

# HY-8 Culvert Analysis Report

## Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 9.38 cfs

Maximum Flow: 10.55 cfs

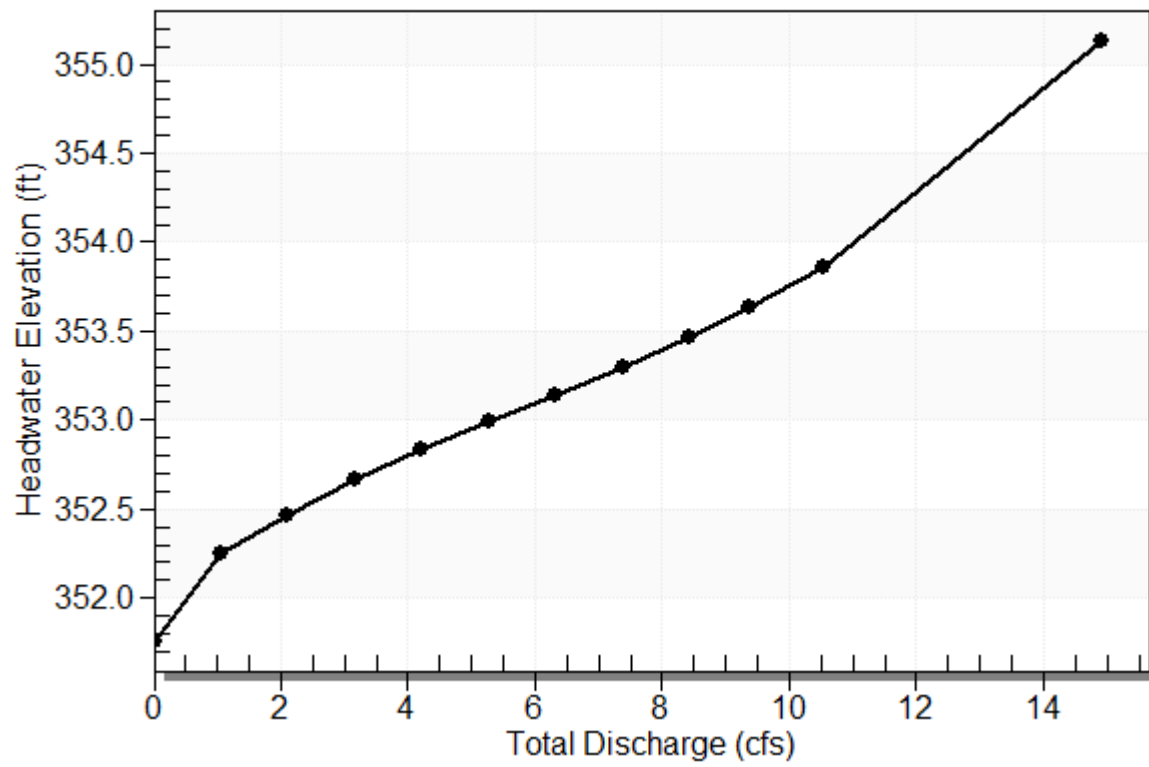
**Table 1 - Summary of Culvert Flows at Crossing: Crossing 12**

Headwater Elevation (ft)	Total Discharge (cfs)	Lt. Sta. 292+15 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
351.76	0.00	0.00	0.00	1
352.25	1.06	1.06	0.00	1
352.46	2.11	2.11	0.00	1
352.66	3.17	3.17	0.00	1
352.83	4.22	4.22	0.00	1
352.99	5.28	5.28	0.00	1
353.14	6.33	6.33	0.00	1
353.29	7.39	7.39	0.00	1
353.46	8.44	8.44	0.00	1
353.63	9.38	9.38	0.00	1
353.86	10.55	10.55	0.00	1
355.00	14.91	14.91	0.00	Overtopping

## Rating Curve Plot for Crossing: Crossing 12

### Total Rating Curve

Crossing: Crossing 12



**Table 2 - Culvert Summary Table: Lt. Sta. 292+15**

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	351.76	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.06	1.06	352.25	0.487	0.0*	1-S2n	0.177	0.380	0.177	0.090	14.449	1.920
2.11	2.11	352.46	0.705	0.0*	1-S2n	0.259	0.546	0.259	0.137	10.273	2.512
3.17	3.17	352.66	0.902	0.0*	1-S2n	0.315	0.677	0.315	0.175	12.069	2.933
4.22	4.22	352.83	1.073	0.0*	1-S2n	0.365	0.786	0.365	0.208	12.604	3.271
5.28	5.28	352.99	1.227	0.0*	1-S2n	0.413	0.882	0.413	0.238	13.323	3.560
6.33	6.33	353.14	1.378	0.0*	1-S2n	0.451	0.967	0.451	0.265	14.276	3.812
7.39	7.39	353.29	1.533	0.0*	5-S2n	0.489	1.049	0.489	0.291	14.705	4.037
8.44	8.44	353.46	1.703	0.0*	5-S2n	0.527	1.121	0.527	0.315	15.206	4.241
9.38	9.38	353.63	1.870	0.0*	5-S2n	0.559	1.182	0.559	0.336	15.664	4.408
10.55	10.55	353.86	2.102	0.0*	5-S2n	0.594	1.247	0.594	0.360	16.269	4.602

\* Full Flow Headwater elevation is below inlet invert.

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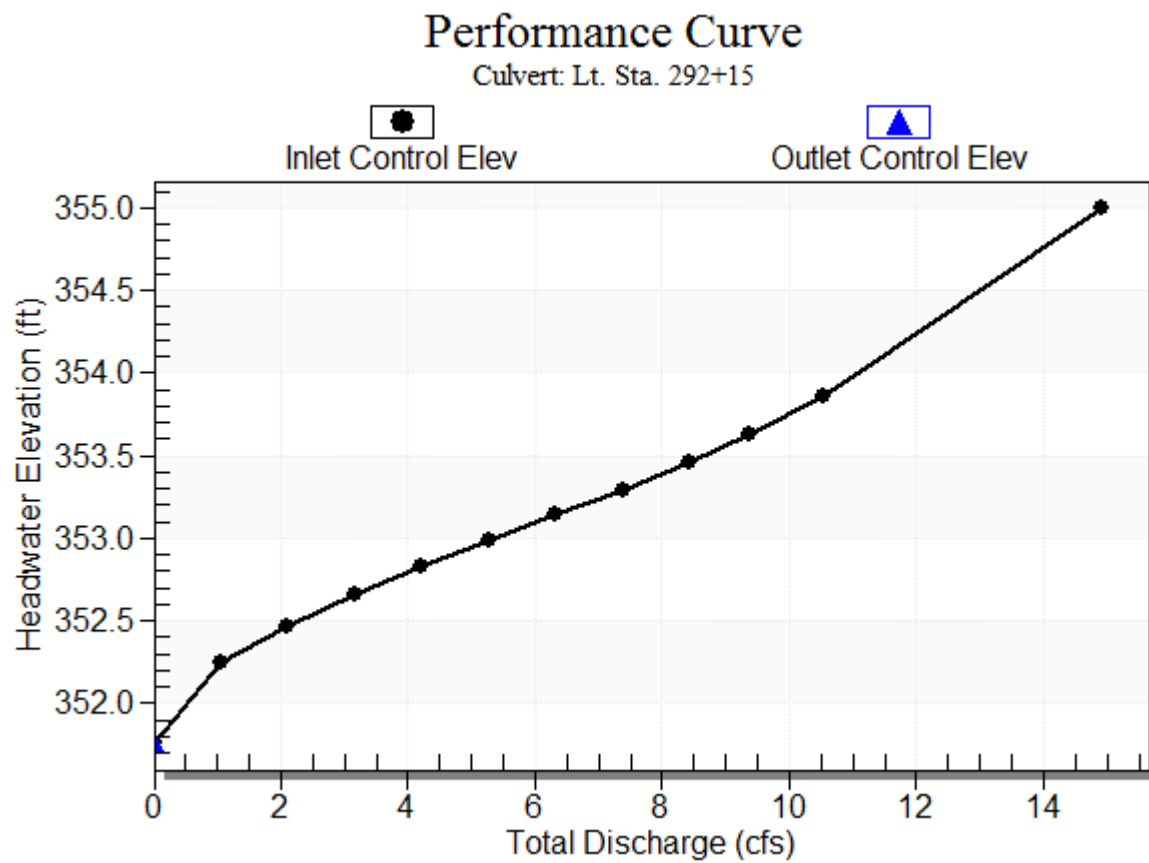
Straight Culvert

Inlet Elevation (invert): 351.76 ft,    Outlet Elevation (invert): 327.16 ft

Culvert Length: 319.60 ft,    Culvert Slope: 0.0772

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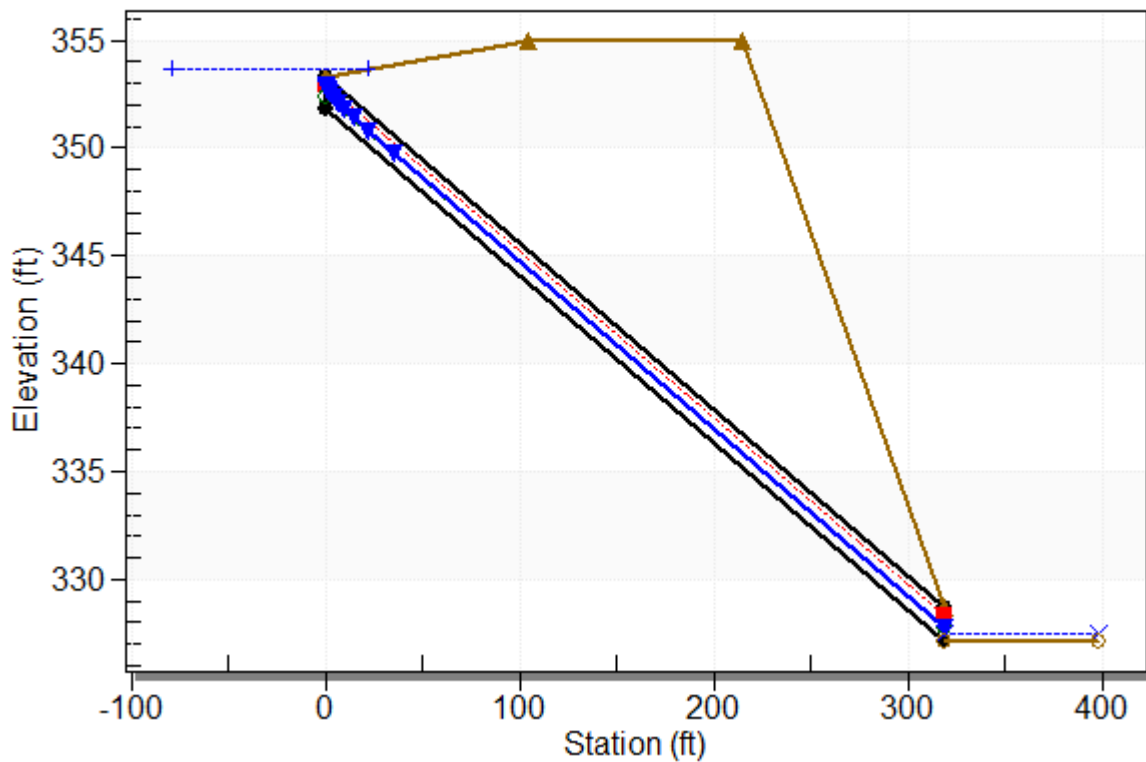
Culvert Performance Curve Plot: Lt. Sta. 292+15



## Water Surface Profile Plot for Culvert: Lt. Sta. 292+15

### Crossing - Crossing 12, Design Discharge - 9.4 cfs

Culvert - Lt. Sta. 292+15, Culvert Discharge - 9.4 cfs



## Site Data - Lt. Sta. 292+15

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 351.76 ft

Outlet Station: 318.65 ft

Outlet Elevation: 327.16 ft

Number of Barrels: 1

## Culvert Data Summary - Lt. Sta. 292+15

Barrel Shape: Circular

Barrel Diameter: 1.50 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 12)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	327.16	0.00	0.00	0.00	0.00
1.06	327.25	0.09	1.92	0.34	1.13
2.11	327.30	0.14	2.51	0.51	1.21
3.17	327.33	0.17	2.93	0.65	1.25
4.22	327.37	0.21	3.27	0.78	1.29
5.28	327.40	0.24	3.56	0.89	1.31
6.33	327.43	0.27	3.81	0.99	1.33
7.39	327.45	0.29	4.04	1.09	1.35
8.44	327.48	0.32	4.24	1.18	1.36
9.38	327.50	0.34	4.41	1.26	1.38
10.55	327.52	0.36	4.60	1.35	1.39

**Tailwater Channel Data - Crossing 12**

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

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

Channel Slope: 0.0600

Channel Manning's n: 0.0375

Channel Invert Elevation: 327.16 ft

**Roadway Data for Crossing: Crossing 12**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 355.00 ft

Roadway Surface: Paved

Roadway Top Width: 110.00 ft