

HY-8 Culvert Analysis Report

Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 381.9 cfs

Maximum Flow: 482.4 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing 40

Headwater Elevation (ft)	Total Discharge (cfs)	Lt. Sta. 667+20 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
344.00	0.00	0.00	0.00	1
346.17	48.24	48.24	0.00	1
347.47	96.48	96.48	0.00	1
348.58	144.72	144.72	0.00	1
349.69	192.96	192.96	0.00	1
350.95	241.20	241.20	0.00	1
352.46	289.44	289.44	0.00	1
354.27	337.68	337.68	0.00	1
356.20	381.90	381.90	0.00	1
358.80	434.16	434.16	0.00	1
361.68	482.40	482.40	0.00	1
370.00	600.21	600.21	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing 40

Total Rating Curve

Crossing: Crossing 40

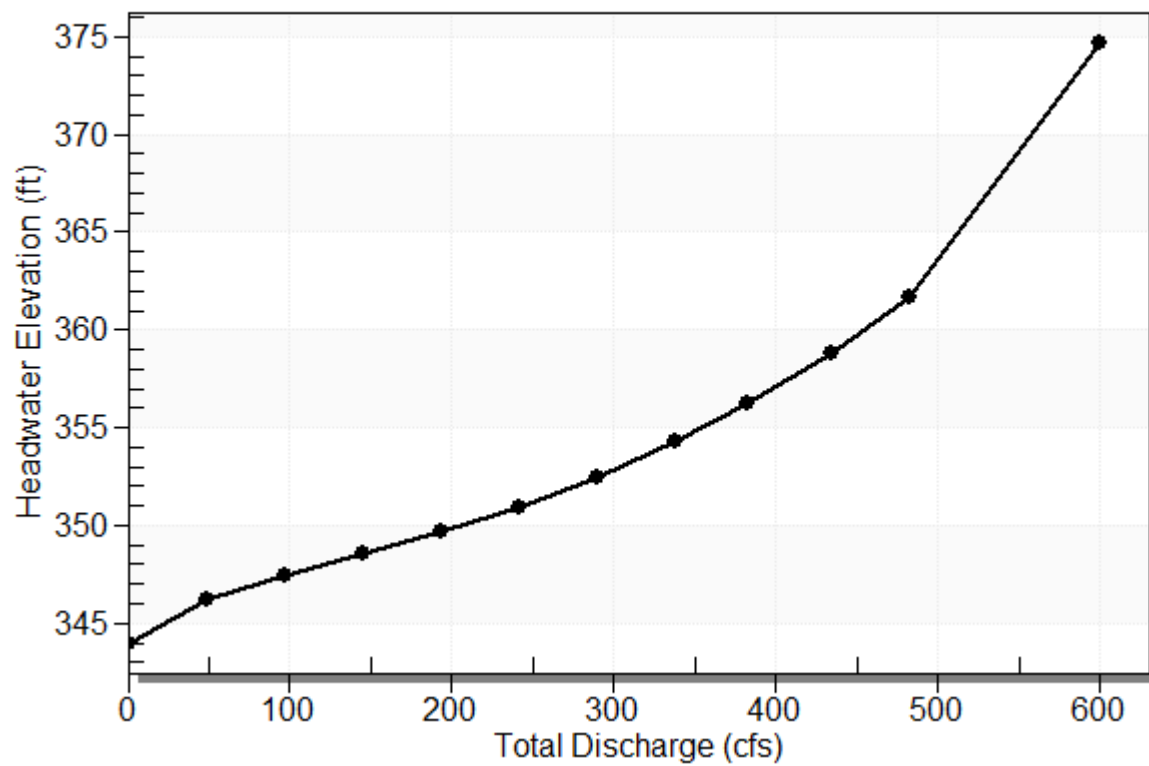


Table 2 - Culvert Summary Table: Lt. Sta. 667+20

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	0.00	344.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
48.24	48.24	346.17	2.172	0.0*	1-S2n	1.041	1.425	1.053	1.644	9.164	2.756
96.48	96.48	347.47	3.475	1.062	1-S2n	1.695	2.261	1.724	2.464	11.190	3.415
144.72	144.72	348.58	4.580	2.315	1-S2n	2.282	2.963	2.327	3.107	12.438	3.847
192.96	192.96	349.69	5.690	3.715	5-S2n	2.832	3.590	2.889	3.653	13.357	4.175
241.20	241.20	350.95	6.954	5.743	5-S2n	3.364	4.165	3.434	4.134	14.048	4.442
289.44	289.44	352.46	8.464	7.354	5-S2n	3.882	4.704	3.953	4.569	14.644	4.669
337.68	337.68	354.27	10.270	9.089	5-S2n	4.392	5.000	4.466	4.967	15.123	4.868
381.90	381.90	356.20	12.198	11.064	4-FFf	5.000	5.000	5.000	5.307	15.276	5.030
434.16	434.16	358.80	14.805	13.675	4-FFf	5.000	5.000	5.000	5.682	17.366	5.204
482.40	482.40	361.68	17.680	16.319	4-FFf	5.000	5.000	5.000	6.007	19.296	5.351

* Full Flow Headwater elevation is below inlet invert.

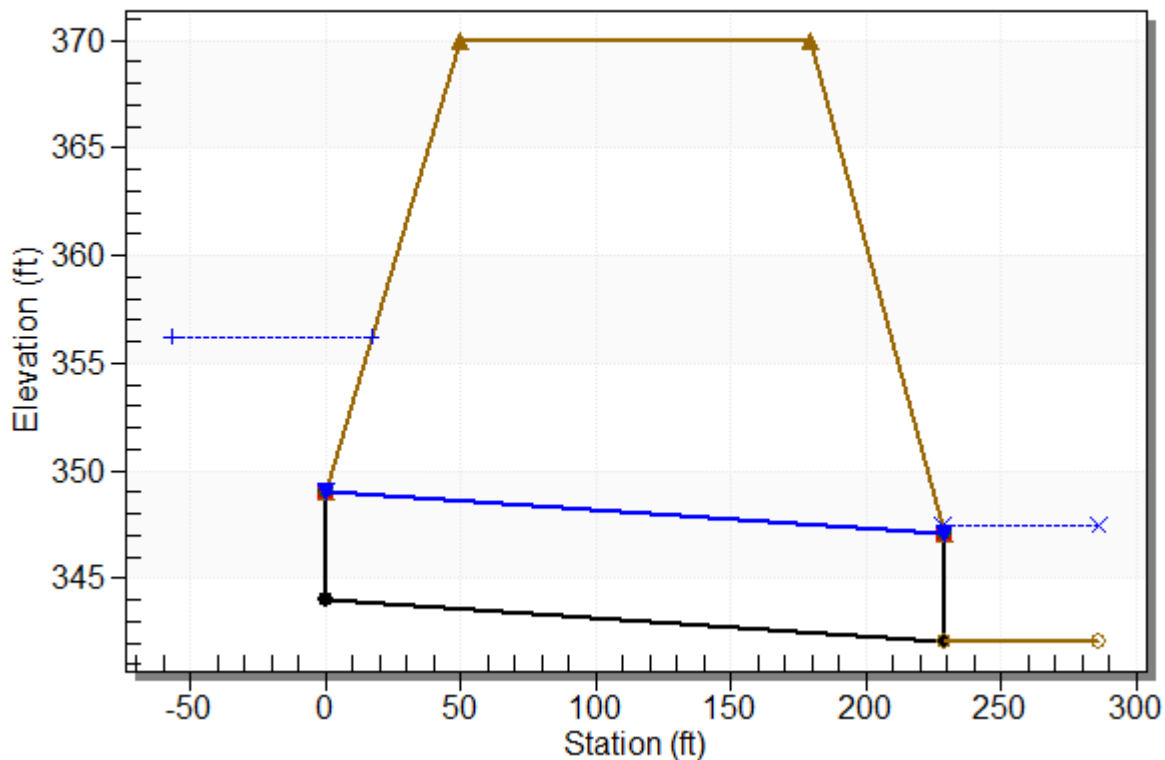
Straight Culvert
Inlet Elevation (invert): 344.00 ft, Outlet Elevation (invert): 342.11 ft
Culvert Length: 229.06 ft, Culvert Slope: 0.0083

Culvert Performance Curve Plot: Lt. Sta. 667+20

Water Surface Profile Plot for Culvert: Lt. Sta. 667+20

Crossing - Crossing 40, Design Discharge - 381.9 cfs

Culvert - Lt. Sta. 667+20, Culvert Discharge - 381.9 cfs



Site Data - Lt. Sta. 667+20

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 344.00 ft

Outlet Station: 229.05 ft

Outlet Elevation: 342.11 ft

Number of Barrels: 1

Culvert Data Summary - Lt. Sta. 667+20

Barrel Shape: Concrete Box

Barrel Span: 5.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75° flare) Wingwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: Crossing 40)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	342.11	0.00	0.00	0.00	0.00
48.24	343.75	1.64	2.76	0.51	0.41
96.48	344.57	2.46	3.42	0.77	0.42
144.72	345.22	3.11	3.85	0.97	0.43
192.96	345.76	3.65	4.17	1.14	0.44
241.20	346.24	4.13	4.44	1.29	0.44
289.44	346.68	4.57	4.67	1.43	0.45
337.68	347.08	4.97	4.87	1.55	0.45
381.90	347.42	5.31	5.03	1.66	0.45
434.16	347.79	5.68	5.20	1.77	0.45
482.40	348.12	6.01	5.35	1.87	0.46

Tailwater Channel Data - Crossing 40

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 9.00 ft

Side Slope (H:V): 1.00 (1:1)

Channel Slope: 0.0050

Channel Manning's n: 0.0450

Channel Invert Elevation: 342.11 ft

Roadway Data for Crossing: Crossing 40

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 370.00 ft

Roadway Surface: Paved

Roadway Top Width: 130.00 ft