Appendix C
Hydrologic Model Input Data and Results

Content:

- Hydrologic Inputs Table
- Hydrologic Results Table
- Culverts Data Table
- HY8 Culvert Analysis Report

This page left intentionally blank

Appendix C

Table C.1 South Salt Creek Hydrologic Inputs

Basin Name	Area (acres)	Basin CN	Basin Lag Time (hr)	Area within Area of Interest (acres)	Percentage of Basin within AOI
SC001	10	87	0.09	7	70%
SC002	78	87	0.36	77	99%
SC003	91	91	0.46	43	47%
SC004	77	88	0.36	16	21%
SC005	189	91	0.52	189	100%
SC006	4	88	0.06	4	100%
SC007	110	91	0.47	102	93%
SC008	3	88	0.07	3	100%
SC009	166	92	0.35	67	40%
SC010	27	93	0.16	27	100%
SC011	27	88	0.19	27	100%
SC012	10	88	0.24	6	60%
SC013	90	89	0.39	90	100%
SC014	26	92	0.20	26	100%
SC015	73	92	0.29	71	97%
SC016	99	89	0.38	98	99%
SC017	15	88	0.12	15	100%
SC018	81	90	0.36	74	91%
SC019	138	92	0.35	138	100%
SC020	62	79	0.42	62	100%
SC021	12	92	0.27	4	33%
SC022	75	85	0.41	75	100%
SC023	18	85	0.16	18	100%
SC024	150	90	0.53	75	50%
SC025	108	89	0.43	108	100%
SC026	2	81	0.05	2	100%
SC027	59	78	0.35	59	100%
SC028	82	87	0.42	82	100%
SC029	15	83	0.13	15	100%
SC030	2	92	0.04	2	100%
SC031	15	88	0.13	15	100%
SC032	30	83	0.28	30	100%
SC033	97	83	0.49	47	48%
SC034	143	84	0.58	143	100%
SC035	14	84	0.11	14	100%
SC036	90	90	0.35	2	2%
SC037	140	73	0.60	140	100%
SC038	96	89	0.37	82	85%

Basin Name	Area (acres)	Basin CN	Basin Lag Time (hr)	Area within Area of Interest (acres)	Percentage of Basin within AOI
SC039	98	84	0.44	95	97%
SC040	113	89	0.32	112	99%
SC041	107	82	0.44	93	87%
SC042	115	93	0.28	115	100%
SC043	113	93	0.38	82	73%
SC044	184	95	0.41	7	4%
SC045	169	90	0.37	136	80%
SC046	120	89	0.33	118	98%
SC047	114	96	0.34	20	18%
SC048	170	95	0.35	3	2%
SC049	59	92	0.36	21	36%
SC050	185	92	0.44	102	55%
SC051	89	92	0.48	12	13%
SC052	19	70	0.25	19	100%
SC053	187	75	0.65	177	95%
SC054	197	88	0.46	158	80%
SC055	117	76	0.47	83	71%
SC056	93	66	0.92	81	87%
SC057	21	65	0.40	20	95%
SC058	120	86	0.44	120	100%
SC059	88	73	0.76	88	100%
SC060	174	87	0.45	160	92%
SC061	47	82	0.32	44	94%
SC062	167	73	0.70	97	58%
SC063	37	66	0.44	1	3%
SC064	198	81	0.69	194	98%
SC065	133	89	0.50	36	27%
SC066	131	88	0.47	130	99%
SC067	64	76	0.44	1	2%
SC068	0	88	0.03	0	100%
SC069	81	83	0.60	5	6%
SC070	104	85	0.56	65	63%
SC071	144	85	0.63	102	71%
SC072	131	89	0.50	131	100%
SC073	173	87	0.46	156	90%
SC074	156	88	0.34	148	95%
SC075	82	82	0.34	82	100%
SC076	172	89	0.33	172	100%

Appendix C

Basin Name	Area (acres)	Basin CN	Basin Lag Time (hr)	Area within Area of Interest (acres)	Percentage of Basin within AOI
SC077	140	88	0.36	132	94%
SC078	64	86	0.45	64	100%
SC079	98	73	0.65	90	92%
SC080	121	86	0.36	121	100%
SC081	108	89	0.37	102	94%
SC082	96	89	0.35	69	72%
SC083	36	95	0.20	35	97%
SC084	173	92	0.36	109	63%
SC085	181	83	0.54	173	96%
SC086	75	81	0.37	75	100%
SC087	114	88	0.51	114	100%
SC088	149	86	0.39	72	48%
SC089	153	86	0.40	12	8%
SC090	176	86	0.39	29	16%
WT001	88	88	0.45	70	80%
WT002	26	81	0.29	26	100%
WT003	96	78	0.53	96	100%
WT004	20	80	0.19	20	100%
WT005	177	88	0.48	36	20%
WT006	114	81	0.51	41	36%
WT007	101	81	0.49	92	91%
WT008	165	79	0.59	150	91%
WT009	105	85	0.44	100	95%
WT010	160	81	0.49	67	42%
WT011	110	81	0.57	28	25%
WT012	113	85	0.34	111	98%
WT013	114	86	0.45	14	12%
WT014	106	88	0.41	13	12%

Table C.2 South Salt Creek Hydrologic Results

Basin Name	Q, 2yr (cfs)	Q, 5yr (cfs)	Q, 10yr (cfs)	Q, 25yr (cfs)	Q, 50yr (cfs)	Q, 100yr (cfs)	Q, 500yr (cfs)
SC001	25.8	37.5	47.2	55.9	63.9	72.5	91.3
SC002	113.8	167.1	211.2	250.7	287.4	327.0	413.3
SC003	129.2	182.6	226.2	265.2	301.1	339.8	424.1
SC004	114.2	166.3	209.1	247.5	283.0	321.2	404.6
SC005	244.0	346.2	429.7	504.2	573.0	647.0	808.4
SC006	12.4	17.9	22.4	26.5	30.3	34.3	43.2
SC007	155.5	219.2	271.2	317.5	360.3	406.3	506.5
SC008	8.3	12.0	15.1	17.8	20.3	23.1	29.0
SC009	292.0	408.0	502.4	586.5	664.1	747.5	929.3
SC010	73.7	101.2	123.5	143.4	161.7	181.5	224.5
SC011	59.6	86.3	108.2	127.8	145.9	165.4	207.9
SC012	19.8	28.8	36.1	42.7	48.8	55.3	69.6
SC013	130.0	188.2	236.1	279.0	318.8	361.5	454.7
SC014	63.1	88.0	108.2	126.2	142.8	160.6	199.5
SC015	147.3	204.5	251.0	292.5	330.8	371.9	461.6
SC029	148.1	213.7	267.7	315.9	360.4	408.5	513.3
SC016	37.0	53.4	66.9	79.0	90.2	102.2	128.5
SC017	132.9	188.7	234.2	274.8	312.4	352.8	440.9
SC018	242.5	338.6	416.8	486.5	550.8	619.9	770.5
SC019	51.4	85.3	114.7	141.8	167.4	195.4	257.5
SC020	25.1	35.1	43.2	50.5	57.1	64.3	80.0
SC021	91.6	138.2	177.1	212.2	244.9	280.2	357.3
SC022	36.3	54.3	69.2	82.6	95.1	108.5	137.8
SC023	189.1	268.9	334.1	392.3	446.1	504.0	630.2
SC024	147.3	213.6	268.2	317.2	362.4	411.2	517.5
SC025	3.9	6.2	8.1	9.9	11.5	13.3	17.2
SC026	52.9	88.8	120.1	149.0	176.4	206.3	272.8
SC027	102.0	151.6	193.0	230.2	264.7	301.8	383.1
SC028	29.9	45.7	59.0	71.1	82.2	94.3	120.8
SC029	6.0	8.4	10.2	11.9	13.5	15.1	18.7
SC030	35.4	51.6	64.9	76.8	87.8	99.7	125.5
SC031	41.0	63.6	82.8	100.1	116.4	134.0	172.7
SC032	90.7	141.6	184.7	223.9	260.6	300.3	387.7
SC033	127.7	195.9	253.5	305.8	354.4	407.1	522.5
SC034	31.2	47.4	61.0	73.2	84.6	96.8	123.7
SC035	145.3	207.5	258.5	304.1	346.1	391.4	490.0
SC036	59.3	110.4	156.9	200.9	243.1	289.8	395.1

Basin Name	Q, 2yr (cfs)	Q, 5yr (cfs)	Q, 10yr (cfs)	Q, 25yr (cfs)	Q, 50yr (cfs)	Q, 100yr (cfs)	Q, 500yr (cfs)
SC037	147.5	212.5	265.8	313.5	357.6	405.0	508.3
SC038	103.0	158.9	206.1	248.9	288.8	332.0	426.9
SC039	190.7	273.9	342.2	403.2	459.5	520.2	652.3
SC040	106.1	166.4	217.7	264.3	307.8	355.2	459.2
SC041	238.4	329.8	404.0	470.1	531.0	596.6	739.4
SC042	194.3	269.4	330.5	384.8	435.0	489.0	606.8
SC043	323.0	438.1	531.4	614.4	691.1	773.6	953.6
SC044	271.9	385.9	479.1	562.2	638.9	721.4	901.2
SC045	204.5	293.9	367.2	432.6	493.1	558.2	700.0
SC046	232.3	312.1	376.8	434.5	487.7	545.0	670.2
SC047	333.6	450.4	545.0	629.3	707.1	790.9	973.7
SC048	104.3	145.0	178.1	207.6	234.8	264.1	327.8
SC049	280.7	393.3	485.1	566.9	642.4	723.5	900.3
SC050	128.9	179.9	221.4	258.4	292.5	329.2	409.2
SC051	60.9	97.5	129.0	157.8	184.8	214.2	279.1
SC052	108.2	168.9	220.3	267.1	310.9	358.4	462.7
SC053	246.7	360.7	454.9	539.3	617.6	702.0	886.0
SC054	73.9	129.0	177.9	223.6	267.0	314.7	421.3
SC055	15.1	33.9	52.6	71.1	89.3	109.8	157.3
SC056	5.6	13.3	21.1	28.7	36.2	44.6	64.2
SC057	140.0	210.0	268.5	321.1	369.9	422.8	538.4
SC058	32.0	59.3	84.1	107.5	130.0	154.9	211.1
SC059	215.9	318.3	403.1	479.2	549.7	625.7	791.9
SC060	55.4	87.4	114.6	139.3	162.5	187.7	243.2
SC061	65.3	120.4	170.5	217.7	263.0	313.2	426.0
SC062	10.1	23.1	35.8	48.3	60.5	74.3	106.1
SC063	132.3	211.8	280.1	342.6	401.3	465.1	605.9
SC064	163.0	236.5	296.9	351.0	401.0	454.9	572.4
SC065	162.8	237.7	299.4	354.8	406.0	461.2	581.5
SC066	42.2	73.6	101.6	127.7	152.5	179.8	240.7
SC067	1.3	1.9	2.4	2.9	3.3	3.7	4.7
SC068	66.6	103.7	135.1	163.7	190.4	219.3	283.0
SC069	100.4	151.7	194.8	233.6	269.7	308.7	394.1
SC070	125.4	190.5	245.2	294.6	340.7	390.5	499.6
SC071	159.9	232.0	291.3	344.4	393.5	446.3	561.6
SC072	204.4	303.8	386.5	460.9	530.0	604.6	767.4
SC073	238.2	348.1	438.9	520.3	595.8	677.1	854.5
SC074	94.0	148.0	193.9	235.8	274.9	317.3	410.4

Basin Name	Q, 2yr (cfs)	Q, 5yr (cfs)	Q, 10yr (cfs)	Q, 25yr (cfs)	Q, 50yr (cfs)	Q, 100yr (cfs)	Q, 500yr (cfs)
SC075	288.8	414.1	516.8	608.6	693.4	784.8	984.1
SC076	210.6	305.5	383.7	453.6	518.3	588.0	739.9
SC077	75.7	112.9	143.9	171.7	197.6	225.5	286.6
SC078	41.4	75.9	107.1	136.5	164.6	195.8	265.8
SC079	158.7	238.7	305.6	365.9	421.9	482.3	614.4
SC080	162.7	234.6	293.9	346.9	395.9	448.6	563.6
SC081	149.0	215.4	270.0	318.8	364.0	412.6	518.6
SC082	95.2	128.9	156.2	180.6	203.0	227.2	280.0
SC083	304.6	423.1	519.5	605.3	684.6	769.8	955.6
SC084	158.2	246.6	321.8	390.2	454.1	523.4	675.4
SC085	79.2	126.0	166.0	202.6	236.9	274.1	356.1
SC086	135.3	197.2	248.1	293.9	336.3	381.9	481.4
SC087	190.9	285.1	363.5	434.1	499.5	570.3	725.1
SC088	192.4	288.2	368.1	440.1	506.9	579.0	736.6
SC089	106.7	158.9	202.4	241.5	277.9	317.1	402.7
WT001	115.0	167.3	210.4	248.9	284.6	323.0	406.7
WT002	31.0	49.3	65.0	79.4	92.9	107.5	139.7
WT003	66.1	110.0	148.3	183.8	217.2	253.7	334.8
WT004	30.3	48.3	63.6	77.7	90.9	105.3	137.0
WT005	212.0	311.5	393.8	467.7	536.1	609.8	770.6
WT006	92.2	148.3	196.4	240.5	281.9	327.0	426.4
WT007	86.2	137.6	181.6	221.9	259.6	300.7	391.1
WT008	112.0	184.0	246.4	304.0	358.2	417.4	548.3
WT009	121.1	182.4	233.7	280.1	323.2	369.7	471.5
WT010	138.3	220.5	290.9	355.2	415.5	481.2	625.8
WT011	85.2	135.8	179.2	218.9	256.0	296.5	385.7
WT012	149.7	226.9	291.6	350.0	404.2	463.0	591.7
WT013	132.2	197.6	252.2	301.5	347.1	396.4	504.2
WT014	149.0	216.4	271.9	321.7	367.7	417.2	525.3

Table C.3

Salt Creek					Evaluate	GIS Contour Data			Overtopping Evaluation				
OBJECTID *	Shape *	Point_X	Point_Y	Note	Evaluate_(yes/no/insufficient_ data)	Road_ elevation	Channel_ elevation_ Upstream	Channel_depth_ at_Road	Approx_Dist_between_ DNR_Xsect	DS_ Backwater	Approx_100yr_WSE_at_ Road	Road_ Overtopped_per_DNR_Data	Depth_ Overtopped
1	Point	154493.8	192180	No Xsect, unmodeled Tributary. From fieldwork, tributary appears abandoned.	Insufficient			0	0	No	0.0	Yes	0.0
2	Point	156376.1	184231	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
3	Point	156559.7	181828	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
4	Point	156573.9	181806	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
5	Point	155829.5	179905	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
6	Point	157676.8	172790	US Xsect only, DS subject to backwater from Salt Mainstem	Insufficient	1185	1171	14	300	Yes	1180.2	No	-4.8
7	Point	157602.4	172773	US Xsect only, DS subject to backwater from Salt Mainstem, continuation of point 6.	Insufficient	1185	1171	14	300	Yes	1180.2	No	-4.8
8	Point	160019.7	168309	US Xsect only, DS subject to backwater from Salt Mainstem	No	1183	1176	7	5650	Yes	1186.5	Yes	3.5
9	Point	158497.1	168311	US Xsect only, DS subject to backwater from Salt Mainstem	Insufficient	1192	1185	7	1130	Yes	1190.6	No	-1.4
10	Point	158434.4	168284	US Xsect only, DS subject to backwater from Salt Mainstem, continuation of point 9.	Insufficient	1192	1185	7	1130	Yes	1190.6	No	-1.4
11	Point	159434.6	160871		Insufficient	1222	1211	11	2140	No	1219.7	No	-2.3
12	Point	159362.7	160871	continuation of point 11.	Insufficient	1222	1211	11	2140	No	1219.7	No	-2.3
13	Point	161975.4	163001	US Xsect only, DS subject to backwater from Salt Mainstem, continuation of point 6.	Insufficient	1202	1192	10	5650	Yes	1198.0	No	-4.0
14	Point	160329	167222	US Xsect only, DS subject to backwater from Salt Mainstem, continuation of point 6.	No	1185	1180	5	5650	Yes	1186.5	Yes	1.5
15	Point	165594	166523	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
16	Point	165603.3	164947	Within FEMA FIS model limits, possibly unmodeled tributary.	Insufficient			0	0	No	0.0	Yes	0.0
17	Point	165227.4	162983	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
18	Point	163406.7	159520	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
19	Point	162786.8	157734	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
20	Point	164680.1	154704	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
21	Point	170181.1	154728		Insufficient	1211	1206	5	1870	No	1211.0	No	0.0
22	Point	172384.6	154832		Yes	1226	1217	9	1540	No	1222.8	No	-3.2
23	Point	172749.3	157703	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
24	Point	175036.3	155217		Yes	1253	1233	20	1760	No	1244.286364	No	-8.713636364
25	Point	180192.8	157807	Downstream only, unable to define flow split	Insufficient	1296	1291	5	1100	No	1297.0	Yes	1.0

Salt Creek					Evaluate	GIS Contour Data			Overtopping Evaluation				
OBJECTID *	Shape *	Point_X	Point_Y	Note	Evaluate_(yes/no/insufficient_ data)	Road_ elevation	Channel_ elevation_ Upstream	Channel_depth_ at_Road	Approx_Dist_between_ DNR_Xsect	DS_ Backwater	Approx_100yr_WSE_at_ Road	Road_ Overtopped_per_DNR_Data	Depth_ Overtopped
26	Point	180348.9	157039	Downstream only, unable to define flow split	Insufficient	1295	1285	10	720	No	1291.0	No	-4.0
27	Point	185580.7	162382	No Xsect, unmodeled Tributary.	Insufficient	1352	1348	4	0	No	1348.0	No	-4.0
28	Point	186083	162955		No	1346	1341	5	2025	No	1347.1	Yes	1.1
29	Point	186749.2	167761	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1380	1366	14	0	No	1366.0	No	-14.0
30	Point	186749.8	168905	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1384	1376	8	0	No	1376.0	No	-8.0
31	Point	186746.3	170466	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1381	1374	7	0	No	1374.0	No	-7.0
32	Point	189704.2	168214	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1400	1398	2	0	No	1398.0	No	-2.0
33	Point	189534.6	163003	Downstream only	Yes	1359	1354	5	50	No	1358.5	No	-0.5
34	Point	190891.9	160745	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
35	Point	190934.7	162167	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0

Salt Creek					Evaluate	GIS Contour Data			Overtopping Evaluation				
OBJECTID *	Shape *	Point_X	Point_Y	Note	Evaluate_(yes/no/insufficient_ data)	Road_ elevation	Channel_ elevation_ Upstream	Channel_depth_ at_Road	Approx_Dist_between_ DNR_Xsect	DS_ Backwater	Approx_100yr_WSE_at_ Road	Road_ Overtopped_per_DNR_Data	Depth_ Overtopped
36	Point	190876.8	157309	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
37	Point	191635.9	157883	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
38	Point	187106.9	157851		Yes	1330	1323	7	3200	No	1330.0125	Yes	0.0125
39	Point	186721.1	163313	No Xsect, unmodeled Tributary.	Insufficient	1356	1348	8	0	No	1348.0	No	-8.0
40	Point	154180.5	158456	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1263	1259	4	4650	No	1264.3	Yes	1.3
41	Point	153102.2	163040	Downstream only	No	1239	1234	5	100	No	1240.1	Yes	1.1
42	Point	157952.9	157779	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient	1244	1242	2	2500	No	1247.3	Yes	3.3
43	Point	149064.5	163027	Downstream only	Yes	1274	1266	8	5599	No	1269.7	No	-4.3
44	Point	149739.2	167223	Downstream only	Yes	1241	1234	7	1362	No	1237.7	No	-3.3
45	Point	150102	168345	Downstream only	Yes	1233	1225	8	190	No	1228.7	No	-4.3
46	Point	149730.2	170764		Yes	1222	1212	10	2430	No	1221.786008	No	-0.21399177
47	Point	146648.3	168366	Downstream only	Yes	1246	1241	5	225	No	1245.4	No	-0.6
48	Point	144466.4	168222	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient			0	0	No	0.0	Yes	0.0
49	Point	146087.5	163075	Downstream only, unable to define flow split on unmodeled tributaries	Insufficient			0	0	No	0.0	Yes	0.0
50	Point	155032.9	166238		No	1214	1205	9	1900	No	1216.3	Yes	2.3
51	Point	155068.7	167164	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
52	Point	160335.5	172285	No Xsect, unmodeled Tributary.	Insufficient	1182	1170	12	0	No	1170.0	No	-12.0
53	Point	160351.8	170240	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
54	Point	157621.3	182571	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
55	Point	157797.4	182371	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
56	Point	158179.8	181690	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
57	Point	158856.2	183456	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
58	Point	158601.9	183586	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
59	Point	155669.8	189524	Within FEMA FIS model limits	Insufficient			0	0	No	0.0	Yes	0.0
60	Point	157083	189566	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
61	Point	156406.8	196471	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
62	Point	152390.8	197394	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
63	Point	154073.4	200066	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
64	Point	146030.3	204092	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
65	Point	145949	204093	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
66	Point	139148.5	203588	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
67	Point	139150.6	204069	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
68	Point	138132.5	205380	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
69	Point	137456.3	205391	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
70	Point	161716	195448	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0

Salt Creek					Evaluate	GIS Contour Data			Overtopping Evaluation				
OBJECTID *	Shape *	Point_X	Point_Y	Note	Evaluate_(yes/no/insufficient_ data)	Road_ elevation	Channel_ elevation_ Upstream	Channel_depth_ at_Road	Approx_Dist_between_ DNR_Xsect	DS_ Backwater	Approx_100yr_WSE_at_ Road	Road_ Overtopped_per_DNR_Data	Depth_ Overtopped
71	Point	161618.9	195501	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
72	Point	153019.7	184254	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
73	Point	154193.6	185490	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
74	Point	154256.3	185509	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
75	Point	152370.6	183720	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
76	Point	154975.8	186457	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
77	Point	151520	204925	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
78	Point	152745	198560	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
79	Point	154817.4	197412	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
80	Point	160306.9	176120	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
81	Point	160694.3	176168	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
82	Point	161053.5	176199	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
83	Point	162218.7	176401	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
84	Point	162402	176242	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
85	Point	162656.5	177405	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
86	Point	163621.9	178044	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
87	Point	164110.3	178251	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
88	Point	155039.4	170942		Yes	1191	1186	5	1570	No	1189.935669	No	-1.06433121
89	Point	162933.1	194723	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
90	Point	161001.1	195836	No Xsect, unmodeled Tributary.	Insufficient			0	0	No	0.0	Yes	0.0
91	Point	165603.3	164947	Within FEMA FIS model limits, possibly unmodeled tributary.	Insufficient			0	0	No	0.0	Yes	0.0

Culverts to Evaluate 10

Table C.3

DNR HYDRAULIC STUDY DATA								County Culvert Data						
OBJECTID *	US_100yr_ depth	US_100yr_ Elevation	US_Q100	US_Distance_ to_point_ (ft)	DS_100yr_ depth	DS_100yr_ Elevation	DS_ Q100	DS_Distance_ to_point_(ft)	County_ Longitude	County_ Latitude	Known_ WSE_100yr	Road_ Name	Culvert_ Description	Culvert_ Openings
1									154500.62649	192193.28052	1178.5	O51	24"x44'	SINGLE
2									156389.60335	184213.03106	1169	O37	28'x227'	TRIPLE
3														
4														
5														
6	9.2	1180.6	4933	300		1179.066667								
7	9.2	1180.6	4933	300		1179.066667								
8	6	1197.4	3909	5650		1186.5			160030.55604	168307.37652		O44	23'x24'	SINGLE
9	5.6	1195	3807	1130		1185.3								
10	5.6	1195	3807	1130		1185.3								
11	5.3	1224.7	3909	1010	6.8	1214.2	3909	1130						
12	5.3	1224.7	3909	1010	6.8	1214.2	3909	1130						
13	6	1197.4	3909	5650		1186.5								
14	6	1197.4	3909	5650		1186.5			160328.94915	167221.97876		O65	8'x5'x41'	TWIN
15									165579.05774	166521.69112		P27	23'x30'	SINGLE
16									165583.30773	164949.61552		P28-1	7'x7'x31'	SINGLE
17														
18									163394.21041	159496.49913	1199.9	T22	10'x6'x32'	TWIN
19									162790.78084	157737.28513		T256	18"x44'	SINGLE
20									164642.55732	154699.31155		S53	6'x5'x62'	TWIN
21	10	1216.4	6280	1070	8.5	1206.9	6280	800						
22	9.9	1224.3	6280	300	10	1216.4	6280	1240	172372.78759	154840.49106		S59	19'x30'	SINGLE
23									172754.25533	157707.33867		S218	8'x5'x28'	SINGLE
24	11.5	1253.9	6280	900	10.7	1235.1	6280	860	175036.48010	155225.13300		S86	10'x9'x99'	TRIPLE
25					6	1288.4	6280	1100	180175.39830	157780.83393		S213	6.5'x4'x52'	TWIN

DNR HYDRAULIC STUDY DATA								County Culvert Data						
OBJECTID *	US_100yr_ depth	US_100yr_ Elevation	US_Q100	US_Distance_ to_point_ (ft)	DS_100yr_ depth	DS_100yr_ Elevation	DS_ Q100	DS_Distance_ to_point_(ft)	County_ Longitude	County_ Latitude	Known_ WSE_100yr	Road_ Name	Culvert_ Description	Culvert_ Openings
26					6	1288.4	6280	720	180320.56271	157048.34983		S88	6.5'x4'x103'	SINGLE
27									185579.82548	162376.69744		S116	72"x46'	SINGLE
28	5.7	1348.1	4315	705	9.7	1345.1	4315	1320	186074.67128	162971.38326	1346.5	P37	8'x5'x52'	TRIPLE
29									186730.68539	167793.21613		P126	7'x6'x99'	SINGLE
30									186750.63449	168926.15613		P125	60"x106'	SINGLE
31									186746.41862	170458.61763		P124	6'x5'x72'	TWIN
32									189748.69215	168242.05841		P208	48"x58'	SINGLE
33					4.5	1359.9	2939	50	189521.14076	162967.62572	1357.4	P38	8'x4'x55'	TWIN
34									190891.12523	160748.61310		S118	4'x4'x26'	SINGLE
35									190936.00440	162184.10235		S117	30"x28'	SINGLE

DNR HYDRAULIC STUDY DATA								County Culvert Data						
OBJECTID *	US_100yr_ depth	US_100yr_ Elevation	US_Q100	US_Distance_ to_point_ (ft)	DS_100yr_ depth	DS_100yr_ Elevation	DS_ Q100	DS_Distance_ to_point_(ft)	County_ Longitude	County_ Latitude	Known_ WSE_100yr	Road_ Name	Culvert_ Description	Culvert_ Openings
36									190872.81818	157308.94741		S119	8'x6'x30'	SINGLE
37									191599.27440	157884.88096		S204	6'x4'x38'	TWIN
38	7.3	1340.7	4315	3000	6.9	1329.3	6377	200	187057.78414	157849.63825		S206	9'x6'x45'	TRIPLE
39									186720.79564	163308.69590	1352	P129	6'x4'x68'	TWIN
40					5.3	1224.7	3909	4650	154156.17540	158458.62326		T157	10'x6'x26'	SINGLE
41					6.1	1236.5	3807	100	153090.03187	163038.65904		O74	7'x5'x52'	TWIN
42					5.3	1224.7	3909	2500	157948.85056	157786.85688		T26	72"x44"x36'	SINGLE
43					3.7	1230.1	2287	5599	149060.04649	163043.83095		O77	6'x6'x38'	SINGLE
44					3.7	1230.1	2287	1362	149740.60156	167251.52595		O155	12'x6'x66'	SINGLE
45					3.7	1230.1	2287	190	150099.30852	168345.48275		O48	8'x6'x51'	SINGLE
46	4.6	1233	3503	2180	7.1	1220.5	3503	250	149729.21215	170749.58391		O153	10'x8'x45'	SINGLE
47					4.4	1242.8	3503	225	146644.09988	168366.81112	1247.1	O192	8'x5'x46'	TWIN
48									144465.26500	168218.67887		O163	7'x4'x28'	SINGLE
49									146084.91957	163055.55960		O78	5'x4'x40'	TWIN
50	6.8	1222.2	3807	1060	5.2	1211.6	3807	840	155034.72548	166218.10052		O203	8'x5'x58'	TWIN
51									155043.51746	167171.99231		O204	5'x4'x26'	SINGLE
52									160350.50291	172283.01490	1184.6	O61	32'x80'	TRIPLE
53									160352.88316	170235.67450	1186.2	O62	32'x120'	TRIPLE
54														
55														
56														
57														
58														
59									155611.48713	189524.53094	1159.8	O175	40'x160'	TRIPLE
60														
61														
62														
63														
64														
65														
66														
67														
68														
69														
70														

DNR HYDRAULIC STUDY DATA								County Culvert Data						
OBJECTID *	US_100yr_ depth	US_100yr_ Elevation	US_Q100	US_Distance_ to_point_ (ft)	DS_100yr_ depth	DS_100yr_ Elevation	DS_ Q100	DS_Distance_ to_point_(ft)	County_ Longitude	County_ Latitude	Known_ WSE_100yr	Road_ Name	Culvert_ Description	Culvert_ Openings
71														
72									153024.68357	184252.18847		O35	5'x4'x50'	SINGLE
73														
74														
75									152339.95463	183714.48974		O150	30"x42'	SINGLE
76									154974.99923	186476.80410		O32	6'x6'x75'	TWIN
77														
78														
79														
80														
81														
82														
83														
84														
85														
86														
87														
88	7.1	1192.5	4933	610	7.5	1185.9	4933	960	155045.86260	170942.65603		O206	9'x7'x50'	TRIPLE
89														
90														
91									165583.30773	164949.61552		P28-2	7'x4'x7'	SINGLE

Table C.3

Modeled Culvert																
OBJECTID	Structure_Type		Downstream_Flowline_(ft)	Tailwater_Elevation_(ft)	Assumed_Crest_Length_(ft)	Embedment_depth_(in)	Culvert_type	Inlet_Configuration	Number_of_barrels	Inlet_Elevation_(ft)	Outlet_Elevation_(ft)	Crest_Elevation_(ft)	Extra	Roadway Overtopped?	Overtopping Elevation (ft)	Overtopping Depth (ft)
1	CMP															
2	DSGB															
3																
4																
5																
6																
7																
8	IBB															
9																
10																
11																
12																
13																
14	CBC															
15	IBB															
16	CBC															
17																
18	CBC															
19	CMP															
20	CBC															
21																
22	IBB															
23	CBC															
24	CBC		1231.3	1242	50	0		30-75°	3	1232	1231.3	1251.78		Yes	1255.05	3.27
25	CBC															

Modeled Culvert																
OBJECTID	Structure_Type		Downstream_Flowline_(ft)	Tailwater_Elevation_(ft)	Assumed_Crest_Length_(ft)	Embedment_depth_(in)	Culvert_type	Inlet_Configuration	Number_of_barrels	Inlet_Elevation_(ft)	Outlet_Elevation_(ft)	Crest_Elevation_(ft)	Extra	Roadway Overtopped?	Overtopping Elevation (ft)	Overtopping Depth (ft)
26	CBC															
27	CMP															
28	CBC															
29	CBC															
30	BBCMP															
31	CBC															
32	BBCMP															
33	CBC		1352.2	1356.7	50		striaght	30-75°	2	1352.3	1352.2	1358.66	1355.85; a	Yes	1364.09	5.43
34	CBC															
35	CP															

Modeled Culvert																
OBJECTID	Structure_Type		Downstream_Flowline_(ft)	Tailwater_Elevation_(ft)	Assumed_Crest_Length_(ft)	Embedment_depth_(in)	Culvert_type	Inlet_Configuration	Number_of_barrels	Inlet_Elevation_(ft)	Outlet_Elevation_(ft)	Crest_Elevation_(ft)	Extra	Roadway Overtopped?	Overtopping Elevation (ft)	Overtopping Depth (ft)
36	CBC															
37	CBC															
38	CBC		464.5	471.4	50	0	gle broken back		2	466.5	464.5	474.7	; Q100 = 22	Yes	479.81	5.11
39	CBC															
40	CBC															
41	CBC															
42	CMPA															
43	CBC															
44	CBC															
45	CBC		1224.3	1228	50	0	straight	e, difficult to tell fro	1	1224.6	1224.3	1233.4	ons. Elevatio	Yes	1238.04	4.64
46	CBC		99	106.1	50	0	straight	e, difficult to tell fro	1	99	99	110	box culverts	Yes	115.89	5.89
47	CBC		1239	1243.4	50	0	straight	30-75° flare	2	1239.1	1239	1246.3	247.06; DA	Yes	1248.49	2.19
48	CBC															Scenario ra
49	CBC															
50	CBC															
51	CBC															
52	CSB															
53	CSB															
54																
55																
56																
57																
58																
59	DSGB															
60																
61																
62																
63																
64																
65																
66																
67																
68																
69																
70																

Modeled Culvert																
OBJECTID	Structure_Type		Downstream_Flowline_(ft)	Tailwater_Elevation_(ft)	Assumed_Crest_Length_(ft)	Embedment_depth_(in)	Culvert_type	Inlet_Configuration	Number_of_barrels	Inlet_Elevation_(ft)	Outlet_Elevation_(ft)	Crest_Elevation_(ft)	Extra	Roadway Overtopped?	Overtopping Elevation (ft)	Overtopping Depth (ft)
71																
72	CBC															
73																
74																
75	CMP															
76	CBC															
77																
78																
79																
80																
81																
82																
83																
84																
85																
86																
87																
88	CBC		1182.6	1190.1	50	0	straight	30-75°	3	1182.8	1182.6	1192.06	194.63; DA	Yes	1197.32	5.26
89																Scenario ran v
90																
91	CBC															

Appendix C

HY-8 Culvert Analysis Report

Table 1 - Summary of Culvert Flows at Crossing: S-206

Headwater Elevation (ft)	Total Discharge (cfs)	S-206 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
471.40	0.00	0.00	0.00	1
471.59	431.50	431.50	0.00	1
472.18	863.00	863.00	0.00	1
472.92	1294.50	1294.50	0.00	1
474.78	1726.00	1722.34	3.62	5
475.94	2157.50	1947.08	210.09	4
476.86	2589.00	2107.50	481.48	3
477.68	3020.50	2240.26	780.20	3
478.43	3452.00	2355.62	1096.33	3
479.14	3883.50	2458.66	1424.39	3
479.81	4315.00	2550.14	1764.81	3
474.70	1704.71	1704.71	0.00	Overtopping

Rating Curve Plot for Crossing: S-206

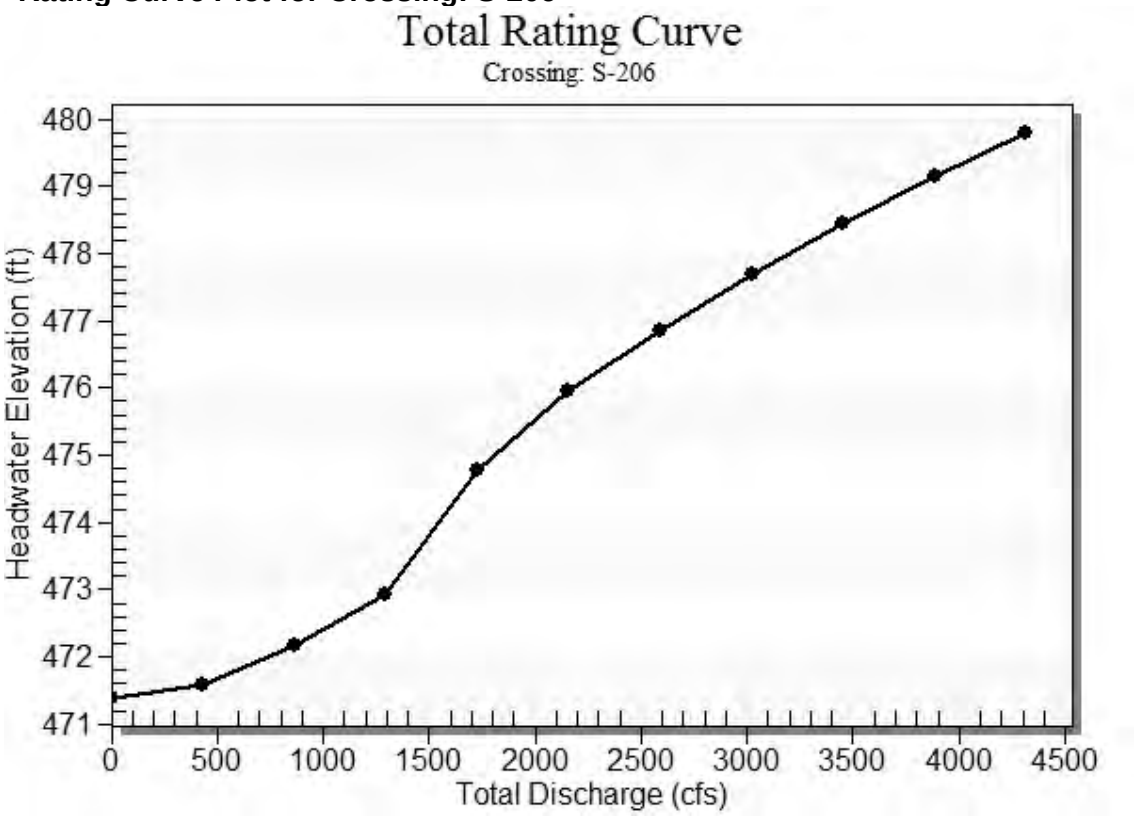


Table 2 - Culvert Summary Table: S-206

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	471.40	0.000	4.900	0-NF	0.000	0.000	6.000	6.900	0.000	0.000
431.50	431.50	471.59	2.939	5.088	1-S1f	0.000	1.994	6.000	6.900	2.664	0.000
863.00	863.00	472.18	4.764	5.677	1-S1f	0.000	1.994	6.000	6.900	5.327	0.000
1294.50	1294.50	472.92	6.416	6.355	5-JS1f	0.000	1.994	6.000	6.900	7.991	0.000
1726.00	1722.34	474.78	8.285	7.479	5-JS1f	0.000	1.994	6.000	6.900	10.632	0.000
2157.50	1947.08	475.94	9.443	8.197	5-S2n	0.000	1.994	3.646	6.900	19.779	0.000
2589.00	2107.50	476.86	10.359	8.764	5-S2n	0.000	1.994	3.879	6.900	20.122	0.000
3020.50	2240.26	477.68	11.177	9.266	5-S2n	0.000	1.994	4.069	6.900	20.393	0.000
3452.00	2355.62	478.43	11.934	9.728	5-S2n	0.000	1.994	4.228	6.900	20.636	0.000
3883.50	2458.66	479.14	12.645	10.160	5-S2n	0.000	1.994	4.361	6.900	20.879	0.000
4315.00	2550.14	479.81	13.305	10.559	5-S2n	0.000	1.994	4.473	6.900	21.117	0.000

****

Single Broken-back Culvert

Inlet Elevation (invert): 466.50 ft,

Break Elevation (invert): 464.50 ft,

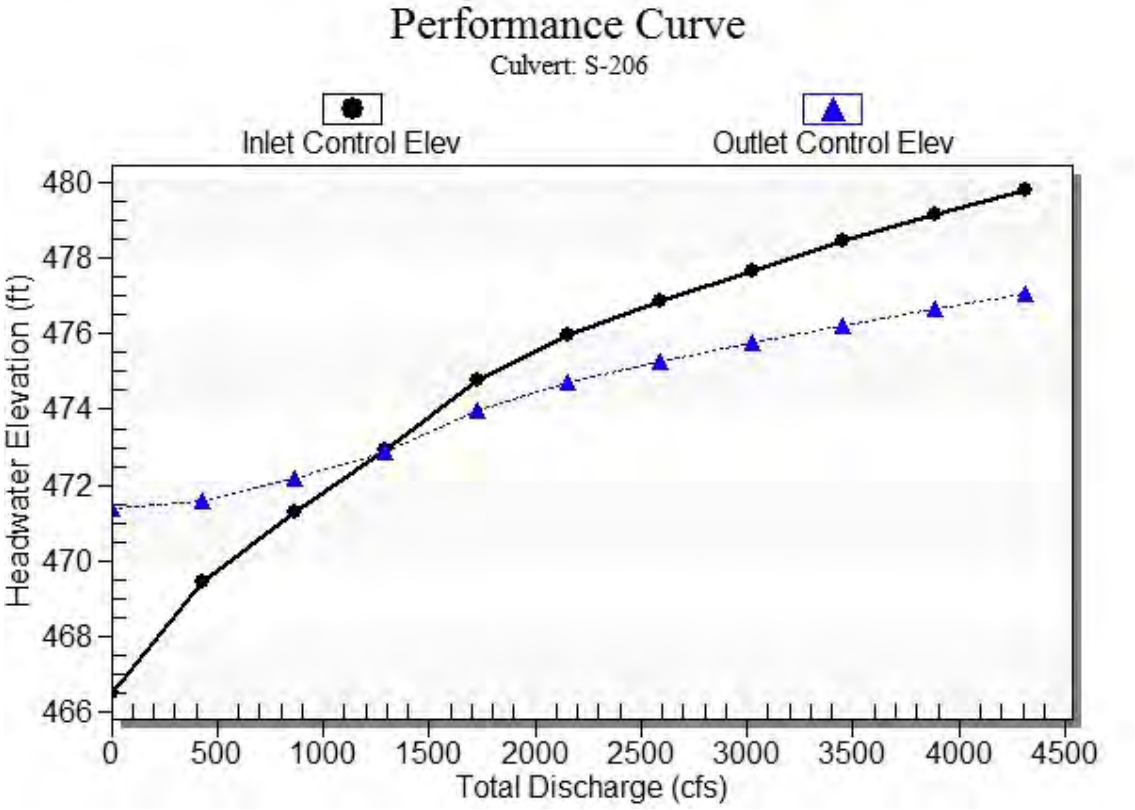
Culvert Length: 45.04 ft,

Upper Culvert Section Slope: 0.0625

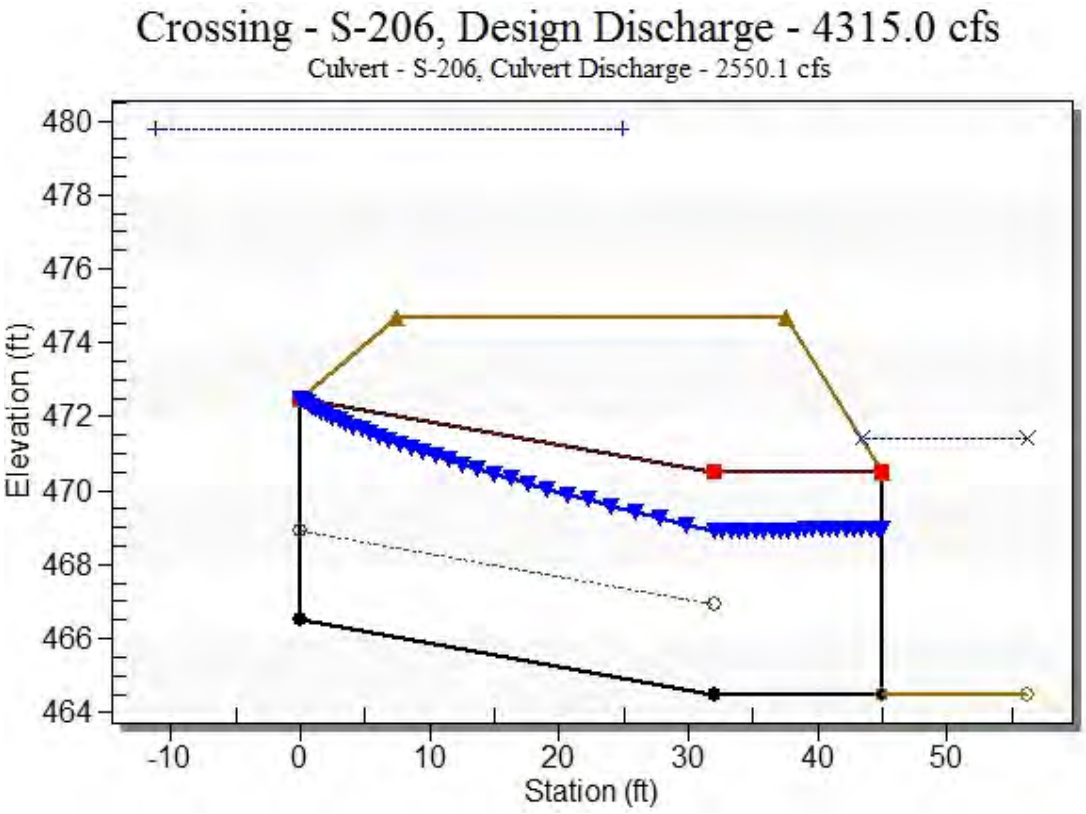
Steep Culvert Section Slope: 0.0000

****

Culvert Performance Curve Plot: S-206



Water Surface Profile Plot for Culvert: S-206



Site Data - S-206

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 466.50 ft

Break Station: 32.00 ft

Break Elevation: 464.50 ft

Outlet Station: 45.00 ft

Outlet Elevation: 464.50 ft

Number of Barrels: 3

Culvert Data Summary - S-206

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 6.00 ft

Upper Section Material: Concrete

Lower Section Material:

Embedment: 0.00 in

Upper Section Manning's n: 0.0130

Lower Section Manning's n: 0.0130

Culvert Type: Single Broken-back

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: S-206)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	471.40	6.90
431.50	471.40	6.90
863.00	471.40	6.90
1294.50	471.40	6.90
1726.00	471.40	6.90
2157.50	471.40	6.90
2589.00	471.40	6.90
3020.50	471.40	6.90
3452.00	471.40	6.90
3883.50	471.40	6.90
4315.00	471.40	6.90

Tailwater Channel Data - S-206

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 471.40 ft

Roadway Data for Crossing: S-206

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 474.70 ft

Roadway Surface: Paved

Roadway Top Width: 30.00 ft

Table 4 - Summary of Culvert Flows at Crossing: O-48

Headwater Elevation (ft)	Total Discharge (cfs)	O-48 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1228.00	0.00	0.00	0.00	1
1229.54	228.70	228.70	0.00	1
1232.68	457.40	457.40	0.00	1
1234.29	686.10	559.69	126.32	5
1235.02	914.80	601.89	312.62	3
1235.64	1143.50	635.42	507.78	3
1236.19	1372.20	664.05	707.89	3
1236.70	1600.90	689.20	909.90	5
1237.16	1829.60	711.52	1117.87	3
1237.61	2058.30	732.11	1326.03	3
1238.04	2287.00	751.25	1535.58	3
1233.40	504.90	504.90	0.00	Overtopping

Rating Curve Plot for Crossing: O-48

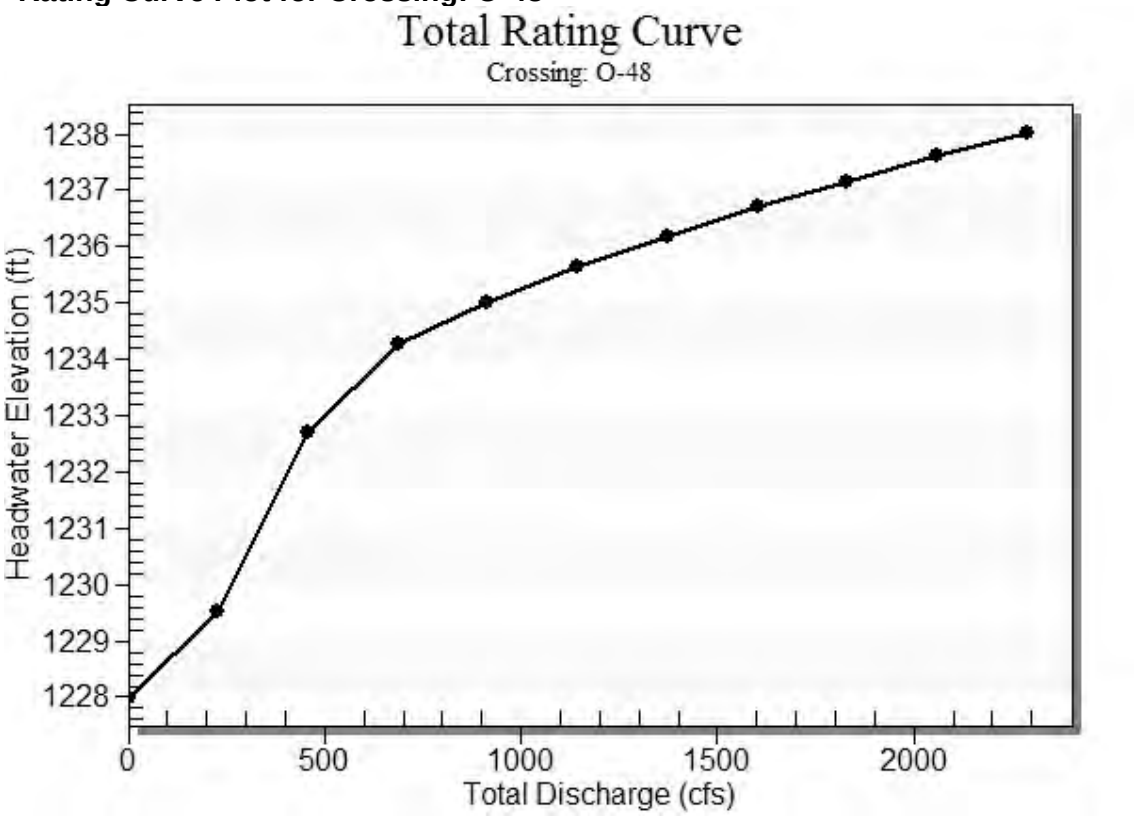


Table 5 - Culvert Summary Table: O-48

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	1228.00	0.000	3.400	0-NF	0.000	0.000	3.700	3.700	0.000	0.000
228.70	228.70	1229.54	4.937	3.866	1-JS1t	1.859	2.939	3.700	3.700	7.726	0.000
457.40	457.40	1232.68	8.084	6.229	5-S2n	3.036	4.665	4.003	3.700	14.282	0.000
686.10	559.69	1234.29	9.686	8.410	5-S2n	3.520	5.337	4.631	3.700	15.107	0.000
914.80	601.89	1235.02	10.419	8.979	5-S2n	3.713	5.602	4.881	3.700	15.415	0.000
1143.50	635.42	1235.64	11.037	9.452	5-S2n	3.866	5.808	5.075	3.700	15.651	0.000
1372.20	664.05	1236.19	11.591	9.870	5-S2n	3.996	5.981	5.238	3.700	15.846	0.000
1600.90	689.20	1236.70	12.098	10.248	5-S2n	4.111	6.131	5.380	3.700	16.013	0.000
1829.60	711.52	1237.16	12.565	10.593	5-S2n	4.210	6.263	5.505	3.700	16.156	0.000
2058.30	732.11	1237.61	13.009	10.918	5-S2n	4.301	6.383	5.620	3.700	16.285	0.000
2287.00	751.25	1238.04	13.435	11.226	5-S2n	4.386	6.494	5.725	3.700	16.403	0.000

****

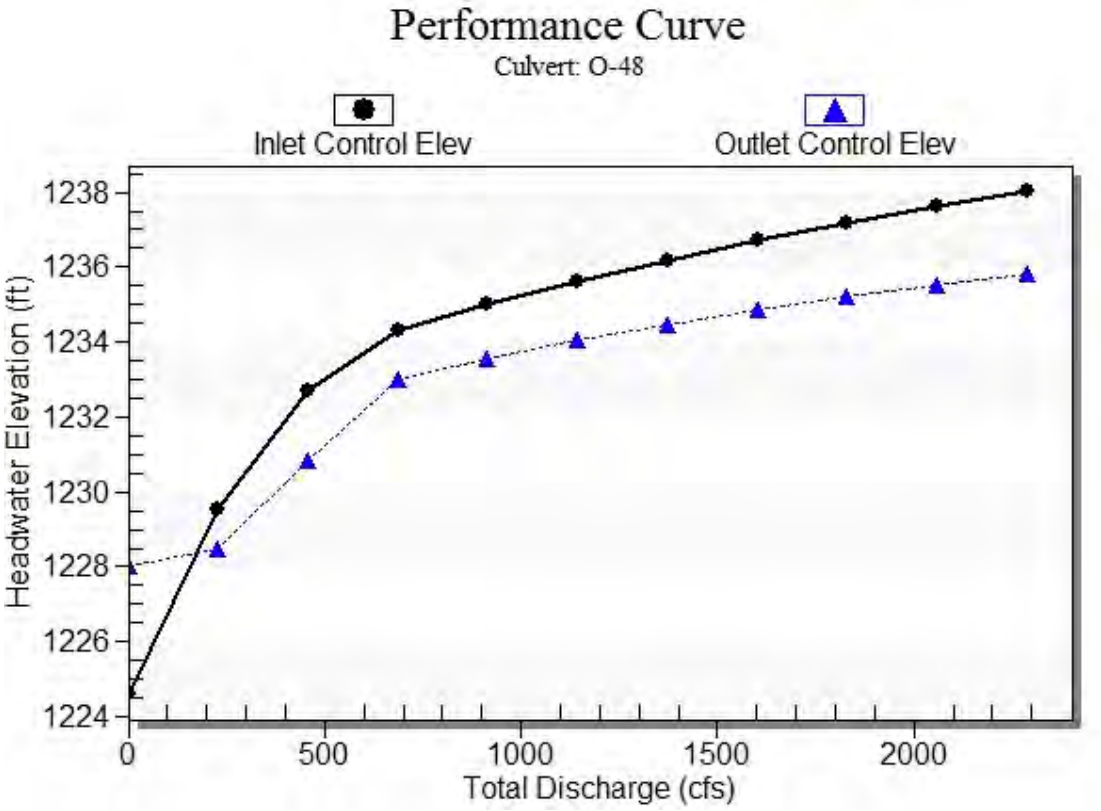
Straight Culvert

Inlet Elevation (invert): 1224.60 ft, Outlet Elevation (invert): 1224.30 ft

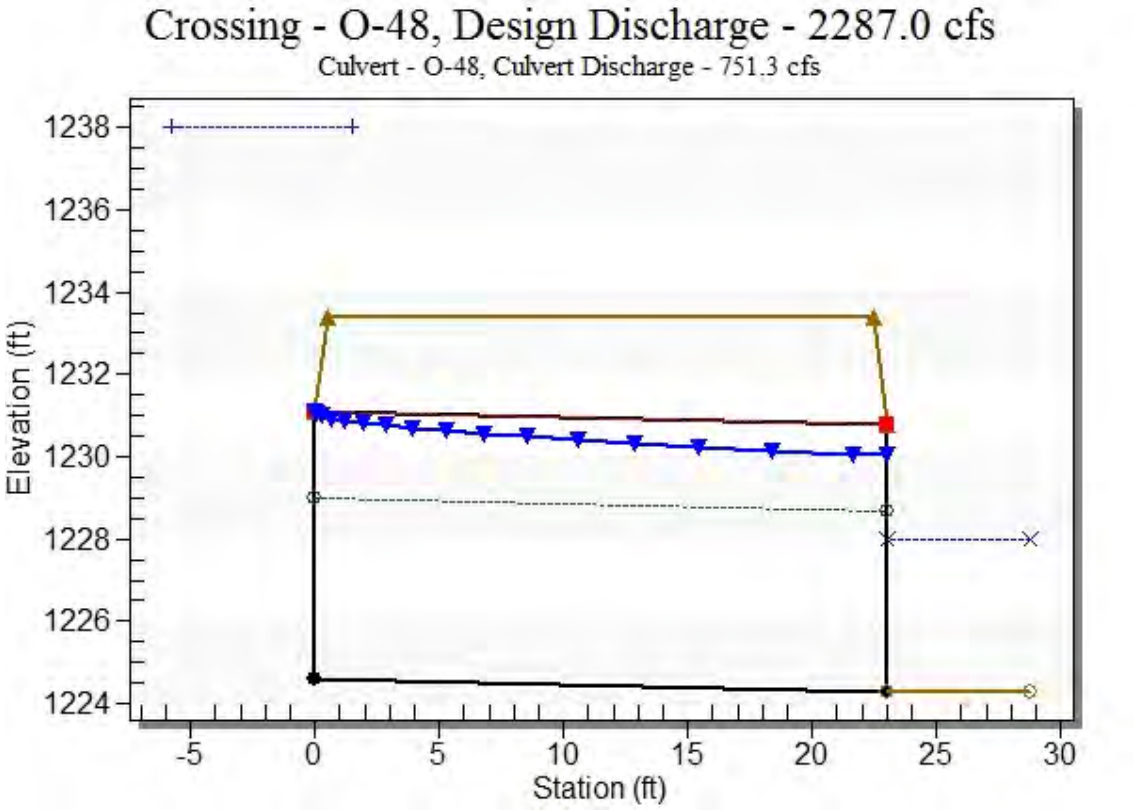
Culvert Length: 23.00 ft, Culvert Slope: 0.0130

****

Culvert Performance Curve Plot: O-48



Water Surface Profile Plot for Culvert: O-48



Site Data - O-48

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1224.60 ft

Outlet Station: 23.00 ft

Outlet Elevation: 1224.30 ft

Number of Barrels: 1

Culvert Data Summary - O-48

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 6.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: NONE

Table 6 - Downstream Channel Rating Curve (Crossing: O-48)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1228.00	3.70
228.70	1228.00	3.70
457.40	1228.00	3.70
686.10	1228.00	3.70
914.80	1228.00	3.70
1143.50	1228.00	3.70
1372.20	1228.00	3.70
1600.90	1228.00	3.70
1829.60	1228.00	3.70
2058.30	1228.00	3.70
2287.00	1228.00	3.70

Tailwater Channel Data - O-48

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1228.00 ft

Roadway Data for Crossing: O-48

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 1233.40 ft

Roadway Surface: Paved

Roadway Top Width: 22.00 ft

Table 7 - Summary of Culvert Flows at Crossing: O-153

Headwater Elevation (ft)	Total Discharge (cfs)	O-153 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
106.10	0.00	0.00	0.00	1
106.69	350.30	350.30	0.00	1
108.42	700.60	700.60	0.00	1
110.81	1050.90	941.30	109.45	6
111.84	1401.20	1024.07	377.04	4
112.67	1751.50	1087.33	664.12	3
113.42	2101.80	1140.51	960.87	3
114.09	2452.10	1186.25	1265.75	3
114.72	2802.40	1227.48	1574.86	3
115.32	3152.70	1265.31	1887.29	3
115.89	3503.00	1300.37	2202.54	3
110.00	872.15	872.15	0.00	Overtopping

Rating Curve Plot for Crossing: O-153

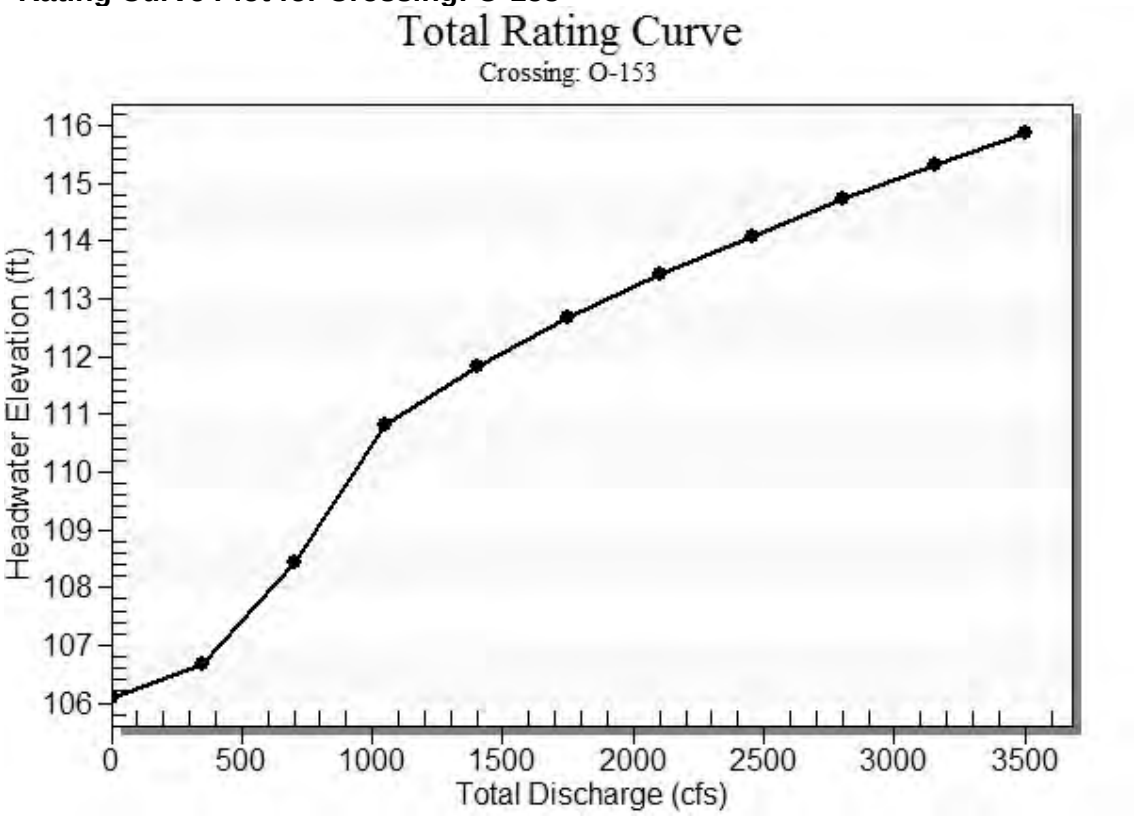


Table 8 - Culvert Summary Table: O-153

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	106.10	0.000	7.100	0-NF	0.000	0.000	7.100	7.100	0.000	0.000
350.30	350.30	106.69	5.712	7.686	8-H2t	-1.000	3.365	7.100	7.100	4.934	0.000
700.60	700.60	108.42	9.179	9.420	8-H2t	-1.000	5.342	7.100	7.100	9.868	0.000
1050.90	941.30	110.81	11.805	11.173	8-JH2t	-1.000	6.504	7.100	7.100	13.258	0.000
1401.20	1024.07	111.84	12.834	11.818	8-JH2t	-1.000	6.880	7.100	7.100	14.424	0.000
1751.50	1087.33	112.67	13.675	12.306	8-JH2c	-1.000	7.161	7.161	7.100	15.185	0.000
2101.80	1140.51	113.42	14.420	12.738	8-H2t	-1.000	7.392	7.392	7.100	15.428	0.000
2452.10	1186.25	114.09	15.090	13.125	8-H2t	-1.000	7.589	7.589	7.100	15.632	0.000
2802.40	1227.48	114.72	15.718	13.488	8-H2t	-1.000	7.764	7.764	7.100	15.811	0.000
3152.70	1265.31	115.32	16.314	13.831	8-H2t	-1.000	7.922	7.922	7.100	15.972	0.000
3503.00	1300.37	115.89	16.885	14.159	8-JH2c	-1.000	8.000	8.000	7.100	16.255	0.000

****

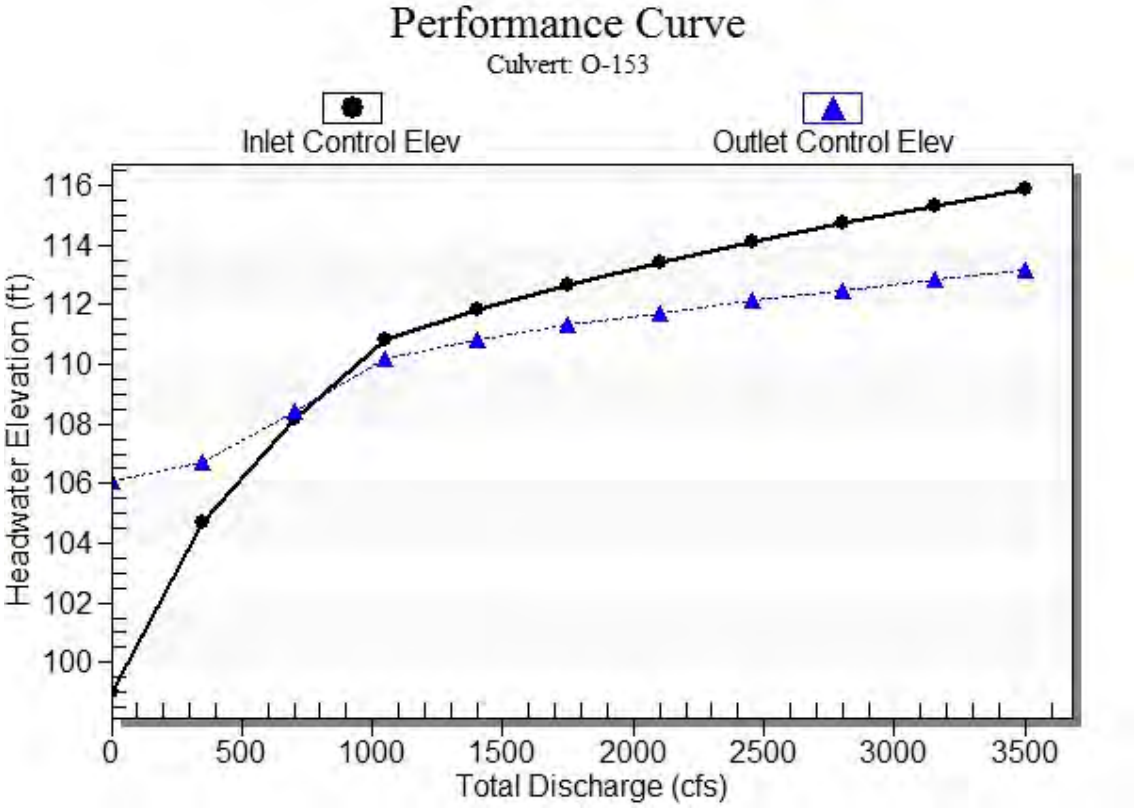
Straight Culvert

Inlet Elevation (invert): 99.00 ft, Outlet Elevation (invert): 99.00 ft

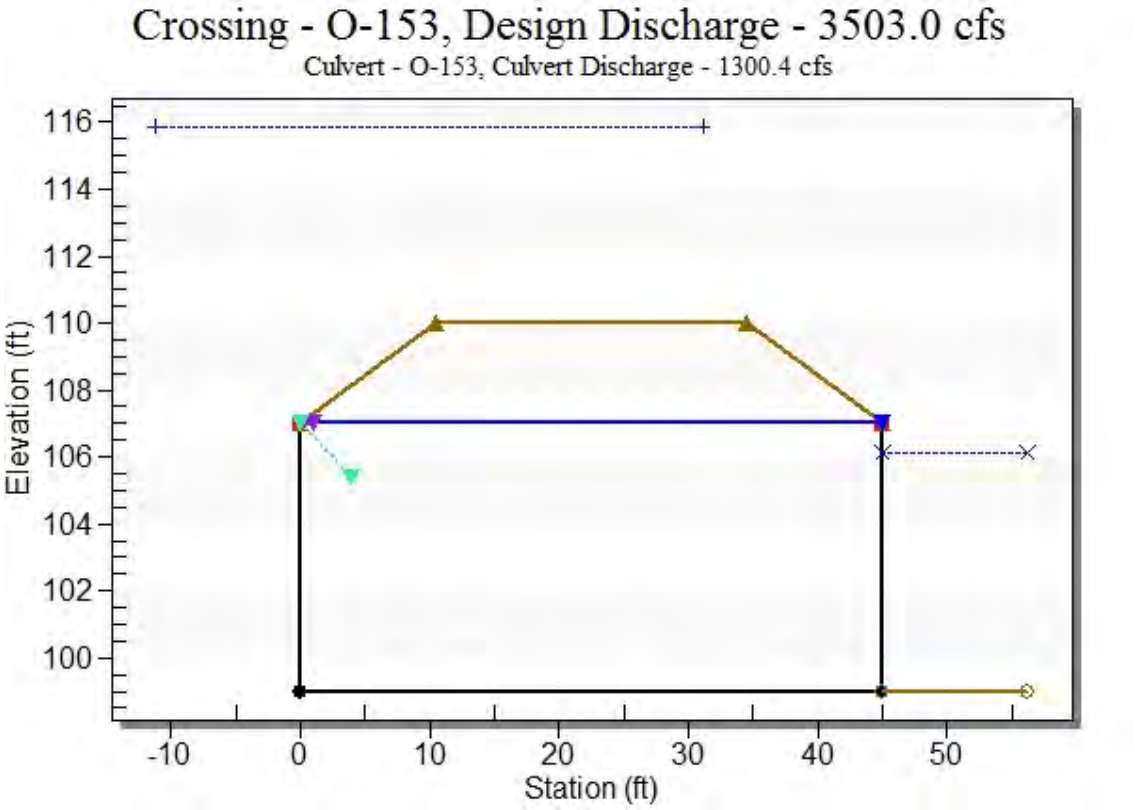
Culvert Length: 45.00 ft, Culvert Slope: 0.0000

****

Culvert Performance Curve Plot: O-153



Water Surface Profile Plot for Culvert: O-153



Site Data - O-153

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 99.00 ft

Outlet Station: 45.00 ft

Outlet Elevation: 99.00 ft

Number of Barrels: 1

Culvert Data Summary - O-153

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 8.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: NONE

Table 9 - Downstream Channel Rating Curve (Crossing: O-153)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	106.10	7.10
350.30	106.10	7.10
700.60	106.10	7.10
1050.90	106.10	7.10
1401.20	106.10	7.10
1751.50	106.10	7.10
2101.80	106.10	7.10
2452.10	106.10	7.10
2802.40	106.10	7.10
3152.70	106.10	7.10
3503.00	106.10	7.10

Tailwater Channel Data - O-153

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 106.10 ft

Roadway Data for Crossing: O-153

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 110.00 ft

Roadway Surface: Paved

Roadway Top Width: 24.00 ft

Table 10 - Summary of Culvert Flows at Crossing: O-192

Headwater Elevation (ft)	Total Discharge (cfs)	O-192 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1243.40	0.00	0.00	0.00	1
1243.98	350.30	350.30	0.00	1
1245.66	700.60	700.60	0.00	1
1247.30	1050.90	899.59	151.27	5
1248.25	1401.20	986.98	414.21	3
1248.49	1500.00	1007.46	492.21	3
1249.79	2101.80	1111.76	989.54	4
1250.44	2452.10	1160.65	1291.35	3
1251.06	2802.40	1204.72	1597.63	3
1251.65	3152.70	1245.14	1907.47	3
1252.22	3503.00	1282.59	2220.33	3
1246.30	797.37	797.37	0.00	Overtopping

Rating Curve Plot for Crossing: O-192

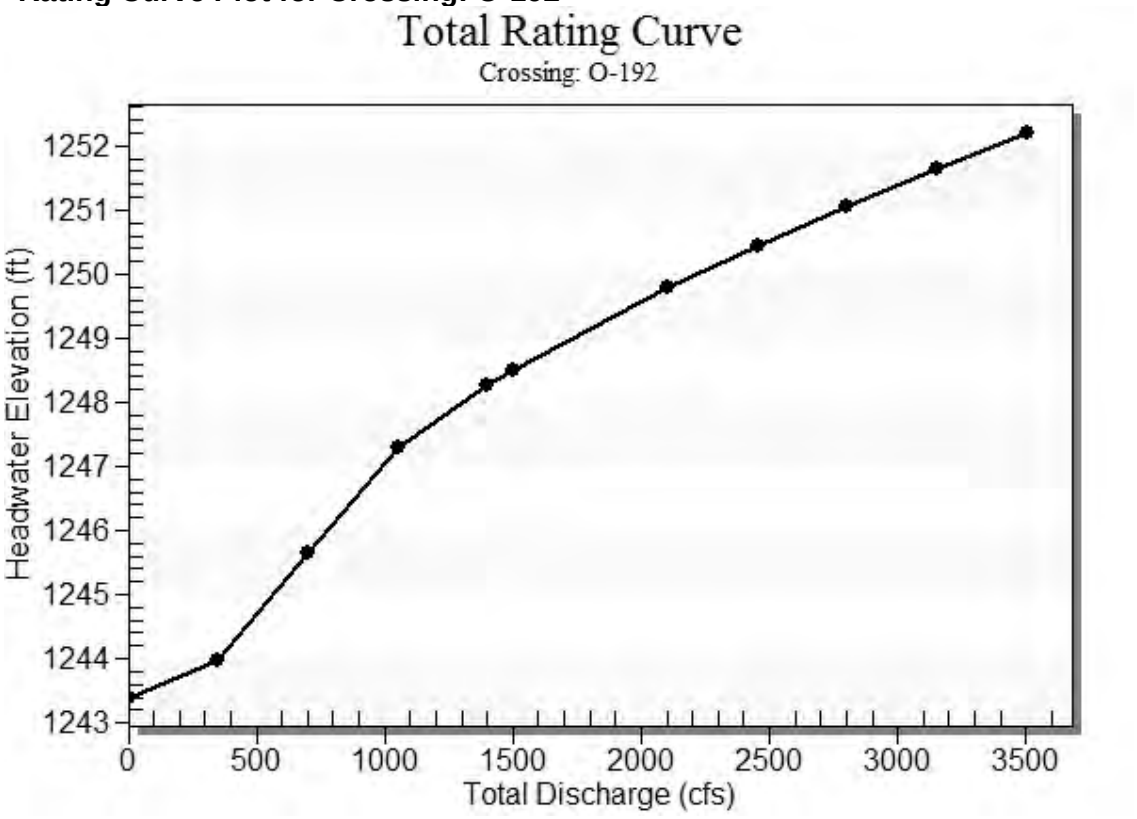


Table 11 - Culvert Summary Table: O-192

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	1243.40	0.000	4.300	0-NF	0.000	0.000	4.400	4.400	0.000	0.000
350.30	350.30	1243.98	3.798	4.878	3-M1t	2.898	2.460	4.400	4.400	4.976	0.000
700.60	700.60	1245.66	6.359	6.559	3-M2t	5.000	3.905	4.400	4.400	9.952	0.000
1050.90	899.59	1247.30	8.199	7.806	7-M2c	5.000	4.613	4.613	4.400	12.188	0.000
1401.20	986.98	1248.25	9.153	8.503	7-M2c	5.000	4.907	4.907	4.400	12.570	0.000
1500.00	1007.46	1248.49	9.391	8.660	7-M2c	5.000	4.975	4.975	4.400	12.657	0.000
2101.80	1111.76	1249.79	10.688	9.479	6-FFc	5.000	5.000	5.000	4.400	13.897	0.000
2452.10	1160.65	1250.44	11.344	9.891	6-FFc	5.000	5.000	5.000	4.400	14.508	0.000
2802.40	1204.72	1251.06	11.963	10.277	6-FFc	5.000	5.000	5.000	4.400	15.059	0.000
3152.70	1245.14	1251.65	12.552	10.644	6-FFc	5.000	5.000	5.000	4.400	15.564	0.000
3503.00	1282.59	1252.22	13.116	10.994	6-FFc	5.000	5.000	5.000	4.400	16.032	0.000

****

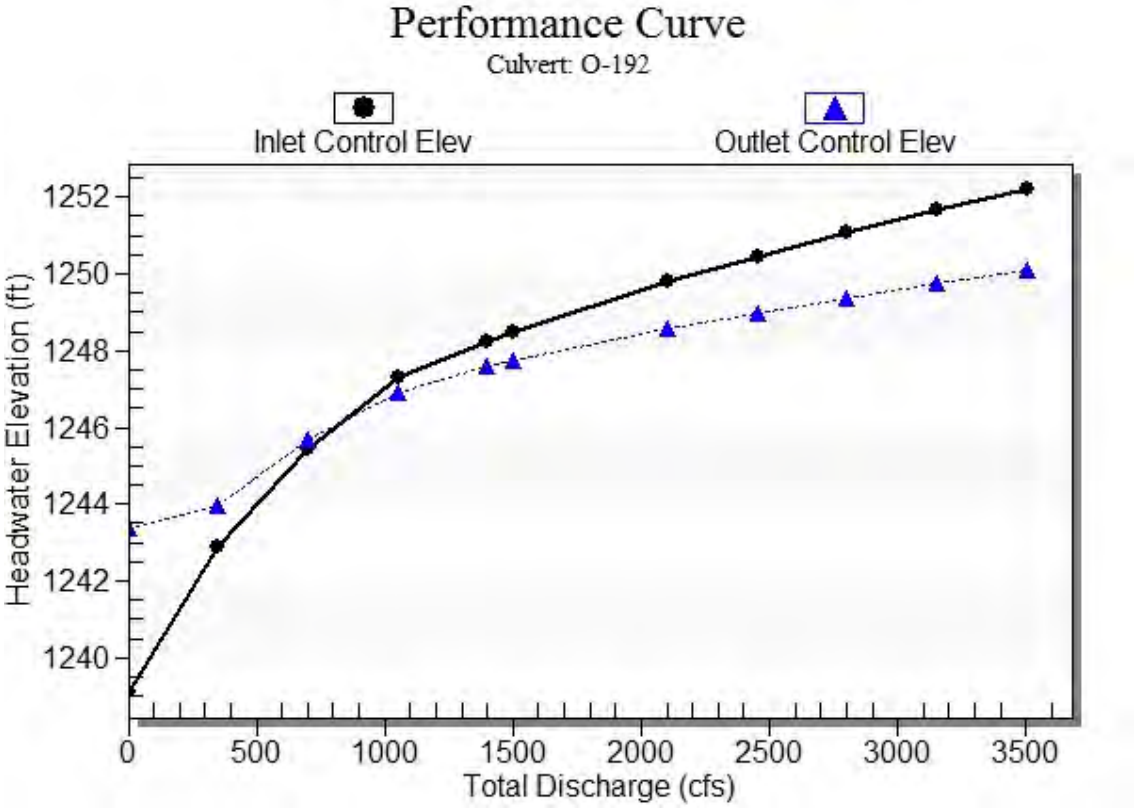
Straight Culvert

Inlet Elevation (invert): 1239.10 ft, Outlet Elevation (invert): 1239.00 ft

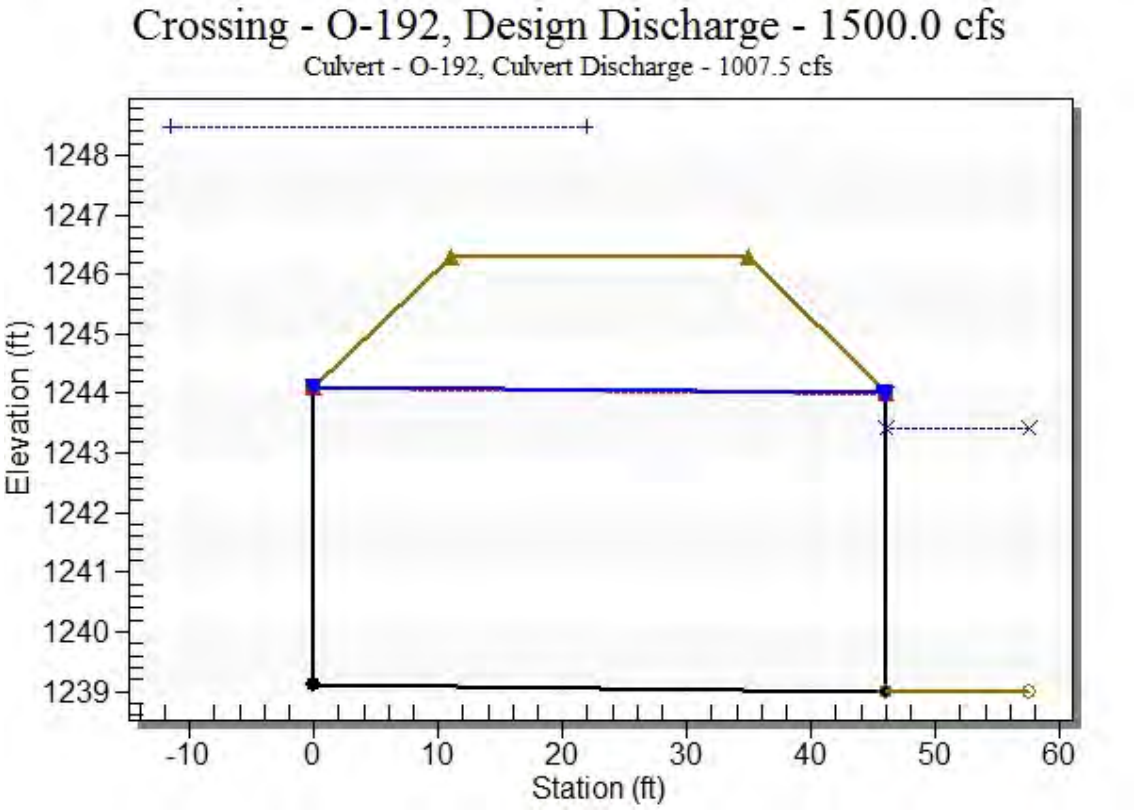
Culvert Length: 46.00 ft, Culvert Slope: 0.0022

****

Culvert Performance Curve Plot: O-192



Water Surface Profile Plot for Culvert: O-192



Site Data - O-192

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1239.10 ft

Outlet Station: 46.00 ft

Outlet Elevation: 1239.00 ft

Number of Barrels: 2

Culvert Data Summary - O-192

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: NONE

Table 12 - Downstream Channel Rating Curve (Crossing: O-192)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1243.40	4.40
350.30	1243.40	4.40
700.60	1243.40	4.40
1050.90	1243.40	4.40
1401.20	1243.40	4.40
1500.00	1243.40	4.40
2101.80	1243.40	4.40
2452.10	1243.40	4.40
2802.40	1243.40	4.40
3152.70	1243.40	4.40
3503.00	1243.40	4.40

Tailwater Channel Data - O-192

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1243.40 ft

Roadway Data for Crossing: O-192

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 1246.30 ft

Roadway Surface: Paved

Roadway Top Width: 24.00 ft

Table 13 - Summary of Culvert Flows at Crossing: O-206

Headwater Elevation (ft)	Total Discharge (cfs)	O-206 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1190.10	0.00	0.00	0.00	1
1190.28	520.00	520.00	0.00	1
1190.80	1040.00	1040.00	0.00	1
1191.69	1560.00	1560.00	0.00	1
1192.69	2080.00	1993.13	86.78	3
1193.56	2600.00	2304.27	295.71	3
1194.43	3120.00	2545.16	575.29	3
1195.33	3640.00	2709.85	930.14	3
1196.16	4160.00	2853.16	1306.82	3
1196.95	4680.00	2981.67	1698.30	3
1197.32	4933.00	3039.68	1893.22	3
1192.00	1707.25	1707.25	0.00	Overtopping

Rating Curve Plot for Crossing: O-206

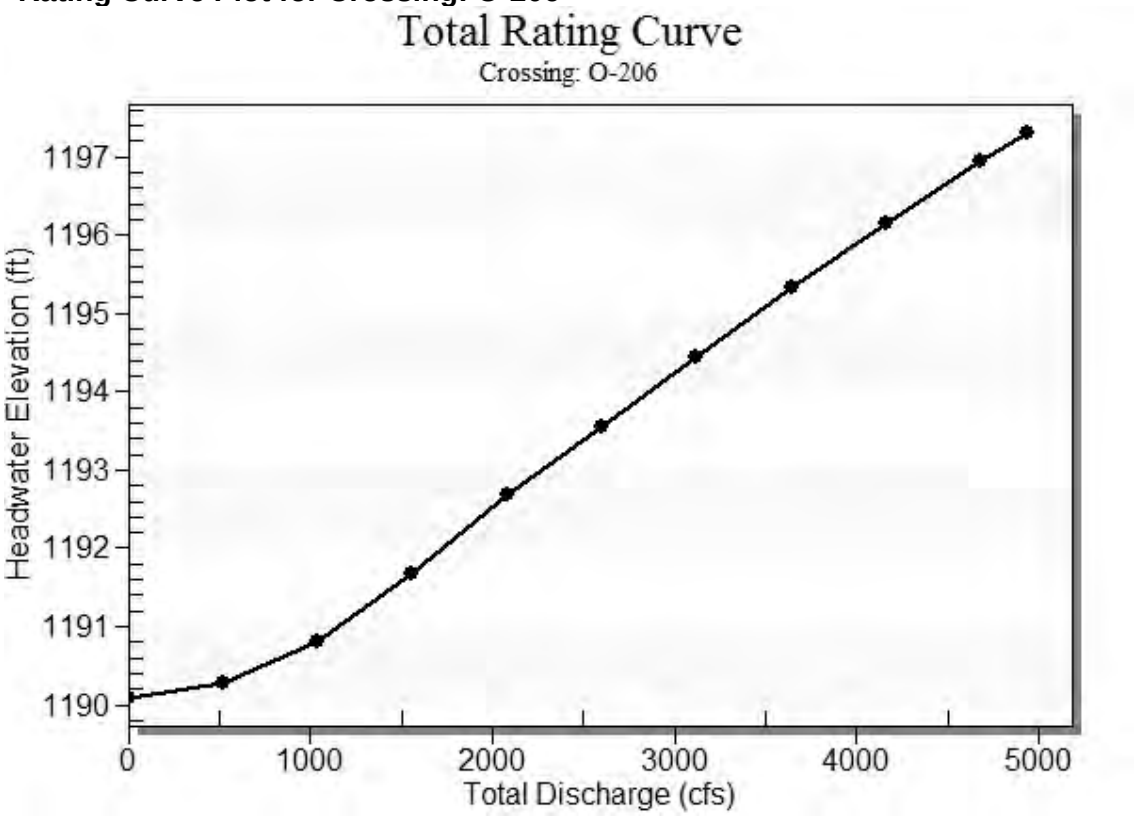


Table 14 - Culvert Summary Table: O-206

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	1190.10	0.000	7.300	0-NF	0.000	0.000	7.000	7.500	0.000	0.000
520.00	520.00	1190.28	3.458	7.476	4-FFf	2.088	2.258	7.000	7.500	2.751	0.000
1040.00	1040.00	1190.80	5.530	8.005	4-FFf	3.413	3.585	7.000	7.500	5.503	0.000
1560.00	1560.00	1191.69	7.367	8.886	4-FFf	4.607	4.698	7.000	7.500	8.254	0.000
2080.00	1993.13	1192.69	9.041	9.889	4-FFf	5.552	5.531	7.000	7.500	10.546	0.000
2600.00	2304.27	1193.56	10.426	10.761	4-FFf	6.214	6.093	7.000	7.500	12.192	0.000
3120.00	2545.16	1194.43	11.631	11.522	4-FFf	7.000	6.511	7.000	7.500	13.466	0.000
3640.00	2709.85	1195.33	12.529	12.086	4-FFf	7.000	6.788	7.000	7.500	14.338	0.000
4160.00	2853.16	1196.16	13.360	12.606	5-FFf	7.000	7.000	7.000	7.500	15.096	0.000
4680.00	2981.67	1196.95	14.147	13.094	5-FFf	7.000	7.000	7.000	7.500	15.776	0.000
4933.00	3039.68	1197.32	14.515	13.322	5-FFf	7.000	7.000	7.000	7.500	16.083	0.000

****

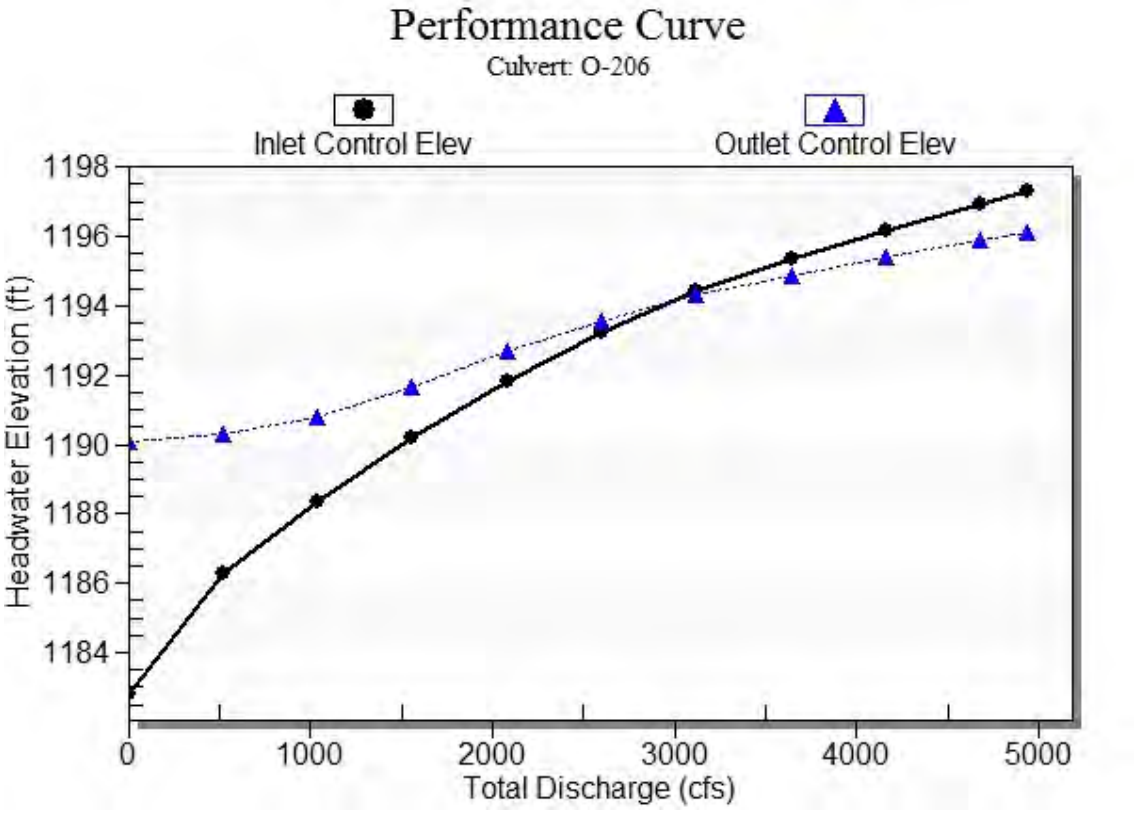
Straight Culvert

Inlet Elevation (invert): 1182.80 ft, Outlet Elevation (invert): 1182.60 ft

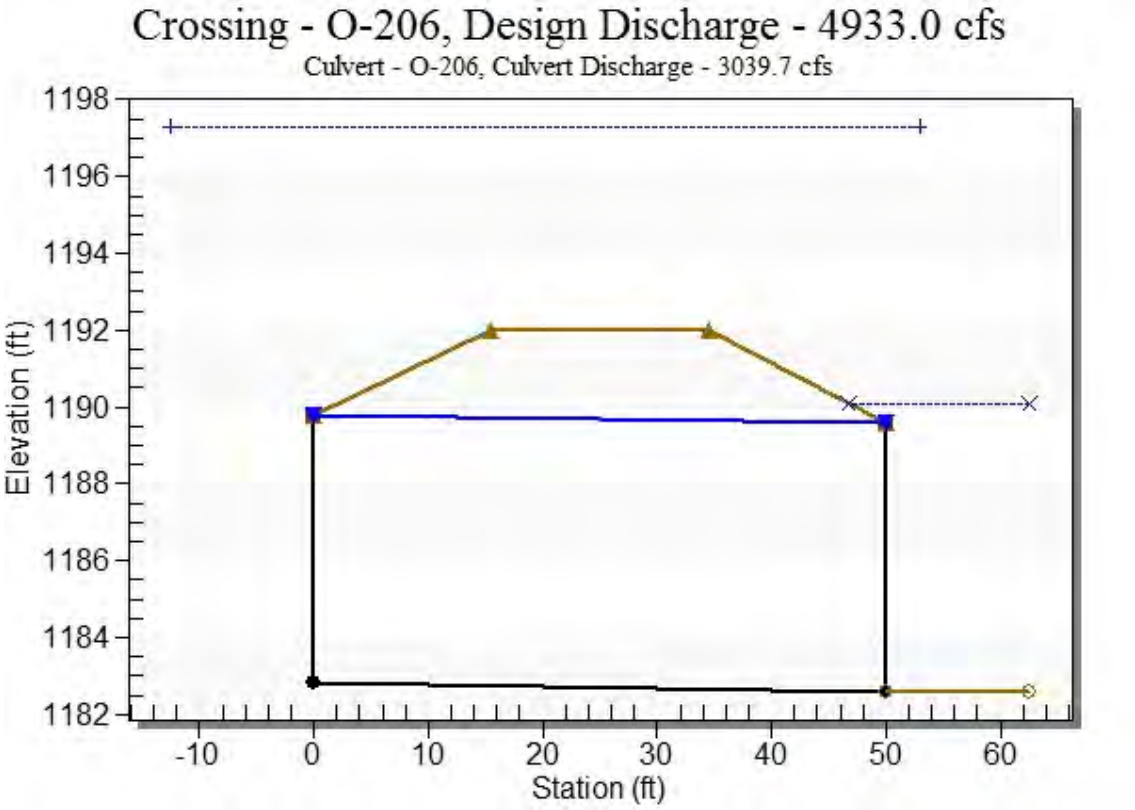
Culvert Length: 50.00 ft, Culvert Slope: 0.0040

****

Culvert Performance Curve Plot: O-206



Water Surface Profile Plot for Culvert: O-206



Site Data - O-206

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1182.80 ft

Outlet Station: 50.00 ft

Outlet Elevation: 1182.60 ft

Number of Barrels: 3

Culvert Data Summary - O-206

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: NONE

Table 15 - Downstream Channel Rating Curve (Crossing: O-206)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1190.10	7.50
520.00	1190.10	7.50
1040.00	1190.10	7.50
1560.00	1190.10	7.50
2080.00	1190.10	7.50
2600.00	1190.10	7.50
3120.00	1190.10	7.50
3640.00	1190.10	7.50
4160.00	1190.10	7.50
4680.00	1190.10	7.50
4933.00	1190.10	7.50

Tailwater Channel Data - O-206

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1190.10 ft

Roadway Data for Crossing: O-206

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 1192.00 ft

Roadway Surface: Paved

Roadway Top Width: 19.00 ft

Table 16 - Summary of Culvert Flows at Crossing: P-38

Headwater Elevation (ft)	Total Discharge (cfs)	P-38 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1355.85	0.00	0.00	0.00	1
1356.45	293.90	293.90	0.00	1
1358.24	587.80	587.80	0.00	1
1359.73	881.70	714.31	167.33	5
1360.57	1175.60	775.91	399.60	3
1361.28	1469.50	824.42	644.93	3
1361.93	1763.40	865.57	897.42	3
1362.51	2057.30	901.24	1155.90	3
1363.06	2351.20	933.42	1417.62	3
1363.59	2645.10	962.90	1682.08	3
1364.09	2939.00	990.38	1948.54	3
1358.66	626.20	626.20	0.00	Overtopping

Rating Curve Plot for Crossing: P-38

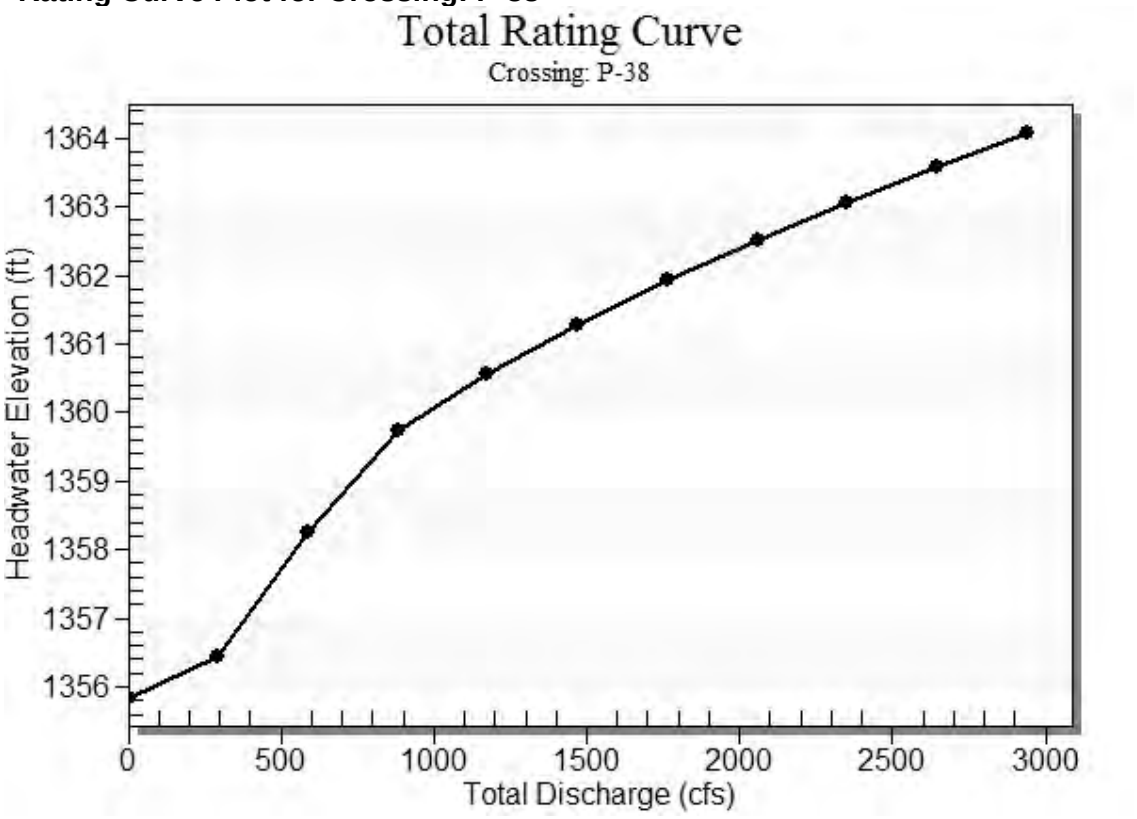


Table 17 - Culvert Summary Table: P-38

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	1355.85	0.000	3.550	0-NF	0.000	0.000	3.650	3.650	0.000	0.000
293.90	293.90	1356.45	3.384	4.154	7-M1t	2.741	2.188	3.650	3.650	5.033	0.000
587.80	587.80	1358.24	5.940	5.831	3-M2t	4.000	3.474	3.650	3.650	10.065	0.000
881.70	714.31	1359.73	7.428	6.968	7-M2c	4.000	3.956	3.956	3.650	11.286	0.000
1175.60	775.91	1360.57	8.267	7.522	6-FFc	4.000	4.000	4.000	3.650	12.124	0.000
1469.50	824.42	1361.28	8.983	7.989	6-FFc	4.000	4.000	4.000	3.650	12.882	0.000
1763.40	865.57	1361.93	9.628	8.408	6-FFc	4.000	4.000	4.000	3.650	13.525	0.000
2057.30	901.24	1362.51	10.214	8.787	6-FFc	4.000	4.000	4.000	3.650	14.082	0.000
2351.20	933.42	1363.06	10.764	9.142	6-FFc	4.000	4.000	4.000	3.650	14.585	0.000
2645.10	962.90	1363.59	11.286	9.478	6-FFc	4.000	4.000	4.000	3.650	15.045	0.000
2939.00	990.38	1364.09	11.787	9.801	6-FFc	4.000	4.000	4.000	3.650	15.475	0.000

****

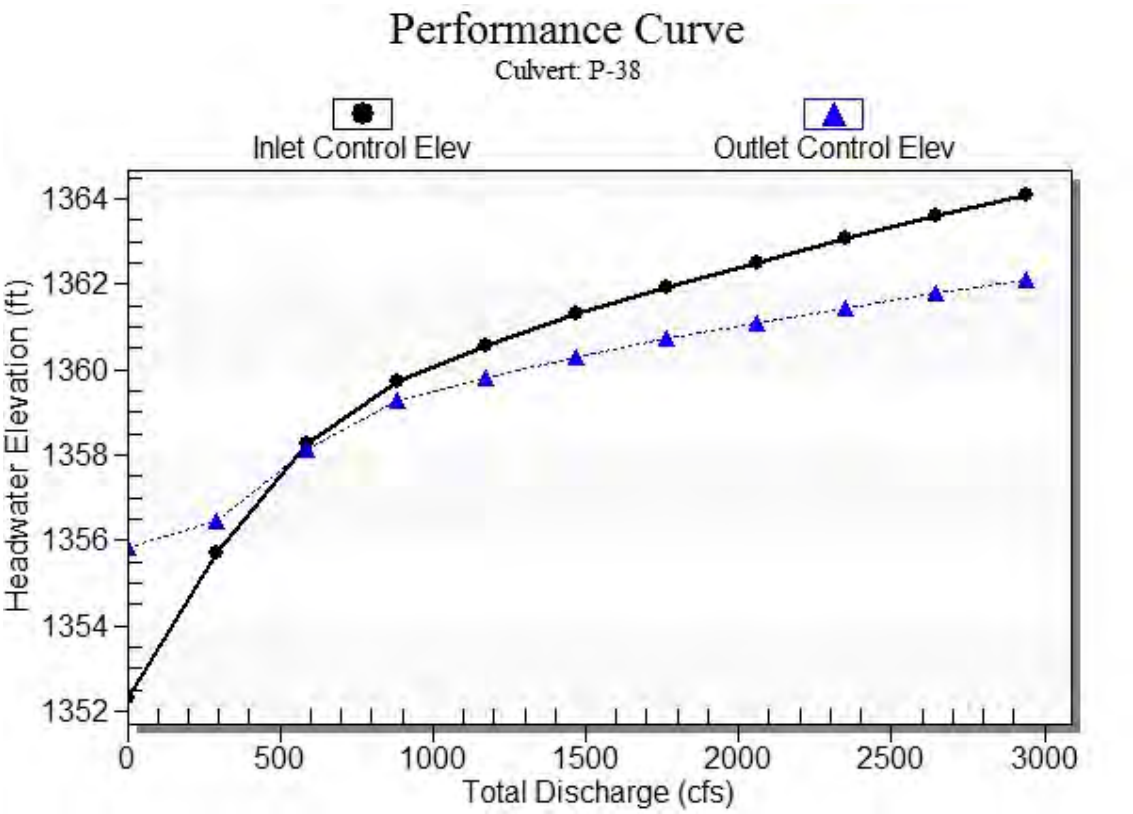
Straight Culvert

Inlet Elevation (invert): 1352.30 ft, Outlet Elevation (invert): 1352.20 ft

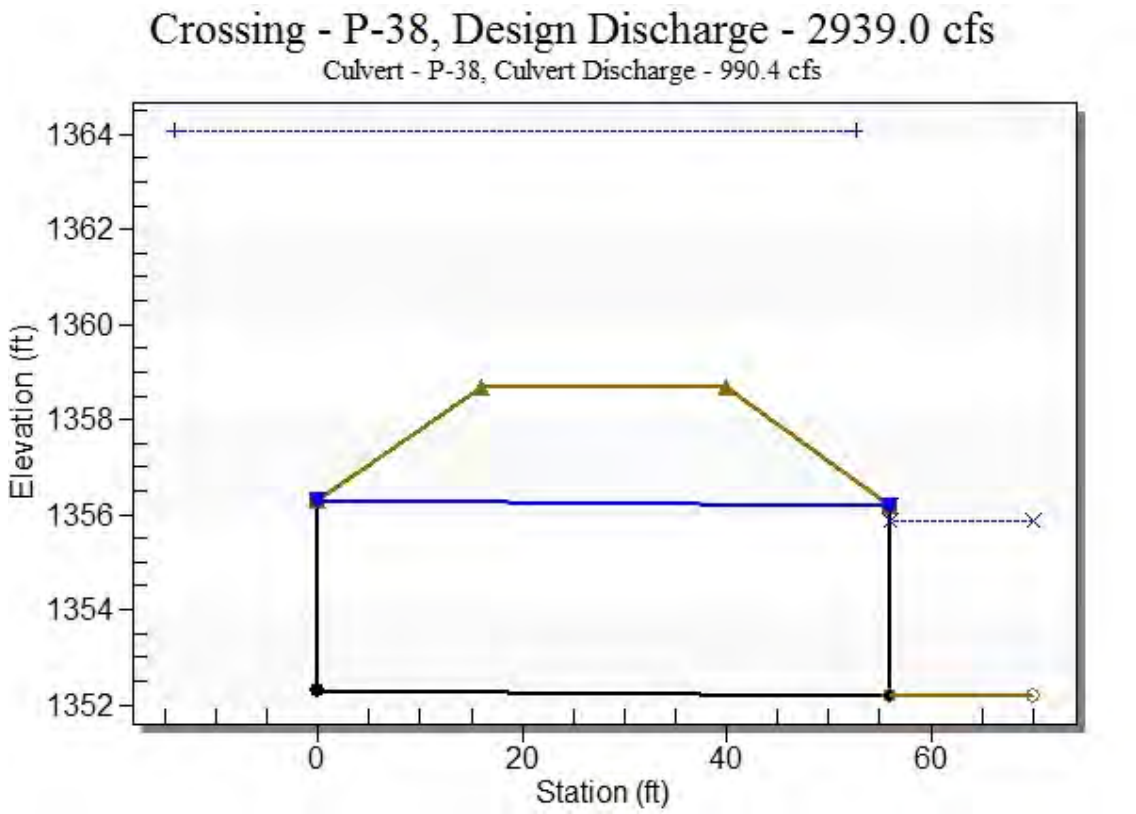
Culvert Length: 56.00 ft, Culvert Slope: 0.0018

****

Culvert Performance Curve Plot: P-38



Water Surface Profile Plot for Culvert: P-38



Site Data - P-38

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1352.30 ft

Outlet Station: 56.00 ft

Outlet Elevation: 1352.20 ft

Number of Barrels: 2

Culvert Data Summary - P-38

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: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: NONE

Table 18 - Downstream Channel Rating Curve (Crossing: P-38)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1355.85	3.65
293.90	1355.85	3.65
587.80	1355.85	3.65
881.70	1355.85	3.65
1175.60	1355.85	3.65
1469.50	1355.85	3.65
1763.40	1355.85	3.65
2057.30	1355.85	3.65
2351.20	1355.85	3.65
2645.10	1355.85	3.65
2939.00	1355.85	3.65

Tailwater Channel Data - P-38

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1355.85 ft

Roadway Data for Crossing: P-38

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 1358.66 ft

Roadway Surface: Paved

Roadway Top Width: 24.00 ft

Table 19 - Summary of Culvert Flows at Crossing: S-86

Headwater Elevation (ft)	Total Discharge (cfs)	S-86 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1242.00	0.00	0.00	0.00	1
1242.14	628.00	628.00	0.00	1
1242.56	1256.00	1256.00	0.00	1
1243.25	1884.00	1884.00	0.00	1
1244.22	2512.00	2512.00	0.00	1
1245.47	3140.00	3140.00	0.00	1
1247.00	3768.00	3768.00	0.00	1
1249.66	4396.00	4396.00	0.00	1
1252.47	5024.00	4936.58	87.40	6
1253.89	5652.00	5186.12	465.55	4
1255.05	6280.00	5380.84	899.01	4
1251.78	4809.57	4809.57	0.00	Overtopping

Rating Curve Plot for Crossing: S-86

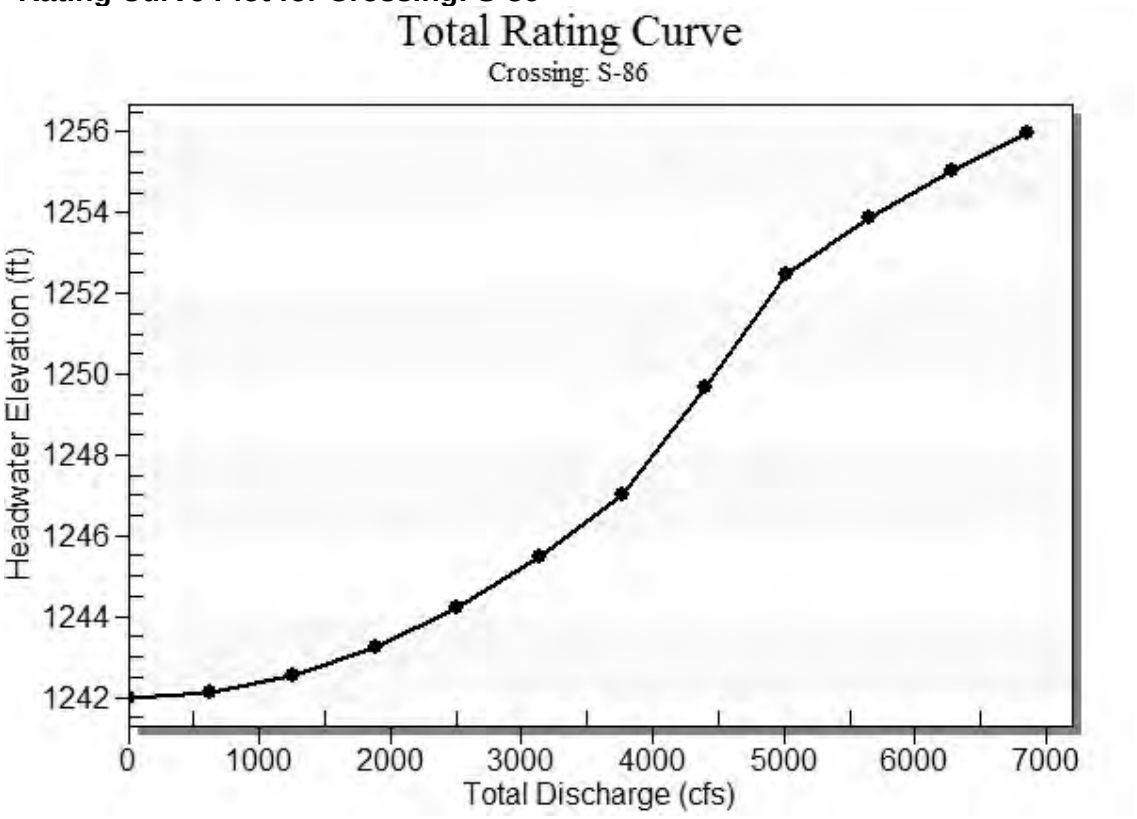


Table 20 - Culvert Summary Table: S-86

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	1242.00	0.000	10.000	0-NF	0.000	0.000	9.000	10.700	0.000	0.000
628.00	628.00	1242.14	4.071	10.139	4-FFf	1.791	2.387	9.000	10.700	2.326	0.000
1256.00	1256.00	1242.56	6.401	10.556	4-FFf	2.891	3.790	9.000	10.700	4.652	0.000
1884.00	1884.00	1243.25	8.376	11.250	4-FFf	3.870	4.966	9.000	10.700	6.978	0.000
2512.00	2512.00	1244.22	10.307	12.223	4-FFf	4.787	6.016	9.000	10.700	9.304	0.000
3140.00	3140.00	1245.47	12.407	13.473	4-FFf	5.665	6.981	9.000	10.700	11.630	0.000
3768.00	3768.00	1247.00	14.826	15.001	4-FFf	6.518	7.883	9.000	10.700	13.956	0.000
4396.00	4396.00	1249.66	17.661	16.807	5-FFf	7.353	8.737	9.000	10.700	16.281	0.000
5024.00	4936.58	1252.47	20.473	18.584	5-FFf	8.060	9.000	9.000	10.700	18.284	0.000
5652.00	5186.12	1253.89	21.892	19.474	5-FFf	9.000	9.000	9.000	10.700	19.208	0.000
6280.00	5380.84	1255.05	23.052	20.199	5-FFf	9.000	9.000	9.000	10.700	19.929	0.000

****

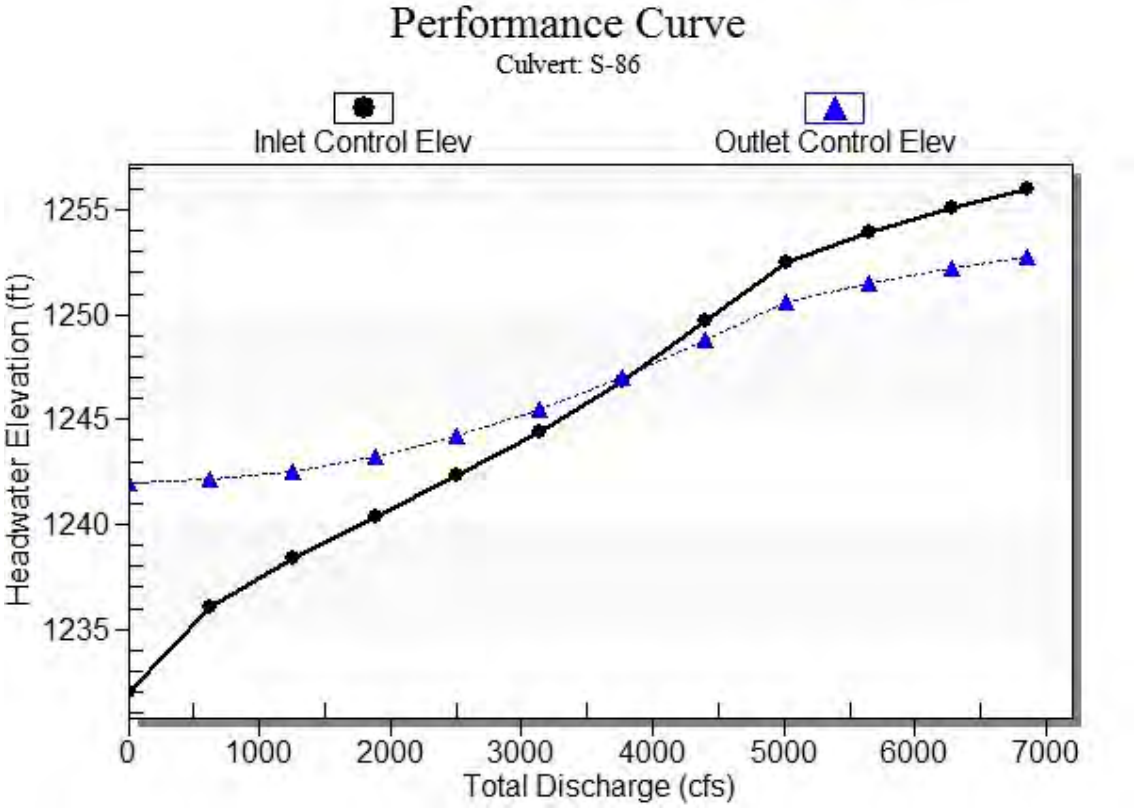
Straight Culvert

Inlet Elevation (invert): 1232.00 ft, Outlet Elevation (invert): 1231.30 ft

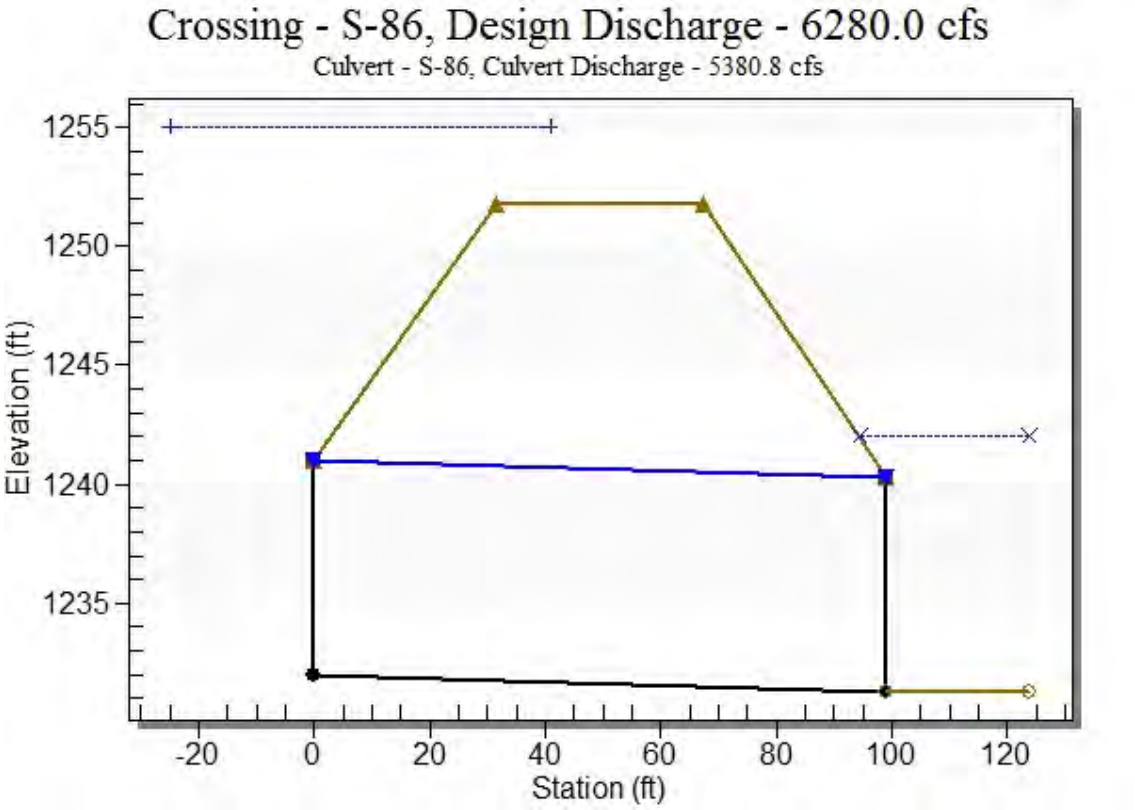
Culvert Length: 99.00 ft, Culvert Slope: 0.0071

****

Culvert Performance Curve Plot: S-86



Water Surface Profile Plot for Culvert: S-86



Site Data - S-86

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1232.00 ft

Outlet Station: 99.00 ft

Outlet Elevation: 1231.30 ft

Number of Barrels: 3

Culvert Data Summary - S-86

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 9.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: NONE

Table 21 - Downstream Channel Rating Curve (Crossing: S-86)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1242.00	10.70
628.00	1242.00	10.70
1256.00	1242.00	10.70
1884.00	1242.00	10.70
2512.00	1242.00	10.70
3140.00	1242.00	10.70
3768.00	1242.00	10.70
4396.00	1242.00	10.70
5024.00	1242.00	10.70
5652.00	1242.00	10.70
6280.00	1242.00	10.70

Tailwater Channel Data - S-86

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1242.00 ft

Roadway Data for Crossing: S-86

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 1251.78 ft

Roadway Surface: Paved

Roadway Top Width: 36.00 ft

This page left intentionally blank