Summary for Subcatchment 6A:

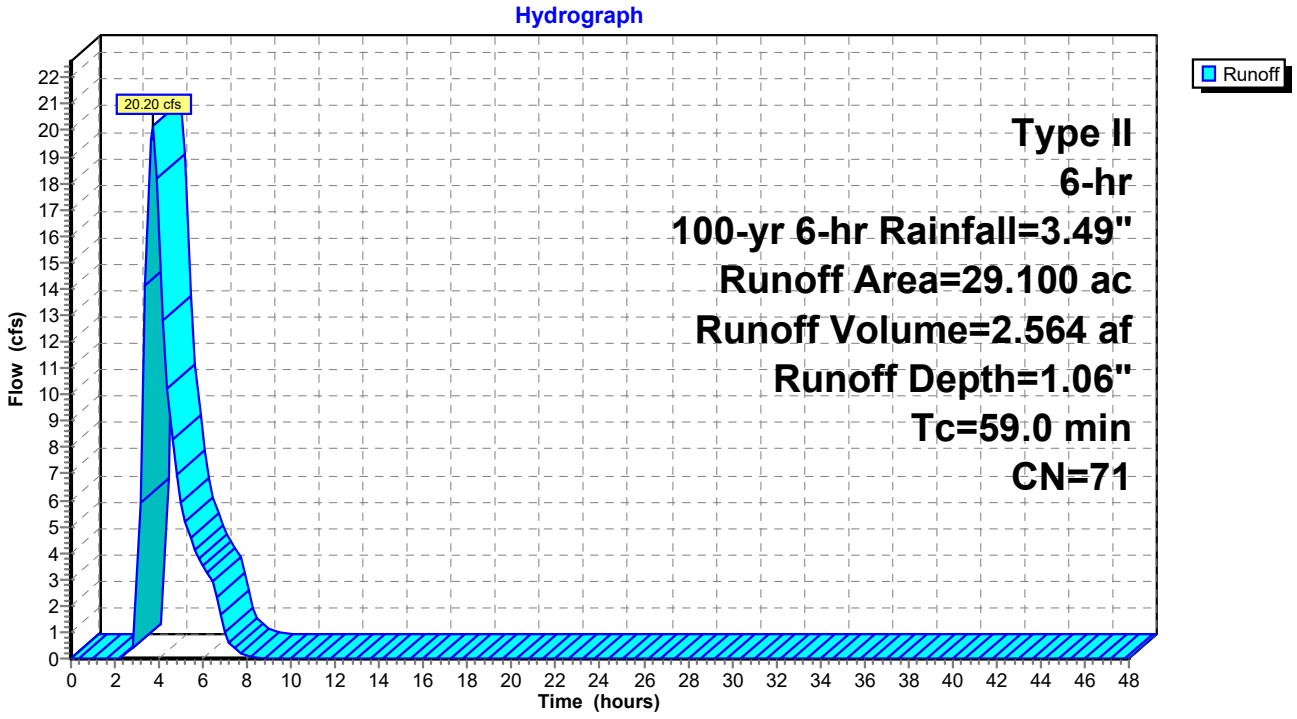
Runoff = 20.20 cfs @ 3.71 hrs, Volume= 2.564 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
0.300	56	Brush, Fair, HSG B
24.100	70	Brush, Fair, HSG C
4.700	77	Brush, Fair, HSG D
29.100	71	Weighted Average
29.100		100.00% Pervious Area

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

Subcatchment 6A:



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Summary for Subcatchment 6B:

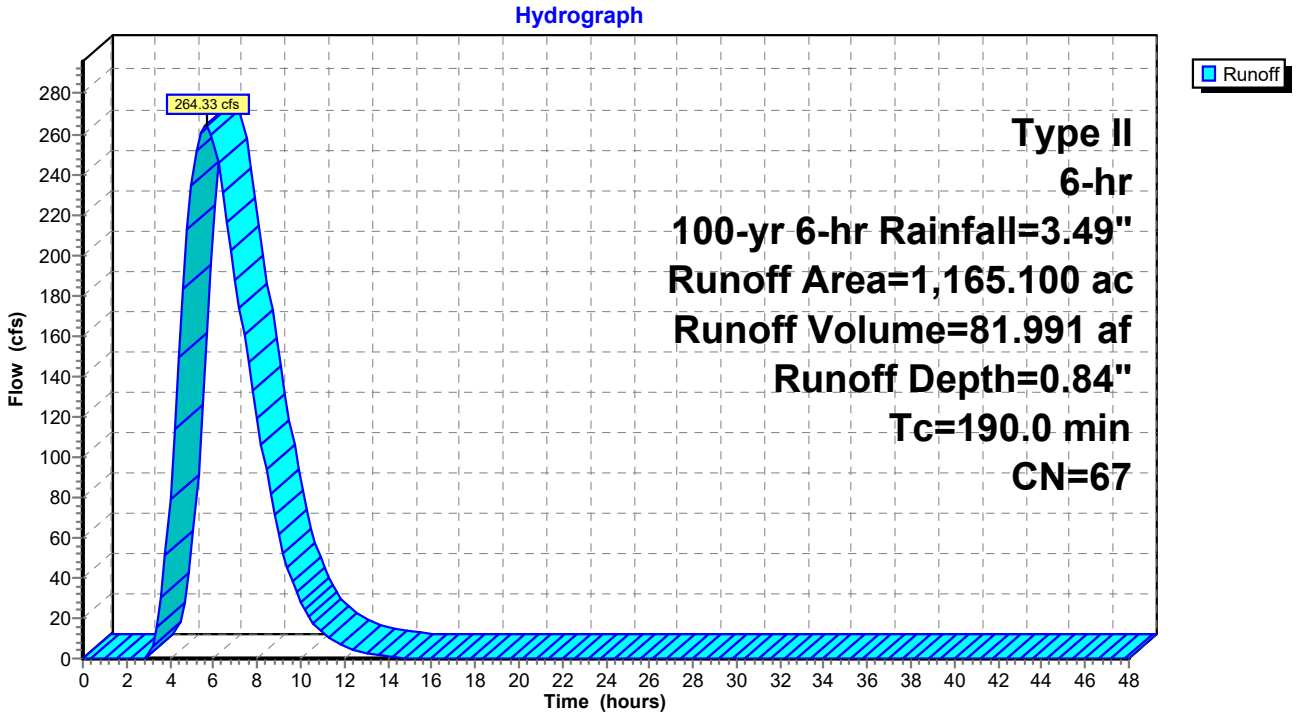
Runoff = 264.33 cfs @ 5.65 hrs, Volume= 81.991 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
341.300	56	Brush, Fair, HSG B
709.400	70	Brush, Fair, HSG C
114.400	77	Brush, Fair, HSG D
1,165.100	67	Weighted Average
1,165.100		100.00% Pervious Area

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

Subcatchment 6B:



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Summary for Subcatchment 6C:

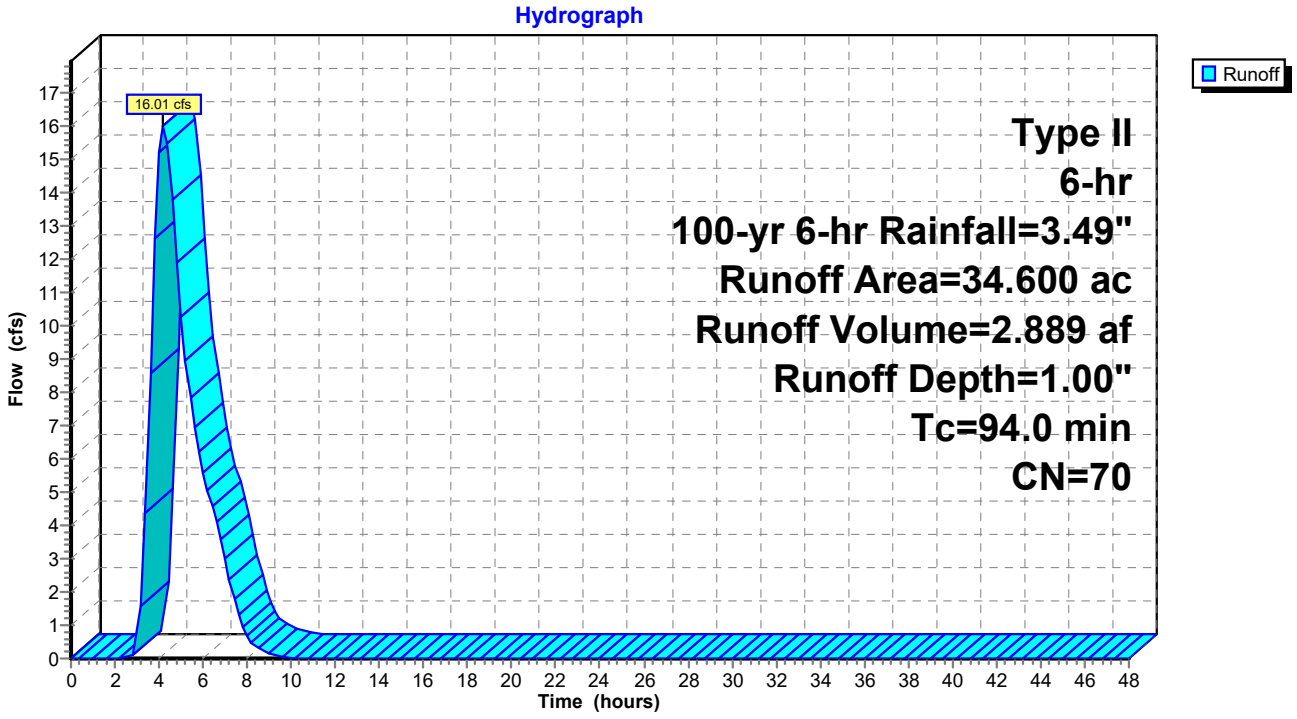
Runoff = 16.01 cfs @ 4.22 hrs, Volume= 2.889 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
34.600	70	Brush, Fair, HSG C
0.000	77	Brush, Fair, HSG D
34.600	70	Weighted Average
34.600		100.00% Pervious Area

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

Subcatchment 6C:



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Summary for Subcatchment 7:

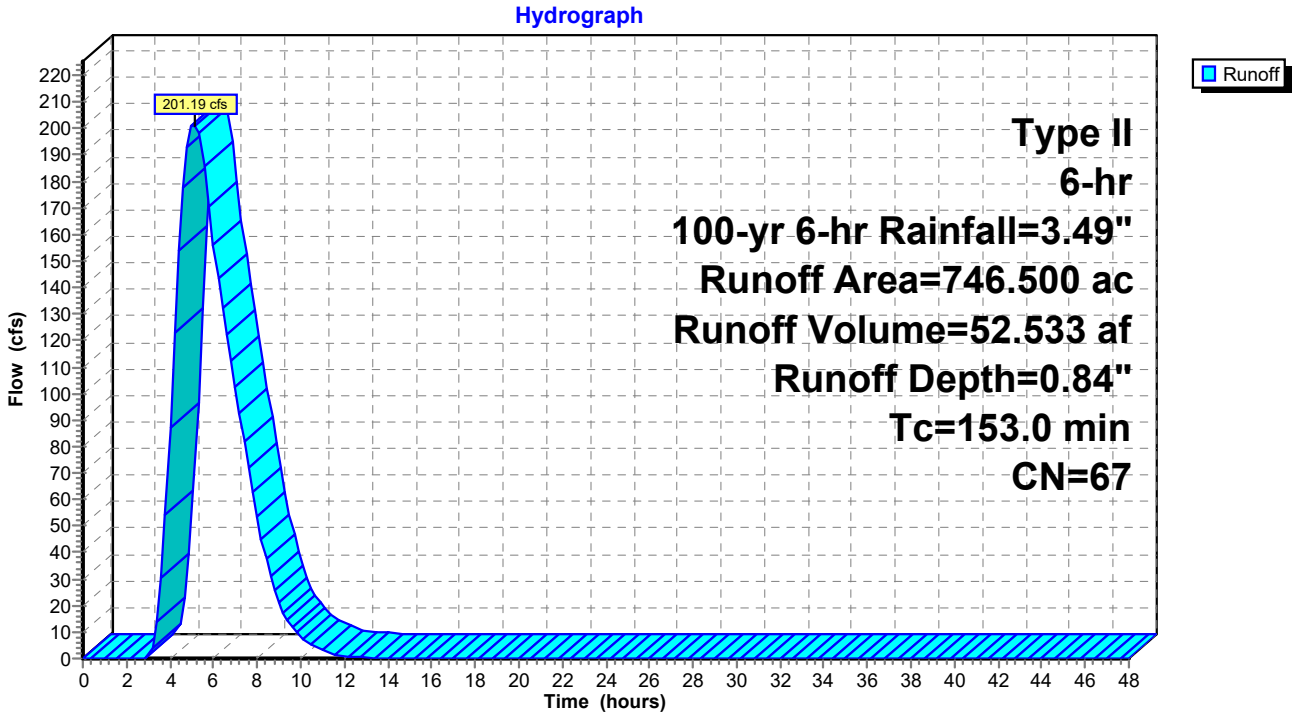
Runoff = 201.19 cfs @ 5.10 hrs, Volume= 52.533 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
235.100	56	Brush, Fair, HSG B
400.600	70	Brush, Fair, HSG C
110.800	77	Brush, Fair, HSG D
746.500	67	Weighted Average
746.500		100.00% Pervious Area

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

Subcatchment 7:



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Summary for Subcatchment RQC: RCQ NW Stream

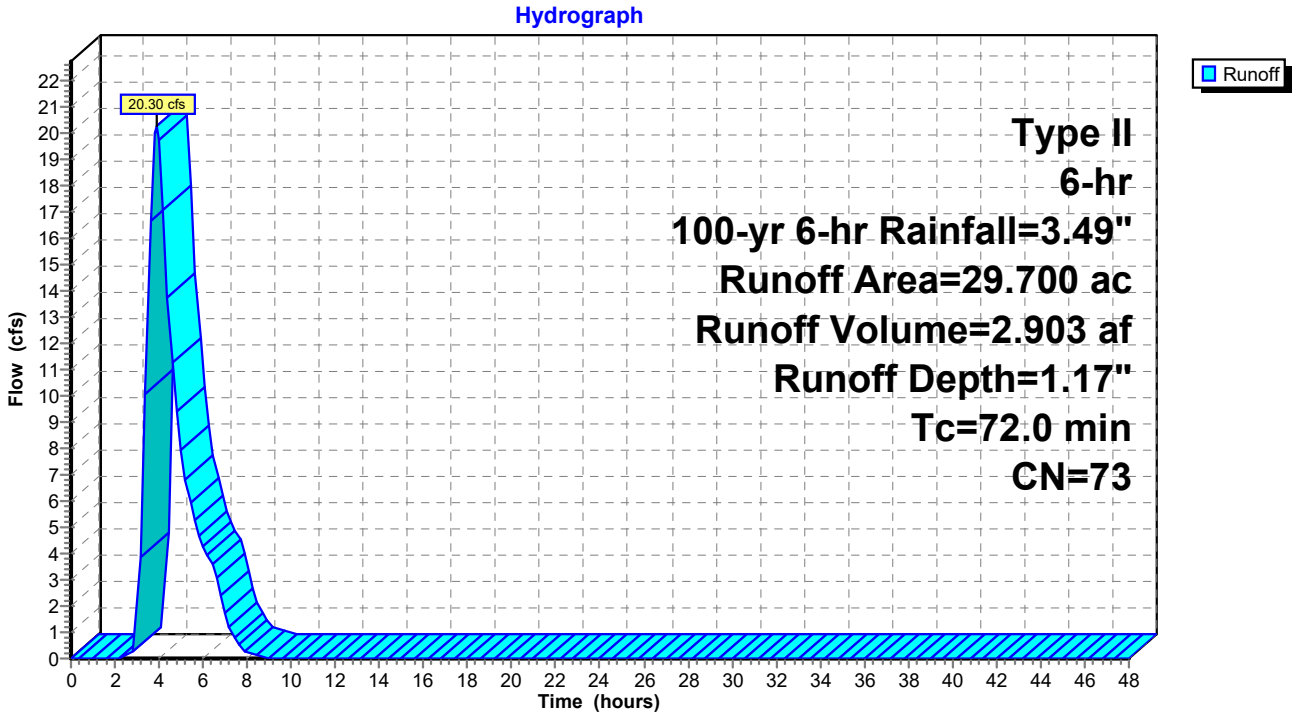
Runoff = 20.30 cfs @ 3.89 hrs, Volume= 2.903 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
3.500	56	Brush, Fair, HSG B
8.200	70	Brush, Fair, HSG C
18.000	77	Brush, Fair, HSG D
29.700	73	Weighted Average
29.700		100.00% Pervious Area

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

Subcatchment RQC: RCQ NW Stream



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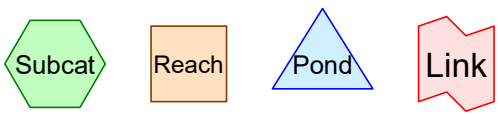

Routing Diagram for HydroCAD_RQC-MTAC_2of2
Prepared by Brown & Caldwell, Printed 4/2/2024

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-yr 24-hr	Type II 24-hr		Default	24.00	1	3.01	2
2	100-yr 6-hr	Type II 6-hr		Default	6.00	1	3.49	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2,400.400	56	Brush, Fair, HSG B (8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19)
876.040	70	Brush, Fair, HSG C (8, 9, 10, 15, 16, 17, 18, 19)
1,766.000	77	Brush, Fair, HSG D (8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19)
5,042.440	**66**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2,400.400	HSG B	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
876.040	HSG C	8, 9, 10, 15, 16, 17, 18, 19
1,766.000	HSG D	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
0.000	Other	
5,042.440		**TOTAL AREA**

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2,400.400	876.040	1,766.000	0.000	5,042.440	Brush, Fair	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
0.000	**2,400.400**	**876.040**	**1,766.000**	**0.000**	**5,042.440**	**TOTAL AREA**	

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Time span=0.00-48.00 hrs, dt=0.20 hrs, 241 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment8: Runoff Area=160.000 ac 0.00% Impervious Runoff Depth=0.63"
Tc=76.2 min CN=68 Runoff=35.56 cfs 8.424 af

Subcatchment9: Runoff Area=95.940 ac 0.00% Impervious Runoff Depth=0.59"
Tc=56.4 min CN=67 Runoff=24.01 cfs 4.717 af

Subcatchment10: Runoff Area=26.600 ac 0.00% Impervious Runoff Depth=0.55"
Tc=53.0 min CN=66 Runoff=6.28 cfs 1.218 af

Subcatchment11: Runoff Area=25.800 ac 0.00% Impervious Runoff Depth=0.40"
Tc=30.6 min CN=62 Runoff=5.20 cfs 0.865 af

Subcatchment12: Runoff Area=23.000 ac 0.00% Impervious Runoff Depth=0.31"
Tc=37.8 min CN=59 Runoff=2.52 cfs 0.587 af

Subcatchment13: Runoff Area=134.000 ac 0.00% Impervious Runoff Depth=0.40"
Tc=50.4 min CN=62 Runoff=20.21 cfs 4.492 af

Subcatchment14: Runoff Area=217.600 ac 0.00% Impervious Runoff Depth=0.47"
Tc=66.0 min CN=64 Runoff=35.31 cfs 8.579 af

Subcatchment15: Runoff Area=820.600 ac 0.00% Impervious Runoff Depth=0.77"
Tc=98.0 min CN=71 Runoff=196.69 cfs 52.393 af

Subcatchment16: Runoff Area=2,560.000 ac 0.00% Impervious Runoff Depth=0.44"
Tc=275.4 min CN=63 Runoff=143.06 cfs 93.230 af

Subcatchment17: Runoff Area=23.900 ac 0.00% Impervious Runoff Depth=0.59"
Tc=45.0 min CN=67 Runoff=6.88 cfs 1.175 af

Subcatchment18: Runoff Area=134.400 ac 0.00% Impervious Runoff Depth=0.47"
Tc=93.6 min CN=64 Runoff=17.22 cfs 5.299 af

Subcatchment19: Runoff Area=820.600 ac 0.00% Impervious Runoff Depth=0.77"
Tc=97.8 min CN=71 Runoff=196.41 cfs 52.393 af

Total Runoff Area = 5,042.440 ac Runoff Volume = 233.372 af Average Runoff Depth = 0.56"
100.00% Pervious = 5,042.440 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment 8:

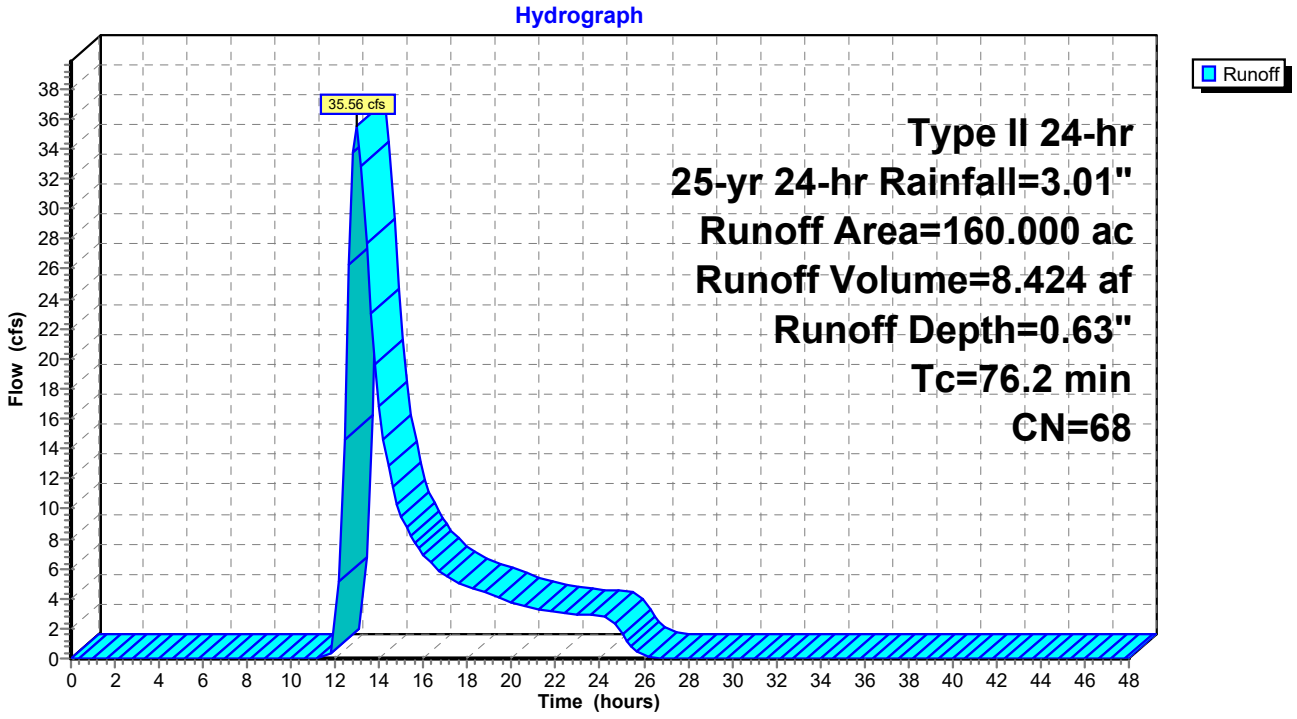
Runoff = 35.56 cfs @ 12.98 hrs, Volume= 8.424 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
38.700	56	Brush, Fair, HSG B
91.700	70	Brush, Fair, HSG C
29.600	77	Brush, Fair, HSG D
160.000	68	Weighted Average
160.000		100.00% Pervious Area

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

Subcatchment 8:



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Summary for Subcatchment 9:

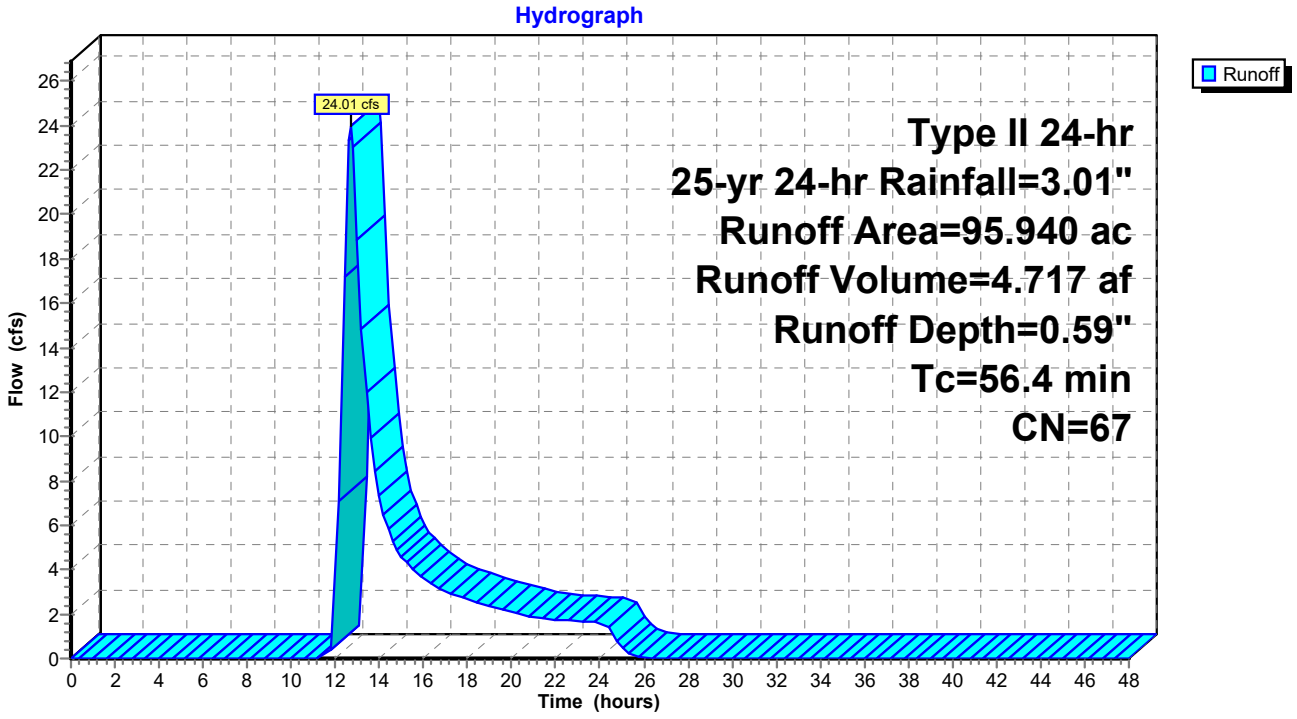
Runoff = 24.01 cfs @ 12.69 hrs, Volume= 4.717 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
30.500	56	Brush, Fair, HSG B
51.940	70	Brush, Fair, HSG C
13.500	77	Brush, Fair, HSG D
95.940	67	Weighted Average
95.940		100.00% Pervious Area

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

Subcatchment 9:



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Summary for Subcatchment 10:

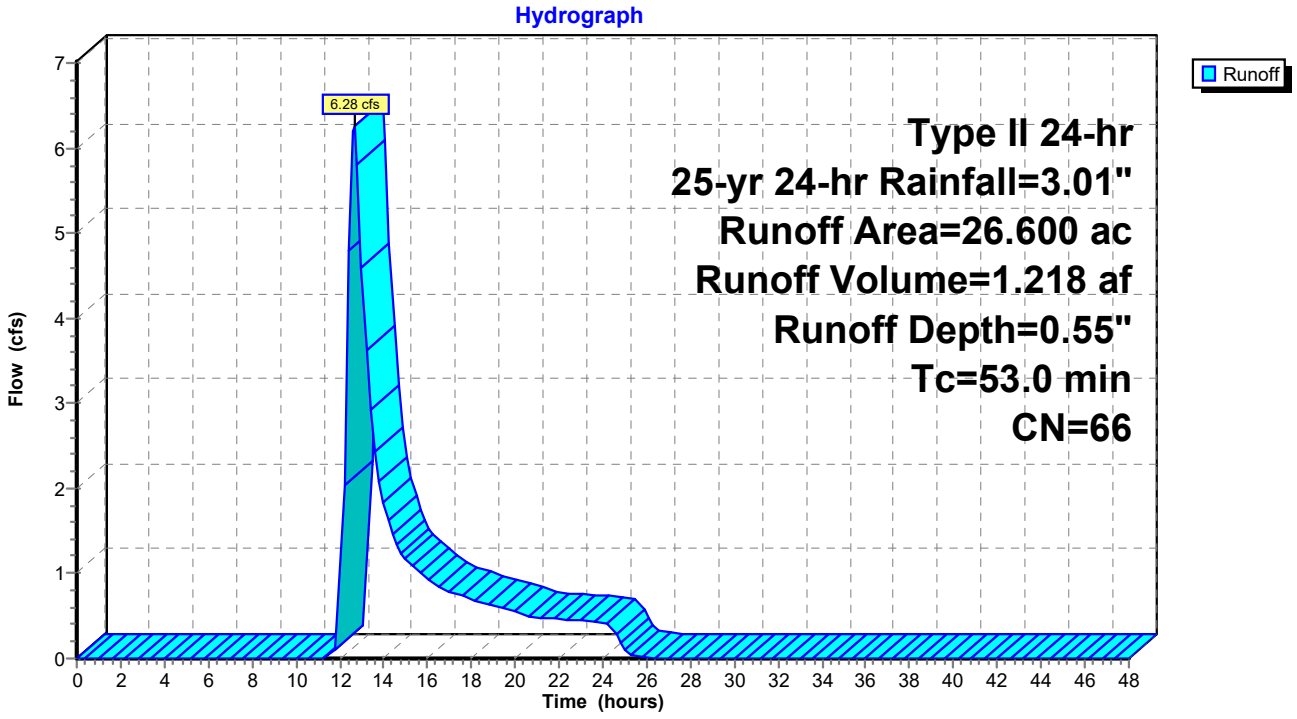
Runoff = 6.28 cfs @ 12.66 hrs, Volume= 1.218 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
9.200	56	Brush, Fair, HSG B
15.900	70	Brush, Fair, HSG C
1.500	77	Brush, Fair, HSG D
26.600	66	Weighted Average
26.600		100.00% Pervious Area

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

Subcatchment 10:



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Summary for Subcatchment 11:

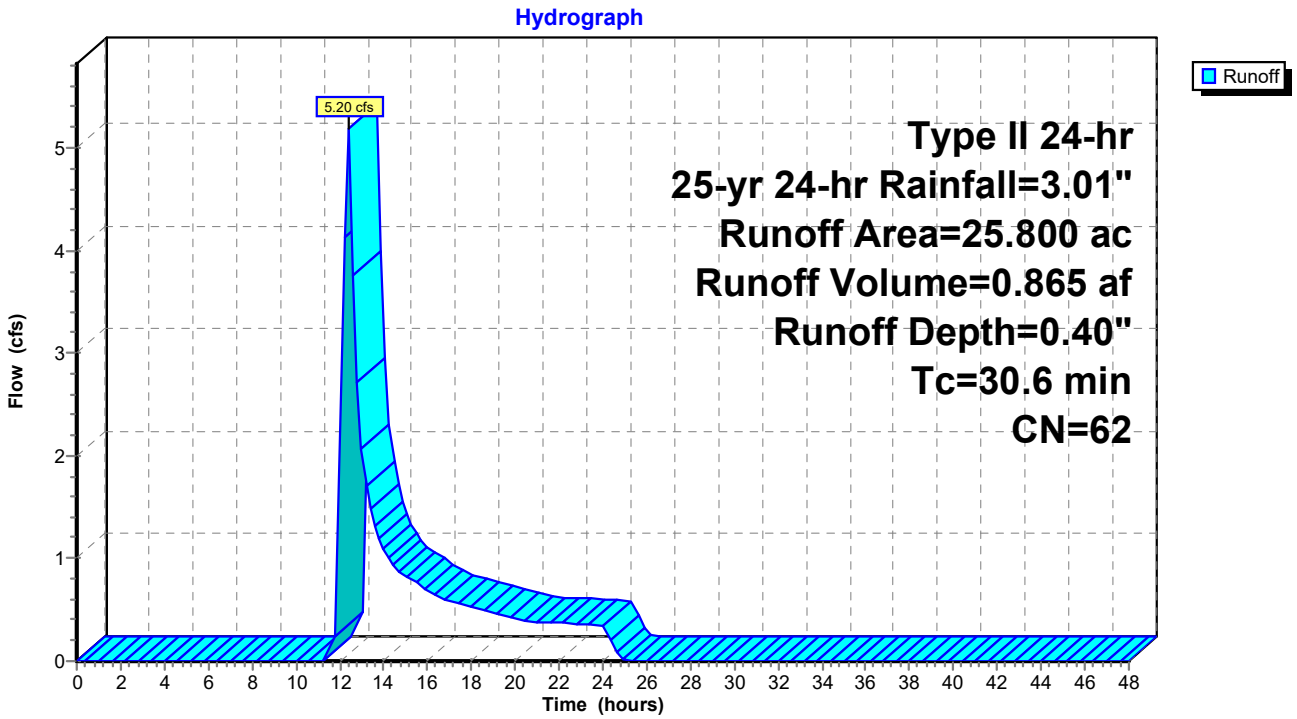
Runoff = 5.20 cfs @ 12.39 hrs, Volume= 0.865 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
18.900	56	Brush, Fair, HSG B
6.900	77	Brush, Fair, HSG D
25.800	62	Weighted Average
25.800		100.00% Pervious Area

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

Subcatchment 11:



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Summary for Subcatchment 12:

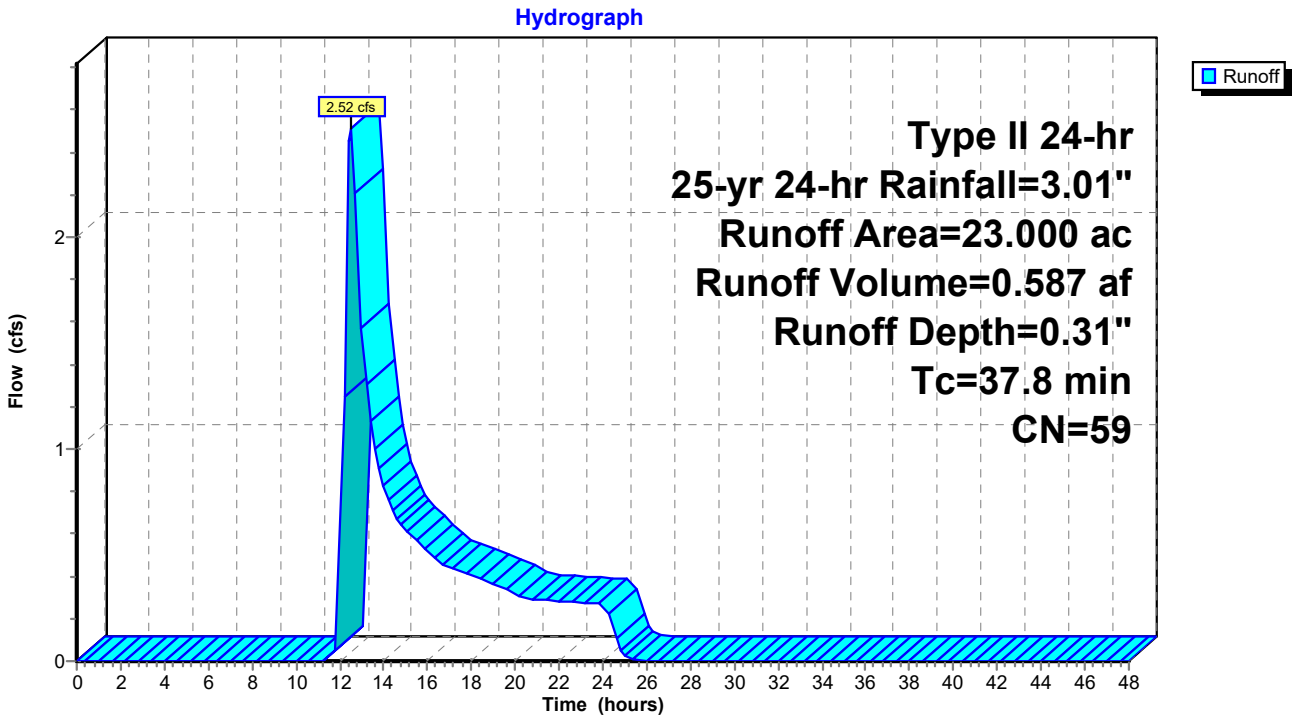
Runoff = 2.52 cfs @ 12.50 hrs, Volume= 0.587 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
19.700	56	Brush, Fair, HSG B
3.300	77	Brush, Fair, HSG D
23.000	59	Weighted Average
23.000		100.00% Pervious Area

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

Subcatchment 12:



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Summary for Subcatchment 13:

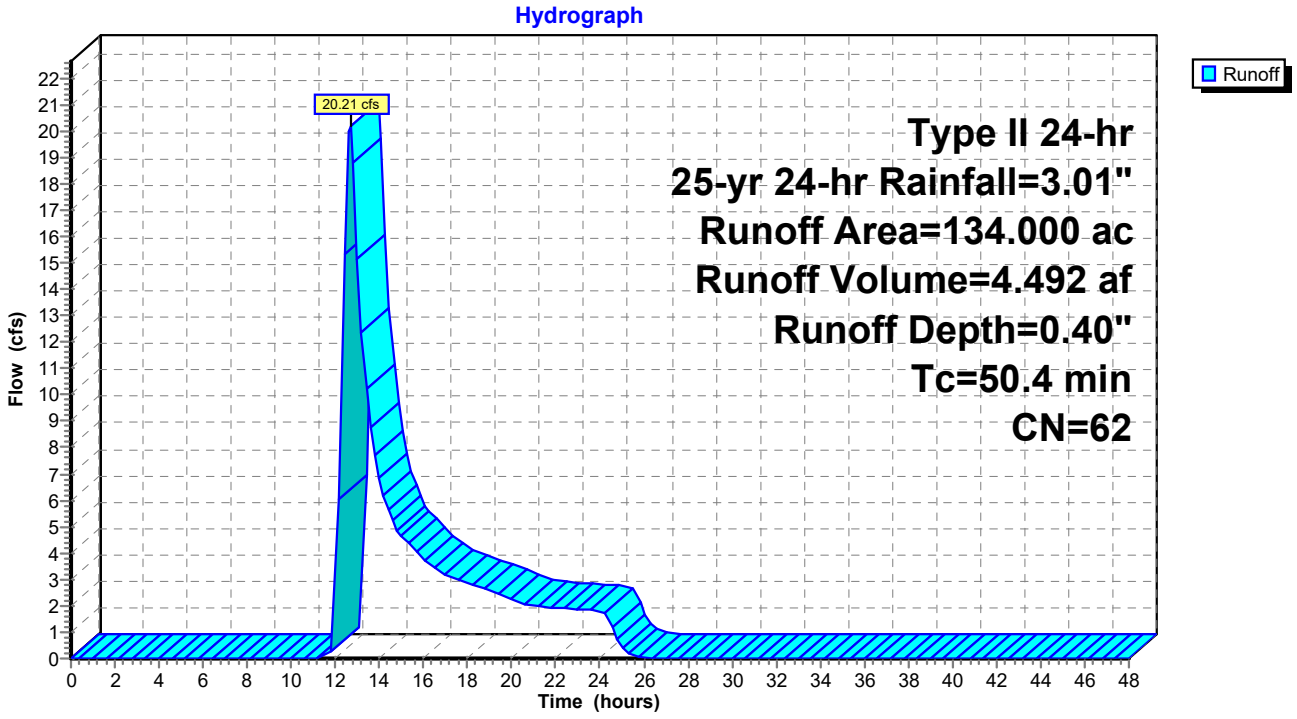
Runoff = 20.21 cfs @ 12.66 hrs, Volume= 4.492 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
93.000	56	Brush, Fair, HSG B
0.000	70	Brush, Fair, HSG C
41.000	77	Brush, Fair, HSG D
134.000	62	Weighted Average
134.000		100.00% Pervious Area

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

Subcatchment 13:



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Summary for Subcatchment 14:

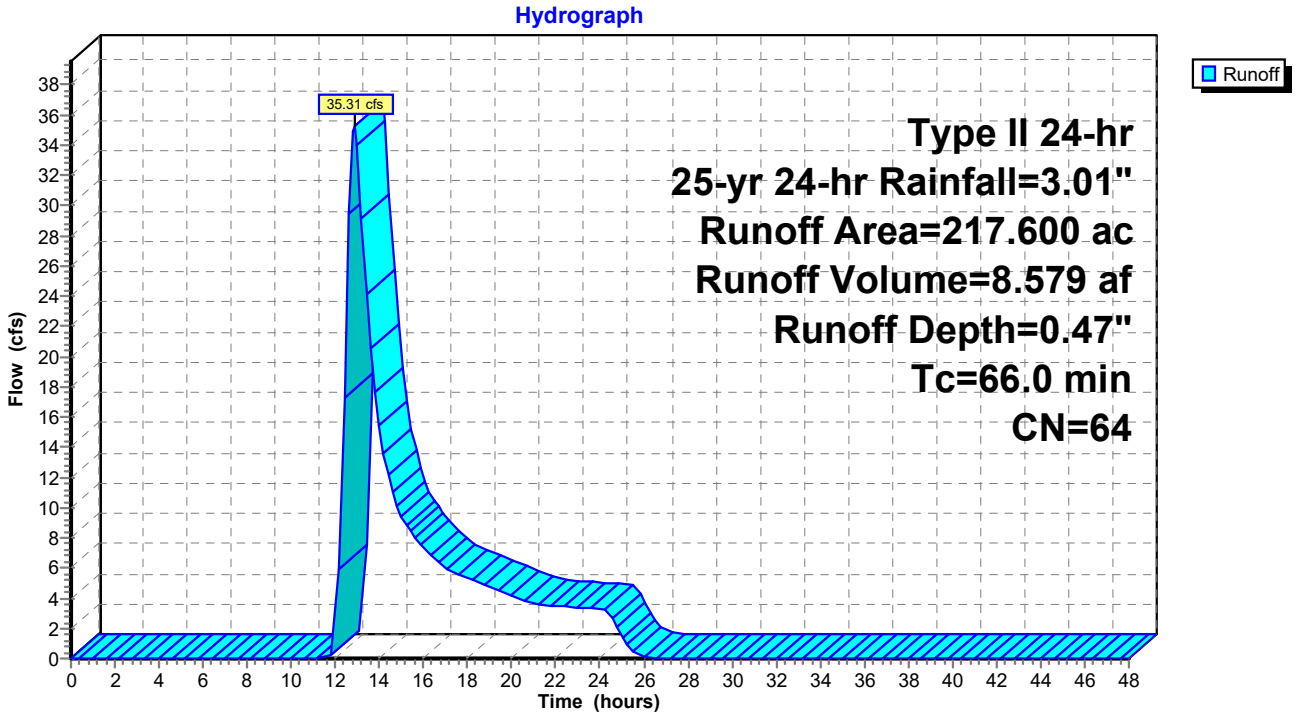
Runoff = 35.31 cfs @ 12.87 hrs, Volume= 8.579 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
129.900	56	Brush, Fair, HSG B
0.000	70	Brush, Fair, HSG C
87.700	77	Brush, Fair, HSG D
217.600	64	Weighted Average
217.600		100.00% Pervious Area

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

Subcatchment 14:



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Summary for Subcatchment 15:

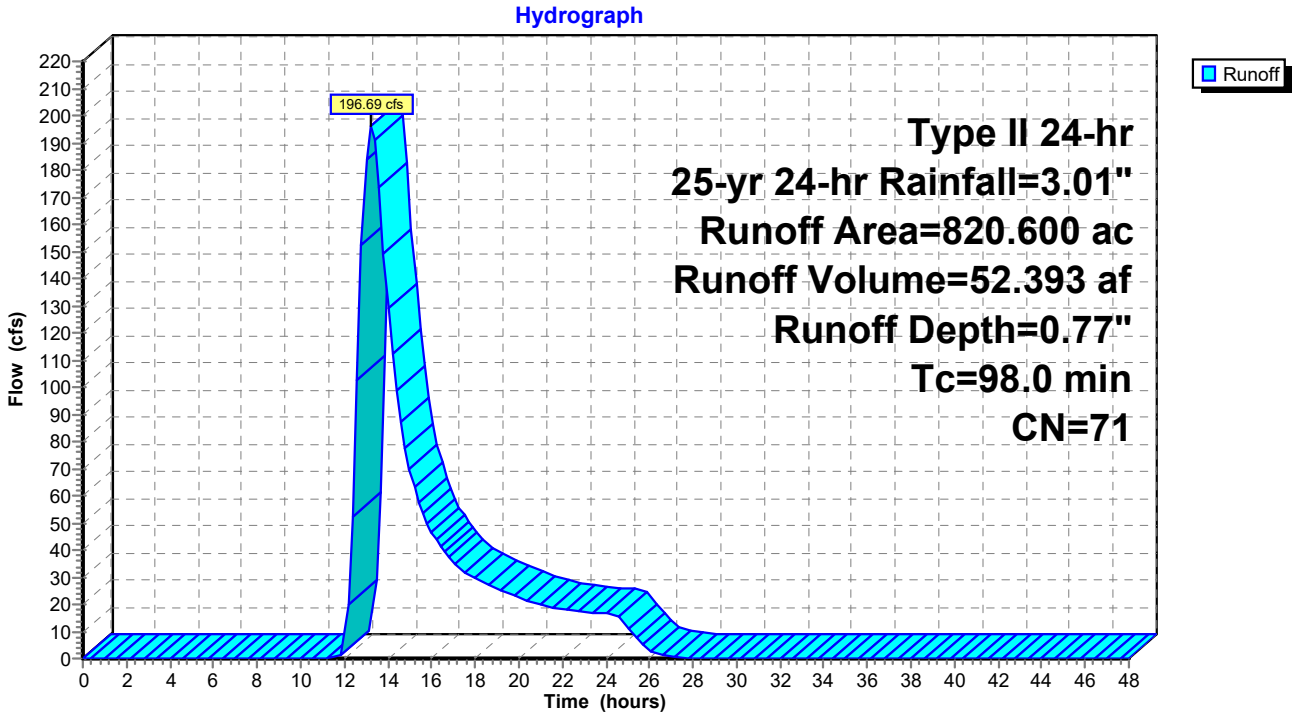
Runoff = 196.69 cfs @ 13.24 hrs, Volume= 52.393 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
220.400	56	Brush, Fair, HSG B
87.500	70	Brush, Fair, HSG C
512.700	77	Brush, Fair, HSG D
820.600	71	Weighted Average
820.600		100.00% Pervious Area

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

Subcatchment 15:



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Summary for Subcatchment 16:

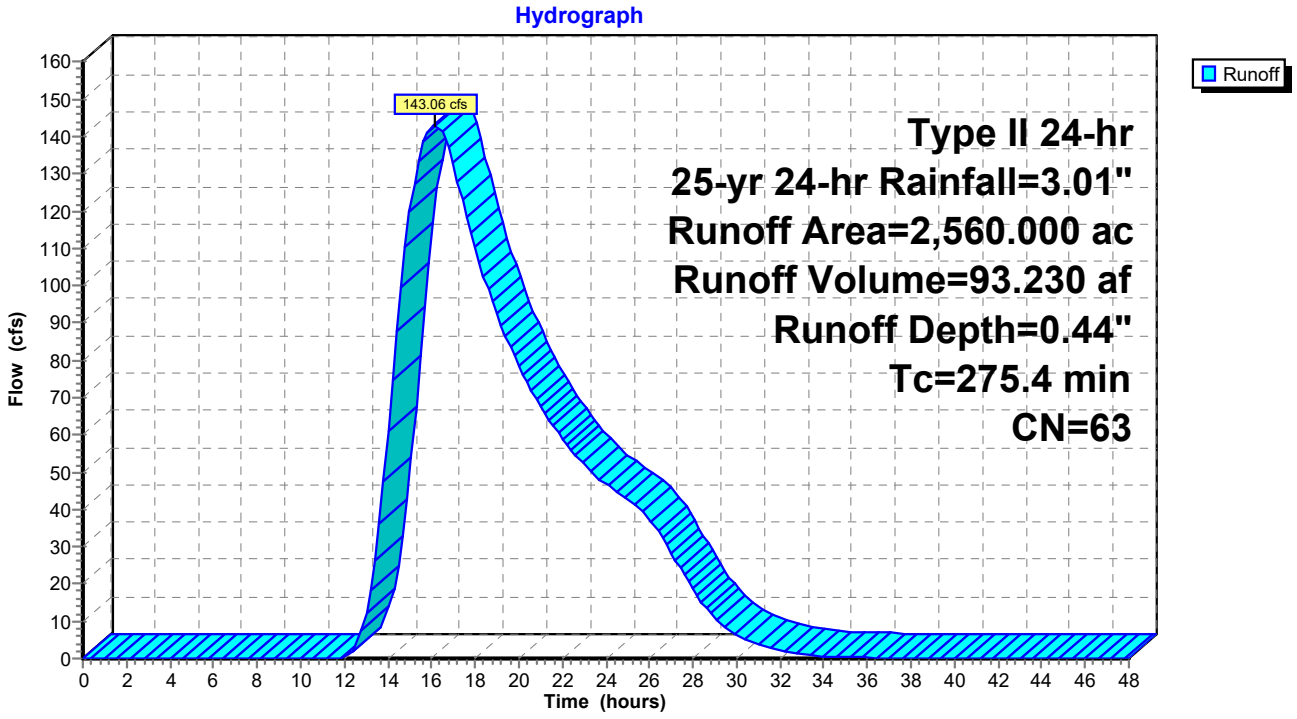
Runoff = 143.06 cfs @ 16.18 hrs, Volume= 93.230 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
1,525.800	56	Brush, Fair, HSG B
535.000	70	Brush, Fair, HSG C
499.200	77	Brush, Fair, HSG D
2,560.000	63	Weighted Average
2,560.000		100.00% Pervious Area

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

Subcatchment 16:



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Summary for Subcatchment 17:

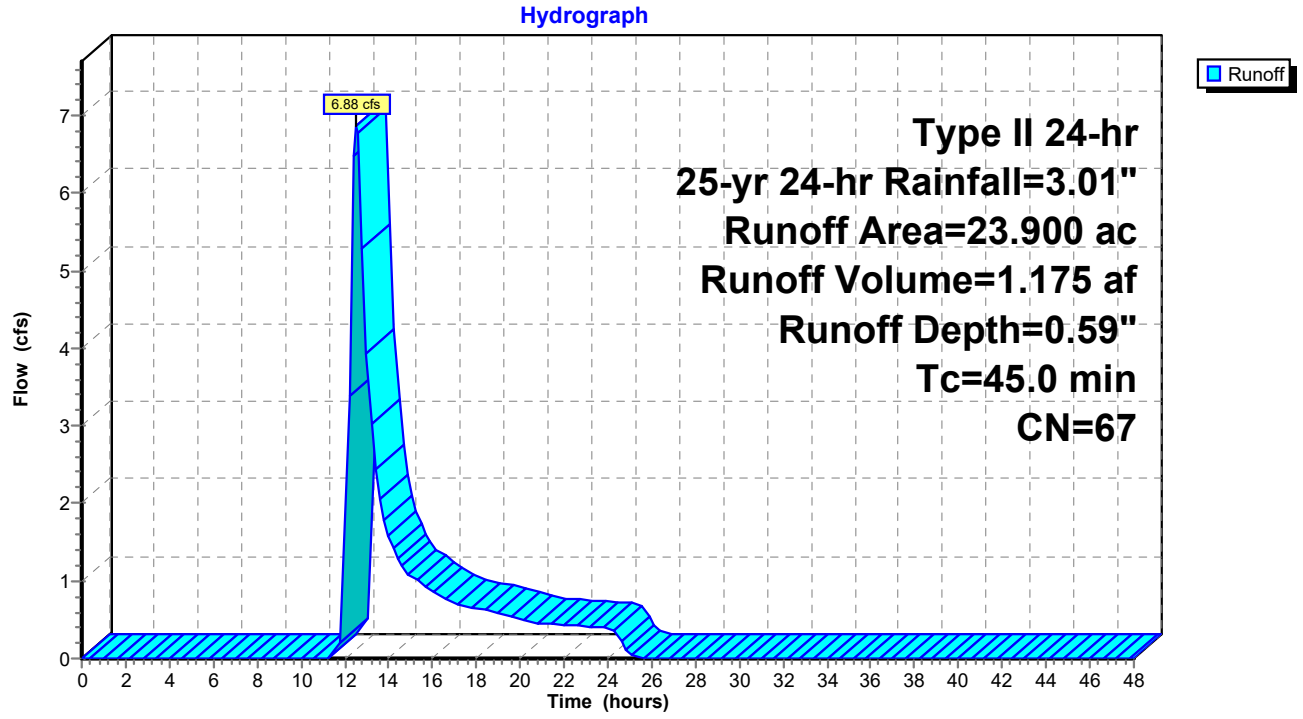
Runoff = 6.88 cfs @ 12.53 hrs, Volume= 1.175 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
10.800	56	Brush, Fair, HSG B
1.700	70	Brush, Fair, HSG C
11.400	77	Brush, Fair, HSG D
23.900	67	Weighted Average
23.900		100.00% Pervious Area

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

Subcatchment 17:



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Summary for Subcatchment 18:

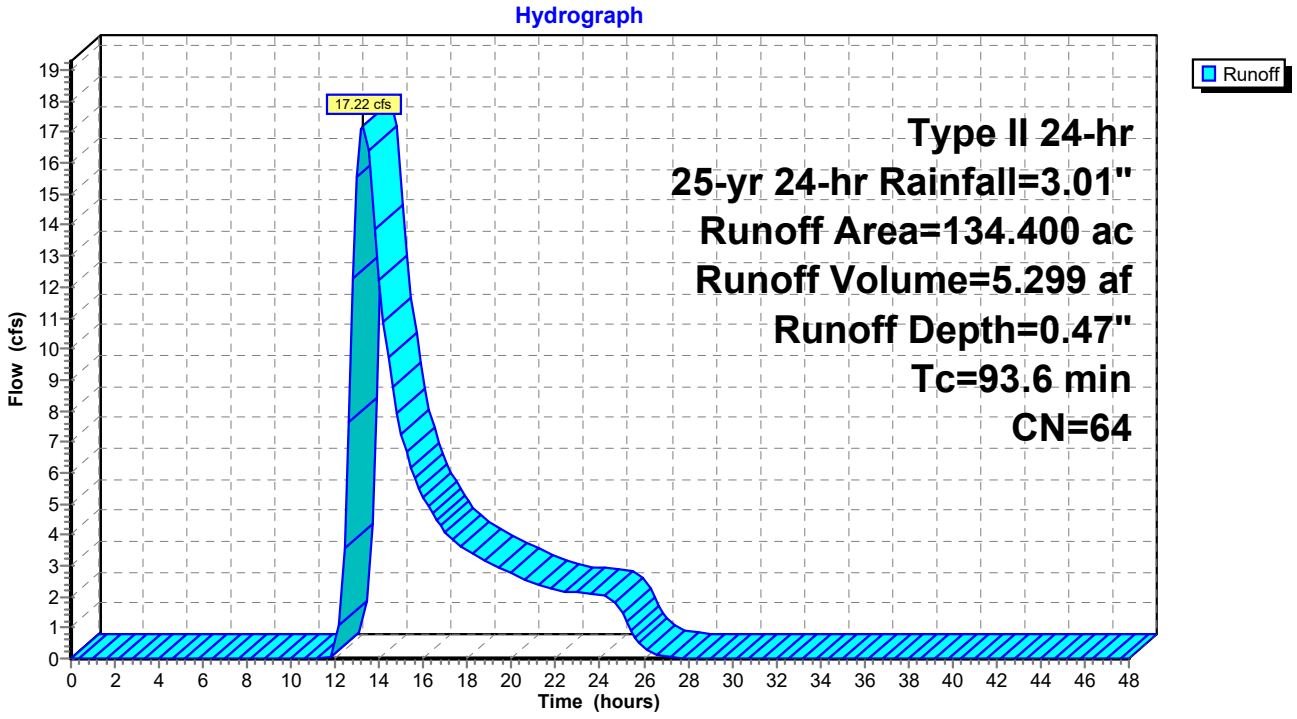
Runoff = 17.22 cfs @ 13.29 hrs, Volume= 5.299 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
83.100	56	Brush, Fair, HSG B
4.800	70	Brush, Fair, HSG C
46.500	77	Brush, Fair, HSG D
134.400	64	Weighted Average
134.400		100.00% Pervious Area

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

Subcatchment 18:



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Summary for Subcatchment 19:

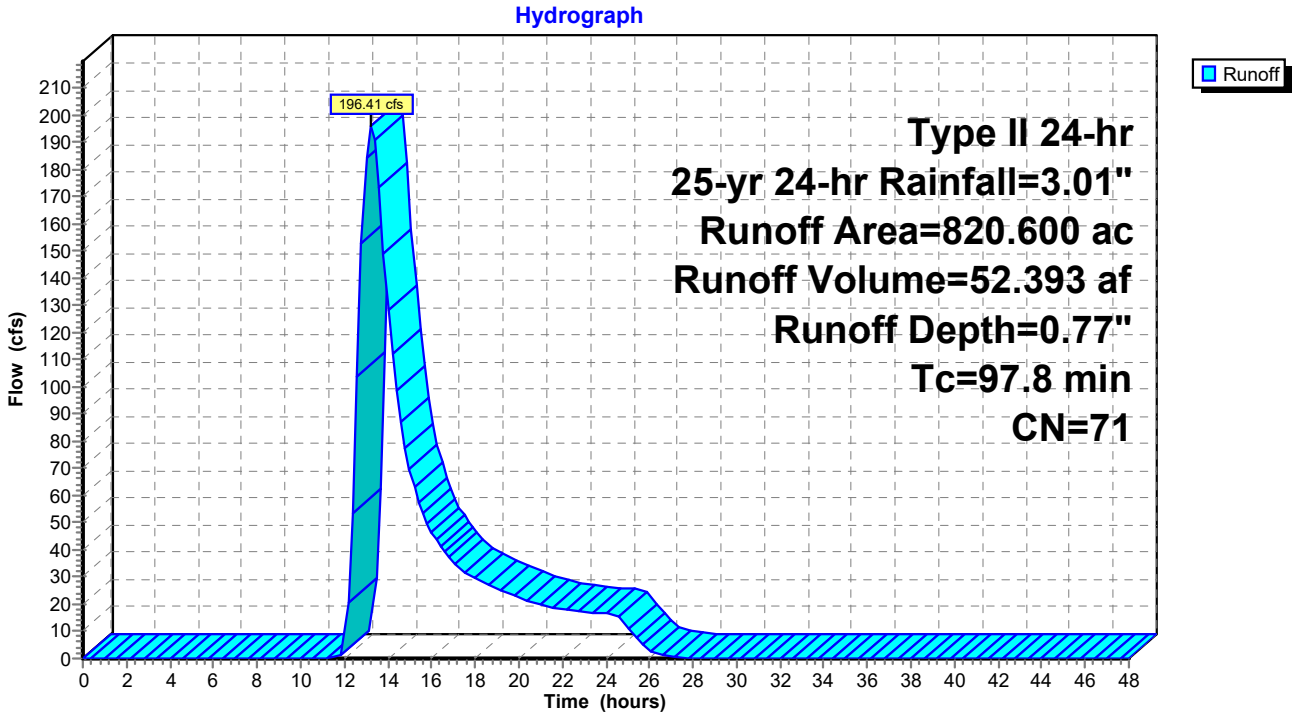
Runoff = 196.41 cfs @ 13.24 hrs, Volume= 52.393 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 24-hr 25-yr 24-hr Rainfall=3.01"

Area (ac)	CN	Description
220.400	56	Brush, Fair, HSG B
87.500	70	Brush, Fair, HSG C
512.700	77	Brush, Fair, HSG D
820.600	71	Weighted Average
820.600		100.00% Pervious Area

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

Subcatchment 19:



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Time span=0.00-48.00 hrs, dt=0.20 hrs, 241 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment8: Runoff Area=160.000 ac 0.00% Impervious Runoff Depth=0.90"
Tc=76.2 min CN=68 Runoff=76.26 cfs 11.940 af

Subcatchment9: Runoff Area=95.940 ac 0.00% Impervious Runoff Depth=0.84"
Tc=56.4 min CN=67 Runoff=53.13 cfs 6.752 af

Subcatchment10: Runoff Area=26.600 ac 0.00% Impervious Runoff Depth=0.79"
Tc=53.0 min CN=66 Runoff=14.24 cfs 1.762 af

Subcatchment11: Runoff Area=25.800 ac 0.00% Impervious Runoff Depth=0.61"
Tc=30.6 min CN=62 Runoff=13.79 cfs 1.313 af

Subcatchment12: Runoff Area=23.000 ac 0.00% Impervious Runoff Depth=0.49"
Tc=37.8 min CN=59 Runoff=8.27 cfs 0.934 af

Subcatchment13: Runoff Area=134.000 ac 0.00% Impervious Runoff Depth=0.61"
Tc=50.4 min CN=62 Runoff=53.47 cfs 6.821 af

Subcatchment14: Runoff Area=217.600 ac 0.00% Impervious Runoff Depth=0.70"
Tc=66.0 min CN=64 Runoff=85.26 cfs 12.694 af

Subcatchment15: Runoff Area=820.600 ac 0.00% Impervious Runoff Depth=1.06"
Tc=98.0 min CN=71 Runoff=396.31 cfs 72.308 af

Subcatchment16: Runoff Area=2,560.000 ac 0.00% Impervious Runoff Depth=0.65"
Tc=275.4 min CN=63 Runoff=343.81 cfs 139.672 af

Subcatchment17: Runoff Area=23.900 ac 0.00% Impervious Runoff Depth=0.84"
Tc=45.0 min CN=67 Runoff=15.20 cfs 1.682 af

Subcatchment18: Runoff Area=134.400 ac 0.00% Impervious Runoff Depth=0.70"
Tc=93.6 min CN=64 Runoff=41.17 cfs 7.840 af

Subcatchment19: Runoff Area=820.600 ac 0.00% Impervious Runoff Depth=1.06"
Tc=97.8 min CN=71 Runoff=396.91 cfs 72.308 af

Total Runoff Area = 5,042.440 ac Runoff Volume = 336.026 af Average Runoff Depth = 0.80"
100.00% Pervious = 5,042.440 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment 8:

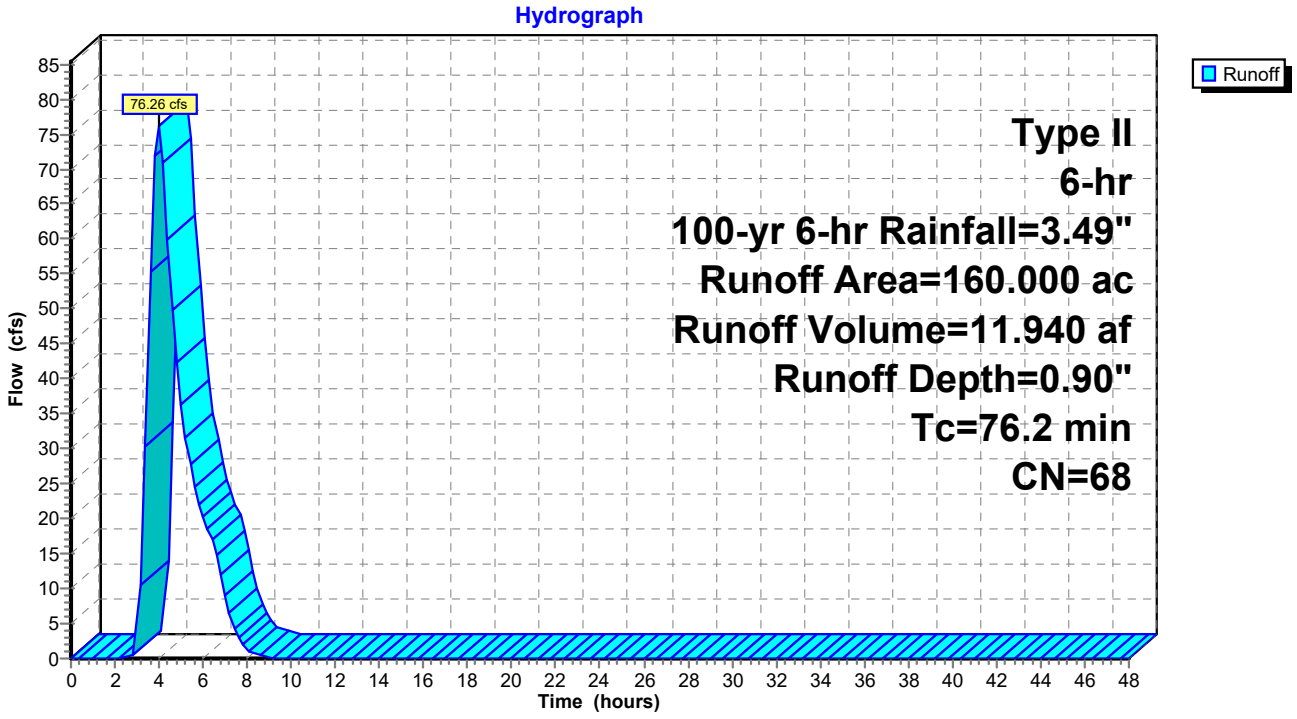
Runoff = 76.26 cfs @ 3.99 hrs, Volume= 11.940 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
38.700	56	Brush, Fair, HSG B
91.700	70	Brush, Fair, HSG C
29.600	77	Brush, Fair, HSG D
160.000	68	Weighted Average
160.000		100.00% Pervious Area

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

Subcatchment 8:



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Summary for Subcatchment 9:

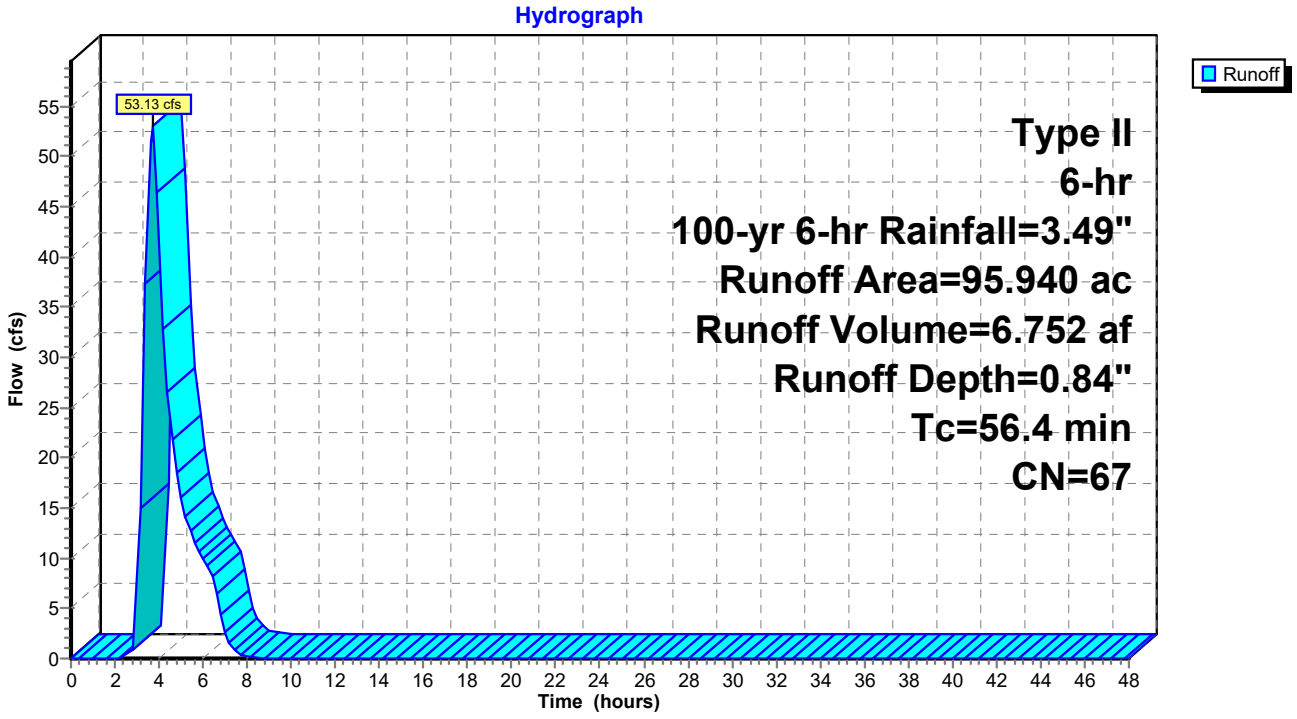
Runoff = 53.13 cfs @ 3.69 hrs, Volume= 6.752 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
30.500	56	Brush, Fair, HSG B
51.940	70	Brush, Fair, HSG C
13.500	77	Brush, Fair, HSG D
95.940	67	Weighted Average
95.940		100.00% Pervious Area

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

Subcatchment 9:



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Summary for Subcatchment 10:

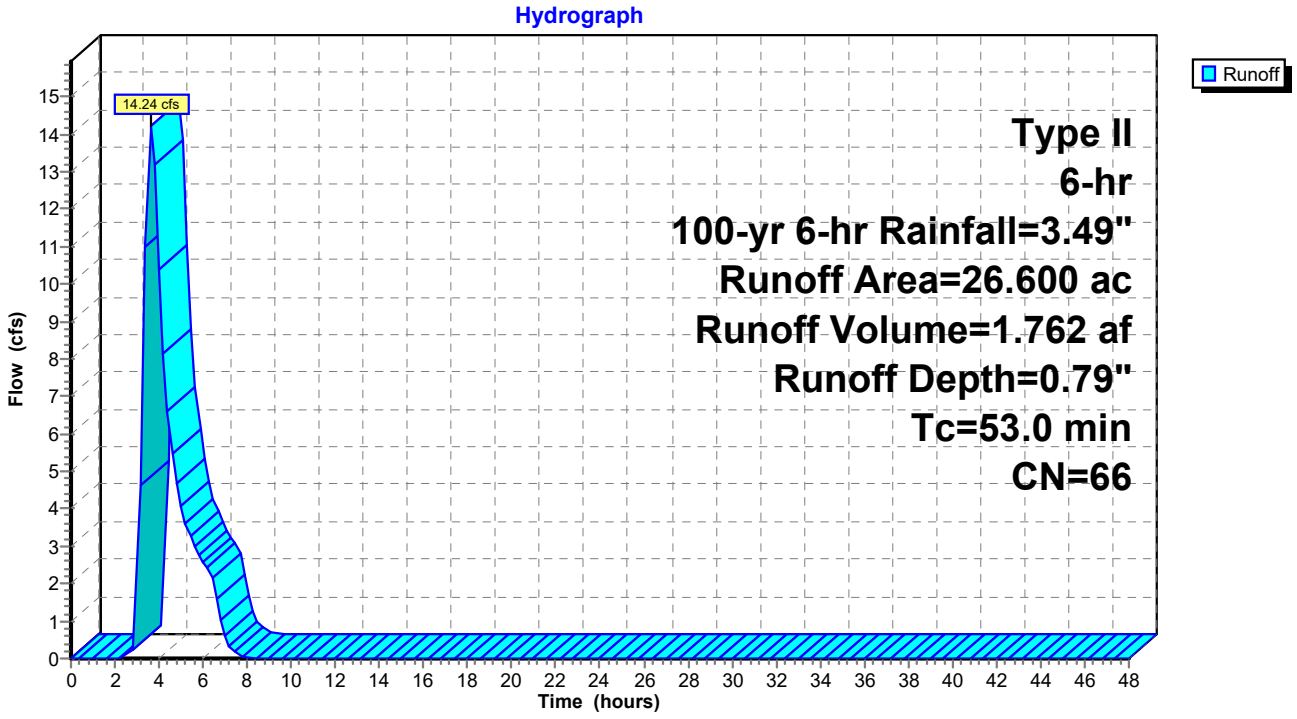
Runoff = 14.24 cfs @ 3.65 hrs, Volume= 1.762 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
9.200	56	Brush, Fair, HSG B
15.900	70	Brush, Fair, HSG C
1.500	77	Brush, Fair, HSG D
26.600	66	Weighted Average
26.600		100.00% Pervious Area

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

Subcatchment 10:



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Summary for Subcatchment 11:

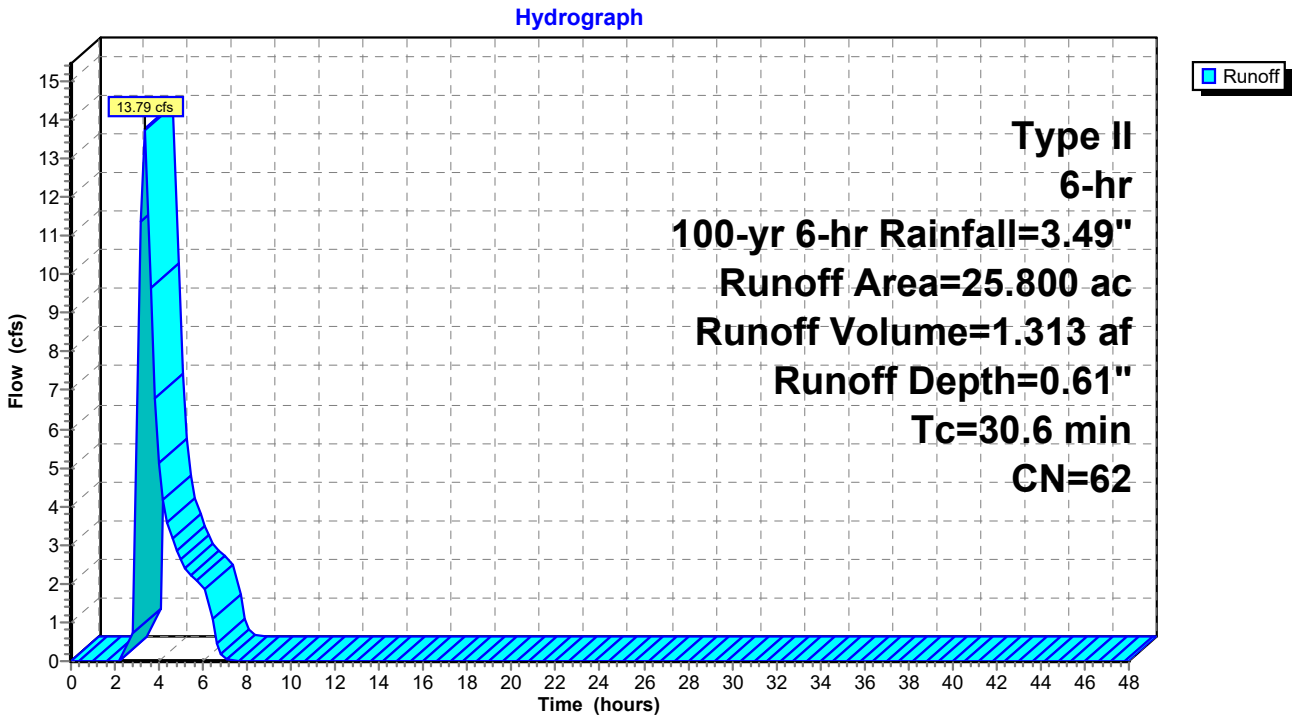
Runoff = 13.79 cfs @ 3.37 hrs, Volume= 1.313 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
18.900	56	Brush, Fair, HSG B
6.900	77	Brush, Fair, HSG D
25.800	62	Weighted Average
25.800		100.00% Pervious Area

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

Subcatchment 11:



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Summary for Subcatchment 12:

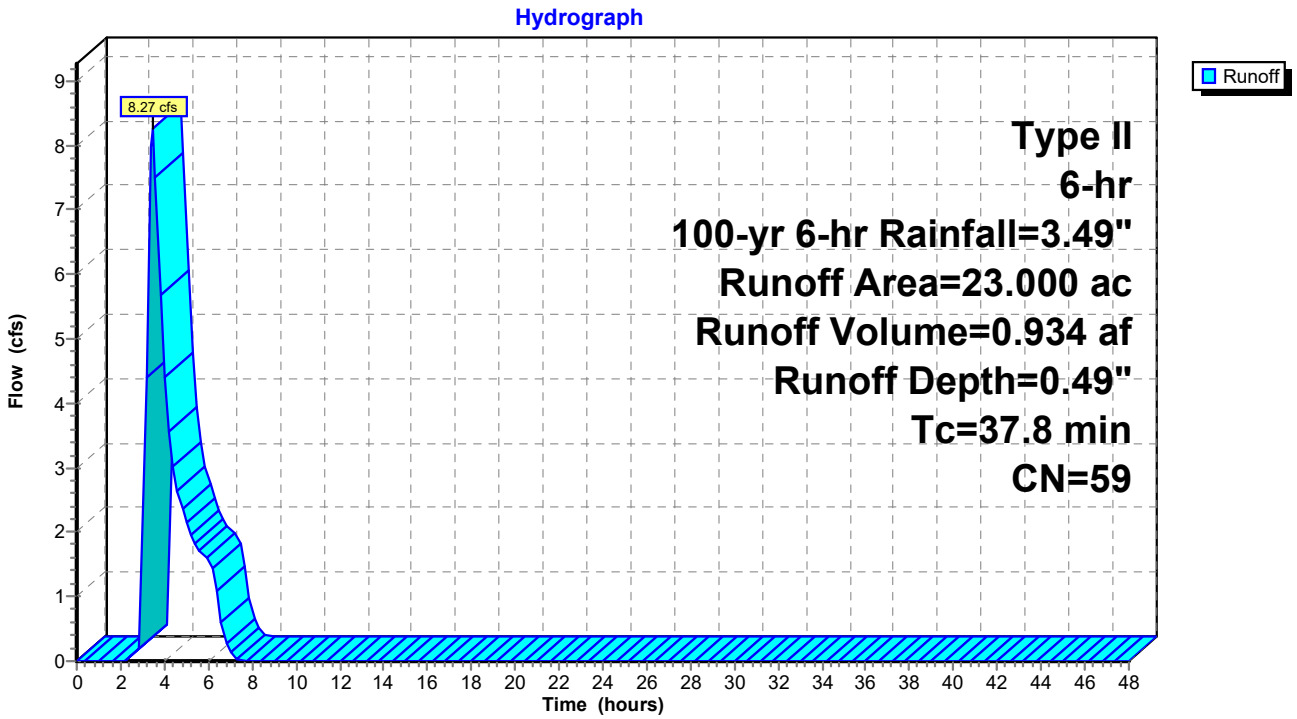
Runoff = 8.27 cfs @ 3.48 hrs, Volume= 0.934 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
19.700	56	Brush, Fair, HSG B
3.300	77	Brush, Fair, HSG D
23.000	59	Weighted Average
23.000		100.00% Pervious Area

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

Subcatchment 12:



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Summary for Subcatchment 13:

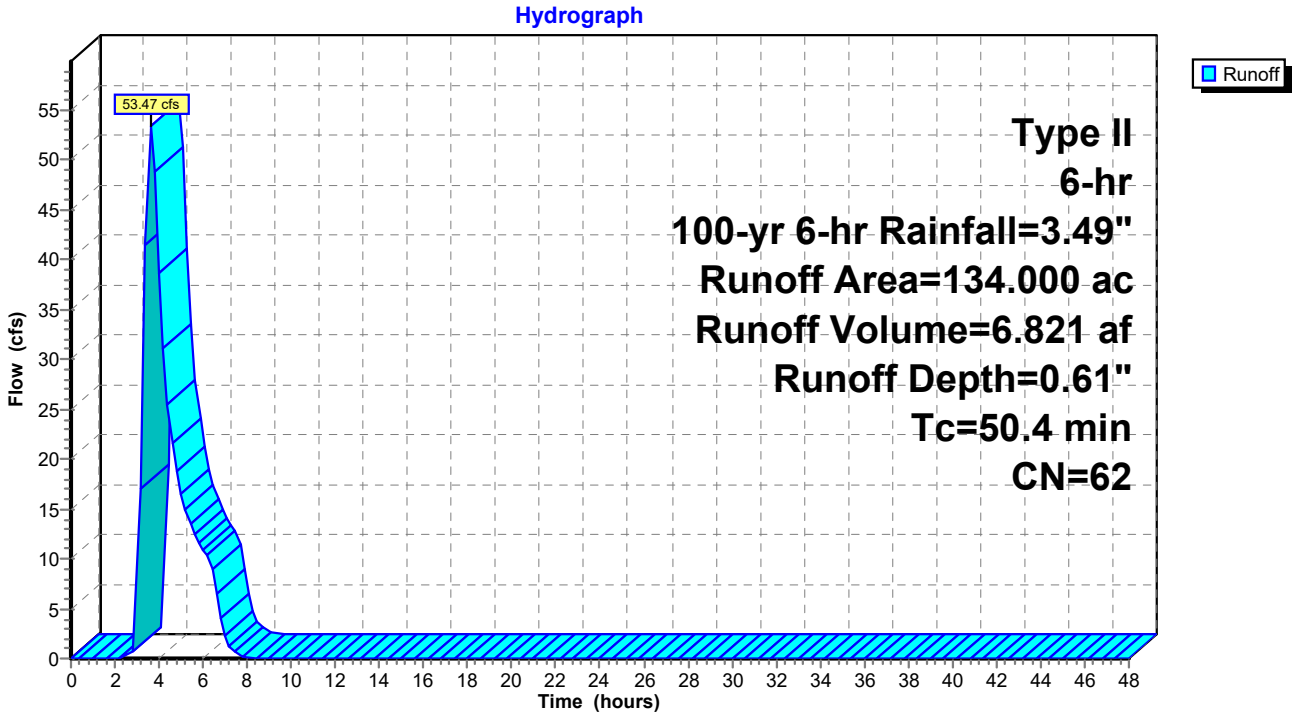
Runoff = 53.47 cfs @ 3.65 hrs, Volume= 6.821 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
93.000	56	Brush, Fair, HSG B
0.000	70	Brush, Fair, HSG C
41.000	77	Brush, Fair, HSG D
134.000	62	Weighted Average
134.000		100.00% Pervious Area

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

Subcatchment 13:



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Summary for Subcatchment 14:

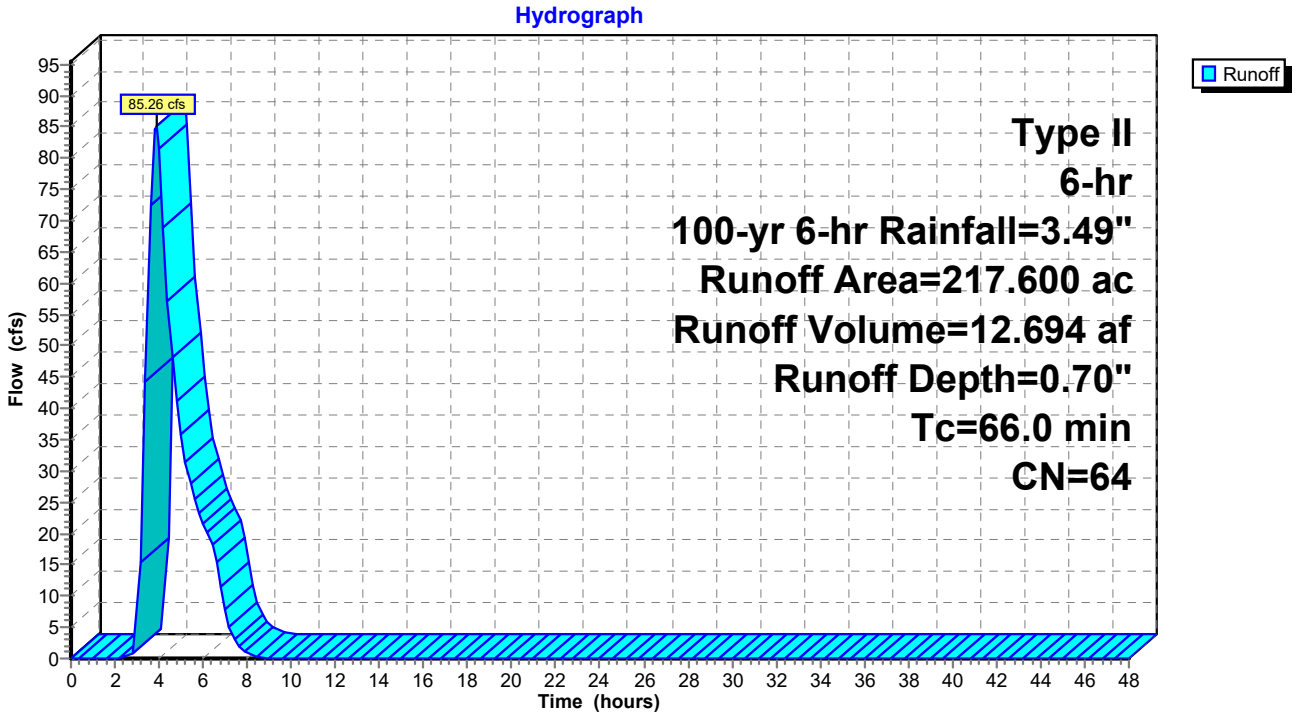
Runoff = 85.26 cfs @ 3.86 hrs, Volume= 12.694 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
129.900	56	Brush, Fair, HSG B
0.000	70	Brush, Fair, HSG C
87.700	77	Brush, Fair, HSG D
217.600	64	Weighted Average
217.600		100.00% Pervious Area

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

Subcatchment 14:



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Summary for Subcatchment 15:

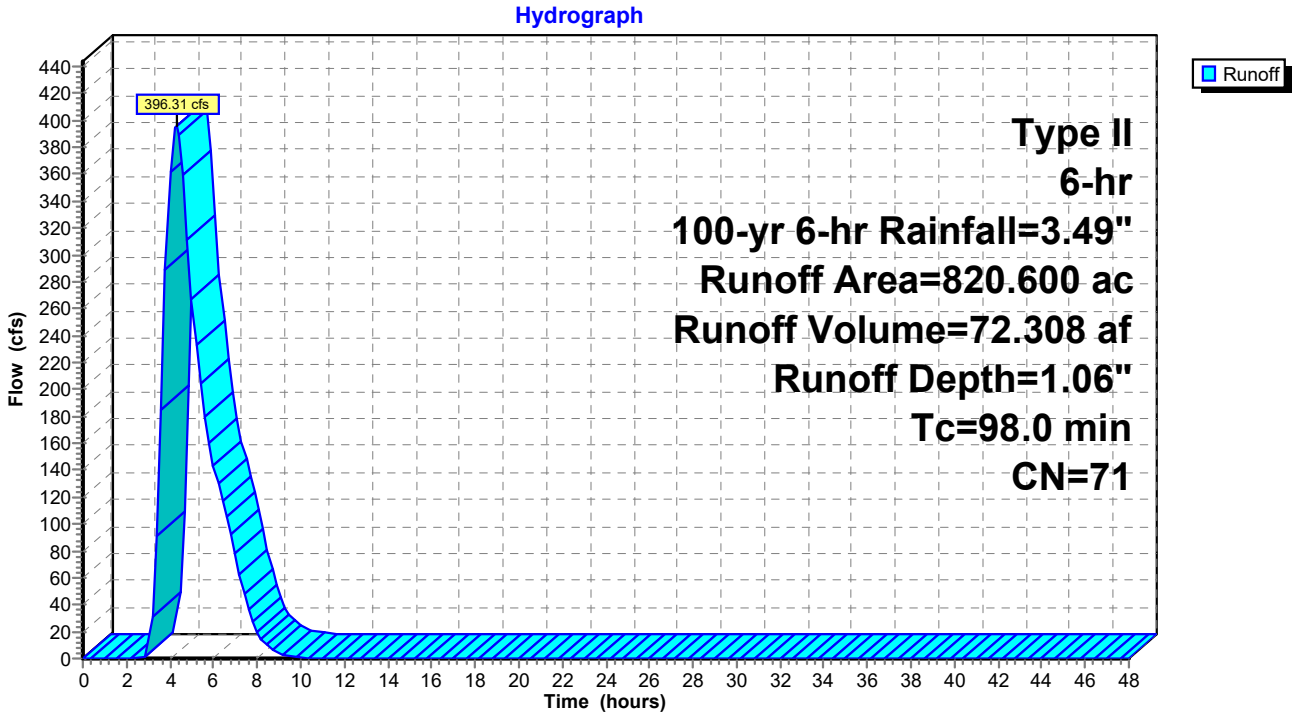
Runoff = 396.31 cfs @ 4.27 hrs, Volume= 72.308 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
220.400	56	Brush, Fair, HSG B
87.500	70	Brush, Fair, HSG C
512.700	77	Brush, Fair, HSG D
820.600	71	Weighted Average
820.600		100.00% Pervious Area

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

Subcatchment 15:



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Summary for Subcatchment 16:

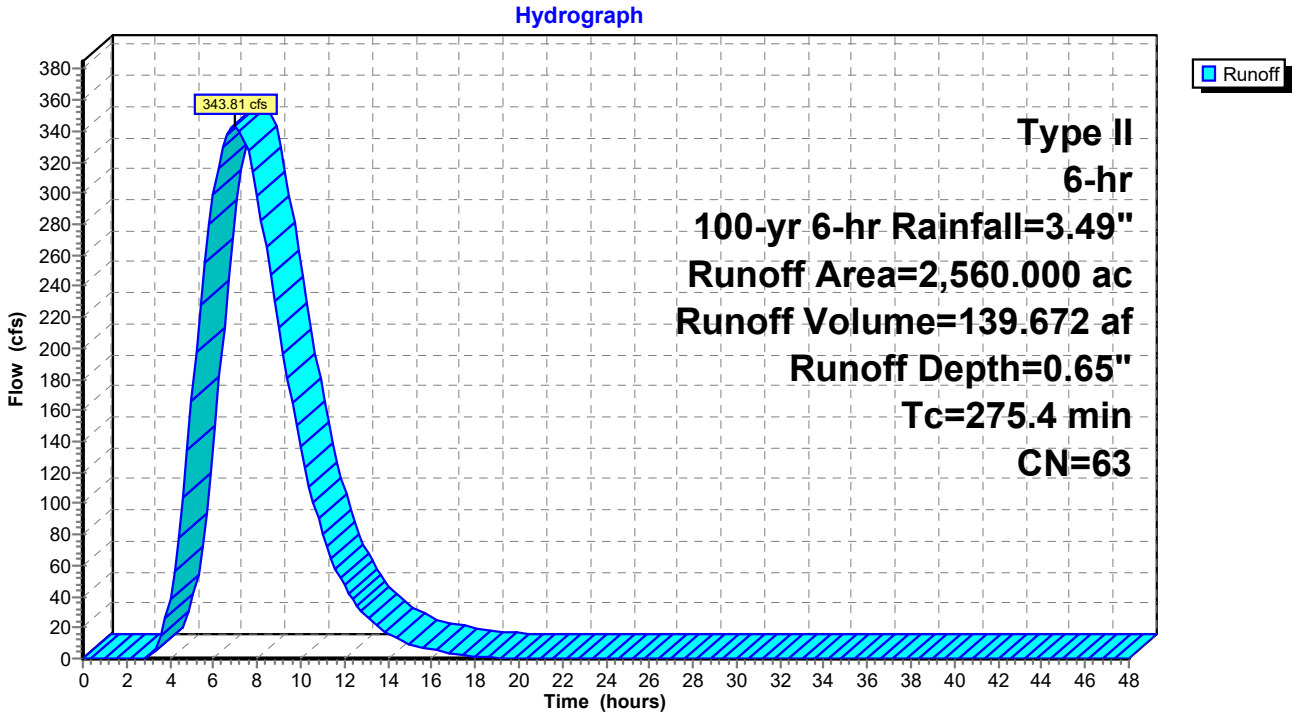
Runoff = 343.81 cfs @ 6.99 hrs, Volume= 139.672 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
1,525.800	56	Brush, Fair, HSG B
535.000	70	Brush, Fair, HSG C
499.200	77	Brush, Fair, HSG D
2,560.000	63	Weighted Average
2,560.000		100.00% Pervious Area

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

Subcatchment 16:



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Summary for Subcatchment 17:

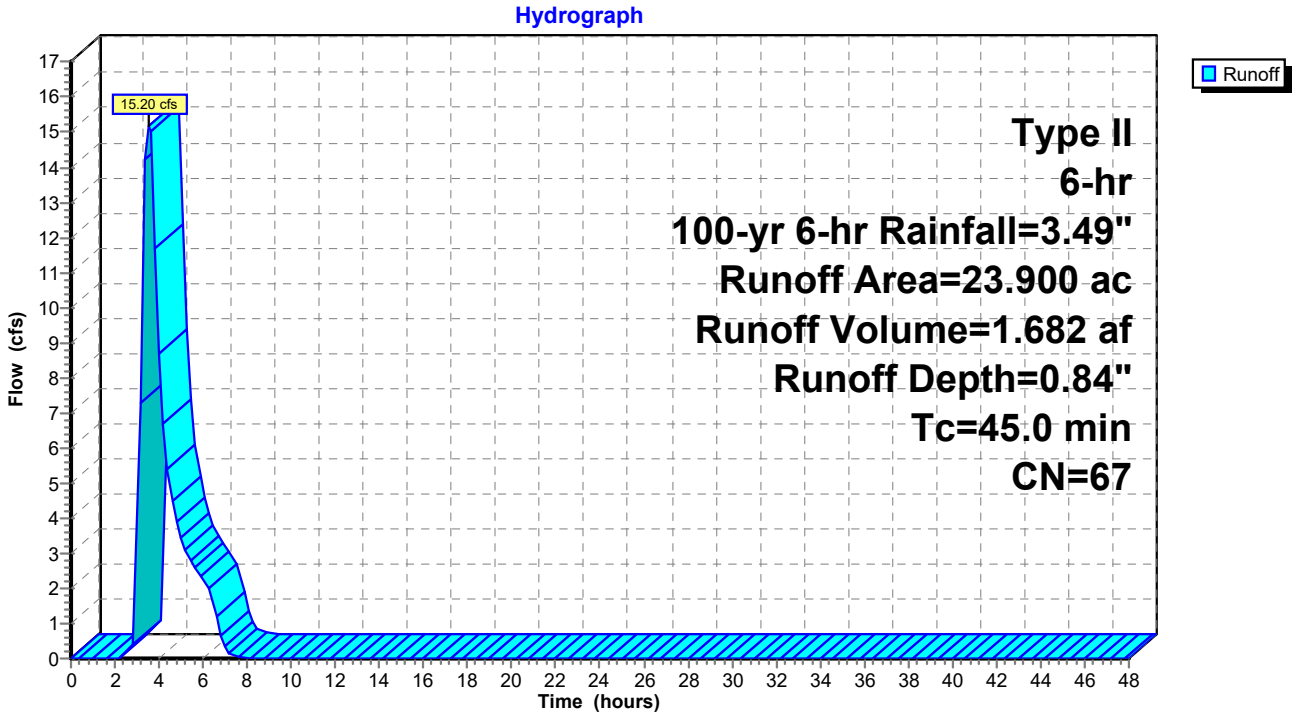
Runoff = 15.20 cfs @ 3.54 hrs, Volume= 1.682 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
10.800	56	Brush, Fair, HSG B
1.700	70	Brush, Fair, HSG C
11.400	77	Brush, Fair, HSG D
23.900	67	Weighted Average
23.900		100.00% Pervious Area

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

Subcatchment 17:



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Summary for Subcatchment 18:

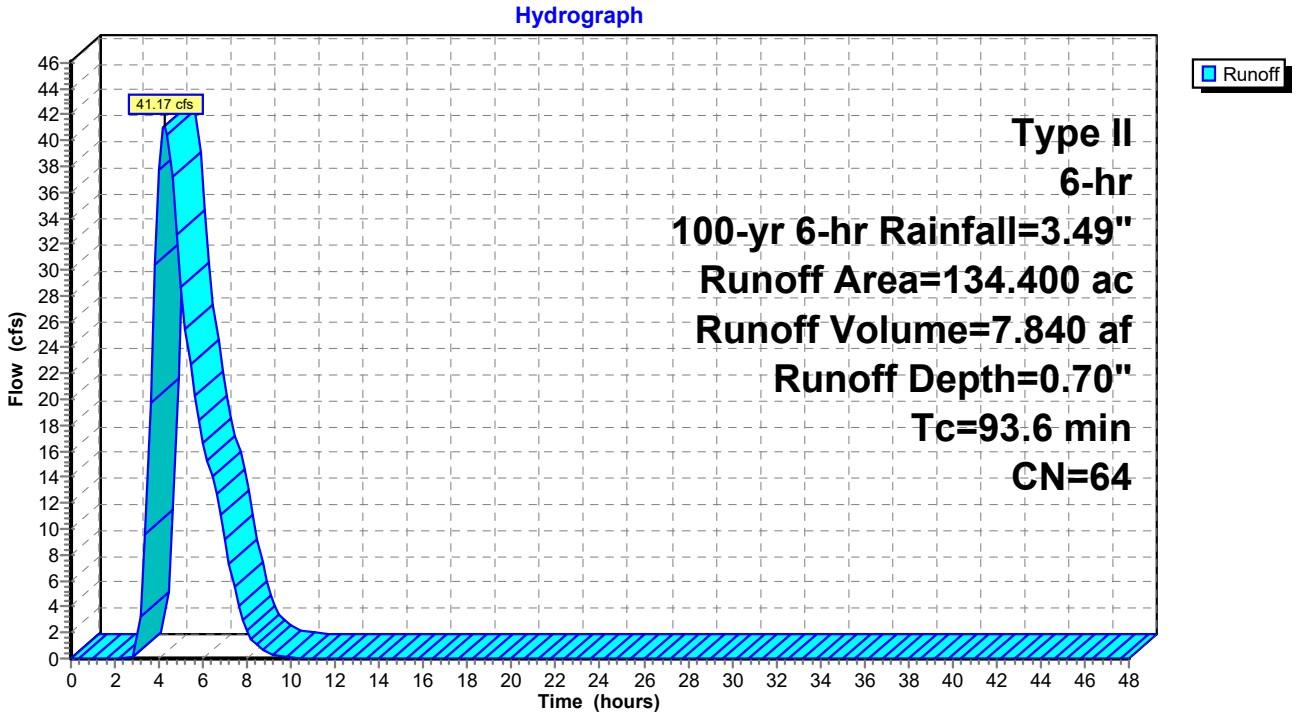
Runoff = 41.17 cfs @ 4.27 hrs, Volume= 7.840 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
83.100	56	Brush, Fair, HSG B
4.800	70	Brush, Fair, HSG C
46.500	77	Brush, Fair, HSG D
134.400	64	Weighted Average
134.400		100.00% Pervious Area

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

Subcatchment 18:



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Summary for Subcatchment 19:

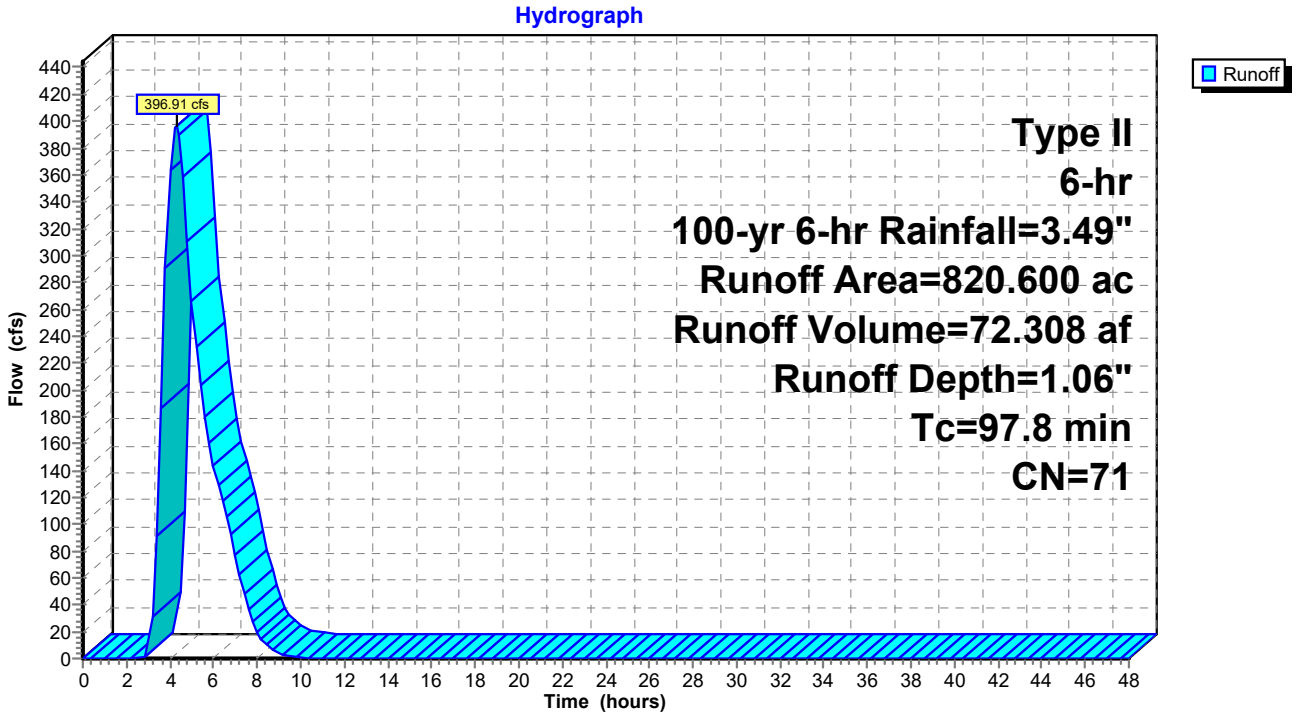
Runoff = 396.91 cfs @ 4.27 hrs, Volume= 72.308 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.20 hrs
Type II 6-hr 100-yr 6-hr Rainfall=3.49"

Area (ac)	CN	Description
220.400	56	Brush, Fair, HSG B
87.500	70	Brush, Fair, HSG C
512.700	77	Brush, Fair, HSG D
820.600	71	Weighted Average
820.600		100.00% Pervious Area

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

Subcatchment 19:



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Attachment E: FHWA HY-8 Culvert Sizing Report

HY-8 Culvert Analysis Report

Crossing 1 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 35.00 cfs

Maximum Flow: 73.20 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing 1

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 4wx4h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.86	7.32	7.32	0.00	1
1.32	14.64	14.64	0.00	1
1.71	21.96	21.96	0.00	1
2.07	29.28	29.28	0.00	1
2.32	35.00	35.00	0.00	1
2.70	43.92	43.92	0.00	1
2.98	51.24	51.24	0.00	1
3.26	58.56	58.56	0.00	1
3.52	65.88	65.88	0.00	1
3.77	73.20	73.20	0.00	1
6.00	135.43	135.43	0.00	Overtopping

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Culvert Data: Concrete Box, 4wx4h

Table 1 - Culvert Summary Table: Concrete Box, 4wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
7.32 cfs	7.32 cfs	0.86	0.81	0.858	7-H2t	-1.00	0.47	0.58	0.58	3.14	3.01
14.64 cfs	14.64 cfs	1.32	1.28	1.323	7-H2t	-1.00	0.75	0.85	0.85	4.32	3.68
21.96 cfs	21.96 cfs	1.71	1.68	1.715	7-H2t	-1.00	0.98	1.05	1.05	5.24	4.12
29.28 cfs	29.28 cfs	2.07	2.03	2.066	7-H2t	-1.00	1.19	1.21	1.21	6.04	4.45
35.00 cfs	35.00 cfs	2.32	2.28	2.322	7-H2c	-1.00	1.33	1.33	1.33	6.56	4.67
43.92 cfs	43.92 cfs	2.70	2.64	2.695	7-H2c	-1.00	1.55	1.55	1.48	7.07	4.96
51.24 cfs	51.24 cfs	2.98	2.92	2.983	7-H2c	-1.00	1.72	1.72	1.60	7.44	5.17
58.56 cfs	58.56 cfs	3.26	3.18	3.257	7-H2c	-1.00	1.88	1.88	1.71	7.78	5.35
65.88 cfs	65.88 cfs	3.52	3.44	3.521	7-H2c	-1.00	2.03	2.03	1.80	8.09	5.52
73.20 cfs	73.20 cfs	3.77	3.69	3.774	7-H2c	-1.00	2.18	2.18	1.90	8.38	5.68

Crossing 2A Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 218.10 cfs

Maximum Flow: 466.60 cfs

Table 2 - Summary of Culvert Flows at Crossing: Crossing 2A

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 10wx8h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.58	46.66	46.66	0.00	1
2.43	93.32	93.32	0.00	1
3.16	139.98	139.98	0.00	1
3.81	186.64	186.64	0.00	1
4.22	218.10	218.10	0.00	1
4.98	279.96	279.96	0.00	1
5.52	326.62	326.62	0.00	1
6.03	373.28	373.28	0.00	1
6.52	419.94	419.94	0.00	1
7.00	466.60	466.60	0.00	1
10.00	780.47	780.47	0.00	Overtopping

Culvert Data: Concrete Box, 10wx8h

Table 2 - Culvert Summary Table: Concrete Box, 10wx8h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)

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0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
46.66 cfs	46.66 cfs	1.58	1.51	1.575	7-H2t	-1.00	0.88	1.17	1.17	3.99	4.78
93.32 cfs	93.32 cfs	2.43	2.39	2.435	7-H2t	-1.00	1.39	1.70	1.70	5.49	5.85
139.98 cfs	139.98 cfs	3.16	3.14	3.158	7-H2t	-1.00	1.83	2.10	2.10	6.67	6.55
186.64 cfs	186.64 cfs	3.81	3.80	3.810	7-H2t	-1.00	2.21	2.43	2.43	7.69	7.08
218.10 cfs	218.10 cfs	4.22	4.21	4.221	7-H2t	-1.00	2.45	2.63	2.63	8.31	7.38
279.96 cfs	279.96 cfs	4.98	4.94	4.980	7-H2t	-1.00	2.90	2.97	2.97	9.42	7.89
326.62 cfs	326.62 cfs	5.52	5.46	5.518	7-H2c	-1.00	3.21	3.21	3.20	10.17	8.22
373.28 cfs	373.28 cfs	6.03	5.95	6.031	7-H2c	-1.00	3.51	3.51	3.42	10.63	8.51
419.94 cfs	419.94 cfs	6.52	6.43	6.523	7-H2c	-1.00	3.80	3.80	3.62	11.06	8.77
466.60 cfs	466.60 cfs	7.00	6.89	6.997	7-H2c	-1.00	4.07	4.07	3.80	11.45	9.02

Crossing 4 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 7.70 cfs

Maximum Flow: 16.90 cfs

Table 3 - Summary of Culvert Flows at Crossing: Crossing 4

Headwater	Total	3' Concrete	Roadway	Iterations

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Elevation (ft)	Discharge (cfs)	Pipe Discharge (cfs)	Discharge (cfs)	
0.00	0.00	0.00	0.00	1
0.62	1.69	1.69	0.00	1
0.87	3.38	3.38	0.00	1
1.06	5.07	5.07	0.00	1
1.22	6.76	6.76	0.00	1
1.31	7.70	7.70	0.00	1
1.51	10.14	10.14	0.00	1
1.63	11.83	11.83	0.00	1
1.75	13.52	13.52	0.00	1
1.87	15.21	15.21	0.00	1
1.98	16.90	16.90	0.00	1
5.00	68.09	68.09	0.00	Overtopping

Culvert Data: 3' Concrete Pipe

Crossing 4 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.69 cfs	1.69 cfs	0.62	0.54	0.624	7-H2c	-1.00	0.40	0.40	0.31	2.99	2.04
3.38 cfs	3.38 cfs	0.87	0.78	0.869	7-H2c	-1.00	0.57	0.57	0.46	3.59	2.51
5.07 cfs	5.07 cfs	1.06	0.96	1.060	7-H2c	-1.00	0.71	0.71	0.57	4.00	2.82
6.76 cfs	6.76 cfs	1.22	1.11	1.225	7-H2c	-1.00	0.82	0.82	0.66	4.34	3.06

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7.70 cfs	7.70 cfs	1.31	1.19	1.308	7-H2c	-1.00	0.87	0.87	0.71	4.50	3.17
10.14 cfs	10.14 cfs	1.51	1.38	1.507	7-H2c	-1.00	1.01	1.01	0.82	4.87	3.42
11.83 cfs	11.83 cfs	1.63	1.50	1.633	7-H2c	-1.00	1.09	1.09	0.88	5.09	3.56
13.52 cfs	13.52 cfs	1.75	1.63	1.753	7-H2c	-1.00	1.17	1.17	0.94	5.30	3.69
15.21 cfs	15.21 cfs	1.87	1.74	1.867	7-H2c	-1.00	1.24	1.24	1.00	5.49	3.81
16.90 cfs	16.90 cfs	1.98	1.86	1.977	7-H2c	-1.00	1.31	1.31	1.05	5.68	3.92

Crossing 5 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 42.50 cfs

Maximum Flow: 89.60 cfs

Table 4 - Summary of Culvert Flows at Crossing: Crossing 5

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 6wx4h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.74	8.96	8.96	0.00	1
1.15	17.92	17.92	0.00	1
1.49	26.88	26.88	0.00	1
1.80	35.84	35.84	0.00	1
2.01	42.50	42.50	0.00	1

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2.35	53.76	53.76	0.00	1
2.60	62.72	62.72	0.00	1
2.84	71.68	71.68	0.00	1
3.07	80.64	80.64	0.00	1
3.29	89.60	89.60	0.00	1
6.00	203.14	203.14	0.00	Overtopping

Culvert Data: Concrete Box, 6wx4h

Crossing 5 - Culvert Summary Table: Concrete Box, 6wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
8.96 cfs	8.96 cfs	0.74	0.71	0.743	7-H2t	-1.00	0.41	0.46	0.46	3.26	2.82
17.92 cfs	17.92 cfs	1.15	1.12	1.151	7-H2t	-1.00	0.65	0.68	0.68	4.36	3.55
26.88 cfs	26.88 cfs	1.49	1.47	1.494	7-H2t	-1.00	0.85	0.86	0.86	5.20	4.04
35.84 cfs	35.84 cfs	1.80	1.78	1.801	7-H2c	-1.00	1.03	1.03	1.01	5.77	4.42
42.50 cfs	42.50 cfs	2.01	1.99	2.013	7-H2c	-1.00	1.16	1.16	1.11	6.11	4.65
53.76 cfs	53.76 cfs	2.35	2.32	2.349	7-H2c	-1.00	1.36	1.36	1.26	6.61	4.99
62.72 cfs	62.72 cfs	2.60	2.56	2.599	7-H2c	-1.00	1.50	1.50	1.37	6.96	5.22
71.68 cfs	71.68 cfs	2.84	2.79	2.838	7-H2c	-1.00	1.64	1.64	1.48	7.27	5.42

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80.64 cfs	80.64 cfs	3.07	3.01	3.067	7-H2c	-1.00	1.78	1.78	1.57	7.56	5.61
89.60 cfs	89.60 cfs	3.29	3.23	3.289	7-H2c	-1.00	1.91	1.91	1.66	7.83	5.78

Crossing 6A Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 10.20 cfs

Maximum Flow: 20.20 cfs

Table 5 - Summary of Culvert Flows at Crossing: Crossing 6A

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Pipe Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.68	2.02	2.02	0.00	1
0.95	4.04	4.04	0.00	1
1.16	6.06	6.06	0.00	1
1.34	8.08	8.08	0.00	1
1.51	10.20	10.20	0.00	1
1.65	12.12	12.12	0.00	1
1.80	14.14	14.14	0.00	1
1.93	16.16	16.16	0.00	1
2.06	18.18	18.18	0.00	1
2.18	20.20	20.20	0.00	1
5.00	68.09	68.09	0.00	Overtopping

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Culvert Data: 3' Concrete Pipe

Table 5 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
2.02 cfs	2.02 cfs	0.68	0.60	0.679	7-H2c	-1.00	0.44	0.44	0.35	3.13	2.16
4.04 cfs	4.04 cfs	0.95	0.85	0.948	7-H2c	-1.00	0.63	0.63	0.51	3.76	2.65
6.06 cfs	6.06 cfs	1.16	1.05	1.159	7-H2c	-1.00	0.77	0.77	0.63	4.21	2.97
8.08 cfs	8.08 cfs	1.34	1.22	1.341	7-H2c	-1.00	0.90	0.90	0.73	4.56	3.21
10.20 cfs	10.20 cfs	1.51	1.39	1.512	7-H2c	-1.00	1.01	1.01	0.82	4.87	3.42
12.12 cfs	12.12 cfs	1.65	1.52	1.654	7-H2c	-1.00	1.11	1.11	0.89	5.13	3.59
14.14 cfs	14.14 cfs	1.80	1.67	1.795	7-H2c	-1.00	1.20	1.20	0.96	5.37	3.74
16.16 cfs	16.16 cfs	1.93	1.81	1.929	7-H2c	-1.00	1.28	1.28	1.03	5.60	3.87
18.18 cfs	18.18 cfs	2.06	1.94	2.057	7-H2c	-1.00	1.37	1.37	1.09	5.81	3.99
20.20 cfs	20.20 cfs	2.18	2.06	2.180	7-H2c	-1.00	1.44	1.44	1.15	6.01	4.10

Crossing 7 Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 91.00 cfs

Maximum Flow: 201.20 cfs

Table 6 - Summary of Culvert Flows at Crossing: Crossing 7

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 8wx6h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.11	20.12	20.12	0.00	1
1.68	40.24	40.24	0.00	1
2.15	60.36	60.36	0.00	1
2.57	80.48	80.48	0.00	1
2.78	91.00	91.00	0.00	1
3.33	120.72	120.72	0.00	1
3.67	140.84	140.84	0.00	1
4.01	160.96	160.96	0.00	1
4.33	181.08	181.08	0.00	1
4.64	201.20	201.20	0.00	1
8.00	437.71	437.71	0.00	Overtopping

Culvert Data: Concrete Box, 8wx6h

Table 6 - Culvert Summary Table: Concrete Box, 8wx6h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)

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0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
20.12 cfs	20.12 cfs	1.11	1.00	1.106	7-H2t	-1.00	0.58	0.89	0.89	2.83	3.92
40.24 cfs	40.24 cfs	1.68	1.58	1.677	7-H2t	-1.00	0.92	1.28	1.28	3.92	4.77
60.36 cfs	60.36 cfs	2.15	2.08	2.149	7-H2t	-1.00	1.21	1.58	1.58	4.77	5.33
80.48 cfs	80.48 cfs	2.57	2.52	2.570	7-H2t	-1.00	1.46	1.83	1.83	5.51	5.76
91.00 cfs	91.00 cfs	2.78	2.73	2.777	7-H2t	-1.00	1.59	1.94	1.94	5.86	5.95
120.72 cfs	120.72 cfs	3.33	3.29	3.325	7-H2t	-1.00	1.92	2.23	2.23	6.78	6.41
140.84 cfs	140.84 cfs	3.67	3.63	3.674	7-H2t	-1.00	2.13	2.40	2.40	7.34	6.68
160.96 cfs	160.96 cfs	4.01	3.96	4.008	7-H2t	-1.00	2.33	2.56	2.56	7.87	6.91
181.08 cfs	181.08 cfs	4.33	4.27	4.330	7-H2t	-1.00	2.52	2.70	2.70	8.38	7.13
201.20 cfs	201.20 cfs	4.64	4.57	4.641	7-H2t	-1.00	2.70	2.84	2.84	8.86	7.32

Crossing 8 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 35.60 cfs

Maximum Flow: 76.30 cfs

Table 7 - Summary of Culvert Flows at Crossing: Crossing 8

Headwater	Total	Concrete Box,	Roadway	Iterations

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Elevation (ft)	Discharge (cfs)	6wx4h Discharge (cfs)	Discharge (cfs)	
0.00	0.00	0.00	0.00	1
0.70	7.63	7.63	0.00	1
1.06	15.26	15.26	0.00	1
1.37	22.89	22.89	0.00	1
1.64	30.52	30.52	0.00	1
1.81	35.60	35.60	0.00	1
2.12	45.78	45.78	0.00	1
2.34	53.41	53.41	0.00	1
2.56	61.04	61.04	0.00	1
2.76	68.67	68.67	0.00	1
2.96	76.30	76.30	0.00	1
6.00	203.13	203.13	0.00	Overtopping

Culvert Data: Concrete Box, 6wx4h

Table 7 - Culvert Summary Table: Concrete Box, 6wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
7.63 cfs	7.63 cfs	0.70	0.63	0.696	7-H2t	-1.00	0.37	0.52	0.52	2.45	2.92
15.26 cfs	15.26 cfs	1.06	1.01	1.063	7-H2t	-1.00	0.59	0.76	0.76	3.33	3.61
22.89 cfs	22.89 cfs	1.37	1.32	1.367	7-H2t	-1.00	0.77	0.95	0.95	4.00	4.07
30.52 cfs	30.52 cfs	1.64	1.60	1.638	7-	-1.00	0.93	1.11	1.11	4.58	4.42

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					H2t						
35.60 cfs	35.60 cfs	1.81	1.77	1.806	7-H2t	-1.00	1.03	1.20	1.20	4.93	4.61
45.78 cfs	45.78 cfs	2.12	2.09	2.122	7-H2t	-1.00	1.22	1.37	1.37	5.56	4.95
53.41 cfs	53.41 cfs	2.34	2.31	2.344	7-H2t	-1.00	1.35	1.49	1.49	5.99	5.16
61.04 cfs	61.04 cfs	2.56	2.51	2.557	7-H2t	-1.00	1.48	1.59	1.59	6.40	5.35
68.67 cfs	68.67 cfs	2.76	2.71	2.761	7-H2t	-1.00	1.60	1.69	1.69	6.79	5.52
76.30 cfs	76.30 cfs	2.96	2.91	2.958	7-H2t	-1.00	1.71	1.78	1.78	7.15	5.68

Crossing 9 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 24.00 cfs

Maximum Flow: 53.10 cfs

Table 8 - Summary of Culvert Flows at Crossing: Crossing 9

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 4wx4h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.69	5.31	5.31	0.00	1
1.07	10.62	10.62	0.00	1
1.39	15.93	15.93	0.00	1
1.68	21.24	21.24	0.00	1

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1.81	24.00	24.00	0.00	1
2.18	31.86	31.86	0.00	1
2.42	37.17	37.17	0.00	1
2.64	42.48	42.48	0.00	1
2.85	47.79	47.79	0.00	1
3.05	53.10	53.10	0.00	1
6.00	135.42	135.42	0.00	Overtopping

Culvert Data: Concrete Box, 4wx4h

Table 8 - Culvert Summary Table: Concrete Box, 4wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
5.31 cfs	5.31 cfs	0.69	0.65	0.694	7-H2t	-1.00	0.38	0.42	0.42	3.14	2.60
10.62 cfs	10.62 cfs	1.07	1.04	1.072	7-H2t	-1.00	0.60	0.63	0.63	4.25	3.23
15.93 cfs	15.93 cfs	1.39	1.36	1.391	7-H2c	-1.00	0.79	0.79	0.78	5.04	3.66
21.24 cfs	21.24 cfs	1.68	1.64	1.676	7-H2c	-1.00	0.96	0.96	0.92	5.55	3.98
24.00 cfs	24.00 cfs	1.81	1.78	1.815	7-H2c	-1.00	1.04	1.04	0.98	5.78	4.12
31.86 cfs	31.86 cfs	2.18	2.15	2.183	7-H2c	-1.00	1.25	1.25	1.14	6.35	4.47
37.17 cfs	37.17 cfs	2.42	2.37	2.415	7-H2c	-1.00	1.39	1.39	1.23	6.69	4.67
42.48 cfs	42.48 cfs	2.64	2.59	2.637	7-	-1.00	1.52	1.52	1.32	6.99	4.84

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					H2c						
47.79 cfs	47.79 cfs	2.85	2.79	2.849	7-H2c	-1.00	1.64	1.64	1.40	7.27	5.00
53.10 cfs	53.10 cfs	3.05	2.99	3.054	7-H2c	-1.00	1.76	1.76	1.48	7.53	5.15

Crossing 10 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 6.30 cfs

Maximum Flow: 14.30 cfs

Table 9 - Summary of Culvert Flows at Crossing: Crossing 10

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Pipe Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.59	1.43	1.43	0.00	1
0.82	2.86	2.86	0.00	1
1.01	4.29	4.29	0.00	1
1.22	6.30	6.30	0.00	1
1.31	7.15	7.15	0.00	1
1.43	8.58	8.58	0.00	1
1.56	10.01	10.01	0.00	1
1.67	11.44	11.44	0.00	1
1.78	12.87	12.87	0.00	1
1.88	14.30	14.30	0.00	1
6.00	71.07	71.07	0.00	Overtopping

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Culvert Data: 3' Concrete Pipe

Table 9 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.43 cfs	1.43 cfs	0.59	0.50	0.591	7-H2c	-1.00	0.37	0.37	0.29	2.86	1.94
2.86 cfs	2.86 cfs	0.82	0.72	0.825	7-H2c	-1.00	0.53	0.53	0.42	3.43	2.40
4.29 cfs	4.29 cfs	1.01	0.88	1.008	7-H2c	-1.00	0.65	0.65	0.52	3.83	2.69
6.30 cfs	6.30 cfs	1.22	1.08	1.224	7-H2c	-1.00	0.79	0.79	0.64	4.25	3.00
7.15 cfs	7.15 cfs	1.31	1.16	1.306	7-H2c	-1.00	0.84	0.84	0.68	4.40	3.11
8.58 cfs	8.58 cfs	1.43	1.27	1.435	7-H2c	-1.00	0.92	0.92	0.75	4.64	3.27
10.01 cfs	10.01 cfs	1.56	1.38	1.556	7-H2c	-1.00	1.00	1.00	0.81	4.85	3.41
11.44 cfs	11.44 cfs	1.67	1.49	1.669	7-H2c	-1.00	1.07	1.07	0.87	5.04	3.53
12.87 cfs	12.87 cfs	1.78	1.60	1.778	7-H2c	-1.00	1.14	1.14	0.92	5.22	3.64
14.30 cfs	14.30 cfs	1.88	1.71	1.882	7-H2c	-1.00	1.20	1.20	0.97	5.39	3.75

Crossing 11 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 5.20 cfs

Maximum Flow: 13.80 cfs

Table 10 - Summary of Culvert Flows at Crossing: Crossing 11

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Pipe Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.57	1.38	1.38	0.00	1
0.79	2.76	2.76	0.00	1
0.96	4.14	4.14	0.00	1
1.07	5.20	5.20	0.00	1
1.24	6.90	6.90	0.00	1
1.36	8.28	8.28	0.00	1
1.47	9.66	9.66	0.00	1
1.58	11.04	11.04	0.00	1
1.68	12.42	12.42	0.00	1
1.77	13.80	13.80	0.00	1
5.00	68.10	68.10	0.00	Overtopping

Culvert Data: 3' Concrete Pipe

Table 10 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00

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1.38 cfs	1.38 cfs	0.57	0.49	0.567	7-H2c	-1.00	0.36	0.36	0.28	2.83	1.92
2.76 cfs	2.76 cfs	0.79	0.70	0.788	7-H2c	-1.00	0.52	0.52	0.41	3.40	2.37
4.14 cfs	4.14 cfs	0.96	0.86	0.959	7-H2c	-1.00	0.64	0.64	0.51	3.79	2.67
5.20 cfs	5.20 cfs	1.07	0.97	1.074	7-H2c	-1.00	0.71	0.71	0.58	4.03	2.84
6.90 cfs	6.90 cfs	1.24	1.13	1.237	7-H2c	-1.00	0.83	0.83	0.67	4.36	3.08
8.28 cfs	8.28 cfs	1.36	1.24	1.358	7-H2c	-1.00	0.91	0.91	0.74	4.59	3.24
9.66 cfs	9.66 cfs	1.47	1.35	1.470	7-H2c	-1.00	0.98	0.98	0.80	4.80	3.37
11.04 cfs	11.04 cfs	1.58	1.45	1.575	7-H2c	-1.00	1.05	1.05	0.85	4.99	3.50
12.42 cfs	12.42 cfs	1.68	1.55	1.676	7-H2c	-1.00	1.12	1.12	0.90	5.17	3.61
13.80 cfs	13.80 cfs	1.77	1.65	1.772	7-H2c	-1.00	1.18	1.18	0.95	5.33	3.71

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

Inlet Elevation (invert): 0.00 ft,

Outlet Elevation (invert): 0.00 ft

Culvert Length: 50.00 ft,

Culvert Slope: 0.0000

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Crossing 12 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 2.50 cfs

Maximum Flow: 8.30 cfs

Table 11 - Summary of Culvert Flows at Crossing: Crossing 12

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Circular Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.45	0.83	0.83	0.00	1
0.62	1.66	1.66	0.00	1
0.75	2.50	2.50	0.00	1
0.86	3.32	3.32	0.00	1
0.96	4.15	4.15	0.00	1
1.05	4.98	4.98	0.00	1
1.13	5.81	5.81	0.00	1
1.21	6.64	6.64	0.00	1
1.29	7.47	7.47	0.00	1
1.36	8.30	8.30	0.00	1
5.00	68.09	68.09	0.00	Overtopping

Culvert Data: 3' Concrete Circular

Table 11 - Culvert Summary Table: 3' Concrete Circular

Total	Culvert	Headwater	Inlet	Outlet	Flow	Normal	Critical	Outlet	Tailwater	Outlet	Tailwater

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Discharge (cfs)	Discharge (cfs)	Elevation (ft)	Control Depth (ft)	Control Depth (ft)	Type	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Velocity (ft/s)	Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.83 cfs	0.83 cfs	0.45	0.38	0.449	7-H2c	-1.00	0.28	0.28	0.21	2.48	1.63
1.66 cfs	1.66 cfs	0.62	0.54	0.619	7-H2c	-1.00	0.40	0.40	0.31	2.97	2.03
2.50 cfs	2.50 cfs	0.75	0.66	0.751	7-H2c	-1.00	0.49	0.49	0.39	3.31	2.30
3.32 cfs	3.32 cfs	0.86	0.77	0.861	7-H2c	-1.00	0.57	0.57	0.46	3.57	2.50
4.15 cfs	4.15 cfs	0.96	0.86	0.961	7-H2c	-1.00	0.64	0.64	0.51	3.79	2.67
4.98 cfs	4.98 cfs	1.05	0.95	1.051	7-H2c	-1.00	0.70	0.70	0.57	3.98	2.81
5.81 cfs	5.81 cfs	1.13	1.03	1.135	7-H2c	-1.00	0.76	0.76	0.61	4.16	2.93
6.64 cfs	6.64 cfs	1.21	1.10	1.214	7-H2c	-1.00	0.81	0.81	0.66	4.31	3.05
7.47 cfs	7.47 cfs	1.29	1.17	1.288	7-H2c	-1.00	0.86	0.86	0.70	4.46	3.15
8.30 cfs	8.30 cfs	1.36	1.24	1.359	7-H2c	-1.00	0.91	0.91	0.74	4.59	3.24

Crossing 15 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 196.70 cfs

Maximum Flow: 396.30 cfs

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Table 12 - Summary of Culvert Flows at Crossing: Crossing 15

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 10wx8h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.46	39.63	39.63	0.00	1
2.23	79.26	79.26	0.00	1
2.87	118.89	118.89	0.00	1
3.44	158.52	158.52	0.00	1
3.96	196.70	196.70	0.00	1
4.48	237.78	237.78	0.00	1
4.95	277.41	277.41	0.00	1
5.41	317.04	317.04	0.00	1
5.85	356.67	356.67	0.00	1
6.28	396.30	396.30	0.00	1
12.00	957.56	957.56	0.00	Overtopping

Culvert Data: Concrete Box, 10wx8h

Table 12 - Culvert Summary Table: Concrete Box, 10wx8h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
39.63 cfs	39.63 cfs	1.46	1.35	1.463	7-H2t	-1.00	0.79	1.16	1.16	3.41	4.66
79.26 cfs	79.26 cfs	2.23	2.15	2.231	7-H2t	-1.00	1.25	1.68	1.68	4.73	5.67
118.89	118.89 cfs	2.87	2.81	2.871	7-	-1.00	1.64	2.06	2.06	5.77	6.33

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cfs					H2t						
158.52 cfs	158.52 cfs	3.44	3.41	3.444	7-H2t	-1.00	1.98	2.38	2.38	6.67	6.83
196.70 cfs	196.70 cfs	3.96	3.93	3.957	7-H2t	-1.00	2.29	2.64	2.64	7.44	7.24
237.78 cfs	237.78 cfs	4.48	4.45	4.476	7-H2t	-1.00	2.60	2.90	2.90	8.21	7.60
277.41 cfs	277.41 cfs	4.95	4.91	4.954	7-H2t	-1.00	2.88	3.12	3.12	8.90	7.92
317.04 cfs	317.04 cfs	5.41	5.35	5.411	7-H2t	-1.00	3.15	3.32	3.32	9.54	8.20
356.67 cfs	356.67 cfs	5.85	5.78	5.851	7-H2t	-1.00	3.41	3.51	3.51	10.16	8.45
396.30 cfs	396.30 cfs	6.28	6.19	6.276	7-H2t	-1.00	3.65	3.69	3.69	10.74	8.68

Crossing 16 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 143.10 cfs

Maximum Flow: 343.80 cfs

Table 13 - Summary of Culvert Flows at Crossing: Crossing 16

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 10wx8h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.40	34.38	34.38	0.00	1
2.10	68.76	68.76	0.00	1

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2.68	103.14	103.14	0.00	1
3.27	143.10	143.10	0.00	1
3.66	171.90	171.90	0.00	1
4.11	206.28	206.28	0.00	1
4.53	240.66	240.66	0.00	1
4.94	275.04	275.04	0.00	1
5.33	309.42	309.42	0.00	1
5.71	343.80	343.80	0.00	1
10.00	780.57	780.57	0.00	Overtopping

Culvert Data: Concrete Box, 10wx8h

Table 13 - Culvert Summary Table: Concrete Box, 10wx8h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
34.38 cfs	34.38 cfs	1.40	1.23	1.404	7-H2t	-1.00	0.72	1.18	1.18	2.91	4.57
68.76 cfs	68.76 cfs	2.10	1.95	2.105	7-H2t	-1.00	1.14	1.69	1.69	4.07	5.52
103.14 cfs	103.14 cfs	2.68	2.56	2.679	7-H2t	-1.00	1.49	2.06	2.06	5.00	6.15
143.10 cfs	143.10 cfs	3.27	3.18	3.269	7-H2t	-1.00	1.85	2.42	2.42	5.92	6.70
171.90 cfs	171.90 cfs	3.66	3.60	3.662	7-H2t	-1.00	2.09	2.64	2.64	6.52	7.03
206.28 cfs	206.28 cfs	4.11	4.06	4.107	7-H2t	-1.00	2.36	2.87	2.87	7.18	7.37
240.66	240.66 cfs	4.53	4.48	4.531	7-	-1.00	2.62	3.09	3.09	7.80	7.67

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cfs					H2t						
275.04 cfs	275.04 cfs	4.94	4.88	4.938	7-H2t	-1.00	2.86	3.28	3.28	8.38	7.93
309.42 cfs	309.42 cfs	5.33	5.27	5.332	7-H2t	-1.00	3.10	3.46	3.46	8.93	8.18
343.80 cfs	343.80 cfs	5.71	5.64	5.714	7-H2t	-1.00	3.32	3.63	3.63	9.46	8.40

Crossing 17 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 6.90 cfs

Maximum Flow: 15.20 cfs

Table 14 - Summary of Culvert Flows at Crossing: Crossing 17

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Pipe Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.61	1.52	1.52	0.00	1
0.85	3.04	3.04	0.00	1
1.04	4.56	4.56	0.00	1
1.20	6.08	6.08	0.00	1
1.28	6.90	6.90	0.00	1
1.48	9.12	9.12	0.00	1
1.61	10.64	10.64	0.00	1
1.72	12.16	12.16	0.00	1
1.84	13.68	13.68	0.00	1
1.95	15.20	15.20	0.00	1
5.00	61.55	61.55	0.00	Overtopping

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Culvert Data: 3' Concrete Pipe

Table 14 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.52 cfs	1.52 cfs	0.61	0.52	0.608	7-H2c	-1.00	0.38	0.38	0.30	2.90	1.98
3.04 cfs	3.04 cfs	0.85	0.74	0.850	7-H2c	-1.00	0.54	0.54	0.43	3.49	2.44
4.56 cfs	4.56 cfs	1.04	0.91	1.039	7-H2c	-1.00	0.67	0.67	0.54	3.89	2.74
6.08 cfs	6.08 cfs	1.20	1.06	1.202	7-H2c	-1.00	0.77	0.77	0.63	4.21	2.97
6.90 cfs	6.90 cfs	1.28	1.13	1.282	7-H2c	-1.00	0.83	0.83	0.67	4.36	3.08
9.12 cfs	9.12 cfs	1.48	1.32	1.481	7-H2c	-1.00	0.95	0.95	0.77	4.72	3.32
10.64 cfs	10.64 cfs	1.61	1.43	1.606	7-H2c	-1.00	1.03	1.03	0.84	4.94	3.46
12.16 cfs	12.16 cfs	1.72	1.54	1.725	7-H2c	-1.00	1.11	1.11	0.89	5.13	3.59
13.68 cfs	13.68 cfs	1.84	1.66	1.838	7-H2c	-1.00	1.18	1.18	0.95	5.32	3.70
15.20 cfs	15.20 cfs	1.95	1.78	1.946	7-H2c	-1.00	1.24	1.24	1.00	5.49	3.81

Crossing 2B Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 715.80 cfs

Maximum Flow: 1511.90 cfs

Table 15 - Summary of Culvert Flows at Crossing: Crossing 2B

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 12wx10h x2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
2.08	151.19	151.19	0.00	1
3.16	302.38	302.38	0.00	1
4.03	453.57	453.57	0.00	1
4.81	604.76	604.76	0.00	1
5.33	715.80	715.80	0.00	1
6.18	907.14	907.14	0.00	1
6.82	1058.33	1058.33	0.00	1
7.42	1209.52	1209.52	0.00	1
8.01	1360.71	1360.71	0.00	1
8.57	1511.90	1511.90	0.00	1
15.00	3211.71	3211.71	0.00	Overtopping

Culvert Data: Concrete Box, 12wx10h x2

Table 15 - Culvert Summary Table: Concrete Box, 12wx10h x2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)

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0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
151.19 cfs	151.19 cfs	2.08	1.84	2.081	7-H2t	-1.00	1.07	1.76	1.76	3.58	6.36
302.38 cfs	302.38 cfs	3.16	2.92	3.155	7-H2t	-1.00	1.70	2.56	2.56	4.91	7.79
453.57 cfs	453.57 cfs	4.03	3.83	4.032	7-H2t	-1.00	2.23	3.17	3.17	5.95	8.74
604.76 cfs	604.76 cfs	4.81	4.64	4.808	7-H2t	-1.00	2.70	3.68	3.68	6.84	9.46
715.80 cfs	715.80 cfs	5.33	5.19	5.335	7-H2t	-1.00	3.02	4.01	4.01	7.44	9.90
907.14 cfs	907.14 cfs	6.18	6.04	6.184	7-H2t	-1.00	3.54	4.52	4.52	8.37	10.55
1058.33 cfs	1058.33 cfs	6.82	6.67	6.816	7-H2t	-1.00	3.92	4.87	4.87	9.05	10.99
1209.52 cfs	1209.52 cfs	7.42	7.28	7.422	7-H2t	-1.00	4.29	5.20	5.20	9.68	11.39
1360.71 cfs	1360.71 cfs	8.01	7.86	8.006	7-H2t	-1.00	4.64	5.51	5.51	10.29	11.75
1511.90 cfs	1511.90 cfs	8.57	8.42	8.572	7-H2t	-1.00	4.98	5.80	5.80	10.87	12.08

Crossing 2C Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 30.40 cfs

Maximum Flow: 71.70 cfs

Table 16 - Summary of Culvert Flows at Crossing: Crossing 2C

Headwater	Total	Concrete Box,	Roadway	Iterations

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Elevation (ft)	Discharge (cfs)	4wx4h Discharge (cfs)	Discharge (cfs)	
0.00	0.00	0.00	0.00	1
0.83	7.17	7.17	0.00	1
1.29	14.34	14.34	0.00	1
1.68	21.51	21.51	0.00	1
2.11	30.40	30.40	0.00	1
2.35	35.85	35.85	0.00	1
2.65	43.02	43.02	0.00	1
2.93	50.19	50.19	0.00	1
3.20	57.36	57.36	0.00	1
3.46	64.53	64.53	0.00	1
3.71	71.70	71.70	0.00	1
6.00	135.43	135.43	0.00	Overtopping

Culvert Data: Concrete Box, 4wx4h

Table 16 - Culvert Summary Table: Concrete Box, 4wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
7.17 cfs	7.17 cfs	0.83	0.80	0.828	7-H2t	-1.00	0.46	0.50	0.50	3.58	2.86
14.34 cfs	14.34 cfs	1.29	1.26	1.290	7-H2t	-1.00	0.74	0.74	0.74	4.85	3.54
21.51 cfs	21.51 cfs	1.68	1.66	1.680	7-H2c	-1.00	0.96	0.96	0.92	5.57	3.99
30.40 cfs	30.40 cfs	2.11	2.08	2.107	7-	-1.00	1.22	1.22	1.11	6.25	4.41

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					H2c						
35.85 cfs	35.85 cfs	2.35	2.32	2.349	7-H2c	-1.00	1.36	1.36	1.21	6.61	4.62
43.02 cfs	43.02 cfs	2.65	2.61	2.649	7-H2c	-1.00	1.53	1.53	1.33	7.02	4.86
50.19 cfs	50.19 cfs	2.93	2.88	2.932	7-H2c	-1.00	1.70	1.70	1.44	7.39	5.07
57.36 cfs	57.36 cfs	3.20	3.14	3.203	7-H2c	-1.00	1.86	1.86	1.54	7.73	5.26
64.53 cfs	64.53 cfs	3.46	3.40	3.462	7-H2c	-1.00	2.01	2.01	1.63	8.04	5.43
71.70 cfs	71.70 cfs	3.71	3.64	3.712	7-H2c	-1.00	2.15	2.15	1.72	8.33	5.59

Crossing 3 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 17.40 cfs

Maximum Flow: 39.70 cfs

Table 17 - Summary of Culvert Flows at Crossing: Crossing 3

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Circular, x2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.69	3.97	3.97	0.00	1
0.97	7.94	7.94	0.00	1
1.19	11.91	11.91	0.00	1
1.45	17.40	17.40	0.00	1

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1.55	19.85	19.85	0.00	1
1.71	23.82	23.82	0.00	1
1.85	27.79	27.79	0.00	1
1.99	31.76	31.76	0.00	1
2.13	35.73	35.73	0.00	1
2.26	39.70	39.70	0.00	1
4.50	112.20	112.20	0.00	Overtopping

Culvert Data: 3' Concrete Circular, x2

Table 17 - Culvert Summary Table: 3' Concrete Circular, x2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
3.97 cfs	3.97 cfs	0.69	0.59	0.691	7-H2c	-1.00	0.44	0.44	0.36	3.11	2.36
7.94 cfs	7.94 cfs	0.97	0.85	0.970	7-H2c	-1.00	0.62	0.62	0.53	3.75	2.95
11.91 cfs	11.91 cfs	1.19	1.05	1.189	7-H2c	-1.00	0.77	0.77	0.67	4.19	3.35
17.40 cfs	17.40 cfs	1.45	1.28	1.445	7-H2c	-1.00	0.93	0.93	0.82	4.66	3.75
19.85 cfs	19.85 cfs	1.55	1.38	1.549	7-H2c	-1.00	1.00	1.00	0.88	4.84	3.90
23.82 cfs	23.82 cfs	1.71	1.52	1.706	7-H2c	-1.00	1.10	1.10	0.97	5.10	4.11
27.79 cfs	27.79 cfs	1.85	1.68	1.853	7-H2c	-1.00	1.19	1.19	1.06	5.34	4.30
31.76 cfs	31.76 cfs	1.99	1.82	1.993	7-	-1.00	1.27	1.27	1.13	5.57	4.47

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					H2c						
35.73 cfs	35.73 cfs	2.13	1.96	2.127	7-H2c	-1.00	1.35	1.35	1.21	5.78	4.62
39.70 cfs	39.70 cfs	2.26	2.09	2.257	7-H2c	-1.00	1.43	1.43	1.27	5.97	4.75

Crossing 6B Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 123.90 cfs

Maximum Flow: 264.30 cfs

Table 18 - Summary of Culvert Flows at Crossing: Crossing 6B

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 8wx6h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.30	26.43	26.43	0.00	1
1.98	52.86	52.86	0.00	1
2.55	79.29	79.29	0.00	1
3.05	105.72	105.72	0.00	1
3.38	123.90	123.90	0.00	1
3.97	158.58	158.58	0.00	1
4.39	185.01	185.01	0.00	1
4.80	211.44	211.44	0.00	1
5.19	237.87	237.87	0.00	1
5.56	264.30	264.30	0.00	1
8.00	437.73	437.73	0.00	Overtopping

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Culvert Data: Concrete Box, 8wx6h

Table 18 - Culvert Summary Table: Concrete Box, 8wx6h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
26.43 cfs	26.43 cfs	1.30	1.20	1.302	7-H2t	-1.00	0.70	1.03	1.03	3.21	4.24
52.86 cfs	52.86 cfs	1.98	1.90	1.981	7-H2t	-1.00	1.11	1.48	1.48	4.47	5.14
79.29 cfs	79.29 cfs	2.55	2.49	2.547	7-H2t	-1.00	1.45	1.81	1.81	5.47	5.74
105.72 cfs	105.72 cfs	3.05	3.02	3.054	7-H2t	-1.00	1.76	2.09	2.09	6.33	6.19
123.90 cfs	123.90 cfs	3.38	3.34	3.382	7-H2t	-1.00	1.95	2.25	2.25	6.87	6.46
158.58 cfs	158.58 cfs	3.97	3.92	3.969	7-H2t	-1.00	2.30	2.54	2.54	7.81	6.89
185.01 cfs	185.01 cfs	4.39	4.33	4.391	7-H2t	-1.00	2.55	2.73	2.73	8.47	7.17
211.44 cfs	211.44 cfs	4.80	4.72	4.796	7-H2t	-1.00	2.79	2.91	2.91	9.10	7.42
237.87 cfs	237.87 cfs	5.19	5.10	5.185	7-H2t	-1.00	3.02	3.07	3.07	9.69	7.64
264.30 cfs	264.30 cfs	5.56	5.48	5.562	7-H2c	-1.00	3.24	3.24	3.22	10.21	7.85

Crossing 6C Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 7.80 cfs

Maximum Flow: 16.00 cfs

Table 19 - Summary of Culvert Flows at Crossing: Crossing 6C

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Pipe Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.61	1.60	1.60	0.00	1
0.85	3.20	3.20	0.00	1
1.03	4.80	4.80	0.00	1
1.19	6.40	6.40	0.00	1
1.32	7.80	7.80	0.00	1
1.46	9.60	9.60	0.00	1
1.59	11.20	11.20	0.00	1
1.70	12.80	12.80	0.00	1
1.81	14.40	14.40	0.00	1
1.92	16.00	16.00	0.00	1
5.00	68.09	68.09	0.00	Overtopping

Culvert Data: 3' Concrete Pipe

Table 19 - Culvert Summary Table: 3' Concrete Pipe

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00

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1.60 cfs	1.60 cfs	0.61	0.53	0.608	7-H2c	-1.00	0.39	0.39	0.31	2.94	2.01
3.20 cfs	3.20 cfs	0.85	0.75	0.846	7-H2c	-1.00	0.56	0.56	0.45	3.53	2.48
4.80 cfs	4.80 cfs	1.03	0.93	1.032	7-H2c	-1.00	0.69	0.69	0.55	3.94	2.78
6.40 cfs	6.40 cfs	1.19	1.08	1.191	7-H2c	-1.00	0.79	0.79	0.65	4.27	3.01
7.80 cfs	7.80 cfs	1.32	1.20	1.317	7-H2c	-1.00	0.88	0.88	0.71	4.51	3.18
9.60 cfs	9.60 cfs	1.46	1.34	1.465	7-H2c	-1.00	0.98	0.98	0.79	4.79	3.37
11.20 cfs	11.20 cfs	1.59	1.46	1.587	7-H2c	-1.00	1.06	1.06	0.86	5.01	3.51
12.80 cfs	12.80 cfs	1.70	1.57	1.703	7-H2c	-1.00	1.14	1.14	0.92	5.21	3.64
14.40 cfs	14.40 cfs	1.81	1.69	1.813	7-H2c	-1.00	1.21	1.21	0.97	5.40	3.75
16.00 cfs	16.00 cfs	1.92	1.80	1.919	7-H2c	-1.00	1.28	1.28	1.02	5.58	3.86

Crossing 13 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 20.20 cfs

Maximum Flow: 53.50 cfs

Table 20 - Summary of Culvert Flows at Crossing: Crossing 13

Headwater Elevation (ft)	Total Discharge	3' Concrete Circular, x2	Roadway Discharge	Iterations

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	(cfs)	Discharge (cfs)	(cfs)	
0.00	0.00	0.00	0.00	1
0.80	5.35	5.35	0.00	1
1.13	10.70	10.70	0.00	1
1.39	16.05	16.05	0.00	1
1.56	20.20	20.20	0.00	1
1.82	26.75	26.75	0.00	1
2.00	32.10	32.10	0.00	1
2.18	37.45	37.45	0.00	1
2.36	42.80	42.80	0.00	1
2.52	48.15	48.15	0.00	1
2.68	53.50	53.50	0.00	1
4.50	112.21	112.21	0.00	Overtopping

Culvert Data: 3' Concrete Circular, x2

Table 20 - Culvert Summary Table: 3' Concrete Circular, x2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
5.35 cfs	5.35 cfs	0.80	0.69	0.798	7-H2c	-1.00	0.51	0.51	0.42	3.37	2.60
10.70 cfs	10.70 cfs	1.13	0.99	1.126	7-H2c	-1.00	0.72	0.72	0.63	4.06	3.24
16.05 cfs	16.05 cfs	1.39	1.23	1.386	7-H2c	-1.00	0.89	0.89	0.79	4.55	3.67
20.20 cfs	20.20 cfs	1.56	1.39	1.563	7-H2c	-1.00	1.01	1.01	0.89	4.86	3.92

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26.75 cfs	26.75 cfs	1.82	1.64	1.815	7-H2c	-1.00	1.16	1.16	1.04	5.28	4.25
32.10 cfs	32.10 cfs	2.00	1.84	2.005	7-H2c	-1.00	1.28	1.28	1.14	5.58	4.48
37.45 cfs	37.45 cfs	2.18	2.02	2.184	7-H2c	-1.00	1.39	1.39	1.24	5.86	4.68
42.80 cfs	42.80 cfs	2.36	2.19	2.356	7-H2c	-1.00	1.49	1.49	1.33	6.12	4.85
48.15 cfs	48.15 cfs	2.52	2.35	2.521	7-H2c	-1.00	1.58	1.58	1.41	6.37	5.01
53.50 cfs	53.50 cfs	2.68	2.51	2.683	7-H2c	-1.00	1.67	1.67	1.49	6.61	5.16

Crossing 14 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 35.30 cfs

Maximum Flow: 85.30 cfs

Table 21 - Summary of Culvert Flows at Crossing: Crossing 14

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 6wx4h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.78	8.53	8.53	0.00	1
1.18	17.06	17.06	0.00	1
1.50	25.59	25.59	0.00	1
1.83	35.30	35.30	0.00	1
2.05	42.65	42.65	0.00	1

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2.30	51.18	51.18	0.00	1
2.54	59.71	59.71	0.00	1
2.76	68.24	68.24	0.00	1
2.98	76.77	76.77	0.00	1
3.19	85.30	85.30	0.00	1
4.50	143.89	143.89	0.00	Overtopping

Culvert Data: Concrete Box, 6wx4h

Table 21 - Culvert Summary Table: Concrete Box, 6wx4h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
8.53 cfs	8.53 cfs	0.78	0.68	0.781	7-H2t	-1.00	0.40	0.63	0.63	2.24	3.15
17.06 cfs	17.06 cfs	1.18	1.08	1.177	7-H2t	-1.00	0.63	0.92	0.92	3.10	3.84
25.59 cfs	25.59 cfs	1.50	1.42	1.502	7-H2t	-1.00	0.83	1.13	1.13	3.77	4.29
35.30 cfs	35.30 cfs	1.83	1.76	1.828	7-H2t	-1.00	1.02	1.33	1.33	4.42	4.68
42.65 cfs	42.65 cfs	2.05	2.00	2.055	7-H2t	-1.00	1.16	1.46	1.46	4.86	4.93
51.18 cfs	51.18 cfs	2.30	2.24	2.303	7-H2t	-1.00	1.31	1.60	1.60	5.34	5.17
59.71 cfs	59.71 cfs	2.54	2.48	2.538	7-H2t	-1.00	1.45	1.72	1.72	5.78	5.38
68.24 cfs	68.24 cfs	2.76	2.70	2.764	7-H2t	-1.00	1.59	1.84	1.84	6.20	5.57

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76.77 cfs	76.77 cfs	2.98	2.92	2.981	7-H2t	-1.00	1.72	1.94	1.94	6.59	5.75
85.30 cfs	85.30 cfs	3.19	3.12	3.191	7-H2t	-1.00	1.84	2.04	2.04	6.97	5.91

Crossing 18 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.00 cfs

Design Flow: 17.20 cfs

Maximum Flow: 41.20 cfs

Table 22 - Summary of Culvert Flows at Crossing: Crossing 18

Headwater Elevation (ft)	Total Discharge (cfs)	3' Concrete Circular, x2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
0.70	4.12	4.12	0.00	1
0.99	8.24	8.24	0.00	1
1.21	12.36	12.36	0.00	1
1.44	17.20	17.20	0.00	1
1.58	20.60	20.60	0.00	1
1.74	24.72	24.72	0.00	1
1.89	28.84	28.84	0.00	1
2.03	32.96	32.96	0.00	1
2.17	37.08	37.08	0.00	1
2.31	41.20	41.20	0.00	1
4.50	112.20	112.20	0.00	Overtopping

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Culvert Data: 3' Concrete Circular, x2

Table 22 - Culvert Summary Table: 3' Concrete Circular, x2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
4.12 cfs	4.12 cfs	0.70	0.61	0.704	7-H2c	-1.00	0.45	0.45	0.36	3.14	2.39
8.24 cfs	8.24 cfs	0.99	0.87	0.988	7-H2c	-1.00	0.63	0.63	0.54	3.78	2.99
12.36 cfs	12.36 cfs	1.21	1.07	1.212	7-H2c	-1.00	0.78	0.78	0.68	4.23	3.39
17.20 cfs	17.20 cfs	1.44	1.27	1.437	7-H2c	-1.00	0.93	0.93	0.82	4.64	3.74
20.60 cfs	20.60 cfs	1.58	1.40	1.579	7-H2c	-1.00	1.02	1.02	0.90	4.89	3.95
24.72 cfs	24.72 cfs	1.74	1.56	1.740	7-H2c	-1.00	1.12	1.12	0.99	5.16	4.16
28.84 cfs	28.84 cfs	1.89	1.72	1.891	7-H2c	-1.00	1.21	1.21	1.08	5.40	4.35
32.96 cfs	32.96 cfs	2.03	1.87	2.034	7-H2c	-1.00	1.30	1.30	1.16	5.63	4.51
37.08 cfs	37.08 cfs	2.17	2.01	2.172	7-H2c	-1.00	1.38	1.38	1.23	5.84	4.66
41.20 cfs	41.20 cfs	2.31	2.14	2.305	7-H2c	-1.00	1.46	1.46	1.30	6.05	4.80

Crossing 19 Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

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Minimum Flow: 0.00 cfs

Design Flow: 196.40 cfs

Maximum Flow: 396.90 cfs

Table 23 - Summary of Culvert Flows at Crossing: Crossing 19

Headwater Elevation (ft)	Total Discharge (cfs)	Concrete Box, 10wx8h Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.00	0.00	0.00	0.00	1
1.46	39.69	39.69	0.00	1
2.23	79.38	79.38	0.00	1
2.87	119.07	119.07	0.00	1
3.45	158.76	158.76	0.00	1
3.95	196.40	196.40	0.00	1
4.48	238.14	238.14	0.00	1
4.96	277.83	277.83	0.00	1
5.42	317.52	317.52	0.00	1
5.86	357.21	357.21	0.00	1
6.28	396.90	396.90	0.00	1
12.00	957.57	957.57	0.00	Overtopping

Culvert Data: Concrete Box, 10wx8h

Table 23 - Culvert Summary Table: Concrete Box, 10wx8h

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)

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0.00 cfs	0.00 cfs	0.00	0.00	0.000	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
39.69 cfs	39.69 cfs	1.46	1.35	1.465	7-H2t	-1.00	0.79	1.16	1.16	3.41	4.66
79.38 cfs	79.38 cfs	2.23	2.15	2.233	7-H2t	-1.00	1.25	1.68	1.68	4.73	5.67
119.07 cfs	119.07 cfs	2.87	2.82	2.873	7-H2t	-1.00	1.64	2.06	2.06	5.78	6.33
158.76 cfs	158.76 cfs	3.45	3.41	3.448	7-H2t	-1.00	1.99	2.38	2.38	6.67	6.84
196.40 cfs	196.40 cfs	3.95	3.93	3.953	7-H2t	-1.00	2.29	2.64	2.64	7.44	7.23
238.14 cfs	238.14 cfs	4.48	4.45	4.481	7-H2t	-1.00	2.60	2.90	2.90	8.21	7.61
277.83 cfs	277.83 cfs	4.96	4.92	4.958	7-H2t	-1.00	2.88	3.12	3.12	8.90	7.92
317.52 cfs	317.52 cfs	5.42	5.36	5.416	7-H2t	-1.00	3.15	3.32	3.32	9.55	8.20
357.21 cfs	357.21 cfs	5.86	5.78	5.857	7-H2t	-1.00	3.41	3.51	3.51	10.17	8.45
396.90 cfs	396.90 cfs	6.28	6.20	6.282	7-H2t	-1.00	3.66	3.69	3.69	10.75	8.68

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Attachment F: Culvert Rip Rap Basin Sizing Calculation for Crossing 2C

Rip Rap Basin

This worksheet calculates the sizing for energy dissipation rip rap basins at culvert outlets.

References

1. FHWA Hydraulic Design of Energy Dissipators.

Solution Methods

The FHWA Design Guide procedure is as follows:
Step 1. Compute the culvert outlet velocity, Vo, and depth, yo. Note, yo = ye (brink depth) for rectangular culverts. These values are calculated by HY-8. Compute Froude number, Fr.

Step 2. Select D50 rip rap size, and use that to determine Co (tailwater parameter) and hs (approx. scour depth). Check that hs/D50 >= 2 and D50/ye >= 0.1. Adjust D50 rip rap size to fit in these parameters. Note, hs/D50 > 2 (but close to 2) are often most economical per FHWA.

Step 3. Determine the dimensions of the rip rap basin.
The length of the dissipation pool (scour hole), Ls, total basin length, LB, and basin width at the basin exit, WB, as shown in FHWA Design Guide Figures 10.1 and 10.2. The walls and apron of the basin should be warped (or transitioned) so that the cross section of the basin at the exit conforms to the cross section of the natural channel. Abrupt transition of surfaces should be avoided to minimize separation zones and resultant eddies.

Step 4. Determine the basin exit depth and exit velocity, and compare with the allowable exit velocity.
The allowable exit velocity may be taken as the estimated normal velocity in the tailwater channel or a velocity specified based on stability criteria, whichever is larger.
If the exit velocity is less than or equal to the allowable velocity, the basin dimensions are acceptable. Steps 2 through 4 may be repeated to adjust rip rap size and/or basin dimensions to optimize performance and cost.

Step 5. Assess need for additional rip rap downstream of the basin exit.
If the ratio of tailwater depth to brink depth is less than or equal to 0.75, no additional rip rap is needed. If the ratio is greater than 0.75, downstream rip rap should be sized as an apron with total length determined by FHWA Design Guide Figure 10.3.

Unit Definition and Standard Properties

pounds per square foot	$psf := 1 \frac{lb}{ft^2}$	pounds per cubic foot	$pcf := 1 \frac{lb}{ft^3}$
unit weight of water	$\gamma_w := 62.4 \cdot pcf$	gravitational acceleration	$g = 32.17 \frac{ft}{s^2}$
cubic feet per second	$cfs := 1 \frac{ft^3}{s}$		

Step1. Culvert Information from HY-8 Model and compute Froude number:

Crossing 2C, Concrete Box, 4 ft wide x 4 feet tall.

Peak Flow from the 25-year, 24-hour design storm $q_{25yr} := 30.4 \cdot cfs$

Culvert width (span) $W_o := 4\ ft$ Culvert height (rise) $H_o := 4\ ft$

Brink depth, depth at outlet of culvert $y_e := 1.22\ ft$

Outlet velocity at edge of culvert $V_o := 6.25\ \frac{ft}{s}$

Tailwater depth from HY-8 $TW := 1.11\ ft$

Tailwater velocity from HY-8 $V_{TW} := 4.41\ \frac{ft}{s}$

Froude number at culvert outlet $F_{ro} := \frac{V_o}{\sqrt{(g \cdot y_e)}} = 1.00$

Froude number at tailwater conditions $F_{rTW} := \frac{V_{TW}}{\sqrt{(g \cdot TW)}} = 0.74$

Ratio of tailwater to outlet depth $\frac{TW}{y_e} = 0.91$

Step 2. Select D50 Rip Rap Size and Check Size to Depth Ratio

Select a rip rap size to be checked later $D_{50} := 0.17\ ft = 2.0\ in$

Tailwater parameter, C_o, based on value of TW/y_e $C_o := 2.4$

Determine dissipation pool depth, h_s $h_s := \left(\left(0.86 \cdot \left(\frac{D_{50}}{y_e}\right)^{-0.55} \cdot F_{ro}\right) - C_o\right) \cdot y_e = 0.2\ ft$

Check ratios for economical sizing:

$\frac{h_s}{D_{50}}$ slightly larger than 2 is ideal. $\frac{h_s}{D_{50}} = 1.0$

$\frac{D_{50}}{y_e} \geq 0.1$ is ideal. $\frac{D_{50}}{y_e} = 0.1$

The following is taken from the FHWA Design Guide for selection of the tailwater parameter. Failure of the basin may interrupt MTAC operations and is considered to be severe. Equation 10.2 is used in this calculation.

To balance the need for avoiding an underdesigned basin against the costs of oversizing a basin, an envelope design relationship in the form of Equation 10.1 and Equation 10.2 was developed. These equations provide a design envelope for the experimental data equivalent to the design figure (Figure XI-2) provided in the previous edition of HEC 14 (Corry, et al., 1983). Equations 10.1 and 10.2, however, improve the fit to the experimental data reducing the root-mean-square (RMS) error from 1.24 to 0.83.

$$\frac{h_s}{y_e} = 0.86\left(\frac{D_{50}}{y_e}\right)^{-0.55}\left(\frac{V_o}{\sqrt{g y_e}}\right) - C_o \qquad (10.1)$$

where,

h_s = dissipator pool depth, m (ft)
y_e = equivalent brink (outlet) depth, m (ft)
D_{50} = median rock size by weight, m (ft)
C_o = tailwater parameter

The tailwater parameter, C_o, is defined as:

$$\begin{array}{ll} C_o = 1.4 & TW/y_e < 0.75 \\ C_o = 4.0(TW/y_e) - 1.6 & 0.75 < TW/y_e < 1.0 \\ C_o = 2.4 & 1.0 < TW/y_e \end{array} \qquad (10.2)$$

A best fit design relationship that minimizes the RMS error when applied to the experimental data was also developed. Equation 10.1 still applies, but the description of the tailwater parameter, C_o, is defined in Equation 10.3. The best fit relationship for Equations 10.1 and 10.3 exhibits a RMS error on the experimental data of 0.56.

$$\begin{array}{ll} C_o = 2.0 & TW/y_e < 0.75 \\ C_o = 4.0(TW/y_e) - 1.0 & 0.75 < TW/y_e < 1.0 \\ C_o = 3.0 & 1.0 < TW/y_e \end{array} \qquad (10.3)$$

Use of the envelope design relationship (Equations 10.1 and 10.2) is recommended when the consequences of failure at or near the design flow are severe. Use of the best fit design relationship (Equations 10.1 and 10.3) is recommended when basin failure may easily be addressed as part of routine maintenance. Intermediate risk levels can be adopted by the use of intermediate values of C_o.

Step 3. Determine Dimensions of Rip Rap Basin (Dissipation Pool and Apron)

Dissipation pool length $L_s := 10 \cdot h_s = 1.7$ *ft*

Use the larger value $L_s := 3 \cdot W_o = 12$ *ft*

Apron length (directly following pool)

$L_A := 1$ $W_o = 4$ *ft*

Total Rip Rap Basin Length $L_B := L_s + L_A = 16$ *ft*

Rip Rap Basin Width at End of Apron

Basin width should either match the width of the natural channel, or should widen at 3:1 from the culvert outlet. $W_B := W_o + 2 \cdot 3 \cdot L_A = 28$ *ft*

The calculated width, W_B, should be adjusted to match natural channel conditions and minimize abrupt flow transitions.

Step 4. Determine Basin Exit Depth and Velocity

Check tailwater velocity from HY-8 Culvert Analysis compared to basin exit velocity based on dimensions calculated in Step 3

Tailwater velocity from HY-8 $V_{TW} = 4.41 \frac{ft}{s}$

Determine basin outlet velocity based on basin dimensions from Step 3.

Basin side slopes, z (zH:1V). Assume 2H:1V $z := 2$

Determine y_B iteratively to match design flow. $y_B := 0.33$ *ft*

Water surface width, T_c, at y_B assuming width, W_B $T_c := W_B + 2 \cdot z \cdot y_B = 29$ *ft*

$$A_c := \sqrt[3]{\left(\frac{\left(y_B \cdot \left(W_B + z \cdot y_B\right)\right)^3}{\left(W_B + 2 \cdot z \cdot y_B\right)}\right) \cdot T_c} = 9.46 \text{ ft}^2 \qquad Q := \sqrt{\left(g \cdot \left(\frac{A_c^3}{T_c}\right)\right)} = 30.5 \text{ cfs}$$

Adjust y_B such that Q is approximately q_{25yr} $q_{25yr} = 30.4$ *cfs*

Velocity at basin outlet, V $V_B := \frac{Q}{A_c} = 3.22 \frac{ft}{s}$

Step 5. Assess Need for Rip Rap Downstream of Basin

If the ratio of tailwater depth to brink depth is less than or equal to 0.75, no additional rip rap is needed.

$$\frac{TW}{y_e} = 0.91$$

Based on procedure in FHWA Design Guide, additional rip rap is needed. However, the velocity at the basin exit is low and unlikely to erode the natural channel beyond the basin exit.

CUP Exhibit 3.9 Noxious Weed Control Plan

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FREMONT COUNTY WEED MANAGEMENT
201 N 6th St, Room 118
Cañon City, CO 81212
719-276-7317
brittany.pierce@fremontco.com

Integrated Weed Management Plan

Project Name: Ranch Land Pit #1/Red Creek Major Mod DATE 09/28/2020

Address (or location of property): Sections 24 & 25 of T20S, R68W, Fremont County, CO

List of Noxious Weeds and Control Plan:

Noxious Weeds Present Control Measures:
Reference "Guideline for Weed Management Plans April 2015"

State Law requires all landowners to manage noxious weed on their property. The following weeds under Colorado Noxious Weed Act, if present, are considered a threat to the economic and environmental value of our state lands. These listed under the Noxious Weed Act shall be managed under the provisions of this article. The following species under this act that have been identified in this county and should be managed in the appropriate manner as mandated throughout the term of the permit and thereafter.

"List A" species - These are rare noxious weed species that are subject to eradication upon confirmed identification during any interval of reclamation to the site. Such List A species confirmed in Fremont County may include, but are not limited to:

*Myrtle Spurge, *Japanese Knotweed, *Giant Reed, *Elongated Mustard

"List B" species - These are noxious weed species distributed throughout the State of Colorado and are subject to eradication, containment, or suppression in order to halt continued spread. Species identified within Fremont County may include, but are not limited to:

Absinth Wormwood, Black Henbane, Bouncingbet, *Bull Thistle, *Canada Thistle, Common Teasel, *Dalmatian Toadflax, Dame's Rocket, *Diffuse Knapweed, Eurasian Watermilfoil, *Hoary Cress, *Houdstongue, Hybrid Knapweed, Hybrid Toadflax, Jointed Goatgrass, *Leafy Spurge, *Musk Thistle, Oxeye Daisy, Perennial Pepperweed, *Russian Knapweed, Russian-olive, *Salt Cedar, Scentless Chamomile, Scotch Thistle, *Spotted Knapweed, *Yellow Toadflax.

"List C" species - Are well-established noxious weed species and are widespread throughout the State for which control is only recommended. Common species in Fremont County include, but are not limited to:

Chicory, Common Burdock, Common Mullein, Downy Brome, Field Bindweed, Halogeton, Johnsongrass, Perennial Sowthistle, Poison Hemlock, Puncturevine, Redstem Filaree

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Identification and treatment can be conducted through Fremont County Weed Management or a recommended partnering agency. Please see Fremont County Weed Control's booklet, "Guideline for Weed Management Plans" for more details such as herbicide rates and specifics about weed control methods.

Fremont County Weed Management is operated by Qualified Licensed Applicators under the Department of Agriculture. Any management or treatment involving chemical treatment should be carried out as indicated on the label. The label is the law. Any information on management planning or about receiving cost share that is available to the public, can be discussed with the department to confirm eligibility.

*These weed species receive priority for cost share funding.

Other Required Action: The vicinity of the proposed planning area is a known location for noxious weed infestations of tamarisk (salt cedar), Russian olive, Canada thistle and hoary cress species. Other noxious species could present themselves on site during any point of time and should also be addressed as stated in the Control Plan. In the event any 'List A' or large populations of 'List B' species are observed, a site visit would be recommended during peak growing season to discuss further management plans. In order to do this, please consider all factors in choosing a time (such as weather, presence of actively growing plants, and operation plans or activities). Any additional questions or concerns in completing this management plan please contact Fremont County Weed Management to discuss available options. (719-276-7317)

Michael B. Doell
Applicant Signature

07/21/2023
Date

Michael B. Doell
Owner/Manager Signature

07/21/2023
Date

Brittany Pierce

Brittany Pierce
Fremont County Weed Management Representative

September, 28 2020
Date

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CUP Exhibit 3.10 Owners within 500 ft.

Parcel Number	Owner	Owner's Address	Parcel Address
99924557	Ranch Land LLC	9990 East Cactus Scottsdale, AZ 85260 and 3925 Hill Circle Colorado Springs, CO 80904	NA
3937000000005	CF&I Steel LP	PO Box 316 Pueblo, CO 81002	NA Minnequa Canal

CUP Exhibit 3.11 Roadway Impact Analysis Form

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Fremont County Department of Planning and Zoning
Roadway Impact Analysis Form

This form shall be used in conjunction with any applications submitted in accordance with Section 8 of the Fremont County Zoning Resolution and or Section VI of the Fremont County Subdivision Regulations. This form is considered a minimum application submittal item and shall be required to be provided at the time of application submittal. This form is intended to provide the minimum items that must be addressed in the roadway impact analysis. The form can be expanded or attachments can be made to further address the roadway impact of the proposed use. **If the estimated average daily traffic increase is less than thirty (30) vehicle trips per day (*one trip to be considered as a single or one-direction vehicle movement with either the origin or the destination [exiting or entering] inside the subject property*) as per the Institute of Transportation Engineers, Trip Generation Handbook, Second Edition or subsequent editions for the entire development, as estimated by the project engineer, then a Roadway Impact Analysis will not be required to be completed by an engineer. In such situations other minimum items shall be addressed by the applicant.**

1. Project Name Red Creek Quarry formerly Ranch Land Rock Pit #1 CUP 02-3

2. Type of application:
   - ☐ Zone Change #1
   - ☐ Zone Change #2 – Use Designation Plan
   - ☐ Zone Change #2 – Final Development Plan
   - ☐ Commercial Development Plan
   - ☐ Commercial Development Modification
   - ☐ Expansion of an existing Business or Industrial Use
   - ☐ Special Review Use Permit
   - ☒ Conditional Use Permit
   - ☐ Temporary Use Permit
   - ☐ Change of Use of Property
   - ☐ Subdivision Preliminary Plan

3. Engineer: 3 Rocks Engineering Address: 430 Main Street
   City: Canon City State: CO Zip Code: 81212
   Telephone #: (719)430-5333 Facsimile #: ( ) Email ronn@3rocksengineering.com

4. Provide a detailed description of the proposed use:
   Red Creek Quarry (RCQ) will the be limestone source for the cement plant whens Bear Creek Quarry is mined out. RCQ will be accessed by an interior Materials Transport and Access Corridor on private property between the cement plant and RCQ. Mining and equipment will be consistent with Holcim's current operation.

5. Provide the estimated average daily traffic to be generated by the proposed use(s), using the Institute of Transportation Engineers, Trip Generation Handbook, Second Edition or subsequent editions. The estimated volumes of traffic to be generated by the proposed use(s) shall include as a minimum, the average weekday traffic volume and the peak-hour (*morning and afternoon*) traffic volumes. Specify the number of trips in each category. (*one trip to be considered as a single or one-direction vehicle movement with either the origin or the destination [exiting or entering] inside the subject property*) **No new daily traffic will be generated.**
   Residential: 0 daily, _____ peak-hour am, _____ peak-hour pm _____
   Employee: 0 daily, _____ peak-hour am, _____ peak-hour pm _____

Red Creek Quarry is a new limestone source that will be operated by Holcim; by Holcim employees . No new traffic trips will be generated by this project as personnel from Bear Creek Quarry will operate Red Creek Quarry. All personnel and equipment will use the plant access on Hwy 120.

Customer: 0 daily, _____ peak-hour am, _____ peak-hour pm

Truck generated by the proposed use: 0 daily, _____ peak-hour am, _____ peak-hour pm

Delivery – required by the use: 0 daily, _____ peak-hour am, _____ peak-hour pm

Total Vehicle Trips: 0 daily, _____ peak-hour am, _____ peak-hour pm

I certify that based on the proposed use(s) the total vehicle trips using the Institute of Transportation Engineers, Trip Generation Handbook, Second Edition or subsequent editions will average less than thirty (30) trips per day based on any fourteen (14) day time frame.

Ronald G Nies cn=Ronald G Nies, c=US, o=3 Rocks Engineering, email=ronn@3rocksengineering.com 03/11/24

_____ Date 3/11/24 Seal

COLORADO REGISTERED RONALD G NIES 3/11/24 30594 PROFESSIONAL ENGINEER

Colorado Licensed Professional Engineer

If the above has been certified, then the applicant can complete the form and acknowledge. If completed by the applicant only the questions marked by asterisk (*) are required to be answered.

NOTE: If the additional information provided warrants improvements to the roadway system, even though the traffic generated by the proposed use is less than thirty (30) trips per day, such improvements will be required. If in the future the use exceeds an average of thirty (30) trips per day a complete analysis could be required.

6. *What is the general location of the subject property? _____
Sections 24 and 25, T20S, R68W of the 6th Principal Meridian in Fremont County CO.

7. *What are the names and/or the numbers of the public roadways that serve the site? _____
CO Hwy 120

Provide a site plan drawing that shows the subject property, its proposed access points and all public roadways within a one-half (½) mile radius of the subject property, marked as Exhibit 7.1. [X] An exhibit has been attached.

8. *What is the classification, according to the Fremont County Master Plan, of the roadway from which the project site will gain access to the public transportation system?
[ ] Expressway or Freeway --- [X] Major Arterial --- [ ] Arterial --- [ ] Collector --- [ ] Local

9. *Do the roadways in question lie within a three (3) mile radius of any incorporated town or city limits or the boundary of another County? [X] Yes --- [ ] No
If yes, provide the name(s) of the jurisdiction(s): City of Florence
In addition if a new roadway is to be constructed, how will it comply with the transportation plan in effect for the municipality? _____

10. *Will this project require a Fremont County Driveway Access Permit or a Colorado Department of Transportation (CDOT) State Highway Access Permit? [ ] Yes --- [X] No
Please explain: _____

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11. *Will the project require construction of, or improvement to any roadway maintained by the CDOT? ☐ Yes --- ☒ No
If yes, will the proposed construction or improvement be in compliance with CDOT's "5 Year Transportation Plan"? ☐ Yes --- ☐ No Please Explain _____

Has CDOT required that the applicant provide a traffic study? ☐ Yes --- ☐ No
If yes, a copy of the study shall be attached to this application, marked as Exhibit 11.1. ☐ An exhibit has been attached.

12. *Will the project require construction of, or improvement to any roadway currently maintained or proposed to be maintained by the County? ☐ Yes --- ☒ No
If yes, what would be the social, economic, land use, safety and environmental impacts and effects of the new roadway on the existing transportation system and neighborhood?_____

13. *Are any roadways proposed to be vacated or closed in conjunction with the proposed project? ☐ Yes --- ☒ No
If yes, please explain._____

14. *Is the proposed project site adjacent to or viewable from any portion of the Gold Belt Tour Scenic Byway or other scenic corridor designated by the Master Plan? ☐ Yes --- ☒ No
If yes, identify the byway and or scenic corridor:_____
If yes, explain how the scenic quality will be affected by the proposed project._____

If yes, what measures will be taken to not have a negative impact on the byway and or scenic corridor?_____

15. *Will the proposed project gain access to the public transportation system via 3rd, 9th, K and or R Streets in the Penrose-Beaver Park Area of the County? ☐ Yes --- ☒ No

16. *Does the subject property have frontage on a public roadway? ☐ Yes --- ☒ No
If answered no, then documentation evidencing a "right of access" to the subject property for the proposed use shall be attached marked as Exhibit 16.1. ☒ An exhibit has been attached. If answered no, then please explain what the right of access consists of: Holcim secured an access corridor during the purchase of the limestone resource.

17. *What is the right-of-way width of the public roadway(s) that serve the site? 100 ft.

18. *What is the surface type of the public roadway(s) that serve the site? Concrete and asphalt

19. *What is the surface width of the public roadway(s) that serve the site? 40 ft

20. *What are the existing drainage facilities for the public roadway(s) that serve the site?
Culverts and bar ditches

21. *Does the public roadway(s) that serves the site have curb and gutter? ☐ Yes --- ☒ No
If answered yes, what is the type of curb and gutter?

22. *Does the public roadway(s) that serves the site have adjacent sidewalks or other pedestrian ways?
☐ Yes --- ☒ No
If answered yes, what is the width(s) and surface type(s)?

23. *How many access points will the subject property have to public roadways? One

24. *Will the proposed roadways that access the public roadways intersect the public roadways other than at perpendicular? ☐ Yes --- ☒ No
If answered yes, please explain:

25. *What are the sight distances, in all directions, from the subject property access point(s) along the public roadway that serves the site? (*mark and provide distance for each that is applicable*)
☐ Northerly, site distance: ☐ Southerly, site distance:
☒ Easterly, site distance: 400 ft. ☒ Westerly, site distance: 1000 ft.

26. *What are the distances from the subject property access point(s), in all directions, to the nearest intersection with another public roadway along the public roadway that serves the site? (*mark and provide distance for each that is applicable*)
☐ Northerly, distance: ☐ Southerly, distance:
☒ Easterly, distance: 3.75 miles ☒ Westerly, distance: 2200 ft

27. *What are the distances from the subject property access point(s), in all directions, to the nearest driveway(s) along the public roadway that serves the site? (*mark and provide distance for each that is applicable*)
☐ Northerly, distance: ☐ Southerly, distance:
☐ Easterly, distance: ☒ Westerly, distance: 1000 ft

28. *What are the distances from the subject property access point(s), in all directions, to the nearest blind curve(s) along the public roadway that serves the site? (*mark and provide distance for each that is applicable*)
☐ Northerly, distance: ☐ Southerly, distance:
☒ Easterly, distance: 400 ft. ☒ Westerly, distance: 1000 ft

29. *What are the distances from the subject property access point(s), in all directions, to the nearest blind hill(s) along the public roadway that serves the site? (*mark and provide distance for each that is applicable*)

☐ Northerly, distance: _____ ☐ Southerly, distance: _____

☒ Easterly, distance: 400 ft ☐ Westerly, distance: _____

30. *Identify any and all hazardous conditions with regard to the public roadway(s) that provide access to the subject property in the general area of the subject property: No hazardous conditions exist regarding this public road access.

If the public roadway(s) that currently serve the subject property have any hazardous conditions, then recommendations shall be made for improvements that will decrease the hazardous conditions on the public roadway(s): _____

31. *Explain what effect the proposed use will have on the existing traffic in the neighborhood. If no change is expected, please explain why no change is expected: No change is expected to traffic in the neighborhood. Please refer to the comment in the top margin of Page 2 of this form.

32. *Will the proposed use, due to the increase in traffic or the type of vehicle traffic generated by the proposed use, change the level and or type of required maintenance for the public roadway(s) that serve the site? ☐ Yes --- ☐ No, (*please explain*) NA

If the proposed use, due to the increase in traffic or the type of vehicle traffic generated by the proposed use, changes the level and or type of required maintenance for the public roadway(s) that serve the site, then recommendations shall be made that would lessen the maintenance impact for the entity in control of maintenance of the public roadway(s): _____

Note: If improvements are required, it may be mandatory that such improvement be installed prior to final approval of the application.

33. *Are new roadways proposed to be constructed, on or off site, in association with the proposed project? ☒ Yes --- ☐ No If yes, provide evidence that the roadways will be constructed to conform to natural contours in order to minimize soil disturbance, cut and fills, protect drainageways and not create to unstable slopes. The interior Material Transport and Access Corridor will be constructed according to guidance from DRMS, CPW, ACE and MSHA.

34. Provide an analysis of the existing traffic volumes on the adjacent roadway system, including the average weekday traffic (*vehicles per day*) and the weekday peak-hour traffic (*vehicles per hour – am and pm*), showing the dates and times of traffic counts or source utilized for traffic volume counts. Determine the existing level of service or percentage of roadway capacity currently in use.

Roadway name or # _____ average weekday traffic_____

Weekday peak-hour traffic _____ am _____ dates _____ times

Weekday peak-hour traffic _____ pm _____ dates _____ times

Current level of service - % of roadway in use_____

_____

Roadway name or # _____ average weekday traffic _____

Weekday peak-hour traffic _____ am _____ dates _____ times

Weekday peak-hour traffic _____ pm _____ dates _____ times

Current level of service / % of roadway in use_____

_____

Roadway name or # _____ average weekday traffic _____

Weekday peak-hour traffic _____ am _____ dates _____ times

Weekday peak-hour traffic _____ pm _____ dates _____ times

Current level of service / % of roadway in use_____

_____

35. Provide an estimate of the probable traffic directional distribution from and to the subject property based on the proposed use(s) and assignment of the estimated traffic volumes to the adjacent roadway network. Estimate the future background and resulting total traffic volumes (*including the estimated generated traffic due to the proposed use*) on the adjacent roadway system for a twenty (20) year design period, showing volumes for both left and right turn movements as well as through traffic._____

_____

_____

36. Determine the projected future levels of service or percentage of roadway capacity to be in use at the subject property's access points and key adjacent intersections. Provide recommendations for street and access improvements if any portions of the roadways do not have the capacity to accept the additional estimated traffic volumes. All necessary improvements will be required to be designed, completed and accepted by the County prior to any final action regarding the application.

_____

_____

_____

_____

_____

37. Please provide any additional information considered by the Certifying Engineer to be pertinent to the roadway impact in association with the proposed project:_____

_____

_____

_____

_____

I hereby certify that the foregoing information was prepared by myself or under my direct supervision and is true and correct to the best of my knowledge and belief.

_____ Date _____ SEAL

Colorado Licensed Professional Engineer

If not completed by an Engineer, then the following acknowledgement shall be signed by the applicant and/or owner.

By signing this Application, the Applicant, or the agent/representative acting with due authorization on behalf of the Applicant, hereby certifies that all information contained in the application and any attachments to the Application, is true and correct to the best of Applicant's knowledge and belief.

Applicant understands that any required private or public improvements imposed as a contingency for approval of the application may be required as a part of the approval process.

Fremont County hereby advises Applicant that if any material information contained herein is determined to be misleading, inaccurate or false, the Board of Commissioners may take any and all reasonable and appropriate steps to declare actions of the Board regarding the Application to be null and void.

Signing this Application is a declaration by the Applicant to conform to all plans, drawings, and commitments submitted with or contained within this Application, provided that the same is in conformance with the Fremont County Zoning Resolution.

Hamza Mekhfi		March 28, 2024
Applicant Printed Name	Signature	Date
Hamz Mekhfi		March 28, 2024
Owner Printed Name	Signature	Date

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CUP Exhibit 3.13 Master Plan Compliance

The subject property is located in the Plains Planning District of the 2015 Fremont County Master Plan.

Objectives

F1. The proposed mining is will be conducted to be protective of water quality and wildlife habitat. The subject parcels are surrounded by Ranch Land LLC, substantially isolated from recreators with the exception of hunters with permission to be on the private land.

F1.1 Holcim has conducted groundwater and surface water baseline quality and quantity characterization investigations. Water monitoring will continue throughout the life of the mine with DRMS.

F1.2 Holcim obtained input from CO DWR, and US ACE while preparing the CO DRMS application. Agency recommendations are incorporated into the DRMS 112 permit application.

F1.3 Brown and Caldwell prepared a stormwater drainage report for the project and it is included in the county application.

F1.4 Brown and Caldwell performed a wildlife investigation/survey of the mine area. CPW visited the site and prepared recommendations that were incorporated in the DRMS 112 permit application.

F1.5 Development will not occur within the flood hazard area of the Arkansas River.

F2. The proposed mining is a long term limestone resource for Holcim. Reclamation will return the mined area to rangeland for cattle and wildlife habitat that will maintain the rural character.

CUP Exhibit 3.14 Surrounding Land Use Compatibility

The Ranch Land LLC ranch includes two areas currently permitted for mining. Mining and cattle ranching are the principal land uses on the ranch.

CUP Exhibit 3.15 Fire Protection Plan

FREMONT COUNTY
FIRE PROTECTION PLAN
AND DISTRICT COMMENT FORM

The Fremont County Subdivision Regulations and Fremont County Zoning Resolution require a fire protection plan be submitted with many different types of applications, at the time of application submittal. In order to provide consistency in the information received, it shall be required that these plans be submitted on this form.

The Fremont County Department of Planning and Zoning (Department), Fremont County Planning Commission (Commission) and Fremont County Board of County Commissioners (Board) take into consideration the responses of the Applicant and the District during their respective review process.

Attachments can be made to this form to provide expanded narrative for any application item including supportive documentation or evidence for provided form item answers. Please indicate at the form item that there is an attachment and label it as an exhibit with the application item number, a period and the number of the attachment for that item (*as an example, the first attached document providing evidence in support of the answer given at application item number 4 would be marked* - Exhibit 4.1, *the fifth attached document supporting the narrative provided for application item 4 would be marked* - Exhibit 4.5). Exhibit numbers should be placed in either the lower right hand area or the upper right hand area of the exhibit.

If the subject property is not in a fire protection district, only applicants' information and map are required. A copy of the Colorado State Forest Service Wildfire Hazard Area Map with the subject property clearly and accurately located, shall be attached and marked as Exhibit A.

APPLICANT INFORMATION

1. Project Name Red Creek Quarry formerly Ranch Land Rock Pit #1 CUP 02-3

2. Project Description
Red Creek Quarry (RCQ) will the be limestone source for the cement plant whens Bear Creek Quarry is mined out.

3. Type of application:

- ☐ Zone Change #1
- ☐ Zone Change #2 – Use Designation Plan
- ☐ Zone Change #2 – Final Development Plan
- ☐ Commercial Development Plan
- ☐ Commercial Development Modification
- ☐ Expansion of an existing Business or Industrial Use
- ☐ Special Review Use Permit
- ☒ Conditional Use Permit
- ☐ Temporary Use Permit
- ☐ Change of Use of Property
- ☐ Subdivision Preliminary Plan
- ☐ Minor Subdivision

3. The subject property is located at:
Sections 24 and 25 T68W of 6th P.M. in Fremont County, Colorado
Address and or General Location (*If general location only is used, it will be required that a legal description of the subject property be attached Marked as Exhibit 3.1*) ☒ An exhibit is attached.

4. Fire protection will be provided in what manner and with what resources?
Fire extinguishers will be available as required by MSHA. Holcim has a water truck with a water canon available in the event of fire emergency.

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