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0.5' ABOVE 100-YEAR FLOOD CALCUATIONS

EASTON COMMERCE PARK

FOR EASTON WOOD AVE PROPCO, LLC

CITY OF EASTON, PLAMER TOWNSHIP, AND WILSON BOROUGH

NORTHAMPTON COUNTY

PENNSYLVANIA

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Revised: ---

Project: 2022-528

HYDROLOGY

The 100-year flow was used to model the post-construction floodplain boundaries, flood elevations, and flood flow velocities. As mentioned in H&H report, the Bushkill is completely undisturbed and out of limit of disturbance in this project, while UNT is proposed to be relocated. The UNT is not listed and shown in the FEMA map and report, therefore, this stream was studied separately through available hydrological tools such as StreamStats and USGS stations. The 100-year flow data, extracted from StreamStats of 621 cfs is reported for the point at which the relocation is proposed (i.e., the common upstream of existing and proposed creeks). As depicted below the drainage area associated with this point is estimated to be 2.32 sq.miles. The StreamStats report is presented in Appendix A of H&H report.

HYDRAULIC ANALYSIS

The UNT was modeled to determine the flood boundaries and elevations for post-construction conditions. It is only Bushkill Creek that is delineated for floodway and reported by FEMA, owing to its larger drainage area, and the other existing UNT within the project site have been considered as tributaries of Bushkill Creek and of a less concern because their flooding does not have floodway delineation. Nonetheless, the hydraulic modeling of the floods in UNT was performed because the project proposes a channel relocation as well as additions of a culvert for necessary stream crossings.

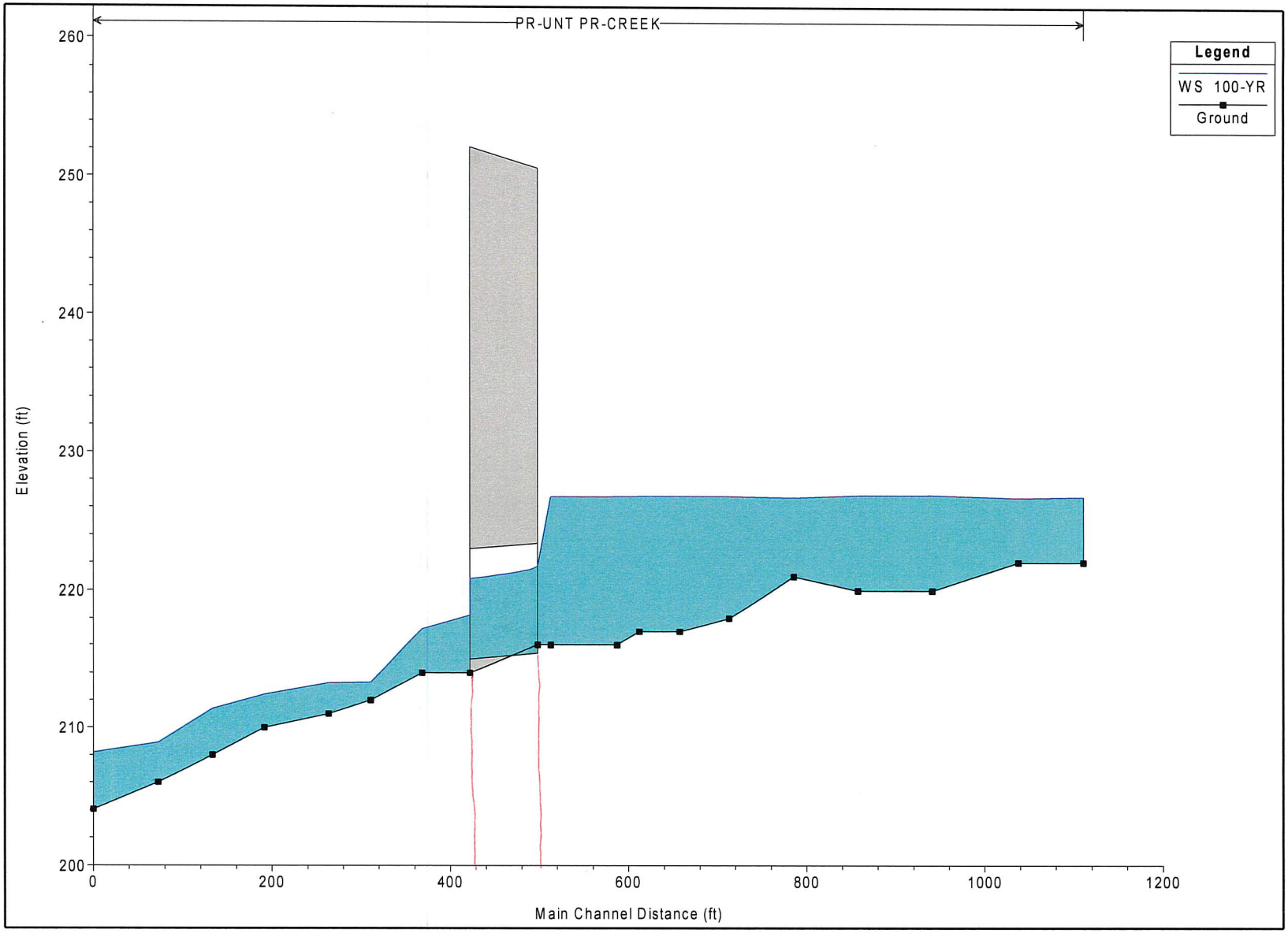
Hydraulic modeling had two parts:

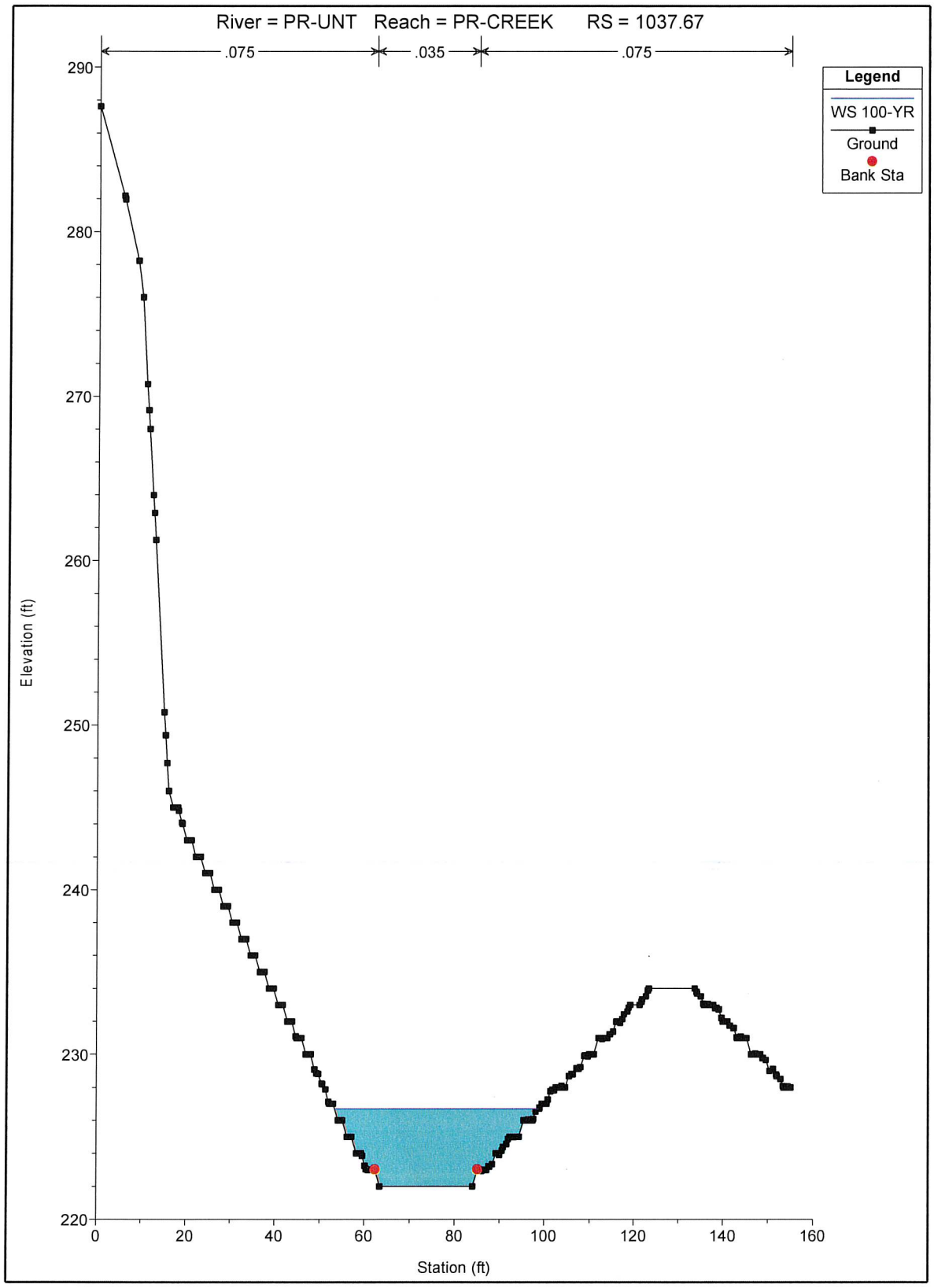
- Modeling 100-year flood for the proposed condition
- Adding 0.5' to the modeled flood elevation to delineate drainage easement per Act 167 requirements

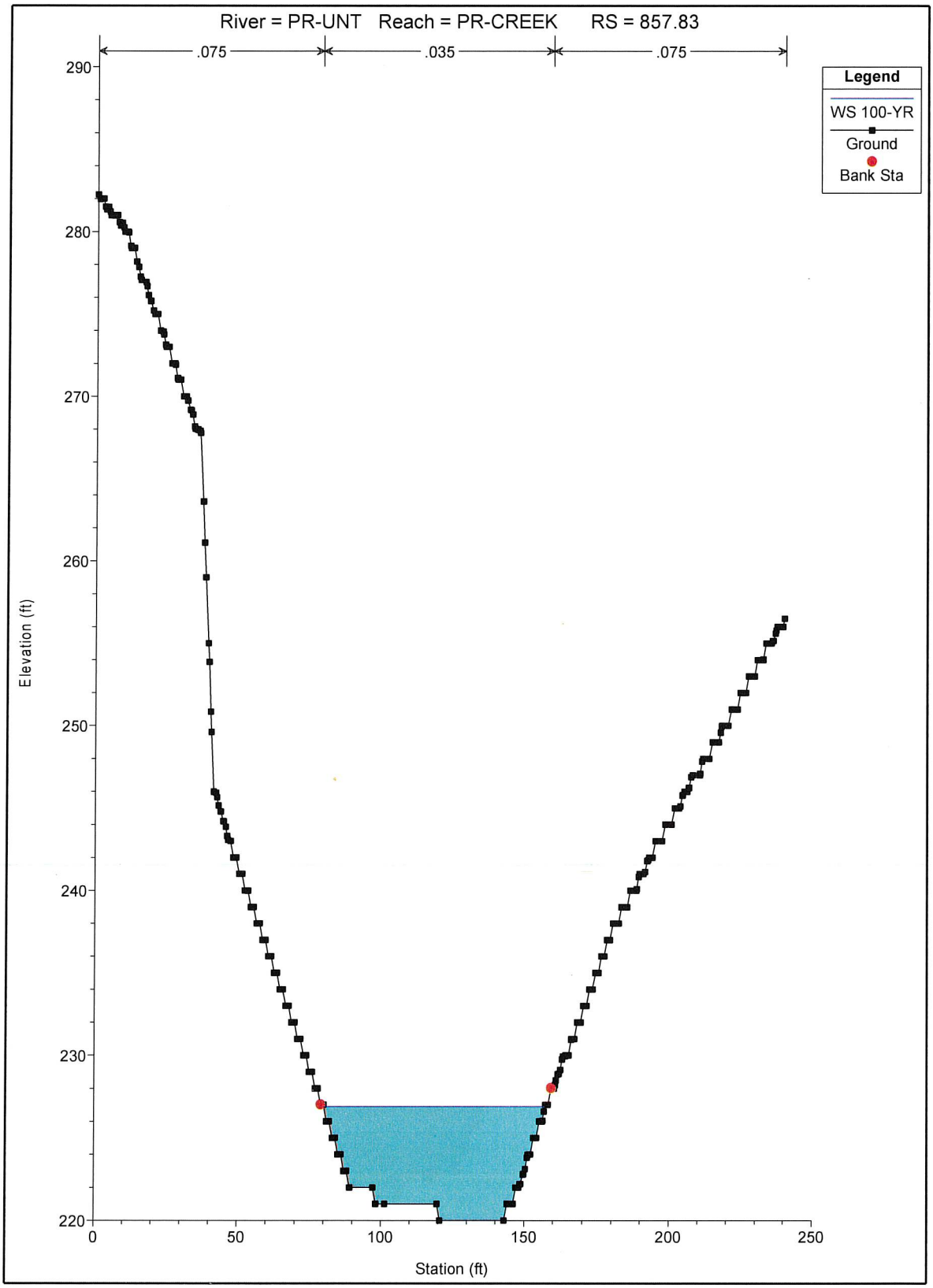
The hydraulic modeling was performed by employing HEC-RAS. The hydrological input to HEC-RAS was provided by the hydrological studies that were described in the previous section. Geometry of the project site as well as offsite locations (to evaluate impacts of proposed development on upstream, downstream, and adjacent properties) was defined based on the site survey. The terrain in the HEC-RAS was generated by exporting the corresponding surfaces from Civil 3D. There is one spot at which the tributary streams of UNT discharges into Bushkill Creek,

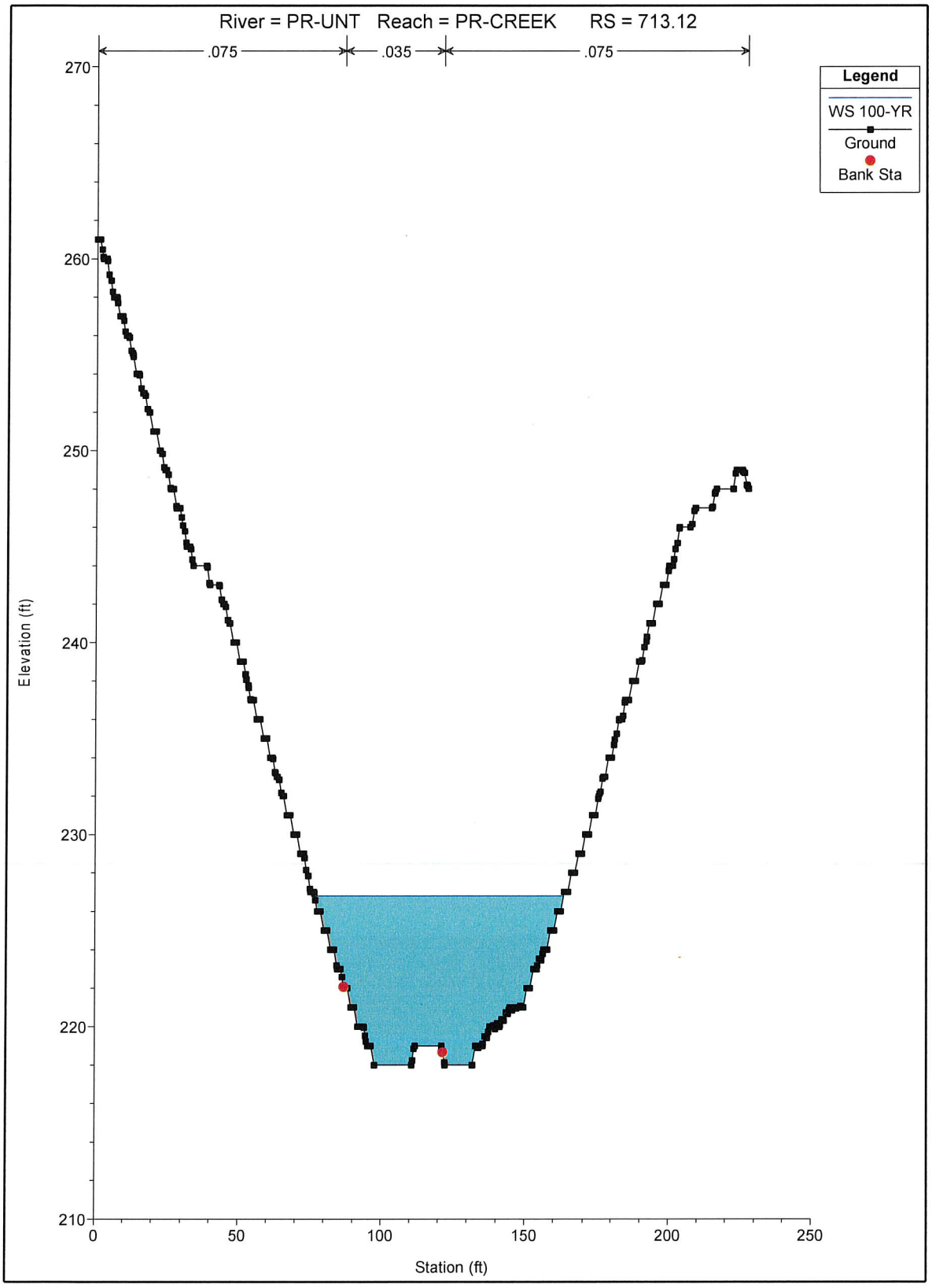
Appendix A

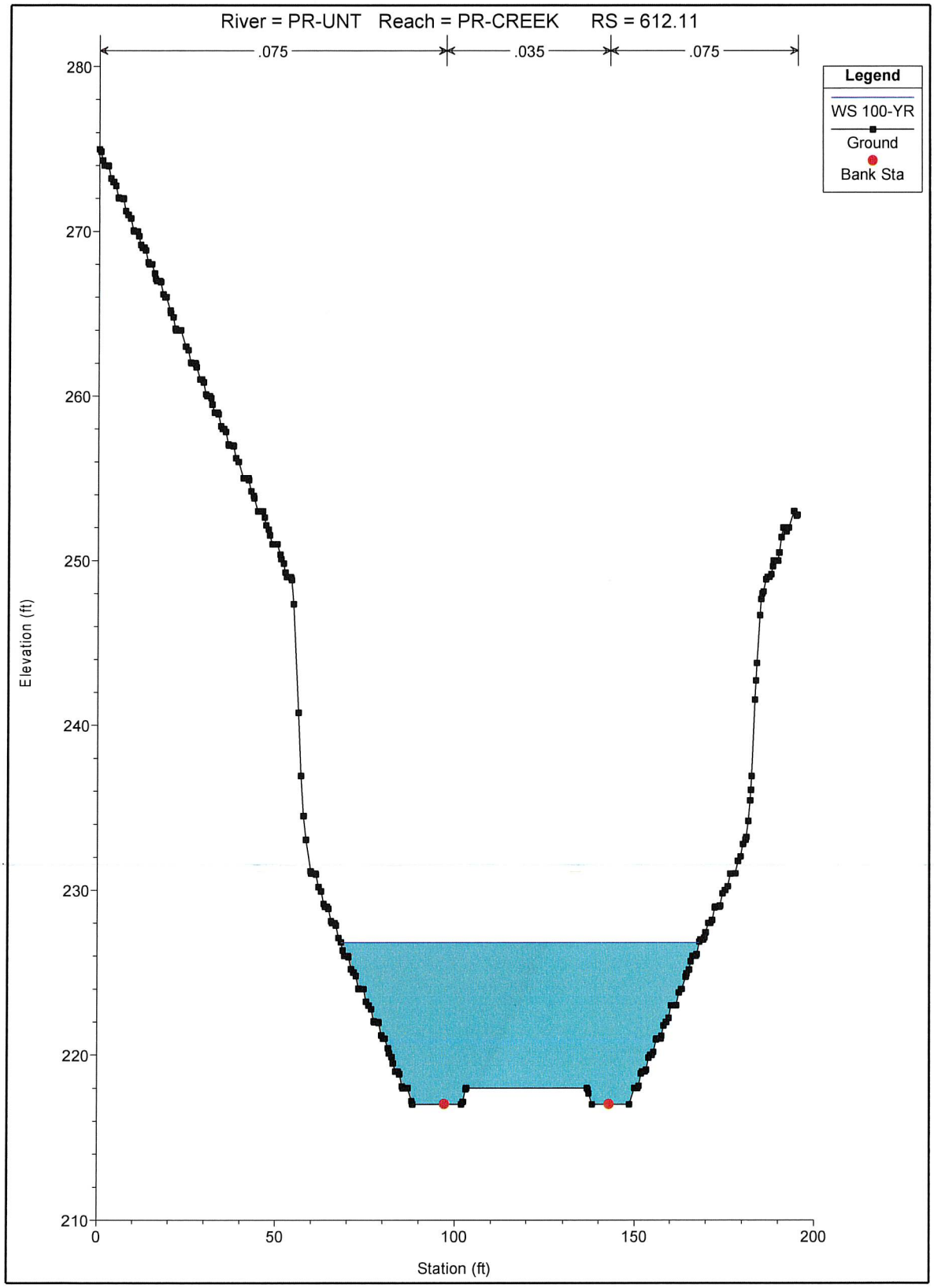
HEC-RAS Outputs

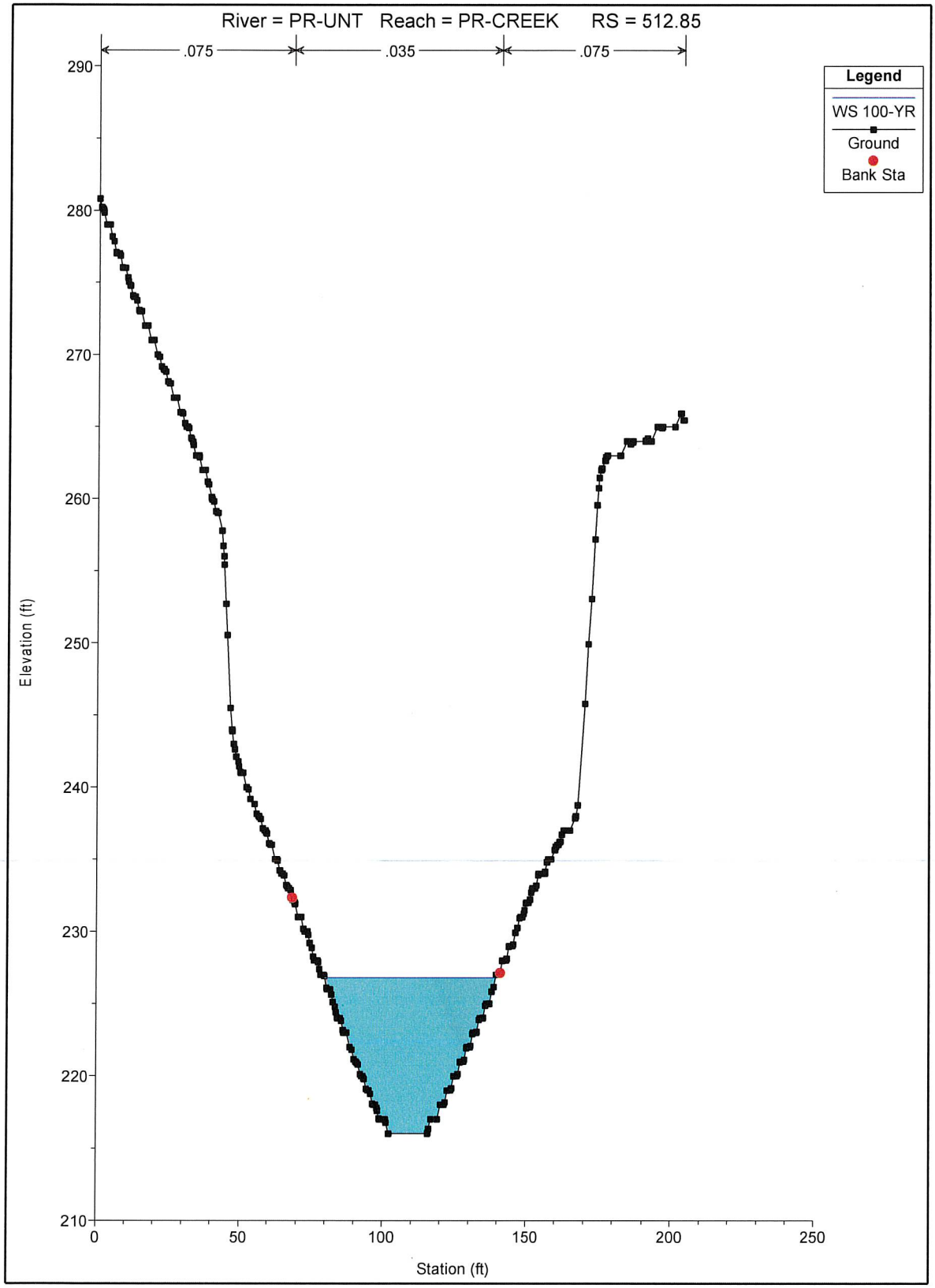

PR-UNT PR-CREEK
Legend
WS 100-YR
Ground
Elevation (ft)
260
250
240
230
220
210
200
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

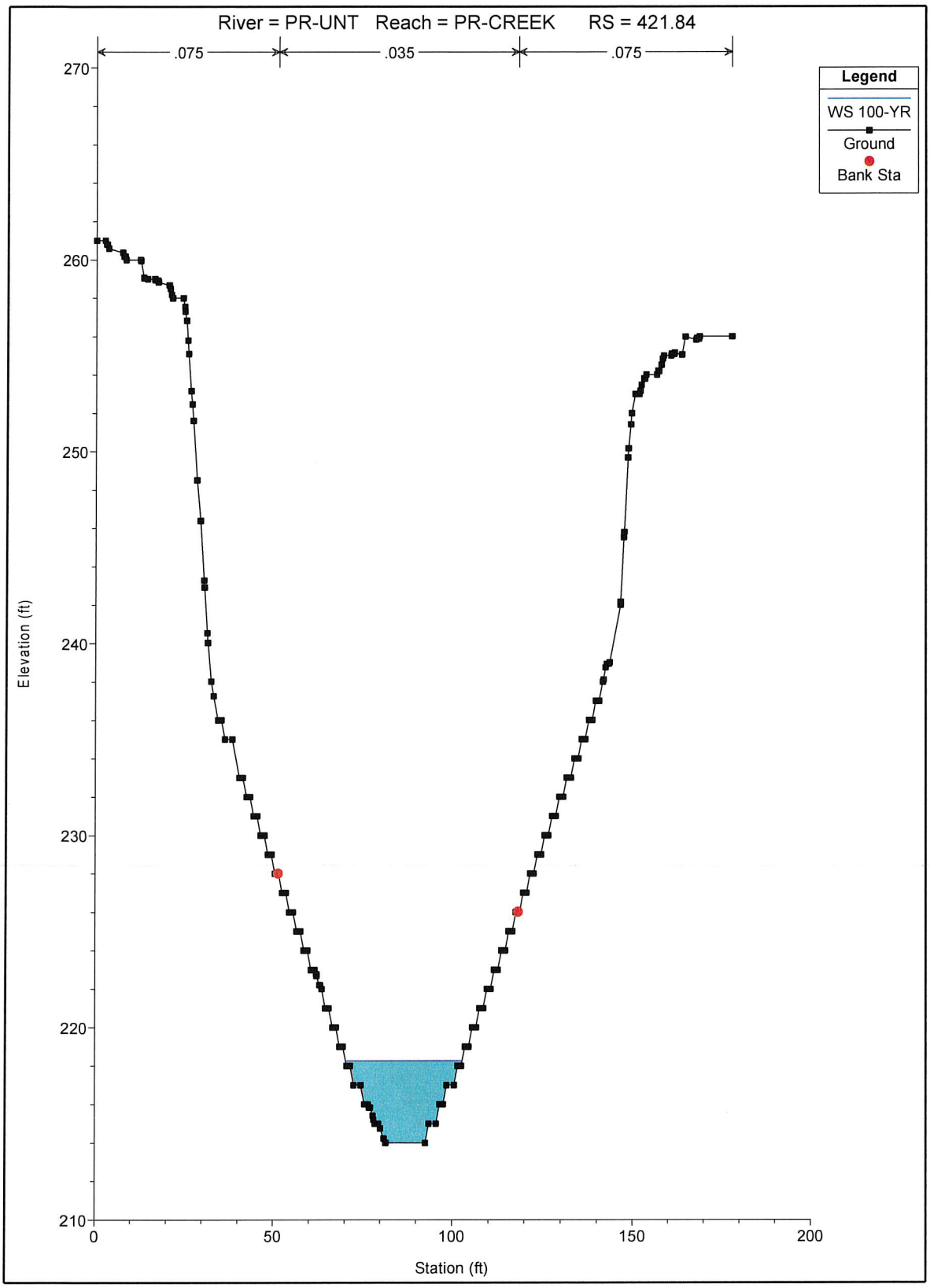

River = PR-UNT Reach = PR-CREEK RS = 1037.67
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
290
280
270
260
250
240
230
220
Elevation (ft)
0
20
40
60
80
100
120
140
160
Station (ft)

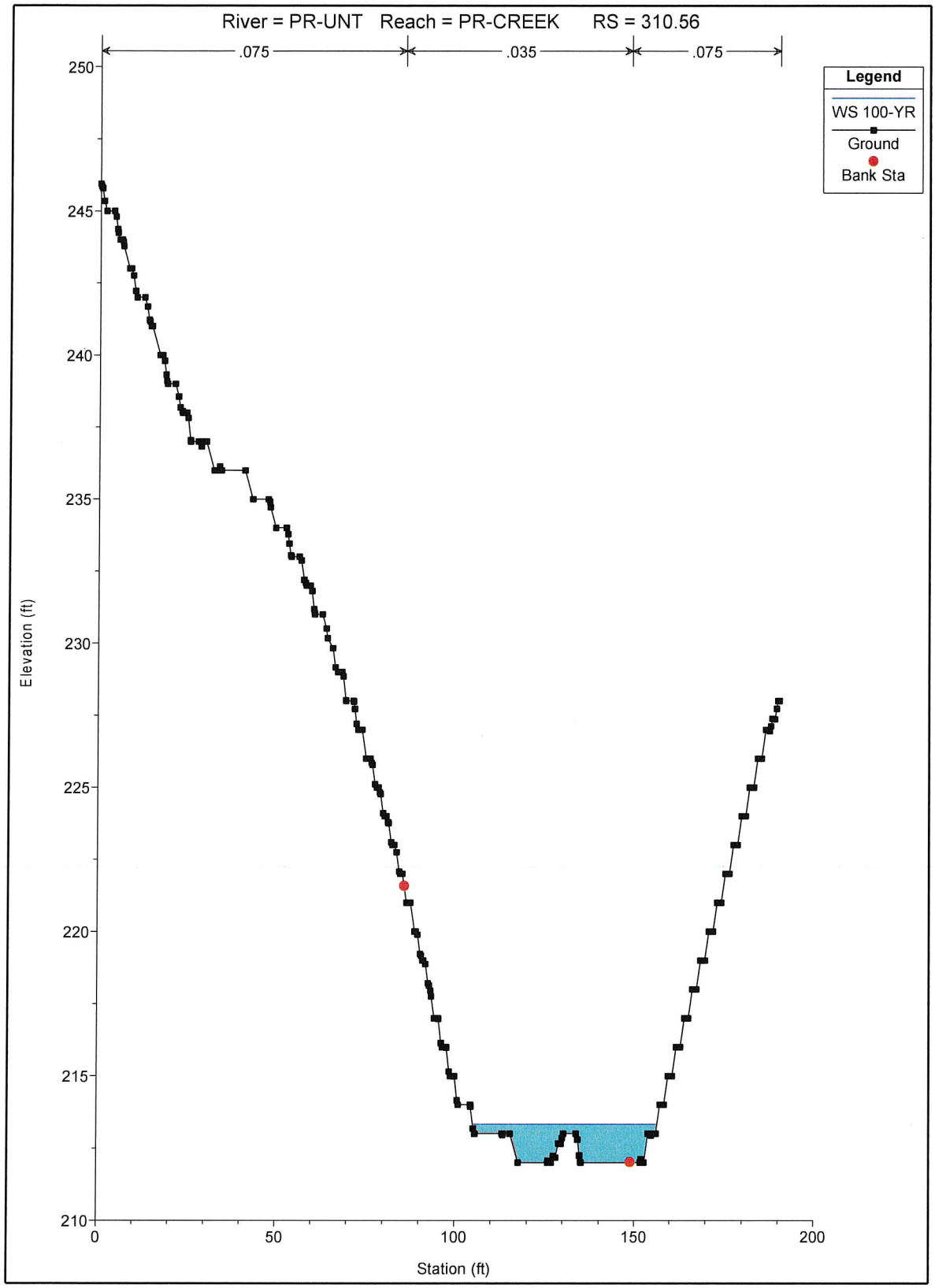

River = PR-UNT Reach = PR-CREEK RS = 857.83
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
290
280
270
260
250
240
230
220
Elevation (ft)
0
50
100
150
200
250
Station (ft)

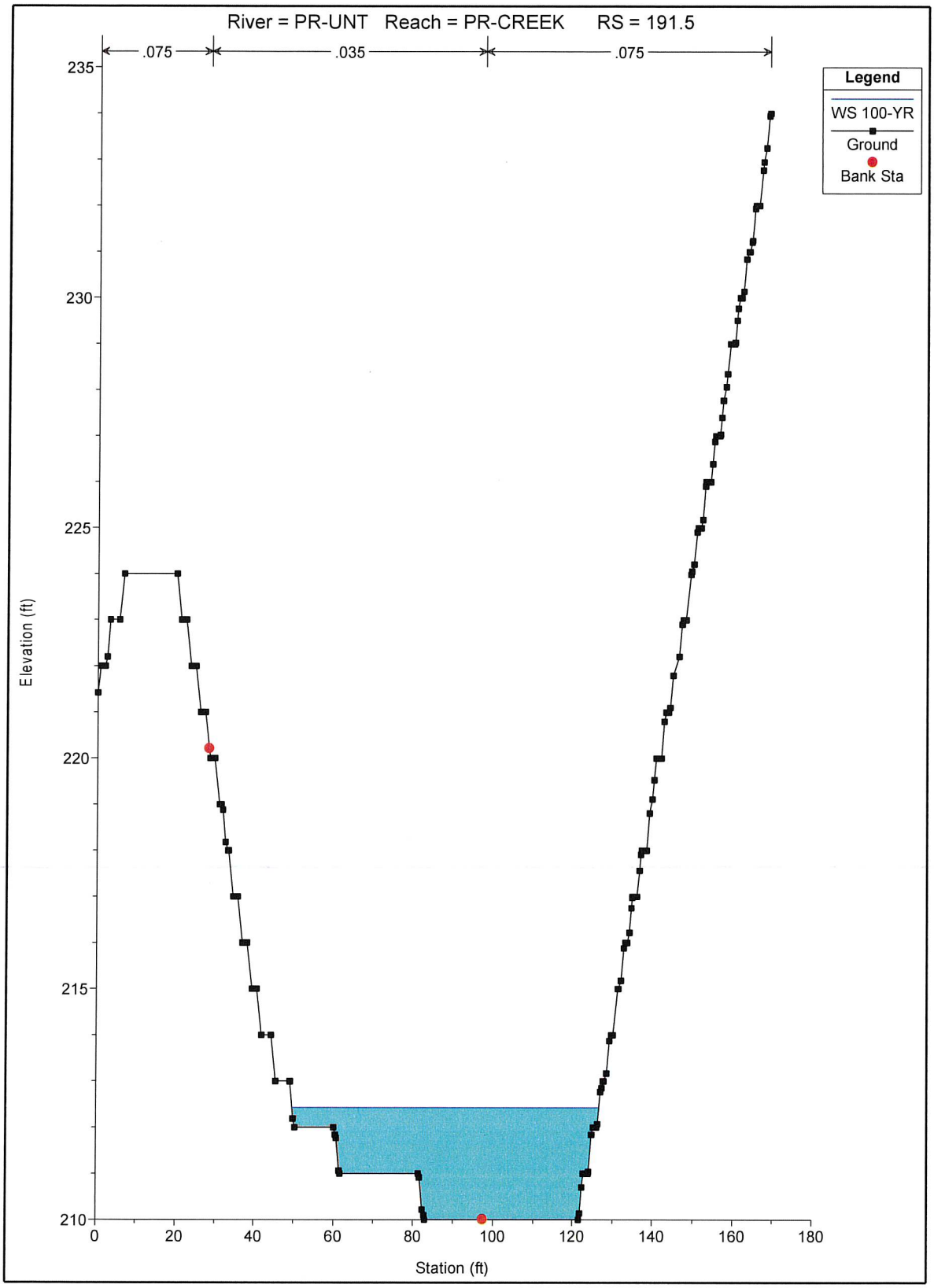

River = PR-UNT Reach = PR-CREEK RS = 713.12
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
270
260
250
240
230
220
210
Elevation (ft)
0
50
100
150
200
250
Station (ft)

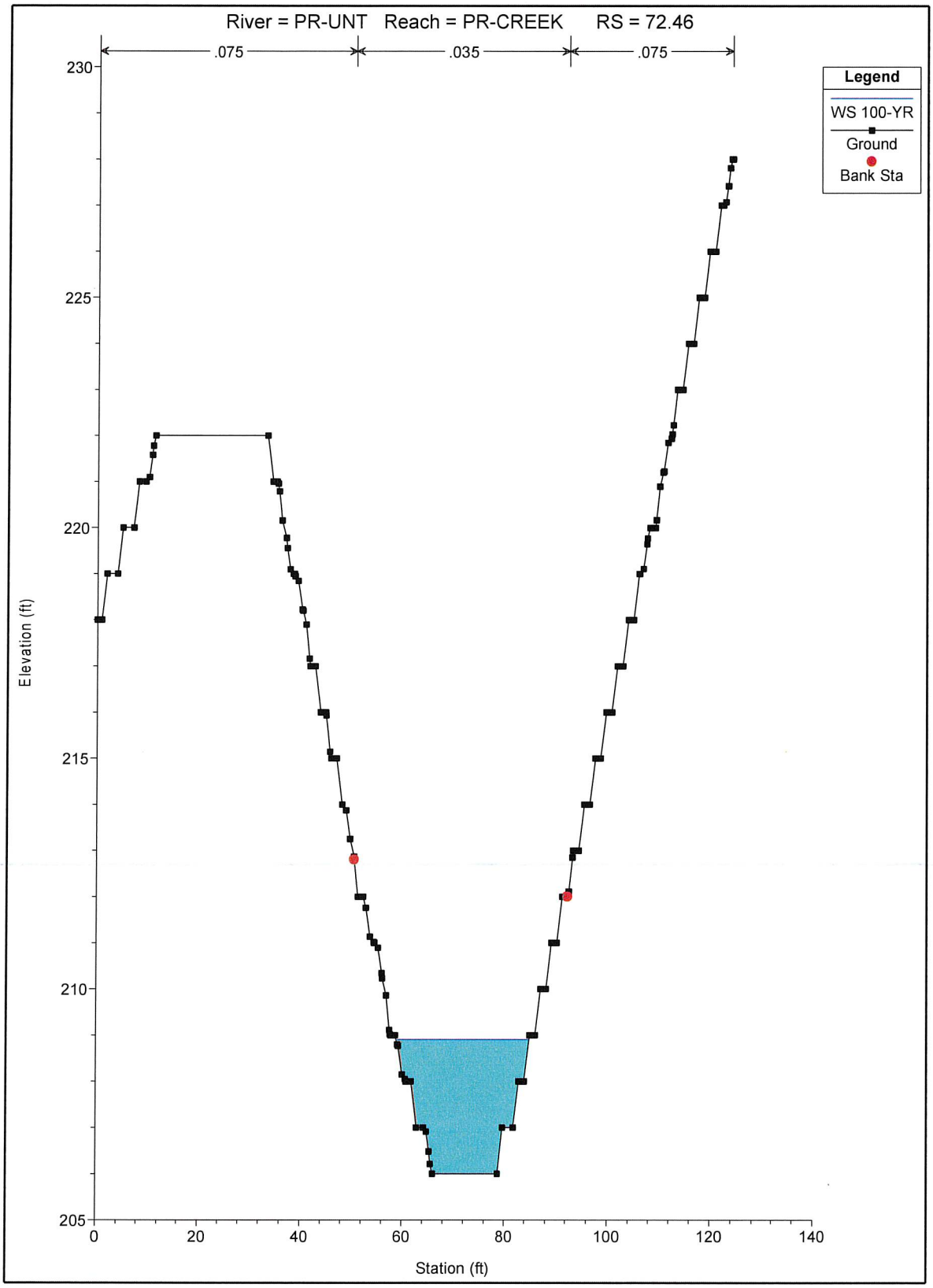

River = PR-UNT Reach = PR-CREEK RS = 612.11
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
Elevation (ft)
280
270
260
250
240
230
220
210
0
50
100
150
200
Station (ft)


River = PR-UNT Reach = PR-CREEK RS = 512.85
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
290
280
270
260
250
240
230
220
210
Elevation (ft)
0
50
100
150
200
250
Station (ft)


River = PR-UNT Reach = PR-CREEK RS = 421.84
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
270
260
250
240
230
220
210
Elevation (ft)
0
50
100
150
200
Station (ft)


River = PR-UNT Reach = PR-CREEK RS = 310.56
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
Elevation (ft)
250
245
240
235
230
225
220
215
210
0
50
100
150
200
Station (ft)


River = PR-UNT Reach = PR-CREEK RS = 191.5
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
235
230
225
220
215
210
Elevation (ft)
0
20
40
60
80
100
120
140
160
180
Station (ft)


River = PR-UNT Reach = PR-CREEK RS = 72.46
.075
.035
.075
Legend
WS 100-YR
Ground
Bank Sta
230
225
220
215
210
205
Elevation (ft)
0
20
40
60
80
100
120
140
Station (ft)

HEC-RAS Plan: Plan 09 River: PR-UNT Reach: PR-CREEK Profile: 100-YR

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)	
PR-CREEK	1110.72	100-YR	621.00	222.00	226.76	225.36	227.31	0.003161	6.14	121.60	37.47	0.52
PR-CREEK	1037.67	100-YR	621.00	222.00	226.69		227.08	0.002072	5.26	153.66	45.48	0.43
PR-CREEK	941.1	100-YR	621.00	220.00	226.91		226.94	0.000118	1.36	457.23	84.80	0.10
PR-CREEK	857.83	100-YR	621.00	220.00	226.89		226.93	0.000156	1.53	405.43	77.06	0.12
PR-CREEK	785.54	100-YR	621.00	221.00	226.72		226.90	0.000768	3.50	216.20	53.36	0.27
PR-CREEK	713.12	100-YR	621.00	218.00	226.80		226.84	0.000108	1.67	543.93	86.67	0.11
PR-CREEK	657.59	100-YR	621.00	217.00	226.81		226.83	0.000060	1.40	690.09	93.58	0.08
PR-CREEK	612.11	100-YR	621.00	217.00	226.81		226.82	0.000041	1.17	752.56	99.69	0.07
PR-CREEK	587.14	100-YR	621.00	216.00	226.78		226.82	0.000078	1.57	469.00	68.79	0.09
PR-CREEK	512.85	100-YR	621.00	216.00	226.78	219.31	226.81	0.000115	1.51	409.96	59.56	0.10
PR-CREEK	482		Culvert									
PR-CREEK	421.84	100-YR	621.00	214.00	218.26		218.97	0.007375	6.81	91.24	32.55	0.72
PR-CREEK	368.44	100-YR	621.00	214.00	217.22	217.22	218.38	0.015123	8.65	71.76	31.13	1.00
PR-CREEK	310.56	100-YR	621.00	212.00	213.32	214.14	216.27	0.126694	14.18	47.60	51.49	2.59
PR-CREEK	263.41	100-YR	621.00	211.00	213.26	213.02	213.64	0.012891	5.53	144.03	111.49	0.87
PR-CREEK	191.5	100-YR	621.00	210.00	212.42		212.81	0.010474	5.64	136.04	76.91	0.81
PR-CREEK	133.35	100-YR	621.00	208.00	211.39	211.39	212.08	0.013926	7.12	114.85	86.40	0.94
PR-CREEK	72.46	100-YR	621.00	206.00	208.90	209.40	210.80	0.026921	11.05	56.20	25.99	1.32
PR-CREEK	0	100-YR	621.00	204.05	208.20	208.01	209.24	0.012182	8.17	75.97	29.99	0.91