

HY-8 Culvert Analysis Report

Project Notes

Project Title: COS-16-1.40 (PID 119871)

Designer: SMS

Project Date: Thursday, August 28, 2025

Notes:

outside culvert barrels one foot higher than the middle lower barrel. two

Project Units: U.S. Customary Units

Outlet Control Option: Full Flow

Exit Loss Option: Standard Method

Crossing Notes:

Crossing Discharge Data

Discharge Selection Method: User Defined

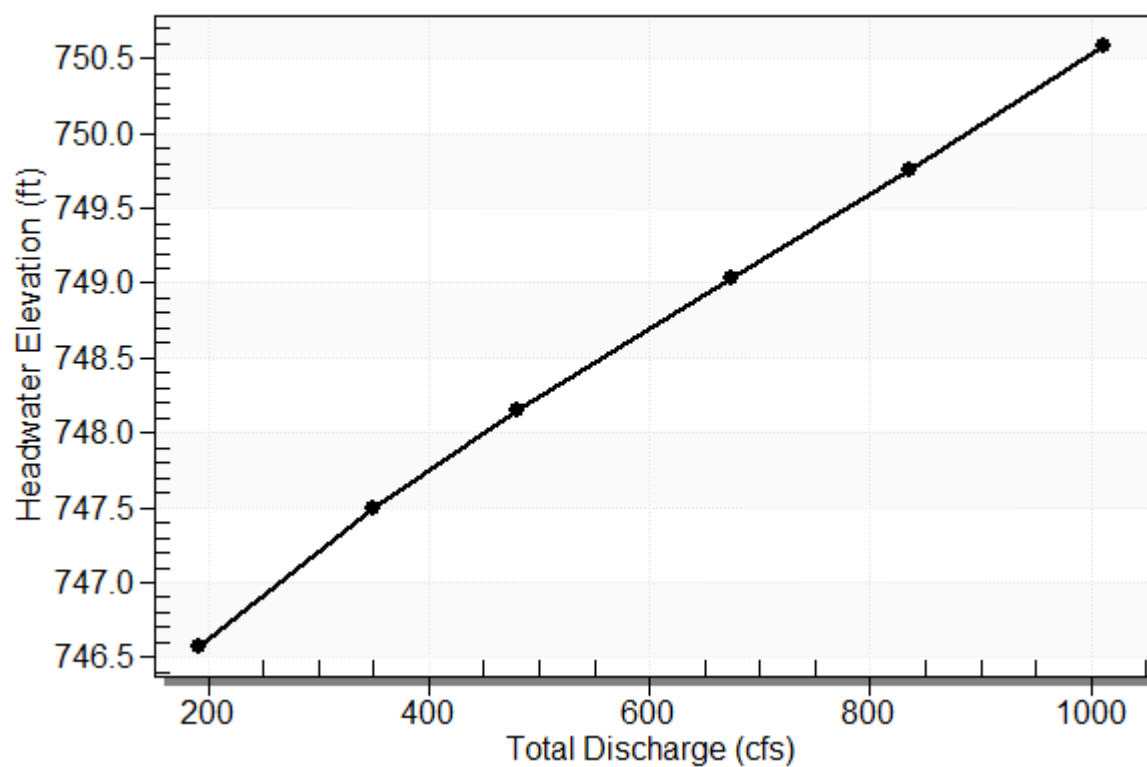
Table 1 - Summary of Culvert Flows at Crossing: Crossing - T483C

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Higher Culverts Discharge (cfs)	Lower Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
746.58	2 yr	191.64	92.11	99.51	0.00	6
747.49	5 yr	348.96	189.15	159.78	0.00	3
748.15	10 yr	480.02	271.82	208.13	0.00	3
749.03	25 yr	673.35	398.58	274.77	0.00	3
749.76	50 yr	835.23	508.50	326.74	0.00	3
750.59	100 yr	1011.41	630.18	381.29	0.00	3
753.34	Overtopping	1470.89	959.16	511.73	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing - T483C

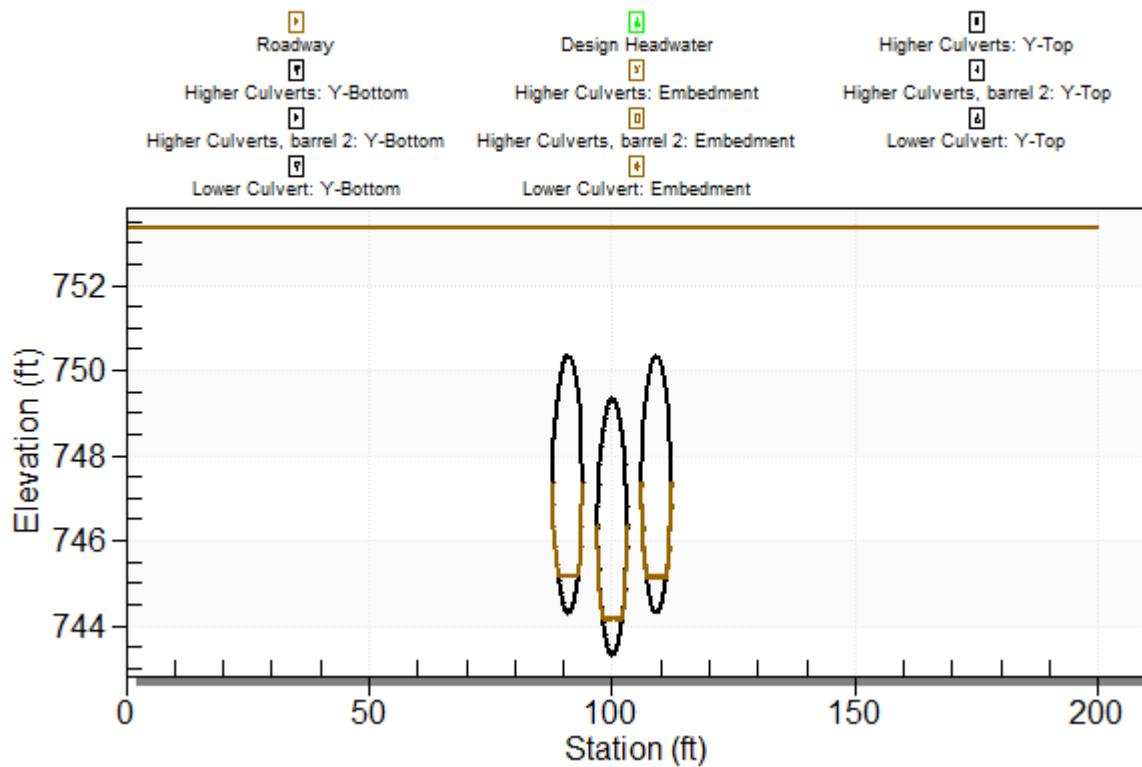
Total Rating Curve

Crossing: Crossing - T483C



Crossing Front View (Roadway Profile): Crossing - T483C

Crossing Front View (Not to scale)



Culvert Notes: Higher Culverts

Table 2 - Culvert Summary Table: Higher Culverts

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)
2 yr	191.64	92.11	746.58	1.416	0.0*	6-FFc	0.900	1.413	1.413	-8.390	6.356
5 yr	348.96	189.15	747.49	2.332	0.0*	6-FFc	1.372	2.201	2.201	-8.390	7.950
10 yr	480.02	271.82	748.15	2.987	0.0*	6-FFc	1.704	2.719	2.719	-8.390	9.080
25 yr	673.35	398.58	749.03	3.870	0.0*	6-FFc	2.110	3.399	3.399	-8.390	10.578
50 yr	835.23	508.50	749.76	4.595	0.0*	6-FFc	2.439	3.886	3.886	-8.390	11.912
100 yr	1011.41	630.18	750.59	5.428	0.0*	6-FFc	2.780	4.322	4.322	-8.390	13.536

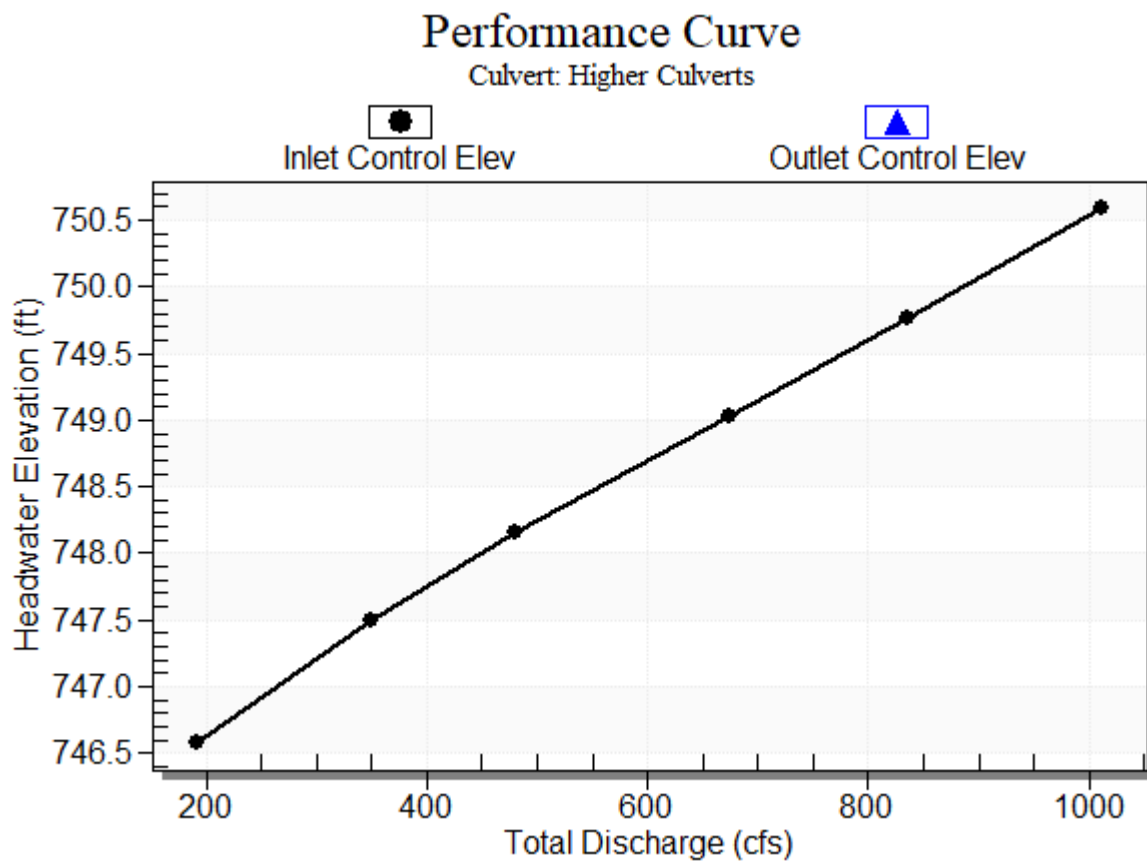
* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

Inlet Elevation (invert): 745.16 ft, Outlet Elevation (invert): 729.31 ft

Culvert Length: 294.53 ft, Culvert Slope: 0.0539

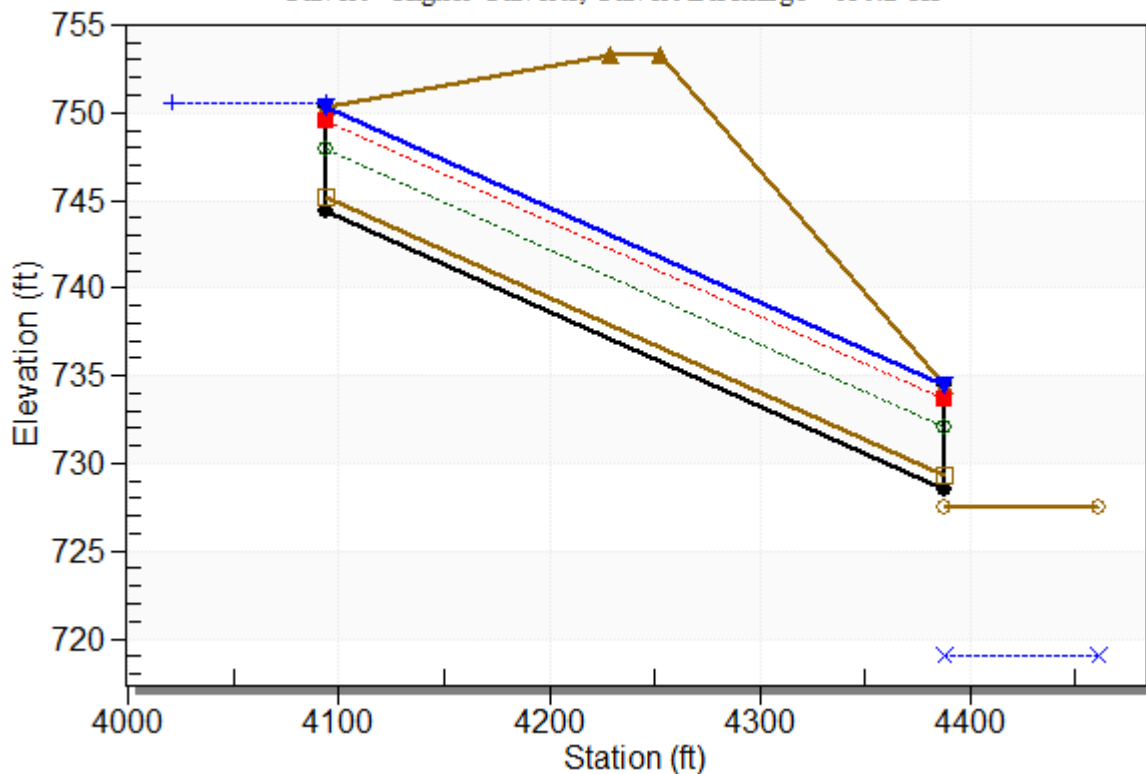
Culvert Performance Curve Plot: Higher Culverts



Water Surface Profile Plot for Culvert: Higher Culverts

Crossing - Crossing - T483C, Design Discharge - 1011.4 cfs

Culvert - Higher Culverts, Culvert Discharge - 630.2 cfs



Site Data - Higher Culverts

Site Data Option: Culvert Invert Data

Inlet Station: 4093.85 ft

Inlet Elevation: 744.33 ft

Outlet Station: 4387.95 ft

Outlet Elevation: 728.48 ft

Number of Barrels: 2

Culvert Data Summary - Higher Culverts

Barrel Shape: Circular

Barrel Diameter: 6.00 ft

Barrel Material: Concrete

Embedment: 10.00 in

Barrel Manning's n: 0.0120 (top and sides)

Manning's n: 0.0350 (bottom)

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Culvert Notes: Lower Culvert

Table 3 - Culvert Summary Table: Lower Culvert

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)
2 yr	191.64	99.51	746.58	2.415	0.0*	6-FFc	1.412	2.267	2.267	-8.390	8.094
5 yr	348.96	159.78	747.49	3.332	0.0*	6-FFc	1.859	2.986	2.986	-8.390	9.674
10 yr	480.02	208.13	748.15	3.987	0.0*	6-FFc	2.166	3.483	3.483	-8.390	10.776
25 yr	673.35	274.77	749.03	4.870	0.0*	6-FFc	2.554	4.049	4.049	-8.390	12.393
50 yr	835.23	326.74	749.76	5.595	0.0*	6-FFc	2.845	4.393	4.393	-8.390	13.858
100 yr	1011.41	381.29	750.59	6.428	0.222	6-FFc	3.140	4.657	4.657	-8.390	15.623

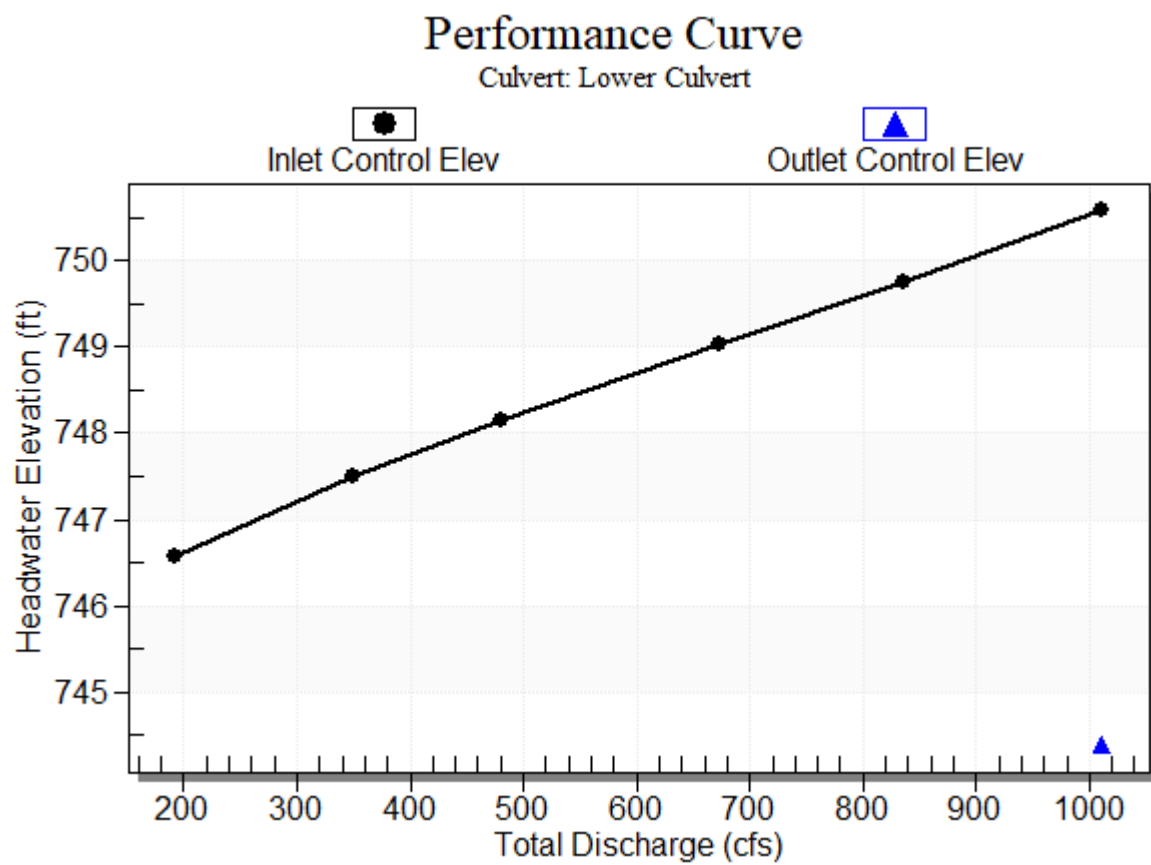
* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

Inlet Elevation (invert): 744.16 ft, Outlet Elevation (invert): 728.31 ft

Culvert Length: 294.53 ft, Culvert Slope: 0.0539

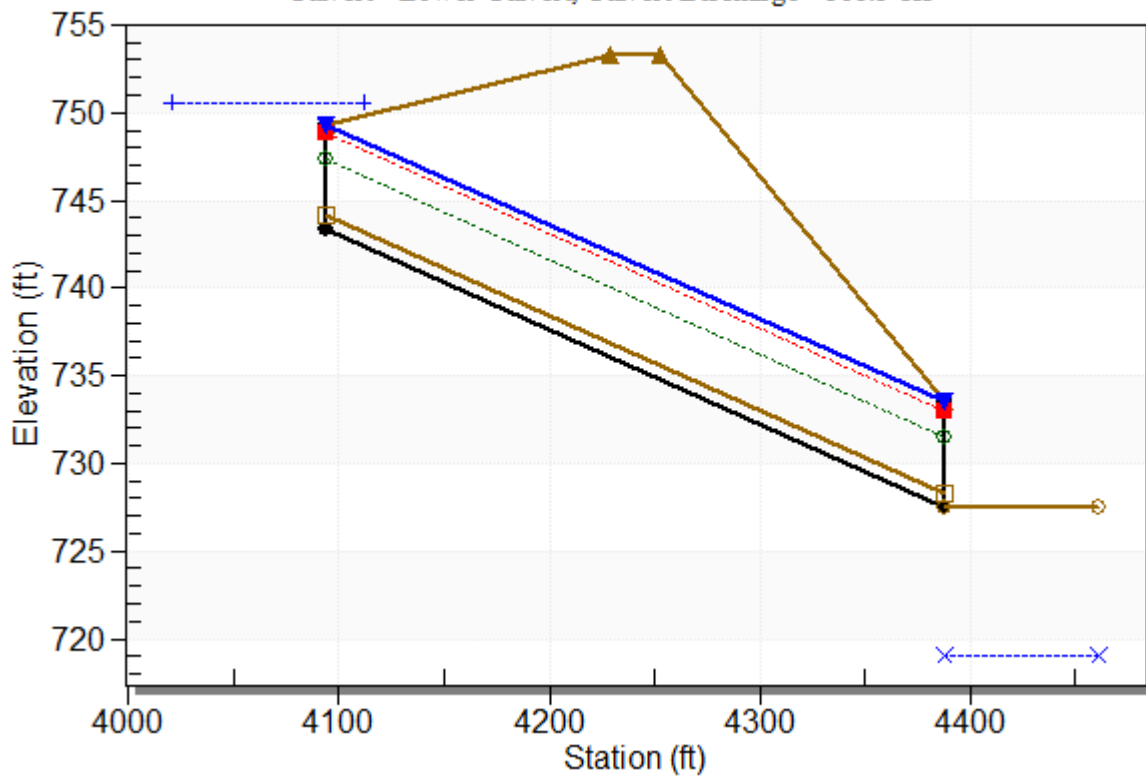
Culvert Performance Curve Plot: Lower Culvert



Water Surface Profile Plot for Culvert: Lower Culvert

Crossing - Crossing - T483C, Design Discharge - 1011.4 cfs

Culvert - Lower Culvert, Culvert Discharge - 381.3 cfs



Site Data - Lower Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 4093.85 ft

Inlet Elevation: 743.33 ft

Outlet Station: 4387.95 ft

Outlet Elevation: 727.48 ft

Number of Barrels: 1

Culvert Data Summary - Lower Culvert

Barrel Shape: Circular

Barrel Diameter: 6.00 ft

Barrel Material: Concrete

Embedment: 10.00 in

Barrel Manning's n: 0.0120 (top and sides)

Manning's n: 0.0350 (bottom)

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 4 - Downstream Channel Rating Curve (Crossing: Crossing - T483C)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
191.64	719.09	-8.39
348.96	719.09	-8.39
480.02	719.09	-8.39
673.35	719.09	-8.39
835.23	719.09	-8.39
1011.41	719.09	-8.39

Tailwater Channel Data - Crossing - T483C

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 719.09 ft

Roadway Data for Crossing: Crossing - T483C

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 200.00 ft

Crest Elevation: 753.34 ft

Roadway Surface: Paved

Roadway Top Width: 24.00 ft