

HY-8 Culvert Analysis Report

Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 169.61 cfs

Maximum Flow: 190.31 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing 45

Headwater Elevation (ft)	Total Discharge (cfs)	Rt. Sta. 745+45 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
355.00	0.00	0.00	0.00	1
356.16	19.03	19.03	0.00	1
356.84	38.06	38.06	0.00	1
357.41	57.09	57.09	0.00	1
357.94	76.12	76.12	0.00	1
358.42	95.16	95.16	0.00	1
358.87	114.19	114.19	0.00	1
359.30	133.22	133.22	0.00	1
359.73	152.25	152.25	0.00	1
360.12	169.61	169.61	0.00	1
360.60	190.31	190.31	0.00	1
371.00	455.35	455.35	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing 45

Total Rating Curve

Crossing: Crossing 45

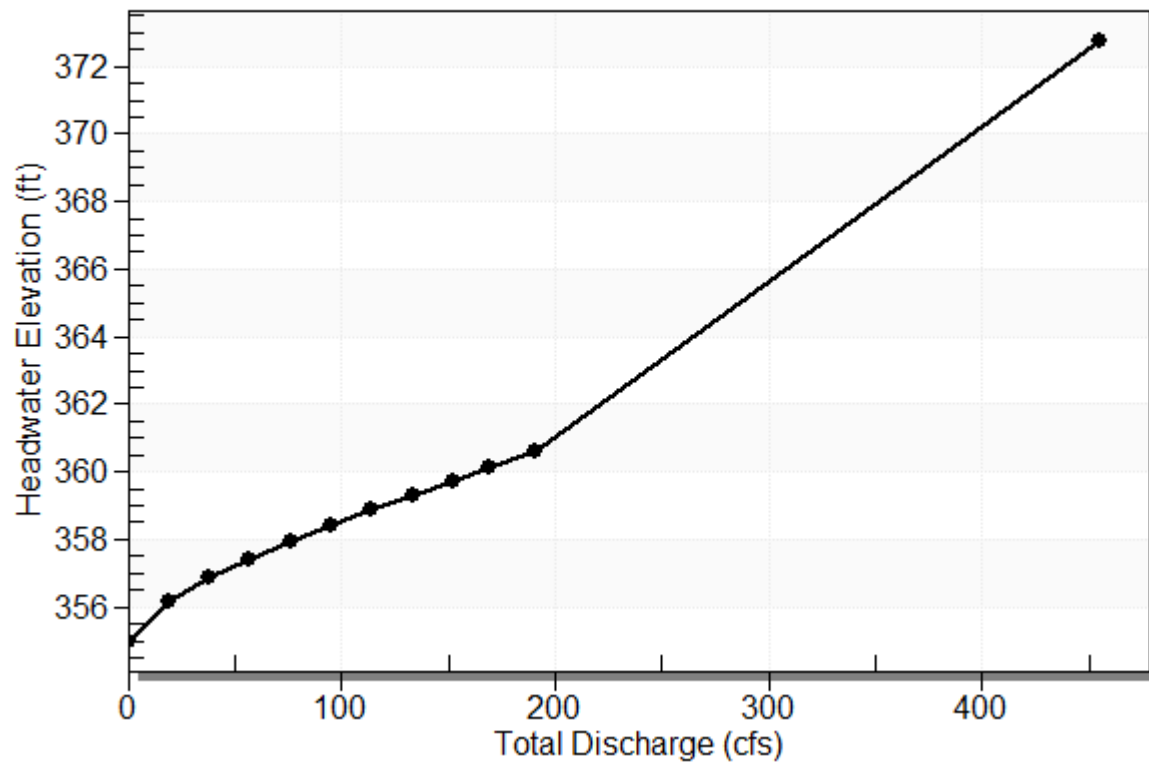


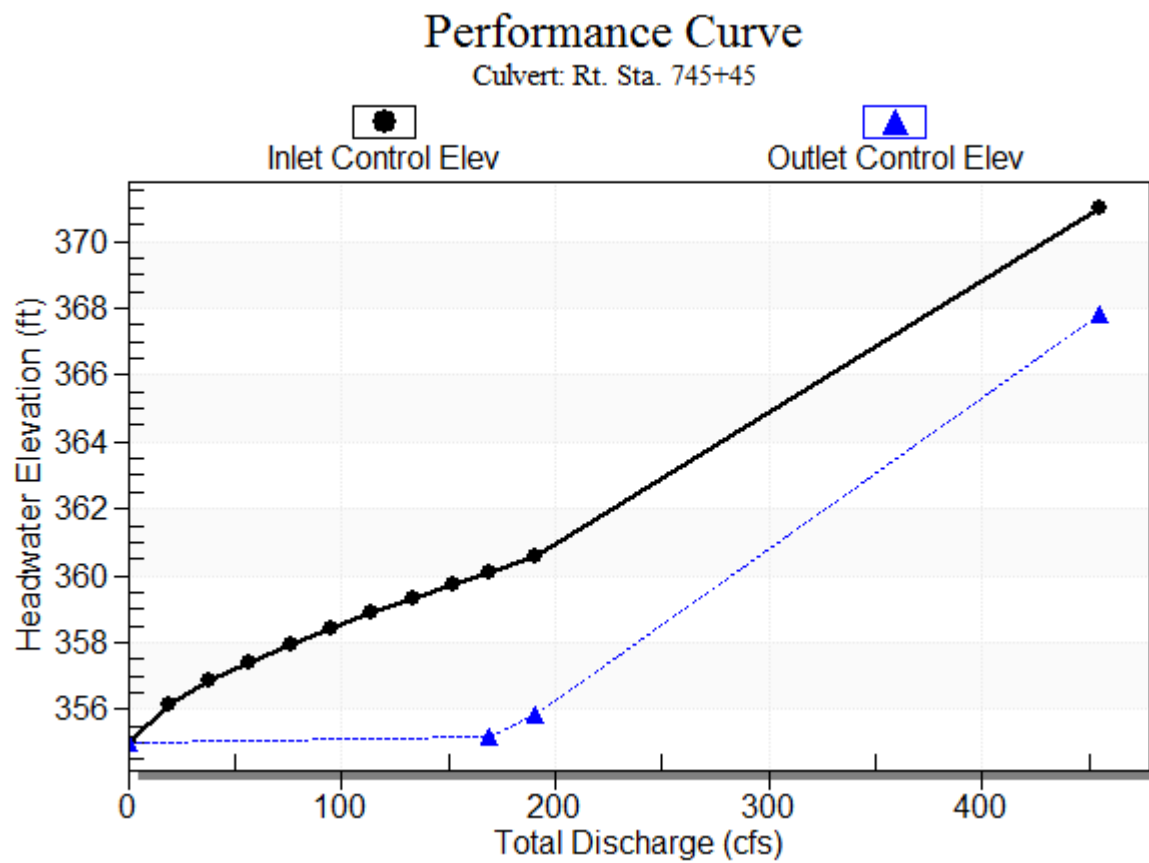
Table 2 - Culvert Summary Table: Rt. Sta. 745+45

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	355.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
19.03	19.03	356.16	1.159	0.0*	1-S2n	0.442	0.766	0.442	0.884	8.607	3.659
38.06	38.06	356.84	1.839	0.0*	1-S2n	0.682	1.216	0.682	1.325	11.154	4.540
57.09	57.09	357.41	2.410	0.0*	1-S2n	0.915	1.594	0.943	1.672	12.102	5.116
76.12	76.12	357.94	2.938	0.0*	1-S2n	1.105	1.931	1.105	1.967	13.777	5.555
95.16	95.16	358.42	3.420	0.0*	1-S2n	1.295	2.241	1.333	2.227	14.273	5.912
114.19	114.19	358.87	3.870	0.0*	1-S2n	1.472	2.530	1.520	2.462	15.020	6.216
133.22	133.22	359.30	4.300	0.0*	1-S2n	1.641	2.804	1.701	2.677	15.666	6.481
152.25	152.25	359.73	4.726	0.0*	1-S2n	1.811	3.065	1.882	2.877	16.180	6.717
169.61	169.61	360.12	5.119	0.165	5-S2n	1.956	3.294	2.041	3.048	16.620	6.913
190.31	190.31	360.60	5.604	0.845	5-S2n	2.128	3.557	2.232	3.241	17.051	7.126

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 355.00 ft, Outlet Elevation (invert): 350.26 ft
Culvert Length: 275.59 ft, Culvert Slope: 0.0172

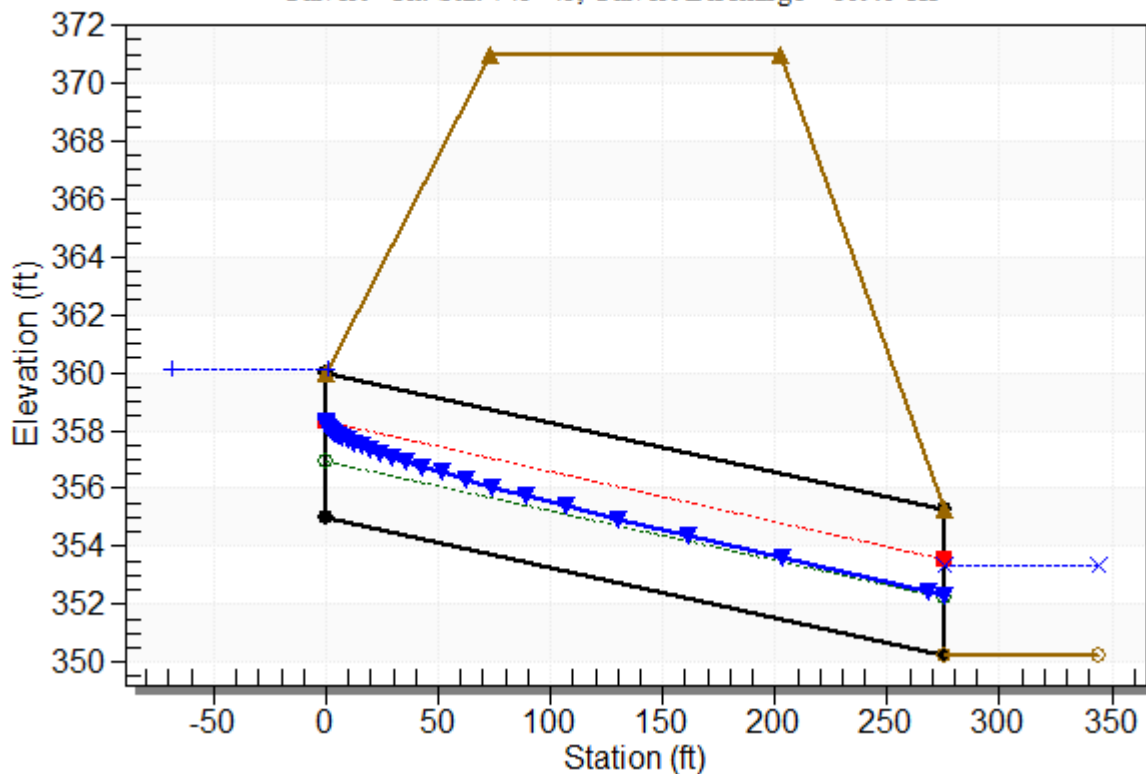
Culvert Performance Curve Plot: Rt. Sta. 745+45



Water Surface Profile Plot for Culvert: Rt. Sta. 745+45

Crossing - Crossing 45, Design Discharge - 169.6 cfs

Culvert - Rt. Sta. 745+45, Culvert Discharge - 169.6 cfs



Site Data - Rt. Sta. 745+45

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 355.00 ft

Outlet Station: 275.55 ft

Outlet Elevation: 350.26 ft

Number of Barrels: 1

Culvert Data Summary - Rt. Sta. 745+45

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 45)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	350.26	0.00	0.00	0.00	0.00
19.03	351.14	0.88	3.66	1.10	0.74
38.06	351.59	1.33	4.54	1.65	0.76
57.09	351.93	1.67	5.12	2.09	0.78
76.12	352.23	1.97	5.55	2.45	0.79
95.16	352.49	2.23	5.91	2.78	0.80
114.19	352.72	2.46	6.22	3.07	0.81
133.22	352.94	2.68	6.48	3.34	0.81
152.25	353.14	2.88	6.72	3.59	0.82
169.61	353.31	3.05	6.91	3.80	0.82
190.31	353.50	3.24	7.13	4.04	0.82

Tailwater Channel Data - Crossing 45

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 5.00 ft

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

Channel Slope: 0.0200

Channel Manning's n: 0.0450

Channel Invert Elevation: 350.26 ft

Roadway Data for Crossing: Crossing 45

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 371.00 ft

Roadway Surface: Paved

Roadway Top Width: 130.00 ft