SUPPLEMENTAL FLOODPLAIN STUDY
TEMESCAL CANYON ROAD NEW BRIDGE PROJECT
375-FOOT LONG, 3-SPAN BRIDGE WITH MINOR CHANNEL GRADING
Lake Elsinore, CA
March 23, 2018

In an effort to address review comments from California and US Fish and Wildlife Service and Western Riverside County Regional Conservation Authority (RCA), the proposed Temescal Canyon Road Bridge has been lengthened to meet the Western Riverside County Multiple Species Conservation Plan (MSHCP) regulations. The proposed bridge is 375 feet long and 17.77 feet high (minimum height). Minor channel grading is proposed in Temescal Wash to allow for the relocation of the existing Corp's 404 JD stream and provide for safe passage of the 100-year flow. The proposed bridge design is described in detail below.

Proposed or With-Project Condition

The type of superstructure for the proposed bridge is tentatively selected as a continuous cast-in-place (CIP) post-tensioned concrete box girder. The structure will be supported by two reinforced concrete seat type abutments, and two sets of pier/bent columns (four 6-foot diameter columns). All pier/bent columns will be supported on driven steel H piles. The bridge will consist of a total of three spans**.** The span dimensions are 110 feet between the bridge abutment and the pier and 155 feet between the two piers.

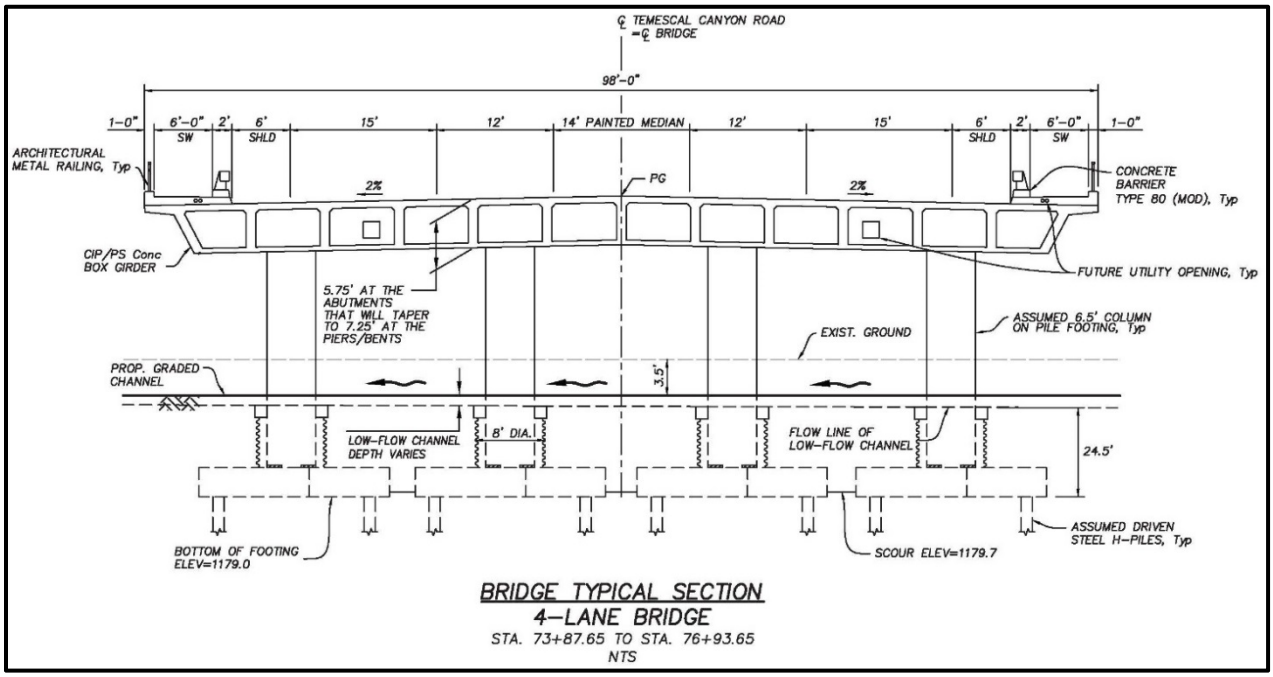


Figure 2: Typical Section of Proposed Temescal Canyon Road Bridge

The proposed bridge is 98-feet wide (with a curb-to-curb width of 80 feet), 375 feet long, 17.77 feet high (minimum), and a structure depth of 5.75 feet at the abutments that will taper to 7.25 feet near the pier/bent. The bridge will be striped with a 14-foot painted median, two 12-foot inside lanes, two 15-foot outside lanes, two 6-foot shoulders that can accommodate a Class II bike lane, and two 6-foot sidewalks separated from vehicular traffic with a concrete barrier, which is

necessary due to a posted speed limit greater than 45 MPH. The roadway slope embankments and cutoff walls will be constructed based on the current bridge design.

The project will include minimal drainage improvements within Temescal Wash. Activities will include minor re-grading of the wash in the vicinity of the bridge and construction of concrete slope protection and cutoff wall to protect the bridge abutments from scour. A 478-foot segment of the existing low flow channel (404 Jurisdictional Delineation) will be relocated to convey low flows through the proposed bridge. The relocated low-flow channel will extend approximately 100 feet downstream of the proposed bridge. It will also extend approximately 250 feet upstream of the proposed bridge. The relocated low-flow channel will be restored to replicate the bio-resource of the existing low-flow channel.

Hydraulic models for the existing and proposed (with-project) conditions were developed using the HEC-RAS model. As shown in Table 1, the 100-year water surface elevations under the proposed condition are lower than the existing condition, from just downstream of the proposed bridge (Station 108111) up to Station 112034 (upstream of the existing Lake Street bridge). The water surface elevations are lower due to the minor grading of the channel (i.e. lower channel invert elevations and somewhat wider flow conveyance area) and improved hydraulic efficiency effected by the proposed bridge. Under the proposed condition, average flow velocities show a slight increase from the proposed bridge upstream to Lake Street Bridge, ranging from 0.01 feet per second to 0.23 feet per second. At Station 108111 (downstream of the proposed bridge), the average flow velocity slightly decreased by 1.83 feet per second.

Table 1: 100-Year Hydraulic Data for the Temescal Canyon Road Bridge for 375-foot, 3-Span Bridge (Existing Versus Proposed Conditions)

Reach	Existing River Sta	Proposed River Sta	Profile	Q Total	Existing W.S. Elev	Proposed W.S. Elev	DELTA	Existing Vel Chnl	Proposed Vel Chnl	DELTA
				(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft/s)	(ft/s)
Temescal Wash	112034	112034	100-Year	8,300	1230.88	1230.85	-0.03	9.49	9.52	0.03
Temescal Wash	111034	111034	100-Year	8,300	1228.08	1227.98	-0.10	7.75	7.98	0.23
Temescal Wash	110484	110484	100-Year	10,400	1225.26	1225.26	0.00	9.97	9.97	0.00
Temescal Wash	110414	110414	100-Year	10,400	1224.82	1224.82	0.00	9.93	9.93	0.00
Temescal Wash	110413	110413	100-Year	10,400	1224.82	1224.81	-0.01	9.93	9.94	0.01
Temescal Wash	110393	110393	**Lake Street Bridge**							
Temescal Wash	110373	110373	100-Year	10,400	1223.73	1223.70	-0.03	11.66	11.71	0.05
Temescal Wash	110372	110372	100-Year	10,400	1223.86	1223.84	-0.02	11.00	11.04	0.04
Temescal Wash	110322	110322	100-Year	10,400	1223.34	1223.30	-0.04	8.96	9.01	0.05
Temescal Wash	109572	109572	100-Year	10,400	1219.93	1219.85	-0.08	2.55	2.58	0.03
Temescal Wash	109492	109492	100-Year	10,400	1219.91	1219.82	-0.09	2.05	2.08	0.03
Temescal Wash	109491	109491	100-Year	10,400	1219.87	1219.79	-0.08	4.00	4.06	0.06
Temescal Wash	109478.5	109478.5	**Existing Temescal Canyon Road Bridge**							
Temescal Wash	109466	109466	100-Year	10,400	1219.82	1219.73	-0.09	4.04	4.11	0.07
Temescal Wash	109465	109465	100-Year	10,400	1219.84	1219.75	-0.09	2.49	2.53	0.04
Temescal Wash	109400	109400	100-Year	10,400	1219.67	1219.59	-0.08	3.30	3.33	0.03
Temescal Wash	108773	108773	100-Year	10,400	1219.02	1218.71	-0.31	3.09	3.24	0.15
Temescal Wash	108690	108690	100-Year	10,400	N/A	1218.51	N/A	N/A	3.86	N/A
Temescal Wash	108605	108608	100-Year	10,400	N/A	1218.37	N/A	N/A	3.85	N/A
Temescal Wash	108500	108500	100-Year	10,400	1218.22	N/A	N/A	4.16	N/A	N/A
Temescal Wash	108462	108462	100-year	10,400	N/A	1218.21	N/A	N/A	3.50	N/A
Temescal Wash	108324	108324	**Proposed Temescal Canyon Road Bridge**							
Temescal Wash	108186	108186	100-year	10,400	N/A	1216.06	N/A	N/A	3.74	N/A
Temescal Wash	108111	108111	100-year	10,400	1215.91	1215.62	-0.29	7.29	5.46	-1.83
Temescal Wash	107700	107700	100-year	10,400	1213.96	1213.96	0.00	6.29	6.29	0.00

Bridge Clearance Allowance or Freeboard for the Proposed or With-Project Condition

As shown in Table 2, under the 100-year and proposed conditions, a bridge clearance allowance or freeboard of 3.11 feet is provided at the upstream face or northeast corner of the bridge. On the other hand, the bridge clearance allowance at the downstream face or northwest corner of the bridge is 5.02 feet as shown in Table 3.

TABLE 2: BRIDGE CLEARANCE ALLOWANCE OR FREEBOARD (UPSTREAM FACE OF BRIDGE)

Location	Bridge Soffit Elevation	100-Year Water Surface Elevation	Bridge Clearance (Feet)
Temescal Canyon Road Bridge	1221.32	1218.21	3.11

TABLE 3: BRIDGE CLEARANCE ALLOWANCE OR FREEBOARD (DOWNSTREAM FACE OF BRIDGE)

Location	Bridge Soffit Elevation	100-Year Water Surface Elevation	Bridge Clearance (Feet)
Temescal Canyon Road Bridge	1221.08	1216.06	5.02

Debris loading of 1-foot was added to each side of the pier as well as bulking factors of 1.2, 1.35, and 1.5 to the 100-year peak discharge to evaluate the impacts of potential debris flows to the bridge clearance allowance (see Tables 4 and 5). Based on the results of the analysis, it was determined that under the 1.2 bulked flow condition, the bridge clearance allowances are 2.33 feet (1221.32 – 1218.99) and 4.34 feet (1221.08 – 1216.74) at the upstream face and downstream face of the bridge, respectively. For the 1.35 bulked flow condition, the bridge clearance allowances are 1.77 feet (1221.32 – 1219.55) at the upstream face and 3.87 feet (1221.08 – 1217.21) at the downstream face while for the 1.5 bulked flow condition, the bridge clearance allowances are 1.25 feet (1221.32 – 1220.07) at the upstream face and 3.42 feet (1221.08 – 1217.66) at the downstream face.

TABLE 4: BRIDGE CLEARANCE ALLOWANCE OR FREEBOARD BASED ON BULKED CONDITION (UPSTREAM FACE OF BRIDGE)

Bulking Factor	Bridge Soffit Elevation	Bulked 100-Year Water Surface Elevation	Bridge Clearance (Feet)
1.2	1221.32	1218.99	2.33
1.35	1221.32	1219.55	1.77
1.5	1221.32	1220.07	1.25

TABLE 5: BRIDGE CLEARANCE ALLOWANCE OR FREEBOARD BASED ON BULKED CONDITION (DOWSNTREAM FACE OF BRIDGE)

Bulking Factor	Bridge Soffit Elevation	Bulked 100-Year Water Surface Elevation	Bridge Clearance (Feet)
1.2	1221.08	1216.74	4.34
1.35	1221.08	1217.21	3.87
1.5	1221.08	1217.66	3.42

The HEC-RAS results and 100-year floodplain map for this proposed bridge design can be found in Appendix A and Exhibit "A", respectively, in the back of this supplemental report.

APPENDIX A.1: HEC-RAS SUMMARY OUTPUT FILES FOR THE PROPOSED CONDITION FOR THE 100-YEAR FLOOD EVENT

HEC-RAS Plan: 9-5-17 Extended Bridge-rev River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	112034	100-YR	8300.00	1220.21	1230.85		1232.26	0.003780	9.52	871.97	93.94	0.55
Reach-1	112034	1.2X100-YR	9960.00	1220.21	1231.42		1233.22	0.004554	10.75	926.11	95.22	0.61
Reach-1	112034	1.5X100-YR	12450.00	1220.21	1233.68		1235.51	0.003801	10.86	1146.80	100.30	0.57
Reach-1	112034	200-YR	15189.00	1220.21	1234.75		1237.02	0.004293	12.09	1262.82	123.31	0.61
Reach-1	112034	1.35X100-YR	11205.00	1220.21	1233.21		1234.82	0.003479	10.19	1099.76	99.24	0.54
Reach-1	111034	100-YR	8300.00	1218.21	1227.98	1225.50	1228.77	0.002813	7.98	1403.23	768.97	0.48
Reach-1	111034	1.2X100-YR	9960.00	1218.21	1228.91	1227.76	1229.53	0.002122	7.33	1820.99	800.96	0.42
Reach-1	111034	1.5X100-YR	12450.00	1218.21	1232.69	1228.28	1232.89	0.000454	4.23	3576.62	1058.86	0.20
Reach-1	111034	200-YR	15189.00	1218.21	1233.82	1228.72	1234.04	0.000436	4.37	4113.17	1151.42	0.20
Reach-1	111034	1.35X100-YR	11205.00	1218.21	1232.24	1228.03	1232.43	0.000445	4.09	3362.88	1021.98	0.20
Reach-1	110484	100-YR	10400.00	1217.21	1225.26	1223.80	1226.72	0.005064	9.97	1089.61	799.72	0.64
Reach-1	110484	1.2X100-YR	12480.00	1217.21	1226.28	1224.47	1227.83	0.004629	10.27	1260.69	857.22	0.62
Reach-1	110484	1.5X100-YR	15600.00	1217.21	1231.71	1225.37	1232.47	0.001225	7.05	2221.51	1299.28	0.34
Reach-1	110484	200-YR	19032.00	1217.21	1232.60	1226.29	1233.60	0.001444	8.00	2382.69	1338.60	0.38
Reach-1	110484	1.35X100-YR	14040.00	1217.21	1231.38	1224.93	1232.03	0.001084	6.53	2163.14	1283.51	0.32
Reach-1	110414	100-YR	10400.00	1214.61	1224.82	1222.89	1226.35	0.005187	9.93	1046.84	477.21	0.65
Reach-1	110414	1.2X100-YR	12480.00	1214.61	1225.74	1223.65	1227.47	0.005140	10.57	1180.25	548.73	0.66
Reach-1	110414	1.5X100-YR	15600.00	1214.61	1231.46	1224.69	1232.37	0.001372	7.63	2045.25	1249.80	0.37
Reach-1	110414	200-YR	19032.00	1214.61	1232.27	1225.74	1233.47	0.001682	8.78	2167.62	1335.73	0.41
Reach-1	110414	1.35X100-YR	14040.00	1214.61	1231.18	1224.18	1231.94	0.001193	7.01	2002.19	1219.55	0.34
Reach-1	110413	100-YR	10400.00	1214.61	1224.81	1222.89	1226.35	0.001299	9.94	1046.28	476.91	0.65
Reach-1	110413	1.2X100-YR	12480.00	1214.61	1225.73	1223.65	1227.47	0.001287	10.58	1179.68	548.42	0.66
Reach-1	110413	1.5X100-YR	15600.00	1214.61	1231.46	1224.69	1232.37	0.000343	7.63	2045.08	1249.68	0.37
Reach-1	110413	200-YR	19032.00	1214.61	1232.27	1225.74	1233.47	0.000421	8.78	2167.42	1335.59	0.41
Reach-1	110413	1.35X100-YR	14040.00	1214.61	1231.18	1224.18	1231.94	0.000298	7.01	2002.06	1219.46	0.34
Reach-1	110393		Bridge									
Reach-1	110373	100-YR	10400.00	1214.61	1223.70	1222.89	1225.84	0.002171	11.71	888.20	390.35	0.82
Reach-1	110373	1.2X100-YR	12480.00	1214.61	1224.27	1223.65	1226.85	0.002383	12.89	968.41	434.52	0.87
Reach-1	110373	1.5X100-YR	15600.00	1214.61	1225.03	1224.69	1228.29	0.002662	14.47	1077.97	494.02	0.93
Reach-1	110373	200-YR	19032.00	1214.61	1225.78	1225.74	1229.78	0.002932	16.03	1187.55	552.60	0.99
Reach-1	110373	1.35X100-YR	14040.00	1214.61	1224.66	1224.18	1227.58	0.002527	13.70	1024.66	465.19	0.90
Reach-1	110372	100-YR	10400.00	1214.61	1223.84	1223.14	1225.70	0.016972	11.04	956.57	400.60	0.77

HEC-RAS Plan: 9-5-17 Extended Bridge-rev River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	110372	1.2X100-YR	12480.00	1214.61	1224.49	1223.83	1226.62	0.017324	11.80	1069.72	451.87	0.79
Reach-1	110372	1.5X100-YR	15600.00	1214.61	1225.40	1224.70	1227.91	0.017604	12.74	1227.79	522.52	0.81
Reach-1	110372	200-YR	19032.00	1214.61	1226.32	1225.59	1229.23	0.017701	13.60	1390.69	594.20	0.82
Reach-1	110372	1.35X100-YR	14040.00	1214.61	1224.96	1224.28	1227.28	0.017484	12.29	1150.41	488.07	0.80
Reach-1	110322	100-YR	10400.00	1216.75	1223.30	1222.19	1224.92	0.011147	9.01	1050.92	784.60	0.62
Reach-1	110322	1.2X100-YR	12480.00	1216.75	1223.93	1222.82	1225.84	0.011225	9.62	1166.82	804.87	0.64
Reach-1	110322	1.5X100-YR	15600.00	1216.75	1224.79	1223.69	1227.14	0.011337	10.43	1325.71	852.89	0.65
Reach-1	110322	200-YR	19032.00	1216.75	1225.66	1224.60	1228.47	0.011386	11.21	1487.63	944.67	0.66
Reach-1	110322	1.35X100-YR	14040.00	1216.75	1224.37	1223.25	1226.50	0.011276	10.04	1248.39	819.14	0.64
Reach-1	109572	100-YR	10400.00	1210.61	1219.85		1219.98	0.000835	2.58	3787.27	616.80	0.17
Reach-1	109572	1.2X100-YR	12480.00	1210.61	1220.66		1220.80	0.000799	2.71	4287.95	626.87	0.17
Reach-1	109572	1.5X100-YR	15600.00	1210.61	1221.78		1221.94	0.000756	2.88	4999.52	640.90	0.17
Reach-1	109572	200-YR	19032.00	1210.61	1222.97		1223.15	0.000705	3.02	5774.04	681.23	0.17
Reach-1	109572	1.35X100-YR	14040.00	1210.61	1221.23		1221.39	0.000776	2.80	4650.59	634.06	0.17
Reach-1	109492	100-YR	10400.00	1210.01	1219.82		1219.92	0.000398	2.08	4286.75	678.14	0.12
Reach-1	109492	1.2X100-YR	12480.00	1210.01	1220.63		1220.74	0.000385	2.18	4838.87	686.23	0.12
Reach-1	109492	1.5X100-YR	15600.00	1210.01	1221.76		1221.89	0.000369	2.29	5619.25	697.51	0.12
Reach-1	109492	200-YR	19032.00	1210.01	1222.95		1223.10	0.000348	2.39	6462.25	733.08	0.12
Reach-1	109492	1.35X100-YR	14040.00	1210.01	1221.21		1221.33	0.000376	2.24	5237.27	692.02	0.12
Reach-1	109491	100-YR	10400.00	1210.01	1219.79	1215.98	1219.92	0.000704	4.06	3998.77	677.78	0.24
Reach-1	109491	1.2X100-YR	12480.00	1210.01	1220.60	1216.40	1220.74	0.000680	4.23	4552.01	685.89	0.24
Reach-1	109491	1.5X100-YR	15600.00	1210.01	1221.73	1216.68	1221.89	0.000650	4.44	5333.88	697.20	0.24
Reach-1	109491	200-YR	19032.00	1210.01	1222.92	1217.10	1223.09	0.000614	4.62	6177.84	731.25	0.23
Reach-1	109491	1.35X100-YR	14040.00	1210.01	1221.18	1216.51	1221.33	0.000664	4.34	4951.22	691.69	0.24
Reach-1	109478.5		Bridge									
Reach-1	109466	100-YR	10400.00	1210.01	1219.73		1219.86	0.000725	4.11	3960.97	677.22	0.24
Reach-1	109466	1.2X100-YR	12480.00	1210.01	1220.55		1220.69	0.000696	4.26	4517.44	685.39	0.24
Reach-1	109466	1.5X100-YR	15600.00	1210.01	1221.69		1221.84	0.000662	4.47	5302.74	696.75	0.24
Reach-1	109466	200-YR	19032.00	1210.01	1222.88		1223.06	0.000622	4.64	6149.14	728.76	0.23
Reach-1	109466	1.35X100-YR	14040.00	1210.01	1221.13		1221.28	0.000677	4.37	4918.47	691.21	0.24
Reach-1	109465	100-YR	10400.00	1210.01	1219.75		1219.84	0.000810	2.53	4236.12	677.39	0.15
Reach-1	109465	1.2X100-YR	12480.00	1210.01	1220.57		1220.67	0.000786	2.65	4792.56	685.56	0.15

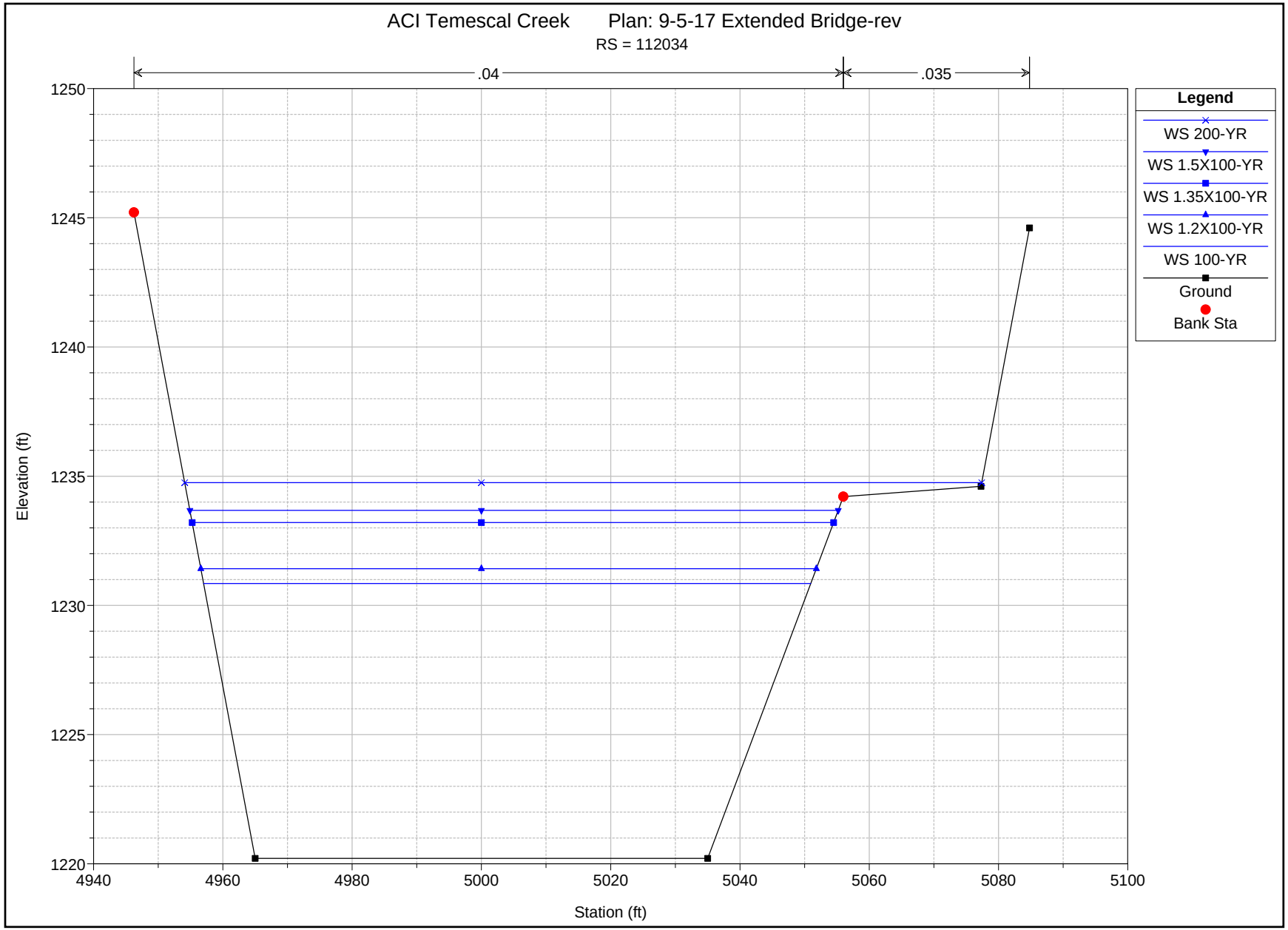
HEC-RAS Plan: 9-5-17 Extended Bridge-rev River: RIVER-1 Reach: Reach-1 (Continued)

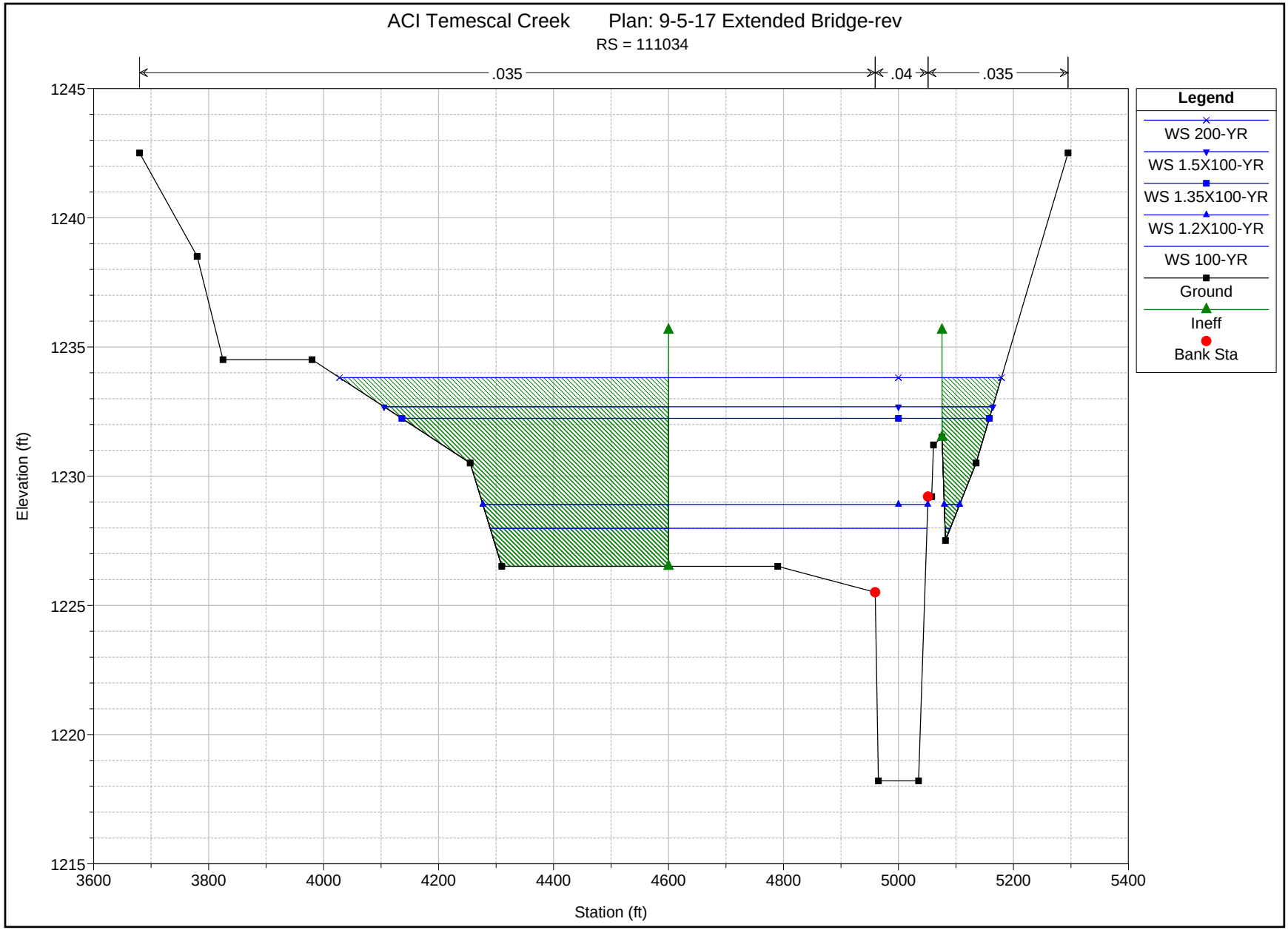
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	109465	1.5X100-YR	15600.00	1210.01	1221.70		1221.82	0.000755	2.80	5577.80	696.92	0.15
Reach-1	109465	200-YR	19032.00	1210.01	1222.90		1223.04	0.000715	2.93	6424.31	729.79	0.15
Reach-1	109465	1.35X100-YR	14040.00	1210.01	1221.15		1221.26	0.000769	2.73	5193.53	691.38	0.15
Reach-1	109400	100-YR	10400.00	1210.00	1219.59	1215.98	1219.77	0.001573	3.33	3091.60	571.19	0.21
Reach-1	109400	1.2X100-YR	12480.00	1210.00	1220.41	1216.34	1220.60	0.001456	3.42	3560.61	581.11	0.20
Reach-1	109400	1.5X100-YR	15600.00	1210.00	1221.54	1216.79	1221.75	0.001331	3.55	4215.65	593.25	0.20
Reach-1	109400	200-YR	19032.00	1210.00	1222.73	1217.25	1222.97	0.001213	3.66	4909.69	774.62	0.19
Reach-1	109400	1.35X100-YR	14040.00	1210.00	1220.99	1216.58	1221.19	0.001386	3.49	3896.36	588.26	0.20
Reach-1	108773	100-YR	10400.00	1207.50	1218.71	1214.24	1218.88	0.001242	3.24	3094.38	567.45	0.19
Reach-1	108773	1.2X100-YR	12480.00	1207.50	1219.55	1214.63	1219.75	0.001230	3.42	3475.84	583.29	0.19
Reach-1	108773	1.5X100-YR	15600.00	1207.50	1220.71	1215.14	1220.95	0.001216	3.66	4001.47	603.20	0.19
Reach-1	108773	200-YR	19032.00	1207.50	1221.94	1215.65	1222.21	0.001183	3.86	4556.29	615.57	0.19
Reach-1	108773	1.35X100-YR	14040.00	1207.50	1220.15	1214.88	1220.37	0.001220	3.54	3746.88	594.49	0.19
Reach-1	108690	100-YR	10400.00	1207.00	1218.51	1214.10	1218.75	0.002230	3.86	2700.75	1082.75	0.25
Reach-1	108690	1.2X100-YR	12480.00	1207.00	1219.35	1214.50	1219.61	0.002243	4.15	3007.94	1085.80	0.25
Reach-1	108690	1.5X100-YR	15600.00	1207.00	1220.49	1215.01	1220.81	0.002261	4.53	3430.70	1089.99	0.26
Reach-1	108690	200-YR	19032.00	1207.00	1221.70	1215.59	1222.08	0.002236	4.88	3878.04	1094.43	0.26
Reach-1	108690	1.35X100-YR	14040.00	1207.00	1219.94	1214.78	1220.23	0.002248	4.34	3226.08	1087.97	0.26
Reach-1	108608	100-YR	10400.00	1206.50	1218.37	1211.27	1218.59	0.001415	3.85	2739.97	1038.12	0.21
Reach-1	108608	1.2X100-YR	12480.00	1206.50	1219.18	1211.84	1219.46	0.001576	4.27	2962.75	1041.11	0.22
Reach-1	108608	1.5X100-YR	15600.00	1206.50	1220.29	1212.59	1220.64	0.001783	4.83	3267.59	1044.03	0.24
Reach-1	108608	200-YR	19032.00	1206.50	1221.46	1213.45	1221.90	0.001943	5.35	3590.33	1047.09	0.25
Reach-1	108608	1.35X100-YR	14040.00	1206.50	1219.75	1212.21	1220.07	0.001682	4.55	3120.29	1042.62	0.23
Reach-1	108462	100-YR	10400.00	1205.70	1218.21	1209.79	1218.40	0.001135	3.50	2969.79	265.17	0.18
Reach-1	108462	1.2X100-YR	12480.00	1205.70	1218.99	1210.30	1219.23	0.001313	3.93	3178.48	265.17	0.20
Reach-1	108462	1.5X100-YR	15600.00	1205.70	1220.07	1211.03	1220.39	0.001557	4.50	3464.10	265.17	0.22
Reach-1	108462	200-YR	19032.00	1205.70	1221.22	1211.79	1221.61	0.001770	5.05	3768.14	265.17	0.24
Reach-1	108462	1.35X100-YR	14040.00	1205.70	1219.55	1210.67	1219.83	0.001437	4.22	3326.17	265.17	0.21
Reach-1	108324		Bridge									
Reach-1	108186	100-YR	10400.00	1204.24	1216.06		1216.28	0.001312	3.74	2778.44	250.64	0.20
Reach-1	108186	1.2X100-YR	12480.00	1204.24	1216.74		1217.01	0.001567	4.23	2948.79	252.42	0.22
Reach-1	108186	1.5X100-YR	15600.00	1204.24	1217.66		1218.03	0.002015	4.88	3194.77	265.17	0.25

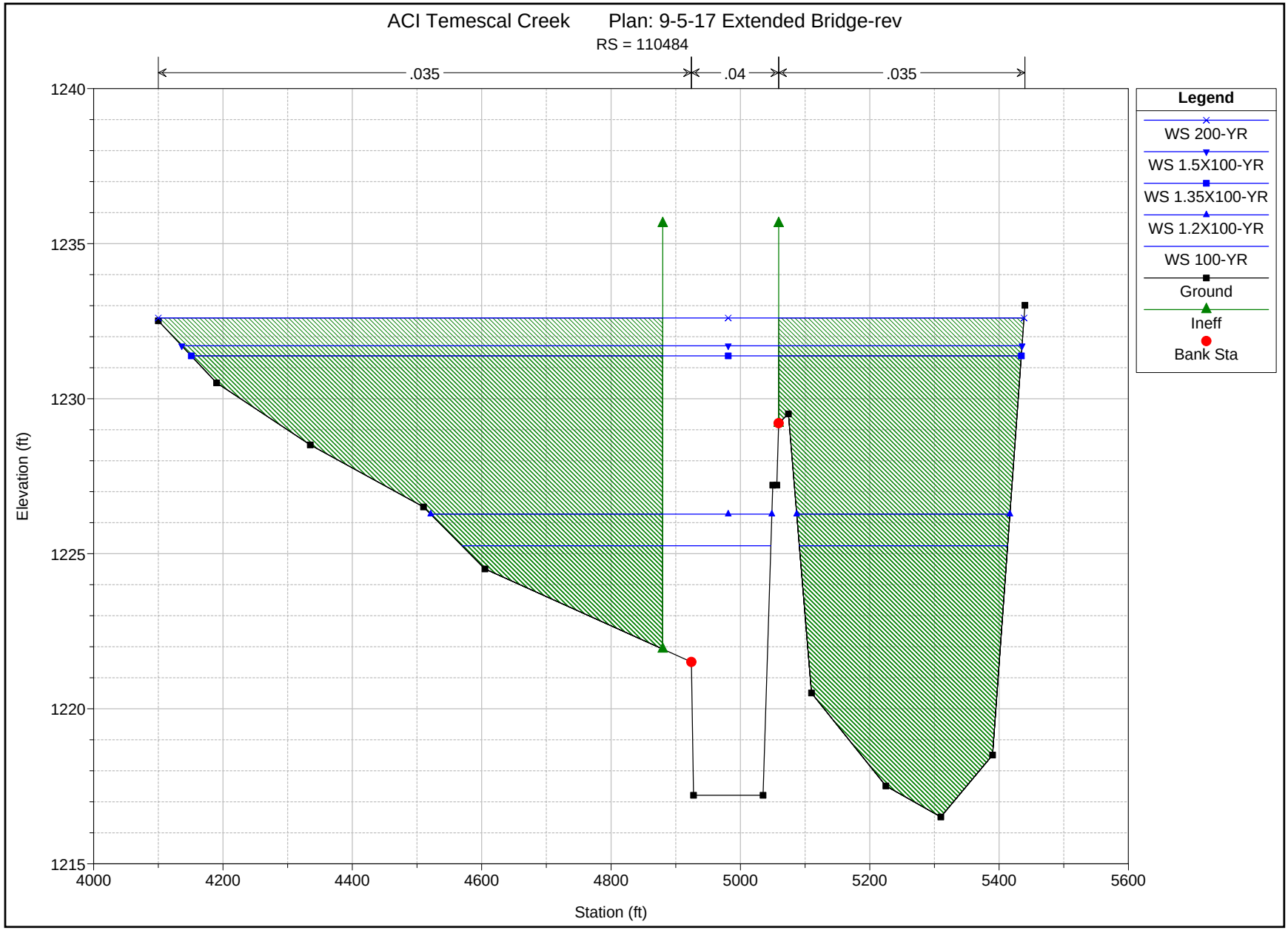
HEC-RAS Plan: 9-5-17 Extended Bridge-rev River: RIVER-1 Reach: Reach-1 (Continued)

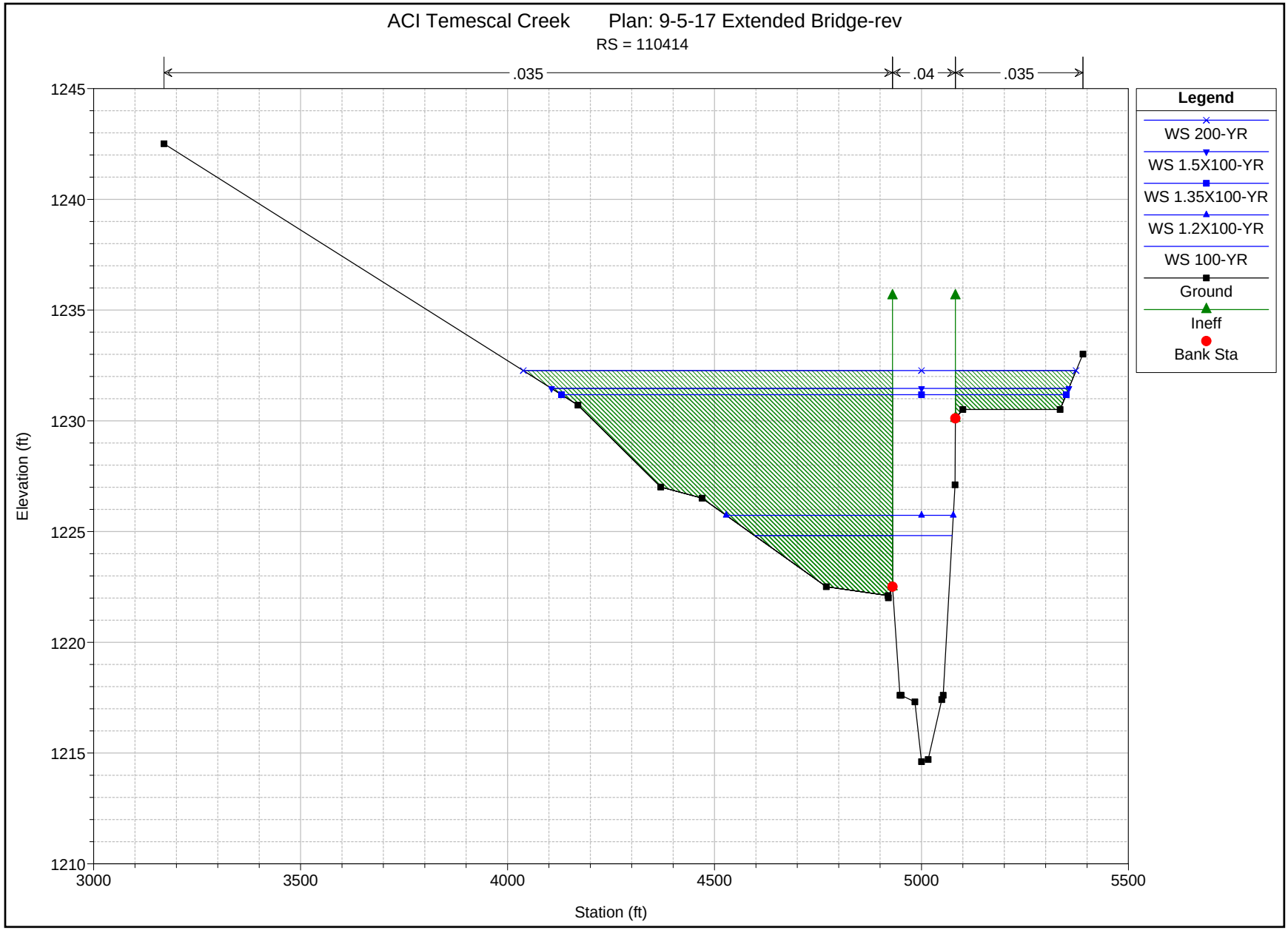
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	108186	200-YR	19032.00	1204.24	1218.58		1219.05	0.002372	5.54	3436.76	265.17	0.27
Reach-1	108186	1.35X100-YR	14040.00	1204.24	1217.21		1217.54	0.001845	4.56	3075.72	265.17	0.24
Reach-1	108111	100-YR	10400.00	1203.72	1215.62	1209.78	1216.07	0.002767	5.46	1931.32	466.19	0.29
Reach-1	108111	1.2X100-YR	12480.00	1203.72	1216.18	1210.51	1216.76	0.003364	6.20	2035.64	468.19	0.32
Reach-1	108111	1.5X100-YR	15600.00	1203.72	1216.90	1211.40	1217.70	0.004272	7.24	2170.89	472.61	0.36
Reach-1	108111	200-YR	19032.00	1203.72	1217.56	1212.25	1218.63	0.005304	8.32	2296.37	473.58	0.40
Reach-1	108111	1.35X100-YR	14040.00	1203.72	1216.55	1210.97	1217.24	0.003817	6.73	2105.82	470.48	0.34
Reach-1	107700	100-YR	10400.00	1201.11	1213.96	1213.00	1214.60	0.004949	6.29	1627.59	1222.02	0.31
Reach-1	107700	1.2X100-YR	12480.00	1201.11	1214.38	1213.30	1215.11	0.004907	6.41	1827.17	1270.28	0.31
Reach-1	107700	1.5X100-YR	15600.00	1201.11	1214.85	1213.73	1215.75	0.005257	6.79	2053.59	1295.38	0.33
Reach-1	107700	200-YR	19032.00	1201.11	1215.37	1214.21	1216.44	0.005365	7.04	2307.96	1310.92	0.33
Reach-1	107700	1.35X100-YR	14040.00	1201.11	1214.62	1213.53	1215.44	0.005097	6.61	1942.38	1288.50	0.32

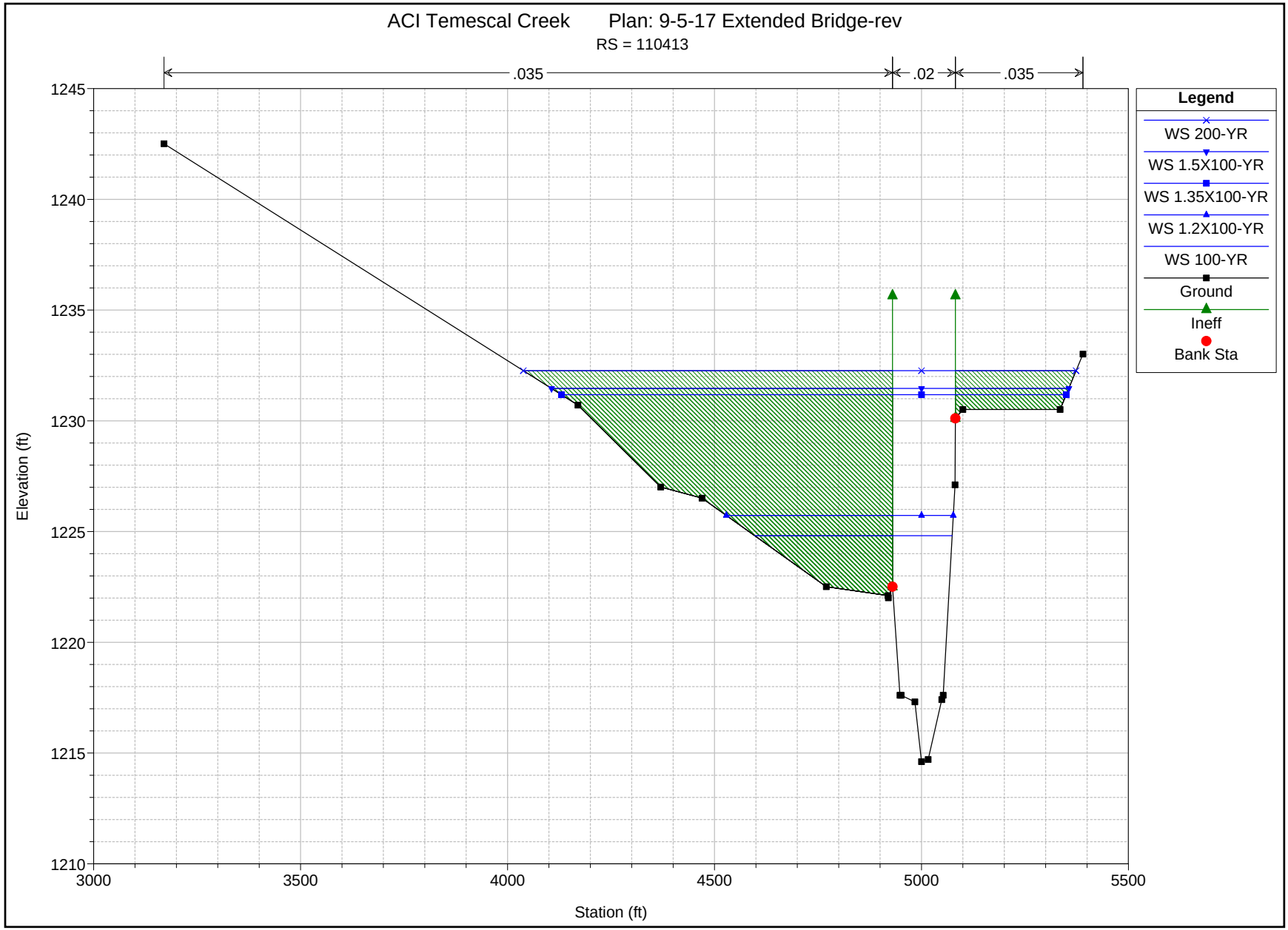
APPENDIX A.2: HEC-RAS STREAM CROSS SECTIONS FOR THE PROPOSED CONDITION

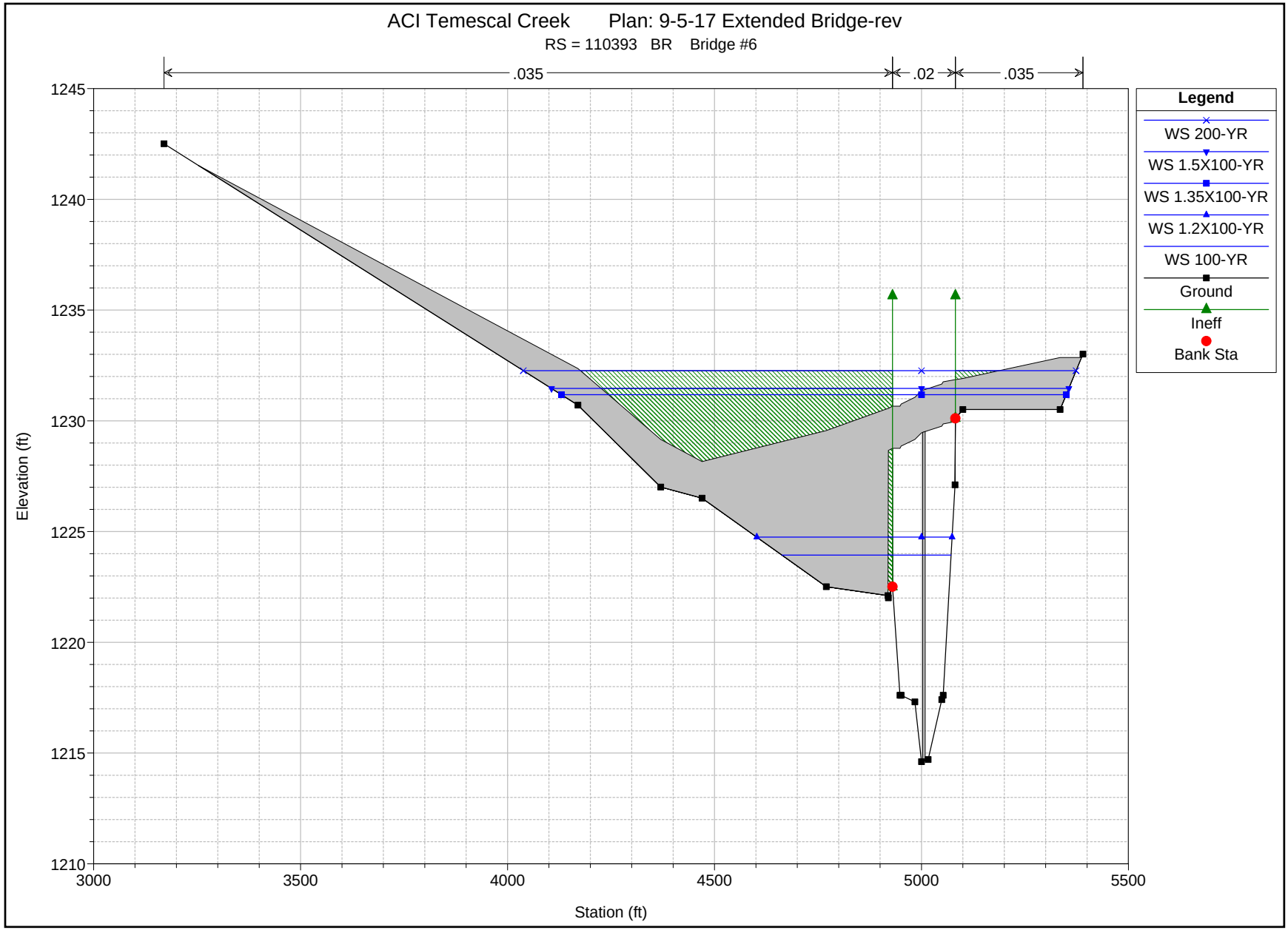

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 112034
.04
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1250
1245
1240
1235
1230
1225
1220
4940
4960
4980
5000
5020
5040
5060
5080
5100

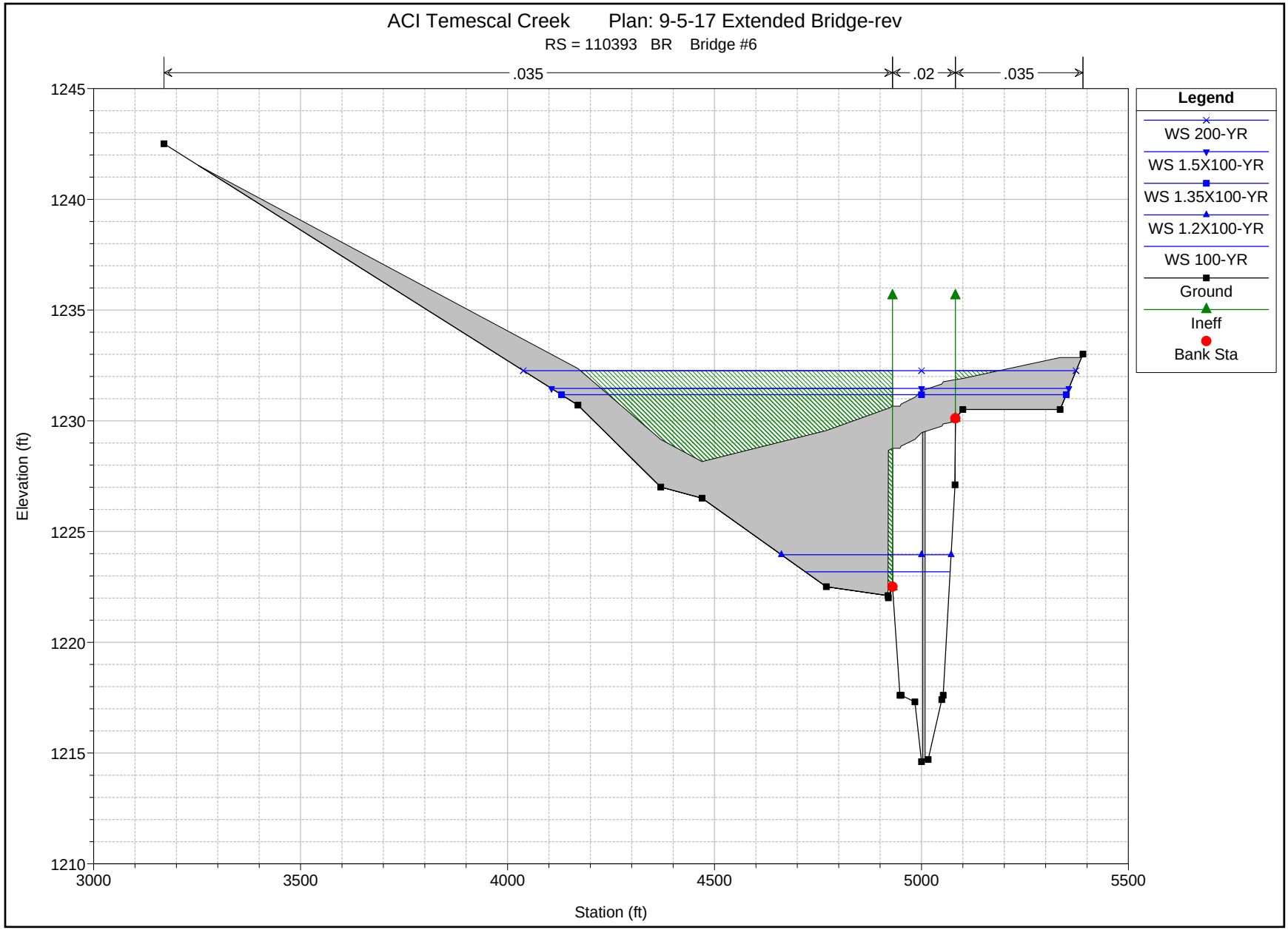

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 111034
.035
.04
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
3600
3800
4000
4200
4400
4600
4800
5000
5200
5400

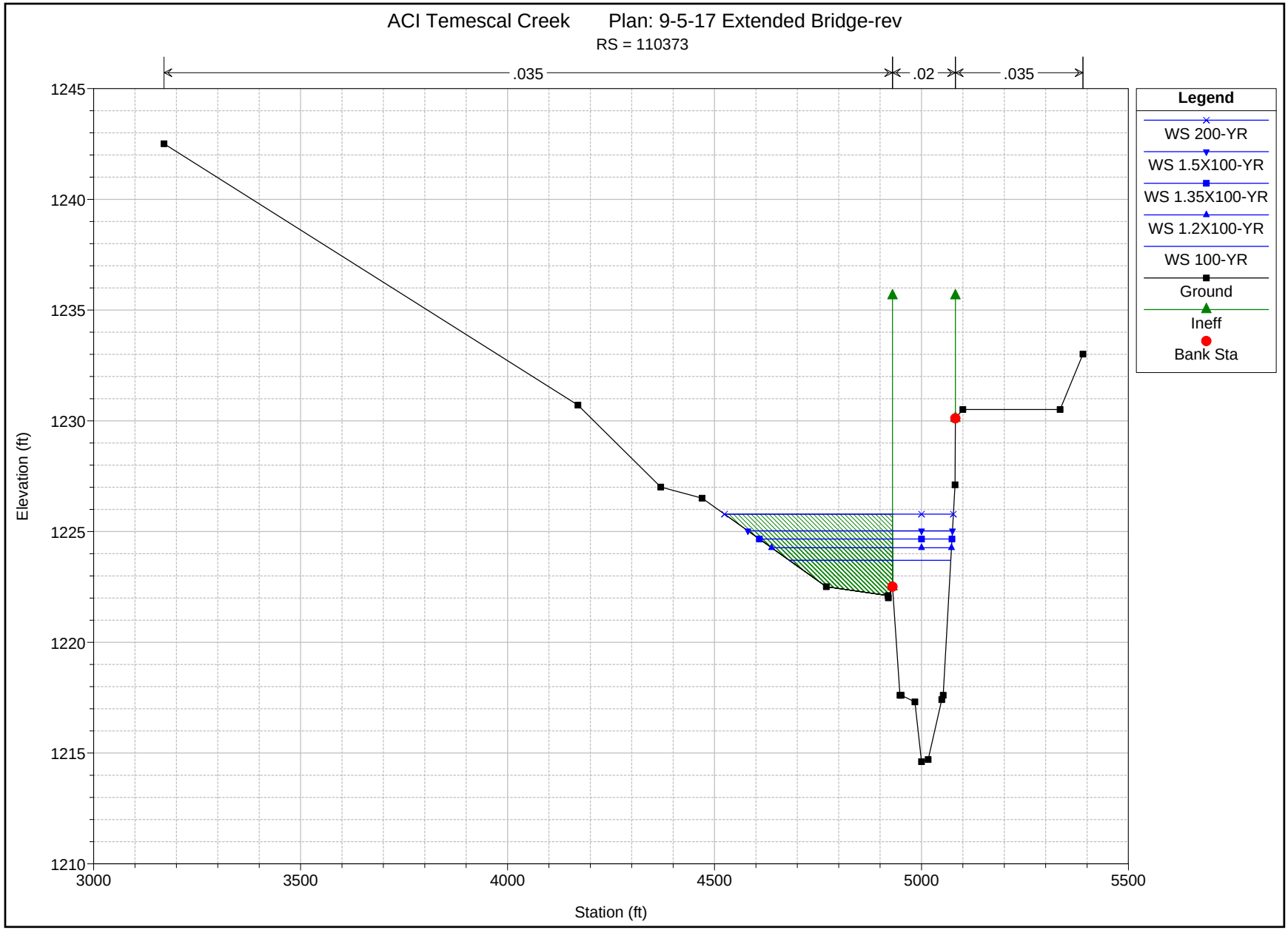

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110484
.035
.04
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1240
1235
1230
1225
1220
1215
4000
4200
4400
4600
4800
5000
5200
5400
5600

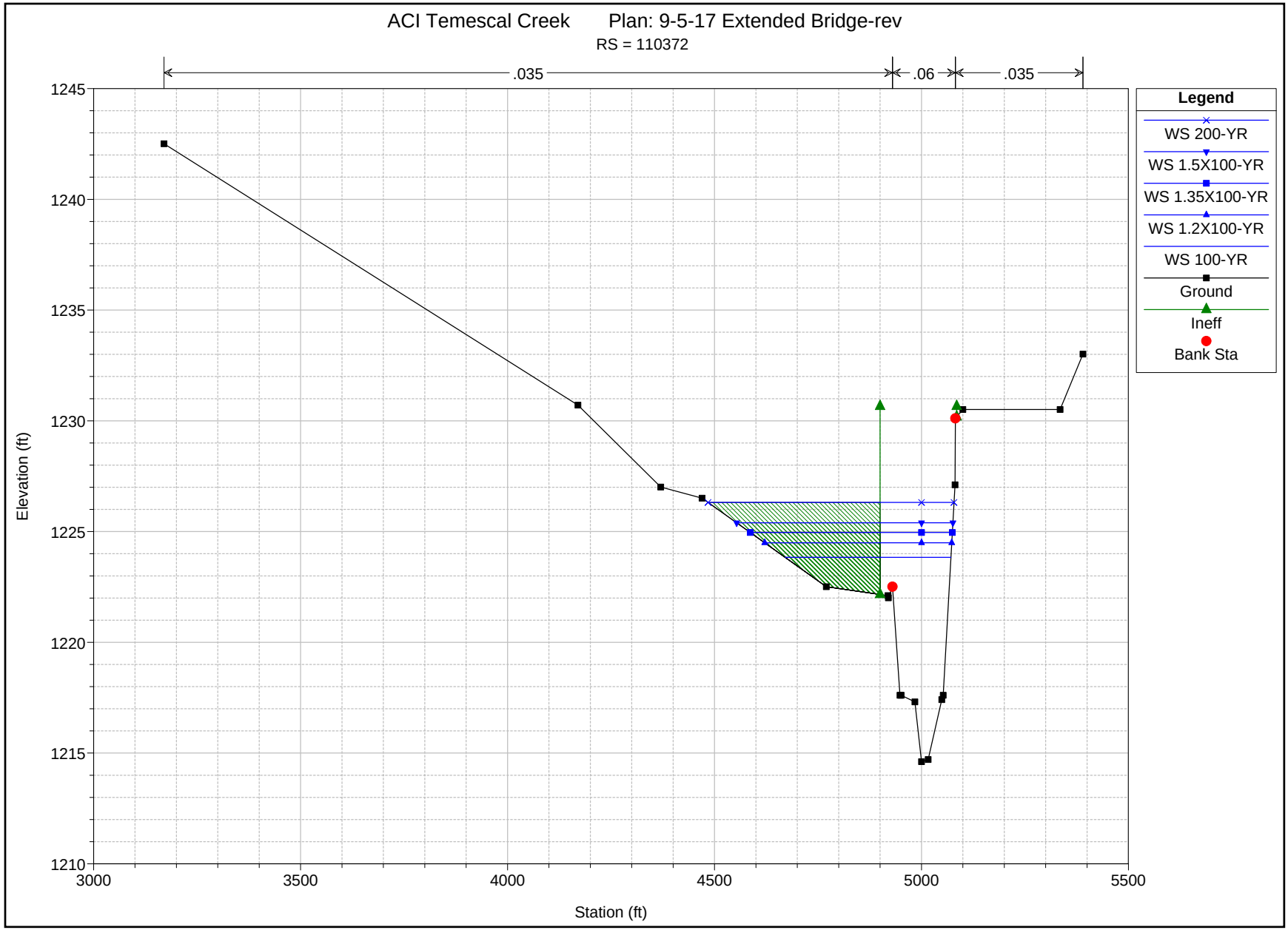

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110414
.035
.04
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500

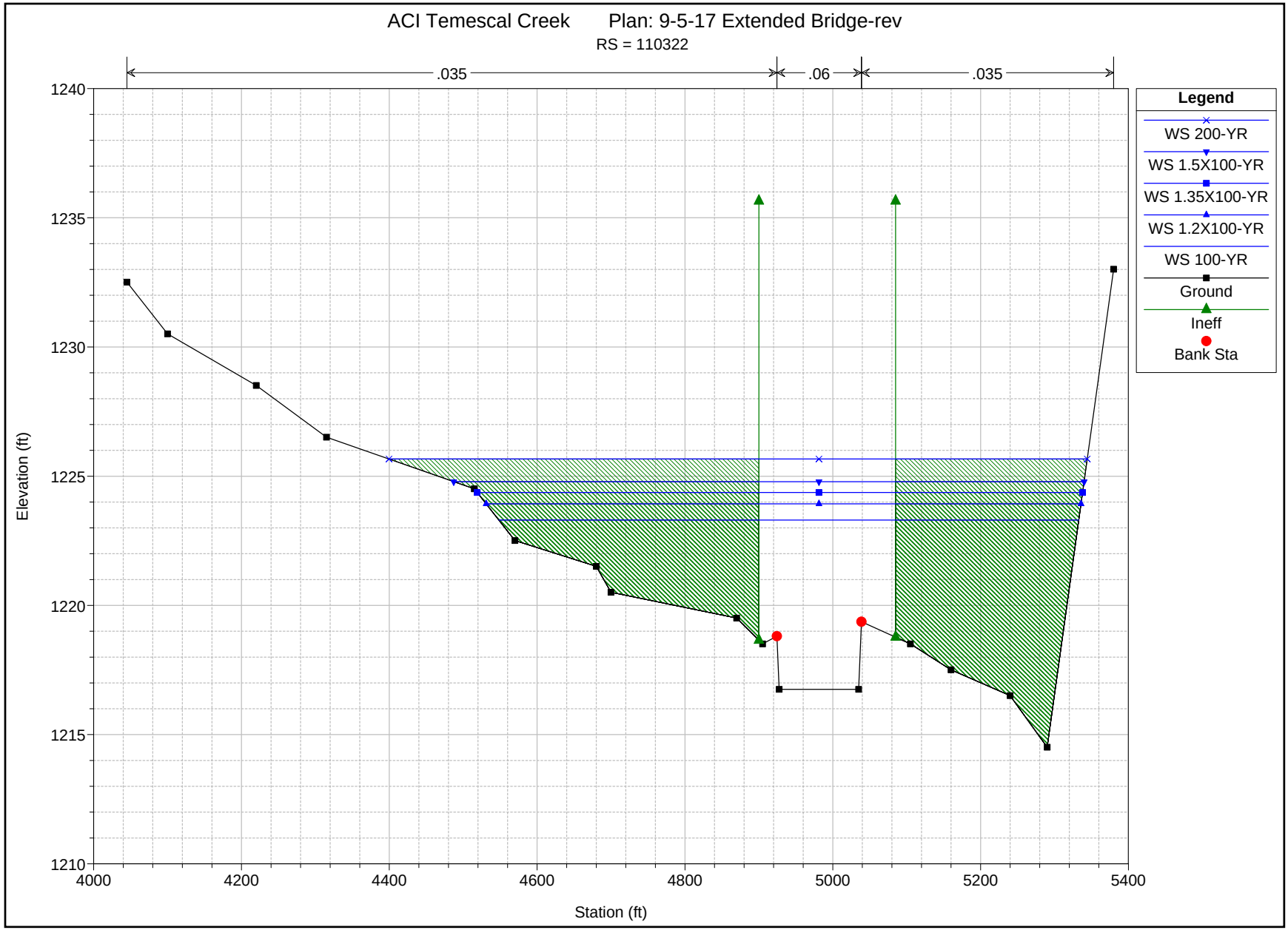

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110413
.035
.02
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500

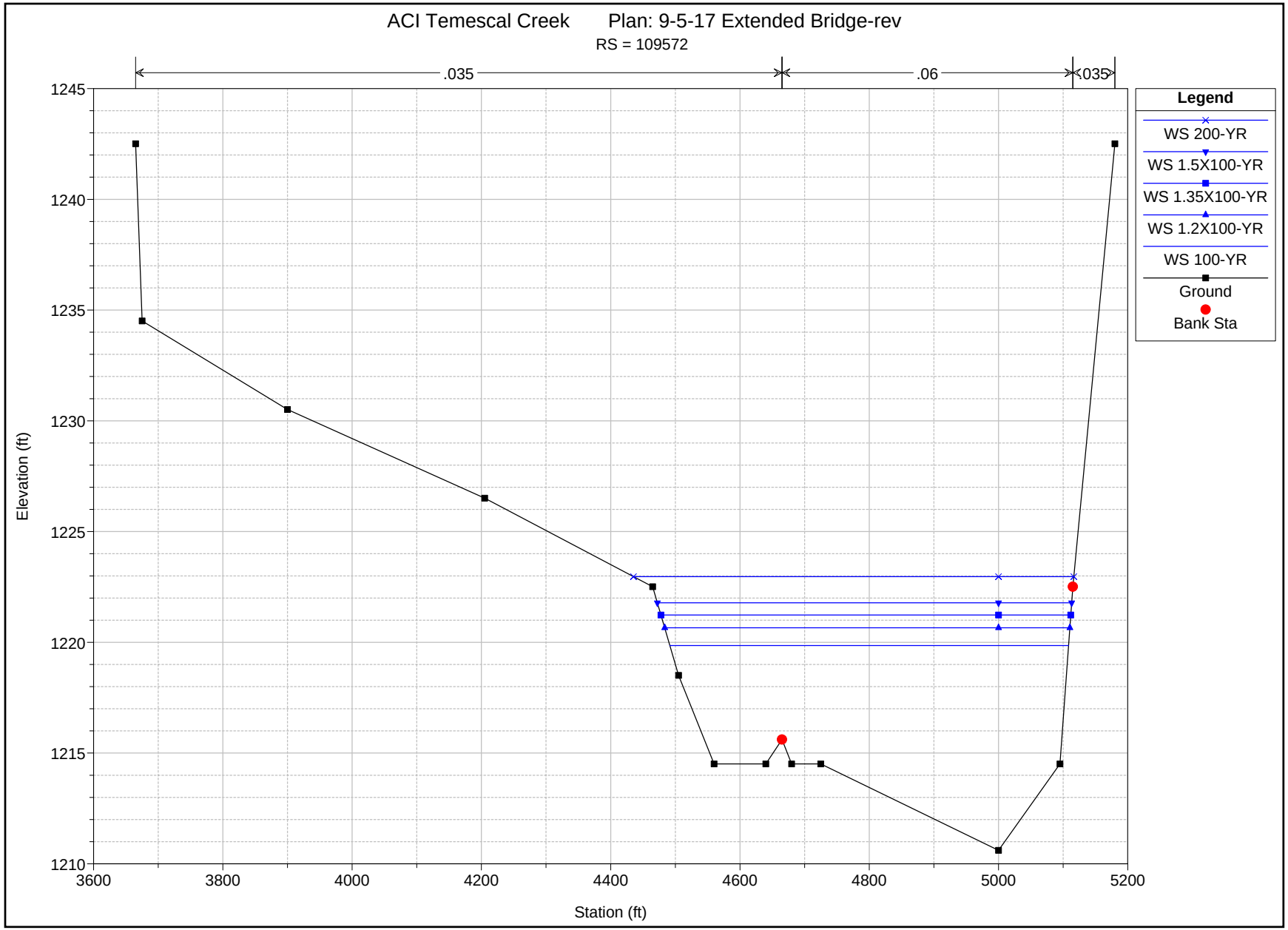

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110393 BR Bridge #6
.035
.02
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500
Station (ft)

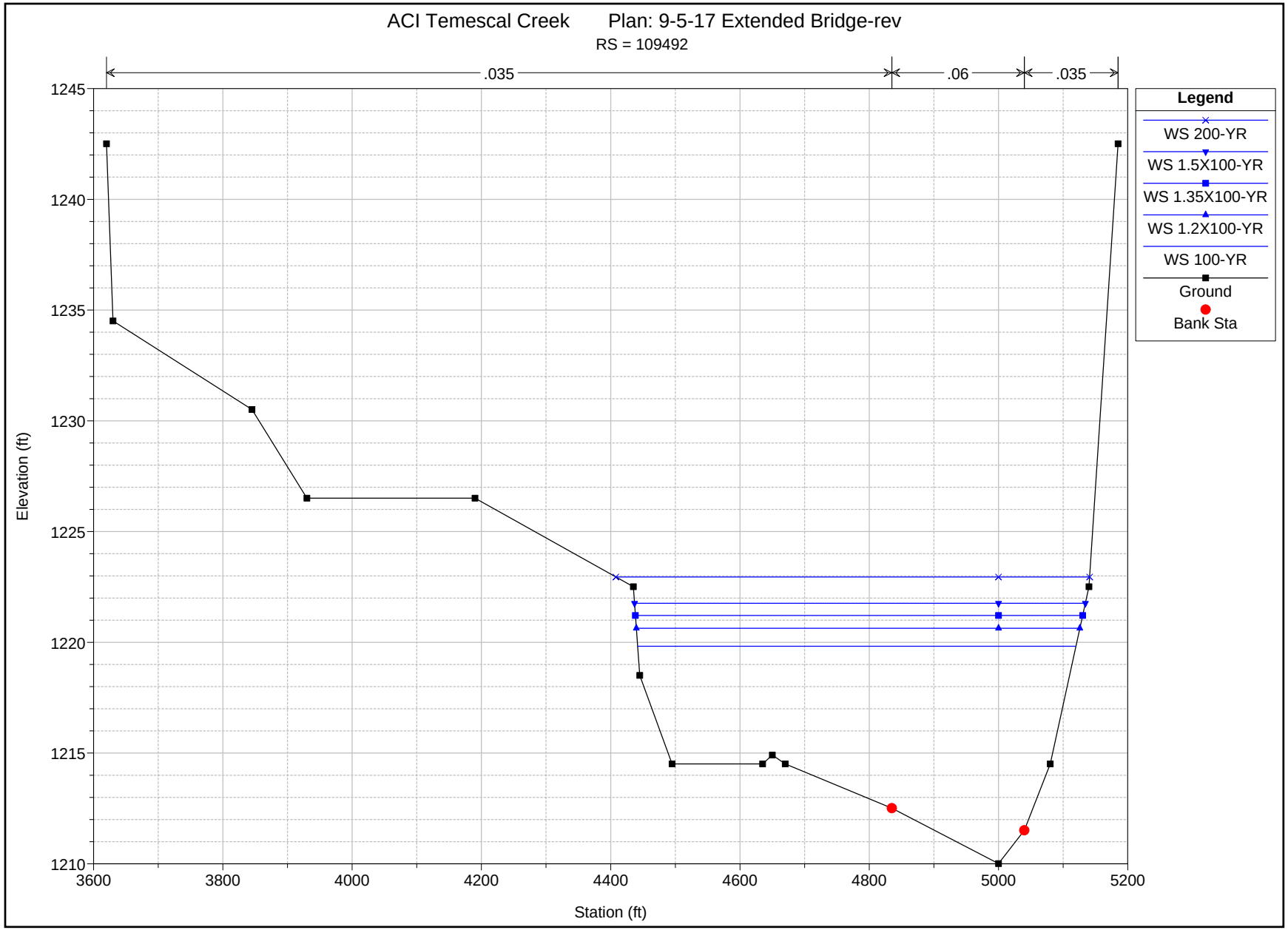

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110393 BR Bridge #6
.035
.02
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500
Station (ft)

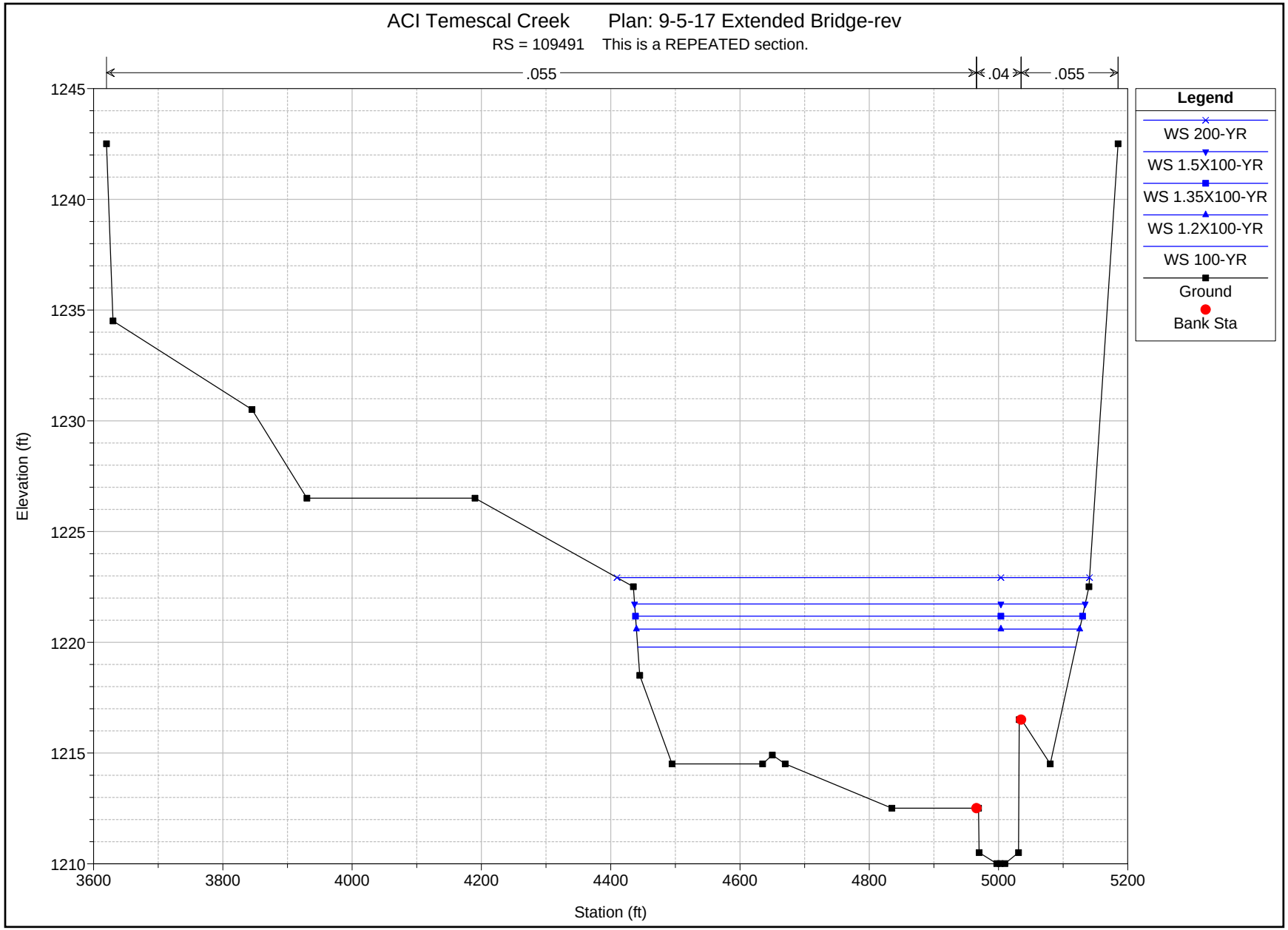

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110373
.035
.02
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500

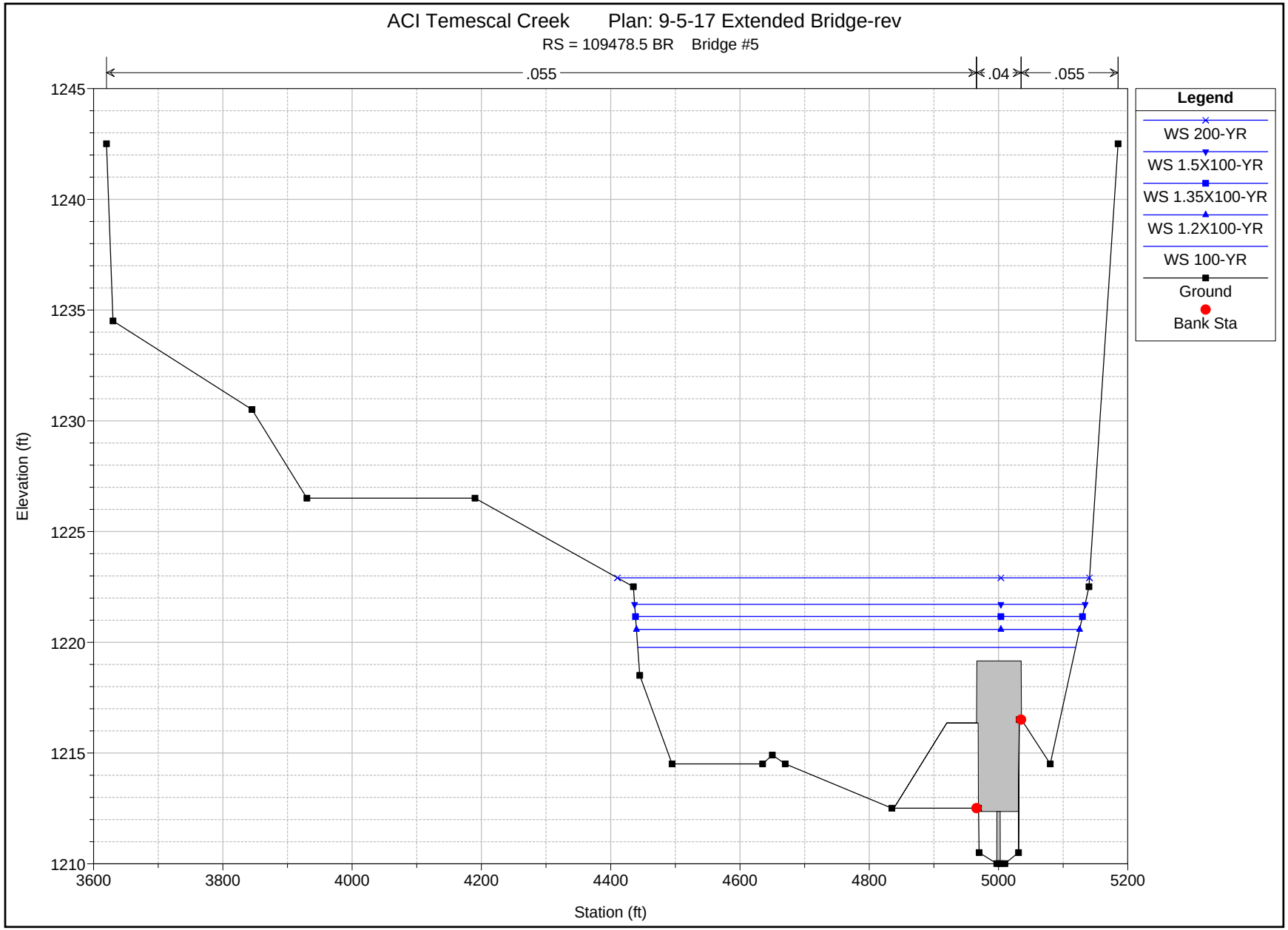

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110372
.035
.06
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3000
3500
4000
4500
5000
5500

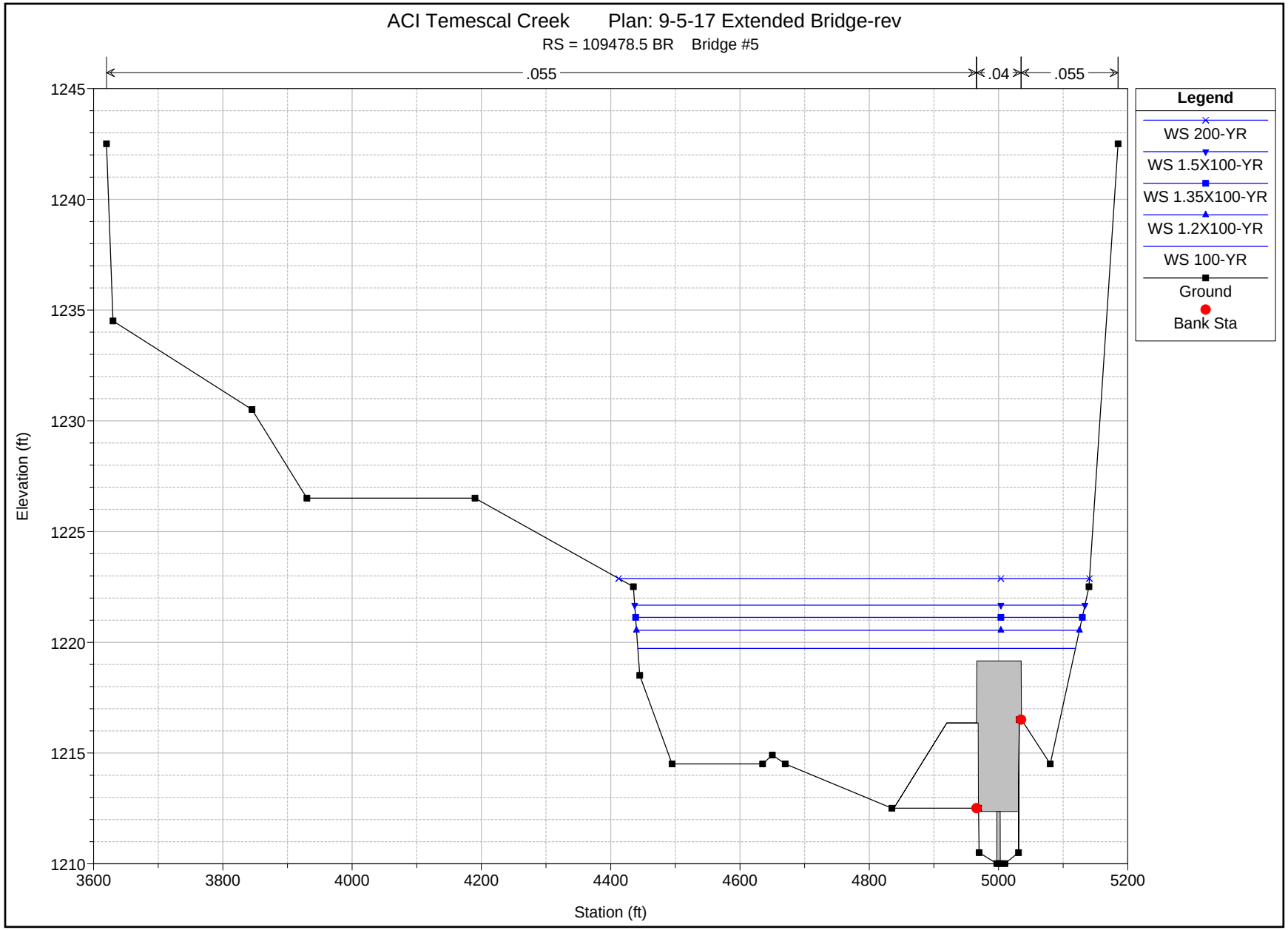

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 110322
.035
.06
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1240
1235
1230
1225
1220
1215
1210
4000
4200
4400
4600
4800
5000
5200
5400

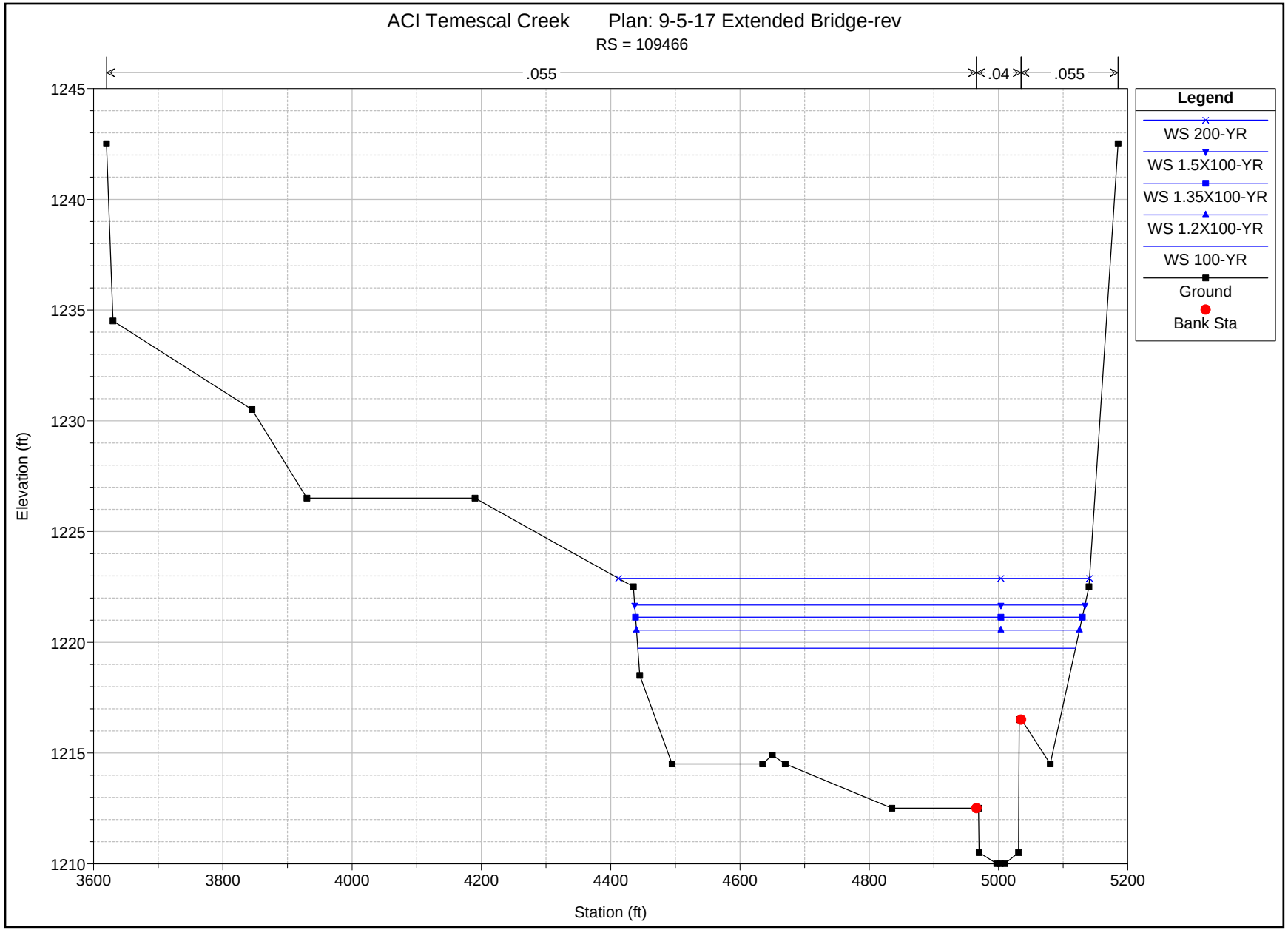

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109572
.035
.06
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200

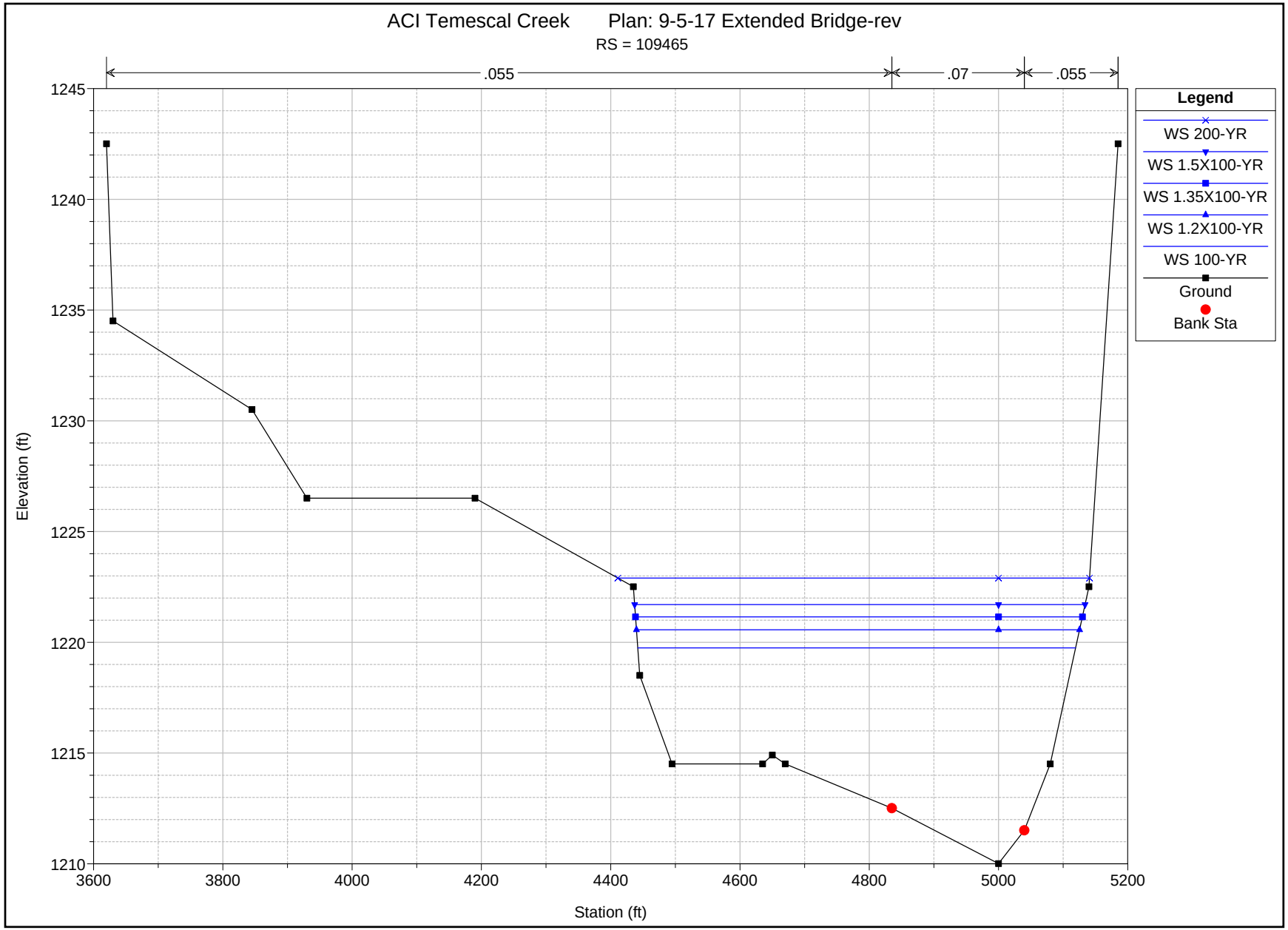

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109492
.035
.06
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200

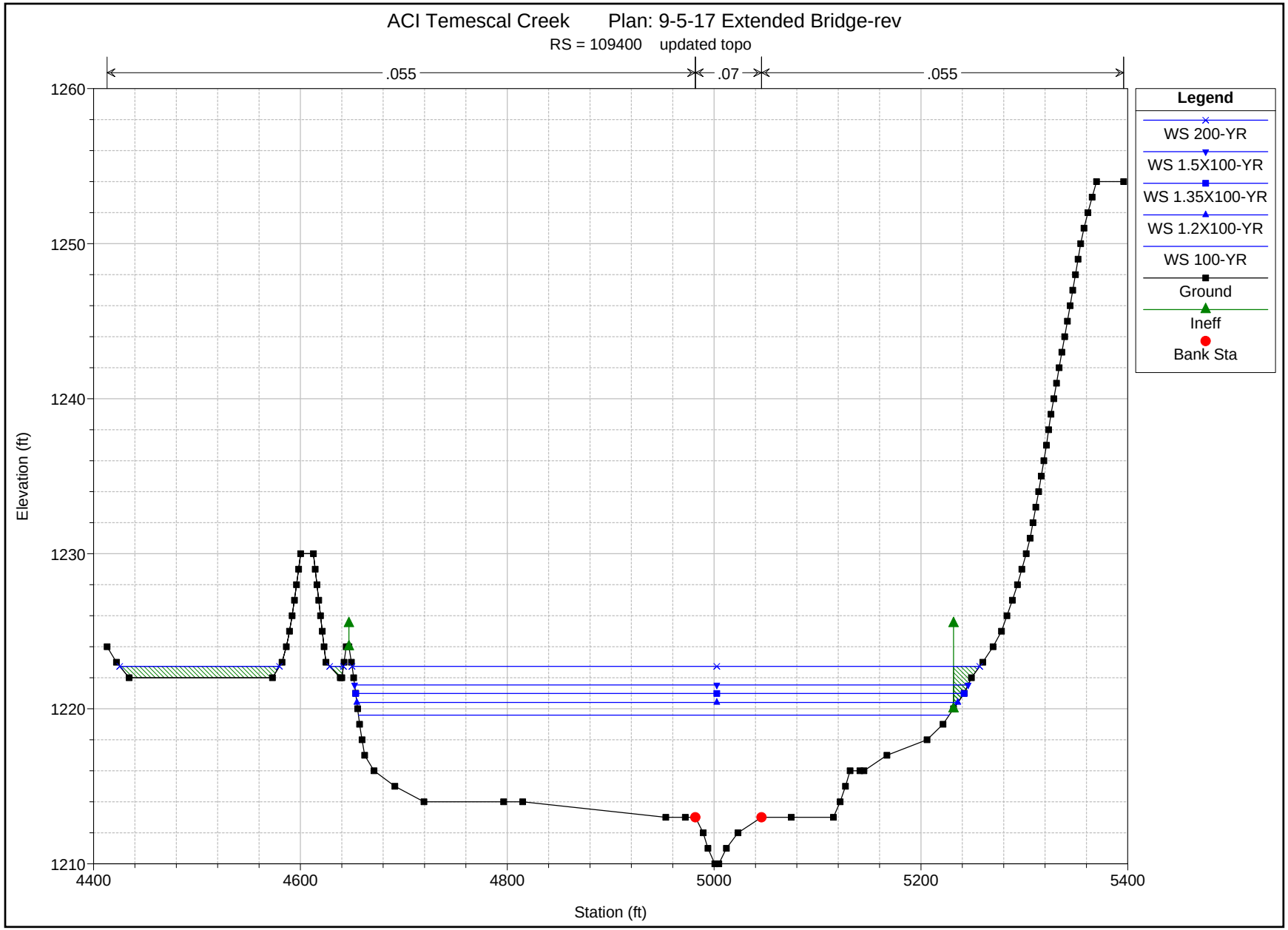

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109491 This is a REPEATED section.
.055
.04
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200
Station (ft)

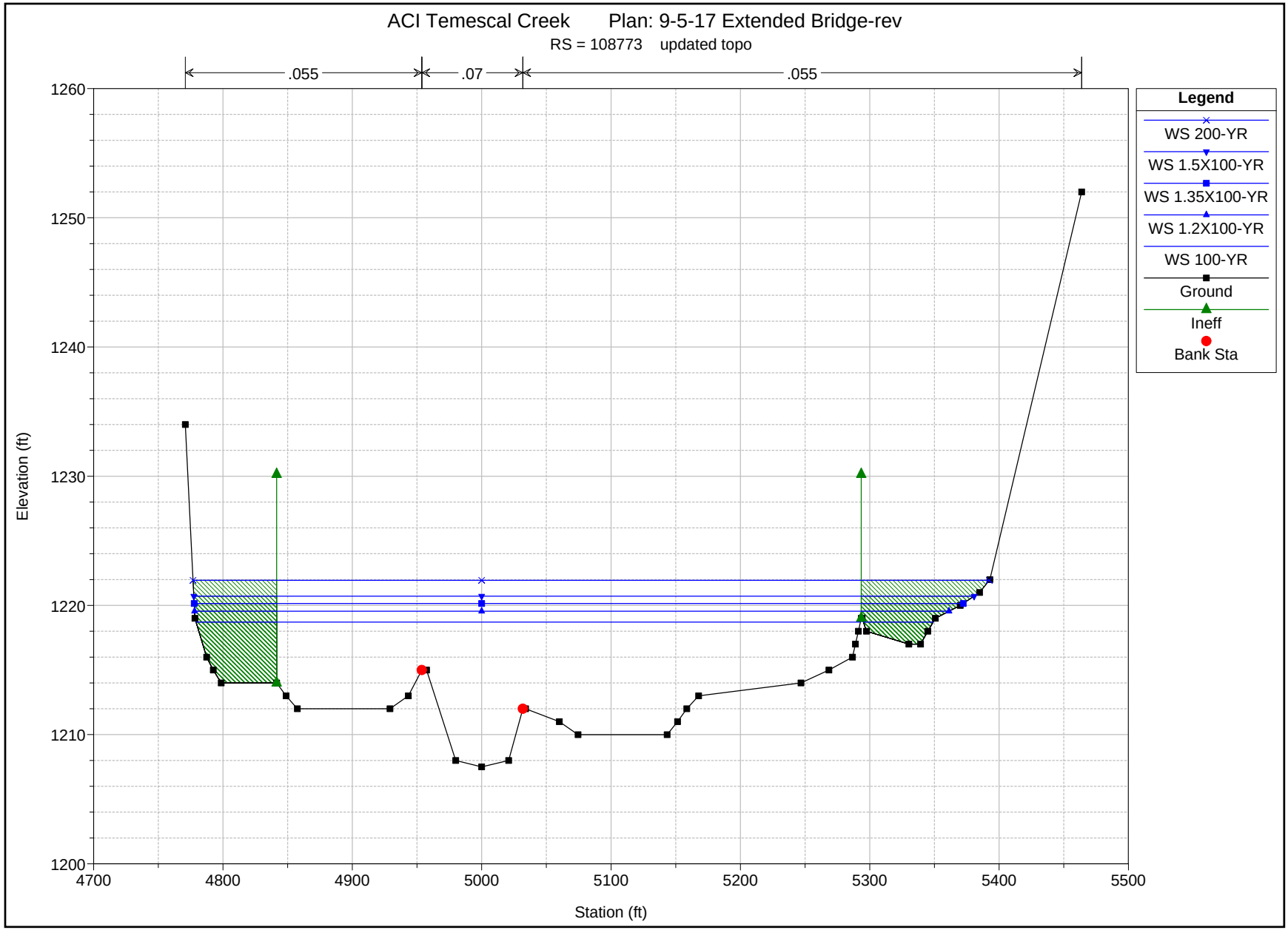

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109478.5 BR Bridge #5
.055
.04
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200
Station (ft)

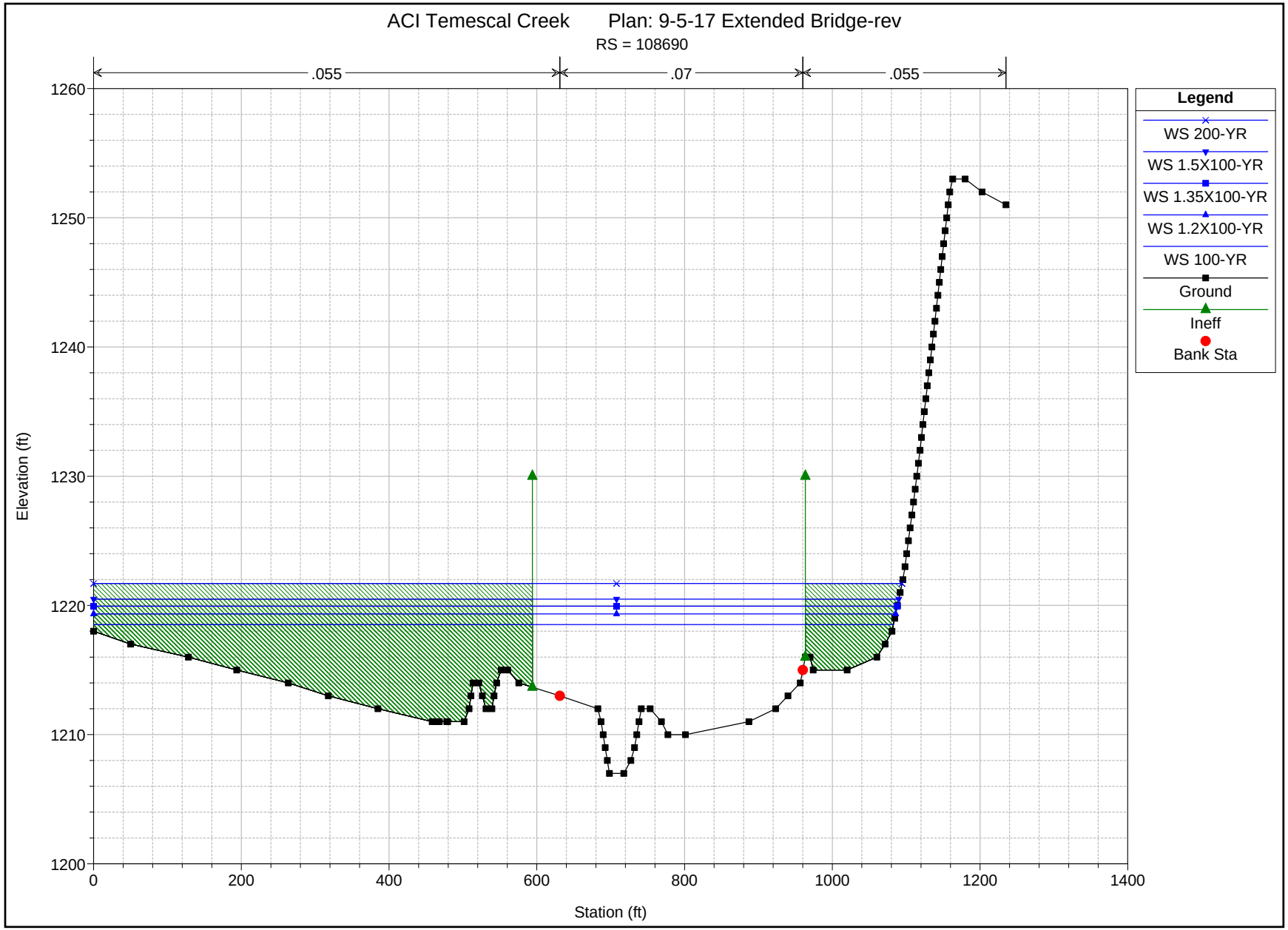

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109478.5 BR Bridge #5
.055
.04
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200

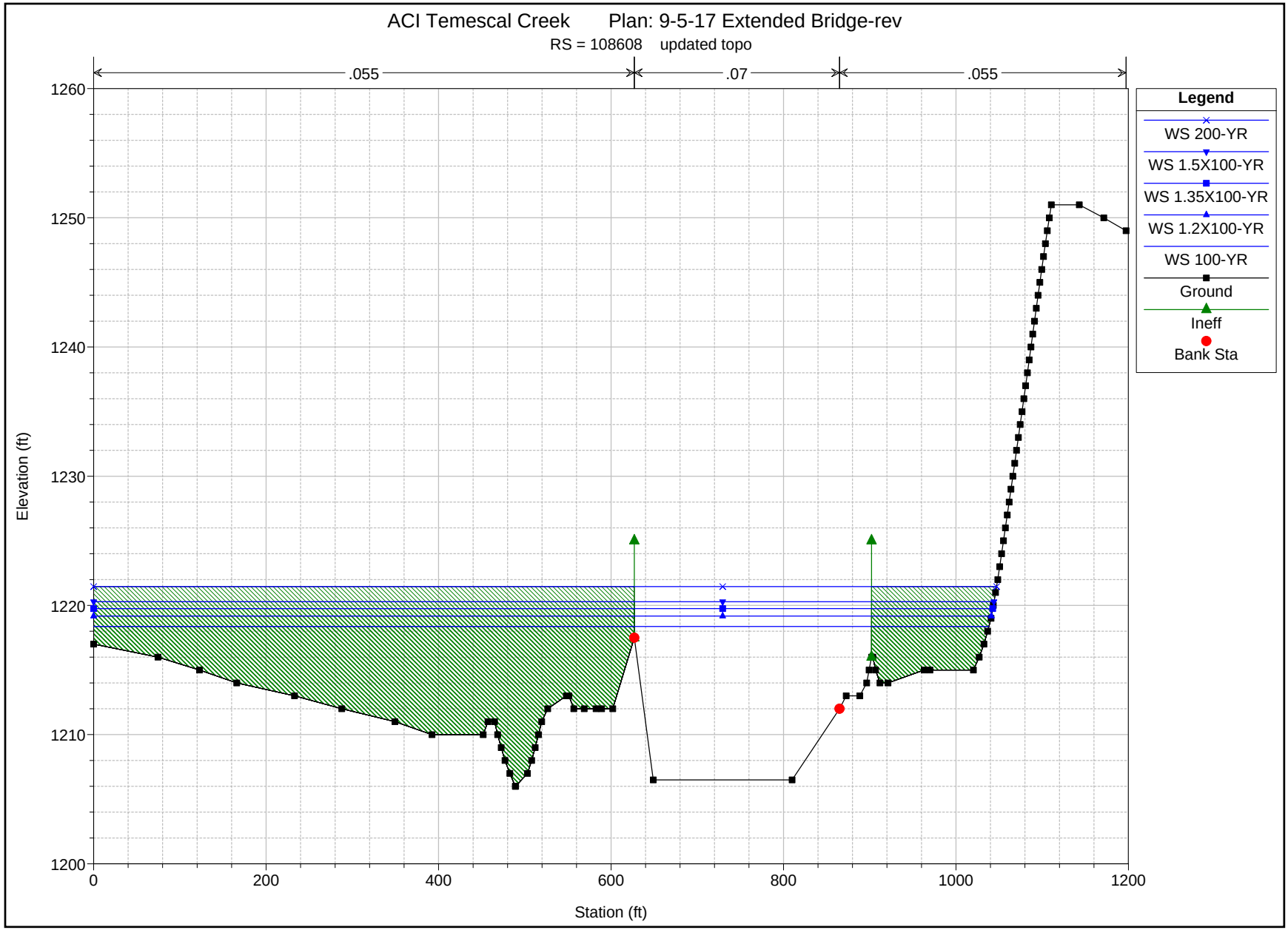

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109466
.055
.04
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200

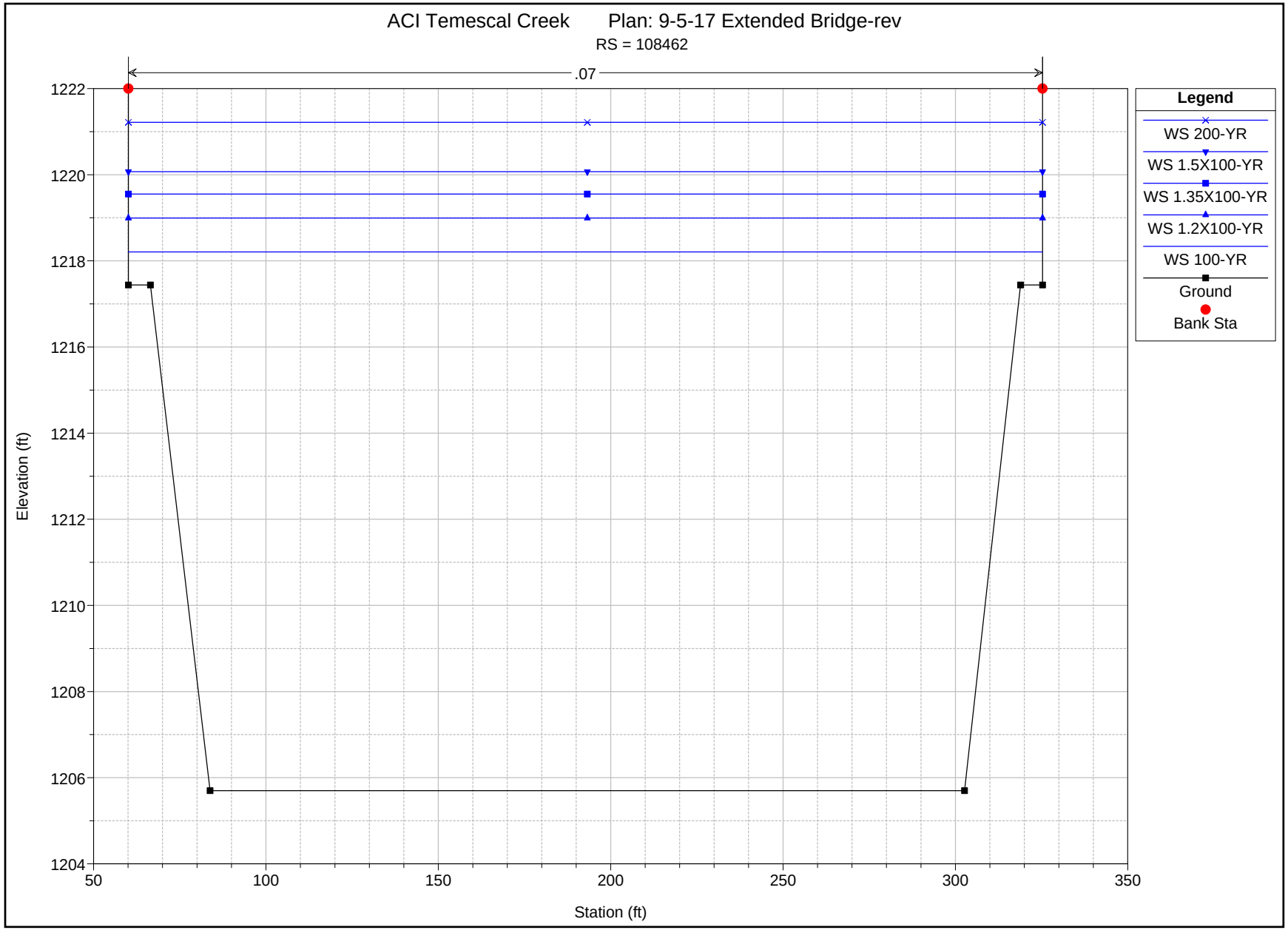

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109465
.055
.07
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1245
1240
1235
1230
1225
1220
1215
1210
3600
3800
4000
4200
4400
4600
4800
5000
5200

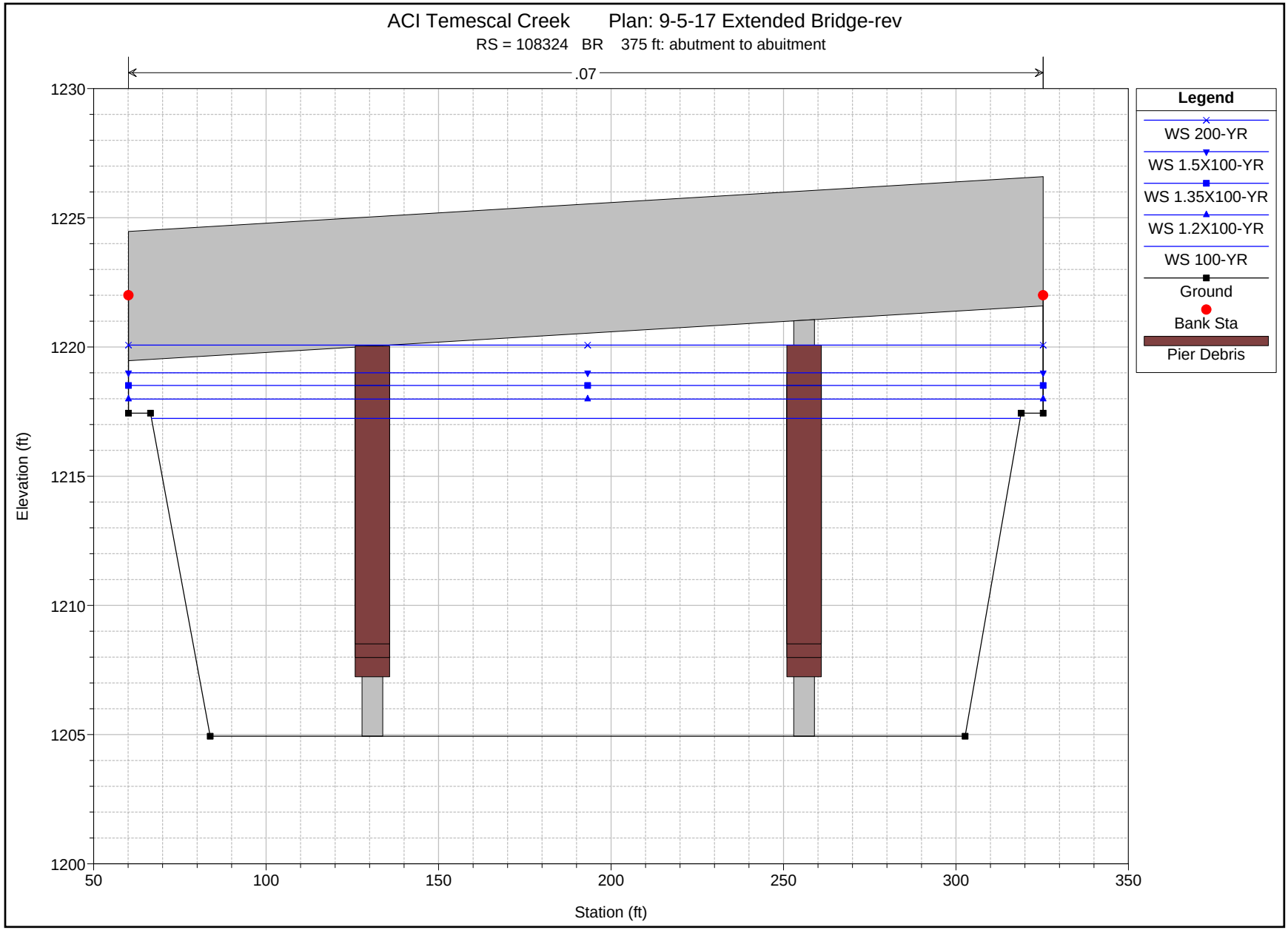

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 109400 updated topo
.055
.07
.055
1260
1250
1240
1230
1220
1210
Elevation (ft)
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta

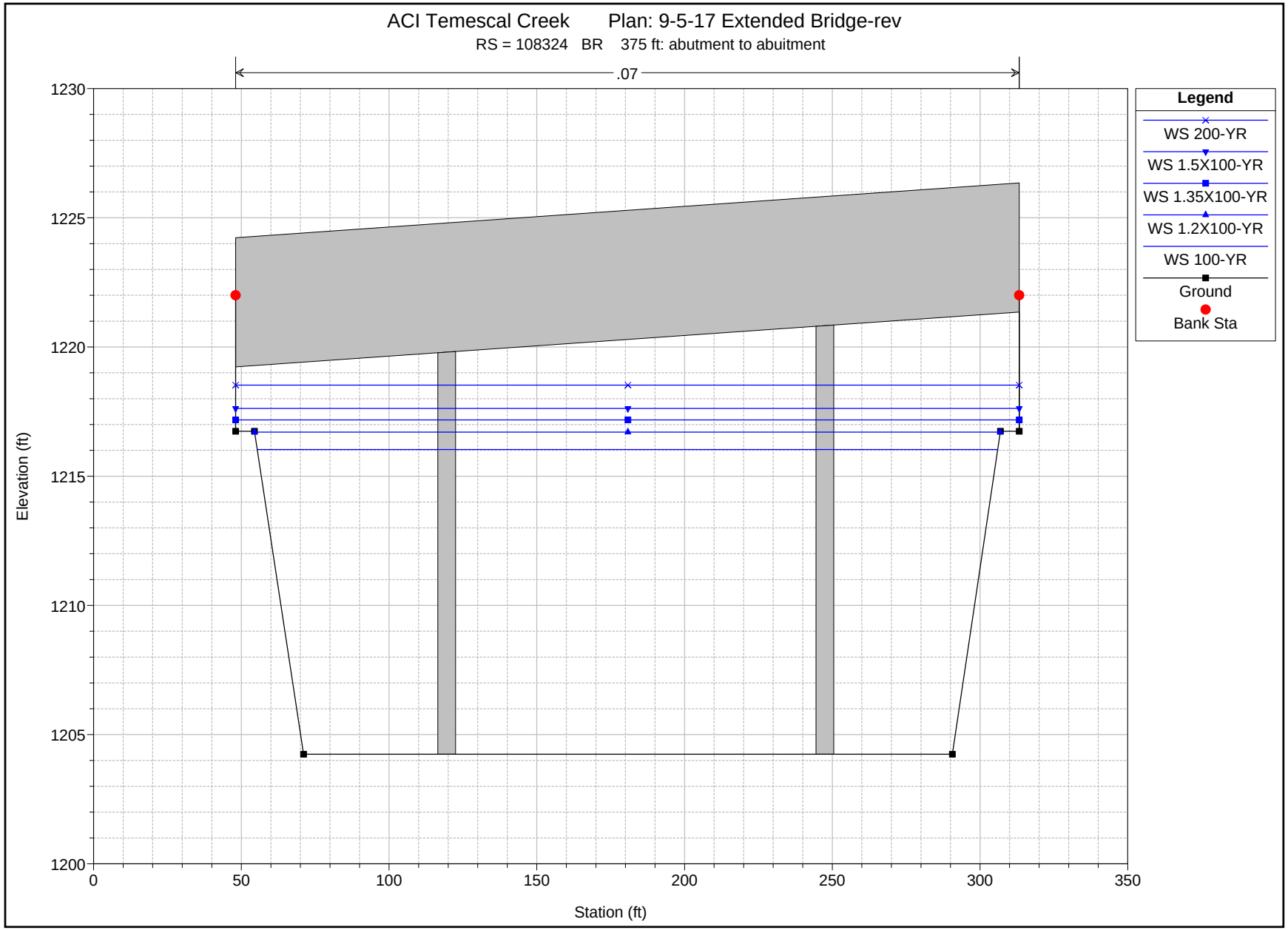

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108773 updated topo
.055
.07
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1260
1250
1240
1230
1220
1210
1200
4700
4800
4900
5000
5100
5200
5300
5400
5500

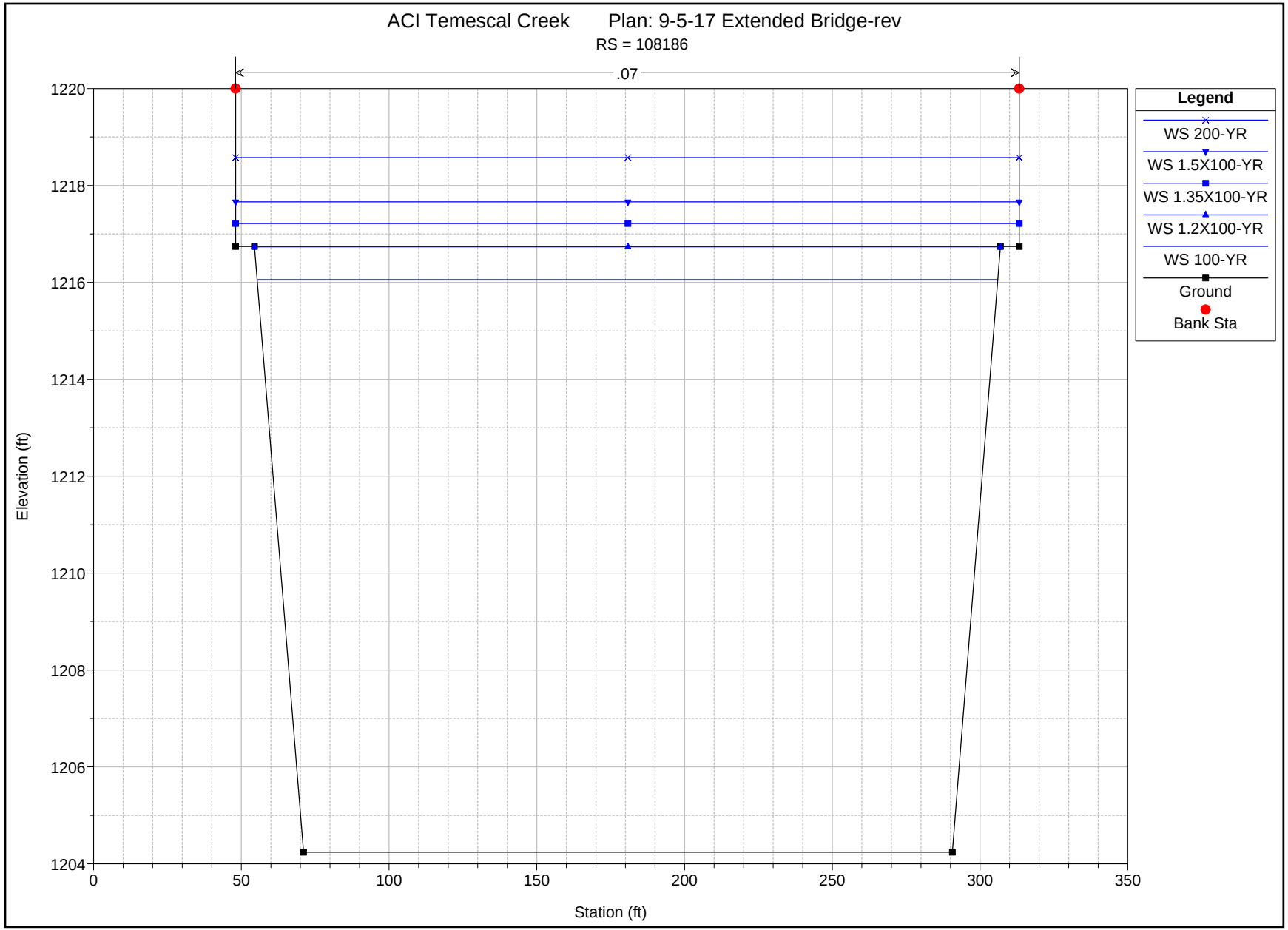

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108690
.055
.07
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1260
1250
1240
1230
1220
1210
1200
0
200
400
600
800
1000
1200
1400

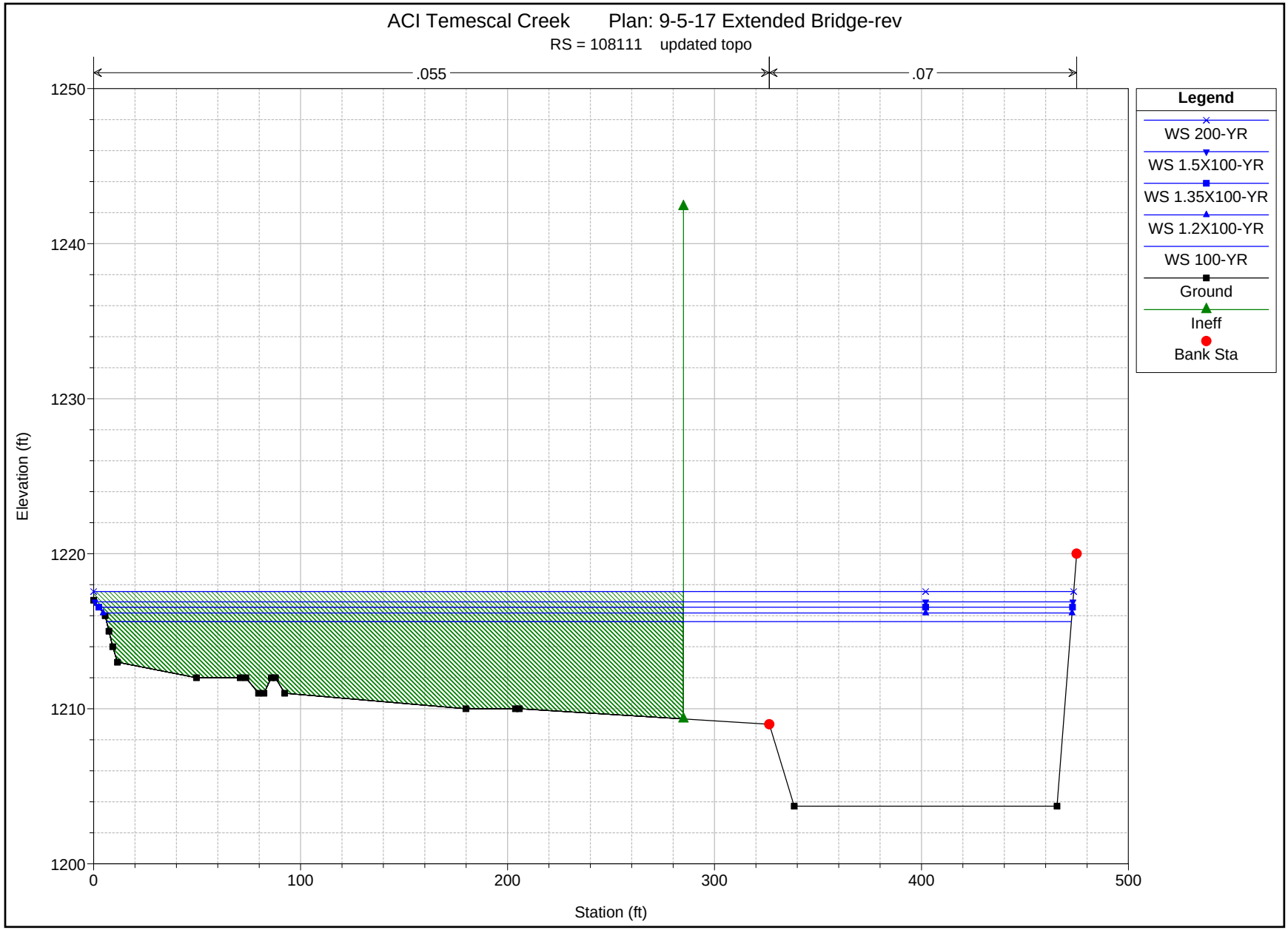

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108608 updated topo
.055
.07
.055
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1260
1250
1240
1230
1220
1210
1200
0
200
400
600
800
1000
1200


ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108462
.07
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1222
1220
1218
1216
1214
1212
1210
1208
1206
1204
50
100
150
200
250
300
350


ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108324 BR 375 ft: abutment to abuitment
.07
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Pier Debris
Elevation (ft)
1230
1225
1220
1215
1210
1205
1200
50
100
150
200
250
300
350
Station (ft)


ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108324 BR 375 ft: abutment to abuitment
.07
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1230
1225
1220
1215
1210
1205
1200
0
50
100
150
200
250
300
350


ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108186
.07
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
1220
1218
1216
1214
1212
1210
1208
1206
1204
0
50
100
150
200
250
300
350


ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 108111 updated topo
.055
.07
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1250
1240
1230
1220
1210
1200
0
100
200
300
400
500

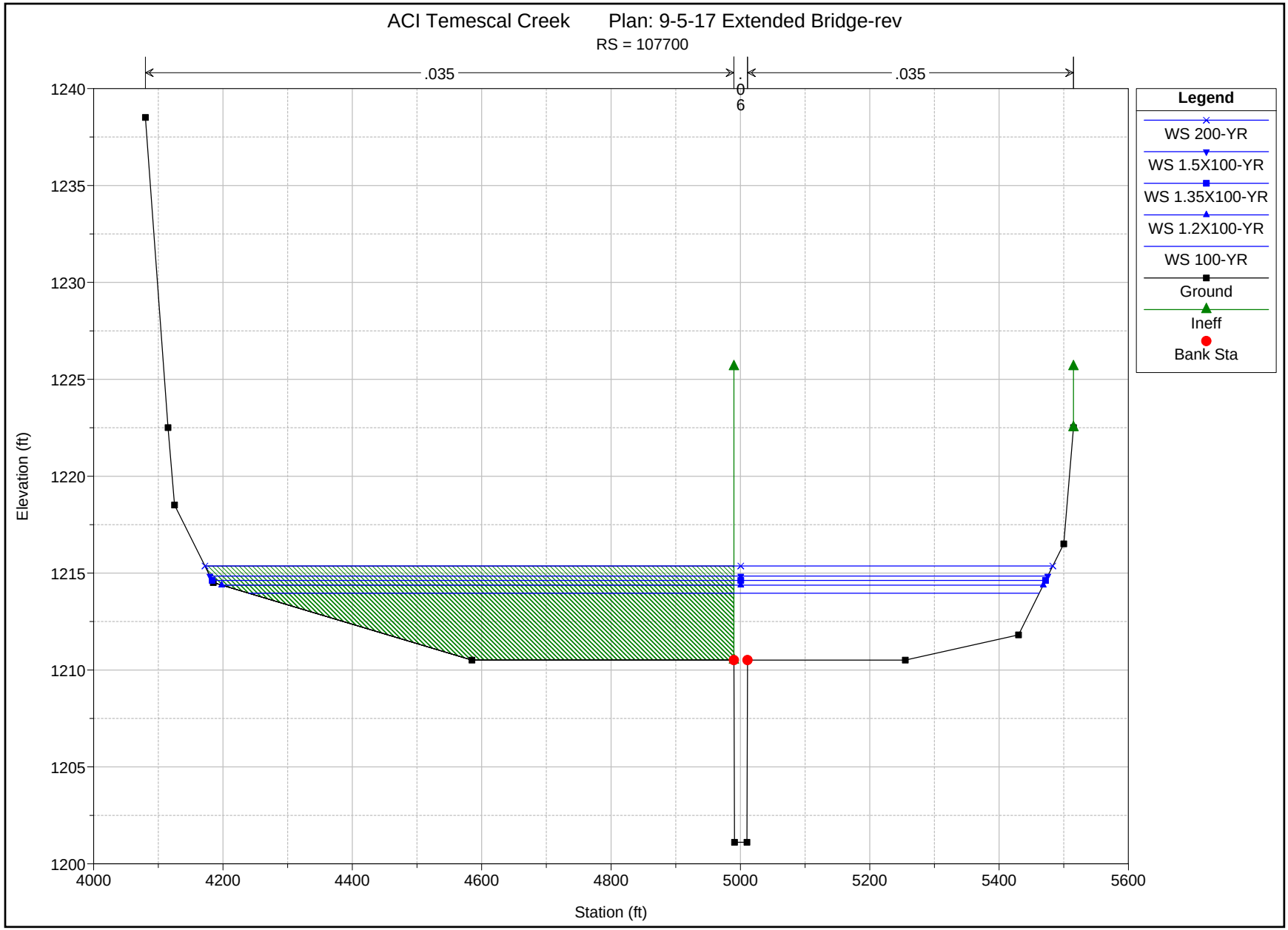
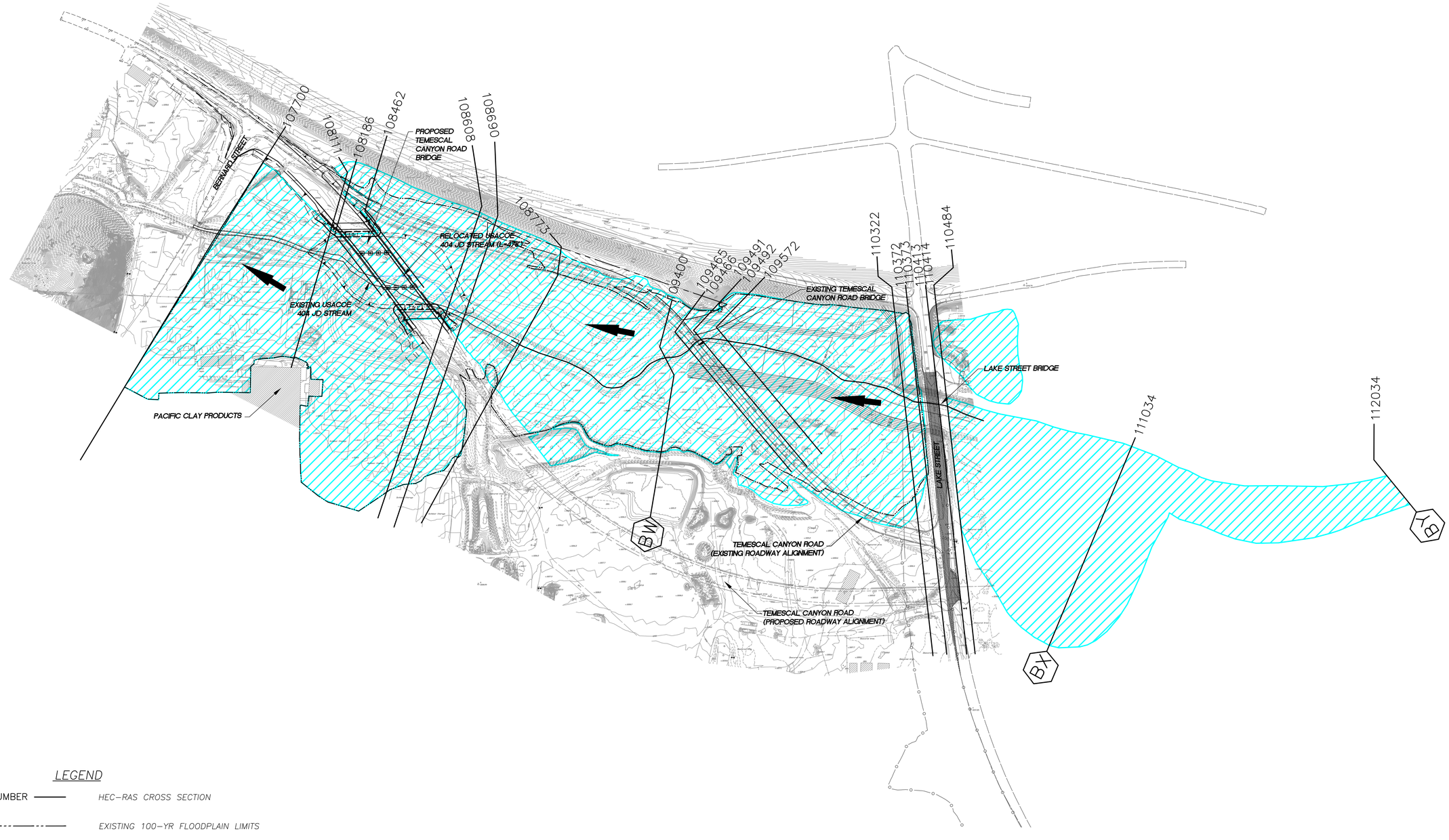

ACI Temescal Creek Plan: 9-5-17 Extended Bridge-rev
RS = 107700
.035
.06
.035
Legend
WS 200-YR
WS 1.5X100-YR
WS 1.35X100-YR
WS 1.2X100-YR
WS 100-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1240
1235
1230
1225
1220
1215
1210
1205
1200
4000
4200
4400
4600
4800
5000
5200
5400
5600

EXHIBIT A: 100-YEAR FLOODPLAIN EXHIBIT FOR TEMESCAL WASH BASED ON PROPOSED CONDITION IN THE VICINITY OF THE TEMESCAL CANYON ROAD BRIDGE

100-YEAR FLOODPLAIN EXHIBIT FOR TEMESCAL WASH BASED ON PROPOSED CONDITION IN THE VICINITY OF THE TEMESCAL CANYON ROAD BRIDGE



LEGEND

SECTION NUMBER ———	HEC–RAS CROSS SECTION
——·——·——	EXISTING 100–YR FLOODPLAIN LIMITS
	PROPOSED 100–YR FLOODPLAIN LIMITS
— — — —	CHANNEL FLOWLINE
——⬡ BV	APPROXIMATE LOCATION OF FEMA FLOOD INSURANCE RATE MAP CROSS SECTION

GRAPHIC SCALE
150 0 75 150 300
1" = 150'

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