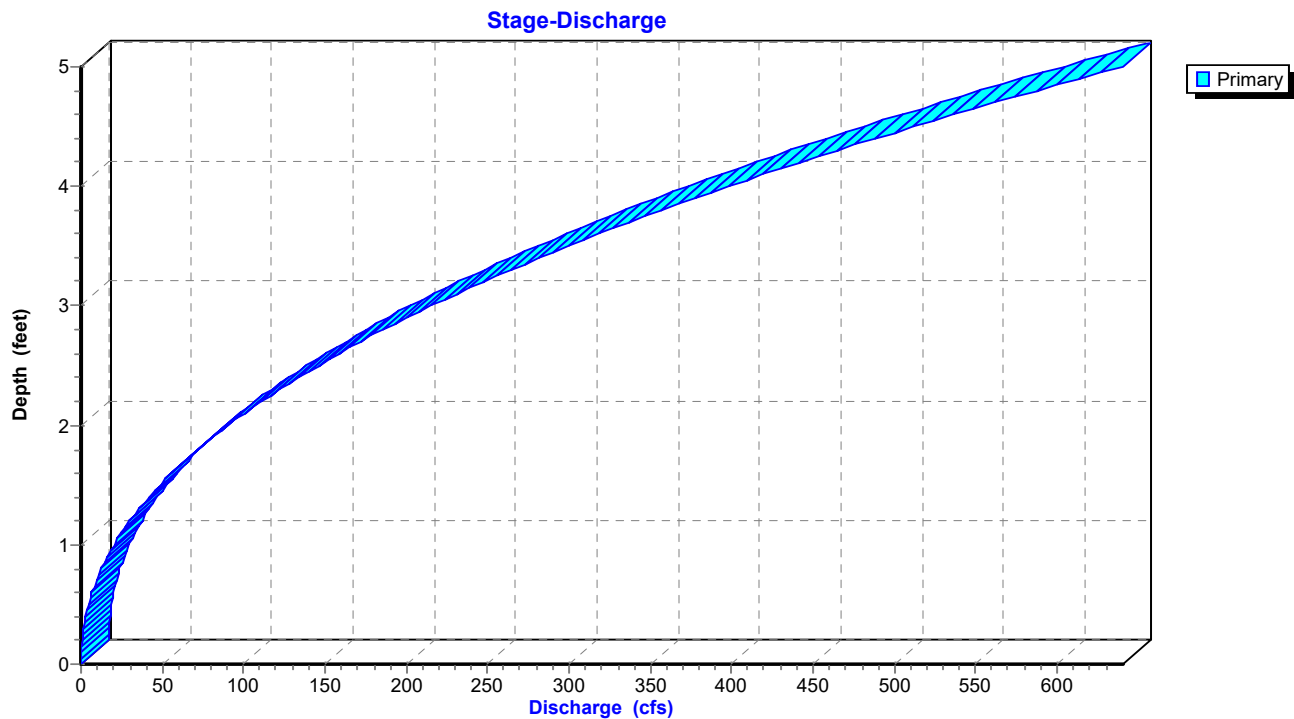
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

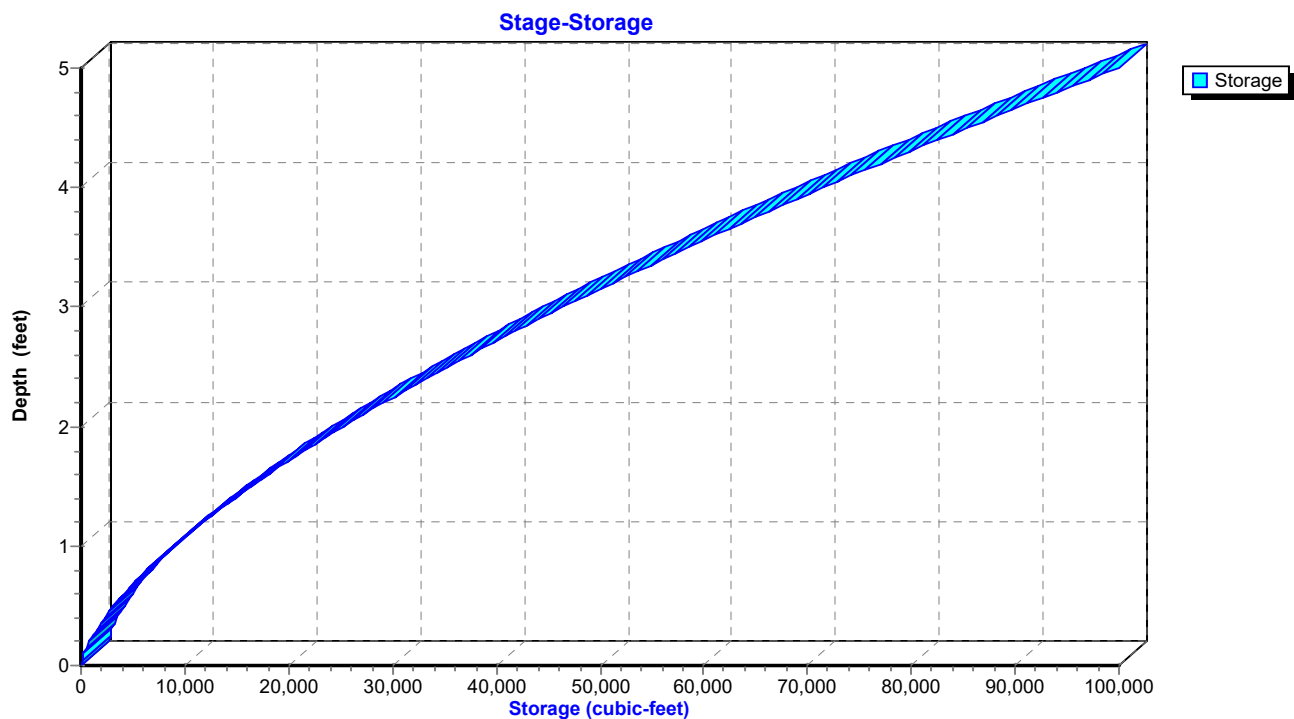


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

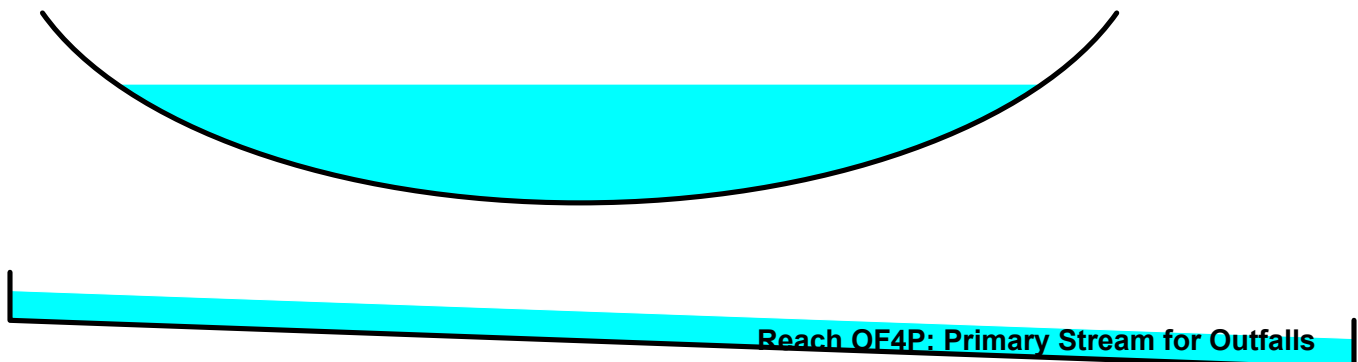
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 4.06" for 50-yr event
Inflow = 232.59 cfs @ 13.67 hrs, Volume= 3,324,329 cf
Outflow = 232.28 cfs @ 13.71 hrs, Volume= 3,324,326 cf, Atten= 0%, Lag= 2.5 min

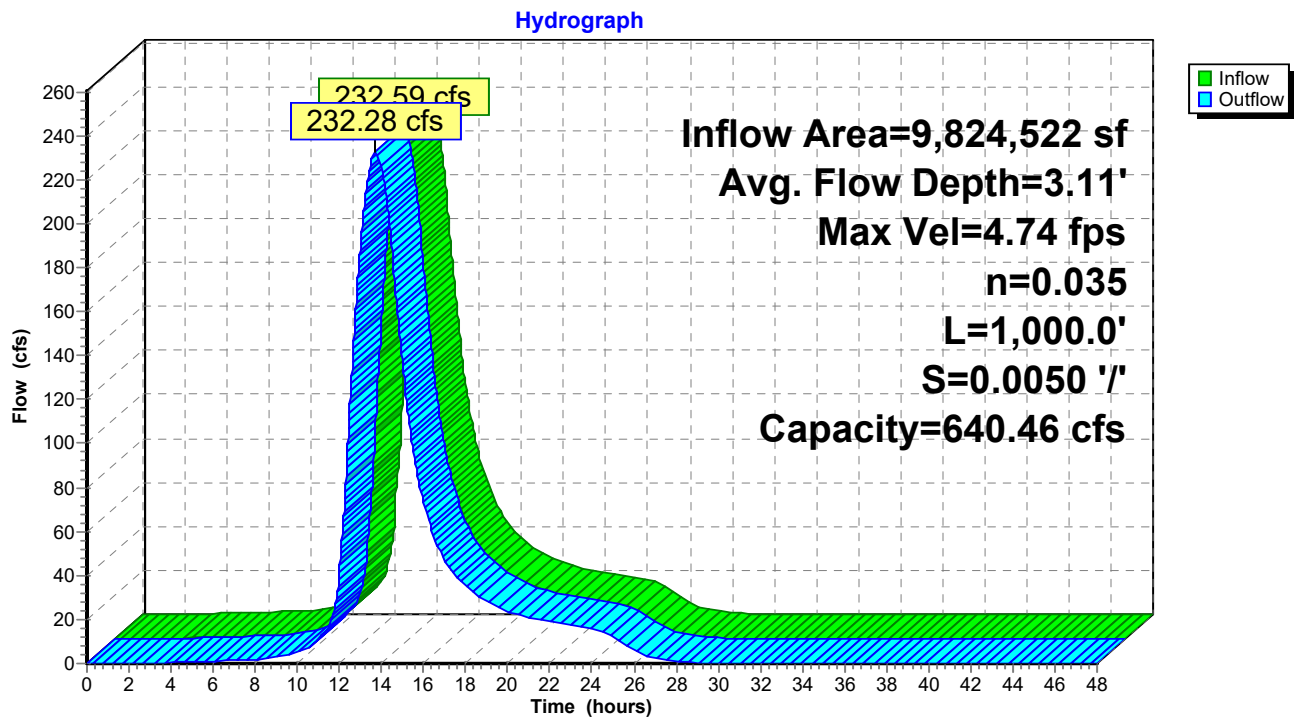
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 12.6 min

Peak Storage= 49,002 cf @ 13.71 hrs
Average Depth at Peak Storage= 3.11', Surface Width= 23.65'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

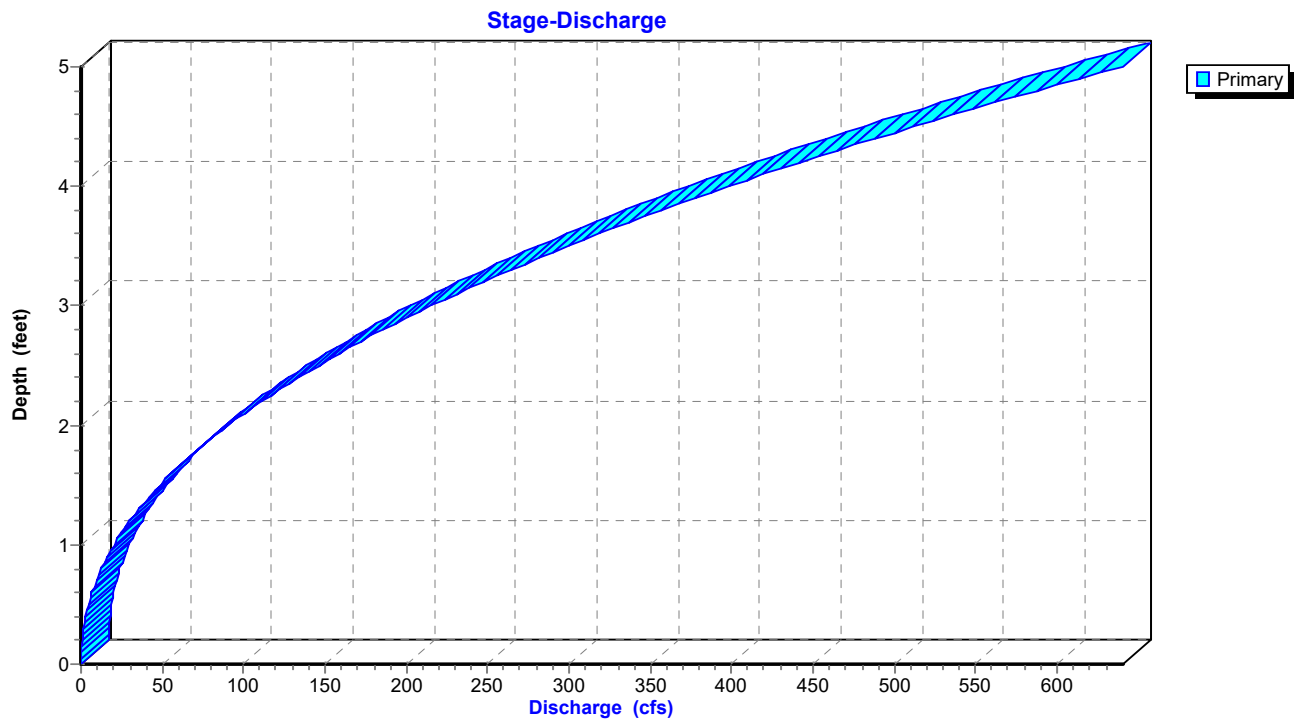
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

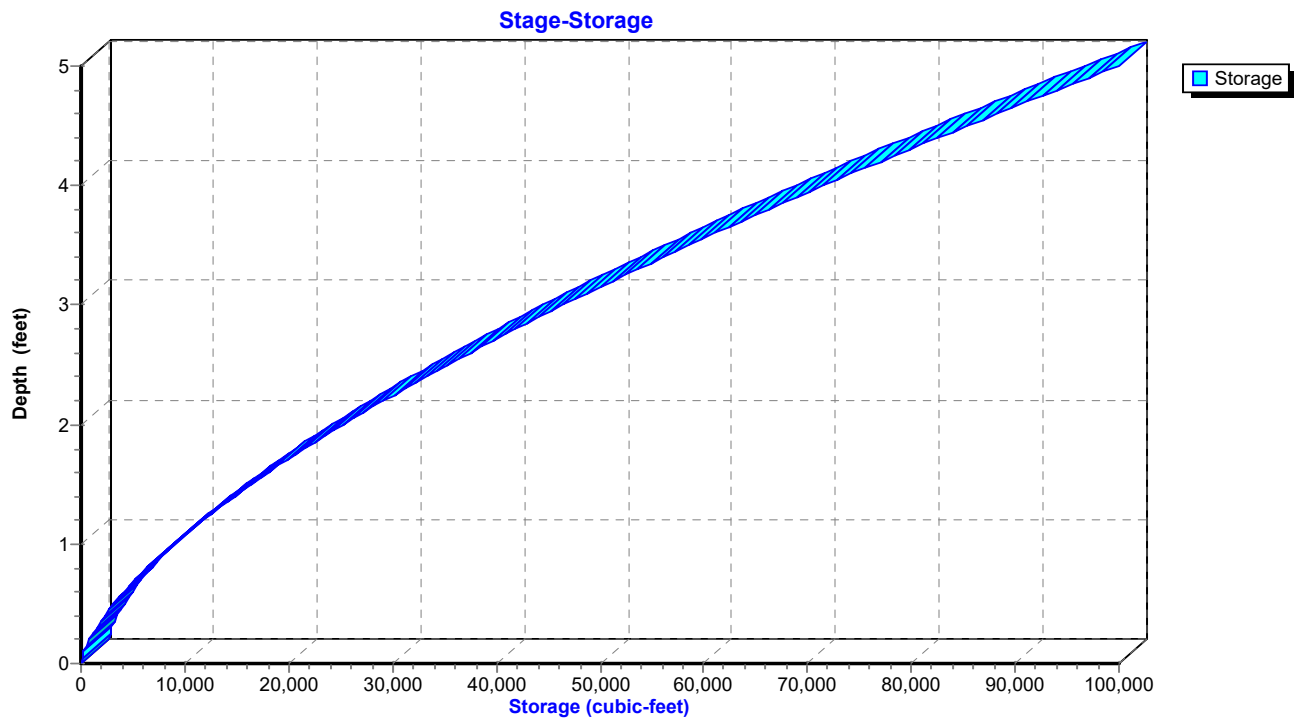


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 2.86" for 50-yr event
 Inflow = 48.09 cfs @ 12.88 hrs, Volume= 362,320 cf
 Outflow = 48.09 cfs @ 12.88 hrs, Volume= 362,320 cf, Atten= 0%, Lag= 0.0 min
 Primary = 48.09 cfs @ 12.88 hrs, Volume= 362,320 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 684.26' @ 12.88 hrs

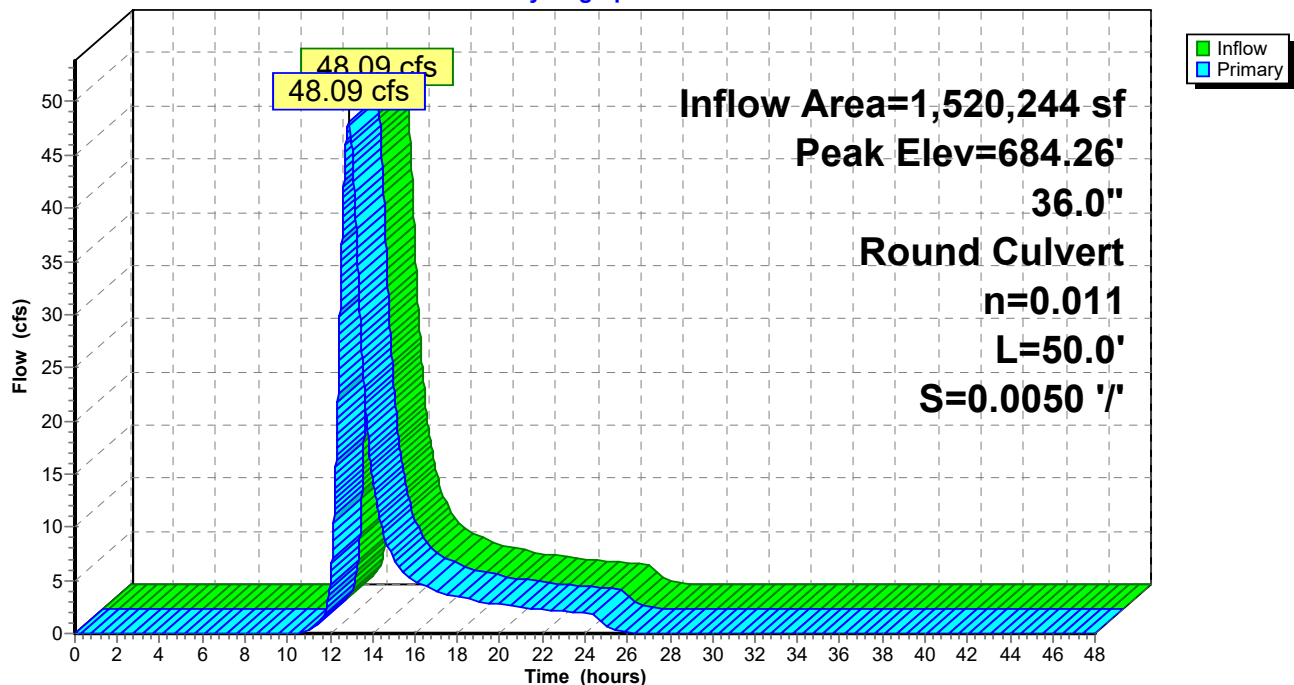
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

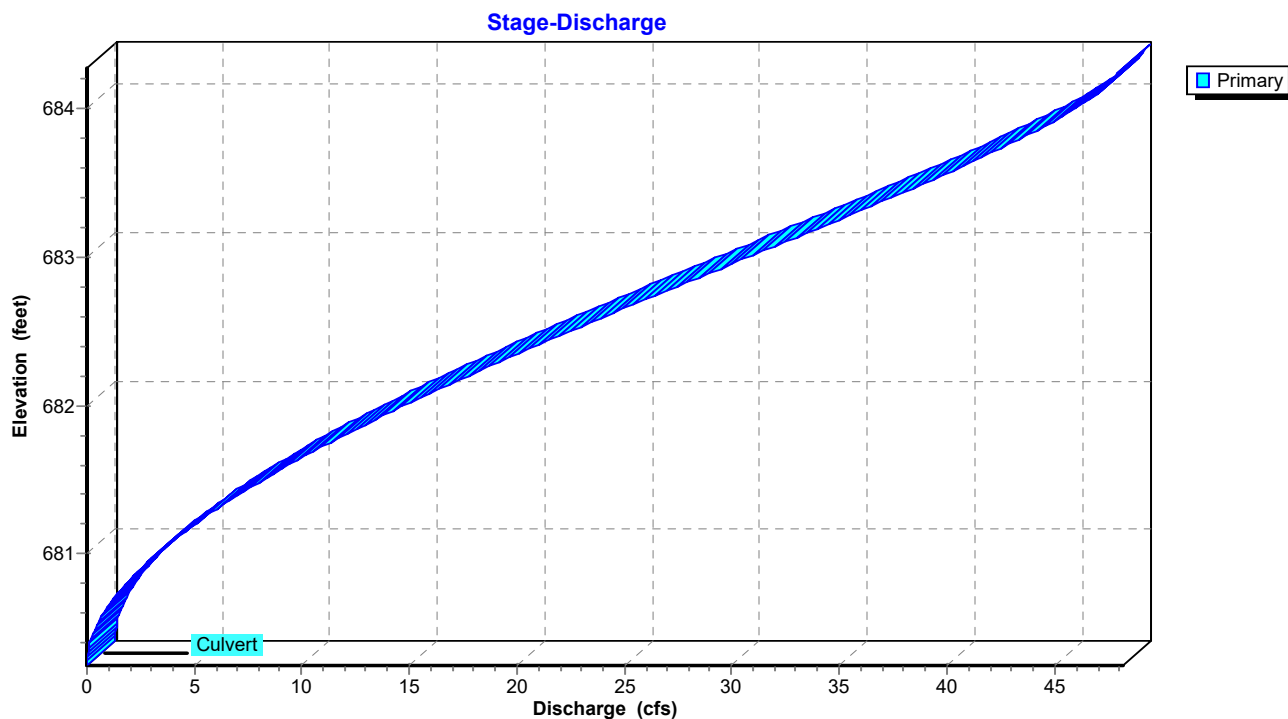
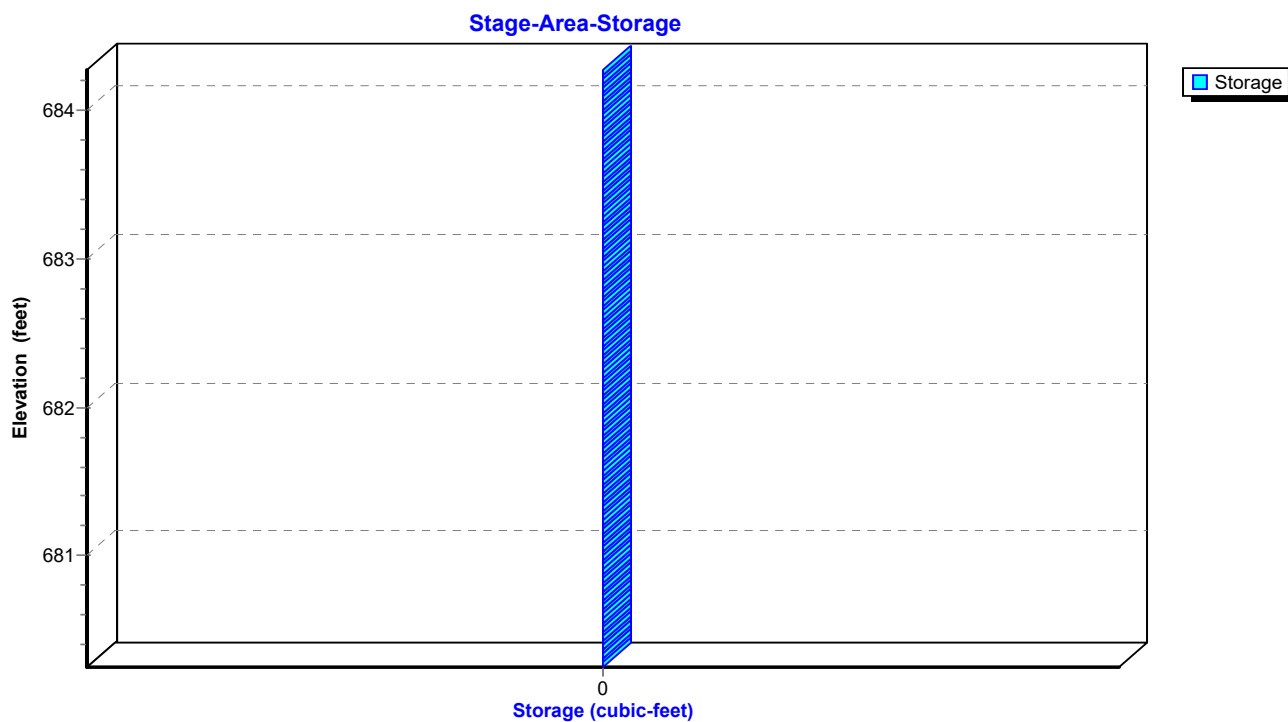
Primary OutFlow Max=47.99 cfs @ 12.88 hrs HW=684.26' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 47.99 cfs @ 6.79 fps)

~~Culvert CD2: Cross Drain~~

Pond CD2: Cross Drain

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

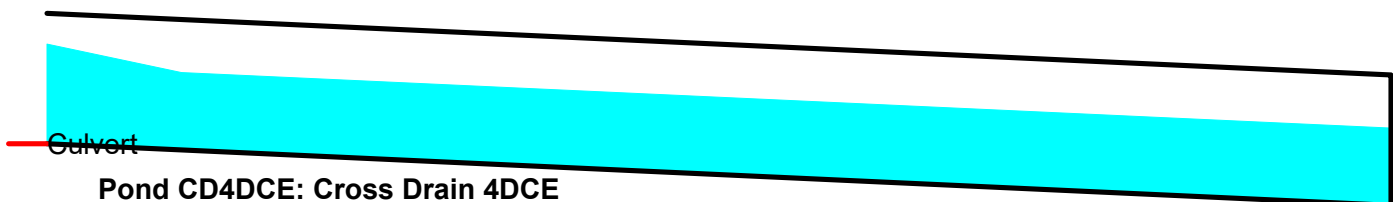
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 3.70" for 50-yr event
 Inflow = 59.89 cfs @ 12.50 hrs, Volume= 380,637 cf
 Outflow = 59.89 cfs @ 12.50 hrs, Volume= 380,637 cf, Atten= 0%, Lag= 0.0 min
 Primary = 59.89 cfs @ 12.50 hrs, Volume= 380,637 cf
 Routed to Pond POND1P : PROP POND

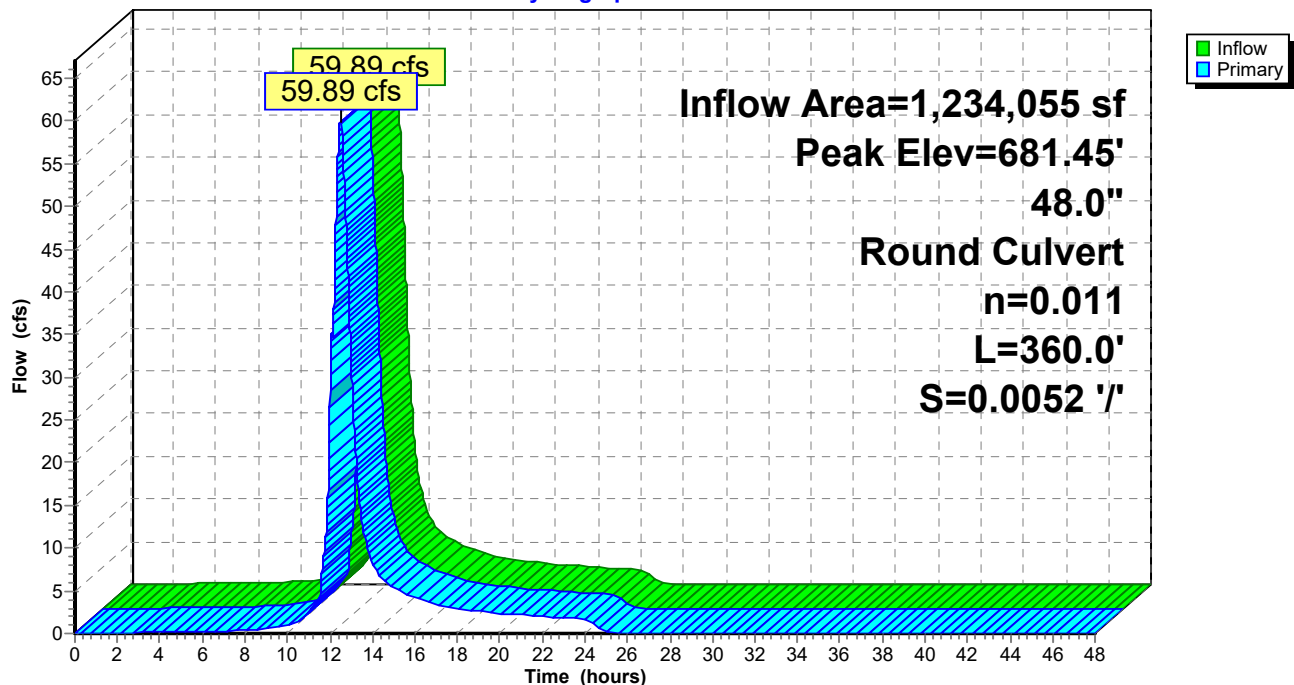
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.45' @ 12.50 hrs

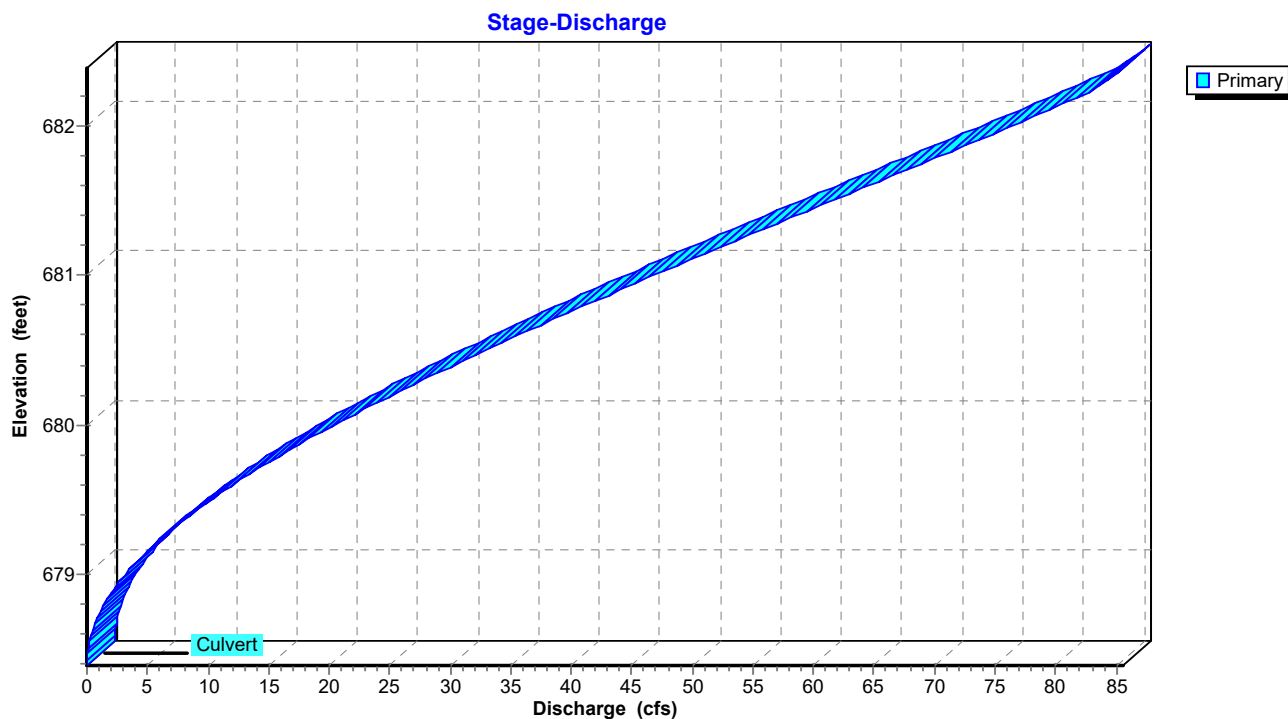
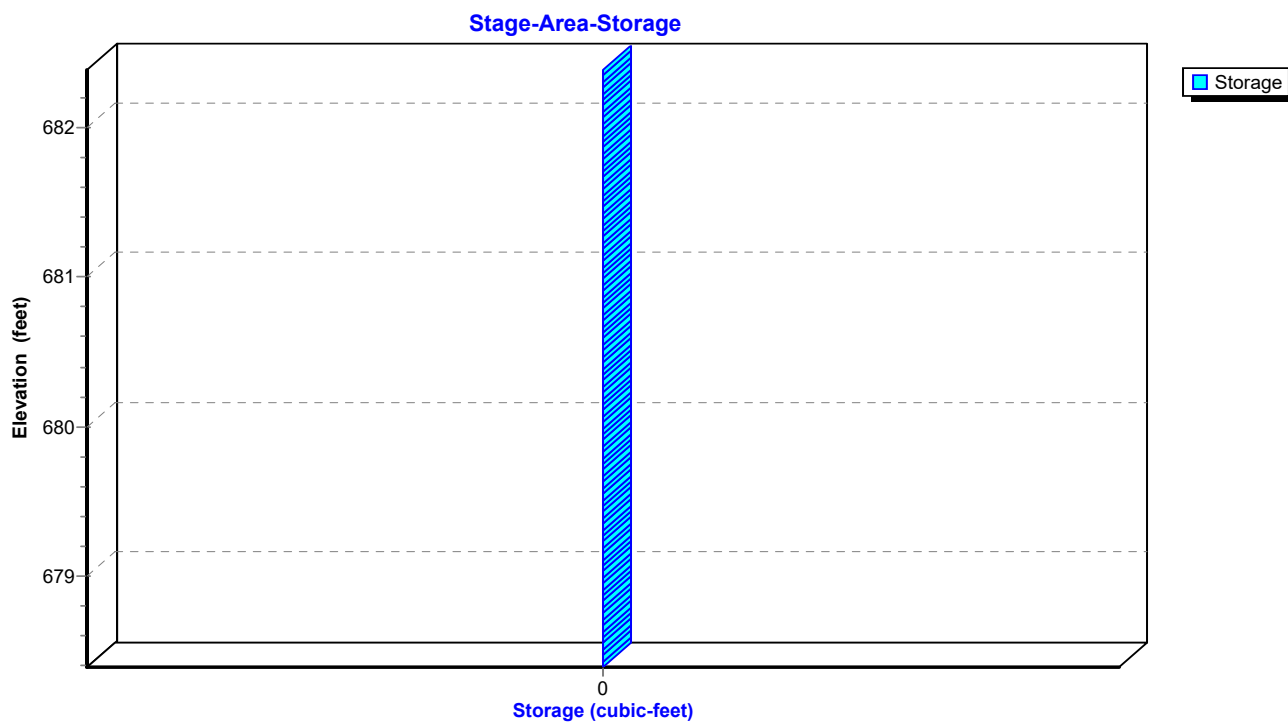
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=59.88 cfs @ 12.50 hrs HW=681.45' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 59.88 cfs @ 8.04 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

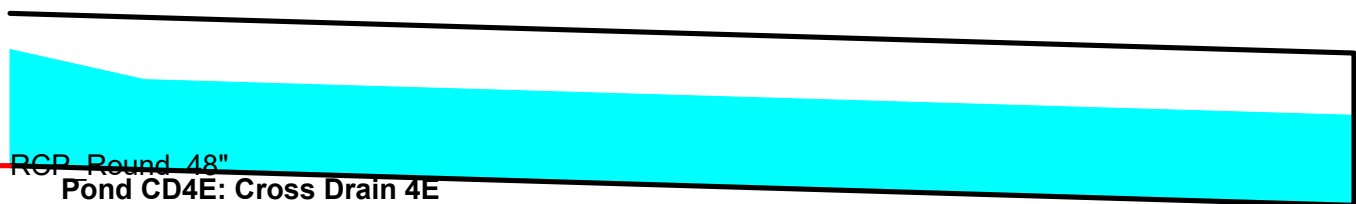
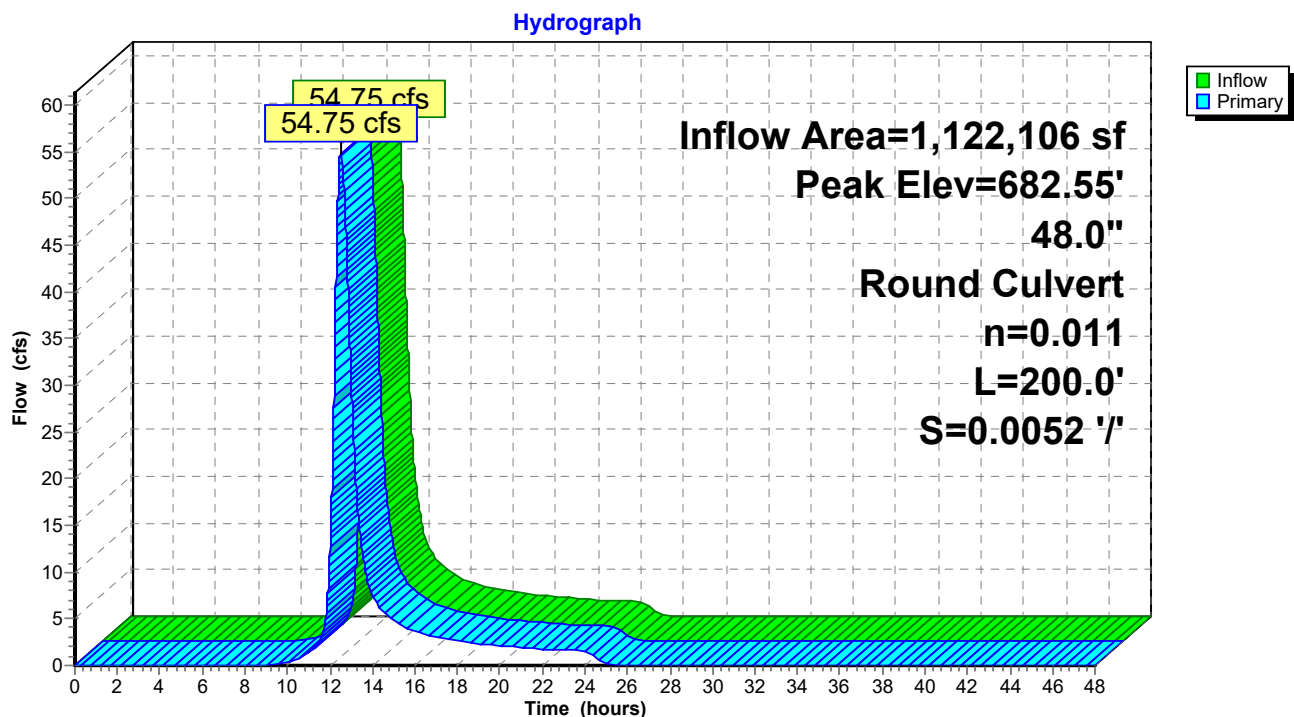
Summary for Pond CD4E: Cross Drain 4E

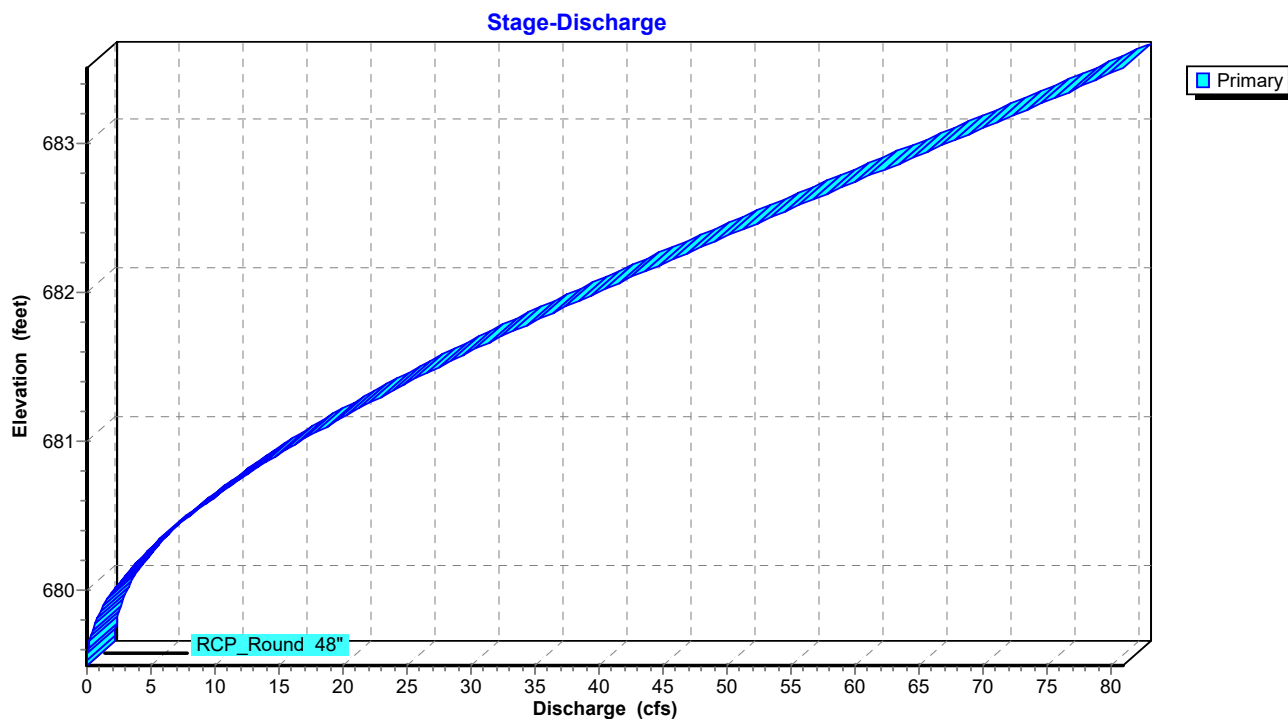
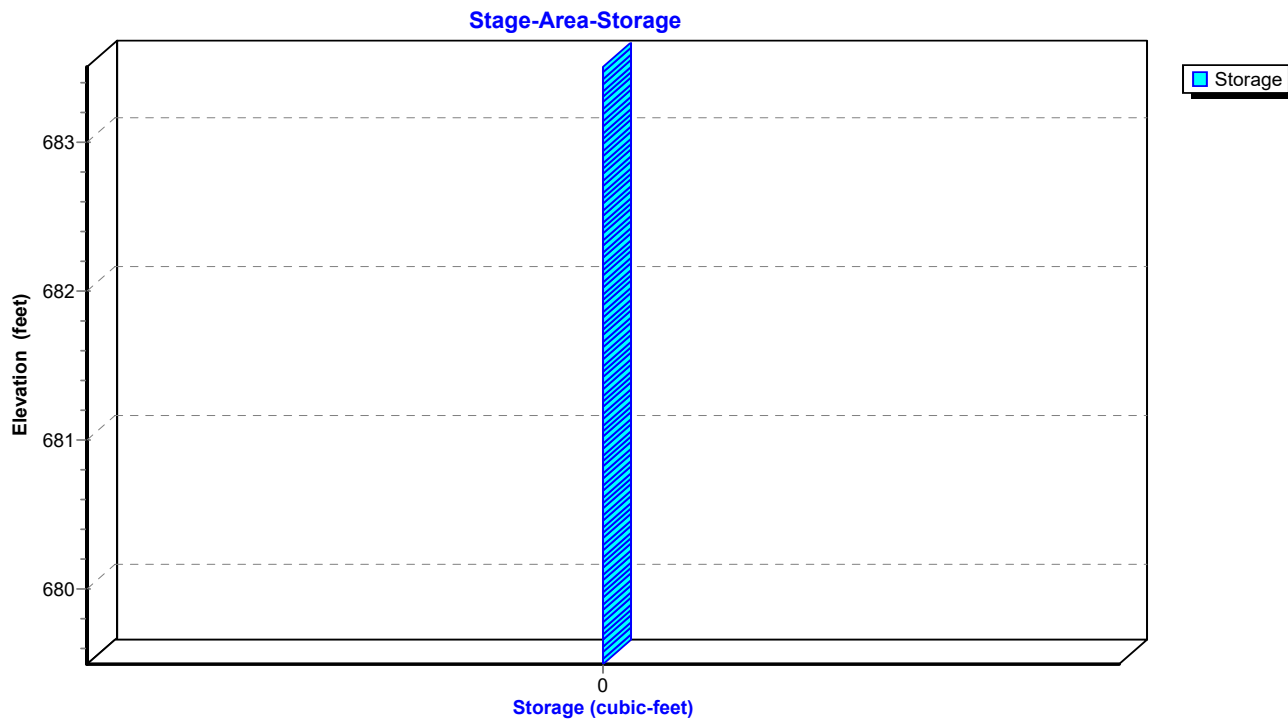
Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 3.41" for 50-yr event
 Inflow = 54.75 cfs @ 12.51 hrs, Volume= 319,033 cf
 Outflow = 54.75 cfs @ 12.51 hrs, Volume= 319,033 cf, Atten= 0%, Lag= 0.0 min
 Primary = 54.75 cfs @ 12.51 hrs, Volume= 319,033 cf
 Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 682.55' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=54.74 cfs @ 12.51 hrs HW=682.55' (Free Discharge)
 ↳ **1=RCP_Round 48"** (Barrel Controls 54.74 cfs @ 7.37 fps)

**Pond CD4E: Cross Drain 4E**

Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 4.58" for 50-yr event
 Inflow = 108.19 cfs @ 12.46 hrs, Volume= 673,315 cf
 Outflow = 46.31 cfs @ 13.04 hrs, Volume= 672,749 cf, Atten= 57%, Lag= 35.1 min
 Primary = 46.31 cfs @ 13.04 hrs, Volume= 672,749 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.87' @ 13.04 hrs Surf.Area= 109,567 sf Storage= 193,726 cf

Plug-Flow detention time= 47.6 min calculated for 672,608 cf (100% of inflow)
 Center-of-Mass det. time= 47.2 min (865.8 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

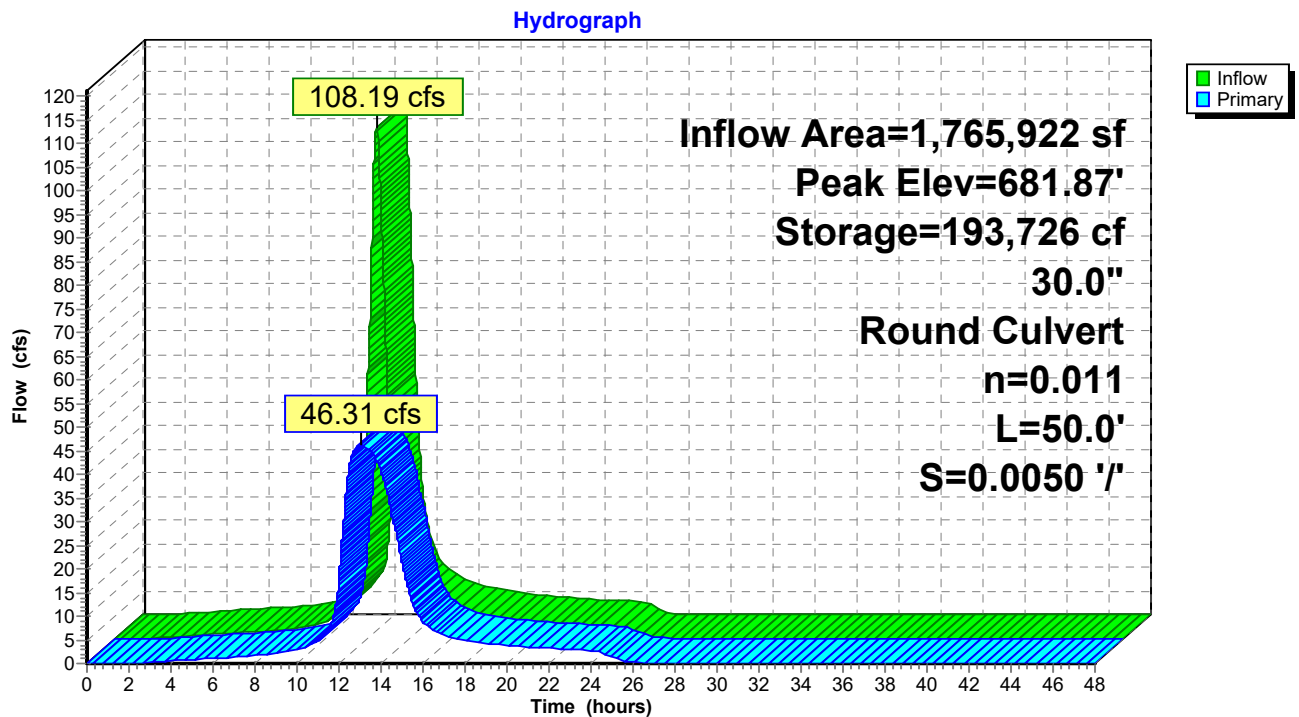
Primary OutFlow Max=46.31 cfs @ 13.04 hrs HW=681.87' (Free Discharge)

↑1=Culvert (Inlet Controls 46.31 cfs @ 9.43 fps)

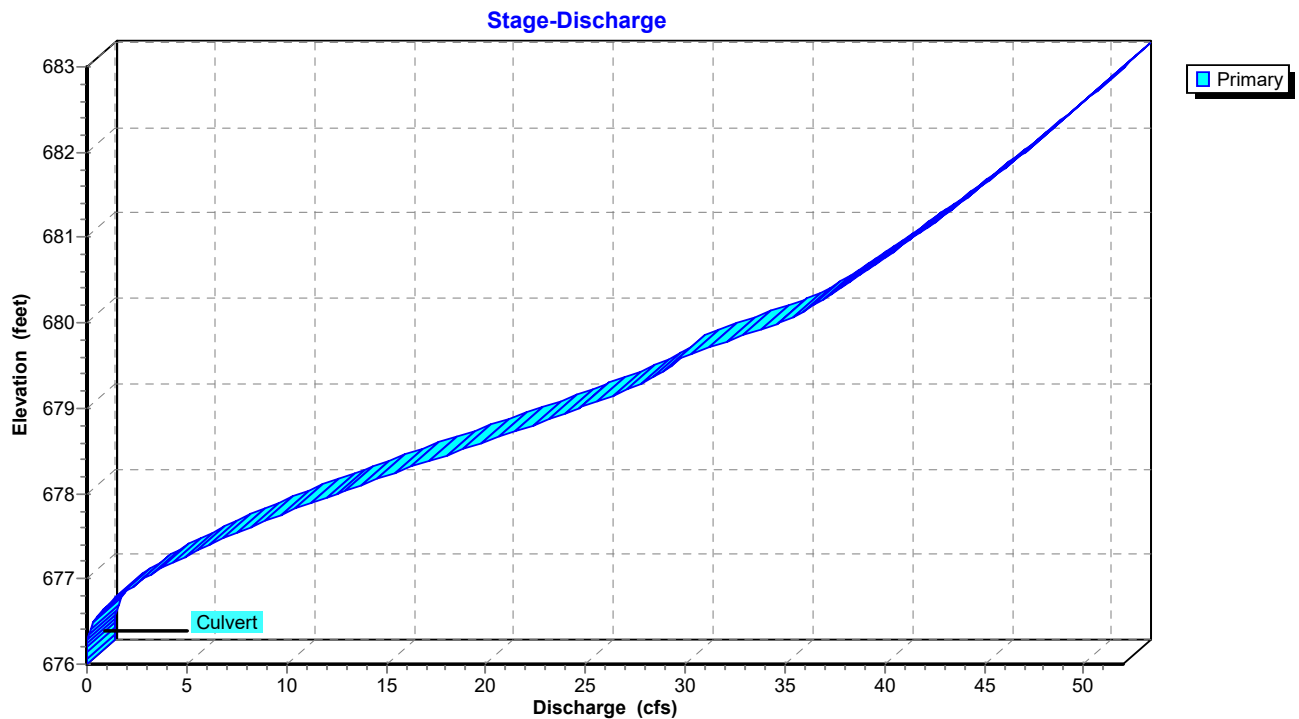
Pond POND1P: PROP POND

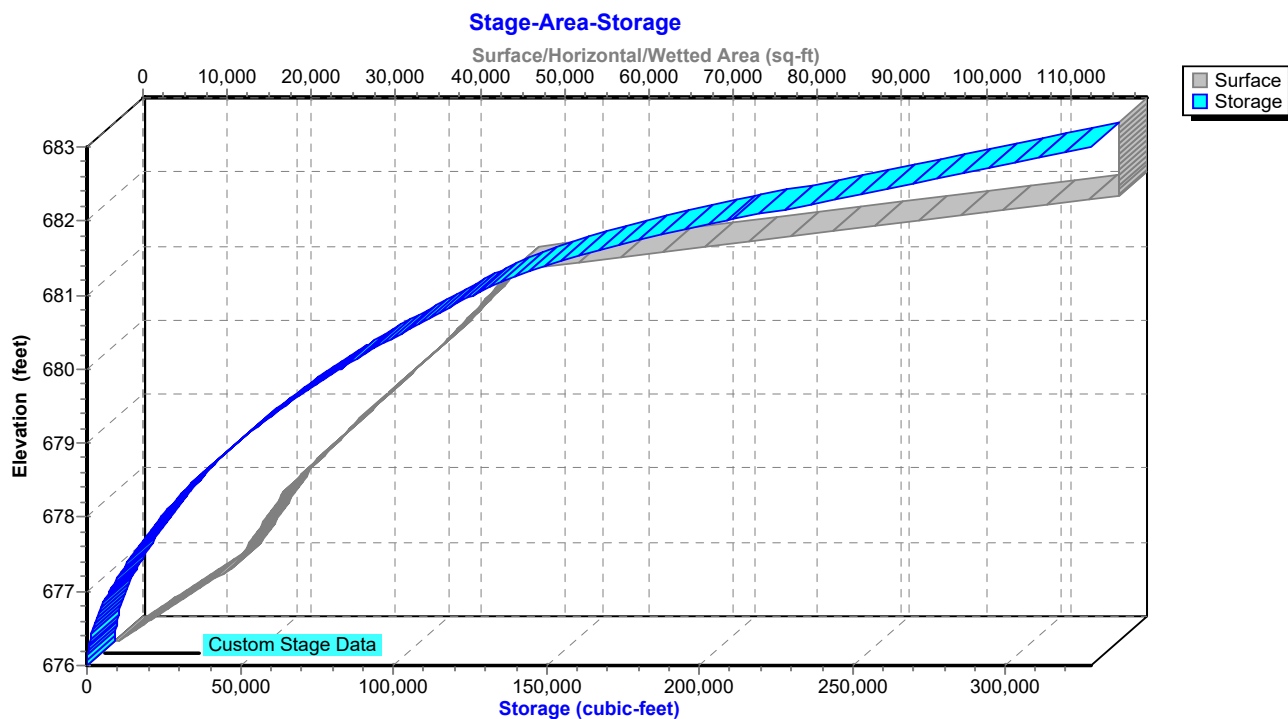
Culvert

Pond POND1P: PROP POND



Pond POND1P: PROP POND



Pond POND1P: PROP POND

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA 1: BASIN 1 PRE Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=4.89"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=198.72 cfs 2,537,591 cf

Subcatchment DA 2: BASIN 2 PRE Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=3.43"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=58.90 cfs 433,944 cf

Subcatchment DA 3: BASIN 3 PRE Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=4.55"
 Flow Length=500' Slope=0.0200 '/' Tc=20.2 min CN=72 Runoff=36.61 cfs 157,415 cf

Subcatchment DA 4: BASIN 4 PRE Runoff Area=41.500 ac 0.00% Impervious Runoff Depth=4.32"
 Flow Length=1,500' Tc=50.3 min CN=70 Runoff=100.52 cfs 650,568 cf

Subcatchment DA1P: BASIN 1 PROPOSED Runoff Area=143.000 ac 1.75% Impervious Runoff Depth=4.89"
 Flow Length=5,750' Tc=143.0 min CN=75 Runoff=198.72 cfs 2,537,591 cf

Subcatchment DA2P: BASIN 2 PROPOSED Runoff Area=34.900 ac 0.00% Impervious Runoff Depth=3.43"
 Flow Length=2,150' Slope=0.0150 '/' Tc=62.3 min CN=62 Runoff=58.90 cfs 433,944 cf

Subcatchment DA3P: BASIN 3 PRE Runoff Area=2.130 ac 0.00% Impervious Runoff Depth=5.35"
 Tc=5.0 min CN=79 Runoff=15.32 cfs 41,364 cf

Subcatchment DA4A: BASIN 4A PROPOSED Runoff Area=4.970 ac 0.00% Impervious Runoff Depth=4.09"
 Flow Length=300' Tc=28.4 min CN=68 Runoff=14.78 cfs 73,840 cf

Subcatchment DA4B: BASIN 4B Runoff Area=12.210 ac 24.57% Impervious Runoff Depth=7.35"
 Flow Length=1,000' Tc=33.8 min CN=96 Runoff=55.10 cfs 325,825 cf

Subcatchment DA4C: BASIN 4C PROPOSED Runoff Area=1.090 ac 0.00% Impervious Runoff Depth=7.35"
 Tc=5.0 min CN=96 Runoff=9.74 cfs 29,087 cf

Subcatchment DA4D: BASIN 4D PROPOSED Runoff Area=1.480 ac 0.00% Impervious Runoff Depth=7.35"
 Tc=5.0 min CN=96 Runoff=13.22 cfs 39,494 cf

Subcatchment DA4E1: BASIN 4E1 Runoff Area=8.360 ac 11.96% Impervious Runoff Depth=3.65"
 Flow Length=500' Tc=28.1 min CN=64 Runoff=22.04 cfs 110,649 cf

Subcatchment DA4E2: BASIN 4E2 Runoff Area=17.400 ac 0.00% Impervious Runoff Depth=4.21"
 Flow Length=1,000' Tc=41.1 min CN=69 Runoff=45.24 cfs 265,631 cf

Reach CD4C: Cross Drain 4C Avg. Flow Depth=0.53' Max Vel=16.73 fps Inflow=9.33 cfs 29,087 cf
 18.0" Round Pipe n=0.011 L=60.0' S=0.0792 '/' Capacity=34.93 cfs Outflow=9.33 cfs 29,087 cf

Reach D4C: Ditch 4C Avg. Flow Depth=0.92' Max Vel=3.06 fps Inflow=9.74 cfs 29,087 cf
 n=0.033 L=313.0' S=0.0104 '/' Capacity=27.19 cfs Outflow=9.33 cfs 29,087 cf

Reach D4D: Ditch 4D Avg. Flow Depth=0.98' Max Vel=3.79 fps Inflow=13.22 cfs 39,494 cf
 n=0.033 L=337.0' S=0.0148 '/' Capacity=32.50 cfs Outflow=12.79 cfs 39,494 cf

TrueRail*Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"*

Prepared by CSR Engineering, Inc

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Reach D4E1: Ditch 4E1 Avg. Flow Depth=1.53' Max Vel=3.11 fps Inflow=22.04 cfs 110,649 cf
n=0.033 L=740.0' S=0.0061 '/' Capacity=103.92 cfs Outflow=21.65 cfs 110,649 cf

Reach OF4: Primary Stream for Avg. Flow Depth=3.27' Max Vel=4.89 fps Inflow=258.38 cfs 3,779,517 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=258.22 cfs 3,779,517 cf

Reach OF4P: Primary Stream for Avg. Flow Depth=3.33' Max Vel=4.95 fps Inflow=268.87 cfs 3,856,857 cf
n=0.035 L=1,000.0' S=0.0050 '/' Capacity=640.46 cfs Outflow=268.53 cfs 3,856,855 cf

Pond CD2: Cross Drain Peak Elev=684.90' Inflow=58.90 cfs 433,944 cf
36.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=58.90 cfs 433,944 cf

Pond CD4DCE: Cross Drain 4DCE Peak Elev=681.83' Inflow=71.43 cfs 444,860 cf
48.0" Round Culvert n=0.011 L=360.0' S=0.0052 '/' Outflow=71.43 cfs 444,860 cf

Pond CD4E: Cross Drain 4E Peak Elev=682.94' Inflow=65.51 cfs 376,280 cf
48.0" Round Culvert n=0.011 L=200.0' S=0.0052 '/' Outflow=65.51 cfs 376,280 cf

Pond POND1P: PROP POND Peak Elev=682.27' Storage=240,344 cf Inflow=125.53 cfs 770,685 cf
30.0" Round Culvert n=0.011 L=50.0' S=0.0050 '/' Outflow=48.37 cfs 770,118 cf

Total Runoff Area = 19,797,149 sf Runoff Volume = 7,636,942 cf Average Runoff Depth = 4.63"
98.02% Pervious = 19,405,109 sf 1.98% Impervious = 392,040 sf

Summary for Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Runoff = 198.72 cfs @ 13.82 hrs, Volume= 2,537,591 cf, Depth= 4.89"

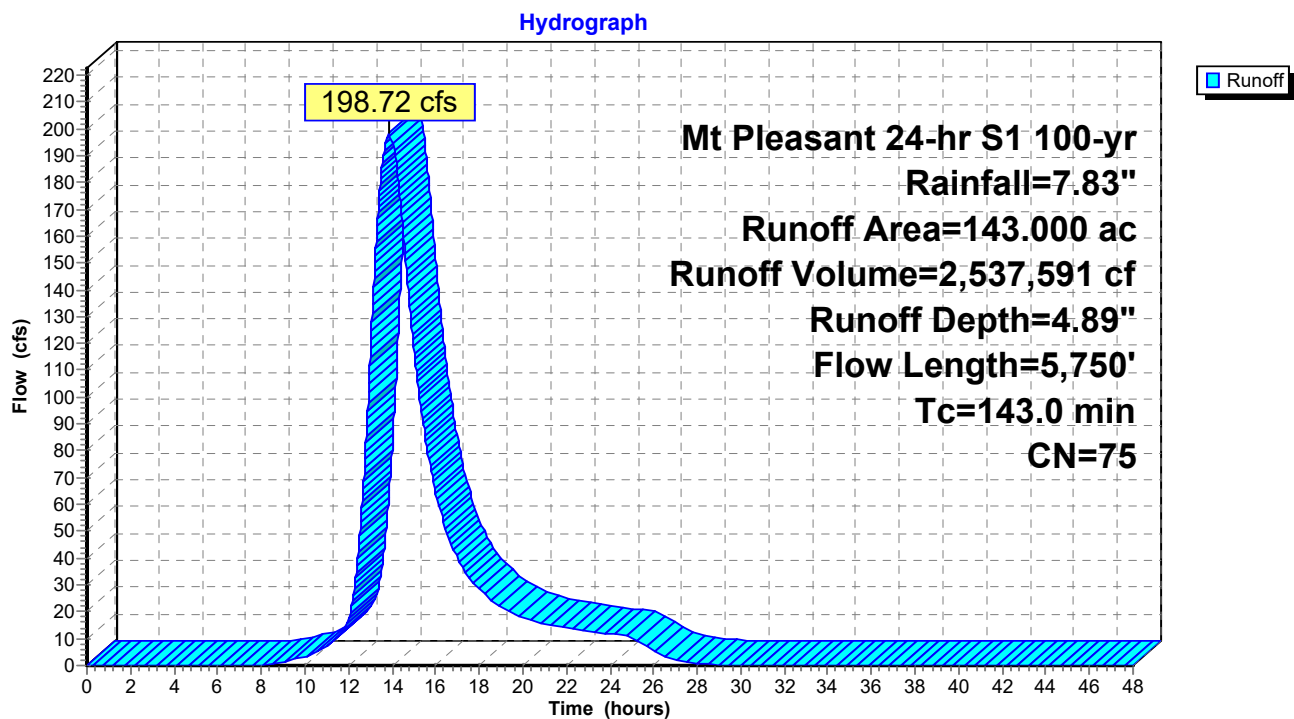
Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Subcatchment DA 1: BASIN 1 PRE DEVELOPMENT

Summary for Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Runoff = 58.90 cfs @ 12.88 hrs, Volume= 433,944 cf, Depth= 3.43"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

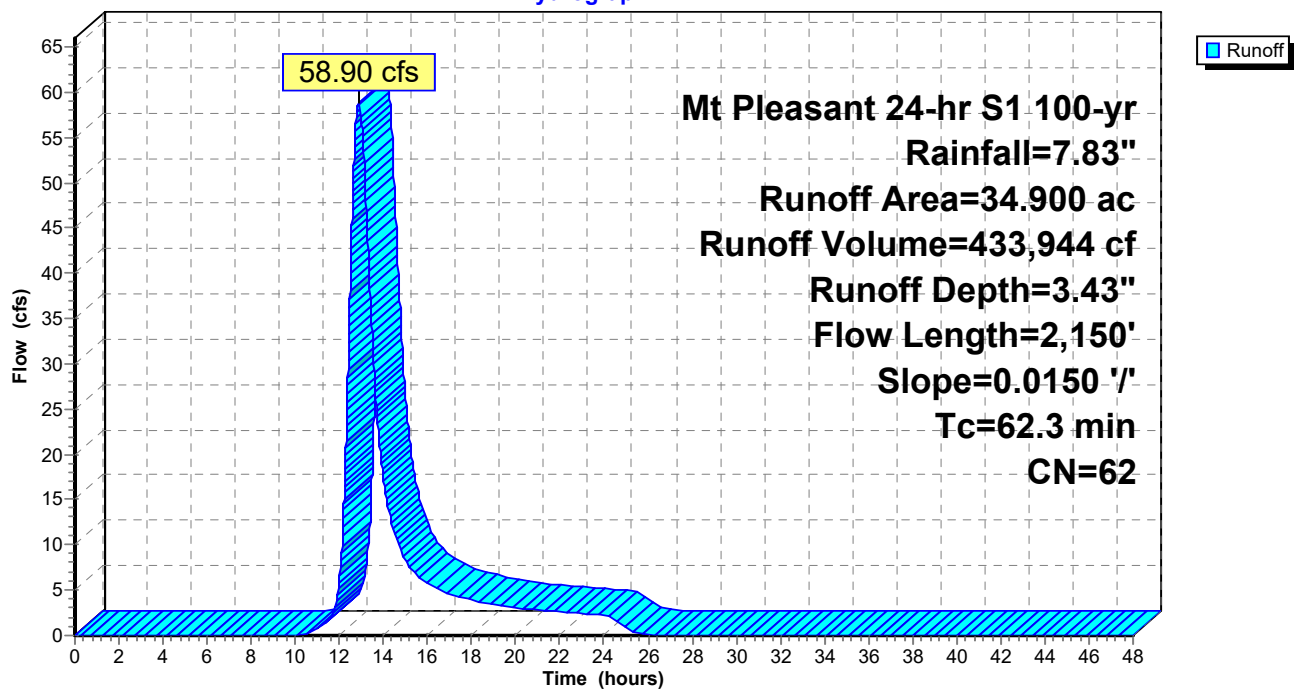
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Subcatchment DA 2: BASIN 2 PRE DEVELOPMENT

Hydrograph



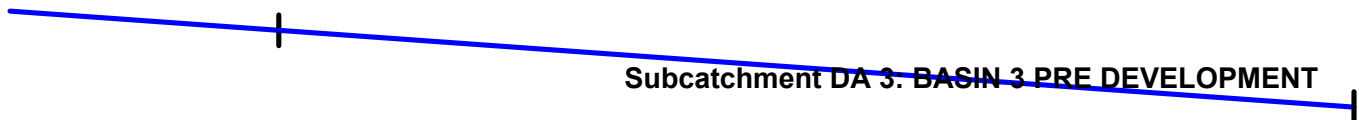
Summary for Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Runoff = 36.61 cfs @ 12.24 hrs, Volume= 157,415 cf, Depth= 4.55"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

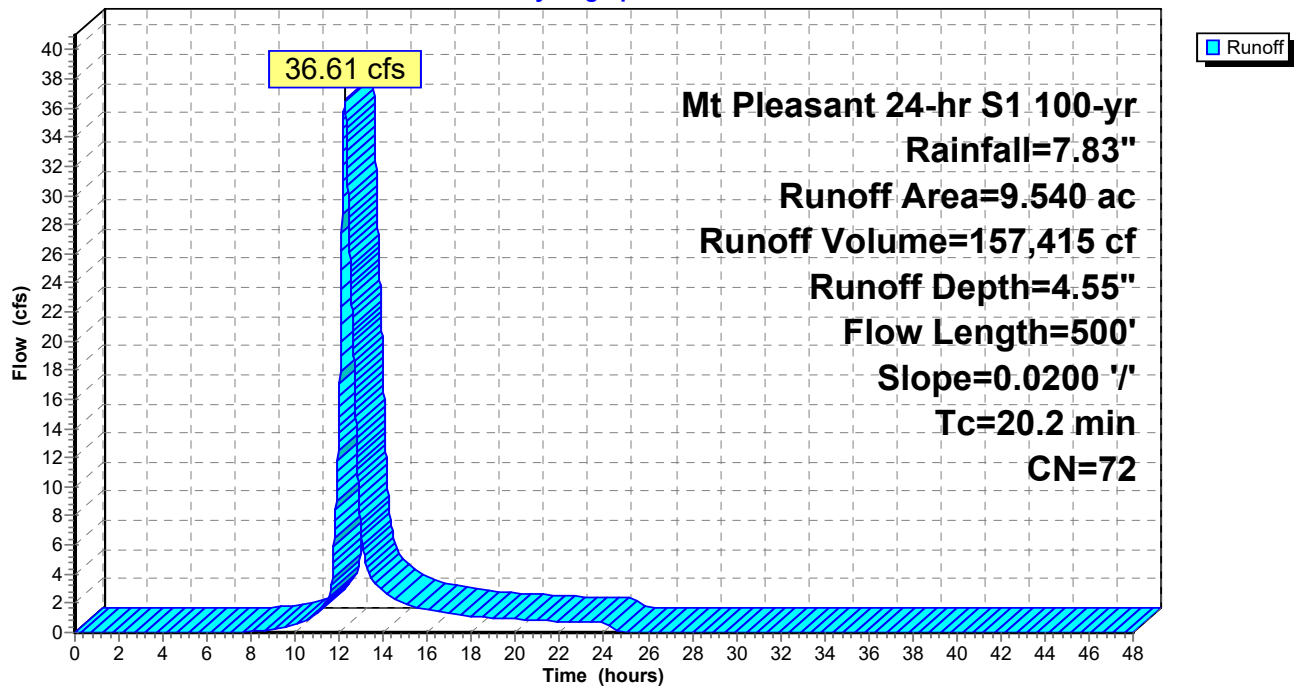
Area (ac)	CN	Description
3.340	78	Meadow, non-grazed, HSG D
3.340	79	Woods, Fair, HSG D
2.290	58	Meadow, non-grazed, HSG B
0.570	60	Woods, Fair, HSG B
9.540	72	Weighted Average
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
6.7	400	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.2	500	Total			



Subcatchment DA 3: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Runoff = 100.52 cfs @ 12.69 hrs, Volume= 650,568 cf, Depth= 4.32"
 Routed to Reach OF4 : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

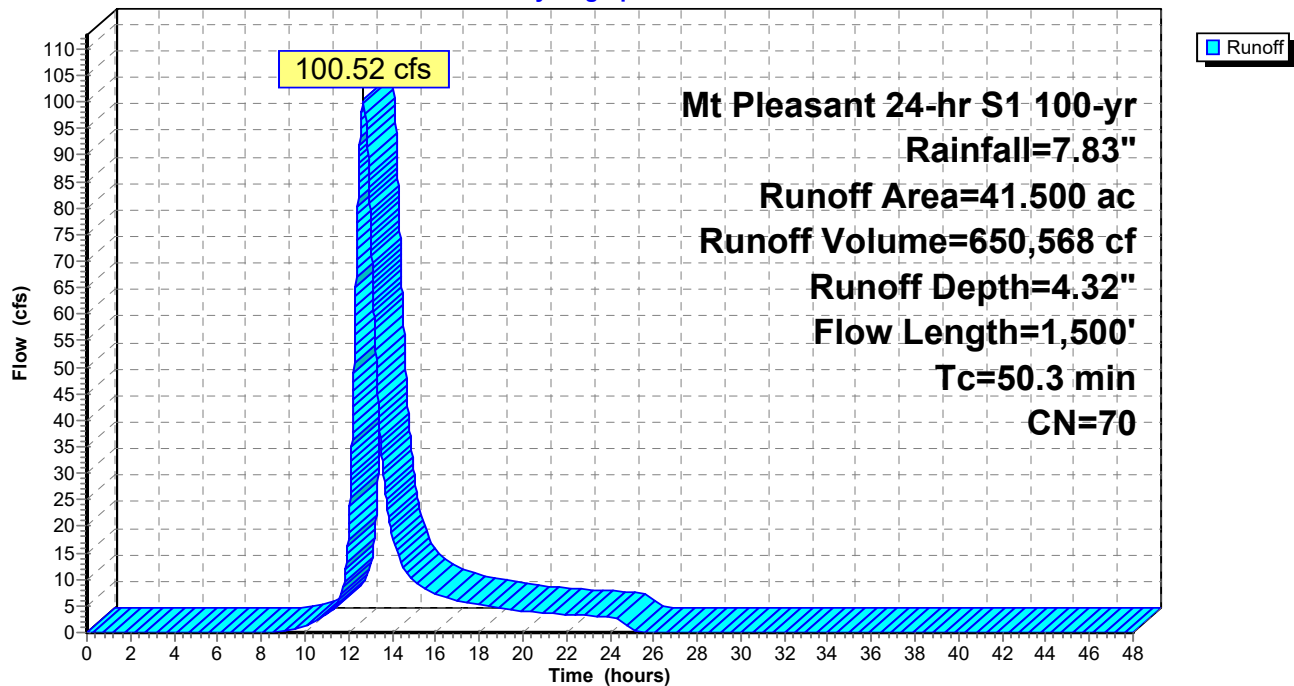
Area (ac)	CN	Description
7.300	78	Meadow, non-grazed, HSG D
1.830	79	Woods, Fair, HSG D
7.640	58	Meadow, non-grazed, HSG B
1.910	60	Woods, Fair, HSG B
4.150	73	Woods, Fair, HSG C
9.960	71	Meadow, non-grazed, HSG C
2.490	73	Woods, Fair, HSG C
4.970	71	Meadow, non-grazed, HSG C
1.250	73	Woods, Fair, HSG C
41.500	70	Weighted Average
41.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
25.8	1,400	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
50.3	1,500	Total			

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Subcatchment DA 4: BASIN 4 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA1P: BASIN 1 PROPOSED

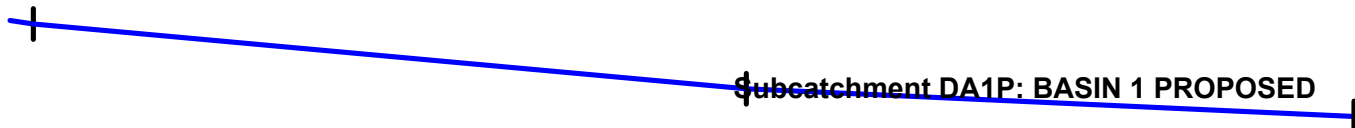
Runoff = 198.72 cfs @ 13.82 hrs, Volume= 2,537,591 cf, Depth= 4.89"

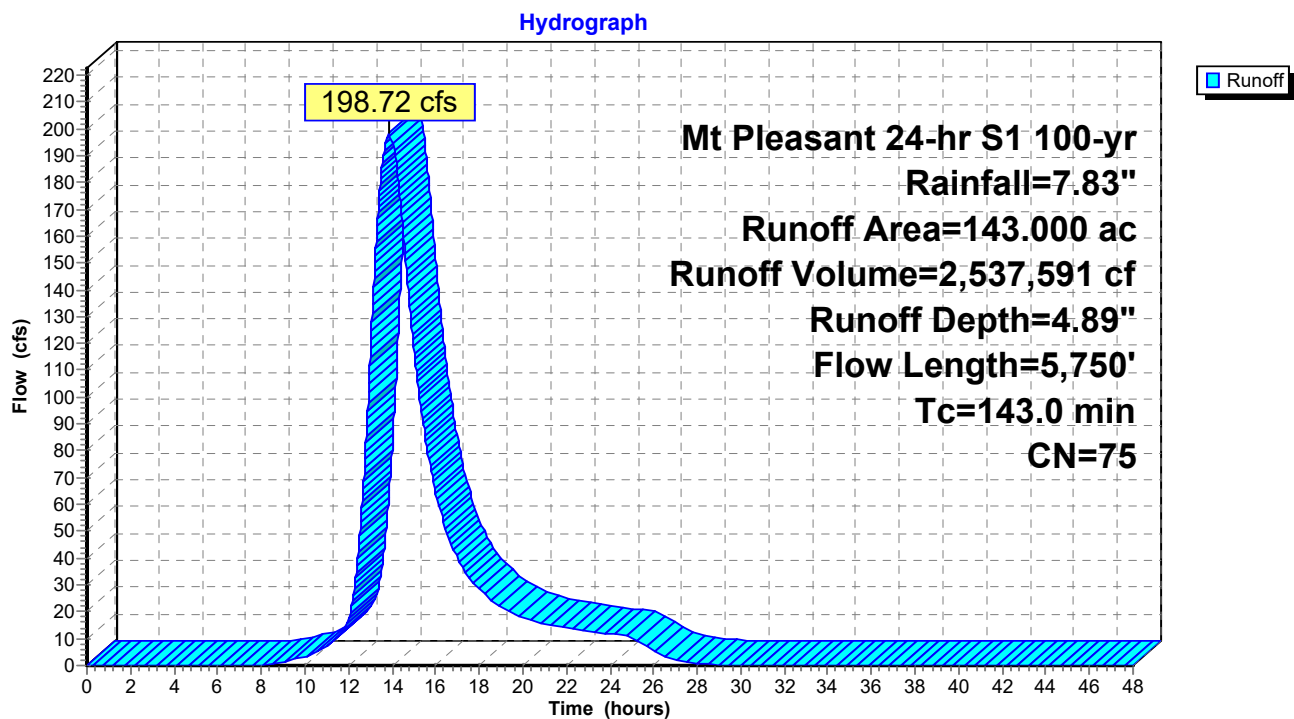
Routed to Reach OF4P : Primary Stream for Outfalls

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
69.500	74	>75% Grass cover, Good, HSG C
71.000	76	Woods/grass comb., Fair, HSG C
2.500	98	Paved parking, HSG C
143.000	75	Weighted Average
140.500		98.25% Pervious Area
2.500		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	100	0.0200	0.05		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
92.8	3,050	0.0120	0.55		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	2,600	0.0060	2.93	11.71	Channel Flow, Area= 4.0 sf Perim= 6.0' r= 0.67' n= 0.030
143.0	5,750	Total			



Subcatchment DA1P: BASIN 1 PROPOSED

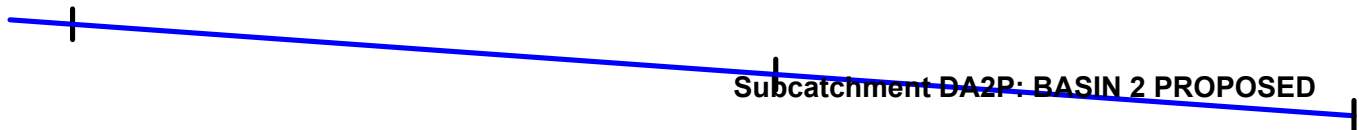
Summary for Subcatchment DA2P: BASIN 2 PROPOSED

Runoff = 58.90 cfs @ 12.88 hrs, Volume= 433,944 cf, Depth= 3.43"
 Routed to Pond CD2 : Cross Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

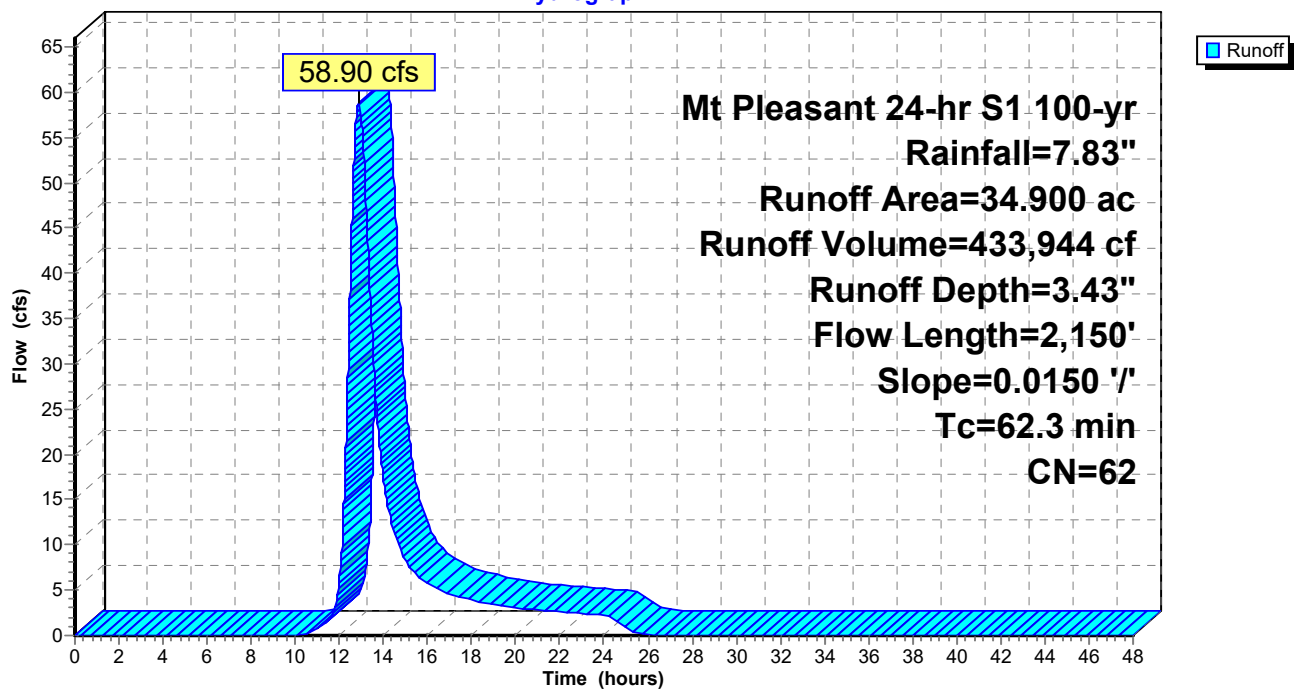
Area (ac)	CN	Description
17.450	58	Meadow, non-grazed, HSG B
14.450	60	Woods, Fair, HSG B
3.000	96	Gravel surface, HSG C
34.900	62	Weighted Average
34.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0150	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.57"
21.9	1,125	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.2	925	0.0150	0.61		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
62.3	2,150	Total			



Subcatchment DA2P: BASIN 2 PROPOSED

Hydrograph



Summary for Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Runoff = 15.32 cfs @ 12.03 hrs, Volume= 41,364 cf, Depth= 5.35"

Routed to Reach OF4P : Primary Stream for Outfalls

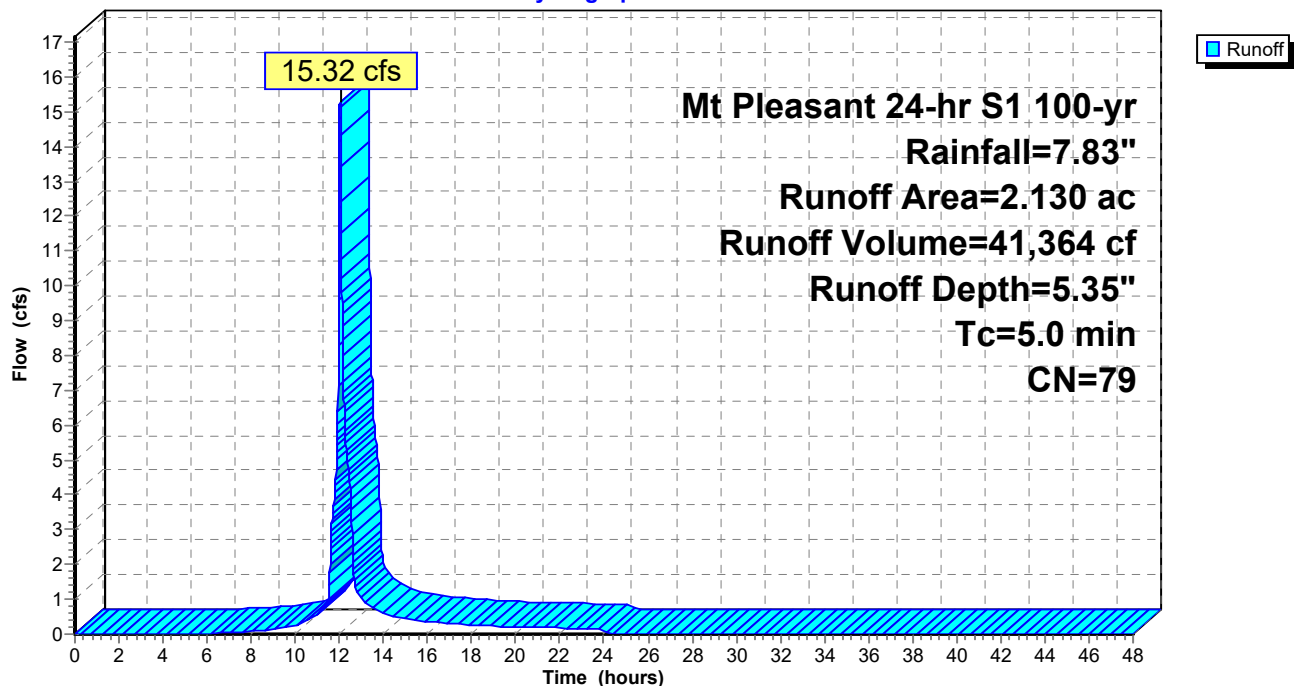
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
2.130	79	Woods, Fair, HSG D
2.130		100.00% Pervious Area

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

Subcatchment DA3P: BASIN 3 PRE DEVELOPMENT

Hydrograph



Summary for Subcatchment DA4A: BASIN 4A PROPOSED

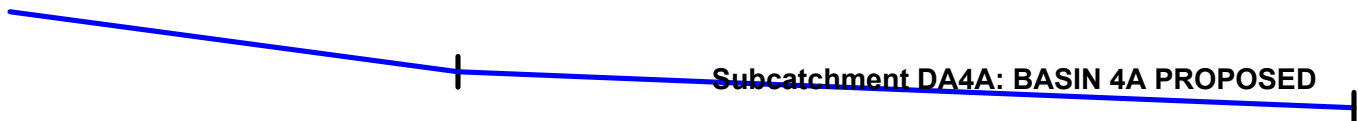
Runoff = 14.78 cfs @ 12.37 hrs, Volume= 73,840 cf, Depth= 4.09"

Routed to Reach OF4P : Primary Stream for Outfalls

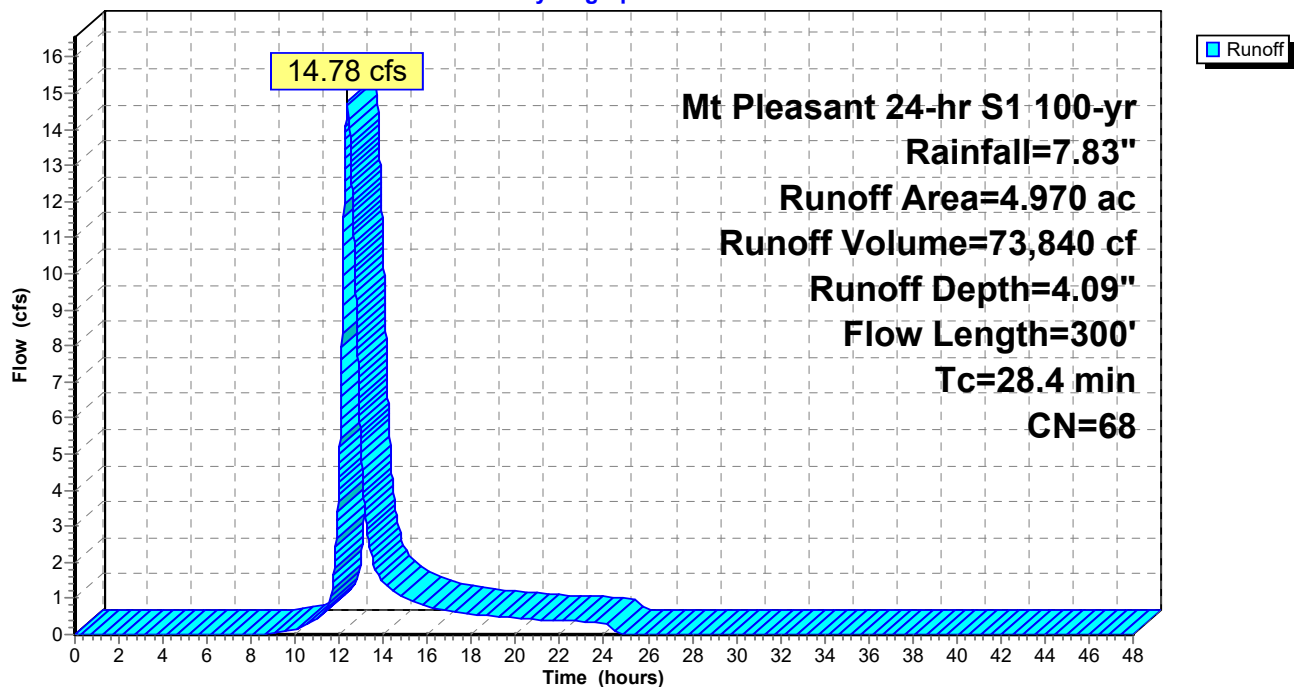
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
1.910	60	Woods, Fair, HSG B
3.060	73	Woods, Fair, HSG C
4.970	68	Weighted Average
4.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
3.9	200	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.4	300	Total			

**Subcatchment DA4A: BASIN 4A PROPOSED**

Hydrograph



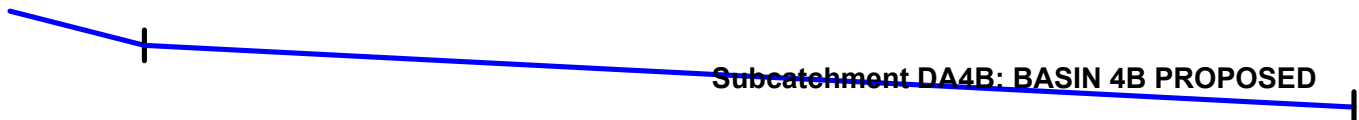
Summary for Subcatchment DA4B: BASIN 4B PROPOSED

Runoff = 55.10 cfs @ 12.42 hrs, Volume= 325,825 cf, Depth= 7.35"
 Routed to Pond POND1P : PROP POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

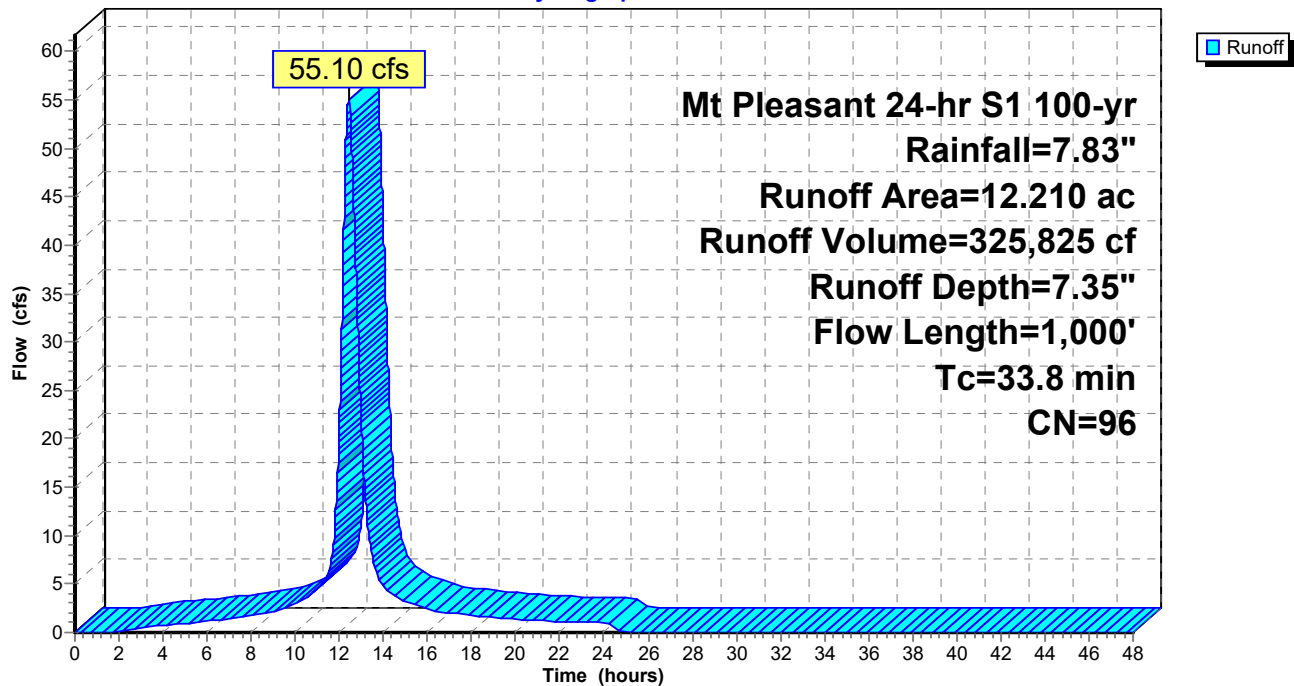
Area (ac)	CN	Description
9.210	96	Gravel surface, HSG C
1.000	98	Paved parking, HSG D
2.000	98	Roofs, HSG D
12.210	96	Weighted Average
9.210		75.43% Pervious Area
3.000		24.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, n= 0.800 P2= 3.57"
9.3	900	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
33.8	1,000	Total			



Subcatchment DA4B: BASIN 4B PROPOSED

Hydrograph



Summary for Subcatchment DA4C: BASIN 4C PROPOSED

Runoff = 9.74 cfs @ 12.03 hrs, Volume= 29,087 cf, Depth= 7.35"
 Routed to Reach D4C : Ditch 4C

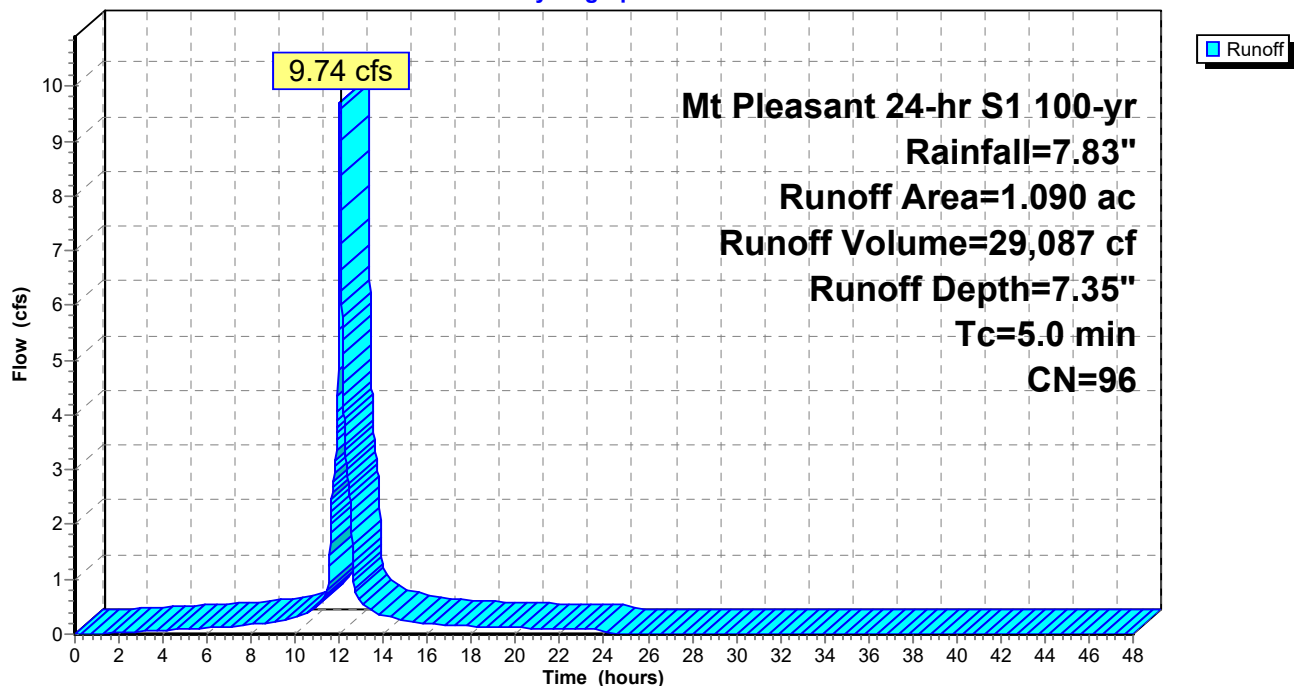
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
1.090	96	Gravel surface, HSG C
1.090		100.00% Pervious Area

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

Subcatchment DA4C: BASIN 4C PROPOSED

Hydrograph



Summary for Subcatchment DA4D: BASIN 4D PROPOSED

Runoff = 13.22 cfs @ 12.03 hrs, Volume= 39,494 cf, Depth= 7.35"
 Routed to Reach D4D : Ditch 4D

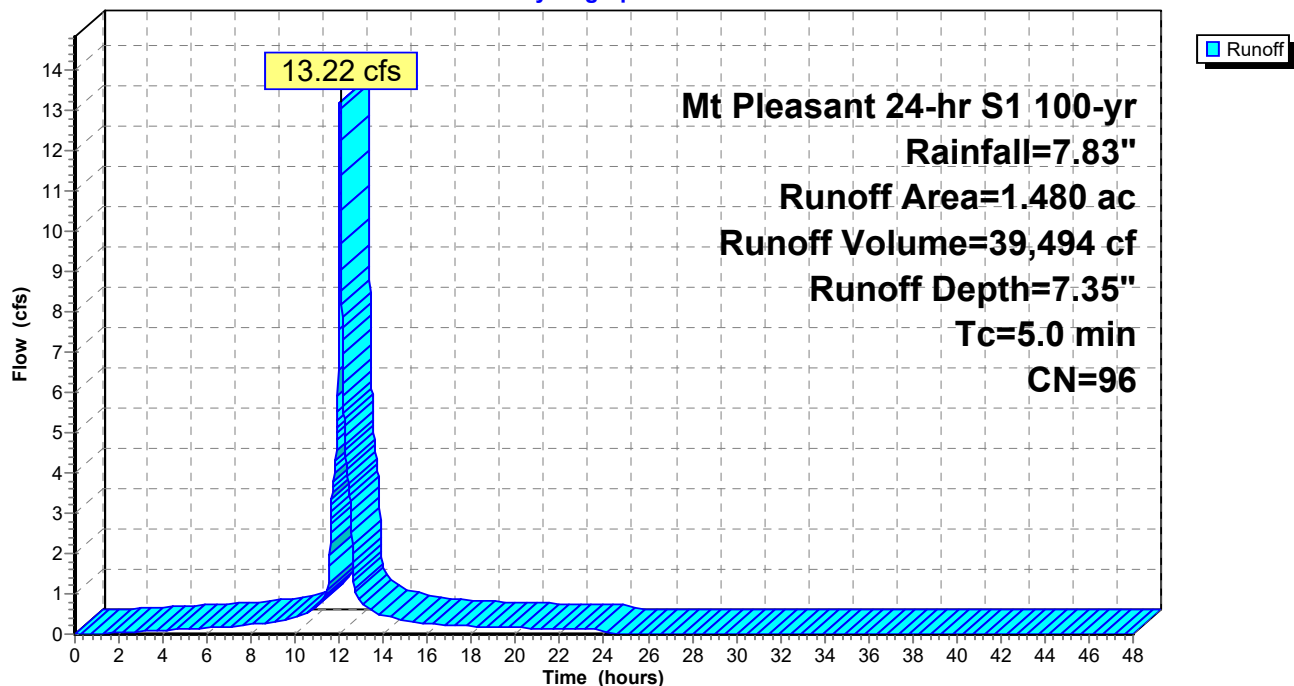
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
1.480	96	Gravel surface, HSG C
1.480		100.00% Pervious Area

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

Subcatchment DA4D: BASIN 4D PROPOSED

Hydrograph



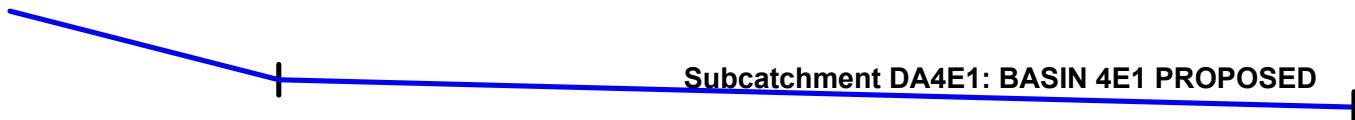
Summary for Subcatchment DA4E1: BASIN 4E1 PROPOSED

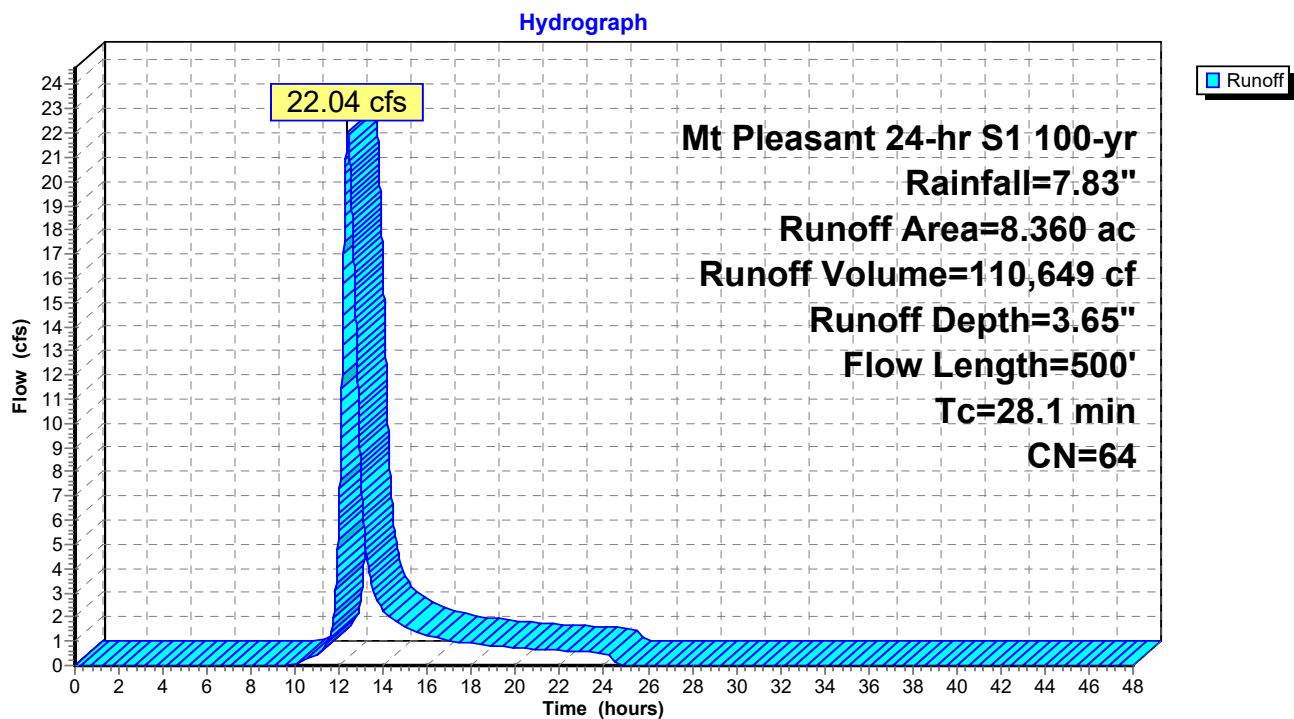
Runoff = 22.04 cfs @ 12.37 hrs, Volume= 110,649 cf, Depth= 3.65"
 Routed to Reach D4E1 : Ditch 4E1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

Area (ac)	CN	Description
3.680	58	Meadow, non-grazed, HSG B
3.680	60	Woods, Fair, HSG B
1.000	98	Paved roads w/curbs & sewers, HSG B
8.360	64	Weighted Average
7.360		88.04% Pervious Area
1.000		11.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	100	0.1000	0.09		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
9.5	400	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
28.1	500	Total			



Subcatchment DA4E1: BASIN 4E1 PROPOSED

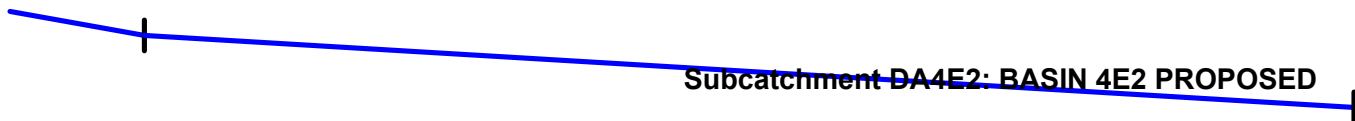
Summary for Subcatchment DA4E2: BASIN 4E2 PROPOSED

Runoff = 45.24 cfs @ 12.56 hrs, Volume= 265,631 cf, Depth= 4.21"
 Routed to Pond CD4E : Cross Drain 4E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Mt Pleasant 24-hr S1 100-yr Rainfall=7.83"

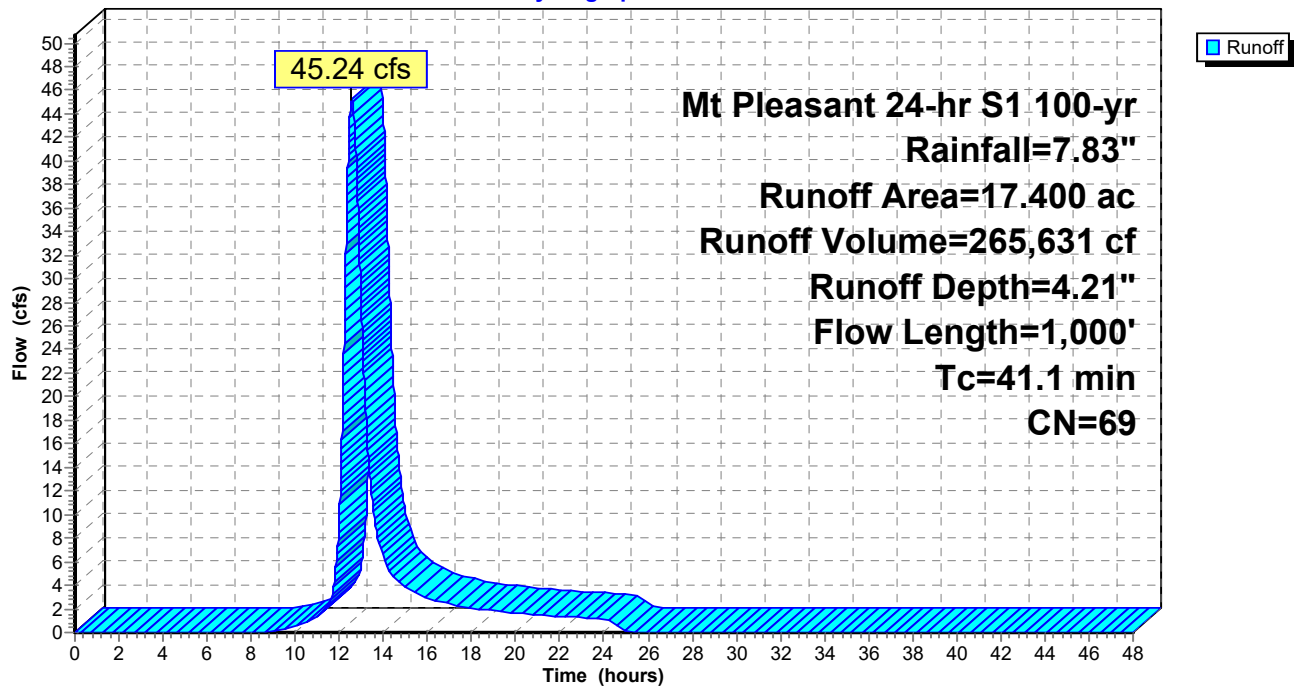
Area (ac)	CN	Description
8.700	79	Woods, Fair, HSG D
4.350	58	Meadow, non-grazed, HSG B
4.350	60	Woods, Fair, HSG B
17.400	69	Weighted Average
17.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0500	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.57"
16.6	900	0.0167	0.90		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
41.1	1,000	Total			



Subcatchment DA4E2: BASIN 4E2 PROPOSED

Hydrograph



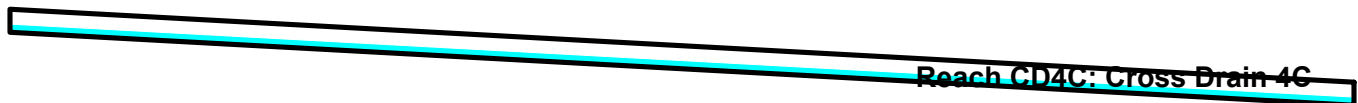
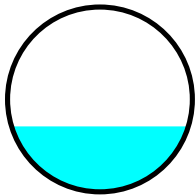
Summary for Reach CD4C: Cross Drain 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 7.35" for 100-yr event
Inflow = 9.33 cfs @ 12.04 hrs, Volume= 29,087 cf
Outflow = 9.33 cfs @ 12.04 hrs, Volume= 29,087 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CD4DCE : Cross Drain 4DCE

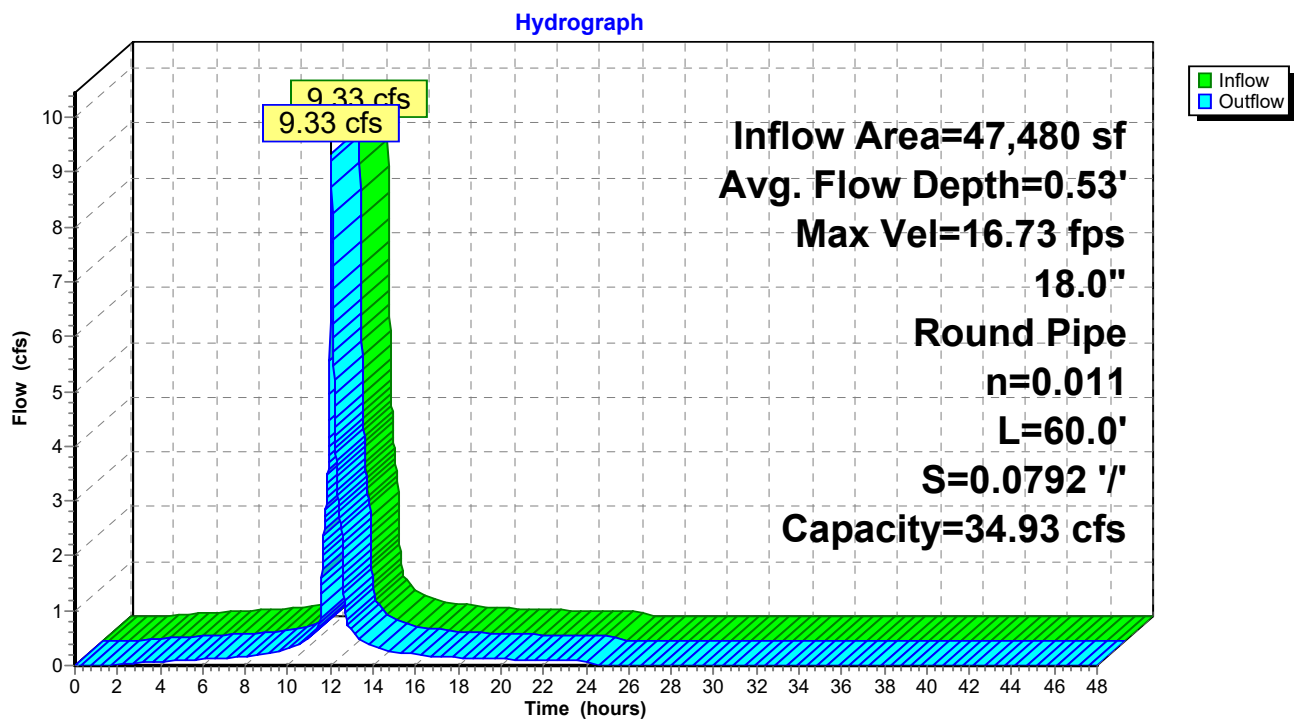
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.73 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 5.09 fps, Avg. Travel Time= 0.2 min

Peak Storage= 33 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.43'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 34.93 cfs

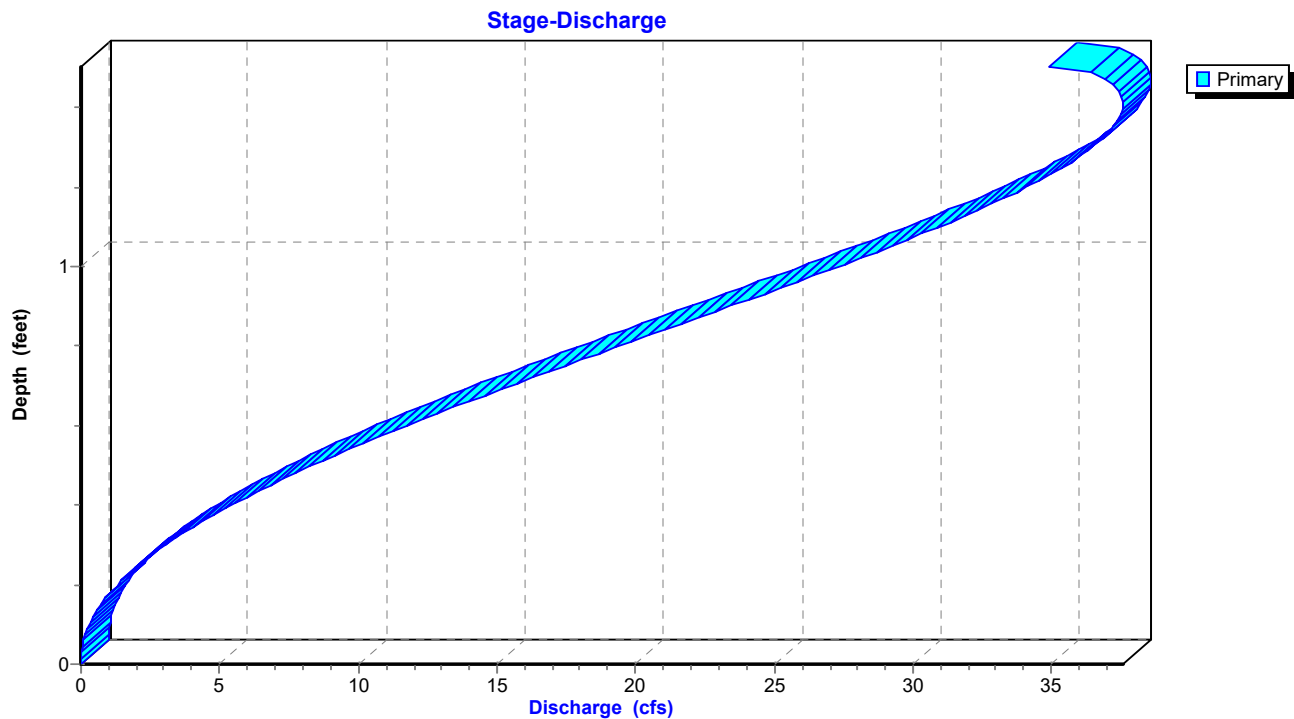
18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0792 '/
Inlet Invert= 683.75', Outlet Invert= 679.00'

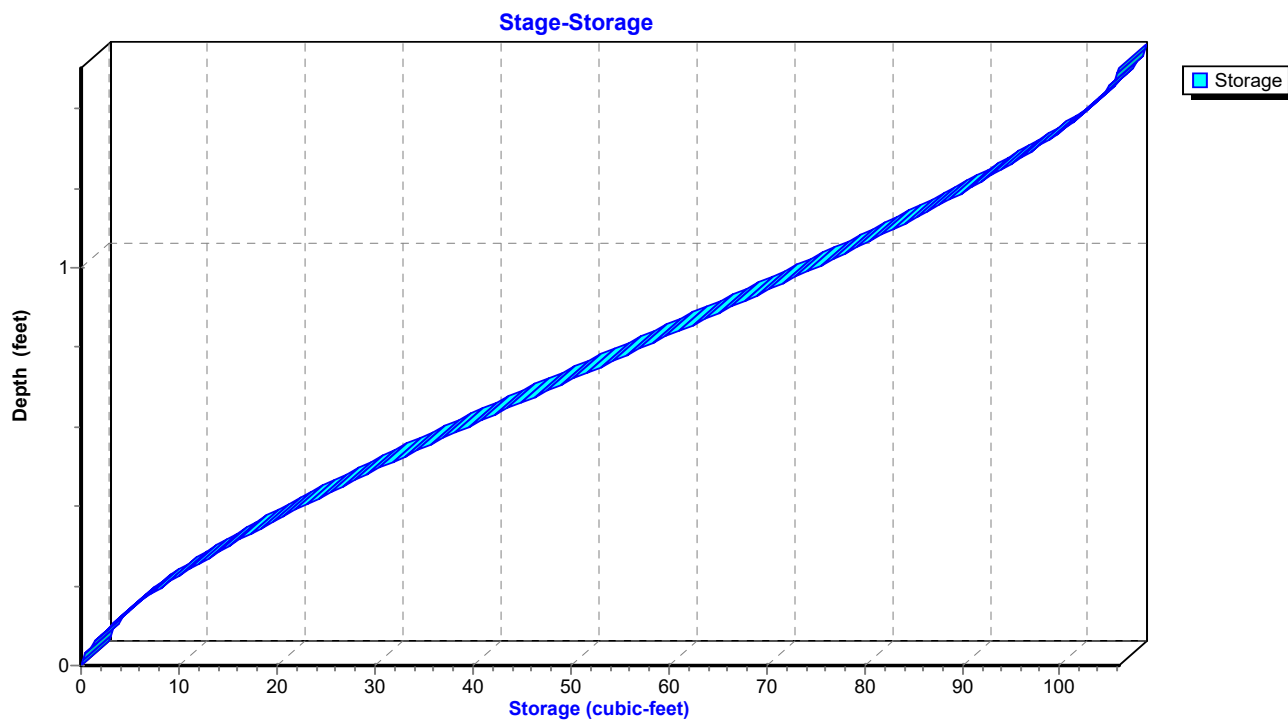


Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C



Reach CD4C: Cross Drain 4C

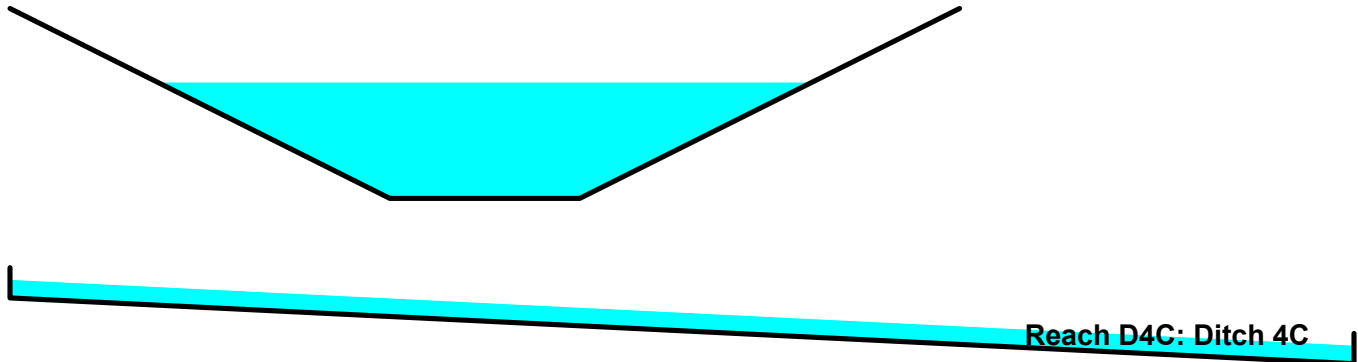
Summary for Reach D4C: Ditch 4C

Inflow Area = 47,480 sf, 0.00% Impervious, Inflow Depth = 7.35" for 100-yr event
Inflow = 9.74 cfs @ 12.03 hrs, Volume= 29,087 cf
Outflow = 9.33 cfs @ 12.04 hrs, Volume= 29,087 cf, Atten= 4%, Lag= 1.1 min
Routed to Reach CD4C : Cross Drain 4C

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.06 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 5.7 min

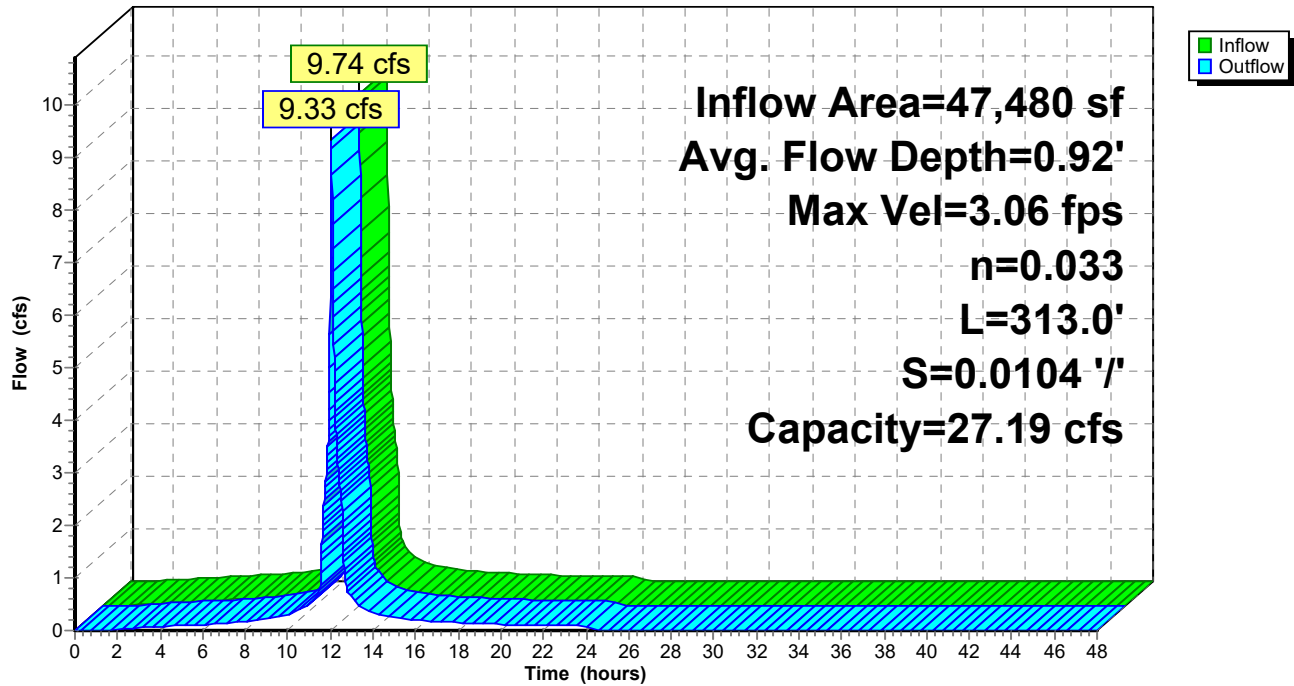
Peak Storage= 954 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.92' , Surface Width= 5.16'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 27.19 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 ' / ' Top Width= 7.50'
Length= 313.0' Slope= 0.0104 ' / '
Inlet Invert= 687.00', Outlet Invert= 683.75'



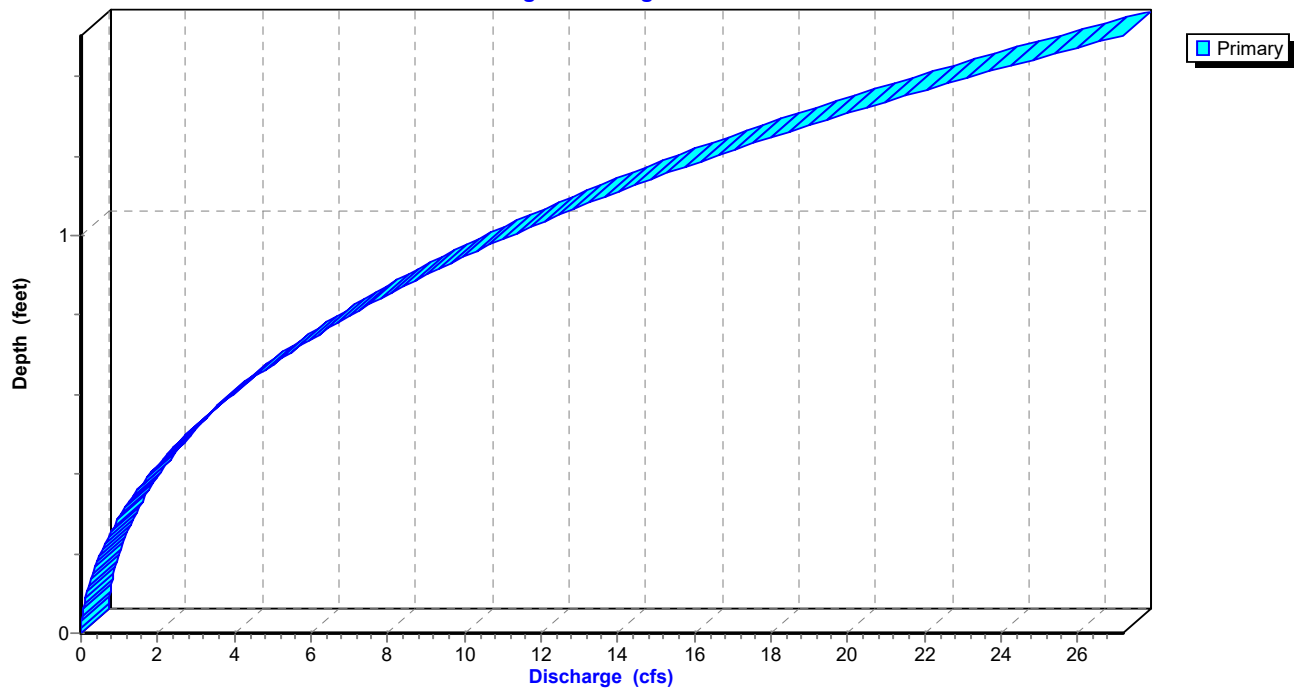
Reach D4C: Ditch 4C

Hydrograph

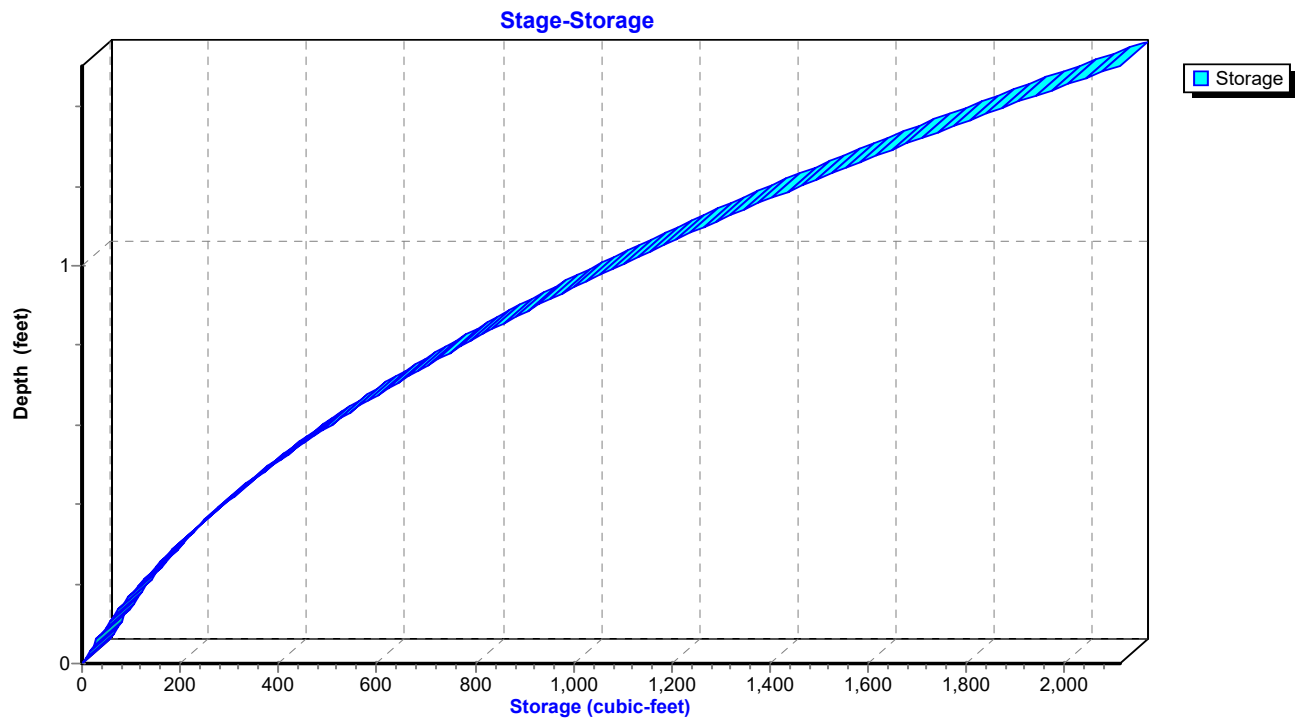


Reach D4C: Ditch 4C

Stage-Discharge



Reach D4C: Ditch 4C



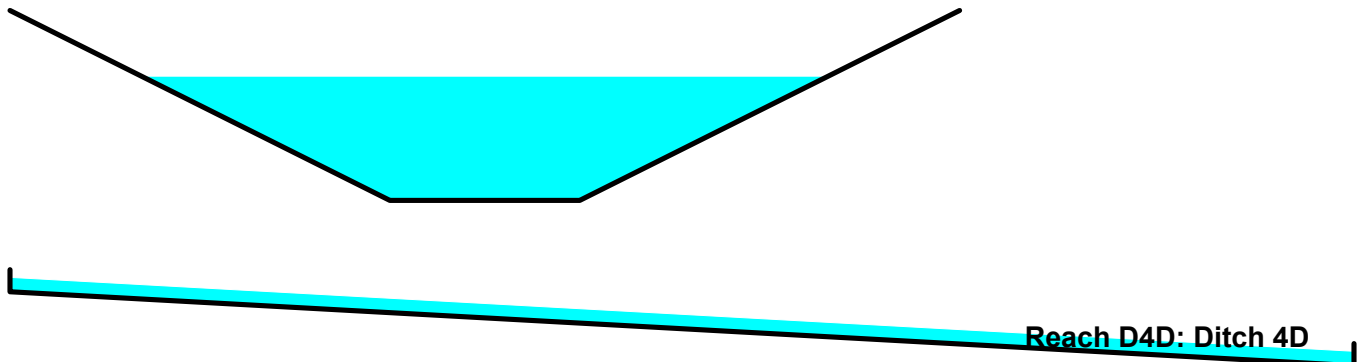
Summary for Reach D4D: Ditch 4D

Inflow Area = 64,469 sf, 0.00% Impervious, Inflow Depth = 7.35" for 100-yr event
Inflow = 13.22 cfs @ 12.03 hrs, Volume= 39,494 cf
Outflow = 12.79 cfs @ 12.04 hrs, Volume= 39,494 cf, Atten= 3%, Lag= 0.9 min
Routed to Pond CD4DCE : Cross Drain 4DCE

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.79 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 4.9 min

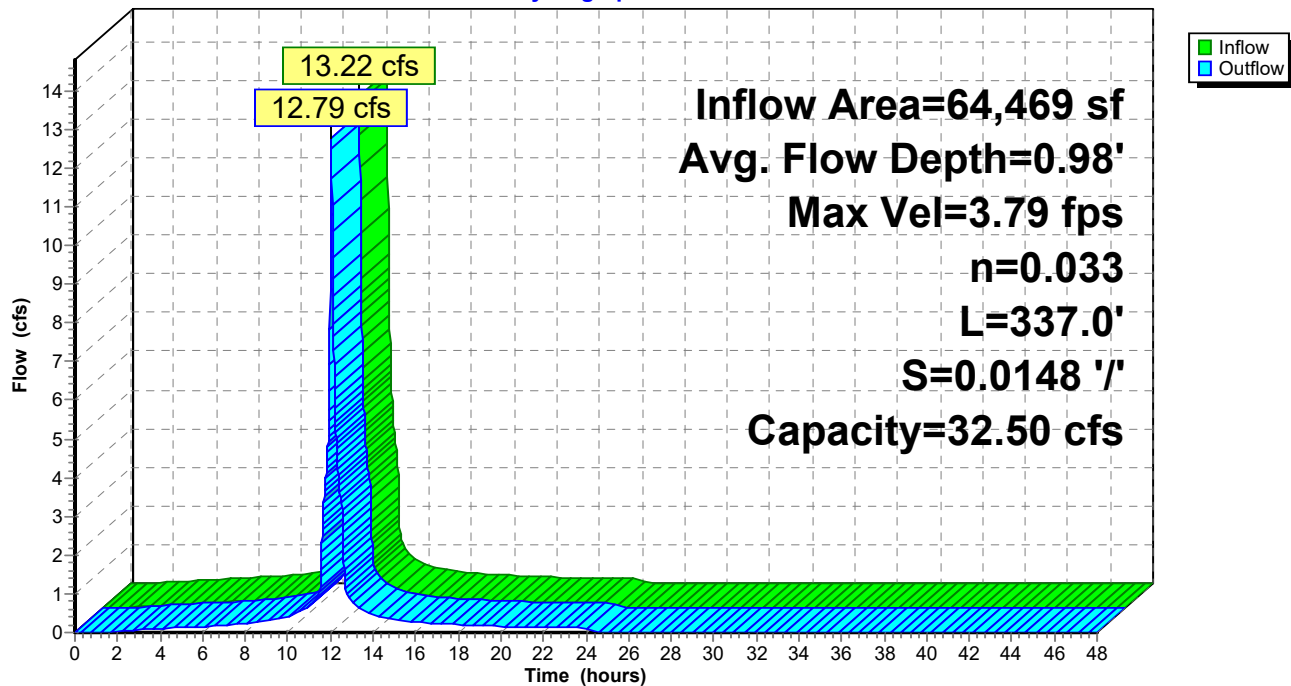
Peak Storage= 1,137 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.98' , Surface Width= 5.41'
Bank-Full Depth= 1.50' Flow Area= 6.8 sf, Capacity= 32.50 cfs

1.50' x 1.50' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 7.50'
Length= 337.0' Slope= 0.0148 '/'
Inlet Invert= 688.00', Outlet Invert= 683.00'



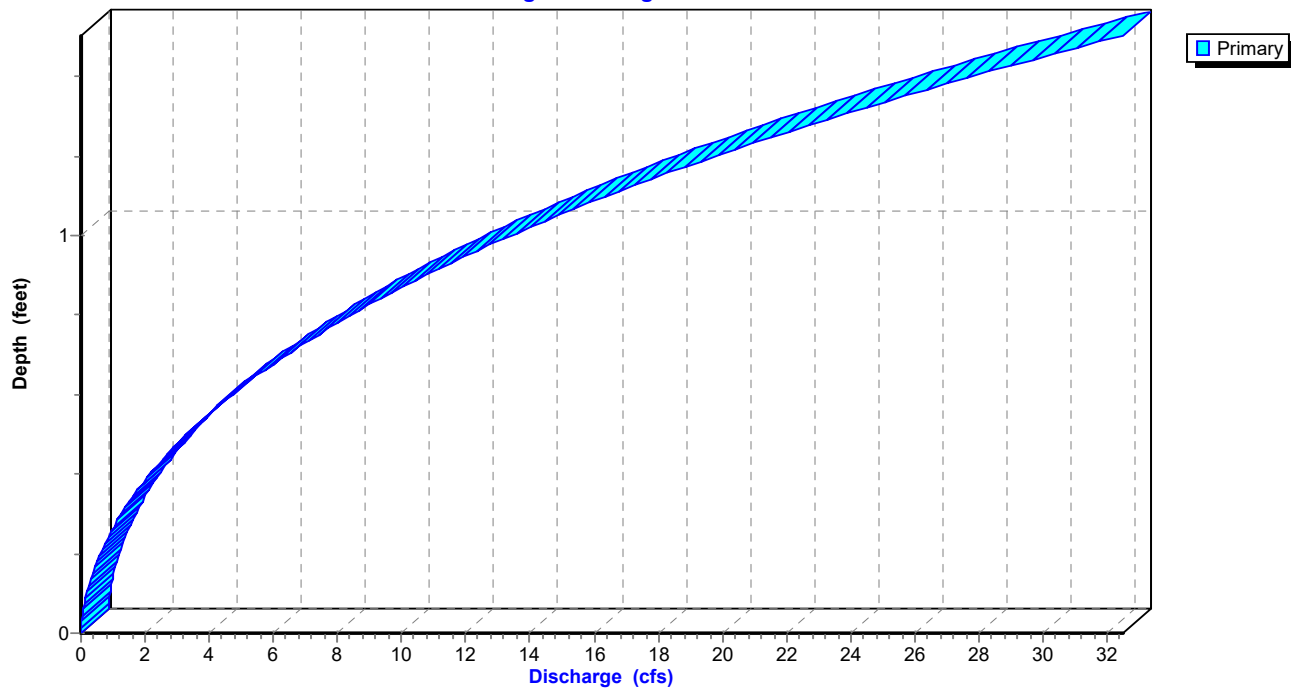
Reach D4D: Ditch 4D

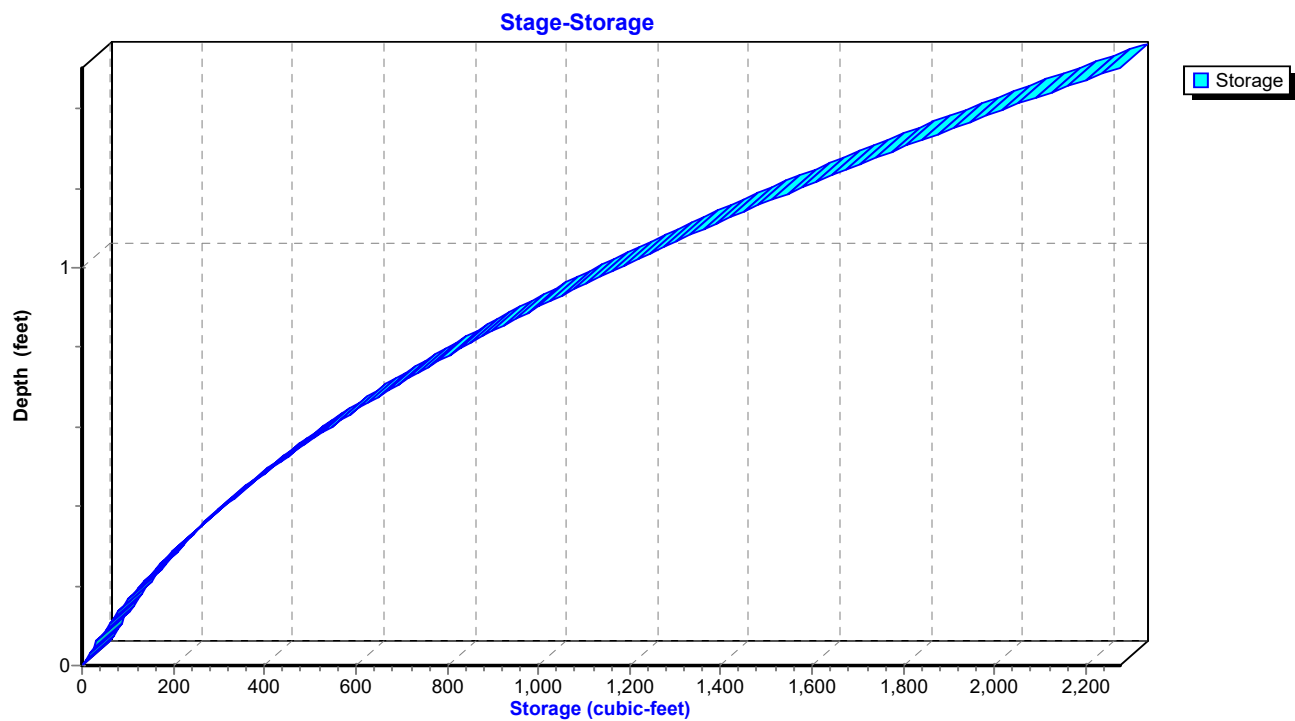
Hydrograph



Reach D4D: Ditch 4D

Stage-Discharge



Reach D4D: Ditch 4D

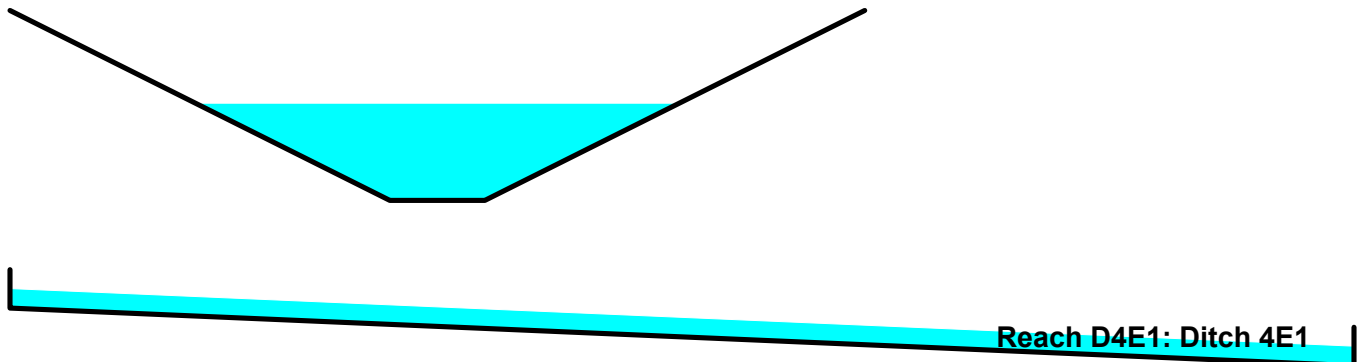
Summary for Reach D4E1: Ditch 4E1

Inflow Area = 364,162 sf, 11.96% Impervious, Inflow Depth = 3.65" for 100-yr event
Inflow = 22.04 cfs @ 12.37 hrs, Volume= 110,649 cf
Outflow = 21.65 cfs @ 12.43 hrs, Volume= 110,649 cf, Atten= 2%, Lag= 3.3 min
Routed to Pond CD4E : Cross Drain 4E

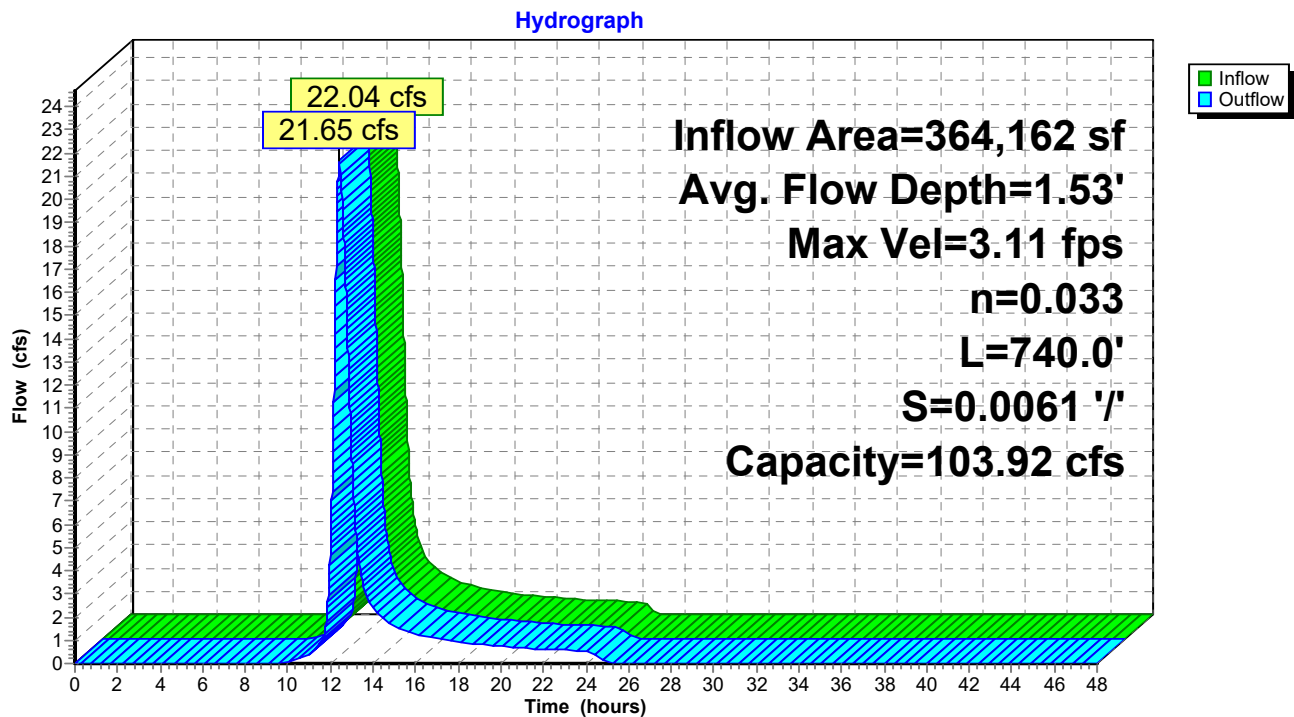
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.11 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 10.8 min

Peak Storage= 5,146 cf @ 12.43 hrs
Average Depth at Peak Storage= 1.53' , Surface Width= 7.61'
Bank-Full Depth= 3.00' Flow Area= 22.5 sf, Capacity= 103.92 cfs

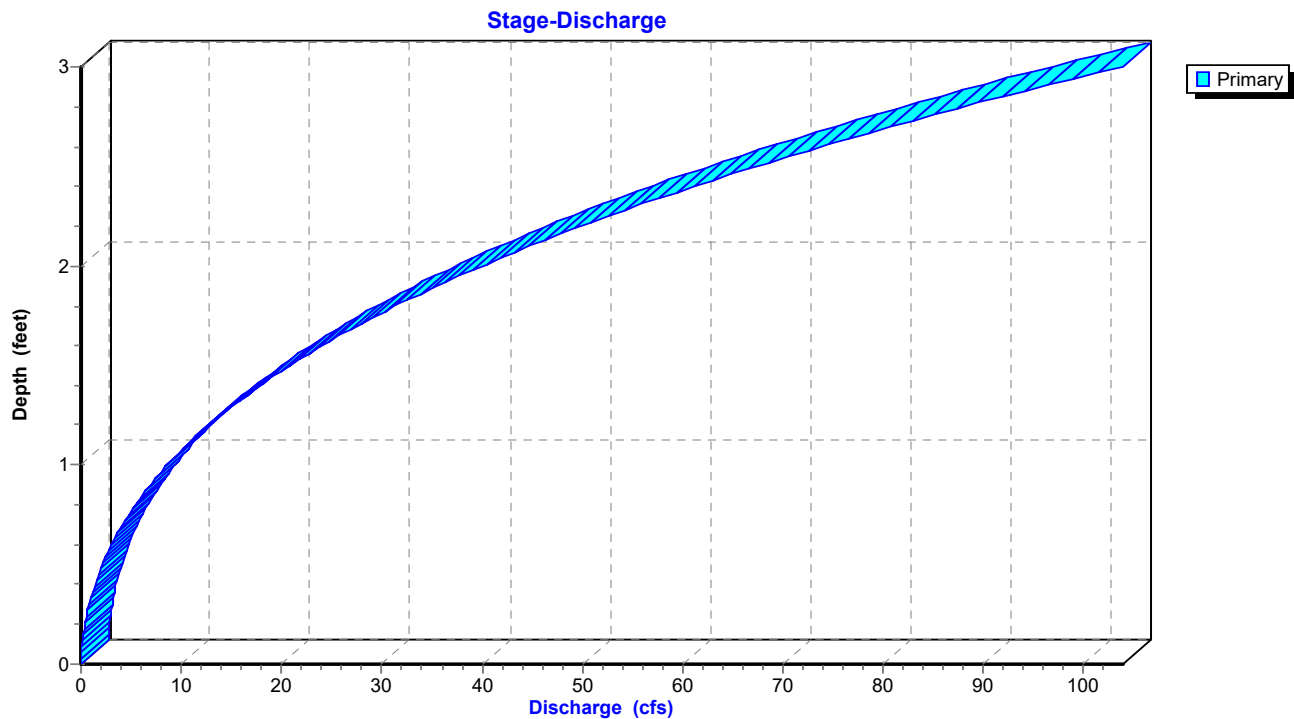
1.50' x 3.00' deep channel, n= 0.033 Riprap, 1-inch
Side Slope Z-value= 2.0 '/' Top Width= 13.50'
Length= 740.0' Slope= 0.0061 '/'
Inlet Invert= 684.00', Outlet Invert= 679.50'



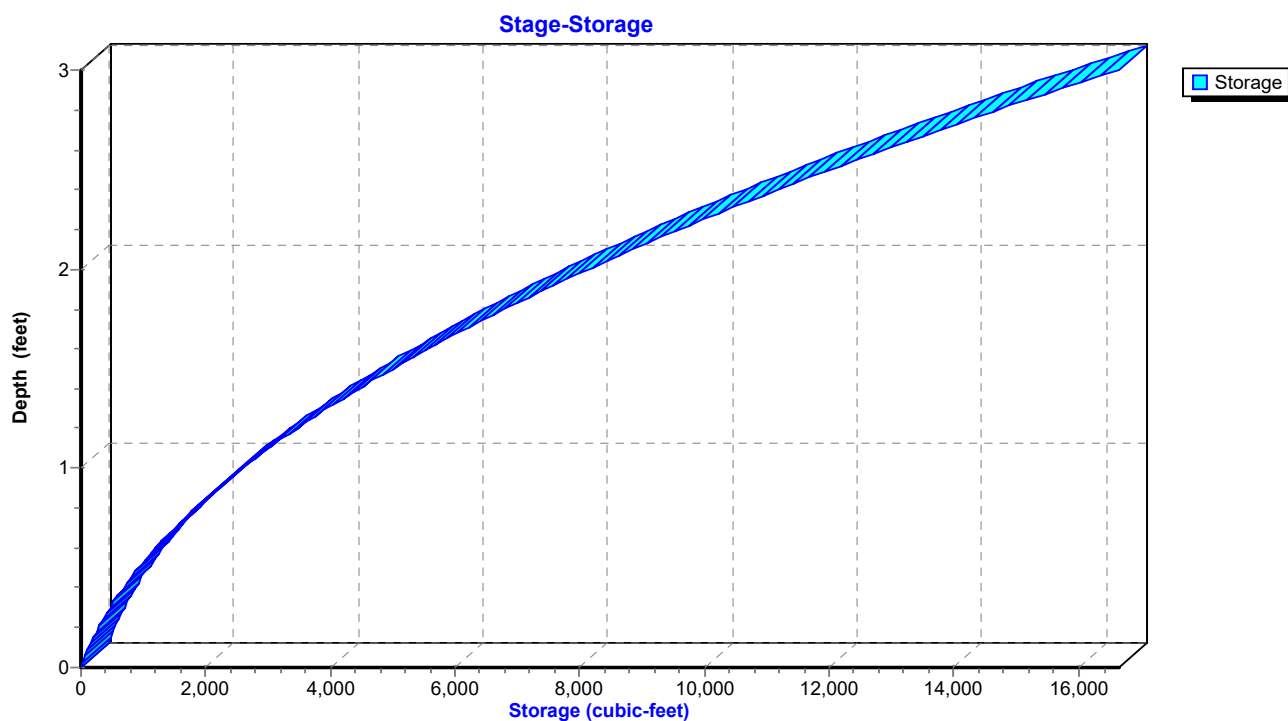
Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



Reach D4E1: Ditch 4E1



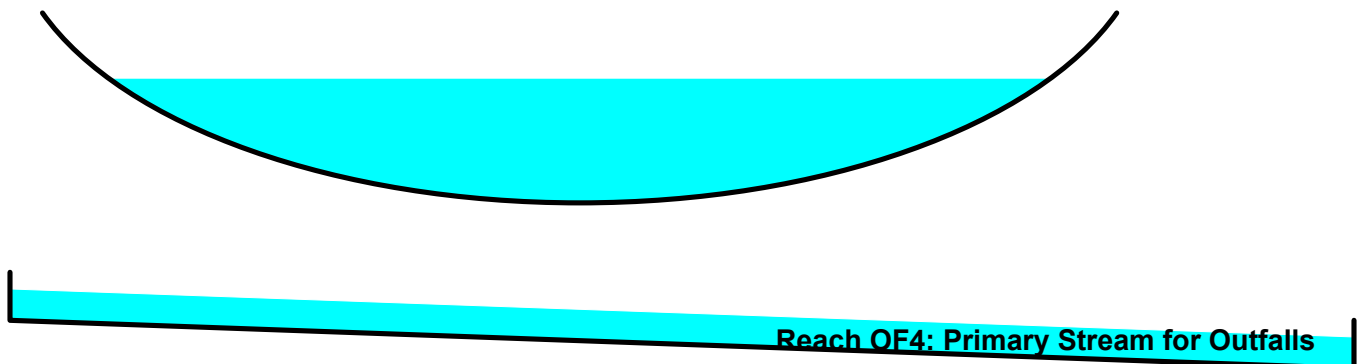
Summary for Reach OF4: Primary Stream for Outfalls

Inflow Area = 9,972,626 sf, 1.09% Impervious, Inflow Depth = 4.55" for 100-yr event
Inflow = 258.38 cfs @ 13.03 hrs, Volume= 3,779,517 cf
Outflow = 258.22 cfs @ 13.10 hrs, Volume= 3,779,517 cf, Atten= 0%, Lag= 4.2 min

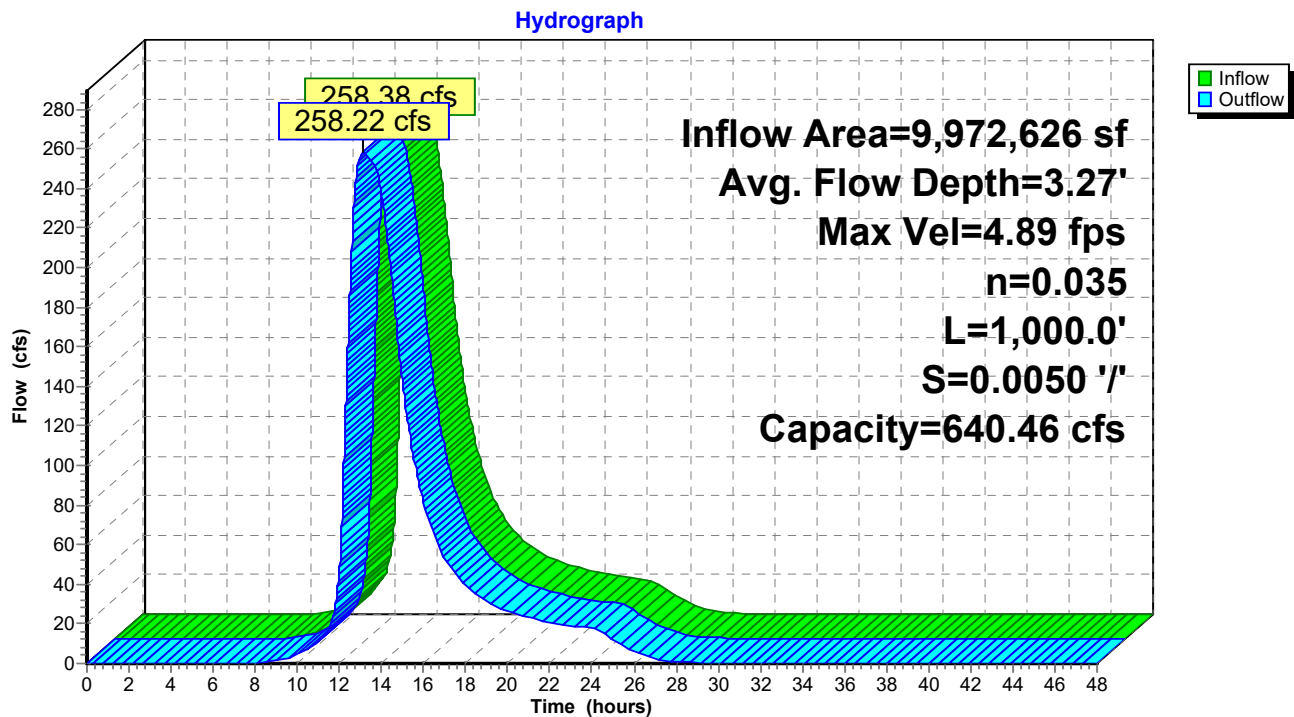
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.76 fps, Avg. Travel Time= 9.5 min

Peak Storage= 52,779 cf @ 13.10 hrs
Average Depth at Peak Storage= 3.27' , Surface Width= 24.24'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

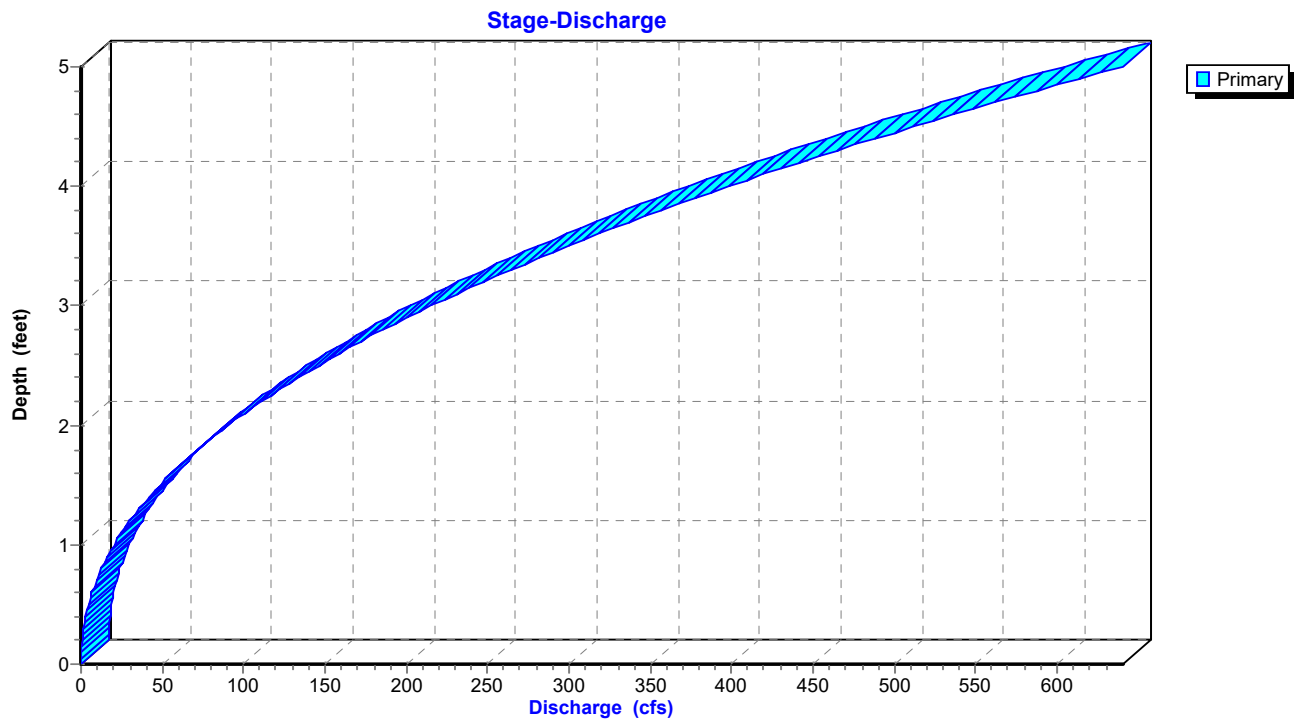
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

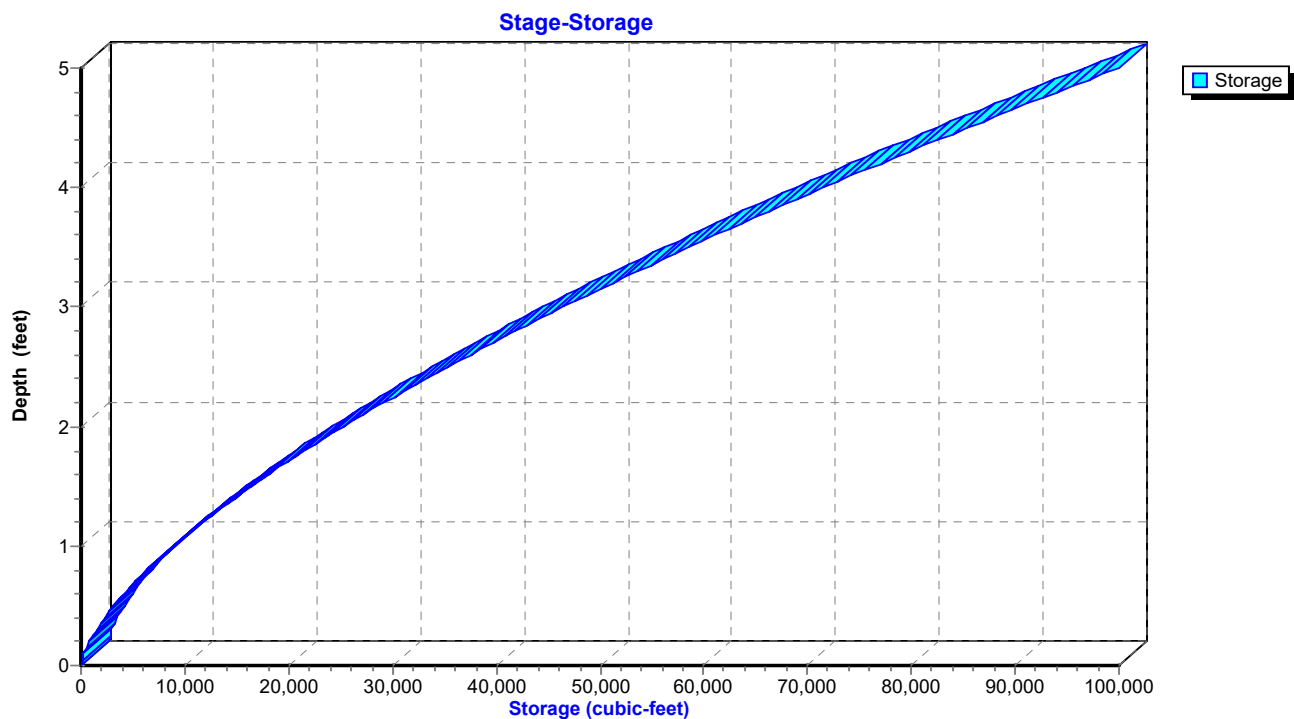


Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls



Reach OF4: Primary Stream for Outfalls

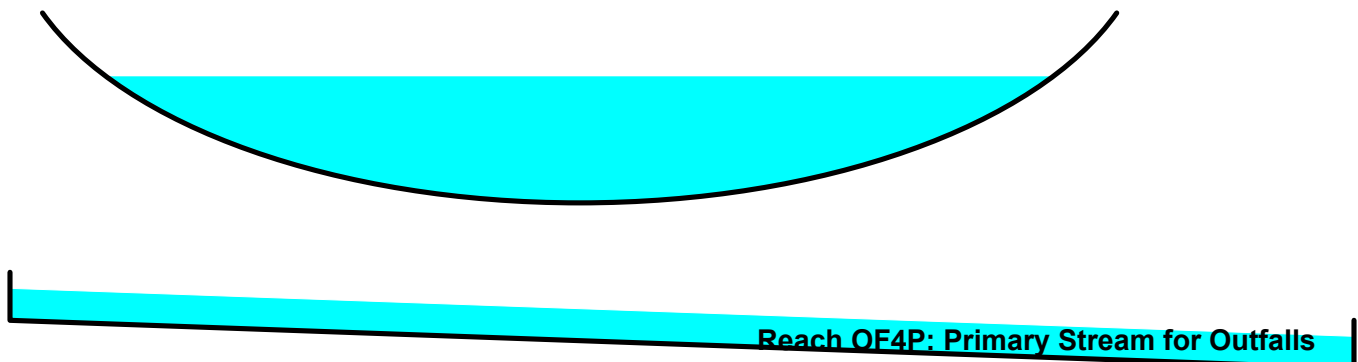
Summary for Reach OF4P: Primary Stream for Outfalls

Inflow Area = 9,824,522 sf, 2.88% Impervious, Inflow Depth = 4.71" for 100-yr event
Inflow = 268.87 cfs @ 13.67 hrs, Volume= 3,856,857 cf
Outflow = 268.53 cfs @ 13.71 hrs, Volume= 3,856,855 cf, Atten= 0%, Lag= 2.5 min

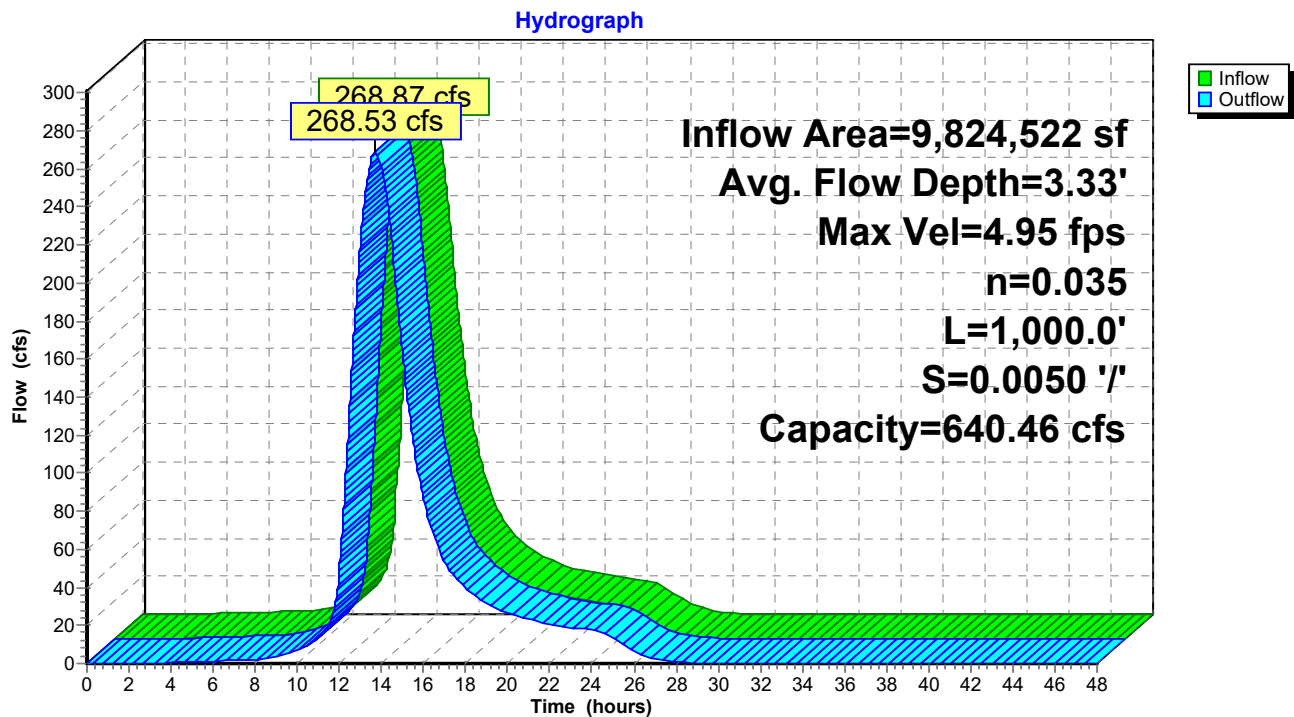
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 12.1 min

Peak Storage= 54,247 cf @ 13.71 hrs
Average Depth at Peak Storage= 3.33' , Surface Width= 24.47'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 640.46 cfs

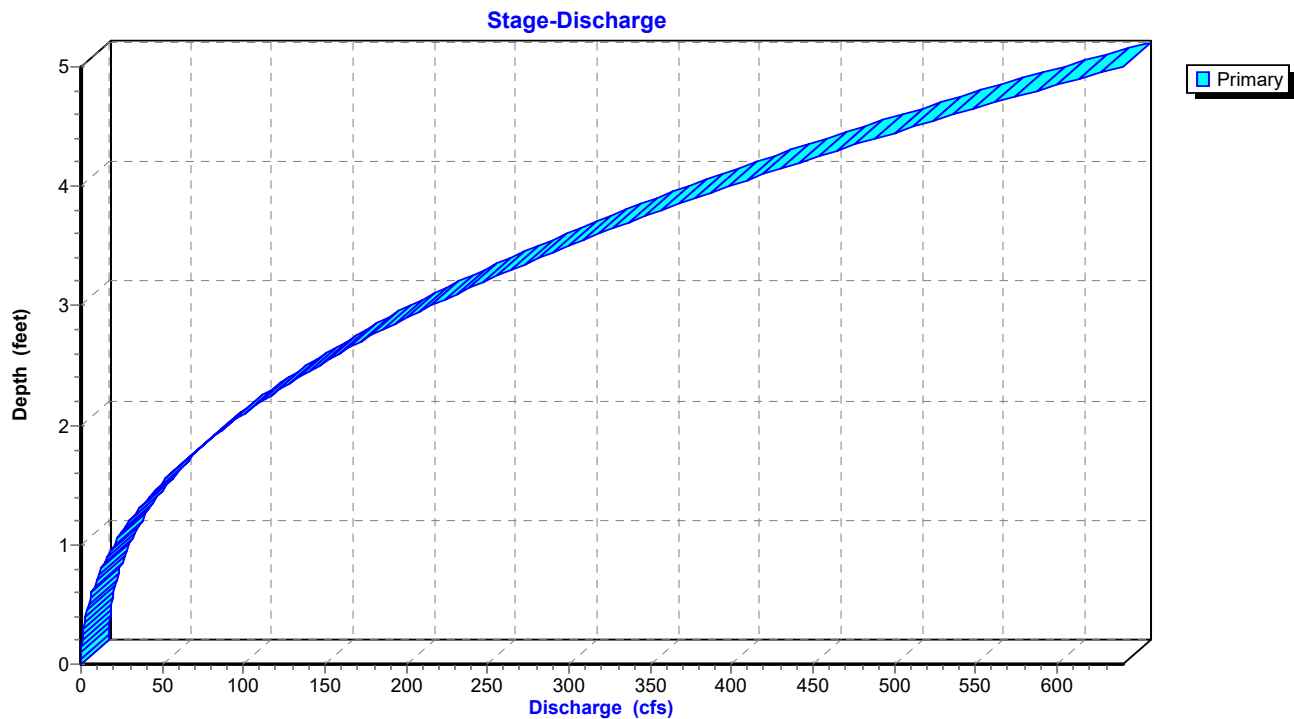
30.00' x 5.00' deep Parabolic Channel, n= 0.035
Length= 1,000.0' Slope= 0.0050 '/'
Inlet Invert= 675.00', Outlet Invert= 670.00'

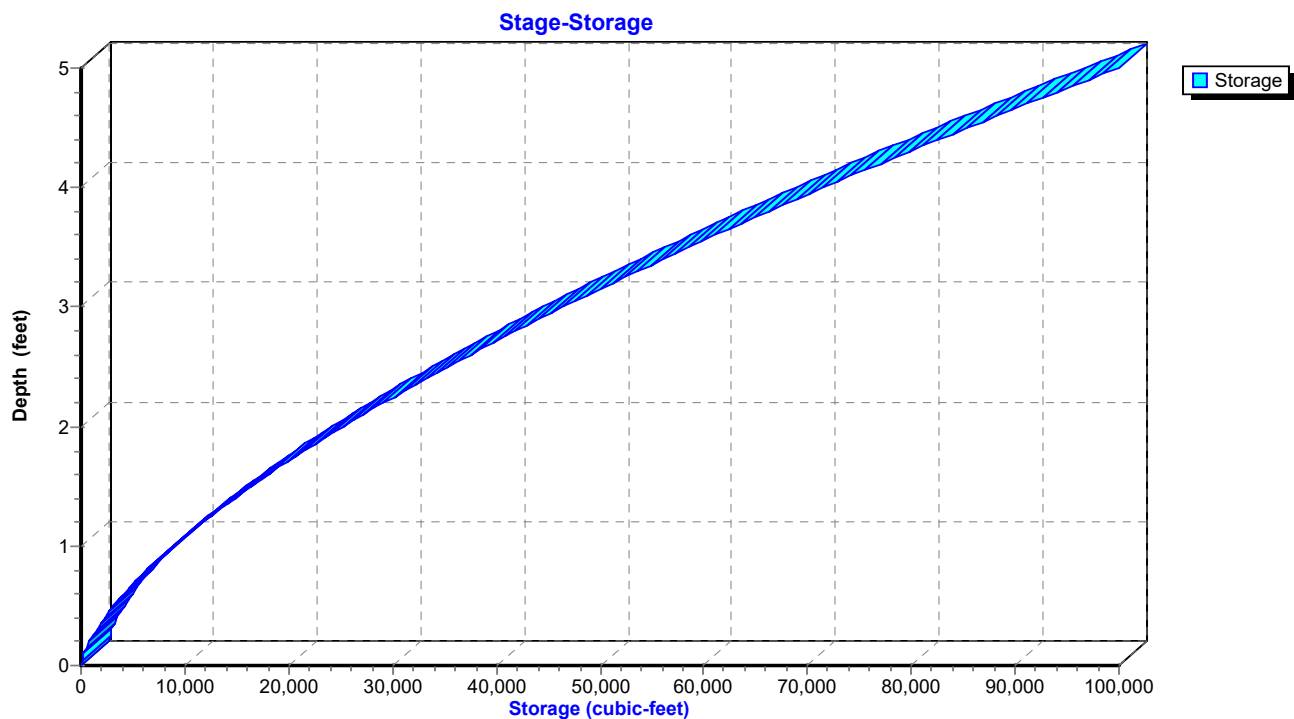


Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls



Reach OF4P: Primary Stream for Outfalls

Summary for Pond CD2: Cross Drain

Inflow Area = 1,520,244 sf, 0.00% Impervious, Inflow Depth = 3.43" for 100-yr event
 Inflow = 58.90 cfs @ 12.88 hrs, Volume= 433,944 cf
 Outflow = 58.90 cfs @ 12.88 hrs, Volume= 433,944 cf, Atten= 0%, Lag= 0.0 min
 Primary = 58.90 cfs @ 12.88 hrs, Volume= 433,944 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 684.90' @ 12.88 hrs

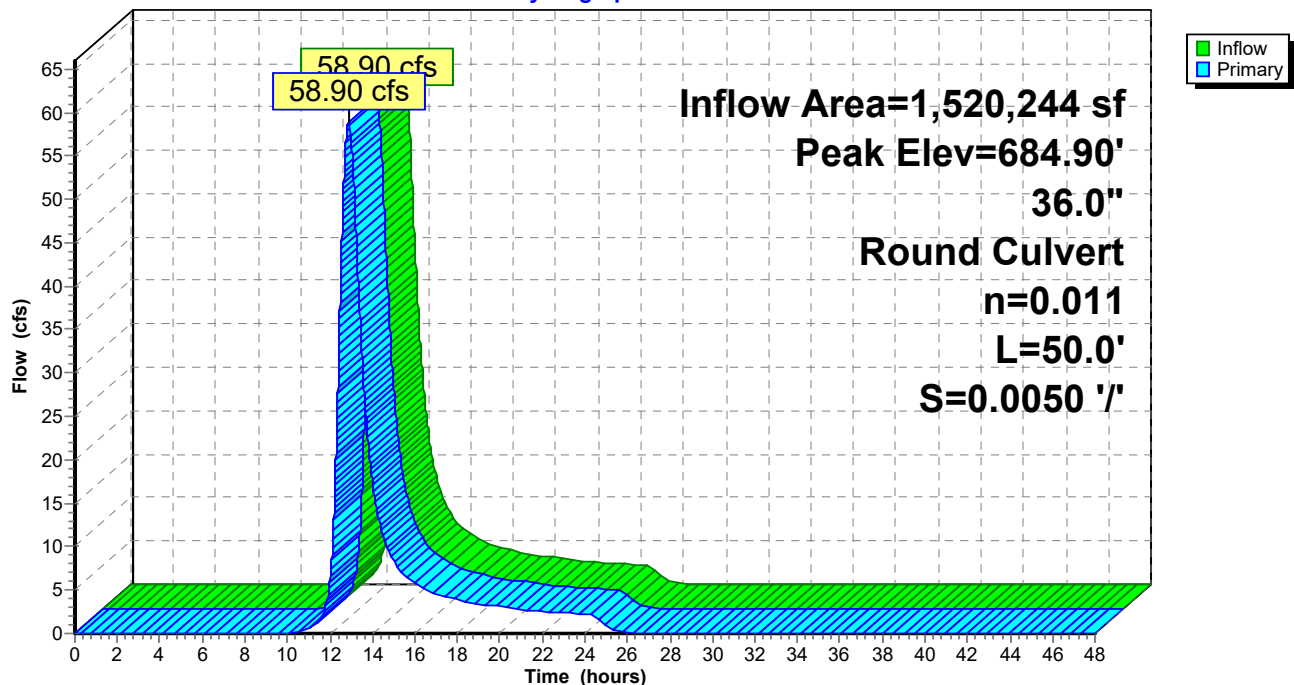
Device	Routing	Invert	Outlet Devices
#1	Primary	680.25'	36.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 680.25' / 680.00' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

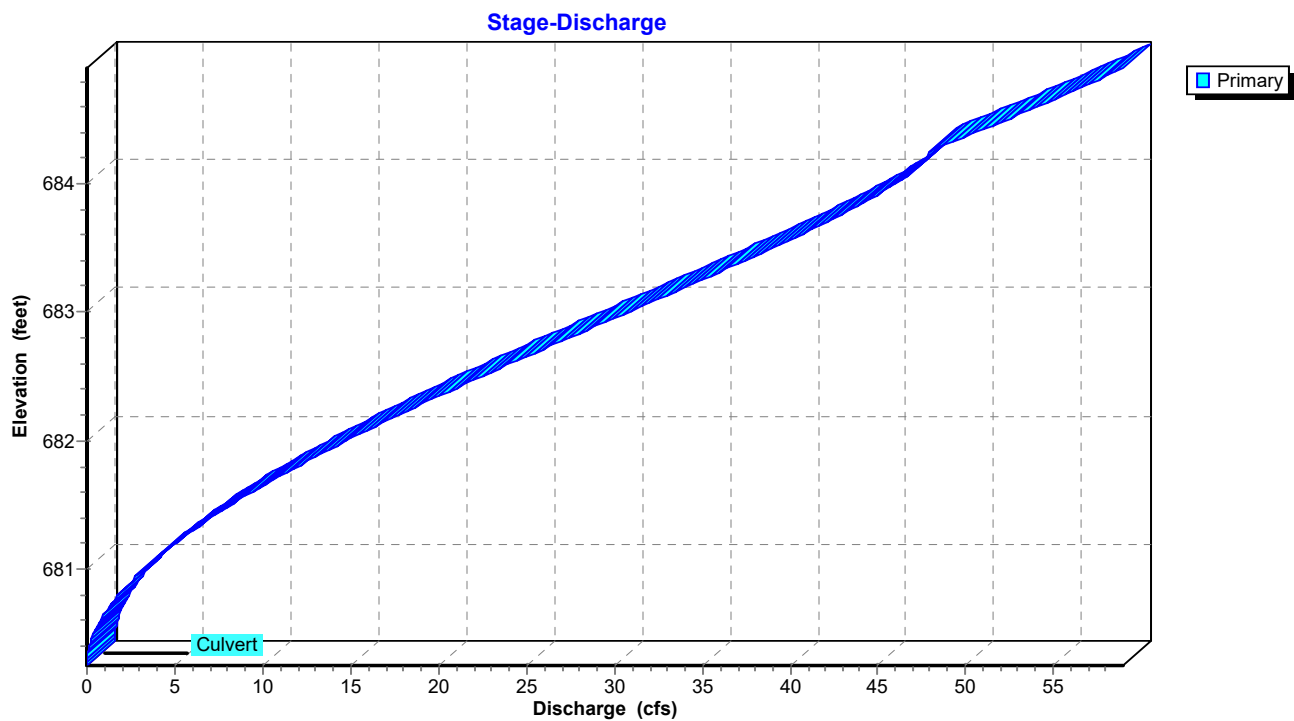
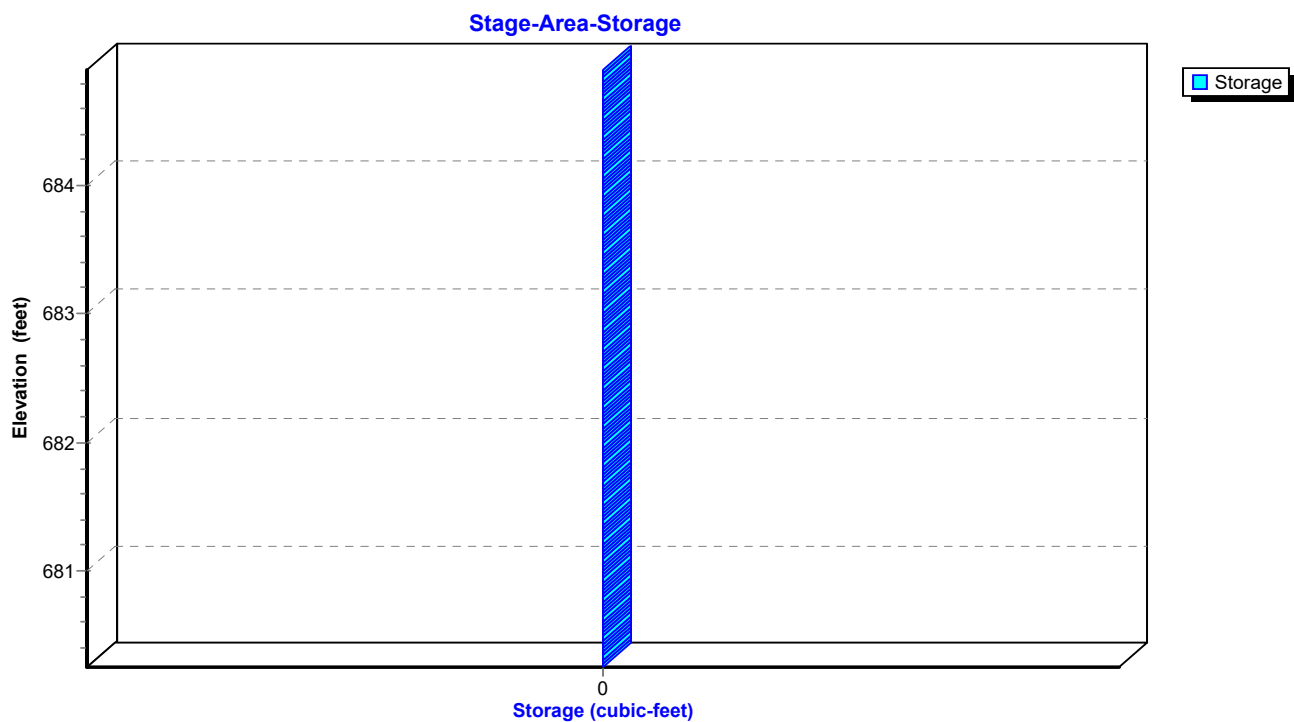
Primary OutFlow Max=58.89 cfs @ 12.88 hrs HW=684.90' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 58.89 cfs @ 8.33 fps)

~~Culvert CD2: Cross Drain~~

Pond CD2: Cross Drain

Hydrograph



Pond CD2: Cross Drain**Pond CD2: Cross Drain**

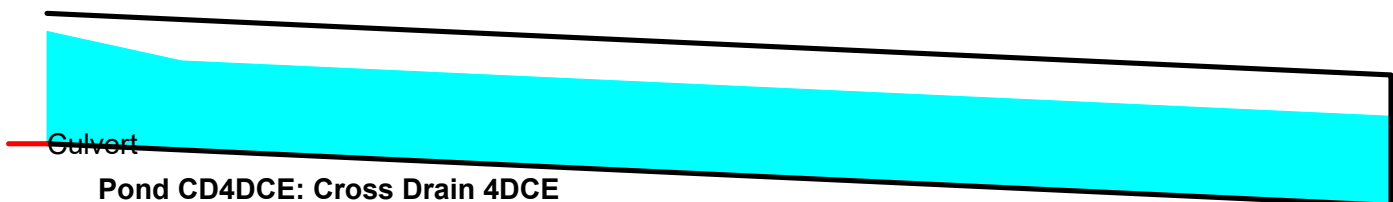
Summary for Pond CD4DCE: Cross Drain 4DCE

Inflow Area = 1,234,055 sf, 3.53% Impervious, Inflow Depth = 4.33" for 100-yr event
 Inflow = 71.43 cfs @ 12.48 hrs, Volume= 444,860 cf
 Outflow = 71.43 cfs @ 12.48 hrs, Volume= 444,860 cf, Atten= 0%, Lag= 0.0 min
 Primary = 71.43 cfs @ 12.48 hrs, Volume= 444,860 cf
 Routed to Pond POND1P : PROP POND

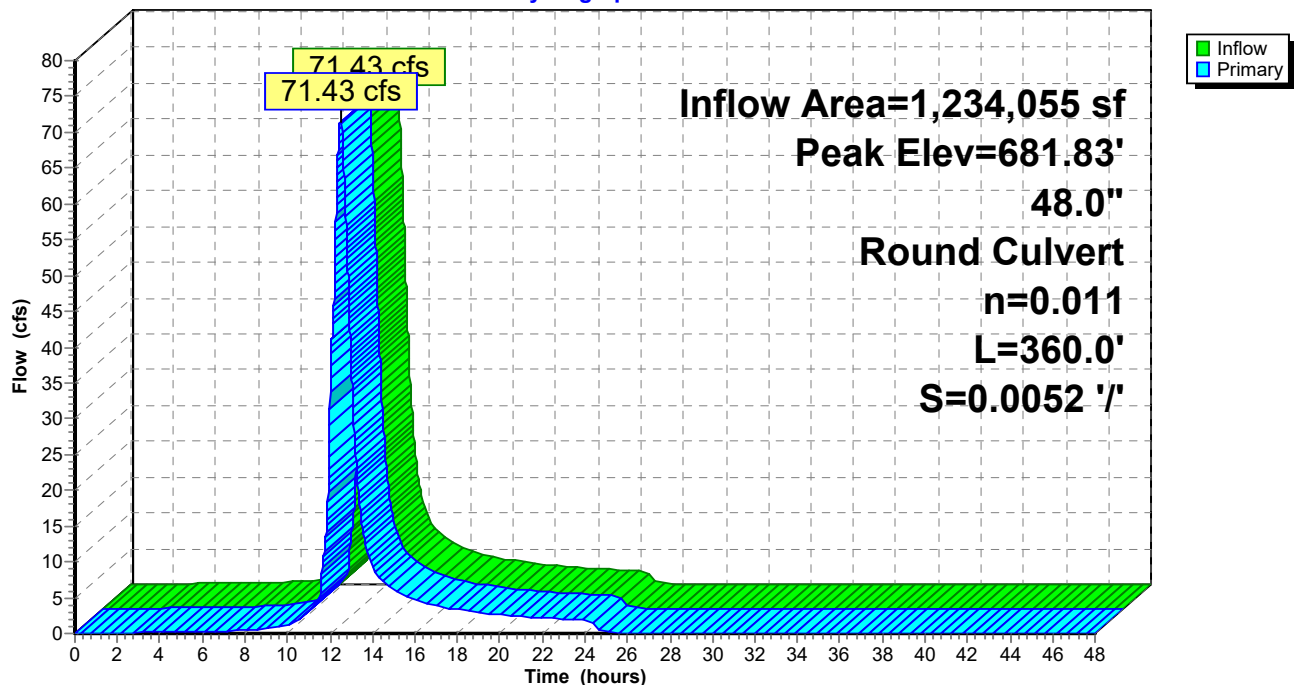
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 681.83' @ 12.48 hrs

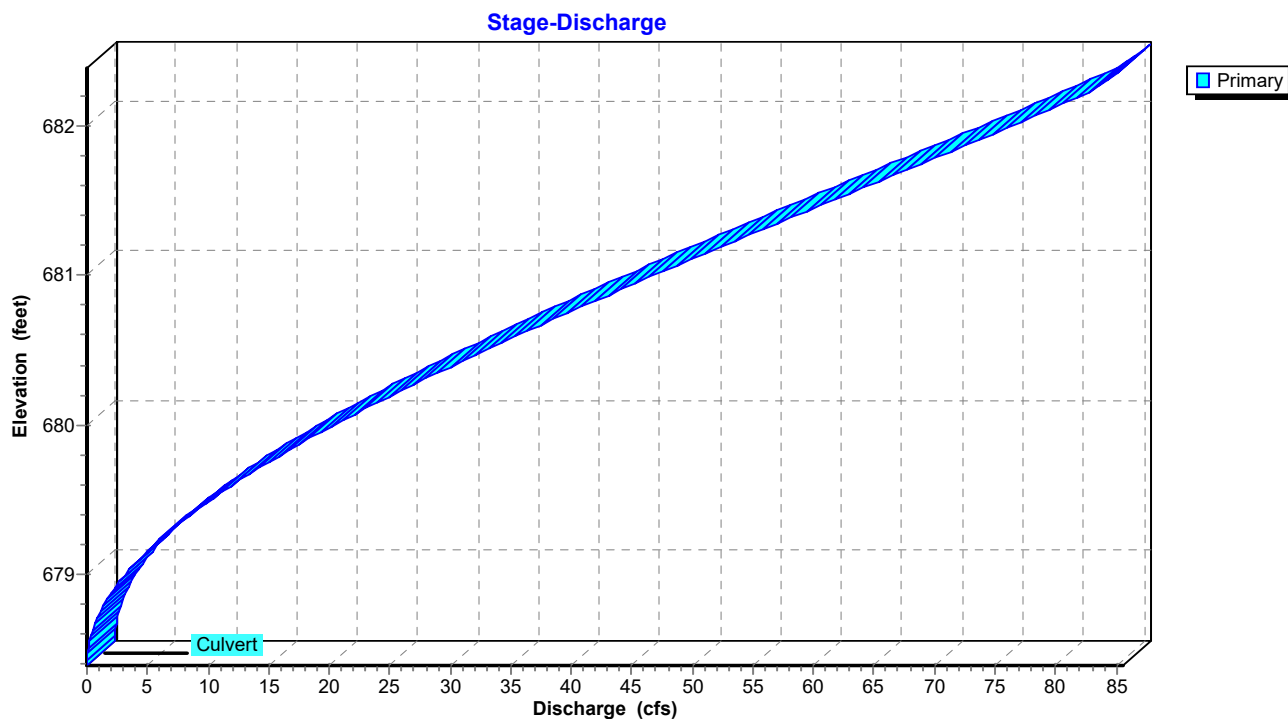
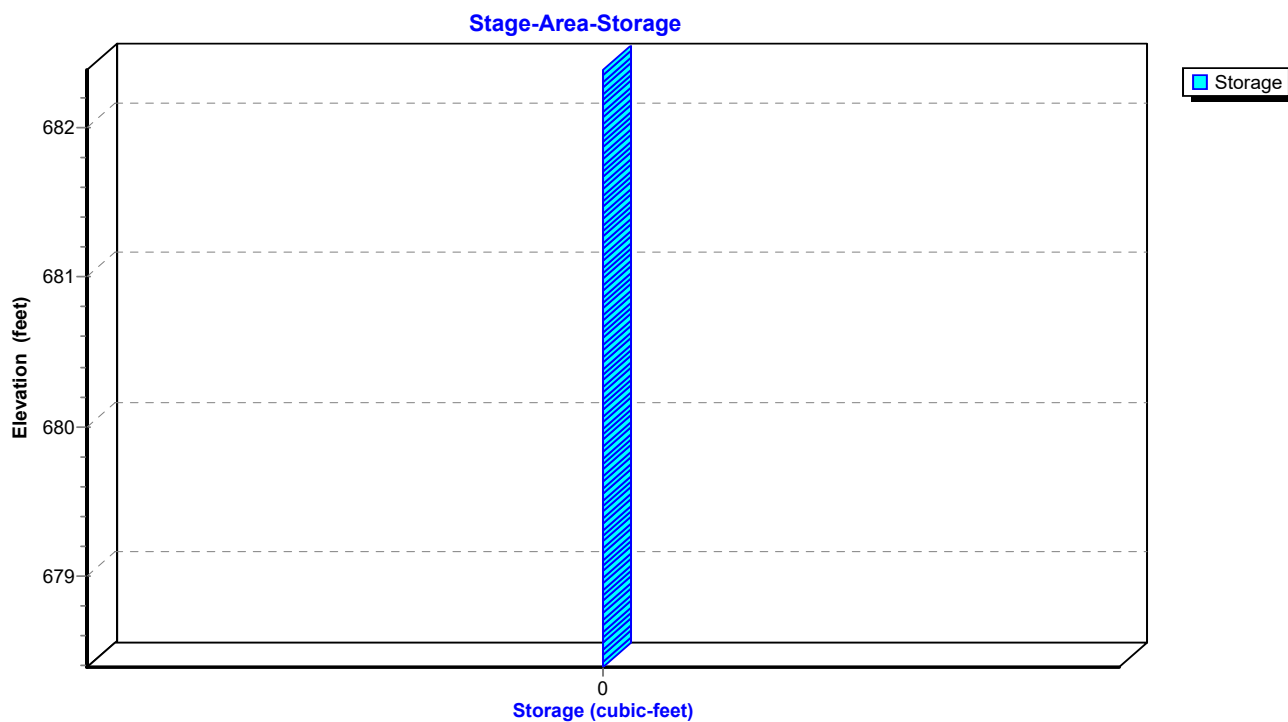
Device	Routing	Invert	Outlet Devices
#1	Primary	678.39'	48.0" Round Culvert L= 360.0' Ke= 0.500 Inlet / Outlet Invert= 678.39' / 676.50' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=71.43 cfs @ 12.48 hrs HW=681.83' (Free Discharge)
 ↑ **1=Culvert** (Barrel Controls 71.43 cfs @ 8.32 fps)

**Pond CD4DCE: Cross Drain 4DCE**

Hydrograph



Pond CD4DCE: Cross Drain 4DCE**Pond CD4DCE: Cross Drain 4DCE**

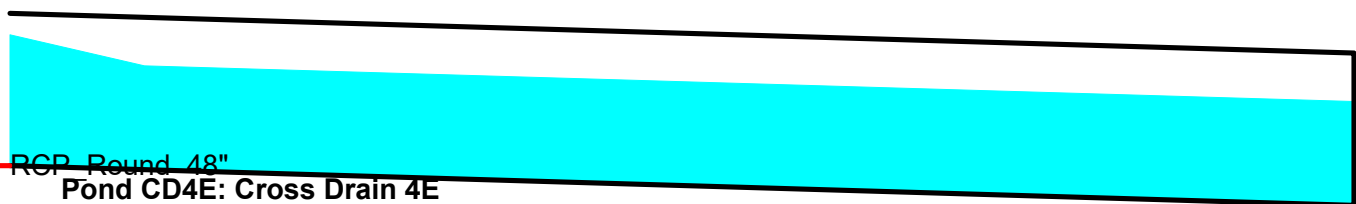
Summary for Pond CD4E: Cross Drain 4E

Inflow Area = 1,122,106 sf, 3.88% Impervious, Inflow Depth = 4.02" for 100-yr event
 Inflow = 65.51 cfs @ 12.51 hrs, Volume= 376,280 cf
 Outflow = 65.51 cfs @ 12.51 hrs, Volume= 376,280 cf, Atten= 0%, Lag= 0.0 min
 Primary = 65.51 cfs @ 12.51 hrs, Volume= 376,280 cf
 Routed to Pond CD4DCE : Cross Drain 4DCE

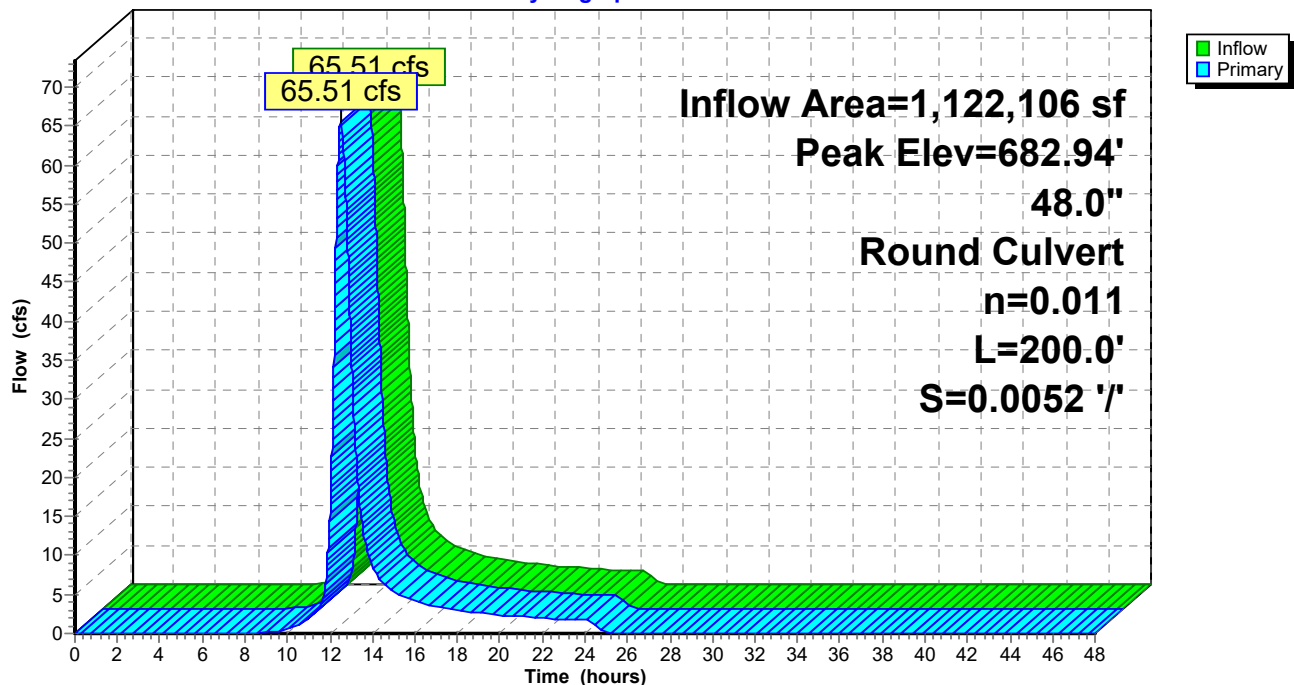
Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 682.94' @ 12.51 hrs

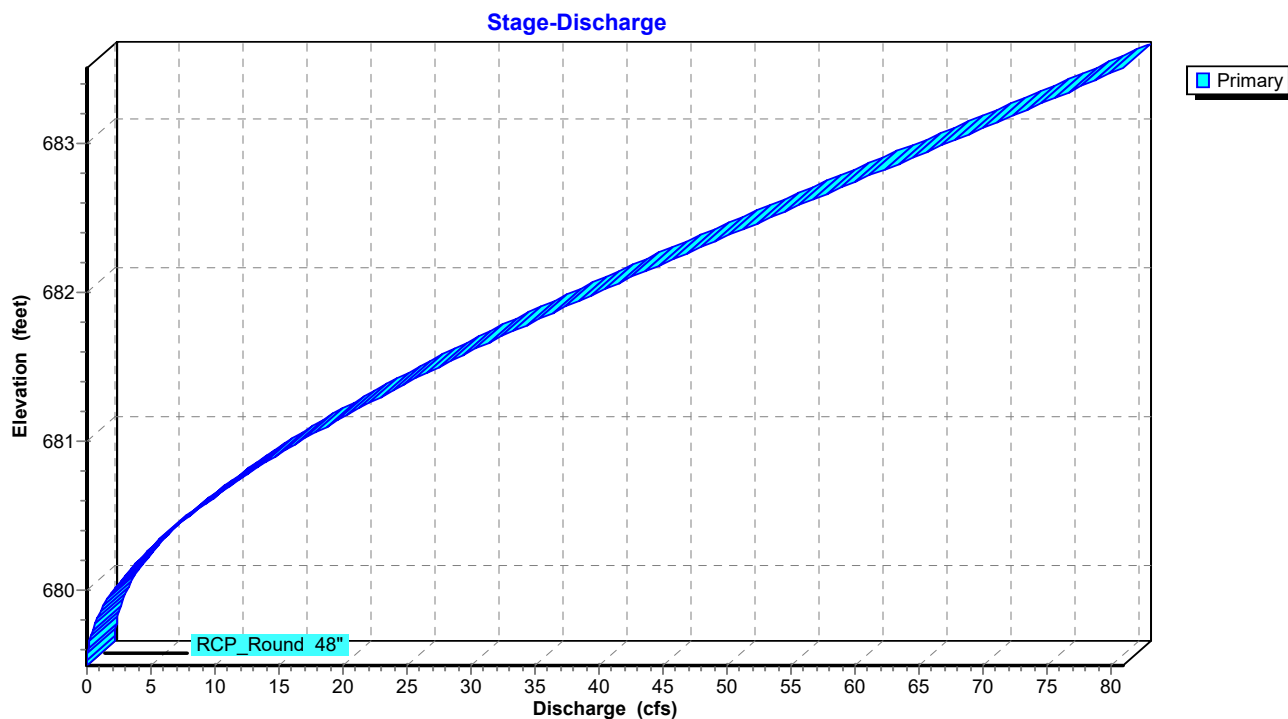
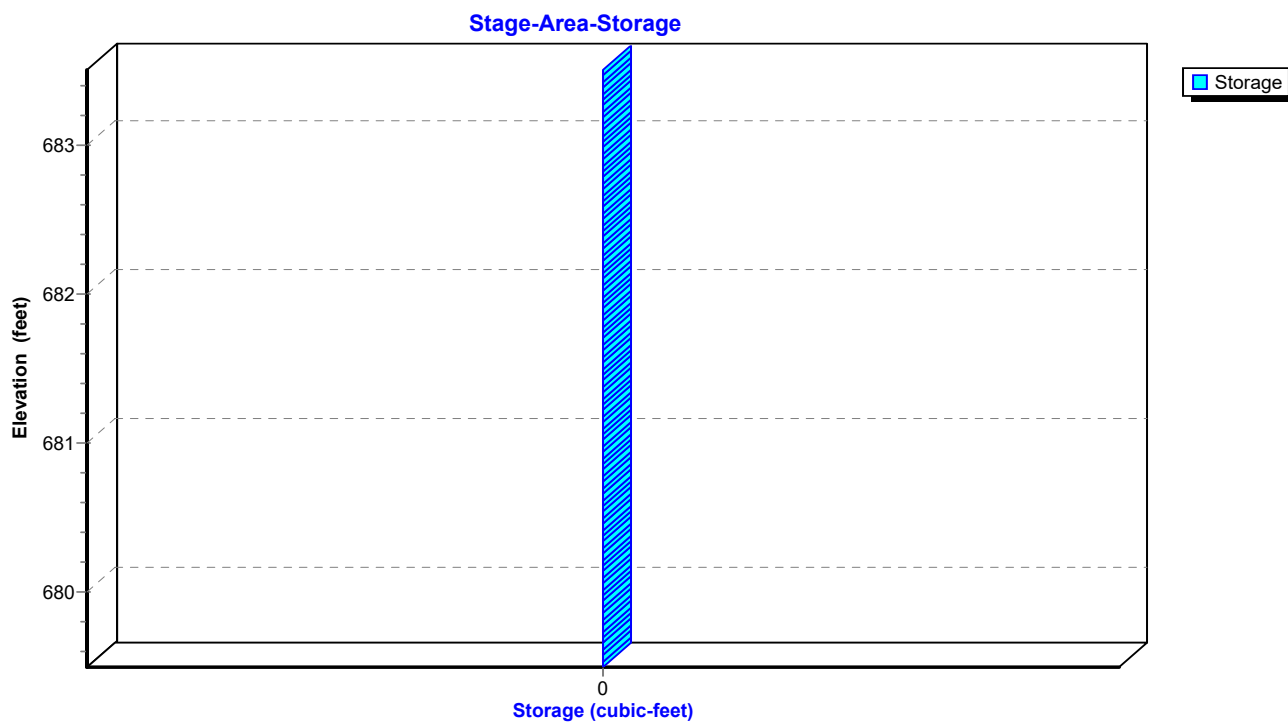
Device	Routing	Invert	Outlet Devices
#1	Primary	679.50'	48.0" Round RCP_Round 48" L= 200.0' Ke= 0.500 Inlet / Outlet Invert= 679.50' / 678.46' S= 0.0052 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf

Primary OutFlow Max=65.51 cfs @ 12.51 hrs HW=682.94' (Free Discharge)
 ↳ **1=RCP_Round 48"** (Barrel Controls 65.51 cfs @ 7.65 fps)

**Pond CD4E: Cross Drain 4E**

Hydrograph



Pond CD4E: Cross Drain 4E**Pond CD4E: Cross Drain 4E**

Summary for Pond POND1P: PROP POND

Inflow Area = 1,765,922 sf, 9.87% Impervious, Inflow Depth = 5.24" for 100-yr event
 Inflow = 125.53 cfs @ 12.46 hrs, Volume= 770,685 cf
 Outflow = 48.37 cfs @ 13.09 hrs, Volume= 770,118 cf, Atten= 61%, Lag= 37.9 min
 Primary = 48.37 cfs @ 13.09 hrs, Volume= 770,118 cf
 Routed to Reach OF4P : Primary Stream for Outfalls

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 682.27' @ 13.09 hrs Surf.Area= 119,057 sf Storage= 240,344 cf

Plug-Flow detention time= 52.6 min calculated for 769,958 cf (100% of inflow)
 Center-of-Mass det. time= 52.3 min (867.9 - 815.6)

Volume	Invert	Avail.Storage	Storage Description
#1	676.00'	327,838 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
676.00	505	0	0
677.00	14,000	7,253	7,253
678.00	20,000	17,000	24,253
679.00	29,000	24,500	48,753
680.00	39,000	34,000	82,753
681.00	47,000	43,000	125,753
682.00	119,057	83,029	208,781
683.00	119,057	119,057	327,838

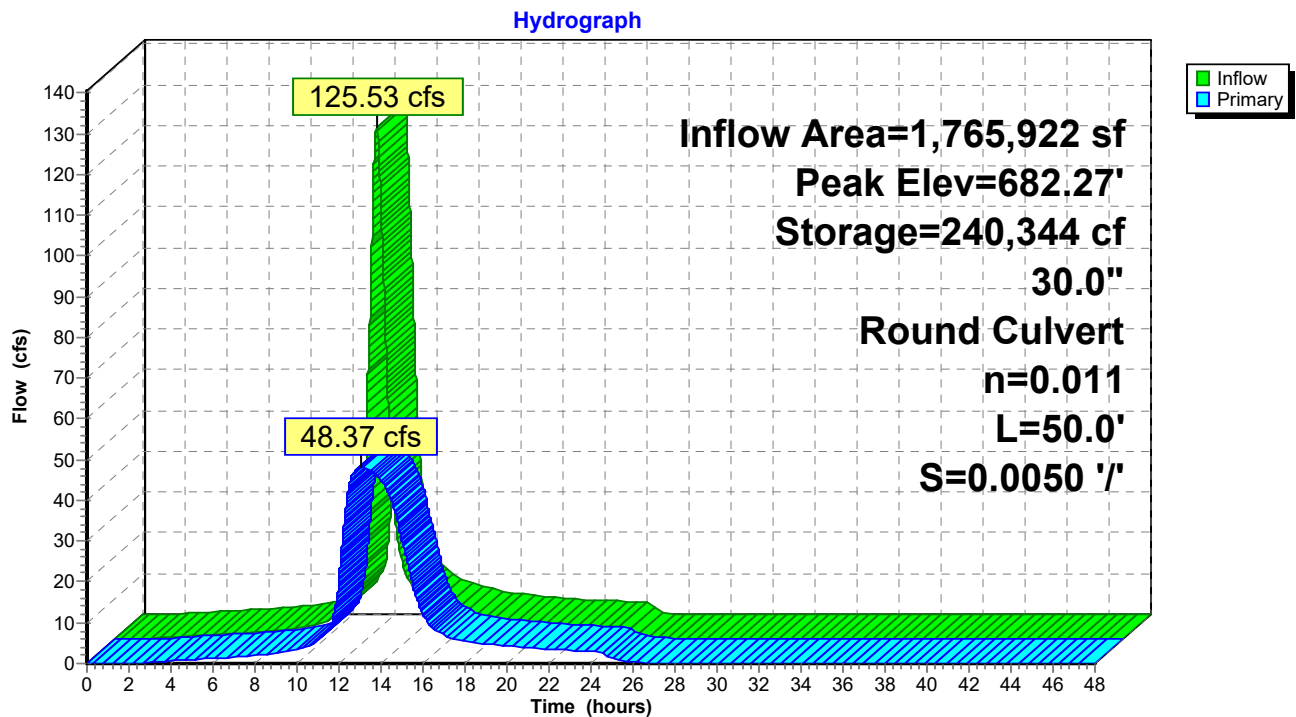
Device	Routing	Invert	Outlet Devices
#1	Primary	676.25'	30.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 676.25' / 676.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

Primary OutFlow Max=48.37 cfs @ 13.09 hrs HW=682.27' (Free Discharge)
 ↑1=Culvert (Inlet Controls 48.37 cfs @ 9.85 fps)

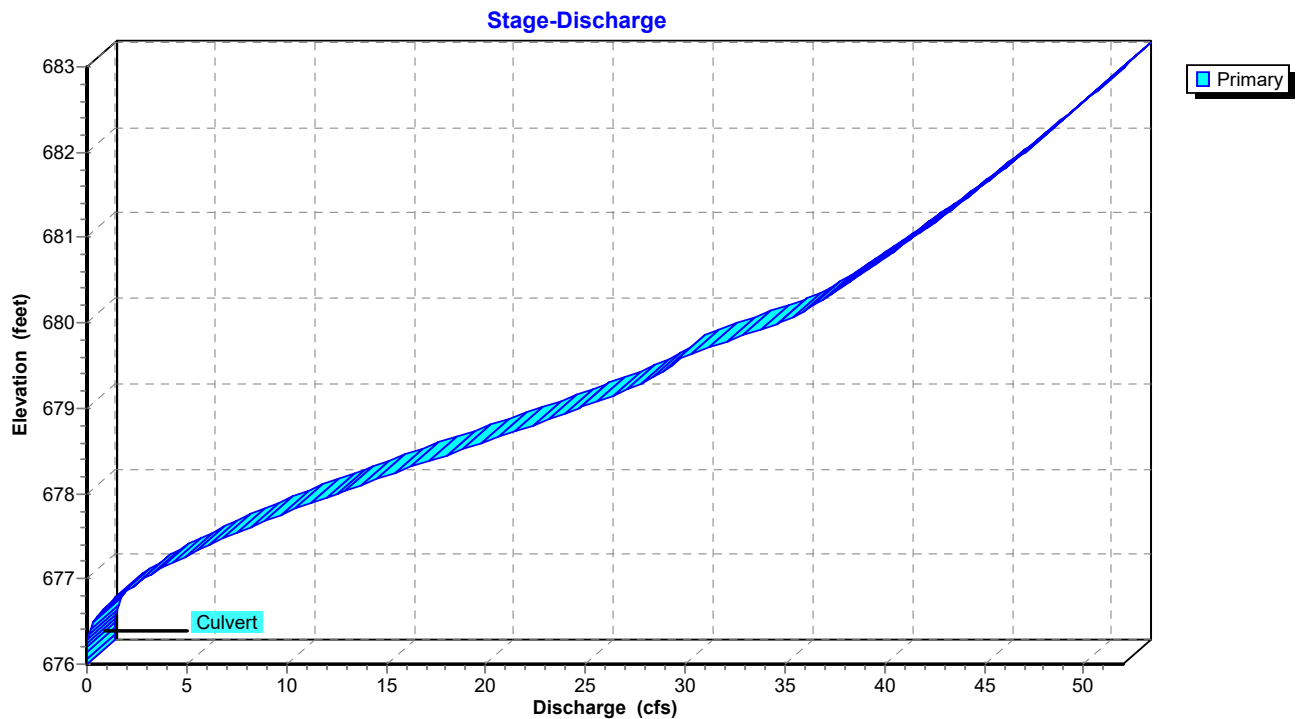
Pond POND1P: PROP POND

Culvert

Pond POND1P: PROP POND



Pond POND1P: PROP POND



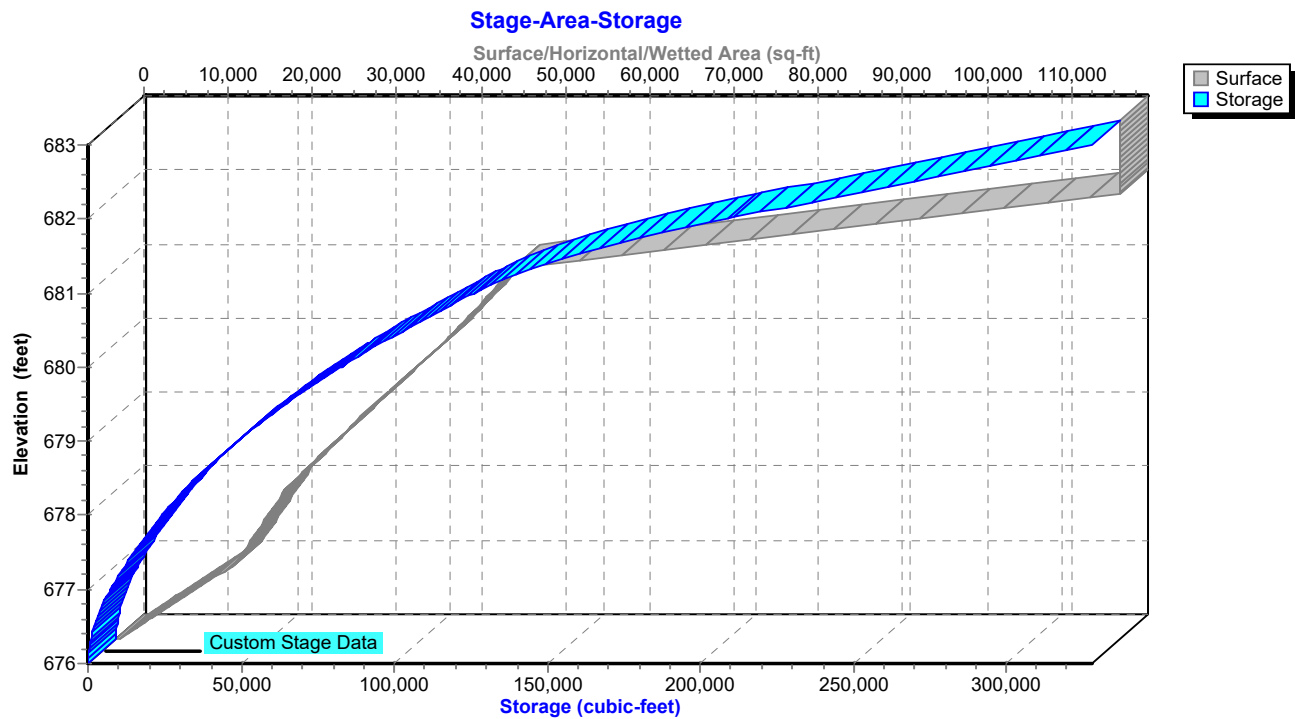
Pond POND1P: PROP POND

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116	Subcat DA 3: BASIN 3 PRE DEVELOPMENT
118	Subcat DA 4: BASIN 4 PRE DEVELOPMENT
120	Subcat DA1P: BASIN 1 PROPOSED
122	Subcat DA2P: BASIN 2 PROPOSED
124	Subcat DA3P: BASIN 3 PRE DEVELOPMENT
125	Subcat DA4A: BASIN 4A PROPOSED
126	Subcat DA4B: BASIN 4B PROPOSED
128	Subcat DA4C: BASIN 4C PROPOSED
129	Subcat DA4D: BASIN 4D PROPOSED
130	Subcat DA4E1: BASIN 4E1 PROPOSED
132	Subcat DA4E2: BASIN 4E2 PROPOSED
134	Reach CD4C: Cross Drain 4C
137	Reach D4C: Ditch 4C
140	Reach D4D: Ditch 4D
143	Reach D4E1: Ditch 4E1
146	Reach OF4: Primary Stream for Outfalls
149	Reach OF4P: Primary Stream for Outfalls
152	Pond CD2: Cross Drain
154	Pond CD4DCE: Cross Drain 4DCE
156	Pond CD4E: Cross Drain 4E
158	Pond POND1P: PROP POND

25-yr Event

161	Node Listing
163	Subcat DA 1: BASIN 1 PRE DEVELOPMENT
165	Subcat DA 2: BASIN 2 PRE DEVELOPMENT
167	Subcat DA 3: BASIN 3 PRE DEVELOPMENT
169	Subcat DA 4: BASIN 4 PRE DEVELOPMENT
171	Subcat DA1P: BASIN 1 PROPOSED

173	Subcat DA2P: BASIN 2 PROPOSED
175	Subcat DA3P: BASIN 3 PRE DEVELOPMENT
176	Subcat DA4A: BASIN 4A PROPOSED
177	Subcat DA4B: BASIN 4B PROPOSED
179	Subcat DA4C: BASIN 4C PROPOSED
180	Subcat DA4D: BASIN 4D PROPOSED
181	Subcat DA4E1: BASIN 4E1 PROPOSED
183	Subcat DA4E2: BASIN 4E2 PROPOSED
185	Reach CD4C: Cross Drain 4C
188	Reach D4C: Ditch 4C
191	Reach D4D: Ditch 4D
194	Reach D4E1: Ditch 4E1
197	Reach OF4: Primary Stream for Outfalls
200	Reach OF4P: Primary Stream for Outfalls
203	Pond CD2: Cross Drain
205	Pond CD4DCE: Cross Drain 4DCE
207	Pond CD4E: Cross Drain 4E
209	Pond POND1P: PROP POND

50-yr Event

212	Node Listing
214	Subcat DA 1: BASIN 1 PRE DEVELOPMENT
216	Subcat DA 2: BASIN 2 PRE DEVELOPMENT
218	Subcat DA 3: BASIN 3 PRE DEVELOPMENT
220	Subcat DA 4: BASIN 4 PRE DEVELOPMENT
222	Subcat DA1P: BASIN 1 PROPOSED
224	Subcat DA2P: BASIN 2 PROPOSED
226	Subcat DA3P: BASIN 3 PRE DEVELOPMENT
227	Subcat DA4A: BASIN 4A PROPOSED
228	Subcat DA4B: BASIN 4B PROPOSED
230	Subcat DA4C: BASIN 4C PROPOSED
231	Subcat DA4D: BASIN 4D PROPOSED
232	Subcat DA4E1: BASIN 4E1 PROPOSED
234	Subcat DA4E2: BASIN 4E2 PROPOSED
236	Reach CD4C: Cross Drain 4C
239	Reach D4C: Ditch 4C
242	Reach D4D: Ditch 4D
245	Reach D4E1: Ditch 4E1
248	Reach OF4: Primary Stream for Outfalls
251	Reach OF4P: Primary Stream for Outfalls
254	Pond CD2: Cross Drain
256	Pond CD4DCE: Cross Drain 4DCE
258	Pond CD4E: Cross Drain 4E
260	Pond POND1P: PROP POND

100-yr Event

263	Node Listing
265	Subcat DA 1: BASIN 1 PRE DEVELOPMENT

267	Subcat DA 2: BASIN 2 PRE DEVELOPMENT
269	Subcat DA 3: BASIN 3 PRE DEVELOPMENT
271	Subcat DA 4: BASIN 4 PRE DEVELOPMENT
273	Subcat DA1P: BASIN 1 PROPOSED
275	Subcat DA2P: BASIN 2 PROPOSED
277	Subcat DA3P: BASIN 3 PRE DEVELOPMENT
278	Subcat DA4A: BASIN 4A PROPOSED
279	Subcat DA4B: BASIN 4B PROPOSED
281	Subcat DA4C: BASIN 4C PROPOSED
282	Subcat DA4D: BASIN 4D PROPOSED
283	Subcat DA4E1: BASIN 4E1 PROPOSED
285	Subcat DA4E2: BASIN 4E2 PROPOSED
287	Reach CD4C: Cross Drain 4C
290	Reach D4C: Ditch 4C
293	Reach D4D: Ditch 4D
296	Reach D4E1: Ditch 4E1
299	Reach OF4: Primary Stream for Outfalls
302	Reach OF4P: Primary Stream for Outfalls
305	Pond CD2: Cross Drain
307	Pond CD4DCE: Cross Drain 4DCE
309	Pond CD4E: Cross Drain 4E
311	Pond POND1P: PROP POND