

HY-8 Culvert Analysis Report

Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 40.42 cfs

Maximum Flow: 45.37 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing 3

Headwater Elevation (ft)	Total Discharge (cfs)	Lt. Sta. 353+18 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
340.07	0.00	0.00	0.00	1
340.96	4.54	4.54	0.00	1
341.35	9.07	9.07	0.00	1
341.68	13.61	13.61	0.00	1
341.98	18.15	18.15	0.00	1
342.25	22.68	22.68	0.00	1
342.49	27.22	27.22	0.00	1
342.72	31.76	31.76	0.00	1
342.94	36.30	36.30	0.00	1
343.16	40.42	40.42	0.00	1
343.43	45.37	45.37	0.00	1
345.00	67.53	67.53	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing 3

Total Rating Curve

Crossing: Crossing 3

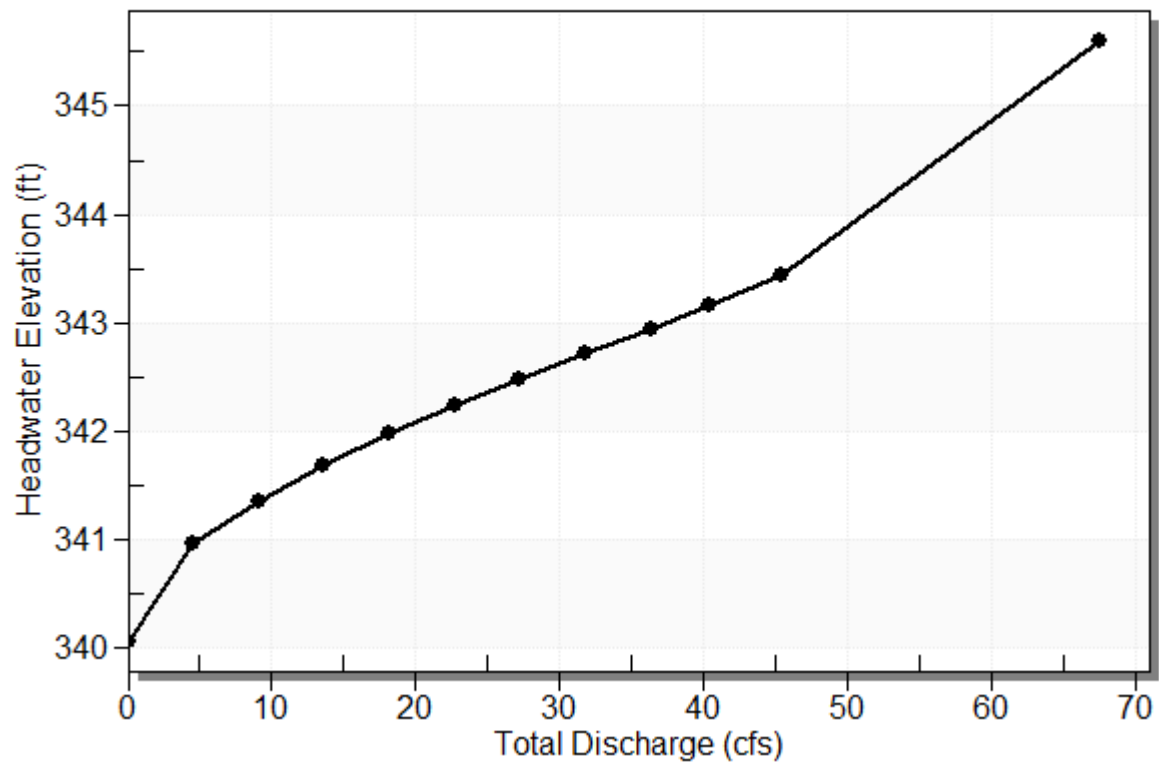


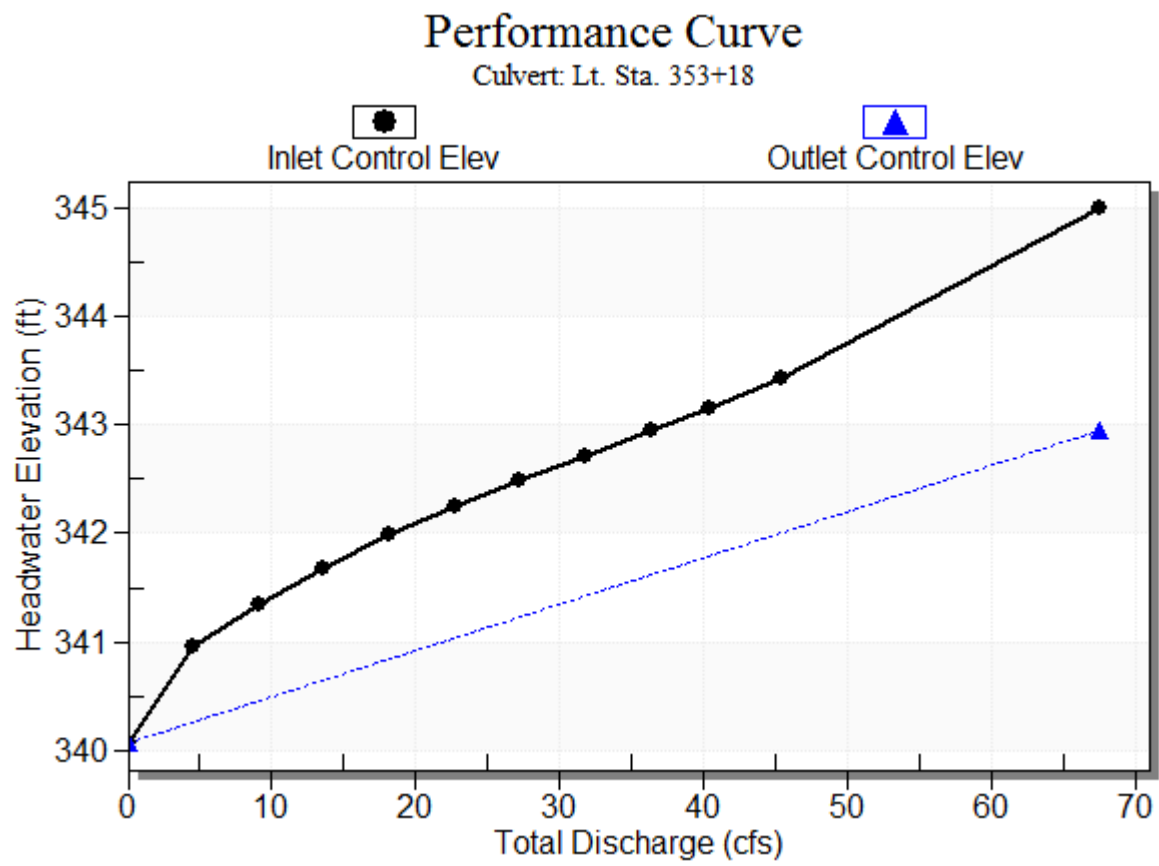
Table 2 - Culvert Summary Table: Lt. Sta. 353+18

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	340.07	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
4.54	4.54	340.96	0.888	0.0*	1-S2n	0.446	0.662	0.446	0.283	6.720	10.224
9.07	9.07	341.35	1.283	0.0*	1-S2n	0.642	0.948	0.653	0.405	7.902	12.380
13.61	13.61	341.68	1.611	0.0*	1-S2n	0.800	1.171	0.800	0.496	8.985	13.796
18.15	18.15	341.98	1.912	0.0*	1-S2n	0.923	1.364	0.941	0.570	9.531	14.882
22.68	22.68	342.25	2.176	0.0*	1-S2n	1.041	1.532	1.055	0.634	10.208	15.773
27.22	27.22	342.49	2.416	0.0*	1-S2n	1.149	1.684	1.176	0.691	10.584	16.536
31.76	31.76	342.72	2.645	0.0*	1-S2n	1.250	1.825	1.250	0.743	11.379	17.205
36.30	36.30	342.94	2.874	0.0*	1-S2n	1.351	1.955	1.351	0.790	11.757	17.802
40.42	40.42	343.16	3.088	0.0*	5-S2n	1.436	2.068	1.464	0.830	11.798	18.301
45.37	45.37	343.43	3.361	0.0*	5-S2n	1.536	2.192	1.550	0.875	12.311	18.850

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 340.07 ft, Outlet Elevation (invert): 335.97 ft
Culvert Length: 283.95 ft, Culvert Slope: 0.0144

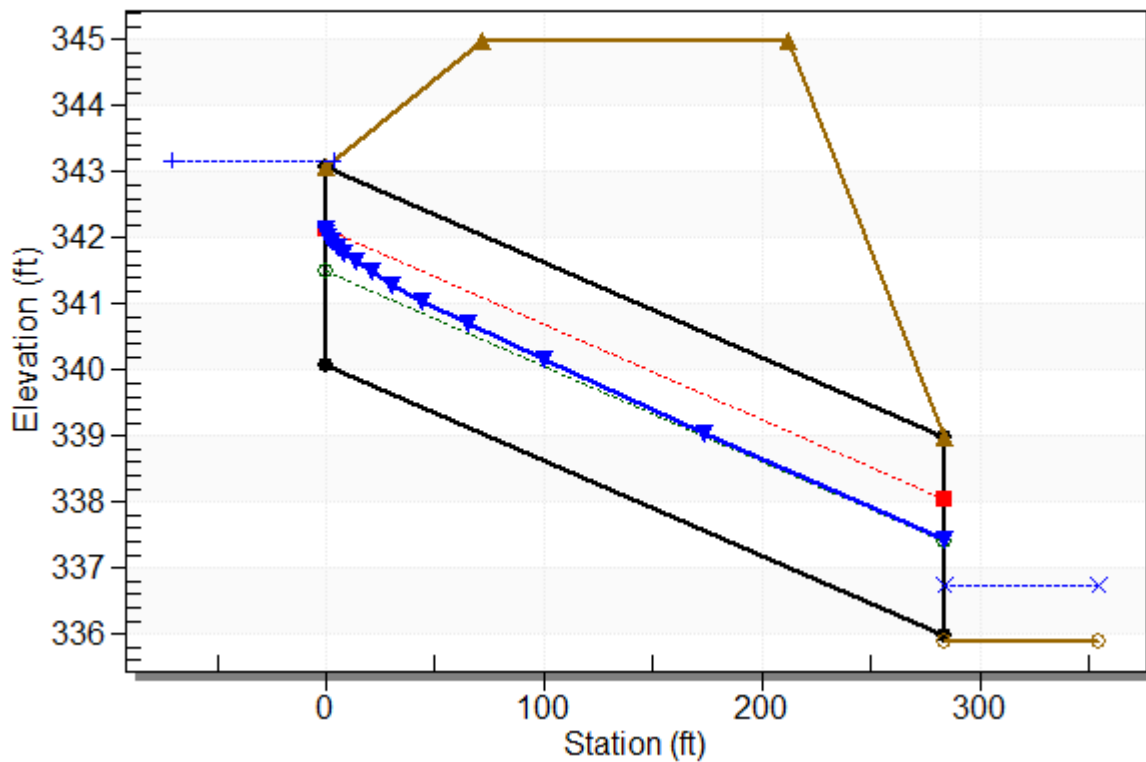
Culvert Performance Curve Plot: Lt. Sta. 353+18



Water Surface Profile Plot for Culvert: Lt. Sta. 353+18

Crossing - Crossing 3, Design Discharge - 40.4 cfs

Culvert - Lt. Sta. 353+18, Culvert Discharge - 40.4 cfs



Site Data - Lt. Sta. 353+18

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 340.07 ft

Outlet Station: 283.92 ft

Outlet Elevation: 335.97 ft

Number of Barrels: 1

Culvert Data Summary - Lt. Sta. 353+18

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Grooved End Projecting

Inlet Depression: NONE

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

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	335.90	0.00	0.00	0.00	0.00
4.54	336.18	0.28	10.22	1.06	3.95
9.07	336.30	0.40	12.38	1.52	4.12
13.61	336.40	0.50	13.80	1.86	4.23
18.15	336.47	0.57	14.88	2.13	4.30
22.68	336.53	0.63	15.77	2.37	4.36
27.22	336.59	0.69	16.54	2.59	4.41
31.76	336.64	0.74	17.21	2.78	4.45
36.30	336.69	0.79	17.80	2.96	4.48
40.42	336.73	0.83	18.30	3.11	4.51
45.37	336.78	0.88	18.85	3.28	4.54

Tailwater Channel Data - Crossing 3

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.00 ft

Side Slope (H:V): 2.00 (2:1)

Channel Slope: 0.0600

Channel Manning's n: 0.0120

Channel Invert Elevation: 335.90 ft

Roadway Data for Crossing: Crossing 3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 345.00 ft

Roadway Surface: Paved

Roadway Top Width: 140.00 ft