Table 43 - Downstream Channel Rating Curve (Crossing: CD-4-06 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
109.72	76.07	2.36
121.35	76.07	2.36
166.07	76.07	2.36

Tailwater Channel Data - CD-4-06 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 76.07 ft

Roadway Data for Crossing: CD-4-06 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 79.77 ft

Roadway Surface: Paved

Roadway Top Width: 278.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 44 - Summary of Culvert Flows at Crossing: CD-5-01 POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-01 POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
81.07	EAST5WET	554.47	554.47	0.00	1
81.30	RRNORTH	584.05	584.05	0.00	1
84.00	Overtopping	860.72	860.72	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-01 POST

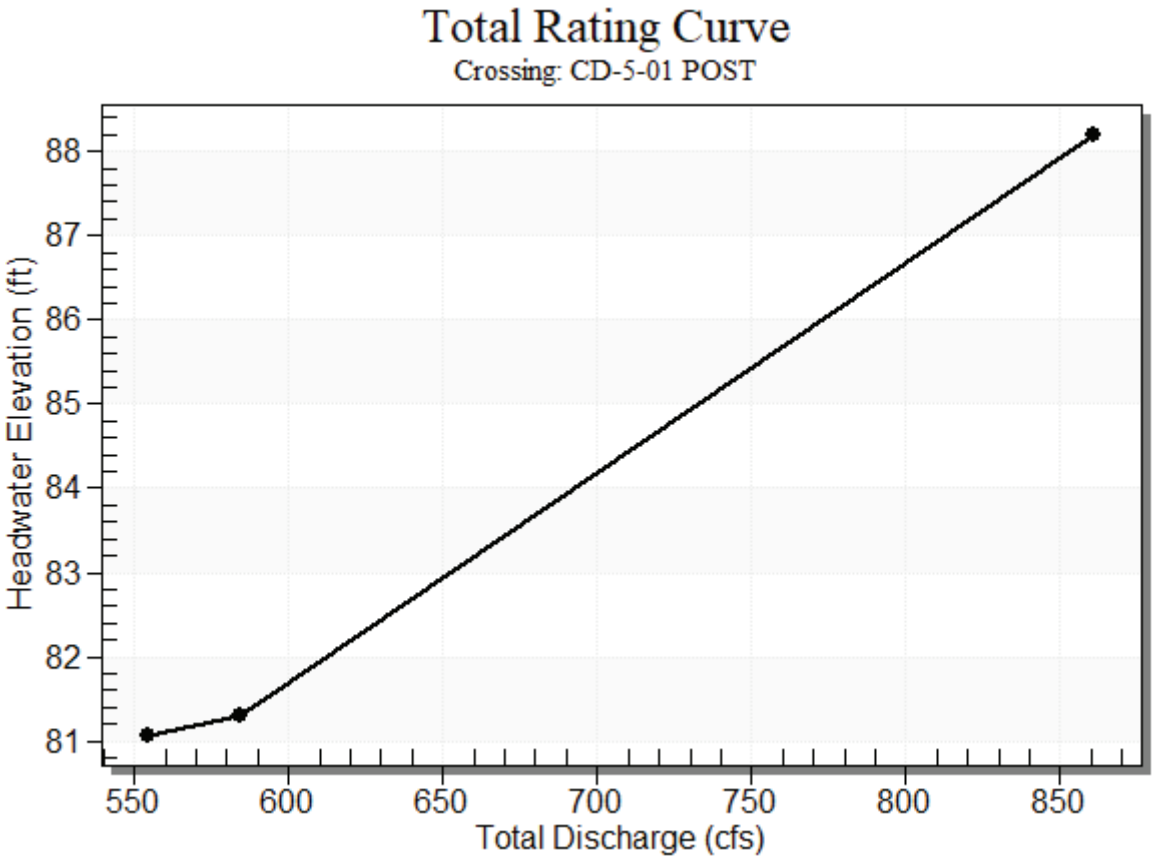


Table 45 - Culvert Summary Table: CD-5-01 POST

Discharge Names	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)
EAST5WET	554.47	554.47	81.07	3.636	5.845	4-FFf	3.167	2.250	3.167	4.000	6.203
RRNORTH	584.05	584.05	81.30	3.803	6.072	4-FFf	3.167	2.312	3.167	4.000	6.534

****

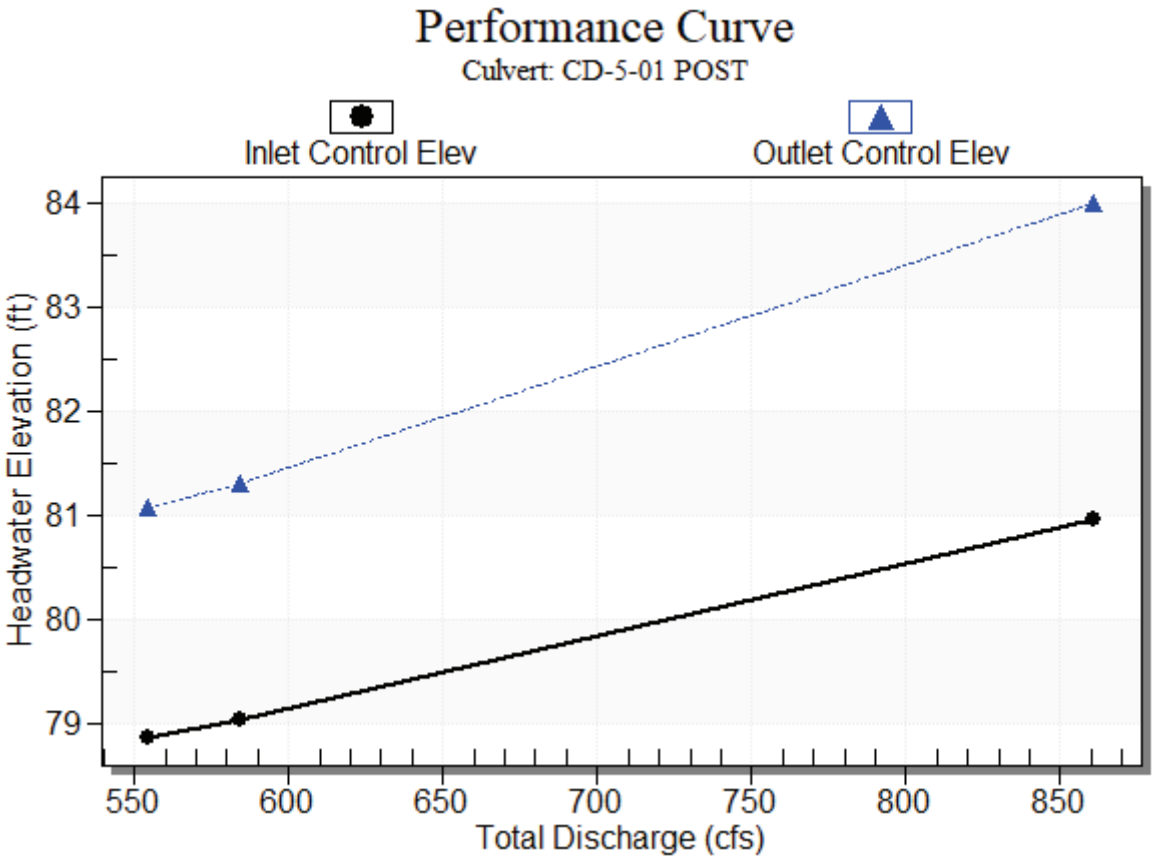
Straight Culvert

Inlet Elevation (invert): 75.23 ft, Outlet Elevation (invert): 75.00 ft

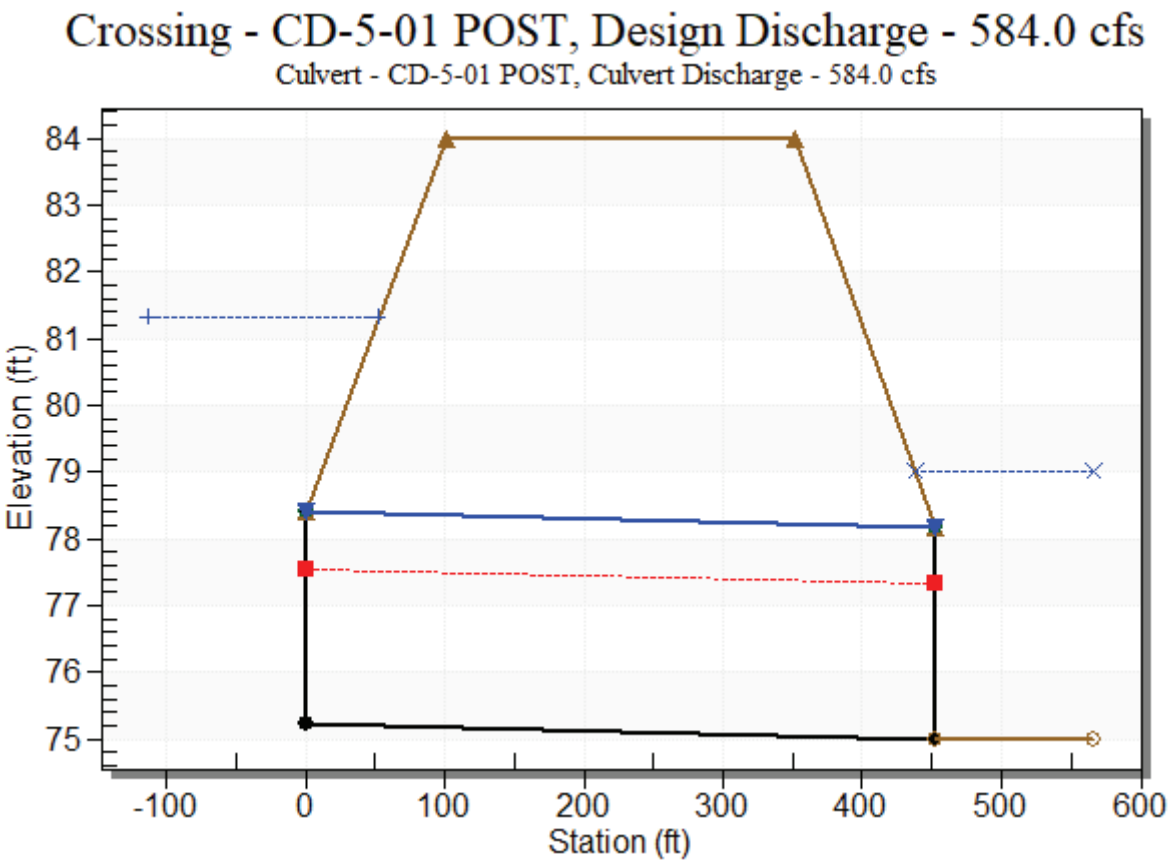
Culvert Length: 453.00 ft, Culvert Slope: 0.0005

****

Culvert Performance Curve Plot: CD-5-01 POST



Water Surface Profile Plot for Culvert: CD-5-01 POST



Site Data - CD-5-01 POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 75.23 ft

Outlet Station: 453.00 ft

Outlet Elevation: 75.00 ft

Number of Barrels: 7

Culvert Data Summary - CD-5-01 POST

Barrel Shape: Elliptical

Barrel Span: 60.00 in

Barrel Rise: 38.00 in

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 46 - Downstream Channel Rating Curve (Crossing: CD-5-01 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
554.47	79.00	4.00
584.05	79.00	4.00

Tailwater Channel Data - CD-5-01 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 79.00 ft

Roadway Data for Crossing: CD-5-01 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 84.00 ft

Roadway Surface: Paved

Roadway Top Width: 250.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 47 - Summary of Culvert Flows at Crossing: CD-5-02 POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-02 POST Discharge (cfs)	CD-5-02B POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
73.74	17-92SE	158.85	118.62	40.39	0.00	11
73.74	17-92SE	158.85	118.62	40.39	0.00	2
79.00	Overtopping	501.84	355.48	146.36	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-02 POST

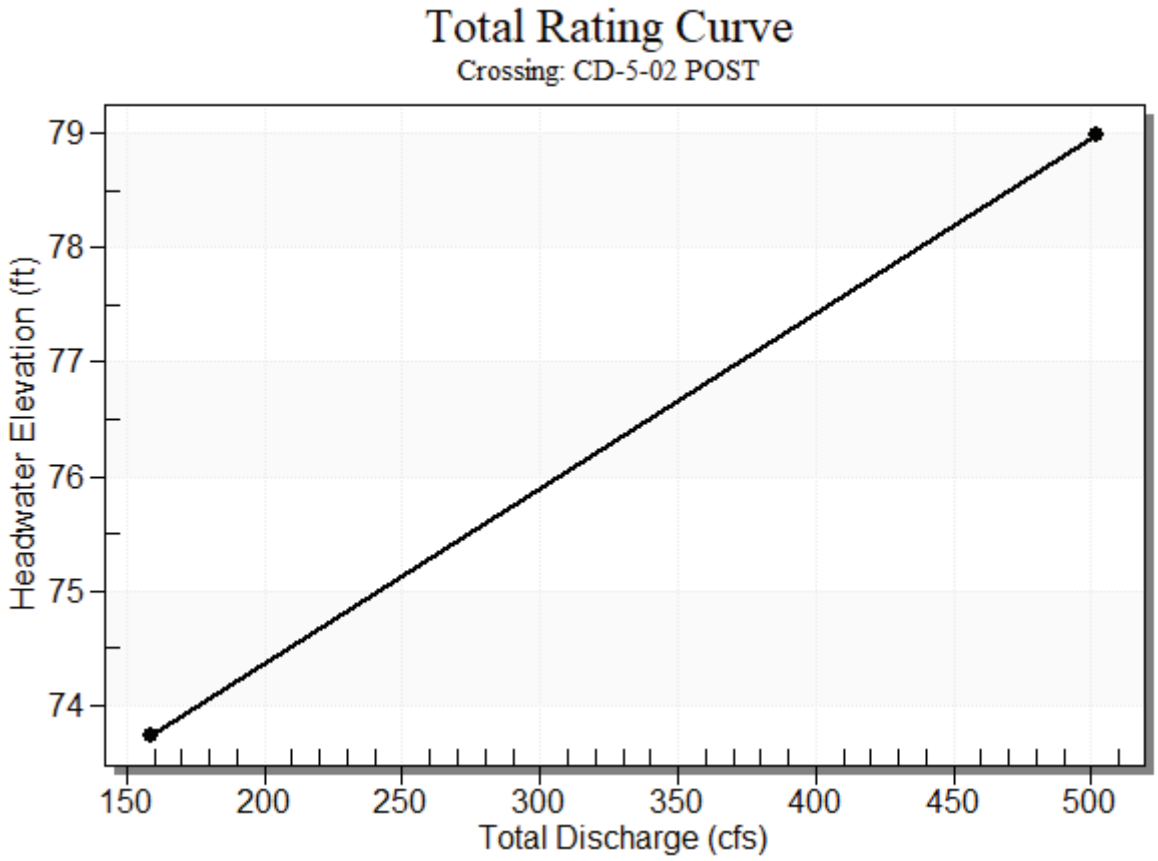


Table 48 - Culvert Summary Table: CD-5-02 POST

Discharge Names	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)
17-92SE	158.85	118.62	73.74	2.742	2.473	1-JS1f	0.864	1.635	3.000	2.000	3.954
17-92SE	158.85	118.62	73.74	2.742	2.473	1-JS1f	0.864	1.635	3.000	2.000	3.954

****

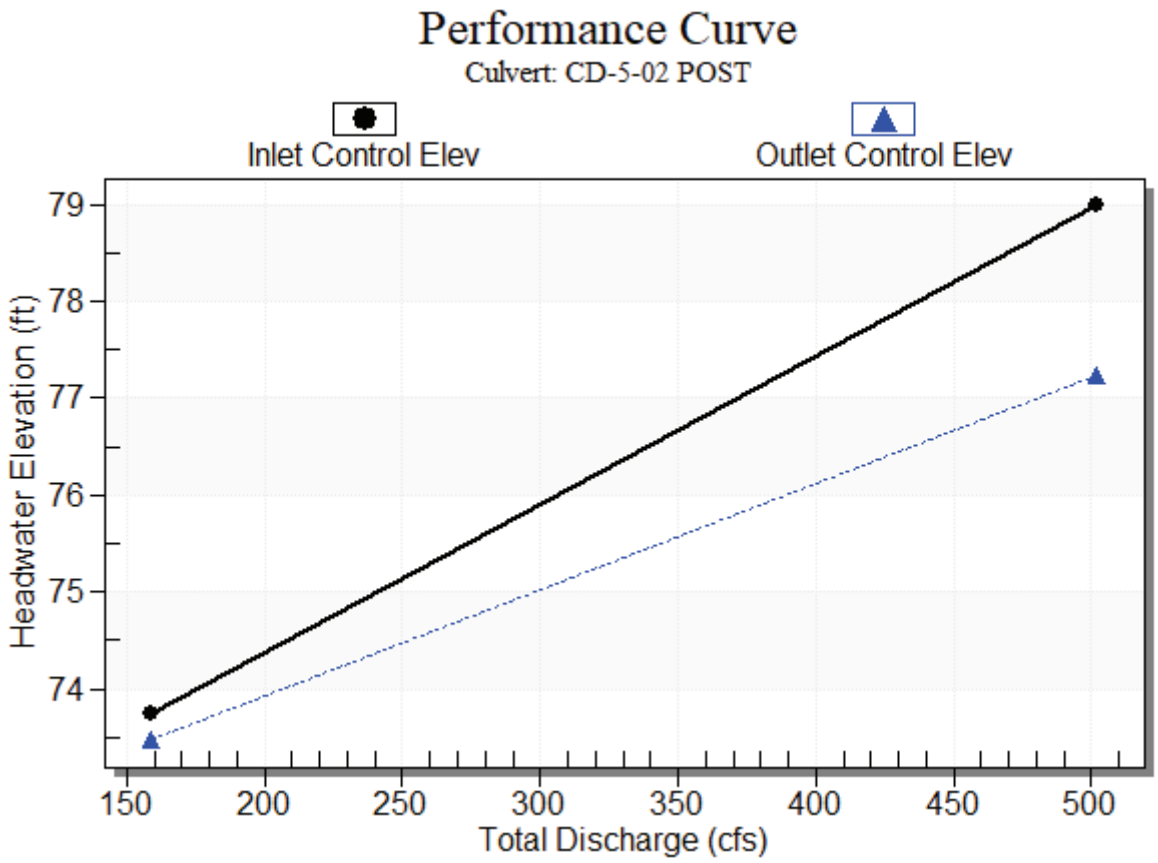
Straight Culvert

Inlet Elevation (invert): 71.00 ft, Outlet Elevation (invert): 68.80 ft

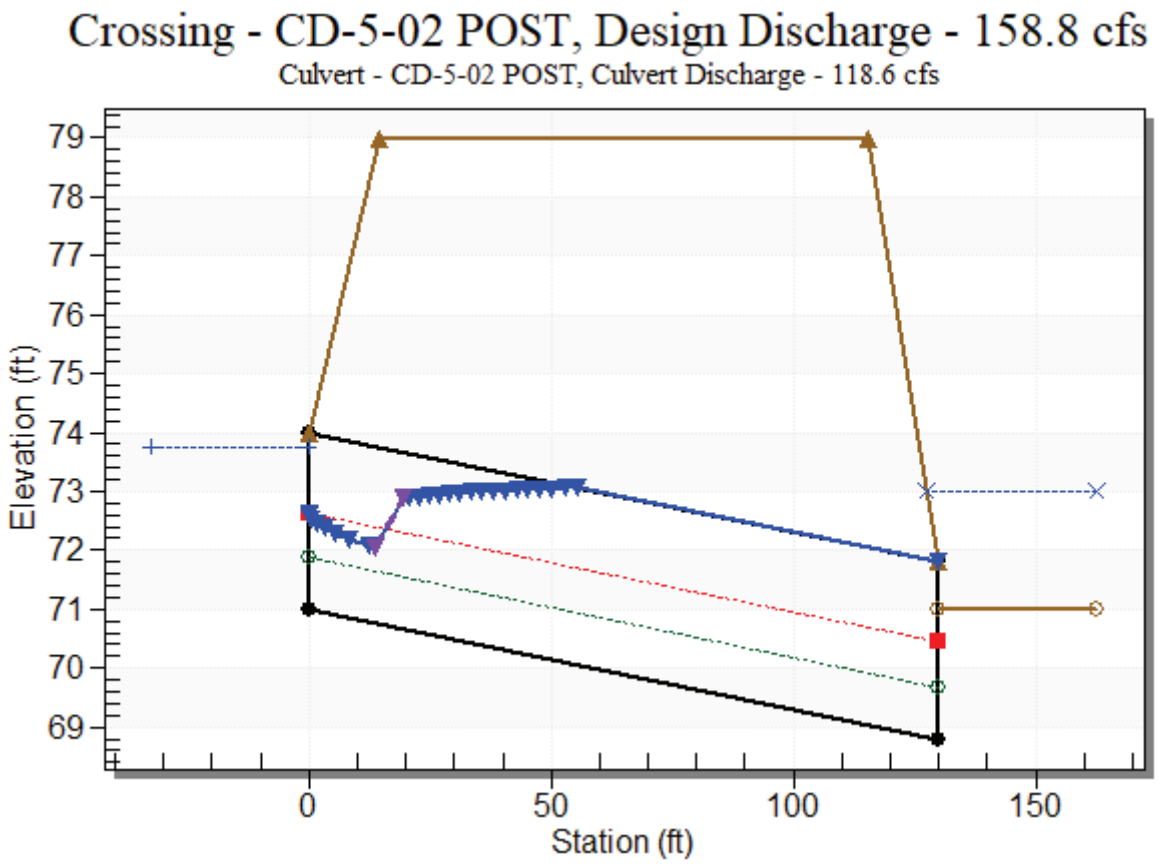
Culvert Length: 130.02 ft, Culvert Slope: 0.0169

****

Culvert Performance Curve Plot: CD-5-02 POST



Water Surface Profile Plot for Culvert: CD-5-02 POST



Site Data - CD-5-02 POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 71.00 ft

Outlet Station: 130.00 ft

Outlet Elevation: 68.80 ft

Number of Barrels: 1

Culvert Data Summary - CD-5-02 POST

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Table 49 - Culvert Summary Table: CD-5-02B POST

Discharge Names	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)
17-92SE	158.85	40.39	73.74	2.742	2.327	1-JS1f	1.178	1.898	4.000	2.000	3.214
17-92SE	158.85	40.39	73.74	2.742	2.327	1-JS1f	1.178	1.898	4.000	2.000	3.214

****

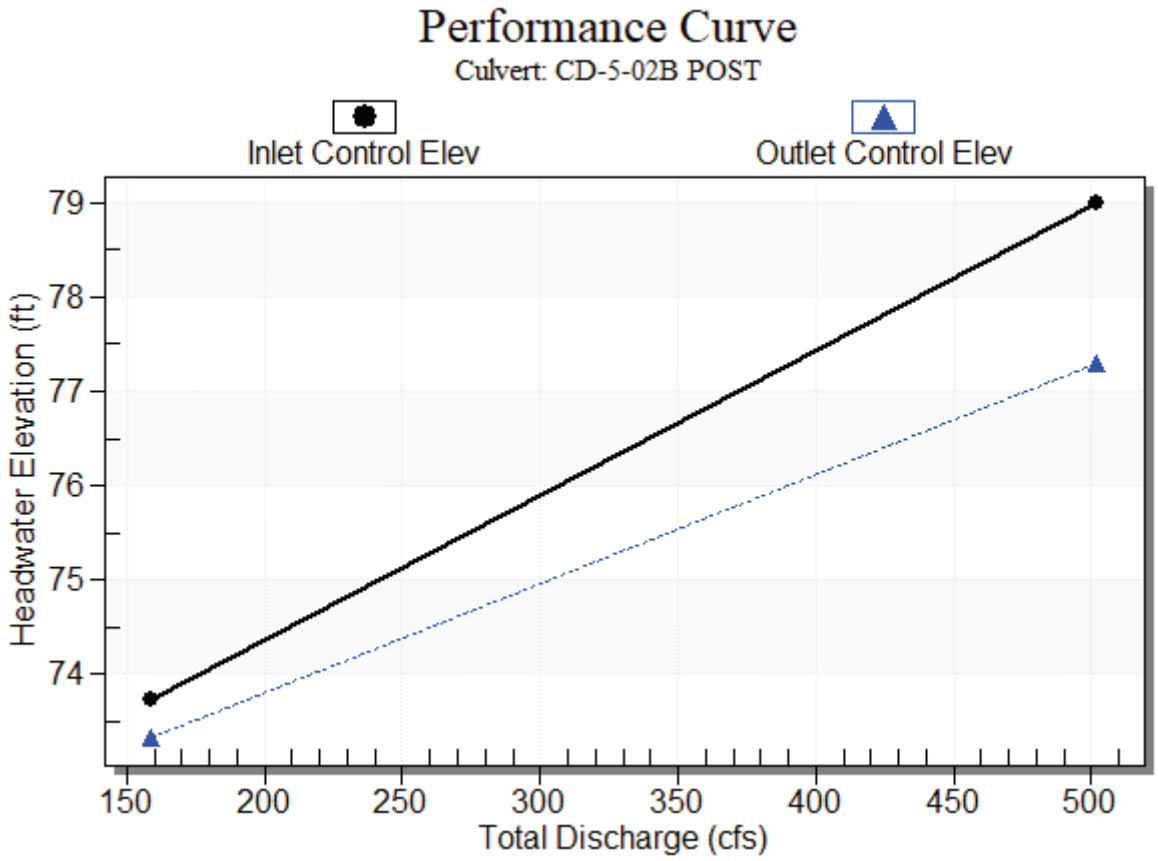
Straight Culvert

Inlet Elevation (invert): 71.00 ft, Outlet Elevation (invert): 68.80 ft

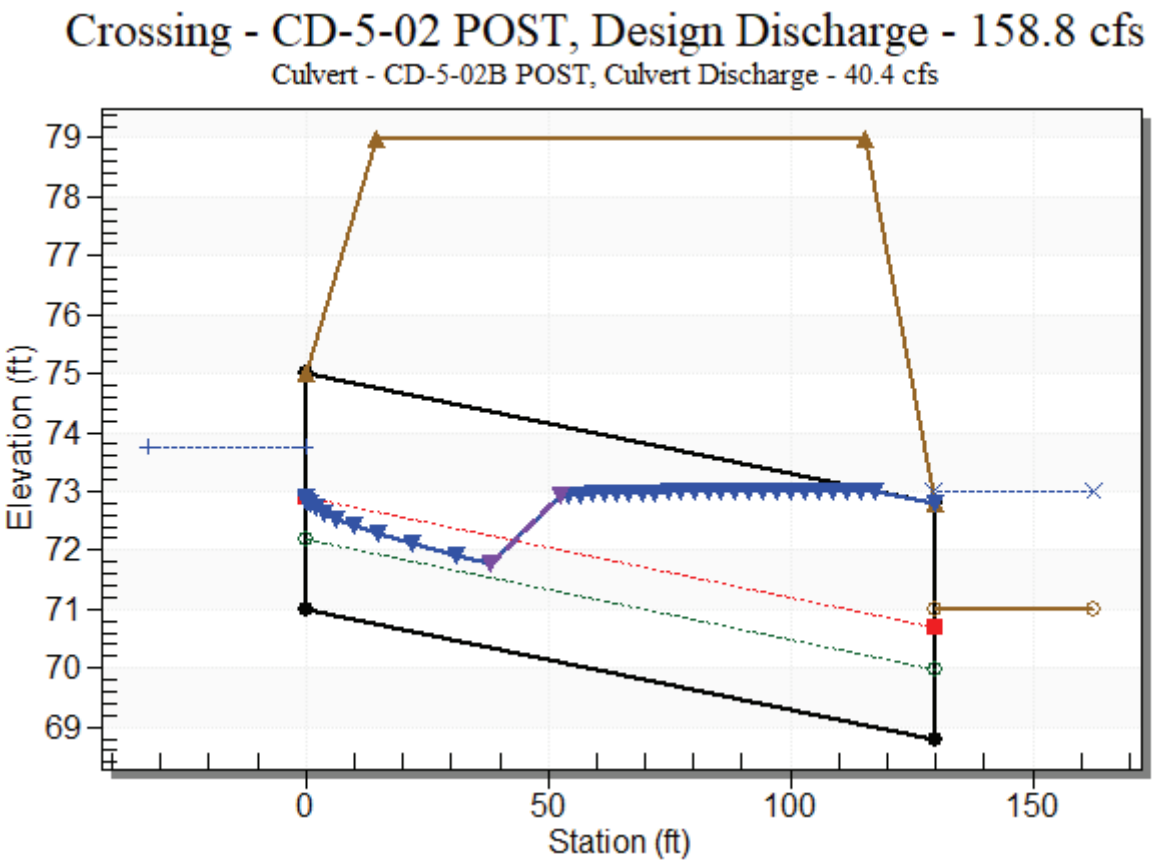
Culvert Length: 130.02 ft, Culvert Slope: 0.0169

****

Culvert Performance Curve Plot: CD-5-02B POST



Water Surface Profile Plot for Culvert: CD-5-02B POST



Site Data - CD-5-02B POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 71.00 ft

Outlet Station: 130.00 ft

Outlet Elevation: 68.80 ft

Number of Barrels: 1

Culvert Data Summary - CD-5-02B POST

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 50 - Downstream Channel Rating Curve (Crossing: CD-5-02 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
158.85	73.00	2.00
158.85	73.00	2.00

Tailwater Channel Data - CD-5-02 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 73.00 ft

Roadway Data for Crossing: CD-5-02 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 79.00 ft

Roadway Surface: Paved

Roadway Top Width: 101.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 51 - Summary of Culvert Flows at Crossing: CD-5-03 POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-03 POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
68.71	17-92NE	613.05	613.05	0.00	1
68.71	17-92NE	613.05	613.05	0.00	1
72.50	Overtopping	1109.36	1109.36	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-03 POST

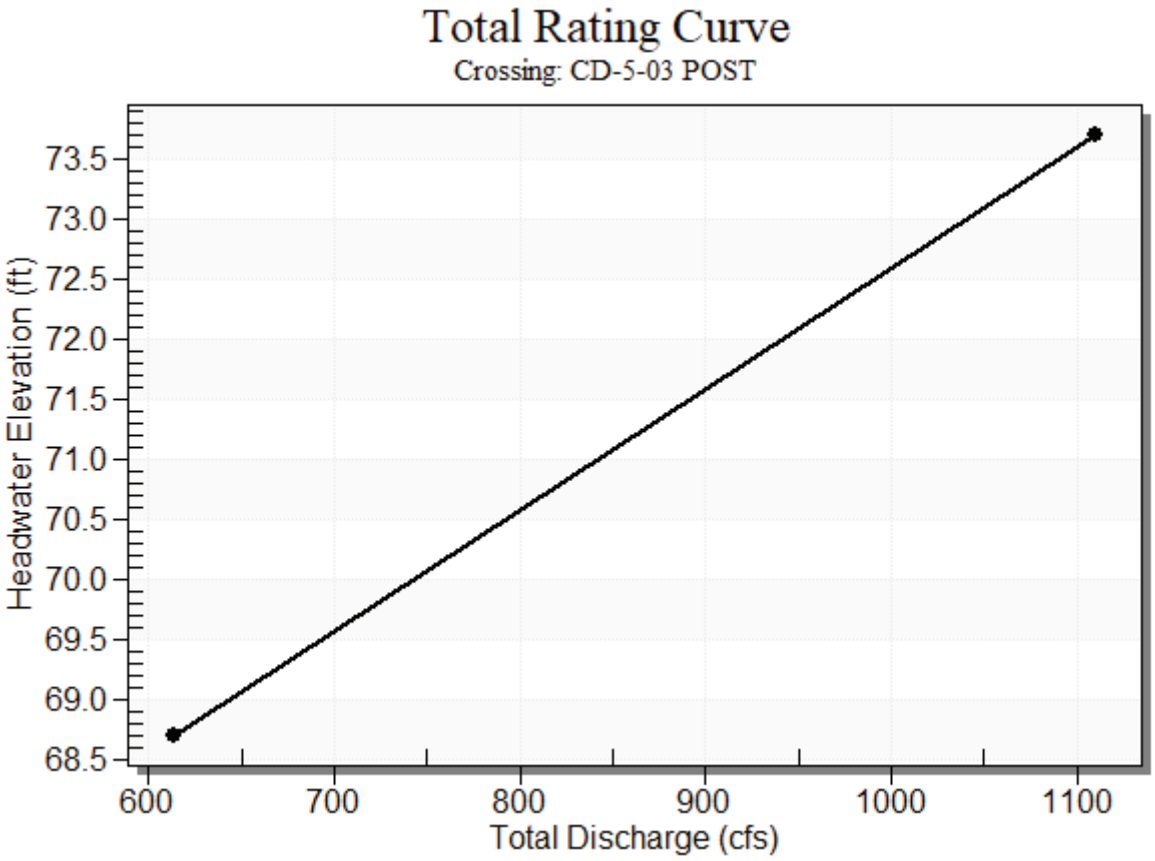


Table 52 - Culvert Summary Table: CD-5-03 POST

Discharge Names	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)
17-92NE	613.05	613.05	68.71	4.698	4.712	7-M2c	4.000	2.726	2.726	2.500	9.369
17-92NE	613.05	613.05	68.71	4.698	4.712	7-M2c	4.000	2.726	2.726	2.500	9.369

****

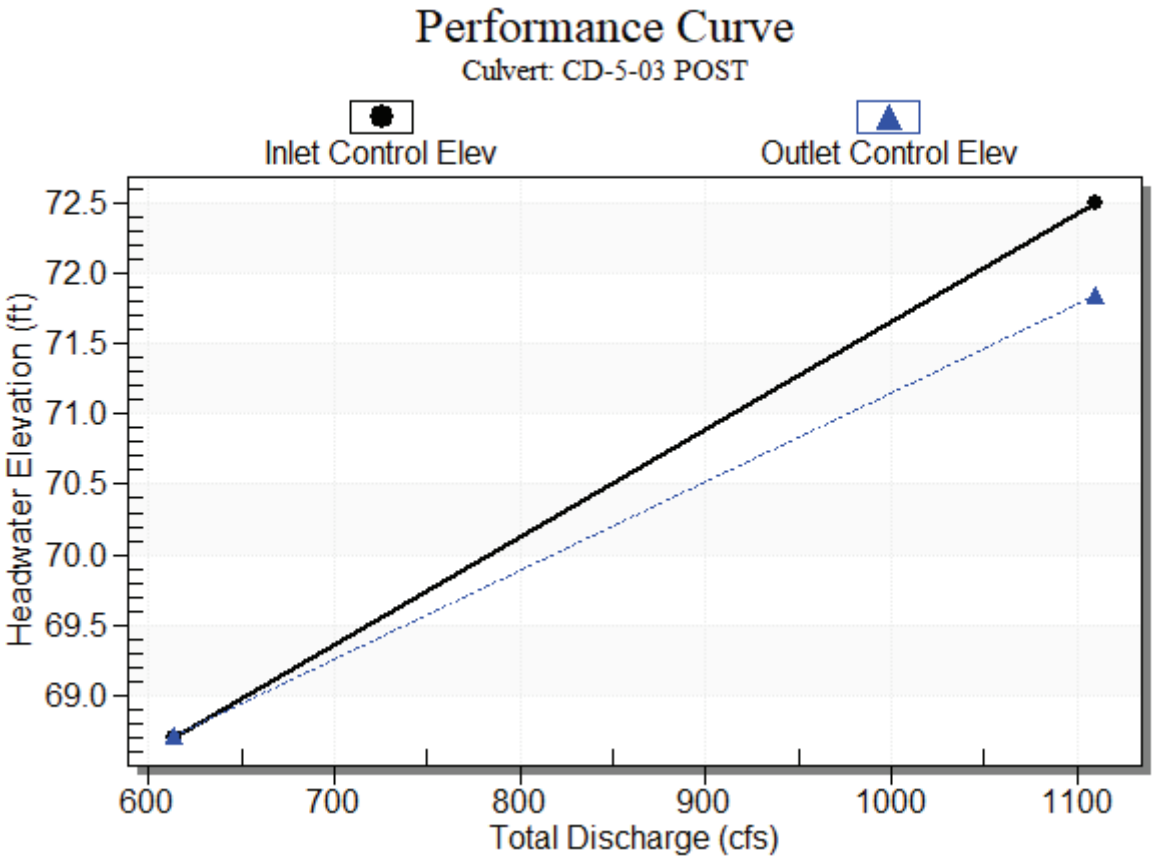
Straight Culvert

Inlet Elevation (invert): 64.00 ft, Outlet Elevation (invert): 63.90 ft

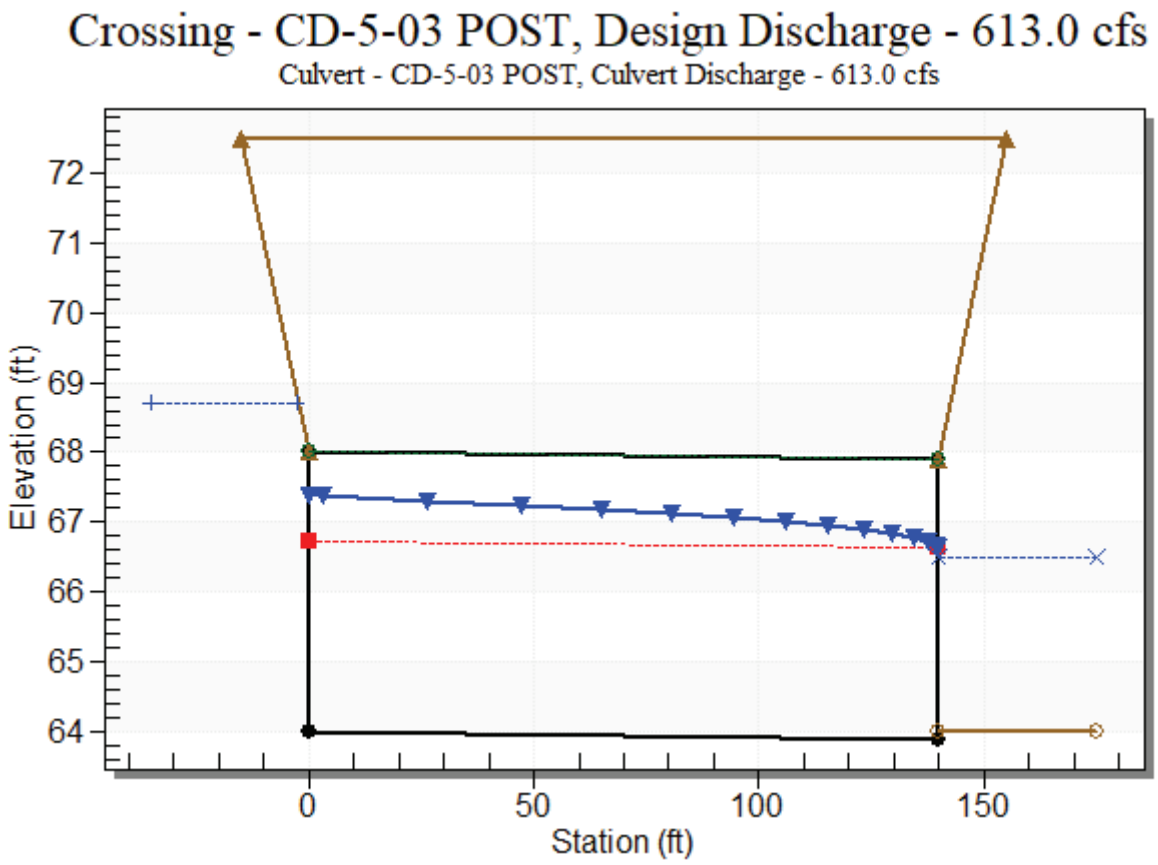
Culvert Length: 140.00 ft, Culvert Slope: 0.0007

****

Culvert Performance Curve Plot: CD-5-03 POST



Water Surface Profile Plot for Culvert: CD-5-03 POST



Site Data - CD-5-03 POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 64.00 ft

Outlet Station: 140.00 ft

Outlet Elevation: 63.90 ft

Number of Barrels: 3

Culvert Data Summary - CD-5-03 POST

Barrel Shape: Concrete Box

Barrel Span: 8.00 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 (90º) Headwall

Inlet Depression: None

Table 53 - Downstream Channel Rating Curve (Crossing: CD-5-03 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
613.05	66.50	2.50
613.05	66.50	2.50

Tailwater Channel Data - CD-5-03 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 66.50 ft

Roadway Data for Crossing: CD-5-03 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 400.00 ft

Crest Elevation: 72.50 ft

Roadway Surface: Paved

Roadway Top Width: 170.00 ft

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 54 - Summary of Culvert Flows at Crossing: CD-5-05A POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-05A POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
86.75	50 year	276.39	276.39	0.00	1
87.66	100 year	303.37	303.37	0.00	1
88.74	500 year	401.83	333.14	68.52	6
88.37	Overtopping	323.23	323.23	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-05A POST

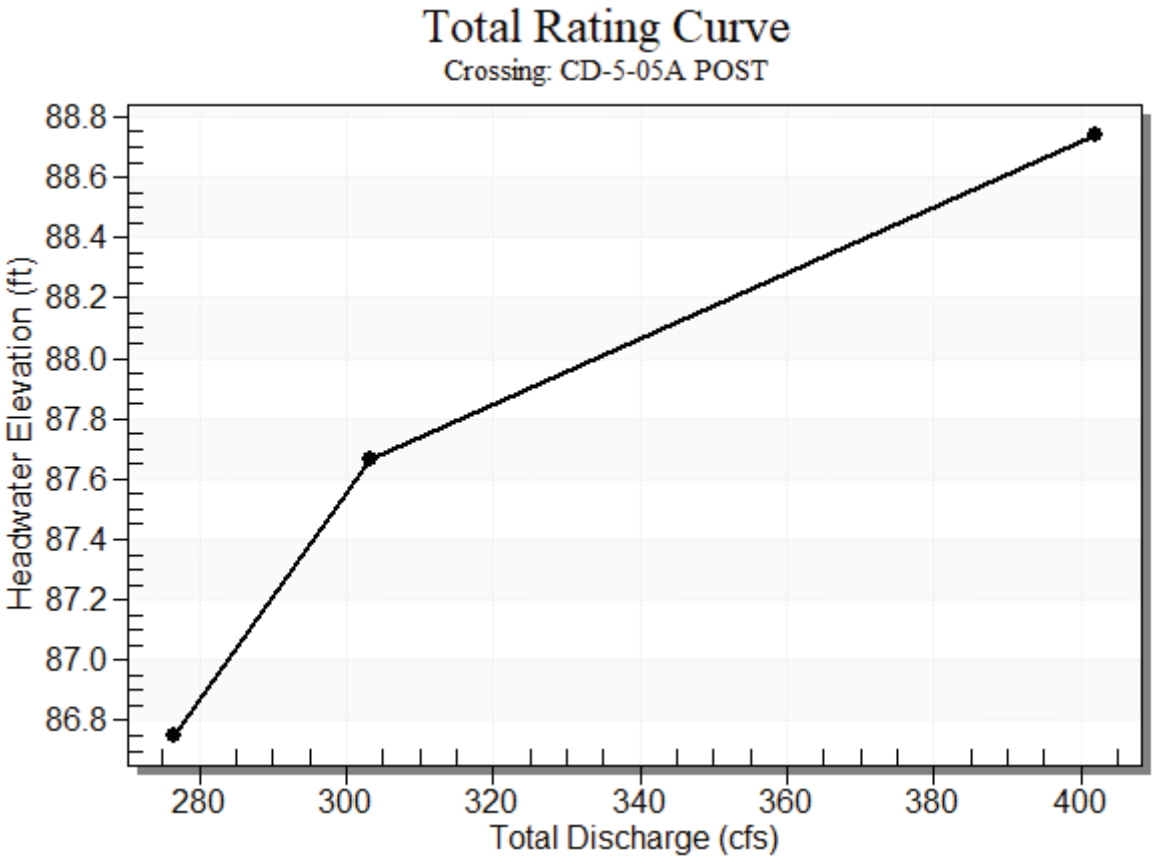


Table 55 - Culvert Summary Table: CD-5-05A POST

Discharge Names	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)
50 year	276.39	276.39	86.75	5.774	6.383	7-M2c	3.000	2.645	2.645	0.100	10.473
100 year	303.37	303.37	87.66	6.556	7.293	7-M2c	3.000	2.729	2.729	0.100	11.233
500 year	401.83	333.14	88.74	7.509	8.374	7-M2c	3.000	2.801	2.801	0.100	12.128

****

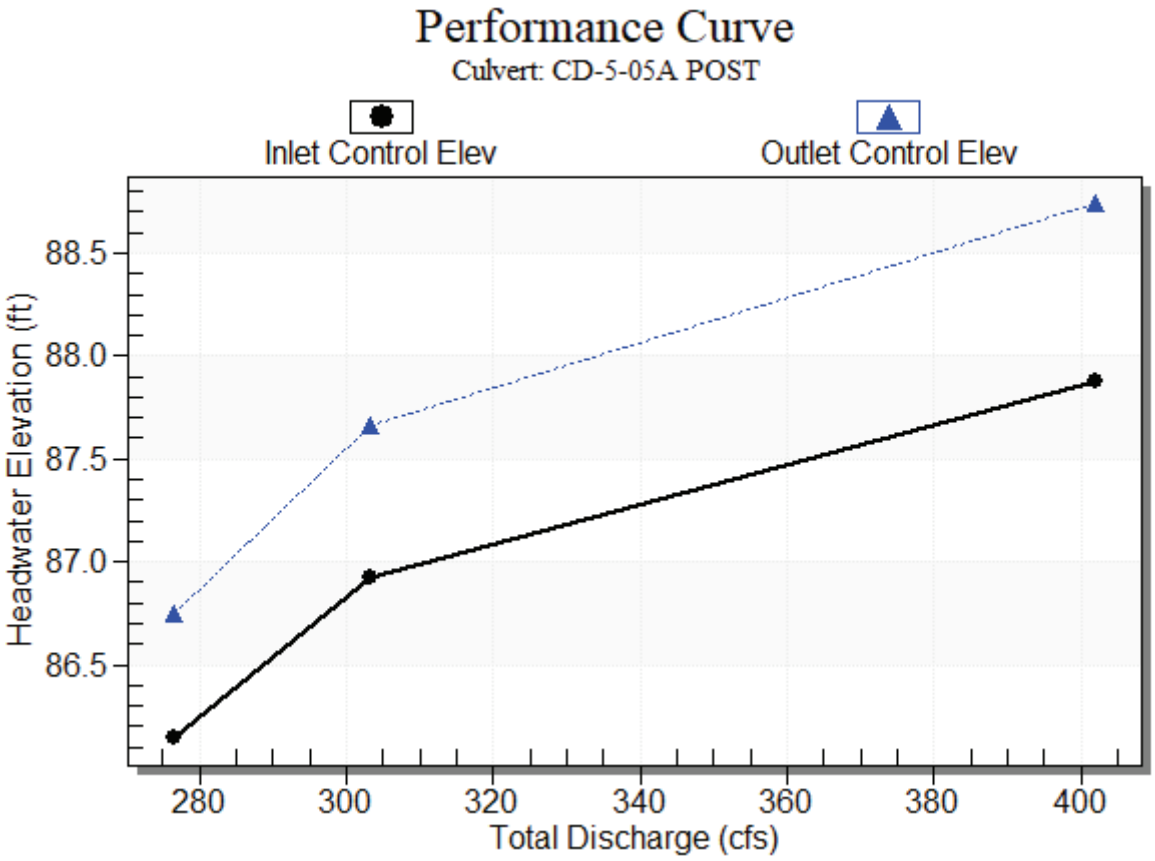
Straight Culvert

Inlet Elevation (invert): 80.37 ft, Outlet Elevation (invert): 79.68 ft

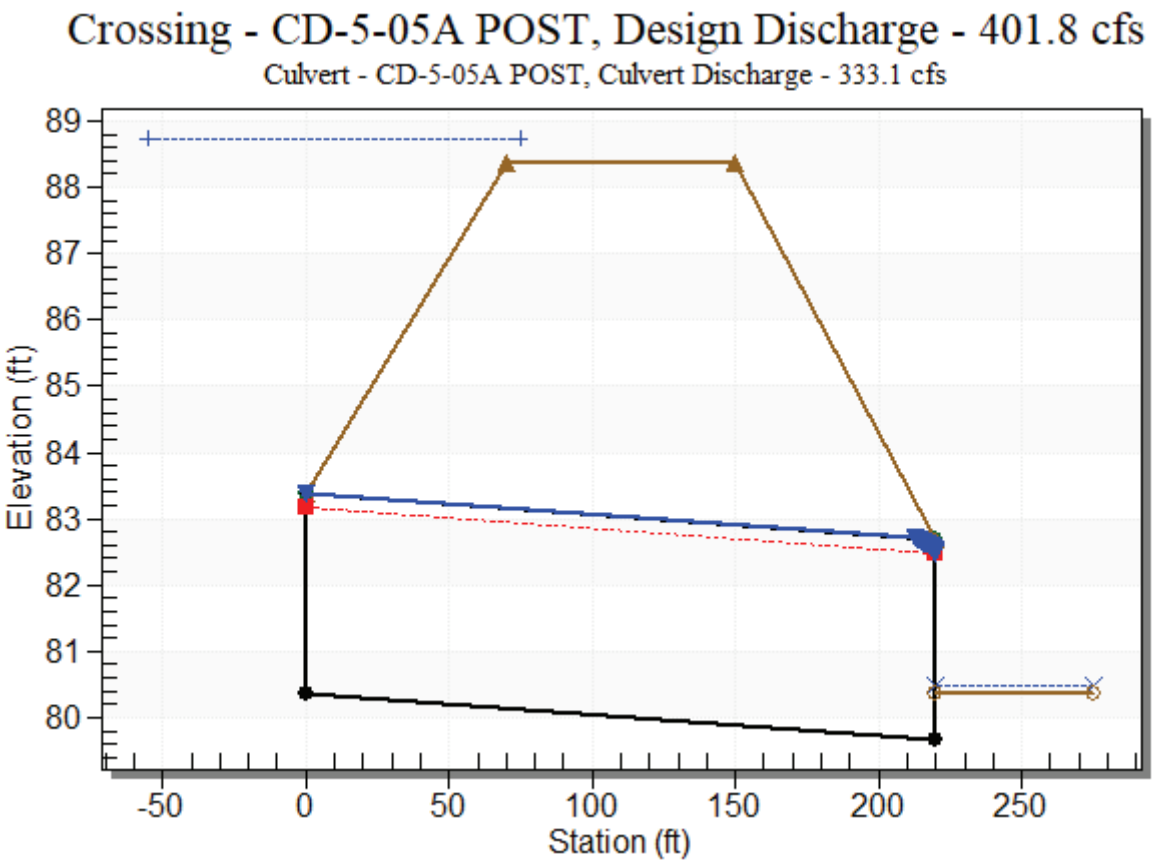
Culvert Length: 220.00 ft, Culvert Slope: 0.0031

****

Culvert Performance Curve Plot: CD-5-05A POST



Water Surface Profile Plot for Culvert: CD-5-05A POST



Site Data - CD-5-05A POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 80.37 ft

Outlet Station: 220.00 ft

Outlet Elevation: 79.68 ft

Number of Barrels: 4

Culvert Data Summary - CD-5-05A POST

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 56 - Downstream Channel Rating Curve (Crossing: CD-5-05A POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
276.39	80.47	0.10
303.37	80.47	0.10
401.83	80.47	0.10

Tailwater Channel Data - CD-5-05A POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 80.47 ft

Roadway Data for Crossing: CD-5-05A POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 88.37 ft

Roadway Surface: Paved

Roadway Top Width: 80.00 ft

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 57 - Summary of Culvert Flows at Crossing: CD-5-05B POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-05B POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
85.54	50 year	355.42	355.42	0.00	1
86.51	100 year	394.84	394.84	0.00	1
87.49	500 year	536.62	431.15	105.20	3
87.00	Overtopping	413.09	413.09	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-05B POST

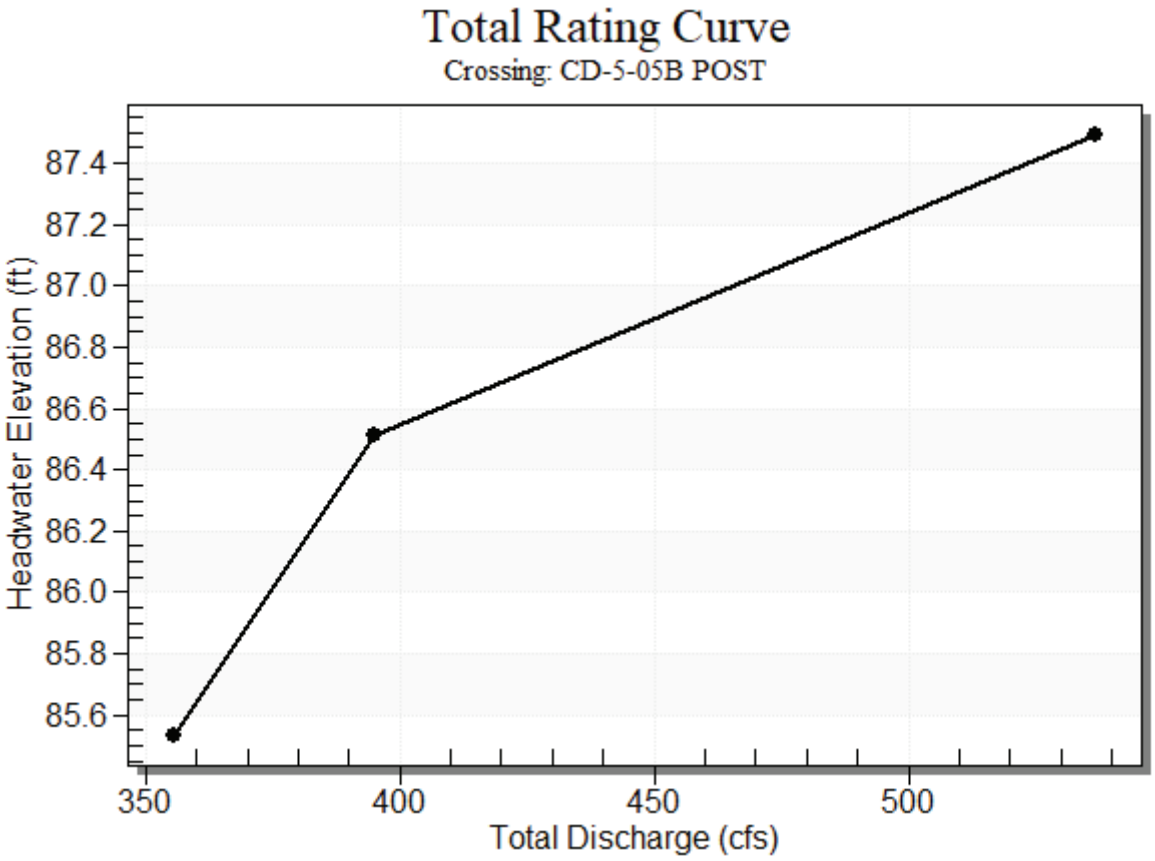


Table 58 - Culvert Summary Table: CD-5-05B POST

Discharge Names	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)
50 year	355.42	355.42	85.54	4.781	6.536	7-M2c	3.000	2.486	2.486	1.470	9.459
100 year	394.84	394.84	86.51	5.426	7.511	7-M2c	3.000	2.597	2.597	1.470	10.121
500 year	536.62	431.15	87.49	6.089	8.494	7-M2c	3.000	2.682	2.682	1.470	10.778

****

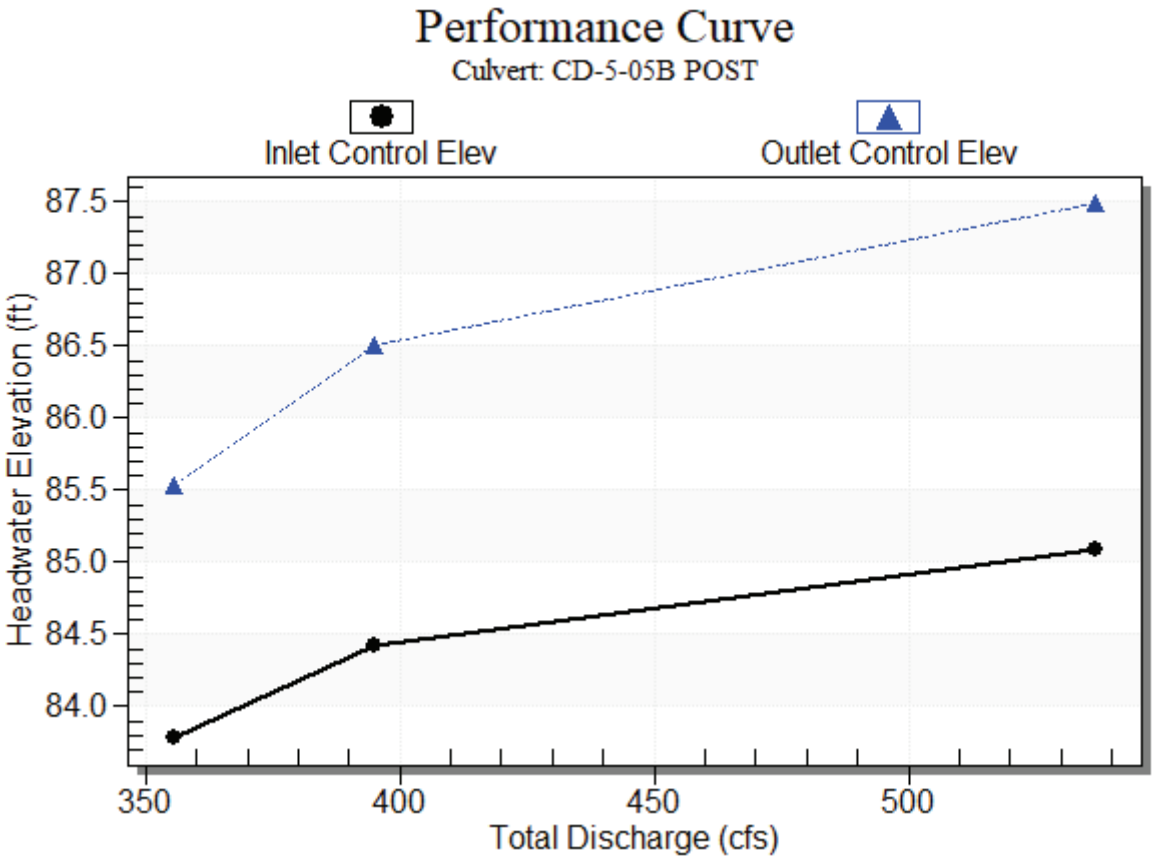
Straight Culvert

Inlet Elevation (invert): 79.00 ft, Outlet Elevation (invert): 78.83 ft

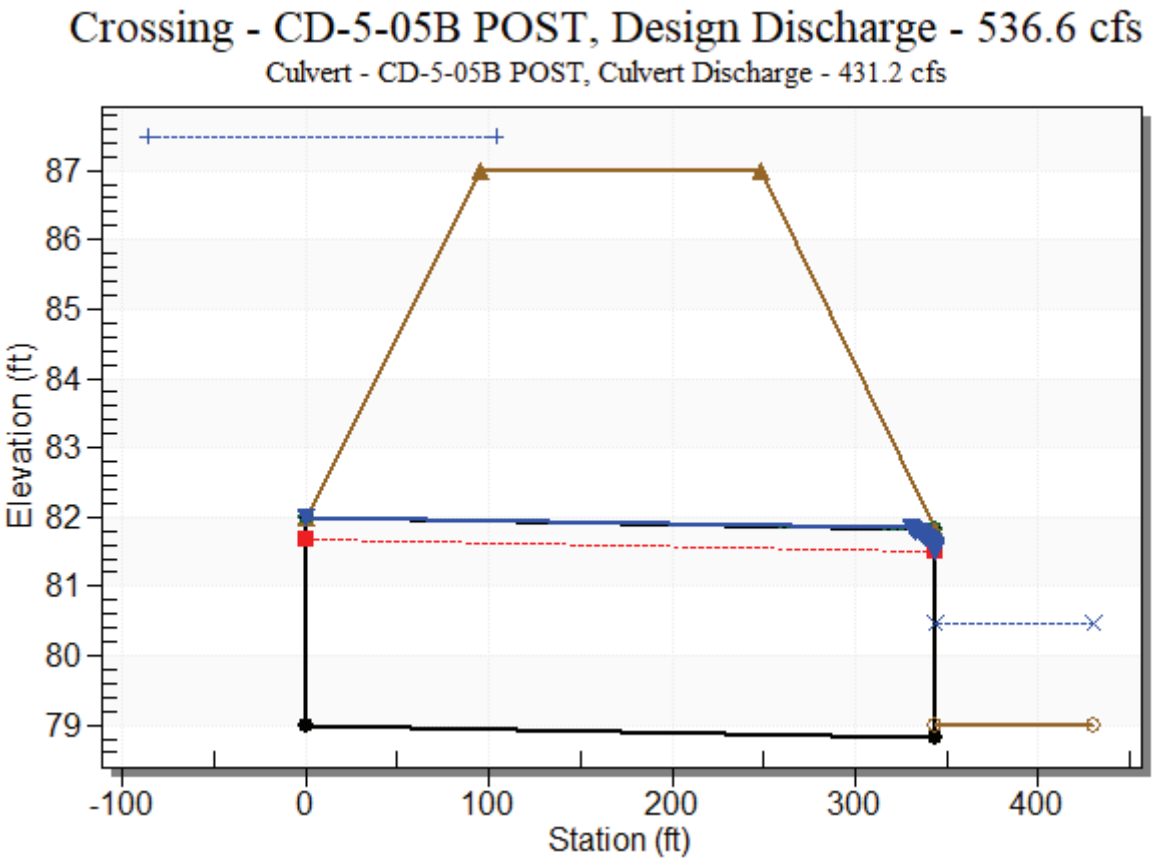
Culvert Length: 344.00 ft, Culvert Slope: 0.0005

****

Culvert Performance Curve Plot: CD-5-05B POST



Water Surface Profile Plot for Culvert: CD-5-05B POST



Site Data - CD-5-05B POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 79.00 ft

Outlet Station: 344.00 ft

Outlet Elevation: 78.83 ft

Number of Barrels: 6

Culvert Data Summary - CD-5-05B POST

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 59 - Downstream Channel Rating Curve (Crossing: CD-5-05B POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
355.42	80.47	1.47
394.84	80.47	1.47
536.62	80.47	1.47

Tailwater Channel Data - CD-5-05B POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 80.47 ft

Roadway Data for Crossing: CD-5-05B POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 87.00 ft

Roadway Surface: Paved

Roadway Top Width: 154.00 ft

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 60 - Summary of Culvert Flows at Crossing: CD-5-06 POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5-06 POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
77.58	50 year	110.32	110.32	0.00	1
77.58	100 year	110.32	110.32	0.00	1
79.75	500 year	172.55	172.55	0.00	1
79.77	Overtopping	172.92	172.92	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5-06 POST

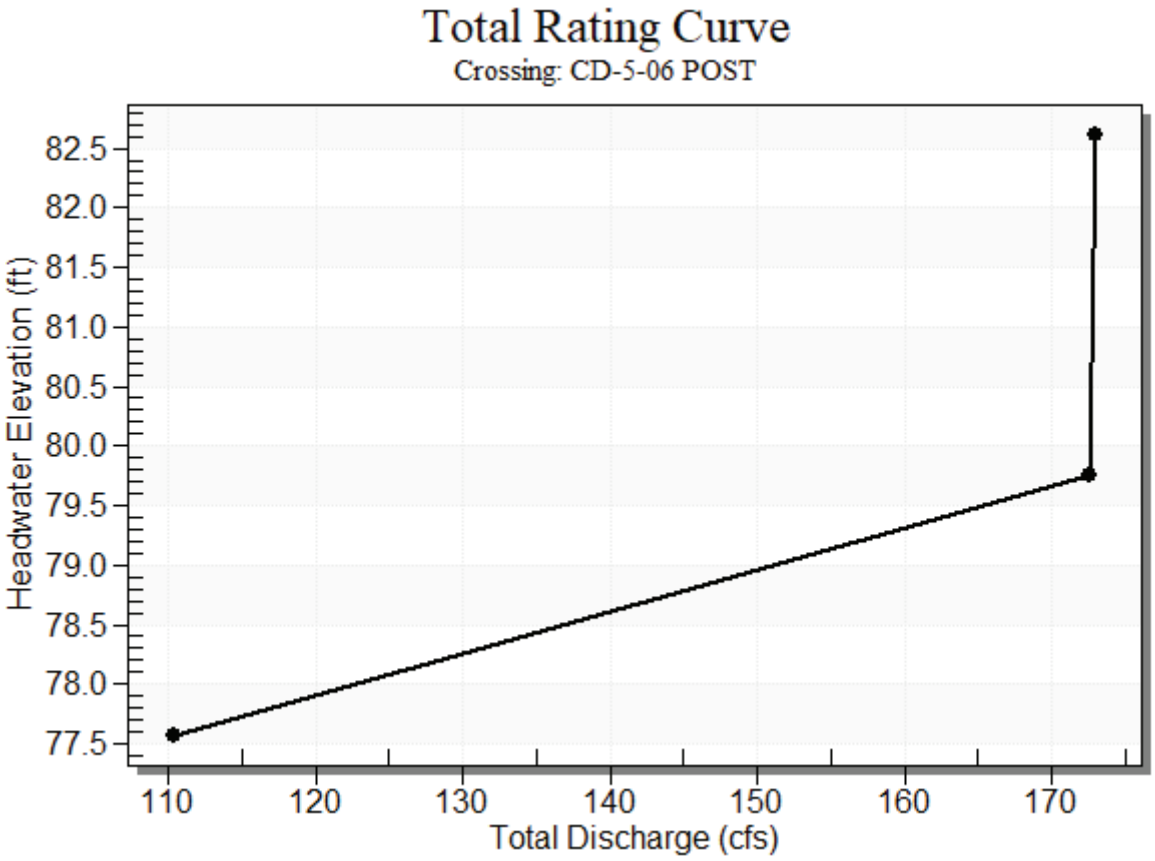


Table 61 - Culvert Summary Table: CD-5-06 POST

Discharge Names	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)
50 year	110.32	110.32	77.58	2.771	3.866	4-FFf	2.405	1.852	3.167	2.360	4.319
100 year	110.32	110.32	77.58	2.771	3.866	4-FFf	2.405	1.852	3.167	2.360	4.319
500 year	172.55	172.55	79.75	3.917	6.044	4-FFf	3.167	2.353	3.167	2.360	6.756

****

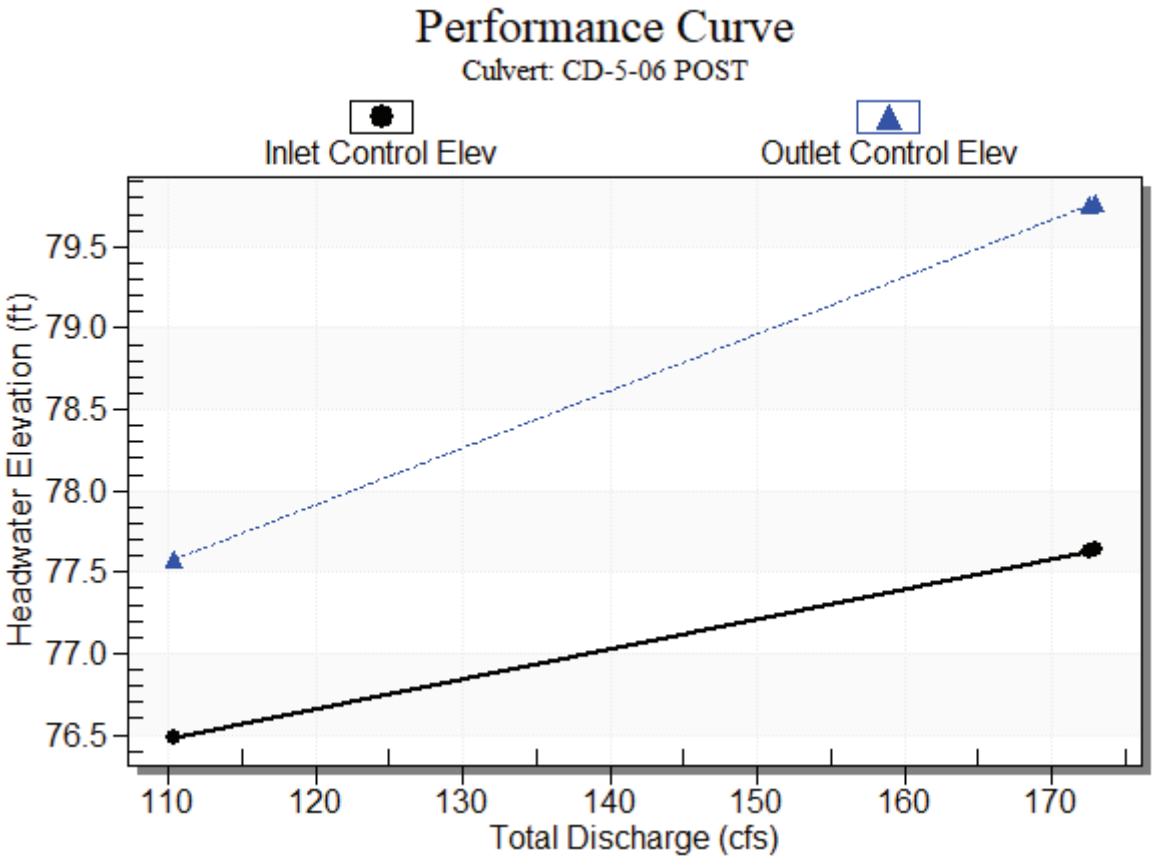
Straight Culvert

Inlet Elevation (invert): 73.71 ft, Outlet Elevation (invert): 72.59 ft

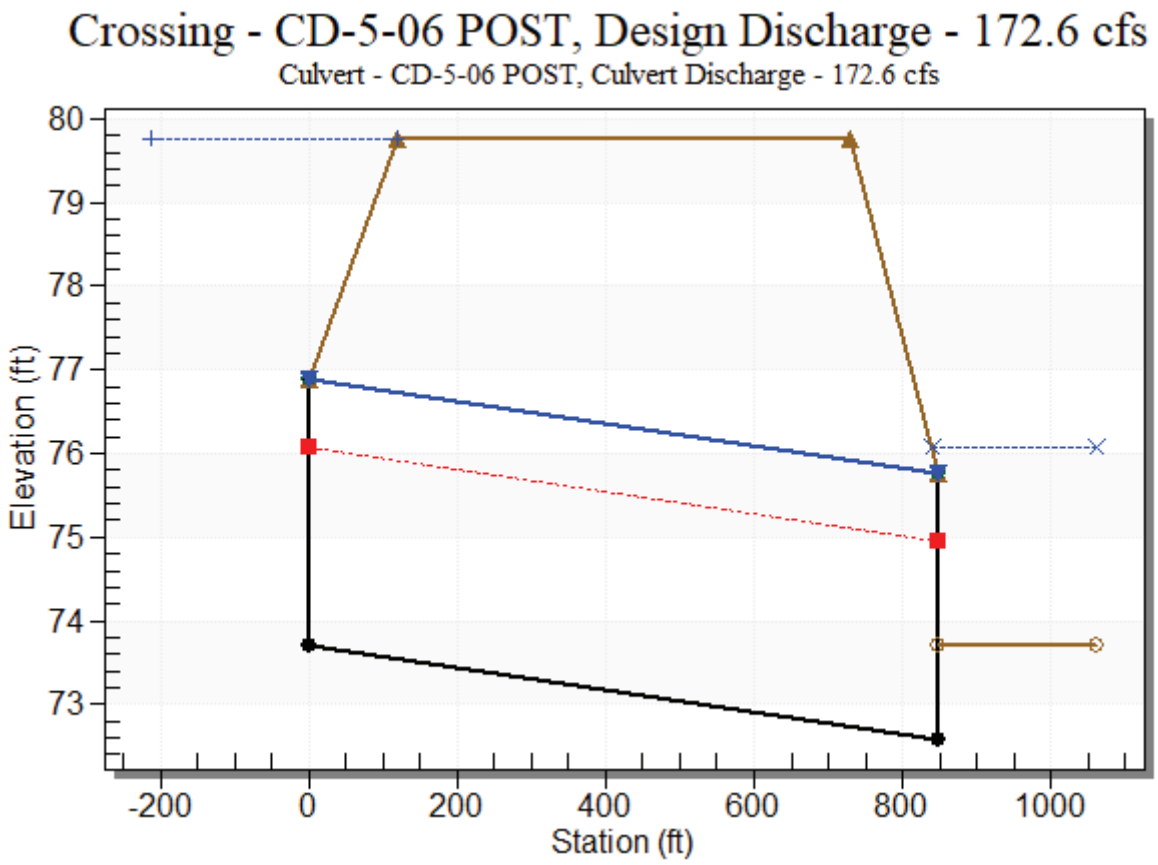
Culvert Length: 849.00 ft, Culvert Slope: 0.0013

****

Culvert Performance Curve Plot: CD-5-06 POST



Water Surface Profile Plot for Culvert: CD-5-06 POST



Site Data - CD-5-06 POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 73.71 ft

Outlet Station: 849.00 ft

Outlet Elevation: 72.59 ft

Number of Barrels: 2

Culvert Data Summary - CD-5-06 POST

Barrel Shape: Elliptical

Barrel Span: 60.00 in

Barrel Rise: 38.00 in

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 62 - Downstream Channel Rating Curve (Crossing: CD-5-06 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
110.32	76.07	2.36
110.32	76.07	2.36
172.55	76.07	2.36

Tailwater Channel Data - CD-5-06 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 76.07 ft

Roadway Data for Crossing: CD-5-06 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 79.77 ft

Roadway Surface: Paved

Roadway Top Width: 610.00 ft

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 63 - Summary of Culvert Flows at Crossing: CD-5B-05B POST

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	CD-5B-05B POST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
77.33	50 year	134.26	134.26	0.00	1
77.55	100 year	145.21	145.21	0.00	1
78.76	500 year	195.45	195.45	0.00	1
79.77	Overtopping	229.18	229.18	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5B-05B POST

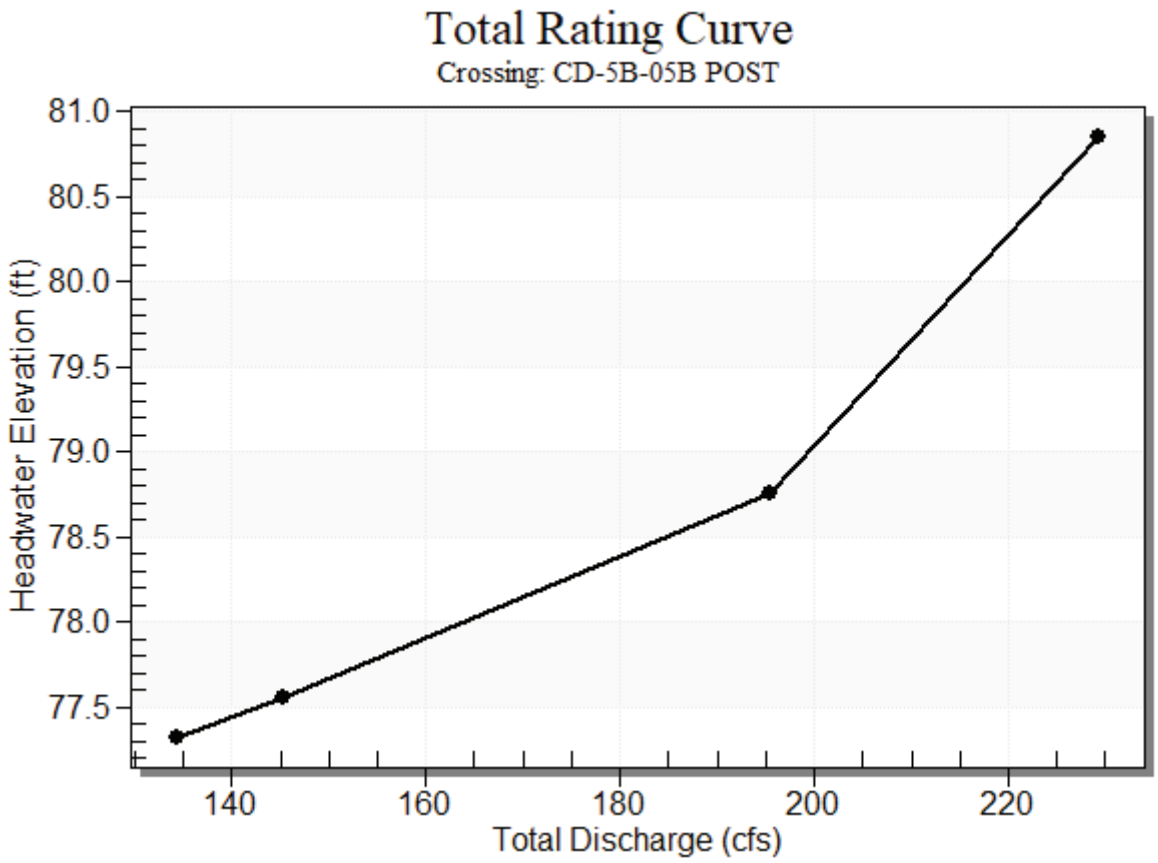


Table 64 - Culvert Summary Table: CD-5B-05B POST

Discharge Names	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)
50 year	134.26	134.26	77.33	3.184	3.628	1-S1f	1.981	2.057	3.167	2.370	5.257
100 year	145.21	145.21	77.55	3.382	3.852	1-S1f	2.089	2.149	3.167	2.370	5.686
500 year	195.45	195.45	78.76	4.412	5.061	4-FFf	3.167	2.507	3.167	2.370	7.653

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Straight Culvert

Inlet Elevation (invert): 73.70 ft, Outlet Elevation (invert): 72.59 ft

Culvert Length: 335.00 ft, Culvert Slope: 0.0033

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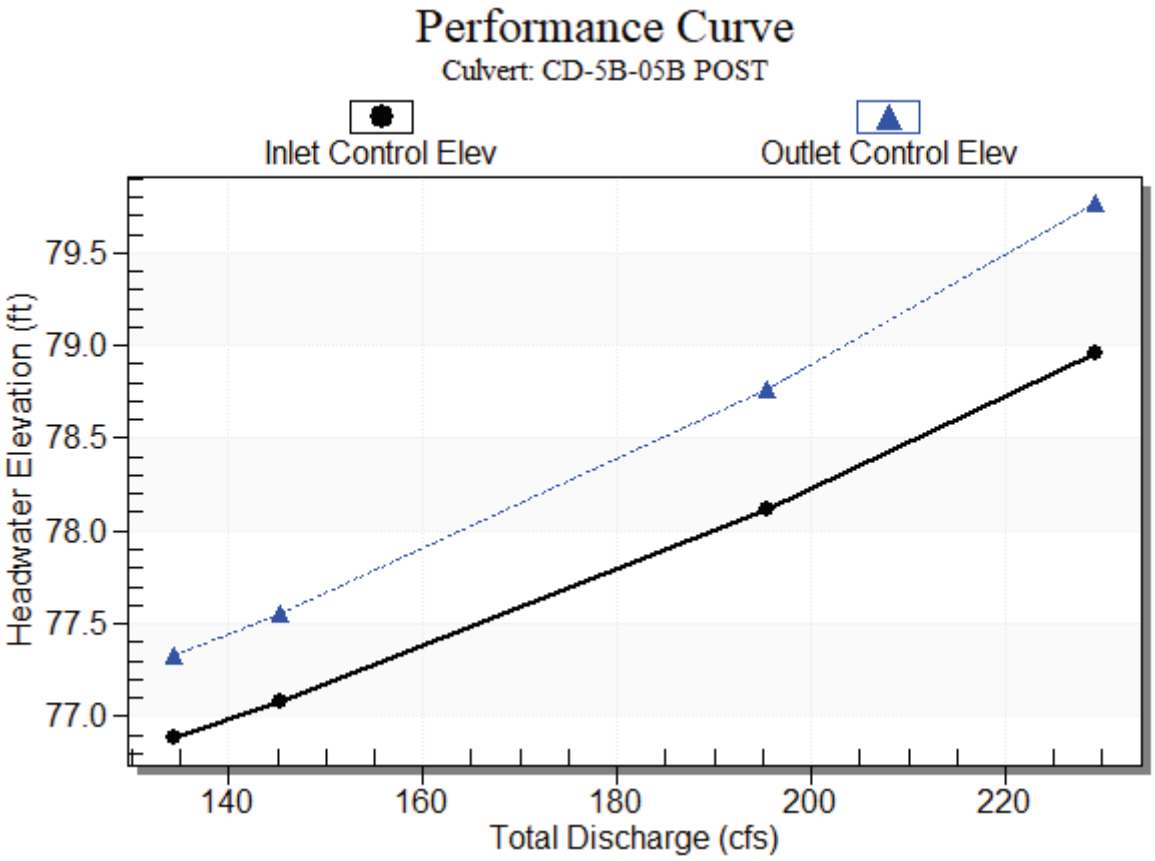
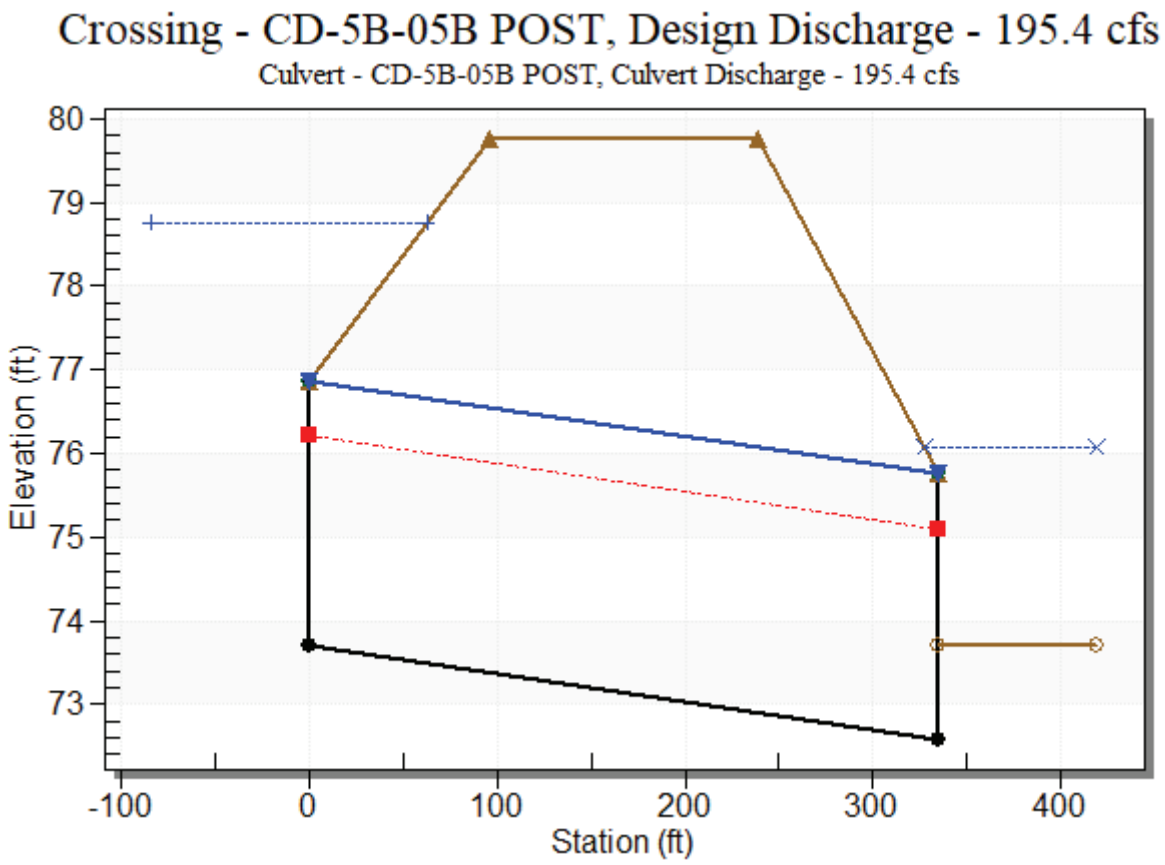
Culvert Performance Curve Plot: CD-5B-05B POST



Water Surface Profile Plot for Culvert: CD-5B-05B POST



Site Data - CD-5B-05B POST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 73.70 ft

Outlet Station: 335.00 ft

Outlet Elevation: 72.59 ft

Number of Barrels: 2

Culvert Data Summary - CD-5B-05B POST

Barrel Shape: Elliptical

Barrel Span: 60.00 in

Barrel Rise: 38.00 in

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 65 - Downstream Channel Rating Curve (Crossing: CD-5B-05B POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
134.26	76.07	2.37
145.21	76.07	2.37
195.45	76.07	2.37

Tailwater Channel Data - CD-5B-05B POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 76.07 ft

Roadway Data for Crossing: CD-5B-05B POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 79.77 ft

Roadway Surface: Paved

Roadway Top Width: 142.00 ft