

# HY-8 Culvert Analysis Report

## Crossing Discharge Data

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

Minimum Flow: 0 cfs

Design Flow: 42.75 cfs

Maximum Flow: 48.05 cfs

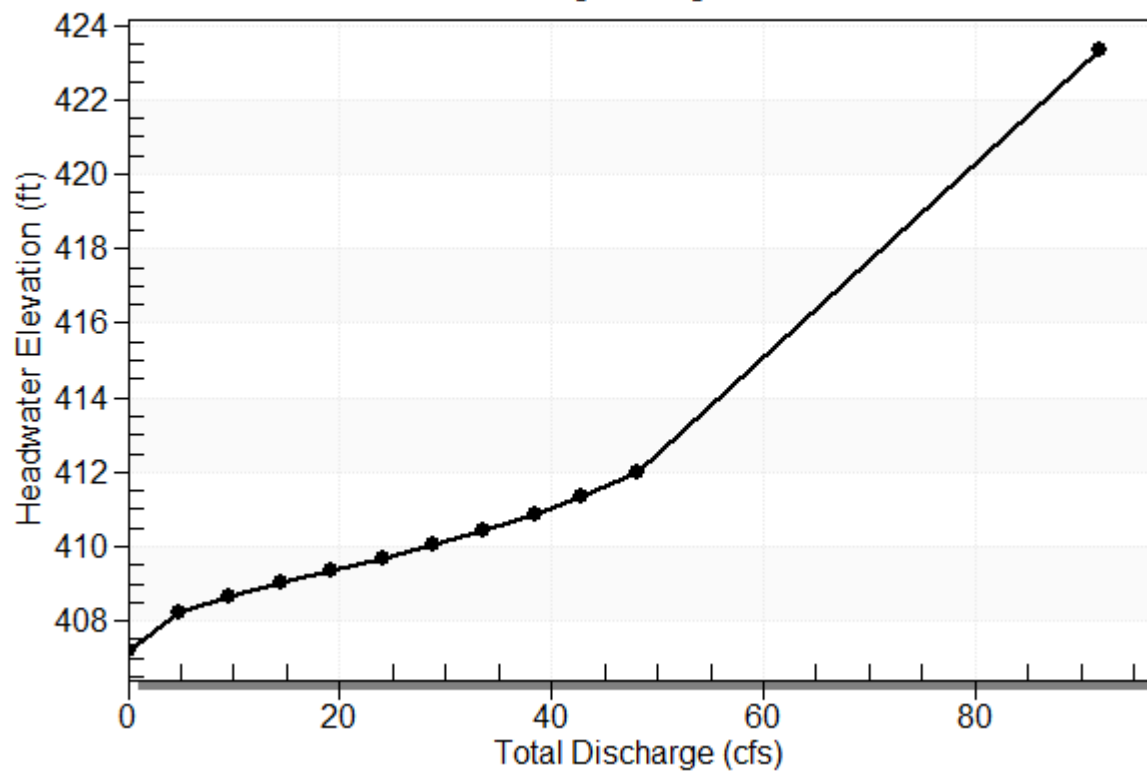
**Table 1 - Summary of Culvert Flows at Crossing: Crossing 11**

Headwater Elevation (ft)	Total Discharge (cfs)	Lt. Sta. 527+77 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
407.23	0.00	0.00	0.00	1
408.21	4.80	4.80	0.00	1
408.67	9.61	9.61	0.00	1
409.05	14.41	14.41	0.00	1
409.38	19.22	19.22	0.00	1
409.70	24.02	24.02	0.00	1
410.04	28.83	28.83	0.00	1
410.43	33.63	33.63	0.00	1
410.88	38.44	38.44	0.00	1
411.34	42.75	42.75	0.00	1
411.98	48.05	48.05	0.00	1
422.00	91.79	91.79	0.00	Overtopping

## Rating Curve Plot for Crossing: Crossing 11

### Total Rating Curve

Crossing: Crossing 11



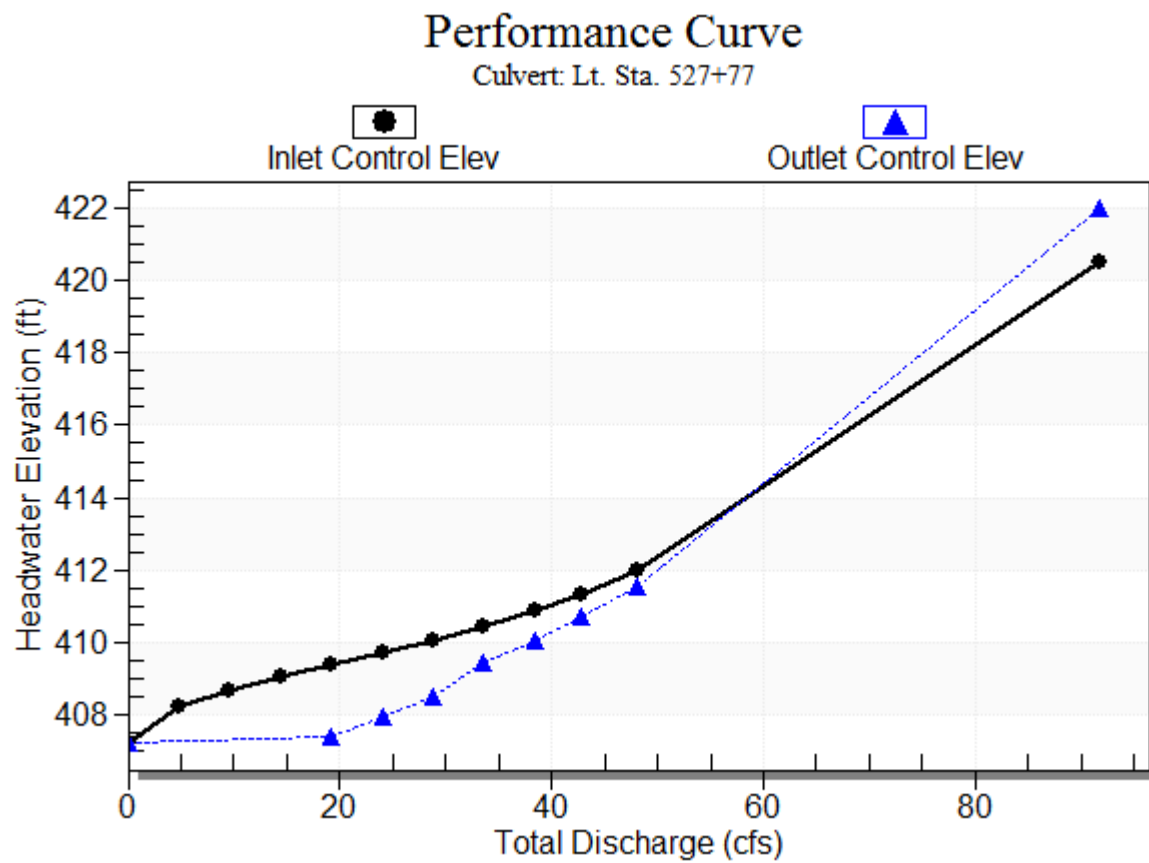
**Table 2 - Culvert Summary Table: Lt. Sta. 527+77**

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	407.23	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
4.80	4.80	408.21	0.980	0.0*	1-S2n	0.535	0.718	0.535	0.360	6.172	3.088
9.61	9.61	408.67	1.437	0.0*	1-S2n	0.769	1.032	0.769	0.467	7.465	3.672
14.41	14.41	409.05	1.820	0.0*	1-S2n	0.958	1.278	0.958	0.544	8.349	4.064
19.22	19.22	409.38	2.149	0.165	1-S2n	1.126	1.482	1.126	0.606	8.963	4.367
24.02	24.02	409.70	2.468	0.699	1-S2n	1.281	1.665	1.294	0.658	9.370	4.617
28.83	28.83	410.04	2.811	1.290	5-S2n	1.434	1.828	1.444	0.705	9.820	4.833
33.63	33.63	410.43	3.199	2.203	5-S2n	1.586	1.970	1.601	0.747	10.127	5.023
38.44	38.44	410.88	3.647	2.848	5-S2n	1.749	2.093	1.758	0.785	10.433	5.193
42.75	42.75	411.34	4.106	3.484	5-S2n	1.912	2.184	1.917	0.817	10.605	5.333
48.05	48.05	411.98	4.746	4.341	5-S2n	2.188	2.274	2.188	0.854	10.577	5.491

\* Full Flow Headwater elevation is below inlet invert.

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Straight Culvert  
Inlet Elevation (invert): 407.23 ft,    Outlet Elevation (invert): 405.29 ft  
Culvert Length: 181.32 ft,    Culvert Slope: 0.0107  
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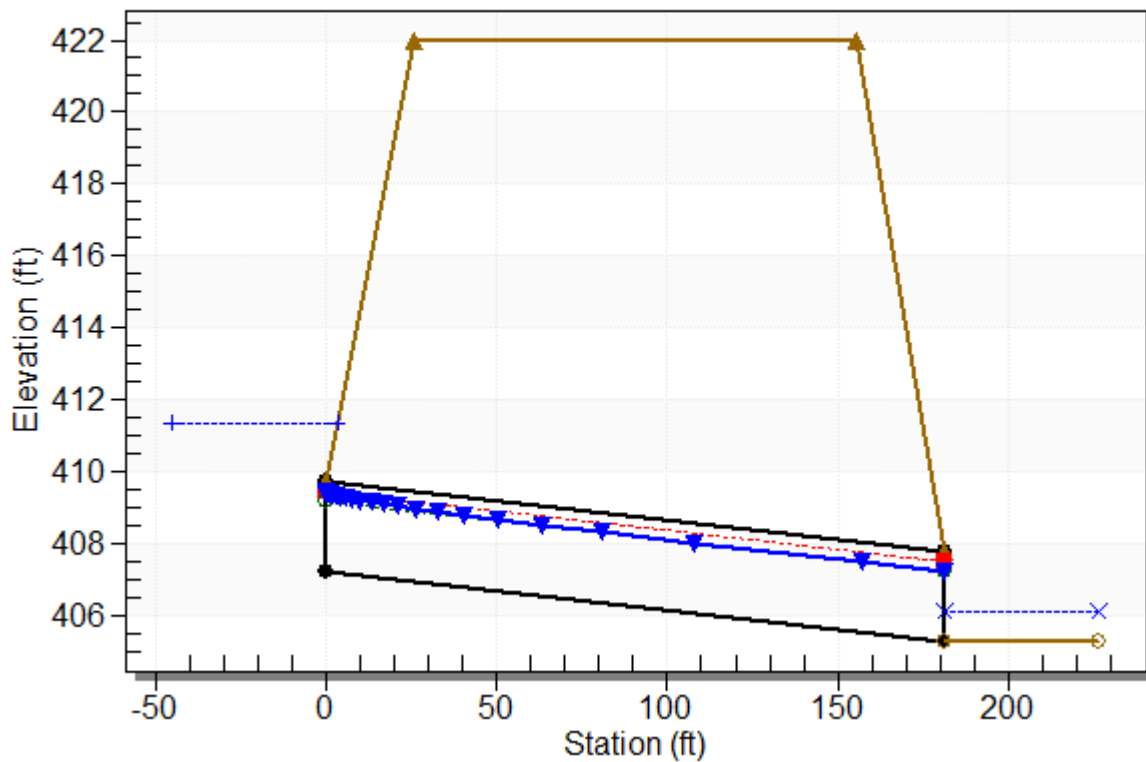
Culvert Performance Curve Plot: Lt. Sta. 527+77



## Water Surface Profile Plot for Culvert: Lt. Sta. 527+77

Crossing - Crossing 11, Design Discharge - 42.8 cfs

Culvert - Lt. Sta. 527+77, Culvert Discharge - 42.8 cfs



### Site Data - Lt. Sta. 527+77

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 407.23 ft

Outlet Station: 181.31 ft

Outlet Elevation: 405.29 ft

Number of Barrels: 1

### Culvert Data Summary - Lt. Sta. 527+77

Barrel Shape: Circular

Barrel Diameter: 2.50 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 11)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	405.29	0.00	0.00	0.00	0.00
4.80	405.65	0.36	3.09	1.35	1.28
9.61	405.76	0.47	3.67	1.75	1.34
14.41	405.83	0.54	4.06	2.04	1.37
19.22	405.90	0.61	4.37	2.27	1.40
24.02	405.95	0.66	4.62	2.47	1.42
28.83	406.00	0.71	4.83	2.64	1.43
33.63	406.04	0.75	5.02	2.80	1.45
38.44	406.08	0.79	5.19	2.94	1.46
42.75	406.11	0.82	5.33	3.06	1.47
48.05	406.14	0.85	5.49	3.20	1.48

**Tailwater Channel Data - Crossing 11**

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 12.00 (1:1)

Channel Slope: 0.0600

Channel Manning's n: 0.0375

Channel Invert Elevation: 405.29 ft

**Roadway Data for Crossing: Crossing 11**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 422.00 ft

Roadway Surface: Paved

Roadway Top Width: 130.00 ft