

# HY-8 Culvert Analysis Report

## Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 42.04 cfs

Maximum Flow: 47.24 cfs

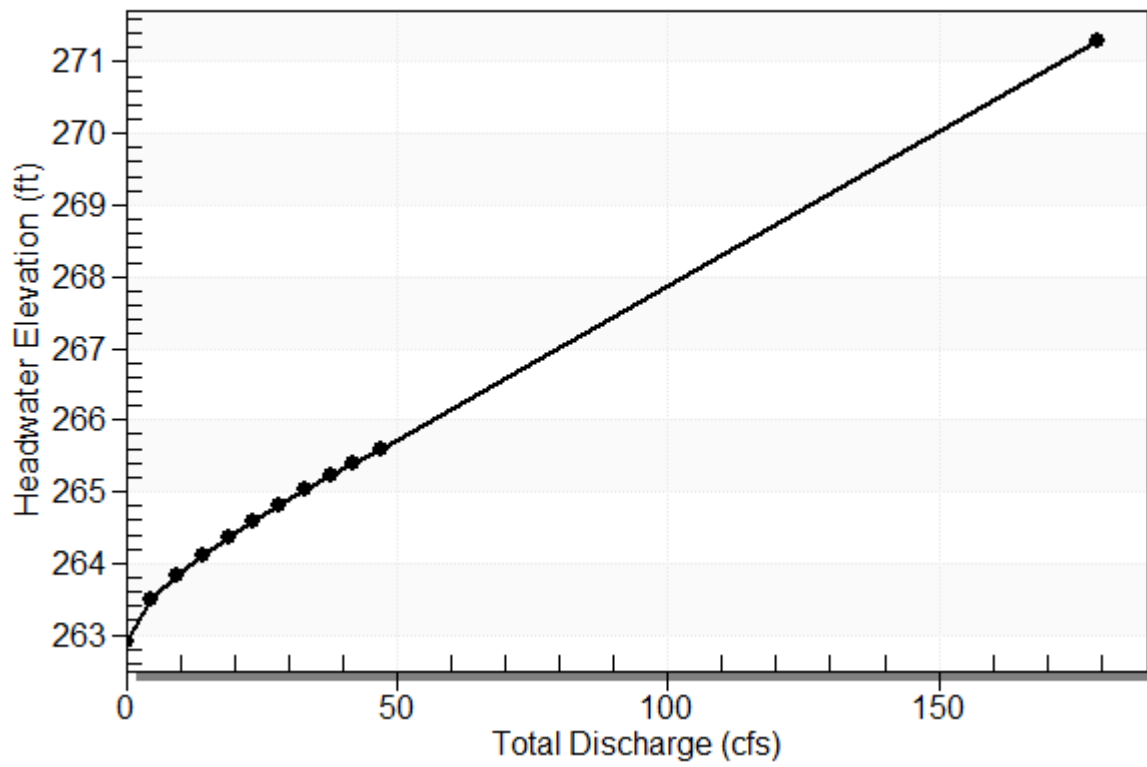
**Table 1 - Summary of Culvert Flows at Crossing: Crossing 17**

Headwater Elevation (ft)	Total Discharge (cfs)	Lt. Sta. 248+65 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
262.92	0.00	0.00	0.00	1
263.49	4.72	4.72	0.00	1
263.83	9.45	9.45	0.00	1
264.11	14.17	14.17	0.00	1
264.36	18.90	18.90	0.00	1
264.59	23.62	23.62	0.00	1
264.81	28.34	28.34	0.00	1
265.02	33.07	33.07	0.00	1
265.21	37.79	37.79	0.00	1
265.39	42.04	42.04	0.00	1
265.59	47.24	47.24	0.00	1
271.00	179.38	179.38	0.00	Overtopping

# Rating Curve Plot for Crossing: Crossing 17

## Total Rating Curve

Crossing: Crossing 17



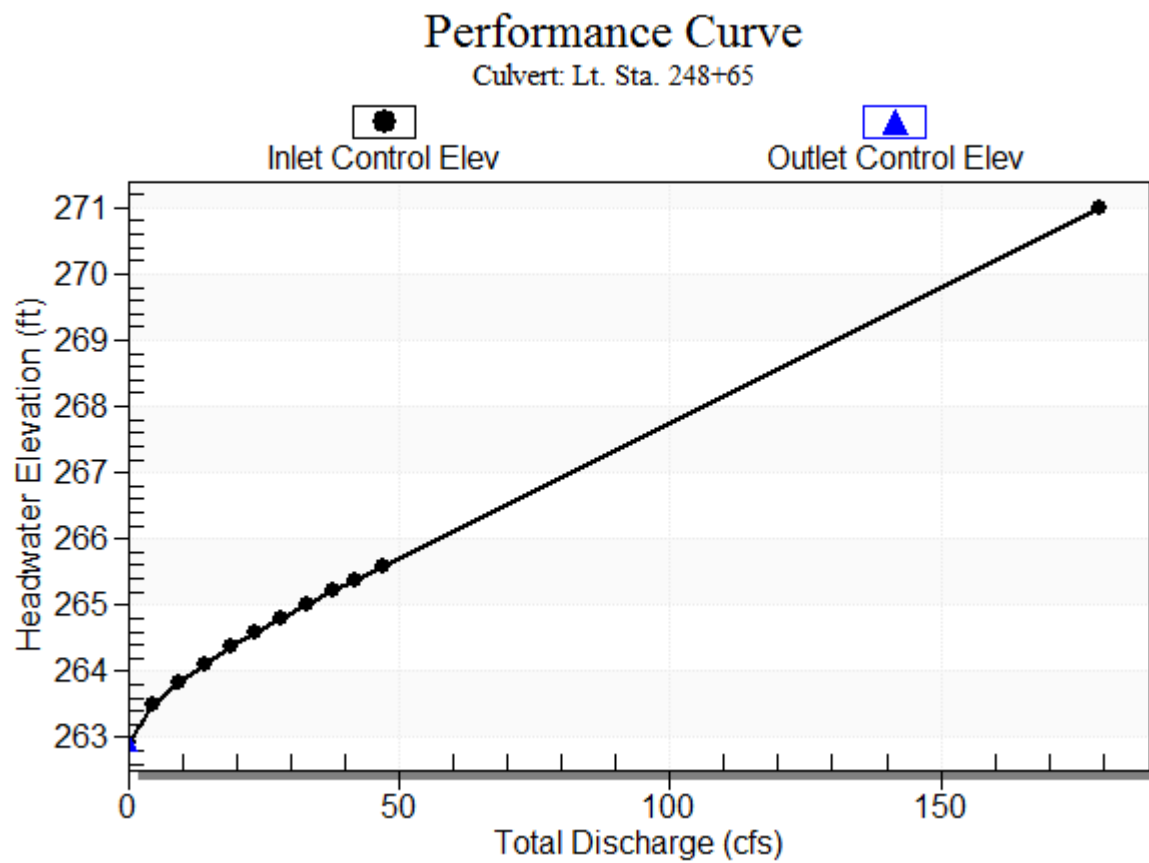
**Table 2 - Culvert Summary Table: Lt. Sta. 248+65**

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	262.92	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
4.72	4.72	263.49	0.573	0.0*	1-S2n	0.092	0.351	0.092	0.356	12.791	3.954
9.45	9.45	263.83	0.909	0.0*	1-S2n	0.185	0.557	0.231	0.537	10.247	4.972
14.17	14.17	264.11	1.191	0.0*	1-S2n	0.277	0.731	0.277	0.681	12.791	5.649
18.90	18.90	264.36	1.443	0.0*	1-S2n	0.367	0.885	0.367	0.805	12.884	6.167
23.62	23.62	264.59	1.675	0.0*	1-S2n	0.416	1.027	0.416	0.915	14.208	6.590
28.34	28.34	264.81	1.891	0.0*	1-S2n	0.465	1.160	0.488	1.016	14.517	6.949
33.07	33.07	265.02	2.097	0.0*	1-S2n	0.514	1.285	0.514	1.108	16.098	7.263
37.79	37.79	265.21	2.295	0.0*	1-S2n	0.562	1.405	0.601	1.194	15.710	7.543
42.04	42.04	265.39	2.465	0.0*	1-S2n	0.607	1.508	0.618	1.268	17.006	7.772
47.24	47.24	265.59	2.667	0.0*	1-S2n	0.660	1.630	0.660	1.352	17.883	8.027

\* Full Flow Headwater elevation is below inlet invert.

\*\*\*\*\*  
Straight Culvert  
Inlet Elevation (invert): 262.92 ft,    Outlet Elevation (invert): 249.14 ft  
Culvert Length: 269.73 ft,    Culvert Slope: 0.0512  
\*\*\*\*\*

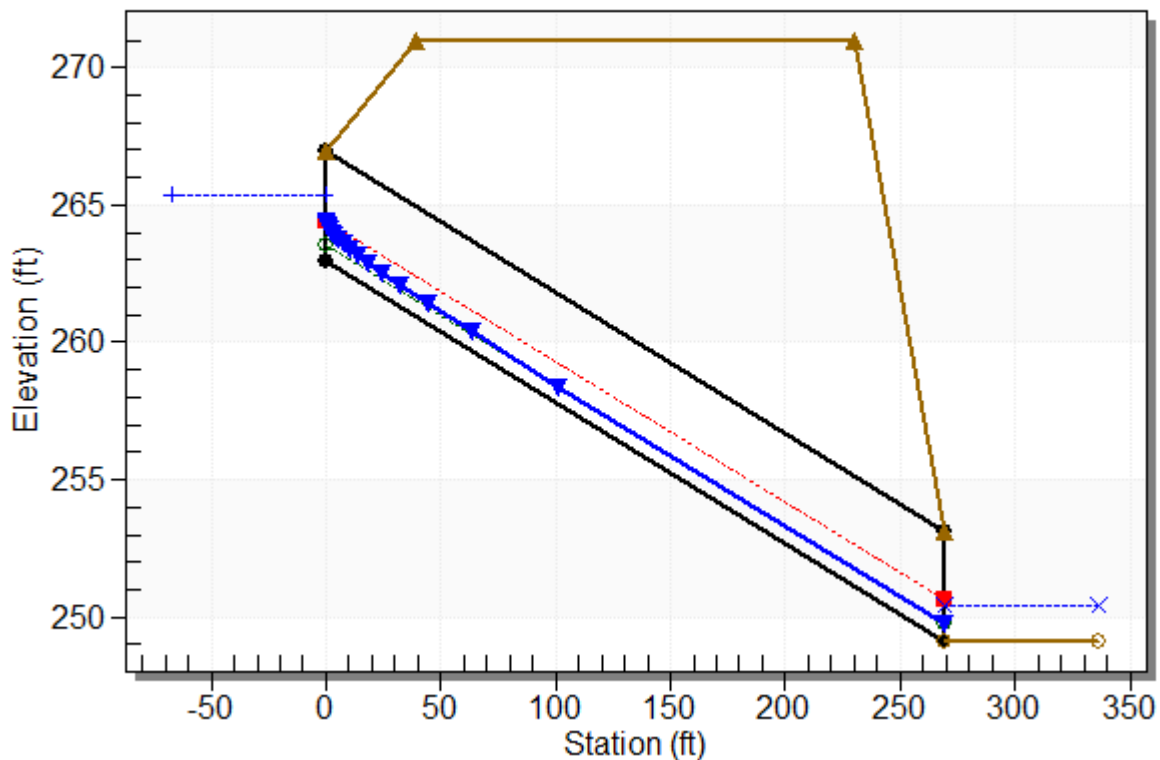
Culvert Performance Curve Plot: Lt. Sta. 248+65



## Water Surface Profile Plot for Culvert: Lt. Sta. 248+65

### Crossing - Crossing 17, Design Discharge - 42.0 cfs

Culvert - Lt. Sta. 248+65, Culvert Discharge - 42.0 cfs



## Site Data - Lt. Sta. 248+65

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 262.92 ft

Outlet Station: 269.38 ft

Outlet Elevation: 249.14 ft

Number of Barrels: 1

## Culvert Data Summary - Lt. Sta. 248+65

Barrel Shape: Concrete Box

Barrel Span: 4.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90 & 15° flare) Wingwall

Inlet Depression: NONE



**Table 3 - Downstream Channel Rating Curve (Crossing: Crossing 17)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	249.14	0.00	0.00	0.00	0.00
4.72	249.50	0.36	3.95	1.11	1.23
9.45	249.68	0.54	4.97	1.68	1.28
14.17	249.82	0.68	5.65	2.13	1.31
18.90	249.95	0.81	6.17	2.51	1.33
23.62	250.06	0.92	6.59	2.86	1.35
28.34	250.16	1.02	6.95	3.17	1.36
33.07	250.25	1.11	7.26	3.46	1.37
37.79	250.33	1.19	7.54	3.73	1.38
42.04	250.41	1.27	7.77	3.95	1.39
47.24	250.49	1.35	8.03	4.22	1.39

**Tailwater Channel Data - Crossing 17**

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 3.00 ft

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

Channel Slope: 0.0500

Channel Manning's n: 0.0375

Channel Invert Elevation: 249.14 ft

**Roadway Data for Crossing: Crossing 17**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 271.00 ft

Roadway Surface: Paved

Roadway Top Width: 190.00 ft