

# HY-8 Culvert Analysis Report

## Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 159.78 cfs

Maximum Flow: 179.4 cfs

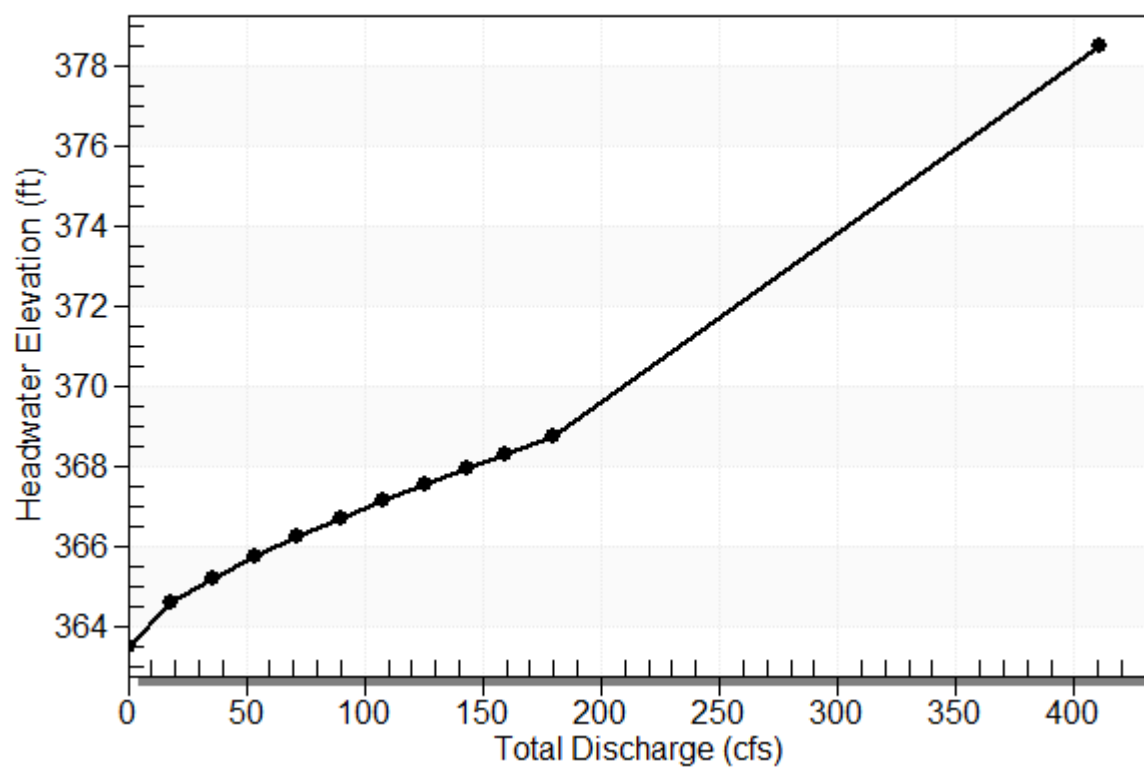
**Table 1 - Summary of Culvert Flows at Crossing: Crossing 38**

Headwater Elevation (ft)	Total Discharge (cfs)	Rt. Sta. 624+65 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
363.54	0.00	0.00	0.00	1
364.61	17.94	17.94	0.00	1
365.23	35.88	35.88	0.00	1
365.76	53.82	53.82	0.00	1
366.24	71.76	71.76	0.00	1
366.71	89.70	89.70	0.00	1
367.14	107.64	107.64	0.00	1
367.55	125.58	125.58	0.00	1
367.95	143.52	143.52	0.00	1
368.32	159.78	159.78	0.00	1
368.77	179.40	179.40	0.00	1
377.00	410.85	410.85	0.00	Overtopping

# Rating Curve Plot for Crossing: Crossing 38

## Total Rating Curve

Crossing: Crossing 38



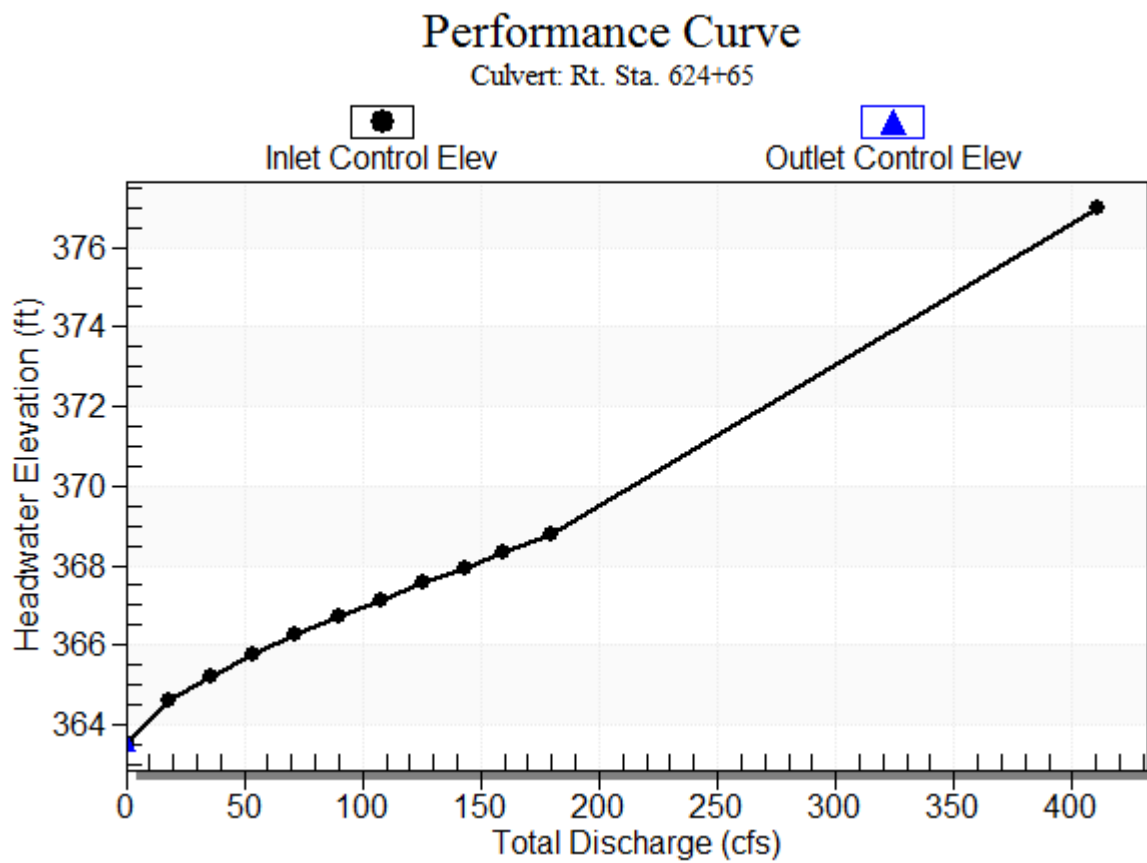
**Table 2 - Culvert Summary Table: Rt. Sta. 624+65**

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	363.54	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
17.94	17.94	364.61	1.066	0.0*	1-S2n	0.216	0.737	0.216	0.538	16.643	2.073
35.88	35.88	365.23	1.692	0.0*	1-S2n	0.431	1.169	0.464	0.811	15.462	2.662
53.82	53.82	365.76	2.217	0.0*	1-S2n	0.556	1.532	0.556	1.029	19.343	3.067
71.76	71.76	366.24	2.703	0.0*	1-S2n	0.671	1.856	0.671	1.216	21.396	3.384
89.70	89.70	366.71	3.168	0.0*	1-S2n	0.785	2.154	0.827	1.384	21.695	3.647
107.64	107.64	367.14	3.600	0.0*	1-S2n	0.899	2.432	0.937	1.538	22.968	3.873
125.58	125.58	367.55	4.011	0.0*	1-S2n	0.994	2.696	1.052	1.679	23.864	4.073
143.52	143.52	367.95	4.413	0.0*	1-S2n	1.086	2.947	1.168	1.812	24.585	4.252
159.78	159.78	368.32	4.778	0.0*	1-S2n	1.170	3.165	1.265	1.926	25.268	4.400
179.40	179.40	368.77	5.228	0.0*	5-S2n	1.271	3.419	1.387	2.057	25.862	4.563

\* Full Flow Headwater elevation is below inlet invert.

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Straight Culvert  
Inlet Elevation (invert): 363.54 ft,    Outlet Elevation (invert): 349.72 ft  
Culvert Length: 215.31 ft,    Culvert Slope: 0.0643  
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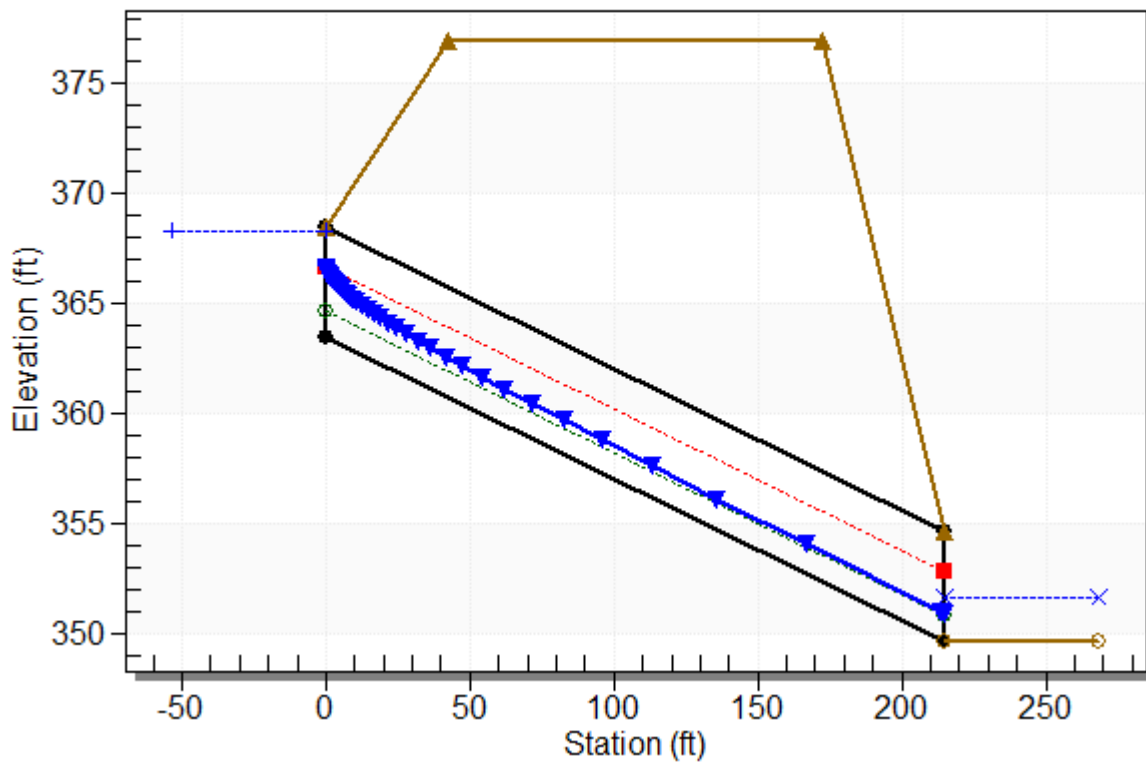
Culvert Performance Curve Plot: Rt. Sta. 624+65



## Water Surface Profile Plot for Culvert: Rt. Sta. 624+65

Crossing - Crossing 38, Design Discharge - 159.8 cfs

Culvert - Rt. Sta. 624+65, Culvert Discharge - 159.8 cfs



### Site Data - Rt. Sta. 624+65

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 363.54 ft

Outlet Station: 214.87 ft

Outlet Elevation: 349.72 ft

Number of Barrels: 1

### Culvert Data Summary - Rt. Sta. 624+65

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 38)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	349.72	0.00	0.00	0.00	0.00
17.94	350.26	0.54	2.07	0.34	0.51
35.88	350.53	0.81	2.66	0.51	0.55
53.82	350.75	1.03	3.07	0.64	0.56
71.76	350.94	1.22	3.38	0.76	0.58
89.70	351.10	1.38	3.65	0.86	0.59
107.64	351.26	1.54	3.87	0.96	0.60
125.58	351.40	1.68	4.07	1.05	0.60
143.52	351.53	1.81	4.25	1.13	0.61
159.78	351.65	1.93	4.40	1.20	0.61
179.40	351.78	2.06	4.56	1.28	0.62

**Tailwater Channel Data - Crossing 38**

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 15.00 ft

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

Channel Slope: 0.0100

Channel Manning's n: 0.0450

Channel Invert Elevation: 349.72 ft

**Roadway Data for Crossing: Crossing 38**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 377.00 ft

Roadway Surface: Paved

Roadway Top Width: 130.00 ft